

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.



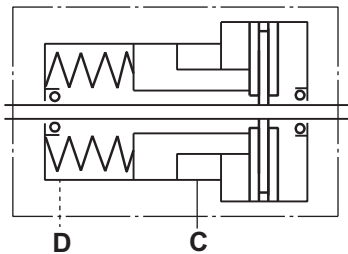
GENERAL

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.

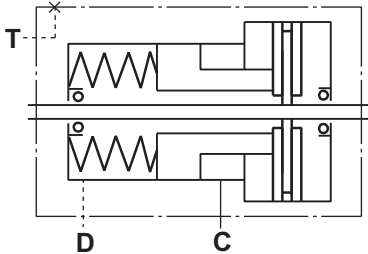
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LB, LBS

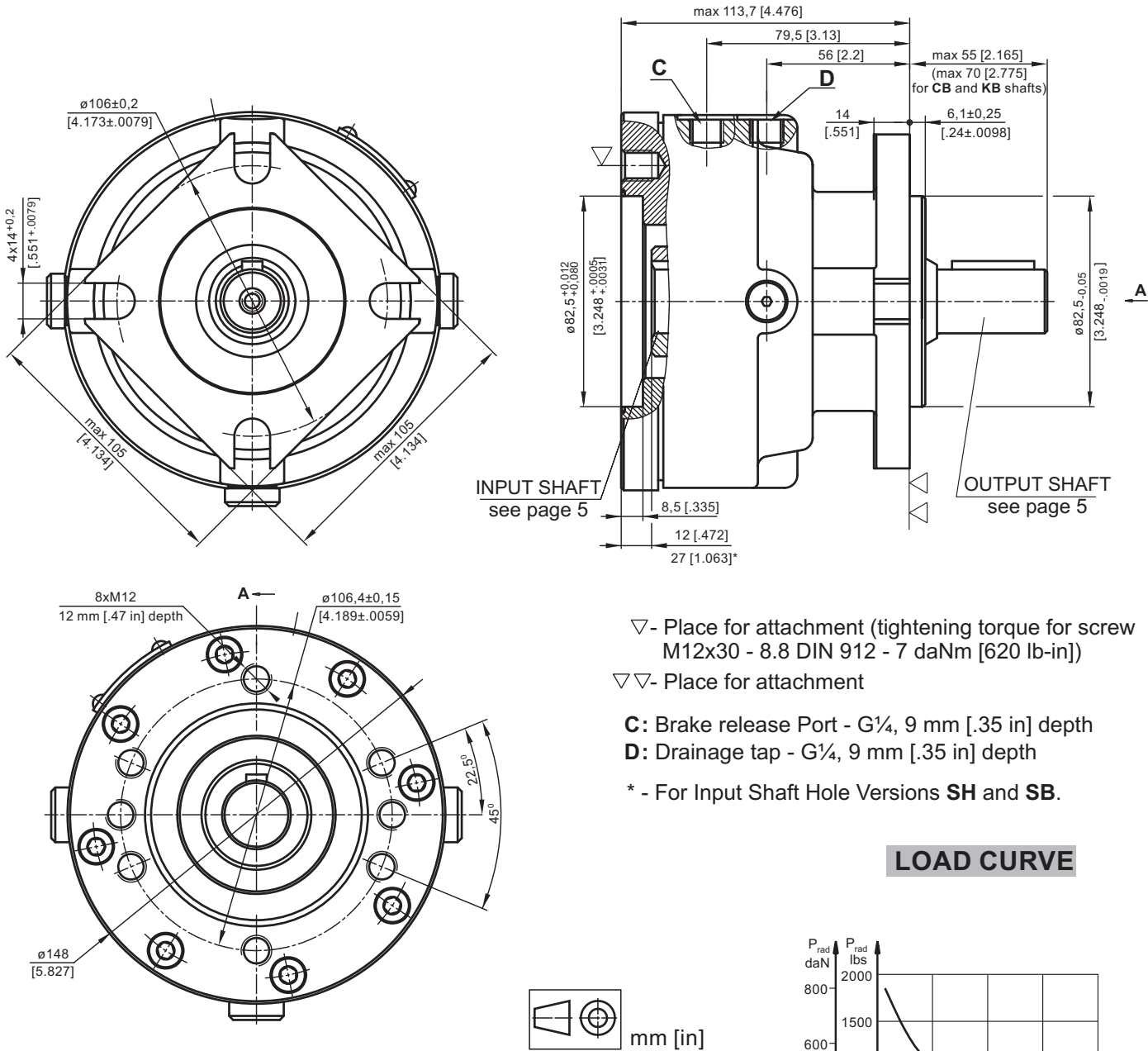


LBV



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 lb-in])

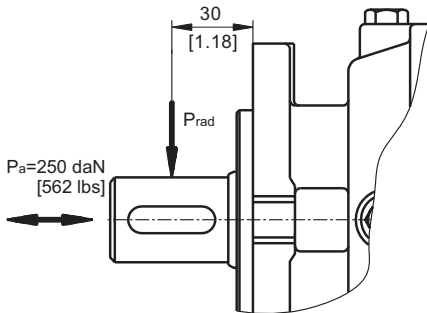
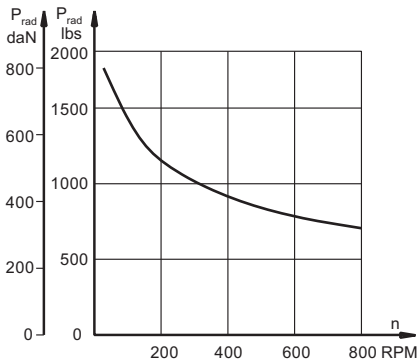
▽▽ - Place for attachment

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

D: Drainage tap - G $\frac{1}{4}$, 9 mm [.35 in] depth

* - For Input Shaft Hole Versions SH and SB.

LOAD CURVE

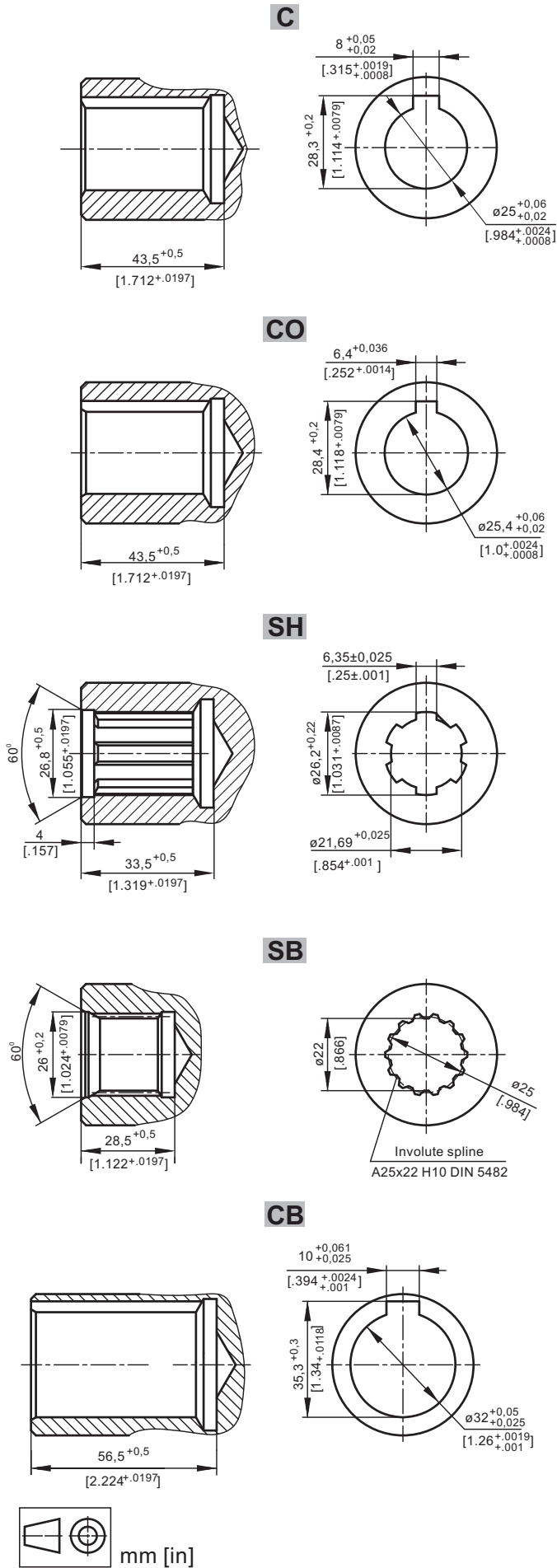


SPECIFICATION DATA

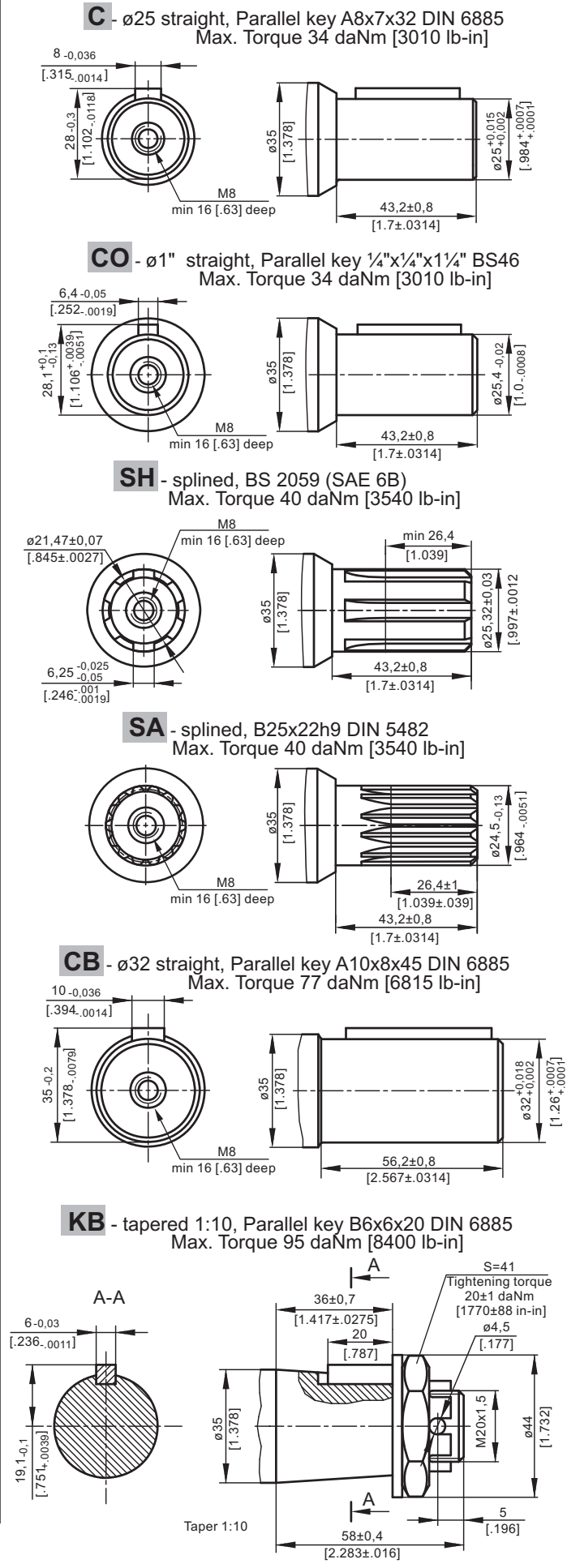
Description LB/288...	7	14	21	32	43	63
*Min. Static Torque, daNm [lb-in]	6-8 [531-708]	13-15 [1150-1327]	20-22 [1770-1947]	31-34 [2743-3009]	41-45 [3628-3982]	61-64 [5399-5665]
Opening Pressure, min bar [PSI]	4-5 [58-73]	8-9 [116-130]	12-13 [174-188]	18-20 [260-290]	24-26 [348-377]	38-39 [550-565]
max	300 [4350]					
Min. oil quantity for brake releasing, cm ³ [in ³]	7 - 8 [.427 - .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

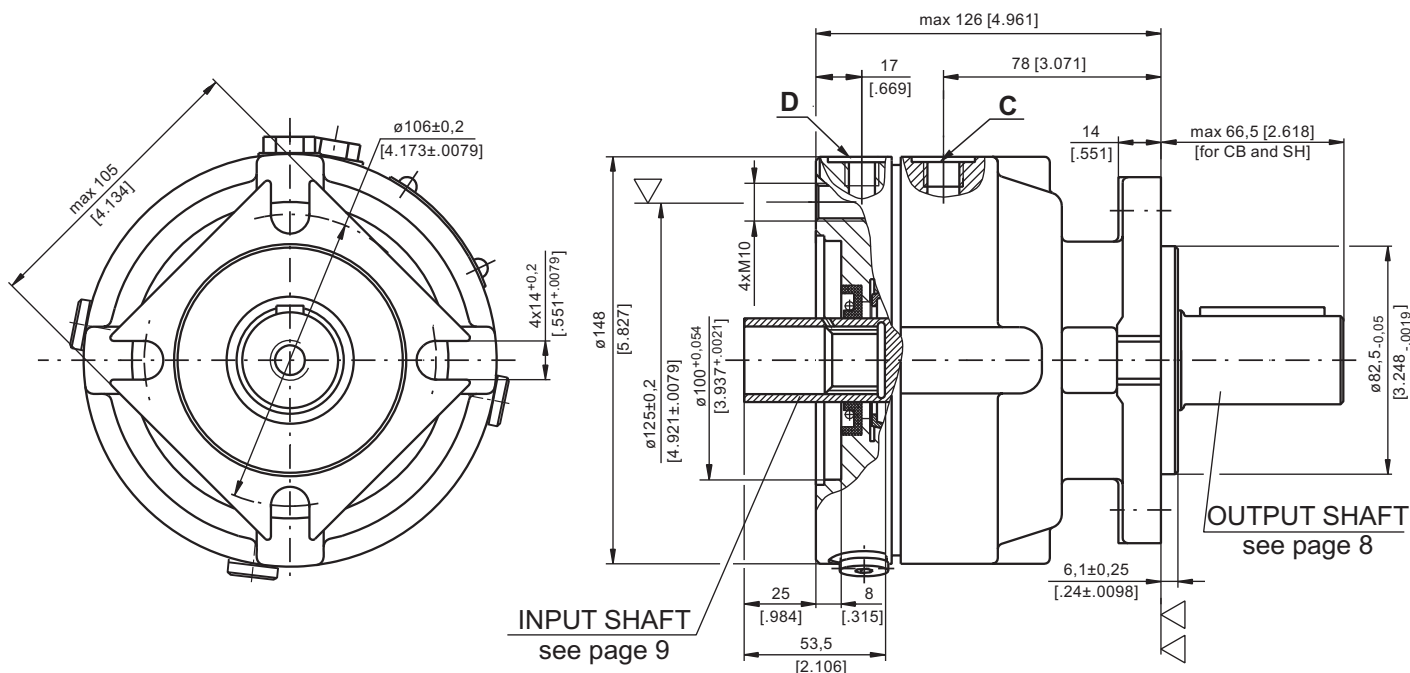


OUTPUT SHAFT EXTENSIONS



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

TYPE LBS/289



▽ - Place for attachment:

LBS - tightening torque for screw M10x35 - 8.8 DIN 912 - 5 daNm [440 lb-in]

LBV - tightening torque for screw M10xL - 12.9 DIN 931 - 6⁺¹ daNm [530⁺⁹⁰ lb-in]

▽▽ - Place for attachment



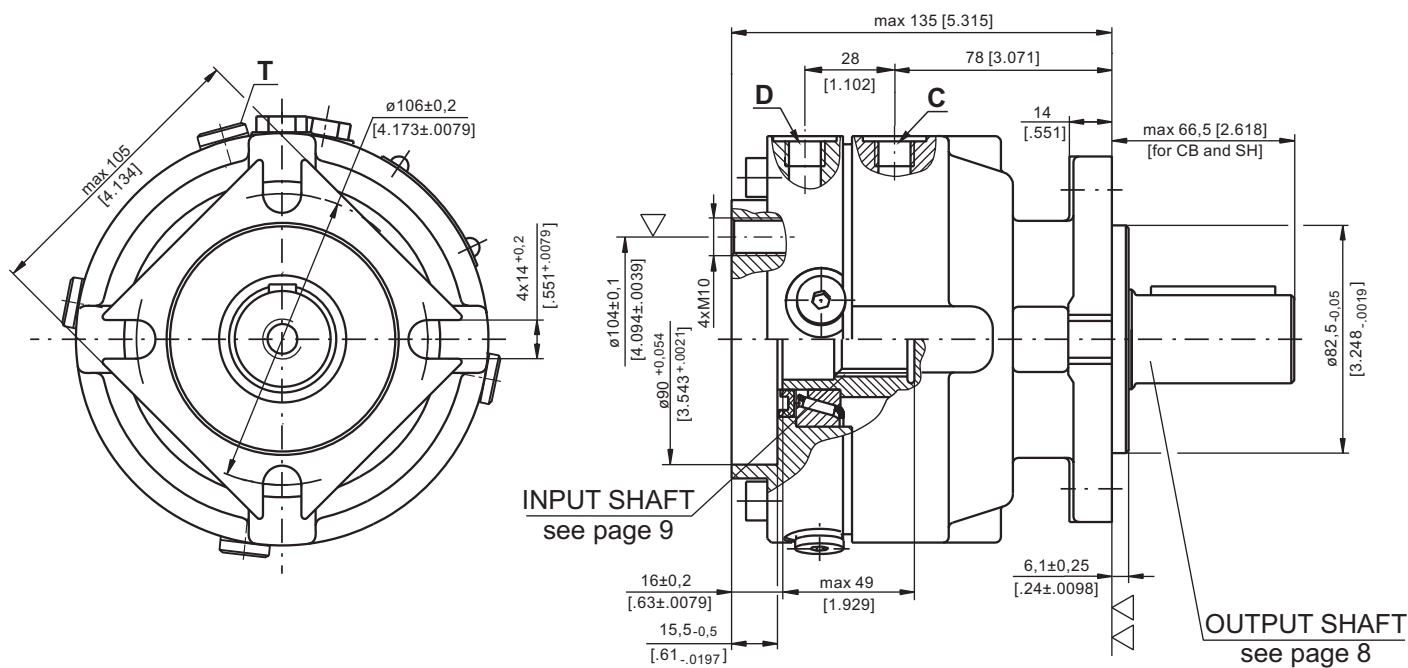
mm [in]

C: Brake release Port - G $\frac{1}{4}$, 9 mm [0.35 in] depth

D: Drain plug for the Brake - G $\frac{1}{4}$, 9 mm [0.35 in] depth

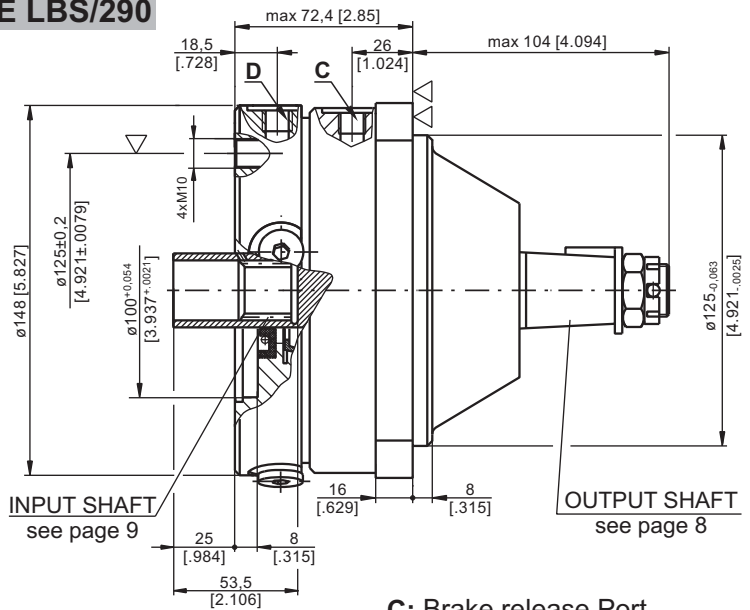
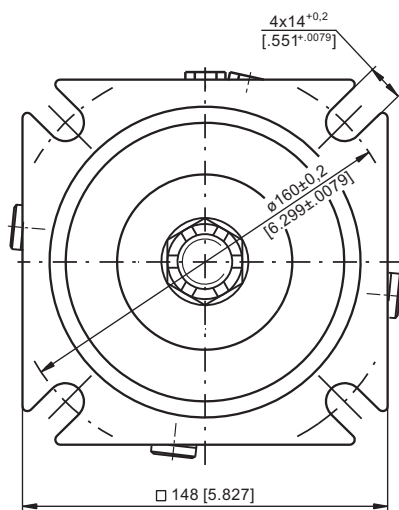
T: Drain plug for the Motor - G $\frac{1}{4}$, 9 mm [0.35 in] depth

TYPE LBV/289



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

TYPE LBS/290



▽ - Place for attachment:

LBS - tightening torque for screw M10x35 - 8.8 DIN 912 - 5 daNm [440 lb-in]

LBV - tightening torque for screw M10xL - 12.9 DIN 931 - 6⁺ daNm [530⁺⁹⁰ lb-in]

▽▽ - Place for attachment

C: Brake release Port

- G¹/₄, 9 mm [0.35 in] depth

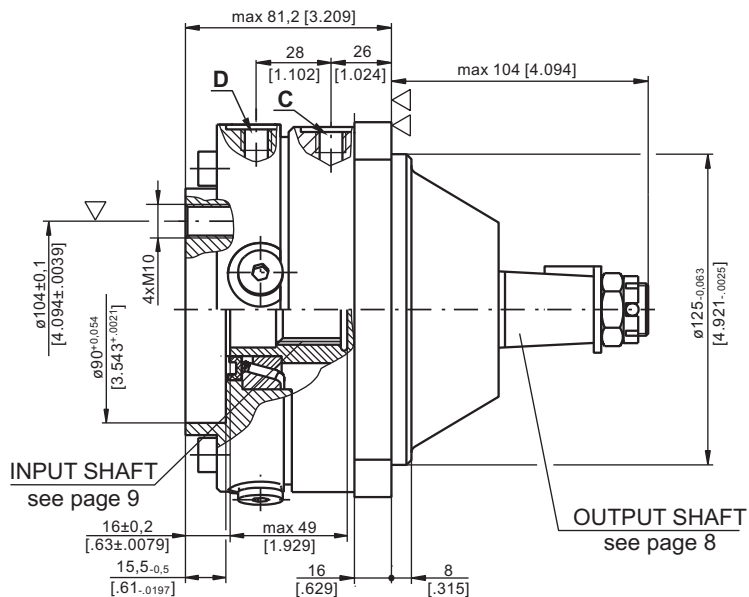
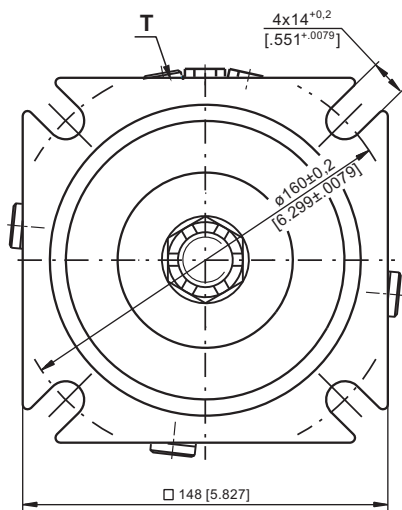
D: Drain plug for the Brake

- G¹/₄, 9 mm [0.35 in] depth

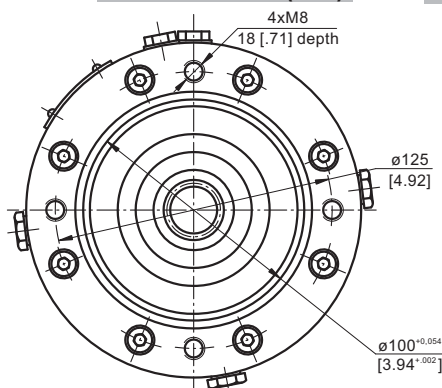
T: Drain plug for the Motor

- G¹/₄, 9 mm [0.35 in] depth

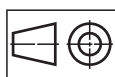
TYPE LBV/290



TYPE LBS/289(290)

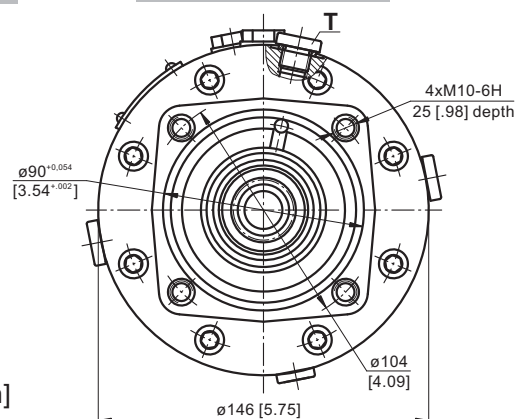


INPUT FACE For Versions 289 and 290



mm [in]

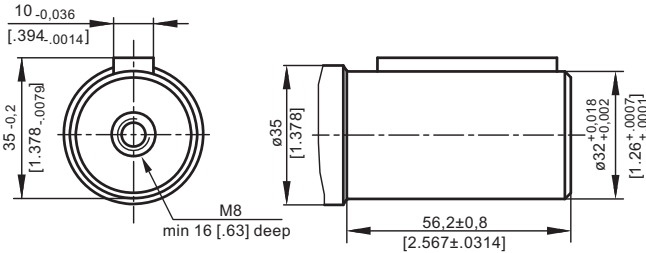
TYPE LBV/289(290)



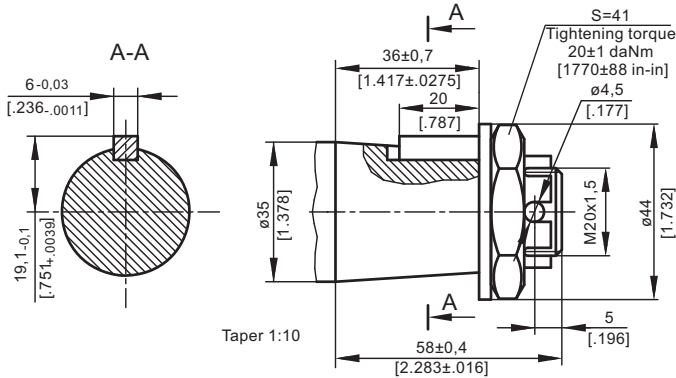
M+S HYDRAULIC

OUTPUT SHAFT EXTENSIONS

CB - ø32 straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm [6815 lb-in]

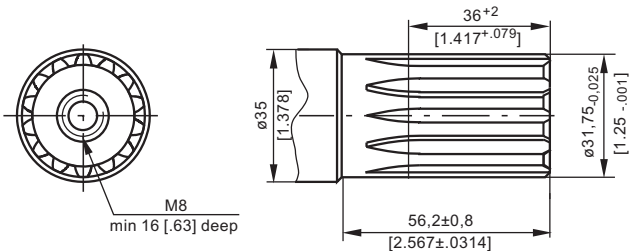


KB - tapered 1:10, Parallel key B6x6x20 DIN 6885
Max. Torque 95 daNm [8400 lb-in]



SPECIFICATION DATA

SH - ø1¼" 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 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 [.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]			

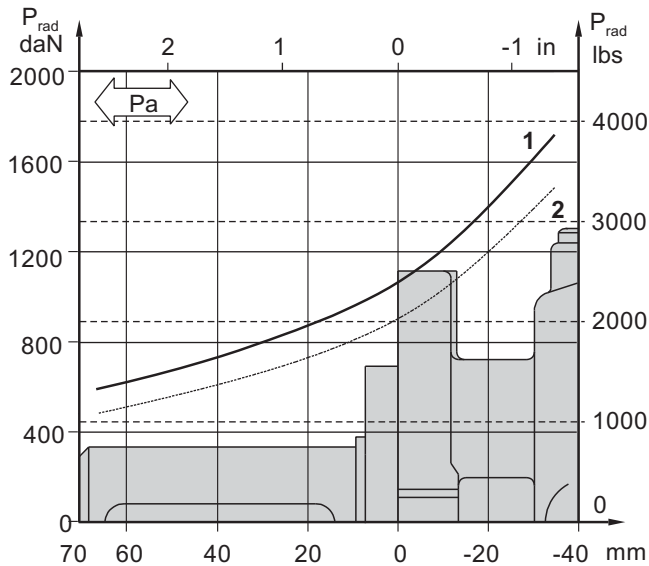
*Static torque is obtained at working pressure - 0 bar [0 PSI].

LOAD CURVE

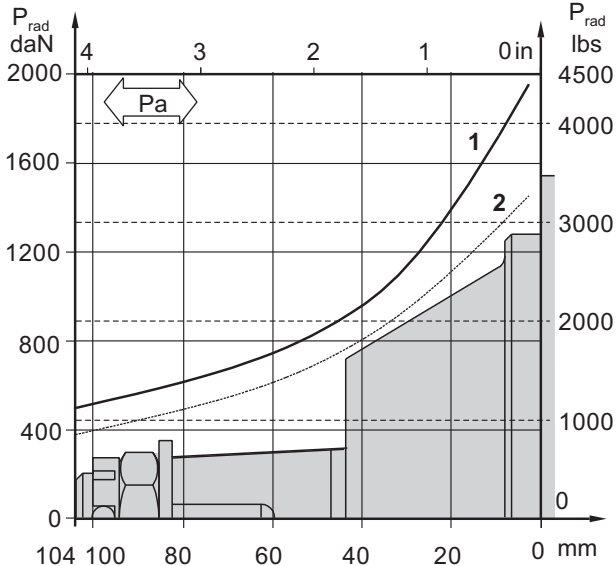
The curve applies to a B10 bearing life of 3000 hours at 200 RPM.

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

LBS(V)/289



LBS(V)/290

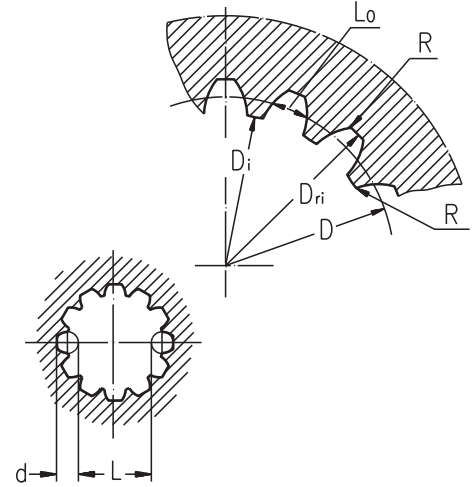


INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

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	+.031	+1,0	+.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** - ø25 straight, Parallel key A8x7x32 DIN 6885
CO - ø1" straight, Parallel key ¼"x¼"x1¼" BS46
SH - ø25,32 splined BS 2059 (SAE 6B)
SA - ø24,5 splined B25x22 DIN 5482

CB - ø32 straight, Parallel key A10x8x45 DIN 6885**KB** - ø35 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** - ø32 straight, Parallel key A10x8x45 DIN 6885
KB - ø35 tapered 1:10, Parallel key B6x6x20 DIN6885
SH - ø1¼" 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.

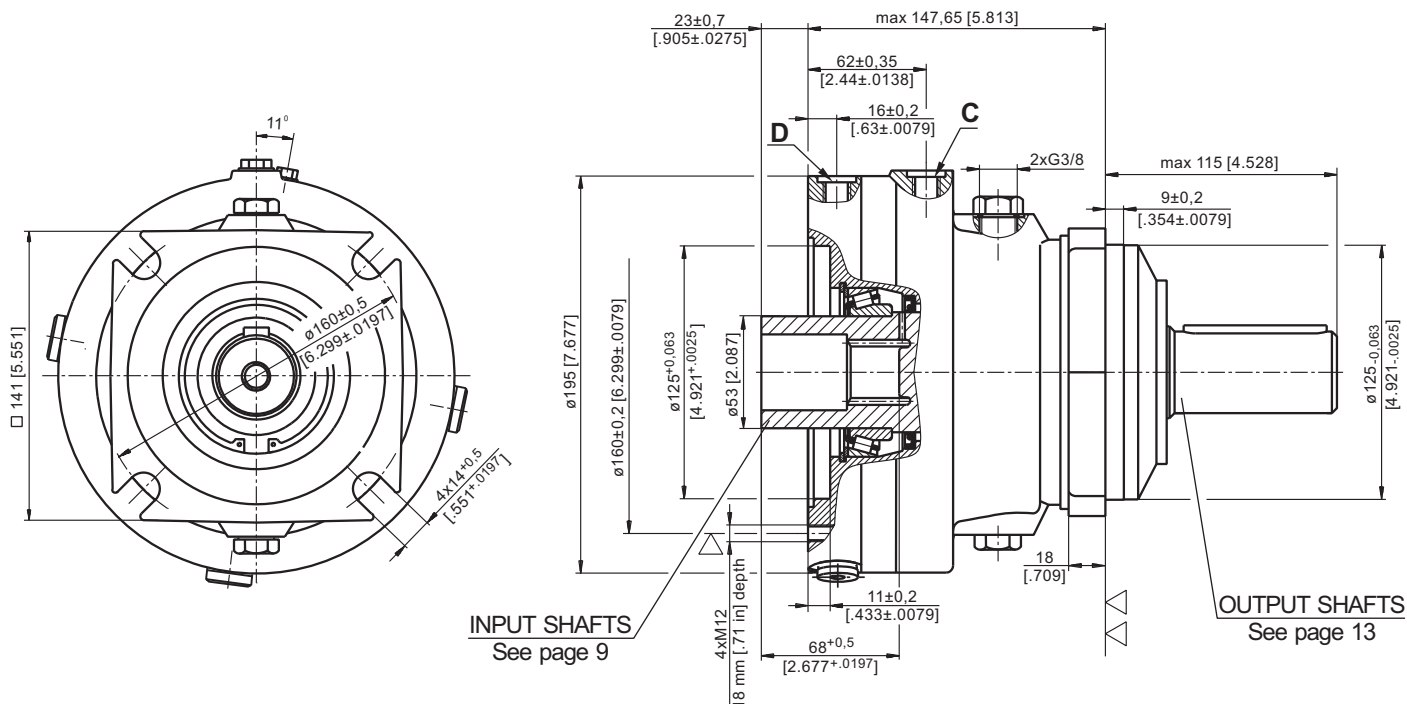
The Disc Brakes are manganophosphatized as standard.

ATTENTION:

- 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 MTS AND MTV HYDRAULIC MOTORS

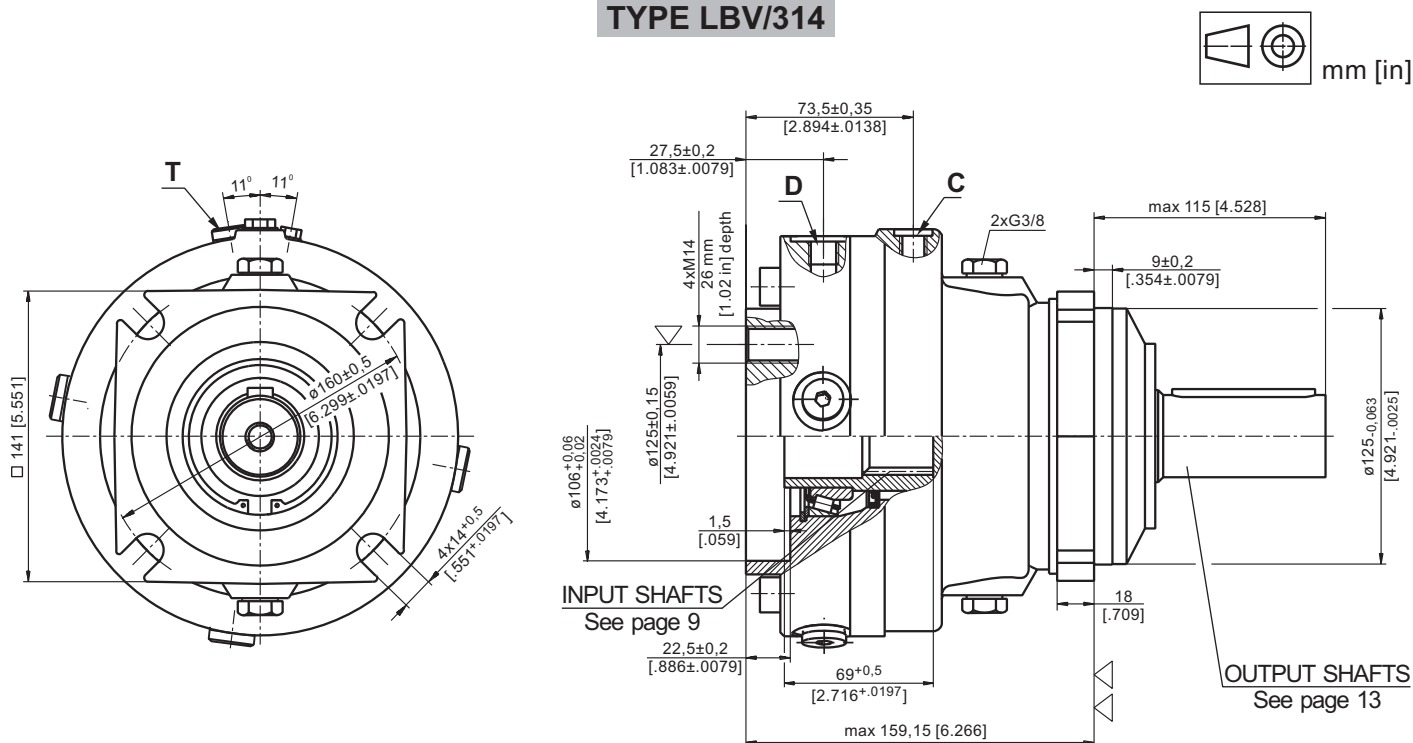
TYPE LBS/314



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

▽▽ - Place for attachment

TYPE LBV/314

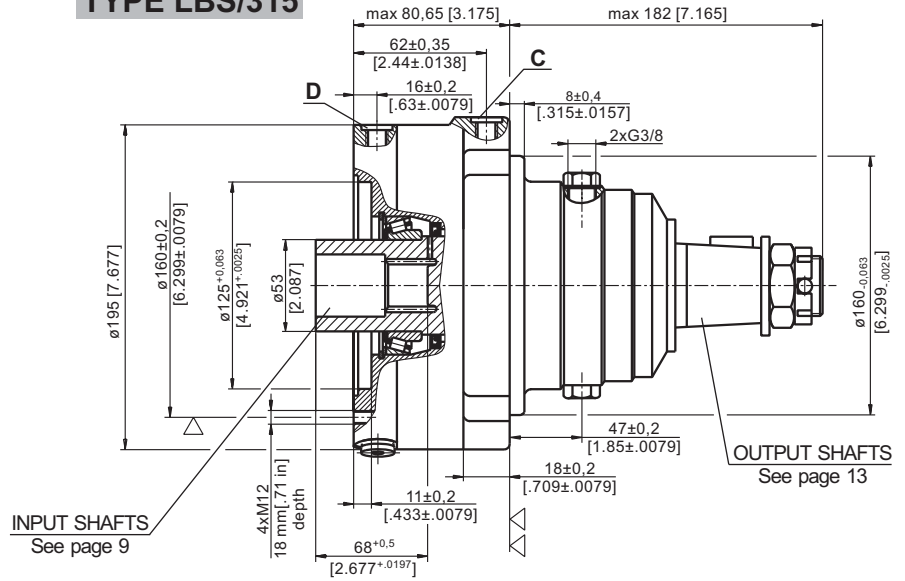
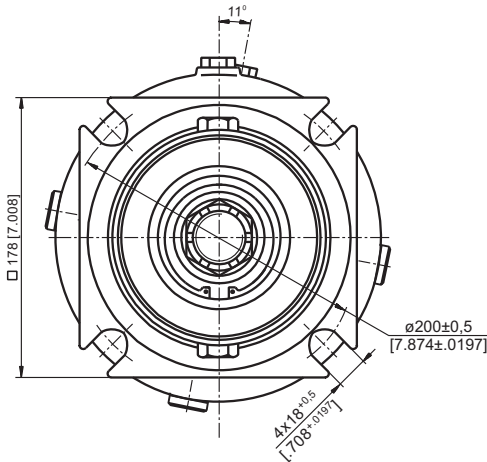


▽ - Place for attachment
(tightening torque for screw M14xL - 8.8 DIN 912,
11,5 daNm [1020 lb-in])

▽▽ - Place for attachment

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

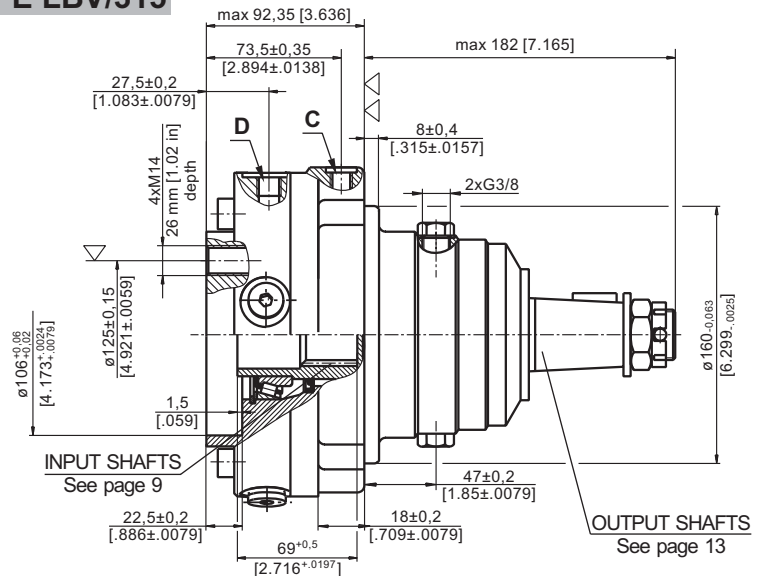
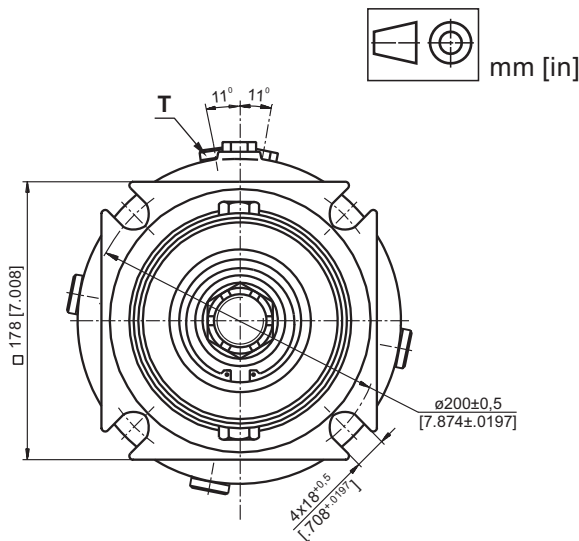
TYPE LBS/315



- ▽ - 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

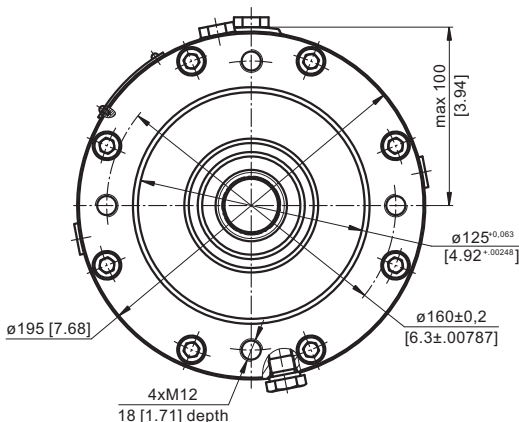


- ▽ - Place for attachment (tightening torque for screw M14xL - 8.8 DIN 912, 11,5 daNm [1020 lb-in])
▽▽ - Place for attachment

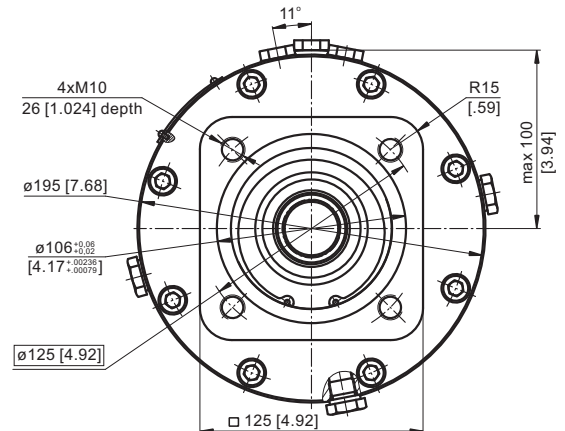
C: Brake release Port - G $\frac{1}{4}$, 9 mm [.35 in] depth
D: Drain plug for the Brake - G $\frac{1}{4}$, 9 mm [.35 in] depth
T: Drain plug for the Motor - G $\frac{1}{4}$, 9 mm [.35 in] depth

INPUT FACE For Versions 314 and 315

TYPE LBS/314(315)



TYPE LBV/314(315)



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 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 cm³ [in³]	8-9 [.488-.549]						
Oil volume cm³ [in³]	250						
Max. Pressure in drain space bar [PSI]	5 [72]						
Weight for .../314 kg [lb]	24 [52.9]						
	.../315 25 [55.1]						

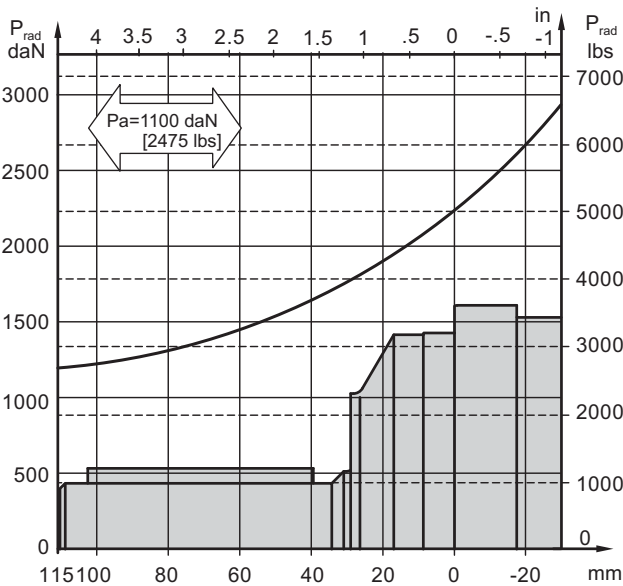
*Static torque is obtained at working pressure - 0 bar.

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

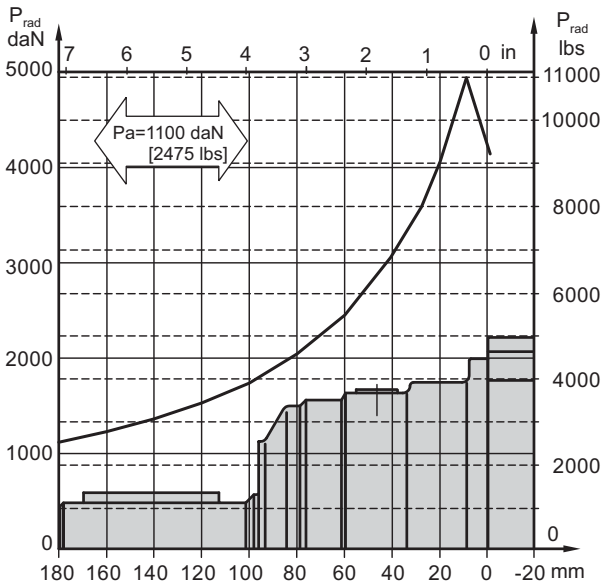
Brakes must always have a drain line

LOAD CURVE

LBS(V) ... /314

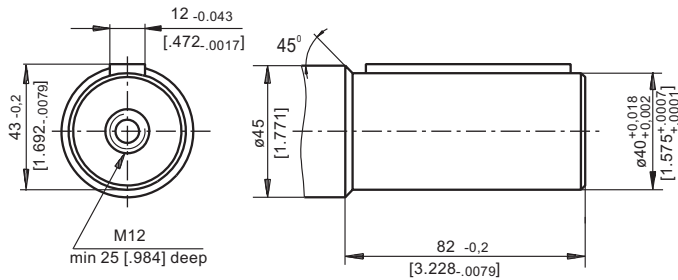


LBS(V) ... /315

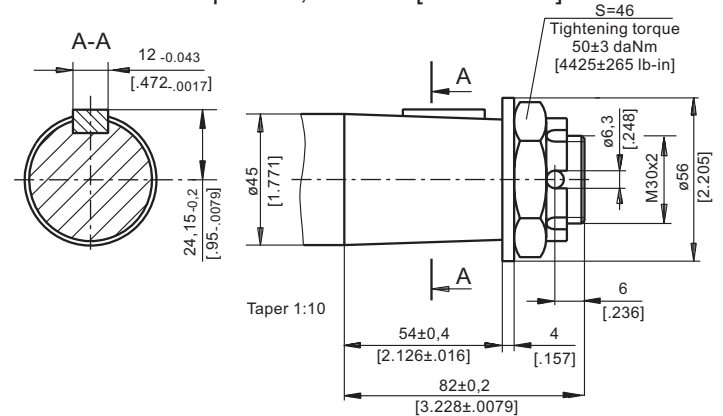


OUTPUT SHAFT EXTENSIONS

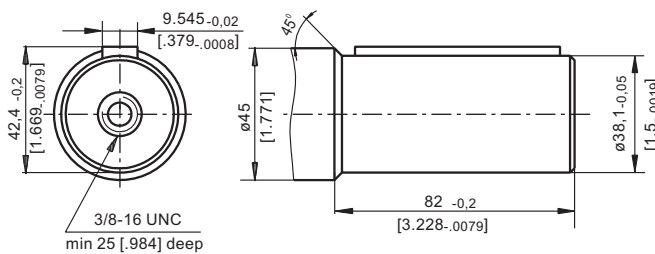
C - $\varnothing 40$ straight, Parallel key A12x8x70 DIN 6885
Max. Torque 132,8 daNm [11755 In-in]



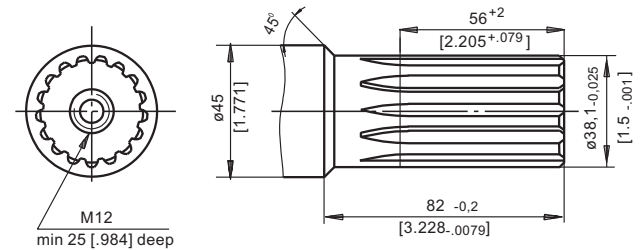
K -tapered 1:10, Parallel key B12x8x28 DIN 6885
Max. Torque 210,7 daNm [18650 lb-in]



CO - $\varnothing 1\frac{1}{2}$ " straight, Parallel key $\frac{3}{8}$ " x $\frac{3}{8}$ " x $2\frac{1}{4}$ " BS46
Max. Torque 132,8 daNm [11755 In-in]



SH - $\varnothing 1\frac{1}{2}$ " 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 - $\varnothing 1\frac{1}{2}$ " straight, Parallel key $\frac{3}{8}$ " x $\frac{3}{8}$ " x $2\frac{1}{4}$ " BS46
SH - $\varnothing 1\frac{1}{2}$ " 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.

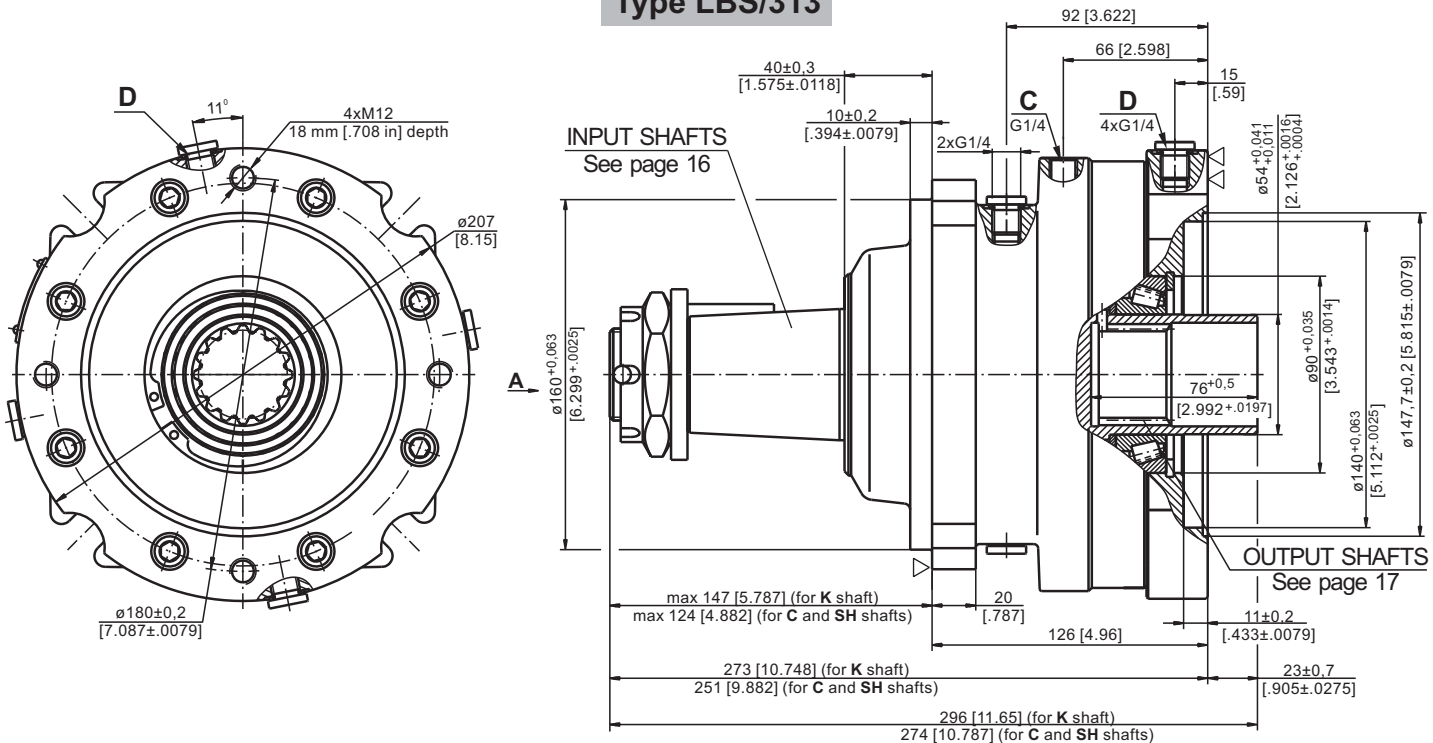
ATTENTION:

- 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

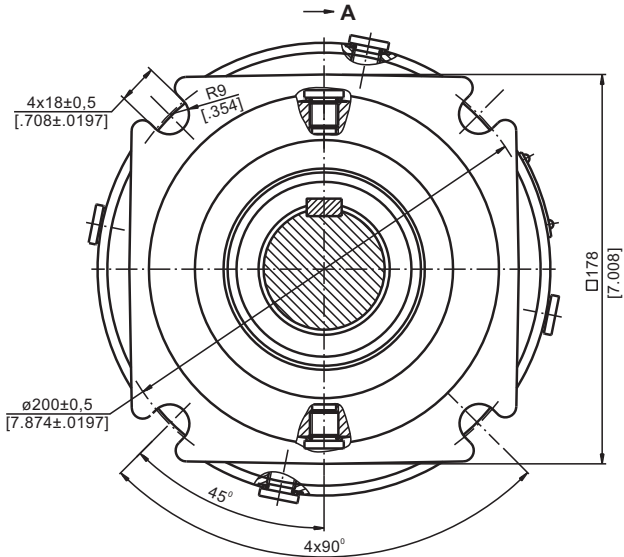
FOR FLANGE ATTACHMENT TO MVS HYDRAULIC MOTORS

Type LBS/313

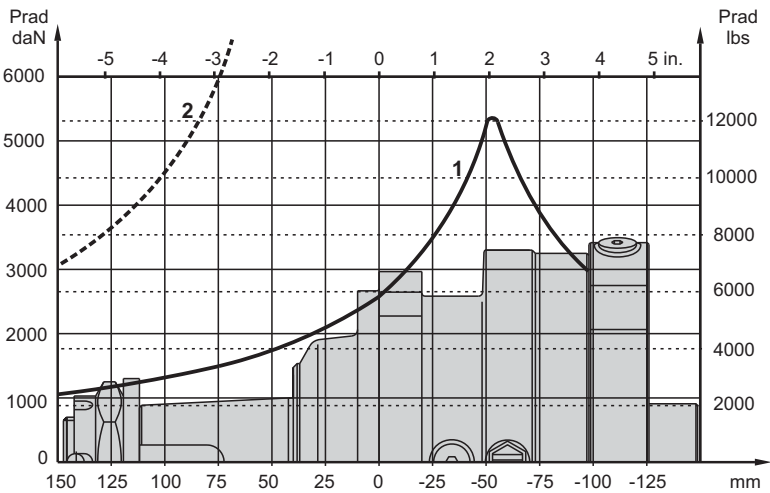


C: Brake release Port - G1/4, 12 mm [.47 in] depth
D: Drainage tap - G1/4, 12 mm [.47 in] depth

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



PERMISSIBLE SHAFT LOADS

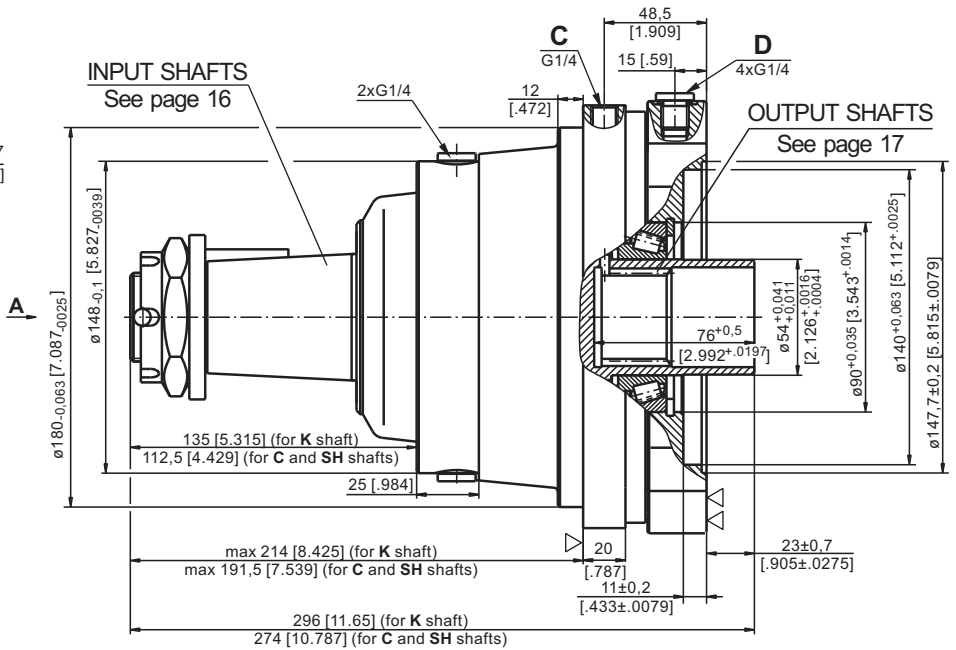
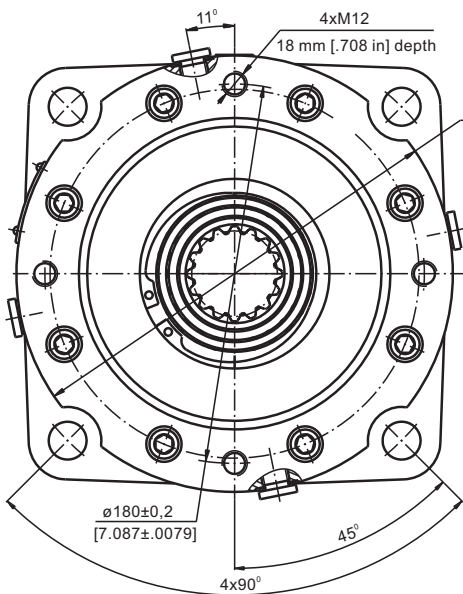


1 - Bearing curve: The curve applies to a B10 bearing life of 3000 hours at 200 RPM.
2 - Shaft curve: The curve represents Max. permissible radial shaft load with safety factor 3:1.

HYDRAULIC DISC BRAKES

FOR FLANGE ATTACHMENT TO MVS HYDRAULIC MOTORS

Type LBS/316

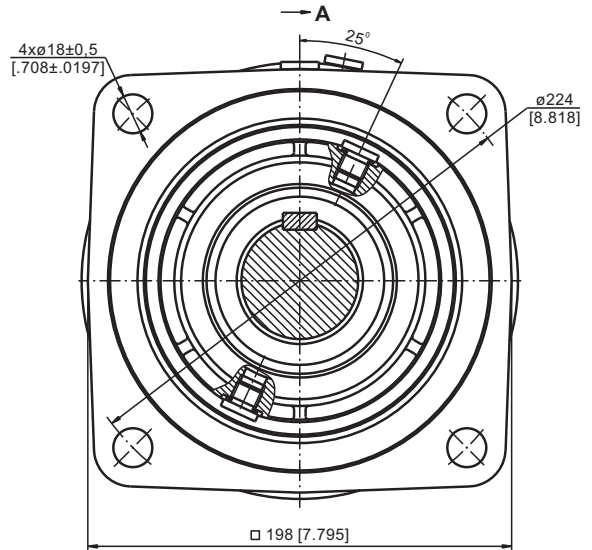


C: Brake release Port - G¼, 12 mm [.47 in] depth

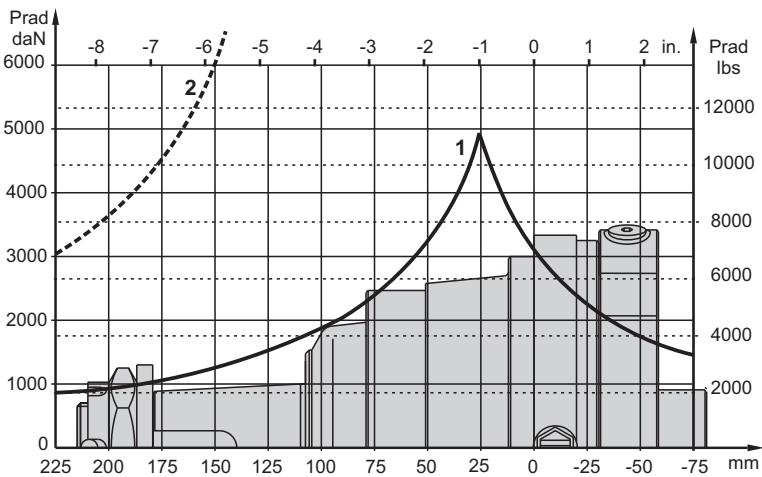
D: Drainage tap - G¼, 12 mm [.47 in] depth

▽- Place for attachment

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



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.

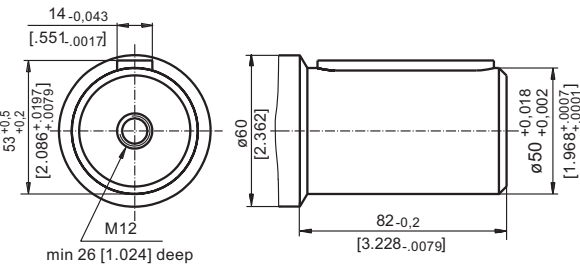
SPECIFICATION DATA

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 cm³ [in³]	8 ÷ 9 [.488 ÷ .549]						
Oil volume cm³ [in³]	250 [15.25]						
Max. Pressure in drain space bar [PSI]	5 [72]						

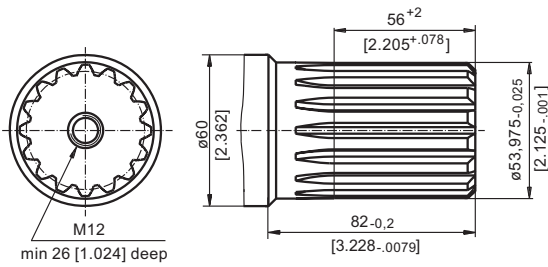
*Static torque is obtained at working pressure - 0 bar.
**The indicated value is a difference between the inlet pressure for driving of the brake and the drain pressure.
Brakes must always have a drain line

SHAFT EXTENSIONS

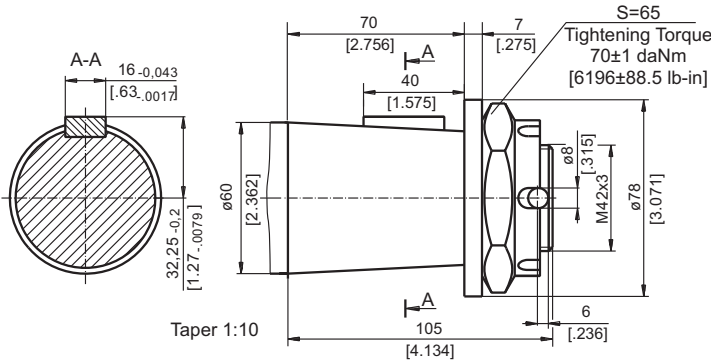
C - ø50 straight, Parallel key A14x9x70 DIN 6885



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



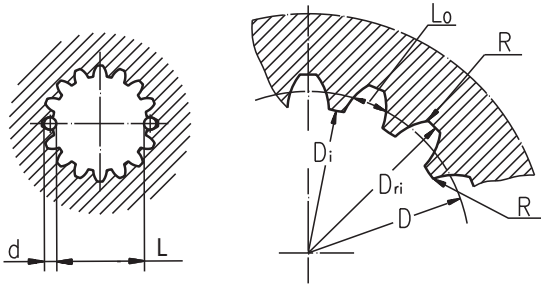
K -tapered 1:10, Parallel key B16x10x32 DIN 6885



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 ⁰	30 ⁰
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]	Lo	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.

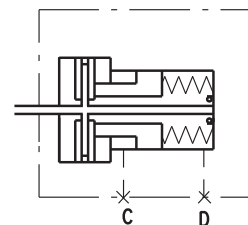
ATTENTION:

- Hydraulic brake is delivered without oil (it is lubricated only).
- 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...R- Wet

B...R 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

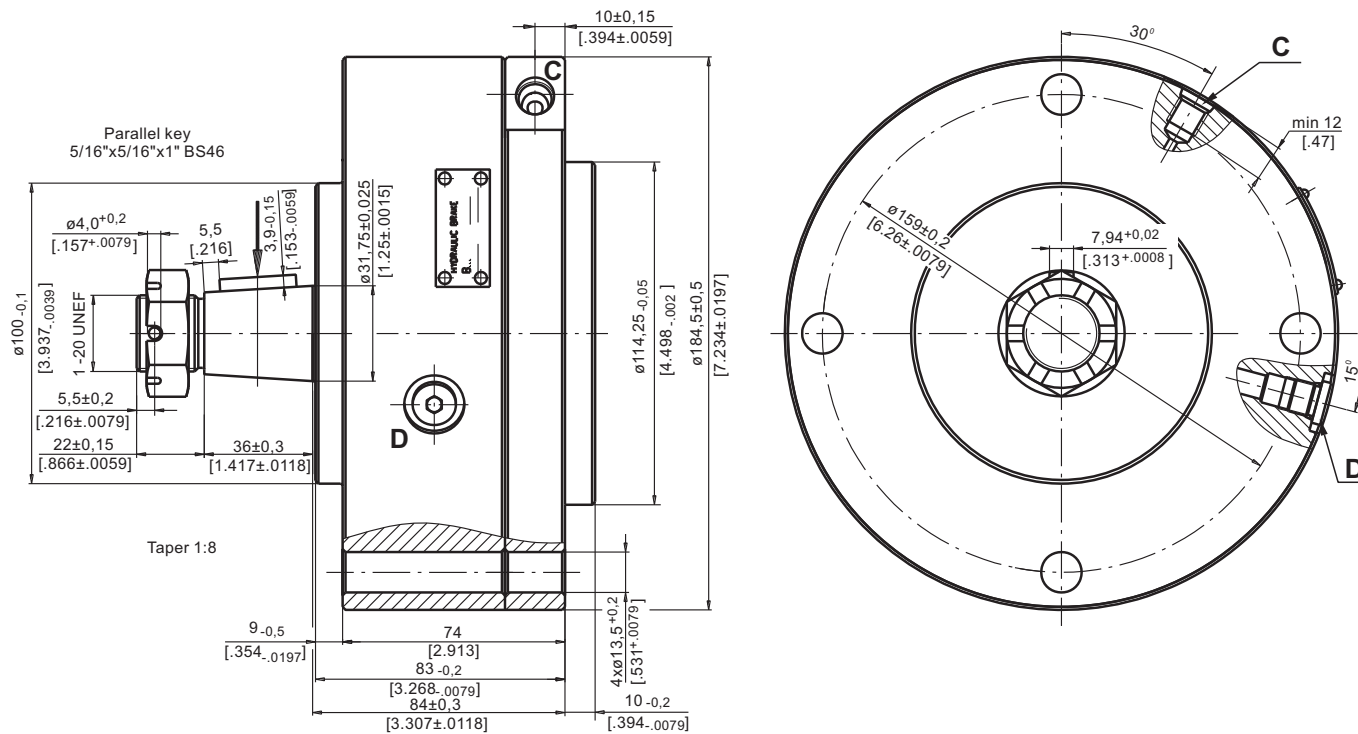
Type	B35R	B55R
Static Torque of Brake, daNm [lb-in]*	35 [3100]	55 [4870]
Initial Release Pressure, bar [PSI]	16 [232]	16 [232]
Full Release Pressure, bar [PSI]	19 [275]	19 [275]
Max. Operating Pressure, bar [PSI]	240 [3480]	240 [3480]
Max. Speed, RPM	90	90
Cont. Radial Shaft Load daN [lbs]**	500 [1125]	500 [1125]
Max. Radial Shaft Load daN [lbs]***	700 [1575]	900 [2030]

* At 0 bar [0 PSI] back pressure

** At radial shaft load of 500 daN [1125 lbs], applied at center-line of the key and speed of rotation 90 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

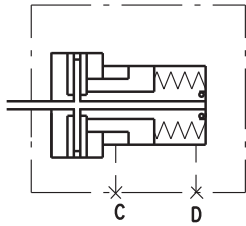
D : Drainage Tap - 7/16-20 UNF



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.

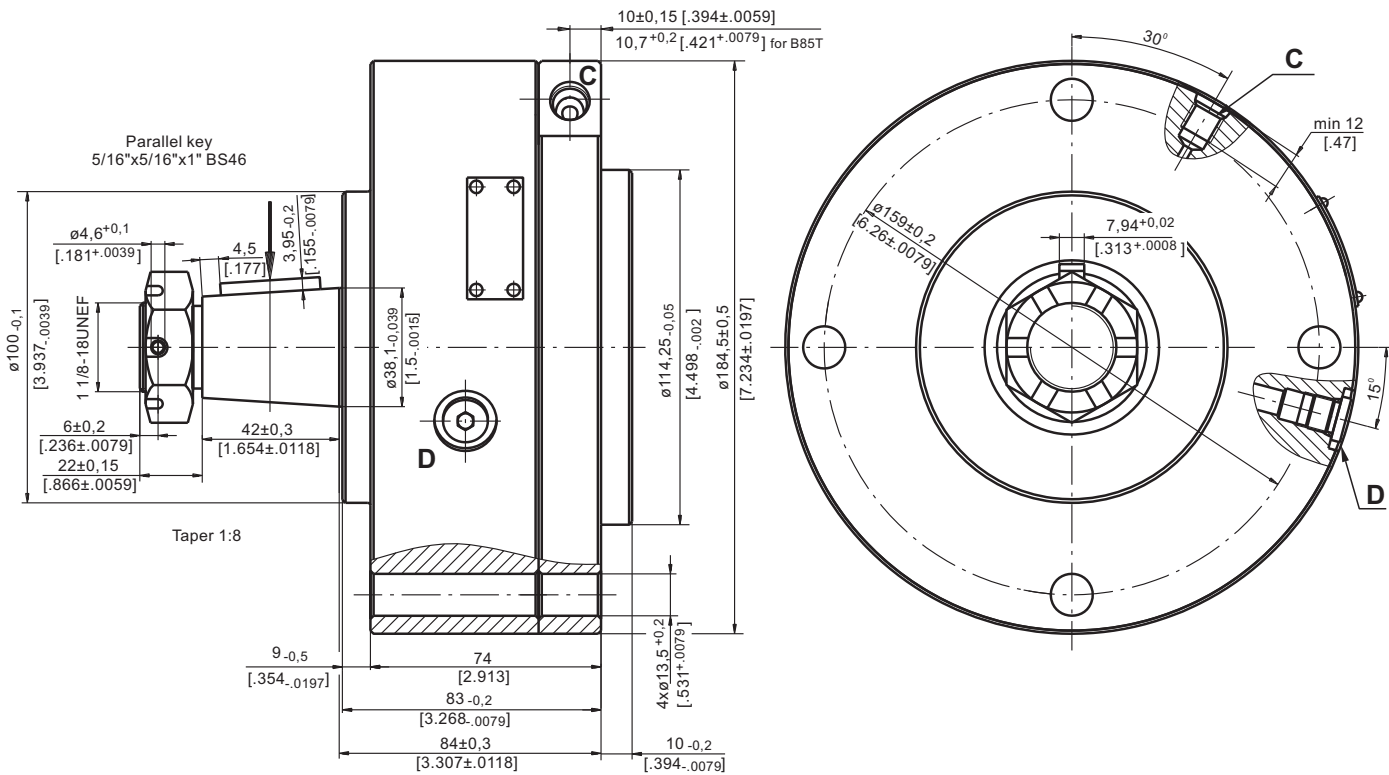


SPECIFICATION DATA

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



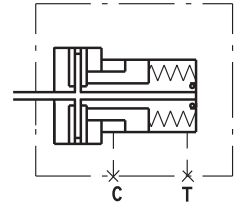
- C : Brake Release Port -7/16-20 UNF
SAE J1926-1/ISO 11926-1
- D : Drainage Tap - 7/16-20 UNF



HYDRAULIC DISC BRAKES B130K...- Wet

This 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.

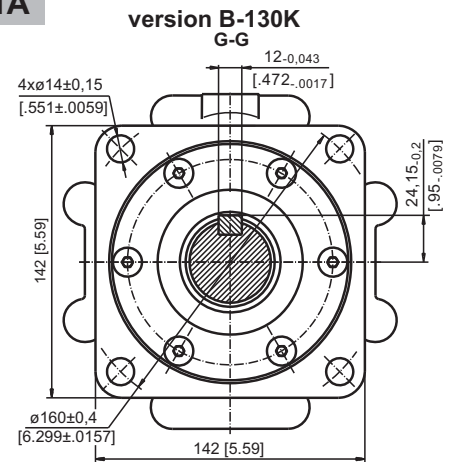
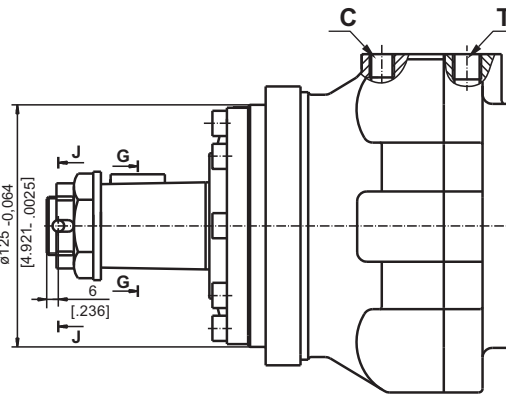
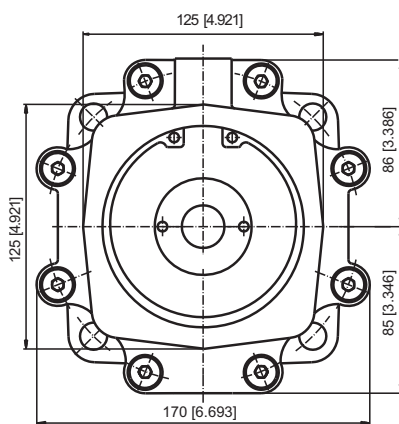
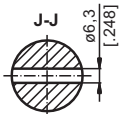


SPECIFICATION DATA

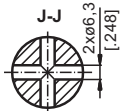
Type	B130K
Static Torque of Brake, daNm [lb-in]*	143 [12565]
Min. Brake Release Pressure, bar [PSI]	31-33 [119-478]
Max. Opening Pressure, bar [PSI]	280 [4060]
Max. Permissible Pressure in Drain Line, bar [PSI]	5 [72]
Weight, kg [lb]	18,5 [40.8]

* At 0 bar [0 PSI] back pressure

DIMENSIONS AND MOUNTING DATA

**version B-130K**

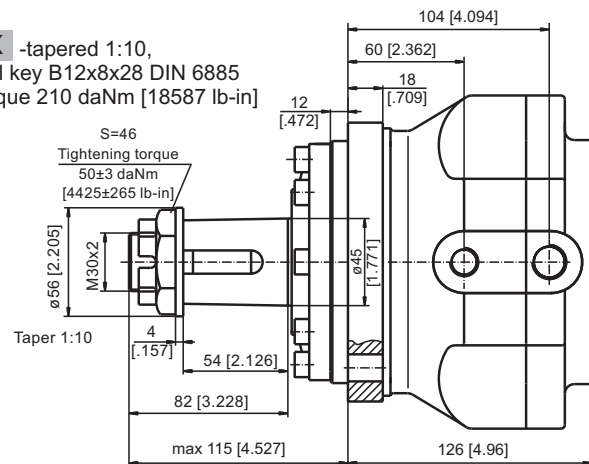
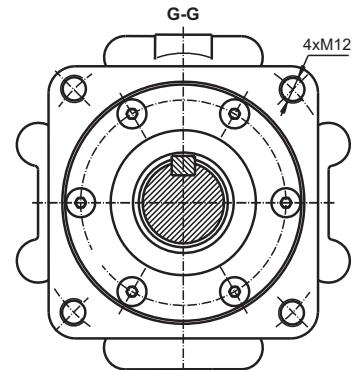
version B-130K-P



K -tapered 1:10,
Parallel key B12x8x28 DIN 6885
Max. Torque 210 daNm [18587 lb-in]

S=46
Tightening torque
 50 ± 3 daNm
[4425 $\pm$ 265 lb-in]/

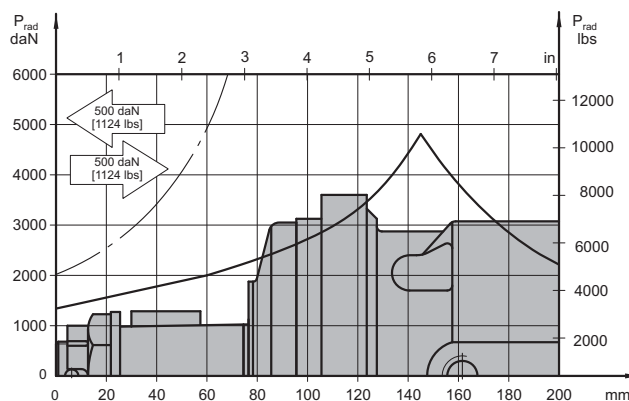
Taper 1:10

**version B-130K-P**

C - Brake release port, G1/4,
12 mm [.472 in] depth

D - Drainage tap, G3/8,
13 mm [.512] depth

PERMISSIBLE SHAFT LOADS



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

MOTOR-BRAKE SPECIAL FEATURES

Special Feature Description	Order Code	Motor type				
		B/MR	MT/B	MTM/B	SW	TW
Low Leakage	LL	O	-	O	-	-
Low Speed Valving	LSV	O	-	O	-	-
Free Running	FR	-	-	O		-
Reverse Rotation	R	O	O	O	-	-
Paint*	P	O	O	O	O	O
Corrosion Protected Paint*	PC	O	O	O	O	O
Special Paint**	PS	O	O	O	O	O
	PCS					
Check Valves		S	S	-	S	S

O	Optional
-	Not applicable
S	Standard

* Colour at customer's request.

** Non painted feeding surfaces, colour at customer's request.

APPLICATION CALCULATION

VEHICLE DRIVE CALCULATIONS

1.Motor speed: n, RPM

$$n = \frac{2,65 \times v_{km} \times i}{R_m} \quad n = \frac{168 \times v_{mi} \times i}{R_{in}}$$

v_{km} - vehicle speed, km/h;

v_{mi} - vehicle speed, mil/h;

R_m - wheel rolling radius, m;

R_{in} - wheel rolling radius, in;

i - gear ratio between motor and wheels.

If no gearbox, use $i=1$.

2.Rolling resistance: RR, daN [lbs]

The resistance force resulted in wheels contact with different surfaces:

$$RR = G \times \rho$$

G - total weight loaded on vehicle, daN [lbs];

ρ - rolling resistance coefficient (Table 1).

Table 1

Rolling resistance coefficient In case of rubber tire rolling on different surfaces	
Surface	ρ
Concrete- faultless	0.010
Concrete- good	0.015
Concrete- bad	0.020
Asphalt- faultless	0.012
Asphalt- good	0.017
Asphalt- bad	0.022
Macadam- faultless	0.015
Macadam- good	0.022
Macadam- bad	0.037
Snow- 5 cm	0.025
Snow- 10 cm	0.037
Polluted covering- smooth	0.025
Polluted covering- sandy	0.040
Mud	0.037÷0.150
Sand- Gravel	0.060÷0.150
Sand- loose	0.160÷0.300

3.Grade resistance: GR, daN [lbs]

$$GR = G \times (\sin \alpha + \rho \times \cos \alpha)$$

α - gradient negotiation angle (Table 2)

Table 2

Grade %	α Degrees	Grade %	α Degrees
1%	0° 35'	12%	6° 5'
2%	1° 9'	15%	8° 31'
5%	2° 51'	20%	11° 19'
6%	3° 26'	25%	14° 3'
8%	4° 35'	32%	18°
10%	5° 43'	60%	31°

4. Acceleration force: FA, daN [lbs]

Force **FA** necessary for acceleration from 0 to maximum speed **v** and time **t** can be calculated with a formula:

$$FA = \frac{v_{km} \times G}{3,6 \times t}, [daN] \quad FA = \frac{v_{mi} \times G}{22 \times t}, [lbs];$$

FA- acceleration force, daN [lbs];

t- time, [s].

5.Tractive effort: DP, daN [lbs]

Tractive effort **DP** is the additional force of trailer. This value will be established as follows:

-acc.to constructor's assessment;

-as calculating forces in items 2, 3 and 4 of trailer; the calculated sum corresponds to the tractive effort requested.

6.Total tractive effort: TE, daN [lbs]

Total tractive effort **TE** is total effort necessary for vehicle motion; that the sum of forces calculated in items from 2 to 5 and increased with 10 % because of air resistance.

$$TE = 1,1 \times (RR + GR + FA + DP)$$

RR- force acquired to overcome the rolling resistance;

GR- force acquired to slope upwards;

FA- force acquired to accelerate (acceleration force);

DP- additional tractive effort (trailer).

7.Motor Torque moment: M, daNm [lb-in]

Necessary torque moment for every hydraulic motor:

$$M = \frac{TE \times R_m [R_{in}]}{N \times i \times \eta_m}$$

N- motor numbers;

η_m - mechanical gear efficiency (if it is available).

8.Cohesion between tire and road covering: Mw, daNm [lb-in]

$$M_w = \frac{G_w \times f \times R_m [R_{in}]}{i \times h_m}$$

To avoid wheel slipping, the following condition should be observed $M_w > M$

f - frictional factor;

G_w- total weight over the wheels, daN [lbs].

Table 3

Surface	Frictional factor f
Steel on steel	0.15 ÷ 0.20
Rubber tire on polluted surface	0.5 ÷ 0.7
Rubber tire on asphalt	0.8 ÷ 1.0
Rubber tire on concrete	0.8 ÷ 1.0
Rubber tire on grass	0.4

9.Radial motor loading: P_{rad} , daN [lbs]
 When motor is used for vehicle motion with wheels mounted directly on motor shaft, the total radial loading of motor shaft P_{rad} is a sum of motion force and weight force acting on one wheel.

- G_w - Weight held by wheel;
- P_{rad} - Total radial loading of motor shaft;
- M/R - Motion force.

$$P_{rad}=\sqrt{G_w^2+\left(\frac{M}{R}\right)^2}$$

In accordance with calculated loadings the suitable motor from the catalogue is selected.

DRAINAGE SPACE AND DRAINAGE PRESSURE

Advantages in oil drainage from drain space: Cleaning; Cooling and Seal lifetime prolonging.

