

BTL Taper bushing

Taper bushing is a new type of component used for joining mechanical transmission. It changed from the traditional design and now features easy-on, easy-off construction and high standardization. The grip is tightened through its taper surface, excellent concentricity and non-clearance joint, its transmission efficiency can also be raised. The sizes of taper bushings are designed in a standard series. The bore, Keyway and thread are machined in accordance with ISO standard. It is interchangeable and the customers can make their own choice according to their purpose and usage. This new type of taper bushing is now widely used.

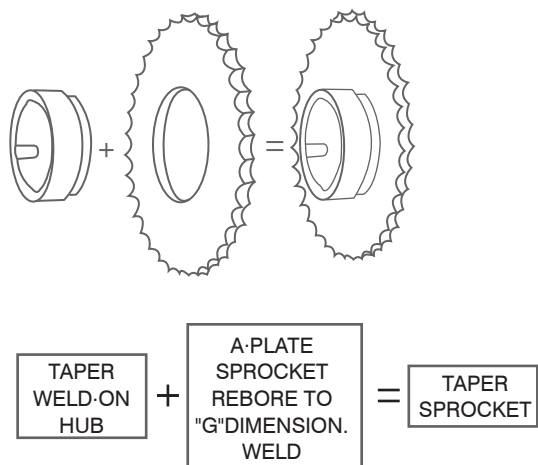


Grey cast iron is the common material for BTL taper bushings. If high tensional bushing is required, ductile iron, steel and forged steel can be used. Bushing made of stainless steel can be used together with sprockets, clutches, gears and other transmission parts which are also made of stainless steel.

When taper bushing is used with other transmission parts in constant starting and stopping, it will cause damage to the bore and keyway and this will degrade precision due to pressing loads. If the damage is severe the whole transmission part should be replaced

BTL Taper bushing includes: taper bushing itself and tightening screws. (also including packaging)

The range for its usage can be enlarged if a weld-on taper hub is used.



BTL Taper bushing

1. Bushing's type and loading capacity.

1.1 General type

1.1.1 Dimension series: this type is divided into three series according to its load-bearing capacity and number of tapped holes:

1) light series: type 1008-3030

Have two un-tapped half-holes for tightening screws and one semi-tapped holes for releasing.

2) Medium series: type 3535-5050

Have three half-holes for tightening screws and two half-tapped holes for releasing.

3) Heavy series: type 6050-120100

Have four half-holes for tightening screws and two half-tapped holes for releasing.

1.1.2 Type and nomenclatures

For each type of bushing, there will be different standard shaft sizes for selection.

Written in four numbers, eg. 2517, the initial two are divided by ten indicating the Maximum bore of the Bushing (in inches).

The other two are divided by ten indicating length through bore (in inches). For example, the Maximum bore of the Bushing is 2.5 inches (2.5 x 25.4mm), length through bore is 1.7 inches (1.7 x 25.4mm).

Written in six numbers, eg. 120100, the initial three divided by ten indicating Max. bore of Bushing (in inches), the other three are divided by ten indicating length through bore (in inches). For example, 120 indicates that the Max bore of Bushing is 12 inches (12 x 25.4mm); 100 indicates that length through bore is 10 inches (10 x 25.4mm).

Written in five numbers, the initial three indicates Max. bore of bushing, the other two indicates length through bore, for example, 10085.

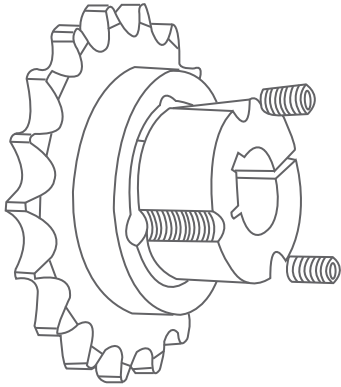
1.1.3 Rating load-bearing capacity

See torque capacity parameters for general type in the following table:

Bush.No	Torque Capacity		Bush.No	Torque Capacity	
	1bf.in	N.m		Lbf.in	N.m
1008	1,200	136	3535	44,800	5,060
1108	1,300	147	4040	77,300	8,740
1210 1215	3,600	407	4545	110,000	12,400
1310 1315	3,850	435	5050	126,000	14,200
1610 1615	4,300	486	6050	282,000	31,900
2012	7,150	808	7060	416,000	47,000
2517 2525	11,600	1,310	8065	456,000	51,500
3020 3030	24,000	2,710	10085	869,000	98,200
			120100	1,520,000	172,000

1bf.in=0.113N.m

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BTL TAPER BUSHING INSTALLATION INSTRUCTIONS

TO ASSEMBLE

1. Clean and degrease the bore and taper surfaces of the bush and the tapered bore of the pulley. Insert the bush into the pulley hub and line up holes (half thread holes must line up with half unloading holes)

2. Lightly oil the grub screws (bush size 1008 to 3030) or the cap screws (bush size to 5050) and screw them in, do not tighten them yet.

3. Clean and degrease the shaft. Fit pulley with taper bush on shaft and locate in desired position.

4. When using a key it should firstly be fitted in the shaft Keyway. There should be a top clearance between the key and the keyway in the bore.

5. Using a hexagon socket wrench (DIN911) gradually tighten the grub cap screws in accordance with the torques as listed in the schedule of screw tightening torques.

6. When the drive has been operating under a load for a short period (half to one hour) check and ensure that the screws remain at the appropriate tightening torque.

7. In order to eliminate the ingress of dirt, fill all empty holes with grease.

REMOVAL

1. Loosen and remove all the screws and place them in holes of bushing.

2. Tighten the screws alternatively till the hub's grip on bushing is loose. The inner bore of bushing can be slid on the shaft.

3. Remove the bushing from the shaft.

BUSH NO	SCREW TIGHTENING TORQUES(Nm)	SCREW	
		QUANTITY	SIZE
1008	5.6	2	1/4"
1108			BSW
1210	20	2	3/8"
1215			BSW
1310	20	2	3/8"
1315			BSW
1610	20	2	3/8"
1615			BSW
2012	31	2	7/16" BSW
2517	48	2	1/2" BSW
3020	90	2	5/8"
3030			BSW
3535	112	3	1/2" BSW
4040	170	3	5/8" BSW
4545	192	3	3/4" BSW
5050	271	3	7/8" BSW

The BTL taper bushing are registered patent products. Any production and sale should be authorised and permitted.

Special Note

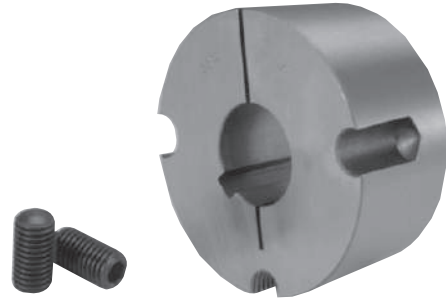
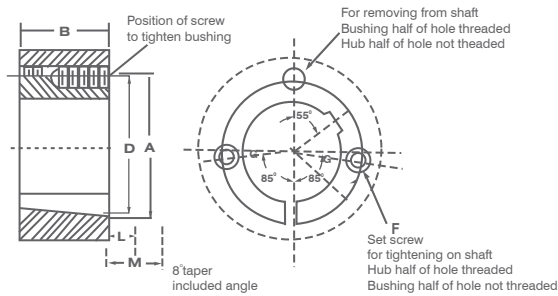
BTL bushing are made of GG25 cast iron. We can also offer other materials according to customers' requirements.

We can do surface coating according to the customers' requirements. *(such as painting, black phosphating, black oxidizing and so on)

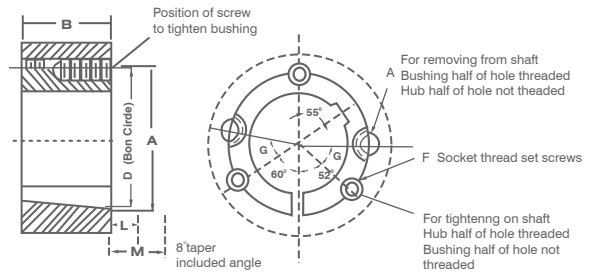
Each part is individually boxed.

BTL bushings are inserted with high quality screws made in Japan.

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3535 thru 5050 sizes



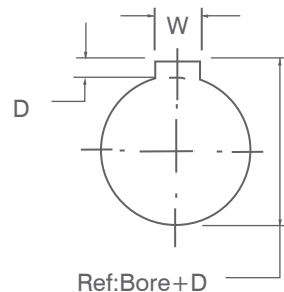
Dimensions for 1008 thru 3030 BTL Taper Bushings

BUSH NO	A	B	D	Set Screws
1008	1.386	7/8	1 21/64	1/4x1/2
1108	1.511	7/8	1 29/64	1/4x1/2
1210	1 7/8	1	1 3/4	3/8x5/8
1215	1 7/8	1 1/2	1 3/4	3/8x5/8
1310	2	1	1 7/8	3/8x5/8
1610	2 1/4	1	2 1/8	3/8x5/8
1615	2 1/4	1 1/2	2 1/8	3/8x5/8
2012	2 3/4	1 1/4	2 5/8	7/16x7/8
2517	3 3/8	1 3/4	3 1/4	1/2x1
2525	3 3/8	2 1/2	3 1/4	1/2x1
3020	4 1/4	2	4	5/8x1 1/4
3030	4 1/4	3	4	5/8x1 1/4

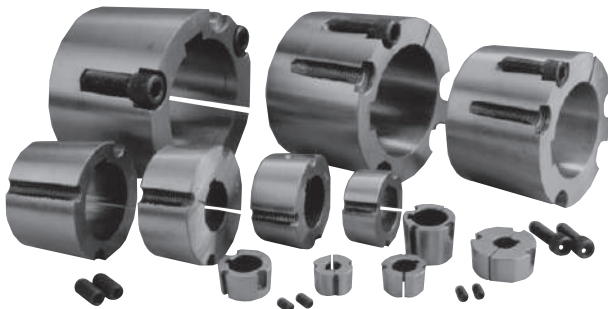
Dimensions for 1008 thru 5050 BTL Taper Bushings

BUSH NO	A	B	D	Set Screws	G
3535	5	3 1/2	4.83	1/2x1 1/2	40°
4040	5 3/4	4	5.54	5/8x1 3/4	40°
4545	6 3/8	4 1/2	6.13	3/4x2	40°
5050	7	5	6.72	7/8x2 1/4	37°

Two screws required
Three screws required



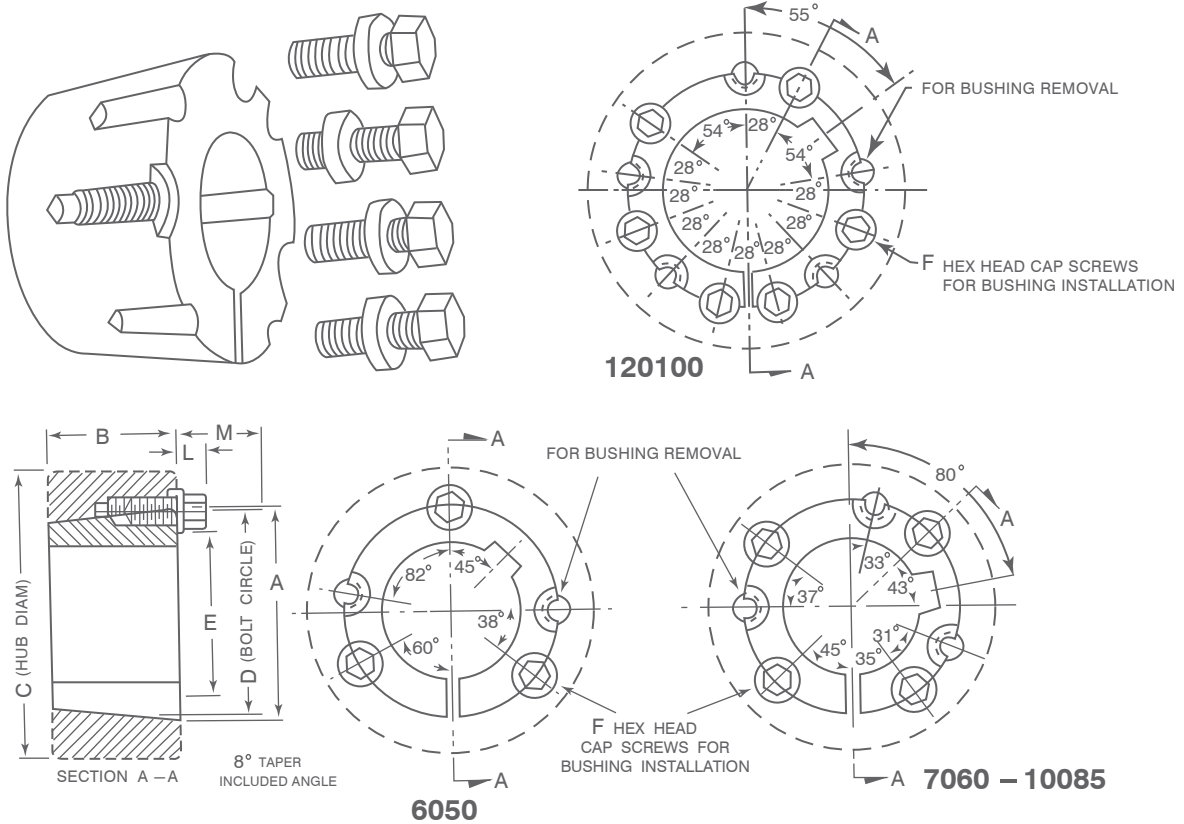
MM Bore Key way dimensions conform to ISO standard
Depth measured at centerline



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TAPER BUSHING DIMENSIONS(Cont.)

6050 thru 120100 Sizes



Dimensions for 6050 thru 120100 BTL Taper Bushings

Bush.No.	A	B	D	Socket Head Cap Screws	E	L	M
6050	9 1/4	5	9	3-1 1/4x3 1/2	6 3/4	1 5/8	4 3/8
7060	10 1/4	6	10	4-1 1/4x3 1/2	7 3/4	1 5/8	4 3/8
8065	11 1/4	6 1/2	11	4-1 1/4x3 1/2	8 3/4	1 5/8	4 3/8
10085	14 3/4	8 1/2	14 1/2	4-1 1/2x4 1/4	11 3/4	2	5 3/8
120100	17 1/4	10	17	6-1 1/2x4 1/4	14 1/4	2	5 3/8

Dimensions for TAPER Bushings Metric. Inches Bore

Bush.No	inches bore		metric bore	
	Min.	Max.	Min.	Max.
6050	4 7/16	6	80	150
7060	4 15/16	7	90	175
8065	5 7/16	8	110	200
10085	7	10	175	250
12100	8	12	200	300

An instruction sheet is packed into each bushing box

Bore and keyway dimensions conform to ISO standard recommendation R773. for "free" fit

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It should be noted that bushing's load bearing capacity is related to screw tightening torque and shaft size. In this catalogue the related tightening torque has been given, The load bearing capacity raised as the shaft size enlarged.

Please consult with the factory if more detailed information needed.

1.2 Flange type (QD bushing)

1.2.1 Dimension series: QD Bushings can be divided into two series according to whether they can be reversed mounting or not.

1) reversable mounting series: type JA - J

There are three screws and three bores on the flange.

2) non-reversable mounting series: type M - W.

Only with four tapped holes on the flange, without un-tapped holes.

1.2.2 Type and load -bearing capacity

According to the dimensions and load bearing capacity, QD Bushings have thirteen specifications, see torque capacity and related screw tightening torque in the table below:

Bush.No	Torque Capacity		Screw Tightening Torque	
	lbf.in	N.m	lbf.in	N.m
JA	1,000	113	54	6.1
SH	3,500	396	108	12.2
SDS	5,000	565	108	12.2
SK	7,000	791	180	20.3
SF	11,000	1,243	360	40.8
E	20,000	2,260	720	81.4
F	30,000	3,390	900	102
J	45,000	5,090	1,620	183
M	85,000	9,600	2,700	305
N	150,000	17,000	3,600	408
P	250,000	28,300	5,400	610
W	375,000	42,400	7,200	814
S	625,000	70,600	9,000	1,020

2. Selection

After selecting bushing type according to bushings' features under different usage condition, the selection to the type mainly depends on the torque and working torque on shaft: $T = 63025N/n$ (lbf.in)

Where: N-transmission torque (house);

n-shaft revolutions per minute(RPM)

calculation torque $T_o = KT$, K-loading coefficient loading force.

See loading coefficient K for bushing connection below:

K	Load type
1.0	light loading start,work even
1.5	light loading start,work uneven
2.0	medium loading start,work even or uneven
2.5	light or heavy loading start,medium shock
3.0	lighty or heavy loading start,heavy shock or rotating

When using T_o to select Bushing type, it should comply with $T_H < T_o$. T_H -Bushing torque capacity, can be got from the given table.