

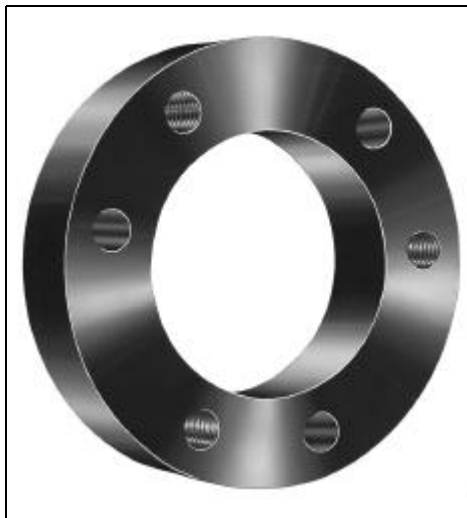
INTERCHANGEABLE BUSHINGS

PRODUCT	PAGE
INDEX	B-1
BUSHING TYPES	B-2, B-3
QD	
Installation/Removal	B-4, B-5
Bushing Dimensions	B-6, B-7
Standard Bushing	B-7
Weld-On Hubs	B-8
TAPER BUSHING	
1008 — 3030 Dimensions	B-9
1008 — 3030 Available Bore Sizes	B-10
3535 — 5050 Dimensions	B-11, B-12
3535 — 5050 Available Bore Sizes	B-13
6050 — 120100 Dimensions	B-14
Installation/Removal	B-15
Reborable Bushings	B-16
Weld-On Hubs	B-17
Bolt-On Hubs/Adapters	B-18

Interchangeable Bushings



**Martin's QD BUSHING LINE NOT ONLY INCLUDES
A COMPLETE RANGE OF SEMI-STEEL
FROM JA-S BUT ALSO STEEL IN
SIZES SF-N**



Martin HAS THE MOST COMPLETE LINE OF TAPER BUSHINGS IN THE INDUSTRY, INCLUDING SEMI-STEEL, STEEL, AND STAINLESS STEEL



TAPER BUSHING
(Inch-Bore)



TAPER BUSHING
(mm-Bore)



TAPER BUSHING
(Steel)*



TAPER BUSHING
(Stainless Steel)*



WELD-ON HUB
TAPED BUSHED
TYPE WWH



WELD-ON HUB
TAPED BUSHED
TYPE WM

Stock "QD" Bushings

The Martin "Quick Detachable" bushings are easy to install and remove. They are split through flange and taper to provide a true clamp on the shaft that is the equivalent of a shrink fit. All sizes except JA and H have a set screw over the key to help maintain the bushings position on the shaft until the cap screws are securely tightened.

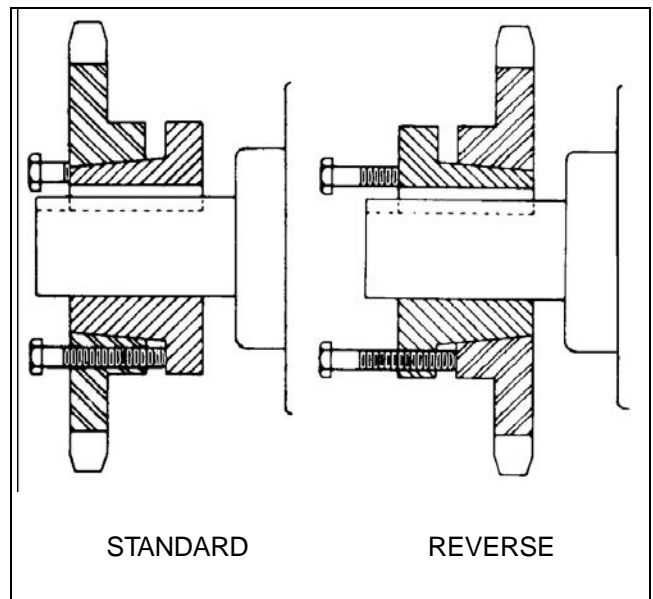
Installation

1. Be sure the tapered cone surfaces of the bushing and the inside of sprocket are clean. ★
2. Place bushing in sprocket, sheave, pulley, or other Martin QD parts. On **M** through **S** bushings, the mating part and bushing **MUST** be assembled so the two threaded holes in the mating part are located as far as possible from the sawcut in the bushing.
3. Place cap screws and lock washers loosely in pull-up holes. Bushing remains fully expanded to assure sliding fit on shaft.
4. With key on shaft, slide sprocket to desired position on shaft. Be sure heads of capscrews are on outside.
5. Align sprocket. Tighten screws alternately and progressively – until they are pulled up tight. To increase leverage, use wrench or length of pipe (see wrench torque chart on page B-5). Do not allow sprocket to be drawn in contact with flange of bushing; there should be a gap of 3,2 to 6,4 mm.

CAUTION: When mounting screws, apply pressure by hand only. If extreme tightening forces are applied, bursting pressures will be created in the sprocket hub. There should be a gap of 3,2 to 6,4mm between the face of the sprocket hub and the flange of the QD bushing. **This gap must not be closed.** If the gap is closed under normal tightening, the shaft is seriously undersized.

Removal

1. Loosen and remove cap screws.
2. Insert cap screws in tapped removal holes.
3. Tighten inserted screws until sprocket is loose on shaft.
4. Remove sprocket from shaft.

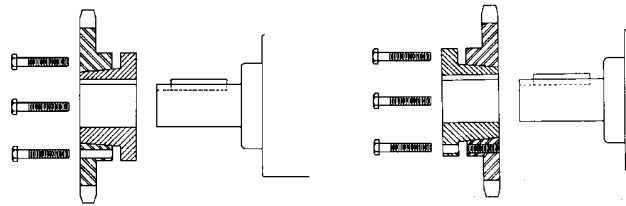


★ **WARNING:** USE OF ANTI-SEIZE LUBRICANT ON TAPERED CONE SURFACES MAY RESULT IN DAMAGE TO SHEAVES AND SPROCKETS.

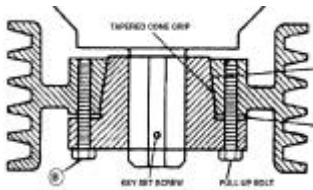
REVERSE Mounting Assembly for QD Sheaves and Sprockets using JA, SH, SD, SDS, SK, SF, E, F, & J Bushings

These bushings, as well as the sprockets and sheaves for them, are each drilled with six holes (three drilled and three tapped) to allow pull-up bolts to be inserted from either side. This enables variations of mounting characteristics to suit a particular installation.

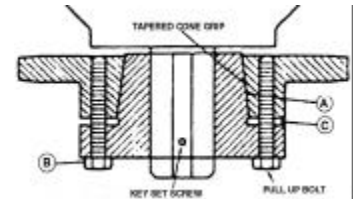
STANDARD MOUNTING REVERSE MOUNTING



MOUNTING

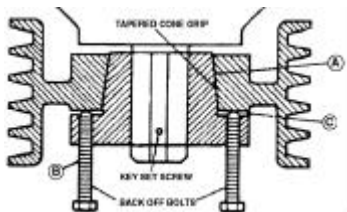


1. Assemble sheave or sprocket with bolts inserted (But not tightened) through DRILLED holes in bushing flange into TAPPED holes in sheave or sprocket.
2. With key in shaft keyseat, slide assembly into approximate position on shaft with flange end of bushing away from bearing.



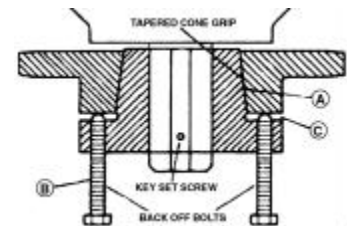
3. Position QD bushing on shaft by tightening set screw over key "hand tight" with standard Allen wrench only. Do not use excessive force.

4. Tighten pull-up bolts alternately and evenly to tightness indicated in torque table below. Do not use extensions on wrench handles. There should be a gap between the face of the sheave or sprocket hub and the flange of the QD Bushing to insure a satisfactory cone grip and press fit. CAUTION: THIS GAP MUST NOT BE CLOSED.



DISMOUNTING

1. Remove pull-up bolts and screw them into TAPPED holes in bushing flange and against hub of sheave or sprocket to break cone grip.
2. Loosen set screw in bushing flange and slide QD bushing from shaft.



Bushing Installation Torque

When a wrench or length of pipe is used to increase leverage in tightening bushing screws, it is imperative to adhere to the wrench torque values given in the chart below.

This adherence is important — because, in mounting the bushing, the tightening force of the screw is multiplied many times by the wedging action of the tapered surface. This action compresses the bushing for a snug fit on the shaft. The bushing screws should always be tightened alternately and progressively.

Wrench Torque Values For Tightening Bushings

QD Bushing Size	Size of Cap Screw (Inch)	Force to Apply With Torque Wrench (Nm)	Proper Wrench Pull With Open End of Socket Wrench	
			Wrench Length	Wrench Pull (Kg)
JA	10 – 24	6,8	101,6	6,8
SH, SDS, SD	1/4 – 20	12,2	101,6	12,3
SK	5/16 – 18	20,3	152,4	13,6
SF	3/8 – 16	40,7	152,4	27,2
E	1/2 – 13	81,3	304,8	27,2
F	9/16 – 12	101,7	304,8	34,0
J	5/8 – 11	183,0	304,8	61,3
M	3/4 – 10	305,0	381,0	81,7
N	7/8 – 9	406,7	381,0	108,9
P	1 – 8	610,1	457,2	136,1
W	1-1/8 – 7	813,5	609,6	136,1
S	1-1/4 – 7	1016,8	762,0	136,1

CAUTION

- A. Be sure cone surfaces are free of paint, grease and dirt.
- B. Tighten pull-up bolts alternately and evenly per bolt torque table.
- C. Never close gap between sheave or sprocket and flange of QD Bushing.

WARNING: use of Anti-seize lubricant on tapered cone surfaces when mounting sheaves voids all mfg. warranties.

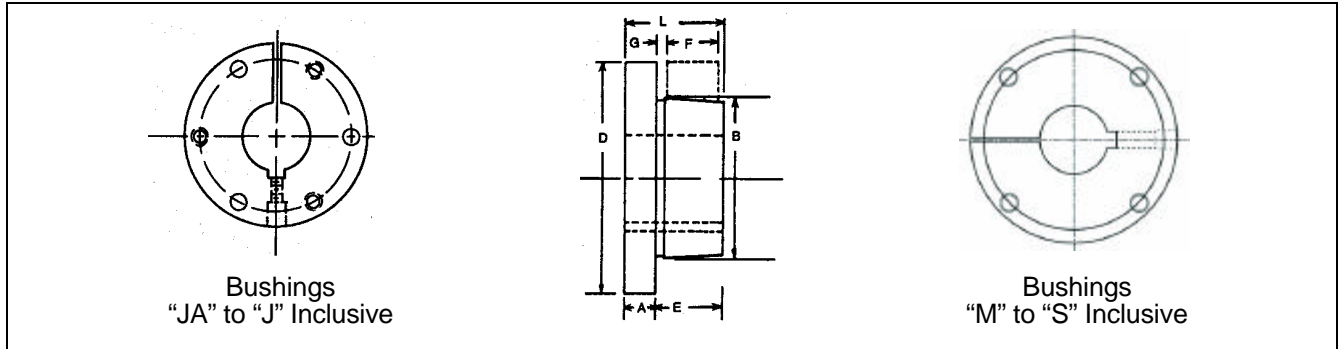
See A, B, C on drawings.

All Steel "QD" Bushings



★F = Length of Mating Bore

★★G = Gap Between "QD" Bushing and Mating Hub



"QD" Bushings — Steel

Bushing	Dimensions (mm)								Screws Required	Stock Bore Range			Average Weight Approx. (Kg)
	A	B	D	E	F	G	L	Cap Bolt Circle		Maximum			
										Minimum	Standard Keyway	Shallow Keyway	
SF-STL	9/16	3.125	4 5/8	1 1/2	1 1/4	1/8	2 1/16	3 3/8	3 3/8 x 2	1/2	2 5/16	2 13/16	3.0
E-STL	3/4	3.834	6	1 7/8	1 5/8	1/8	2 5/8	5	3 1/2 x 2 3/4	7/8	2 7/8	3 1/2	10.0
F-STL	13/16	4.437	6 5/8	2 13/16	2 1/2	3/16	3 5/8	5 5/8	3 5/8 x 3 3/8	1	3 5/8	4	11.5
J-STL	1	5.148	7 1/4	3 1/2	3 3/16	3/16	4 1/2	6 1/4	3 5/8 x 4 1/2	1 7/16	3 3/4	4 1/2	18.0
M-STL	1 1/4	6.500	9	5 1/2	5 3/16	3/16	6 3/4	7 7/8	4 3/4 x 6 3/4	2	4 3/4	5 1/2	37.0
N-STL	1 1/2	7.000	10	6 5/8	6 1/4	3/16	8 1/8	8 1/2	4 7/8 x 8 1/2	2 1/2	5 5/8	5 7/8	57.0

Bushing	Bores	Keyway
SF-STL	2 7/8 - 2 9/16 2 5/8 - 2 3/4 2 13/16 - 2 1/2 2 5/16	5/8 x 3/16 5/8 x 1/16 3/4 x 1/16 3/4 x 1/32
E-STL	7/8 - 2 7/8 2 5/16 - 3 1/4 3 3/16 - 3 1/2	STD. 3/4 x 1/8 7/8 x 1/16
F-STL	1 - 3 5/16 3 3/8 - 3 3/4 3 7/8 - 3 15/16 4	STD. 7/8 x 3/16 1 x 1/8 NONE
J-STL	3 7/16 - 3 3/4 3 13/16 - 4 1/2	STD. 1 x 1/8
M-STL	2 - 4 3/4 4 13/16 - 5 1/2 5 9/16 - 5 7/8	STD. 1 1/4 x 1/4 1 1/2 x 1/4
N-STL	2 1/2 - 5 1/8 5 3/16 - 5 1/2 5 9/16 - 5 7/8	STD. 1 1/4 x 1/4 1 1/2 x 1/4

Shallow Key Dimension — Standard			
Key Seat	Key	Keyway	Key
1/4 x 1/32	1/4 x 5/32	3/4 x 1/8	3/4 x 1/2
1/4 x 1/16	1/4 x 3/16	7/8 x 1/8	7/8 x 1/2
3/8 x 1/32	3/8 x 1/32	7/8 x 3/16	7/8 x 5/8
3/8 x 1/16	3/8 x 1/4	1 x 1/8	1 x 5/8
3/8 x 1/8	3/8 x 5/16	1 1/4 x 1/4	1 1/4 x 7/8
1/2 x 1/32	1/2 x 5/32	1 1/2 x 1/8	1 1/2 x 7/8
1/2 x 1/16	1/2 x 5/16	1 1/2 x 1/4	1 1/2 x 1
1/2 x 1/8	1/2 x 3/8	1 3/4 x 1/8	1 3/4 x 3/4
5/8 x 1/16	5/8 x 3/8	1 3/4 x 1/4	1 3/4 x 7/8
3/4 x 1/16	3/4 x 7/16	2 x 1/4	2 x 1

Standard Keyway and Key Dimension		
Bores	Keyway	Key
7/8	3/16 x 3/32	3/16 x 3/16
15/16 - 1 1/4	1/4 x 1/8	1/4 x 1/4
1 5/16 - 1 3/8	5/16 x 5/32	5/16 x 5/16
1 7/16 - 1 3/4	3/8 x 3/16	3/8 x 3/8
1 9/16 - 2 1/4	1/2 x 1/4	1/2 x 1/2
2 5/16 - 2 3/4	5/8 x 5/16	5/8 x 5/8
2 13/16 - 3 1/4	3/4 x 3/8	3/4 x 3/4
3 1/16 - 3 3/4	7/8 x 7/16	7/8 x 7/8
3 3/16 - 4 1/2	1 x 1/2	1 x 1
4 9/16 - 5 1/2	1 1/4 x 5/8	1 1/4 x 1 1/4
5 9/16 - 6 1/2	1 1/2 x 3/4	1 1/2 x 1 1/2
6 9/16 - 7 1/2	1 3/4 x 3/4	1 3/4 x 1 1/2
7 9/16 - 9	2 x 3/4	2 1/2 x 1 1/2
9 1/16 - 11	2 1/2 x 7/8	—
11 1/16 - 13	3 x 1	—

Shallow Key Dimension — Steel			
Key Seat	Key	Keyway	Key
1/4 x 1/32	1/4 x 5/32	3/4 x 1/16	3/4 x 7/16
1/4 x 1/16	1/4 x 3/16	3/4 x 1/8	3/4 x 1/2
3/8 x 1/32	3/8 x 1/32	7/8 x 1/16	7/8 x 1/2
3/8 x 1/16	3/8 x 1/4	7/8 x 3/16	7/8 x 5/8
3/8 x 1/8	3/8 x 5/16	1 x 1/8	1 x 5/8
1/2 x 1/32	1/2 x 5/32	1 1/4 x 1/4	1 1/4 x 7/8
1/2 x 1/16	1/2 x 5/16	1 1/2 x 1/4	1 1/2 x 1
1/2 x 1/8	1/2 x 3/8	1 3/4 x 1/8	1 3/4 x 3/4
5/8 x 1/16	5/8 x 3/8	1 3/4 x 3/8	1 3/4 x 1
5/8 x 1/8	5/8 x 1/2	2 x 1/4	2 x 1

Bushing	Plain Bores Not Split
SH-STL	1/2
SD-STL	1/2
SK-STL	1/2
SF-STL	1 15/16
E-STL	7/8 - 1 15/16
F-STL	1 - 2 7/16 - 2 15/16
J-STL	1 7/16 - 2 15/16
M-STL	2 - 2 5/16
N-STL	2 7/16 - 4 15/16

QD bushings made of stainless steel are available as made to order.

Bushing	Dimensions (mm)								Cap Screws Required (In)	Stock Bore Range			Set Screw Size (In)	Average Weight Approx. (Kg)
	A	B	D	E	F	G	L	Bolt Circle		Minimum	Maximum			
											Standard Keyway	Shallow Keyway		
H	7,9	41,3	63,5	25,4	22,2	3,2	31,8	50,8	2-1/4 x 3/4	12,7	31,8	38,1	1/4	0,32
JA	9,5	34,9	50,8	17,5	14,3	3,2	27,0	42,3	3-10 x 1	9,5	25,4	31,8	10-24	0,41
SH	11,1	47,6	68,3	22,2	20,6	4,8	33,3	57,2	3-1/2 x 1 3/8	12,7	34,9	42,9	1/4	0,45
SDS	12,7	55,5	81,0	22,2	19,1	4,8	34,9	68,3	3-1/2 x 1 3/8	12,7	42,9	50,8	1/4	0,45
SD	12,7	55,5	81,0	33,3	31,8	4,8	46,0	68,3	3-1/2 x 1 7/8	12,7	42,9	49,2	1/4	0,68
SK	14,3	71,4	98,4	34,9	31,8	4,8	49,2	84,1	3-5/16 x 2	12,7	54,0	63,5	5/16	0,91
SF	14,3	79,4	117,5	38,1	31,8	6,4	52,4	98,4	3-3/8 x 2	12,7	58,7	71,4	5/16	1,36
E	19,1	97,4	152,4	47,6	41,3	7,9	66,7	127,0	3-1/2 x 2 3/4	22,2	73,0	88,9	3/8	4,54
F	20,6	112,7	168,3	71,4	63,5	9,5	92,1	142,9	3-9/16 x 3 5/8	25,4	84,1	100,0	1/2	5,22
J	25,4	130,8	184,2	88,9	81,0	9,5	114,3	158,8	3-5/8 x 4 1/2	36,5	95,3	114,3	5/8	8,17
M	31,8	165,1	228,6	139,7	131,8	9,5	171,5	200,0	4-3/4 x 6 3/4	49,2	120,7	139,7	3/4	16,79
N	38,1	177,8	254,0	168,3	158,8	11,1	206,4	215,9	4-7/8 x 8 1/2	61,9	130,2	152,4	3/4	25,86
P	44,5	209,6	298,5	193,7	184,2	12,7	238,1	254,0	4-1 x 9 1/2	74,6	150,8	177,8	7/8	54,45
W	50,8	265,1	381,0	238,1	228,6	12,7	288,9	323,9	4-1 1/8 x 11 1/2	101,6	190,5	215,9	1	113,43
S	82,6	308,0	450,9	317,5	304,8	12,7	400,1	381,0	5-1 1/4 x 15 1/2	152,4	206,8	254,0	1 1/4	181,49

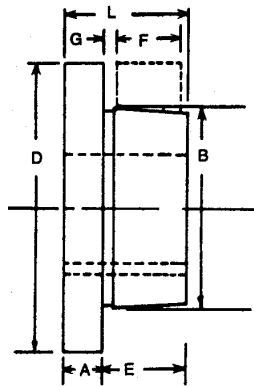
Inch Bore

Bushing	Bores	Keyway
JA	3/8 - 7/16 1/2 - 1 1 1/8 - 1 1/8 1 3/16 1 1/4	NO K.W. STD. 1/4 - 1/16 1/4 - 1/16 NO K.W.
SH	1/2 - 1 3/8 1 1/16 - 1 1/2 1 1/16 - 1 5/8 1 11/16	STD 3/8 x 1/16 3/8 - 1/16 NO K.W.
SDS	1/2 - 1 11/16 1 3/4 1 13/16 1 7/8 - 1 15/16 2	STD. 3/8 x 1/8 1/2 x 1/8 1/2 x 1/16 NO K.W.
SD	1/2 - 1 11/16 1 3/4 1 13/16 1 7/8 1 15/16 2	STD. 3/8 x 1/8 1/2 x 1/8 1/2 x 1/16 NO K.W.
SK	1/2 - 2 1/8 2 5/16 - 2 1/4 2 5/16 - 2 1/2 2 5/16 - 2 5/8	STD. 1/2 x 1/8 5/8 x 1/16 NO K.W.
SF	1/2 - 2 1/4 2 5/16 - 2 1/2 2 5/16 - 2 3/4 2 13/16 - 2 7/8 2 5/16	STD. 5/8 x 3/16 5/8 x 1/16 3/4 x 1/16 3/4 x 1/32
E	7/8 - 2 7/8 2 15/16 - 3 1/4 3 3/8 - 3 1/2	STD. 3/4 x 1/8 7/8 x 1/16
F	1 - 3 1/16 3 3/8 - 3 3/4 3 7/8 - 3 15/16 4	STD. 7/8 x 3/16 1 x 1/8 NONE
J	1 1/4 - 3 3/4 3 13/16 - 4 1/2	STD. 1 x 1/8
M	2 - 4 3/4 4 13/16 - 5 1/2	STD. 1 1/4 x 1/4
N	2 7/16 - 5 5 1/8 - 5 1/2 5 9/16 - 6	STD. 1 1/4 x 1/4 1 1/2 x 1/4
P	2 15/16 - 5 15/16 6 - 6 1/2 6 9/16 - 7	STD. 1 1/2 x 1/4 1 3/4 x 1/8
W	4 - 7 1/2 7 9/16 - 8 1/2	STD. 2 x 1/4

Keystock provided for nonstandard keyways.

Millimeter Bore

Bushing	Bore MM	Key★ WXT
SH	24, 25 28, 30	8x7
	32, 35	10x8
SDS	24, 25 28, 30	8x7
	32, 35 38	10x8
	40, 42	12x8
SD	24, 25 28, 30	8x7
	32, 35 38	10x8
	40, 42	12x8
SK	24, 25 28, 30	8x7
	32, 35 38	10x8
	40, 42 48, 50 55	12x8 14x9 16x10
SF	28, 30	8x7
	32, 35 38	10x8
	40, 42 48, 50 55 60	12x8 14x9 16x10 18x11
E	35, 38 40, 42 48, 50 55	10x8 12x8 14x9 16x10
	60, 65 70, 75	18x11 20x12
F	48, 50 55	14x9 16x10
	60, 65 70, 75 80, 85 90	18x11 20x12 22x14 25x14
J	50 55	14x9 16x10
	60, 65 70, 75 80, 85 90, 95 100	18x11 20x12 22x14 25x14 28x16

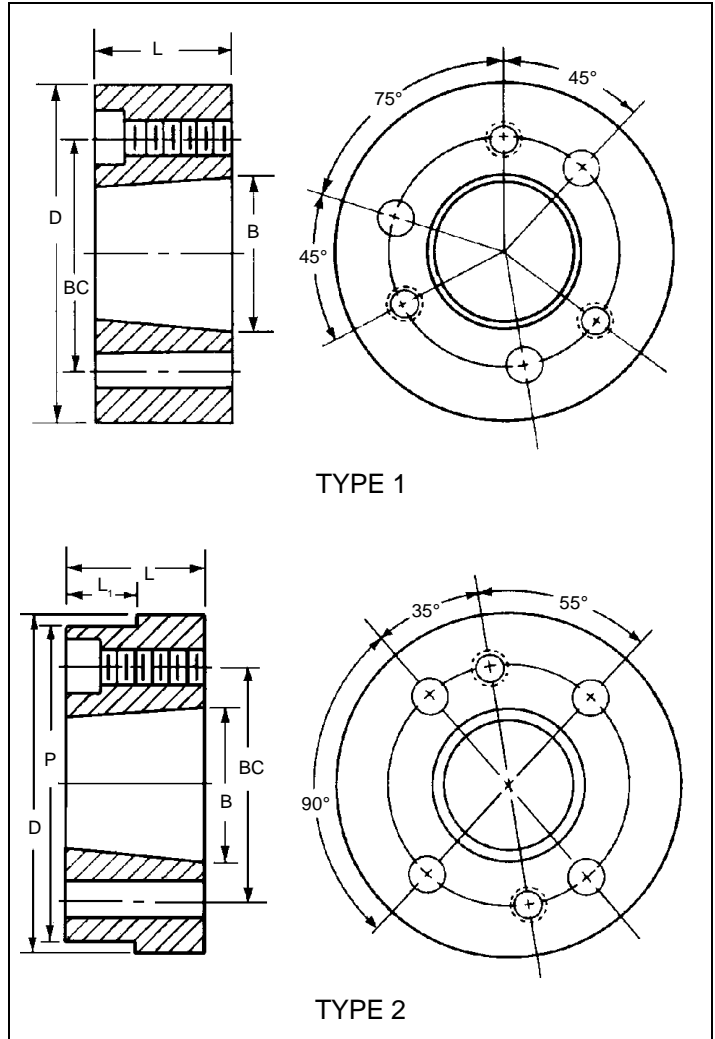


★Important — The metric system does not refer to keyseat or keyway dimensions as does the English system; instead dimensions are given for the key itself which is rectangular in shape, not square as in the English system.

NOTE:
.03937"=1mm
Ex—24 mm = 0.94488"

TO ORDER:
SH 24 mm

“QD” Weld-On Hubs



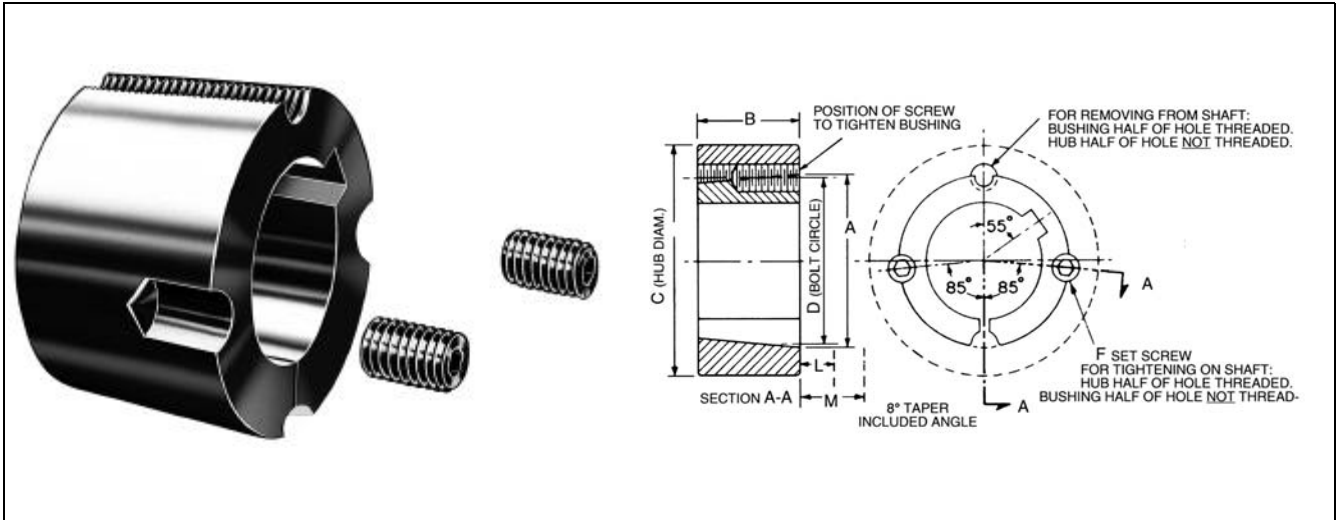
Martin QD weld-on hubs are suitable for use in many applications, such as welding to plate steel sprockets.

Weld-on hubs are made of steel, drill tapped and taper bored for QD bushings

QD Type 1 and Type 2 Weld-On Hubs

Catalog Number	Dimensions — MM						Type Drilling	Approx. Weight Kg	Mounting
	D★	L	B	P	L ₁	BC			
JA-A	57,2	14,3	34,9	—	—	42,1	1	,18	STD or Reverse Mount ↓
SH-A	76,2	20,6	47,5	—	—	57,2	1	,45	
SDS-A	88,9	19,1	55,6	—	—	68,3	1	,57	
SK-A	111,1	31,8	71,5	—	—	84,1	1	1,36	
SF-A	127,0	31,8	79,4	—	—	98,4	1	1,81	
E-A	158,8	41,3	97,3	—	—	127,0	1	4,08	STD Mount Only
F-A	177,8	63,5	112,7	—	—	142,9	1	7,26	
J-A	196,9	81,0	130,6	—	—	158,8	1	10,21	
M-A	241,3	131,8	164,9	235,0	90,5	200,0	2	22,69	
N-A	266,7	158,8	177,5	260,4	114,3	215,9	2	34,03	
P-A	330,2	184,2	209,3	—	—	254,0	2	70,33	STD Mount Only
W-A	393,7	228,6	265,1	—	—	323,9	2	136,12	
S-A	495,3	304,8	308,0	476,3	190,5	381,0	2	253,18	

★Tolerance of D Dimension
JA-A Thru J-A = (+,000,-,050)
M-A Thru S-A = (+,000,-,076)



Dimensions

Bushing Number	A	B	CØ			D	F†	L★		M★★	
			Class 20 Gray Iron	Class 30 Gray Iron	Steel			Standard Hex. Key	Standard Short Key‡	Hex. Key	Short Key‡
1008	35,2	22,2	60,3	55,6	49,2	33,7	31,8 x 12,7	28,6	15,9	31,8	44,5
1108	38,4	22,2	63,5	58,7	52,4	36,9	31,8 x 12,7	28,6	15,9	31,8	44,5
1210	47,6	25,4	92,1	82,6	73,0	44,5	34,9 x 15,9	34,9	20,6	41,3	27,0
1215	47,6	38,1	79,4	73,0	66,7	44,5	34,9 x 15,9	34,9	20,6	41,3	27,0
1310	50,8	25,4	95,3	85,7	76,2	47,6	34,9 x 15,9	34,9	20,6	41,3	27,0
1610	57,2	25,4	101,6	101,6	82,6	54,0	34,9 x 15,9	34,9	20,6	41,3	27,0
1615	57,2	38,1	88,9	82,6	76,2	54,0	34,9 x 15,9	34,9	20,6	41,3	27,0
2012	69,9	31,8	120,7	116,8	98,4	66,7	36,5 x 22,2	39,7	23,8	50,8	34,9
2517	85,7	44,5	139,7	123,8	111,1	82,6	38,1 x 25,4	41,3	25,4	57,2	41,3
2525	85,7	63,5	120,7	114,3	108,0	82,6	38,1 x 25,4	41,3	25,4	57,2	41,3
3020	108,0	50,8	177,8	158,8	142,9	101,6	41,3 x 31,8	46,0	30,2	68,3	52,4
3030	108,0	76,2	158,8	146,1	136,5	101,6	41,3 x 31,8	46,0	30,2	68,3	52,4

Bushings cannot be bored larger than largest bore listed.

For detail dimensions required for machining hubs, consult factory.

Ø For general reference. Severe conditions may require larger hub. Heavy well-located web may permit smaller hub. Hub diameter required depends on the particular application. Consult Martin giving full information on the proposed design. Hub diameters shown are based on 1400, 2110 and 3500 Kg/Cm² minimum ultimate tensile strength respectively for Class 20 gray iron, Class 30 gray iron and steel hubs.

† 2 screws required. Use in positions shown for tightening bushing on shaft. In removing bushing from shaft, remove screws and use one of them in the other hole. Bushing price includes screws.

★ Space required to tighten bushing. Also space required to loosen screws to permit removal of hub by puller.

★★ Space required to loosen bushing using one screw as jackscrew — no puller required.

‡ Standard hex key cut to minimum usable length.

Taper Bushings Dimensions

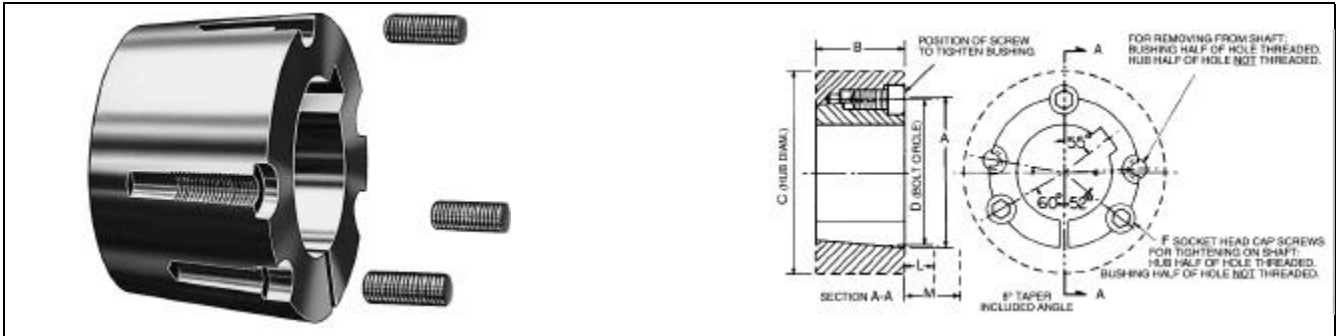


Metric Bores and Keyways

Bore Dia.	Keyway		Shallow Keyway Depth	Bore Sizes Available								
	Width	Depth		1008	1108	1210	1610	1615	2012	2517	3020	3030
9	3	1,4	—	x	x							
10	3	1,4	—	x	x							
11	4	1,8	—	x	x	x						
12	4	1,8	—	x	x	x						
14	5	2,3	—	x	x	x	x	x	x			
15	5	2,3	—	x	x	x	x	x	x			
16	5	2,3	—	x	x	x	x	x	x	x		
18	6	2,8	—	x	x	x	x	x	x	x		
19	6	2,8	—	x	x	x	x	x	x	x		
20	6	2,8	—	x	x	x	x	x	x	x		
22	6	2,8	—	x	x	x	x	x	x	x		
24	8	3,3	1,3	x	x	x	x	x	x	x		
25	8	3,3	1,3	x	x	x	x	x	x	x	x	
28	8	3,3	1,3		x	x	x	x	x	x	x	
30	8	3,3	—			x	x	x	x	x	x	
32	10	3,3	—			x	x	x	x	x	x	
35	10	3,3	—				x	x	x	x	x	x
38	10	3,3	—				x	x	x	x	x	x
40	12	3,3	1,3				x	x	x	x	x	x
42	12	3,3	1,3				x	x	x	x	x	x
45	14	3,8	—						x	x	x	x
48	14	3,8	—						x	x	x	x
50	14	3,8	—						x	x	x	x
55	16	4,3	—							x	x	x
60	18	4,4	—							x	x	x
65	18	4,4	—								x	x
70	20	4,9	—								x	x
75	20	4,9	—								x	x

Inch Bores and Keyways

Bore Dia.	Keyway		Shallow Keyway Depth	Bore Sizes Available								
	Width	Depth		1008	1108	1210	1610	1615	2012	2517	3020	3030
0,375	0,125	0,062	—	x	x							
0,500	0,125	0,062	—	x	x		x	x				
0,625	0,187	0,093	—	x	x	x	x	x				
0,750	0,187	0,093	—	x	x	x	x	x	x			
0,875	0,250	0,125	—	x	x	x	x	x	x			
1,000	0,250	0,125	0,062	x	x	x	x	x	x			
1,125	0,312	0,125	0,078		x	x	x	x	x			
1,250	0,312	0,125	—			x	x	x	x	x	x	x
1,375	0,375	0,125	—				x	x	x	x	x	x
1,500	0,375	0,125	—				x	x	x	x	x	x
1,625	0,437	0,156	0,125				x	x	x	x	x	x
1,750	0,437	0,156	—						x	x	x	x
1,875	0,500	0,156	—						x	x	x	x
2,000	0,500	0,156	—						x	x	x	x
2,125	0,625	0,218	—							x	x	x
2,250	0,625	0,218	—							x	x	x
2,375	0,625	0,218	—							x	x	x
2,500	0,625	0,218	—							x	x	x
2,625	0,750	0,250	—								x	x
2,750	0,750	0,250	—								x	x
2,875	0,750	0,250	—								x	x
3,000	0,750	0,250	—								x	x



No. 3525 to 4040 Bushings

Bushing Number	Bore	Approx. Wgt. (Kg)	Bushing Keyseat	Shaft Keyseat	A	B	CØ			D	F†	G	R
							Class 20 Gray Iron	Class 30 Gray Iron	Steel				
3525	30 to 38	4,5	10 x 3,3	10 x 5,0	127	63,5	197	178	165	123	12,7 x 38	39°	▲
	38 to 44	4,2	12 x 3,3	12 x 5,0									
	44 to 50	4,2	14 x 3,8	14 x 5,5									
	50 to 58	4,1	16 x 4,3	16 x 6,0									
	58 to 65	3,6	18 x 4,4	18 x 7,0									
	65 to 75	3,2	20 x 4,9	20 x 7,5									
	75 to 85	2,7	22 x 5,4	22 x 9,0									
3535	30 to 38	6,4	10 x 3,3	10 x 5,0	127	89	197	178	165	123	12,7 x 38	39°	▲
	38 to 44	6,2	12 x 3,3	12 x 5,0									
	44 to 50	5,9	14 x 3,8	14 x 5,5									
	50 to 58	5,4	16 x 4,3	16 x 6,0									
	58 to 65	5,0	18 x 4,4	18 x 7,0									
	65 to 75	4,5	20 x 4,9	20 x 7,5									
	75 to 85	4,0	22 x 5,4	22 x 9,0									
4030	38 to 44	7,7	12 x 3,3	12 x 5,0	146	76,2	241	216	197	141	16 x 44	40°	▲
	44 to 50	7,3	14 x 3,8	14 x 5,5									
	50 to 58	6,8	16 x 4,3	16 x 6,0									
	58 to 65	6,4	18 x 4,4	18 x 7,0									
	65 to 75	5,9	20 x 4,9	20 x 7,5									
	75 to 85	5,4	22 x 5,4	22 x 9,0									
	85 to 95	5,0	25 x 5,4	25 x 9,0									
4040	38 to 44	10,0	12 x 3,3	12 x 5,0	146	102	241	216	197	141	16 x 44	40°	▲
	44 to 50	9,5	14 x 3,8	14 x 5,5									
	50 to 58	9,0	16 x 4,3	16 x 6,0									
	58 to 65	8,6	18 x 4,4	18 x 7,0									
	65 to 75	8,2	20 x 4,9	20 x 7,5									
	75 to 85	7,7	22 x 5,4	22 x 9,0									
	85 to 95	6,8	25 x 5,4	25 x 9,0									

Bushings cannot be bored larger than largest bore listed.

For detail dimensions required for machining hubs, consult factory.

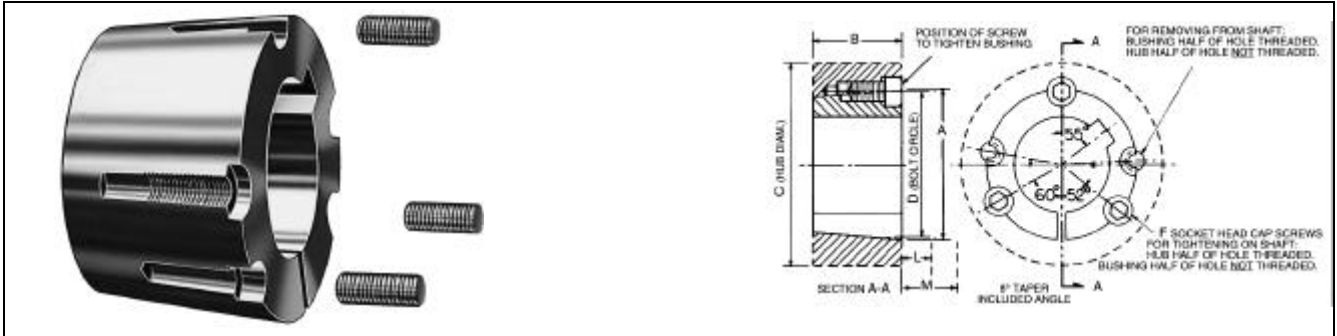
Ø For general reference. Severe conditions may require larger hub. Heavy well-located web may permit smaller hub. Hub diameter required depends on the particular application. Consult factory giving full information on the proposed design. Hub diameters shown are based on 20,000, 30,000 and

50,000 P.S.I. minimum ultimate tensile strength respectively for Class 20 gray iron, Class 30 gray iron and steel hubs.

† 3 screws required. Use in positions shown for tightening bushing on shaft. In removing bushing from shaft, remove screws and use two of them in the other two holes. Bushing price includes screws. See following footnote.

▲ Provide sufficient space to tighten and loosen bushing. Width across flats of screw head is same as screw diameter which is shown in column F.

Taper Bushings Dimensions



No. 4535 to 5050 Bushings

Bushing Number	Bore	Approx. Wgt. (Kg)	Bushing Keyseat	Shaft Keyseat	A	B	CØ			D	F†	G	R
							Class 20 Gray Iron	Class 30 Gray Iron	Steel				
4535	50 to 58	10,4	16 x 4,3	16 x 6,0	161	89	267	241	222	156	19 x 51	40°	▲
	58 to 65	10,0	18 x 4,4	18 x 7,0									
	65 to 75	9,5	20 x 4,9	20 x 7,5									
	75 to 85	9,1	22 x 5,4	22 x 9,0									
	85 to 95	8,2	25 x 5,4	25 x 9,0									
	95 to 110	7,3	28 x 6,4	28 x 10,0									
4545	50 to 58	13,6	16 x 4,3	16 x 6,0	161	114	267	241	222	156	19 x 51	40°	▲
	58 to 65	12,7	18 x 4,4	18 x 7,0									
	65 to 75	12,2	20 x 4,9	20 x 7,5									
	75 to 85	11,8	22 x 5,4	22 x 9,0									
	85 to 95	10,4	25 x 5,4	25 x 9,0									
	95 to 110	9,1	28 x 6,4	28 x 10,0									
5040	65 to 75	13,1	20 x 4,9	20 x 7,5	178	101,6	292	267	241	171	22 x 57	37°	▲
	75 to 85	12,7	22 x 5,4	22 x 9,0									
	85 to 95	11,8	25 x 5,4	25 x 9,0									
	95 to 110	10,9	28 x 6,4	28 x 10,0									
	110 to 130	10,0	32 x 7,4	32 x 11,0									
	130 to 140	8,9	36 x 6,4	36 x 12,0									
5050	65 to 75	17,2	20 x 4,9	20 x 7,5	178	127	292	267	241	171	22 x 57	37°	▲
	75 to 85	15,9	22 x 5,4	22 x 9,0									
	85 to 95	14,5	25 x 5,4	25 x 9,0									
	95 to 110	12,2	28 x 6,4	28 x 10,0									
	110 to 130	10,9	32 x 7,4	32 x 11,0									
	130 to 140	10,4	36 x 6,4	36 x 12,0									

Bushings cannot be bored larger than largest bore listed.

For detail dimensions required for machining hubs, consult factory.

Ø For general reference. Severe conditions may require larger hub. Heavy well-located web may permit smaller hub. Hub diameter required depends on the particular application. Consult factory giving full information on the proposed design. Hub diameters shown are based on 20,000, 30,000 and

50,000 P.S.I. minimum ultimate tensile strength respectively for Class 20 gray iron, Class 30 gray iron and steel hubs.

† 3 screws required. Use in positions shown for tightening bushing on shaft. In removing bushing from shaft, remove screws and use two of them in the other two holes. Bushing price includes screws. See following footnote.

▲ Provide sufficient space to tighten and loosen bushing. Width across flats of screw head is same as screw diameter which is shown in column F.



Taper Bushings Dimensions

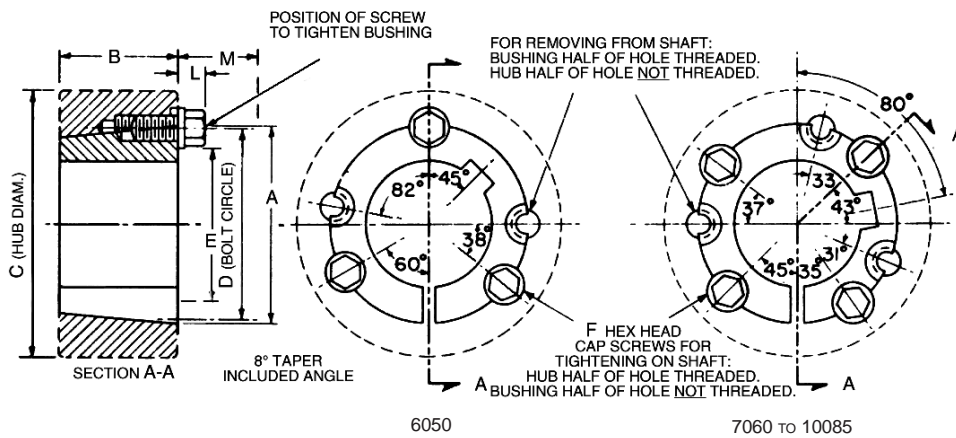
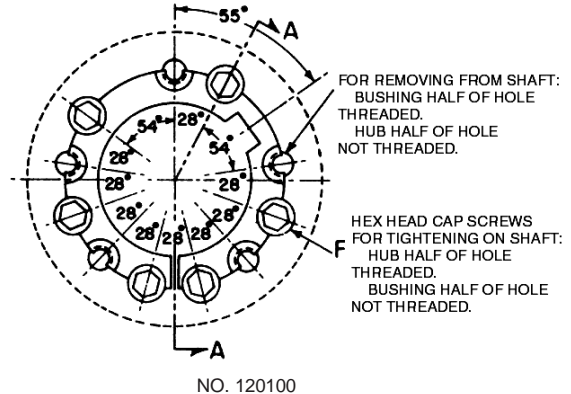
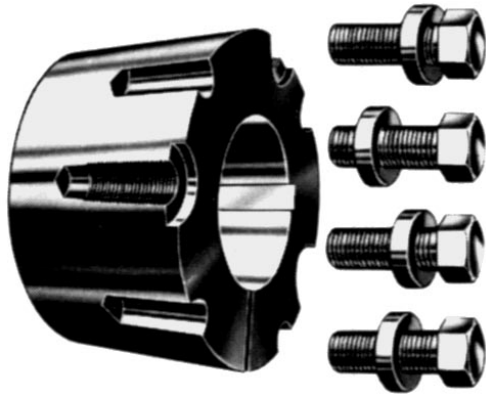
Metric Bores and Keyways

Bore Dia.	Keyway		Shallow Keyway Depth	Bore Sizes Available							
	Width	Depth		3525	3535	4030	4040	4535	4545	5040	5050
35	10	3,3	—	x	x						
38	10	3,3	—	x	x						
40	12	3,3	—	x	x	x	x				
42	12	3,3	—	x	x	x	x				
45	14	3,8	—	x	x	x	x				
48	14	3,8	—	x	x	x	x				
50	14	3,8	—	x	x	x	x				
55	16	4,3	—	x	x	x	x	x	x		
60	18	4,4	—	x	x	x	x	x	x		
65	18	4,4	—	x	x	x	x	x	x		
70	20	4,9	—	x	x	x	x	x	x	x	x
75	20	4,9	—	x	x	x	x	x	x	x	x
80	22	5,4	—	x	x	x	x	x	x	x	x
85	22	5,4	—	x	x	x	x	x	x	x	x
90	25	5,4	—	x	x	x	x	x	x	x	x
95	25	5,4	—	x		x	x	x	x	x	x
100	28	6,4	4,4	x		x	x	x	x	x	x
105	28	6,4	—			x		x	x	x	x
110	28	6,4	—			x		x	x	x	x
115	32	7,4	5,4			x		x		x	x
120	32	7,4	—					x		x	x
125	32	7,4	—					x		x	x
130	32	7,4	—							x	
140	32	8,4	6,4							x	

Inch Bores and Keyways

Bore Dia.	Keyway		Shallow Keyway Depth	Bore Sizes Available							
	Width	Depth		3525	3535	4030	4040	4535	4545	5040	5050
1,500	0,375	0,125	—	x	x						
1,625	0,437	0,156	—	x	x						
1,750	0,437	0,156	—	x	x	x	x				
1,875	0,500	0,156	—	x	x	x	x				
2,000	0,500	0,156	—	x	x	x	x				
2,125	0,625	0,218	—	x	x	x	x	x	x		
2,250	0,625	0,218	—	x	x	x	x	x	x		
2,375	0,625	0,218	—	x	x	x	x	x	x		
2,500	0,625	0,218	—	x	x	x	x	x	x		
2,625	0,750	0,250	—	x	x	x	x	x	x	x	x
2,750	0,750	0,250	—	x	x	x	x	x	x	x	x
2,875	0,750	0,250	—	x	x	x	x	x	x	x	x
3,000	0,750	0,250	—	x	x	x	x	x	x	x	x
3,125	0,875	0,312	—	x	x	x	x	x	x	x	x
3,250	0,875	0,312	—	x	x	x	x	x	x	x	x
3,375	0,875	0,312	—	x	x	x	x	x	x	x	x
3,500	0,875	0,312	—	x	x	x	x	x	x	x	x
3,750	1,000	0,375	0,312	x		x	x	x	x	x	x
4,000	1,000	0,375	0,218	x		x	x	x	x	x	x
4,250	1,250	0,437	—			x		x	x	x	x
4,500	1,250	0,437	0,343			x		x	x	x	x
4,750	1,250	0,437	—					x		x	x
5,000	1,250	0,437	0,343					x		x	x

Taper Bushings Dimensions



No 6050 to 120100 Taper Bushings

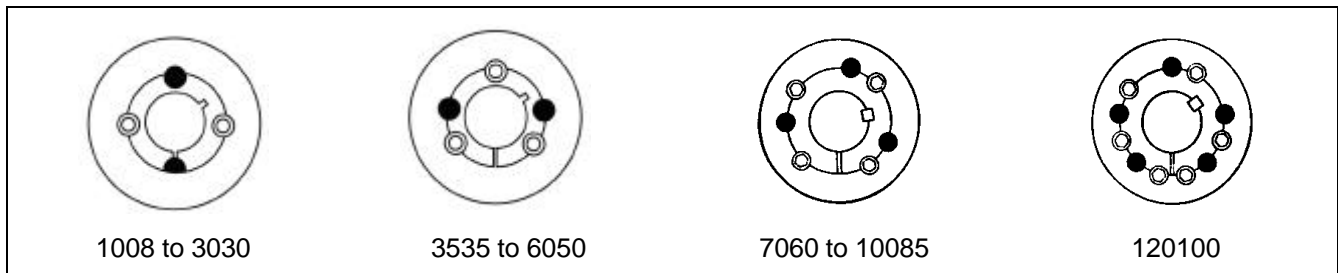
Bush Number	Bore	Weight (Kg)	Bushing Keyseat	Shaft Keyseat	A	B	CØ			D	E	F†	L*	M**
							Class 20 Gray Iron	Class 30 Gray Iron	Steel					
6050	95 to 110 110 to 130 130 to 150	27 25 23	28 x 6,4 32 x 7,4 36 x 8,4	28 x 10,0 32 x 11,0 36 x 12,0	235,0	127,0	431,8	393,7	342,9	228,6	171,5	31,8 x 88,9	41,3	111,1
7060	110 to 130 130 to 150	39 34	32 x 7,4 36 x 8,4	32 x 11 36 x 23 40 x 13	260,4	152,4	469,9	431,8	374,7	254,0	196,9	31,8 x 88,9	41,3	111,1
F8065	130 to 139,7 150 to 165,1 170 to 190,5	54 45 38	36 x 8,4	36 x 12 40 x 13 45 x 15	285,8	165,1	482,6	444,5	393,7	279,4	222,3	31,8 x 88,9	41,3	111,1
F10085	170 to 200 200 to 230 230 to 260	118 104 88	45 x 10,4 50 x 11,4 56 x 12,4	45 x 15 50 x 17 56 x 20	374,7	215,9	596,9	558,8	495,3	368,3	298,5	38,1 x 114,3	50,8	136,5
F120100	260 to 290 290 to 320	188 174	63 x 12,4	63 x 20	438,2	254,0	711,9	669,1	584,2	431,8	362,0	38,1 x 114,3	50,8	136,5

Class 20 gray iron, Class 30 gray iron and steel hubs.


F Not currently stocked — Available on order.

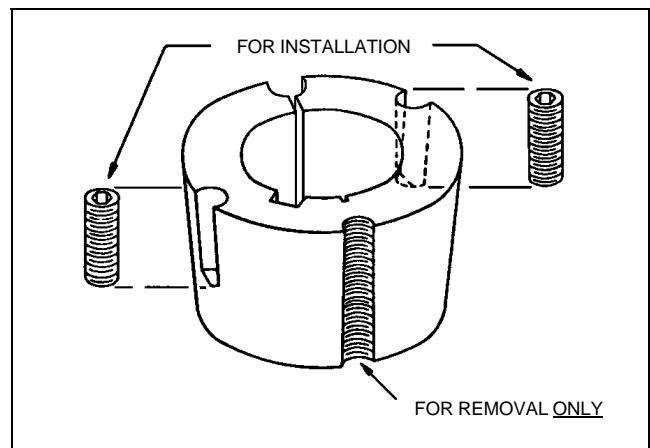
† 3 screws for 6050; four for 7060 to 10085; six for 120100. Use in positions shown for tightening bushing on shaft. In loosening bushing,

IMPORTANT: Follow all instructions in this manual carefully. This is necessary to insure satisfactory performance.




To Install:

1. Clean shaft, bore, and outside of bushing, and bore of hub (taking bushing from hub if already assembled). Remove any oil, lacquer, or dirt. Place bushing in hub and match half holes to make complete holes (each complete hole will be threaded on one side only).
2. Oil thread and point of set screws or thread and under head of cap screws. Place screws loosely in holes that are threaded on hub side (shown thus  in diagram).
3. Make sure bushing is free in hub. Slip assembly onto shaft and locate in position desired.
4. Tighten screws (see note*) alternately and evenly until all are pulled up very tightly. Use a piece of pipe on wrench to increase leverage. (See table for wrench torque on reverse side.)
5. Hammer against large end of bushing using hammer and block or sleeve to avoid damage. Screws can now be turned a little more using the specified wrench torque. Repeat this alternate hammering and screw re-tightening until the specified wrench torque no longer turns the screws after hammering.
6. After drive has been running under load for a short time stop and check tightness of screws. Fill other holes with grease to exclude dirt.



To Remove:

1. Remove all screws. Oil thread and point of set screws or thread and under head of cap screws.
2. Insert screws in holds that are threaded on bushing side (shown thus  in diagram). In sizes where washers are found under screw heads, be sure to use these washers. Note that one screw in each hub is left over and is not used in this loosening operation.
3. Tighten screws alternately until bushing is loosened in hub. If bushing does not loosen immediately, tap on hub.

Recommended Wrench Torque

Bush Size	1008	1108	1210	1610	1615	2012	2517	3020	3030	3525	3535	4030	4040	4535	4545	5040	5050
Screw Tightening Torque (Nm)	5,6	5,6	20	20	20	30	50	90	90	115	115	170	170	190	190	270	270
Screw Details	Qty	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3
	Size (BSW)	1/4	1/4	3/8	3/8	3/8	7/16	1/2	5/8	5/8	1/2	5/8	5/8	3/4	3/4	7/8	7/8
	Hex. Socket Size (mm)	3	3	5	5	5	6	6	8	8	10	10	12	12	14	14	14
Large End Dia. (mm)	35,0	38,0	47,5	57,0	57,0	70,0	85,5	108,0	108,0	127,0	127,0	146,0	146,0	162,0	162,0	177,5	177,5
Approx. Mass (kg)	0,1	0,1	0,2	0,3	0,5	0,7	1,5	2,7	3,6	3,8	5,0	5,6	7,7	7,5	10,0	11,1	14,0

When ordering Bushings give: Number stamped on large end of bushing, bore, and quantity.

★If two bushings are used in the same sheave, pulley, or other unit member, tighten one bushing on shaft per steps 4 and 5 before starting to tighten screws in other bushing.

Taper Bushings Metric and Reborable



Stock Reborable Taper Bushings With No Keyways

Sintered Steel		Gray Iron		Steel*		Stainless Steel*	
1008	$\frac{9}{16}$			1008	$\frac{1}{2}$	1008	$\frac{1}{2}$
1108	$\frac{1}{2}$			1108	$\frac{1}{2}$	1108	*
1210	$\frac{9}{16}$			1210	$\frac{1}{2}$	1210	$\frac{1}{2}$
1215	$\frac{1}{2}$			1215	$\frac{1}{2}$	1215	*
1310	$\frac{1}{2}$			1310	*	1310	*
1610	$\frac{1}{2}$ $1\frac{5}{16}$			1610	$\frac{1}{2}$	1610	$\frac{1}{2}$
1615	$\frac{1}{2}$ $1\frac{5}{16}$			1615	$\frac{1}{2}$	1615	*
2012	$\frac{1}{2}$			2012	$\frac{1}{2}$	2012	$\frac{1}{2}$
2517	$\frac{1}{2}$ $1\frac{9}{16}$			2517	$\frac{1}{2}$	2517	$\frac{1}{2}$
		2525	$2\frac{1}{8}$	2525	*	2525	*
3020	$\frac{5}{16}$ $1\frac{11}{16}$	3020	$\frac{5}{16}$ $1\frac{7}{16}$ $2\frac{5}{16}$	3020	$\frac{5}{16}$	3020	$\frac{5}{16}$
		3030	$\frac{5}{16}$ $2\frac{7}{16}$ $2\frac{15}{16}$	3030	*	3030	*
		3535	$1\frac{3}{16}$ $2\frac{7}{16}$ $2\frac{15}{16}$	3535	*	3535	*
		4040	$1\frac{7}{16}$ $3\frac{7}{16}$ $3\frac{15}{16}$	4040	*	4040	*
		4545	$3\frac{5}{16}$ $4\frac{7}{16}$	4545	*	4545	*
		5050	$2\frac{7}{16}$ $3\frac{15}{16}$				
		6050	$3\frac{7}{16}$ $5\frac{7}{16}$				
		7060	$3\frac{15}{16}$				
		8065	$4\frac{7}{16}$				
		10085	7				
		120100	8				

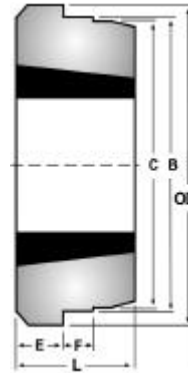
★ Not currently stocked. Consult factory for availability and pricing.

* Stock in U.S.A

Martin Taper Bushed Type W Weld-On Hubs are made of steel, drilled, tapped, and taper bored to receive Tapered Bushings. They are very useful for welding into fan rotors, pulleys, plate sprockets, impellers, agitators, and many other devices which must be firmly fastened to the shaft. Cases where the attached item is of small dimensions should be referred to Martin.

Taper Bushed Type W Weld-On Hubs

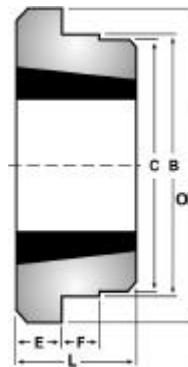
Type W							
Part Number	Bush No.	OD	B	C	L	E	F
W12	1215	73,03	63,50	62,71	38,10	15,88	9,53
W16	1615	82,55	73,03	72,24	38,10	15,88	9,53
W20	2017	101,60	88,90	88,11	44,45	19,05	11,91
W25	2517	127,00	111,13	110,34	44,45	19,05	12,70
W30	3030	149,86	133,35	132,56	76,20	25,40	19,05
W35	3535	184,15	158,75	157,96	88,90	31,75	25,40
W40	4040	225,43	196,85	196,06	101,60	31,75	31,75
W45	4545	254,00	222,25	221,46	114,30	38,10	38,10



Type W

Taper Bushed Type WH Weld-On Hubs

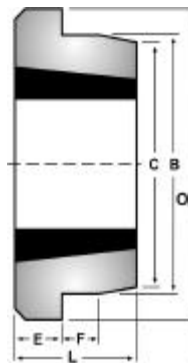
Type WH							
Part Number	Bush No.	OD	B	C	L	E	F
WH12	1210	70,00	65,00	64,50	25,00	9,00	10,00
WH16	1610	80,00	75,00	74,50	25,00	9,00	10,00
WH20	2012	95,00	90,00	89,50	32,00	12,00	12,00
WH25	2517	115,00	110,00	109,50	44,00	19,00	15,00
WH30	3020	145,00	140,00	139,50	50,00	20,00	15,00
WH35	3525	190,00	180,00	179,50	65,00	25,00	25,00
WH35-2	3535	190,00	180,00	179,50	89,00	25,00	25,00
WH40-1	4030	200,00	190,00	189,50	76,00	32,00	30,00
WH40-2	4040	200,00	190,00	189,50	101,00	32,00	30,00
WH45-1	4535	210,00	200,00	199,50	89,00	40,00	30,00
WH45-2	4545	210,00	200,00	199,50	114,00	40,00	30,00
WH50-1	5040	230,00	220,00	219,50	102,00	40,00	35,00
WH50-2	5050	230,00	220,00	219,50	127,00	40,00	35,00



Type WH

Taper Bushed Type WM Weld-On Hubs

Type WM							
Part Number	Bush No.	OD	B	C	L	E	F
WM12	1210	70,00	60,00	58,00	25,00	9,00	10,00
WM16-1	1610	83,00	70,00	68,00	25,00	9,00	10,00
WM16-2	1615	83,00	70,00	68,00	38,00	16,00	11,00
WM20	2012	95,00	90,00	88,00	32,00	12,00	12,00
WM25	2517	127,00	110,00	108,00	44,00	19,00	13,00
WM30-1	3020	152,00	130,00	125,00	50,00	20,00	15,00
WM30-2	3030	152,00	130,00	125,00	76,00	25,00	19,00
WM35	3535	184,00	155,00	151,00	89,00	32,00	25,00
WM40	4040	225,00	195,00	187,00	102,00	32,00	32,00
WM45	4545	254,00	220,00	213,00	114,00	38,00	38,00
WM50	5050	276,00	242,00	228,00	127,00	38,00	38,00

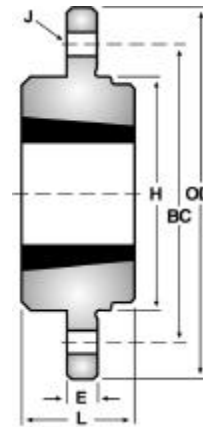


Type WM

Bolt-on Hubs/ Adapters

Taper Bushed Type BF Bolt-On Hubs

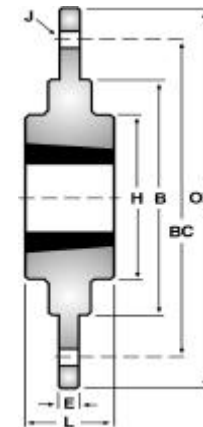
Type BF							
Part Number	Bush No.	OD	B	BC	L	E	F
BF12	1210	120,00	80,00	100,00	25,00	6,50	6 x 6,6
BF16	1610	130,00	90,00	110,00	25,00	6,50	6 x 6,6
BF20	2012	145,00	100,00	125,00	32,00	8,50	6 x 9,0
BF25	2517	185,00	119,00	155,00	44,00	11,50	6 x 11,0
BF30	3020	220,00	147,00	190,00	50,00	11,50	6 x 13,0



Type BF

Taper Bushed Type SM Bolt-On Hubs

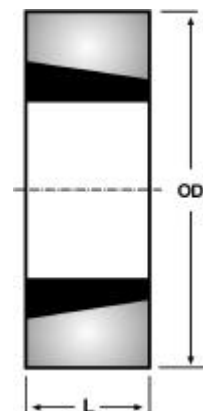
Type SM								
Part Number	Bush No.	OD	B	BC	L	E	F	J
SM12	1210	180.00	90.00	135.00	25.00	6.50	75.00	6 x 7.5
SM16	1615	200.00	110.00	150.00	38.00	7.50	85.00	7 x 7.5
SM20	2012	270.00	140.00	190.00	32.00	8.50	110.00	6 x 9.5
SM25	2517	340.00	170.00	240.00	45.00	9.50	125.00	8 x 11.5
SM30-1	3020	430.00	220.00	300.00	51.00	13.50	160.00	8 x 13.5
SM30-2	3020	485.00	250.00	340.00	51.00	13.50	160.00	8 x 13.5



Type SM

Taper Bushed Adapters

Adapters						
Part Number	Bush No.	OD	L	Keyway		
				Width	Depth	
1008BM	1008	45	22	5.0	2.5	
1008AM				—	—	
1210BM	1210	60	25	6.0	3.0	
1210AM				—	—	
1215BM	1215	60	38	6.0	3.0	
1215AM				—	—	
1610BM	1610	70	25	10.0	4.0	
1610AM				—	—	
1615BM	1615	70	38	10.0	4.0	
1615AM				—	—	
2517BM	2517	105	45	16.0	4.0	
2517AM				—	—	
3030BM	3030	130	76	20.0	5.0	
3030AM				—	—	
3535BM	3535	160	89	22.0	5.0	
3535AM				—	—	
4040BM	4040	185	102	24.0	5.0	
4040AM				—	—	



Adapters

Warning & Safety Reminder



WARNING & SAFETY REMINDER

Safety must be considered a basic factor in machinery operation at all times. Most accidents are the result of carelessness or negligence. All rotating power transmission products are potentially dangerous and must be guarded by the contractor, installer, purchaser, owner, and user as required by applicable laws, regulations, standards, and good safety practice. Additional specific information must be obtained from your local authorities; other sources may include the latest editions of American Society of Mechanical Engineers at 345 East 47th Street, New York, NY 10017 (+1-212-705-7722)

It is the responsibility of the contractor, installer, purchaser, owner, and user to install, maintain, and operate the parts or components manufactured or supplied by *Martin* Sprocket & Gear, Inc., in such a manner as to comply with the requirements of your local laws, ordinances, regulations, authorities, and safety acts which are similar in spirit and intention of the Williams-Steiger Occupational Safety Act in the USA as well as the American National Standard Institute Safety Code.

CAUTION

Guards, access doors, and covers must be securely fastened before operating any equipment.

If parts are to be inspected, cleaned, observed, or general maintenance performed, the following precautions must be taken.

1. Isolate the power source from the equipment.
2. Disconnect or reconnect any equipment only if the construction is fully visible and understood.
3. Wear eye protection.
4. Wear appropriate protective clothing, hats, gloves and safety shoes as warranted by the circumstances.
5. Check that all tools are used in good working condition only.
6. Loosen tensioning devices carefully.
7. Avoid sudden and unexpected movement of parts of the equipment and/or components.
8. Do not reuse individual components.
9. Do not reuse a damaged or faulty part.

Failure to follow these measures may result in personal injury or property damage.

WARNING

NOTE: CATALOG DIMENSIONS

Every effort is made to keep all catalog dimensions and styles current in the catalog. However, from time to time it is necessary because of manufacturing changes to alter stock products dimensionally.

If any stock product dimension or style shown in this catalog is critical to your application please consult factory for verification.