

**TYPE E
TAPERED
ROLLER
BEARINGS**

Moline Type E Tapered Roller Bearings offer many advantages including high-speed suitability, positive locking to the shaft, ruggedness, and low price.

The housings are as compact as possible without sacrificing their brawny ruggedness. Made in the USA of high quality Class 30 cast iron, they are precision machined to close tolerances.

On each end of the inner race there is a Drive Collar with two headless set screws. These screws extend through clearance holes in the inner race, locking it to the shaft.

Moline uses only genuine Timken® Tapered Roller Bearings. They are made from vacuum degassed steel which gives rollers and races added life, and provides superior load and speed characteristics. A long inner race insures load distribution over a considerable length of shaft. In addition, the arrangements of Timken rollers and races is such that Moline Type E Mounted Bearings will handle slight angular shaft misalignment. These bearings also have high radial and thrust load capacities, and are capable of handling most combinations of loads found in all normal applications.

Moline Type E Pillow Blocks, Flange Bearings, Piloted Flange Bearings, and Wide Slot Take-ups are ready to slip onto the shaft when received, because they are completely assembled, adjusted, sealed and pre-lubricated at the factory. There is no danger of bearing failure resulting from dirt or dust entering the bearing

before or during installation. Such contamination is very difficult to prevent in bearings that are not shaft ready. No time or expense is required for cleaning housings, for adjusting, or for initial lubrication. Therefore, overall installed cost is less in many instances. Operating expense over time is also generally less.

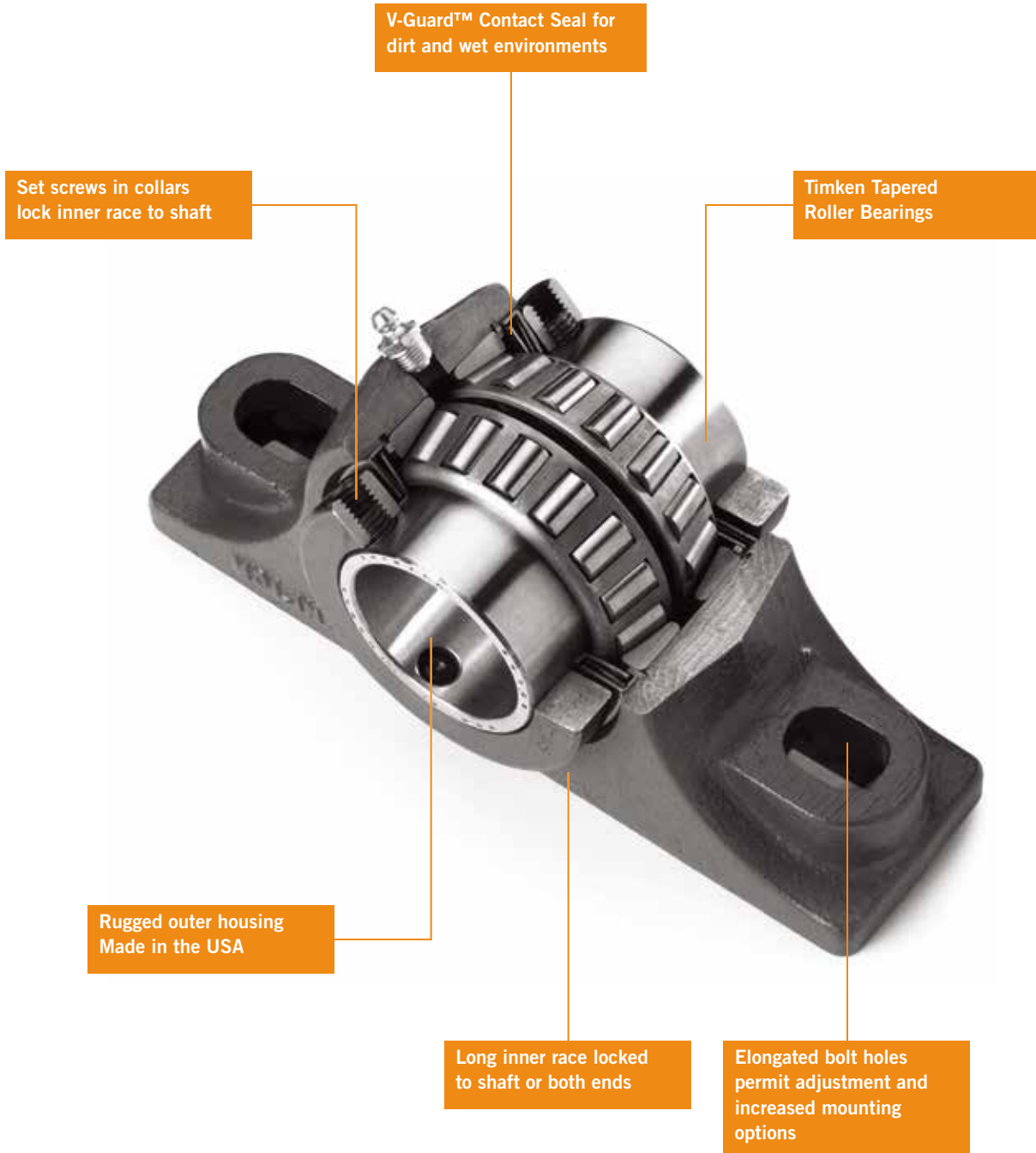
The V-Guard™ contact seal, which is built in at each end of the bearing during factory assembly, effectively seals against loss of lubricant and admission of dust and dirt, both on and off the shaft. Efficiency of the seal is consistent throughout the allowable range of self-alignment.

Bore tolerance is $+.001"/- .000"$ for 3" and smaller bores; $+.002"/- .000"$ for bores larger than 3".

Moline Mounted Type E bearings are available in shaft sizes from $1\frac{3}{16}"$ to 7" and 35 to 180mm in Pillow Blocks, $1\frac{3}{16}"$ to $4\frac{1}{2}"$ and 35 to 115mm in 4-Bolt Flanges, $1\frac{1}{2}"$ to 5" and 40 to 125mm in Piloted Flanges, and $1\frac{3}{4}"$ to $3\frac{1}{2}"$ and 45 to 90mm in Wide Slot Take-ups.

All housings are available in our standard painted finish. Custom Colors, Powder Coating, Stainless Steel Powder coating, Nickel plating, Epoxy coatings and Teflon coatings will be quoted on request.

Moline Type E bearings are carried in warehouse and distributor stocks all over the United States and in Canada.



MOLINE TYPE E MOUNTED BEARINGS

TIMKEN TIMKEN INSERT INSIDE



FEATURES OF MOLINE TYPE E TAPERED ROLLER BEARINGS

WITH TIMKEN® TAPERED ROLLER BEARINGS

- Available in shaft sizes from 1 $\frac{3}{16}$ " to 7", and 35mm to 180mm
- Easy installation and maintenance
- Supplied from the factory in shaft ready condition
- Assembled, adjusted and pre-lubricated in advance for immediate use
- Dimensionally interchangeable with comparable competitive Type E units
- Tapered roller bearings with double-extended inner race
- Extended inner race has two locking collars
- Available with standard V-Guard™ Nitrile and Teflon Contact Seal or Balanced Labyrinth Seal
- Case hardened rollers and races
- 65° set screw spacing on locking collars
- Timken® tapered roller bearing inserts allow for a combination of radial and thrust loads
- Misalignment = .010" per foot of shaft
- Excellent thrust load capacity
- Close fit oversized collars act as flingers for additional protection in dusty or damp environments
- Rugged housings are made in the USA of Class 30 cast iron
- Standard grease operating temperature is up to 250°
- High temperature grease is available up to 350°
- For custom lubrication, please call the factory for more information
- Housings available in the standard painted finish. Powder coating in RAL or custom colors, Stainless Steel Powder coating, Nickel-plating, Epoxy, Teflon and other coatings are available upon request
- Custom machining and design is available. Please call the factory for further information
- Made in the United States

Standard V-Guard™ Contact Seal made of Nitrile, Teflon and Steel for extreme dirt and wet environments.



Balanced Metal Labyrinth Seal for high speed applications



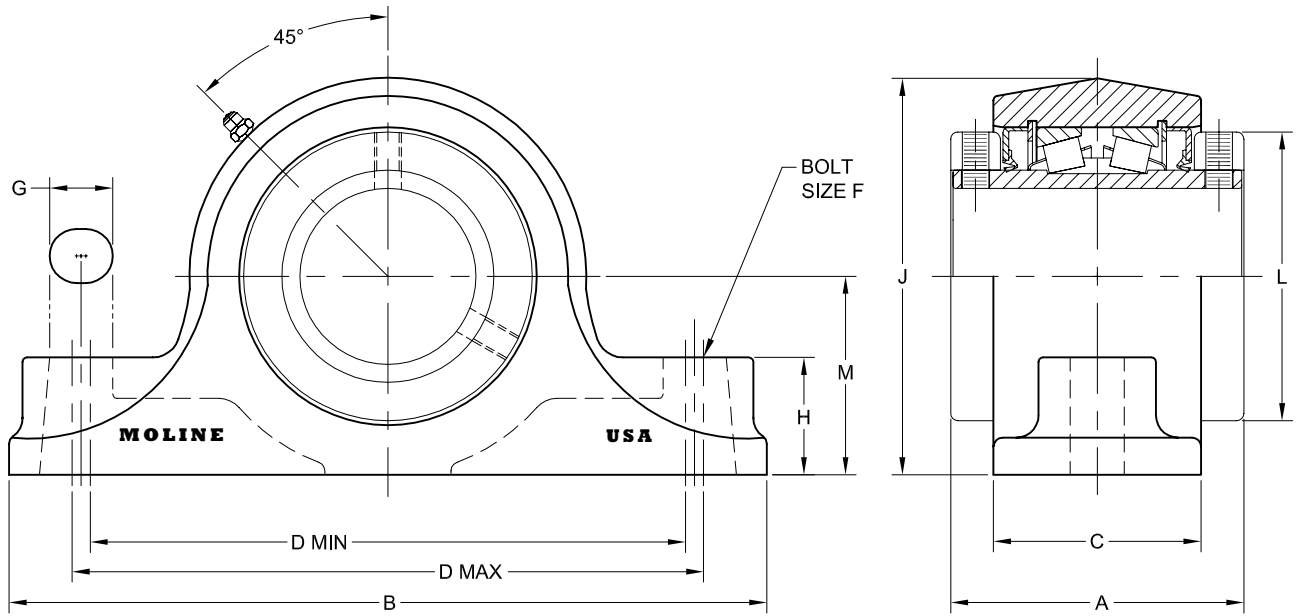
TYPE E 2-BOLT PILLOW BLOCK

SHAFT SIZE	MOLINE PART #	DIMENSIONS (INCHES)											WEIGHT LBS.	
		A	B	C	MIN D	CENTER TO CENTER D	MAX D	F	G	H	J	L		M
1 ³ / ₁₆ 1 ¹ / ₄	19321103 19321104	2 ³ / ₄	6	1 ⁷ / ₈	4 ⁵ / ₈	4 ³ / ₄	4 ⁷ / ₈	³ / ₈	1 ⁹ / ₃₂	⁷ / ₈	3	2 ¹ / ₄	1 ¹ / ₂	4
1 ³ / ₈ 1 ⁷ / ₁₆ 35 mm	19321106 19321107 19321035	3	7 ³ / ₈	2 ¹ / ₈	5	5 ¹ / ₂	6	¹ / ₂	1 ¹ / ₈	1 ¹ / ₈	3 ⁷ / ₈	2 ³ / ₄	1 ⁷ / ₈	6.9
1 ¹ / ₂ 1 ⁵ / ₈ 1 ¹ / ₁₆ 40 mm	19321108 19321110 19321111 19321040	3 ³ / ₈	7 ⁷ / ₈	2 ³ / ₈	5 ⁵ / ₈	6 ¹ / ₁₆	6 ¹ / ₂	¹ / ₂	1 ¹ / ₁₆	1 ¹ / ₄	4 ¹ / ₄	3 ³ / ₁₆	2 ¹ / ₈	9.5
1 ³ / ₄ 1 ⁷ / ₈ 1 ¹⁵ / ₁₆ 2 45 mm 50 mm	19321112 19321114 19321115 19321200 19321045 19321050	3 ¹ / ₂	8 ⁷ / ₈	2 ¹ / ₂	6 ¹ / ₈	6 ¹¹ / ₁₆	7 ¹ / ₄	⁵ / ₈	1 ⁵ / ₁₆	1 ⁵ / ₁₆	4 ¹ / ₂	3 ³ / ₈	2 ¹ / ₄	11
2 ³ / ₁₆ 55 mm	19321203 19321055	3 ³ / ₄	9 ⁵ / ₈	2 ⁵ / ₈	6 ¹ / ₁₆	7 ³ / ₈	8	⁵ / ₈	1 ⁷ / ₁₆	1 ¹ / ₂	5	3 ³ / ₄	2 ¹ / ₂	14
2 ¹ / ₄ 2 ⁷ / ₁₆ 2 ¹ / ₂ 60 mm 65 mm	19321204 19321207 19321208 19321060 19321065	4	10 ¹ / ₂	2 ⁷ / ₈	7 ¹ / ₈	7 ⁷ / ₈	8 ⁵ / ₈	⁵ / ₈	1 ¹ / ₂	1 ⁵ / ₈	5 ¹¹ / ₁₆	4	2 ³ / ₄	19
2 ¹¹ / ₁₆ 2 ³ / ₄ 2 ¹⁵ / ₁₆ 3 70 mm 75 mm	19321211 19321212 19321215 19321300 19321070 19321075	4 ¹ / ₂	12	3	7 ⁷ / ₈	8 ¹³ / ₁₆	9 ³ / ₄	³ / ₄	1 ¹³ / ₁₆	1 ⁷ / ₈	6 ⁵ / ₁₆	4 ¹¹ / ₁₆	3 ¹ / ₈	26
3 ³ / ₁₆ 3 ¹ / ₄ 3 ⁷ / ₁₆ 3 ¹ / ₂ 80 mm 85 mm 90 mm	19321303 19321304 19321307 19321308 19321080 19321085 19321090	5	14	3 ⁵ / ₈	9 ³ / ₄	10 ⁵ / ₈	11 ¹ / ₂	⁷ / ₈	1 ⁷ / ₈	2 ¹ / ₄	7 ¹ / ₂	5 ¹⁵ / ₁₆	3 ³ / ₄	44

*Note: The elongated slots give broader mounting capabilities while still allowing the same center to center, min and max mounting dimensions of the old style Type E.

TYPE E 2-BOLT PILLOW BLOCK

TYPE E



CAD drawings available upon request at no additional charge.

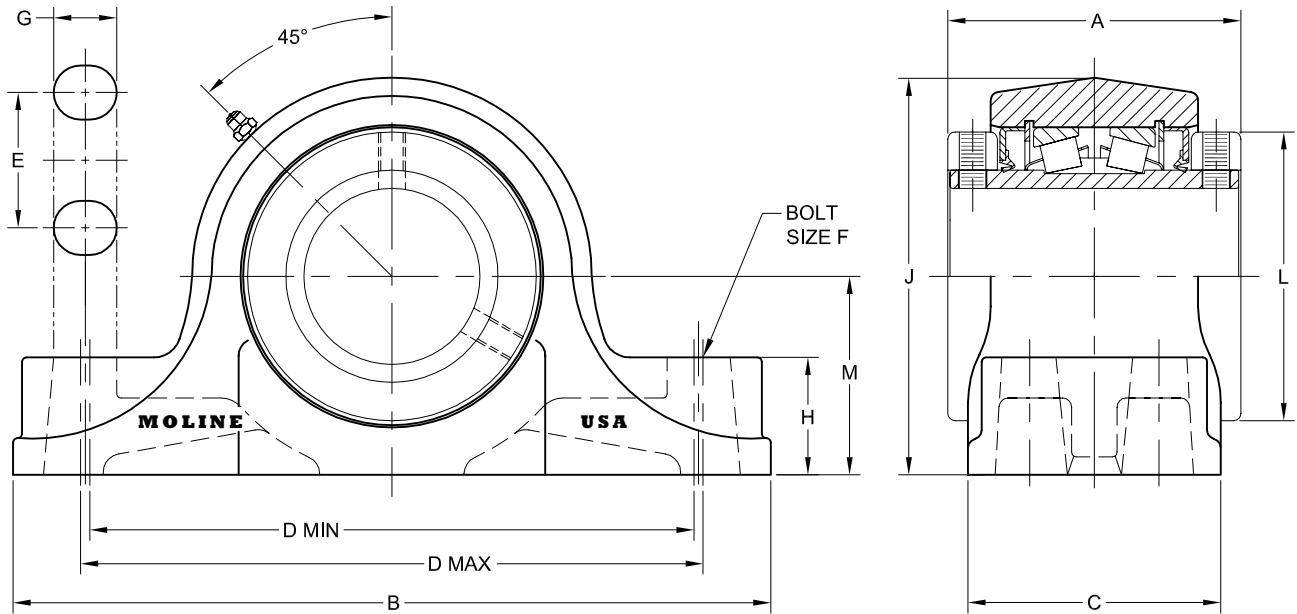
Furnished in non-expansion type only.

TYPE E 4-BOLT PILLOW BLOCK

SHAFT SIZE	MOLINE PART #	DIMENSIONS (INCHES)													WEIGHT LBS.
		A	B	C	MIN D	CENTER TO CENTER D	MAX D	E	F	G	H	J	L	M	
2 ¼	19341204	4	10 ½	3 ½	8 5/16	8 ½	8 11/16	1 7/8	5/8	7/8	1 5/8	5 ½	4	2 ¾	19
2 7/16	19341207														
2 ½	19341208														
60mm	19341060														
65mm	19341065														
2 11/16	19341211	4 ½	12	4	9 3/16	9 ½	9 13/16	2 1/8	5/8	7/8	1 7/8	6 ¼	4 11/16	3 1/8	26
2 ¾	19341212														
2 15/16	19341215														
3	19341300														
70mm	19341070														
75mm	19341075														
3 3/16	19341303	5	14	4 ½	10 ¾	11	11 ¼	2 3/8	¾	1 3/16	2 ¼	7 ½	5 5/16	3 ¾	44
3 ¼	19341304														
3 7/16	19341307														
3 ½	19341308														
80mm	19341080														
85mm	19341085														
90mm	19341090														
3 15/16	19341315	6 ¼	15 ¼	4 ½	12 ¼	12 ½	12 ¾	2 ¼	¾	1 ½	2 7/16	8 ½	5 ¾	4 ¼	65
4	19341400														
100mm	19341100														

TYPE E 4-BOLT PILLOW BLOCK

TYPE E



CAD drawings available upon request at no additional charge.

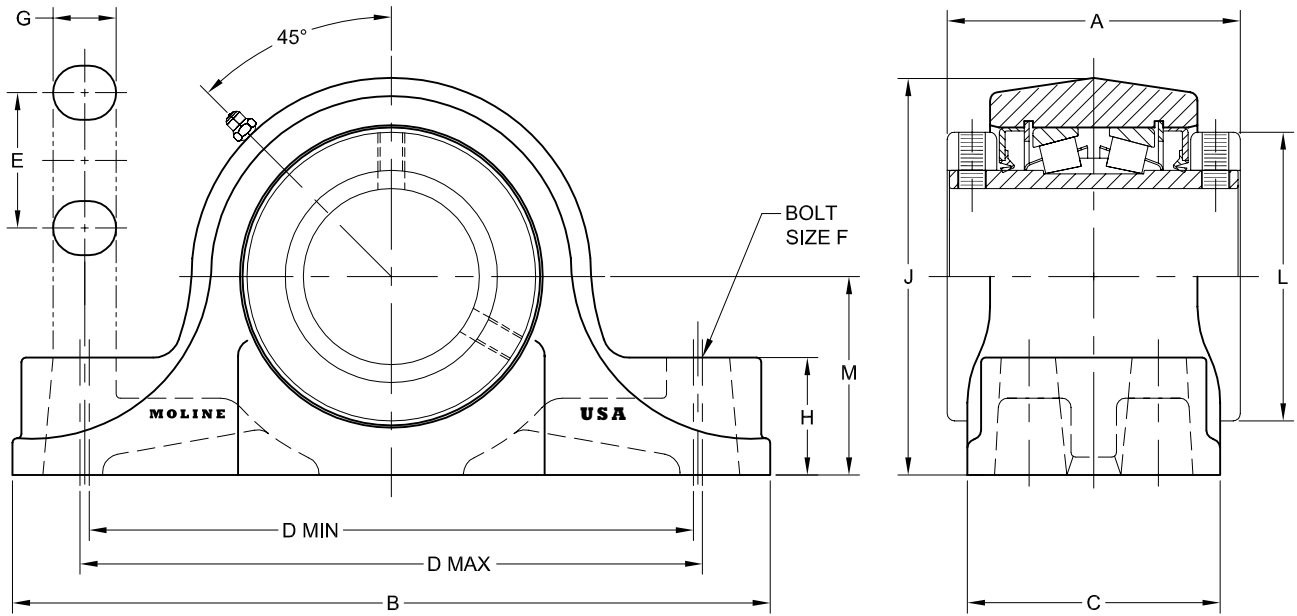
Furnished in non-expansion type only.

TYPE E 4-BOLT PILLOW BLOCK CONTINUED

SHAFT SIZE	MOLINE PART #	DIMENSIONS (INCHES)													WEIGHT LBS.
		A	B	C	MIN D	CENTER TO CENTER D	MAX D	E	F	G	H	J	L	M	
4 ⁷ / ₁₆	19341407	6 ³ / ₄	16 ⁵ / ₈	4 ⁵ / ₈	13 ¹ / ₄	13 ¹ / ₂	13 ³ / ₄	2 ¹ / ₂	3/4	1 ³ / ₁₆	2 ³ / ₄	9 ³ / ₈	6 ¹ / ₄	4 ³ / ₄	81
4 ¹ / ₂	19341408														
110mm	19341110														
115mm	19341115														
4 ¹⁵ / ₁₆	19341415	7 ¹ / ₄	18 ¹ / ₂	5 ¹ / ₈	15 ¹ / ₄	15 ¹ / ₂	15 ³ / ₄	2 ³ / ₄	7/8	1 ¹ / ₄	3	10 ⁷ / ₈	7 ¹ / ₄	5 ¹ / ₂	132
5	19341500														
125mm	19341125														
5 ⁷ / ₁₆	19341507	9	22	6 ¹ / ₄	17 ³ / ₈	18 ¹ / ₄	19 ¹ / ₈	3 ³ / ₄	1	2	3 ¹ / ₄	13 ³ / ₁₆	9 ³ / ₈	6 ¹ / ₁₆	243
5 ¹⁵ / ₁₆	19341515														
6	19341600														
130mm	19341130														
135mm	19341135														
140mm	19341140														
150mm	19341150														
6 ⁷ / ₁₆	19341607	10 ¹ / ₂	26	7 ¹ / ₈	21 ¹ / ₄	22 ¹ / ₄	23 ¹ / ₄	4 ⁵ / ₈	1	2 ¹ / ₈	3 ¹ / ₁₆	15	10 ⁷ / ₈	7 ¹ / ₂	356
6 ¹ / ₂	19341608														350
6 ¹⁵ / ₁₆	19341615														340
7	19341700														335
160mm	19341160														340
170mm	19341170														340
180mm	19341180														335

TYPE E 4-BOLT PILLOW BLOCK

TYPE E



CAD drawings available upon request at no additional charge.

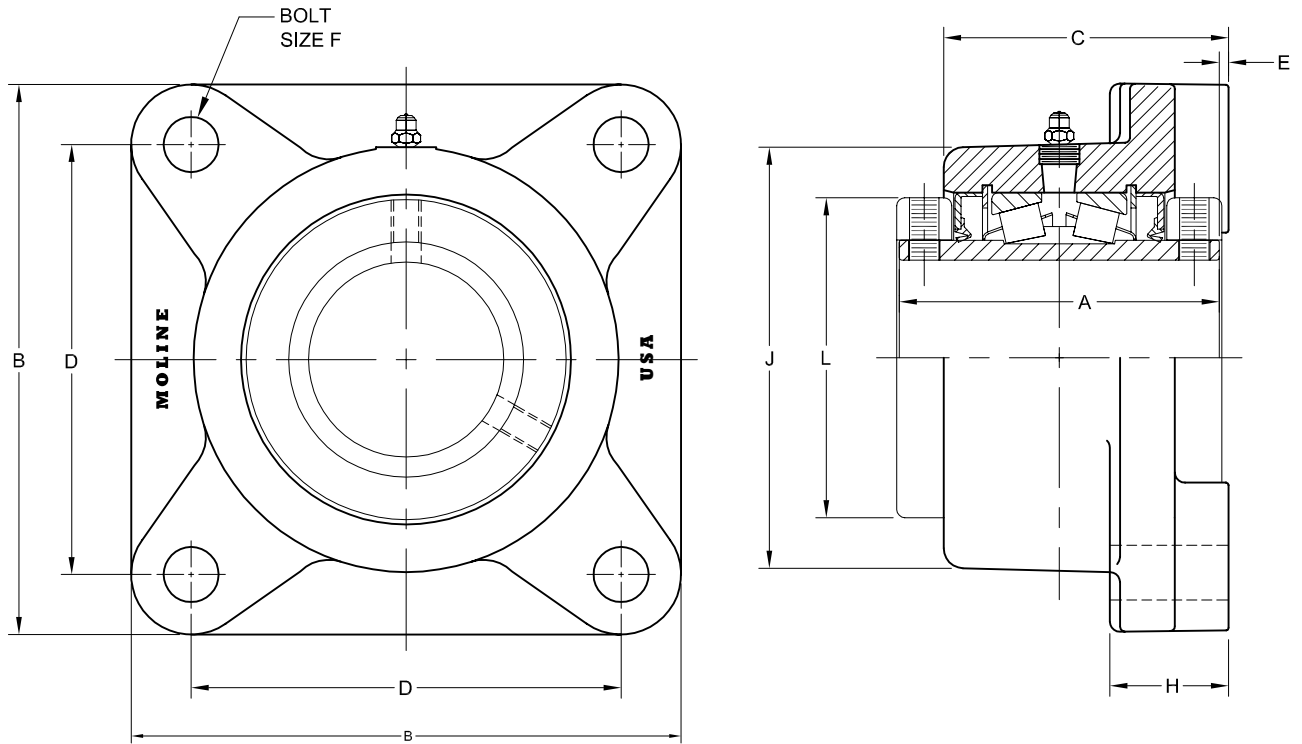
Furnished in non-expansion type only.

TYPE E 4-BOLT FLANGE

SHAFT SIZE	MOLINE PART #	DIMENSIONS (INCHES)									WEIGHT LBS.
		A	B	C	D	E	F	H	J	L	
1 3/16 1 1/4	19311103 19311104	2 3/4	3 3/4	2 11/32	2 7/8	1/16	3/8	1	2 15/16	2 1/4	4.5
1 3/8 1 7/16 35mm	19311106 19311107 19311035	3	4 5/8	2 19/32	3 1/2	1/16	1/2	1 1/16	3 7/8	2 3/4	6.7
1 1/2 1 5/8 1 11/16 40mm	19311108 19311110 19311111 19311040	3 3/8	5 3/8	2 31/32	4 1/8	1/8	1/2	1 3/16	4 1/4	3 1/8	10
1 3/4 1 7/8 1 15/16 2 45mm 50mm	19311112 19311114 19311115 19311200 19311045 19311050	3 1/2	5 5/8	3 3/32	4 3/8	1/8	1/2	1 3/16	4 1/2	3 3/8	12
2 3/16 55mm	19311203 19311055	3 3/4	6 1/4	3 9/32	4 7/8	1/8	5/8	1 3/8	4 7/8	3 3/4	16
2 1/4 2 7/16 2 1/2 60mm 65mm	19311204 19311207 19311208 19311060 19311065	4	6 7/8	3 9/16	5 3/8	3/16	5/8	1 1/2	5 3/4	4	21

TYPE E 4-BOLT FLANGE

TYPE E



CAD drawings available upon request at no additional charge.

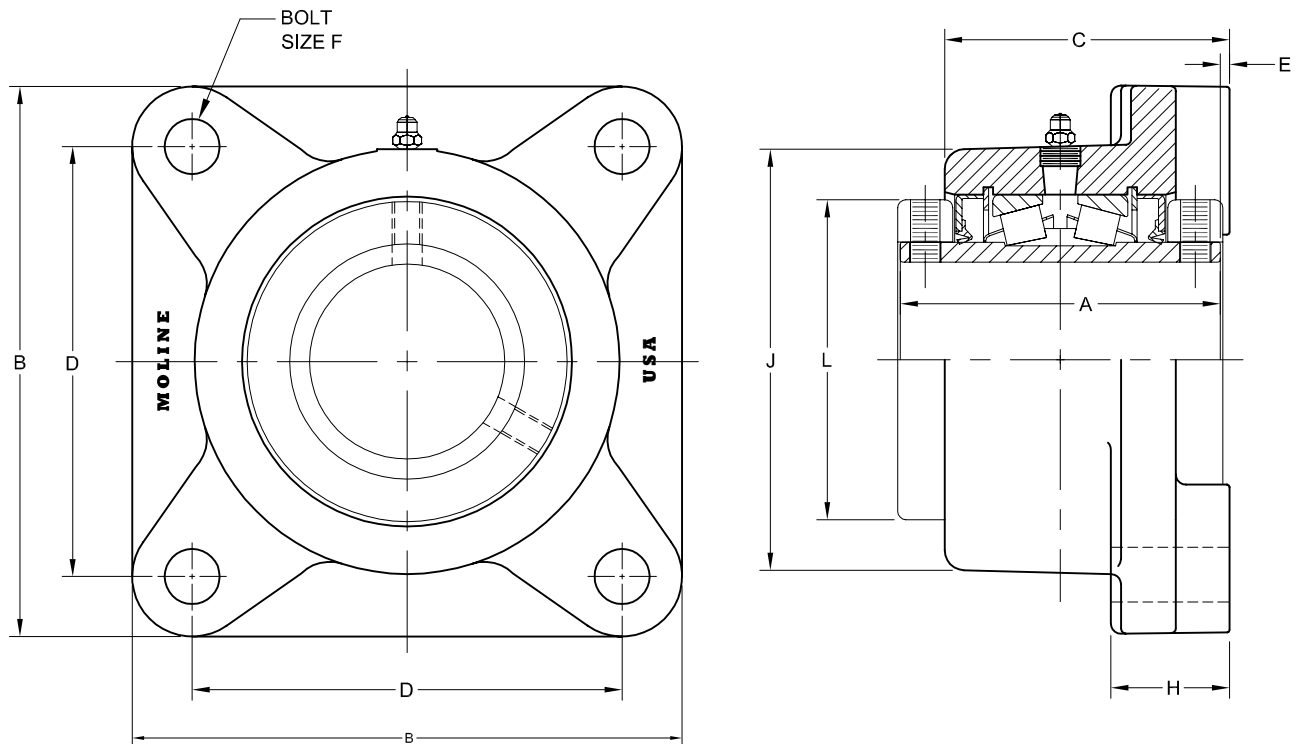
Furnished in non-expansion type only.

TYPE E 4-BOLT FLANGE CONTINUED

SHAFT SIZE	MOLINE PART #	DIMENSIONS (INCHES)									WEIGHT LBS.
		A	B	C	D	E	F	H	J	L	
2 ¹¹ / ₁₆	19311211	4 ¹ / ₂	7 ³ / ₄	3 ¹⁵ / ₁₆	6	³ / ₁₆	³ / ₄	1 ⁵ / ₈	6 ¹ / ₂	4 ¹¹ / ₁₆	28
2 ³ / ₄	19311212										
2 ¹⁵ / ₁₆	19311215										
3	19311300										
70mm	19311070										
75mm	19311075										
3 ³ / ₁₆	19311303	5	9 ¹ / ₄	4 ¹ / ₂	7	¹ / ₄	³ / ₄	1 ⁷ / ₈	7 ⁵ / ₈	5 ⁵ / ₁₆	51
3 ¹ / ₄	19311304										
3 ⁷ / ₁₆	19311307										
3 ¹ / ₂	19311308										
80mm	19311080										
85mm	19311085										
90mm	19311090										
3 ¹⁵ / ₁₆	19311315	6 ¹ / ₄	10 ¹ / ₄	5 ⁵ / ₈	7 ³ / ₄	¹ / ₄	⁷ / ₈	2 ¹ / ₈	8 ⁷ / ₁₆	5 ³ / ₄	74
4	19311400										
100mm	19311100										
4 ⁷ / ₁₆	19311407	6 ³ / ₄	10 ⁷ / ₈	5 ¹⁵ / ₁₆	8 ³ / ₄	¹¹ / ₃₂	⁷ / ₈	2 ⁷ / ₁₆	9 ¹ / ₈	6 ¹ / ₄	96
4 ¹ / ₂	19311408										
110mm	19311110M										
115mm	19311115M										

TYPE E 4-BOLT FLANGE

TYPE E



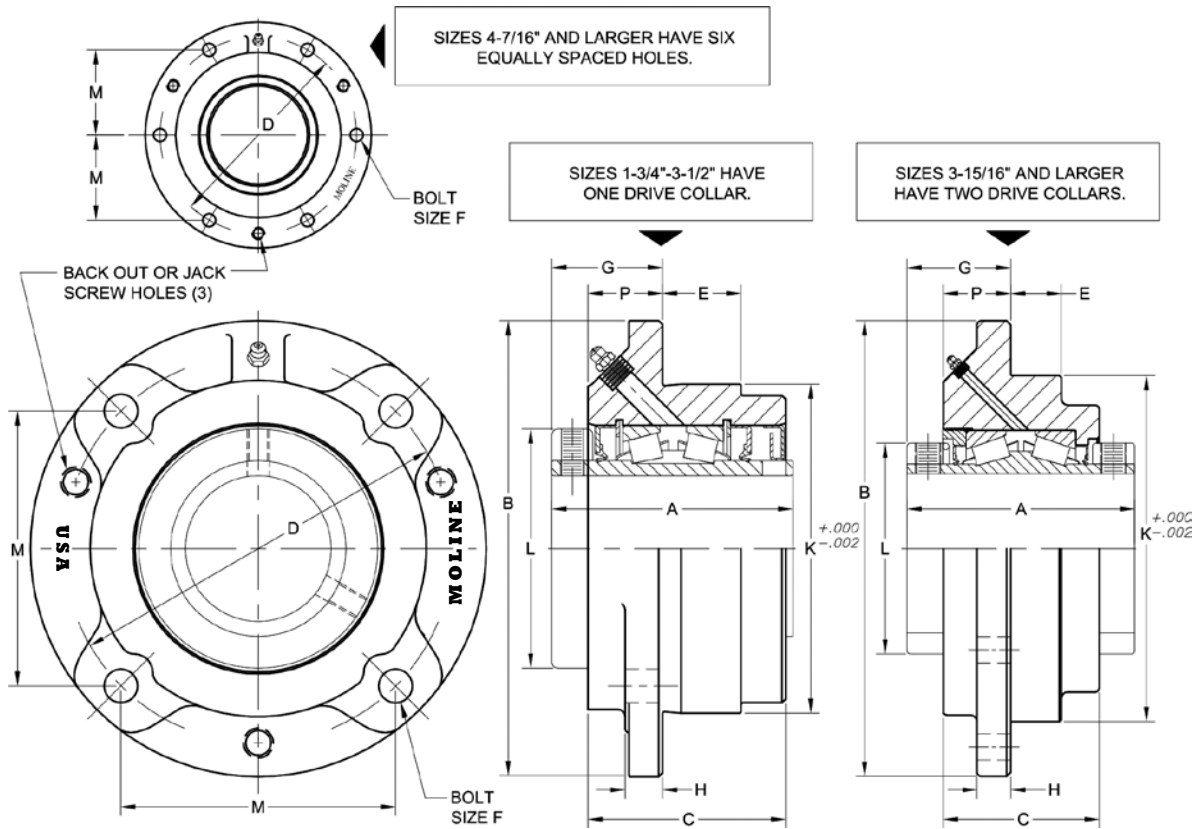
CAD drawings available upon request at no additional charge.

Furnished in non-expansion type only.

TYPE E PILOTED FLANGE

SHAFT SIZE	MOLINE PART #	DIMENSIONS (INCHES)												WEIGHT LBS.
		A	B	C	D	E	F	G	H	K	L	M	P	
1 1/2 1 5/8 1 11/16 40mm	19331108 19331110 19331111 19331040	3 3/8	6 1/8	2 13/16	5 1/8	1 3/8	7/16	1 9/16	7/16	4 1/4	3 1/8	3.62	1 1/16	9.2
1 3/4 1 7/8 1 15/16 2 45mm 50mm	19331112 19331114 19331115 19331200 19331045 19331050	3 1/2	6 3/8	2 29/32	5 3/8	1 3/16	7/16	1 9/16	9/16	4 1/2	3 3/8	3.80	1 1/32	10.3
2 3/16 55mm	19331203 19331055	3 3/4	7 1/8	3 3/32	6	1 3/16	1/2	1 11/16	9/16	5	3 3/4	4.24	1 3/32	12
2 1/4 2 7/16 2 1/2 60mm 65mm	19331204 19331207 19331208 19331060 19331065	4	7 5/8	3 5/16	6 1/2	1 5/16	1/2	1 13/16	5/8	5 1/2	4	4.60	1 1/4	16
2 11/16 2 3/4 2 15/16 3 70mm 75mm	19331211 19331212 19331215 19331300 19331070 19331075	4 1/2	8 3/4	3 11/16	7 1/2	1 1/2	5/8	2	3/4	6 3/8	4 11/16	5.30	1 1/4	28
3 3/16 3 1/4 3 7/16 3 1/2 80mm 85mm 90mm	19331303 19331304 19331307 19331308 19331080 19331085 19331090	5	10 1/4	4 3/16	8 5/8	1 1/4	3/4	2 7/16	7/8	7 3/8	5 5/16	6.10	1 21/32	43
3 15/16 4 100mm	19331315 19331400 19331100	6 1/4	10 7/8	4 1/2	9 3/8	1 1/2	3/4	2 11/16	15/16	8 1/8	5 3/4	6.63	1 7/8	57
4 7/16 4 1/2 110mm 115mm	19331407 19331408 19331110 19331115M	6 3/4	13 1/2	4 5/8	11 3/4	1 1/2	3/4	3 1/32	1	10 1/4	6 1/4	5.09	2	93
4 15/16 5 125mm	19331415 19331500 19331125	7 1/4	14 3/4	5 1/16	12 3/4	1 3/4	7/8	2 31/32	1 1/4	11	7 1/4	5.52	1 7/8	122

TYPE E PILOTED FLANGE



Note: Sizes 1 3/4" - 3 1/2" have one drive collar.

Sizes 3 15/16" and larger have 2 collars.

Also, sizes 4 7/16" and larger units have 6 equally spaced holes. All other units have 4 holes.

For personal service and special requests, please call us at 800.242.4633.

CAD drawings available upon request at no additional charge.

Furnished in non-expansion type only.

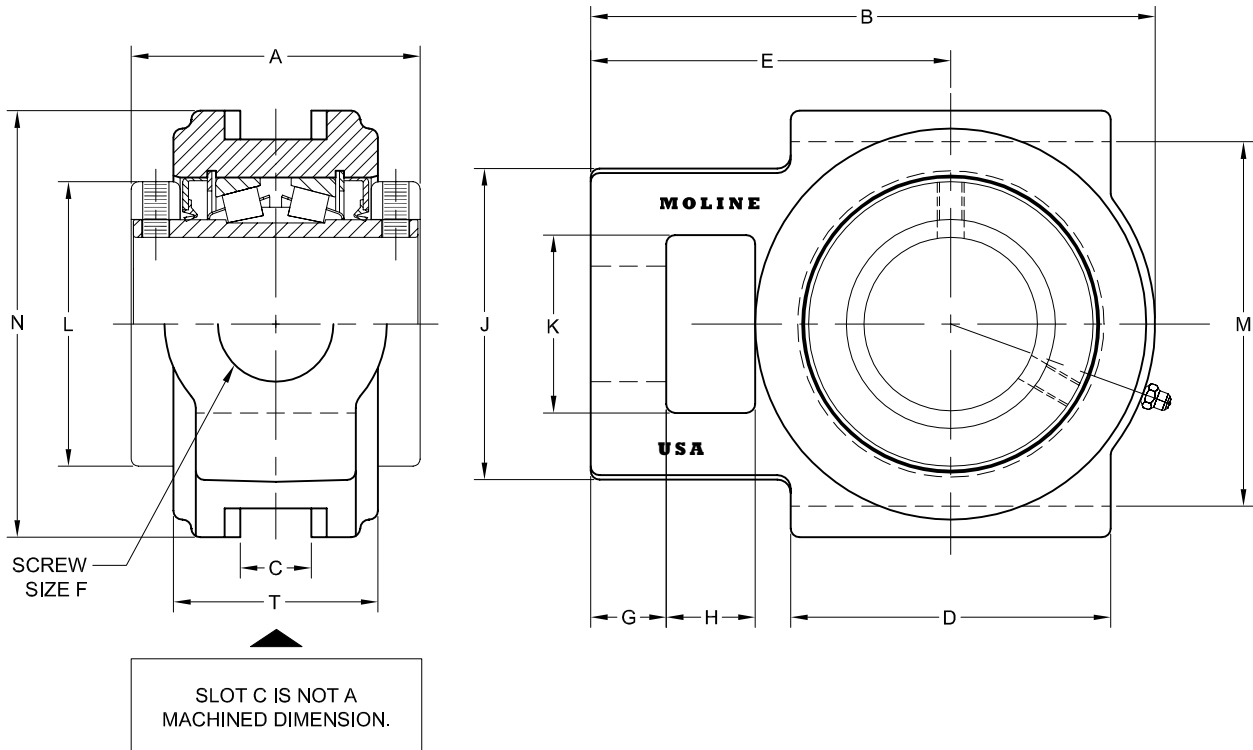
For nomenclature see pages 226 and 227.

TYPE E WIDE SLOT TAKE-UP

SHAFT SIZE	MOLINE PART #	DIMENSIONS (INCHES)														WEIGHT LBS.
		A	B	C	D	E	F	G	H	J	K	L	M	N	T	
1 3/4	19351112	3 1/2	6 5/16	1 1/16	3 3/4	3 15/16	1	1 5/16	3/4	3 5/16	1 15/16	3 3/8	4	4 3/4	2 7/16	12
1 7/8	19351114															
1 15/16	19351115															
2	19351200															
45mm	19351045															
50mm	19351050															
2 3/16	19351203	3 3/4	7 1/8	1 3/16	3 3/4	4 5/8	1 1/8	1	1	3 7/8	2 1/4	3 3/4	4 1/2	5 1/4	2 9/16	16
55mm	19351055															
2 1/4	19351204	4	7 13/16	1 1/32	4 1/2	5 1/16	1 1/2	1 1/16	1 1/4	4 1/4	2 1/2	4	5 1/8	6	2 3/4	21
2 7/16	19351207															
2 1/2	19351208															
60mm	19351060															
65mm	19351065															
2 11/16	19351211	4 1/2	9 1/8	1 25/32	4 3/4	5 7/8	1 1/2	1 3/8	1 1/4	4 7/8	2 3/4	4 11/16	5 15/16	6 3/4	3	30
2 3/4	19351212															
2 15/16	19351215															
3	19351300															
70mm	19351070															
75mm	19351075															
3 3/16	19351303	5	10 1/4	1 25/32	6	6 3/8	1 3/4	1 1/16	1 5/8	4 7/8	2 7/8	5 5/16	6 13/16	7 13/16	3 13/16	45
3 1/4	19351304															
3 7/16	19351307															
3 1/2	19351308															
80mm	19351080															
85mm	19351085															
90mm	19351090															

TYPE E WIDE SLOT TAKE-UP

TYPE E



CAD drawings available upon request at no additional charge.

Furnished in non-expansion type only.

TYPE E APPLICATION GUIDE

MOUNTING INSTRUCTIONS

It is critical to the performance of the bearing that it be mounted properly. Failure to follow proper mounting practice may result in reduced bearing life.

For best results, clean the shaft and bore of the bearing. The shaft should be straight, free of burrs and nicks, and the correct size. Lubricate the shaft and bearing bore with grease or oil to facilitate assembly. Slip bearing into position. When light press fit is required, press against the end of the inner ring of bearing. Do not strike or exert pressure on the housings or seals. Bolt the unit to the support, using shims where necessary to align bearing so the inner ring doesn't rub on the housing bore. Use shims that cover across the entire housing base.

Determine the final shaft position and hand tighten set screws firmly onto shaft. If possible, rotate the shaft slowly under load. If there is any strain, or vibration, it could be due to incorrect alignment, a bent shaft or bent supports. Tighten set screws alternately in small increments to the torque value listed below. To ensure full locking of the inner race to the shaft, after 24 hours of operation the set screws should be retightened.

SHAFT DIAMETER	SHAFT TOLERANCES
1 $\frac{3}{16}$ – 1 $\frac{1}{2}$ 35mm	Plus .0000" to minus .0005" Plus .0000" to minus .013mm
1 $\frac{5}{8}$ – 4 40mm – 100mm	Plus .0000" to minus .0010" Plus .0000" to minus .025mm
4 $\frac{7}{16}$ – 6 110mm – 140mm	Plus .0000" to minus .0015" Plus .0000" to minus .038mm
6 $\frac{7}{16}$ – 7 160mm – 180mm	Plus .0000" to minus .0020" Plus .0000" to minus .051mm

SHAFT SIZE		SET SCREW SIZE	TORQUE IN – LBS
IN	MM		
1 $\frac{3}{16}$ – 1 $\frac{1}{16}$	35 – 40	$\frac{5}{16}$ – 18	165
1 $\frac{3}{4}$ – 2 $\frac{1}{2}$	45 – 65	$\frac{3}{8}$ – 16	290
2 $\frac{1}{16}$ – 3 $\frac{1}{2}$	70 – 90	$\frac{1}{2}$ – 13	620
3 $\frac{15}{16}$ – 5	100 – 125	$\frac{5}{8}$ – 18	1325
5 $\frac{7}{16}$ – 7	130 – 180	$\frac{3}{4}$ – 10	2150

LUBRICATION INSTRUCTIONS

All Moline bearings are factory lubricated with number 2 consistency lithium base grease that is suitable for most applications. Relubricate with lithium base grease or a grease that is compatible with original lubricant and suitable for roller bearing service. It should be noted that when re-lubricating, adding a small amount of grease on a frequent basis is preferable to a large amount of grease infrequently. In unusual cases consult the factory or a reputable grease supplier.

Storage or Special Shutdown

If exposed to wet or dusty conditions or to corrosive vapors, extra protection is necessary: add grease until it shows at the seals; rotate the bearing to distribute grease; cover the bearing. After storage or idle period, add a little fresh grease before running.

High Speed Operation

In the higher speed ranges, too much grease will cause overheating. The amount of grease that the bearing will take for a particular high-speed application can only be determined by experience (see "Operating Temperature" below). If excess grease in the bearing causes overheating, it will be necessary to remove grease fitting (also drain plug when furnished) to permit excess grease to escape. The bearing has been greased at the factory and is ready to run. When establishing a re-lubrication schedule, note that a small amount of grease at frequent intervals is preferable to a large amount at infrequent intervals.

Operation in Presence of Dust, Water, or Corrosive Vapors

Under these conditions the bearing should contain as much grease as speed will permit, since a full bearing with consequent slight leakage is the best protection against entrance of foreign material. In higher speed ranges too much grease will cause overheating (see "High Speed Operation" above). In lower speed ranges, it is advisable to add extra grease to a new bearing before putting into operation. Bearings should be greased as often as necessary (daily if required) to maintain a slight leakage at the seals.

TYPE E APPLICATION GUIDE

Normal Operation

The bearing has been greased at the factory and is ready to run. The following table is a general guide for re-lubrication. However, certain conditions may require a change of lubricating periods as dictated by experience. See “High Speed Operation” and “Operation in Presence of Dust, Water, or Corrosive Vapors” above.

Operating Temperature

Abnormal bearing temperature may indicate faulty lubrication. Normal temperature may range from “cool to warm to the touch” up to a point “too hot to touch for more than a few seconds,” depending on bearing size and speed, and surrounding conditions. Unusually high temperature accompanied by excessive leakage of grease indicates too much grease. High temperature with no grease showing at the seals, particularly if the bearing seems noisy usually indicates too little grease. Normal temperature and a slight showing of grease at the seals indicate proper lubrication.

Kind of Grease

Many ordinary cup greases will disintegrate at speeds far below those at which Moline bearings will operate successfully if proper grease is used. Moline bearings have been lubricated at the factory with No. 2 consistency lithium base grease that is suitable for normal operating conditions. Re-lubricate with lithium base grease or a grease that is compatible with original lubricant and suitable for roller bearing service. In unusual or doubtful cases, the recommendation of a reputable grease manufacturer should be secured.

Special Operating Conditions

Refer acid, chemical, extreme or other special operating conditions to the Moline Bearing Company, Batavia, Illinois

THRUST LOAD RATINGS

Moline Type E bearings have the capacity to carry heavy radial, thrust, and combined radial/thrust loads. The maximum recommended load which can be applied is limited by various components in the system, such as the bearing, housing, shaft, shaft attachment, speed and life requirements as listed in this catalog.

Select a bearing from the Type E selection chart having a radial load rating at the operating speed equal to or greater than the calculated “Equivalent Radial Load” for a desired L10 life. This simple method is all that is required for the majority of applications and provides for occasional average shock loads. (Equivalent Radial Load = P). L10 Hours of Life is the life that may be expected from at least 90% of a given group of bearings operating under identical conditions.

For L10 Hours of Life other than those listed in the selection chart, multiply the Equivalent radial load by one of the following factors:

for 50,000 L10 Hours of Life use the factor of 1.16;
80,000 - 1.34. Then select a bearing from the bold face (30000) L10 ratings only in the selection chart having a rating equal to or greater than this value.

Lubrication Guide

Read preceding paragraphs before establishing lubrication schedule.

HOURS RUN PER DAY	SUGGESTED LUBRICATION PERIOD IN WEEKS							
	1 TO 250 RPM	251 TO 500 RPM	501 TO 750 RPM	751 TO 1000 RPM	1001 TO 1500 RPM	1501 TO 2000 RPM	2001 TO 2500 RPM	2501 TO 3000 RPM
8	12	12	10	7	5	4	3	2
16	12	7	5	4	2	2	2	1
24	12	5	3	2	1	1	1	1

TYPE E APPLICATION GUIDE CONTINUED

Heavy Service

For heavy shock loads, frequent shock loads or severe vibrations, add up to 50% (according to severity of conditions) to the Equivalent Radial Load to obtain a modified radial load.

Thrust load values shown in the table below are recommended as a guide for normal applications that will give adequate L10 life. Where substantial radial load is also present, it is advisable to calculate the L10 life to assure it meets the requirements. The effectiveness of the shaft attachment to carry thrust load depends on proper tightening of the set screws, shaft tolerance, and shaft deflections. Therefore, it is advisable to use auxiliary thrust carrying devices such as shaft shoulder, snap ring, or a thrust collar to locate the bearing under heavier thrust loads or where extreme reliability is desired.

RPM RANGE	20-200	201-2000	OVER 2000
Recommended Thrust Load	C90/4	C90/8	C90/12

The shaft tolerances recommended are adequate under normal radial, thrust, and combination radial/thrust load applications. The radial load is limited by the attachment to the shaft (see table on following page). Since the allowable load, especially at low speed, is very large, the shaft should be checked to assure adequate shaft strength.

The magnitude and direction of both the thrust and radial load must be taken into account when selecting a housing. When pillow blocks are utilized, heavy loads should be directed through the base. Where a load pulls the housing away from the mounting base, both the hold down bolts and housing must be of adequate strength. Auxiliary load carrying devices such as shear bars are advisable for side or end loading of pillow blocks and radial loads for flange units.

To determine the L10 hours of life for loads and RPM's not listed, use the following equation:

$$L_{10} = \left(\frac{C_{90}}{P} \right)^{10/3} \times \frac{1,500,000}{\text{RPM}}$$

Where:

L_{10} = Life, hours

C_{90} = Dynamic Capacity, lbs. (page 37)

P = Equivalent Radial Load, lbs.

When the load on a two row roller bearing is solely a radial load with no thrust (axial) load, the load is shared equally by both rows of rollers and the equivalent load is the same as the actual load. However, when a thrust (axial) load is applied, the loading on the two rows is shared unequally depending on the ratio of thrust to radial load. The use of the X (radial factor) and Y (thrust) factor from Table 1 convert the actual applied thrust and radial loads to equivalent radial load which has the same effect on the life of a bearing as a radial load of this magnitude.

$$P = XFR + YFA$$

Where:

P = Equivalent radial load, lbs.

FR = Radial load, lbs.—

(see page 37 for allowable slip fit maximum)

FA = Thrust (axial) load, lbs.

e = Thrust load to radial load factor (page 37)

X = Radial load factor (page 37)

Y = Thrust load factor (page 37)

To find X and Y, first calculate FA/FR and compare to e . Determine X and Y from Table 1. Light Thrust FA/FR less than or equal to e or heavy thrust FA/FR greater than e .

Substitute all known values into the equivalent radial load equation. The equivalent radial load (P) thus determined can be used in the L_{10} life formula or compared to the allowable equivalent radial load rating desired in the expanded rating table to select a bearing.

If the calculated value of P is less than FR then use $P = FR$.

TYPE E APPLICATION GUIDE

Type E Thrust Factors and Seal Speeds

SHAFT SIZE	E	LIGHT THRUST IF A/FR≤E		HEAVY THRUST IF FA/FR≥E		DYNAMIC CAPACITY C90*		MAXIMUM RPM LABYRINTH SEAL	MAXIMUM RPM CONTACT SEAL	MAXIMUM SLIP FIT RADIAL LOAD FR**
		X	Y	X	Y	LBS.	NEWTONS			
1 3/16 - 1 1/4	.49	.87	1.77	.70	2.14	3010	16948	4490	3800	3100
1 3/8 - 1 7/16 35mm	.46	.87	1.89	.70	2.28	6100	27134	3820	3200	5000
1 1/2 - 1 11/16 40mm	.44	.87	1.96	.70	2.37	7860	34963	3320	2800	6400
1 3/4 - 2 45mm 50mm	.33	.87	2.64	.70	3.18	10300	45817	3050	2650	8400
2 3/16 55mm	.36	.87	2.38	.70	2.87	10900	48486	2730	2300	8900
2 1/4 - 2 1/2 60mm 65mm	.40	.87	2.17	.70	2.63	11600	51599	2420	2100	9500
2 11/16 - 3 70mm 75mm	.46	.87	1.87	.70	2.26	12300	54713	2060	1965	10000
3 3/16 - 3 1/2 80mm 85mm 90mm	.50	.87	1.71	.70	2.07	19600	87185	1640	1640	16000
3 15/16 - 4 100mm	.49	.87	1.77	.70	2.14	26900	119657	1530	1530	22000
4 7/16 - 4 1/2 110mm 115mm	.53	.87	1.63	.70	1.97	33000	146791	1360	1360	27000
4 15/16 - 5 125mm	.47	.87	1.83	.70	2.21	45500	202394	1200	1200	35000
5 7/16 - 6 130mm 135mm 140mm 150mm	.54	.87	1.76	.70	2.12	41412	184210	915	915	42400
6 7/16 - 7 160mm 170mm 180mm	.54	.87	1.61	.70	1.95	70470	313466	790	750	72000

* C90—Dynamic capacity based on a rated life of 90 million revolutions or 3,000 hours at 500 RPM.

** If load exceeds maximum allowable slip fit radial load, snug to light press fit of shaft is required.



TYPE E RADIAL LOAD RATINGS

SHAFT SIZES	MINIMUM HOURS LIFE*	RADIAL LOAD RATINGS AT VARIOUS REVOLUTIONS PER MINUTE									
		50	100	150	250	500	750	1000	1200	1360	1530
1 3/16 1 1/4	10000	5297	4303	3810	3269	2655	2351	2157	2042	1966	1898
	30000	3810	3095	2740	2351	1910	1691	1551	1468	1414	1365
	40000	3495	2839	2514	2157	1752	1551	1423	1347	1297	1252
	60000	3095	2514	2226	1910	1551	1373	1260	1193	1149	1109
	100000	2655	2157	1910	1638	1331	1178	1081	1023	986	951
1 3/8 1 7/16 35mm	10000	8481	6889	6100	5233	4251	3764	3453	3269	3148	3039
	30000	6100	4955	4387	3764	3057	2707	2483	2351	2264	2186
	40000	5596	4545	4024	3453	2804	2483	2278	2157	2077	2005
	60000	4955	4024	3564	3057	2483	2199	2017	1910	1839	1775
	100000	4251	3453	3057	2623	2130	1886	1730	1638	1578	1523
1 1/2 1 5/8 1 11/16 40mm	10000	10928	8877	7860	6743	5477	4850	4449	4212	4057	3916
	30000	7860	6384	5653	4850	3939	3488	3200	3029	2918	2816
	40000	7210	5856	5186	4449	3614	3200	2935	2779	2677	2584
	60000	6384	5186	4592	3939	3200	2833	2599	2461	2370	2288
	100000	5477	4449	3939	3380	2745	2431	2230	2111	2033	1963
1 3/4 1 7/8 1 15/16 2 45mm 50mm	10000	14321	11632	10300	8837	7178	6355	5830	5520	5316	5132
	30000	10300	8366	7408	6355	5162	4571	4193	3970	3824	3691
	40000	9448	7674	6795	5830	4735	4193	3846	3642	3507	3386
	60000	8366	6795	6017	5162	4193	3713	3406	3225	3106	2998
	100000	7178	5830	5162	4429	3597	3185	2922	2766	2664	2572
2 3/16 55mm	10000	15155	12310	10900	9351	7596	6726	6170	5841	5626	5431
	30000	10900	8854	7840	6726	5463	4837	4437	4201	4046	3906
	40000	9999	8121	7191	6170	5011	4437	4070	3854	3712	3583
	60000	8854	7191	6368	5463	4437	3929	3604	3412	3287	3172
	100000	7596	6170	5463	4687	3807	3371	3092	2928	2820	2722
2 1/4 2 7/16 2 1/2 60mm 65mm	10000	16129	13100	11600	9952	8083	7158	6566	6216	5987	5779
	30000	11600	9422	8343	7158	5814	5148	4722	4471	4306	4157
	40000	10641	8643	7653	6566	5333	4722	4332	4101	3950	3813
	60000	9422	7653	6777	5814	4722	4181	3836	3631	3498	3376
	100000	8083	6566	5814	4988	4051	3587	3291	3116	3001	2897
2 11/16 2 3/4 2 15/16 3 70mm 75mm	10000	17102	13891	12300	10552	8571	7590	6962	6591	6348	6128
	30000	12300	9991	8846	7590	6165	5459	5007	4741	4566	4407
	40000	11283	9165	8115	6962	5655	5007	4593	4349	4188	4043
	60000	9991	8115	7186	6165	5007	4434	4067	3851	3709	3580
	100000	8571	6962	6165	5289	4296	3804	3489	3304	3182	3071

Note: The RED load rating values in the table indicate radical loads that exceed the Maximum Allowable Slip Fit Radical Load. Operation at these conditions may require line-to-line or light press fit on the shaft.

TYPE E RADIAL LOAD RATINGS

SHAFT SIZES	RADIAL LOAD RATINGS AT VARIOUS REVOLUTIONS PER MINUTE								
	1640	1750	2060	2420	2730	3050	3320	3820	4490
1 3/16 1 1/4	1859	1823	1736	1654	1596	1543	1505	1443	1374
	1337	1311	1249	1190	1148	1110	1082	1038	988
	1227	1203	1145	1091	1053	1018	993	952	907
	1086	1065	1014	966	932	902	879	843	803
	932	914	870	829	800	774	754	723	689
1 3/8 1 7/16 35mm	2976	2919	2780	2649	2555	2471	2409	2310	-----
	2141	2099	1999	1905	1837	1777	1733	1661	-----
	1964	1926	1834	1747	1685	1630	1589	1524	-----
	1739	1705	1624	1547	1492	1444	1407	1349	-----
	1492	1463	1393	1327	1280	1238	1207	1158	-----
1 1/2 1 5/8 1 11/16 40mm	3835	3761	3582	3413	3292	3184	3104	-----	-----
	2758	2705	2576	2455	2367	2290	2232	-----	-----
	2530	2482	2363	2252	2172	2101	2048	-----	-----
	2241	2197	2092	1994	1923	1860	1813	-----	-----
	1922	1885	1795	1710	1650	1596	1556	-----	-----
1 3/4 1 7/8 1 15/16 2 45mm 50mm	5026	4929	4694	4472	4313	4172	-----	-----	-----
	3615	3545	3376	3217	3102	3001	-----	-----	-----
	3316	3252	3097	2951	2846	2753	-----	-----	-----
	2936	2879	2742	2613	2520	2437	-----	-----	-----
	2519	2470	2352	2241	2162	2091	-----	-----	-----
2 3/16 55mm	5319	5216	4967	4733	4565	-----	-----	-----	-----
	3825	3752	3572	3404	3283	-----	-----	-----	-----
	3509	3441	3277	3122	3012	-----	-----	-----	-----
	3107	3047	2902	2765	2667	-----	-----	-----	-----
	2666	2614	2489	2372	2288	-----	-----	-----	-----
2 1/4 2 7/16 2 1/2 60mm 65mm	5660	5551	5286	5037	-----	-----	-----	-----	-----
	4071	3992	3802	3622	-----	-----	-----	-----	-----
	3734	3662	3487	3323	-----	-----	-----	-----	-----
	3307	3243	3088	2942	-----	-----	-----	-----	-----
	2837	2782	2649	2524	-----	-----	-----	-----	-----
2 11/16 2 3/4 2 15/16 3 70mm 75mm	6002	5886	5605	-----	-----	-----	-----	-----	-----
	4317	4233	4031	-----	-----	-----	-----	-----	-----
	3960	3883	3698	-----	-----	-----	-----	-----	-----
	3506	3439	3274	-----	-----	-----	-----	-----	-----
	3008	2950	2809	-----	-----	-----	-----	-----	-----

Note: Because the allowable loads, especially at low speeds, are extremely high, be sure the shaft strength is adequate and pillow blocks are base loaded. When imposed load is horizontal, be sure hold-down bolts are adequate. If bearings are cap loaded, full details on load, speed and shaft size should be referred to Moline Bearing Company. Consult Moline for speeds and loads greater than listed.

*“Minimum Hours Life” is the life expected from at least 90% of a given group of bearings operating under identical conditions (proper installation, correct alignment and maintenance). Average life will be approximately five times the minimum life.



TYPE E RADIAL LOAD RATINGS CONTINUED

SHAFT SIZES	MINIMUM HOURS LIFE*	RADIAL LOAD RATINGS AT VARIOUS REVOLUTIONS PER MINUTE									
		50	100	150	200	500	750	1000	1200	1360	1530
3 ³ / ₁₆											
3 ¹ / ₄	10000	27252	22135	19600	16815	13658	12094	11094	10503	10116	9765
3 ⁷ / ₁₆	30000	19600	15920	14097	12094	9823	8698	7979	7554	7276	7023
3 ¹ / ₂	40000	17979	14604	12931	11094	9011	7979	7319	6930	6674	6443
80mm	60000	15920	12931	11450	9823	7979	7065	6481	6136	5910	5705
85mm	100000	13658	11094	9823	8428	6845	6061	5560	5264	5070	4894
	10000	37401	30379	26900	23078	18745	16598	15226	14415	13884	13402
3 ¹⁵ / ₁₆	30000	26900	21850	19347	16598	13482	11938	10951	10368	9986	9639
4	40000	24676	20043	17747	15226	12367	10951	10045	9511	9160	8842
100mm	60000	21850	17747	15715	13482	10951	9697	8895	8421	8111	7829
	100000	18745	15226	13482	11566	9395	8319	7631	7225	6959	6717
	10000	45883	37268	33000	28311	22996	20362	18678	17684	17033	----
4 ⁷ / ₁₆	30000	33000	26804	23734	20362	16539	14645	13434	12719	12250	----
4 ¹ / ₂	40000	30271	24588	21772	18678	15172	13434	12323	11667	11237	----
110mm	60000	26804	21772	19278	16539	13434	11895	10912	10331	9950	----
115mm	100000	22996	18678	16539	14189	11525	10205	9361	8863	8536	----
	10000	63263	51385	45500	39035	31706	28075	25754	24383	----	----
4 ¹⁵ / ₁₆	30000	45500	36957	32725	28075	22804	20192	18523	17537	----	----
5	40000	41738	33902	30019	25754	20918	18523	16991	16087	----	----
125mm	60000	36957	30019	26581	22804	18523	16401	15045	14244	----	----
	100000	31706	25754	22804	19564	15891	14071	12907	12220	----	----
	10000	57579	46769	41412	35528	28858	25553	23440	----	----	----
5 ¹⁵ / ₁₆	30000	41412	33637	29784	25553	20755	18378	16858	----	----	----
6	40000	37988	30856	27322	23440	19039	16858	15464	----	----	----
130mm	60000	33637	27322	24193	20755	16858	14928	13693	----	----	----
135mm	100000	28858	23440	20755	17806	14463	12807	11748	----	----	----
140mm											
150mm											
	10000	97981	79585	70470	60457	49107	43482	----	----	----	----
6 ⁷ / ₁₆	30000	70470	57239	50684	43482	35319	31274	----	----	----	----
6 ¹⁵ / ₁₆	40000	64643	52507	46493	39887	32398	28688	----	----	----	----
7	60000	57239	46493	41168	35319	28688	25402	----	----	----	----
160mm	100000	49107	39887	35319	30300	24612	21793	----	----	----	----
170mm											
180mm											

Note: The RED load rating values in the table indicate radical loads that exceed the Maximum Allowable Slip Fit Radical Load. Operation at these conditions may require line-to-line or light press fit on the shaft.

TYPE E RADIAL LOAD RATINGS

TYPE E

SHAFT SIZES	RADIAL LOAD RATINGS AT VARIOUS REVOLUTIONS PER MINUTE								
	1640	1750	2060	2420	2730	3050	3320	3820	4490
3 3/16									
3 1/4	9564	-----	-----	-----	-----	-----	-----	-----	-----
3 7/16	6879	-----	-----	-----	-----	-----	-----	-----	-----
3 1/2	6310	-----	-----	-----	-----	-----	-----	-----	-----
80mm	5587	-----	-----	-----	-----	-----	-----	-----	-----
85mm	4793	-----	-----	-----	-----	-----	-----	-----	-----
90mm									
3 15/16	-----	-----	-----	-----	-----	-----	-----	-----	-----
4	-----	-----	-----	-----	-----	-----	-----	-----	-----
100mm	-----	-----	-----	-----	-----	-----	-----	-----	-----
	-----	-----	-----	-----	-----	-----	-----	-----	-----
4 7/16	-----	-----	-----	-----	-----	-----	-----	-----	-----
4 1/2	-----	-----	-----	-----	-----	-----	-----	-----	-----
110mm	-----	-----	-----	-----	-----	-----	-----	-----	-----
115mm	-----	-----	-----	-----	-----	-----	-----	-----	-----
	-----	-----	-----	-----	-----	-----	-----	-----	-----
4 15/16	-----	-----	-----	-----	-----	-----	-----	-----	-----
5	-----	-----	-----	-----	-----	-----	-----	-----	-----
125mm	-----	-----	-----	-----	-----	-----	-----	-----	-----
	-----	-----	-----	-----	-----	-----	-----	-----	-----
5 7/16									
5 15/16	-----	-----	-----	-----	-----	-----	-----	-----	-----
6	-----	-----	-----	-----	-----	-----	-----	-----	-----
130mm	-----	-----	-----	-----	-----	-----	-----	-----	-----
135mm	-----	-----	-----	-----	-----	-----	-----	-----	-----
140mm	-----	-----	-----	-----	-----	-----	-----	-----	-----
150mm	-----	-----	-----	-----	-----	-----	-----	-----	-----
6 7/16									
6 1/2	-----	-----	-----	-----	-----	-----	-----	-----	-----
6 15/16	-----	-----	-----	-----	-----	-----	-----	-----	-----
7	-----	-----	-----	-----	-----	-----	-----	-----	-----
160mm	-----	-----	-----	-----	-----	-----	-----	-----	-----
170mm	-----	-----	-----	-----	-----	-----	-----	-----	-----
180mm	-----	-----	-----	-----	-----	-----	-----	-----	-----

Note: Because the allowable loads, especially at low speeds, are extremely high, be sure the shaft strength is adequate and pillow blocks are base loaded. When imposed load is horizontal, be sure hold-down bolts are adequate. If bearings are cap loaded, full details on load, speed and shaft size should be referred to Moline Bearing Company. Consult Moline for speeds and loads greater than listed.

*“Minimum Hours Life” is the life expected from at least 90% of a given group of bearings operating under identical conditions (proper installation, correct alignment and maintenance). Average life will be approximately five times the minimum life.



TYPE E SERIES INTERCHANGE

Type E Series Interchange

MOLINE*	BROWNING*	ROYERSFORD*	SEALMASTER*	TIMKEN*	DODGE
2-Bolt Pillow Block 19321 (Pages 20–21)	PBE920** True Type E	20-02-0 True Type E	EPB-2** True Type E	E-P2B-TRB True Type E	P2BE
4-Bolt Pillow Block 19341 (Pages 22–25)	PBE920F** True Type E	20-04-0 True Type E	EPB-4** True Type E	E-P4B-TRB True Type E	P4BE
4-Bolt Flange 19311 (Pages 26–29)	FBE920 True Type E	20-05-0 True Type E	EFB True Type E	E-4BF-TRB True Type E	F4BE
Piloted Flange 19331 (Pages 30–31)	-----	20-06-0 True Type E	-----	E-PF-TRB True Type E	FCE
Wide Slot Take-Up 19351 (Pages 32–33)	TUE920 True Type E	20-07-0 True Type E	ETU True Type E	E-TU-TRB True Type E	WSTUE

*True Type E = Timken Cup/Cone Assembly (extended sleeve) and double collar.

**Denotes pillow block center to center dimension slightly different.

Type E/Spherical E Interchange

MOLINE	SKF	REX	LINK-BELT	DODGE	SEALMASTER
2-Bolt Pillow Block (Pages 96–97) 29121 (Expansion) 29221 (Non-Expansion)	SYE SYE-H	ZEP	EPE-B22400H EP-B22400H	EP2B-S2-000RE EP2B-S2-000R	USRBE5000E USRBE5000
4-Bolt Flange (Pages 98–99) 29111 (Expansion) 29211 (Non-Expansion)	-----	ZEF	EFR-B22400H	EF4B-S2-000RE EF4B-S2-000R	USFBE5000E USFBE5000
Piloted Flange (Pages 100–101) 29131 (Expansion) 29231 (Non-Expansion)	-----	-----	FCB22400H	-----	USFCE5000E USFCE5000

TYPE E/INTERCHANGE GUIDE CONTINUED

Type E/Spherical E Interchange

MOLINE	SKF	SEALMASTER	REX	DODGE
2-Bolt Pillow Block (Pages 114–115) 29621 (Expansion) 29721 (Non-Expansion)	SYE-N SYE-NH	USRBE5000A USRBE5000	ZEPS6000 ZEP6000	EP2B-IP-RE EP2B-IP-R
4-Bolt Flange (Pages 116–117) 29611 (Expansion) 29711 (Non-Expansion)	-----	USFBE5000A USFBE5000	ZEF6000	EF4B-IP-RE EF4B-IP-R
Piloted Flange (Pages 118–119) 29631 (Expansion) 29731 (Non-Expansion)	-----	USFCE5000A USFCE5000	-----	EFCIP - 0751 <i>or</i> FCIP - 0698

Note: This is a general dimensional interchange.

For exact dimensions and comparison information on inserts and seals, please contact the factory.

For Nomenclature see pages 226–227