

TIMKEN

SEALED ROLL NECK BEARINGS ADVANCING TECHNOLOGY FOR THE METALS INDUSTRY



Photo courtesy of SMS Siemag

STRENGTH WHERE IT COUNTS

Flat product rolling mills require well-engineered bearings that can operate at high speeds and withstand harsh environments, all while carrying heavy loads. At the same time, there's constant pressure to increase productivity while reducing costs.

For more than 100 years, Timken has provided high-quality bearings for rigorous applications in hot and cold rolling mills, while continuously improving the company's bearings and seals to keep pace with the demands of the metals industry.

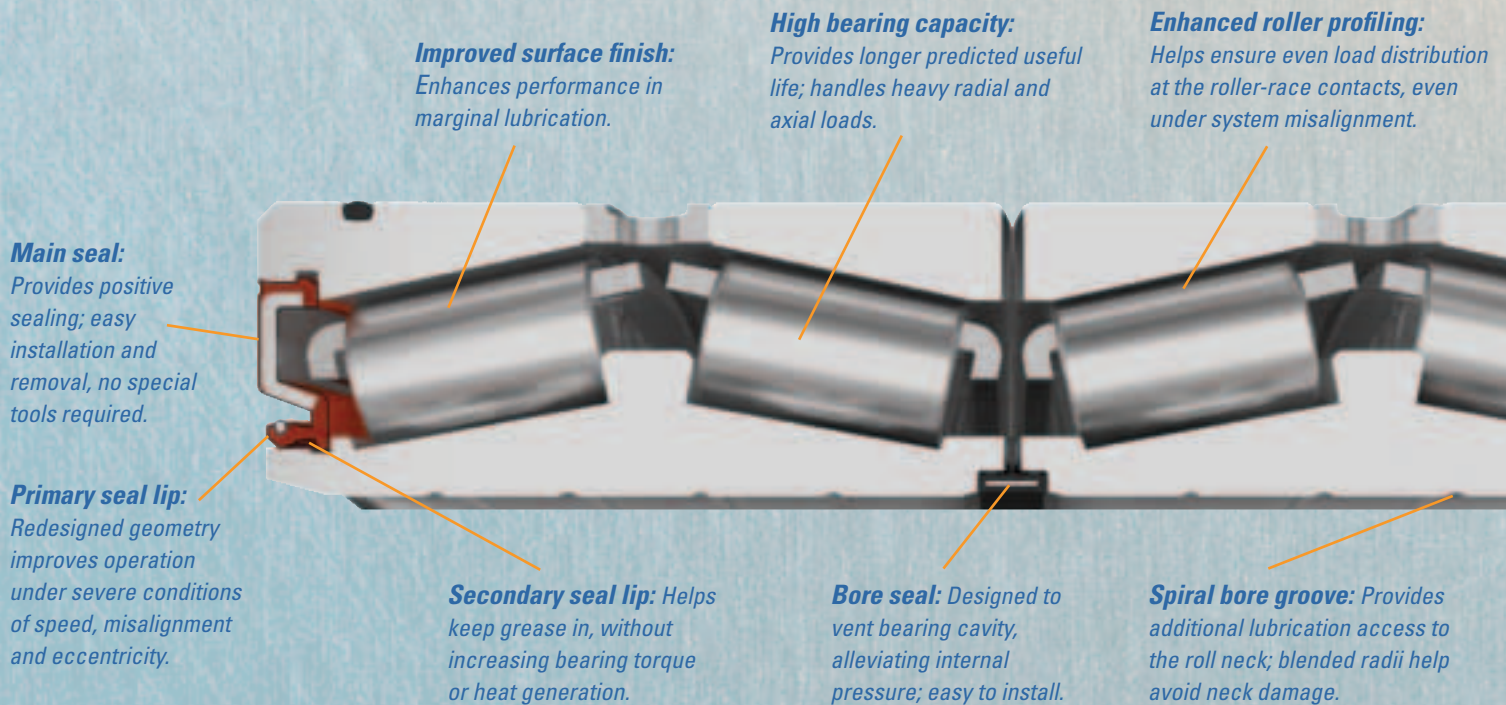
Timken engineering experience and know-how are reflected in the newest sealed roll neck bearing design. It offers industry-leading tapered roller bearing design, combined with advanced proprietary sealing solutions to reduce contamination ingress and extend bearing life, expected to result in a lower cost-per-ton-rolled for mill operators.

IMPROVED MAIN SEAL DESIGN CAN SIGNIFICANTLY BOOST PERFORMANCE

Contaminants and water ingress can reduce bearing life and excessive grease loss can lead to increased maintenance costs or strip staining. Timken technologists developed new, innovative seals that can address these operating concerns with a design that's also easy for the maintenance professional to use, resulting in the integrated main seal design.

Leveraging 50 years of seal development expertise, Timken created innovative sealing solutions that may provide major benefits to mill operators, including:

- Longer bearing life due to improved sealing against water and contaminant ingress and maximum bearing load rating within the envelope.
- Potential for extended maintenance intervals due to reduced grease loss and contamination ingress.
- Lower cost of ownership due to less required maintenance and longer bearing life.
- Easy-to-assemble seals that reduce bearing maintenance time.



ENGINEERED FOR RELIABILITY UNDER HARSH CONDITIONS

Mill operators depend on high-performance bearings to keep their operations running smoothly. The Timken roll neck bearing with an integrated seal can handle difficult working conditions, including high temperatures and speeds, as well as heavy shock loads and misalignment.

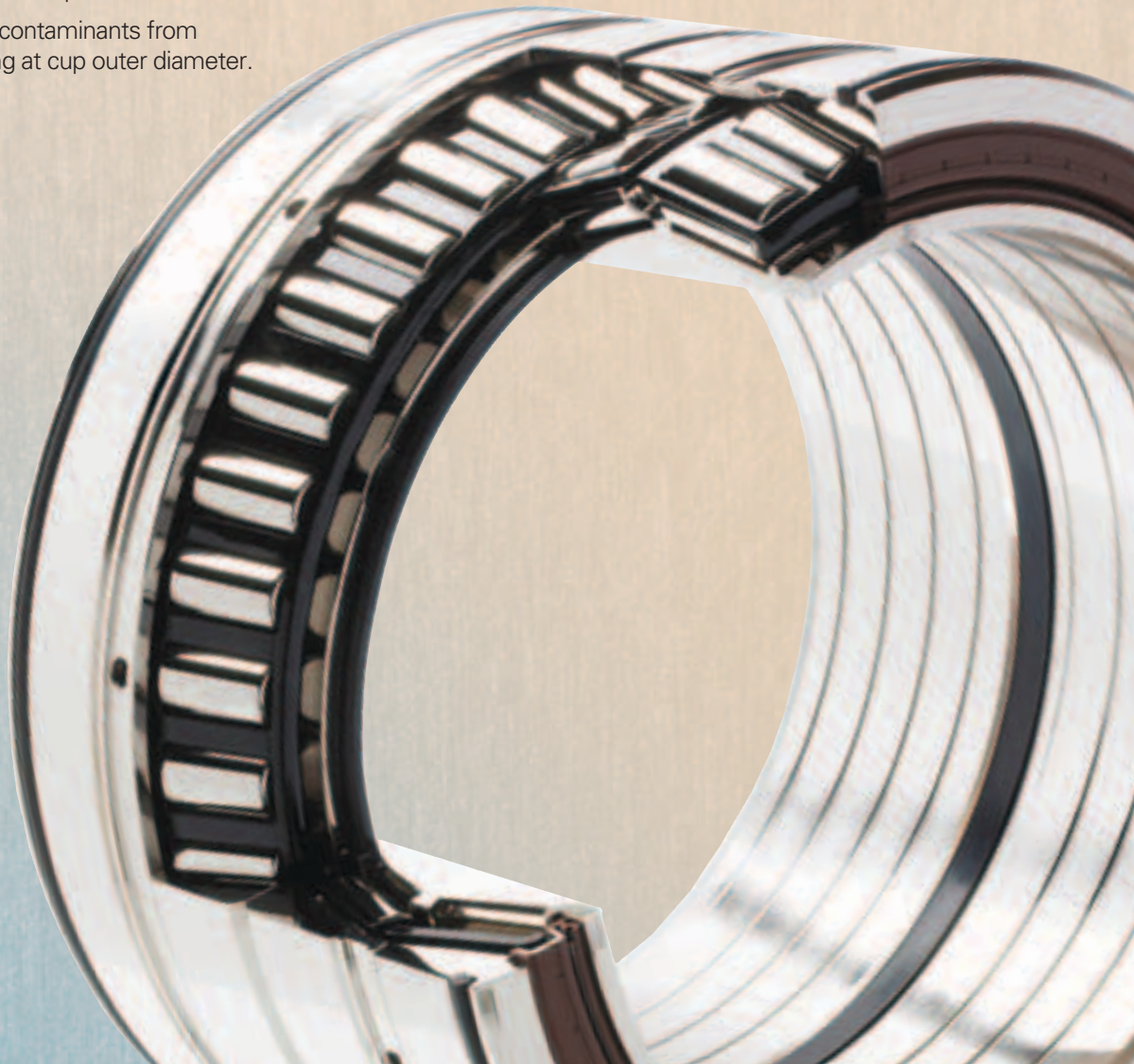
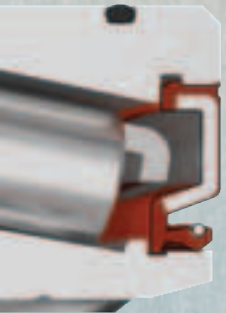
- Enhanced sealing due to high-performance seal designs with improved contact geometry.
- Improved performance in marginal lubrication due to better surface finishes.
- Misalignment accommodated by enhanced roller profiling for uniform load distribution.
- Increased toughness and fatigue life from case-carburized components.
- Improved load sharing provided by four single cups.
- Reduced cone face wear due to inboard and outboard cone face slots.
- Reduced potential for roll neck damage due to spiral bore grooves with blended radii that provide lubricant access to the roll neck.
- Fewer components to handle due to advanced integrated design with no center spacers or seal carriers.
- More effective exclusion of contaminants from the chock bore due to sealing at cup outer diameter.

OPTIONAL FEATURES

PRE-GREASED ASSEMBLY: Bearings can be supplied as pre-greased assemblies. Several grease options are available, including Timken Premium Mill grease, which is known for its excellent resistance to water washout. Timken sealed roll neck bearings and seals are designed to work with different types of oil lubrication systems, as well. Contact your Timken engineer for assistance with grease type, fill recommendations and applications in oil-lubricated systems.

SOLID CUP SPACERS: The standard sealed bearing can be re-lubricated in the chock through the holes in the cup spacers. For chocks which are not configured with lubrication lines, the sealed bearing can be provided with solid cup spacers.

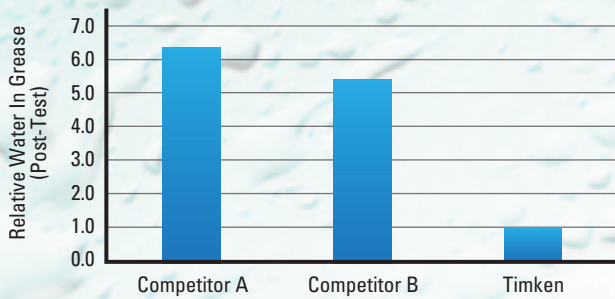
CENTER DOUBLE CUP: The standard sealed bearing design contains four single cups; however, a double cup version is available upon request.



TESTING PROVES PERFORMANCE OF NEW SEALS

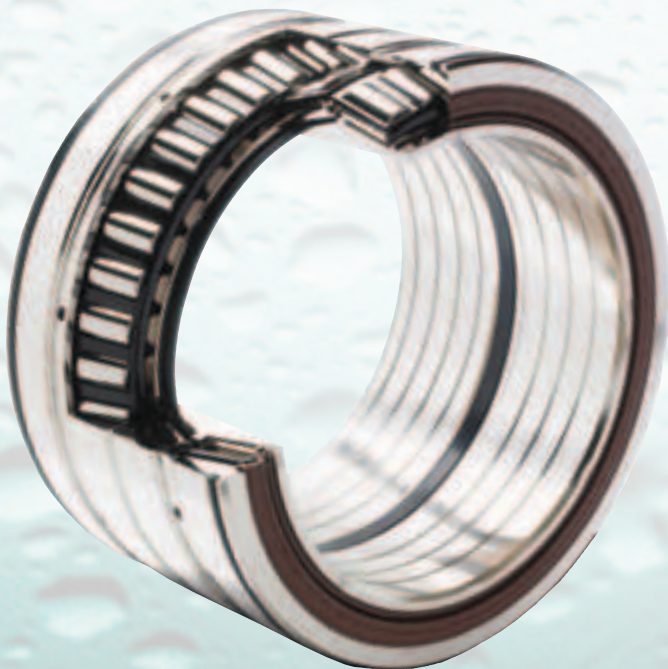
With more than 55 patents in seal technology, Timken understands sealing performance. Timken sealing engineers used advanced seal testing facilities to extensively develop and test main seal designs for the bearing. The positive results of this work are shown below.

WATER INGRESS TEST RESULTS



Statistically small sample size in dynamic lab test simulating rolling mill conditions. Actual experience may vary.

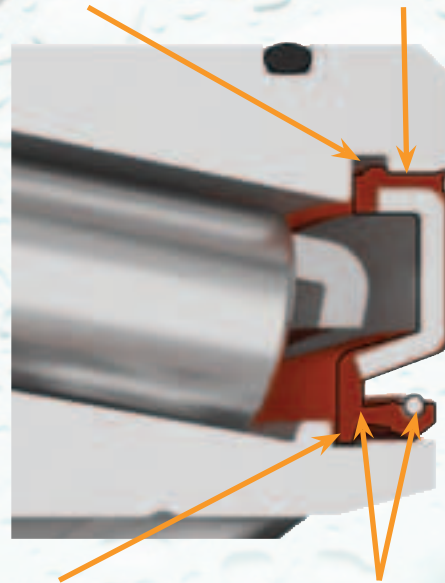
Not only is water effectively excluded from entering the bearing, but the grease is better retained as well, resulting in reduced grease consumption and related disposal costs.



RESILIENT MAIN SEALS HANDLE HIGH SPEEDS, MISALIGNMENT AND ECCENTRICITY

Easy installation and removal. No special tools or staking required. Positive retention.

Positive sealing at seal outer diameter.



Grease retention barrier: secondary lip interfaces with cone to form labyrinth.

Improved dynamic response for extreme load conditions: optimized independent spring design.

SOLID COMBINATION: HIGHLY RATED BEARINGS PACKAGED WITH DEPENDABLE MAIN SEALS

Timken engineers designed the bearing to optimize space for the main seals, while still maintaining industry-leading bearing load ratings inside the same bearing envelope.

The enhanced design of the main seal lip geometry improves operation under extreme conditions of speed, misalignment and eccentricity. To aid in grease retention, a labyrinth-type secondary lip was added, without increasing bearing torque or heat generation.

Positive sealing at the main seal-to-cup interface helps prevent ingress of water or contaminants. This design feature not only provides positive seal location and retention, it also allows for easy seal installation and removal. Seals are made from a fluoroelastomer material, which is resistant to most rolling fluids and can perform throughout a large operating temperature range between -25° C and 200° C (-13° F - 390° F).*

**As reported by NAK Sealing Technologies Corporation.*

Warning: Do not exceed the fluoroelastomer temperature of 250° C (482° F).



MAIN SEAL INSTALLATION

Main seals for the integrated roll neck bearing can be easily installed and removed without special tools. These seals have a unique design and dimensions, so they are not interchangeable with other bearings or seals.

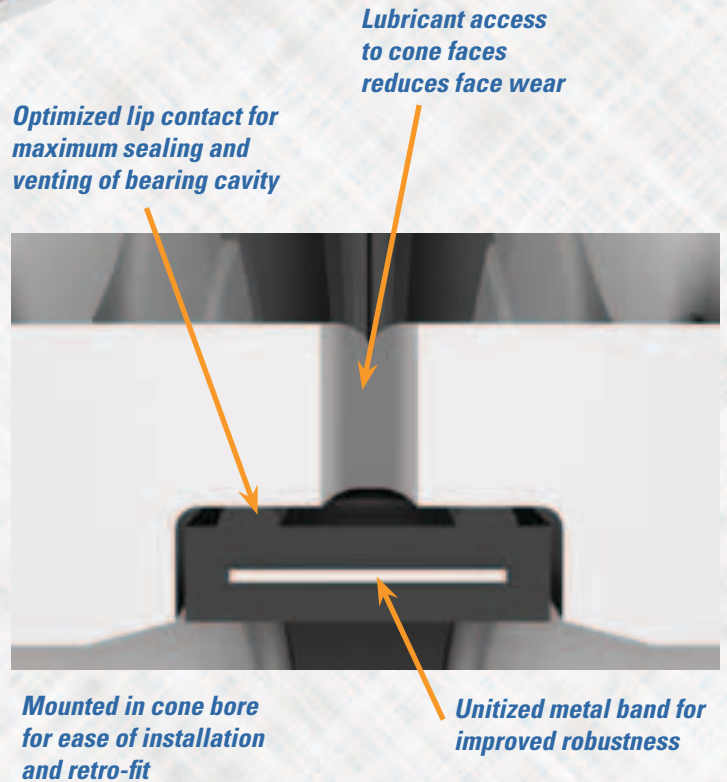
Install or remove the integrated seal by working it in or out gradually by hand or with a soft-headed mallet.

Do not attempt to install or remove these seals with a press because that may cause damage to the outer diameter (OD) of the seal. Also, these seals should not be staked into place and do not require a clamping device to retain them axially. The rubber OD design is sufficient to ensure positive retention.



ROBUST BORE SEAL BLOCKS WATER AND RELIEVES PRESSURE

The bore seal provides excellent water-exclusion capabilities, and the design has been optimized to vent under pressure, preventing the build-up of internal bearing pressure, which can be detrimental to the performance of the main seals. A fully unitized design improves the overall robustness of the seal.



BORE SEAL INSTALLATION

The bore seal design is easy to mount through the cone bore and snaps positively in place to ensure proper mounting.

INSTALLATION PROCEDURE

The installation procedure for the bore seals is a simple, manual method requiring no special tools or skills. The picture below demonstrates the basic installation process.

Bend the lubricated seal into a curved shape and locate it in the groove formed by the intersection of the two cones. Release the seal and allow it to snap in to place. Check that the seal is properly seated.

CHOOSE THE SEALED ROLL NECK BEARING THAT'S RIGHT FOR YOUR MILL

Timken offers a wide range of sealed roll neck bearings to meet the needs of the rolling mill industry, including the following options:

- Integrated Seal Design
- Seal Carrier Design
- Special Designs (available upon request)

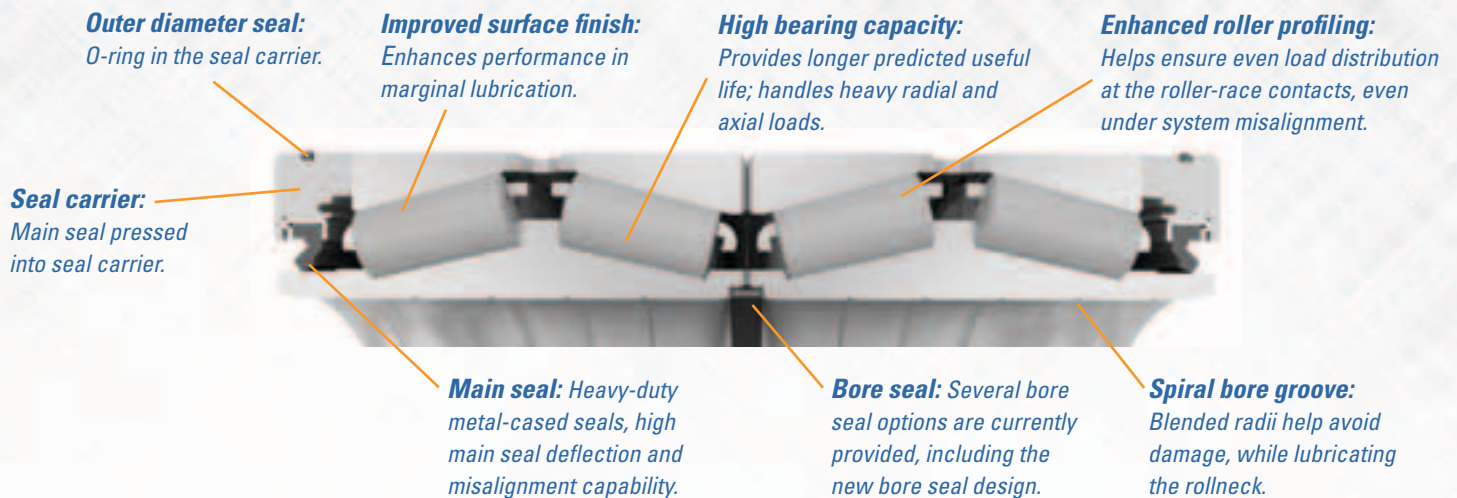
SEAL CARRIER DESIGN

Engineered with heavy-duty main seals in independent seal carriers, this design offers a very high level of protection against contamination ingress.

Due to the addition of the seal carrier, the overall bearing width is typically increased to maintain the same bearing capacity, compared to an integrated seal design with similar load ratings. When existing roll neck bearing space is limited, a seal carrier bearing can fit into the available envelope, but this typically results in decreased bearing capacity.

BENEFITS AVAILABLE WITH THE SEAL CARRIER DESIGN:

- Dependable protection against contamination ingress
- Main seals that can handle high levels of misalignment
- Heavy-duty metal-encased main seals handle tough applications
- Longer expected bearing life, due to Timken premium bearing design and materials



Options include: Center double cup; solid cup spacers; pre-greased assembly.

SPECIAL DESIGNS

In addition to the integrated seal design and seal carrier design, Timken manufactures many special designs that meet the needs of mill operators. These special designs are listed in the product tables of this brochure. Additionally, custom designs can be created upon request. Contact your Timken engineer to learn more about existing Timken special designs or to initiate a new custom design.

PRODUCT TABLES

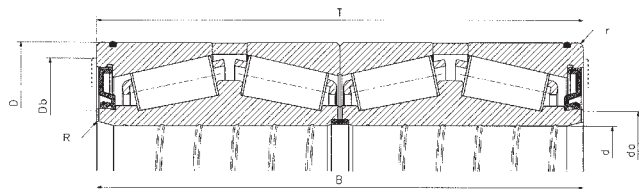


FIGURE 1

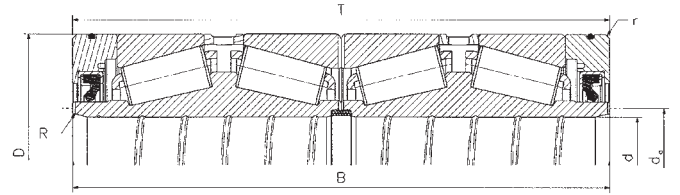


FIGURE 2

Base Part No.	Design Type	Bore	O.D.	Width Over Cups	Width Over Cones	Dynamic Load Rating	Dynamic Load Rating	K Factor	Max. Shaft Radius	Cone Backing Diameter	Max. Housing Radius	Cup Backing Diameter	Weight*
		d	D	T	B	C _{90 (4)}	C _{1 (4)}		R	d _b	r	D _b	
		mm inch	mm inch	mm inch	mm inch	kN Lbf	kN Lbf		mm inch	mm inch	mm inch	mm inch	Kg Lbs
NP935171	Fig 2	195.000	270.000	250.000	250.000	404	1560	1.20	2.0	211.0	1.5	237.0	44
		7.6772	10.6300	9.8425	9.8425	90800	350000		0.08	8.31	0.06	9.33	96
NP851756	Fig 2	220.000	295.000	315.000	315.000	478	1844	1.57	1.0	234.0	0.8	277.0	57
		8.6614	11.6142	12.4016	12.4016	107400	414000		0.04	9.21	0.03	10.91	125
NP115001	Fig 2	220.000	295.000	315.000	315.000	526	2020	1.65	1.0	233.0	0.8	277.0	54
		8.6614	11.6142	12.4016	12.4016	118200	456000		0.04	9.17	0.03	10.91	120
NP617527	Fig 1	220.663	314.325	239.712	239.712	618	2380	1.45	1.5	237.0	3.3	288.0	58
		8.6875	12.3750	9.4375	9.4375	138800	536000		0.06	9.33	0.13	11.34	127
NP759868	Fig 2	240.000	320.000	294.000	294.000	476	1836	1.44	1.5	255.0	0.8	303.0	51
		9.4488	12.5984	11.5748	11.5748	107000	412000		0.06	10.04	0.03	11.93	112
NP184658	Fig 2	240.000	338.000	340.000	340.000	676	2600	1.51	1.5	258.0	0.8	313.0	90
		9.4488	13.3071	13.3858	13.3858	151800	586000		0.06	10.16	0.03	12.32	198
NP526790	Fig 2	240.000	338.000	340.000	340.000	836	3220	1.5	1.5	258.0	0.8	314.0	93
		9.4488	13.3071	13.3858	13.3858	187800	724000		0.06	10.16	0.03	12.36	206
NP210270	Spec.	241.478	349.148	228.600	228.600	696	2680	1.64	1.5	259.0	3.3	329.0	71
		9.5070	13.7460	9.0000	9.0000	156600	604000		0.06	10.2	0.13	12.95	155
NP167500	Fig 2	245.000	345.000	310.000	310.000	606	2340	1.52	1.5	263.0	1.5	325.0	89
		9.6457	13.5827	12.2047	12.2047	136000	524000		0.06	10.35	0.06	12.8	196
NP390849	Fig 1	247.650	393.700	269.876	269.876	1114	4300	1.49	1.5	299.0	3.3	370.0	129
		9.7500	15.5000	10.6250	10.6250	250000	966000		0.06	11.77	0.13	14.57	284
NP831379	Fig 1	254.000	358.775	269.875	269.875	830	3200	1.58	3.3	271.0	5.0	340.0	82
		10.0000	14.1250	10.6250	10.6250	186800	720000		0.13	10.67	0.2	13.39	180
NP588161	Fig 2	260.000	365.000	340.000	340.000	954	3680	1.45	2.5	278.0	3.3	339.0	98
		10.2362	14.3701	13.3858	13.3858	214000	828000		0.098	10.94	0.13	13.35	215
NP348929	Fig 1	266.700	355.600	228.600	230.185	688	2660	1.62	1.5	280.0	3.3	336.0	60
		10.5000	14.0000	9.0000	9.0624	154800	598000		0.06	11.02	0.13	13.23	132
NP954936	Fig 1	269.875	381.000	282.575	282.575	1000	3860	1.76	3.3	291.3	3.3	354.0	98
		10.6250	15.0000	11.1250	11.1250	224000	866000		0.13	11.47	0.13	13.94	216
NP810309	Fig 1	273.050	380.898	244.475	244.475	758	2920	1.76	1.5	292.0	3.3	363.0	81
		10.7500	14.9960	9.6250	9.6250	170200	656000		0.06	11.5	0.13	14.29	177
NP814280	Fig 1	276.225	393.700	269.875	269.875	904	3480	1.49	3.2	300.0	3.3	370.0	108
		10.8750	15.5000	10.6250	10.6250	204000	784000		0.126	11.81	0.13	14.57	238
NP962698	Fig 1	279.400	393.700	269.875	269.875	868	3340	1.44	3.2	300.0	3.3	371.0	99
		11.0000	15.5000	10.6250	10.6250	195200	754000		0.126	11.81	0.13	14.61	219
NP962698	Fig 1	279.400	393.700	320.000	320.000	868	3340	1.44	3.2	300.0	3.3	371.0	100
		11.0000	15.5000	12.5984	12.5984	195200	754000		0.126	11.81	0.13	14.61	219
NP919993	Fig 1	279.578	380.898	244.475	244.475	758	2920	1.76	1.5	297.0	3.3	363.0	75
		11.0070	14.9960	9.6250	9.6250	170200	656000		0.06	11.69	0.13	14.29	166

*Assembly weight does not include auxiliary components.

Spec. indicates special designs not shown in the figures above.

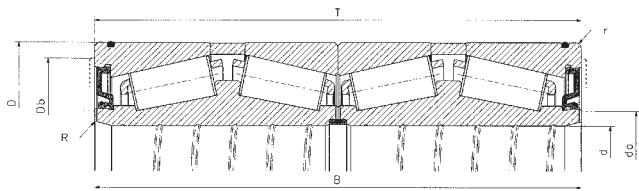


FIGURE 1

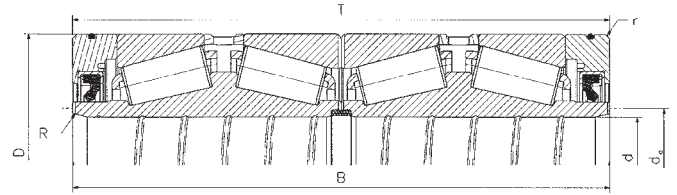


FIGURE 2

Base Part No.	Design Type	Bore	O.D.	Width Over Cups	Width Over Cones	Dynamic Load Rating	Dynamic Load Rating	K Factor	Max. Shaft Radius	Cone Backing Diameter	Max. Housing Radius	Cup Backing Diameter	Weight*
		d	D	T	B	C ₉₀₍₄₎	C ₁₍₄₎		R	d _a	r	D _b	
		mm inch	mm inch	mm inch	mm inch	kN Lbf	kN Lbf		mm inch	mm inch	mm inch	mm inch	Kg Lbs
NP229649	Spec.	280.000	380.000	290.000	290.000	1196	4620	1.56	3.3	299.0	6.4	351.0	90
		11.0236	14.9606	11.4173	11.4173	270000	1038000		0.13	11.77	0.25	13.82	197
NP385213	Fig 2	280.000	380.000	340.000	340.000	988	3820	1.56	1.5	296.0	0.8	350.0	110
		11.0236	14.9606	13.3858	13.3858	222000	858000		0.06	11.65	0.03	13.78	241
NP558574	Fig 1	285.750	380.898	244.475	244.475	758	2920	1.76	1.5	301.0	3.3	363.0	70
		11.2500	14.9960	9.6250	9.6250	170200	656000		0.06	11.85	0.13	14.29	154
NP163219	Spec.	295.000	389.950	220.000	220.000	768	2960	1.71	1.5	308.0	1.5	367.0	66
		11.6142	15.3524	8.6614	8.6614	172600	666000		0.06	12.13	0.06	14.45	146
NP464305	Spec.	304.648	438.048	279.400	280.990	996	3840	1.4	3.3	327.0	4.8	404.0	137
		11.9940	17.2460	11.0000	11.0626	224000	864000		0.13	12.87	0.19	15.91	302
NP898539	Fig 1	304.800	419.100	269.875	269.875	1006	3880	1.83	3.3	328.0	7.0	397.0	108
		12.0000	16.5000	10.6250	10.6250	226000	872000		0.13	12.91	0.275	15.63	237
NP435619	Spec.	304.902	412.648	266.700	266.700	990	3820	1.76	3.3	322.0	1.5	395.0	99
		12.0040	16.2460	10.5000	10.5000	222000	858000		0.13	12.68	0.06	15.55	217
NP377177	Spec.	305.003	438.048	279.400	280.990	996	3840	1.4	3.3	327.0	4.8	404.0	137
		12.0080	17.2460	11.0000	11.0626	224000	864000		0.13	12.87	0.19	15.91	301
NP305400	Fig 1	310.000	430.000	350.000	350.000	1214	4680	1.7	3.2	331.0	4.0	407.0	152
		12.2047	16.9291	13.7795	13.7795	272000	1052000		0.126	13.03	0.157	16.02	334
NP683330	Fig 1	317.500	422.275	269.875	269.875	1006	3880	1.83	3.3	332.0	3.3	403.0	99
		12.5000	16.6250	10.6250	10.6250	226000	872000		0.13	13.07	0.13	15.87	218
NP999842	Spec.	330.302	438.023	254.000	247.650	662	2560	1.27	1.5	347.0	3.3	415.0	97
		13.0040	17.2450	10.0000	9.7500	149000	574000		0.06	13.66	0.13	16.34	213
NP416510	Fig 1	341.312	457.098	254.000	254.000	948	3660	1.24	1.5	365.0	3.3	432.0	111
		13.4375	17.9960	10.0000	10.0000	214000	822000		0.06	14.37	0.13	17.01	245
NP996241	Fig 1	343.052	457.098	254.000	254.000	948	3660	1.24	1.5	365.0	3.3	432.0	108
		13.5060	17.9960	10.0000	10.0000	214000	822000		0.06	14.37	0.13	17.01	237
NP719584	Fig 1	343.052	457.098	254.000	254.000	802	3100	0.82	1.5	365.0	3.3	434.0	110
		13.5060	17.9960	10.0000	10.0000	180200	696000		0.06	14.37	0.13	17.09	243
NP974481	Spec.	355.600	457.200	252.413	252.413	834	3220	1.48	1.5	366.0	2.0	432.0	96
		14.0000	18.0000	9.9375	9.9375	187600	724000		0.06	14.41	0.08	17.01	211
NP631856	Spec.	355.600	482.600	269.876	265.116	1088	4200	1.29	1.5	374.0	3.3	454.0	135
		14.0000	19.0000	10.6250	10.4376	244000	944000		0.06	14.72	0.13	17.87	296
NP096778	Spec.	355.600	488.950	265.110	265.110	1088	4200	1.29	1.5	374.0	3.3	460.0	144
		14.0000	19.2500	10.4374	10.4374	244000	944000		0.06	14.72	0.13	18.11	316
NP587863	Spec.	355.600	488.950	317.500	317.500	1394	5380	1.76	1.5	374.0	3.3	466.0	172
		14.0000	19.2500	12.5000	12.5000	314000	1208000		0.06	14.72	0.13	18.35	378
NP272258	Spec.	384.175	546.100	400.050	400.050	2020	7800	1.76	3.0	410.0	6.4	513.0	283
		15.1250	21.5000	15.7500	15.7500	454000	1752000		0.12	16.14	0.25	20.2	622

*Assembly weight does not include auxiliary components.
Spec. indicates special designs not shown in the figures above.

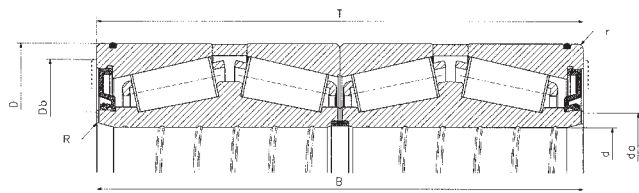


FIGURE 1

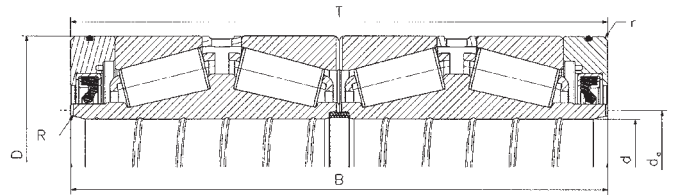


FIGURE 2

Base Part No.	Design Type	Bore	O.D.	Width Over Cups	Width Over Cones	Dynamic Load Rating	Dynamic Load Rating	K Factor	Max. Shaft Radius	Cone Backing Diameter	Max. Housing Radius	Cup Backing Diameter	Weight†
		d	D	T	B	C _{90 (4)}	C ₁₍₄₎		R	d _a	r	D _b	
		mm inch	mm inch	mm inch	mm inch	kN Lbf	kN Lbf		mm inch	mm inch	mm inch	mm inch	Kg Lbs
T-6241-A	Fig 2	390.000 15.3543	510.000 20.0787	350.800 13.8110	350.000 13.8110	1050 235000	4041 908500	1.40	2.0 0.078	411.0 16.18	4.5 0.177	479.0 18.86	190 417
NP041977	Spec.	406.400 16.0000	546.100 21.5000	288.924 11.3750	288.924 11.3750	1332 300000	5140 1154000	1.37	1.5 0.06	425.0 16.73	6.4 0.25	516.0 20.31	183 402
NP706368	Spec.	406.400 16.0000	546.100 21.5000	330.000 12.9921	330.000 12.9921	1358 306000	5240 1178000	1.23	1.5 0.06	435.0 17.13	6.4 0.25	516.0 20.31	209 459
NP553477	Fig 1	406.400 16.0000	562.000 22.1260	381.000 15.0000	381.000 15.0000	1922 432000	7400 1666000	1.76	3.3 0.13	413.0 16.26	6.4 0.25	534.0 21.02	266 585
NP561275	Fig 2	409.575 16.1250	546.100 21.5000	334.975 13.1880	334.975 13.1880	1166 262000	4500 1012000	0.96	3.3 0.13	428.0 16.85	6.4 0.25	510.0 20.08	226 498
NP895224	Fig 1	415.925 16.3750	590.550 23.2500	435.000 17.1260	435.000 17.1260	1958 440000	7560 1698000	1	3.3 0.13	444.0 17.48	6.4 0.25	540.0 21.26	392 863
NP800471	Spec.	430.000 16.9291	575.000 22.6378	380.000 14.9606	380.000 14.9606	1646 370000	6340 1428000	1.33	1.5 0.06	452.0 17.8	6.4 0.25	537.0 21.14	275 604
NP186641	Spec.	431.800 17.0000	571.500 22.5000	336.550 13.2500	336.550 13.2500	1592 358000	6140 1380000	1.33	2.0 0.08	453.0 17.83	3.3 0.13	537.0 21.14	231 509
NP981440	Spec.	440.000 17.3228	590.000 23.2283	481.500 18.9567	481.500 18.9567	2320 522000	8960 2020000	1.73	3.5 0.138	463.0 18.23	7.5 0.295	552.0 21.73	368 810
NP189922	Fig 1	450.000 17.7165	595.000 23.4252	368.000 14.4882	368.000 14.4882	1920 432000	7400 1664000	1.96	3.0 0.118	481.0 18.94	6.0 0.24	567.0 22.32	269 592
NP189922	Fig 1	450.000 17.7165	595.000 23.4252	404.000 15.9055	404.000 15.9055	1920 432000	7400 1664000	1.96	3.0 0.118	481.0 18.94	6.0 0.24	567.0 22.32	289 636
NP428889	Fig 1	457.200 18.0000	596.900 23.5000	279.400 11.0000	276.225 10.8750	1278 288000	4920 1108000	1.44	3.0 0.118	480.0 18.9	3.5 0.14	570.0 22.44	200 439
NP062614	Spec.	457.200 18.0000	606.000 23.8583	381.000 15.0000	381.000 15.0000	1946 438000	7500 1688000	1.92	3.0 0.12	482.0 18.98	6.0 0.24	576.0 22.68	290 638
NP105083	Fig 1	460.000 18.1102	625.000 24.6063	421.000 16.5748	421.000 16.5748	2260 508000	8740 1962000	1.76	3.0 0.118	486.0 19.13	9.0 0.35	588.0 23.15	362 796
NP471919	Fig 1	482.600 19.0000	615.950 24.2500	330.200 13.0000	330.200 13.0000	1682 378000	6480 1458000	1.76	6.4 0.25	507.0 19.96	6.5 0.254	585.0 23.03	232 510
NP998820	Fig 2	482.600 19.0000	615.950 24.2500	379.984 14.9600	379.984 14.9600	1400 314000	5400 1214000	1.76	3.3 0.13	507.0 19.96	6.0 0.24	585.0 23.03	259 571
NP453574	Fig 1	482.600 19.0000	615.950 24.2500	377.825 14.8750	406.400 16.0000	1752 394000	6760 1520000	1.76	4.1 0.16	507.0 19.96	6.4 0.25	582.0 22.91	266 585
NP216529	Fig 2	482.600 19.0000	615.950 24.2500	400.050 15.7500	400.050 15.7500	1834 412000	7080 1592000	1.76	6.4 0.25	504.0 19.84	7.4 0.29	582.0 22.91	282 620
NP630107	Fig 2	482.600 19.0000	615.950 24.2500	400.050 15.7500	419.100 16.5000	1682 378000	6480 1458000	1.76	4.0 0.16	507.0 19.96	6.4 0.25	585.0 23.03	281 617
NP471919	Fig 1	482.600 19.0000	615.950 24.2500	420.000 16.5354	420.000 16.5354	1682 378000	6480 1458000	1.76	6.4 0.25	507.0 19.96	6.5 0.254	585.0 23.03	262 576

*Assembly weight does not include auxiliary components.
Spec. indicates special designs not shown in the figures above.

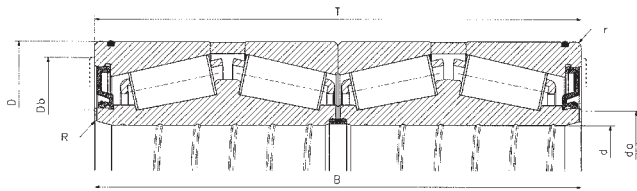


FIGURE 1

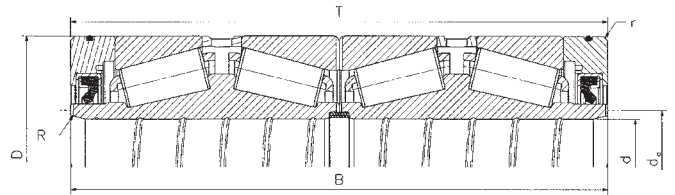


FIGURE 2

Base Part No.	Design Type	Bore	O.D.	Width Over Cups	Width Over Cones	Dynamic Load Rating	Dynamic Load Rating	K Factor	Max. Shaft Radius	Cone Backing Diameter	Max. Housing Radius	Cup Backing Diameter	Weight*
		d	D	T	B	C ₉₀₍₄₎	C ₁₍₄₎		R	d _a	r	D _b	
		mm inch	mm inch	mm inch	mm inch	kN Lbf	kN Lbf		mm inch	mm inch	mm inch	mm inch	Kg Lbs
NP644633	Fig 1	482.600 19.0000	615.950 24.2500	500.000 19.6850	500.000 19.6850	1682 378000	6480 1458000	1.76	6.4 0.25	507.0 19.96	6.5 0.254	585.0 23.03	342 752
NP313976	Fig 2	482.600 19.0000	615.950 24.2500	379.984 14.9600	379.984 14.9600	1400 314000	5400 1214000	1.76	3.3 0.13	507.0 19.96	6.0 0.24	585.0 23.03	259 570
NP780879	Spec.	489.026 19.2530	634.873 24.9950	320.675 12.6250	320.675 12.6250	1692 380000	6520 1468000	1.71	3.3 0.13	513.0 20.2	2.0 0.08	597.0 23.5	246 541
NP109340	Spec.	490.000 19.2913	625.000 24.6063	385.000 15.1575	385.000 15.1575	1766 398000	6820 1532000	1.77	3.0 0.12	513.0 20.2	3.0 0.12	591.0 23.27	284 624
NP409679	Fig 1	510.000 20.0787	655.000 25.7874	379.000 14.9213	377.000 14.8426	2100 472000	8120 1824000	1.79	1.5 0.06	531.0 20.91	6.4 0.25	624.0 24.57	314 690
DX283454	Spec.	510.000 20.0787	655.000 25.7874	410.000 16.1417	408.000 16.0630	2580 582000	9980 2240000	1.79	1.6 0.063	531.0 20.91	6.4 0.25	624.0 24.57	331 727
NP877970	Spec.	558.800 22.0000	736.600 29.0000	457.200 18.0000	455.612 17.9375	2580 580000	9960 2240000	1.69	4.0 0.16	588.0 23.15	6.4 0.25	693.0 27.28	510 1123
NP321803	Spec.	585.788 23.0625	771.525 30.3750	479.425 18.8750	479.425 18.8750	3060 688000	11800 2660000	1.54	4.8 0.19	618.0 24.33	6.4 0.25	732.0 28.82	588 1294
NP264014	Fig 2	585.788 23.0625	771.525 30.3750	567.000 22.3228	567.000 22.3228	3400 766000	13140 2960000	1.76	3.3 0.13	615.0 24.21	6.4 0.25	726.0 28.58	698 1535
NP324718	Spec.	609.600 24.0000	787.400 31.0000	361.950 14.2500	361.950 14.2500	2120 476000	8160 1834000	1.58	6.4 0.25	642.0 25.28	1.5 0.06	738.0 29.06	438 964
NP891876	Spec.	685.500 26.9882	862.000 33.9370	375.000 14.7638	375.000 14.7638	2500 560000	9600 2160000	1.76	3.3 0.13	714.0 28.11	2.0 0.08	837.0 32.95	478 1051
NP145790	Spec.	685.800 27.0000	876.300 34.5000	355.600 14.0000	352.425 13.8750	2500 560000	9600 2160000	1.76	3.3 0.13	714.0 28.11	6.4 0.25	843.0 33.19	504 1108
NP026261	Spec.	685.800 27.0000	876.300 34.5000	428.625 16.8750	428.625 16.8750	2500 560000	9600 2160000	1.76	3.3 0.13	714.0 28.11	6.4 0.25	843.0 33.19	580 1276
277TQS 9801	Spec.	704.850 27.7500	914.400 36.0000	552.450 21.7500	552.450 21.7500	3540 800000	13665 3072000	1.36	0.1 0.006	738.2 29.06	8.8 0.346	856.4 33.72	977 2150
NP388194	Fig 2	708.025 27.8750	930.275 36.6250	565.150 22.2500	565.150 22.2500	3980 894000	15320 3440000	1.72	4.0 0.16	744.0 29.29	5.0 0.2	882.0 34.72	1032 2270
NP019603	Fig 1	710.000 27.9528	900.000 35.4331	410.000 16.1417	410.000 16.1417	2580 580000	9940 2240000	1.11	3.5 0.138	741.0 29.17	6.4 0.25	852.0 33.54	594 1306
NP778193	Fig 2	711.200 28.0000	914.400 36.0000	390.000 15.3543	390.000 15.3543	2020 454000	7800 1754000	1.36	3.5 0.14	744.0 29.29	5.0 0.2	870.0 34.25	622 1368
NP746115	Fig 2	711.200 28.0000	914.400 36.0000	420.000 16.5354	420.000 16.5354	2020 454000	7800 1754000	1.36	4.0 0.16	744.0 29.29	5.0 0.2	870.0 34.25	655 1440
NP839885	Fig 2	717.550 28.2500	946.150 37.2500	660.000 25.9843	660.000 25.9843	4820 1086000	18620 4180000	1.76	3.3 0.13	753.0 29.65	1.5 0.06	900.0 35.43	1313 2889

*Assembly weight does not include auxiliary components.
Spec. indicates special designs not shown in the figures above.

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