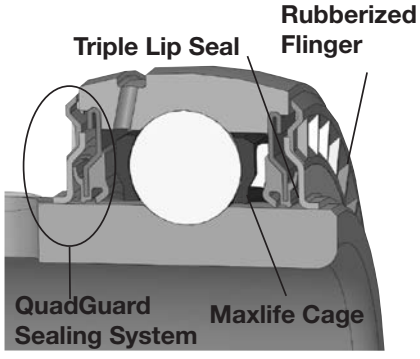
FEATURES/BENEFITS

Extreme Duty Setscrew Ball Bearings

The DODGE SC/SCMED Extreme Duty ball bearing offers extended life in the toughest industrial applications. Incorporating patented DODGE-only features such as the QuadGuard sealing system and the Maxlife ball cage, the DODGE SCED/SCMED bearing outperforms the competition in demanding environments where increasing equipment uptime is critical to success. Extreme conditions require highly-engineered products that will last. The DODGE Extreme Duty ball bearing is up to the challenge.

Insert: The Dodge Extreme Duty ball bearing incorporates 65° degree setscrews that provide maximum locking force without compromising the strength of the inner ring. Additional shaft attachment methods are available upon request. The design also includes an anti-rotation pin that prevents the insert from rotating in the housing under load which causes premature failure.

Sealing: The SCED uses the patented QuadGuard sealing system that offers superior protection in tough environments where there is significant risk of contamination. Industries such as agriculture, aggregate, cement, paper, wood products and metals require a sealing system that will extend the life of the bearing in harsh conditions. There are two major components to the QuadGuard design. The first is a unique triple-lip seal design that maximizes sealing without sacrificing the speed rating compared to a single lip design. The Dodge patented triple-lip design uses a mechanically retained seal where there are two contact points on the inner ring and one that rides against the flinger surface. Three points of contact maximize the ability of the bearing to guard against contamination and retain lubricants. The QuadGuard seal also incorporates the industry's first and only patented rubberized flinger. This flinger uses molded rubber to provide additional protection from contaminants entering the bearing. The baffle design of the rubber on the external surface of the flinger enhances the removal of liquid as it rotates. Grease chambers on the internal surface prevent lubricants from exiting the bearing. This superior design will increase service life in dirty environments thus leading to extended up-time for our customers. When used in conjunction with one another, the triple-lip seal and rubberized flinger create a sealing system that is perfect for demanding environments.



Retainer: The Maxlife Cage is the product of extensive research and development in retainer technology and industry leading engineering. The cage consists of a two-piece design that creates a grease compartment around each of the rolling elements. These compartments allow balls to be constantly in contact with grease, so a good oil film will always exist to prevent wear and minimize friction and heat. The Maxlife cage reduces the relative motion between the components and the grease which results in lower operating temperatures and extended life. The compartmental construction of the cage tends to hold in the grease and prevent it from being washed out in extremely wet or dirty conditions. This feature allows for extended life and the ability for the bearing to be relubricated with less frequency than standard designs.

Lubrication:

Synthetic Grease

- SHC 220 PM synthetic grease standard
- Extends grease life. Less maintenance required.
- Cooler operating temperatures
- Extends life in wet applications

Housings:

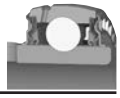
- Cast Iron
  - Pillow blocks
  - 2 and 4 bolt flange bearings
  - Tapped-base pillow blocks
  - Piloted flange
  - Wide and narrow slot take-up bearings

Maxlife Cage

End-Covers:

Dodge Extreme Duty ball bearings contain a machined groove in the housing to accommodate a snap-on style polymer end-cover as a standard feature. The end-cover provides additional protection from the environment and creates a safer working environment for employees maintaining equipment. The snap-on style end-cover incorporates an additional lip on the mounting surface for a more rigid fit within the housing. The design is more durable than a bolt-on style that uses the grease fitting to secure the cover in place and can be easily knocked off the bearing housings. Closed and open end-covers are available.

NOTE: Instruction manuals and drawings for Dodge bearings are available on www.dodge-pt.com



Selection of Extreme Duty Setscrew Ball Bearings

DODGE Extreme Duty mounted ball bearings are primarily designed for radial loading. However, they have the capacity to carry thrust loads and combined radial/thrust loads. The maximum recommended load which can be applied is limited by various components in the system, such as bearing, housing, shaft attachments, speed and life requirements as listed in this catalog and the instruction manual that accompanies each bearing. DODGE Extreme Duty ball bearings have been applied successfully when these limits have been exceeded under controlled operating conditions. Contact DODGE Engineering for applications which exceed these recommendations.

Select a bearing from the Selection Table that has a radial load rating at the operating speed equal to or greater than the calculated Equivalent Radial Load for a desired L_{10} life. This simple method is all that is required for the majority of general applications and provides for occasional average shock loads.

L_{10} Hours Life-the life which may be expected for at least 90% of a given group of bearings operating under identical conditions.

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 Equivalent Radial Load. Consult Application Engineering for additional selection assistance.

A maximum thrust load value of C/10 is recommended as a guide for general applications and will give adequate L_{10} life. If the thrust load exceeds this limit, it is advisable to use auxiliary thrust carrying devices, such as a shaft shoulder, snap ring, or a thrust collar. Where substantial radial 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 L_{10} hours life for loads and RPMs not listed use the following equation:

$$L_{10} = \left(\frac{C}{P}\right)^{3} \times \left(\frac{16{,}667}{n}\right)$$

Where:

L_{10}= Life, hours

C = Dynamic Capacity, lbs. or N

P = Equivalent Radial Load, lbs. or N

n = Revolutions per minute

When the load on a ball bearing is solely a radial load with no thrust (axial) load, the Equivalent Radial Load (P) is equal to the actual radial load. However, when a thrust (axial) load is applied, the radial and thrust loads applied must be converted into an Equivalent Radial Load. Use X (radial factor) and Y (thrust factor) from Table 1 to convert the actual applied thrust and radial loads to an Equivalent Radial Load which has the same effect on the life of a bearing as a radial load of this magnitude.

$$P = XF_R + YF_A$$

Where:

P = Equivalent Radial Load, lbs.
F_R= Radial load, lbs.
F_A= Thrust load, lbs.
e = Thrust load to radial load factor (Table 1)
X = Radial load factor (Table 1)
Y = Thrust Factor (Table 1)
C_0= Basic static capacity (Selection Table)

To find X and Y, first calculate F_A/C_0 to determine e. Calculate F_A/F_R and compare to e to determine the X and Y factors to use from Table 1.

Shaft Tolerances		
Normal Shaft Size	**Commercial Shaft Tolerance (Inches)**	**Recommended Shaft Tolerances Setscrew Ball Bearing (Inches)**
Up to 1-1/2"	+0.000 -0.002	+0.0000 -0.0005
Over 1-1/2" to 2-1/2"	+0.000 -0.003	+0.0000 -0.0010
Over 2-1/2" to 4"	+0.000 -0.004	+0.0000 -0.0010

NOTE: Bearing analysis program "BEST" is available on www.ptwizard.com

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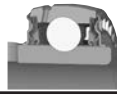

Selection of Extreme Duty Setscrew Ball Bearings

Table 1

F_A/C_0	e	Radial/Thrust Factors			
		If F_A/F_R is equal to or less than e		If F_A/F_R is greater than e	
		$F_A/F_R \leq e$		$F_A/F_R > e$	
		X	Y	X	Y
0.014	0.19	1	0	0.56	2.30
0.021	0.21	1	0	0.56	2.15
0.028	0.22	1	0	0.56	1.99
0.042	0.24	1	0	0.56	1.85
0.056	0.26	1	0	0.56	1.71
0.070	0.27	1	0	0.56	1.63
0.084	0.28	1	0	0.56	1.55
0.110	0.30	1	0	0.56	1.45
0.170	0.34	1	0	0.56	1.31
0.280	0.38	1	0	0.56	1.15
0.420	0.42	1	0	0.56	1.04
0.560	0.44	1	0	0.56	1.00

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 chart to select a bearing (Selection Table).

If calculated value of P is less than F_R, use $P=F_R$.

Lubrication- DODGE Ball Bearings are lubricated at the factory and are ready to run. The bearings are initially lubricated with a lithium complex grease and should be relubricated with the same or some equivalent. For high speeds, high loads, extreme temperatures and other abnormal operating conditions, special greases may be required. Contact DODGE Application Engineering for recommendations on these types of applications.

Misalignment - DODGE Ball Bearings are designed to allow a maximum of ±2° static misalignment. These bearings are not suitable for dynamic misalignment. To ensure good alignment, mounting surfaces must be checked for flatness and must lie in the same plane. When tightening base bolts, each bolt should be alternately tightening in incremental torque values until full torque is achieved to prevent the angular shifting of the pillow block that occurs when one bolt is tightened to its full torque. Shimming may be required to minimize misalignment.

NOTE: Bearing analysis program “BEST” is available on www.ptwizard.com