

Informative Application Guidelines, with respect to *Motors & Drives* to keep you better INFORMED.

APPLICATION GUIDELINE #01

(Greasing Intervals)

.....Brought to you by your Motor & Drive Specialists

BEARING GREASING INTERVALS

Bearing regreasing interval time is an issue which tends to be as much of an art as it is a science.

From the scientific end of the spectrum, greasing intervals are dependent on bearing type, bearing size, grease type and rotational speed. If ideal conditions were to exist in all motor/ bearing applications, regreasing intervals would be easy to calculate.

The challenge comes into play when we apply the motor/ bearing combination into the real world and then try to make a responsible regreasing interval recommendation that will give rated bearing life in 99% of the cases. Required regreasing intervals can be shortened by a multitude of external influences such as vibration, moisture, dust and other contaminants, the type of grease used, high ambient temperatures and high radial load applied to the shaft of the motor. Every motor in an industrial application tends to be subject to a unique combination of varying degrees of the previously listed factors. This makes it virtually impossible to recommend a blanket regreasing interval that satisfies the bearing's needs and satisfies the customer's wishes of having the longest greasing interval possible and still allow the bearings to attain rated life expectancy in 99% of all applications.

Toshiba is conservative in its recommendations for greasing intervals. We mimic the recommendations that are published by such bearing manufacturers as SKF, NTN and NSK. We have also checked with grease manufacturers such as Shell and Chevron and found that the grease manufactures publish almost identical recommended greasing intervals as the bearing manufacturers do. (Most manufacturers follow the guidelines set forth by the National Lubricating and Greasing Institute.) The one factor that the recommended greasing intervals have in common besides being very similar in time frames is that they are published on the conservative side. This is where the "art" aspect of recommending bearing greasing intervals comes into play. Bearing manufacturers point out that greasing intervals can be significantly stretched out if ideal conditions exist.

This increase in regreasing intervals can be as much as 2.5 times for roller bearings and as much as 3 times for ball bearings. Somewhere in between the "worst case" scenario and the "ideal" situation lies a regreasing interval which is appropriate for each specific motor/ bearing application. We feel that it would be inappropriate to make a blanket statement that extends the recommended greasing interval beyond the time frame recommended by the bearing and grease manufacturers unless very specific external parameters are known.

The single most significant thing that increases greasing intervals, that is under the control of the manufacturer, is to supply ball bearings in lieu of roller bearings. The greasing interval for a ball bearing is almost exactly double that of a roller bearing if both bearings are the same physical size. Ball bearings have the capacity of handling a limited amount of radial thrust as compared to roller bearings, but are still suitable for many applications and therefore should be seriously considered when making motor/bearing selections. Please note that higher HP motors, (i.e. 440 frames and larger) will require roller bearings for belt drive applications.

BEARING GREASING INTERVALS CHART

SYNC. RPM RANGE	FRAME SIZE	STANDARD DUTY	SEVERE DUTY	VERY SEVERE DUTY
3600 1800-900	143T-256T 143T-256T	8 MONTHS 30 MONTHS	4 MONTHS 12 MONTHS	1 MONTH 4 MONTHS
Bearing Size 6205/6206 6207/6208/6305 6306 6308/6309		Periodic Grease Amount 3 Grams 5 Grams 10 Grams 20 Grams		
3600 1800-900	284T-365T 284T-365T	8 MONTHS 24 MONTHS	4 MONTHS 12 MONTHS	1 MONTH 4 MONTHS
Bearing Size 6211 6309 6310/6312 6314		Periodic Grease Amount 10 Grams 20 Grams 30 Grams 50 Grams		
3600 1800-900	404T-447T 404T-447T	8 MONTHS 18 MONTHS	4 MONTHS 8 MONTHS	1 MONTH 3 MONTHS
Bearing Size 6216 6313/NU317 NU318/NU320 6317/6318 6320/6322/6324 NU322/NU324 NU328/NU2228		Periodic Grease Amount 20 Grams 30 Grams 50 Grams 80 Grams 80 Grams 80 Grams 100 Grams		

Notes:

1. When relubricating roller bearings divide the monthly service time by two.
2. See Fig. 2 below for definitions of Service Conditions
3. Gram quantity when using a typical low pressure hand grease gun equals (4 pumps = 5 grams)

Figure 2:

SERVICE CONDITIONS	
STANDARD DUTY	Eight hours per day; Light to normal loading; Clean condition, free from dust.
SEVERE DUTY	24 hours per day; Light to normal shock loading, vibration; Exposure to dirt or dusty conditions.
VERY SEVERE DUTY	24 hours per day; High ambient; Normal to high shock loading, vibration; Dusty conditions; Confined mounting conditions.

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Reliability in motion