

MOTOR MAINTENANCE

WARNING: UL rated motors must only be serviced by authorized motor service centers if they are to be returned to a flammable and/or explosive atmosphere.

General Inspection

Inspect the motor at regular intervals, approximately every 500 hours of operation or every 3 months, whichever occurs first. Keep the motor clean and the ventilation openings clear. The following steps should be performed at each inspection:

WARNING: Do not touch electrical connections before you first ensure that power has been disconnected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt the installation, operation and maintenance of the equipment.

1. Check that the motor is clean. Check that the interior and exterior of the motor is free of dirt, oil, grease, water, etc. Oily vapor, paper pulp, etc. can accumulate and block motor ventilation. If the motor is not properly ventilated, overheating can occur and cause early motor failure.
2. Use a 'Megger' periodically to ensure that the integrity of the winding insulation has been maintained. Record the Megger readings. Immediately investigate any significant drop in insulation resistance.
3. Check all electrical connectors to be sure that they are tight.

Lubrication & Bearings

Bearing grease will lose its lubricating ability over time, not suddenly. The lubricating ability of grease over time depends primarily on the type of grease, the size of the bearing, the speed at which the bearing operates and the severity of the operating conditions. Good results can be obtained if the following recommendations are used in your maintenance program.

Type of Grease

A high-grade ball or roller bearing grease should be used. Recommended grease for standard service conditions is Polyrex EM (Exxon Mobil).

Equivalent and compatible greases include:

Texaco Polystar, Rycon Premium #2, Pennzoil Pen 2 Lube and Chevron SRI.

- Maximum operating temperature for standard motors = 110°C.
- Shutdown temperature in case of a malfunction = 115°C.

Lubrication Intervals

Recommended lubrication intervals are shown in Table .1. It is important to realize that the recommended intervals of Table .1 are based upon average use.

Refer to additional information contained in Tables .2 and .3.

Table .1 – Lubrication Intervals*

NAMA / (IEC) Frame Size	RPM					
	1000	6000	3600	1800	1200	900
Up to 210 incl. (132)	**	2700 hrs	5500 hrs.	12000 hrs.	18000 hrs.	22000 hrs.
Over 210 to 280 incl. (180)			3600 hrs.	9500 hrs.	15000 hrs.	18000 hrs.
Over 280 to 360 incl. (225)			*2200 hrs.	7400 hrs.	12000 hrs.	15000 hrs.
Over 360 to 5800 incl. (300)			*2200 hrs.	3500 hrs.	7400 hrs.	10500 hrs.

*Lubrication intervals are for ball bearings. For roller bearings, divide the listed lubrication interval by 2.

**For 6205 and 6806 bearings. Relubrication interval for 6205 bearings is 1550 hrs. (using grease lubrication). Relubrication interval for 6806 bearings is 720 hrs. (using grease lubrication).

Table .2 – Service Conditions

Severity of Service	Ambient Temperature Maximum	Atmospheric Contamination	Type of Bearing
Standard	40°C	Clean, Little Corrosion	Deep Groove Ball Bearing
Severe	50°C	Moderate dirt, Corrosion	Ball Thrust, Roller
Extreme	>50°C* or Class H Insulation	Severe dirt, Abrasive dust, Corrosion	All Bearings
Low Temperature	<-30°C**		

*Special high temperature grease is recommended (Dow Corning DC44). Note that Dow Corning DC44 grease does not mix with other grease types. Thoroughly clean bearing & cavity before adding grease.

**Special low temperature grease is recommended (Aeroshell 7).

Table .3 – Lubrication Interval Multiplier

Severity of Service	Multiplier
Standard	1.0
Severe	0.5
Extreme	0.1
Low Temperature	1.0

Table .4 – Bearings Sizes and Types

Frame Size NEMA (IEC)	Bearing Description (These are the 'Large' bearings (Shaft End) in each frame size)					
	Bearing	OD D mm	Width B mm	Weight of Grease to Add* Oz (Grams)	Volume of grease To be added	
					In3	Tea- spoon
Up to 210 incl. (132)	6307	80	21	0.30 (8.4)	0.6	2.0
Over 210 to 280 incl. (180)	6311	120	29	0.61 (17)	1.2	3.9
Over 280 to 360 incl. (225)	6313	140	33	0.81 (23)	1.5	5.2
Over 360 to 449 incl. (280)	NU319	200	45	2.12 (60)	4.1	13.4
Over 5000 to 5800 incl. (355)	NU328	300	62	4.70 (130)	9.2	30.0
Spindle Motors						
76 Frame	6207	72	17	0.22 (6.1)	0.44	1.4
77 Frame	6210	90	20	0.32 (9.0)	0.64	2.1
80 Frame	6213	120	23	0.49 (14.0)	0.99	3.3

*weight in grams = .005 DB

Lubrication Procedure

Be sure that the grease you are adding to the motor is compatible with the grease already in the motor. Consult the motor distributor or an authorized service center if grease other than the recommended type is to be used.

Caution: To avoid damage to motor bearings, grease must be kept free of dirt. For an extremely dirty environment, contact the motor manufacturer service center for additional information.

With Grease Outlet Plug –

1. Clean all grease fittings.
2. Remove grease outlet plug.
3. If the motor is stopped, add the recommended amount of grease. If the motor is to be greased while running, a slightly greater quantity of grease will have to be added. Add grease slowly until new grease appears at shaft hole in the endplate or purge outlet plug.

Without Grease Outlet Plug-

1. Disassemble motor.
2. Add recommended amount to bearing and bearing cavity. (Bearing should be about 1/3 full of grease and outboard bearing cavity should be about 1/2 full of grease). Note: Bearing should be 1/3 full when only one side of bearing is completely full of grease.
3. Assemble motor.

Sample Lubrication Determination

Assume – NEMA 286T (IEC 180), 1750-rpm motor driving an exhaust fan in an ambient temperature of 43°C and the atmosphere is moderately corrosive.

1. Table .1 list 950 hours of standard conditions.
2. Table .2 classifies severity of service as 'Severe'.
3. Table .3 lists a multiplier value of 0.5 for service conditions.
4. Table .4 shows that 1.2 in³ or 3.9 teaspoon of grease is to be added.

Note: Smaller bearings in size category may require reduced amounts of grease.