

IX. Lubrication

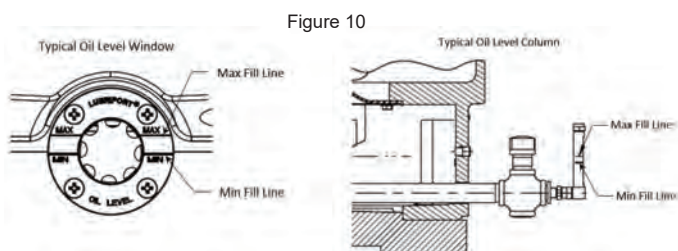
Motor must be at rest and electrical controls should be locked open to prevent energizing while being serviced. If motor is being taken out of storage, refer to **Section III “STORAGE”, item 4** for instructions.

1. Oil lubricated bearings

Motors are tested with oil at our manufacturing facility then drained prior to shipment. A small amount of residual oil and rust inhibitor will remain on the oil sump. This residual oil and rust inhibitor is compatible with Turbine Type Mineral Oils and Synthetic, PAO (Poly Alpha Olefin) based oils listed in this manual. It is not necessary to drain this residual oil when adding new oil for operation.

Change oil once per year with normal service conditions. Frequent starting and stopping, damp or dusty environment, extreme temperature, or any other severe service conditions will warrant more frequent oil changes. If there is any question, consult Nidec Motor Corporation Product Service Department for recommended oil change intervals regarding your particular situation.

Determine required oil ISO Viscosity Grade (VG) and base oil type from Table 3, then see Table 4 and 5 for approved oils. Add oil into oil fill hole at each bearing housing until the oil level reaches between minimum and maximum marks located on the sight of the gauge window. Figure 10 illustrates a typical oil level window or column to confirm oil fill. Oil level should be confirmed with motor off and should be not be above the max fill line or below the min fill line. It is important to wipe excess oil from the threads of the drain hole and to coat the plug threads with Gasoil[®] P/N SS08, manufactured by Federal Process Corporation or equivalent thread sealant before replacing the drain plug. Plug should be tightened to a minimum of 20 lb.-ft. using a torque wrench. See the motor nameplate or Table 7 for the approximate quantity of oil required.



2. Grease Lubricated Bearings

A. Relubrication of Units In Service

Grease lubricated bearings are pre-lubricated at the factory and normally do not require initial lubrication. Relubricating interval depends upon speed, type of bearing and service. Refer to Table 1 or suggested regreasing intervals and quantities. Note that operating environment and application may dictate more frequent lubrication. To relubricate bearings, remove the drain plug. Inspect grease drain and remove any blockage (caked grease or foreign particles) with a mechanical probe, taking care not to damage bearing.

WARNING

Should a motor supplied with a self-release coupling become uncoupled, the motor and pump must be stationary and all power locked out before manually re-coupling.

Add new grease at the grease inlet. New grease must be compatible with the grease already in the motor (refer to table 2 and 6 for recommended greases).

WARNING

Greases of different bases (lithium, polyurea, clay, etc.) may not be compatible when mixed. Mixing such greases can result in reduced lubricant life and premature bearing failure. Prevent such intermixing by disassembling motor, removing all old grease and repacking with new grease per item B of this section. Refer to Table 2 for recommended greases.

Run the motor for 15 to 30 minutes with the drain plug removed to allow purging of any excess grease. Shut off unit and replace the drain plug. Return motor to service.

WARNING

Overgreasing can cause excessive bearing temperatures, premature lubricant breakdown and bearing failure. Care should be exercised against overgreasing.

B. Change of Lubricant

Motor must be disassembled as necessary to gain full access to bearing housing(s).

Remove all old grease from bearings and housings (including all grease fill and drain holes). Inspect and replace damaged bearings. Fill bearing housings both inboard and outboard of bearing approximately 30 percent full of new grease. Grease fill ports must be completely charged with new grease. Inject new grease into bearing between rolling elements to fill bearing. Remove excess grease extending beyond the edges of the bearing races and retainers.

Table 1
Recommended Grease Replenishment Quantities & Lubrication Intervals

Bearing Number		Grease Replenishment Quantity (Fl. Oz.)	Lubrication Interval		
62xx, 72xx	63xx, 73xx		1801 thru 3600 RPM	1201 thru 1800 RPM	1200 RPM and slower
03 thru 07	03 thru 06	0.2	1 Year	2 Years	2 Years
08 thru 12	07 thru 09	0.4	6 Months	1 Year	1 Year
13 thru 15	10 thru 11	0.6	6 Months	1 Year	1 Year
16 thru 20	12 thru 15	1.0	3 Months	6 Months	6 Months
21 thru 28	16 thru 20	1.8	3 Months	6 Months	6 Months

Refer to motor nameplate for bearings provided on a specific motor. For bearings not listed in Table 1, the amount of grease required may be calculated by the formula:

$$G = 0.11 \times D \times B$$

Where: G = Quantity of grease in fluid ounces
D = Outside diameter of bearing in inches
B = Width of bearing in inches

Table 2
Recommended Greases

Motor Frame Size	Motor Enclosure	Grease Manufacturer	Grease (NLGI Grade 2)
All Thru 447	All	Exxon Mobil	Polyrex-EM
449 and Up	Open Dripproof		
449 and Up	TEFC and Explosionproof		Mobilith SHC-100

The above greases are interchangeable with the grease provided in units supplied from the factory (unless stated otherwise on motor lubrication nameplate).

Table 3
Nidec Motor Corporation Recommended Oil Viscosities

Use chart below when "no" special lubrication plate is attached to the motor

Angular Contact Thrust Bearing (7XXX Series) (ABMA BT-Series)						
Motor Enclosure	Frame Size	Speed (RPM)	Ambient Temperature	ISO VG	Base Oil Type	
Open Dripproof or Weather Protected	324 and larger	All	-15°C thru 40°C (5-104°F)	32	Mineral or Synthetic	
			41°C thru 50°C (105-122°F)	68	Synthetic Only	
-15°C thru 40°C (5-104°F)	404 thru 447		32	Mineral or Synthetic		
			41°C thru 50°C (105-122°F)	68	Synthetic Only	
Totally Enclosed or Explosion proof	449 thru 5811		1801-3600	-15°C thru 40°C (104°F)	32	Synthetic Only
			1800 & below		68	Synthetic Only
		All	41°C thru 50°C (105-122°F)	Refer to Office		

Spherical Roller Thrust Bearing (29XXX Series) (ABMA TS-Series)					
Motor Enclosure	Frame Size	Speed (RPM)	Ambient Temperature	ISO VG	Base Oil Type
Open Dripproof or Weather Protected	444 and larger	1800 and below	-15°C thru 25°C (5-77°F)	68	Mineral or Synthetic
			6°C thru 40°C (42-104°F)	150	
			41°C thru 50°C (105-122°F)		68
Totally Enclosed or Explosion proof	449 and larger		-15°C thru 25°C (5-77°F)	68	Mineral or Synthetic
			6°C thru 40°C (42-104°F)	150	Synthetic Only
			41°C thru 50°C (105-122°F)	Refer to Office	

Notes:

1. If lower guide bearing is oil lubricated, it should use the same oil as the thrust bearing.
2. If lower guide bearing is grease-lubricated, refer to TABLE 2 for recommended greases.
3. Refer to Nidec Motor Corporation for ambient temperatures other than those listed.

Table 4
Nidec Motor Corporation Approved Oil Specifications For Use with Anti-Friction Bearings

Oil Manufacturer	ISO VG 32		SO VG 68		ISO VG 150	
	Viscosity: 130-165 SSU @ 100F		Viscosity: 284-347 SSU @100F		Viscosity: 620-765 SSU @ 100F	
	Mineral Base Oil	Synthetic Base Oil	Mineral Base Oil	Synthetic Base Oil	Mineral Base Oil	Synthetic Base Oil
Chevron Texaco	Regal R&O 32	Cetus HiPerSyn 32 Cetus PAO 32	Regal R&O 68	Cetus HiPerSyn 68 Cetus PAO 68	Regal R&O 150	Cetus HiPerSyn 150 Cetus PAO 150
ExxonMobil	DTE Oil Light Teresstic 32	SHC 624	DTE Oil Heavy Medium Teresstic 68	SHC 626	DTE Oil Extra Heavy Teresstic 150	SHC 629
Conoco Phillips 66	Multipurpose R&O 32	Syncon R&O 32	Multipurpose R&O 68	Syncon R&O 68	Multipurpose R&O 150	Syncon R&O 150
Shell Oil Co.	Turbo T 32 Tellus S2 MX 32	Tellus S4 ME 32	Turbo T 68 Tellus S2 MX 68 Morlina S2B 68	Tellus S4 ME 68	Morlina S2B 150	X

Table 5 Recommended Food Grade Oils (NSF HI)

Company	ISO VG32	ISOVG46	ISOVG68	ISOVG100	ISO VG150
	130-165 SSU @ 100F	190-235 SSU @ 100F	284-347 SSU @ 100F	415-510 SSU @ 100F	620-765 SSU @ 100F
Exxon Mobil	Mobil SHC Cibus 32	Mobil SHC Cibus 46	Mobil SHC Cibus 68	None listed	Mobil SHC Cibus 150
Petro Canada	Purity AW32	Purity AW46	Purity AW68	Purity AW100	None listed
Shell	Cassida Fluid HF 32	Cassida Fluid HF 46	Cassida Fluid HF 68	Cassida Fluid HF 100	None listed
Chevron	Lubricating Oil FM 32	Lubricating Oil FM 46	Lubricating Oil FM 68	Lubricating Oil FM 100	None listed
Ultrachem Inc. • Omnilube	FGH 2032 Synthetic	FGH 2046 Synthetic	FGH 2068 Synthetic	FGH 2100 Synthetic	FGH 2150 Synthetic

Table 6 Recommended Food Grade Greases (NSF HI)

Company	Grease
Exxon Mobil	Mobilgrease EAL 102
Keystone	Nevastane HT/AW2
Shell	Cassida Grease EPS 2
Petro-Canada	Purity FG 2

Table 7 Approximate Oil Sump Capacities

Frame Size	Motor Type Designation (See Motor Nameplate)	Oil Capacity (Quarts)	
		Upper Bearing	Lower Bearing
180 - 280	AU, AV-4	Grease	
180 - 280	AV		
320 - 440	RV		
320 - 360	RV-4, RU	3	
400	RV-4, RU	5	
440	RV-4 (2 pole)	17	
	RV-4, RU (4 pole & slower)	6	
180 - 440	TV-9, TV, LV-9, LV	Grease	
180 - 360	TV-4, TU, LV-4, LU		
400	TV-4, TU, LV-4, LU	6	Grease
440	TV-4, TU, LV-4, LU	5	
449	JU, JV-4	22	Grease
	HU, HV-4	12	
	RU, RV4	24	
	JV-3, JV, HV		
5000	HV, EV, JV, RV	30	
	RU, RV-4		
	HU, HV-4 (4 pole & slower)	12	
	HV-4 (2 pole only)	20	
5808-5810	EU, JU, EV-4, JV-4	22	5
5808-5810	HU, HV-4	24	3
5807-5811	EU, JU, EV-4, JV-4	37	4
5812	JU, JV4	41	4
5813	RU, RV-4	48	4
6808-6810	HU, HV-4	70	3
6808-6810	HV (Bow Thruster)	Grease	Grease
6808-6810	HV (Other Than Bow Thruster)	70	3
6812	JU, JV4	48	7
6813	RU, RV4	48	7
8000	RU, RV-4	70	6
	RV	Grease	Grease
9600	RU, RV-4	95	13
	RV	Grease	Grease