

To optimize an LM system's functionality, it is necessary to provide lubrication according to the usage conditions. Use without lubrication may increase wear on the rolling elements and shorten the service life.

Lubrication has the following effects:

- (1) Minimizes friction between moving elements to prevent seizure and reduce wear
- (2) Forms an oil film on the raceway to decrease stress acting on the surface and extend rolling fatigue life
- (3) Covers metal surfaces with an oil film to prevent the formation of rust

Even when the LM system has seals, the internal lubricant gradually seeps out during operation. Therefore, the system needs to be lubricated at an appropriate interval according to the usage conditions.

Types of Lubricants

LM systems mainly use grease or sliding surface oil for their lubricants.

The requirements that lubricants need to satisfy generally consist of the following:

- (1) Extreme pressure resistance
- (2) Reduce friction
- (3) High wear resistance
- (4) High thermal stability
- (5) Excellent rust-proofing performance
- (6) Excellent fluidity
- (7) Consistency of grease must not vary significantly even with repeated stirring

Grease Lubrication

Greasing intervals vary depending on the usage environment and conditions. For normal use, we recommend greasing the system approximately every 100 km of travel distance (3 to 6 months). When replenishing grease through the LM system's grease nipple and lubrication hole, use grease of the same type. Mixing different types of grease may hinder the system's performance.

Lubricant	Type	Brand name
Grease	Lithium-based grease Urea-based grease Calcium-based grease	AFA Grease see A24-7 AFB-LF Grease see A24-9 AFC Grease see A24-11 AFE-CA Grease see A24-13 AFF Grease see A24-15 AFG Grease see A24-18 AFJ Grease see A24-21 L100 Grease see A24-25 L500 Grease see A24-27 L700 Grease see A24-29 Shell Alvania Grease S (Showa Shell Sekiyu) Daphne Eponex Grease MP (Idemitsu) Equivalent product

*The recommended grease will vary according to the usage conditions and environment.

Oil Lubrication

Lubricant	Type	Brand name
Oil	Sliding surface oil or turbine oil ISOVG32 to 68	Daphne Super Multi Oil (Idemitsu) Mobil Vactra Oil Numbered Series (Exxon Mobil) Mobil Vactra Oil No. 2 SLC (Exxon Mobil) Mobil DTE Oil Series (Exxon Mobil) Shell Tonna S3 M (Showa Shell Sekiyu) Equivalent product

- The amount of oil to be supplied varies with stroke length. For a long stroke, increase the lubrication frequency or the amount of oil applied so that an oil film is able to form along the raceway to the end of the stroke.
- In environments where liquid coolant may spatter, the lubricant may become mixed with the coolant. This could result in the lubricant being emulsified or washed away, causing significantly decreased lubrication performance. In such settings, apply a lubricant with high viscosity (kinematic viscosity: approx. 68 mm²/s) and high emulsification resistance, and adjust the lubrication frequency or the amount of feed lubricant.
For machine tools and similar devices that are subject to heavy loads, require high rigidity, and operate at high speed, oil lubrication is recommended.
- Use only after making sure that the lubrication oil discharges normally from the ends of the lubrication piping, i.e., the oiling ports that connect to your LM system.