

■ LUBRICATION AND MAINTENANCE

The clutch should receive proper care and lubrication to ensure maximum long-life performance.

See the maintenance instructions below.

Recommended Oil

| Oil Company | Overrunning or Backstop Applications | | Indexing Applications | For MUC and MIC Series |
|-------------|---|---|-----------------------|------------------------|
| | In low speed applications (below 1/3 of max. overrun speed) or ambient temperature - 10°C to 30°C | In high-speed applications (about max. overrun speed) or ambient temperature 30°C to 50°C | | |
| Shell Oil | Dexron II Rimulla CT Oil 10W Shell Clavus Oil 17 Rotella S Oil 10W | Rimulla CT Oil 20W/20, 30 Rotella S Oil 20W/20, 30 | Shell Clavus Oil 15 | Shell Dexron |
| Mobil Oil | ATF 220 Delvac 1310 DTE Oil Light | Delvac 1330 | Gargoyle Arctic Light | ATF 220 |
| Nihon Oil | Pan Torque Dexron FBK Turbine Oil 32 | Hispart SS-20, 30 | — | — |
| BP | BP Energol THB32 | — | — | — |
| ESSO | Telesso 32 Essolub D-3 10W ATF Dexron | Essolub D-3 30 | — | ATF Dexron |
| Gulf | Harmony 32 Veritas SD10 | Veritas SD30 | — | — |

Note: Do not use oil that contains EP additives.

Recommended Grease

| | 200 MZ BB PB LD SR PG Series | BS Series | MUC MIC |
|-------------|--|--|------------|
| Oil Company | Multi purpose including Li (Consistency: NLGI No.2) | Multi purpose including Li (Consistency: NLGI No.1) | — |
| Shell Oil | Alvania Grease No.2 | Alvania Grease No.1 | — |
| Mobil Oil | Mobilux Grease No.2 | Mobilux Grease No.1 | — |
| Nihon Oil | Multinoc Grease No.2 | — | — |
| Kyodo Yushi | — | Unilight SL No.1 | — |
| Gulf | — | Crown Grease No.1 | — |
| ESSO | Beacon 2 | — | Beacon 325 |

Note: Do not use grease that contains EP additives.

Maintenance Instructions

| Series | Lubricant | Maintenance |
|---------------------------|--|--|
| MZ PG BB LD | Pre-lubricated with grease | No lubrication maintenance required |
| 200 PB | Grease lubrication | Change the grease and clean the inside of the Cam Clutch every six months. |
| MG MI-S MI PO MR PS | Oil lubrication | Add oil every 100 hours. Change the oil and clean the inside of the Cam Clutch every three months. |
| MX | Oil lubrication | Change the oil and clean the inside of the Cam Clutch every 300 hours. |
| MG-R | Oil lubrication | Add oil every 300 hours. Change the oil and clean the inside of the Cam Clutch every 3 months. |
| BS | 30 - 135 | Pre-lubricated with grease |
| | 160 - 350 | Grease lubrication |
| | 425 - 450 | Oil lubrication |
| BS-R | 65R - 450R | Oil lubrication |
| Box | Oil bath system or self-lubrication system | Lubrication maintenance is necessary only once a year for normal use. |
| MUC MIC | Grease lubrication | Add grease every 200 hours. |
| | Oil lubrication | Add oil every 200 hours. |

■ LUBRICATION FOR THE BR SERIES

BR Series Cam Clutches need periodic maintenance and lubrication to provide maximum performance throughout their service life. Lack of the prescribed maintenance and lubrication will shorten the Cam Clutch's service life and may result in unnecessary mechanical damage. The Cam clutches in the BR series can be lubricated with oil or grease depending on the type of application.

1. Recommended Oils

| Manufacturer | Type |
|--------------|---------------------------------------|
| Nihon Sekiyu | FBK Turbine 32, Pantorque Dexron |
| Shell Oil | Rotera 10W, Rimura 10W, Turbo Oil T32 |
| Mobil | DTE Oil Light, ATF 220 |
| Esso | Teresso 32, Dexron II |

2. Recommended Greases

| Manufacturer | Type |
|--------------|----------------------|
| Nihon Sekiyu | Multi-Knock Grease 1 |
| Shell Oil | Albania Grease 1 |
| Mobil | Mobil Grease 77 |
| Esso | Listan 1 |

1. Do not use any EP additives in the oil or grease as they will shorten the Cam Clutch's service life.
2. The above oils and greases are recommended for operating environments ranging from -5°C to +40°C. Contact TSUBAKI for operating temperatures outside of this range.
3. Package type Cam Clutches are shipped pre-packed with grease.
4. Special Cam Clutch oil (1 liter can) and grease (500g can) are available from TSUBAKI.

■ MAINTENANCE FOR THE BR SERIES

Open Type Cam Clutch

1. Follow the guidelines listed below for oil lubrication.
 - 1) Make sure there are no oil leaks at installation surfaces.
 - 2) Use the correct amount of oil, and when needed, replenish oil to the specified level only. Avoid over lubrication as it will cause the Cam Clutch to run hot.
 - 3) Change oil at least once every six months according to the following procedure:
 - (1) Dispose of old oil.
 - (2) Spin the Cam Clutch for 10 minutes in detergent oil in a free running condition (no clutch engagement).
 - (3) Remove the detergent oil, and fill with new oil to the specified level.
2. Follow the guidelines below for grease lubrication.
 - 1) Before running the Cam Clutch, remove the grease port plug and inject grease into the cam cage. Inject the amount shown in the Grease Volume Table on the right.
 - 2) Run the Cam Clutch disengaged for 30 minutes with the grease port open. Excess grease around the clutches will flow out of the tapped holes.
 - 3) Wipe off the excess grease, and re-install the grease port plug.
 - 4) The Cam Clutch should be re-greased every three months according to the procedure outlined in steps 1 through 3 above.

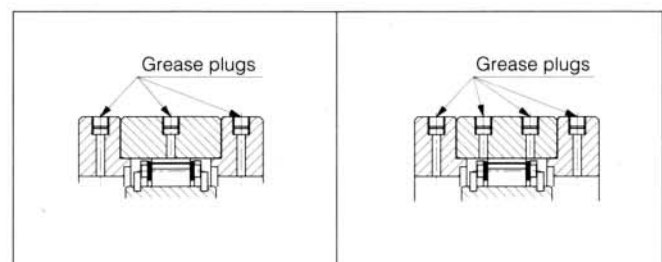
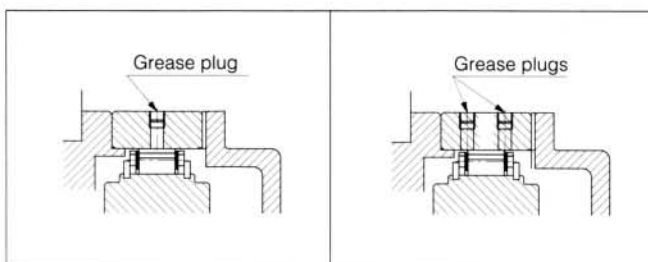
Package Type Cam Clutch

Package type Cam Clutches are shipped pre-greased at the factory and should be re-greased every three months after installation. Follow the procedure below.

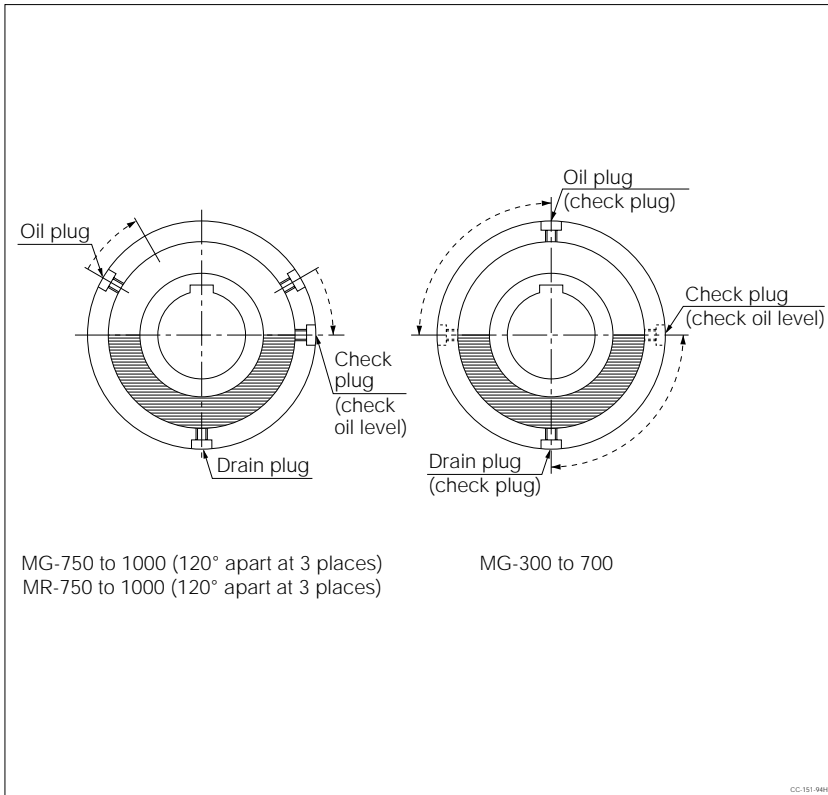
1. Remove the grease port plugs at the bearing and cam cage.
2. Inject equal amounts of grease into the cam cage and bearing. Refer to the Grease Volume Table for the correct amount.
3. Run the Cam Clutch disengaged for 30 minutes with the grease port plugs removed. Excess grease in the clutch area will flow out of the tapped holes. Be careful to avoid over greasing. Too much grease in the Cam Clutch will cause it to run hot, interfere with the clutch action, and may lead to mechanical damage.
4. Wipe off excess grease and re-install the grease port plugs.

Grease Volume Table (g)

| Model | Bearing | Cam Clutch | Model | Bearing | Cam Clutch |
|--------|---------|------------|--------|---------|------------|
| BR 20P | 5 | 5 | BR 80P | 80 | 20 |
| BR 25P | 5 | 5 | BR 90P | 90 | 20 |
| BR 30P | 10 | 5 | BR100P | 160 | 35 |
| BR 35P | 10 | 5 | BR130P | 280 | 45 |
| BR 40P | 15 | 5 | BR150P | 460 | 70 |
| BR 45P | 20 | 8 | BR180P | 380 | 70 |
| BR 50P | 30 | 8 | BR190P | 500 | 110 |
| BR 60P | 40 | 15 | BR220P | 540 | 120 |
| BR 70P | 50 | 15 | BR240P | 750 | 130 |

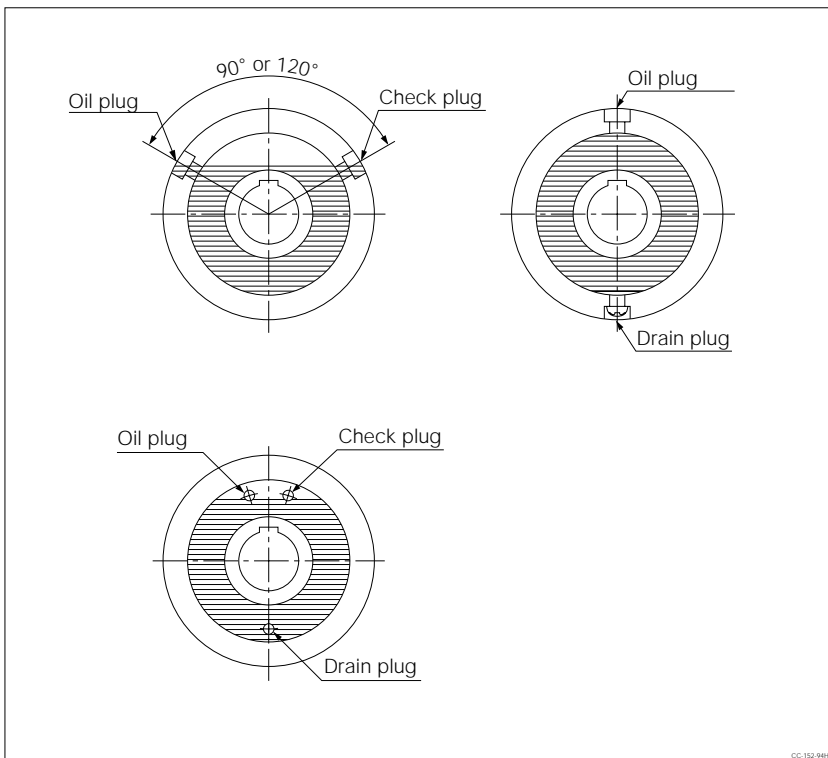


■ LUBRICANT REPLENISHING METHOD FOR THE MG AND MR SERIES



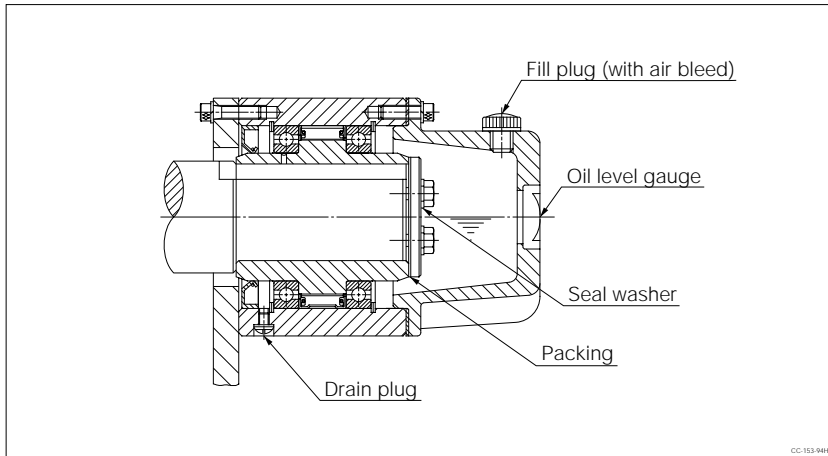
1. As a general rule, the level of the lubricant should be equal to the height of the center of the shaft for overrunning or back-stopping applications.
2. On every series, on the outer race, there are two to four plugs.
3. On models that have four plugs, place them so that one is at the top, one is at each side, and one is at the bottom. Then remove the plugs from the top and the sides and insert oil into the top hole until it begins to spill out from the side holes.
4. On models that have three plugs, place one plug at the bottom and have the other two near the top. Remove the two upper plugs and insert oil into either side. Check the level by slowly turning the clutch until one of the upper plugs reaches the height of the center of the shaft.
5. On models that have only two plugs, place one plug at the top position, remove its plug, and then insert oil. Then rotate the clutch 90° to check that the oil is filled up to the level of the center of the shaft.

■ LUBRICANT REPLENISHING METHOD FOR THE MI, MI-S, PO, PS, AND MX SERIES



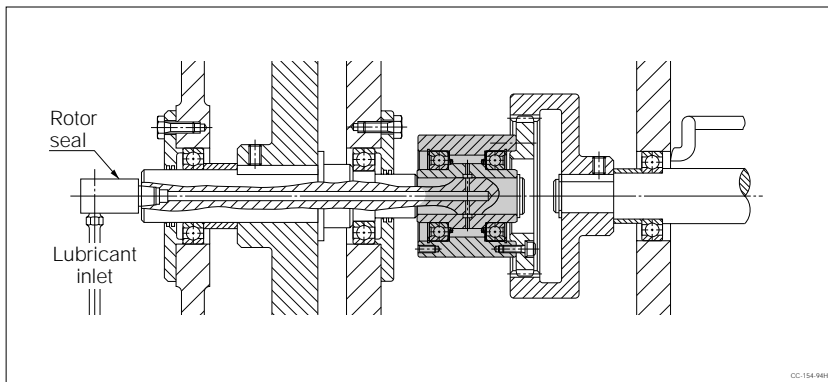
1. The level of the lubricant should be near the top of the inside of the cam clutch.
2. On the outside surface or on the side surface, there are oil plugs for oil filling and draining.
3. On models with three or four plugs on the outside surface, slightly turn the clutch and insert oil into one hole until oil begins to overflow out from one of its neighboring holes.
4. On models with two plugs, insert the tip of the oil feeder into the plug and fill completely with oil until it overflows.
5. On models with plugs on the side surface, place the two plugs lined up next to each other at the top, remove their plugs, and insert oil into one of them until oil begins to spill out from the other one.

■ LUBRICANT REPLENISHING METHOD FOR THE MG-R SERIES



1. As a general rule, the level of the lubricant should be equal to the center of the shaft. Verify the level of the oil by the window-type oil level gauge built into the oil reserve tank.
2. On the outer race there are three or four oil plugs. Make one of these plugs the drain plug by installing the clutch so that the plug is at the very bottom. Since you insert oil through the oil plug on the oil reserve tank, install the oil reserve tank so that the oil plug is at the very top.

■ SPECIAL LUBRICATION METHODS



In some situations the Cam Clutch might be installed deep within your equipment making routine maintenance very difficult, or even impossible. The diagram on the left shows one such example.

In this example, a through hole is prepared through the shaft, and the oil is forced into the clutch through a rotor seal.

■ LUBRICANT REPLENISHING METHOD FOR THE MUC AND MIC SERIES