

Cam Clutch Installation and Maintenance Instruction

200 Series

B203, B204, B205, B206, B207, B208, B209, B210, B211, B212, B213, B214

Thank you for buying Cam Clutch products.
 Before installing or working on the product, check label for correct size and make sure you have the complete set of parts. If any part is missing, contact your distributor immediately.
 This instruction should be considered an essential part of the unit and remain with the unit when redistributed.

SAFETY

- Your Cam Clutch is a high quality, sophisticated unit which should be handled by experienced engineers only.
- For safety purposes, make sure this manual is easily accessible by the user at all times.

Safety precautions in this Instruction are classified into two categories: "WARNING" and "CAUTION". These are defined as follows:

| | |
|--|---|
|  WARNING | Death or serious injury may result from misusing the product without following the instructions. |
|  CAUTION | Minor or moderate injury, as well as damage to the product may result from misusing the product without following the instructions. |

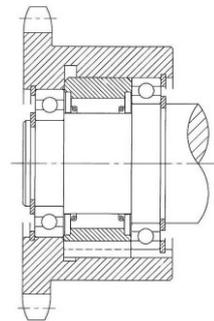
Notice that although categorized under "CAUTION", subjects discussed may lead to serious results depending on the situation.

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|---|
|  WARNING |
| <ul style="list-style-type: none"> ● Make sure turning forces are not applied to Cam Clutch or turning shaft of the equipment when conducting inspection or maintenance. Pay special attention to the back stopping application to prevent accidents. ● Frequent starting and stopping will apply excessive force on the mounting. Verify mounting strength. ● Inaccurate installation and mounting, various load conditions, wear and tear of parts, and life expectancy can all affect the performance of a Cam Clutch. Inspect and maintain periodically and install a safety devise on your equipment. ● Comply with Ordinance on Labor Safety and Hygiene 2-1-1 general standards. |
|  CAUTION |
| <ul style="list-style-type: none"> ● To ensure safety and optimal performance, carefully read this instruction manual in its entirety. ● Confirm rotational direction prior to installing. |

Installation

1. 200 series Cam clutch is shaft mounted, so the shaft on which the clutch is mounted must be hardened to Rc56-60 and 1.5 mm case depth after grinding. Grind to 1.5S finish. The taper of this shaft should not exceed 0.01 mm per 50mm.
2. For installation of the clutch, mount the clutch with bearings at both sides or on one side in order to obtain concentricity between the shaft and the clutch outer race and to take up radial or thrust loads which may work on the outer race or the shaft. See the installation example.
3. The clutch should be mounted on the shaft by rotating it in the direction marked by the arrow shown on the clutch plate. Do not apply shock to the clutch by hammering.
4. The clutches have the same outside diameters as the 6200 type bearings (B205 = 6205, B208 = 6208). Bore tolerance of the housing in which the clutch is assembled should be within the table below.
5. For indexing, oil lubrication is recommended.
6. Concentricity of the housing bore and shaft should be within 0.05mm TIR.
7. Key profile should be in accordance with JIS B1301-1959. Align the key to slide through the keyway smoothly before installation.

Installation example



| Model No. | Recommended shaft dia. (mm) | Recommended housing bore dia. (mm) |
|-----------|---------------------------------------|------------------------------------|
| B203 | 16.510 ⁰ _{-0.025} | 40 ^{+0.025} ₀ |
| B204 | 18.796 ⁰ _{-0.025} | 47 ^{+0.025} ₀ |
| B205 | 23.622 ⁰ _{-0.025} | 52 ^{+0.030} ₀ |
| B206 | 32.766 ⁰ _{-0.025} | 62 ^{+0.030} ₀ |
| B207 | 42.088 ⁰ _{-0.025} | 72 ^{+0.030} ₀ |
| B208 | 46.761 ⁰ _{-0.025} | 80 ^{+0.030} ₀ |

| Model No. | Recommended shaft dia. (mm) | Recommended housing bore dia. (mm) |
|-----------|---------------------------------------|------------------------------------|
| B209 | 46.761 ⁰ _{-0.025} | 85 ^{+0.035} ₀ |
| B210 | 56.109 ⁰ _{-0.025} | 90 ^{+0.035} ₀ |
| B211 | 56.109 ⁰ _{-0.025} | 100 ^{+0.035} ₀ |
| B212 | 70.029 ⁰ _{-0.025} | 110 ^{+0.035} ₀ |
| B213 | 70.029 ⁰ _{-0.025} | 120 ^{+0.035} ₀ |
| B214 | 79.356 ⁰ _{-0.025} | 125 ^{+0.040} ₀ |

■ Lubrication

1. The 200 series Cam Clutch is pre-lubricated with grease. And change the grease and clean the inside of the Cam Clutch every six months. Recommended lubricants are the table below.
2. Do not use the grease or oil that contains EP additives.

Recommended Grease

| Brand | -5 °C to 40 °C (23 F to 104 F) | -40 °C to +40 °C (-40 F to 104 F) |
|----------------------|--|-----------------------------------|
| Shell | Alvania Grease S2, Sunlight Grease No.2, Aeroshell No.7, Aeroshell No.22 | Alvania Grease RA |
| Fiske Bros. | Lubriplate Low-Temp, Aero Lubriplate | ----- |
| Kyodo Yushi | Multemp PS No.1, Unilube No.2 | Multemp PS No.1 |
| Petro-Canada | PRECISION Synthetic | ----- |
| Exxon Mobil | ----- | Beacon 325 |
| JX Nippon Oil&Energy | Multinoc Grease No.2 | ----- |
| Idemitsu Kosan | Daphne Eponex No.2 | ----- |
| Cosmo Oil | Dynamax Super No.2 | ----- |

Recommended Oil for Overrunning and Backstopping

| Ambient temperature in Overrunning and Backstopping Applications | |
|---|---|
| -10 °C to +30 °C (+14 F to +86 F) | +30 °C to +50 °C (+86 F to +122 F) |
| Any Automatic Transmission Fluid (ATF) Shell Turbo Oil T32, Turbo Oil 68, Rimulla D Oil 10W, New Super ATF, Gelco ATF Exxon Mobil DTE Oil Light, Multipurpose ATF, Delvac Hydraulic 10W, ATF220 Teresso 32, Teresstic Oil 68, DTE Heavy Medium Texaco Regal Oil R&O 68, Chevron GST Oil 68 BP Rnergol THB32, Gulf Harmony 32 JX Nippon Oil& Energy FBK Turbine 32, FBK Oil RO32, Pan Automatic D2, Diamond ATF II, Diamond Turbine Oil 32, ATF II (N) Idemitsu Kosan Daphne Turbine Oil 32, Apolloile ATF-DX Cosmo Oil Cosmo Turbine Super 32, Cosmo ATF II, Cosmo Turbine 32 | Exxon Mobil Delvac 1330, Essolube XT1 10W-30 Shell Rimulla D Oil 20W/20, Rimura D Oil 30 White Parrot Super S-3-20W/20, 30 JX Nippon Oil&Energy Appoloile Dieselmotive S-320, S-330, FBK Oil RO68 Cosmo Oil Cosmo Diesel CD20W |

Recommended Oil for Indexing

| Ambient temperature in Indexing Application | |
|--|--|
| -7 °C to +30 °C (+20 F to +86 F) | -23 °C to -7 °C (-10 F to +20 F) |
| At 150strokes per minutes or less | At 150strokes per minutes or less |
| Any Automatic Transmission Fluid (ATF) Shell Turbo Oil 32 Exxon Mobil DTE Oil Light, Teresstic Oil 32 Texco Regal Oil R&O 32 Idemitsu Daphne Oil CR10 Sanwa Kasei Kogyo Samic Arctic Oil Light | Any Automatic Transmission Fluid (ATF) Shell Clavus oil 15 Exxon Mobil Zerice 46 |

Note : Maximum ambient temperature +122 F(+50 °C) is depending on the operational condition.
Contact TSUBAKI for operating temperatures outside of this range.

■ Warranty

Tsubakimoto Chain Co.: hereinafter referred to as "Seller"
 Customer: hereinafter referred to as "Buyer"
 Goods sold or supplied by Seller to Buyer: hereinafter referred to as "Goods"

1. Warranty period without charge
18 months effective the date of shipment or 12 months effective the first use of Goods, including installation of Goods to Buyer's equipment or machines - whichever comes first.
2. Warranty coverage
Should any damage or problem with the Goods arise within the warranty period, given that the Goods were operated and maintained under instructions provided in the manual, Seller would repair and replace at no charge once the Goods are returned to Seller. The following are excluded from the warranty.
 - 1) Any costs related to removing Goods from the Buyer's equipment or machines to repair or replace parts.
 - 2) Costs to transport Buyer's equipment or machines to the Buyer's repair shop.
 - 3) Costs to reimburse any profit loss due to any repair or damage and consequential losses caused by the Buyer.
3. Warranty with charge
Seller will charge any investigation and repair of Goods caused by:
 - 1) Improper installation by failing to follow the instruction manual.
 - 2) Insufficient maintenance or improper operation by the Buyer.
 - 3) Incorrect installation of Goods to other equipment or machines.

- 4) Any modifications or alterations of Goods by the Buyer.
 - 5) Any repair by engineers other than the Seller or those designated by the Seller.
 - 6) Operation in an inappropriate environment not specified in the manual.
 - 7) Force Majeure or forces beyond the Seller's control such as natural disasters and injustice done by a third party.
 - 8) Secondary damage or problem incurred by the Buyer's equipment or machines.
 - 9) Defected parts supplied, or specified by the Buyer.
 - 10) Incorrect wiring or parameter setting by the Buyer.
 - 11) The end of life cycle of the Goods under normal usage.
 - 12) Loss or damage not liable to the Seller.
4. Dispatch Service
Service to dispatch a Seller's engineer to investigate, adjust or trial test Seller's Goods is at the Buyer's expense.
 5. Disclaimer
 - 1) In our constant efforts to improve, Tsubakimoto Chain Co. may change the contents of this document without notice.
 - 2) Considerable effort has been made to ensure that the contents of this document are free from errors. However, Tsubakimoto Chain Co. makes no warranties with respect to the accuracy of information described herein. In the mean time, we would appreciate comments or reports on any inaccuracies or omissions found in this document to help us make timely amendments as necessary. Your cooperation is greatly appreciated.



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