

BS-F Series Cam Clutch

Installation and Maintenance Manual

**BS85F, BS95F, BS115F, BS140F, BS165F, BS200F, BS225F, BS250F
BS270F, BS300F, BS360F, BS425F, BS465F**

Thank you for choosing Tsubaki 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 parts are missing, contact your distributor immediately.

This Installation and Maintenance Manual (IMM) should be considered an essential part of the unit and remain with the unit when redistributed.

SAFETY

- Your Cam Clutch is a high quality, well-engineered product which should be handled by experienced personnel only.
- For safety purposes, make sure this manual is easily accessible by the user at all times.
- To ensure safety and optimal performance, carefully read this instruction manual in its entirety.



WARNING

Death or serious injury may result from misuse, improper installation and/or improper maintenance of this product. Please refer to the detailed instructions provided in this manual for installation and maintenance specifications.



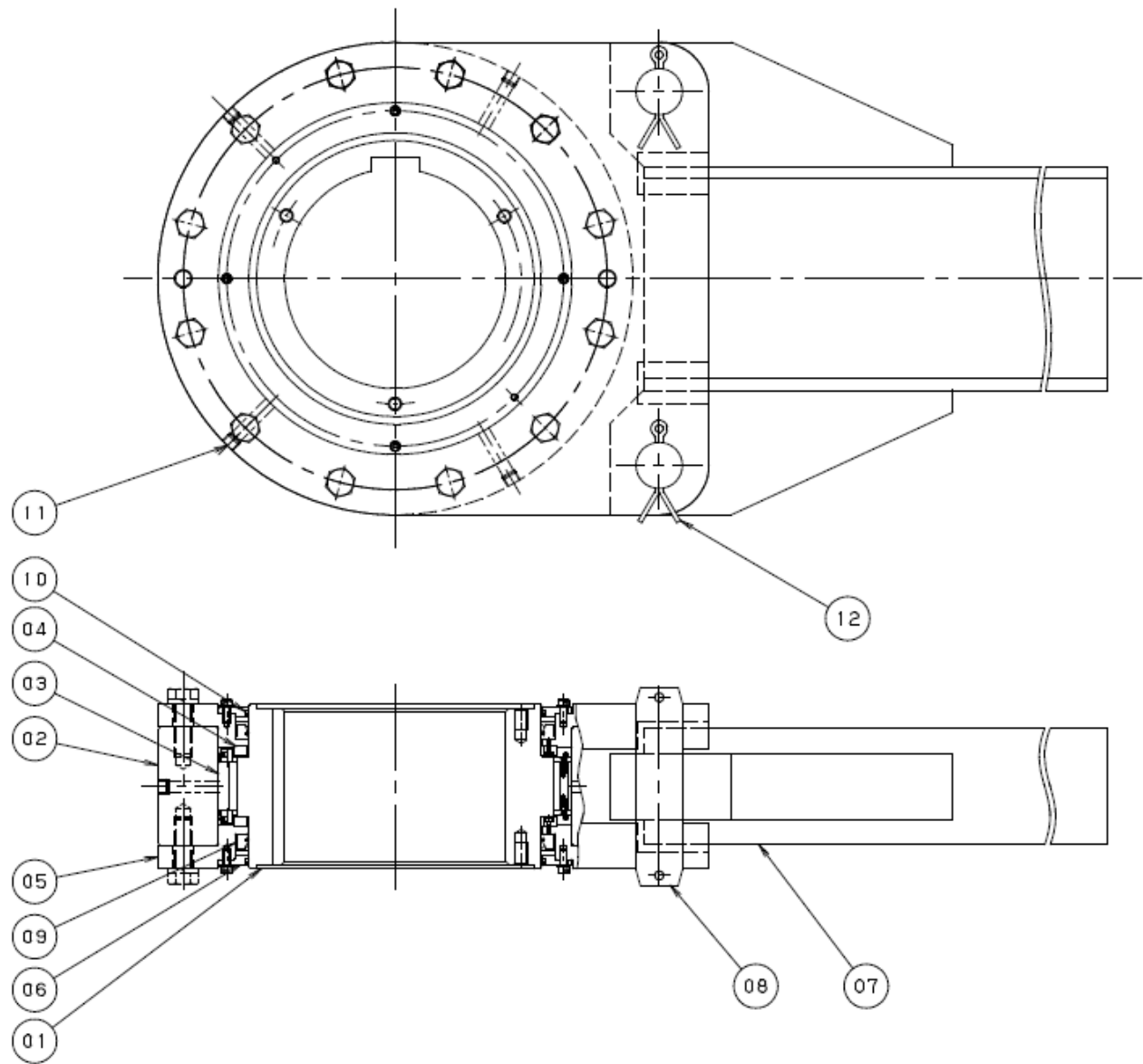
WARNING

USE CARE TO PREVENT INJURY COMPLY WITH THE FOLLOWING TO AVOID SERIOUS PERSONAL INJURY:

1. Guards must be provided on all chain and sprocket installations in accordance with provisions of ANSI B11.19 - 2010 "Safety Standards for Mechanical Power Transmission Apparatus," and ASME B20.1 - 2015 "Safety Standards for Conveyors and Related Equipment," or other applicable safety standards. When revisions of these standards are published, the updated edition shall apply.
2. Always lock out the power switch before installing, removing, lubricating or servicing a system which uses PTUC product.
3. When connecting or disconnecting PTUC products, eye protection is required. Wear safety glasses, protective clothing, gloves and safety shoes.
4. Improper installation or mounting, as well as operating conditions and maintenance, can affect the performance of a cam clutch. The cam clutch should be inspected regularly.

PTUC is used by Tsubaki to designate Power Transmission Unit Components. PTUC products include Cam Clutch, DISCO, POWER-LOCK®, Shock Relay, Gearmotor, HF Drive, Shock Damper, Power Cylinder™, Couplings, SCR variable speed motor and other like products manufactured by/for Tsubaki.

Construction



- | | | | |
|--------------|-------------------|--------------|------------------|
| ① Inner race | ④ Thrust bearing | ⑦ Torque arm | ⑩ Labyrinth ring |
| ② Outer race | ⑤ Side plate | ⑧ Pin | ⑪ Socket plug |
| ③ Cam cage | ⑥ Labyrinth plate | ⑨ Oil seal | ⑫ Cotter pin |

Installation and Usage

1. Recommended shaft tolerance is shown below. Interference fit and shrink fit are prohibited for clutch fixing.

Clutch Bore	Shaft Fit Guide
1.20 to 2.00 inches dia. 30mm to 50mm dia.	Line fit to .0010 inches loose (0.025mm)
2.00 to 3.15 inches dia. 50mm to 80mm dia.	Line fit to .0012 inches loose (0.030mm)
3.15 to 4.70 inches dia. 80mm to 120mm dia.	Line fit to .0014 inches loose (0.036mm)
4.70 to 7.10 inches dia. 120mm to 180mm dia.	Line fit to .0016 inches loose (0.041mm)
7.10 to 9.85 inches dia. 180mm to 250mm dia.	Line fit to .0018 inches loose (0.046mm)
9.85 to 12.40 inches dia. 250mm to 315mm dia.	Line fit to .0020 inches loose (0.051mm)
12.40 to 15.70 inches dia. 315mm to 400mm dia.	Line fit to .0023 inches loose (0.058mm)
15.70 to 17.72 inches dia. 400mm to 500mm dia.	Line fit to .0025 inches loose (0.064mm)

2. Before installation, verify that the rotation of inner race is in the same direction as the direction of the conveyor shaft.
3. Clean the shaft and remove burrs.
4. Only a parallel key is recommended for Backstop fixing. Do not use a tapered key. And there must be clearance between Backstop keyway and key top. The key should be in accordance with ANSI B17, 1-1967 (R 1998). See Fig 1 and 2.
5. Apply pressure only on the end face of inner race when installing the Backstop onto the shaft. Do not hit the side plate, labyrinth plate or bolts with a hammer. See Fig 1.
6. Lift torque arm and attach it to the Backstop with torque arm pins and cotter pins with Backstop. Coat pins with grease for easy mounting of the Backstop and preventing stuck pins.
7. The end of torque arm will move to some extent while the conveyor is operating. Support the torque arm end only in the direction of rotation, be sure to allow it a certain amount of free movement axially. See Fig 3. The Backstop sustains damage if the torque arm end tip is fixed securely.
8. In order to suppress the temperature rise of Backstop and to extend the lubricant life, installation of a protective cover against direct sunshine is recommended.

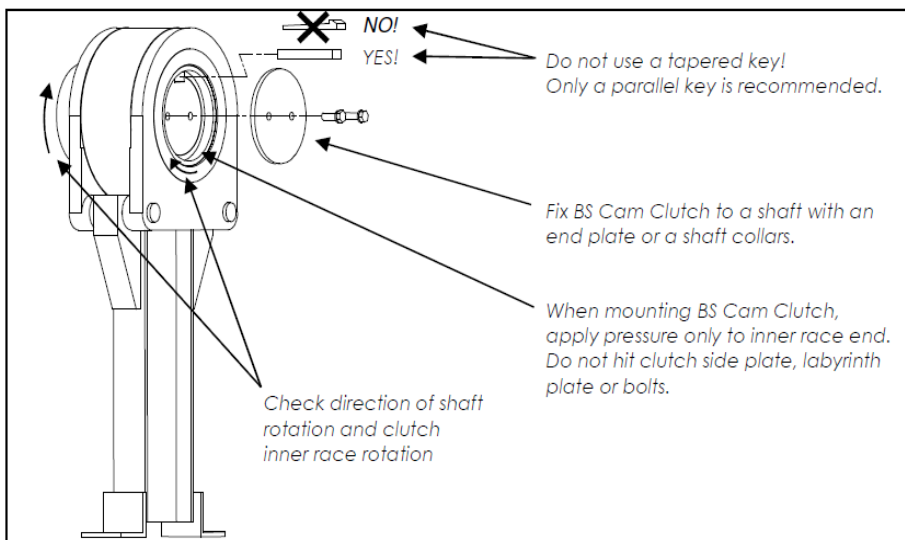


Fig 1

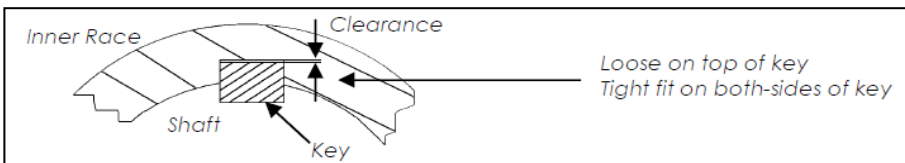


Fig 2

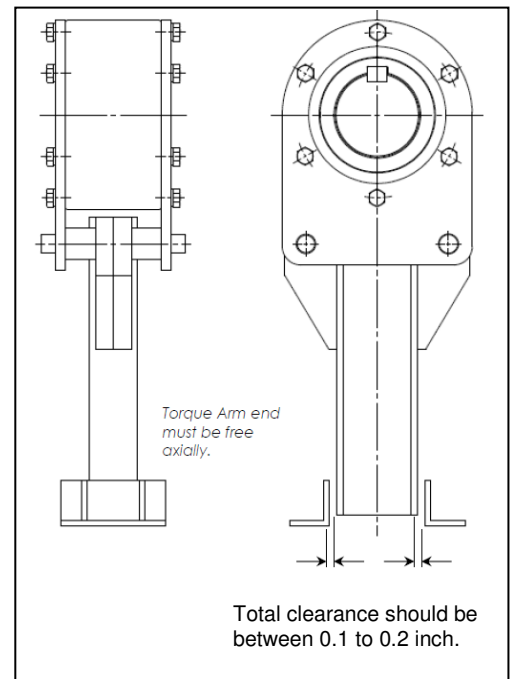


Fig 3

▪ **Air Breather Installation**

- For overrunning RPM greater than the following RPM, air breather is recommended.

Size	BS85F	BS95F	BS115F	BS140F	BS165F	BS200F	BS225F
Max. Inner race Overrunning RPM	100	100	100	100	100	100	80

Size	BS250F	BS270F	BS300F	BS360F	BS425F	BS465F
Max. Inner race Overrunning RPM	50	50	50	50	50	50

- 45 degree or less from 12:00 O'clock. See Fig 4.

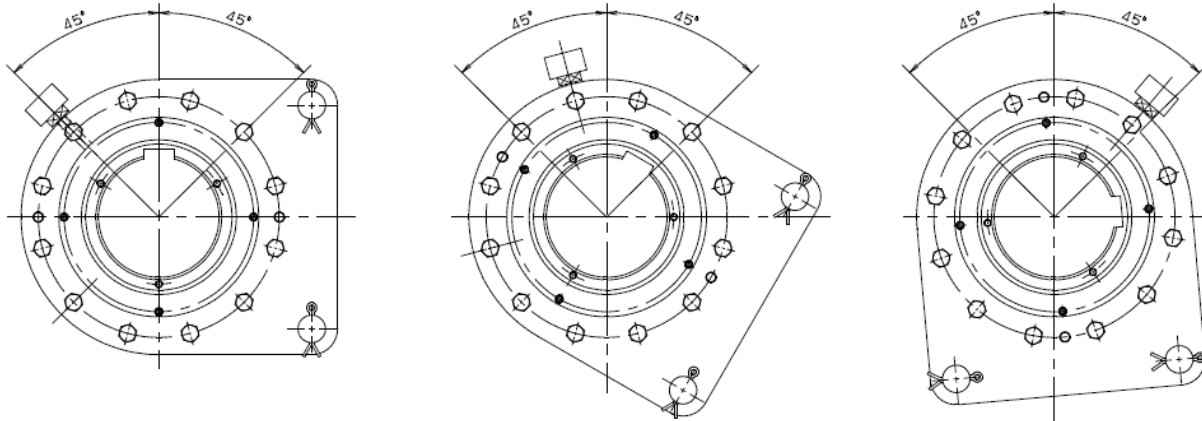


Fig 4

▪ **Check Items for Installation**

- Make sure Backstop is installed under an environment which the ambient temperature is within the range of -40° F to +149° F (-40° C to +65° C).
- Check if Backstop is lubricated properly and/ or installed correctly by monitoring the Backstop running temperature, normally surface of Backstop temperature would not exceed 212° F (100° C).
Note: Backstop operating temperature may surge at maximum overrunning speed. An adequate cooling device is required if Backstop operating temperatures exceed 212° F (100° C) due to the heat emission of the driven equipment.

▪ **Noise Check**

During operation if noise is heard by a noise-accentuator stick as continuous rumbling sound, this is normal and of no concern. If an abnormal variation in sound is heard the following points could be causes:

- Installation problem with torque arm
- Extreme wear caused by poor lubrication
- Dust or metal pieces contaminating the grease
- Damage to inner race by extreme pressure at key fixing
- Interval dislodged by PRESSING AGAINST outer race

Lubrication and Maintenance

Grease is packed in Backstop before shipment but requires periodic maintenance as specified below.

Maintenance

- Periodic change of grease is necessary after 7,500 to 10,000 hours of operation. The actual operation time between changes should be decided after considering the operating conditions. Inject new grease after draining and cleaning inside of Backstop. The detailed procedure is described on the next page.
- Grease sampling should be taken at regular 12 month intervals depending on environmental and contamination conditions. Additional grease replacement might be needed during sampling if excessive liquid is removed, replace at least 50% more by volume than lost.

Recommended Grease

Brand	BS-F Series
Exxon Mobil	Beacon 325
Petro-Canada	PRECISION Synthetic

Notes: 1. Do not use grease that contains EP additives.

Cleaning

1. Wipe off the dust around the plug area on the outer race.
2. Remove two plugs one on the top, another on the side of the Backstop.
3. Rotate the shaft and pour the proper amount of cleaning oil (Kerosene) into Backstop. The quantity of cleaning oil for each model is shown in the table below.

Amount of cleaning oil

Size	BS85F	BS95F	BS115F	BS140F	BS165F	BS200F	BS225F
OZ (Liters)	33.3 (1.0)	33.3 (1.0)	33.3 (1.0)	33.3 (1.0)	33.3 (1.0)	33.3 (1.0)	33.3 (1.0)

Size	BS250F	BS270F	BS300F	BS360F	BS425F	BS465F
OZ (Liters)	100 (3.0)	100 (3.0)	100 (3.0)	100 (3.0)	200 (6.0)	200 (6.0)

4. Fix the upper plug and tighten the side plugs. Run the conveyor for two or three hours.

Re-clean

1. Remove the bottom plug, loosen the top plug and drain oil.
2. Pour the cleaning oil from upper hole. The quantity of cleaning oil for each model is shown in the table below

Amount of cleaning oil

Size	BS85F	BS95F	BS115F	BS140F	BS165F	BS200F
OZ (Liters)	3.33 (0.1)	3.33 (0.1)	6.66 (0.2)	9.99 (0.3)	9.99 (0.3)	13.32 (0.4)

Size	BS225F	BS250F	BS270F	BS300F	BS360F	BS425F	BS465F
OZ (Liters)	43.29 (1.3)	96.57 (2.9)	109.89 (3.3)	139.86 (4.2)	159.84 (4.8)	186.48 (5.6)	233.1 (7.0)

3. Cleaning process is complete when the drained oil is clear.

Re-charge the new grease

1. Remove two plugs one on the top, another on the bottom of the Backstop. Attach the grease nipple (Thread size PT1/4) on the top of Backstop.
2. Inject the new grease by a grease gun until the grease comes out from the bottom plug. Approximate amount of grease for each model is shown below. During this procedure the shaft shall be stationary, until recommended quantity is injected.
3. Remove the grease nipple and replace the original top and bottom plugs. Tighten all plugs of the Backstop.
4. After completion of grease injection, rotate the shaft for 2 hours for test run in order to get good lubricating condition. During this test run, do not apply hold back torque on the Backstop

Amount of grease

Size	BS85F	BS95F	BS115F	BS140F	BS165F	BS200F
Lbs (g)	0.14 (65)	0.17 (75)	0.23 (105)	0.33 (150)	0.35 (160)	0.42 (190)

Size	BS225F	BS250F	BS270F	BS300F	BS360F	BS425F	BS465F
Lbs (kg)	2.86 (1.3)	3.08 (1.4)	3.52 (1.6)	3.96 (1.8)	4.19 (1.9)	7.71 (3.5)	9.69 (4.4)

TSUBAKIMOTO CHAIN CO.

1-1, Kohtari-Kuresumi, Nagaokakyo Kyoto 617- 0833, Japan
Website: <http://tsubakimoto.com/tem/>

Technical Support and Customer Service:

U.S. Tsubaki Power Transmission, LLC

301 E. Marquardt Drive Wheeling, IL 60090
Tel : 800-323-7790
Fax: 847-459-9515
<http://www.ustsubaki.com/>

Tsubaki of Canada Limited

1630 Drew Road, Mississauga, ON L5S 1J6
Tel : 905-676-0400
Fax: 905-676-0904
<http://tsubaki.ca/>

Global Associated Partners:

Tsubakimoto Europe B.V.
<http://tsubaki.eu/>

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