



BACKSTOP CAM CLUTCH PRODUCTS



TSUBAKI

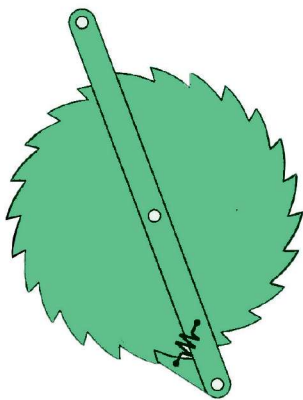
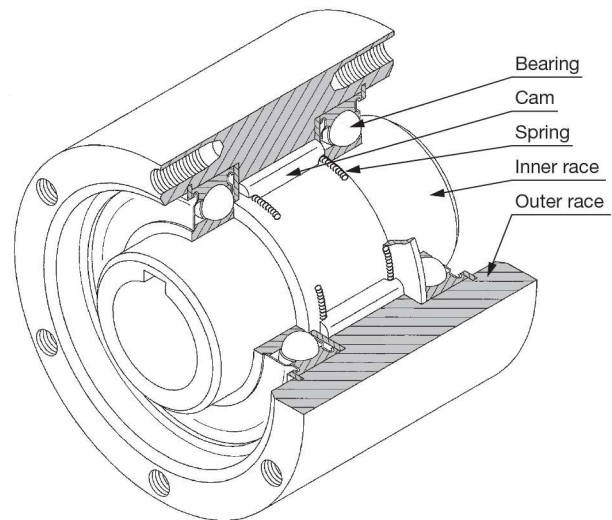
BACKSTOP CAM CLUTCH PRODUCTS

Product Catalog

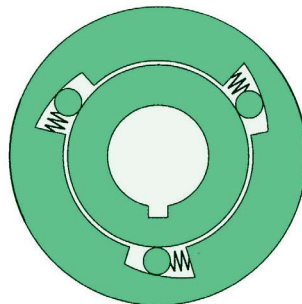
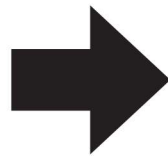
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Tsubaki Cam Clutch Solutions

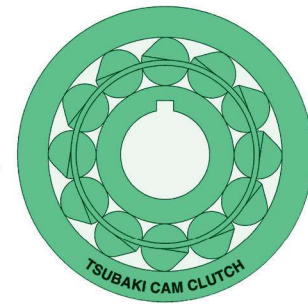
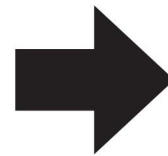
Over the last 50 years, Tsubaki engineers have spent thousands of man hours designing and improving uni-directional/mechanical clutches in an effort to improve reliability and performance. Evolution of the uni-directional clutch started with simple prop and ratchet type designs, and has progressed to the roller ramp and non-contact sensing cam type commonly used today. Innovative designs and features incorporated into our Cam Clutch products assure efficient and dependable operation in the harshest environments.



Ratchet Clutch



Roller Clutch



Tsubaki Cam Clutch

Typical Applications

Air Cleaning Plants
Agricultural Machines
Bucket Elevators
Compressors
Conveyors
Cranes and Hoists
Dry Cleaning Machinery
Duplicator Equipment

Heat-treatment Furnaces
Induced Draft Fans
Multi-state Conveyors
Packaging Machinery
Printing Machinery
Pumps
Punch Presses and Feeders
Power Plants

Refinery Equipment
Speed Reducers
Standby Power Units
Textile Looms
Two-speed Grinders
Fish Net Machines
Washing Machines
Wire Winding Machines

TABLE OF CONTENTS

Cam Clutch Basics	1
BR Non-contact Innovation	4
Backstop Clutch Selection Guide	5
BS-HS Series Cam Clutch	11
BS Series Cam Clutch	13
BS-R Series Cam Clutch	19
BS/BS-HS Series Safety Cover	23
BS-HS Series Torque Arm	25
BS Series Torque Arm	27
BSEU Series Cam Clutch	31
BR-HT Series Cam Clutch	33
Cam Clutch Calculated Wear Life	37
Shaft Tolerance Guide	41
Backstop Application Request Form	42

TSUBAKI BACKSTOP CAM CLUTCH PRODUCTS



BS/BS-HS

BS & BS-HS provide designs available for both low and high speed conveyor applications. Non-rollover design provides additional safety.

Bore Range:
0.750" to 17.717"
(20 to 450 mm)

Torque Range:
217 to 722,800 lb.ft.
(294 to 980,000 Nm)

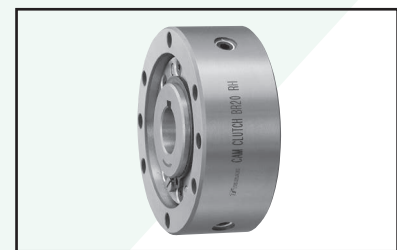


BSEU

BSEU Cam Clutches are a European variation popular on many bucket elevators in North and South America.

Bore Range:
0.787" to 3.543"
(20 to 90 mm)

Torque Range:
159 to 3,467 lb.ft.
(216 to 4,700 Nm)



BR-HT

BR-HT Series is designed for backstop applications where high-speed overrunning is required. Lift-off cam design assures minimal heat generation and longest life.

Bore Range:
0.787" to 5.118"
(20 to 320 mm)

Torque Range:
77 to 269,950 lb.ft.
(105 to 366,000 Nm)

CAM CLUTCH BASICS

All Tsubaki Cam Clutches use a cam type construction. This is also referred to as a “sprag” style clutch. An older style clutch which Tsubaki does not supply is called a “Ramp & Roller” or simply a “Roller” clutch. The following is an explanation of the features of each type. This discussion mentions Tsubaki BS Series backstop clutches but is relevant to other Tsubaki Cam Clutches.

Non-rollover Backstop Cam

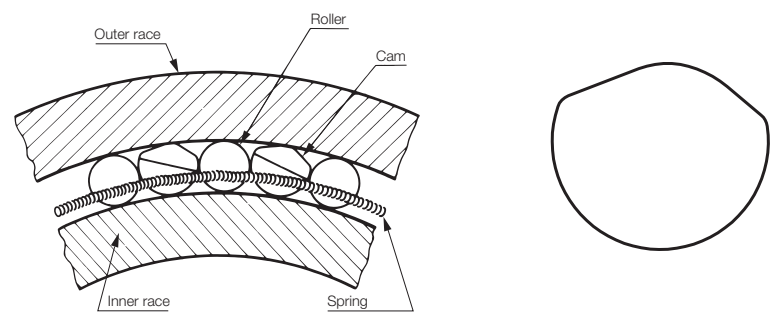


General Cam Construction

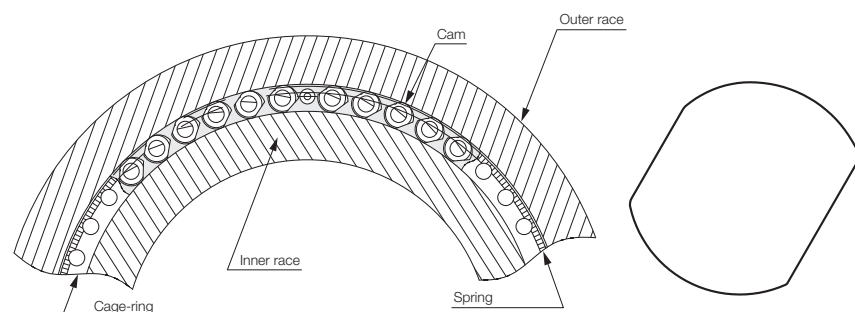


Cams and their constructions

The BS Series Cam Clutches use non-rollover cams which provide an additional level of safety. Even if a Cam Clutch has been selected appropriately for an application, unanticipated loads can occur. With a traditional cam profile, as used by some manufacturers, the unanticipated load might cause the cam to “rollover,” allowing the conveyor to move backward. The cam profile used by Tsubaki is most suited for the backstopping function, placing importance on the load distribution among multiple cams and a large surface cross section. Even if an unexpectedly large reverse torque occurs, the clutches will not roll over, preventing the conveyor from reversing.



Small size Cam Clutch construction and cam profile



Larger size Cam Clutch construction and Non-rollover cam design

Small size BS Cam Clutches use a structure where cams and rollers are arranged alternately, and rollers act as a bearing to maintain the concentricity of the inner and outer races.

Large size BS-HS series Cam Clutches use a unique cam cage and structure supporting both sides with bearings, making it possible to use at a higher overrunning speed. Additionally, torque capacity is significantly increased allowing the large conveyor to be operated much more safely.

CAM CLUTCH BASICS

OPERATING PRINCIPLES

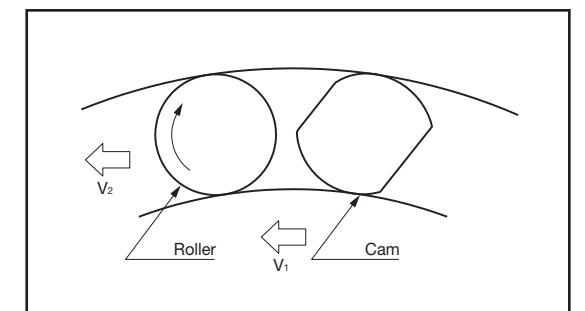
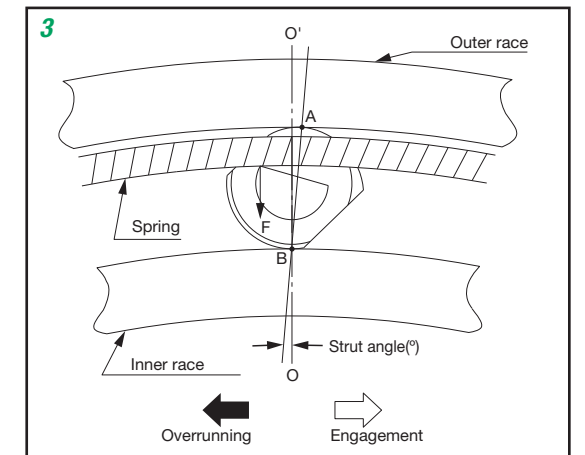
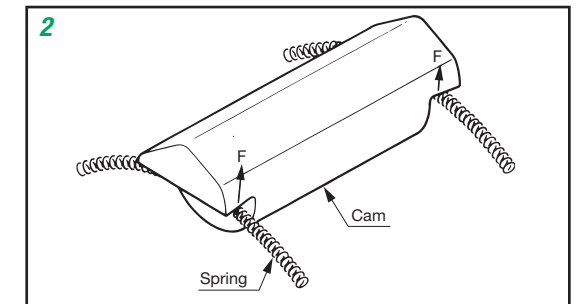
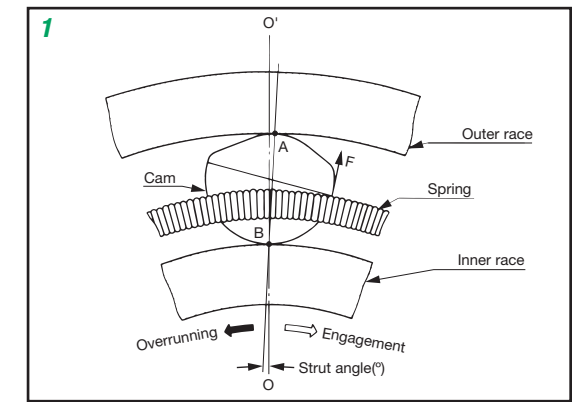
The outer race's rotation is stopped by the torque arm. Cams contact with the inner and outer races at points A and B respectively. AB maintains a constant engagement angle (strut angle θ) with the center line O-O'. The strut angle is an integral part of the overrunning and engagement function of the BS Cam Clutch. See 1.

Springs give the rotational moment of F to cams ensuring precise contact is maintained between the inner and outer races. When the inner race (conveyor shaft) rotates in the direction of the black arrow, the inner race overruns smoothly because AB does not act as a strut. At this time, cams maintain light contact due to the spring force. See 2.

When the conveyor stops and the inner race (conveyor shaft) rotates in the direction of the white arrow, the inner race is locked immediately by the cams because AB acts as a strut, and prevents the conveyor from rotating in reverse. See 3.

Self-lubrication function

When the inner race overruns, rollers also rotate so the cam and roller cage orbit around the outer circumference of the inner race at low speed. Grease in the cam and roller cage spreads completely throughout the insides of the Cam Clutch due to the orbital motion, thus maintaining good lubrication.





BR-HT, BREU SERIES INNOVATION

CAM CLUTCH BASICS

DISPLACEMENT OF CONTACT POINT FUNCTION

Rollers function as bearings and orbit while rotating on their axis, and supporting the outer race. There is a slight clearance between the rollers, the inner and outer races; therefore the bottom of the cam space between the inner and outer races is slightly wider compared with the top. Cams always maintain contact by spring force, and the slant of the cams is automatically different at the top and the bottom.

Cams continuously orbit by changing the contact point with the inner and outer races; therefore the wear on cams due to overrunning is diminished to the minimum, and the overrunning wear life on the Cam Clutch is at the maximum length.

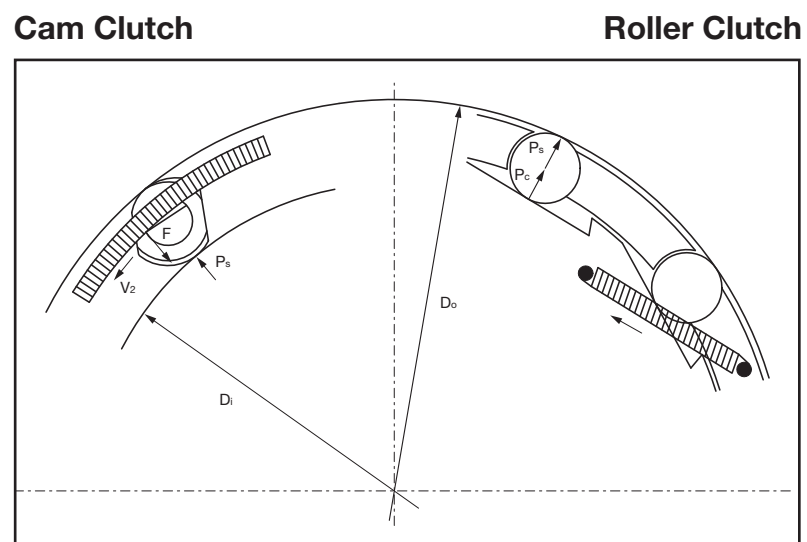
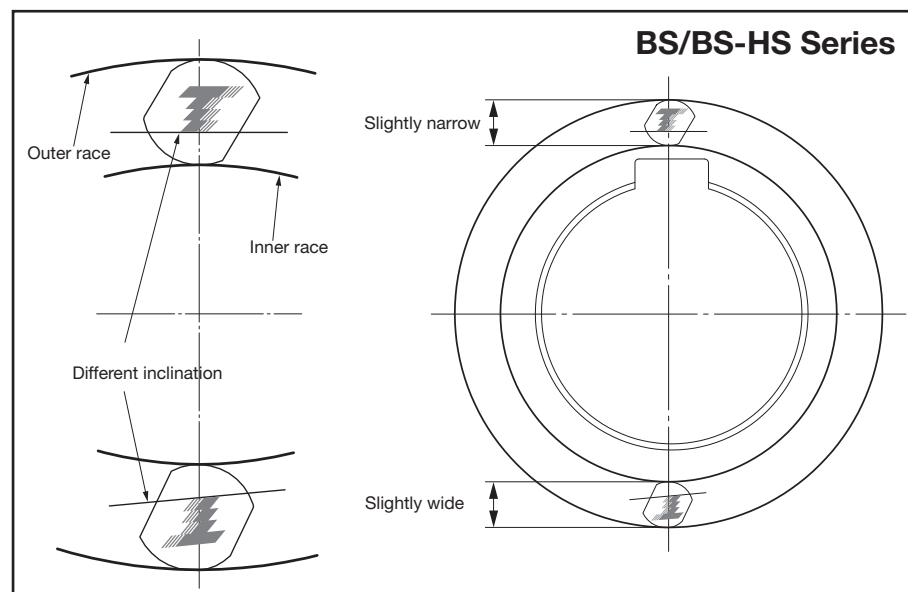
For the conveyor, which is always in an overrunning condition during the operation, as well as the self-lubrication function and the sliding speed diminishing function, it is one of the major features of a cam and roller cage to realize a long operating life.

Tsubaki BS and BS-HS Cam Clutch compared with Ramp & Roller Clutch

Cam Clutch cams slide on the outer circumference of the inner race (D_i) at the decelerated sliding speed due to the sliding speed diminishing function described above. The contact force of cams and inner and outer races are given only by spring force (P_s).

As for the Roller Clutches, rollers slide in the inner circumference of the outer race (D_o) because rollers are built onto a roller cage which is connected with the inner race. Therefore the sliding speed of the Roller Clutch is faster when compared with that of the Cam Clutch between the cams and inner race. In addition, the contact force of rollers and the outer race is quite large in the Ramp & Roller design because the centrifugal force (P_c) caused by the rotation of the roller cage is added to the spring force (P_s).

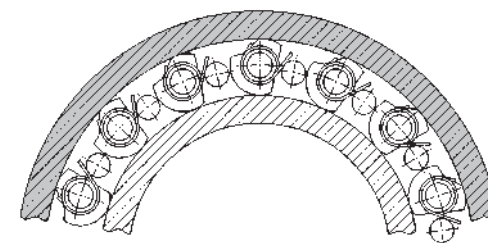
The BS Cam Clutches overrun with low sliding speed and low contact force, thus the BS Cam Clutches have a long overrunning wear life when compared with the Roller Clutches.



NON-CONTACT DESIGN EXTENDS SERVICE LIFE

Greatly Increased Service Life

Made possible by Tsubaki's extensive experience in mechanical power transmission, the cams used in the BR Cam Clutch offer a unique cross section that provides positive mechanical engagement only when needed. Otherwise, the Cam Clutch rotates freely with absolutely no mechanical contact in the clutch mechanism. The result is a greatly increased service life compared to conventional types.



Backstop Applications with High-Speed Overrunning

When the Cam Clutch is stationary, the cam locks the inner and outer races together (Figure 5). When the inner race (load side) overruns at a high speed, the cam disengages by releasing the inner race (Figure 6). When the inner race stops, the cam rotates back into an engaged position. If the inner race tries to rotate in the reverse direction, the cams then serve as a stop between the anchored outer race and inner race to prevent reverse rotation and provide backstopping.

High-Speed and Low-Speed-Engaged Overrunning

When the Cam Clutch is stationary, the cam locks the inner and outer races together (Figure 5). When the inner race (load side) overruns at a high speed, the cam disengages by releasing from the inner race (Figure 6). When the high-speed rotation of the inner race stops and the inner race begins to rotate slowly, the cam rotates back into an engaged position. Then when you start to drive the outer race at low speed of rotation, the cams serve as a prop and drive the inner race at the same low speed of rotation. Please reference Figure 7.

A More Economical Design

The open-type BR Series features a simple design in which the Cam Clutch mechanism is incorporated in a cage between standard dimension inner and outer bearing races. This allows the Cam Clutch to be easily and economically integrated into a wide variety of mechanical systems. Tsubaki also offers a package-type Cam Clutch that incorporates a bearing assembly to reduce maintenance demands.

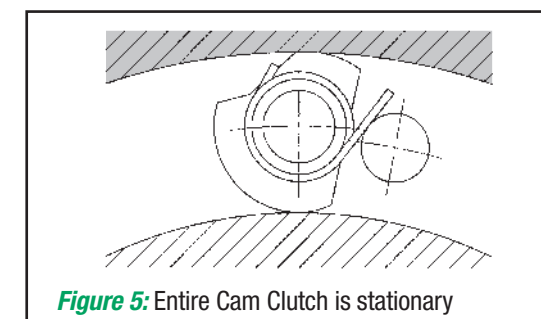
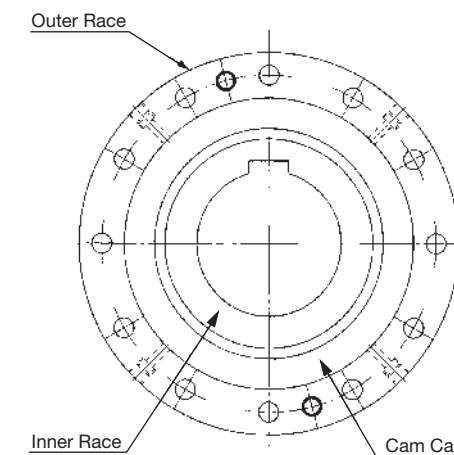


Figure 5: Entire Cam Clutch is stationary

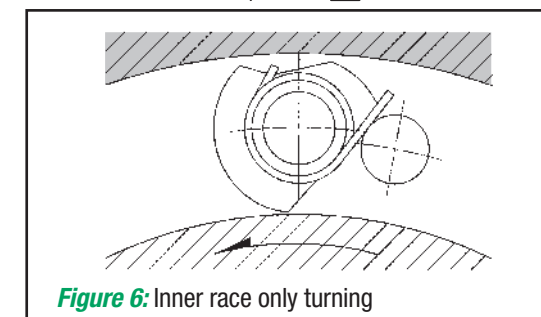


Figure 6: Inner race only turning

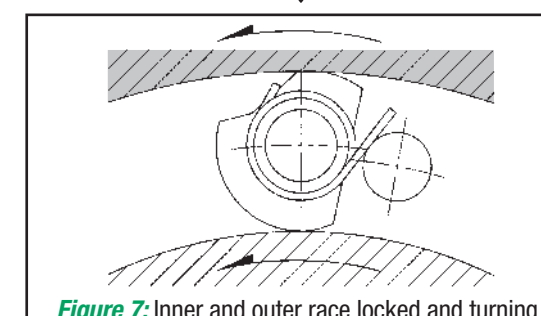
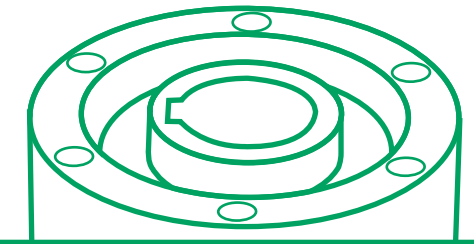


Figure 7: Inner and outer race locked and turning

Backstop Clutch Selection Guide



BACKSTOPPING TO PREVENT REVERSE ROTATION

A backstop Cam Clutch is used to prevent the rotating shaft from being driven in the reverse direction. The Cam Clutch will continue overrunning while the shaft rotates and engages to prevent reverse shaft rotation.

Normally, the inner race is mounted on the rotating shaft, and the outer race is fixed to the machine frame. The inner race overruns in normal operation. As soon as the shaft begins to rotate in the reverse direction, the cams engage with the inner and outer races to prevent reversing. **Figure 8** depicts a typical setup for installing a backstop Cam Clutch.

Backstop Cam Clutch Speed Grouping

Backstopping Cam Clutches are grouped into three different speed classifications that are dependant on the overrunning speed and load conditions. The following table provides the three different classifications for consideration.

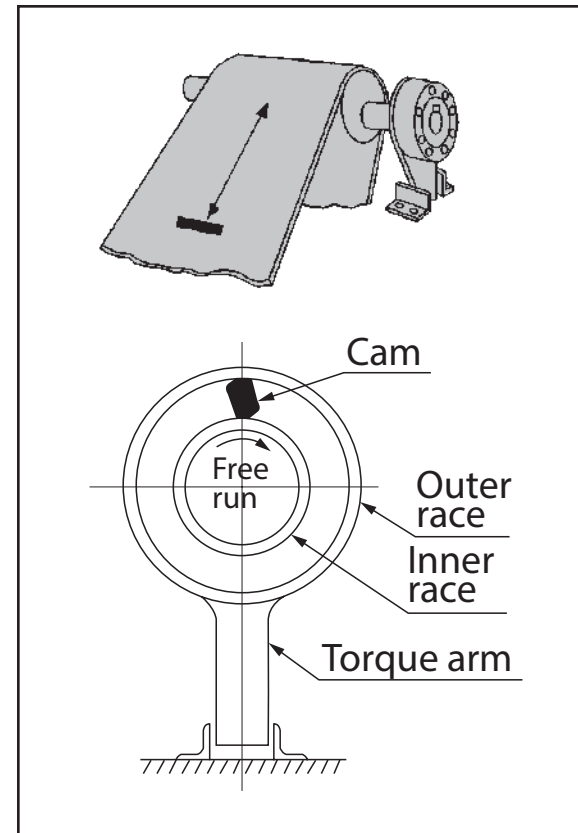
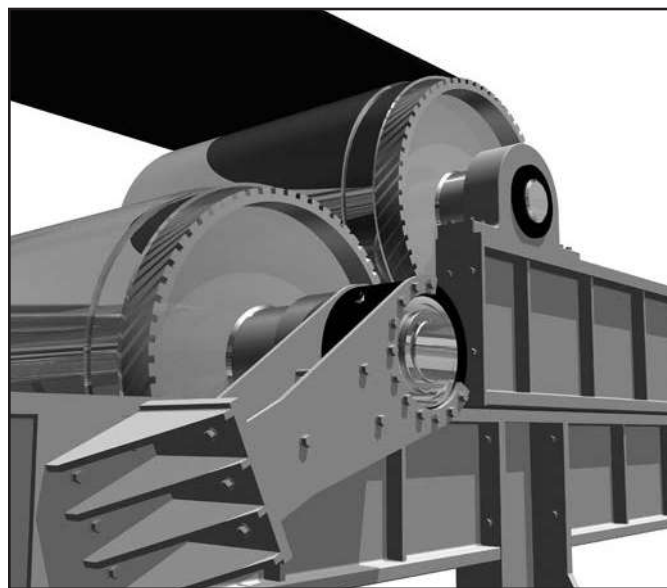


Figure 8: Typical backstop installation



BACKSTOP CAM CLUTCH MOUNTING ORIENTATION

Preventing reverse rotation of inclined and vertical conveyor systems is one of the most common application solutions provided when implementing a backstop Cam Clutch. The following table identifies the three standard mounting types and the given series associated with each mounting type. Please reference **Figure 9** for a depiction of the mounting styles.

	Mounting Location Designator	Mounting Position	Common Application	Overrunning Speed (RPM) Reverse Torque	Typical Series
Backstopping	A	Pulley Shaft	Backstopping for low speed overrunning	0 - 150 RPM High Reversing Torque	BS/BS-HS BS-R
	B	Intermediate Shaft - Gear Reduction Systems	Backstopping for medium speed overrunning	150 to 700 RPM Medium Reversing Torque	MGUS/MGUS-R
	C	Directly connected to motor shaft	Backstopping for high speed overrunning	700 to 3,600 RPM Low Reversing Torque	BR-HT/BREU

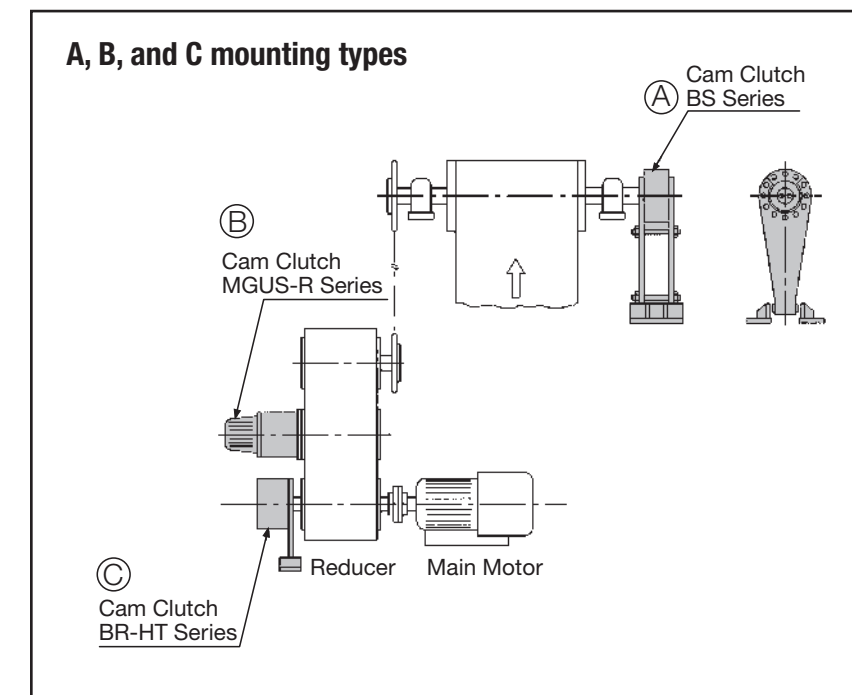
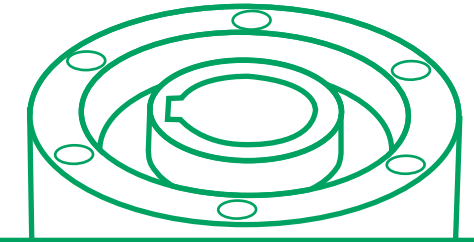


Figure 9: A,B,C backstop mounting

Backstop Clutch Selection Guide



BACKSTOPPING FOR LOW SPEED OVERRUNNING (OVERRUNNING AT 150 RPM OR LESS)

In this application, the inner race is mounted directly onto the conveyor head pulley, or driven shaft. The outer race is connected to the conveyor frame to prevent reverse rotation. Since reverse rotation is prevented directly by the conveyor shaft without using a drive chain, gears, or couplings, this is regarded as the safest and most reliable mounting method. Furthermore, due to the fact that the Cam Clutch is connected to the conveyor pulley, low overrunning slip speed is reduced, as well as the slipping distance. The result is reduced wear and long service life. In addition to conveyor systems, this system is also used to prevent reverse rotation on inclined and screw type pumps. Please see [Figure 10](#) for an illustration of mounting.

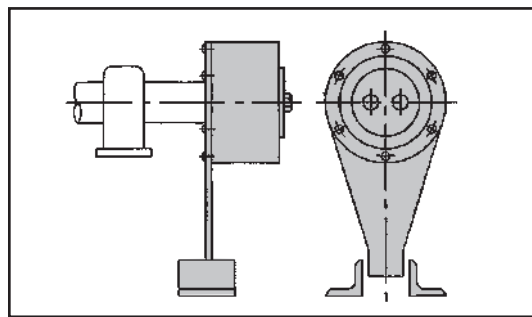


Figure 10: BS Series mounting low speed

Typical Series	Advantages
BS/BS-HS/BS-R BSEU	<ul style="list-style-type: none"> • Designed specifically for conveyor applications • Dust-proof enclosure • Virtually maintenance-free

BACKSTOPPING FOR MEDIUM SPEED OVERRUNNING (150 TO 700 RPM)

In this application, the Cam Clutch is mounted on a gear reducer shaft rotating at medium speeds to prevent reverse rotation. As speed increases, the torque required to maintain the load at a given rate decreases. Therefore, the Cam Clutch required only needs to withstand a comparatively small torque that is inversely proportional to the rotating speed ratio of the reducer output shaft. Considering the application requirements, even a small Cam Clutch can be utilized in this application. [Figure 11](#) provides an illustration of how the Cam Clutch could be mounted for this particular application.

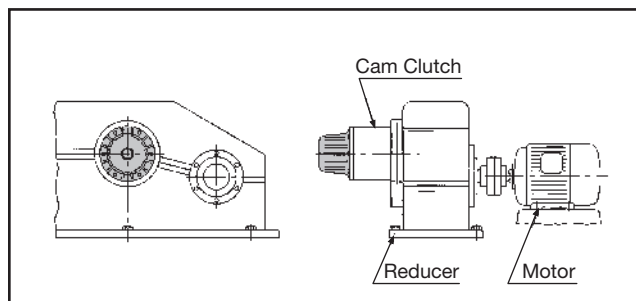


Figure 11: MGUS Series mounting medium speed

Typical Series	Advantages
MGUS/MGUS-R	<ul style="list-style-type: none"> • Compact design can handle high torque • Excellent wear characteristics

BACKSTOPPING FOR HIGH SPEED OVERRUNNING (OVERRUNNING AT 700 TO 3,600 RPM)

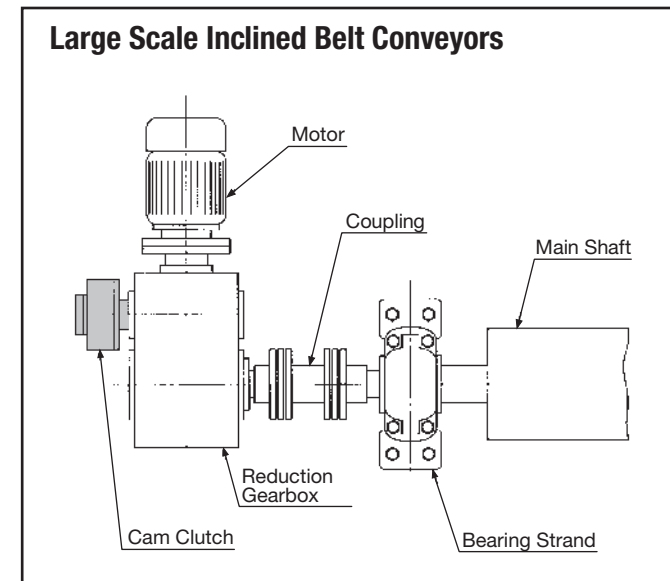


Figure 12: Cam Clutch installed on gear reducer

Inclined Belt Conveyors

In this application, the gear reducer is tasked with driving a large scale inclined conveyor system. The Cam Clutch is installed to prevent the conveyor from rolling backwards in the event of stoppage or overload. As depicted in [Figure 12](#), the Cam Clutch is mounted directly onto the reducer to prevent damage that would result due to reverse rotation.

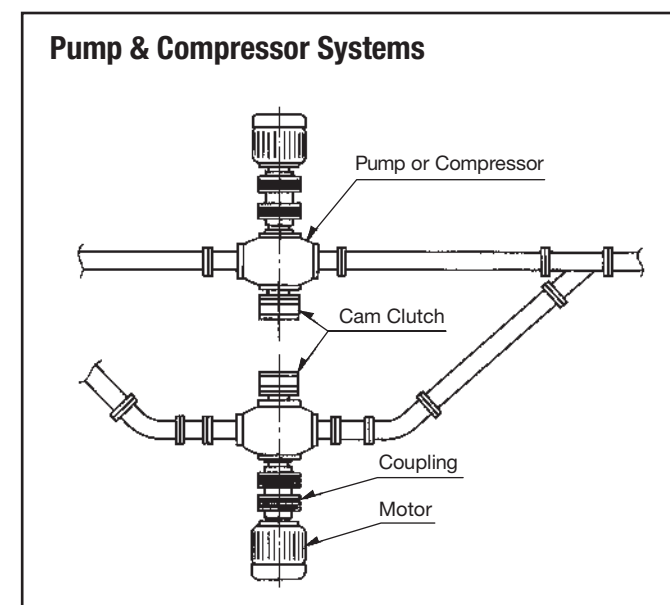


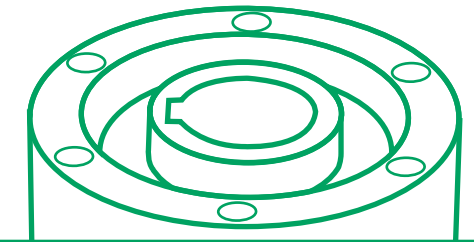
Figure 13: Cam Clutch installed on pump/compressor system

Pump/Compressor Systems

There are many applications in which multiple pump or compressor systems are feeding into the same line. These are common in applications where energy savings is required, or emergency backup/redundancy is highly desired. When the system is shut down, or another pump comes on line, there may be a tendency for a given pump to back-spin when not running. Allowing this to happen may result in damaging the pump or compressor. Installing a backstopping Cam Clutch can prevent this. Please reference [Figure 13](#) for an illustration example.

Backstop Clutch Selection Guide

INFORMATION FOR SELECTION



BACKSTOP SELECTION

Backstop clutches by definition are required to hold back a load from moving in a reverse direction. Care must be taken in calculating the torque requirements and should be based on maximum or worst case conditions and not averages or normally seen loads. Because the failure of a backstop or holdback clutch might result in damages, take time in considering all the possible loadings and select appropriate service factors. Below is more than one selection formula; it is generally advised to select the Cam Clutch that provides the largest safety factor.

General Selection Method:

- A) Calculate the static torque reverse motion based upon the maximum load expected and multiply it by the service factor. Selection is based on the [formula to the right](#).
- B) Select the clutch by:
 - 1) Design torque requirement
 - 2) Maximum overrunning speed
 - 3) Bore size and installation method

Required Torque x Service Factor = Design Torque

The torque capacity of the selected Cam Clutch must be greater than the design torque requirement, must accept the maximum overrunning speed, and be suitable for the bore and installation method required.

Motor Stall Torque Selection Method:

Another method commonly used to select the proper backstop clutch size for conveyors is to use the motor name plate ratings plus the motor's ability to produce excess torque. Depending on the motor size, it may develop over 300% of rated torque. After stalling an overloaded conveyor can overload the backstop. For proper selection of the backstop, all facets of the mechanical system should be considered to ensure that the backstop is not the weakest link in the conveyor drive. If the motor breakdown torque is not known, refer to the motor manufacturer.

Selection is based on the following formula:

$$\text{Motor stall torque } T(\text{lb.ft.}) = \frac{\text{Motor power hp} \times 5252}{\text{Shaft speed } N \text{ (r/min)}} \times \frac{S}{100} \leq T_{\max}$$

or

$$\text{Motor stall torque } T(\text{N}\cdot\text{m}) = \frac{\text{Motor power kW} \times 9550}{\text{Shaft speed } N \text{ (r/min)}} \times \frac{S}{100} \leq T_{\max}$$

S = Stall torque percentage
Must be greater than 100% and should be obtained from motor manufacturer

T_{\max} = Torque capacity of the Cam Clutch and must be greater than the motor stall torque

Select service factor from table below:

SF	Service condition
1.5	Backstopping: Several times a day
2.0	Backstopping: More than several times a day

NOTE

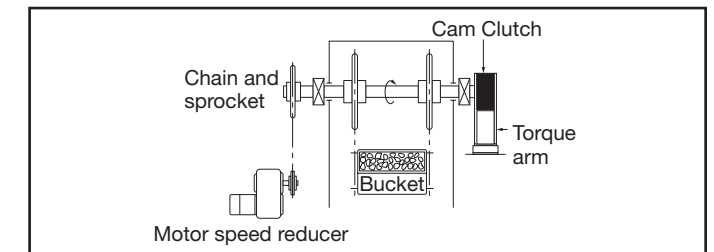
Always allow for the maximum possible load in your calculations, since backstopping often occurs when the conveyor is loaded above its normal loading capacity.

Bucket Elevator Selection Method:

The torque capacity of the selected Cam Clutch must be greater than the calculated torque (T), must accept the required shaft speed, and be suitable for the bore and installation method required.

Metric formula:

$$T(\text{Nm}) = \frac{9.8 \times (L + D) \times Q \times D \times 1000}{120 \times V} \times \text{Service Factor}$$



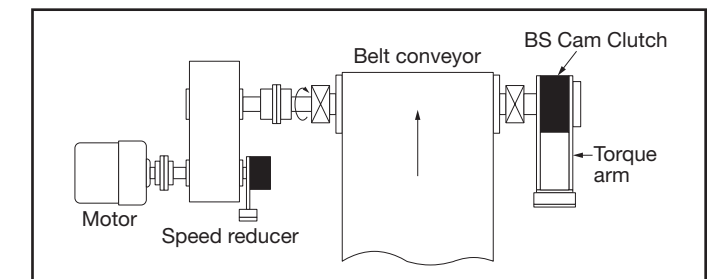
L = Total lift in meters
D = Pitch diameter of head sprocket in meters
Q = Maximum possible load in tons per hours (1 ton = 1000 kg)
V = Velocity of conveyor in meter/minute
SF = Service Factor from above chart

Belt Conveyor Selection Method:

Using these calculations, a slightly smaller Cam Clutch might be suggested because friction factors inherent in the belt conveyor are taken into consideration. Any calculations from this formula should be compared with the Motor Stall Torque Selection Method. We strongly suggest that any Cam Clutch selection be based on the larger value and choose the Cam Clutch that provides a greater safety factor. Please contact Tsubaki with any questions.

Selection Procedure:

- (1) Calculate the power to move an empty belt and idlers: (P1)
 $P_1 = 0.06 \times f \times W \times V \times \frac{\ell + \ell_0}{367}$ (kW)
- (2) Calculate the power to move a loaded belt horizontally: (P2)
 $P_2 = f \times Q \times t \times \frac{\ell + \ell_0}{367}$ (kW)
- (3) Calculate the power to move the load vertically: (P3)
 $P_3 = \frac{h \times Q \times t}{367}$ (kW)
- (4) Calculate the backstop power: (Pr)
 $Pr = P_3 - 0.7(P_1 + P_2)$ (kW)
- (5) Calculate the backstop torque: (T)
 $T = \frac{9550 \times Pr}{N} \times SF$ (N m)
- (6) Select the proper clutch which satisfies the calculated backstop torque (T)



Note:
f = Friction coefficient of rollers (0.03 normally used)
h = Total lift (m)
 ℓ = Horizontal distance between head pulley and tail pulley (m)
 ℓ_0 = Modification coefficient for ℓ (49 m normally used)
N = Shaft speed on which the clutch is mounted – r/min
Q = Max. possible load in tons per hour (metric ton/hr.)
SF = Service factor
V = Velocity of conveyor (m/min)
W = Weight of moving parts of the conveyor in the unloaded condition (kg/m)

(W) Estimates for non-loaded belt weight (kg/m)

Width of Belt (mm)	400	450	500	600	750	900
Estimated Weight: W	22.4	28	30	35.5	53	63
Width of Belt (mm)	1050	1200	1400	1600	1800	2000
Estimated Weight: W	80	90	112	125	150	160

HOW TO ORDER



BS-HS SERIES CAM CLUTCH

BS-HS Series Cam Clutch offers a higher strength/higher rpm option. Non-rollover cams are flanked by individual bearings on both sides. This series is identified by "HS" following the frame size number. Designed to provide inner race overrunning capability in one direction of operation, and engage the outer race when reverse rotation is experienced. Typically found on long incline conveyor systems, bucket elevators, and large pumping systems.

BS-HS Series Cam Clutch units are all manufactured on a made-to-order basis. When ordering, please specify bore size and keyway dimensions along with tolerances if available. Tsubaki includes the shaft key with your BS-HS Cam Clutch. If tolerances are not known, Tsubaki will produce per our standards. A complete Cam Clutch assembly typically includes the Cam Clutch, torque arm, shaft key, shaft end plate, and safety cover or oil reservoir. BS-HS Series Cam Clutches are pre-lubricated with grease prior to shipping.

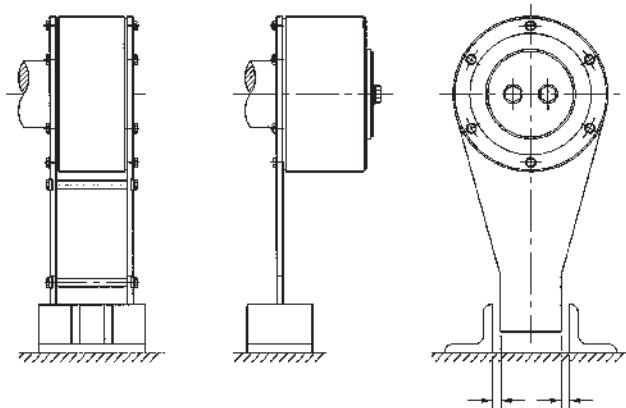
Example How To Order Code: BS-HS Series Cam Clutch

BS	300	HS	-	10.4375"
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Series	Frame Size	Descriptor	-	Available Bore Range	
BS: Backstop type	160	HS: High speed/ High strength	-	3.937" to 6.250"	(100 to 160 mm)
	200			3.937" to 7.875"	(100 to 200 mm)
	220			5.937" to 8.625"	(150 to 220 mm)
	250			6.875" to 9.750"	(175 to 250 mm)
	270			7.875" to 10.625"	(200 to 270 mm)
	300			9.000" to 11.750"	(230 to 300 mm)
	350			9.875" to 13.725"	(250 to 350 mm)
	425			12.750" to 16.625"	(325 to 425 mm)
450	13.750" to 17.625"	(350 to 450 mm)			

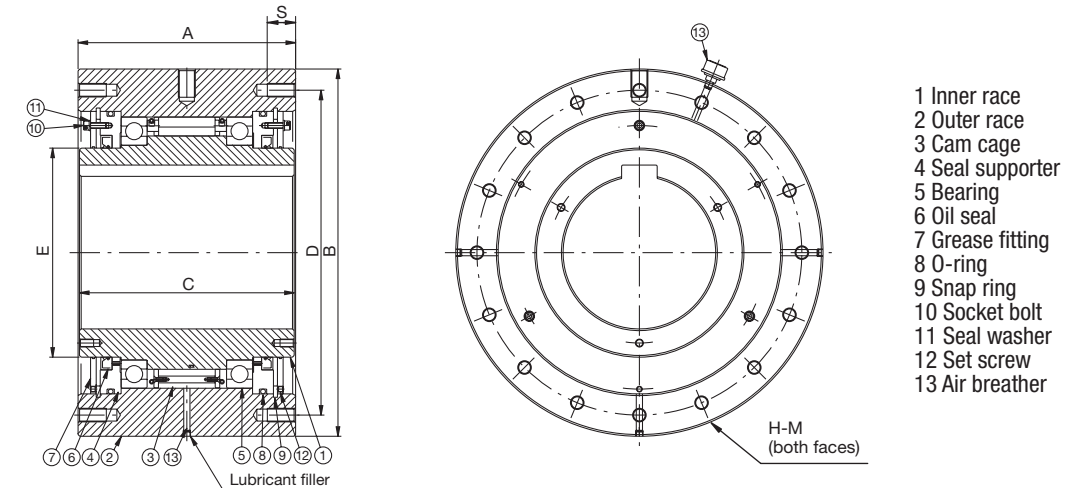
When ordering, specify the required bore size, keyway dimensions, and special tolerance if needed.

Specifications		
Torque Capacity	Overrunning	
lb.ft.	(Nm)	Max. RPM
28912	(39200)	350
45507	(61700)	250
75231	(102000)	200
108421	(147000)	170
150462	(204000)	160
216843	(294000)	150
289124	(392000)	110
542107	(735000)	85
722809	(980000)	80

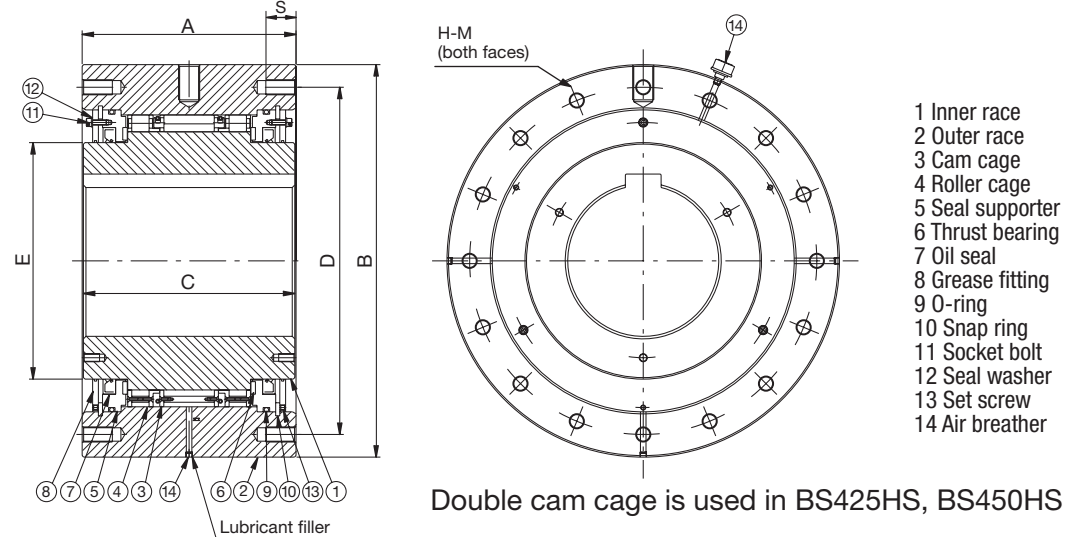


BS-HS SERIES CAM CLUTCH

BS160HS~BS270HS



BS300HS~BS350HS BS425HS~BS450HS



Double cam cage is used in BS425HS, BS450HS

Shaft tolerances are found on page 41.

Dimensions and Capacities

Model	Torque lb.ft. (Nm)	Inner Race Max. Overrunning Speed (RPM)	Drag Torque lb.ft. (Nm)	A in. (mm)	B in. (mm)	C in. (mm)	D PCD in. (mm)	E in. (mm)	S in. (mm)	H-M Size x Pitch No. of Tapped Holes	Grease Filler Size	Grease Quantity lbs. (kg)	Weight* lb. (kg)
BS160HS	28912 (39200)	350	25.3 (34.3)	7.1 (180)	14.2 (360)	6.9 (175)	12.402 (315)	8.7 (220)	1.6 (40)	M20 x P2.5 (10)	PT 1/4	0.5 (0.23)	264 (120)
BS200HS	45507 (61700)	250	32.5 (44.1)	8.1 (205)	16.9 (430)	7.9 (200)	14.961 (380)	10.2 (260)	1.6 (40)	M22 x P2.5 (8)	PT 1/4	0.7 (0.31)	440 (200)
BS220HS	75231 (102000)	200	54.2 (73.5)	13.0 (330)	19.7 (500)	12.8 (325)	16.535 (420)	11.4 (290)	1.6 (40)	M20 x P2.5 (16)	PT 1/4	2.9 (1.3)	858 (390)
BS250HS	108421 (147000)	170	68.7 (93.1)	14.6 (370)	23.6 (600)	14.4 (365)	20.866 (530)	13.0 (330)	2.0 (50)	M24 x P3.0 (16)	PT 1/4	3.7 (1.7)	1672 (760)
BS270HS	150462 (204000)	160	72.3 (98)	15.2 (385)	25.6 (650)	15.0 (380)	22.638 (575)	14.6 (370)	2.0 (50)	M24 x P3.0 (16)	PT 1/4	4.4 (2)	1870 (850)
BS300HS	216843 (294000)	150	79.7 (108)	16.7 (425)	30.7 (780)	16.5 (420)	27.165 (690)	18.5 (470)	2.4 (60)	M30 x P3.5 (16)	PT 1/4	7.9 (3.6)	3080 (1400)
BS350HS	289124 (392000)	110	116 (157)	17.3 (440)	36.6 (930)	18.9 (480)	32.087 (815)	21.1 (535)	2.8 (70)	M36 x P4.0 (16)	PT 1/4	9.0 (4.1)	5060 (2300)
BS425HS	542107 (735000)	85	159 (216)	22.4 (570)	40.6 (1030)	22.8 (580)	37.008 (940)	25.0 (635)	2.8 (70)	M36 x P4.0 (18)	PT 1/4	15.2 (6.9)	7260 (3300)
BS450HS	722809 (980000)	80	181 (245)	22.4 (570)	42.9 (1090)	23.6 (600)	38.976 (990)	25.4 (645)	3.1 (80)	M42 x P4.5 (18)	PT 1/4	15.8 (7.2)	8140 (3700)

* Listed weight is for Cam Clutch with smallest bore. This is max. possible weight.

HOW TO ORDER



BS SERIES CAM CLUTCH

BS Series Cam Clutch products are designed to provide inner race overrunning capability in one direction of operation, and engage the outer race when reverse rotation is experienced. BS Series units are often found on incline conveyor systems, or pump systems that may experience reverse rotation due to excessive loading on the discharge side of the pump. BS Series Cam Clutches are a cam and roller design incorporating the low friction bearing into the cam cage.

A complete Cam Clutch assembly typically includes the Cam Clutch, torque arm, shaft key, shaft end plate, and safety cover or oil reservoir. The shaft key is included with the Cam Clutch but please select each additional item individually as needed. Grease lubrication is standard for BS30 through BS350 Cam Clutches. Size BS425 and BS450 use oil lubrication.



How To Order: For the BS Series Cam Clutch that is needed, please specify the series, frame size, and bore size. If the bore size needed is not specified or if different key dimensions are required, please contact Tsubaki. Made-to-order Cam Clutches are readily available.

Series	Frame Size	-	Available Bore Range	Full Description
BS	30	-	1	BS30 Cam Clutch with 1.000" bore including 1/4" wide key

BS Series Cam Clutch Product Overview				
Series	Frame Size	-	Available Bore Range	
BS: Backstop Cam Clutch	30	-	0.750" to 1.181"	(20 to 30 mm)
	50	-	1.125" to 2.000"	(28.58 to 50.8 mm)
	65	-	1.500" to 2.559"	(38.1 to 65 mm)
	75	-	1.938" to 2.953"	(49.2 to 75 mm)
	85	-	2.362" to 3.346"	(60 to 85 mm)
	95	-	2.250" to 3.740"	(57.15 to 95 mm)
	110	-	2.437" to 4.331"	(61.9 to 110 mm)
	135	-	2.937" to 5.315"	(74.6 to 135 mm)
	160	-	3.937" to 6.250"	(100 to 160 mm)
	200	-	3.937" to 7.875"	(100 to 200 mm)
	220	-	5.937" to 8.625"	(150 to 220 mm)
	250	-	6.875" to 9.750"	(175 to 250 mm)
	270	-	7.875" to 10.625"	(200 to 270 mm)
	300	-	9.000" to 11.750"	(230 to 300 mm)
	335	-	9.875" to 11.750"	(250 to 300 mm)
	350	-	9.875" to 13.725"	(250 to 350 mm)
	425	-	12.750" to 16.625"	(325 to 425 mm)
450	-	13.750" to 17.625"	(350 to 450 mm)	

Specifications		
Torque Capacity		Overrunning Max. RPM
lb.ft.	(Nm)	
217	(294)	350
578	(784)	300
1158	(1570)	340
1807	(2450)	300
4337	(5880)	300
5782	(7840)	250
7966	(10800)	250
11580	(15700)	200
18070	(24500)	100
27437	(37200)	100
36140	(49000)	80
65053	(88200)	50
90720	(123000)	50
129811	(176000)	50
195453	(265000)	50
231594	(314000)	50
376156	(510000)	50
505966	(686000)	50

BS30 - BS75 SERIES CAM CLUTCH

Example How To Order Code: BS Series Cam Clutch

BS	30	-	1B
Series	Frame Size	-	Bore Symbol
BS: Backstop Cam Clutch	30	-	L
			P
			1
			1B
			30
	50	-	1D
			1F
			1G
			1H
			1J
			1L
			45
			1P
			50
			2
	65	-	1H
			40
			1J
			1L
			45
			1P
			50
			2
			2B
			55
	75	-	2D
			60
			2G
			2H
			65
1R			
2			
2B			
2D			
60			
2G			
2H			
65			
2J			
2L			
70			
2P			
2R			
75			

The bore sizes listed below are standards. Special bore and keyway sizes are available upon request.

Specifications				
Bore Size		Bore Keyseat	Torque Capacity	
inch	(mm)		lb.ft.	(Nm)
0.750	(19.05)	3/16 x 3/32"	217	(294)
0.875	(22.23)	3/16 x 3/32"		
1.000	(25.40)	1/4 x 1/8"		
1.125	(28.58)	1/4 x 1/8"		
1.181	(30)	8 x 3.3 mm		
1.250	(31.75)	1/4 x 1/8"	578	(784)
1.375	(34.93)	5/16 x 5/32"		
1.438	(36.51)	3/8 x 3/16"		
1.500	(38.10)	3/8 x 3/16"		
1.625	(41.28)	3/8 x 3/16"		
1.750	(44.45)	3/8 x 3/16"		
1.771	(45)	14 x 3.8 mm		
1.875	(47.63)	1/2 x 1/4"		
1.968	(50)	14 x 3.8 mm		
2.000	(50.80)	1/2 x 1/4"		
1.500	(38.10)	3/8 x 3/16"		
1.575	(40)	12 x 3.3 mm		
1.625	(41.28)	3/8 x 3/16"		
1.750	(44.45)	3/8 x 3/16"		
1.771	(45)	14 x 3.8 mm		
1.875	(47.63)	1/2 x 1/4"		
1.969	(50)	14 x 3.8 mm		
2.000	(50.80)	1/2 x 1/4"		
2.125	(53.98)	1/2 x 1/4"		
2.165	(55)	16 x 4.3 mm		
2.250	(57.15)	1/2 x 1/4"		
2.362	(60)	18 x 4.4 mm		
2.438	(61.91)	5/8 X 5/16"		
2.500	(63.50)	5/8 X 5/16"	1807	(2450)
2.559	(65)	18 x 4.4 mm		
1.938	(49.2)	1/2 x 1/4"		
2.000	(50.8)	1/2 x 1/4"		
2.125	(53.98)	1/2 x 1/4"		
2.250	(57.15)	1/2 x 1/4"		
2.362	(60)	18 x 4.4 mm		
2.438	(61.91)	5/8 X 5/16"		
2.500	(63.50)	5/8 x 5/16"		
2.559	(65)	18 x 4.4 mm		
2.625	(66.68)	5/8 x 5/16"		
2.750	(69.85)	5/8 x 5/16"		
2.755	(70)	20 x 4.9 mm		
2.875	(73.03)	3/4 x 3/8"		
2.938	(74.61)	3/4 x 3/8"		
2.952	(75)	20 x 4.9 mm		

BS85 - BS135 SERIES CAM CLUTCH

Example How To Order Code: BS Series Cam Clutch

BS	85	-	75		
Series	Frame Size	-	Bore Symbol		
BS: Backstop type	85	-	2F		
			2G		
			2H		
			2J		
			2L		
			70		
			2P		
			2R		
			75		
			3		
			3B		
			80		
			3D		
			85		
			95	-	2D
					2F
					2G
					2H
	2J				
	2L				
	2P				
	2R				
	3				
	3B				
	80				
	3D				
	85				
	3G				
	90				
	95				
	110	-			2G
					2H
			2J		
			2L		
			2R		
			3		
3B					
3D					
85					
3G					
3H					
90					
3J					
95					
3L					
3P					
3R					
4					
105					
4D					
110					

The bore sizes listed below are standards. Special bore and keyway sizes are available upon request.

Specifications				
Bore Size		Bore Keyseat	Torque Capacity	
inch	(mm)		lb.ft.	(Nm)
2.375	(60.33)	5/8 x 5/16"	4337	(5880)
2.438	(61.91)	5/8 x 5/16"		
2.500	(63.50)	5/8 x 5/16"		
2.625	(66.68)	5/8 x 5/16"		
2.750	(69.85)	5/8 x 5/16"		
2.755	(70)	20 x 4.9 mm		
2.875	(73.03)	3/4 x 3/8"		
2.938	(74.61)	3/4 x 3/8"		
2.952	(75)	20 x 4.9 mm		
3.000	(76.20)	3/4 x 3/8"		
3.125	(79.38)	3/4 x 3/8"		
3.149	(80)	22 x 5.4 mm		
3.250	(82.55)	3/4 x 3/8"		
3.346	(85)	22 x 5.4 mm		
2.250	(57.15)	1/2 x 1/4"		
2.375	(60.33)	5/8 x 5/16"		
2.438	(61.91)	5/8 x 5/16"		
2.500	(63.50)	5/8 x 5/16"		
2.625	(66.68)	5/8 x 5/16"		
2.750	(69.85)	5/8 x 5/16"		
2.875	(73.03)	3/4 x 3/8"		
2.938	(74.61)	3/4 x 3/8"		
3.000	(76.20)	3/4 x 3/8"		
3.125	(79.38)	3/4 x 3/8"		
3.149	(80)	22 x 5.4 mm		
3.250	(82.55)	3/4 x 3/8"		
3.346	(85)	22 x 5.4 mm		
3.438	(87.31)	7/8 x 7/16"		
3.543	(90)	25 x 5.4 mm		
3.740	(95)	25 x 5.4 mm		
2.438	(61.91)	5/8 x 5/16"		
2.500	(63.50)	5/8 x 5/16"		
2.625	(66.68)	5/8 x 5/16"		
2.750	(69.85)	5/8 x 5/16"		
2.938	(74.61)	3/4 x 3/8"		
3.000	(76.2)	3/4 x 3/8"		
3.125	(79.38)	3/4 x 3/8"		
3.250	(82.55)	3/4 x 3/8"		
3.346	(85)	22 x 5.4 mm		
3.438	(87.31)	7/8 x 7/16"		
3.500	(88.90)	7/8 x 7/16"		
3.543	(90)	25 x 5.4 mm		
3.625	(92.08)	7/8 x 7/16"		
3.740	(95)	25 x 5.4 mm		
3.750	(95.25)	7/8 x 7/16"		
3.875	(98.43)	1 x 1/2"		
3.938	(100.01)	1 x 1/2"		
4	(101.60)	1 x 1/2"		
4.134	(105)	28 x 6.4 mm		
4.250	(107.95)	1 x 1/2"		
4.330	(110)	28 x 6.4 mm		

BS135 - BS450 SERIES CAM CLUTCH

Example How To Order Code: BS Series Cam Clutch

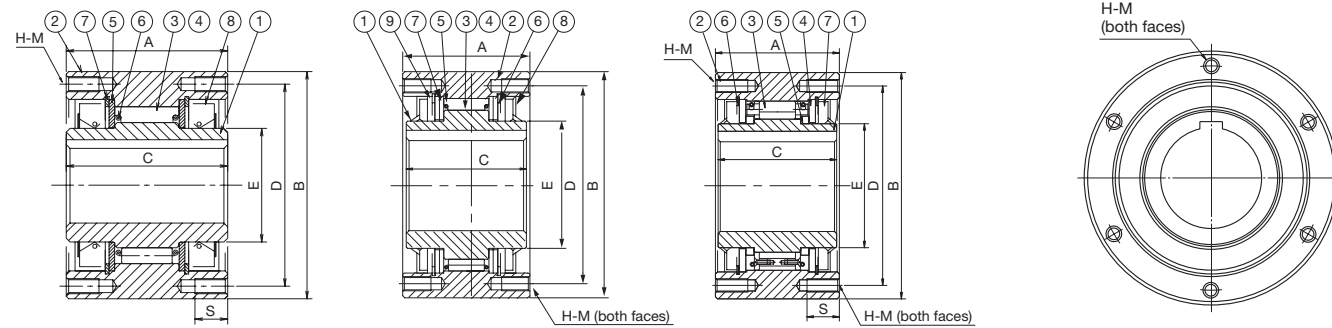
BS	135	-	4		
Series	Frame Size	-	Bore Symbol		
BS: Backstop type	135	-	2R		
			3		
			3B		
			3D		
			3G		
			3H		
			3J		
			3L		
			3P		
			3R		
			4		
			105		
			4D		
			110		
			4G		
			4H		
			4L		
			4R		
	5				
	5D				
	135				
	160	-	-	MTO Bore size is made-to-order, please specify bore and keyway requirement	
					200
					220
250					
270					
300					
335	-	-	MTO Bore size is made-to-order, please specify bore and keyway requirement		
				350	
				425	
				450	
				450	

The bore sizes listed below are standards. Special bore and keyway sizes are available upon request.

Specifications				
Bore Size		Bore Keyseat	Torque Capacity	
inch	(mm)		lb.ft.	(Nm)
2.938	(74.61)	3/4 x 3/8"	11580	(15700)
3.000	(76.20)	3/4 x 3/8"		
3.125	(79.38)	3/4 x 3/8"		
3.250	(82.55)	3/4 x 3/8"		
3.438	(87.31)	7/8 x 7/16"		
3.500	(88.90)	7/8 x 7/16"		
3.625	(92.08)	7/8 x 7/16"		
3.750	(95.25)	7/8 x 7/16"		
3.875	(98.43)	1 x 1/2"		
3.938	(100.01)	1 x 1/2"		
4.000	(101.60)	1 x 1/2"		
4.134	(105)	28 x 6.4 mm		
4.250	(107.95)	1 x 1/2"		
4.330	(110)	28 x 6.4 mm		
4.438	(112.72)	1 x 1/2"		
4.500	(114.30)	1 x 1/2"		
4.750	(120.65)	1-1/4 x 5/8"		
4.938	(125.43)	1-1/4 x 5/8"		
5.000	(127)	1-1/4 x 5/8"		
5.250	(133.35)	1-1/4 x 5/8"		
5.315	(135)	36 x 8.4 mm		
3.937" to 6.250"			18070	(24500)
3.937" to 7.875"			27437	(37200)
5.937" to 8.625"			36140	(49000)
6.875" to 9.750"			65053	(88200)
7.875" to 10.625"			90720	(123000)
9.000" to 11.750"			129811	(176000)
9.875" to 11.750"			195453	(265000)
9.875" to 13.725"			231594	(314000)
12.750" to 16.625"			376156	(510000)
13.750" to 17.625"			505966	(686000)

BS30 - BS135 SERIES DIMENSIONS

BS30~135



BS30 to BS50

- 1 Inner race
- 2 Outer race
- 3 Cam
- 4 Roller
- 5 Plate
- 6 Spring
- 7 Spirolox
- 8 Oil seal

BS65 to BS75

- 1 Inner race
- 2 Outer race
- 3 Cam
- 4 Roller
- 5 Spring
- 6 Plate
- 7 Thrust metal
- 8 Oil seal
- 9 Spirolox

BS85 to BS135

- 1 Inner race
- 2 Outer race
- 3 Cam cage
- 4 Plate
- 5 Thrust metal
- 6 Spirolox
- 7 Oil seal

Shaft tolerances are found on page 41.

Dimensions and Capacities

Model	Torque lb.ft. (Nm)	Inner Race Max. Overrunning Speed (RPM)	Drag Torque lb.ft. (Nm)	A in. (mm)	B in. (mm)	C in. (mm)	D PCD in. (mm)	E in. (mm)	S in. (mm)	H-M Size x Pitch No. of Tapped Holes	Weight* lb. (kg)
BS30	217 (294)	350	0.43 (0.58)	2.520 (64)	3.543 (90)	2.520 (64)	3.150 (80)	1.772 (45)	0.512 (13)	M6 XP1.0 (4)	5.1 (2.3)
BS50	578 (784)	300	0.72 (0.98)	2.638 (67)	4.921 (125)	2.638 (67)	4.331 (110)	2.756 (70)	0.630 (16)	M8 x P1.25 (4)	10.3 (4.7)
BS65	1158 (1570)	340	2.89 (3.92)	3.543 (90)	6.299 (160)	3.346 (85)	5.512 (140)	3.543 (90)	0.787 (20)	M10 x P1.5 (6)	28.6 (13)
BS75	1807 (2450)	300	4.34 (5.88)	3.543 (90)	6.693 (170)	3.346 (85)	5.906 (150)	3.937 (100)	0.787 (20)	M10 x P1.5 (6)	32.3 (14.7)
BS85	4337 (5880)	300	5.78 (7.84)	4.528 (115)	8.268 (210)	4.331 (110)	7.283 (185)	4.528 (115)	1.181 (30)	M12 x P1.75 (6)	59.8 (27.2)
BS95	5782 (7840)	250	7.23 (9.8)	4.528 (115)	9.055 (230)	4.331 (110)	7.874 (200)	5.118 (130)	1.181 (30)	M14 x P2.0 (6)	70.8 (32.2)
BS110	7966 (10800)	250	10.84 (14.7)	4.528 (115)	10.630 (270)	4.331 (110)	8.661 (220)	5.906 (150)	1.181 (30)	M16 x P2.0 (6)	84.9 (38.6)
BS135	11580 (15700)	200	14.46 (19.6)	5.315 (135)	12.598 (320)	5.118 (130)	11.024 (280)	7.087 (180)	1.181 (30)	M16 x P2.0 (8)	167.4 (76.1)

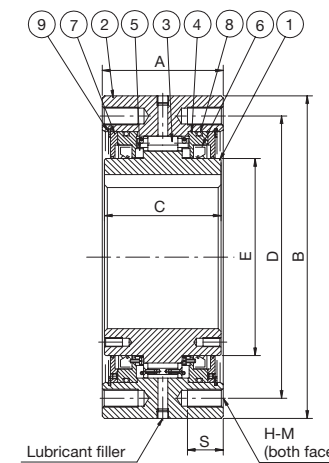
* Listed weight is for Cam Clutch with smallest bore. This is max. possible weight.

Chamfer of the Bore End Faces

Shaft Diameter		Chamfer	
Under 2"	(Under 50 mm)	0.06"	(1.5 mm)
2" thru 4-15/16"	(50 to 125 mm)	0.08"	(2 mm)
4-15/16" thru 11-7/32"	(125 to 285 mm)	0.12"	(3 mm)

BS160 - BS450 SERIES CAM CLUTCH

BS160 to BS220



- 1 Inner race
- 2 Outer race
- 3 Cam cage
- 4 Seal supporter
- 5 Thrust metal
- 6 Oil seal
- 7 Grease fitting
- 8 O-ring
- 9 Snap ring

Shaft tolerances are found on page 41.

Dimensions and Capacities

Model	Torque lb.ft. (Nm)	Inner Race Max. Overrunning Speed (RPM)	Drag Torque lb.ft. (Nm)	A in. (mm)	B in. (mm)	C in. (mm)	D PCD in. (mm)	E in. (mm)	S in. (mm)	H-M Size x Pitch No. of Tapped Holes	Grease Filler Size	Grease Quantity lbs. (kg)	Weight * lb. (kg)
BS160	18070 (24500)	100	25 (34.3)	5.315 (135)	14.173 (360)	5.118 (130)	12.402 (315)	8.661 (220)	1.575 (40)	M20 x P2.5 (10)	PT 1/4	0.26 (0.12)	216 (98.1)
BS200	27437 (37200)	100	33 (44.1)	5.906 (150)	16.929 (430)	5.709 (145)	14.961 (380)	10.433 (265)	1.575 (40)	M22 x P2.5 (8)	PT 1/4	0.31 (0.14)	367 (167)
BS220	36140 (49000)	80	54 (73.5)	9.252 (235)	19.685 (500)	9.055 (230)	16.535 (420)	11.417 (290)	1.575 (40)	M20 x P2.5 (16)	PT 1/4	1.76 (0.8)	662 (301)
BS250	65053 (88200)	50	69 (93.1)	11.614 (295)	23.622 (600)	11.417 (290)	20.866 (530)	12.992 (330)	1.969 (50)	M24 x P3.0 (16)	PT 1/4	2.42 (1.1)	1276 (580)
BS270	90720 (123000)	50	72 (98)	11.614 (295)	25.591 (650)	11.417 (290)	22.638 (575)	14.567 (370)	1.969 (50)	M24 x P3.0 (16)	PT 1/4	2.64 (1.2)	2112 (640)
BS300	129811 (176000)	50	80 (108)	11.614 (295)	30.709 (780)	11.417 (290)	27.165 (690)	18.504 (470)	2.362 (60)	M30 x P3.5 (16)	PT 1/4	2.86 (1.3)	2094 (952)
BS335	195453 (265000)	50	101 (137)	12.008 (305)	33.465 (850)	12.598 (320)	29.528 (750)	19.488 (495)	2.756 (70)	M36 x P4.0 (16)	PT 1/4	3.08 (1.4)	2508 (1140)
BS350	231594 (314000)	50	116 (157)	12.598 (320)	36.614 (930)	14.173 (360)	32.087 (815)	21.063 (535)	2.756 (70)	M36 x P4.0 (16)	PT 1/4	3.30 (1.5)	3520 (1600)
BS425	376156 (510000)	50	159 (216)	17.323 (440)	40.551 (1030)	17.717 (450)	37.008 (940)	25.000 (635)	2.756 (70)	M36 x P4.0 (18)	-	Oil: 6000 ml	5280 (2400)
BS450	505966 (686000)	50	181 (245)	17.717 (450)	42.913 (1090)	18.898 (480)	38.976 (990)	25.394 (645)	3.150 (80)	M42 x P4.5 (18)	-	Oil: 7000 ml	6204 (2820)

* Listed weight is for Cam Clutch with smallest bore. This is max. possible weight.

Chamfer of the Bore End Faces

Shaft Diameter		Chamfer	
2" thru 4-15/16"	(50 to 125 mm)	0.08"	(2 mm)
4-15/16" thru 11-7/32"	(125 to 285 mm)	0.12"	(3 mm)
Over 11-7/32"	(Over 285 mm)	0.20"	(5 mm)

HOW TO ORDER



BS-R SERIES CAM CLUTCH

BS-R Series Cam Clutch is used in applications that require continuous oil lubrication due to the environment or the duty cycle. The addition of an oil reservoir also offers easy lubrication maintenance. The torque capacities and max. overrunning rpm are the same as the standard BS Series Cam Clutch however, the added oil capacity helps to lower heat buildup which can extend the life of the Cam Clutch. When ordering an Oil Reservoir style Cam Clutch, the "R" which denotes the reservoir is inserted between the Cam Clutch frame size and the bore size as illustrated below.

Example How To Order Code: BS-R Series Cam Clutch

BS	200	R	-	4.437
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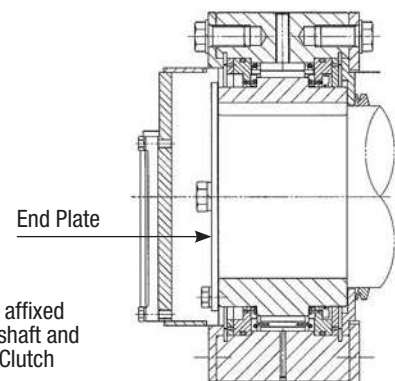
Series	Frame Size	Reservoir	-	Available Bore Range
BS: Backstop type	160	R: Oil reservoir	-	3.937" to 6.250" (100 to 160 mm)
	200			3.937" to 7.875" (100 to 200 mm)
	220			5.937" to 8.625" (150 to 220 mm)
	250			6.875" to 9.750" (175 to 250 mm)
	270			7.875" to 10.625" (200 to 270 mm)
	300			9.000" to 11.750" (230 to 300 mm)
	335			9.875" to 11.750" (250 to 300 mm)
	350			9.875" to 13.725" (250 to 350 mm)
	425			12.750" to 16.625" (325 to 425 mm)
450	13.750" to 17.625" (350 to 450 mm)			

When ordering, specify the required bore size, keyway dimensions, and special tolerance if needed.

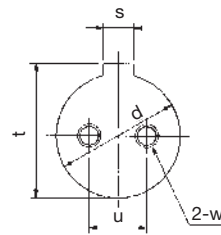
Specifications		
Torque Capacity	Overrunning	
lb.ft.	(Nm)	Max. RPM
18070	(24500)	100
27437	(37200)	100
36140	(49000)	80
65053	(88200)	50
90720	(123000)	50
129811	(176000)	50
195453	(265000)	50
231594	(314000)	50
376156	(510000)	50
505966	(686000)	50

Additional important requirements when ordering a BS-R oil reservoir style Cam Clutch

An end plate is used to fix the Cam Clutch onto the shaft and help contain the oil within the reservoir. To assist, Tsubaki provides this end plate but dimensions of the shaft end are required from the customer. The required dimensions are detailed on the following pages. Below is an example to further explain.

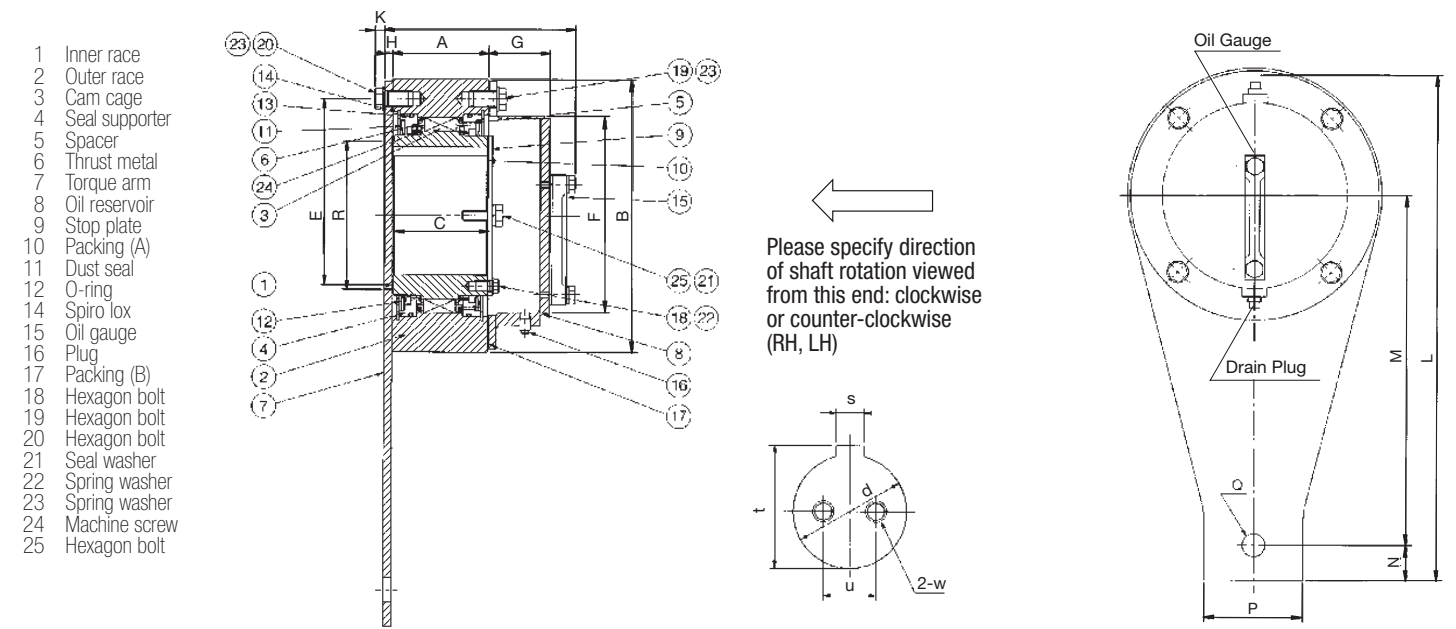


End plate is affixed to both the shaft and to the Cam Clutch



Dimensions detailing the end of the shaft are required so that Tsubaki can supply a matching plate

BS65R - BS135R SERIES DIMENSIONS



When ordering the Oil Reservoir type Cam Clutch, please specify the requested data below:

d	Bore diameter	w	Size of tapped holes
s	Keyway width	a	Angle relation between center of keyway and tapped holes
t	Keyway height	CW/CCW	Clockwise/counterclockwise shaft rotation direction when looking at Cam Clutch
u	Distance between tapped holes	W	

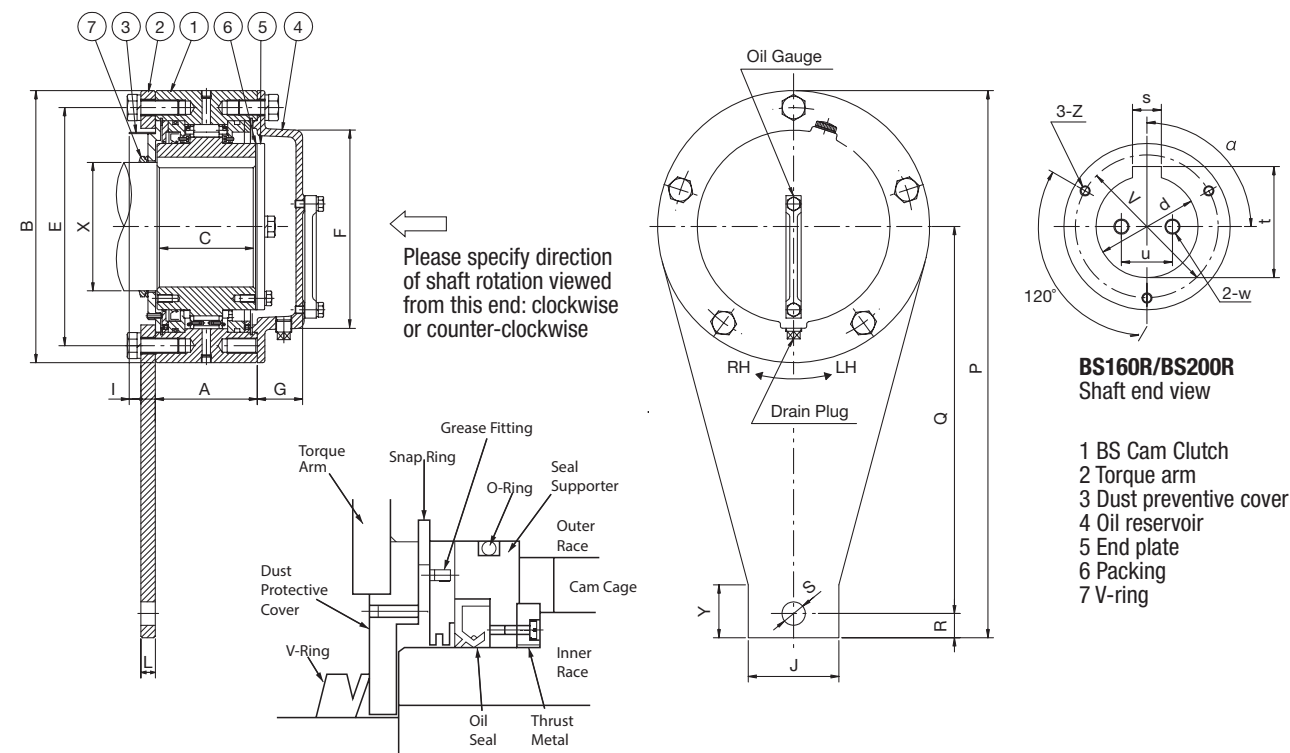
Shaft tolerances are found on page 41.

Dimensions and Capacities														
Model	A	B	C	E (PCD)	F	G	H	K	L	M	N	P	Q	R
	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)
BS65 R	3.543 (90)	6.299 (160)	3.346 (85)	5.512 (140)	4.528 (115)	1.969 (50)	0.236 (6)	0.374 (9.5)	12.047 (306)	8.268 (210)	0.630 (16)	1.969 (50)	0.531 (13.5)	3.543 (90)
BS75 R	3.543 (90)	6.693 (170)	3.346 (85)	5.906 (150)	4.921 (125)	1.969 (50)	0.236 (6)	0.374 (9.5)	13.937 (354)	9.843 (250)	0.748 (19)	2.559 (65)	0.650 (16.5)	3.937 (100)
BS85 R	4.528 (115)	8.268 (210)	4.331 (110)	7.283 (185)	5.512 (140)	2.362 (60)	0.354 (9)	0.433 (11)	17.087 (434)	11.811 (300)	1.142 (29)	3.740 (95)	0.807 (20.5)	4.528 (115)
BS95 R	4.528 (115)	9.055 (230)	4.331 (110)	7.874 (200)	6.299 (160)	2.362 (60)	0.354 (9)	0.492 (12.5)	19.567 (497)	13.780 (350)	1.260 (32)	4.134 (105)	0.807 (20.5)	5.118 (130)
BS110 R	4.528 (115)	10.630 (270)	4.331 (110)	8.661 (220)	7.087 (180)	2.362 (60)	0.472 (12)	0.551 (14)	22.047 (560)	15.157 (385)	1.575 (40)	4.331 (110)	1.024 (26)	5.512 (140)
BS135 R	5.315 (135)	12.598 (320)	5.118 (130)	11.024 (280)	9.055 (230)	2.362 (60)	0.472 (12)	0.551 (14)	26.220 (666)	18.504 (470)	1.417 (36)	4.724 (120)	1.024 (26)	7.087 (180)

Dimensions and Capacities							
Model	Mounting Bolt Size - Quantity		Stop Plate Bolt* Size - Quantity	Oil Capacity		Max. Weight	
	Torque Arm Side	Reservoir Side		oz.	(ml)	lb.	(kg)
BS65 R	M10 x 25 (6)	M10 x 20 (3)	M6 x 20 (3 + 2)	8.5	(250)	34.8	(15.8)
BS75 R	M10 x 25 (6)	M10 x 20 (3)	M6 x 20 (3 + 2)	10.1	(300)	36.3	(16.5)
BS85 R	M12 x 30 (6)	M12 x 25 (3)	M6 x 25 (3 + 2)	15.2	(450)	69.1	(31.4)
BS95 R	M14 x 35 (6)	M14 x 30 (3)	M6 x 25 (3 + 2)	20.3	(600)	83.8	(38.1)
BS110 R	M16 x 40 (6)	M16 x 35 (3)	M8 x 25 (3 + 2)	25.4	(750)	103.2	(46.9)
BS135 R	M16 x 35 (8)	M16 x 35 (4)	M10 x 30 (3 + 2)	44	(1300)	189.6	(86.2)

* This bolt size and quantity are the bolts supplied by Tsubaki to attach the stop plate to the tapped holes on the inner race of the Cam Clutch. Other bolts, usually two, are required to attach the Stop Plate to the end of the customer's shaft. These two bolts to attach to customer's shaft are furnished by the customer.

BS160R - BS200R SERIES DIMENSIONS



When ordering the Oil Reservoir type Cam Clutch, please specify the requested data below:

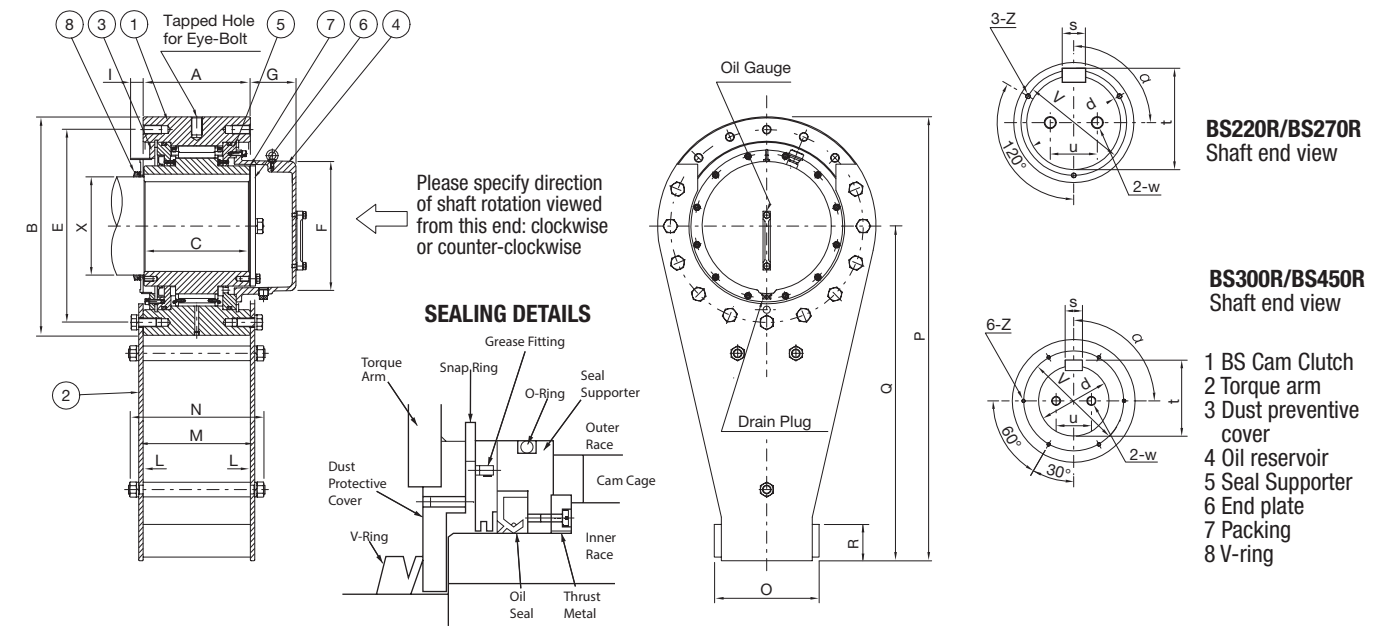
d	Bore diameter	w	Size of tapped holes
s	Keyway width	a	Angle relation between center of keyway and tapped holes
t	Keyway height	CW/CCW	Clockwise/counterclockwise shaft rotation direction when looking at Cam Clutch
u	Distance between tapped holes		

Shaft tolerances are found on page 41.

Dimensions and Capacities												
Model	A	B	C	E (PCD)	F	G	L	I	J	R	P	Q
	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)
B160 R	5.315 (135)	14.173 (360)	5.118 (130)	12.402 (315)	10.039 (255)	2.362 (60)	0.748 (19)	0.630 (16)	4.724 (120)	1.260 (32)	31.181 (792)	22.835 (580)
BS200 R	5.906 (150)	16.929 (430)	5.709 (145)	14.961 (380)	12.205 (310)	2.362 (60)	0.748 (19)	0.827 (21)	5.118 (130)	1.693 (43)	32.992 (838)	24.528 (623)

Dimensions and Capacities										
Model	S	V	Y	Z	Mounting Bolt Size - Quantity		Oil Capacity		Max. Weight	
					Torque Arm Side	Reservoir Side	oz.	(ml)	lb.	(kg)
B160 R	1.220 (31)	7.480 (190)	2.559 (65)	M10	M20 x 55 (10)	M20 x 40 (5)	44	(1300)	238	(108)
BS200 R	1.614 (41)	9.252 (235)	2.756 (70)	M12	M22 x 60 (8)	M22 x 40 (4)	64.2	(1900)	400	(182)

BS220R - BS450R SERIES DIMENSIONS



When ordering the Oil Reservoir type Cam Clutch, please specify the requested data below:

d	Bore diameter	w	Size of tapped holes
s	Keyway width	a	Angle relation between center of keyway and tapped holes
t	Keyway height	CW/CCW	Clockwise/counterclockwise shaft rotation direction when looking at Cam Clutch
u	Distance between tapped holes		

Shaft tolerances are found on page 41.

Dimensions and Capacities												
Model	A	B	C	E (PCD)	F	G	I	L	M	N	O	P
	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)
B220 R	9.252 (235)	19.685 (500)	9.055 (230)	16.535 (420)	11.654 (296)	3.740 (95)	1.378 (35)	0.472 (12)	10.197 (259)	12.244 (311)	9.370 (238)	42.126 (1070)
BS250 R	11.614 (295)	23.622 (600)	11.417 (290)	20.866 (530)	13.976 (355)	4.921 (125)	1.378 (35)	0.472 (12)	12.559 (319)	14.764 (375)	11.339 (288)	51.181 (1300)
BS270 R	11.614 (295)	25.591 (650)	11.417 (290)	22.638 (575)	15.551 (395)	5.118 (130)	1.575 (40)	0.472 (12)	12.559 (319)	14.764 (375)	11.732 (298)	56.102 (1425)
B300 R	11.614 (295)	30.709 (780)	11.417 (290)	27.165 (690)	19.488 (495)	5.118 (130)	1.772 (45)	0.748 (19)	13.110 (333)	15.591 (396)	14.016 (356)	66.535 (1690)
BS335 R	12.008 (305)	33.465 (850)	12.598 (320)	29.528 (750)	20.669 (525)	5.315 (135)	2.362 (60)	3.543 (90)	13.504 (343)	15.945 (405)	15.197 (386)	75.787 (1925)
B350 R	12.598 (320)	36.614 (930)	14.173 (360)	32.087 (815)	22.244 (565)	5.315 (135)	2.795 (71)	0.748 (19)	14.094 (358)	16.929 (430)	16.299 (414)	81.299 (2065)
BS425 R	17.323 (440)	40.551 (1030)	17.717 (450)	37.008 (940)	26.772 (680)	6.693 (170)	2.756 (70)	0.866 (22)	19.055 (484)	22.441 (570)	18.661 (474)	91.142 (2315)
BS450 R	17.717 (450)	42.913 (1090)	18.898 (480)	38.976 (990)	27.165 (690)	7.087 (180)	3.150 (80)	0.866 (22)	19.449 (494)	22.835 (580)	20.709 (526)	100.197 (2545)

Dimensions and Capacities										
Model	Q	R	V	Z	Mounting Bolt Size - Quantity	Oil Capacity		Max. Weight		
						oz.	(ml)	lb.	(kg)	
B220 R	32.28 (820)	3.15 (80)	10.04 (255)	M12	M20 x 55 (22)	115	(3400)	763.4	(347)	
BS250 R	39.37 (1000)	3.94 (100)	11.42 (290)	M14	M24 x 55 (22)	277	(8200)	1401.4	(637)	
BS270 R	43.31 (1100)	4.33 (110)	12.60 (320)	M14	M24 x 55 (22)	338	(10000)	1452	(660)	
B300 R	51.18 (1300)	5.31 (135)	15.16 (385)	M14	M30 x 70 (22)	507	(15000)	2310	(1050)	
BS335 R	59.06 (1500)	5.31 (135)	16.34 (415)	M16	M36 x 85 (22)	541	(16000)	2662	(1210)	
B350 R	62.99 (1600)	5.31 (135)	17.40 (442)	M16	M36 x 85 (22)	609	(18000)	3762	(1710)	
BS425 R	70.87 (1800)	6.50 (165)	20.87 (530)	M20	M36 x 85 (26)	1082	(32000)	3476	(1580)	
BS450 R	0.00 (2000)	0.00 (165)	0.00 (550)	M20	M42 x 100 (26)	1183	(35000)	6446	(2930)	



HOW TO ORDER

BS/BS-HS SERIES SAFETY COVER

This safety cover is specifically designed to fit the BS and BS-HS Series Cam Clutch. The safety cover is intended to protect and cover the rotating portion of the Cam Clutch from debris and foreign objects entering the rotating portion of the unit.

Example How to Order Code: Example Model Number for BS-HS Series Safety Cover

BS	160	HS	SC
Series	Frame Size in mm	Type	Safety Cover
BS: Backstop type	30	Blank: Standard BS Series units 35 through 200 Series	SC: Safety cover
	50		
	65		
	75		
	85		
	95		
	110		
	135		
	160	HS: High speed units only 160HS and 200HS	
	200		

Note: BS220 and larger safety cover options available on a made-to-order basis. Contact Tsubaki.

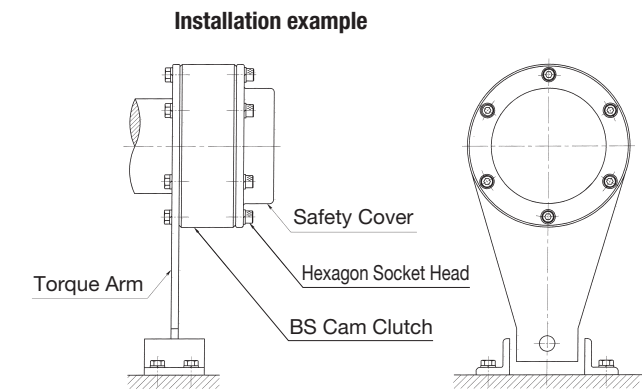
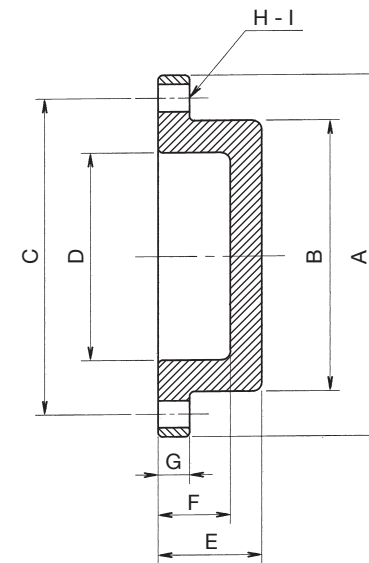
Cover Installed



Contents Delivered



BS/BS-HS SAFETY COVER



Dimensions and Capacities

Model	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)	G in. (mm)	H - I in. (mm)	M.B.S. - Qty.	Weight lb. (kg)
BS30SC	3.543 (90)	2.362 (60)	3.150 (80)	1.890 (48)	0.945 (24)	0.709 (18)	0.276 (7)	4-6.6	M6 x 16 (4)	1.1 (0.5)
BS50SC	4.921 (125)	3.346 (85)	4.331 (110)	2.874 (73)	1.063 (27)	0.827 (21)	0.276 (7)	4-9.0	M8 x 20 (4)	2.0 (0.9)
BS65SC	6.299 (160)	4.331 (110)	5.512 (140)	3.780 (96)	1.299 (33)	1.024 (26)	0.315 (8)	6-11.0	M10 x 25 (6)	3.7 (1.7)
BS75SC	6.693 (170)	4.724 (120)	5.906 (150)	4.173 (106)	1.299 (33)	1.024 (26)	0.315 (8)	6-11.0	M10 x 25 (6)	4.0 (1.8)
BS85SC	8.268 (210)	5.709 (145)	7.283 (185)	5.157 (131)	1.417 (36)	1.142 (29)	0.315 (8)	6-13.5	M12 x 30 (6)	5.9 (2.7)
BS95SC	9.055 (230)	6.299 (160)	7.874 (200)	5.748 (146)	1.496 (38)	1.220 (31)	0.315 (8)	6-15.5	M14 x 35 (6)	7.3 (3.3)
BS110SC	10.630 (270)	6.890 (175)	8.661 (220)	6.260 (159)	1.969 (50)	1.654 (42)	0.394 (10)	6-17.5	M16 x 40 (6)	12.1 (5.5)
BS135SC	12.598 (320)	9.055 (230)	11.024 (280)	8.425 (214)	1.969 (50)	1.654 (42)	0.394 (10)	8-17.5	M16 x 40 (6)	16.5 (7.5)
BS160SC	14.173 (360)	10.236 (260)	12.402 (315)	9.606 (244)	1.969 (50)	1.654 (42)	0.394 (10)	10-22.0	M20 x 45 (10)	20.2 (9.2)
BS160HSSC	14.173 (360)	10.236 (260)	12.402 (315)	9.606 (244)	1.969 (50)	1.654 (42)	0.394 (10)	10-22.0	M20 x 45 (10)	20.2 (9.2)
BS200SC	16.929 (430)	12.598 (320)	14.961 (380)	11.969 (304)	2.165 (55)	1.850 (47)	0.394 (10)	8-24.0	M22 x 50 (8)	28.6 (13)
BS200HSSC	16.929 (430)	12.598 (320)	14.961 (380)	11.969 (304)	2.165 (55)	1.850 (47)	0.394 (10)	8-24.0	M22 x 50 (8)	28.6 (13)

HOW TO ORDER



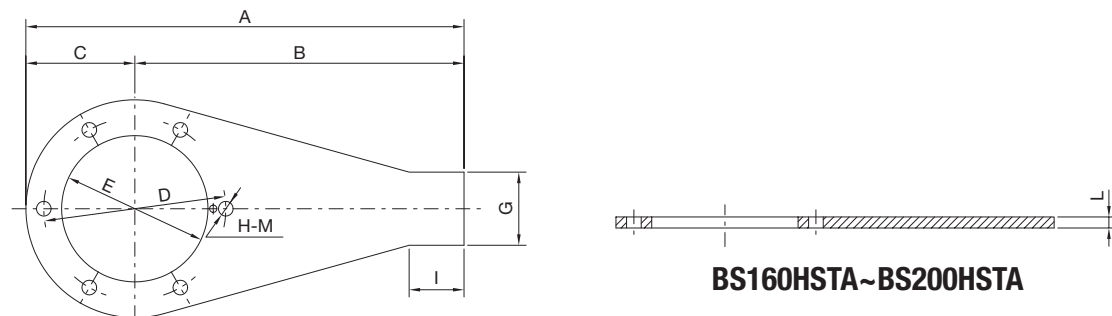
BS-HS SERIES TORQUE ARM

Select applications may require the addition of a torque arm depending on how the Cam Clutch is to be mounted or implemented into the system. The following provides direction as to how to order a specific torque arm for a given Cam Clutch size and series.

Example How to Order Code: Example Model Number for BS-HS Series Torque Arm

BS	160	HS	TA
Series	Cam Clutch Frame Size*	High-Speed	Torque Arm
BS: Backstop type	160	HS: High speed/ High strength	TA: Torque arm
	200		
	220		
	250		
	270		
	300		
	350		
	425		
450			

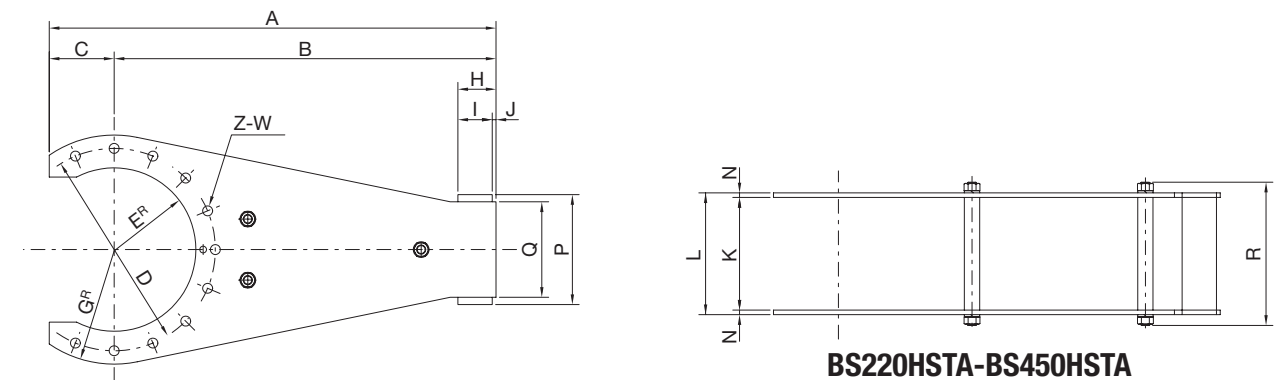
* Frame size listed is to be used with the applicable BS-HS Series frame size listed on page 79. All BS-HS Series Cam Clutch torque arms are made-to-order (MTO)



Single Torque Arm Style

Dimensions and Capacities										
Torque Arm	A	B	C	D	E	G	I	L	H-M	Weight
	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	Qt. & Dia.	lb. (kg)
BS160HSTA	31.181 (792)	24.094 (612)	7.087 (180)	12.402 (315)	10.236 (260)	4.724 (120)	2.559 (65)	1.102 (28)	10-22.0	64 (29.3)
BS200HSTA	32.992 (838)	24.528 (623)	8.465 (215)	14.961 (380)	12.205 (310)	5.118 (130)	2.756 (70)	1.102 (28)	8-24.0	77 (34.8)

TORQUE ARM (OPTION)



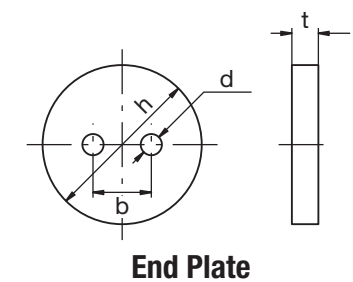
Dual Torque Arm Style

Dimensions and Capacities																	
Torque Arm	A	B	C	D	E	G	H	I	J	K	L	N	P	Q	R	W-Z	Weight
	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	in. (mm)	Qt. & Dia.	lb. (kg)
BS220HSTA	37.402 (950)	32.283 (820)	5.118 (130)	16.535 (420)	6.929 (176)	9.252 (235)	3.150 (80)	2.756 (70)	0.394 (10)	12.992 (330)	14.488 (368)	0.748 (19)	9.370 (238)	7.874 (200)	16.535 (420)	11-22	176 (80)
BS250HSTA	46.063 (1170)	39.370 (1000)	6.693 (170)	20.866 (530)	8.425 (214)	11.811 (300)	3.937 (100)	3.543 (90)	0.394 (10)	14.567 (370)	16.063 (408)	0.748 (19)	11.339 (288)	9.843 (250)	18.268 (464)	11-26	286 (130)
BS270HSTA	50.000 (1270)	43.307 (1100)	6.693 (170)	22.638 (575)	9.252 (235)	12.795 (325)	4.331 (110)	3.937 (100)	0.394 (10)	15.157 (385)	16.654 (423)	0.748 (19)	11.732 (298)	10.236 (260)	18.858 (479)	11-26	330 (150)
BS300HSTA	58.268 (1480)	51.181 (1300)	7.087 (180)	27.165 (690)	11.220 (285)	15.354 (390)	5.315 (135)	4.724 (120)	0.591 (15)	16.732 (425)	18.937 (481)	1.102 (28)	14.016 (356)	11.811 (300)	21.378 (543)	11-32	616 (280)
BS350HSTA	72.835 (1850)	62.992 (1600)	9.843 (250)	32.087 (815)	12.913 (328)	18.307 (465)	5.315 (135)	4.724 (120)	0.591 (15)	17.323 (440)	19.528 (496)	1.102 (28)	16.299 (414)	13.780 (350)	22.362 (568)	11-39	924 (420)
BS425HSTA	83.071 (2110)	70.866 (1800)	12.205 (310)	37.008 (940)	14.961 (380)	20.276 (515)	6.496 (165)	5.906 (150)	0.591 (15)	22.441 (570)	24.961 (634)	1.260 (32)	18.661 (474)	16.142 (410)	28.346 (720)	11-39	1364 (620)
BS450HSTA	91.339 (2320)	78.740 (2000)	12.598 (320)	38.976 (990)	15.748 (400)	21.457 (545)	6.496 (165)	5.906 (150)	0.591 (15)	22.441 (570)	24.961 (634)	1.260 (32)	20.709 (526)	17.717 (450)	28.346 (720)	11-45	1628 (740)

End Plate Dimension Table:

Dimensions for end plates are for reference purposes only. Depending on the application, an end plate may or may not be required. Dimensions provided in the end plate dimensional table are intended to provide end users the ability to fabricate an end plate in the event one is needed.

Model	h	t	d	b	Bolt Size
	in. (mm)	in. (mm)	in. (mm)	in. (mm)	
BS160HS	7.874 (200)	0.394 (10)	0.571 (14.5)	2.362 (60)	M12
BS200HS	9.449 (240)	0.394 (10)	0.571 (14.5)	2.362 (60)	M12
BS220HS	11.024 (280)	0.551 (14)	0.571 (14.5)	2.362 (60)	M12
BS250HS	12.205 (310)	0.551 (14)	0.728 (18.5)	3.937 (100)	M16
BS270HS	12.992 (330)	0.551 (14)	0.728 (18.5)	3.937 (100)	M16
BS300HS	14.173 (360)	0.551 (14)	0.728 (18.5)	3.937 (100)	M16
BS335HS	14.961 (380)	0.551 (14)	0.728 (18.5)	3.937 (100)	M16
BS425HS	18.110 (460)	0.709 (18)	0.886 (23)	5.906 (150)	M20
BS450HS	20.079 (510)	0.709 (18)	0.886 (23)	5.906 (150)	M20





HOW TO ORDER

BS SERIES TORQUE ARM

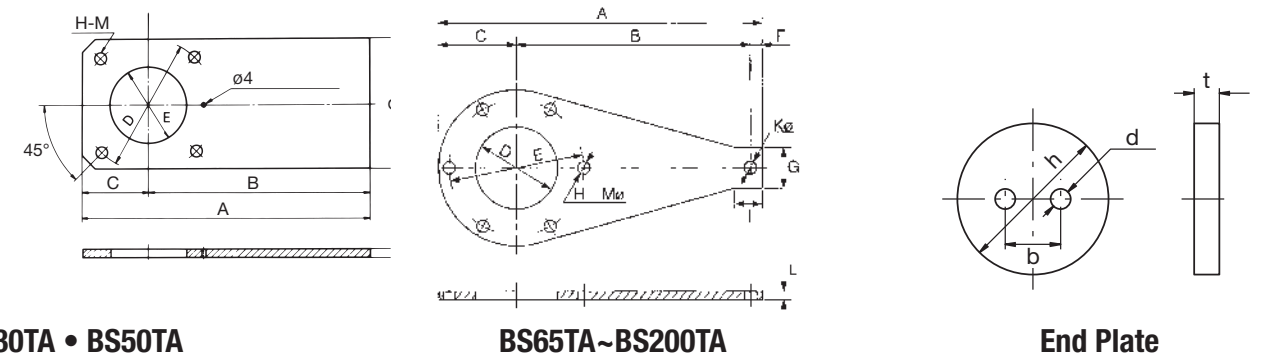
Select applications may require the addition of a torque arm depending on how the Cam Clutch is to be mounted or implemented into the system. The following provides direction as to how to order a specific torque arm for a given Cam Clutch size and series.

Example How to Order Code: Example Model Number for BS Series Torque Arm

BS	30	TA
Series	Frame Size in mm*	Torque Arm
BS: Backstop type	30	TA: Torque arm
	50	
	65	
	75	
	85	
	95	
	110	
	135	
	160	
	200	
	220	
	250	
	270	
	300	
335		
350		
425		
450		

* Frame size listed is to be used with the applicable BS Series frame size listed on pages 81-86. Items in bold are commonly stocked sizes. Items that are not in bold are made-to-order (MTO). Contact Tsubaki for BS220 to BS450 Torque Arm dimensions.

TORQUE ARM (OPTION)



BS30TA • BS50TA

BS65TA~BS200TA

End Plate

Single Torque Arm Style

Dimensions and Capacities												
Torque Arm	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	F in. (mm)	G in. (mm)	I in. (mm)	K in. (mm)	L in. (mm)	H-M Qt. & Dia.	Weight lb. (kg)
BS30TA	6.614 (168)	5.118 (130)	1.496 (38)	3.150 (80)	2.165 (55)	-	2.953 (75)	-	-	0.236 (6)	4 - 6.6	1.1 (0.5)
BS50TA	9.055 (230)	7.087 (180)	1.969 (50)	4.331 (110)	3.150 (80)	-	3.937 (100)	-	-	0.236 (6)	4-9	1.8 (0.8)
BS65TA	12.047 (306)	8.268 (210)	3.150 (80)	5.512 (140)	3.543 (90)	0.630 (16)	1.969 (50)	1.181 (30)	0.531 (13.5)	0.236 (6)	6 - 11	2.6 (1.2)
BS75TA	13.937 (354)	9.843 (250)	3.346 (85)	5.906 (150)	3.937 (100)	0.748 (19)	2.559 (65)	1.378 (35)	0.650 (16.5)	0.236 (6)	6 - 11	3.5 (1.6)
BS85TA	17.087 (434)	11.811 (300)	4.134 (105)	7.283 (185)	4.528 (115)	1.142 (29)	3.740 (95)	1.772 (45)	0.807 (20.5)	0.354 (9)	6 - 14	8.4 (3.8)
BS95TA	19.567 (497)	13.780 (350)	4.528 (115)	7.874 (200)	5.118 (130)	1.260 (32)	4.134 (105)	2.165 (55)	0.807 (20.5)	0.354 (9)	6 - 16	10.3 (4.7)
BS110TA	22.047 (560)	15.157 (385)	5.315 (135)	8.661 (220)	5.512 (140)	1.575 (40)	4.331 (110)	2.362 (60)	0.906 (26)	0.472 (12)	6 - 18	18.3 (8.3)
BS135TA	26.220 (666)	18.504 (470)	6.299 (160)	11.024 (280)	7.087 (180)	1.417 (36)	4.724 (120)	2.559 (65)	1.024 (26)	0.472 (12)	6 - 18	24.4 (11.1)
BS160TA	31.181 (792)	22.835 (580)	7.087 (180)	12.402 (315)	10.236 (260)	1.260 (32)	4.724 (120)	2.559 (65)	1.220 (31)	0.748 (19)	10 - 22	44.0 (20)
BS200TA	32.992 (838)	22.835 (580)	8.465 (215)	14.961 (380)	12.205 (310)	1.693 (43)	5.118 (130)	2.756 (70)	1.614 (41)	0.748 (19)	9 - 24	52.4 (23.8)

End Plate Dimension Table:

Dimensions for end plates are for reference purposes only. Depending on the application, an end plate may or may not be required. Dimensions provided in the end plate dimensional table are intended to provide end users the ability to fabricate an end plate in the event one is needed.

Model	h in. (mm)	t in. (mm)	d in. (mm)	b in. (mm)	Bolt Size	Model	h in. (mm)	t in. (mm)	d in. (mm)	b in. (mm)	Bolt Size
BS30	1.772 (45)	0.177 (4.5)	0.236 (6)	0.394 (10)	M5	BS95	4.921 (125)	0.354 (9)	0.453 (11.5)	1.772 (45)	M10
BS50	2.756 (70)	0.177 (4.5)	0.276 (7)	0.787 (20)	M6	BS110	5.512 (140)	0.354 (9)	0.453 (11.5)	1.772 (45)	M10
BS65	3.543 (90)	0.236 (6)	0.374 (9.5)	0.984 (25)	M8	BS135	6.890 (175)	0.394 (10)	0.453 (11.5)	1.772 (45)	M10
BS75	3.937 (100)	0.236 (6)	0.374 (9.5)	0.984 (25)	M8	BS160	7.874 (200)	0.394 (10)	0.571 (14.5)	2.362 (60)	M12
BS85	4.528 (115)	0.354 (9)	0.374 (9.5)	0.984 (25)	M8	BS200	9.449 (240)	0.394 (10)	0.571 (14.5)	2.362 (60)	M12



HOW TO ORDER

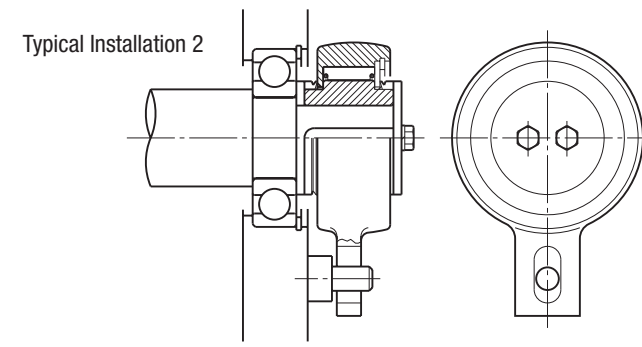
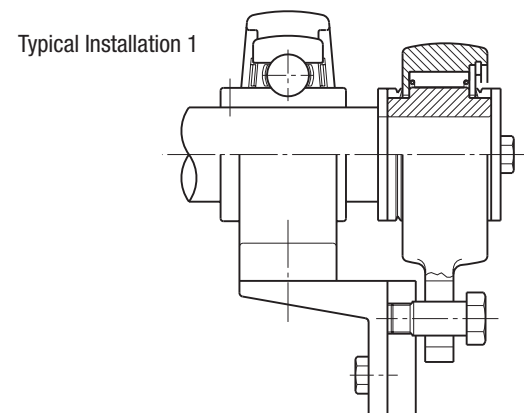
BSEU SERIES CAM CLUTCH

BSEU Series Cam Clutch was developed as a user-friendly backstopping Cam Clutch. It has cam and roller construction which is the same as the smaller size BS Series Cam Clutch. The outer race has a special shape which combines the torque arm providing easy installation. These Cam Clutches are shipped pre-lubricated with grease and ready for installation. Most often used as a backstop in applications where limited space is available.

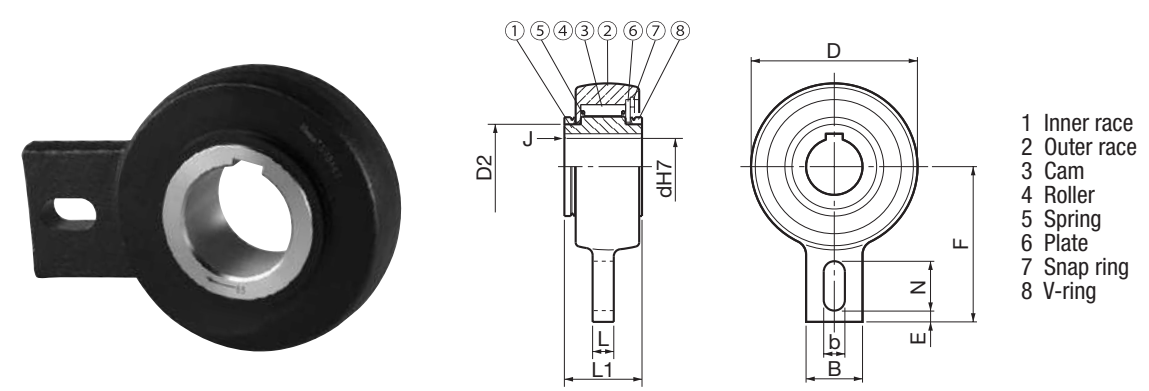
Example How to Order Code: BSEU Series Cam Clutch

BSEU	90	-	80
Series	Size		Bore
BSEU: Backstop type with integral torque arm	25	-	20
			25
	40	-	20
			25
			30
			35
			40
	70	-	45
			50
			55
			60
			65
			70
			90
	80		
	85		
	90		

Specifications		
Torque Capacity		Overrunning Speed
lb.ft.	(Nm)	Max. r/min
159	(216)	500
159	(216)	500
1062	(1440)	450
1062	(1440)	450
1062	(1440)	450
1062	(1440)	450
2316	(3140)	350
2316	(3140)	350
2316	(3140)	350
2316	(3140)	350
2316	(3140)	350
2316	(3140)	350
3467	(4700)	250
3467	(4700)	250
3467	(4700)	250
3467	(4700)	250



BSEU SERIES CAM CLUTCH



Shaft tolerances are found on page 41.

Dimensions and Capacities													
Model	Bore Size in. (mm)	Inner Race Keyway (mm)	D in. (mm)	D2 in. (mm)	L1 in. (mm)	L in. (mm)	B in. (mm)	F in. (mm)	b in. (mm)	N in. (mm)	E in. (mm)	J in. (mm)	Weight Max, lb. (kg)
BSEU25-20	0.787 (20)	6 x 2.8	3.268 (83)	1.654 (42)	1.378 (35)	0.472 (12)	1.575 (40)	3.543 (90)	0.591 (15)	1.378 (35)	0.197 (5)	0.039 (1)	2.2 (1)
BSEU25-25	0.984 (25)	8 x 3.3	3.268 (83)	1.654 (42)	1.378 (35)	0.472 (12)	1.575 (40)	3.543 (90)	0.591 (15)	1.378 (35)	0.197 (5)	0.039 (1)	2.2 (1)
BSEU40-20	0.787 (20)	6 x 2.8	4.646 (118)	2.362 (60)	2.165 (55)	0.591 (15)	1.575 (40)	4.331 (110)	0.591 (15)	1.378 (35)	0.315 (8)	0.059 (1.5)	8.4 (3.8)
BSEU40-25	0.984 (25)	8 x 3.3	4.646 (118)	2.362 (60)	2.165 (55)	0.591 (15)	1.575 (40)	4.331 (110)	0.591 (15)	1.378 (35)	0.315 (8)	0.059 (1.5)	8.4 (3.8)
BSEU40-30	1.181 (30)	8 x 3.3	4.646 (118)	2.362 (60)	2.165 (55)	0.591 (15)	1.575 (40)	4.331 (110)	0.591 (15)	1.378 (35)	0.315 (8)	0.059 (1.5)	8.4 (3.8)
BSEU40-35	1.378 (35)	10 x 3.3	4.646 (118)	2.362 (60)	2.165 (55)	0.591 (15)	1.575 (40)	4.331 (110)	0.591 (15)	1.378 (35)	0.315 (8)	0.059 (1.5)	8.4 (3.8)
BSEU40-40	1.575 (40)	12 x 3.3	4.646 (118)	2.362 (60)	2.165 (55)	0.591 (15)	1.575 (40)	4.331 (110)	0.591 (15)	1.378 (35)	0.315 (8)	0.059 (1.5)	8.4 (3.8)
BSEU70-45	1.772 (45)	14 x 3.8	6.496 (165)	3.543 (90)	2.323 (59)	0.787 (20)	3.150 (80)	5.512 (140)	0.709 (18)	1.378 (35)	0.394 (10)	0.059 (1.5)	16.7 (7.6)
BSEU70-50	1.969 (50)	14 x 3.8	6.496 (165)	3.543 (90)	2.323 (59)	0.787 (20)	3.150 (80)	5.512 (140)	0.709 (18)	1.378 (35)	0.394 (10)	0.059 (1.5)	16.7 (7.6)
BSEU70-55	2.165 (55)	16 x 4.3	6.496 (165)	3.543 (90)	2.323 (59)	0.787 (20)	3.150 (80)	5.512 (140)	0.709 (18)	1.378 (35)	0.394 (10)	0.079 (2)	16.7 (7.6)
BSEU70-60	2.362 (60)	18 x 4.4	6.496 (165)	3.543 (90)	2.323 (59)	0.787 (20)	3.150 (80)	5.512 (140)	0.709 (18)	1.378 (35)	0.394 (10)	0.079 (2)	16.7 (7.6)
BSEU70-65	2.559 (65)	18 x 4.4	6.496 (165)	3.543 (90)	2.323 (59)	0.787 (20)	3.150 (80)	5.512 (140)	0.709 (18)	1.378 (35)	0.394 (10)	0.079 (2)	16.7 (7.6)
BSEU70-70	2.756 (70)	20 x 4.9	6.496 (165)	3.543 (90)	2.323 (59)	0.787 (20)	3.150 (80)	5.512 (140)	0.709 (18)	1.378 (35)	0.394 (10)	0.079 (2)	16.7 (7.6)
BSEU90-75	2.953 (75)	20 x 4.9	7.480 (190)	4.724 (120)	2.480 (63)	0.787 (20)	3.150 (80)	6.496 (165)	0.787 (20)	1.575 (40)	0.591 (15)	0.079 (2)	22.0 (10)
BSEU90-80	3.150 (80)	22 x 5.4	7.480 (190)	4.724 (120)	2.480 (63)	0.787 (20)	3.150 (80)	6.496 (165)	0.787 (20)	1.575 (40)	0.591 (15)	0.079 (2)	22.0 (10)
BSEU90-85	3.346 (85)	22 x 5.4	7.480 (190)	4.724 (120)	2.480 (63)	0.787 (20)	3.150 (80)	6.496 (165)	0.787 (20)	1.575 (40)	0.591 (15)	0.079 (2)	22.0 (10)
BSEU90-90	3.543 (90)	25 x 5.4	7.480 (190)	4.724 (120)	2.480 (63)	0.787 (20)	3.150 (80)	6.496 (165)	0.787 (20)	1.575 (40)	0.591 (15)	0.079 (2)	22.0 (10)

HOW TO ORDER



BR-HT SERIES CAM CLUTCH

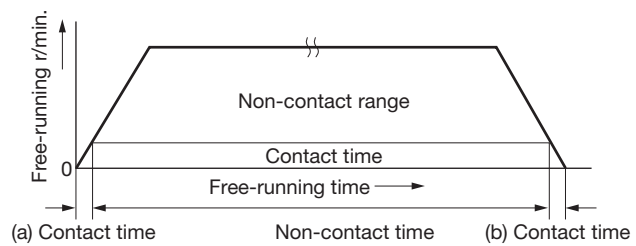
BR-HT is mainly used in backstop applications as an integral part of a gear reducer. Prevention of reverse rotation for inclined conveyor and bucket elevator are typical application examples. BR-HT assures not only the immediate backstop function under high torque, but also long service life by the "lift-off" design. In addition, installation on the high speed shaft with low torque enables selection of more compact models with resulting lower cost.

Example How To Order Code: BR-HT Series Cam Clutch

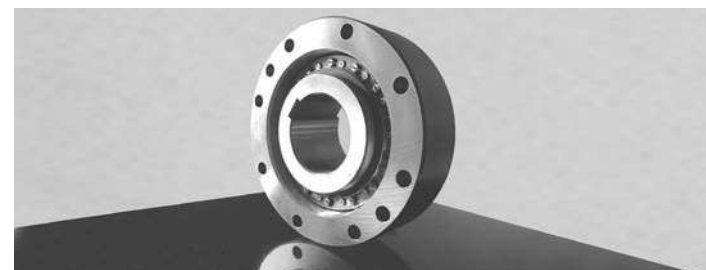
BR	40	HT	-	R66B	-	35
Series	Size	Descriptor	-	Cross	-	Bore
BR: High speed overrunning backstop clutch	40: Size of the Cam Clutch BR-HT Series has sizes available from 15 thru 300	HT: Descriptor for high torque capacity	-	R66B: Provides interchange information plus description of the cam cage width The "B" is an internal Tsubaki designator for the width of the cam	-	35: 35 mm bore diameter For each size within a given BR Series Cam Clutch, multiple bore diameters are available

Service Life of BR-HT Series

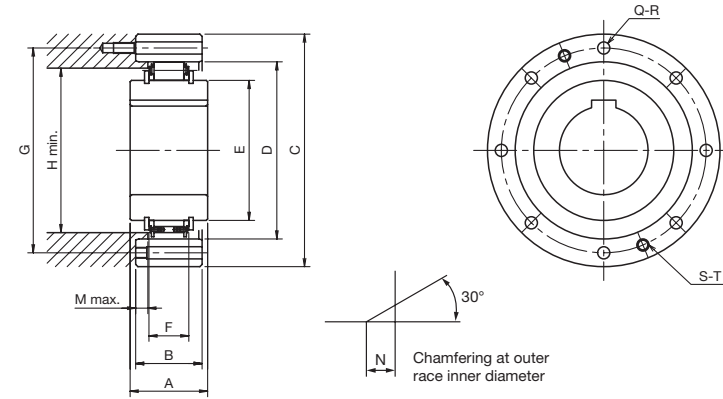
The service life of previous TSUBAKI Cam Clutch models was determined as the frictional service life during free-running (when the clutch was disengaged) and the fatigue service life of the engaged clutch. However, with BR-HT Series, frictional service life is not a factor because there is no mechanical contact when the clutch is disengaged. As a result, service life is determined solely by the fatigue life of the engaged clutch.



Friction in the clutch mechanism only occurs during a very short period of time denoted by "a" and "b". "a" is the time during which the cam is engaged until the acceleration of inner race causes it to disengage. "b" is the time during which the cam engages when the inner race decelerates.



BR-HT SERIES CAM CLUTCH



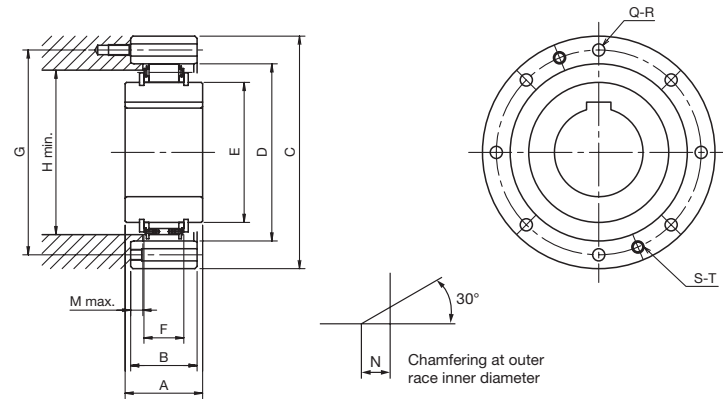
Shaft tolerances are found on page 41.

Dimensions and Capacities

Model	Bore Size mm	T.C. lb.ft (Nm)	Inner Race Overrunning Speed (r/min)		Max. Engage- ment (r/min)	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	Mounting Holes		Removal Holes Qty-Size S-T	F in. (mm)	Weight lbs. (kg)	H min. in. (mm)	M max. in. (mm)	N Chamfer in. (mm)
			Min.	Max.							PCD G	Qty-Size Q-R						
BR15HT-R31A	*20	77 (105)	880	3600	550	0.945 (24)	0.984 (25)	3.346 (85)	2.165 (55)	1.181 (30)	2.756 (70)	6-M6	2-M6	0.669 (17)	1.8 (0.8)	1.772 (45)	0.118 (3)	0.039 (1)
BR18HT-R38A	*25	114 (155)	850	3600	500	0.945 (24)	0.984 (25)	3.543 (90)	2.441 (62)	1.457 (37)	2.953 (75)	6-M6	2-M6	0.669 (17)	2.0 (0.9)	1.969 (50)	0.118 (3)	0.039 (1)
BR20HT-S20B	20	166 (225)	850	3600	400	1.378 (35)	1.378 (35)	3.543 (90)	2.598 (66)	1.614 (41)	3.071 (78)	6-M6	2-M6	0.984 (25)	2.9 (1.3)	2.087 (53)	0.157 (4)	0.039 (1)
BR25HT-B46B	25 30	295 (400)	800	3600	380	1.378 (35)	1.378 (35)	3.740 (95)	2.756 (70)	1.772 (45)	3.228 (82)	6-M6	2-M6	0.984 (25)	3.1 (1.4)	2.283 (58)	0.157 (4)	0.039 (1)
BR30HT-S30B	30	369 (500)	740	3600	360	1.378 (35)	1.378 (35)	3.937 (100)	2.953 (75)	1.969 (50)	3.425 (87)	6-M6	2-M6	0.984 (25)	3.3 (1.5)	2.520 (64)	0.157 (4)	0.039 (1)
BR30HT-R51B	25 30 35 36	369 (500)	740	3600	360	1.378 (35)	1.378 (35)	4.134 (105)	2.953 (75)	1.969 (50)	3.543 (90)	6-M6	2-M6	0.984 (25)	4.0 (1.8)	2.520 (64)	0.157 (4)	0.039 (1)
BR35HT-B56B	35 40	443 (600)	710	3600	340	1.378 (35)	1.378 (35)	4.331 (110)	3.150 (80)	2.165 (55)	3.780 (96)	8-M6	2-M6	0.984 (25)	4.2 (1.9)	2.756 (70)	0.157 (4)	0.039 (1)
BR38HT-R61A	30 35 40 *45	313 (425)	740	3600	400	0.984 (25)	0.984 (25)	4.724 (120)	3.346 (85)	2.362 (60)	4.134 (105)	6-M8	2-M8	0.748 (19)	4.0 (1.8)	2.913 (74)	0.118 (3)	0.039 (1)
BR40HT-S40B	40	627 (850)	670	3600	320	1.378 (35)	1.378 (35)	4.921 (125)	3.543 (90)	2.559 (65)	4.252 (108)	8-M8	2-M8	0.984 (25)	5.3 (2.4)	3.228 (82)	0.157 (4)	0.039 (1)
BR40HT-R66B	35 40 45 *48	627 (850)	670	3600	320	1.378 (35)	1.378 (35)	5.197 (132)	3.543 (90)	2.559 (65)	4.528 (115)	8-M8	2-M8	0.984 (25)	6.4 (2.9)	3.228 (82)	0.157 (4)	0.039 (1)
BR45HT-S45B	45	701 (950)	640	3600	310	1.378 (35)	1.378 (35)	5.118 (130)	3.740 (95)	2.756 (70)	4.409 (112)	8-M8	2-M8	0.984 (25)	5.7 (2.6)	3.386 (86)	0.157 (4)	0.039 (1)
BR48HT-R76B	45 55 *60	811 (1100)	620	3600	300	1.378 (35)	1.378 (35)	5.512 (140)	3.937 (100)	2.953 (75)	4.921 (125)	8-M8	2-M8	0.984 (25)	7.3 (3.3)	3.622 (92)	0.157 (4)	0.039 (1)
BR50HT-B86B	40 45 50 60 65 *70	1069 (1450)	590	3600	280	1.575 (40)	1.575 (40)	5.906 (150)	4.331 (110)	3.346 (85)	5.197 (132)	8-M8	2-M8	0.984 (25)	9.5 (4.3)	4.055 (103)	0.256 (6.5)	0.039 (1)
BR58HT-R101B	55 70 *80	1328 (1800)	550	3600	260	1.969 (50)	1.969 (50)	6.890 (175)	4.921 (125)	3.937 (100)	6.102 (155)	8-M10	2-M10	0.984 (25)	14.7 (6.7)	4.606 (117)	0.453 (11.5)	0.039 (1)
BR60HT-B85A	45 50 60 65	1770 (2400)	420	3600	230	2.362 (60)	1.969 (50)	6.890 (175)	4.921 (125)	3.622 (92)	6.102 (155)	8-M10	2-M10	1.417 (36)	16.7 (7.6)	4.331 (110)	0.236 (6)	0.039 (1)
BR70HT-B100A	45 50 55 60 70 75 *80	2323 (3150)	390	3600	220	2.362 (60)	1.969 (50)	7.480 (190)	5.512 (140)	4.213 (107)	6.496 (165)	12-M10	2-M10	1.417 (36)	20.2 (9.2)	4.921 (125)	0.236 (6)	0.059 (1.5)
BR80HT-S80A	80	3688 (5000)	440	3600	200	2.756 (70)	2.362 (60)	8.268 (210)	6.299 (160)	5.000 (127)	7.283 (185)	12-M10	2-M10	1.417 (36)	26.4 (12)	5.827 (148)	0.433 (11)	0.059 (1.5)
BR80HT-B120B	60 65 70 75 80 95	5163 (7000)	310	3600	160	2.756 (70)	2.362 (60)	8.268 (210)	6.299 (160)	5.000 (127)	7.283 (185)	12-M10	2-M10	1.969 (50)	28.6 (13)	5.827 (148)	0.157 (4)	0.059 (1.5)
BR90HT-S90A	90	4425 (6000)	410	3000	190	3.150 (80)	2.756 (70)	9.055 (230)	7.087 (180)	5.787 (147)	8.110 (206)	12-M12	2-M12	1.417 (36)	35.2 (16)	6.693 (170)	0.630 (16)	0.079 (2)
BR90HT-B140B	65 90 100 110	6638 (9000)	300	3000	150	2.756 (70)	2.756 (70)	9.646 (245)	7.087 (180)	5.787 (147)	8.583 (218)	12-M12	2-M12	1.969 (50)	44.0 (20)	6.693 (170)	0.354 (9)	0.079 (2)
BR95HT-S100C	100	15120 (20500)	240	2700	130	3.543 (90)	3.150 (80)	11.417 (290)	8.268 (210)	6.969 (177)	10.157 (258)	12-M16	2-M16	2.480 (63)	72.6 (33)	7.874 (200)	0.295 (7.5)	0.079 (2)
BR95HT-R170C	70 85 90 100 120 130	15120 (20500)	240	2700	130	3.150 (80)	3.150 (80)	11.417 (290)	8.268 (210)	6.969 (177)	10.157 (258)	12-M16	2-M16	2.480 (63)	77.0 (35)	7.874 (200)	0.295 (7.5)	0.079 (2)

- Notes:
1. T.C. = Torque Capacity. The maximum transmissible torque is twice the T.C.
 2. Keyway size is not listed in the table. Keyway size is per ISOR773 DIN6885.1 unless the bore is preceded by an asterisk (*). If bore is preceded by an asterisk, keyway is per DIN6885.3.
 3. Minimum overrunning speed of inner race should not be below listed value during continuous operation.
 4. Max. engagement speed must not be exceeded when transmitting torque.

BR-HT SERIES CAM CLUTCH



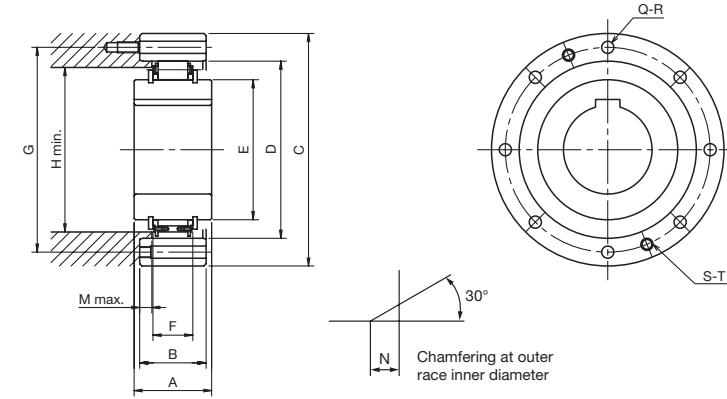
Shaft tolerances are found on page 41.

Dimensions and Capacities

Model	Bore Size mm	T.C. lb.ft (Nm)	Inner Race Overrunning Speed (r/min)		Max. Engage- ment (r/min)	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	Mounting Holes		Removal Holes Qty-Size S-T	F in. (mm)	Weight lbs. (kg)	H min. in. (mm)	M max. in. (mm)	N Chamfer in. (mm)
			Min.	Max.							PCD G	Qty-Size Q-R						
BR98HT-R200C	130 155	19914 (27000)	230	2100	110	3.150 (80)	3.150 (80)	12.205 (310)	9.449 (240)	8.150 (207)	10.945 (278)	12-M16	2-M16	2.480 (63)	72.6 (33)	9.055 (230)	0.295 (7.5)	0.079 (2)
BR100HT-S100A	100	8113 (11000)	440	2700	210	3.543 (90)	3.150 (80)	11.417 (290)	8.268 (210)	5.630 (143)	10.157 (258)	12-M16	2-M16	2.071 (52.6)	61.6 (28)	7.874 (200)	0.453 (11.5)	0.079 (2)
BR130HT-S130A	130	11801 (16000)	400	2400	190	3.150 (80)	3.150 (80)	12.677 (322)	9.449 (240)	6.811 (173)	10.945 (278)	12-M16	2-M16	2.071 (52.6)	72.6 (33)	8.268 (210)	0.453 (11.5)	0.079 (2)
BR180HT-S180A	180	23602 (32000)	300	1300	160	3.543 (90)	3.150 (80)	16.220 (412)	12.205 (310)	9.567 (243)	14.173 (360)	12-M20	2-M20	2.087 (53)	123.2 (56)	11.024 (280)	0.453 (11.5)	0.079 (2)
BR180HT-S180C	180	39091 (53000)	250	1300	120	4.724 (120)	4.724 (120)	16.614 (422)	12.205 (310)	9.567 (243)	14.567 (370)	16-M20	2-M20	3.268 (83)	187.0 (85)	11.024 (280)	0.650 (16.5)	0.079 (2)
BR180HT-S180WA	180	47204 (64000)	300	1300	160	6.299 (160)	6.299 (160)	16.220 (412)	12.205 (310)	9.567 (243)	14.173 (360)	12-M20	2-M20	4.173 (106)	235.4 (107)	11.024 (280)	1.181 (30)	0.079 (2)
BR180HT-S180WC	180	78181 (106000)	250	1300	120	9.449 (240)	9.449 (240)	16.732 (425)	12.205 (310)	9.567 (243)	14.567 (370)	16-M20	2-M20	6.535 (166)	382.8 (174)	11.024 (280)	1.378 (35)	0.079 (2)
BR180HT-R240A	185	23602 (32000)	220	1300	110	3.543 (90)	3.150 (80)	15.748 (400)	12.205 (310)	9.567 (243)	14.173 (360)	12-M20	2-M20	2.087 (53)	110.0 (50)	11.024 (280)	0.453 (11.5)	0.079 (2)
BR180HT-R240D	185	47204 (64000)	210	1300	100	4.724 (120)	4.921 (125)	16.535 (420)	12.205 (310)	9.567 (243)	14.567 (370)	16-M24	2-M24	3.780 (96)	184.8 (84)	11.024 (280)	0.492 (12.5)	0.079 (2)
BR180HT-R240WB	185	51629 (70000)	220	1300	110	6.299 (160)	6.299 (160)	16.220 (412)	12.205 (310)	9.567 (243)	14.173 (360)	24-M20	2-M20	5.512 (140)	220.0 (100)	11.024 (280)	0.315 (8)	0.079 (2)
BR180HT-R240WD	185	94408 (128000)	210	1300	100	9.449 (240)	9.449 (240)	16.732 (425)	12.205 (310)	9.567 (243)	14.567 (370)	24-M24	2-M24	7.559 (192)	358.6 (163)	11.024 (280)	0.866 (22)	0.079 (2)
BR190HT-R260A	205	28765 (39000)	200	1300	95	4.134 (105)	3.150 (80)	16.929 (430)	12.992 (330)	10.354 (263)	14.961 (380)	16-M20	2-M20	2.087 (53)	132.0 (60)	11.811 (300)	0.453 (11.5)	0.079 (2)
BR220HT-S220A	220	33190 (45000)	280	1100	140	4.134 (105)	3.150 (80)	18.504 (470)	14.173 (360)	11.535 (293)	16.142 (410)	16-M20	2-M20	2.087 (53)	162.8 (74)	12.992 (330)	0.453 (11.5)	0.079 (2)
BR220HT-S220C	220	51629 (70000)	230	1100	110	4.724 (120)	4.724 (120)	18.504 (470)	14.173 (360)	11.535 (293)	16.142 (410)	24-M20	2-M20	3.268 (83)	220.0 (100)	12.992 (330)	0.650 (16.5)	0.079 (2)
BR220HT-S220WA	220	66380 (90000)	280	1100	140	6.299 (160)	6.299 (160)	18.898 (480)	14.173 (360)	11.535 (293)	16.142 (410)	18-M24	2-M24	4.173 (106)	310.2 (141)	12.992 (330)	0.984 (25)	0.079 (2)
BR220HT-S220WC	220	103258 (140000)	230	1100	110	9.449 (240)	9.449 (240)	19.291 (490)	14.173 (360)	11.535 (293)	16.142 (410)	20-M30	2-M30	6.535 (166)	473.0 (215)	12.992 (330)	1.378 (35)	0.079 (2)
BR220HT-R290B	230	44254 (60000)	195	1100	115	4.134 (105)	3.150 (80)	18.110 (460)	14.173 (360)	11.535 (293)	16.142 (410)	16-M20	2-M20	2.756 (70)	191.4 (87)	12.992 (330)	0.118 (3)	0.079 (2)
BR220HT-R290D	230	67856 (92000)	190	1100	95	4.724 (120)	4.331 (110)	18.110 (460)	14.173 (360)	11.535 (293)	16.142 (410)	16-M20	2-M20	3.780 (96)	321.2 (146)	12.992 (330)	0.197 (5)	0.079 (2)
BR220HT-R290WB	230	88507 (120000)	195	1100	115	6.299 (160)	6.299 (160)	18.898 (480)	14.173 (360)	11.535 (293)	16.142 (410)	18-M24	2-M24	5.512 (140)	264.0 (120)	12.992 (330)	0.315 (8)	0.079 (2)
BR220HT-R290WD	230	135711 (184000)	190	1100	95	9.449 (240)	9.449 (240)	19.291 (490)	14.173 (360)	11.535 (293)	16.732 (425)	20-M30	2-M30	7.559 (192)	453.2 (206)	12.992 (330)	0.866 (22)	0.079 (2)
BR230HT-R310B	240	51629 (70000)	190	1100	90	4.331 (110)	4.921 (125)	19.567 (497)	14.961 (380)	12.323 (313)	17.717 (450)	24-M20	2-M20	2.756 (70)	242.0 (110)	13.780 (350)	1.004 (25.5)	0.118 (3)

- Notes: 1. T.C. = Torque Capacity. The maximum transmissible torque is twice the T.C.
 2. Keyway size is not listed in the table. Keyway size is per ISOR773 DIN6885.1 unless the bore is preceded by an asterisk (*)
 If bore is preceded by an asterisk, keyway is per DIN6885.3
 3. Minimum overrunning speed of inner race should not be below listed value during continuous operation.
 4. Max. engagement speed must not be exceeded when transmitting torque.

BR-HT SERIES CAM CLUTCH

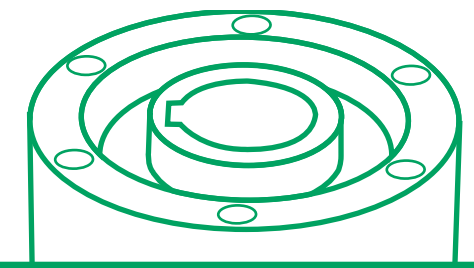


Shaft tolerances are found on page 41.

Dimensions and Capacities

Model	Bore Size mm	T.C. lb.ft (Nm)	Inner Race Overrunning Speed (r/min)		Max. Engage- ment (r/min)	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	Mounting Holes		Removal Holes Qty-Size S-T	F in. (mm)	Weight lbs. (kg)	H min. in. (mm)	M max. in. (mm)	N Chamfer in. (mm)
			Min.	Max.							PCD G	Qty-Size Q-R						
BR230HT-R310D	240	81132 (110000)	185	1100	80	4.724 (120)	4.921 (125)	19.567 (497)	14.961 (380)	12.323 (313)	17.717 (450)	24-M20	2-M20	3.780 (96)	255.2 (116)	13.780 (350)	0.492 (12.5)	0.118 (3)
BR240HT-S240A	240	39828 (54000)	220	1100	120	4.134 (105)	3.543 (90)	19.685 (500)	15.354 (390)	12.717 (323)	17.323 (440)	16-M20	2-M20	2.087 (53)	200.2 (91)	14.173 (360)	0.650 (16.5)	0.118 (3)
BR240HT-S240C	240	64905 (88000)	185	1100	110	4.724 (120)	4.724 (120)	20.472 (520)	15.354 (390)	12.717 (323)	17.323 (440)	16-M24	2-M24	3.268 (83)	283.8 (129)	14.173 (360)	0.650 (16.5)	0.118 (3)
BR240HT-S240WA	240	79656 (108000)	220	1100	120	7.087 (180)	7.087 (180)	19.882 (505)	15.354 (390)	12.717 (323)	17.323 (440)	24-M24	2-M24	4.173 (106)	354.2 (161)	14.173 (360)	1.378 (35)	0.118 (3)
BR240HT-S240WC	240	129811 (176000)	185	1100	110	9.449 (240)	9.449 (240)	20.866 (530)	15.354 (390)	12.717 (323)	17.323 (440)	24-M30	2-M30	6.535 (166)	547.8 (249)	14.173 (360)	1.378 (35)	0.118 (3)
BR240HT-R320B	250	56792 (77000)	190	1100	115	4.134 (105)	3.150 (80)	19.291 (490)	15.354 (390)	12.717 (323)	17.323 (440)	16-M24	2-M24	2.756 (70)	171.6 (78)	14.173 (360)	0.118 (3)	0.118 (3)
BR240HT-R320D	250	83344 (113000)	180	1100	105	4.724 (120)	4.724 (120)	20.472 (520)	15.354 (390)	12.717 (323)	17.323 (440)	16-M24	2-M24	3.780 (96)	281.6 (128)	14.173 (360)	0.394 (10)	0.118 (3)
BR240HT-R320WB	250	113584 (154000)	190	1100	115	7.087 (180)	7.087 (180)	19.882 (505)	15.354 (390)	12.717 (323)	17.323 (440)	24-M24	2-M24	5.512 (140)	380.6 (173)	14.173 (360)	0.709 (18)	0.118 (3)
BR240HT-R320WD	250	166689 (226000)	180	1100	105	9.449 (240)	9.449 (240)	20.866 (530)	15.354 (390)	12.717 (323)	18.110 (460)	24-M30	2-M30	7.559 (192)	569.8 (259)	14.173 (360)	0.866 (22)	0.118 (3)
BR260HT-S260A	260	48679 (66000)	250	1000	130	4.134 (105)	4.134 (105)	21.654 (550)	16.929 (430)	14.291 (363)	19.685 (500)	16-M24	2-M24	2.244 (57)	268.4 (122)	15.748 (400)	0.866 (22)	0.118 (3)
BR260HT-S260C	260	81132 (110000)	190	1000	100	4.921 (125)	4.921 (125)	22.835 (580)	16.929 (430)	14.291 (363)	19.685 (500)	24-M24	2-M24	3.425 (87)	374.0 (170)	15.748 (400)	0.669 (17)	0.118 (3)
BR260HT-S260WA	260	97358 (132000)	250	1000	130	8.268 (210)	8.268 (210)	21.654 (550)	16.929 (430)	14.291 (363)	19.685 (500)	24-M24	2-M24	4.488 (114)	517.0 (235)	15.748 (400)	1.811 (46)	0.118 (3)
BR260HT-S260WC	260	162263 (220000)	190	1000	100	9.843 (250)	9.843 (250)	22.835 (580)	16.929 (430)	14.291 (363)	19.685 (500)	24-M30	2-M30	6.850 (174)	710.6 (323)	15.748 (400)	1.417 (36)	0.118 (3)
BR260HT-R360D	280	110634 (150000)	170	1000	90	4.921 (125)	4.724 (120)	21.260 (540)	16.929 (430)	14.291 (363)	19.685 (500)	24-M24	2-M24	3.937 (100)	279.4 (127)	15.748 (400)	0.315 (8)	0.118 (3)
BR260HT-R360WB	280	144562 (196000)	175	1000	95	8.268 (210)	8.268 (210)	21.654 (550)	16.929 (430)	14.291 (363)	19.685 (500)	24-M24	2-M24	5.827 (148)	499.4 (227)	15.748 (400)	1.142 (29)	0.118 (3)
BR260HT-R360WD	280	221268 (300000)	170	1000	90	9.843 (250)	9.843 (250)	22.835 (580)	16.929 (430)	14.291 (363)	19.685 (500)	24-M30	2-M30	7.874 (200)	684.2 (311)	15.748 (400)	0.906 (23)	0.118 (3)
BR300HT-S300A	300	60480 (82000)	230	1000	120	4.134 (105)	4.134 (105)	24.803 (630)	18.898 (480)	16.260 (413)	22.047 (560)	24-M24	2					

Calculated Wear Life



LIFE OF CAM CLUTCH

Regarding Cam Clutch life, there are two conditions that have a major impact. These are listed below. When assessing the expected lifetime of the Cam Clutch it is important to consider these in relation to the actual application:

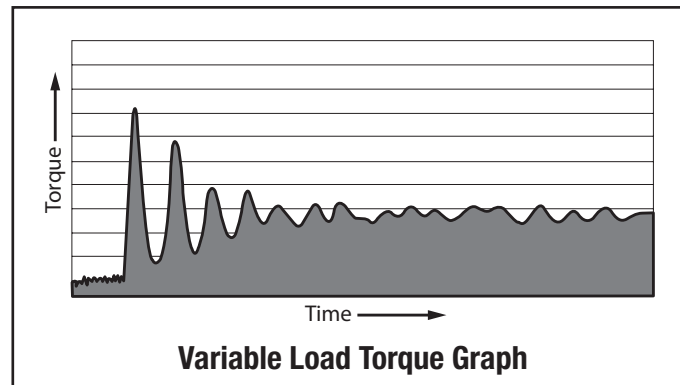
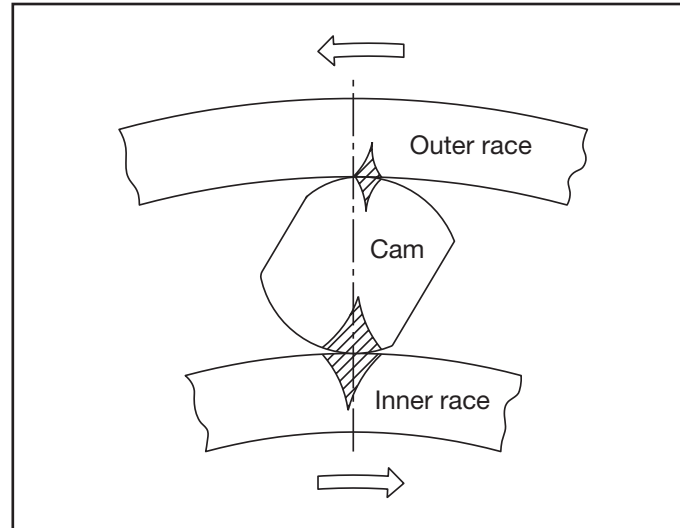
1. Overrunning abrasion (wear) life
2. Engagement fatigue life

When assessing the expected lifetime of the Cam Clutch, it is important to consider the above conditions in relation to the actual application.

Overrunning abrasion (wear) life

*When the Cam Clutch overruns:

On the contact surfaces of cams and races, skids occur in direct proportion to the overrunning rotational speed. Therefore it is important to pay particular attention to abrasions at the contact points. As the contact pressure by the weak spring force F is low, with sufficient lubrication, these parts will not wear or abrade in a short time. Though it may vary depending on the lubricating condition, the right graph shows the calculated abrasion life, which has been properly lubricated based on the instructions provided in the catalog. Abrasion life must be verified especially for applications involving high speed and long overrunning periods.



Engagement fatigue life

*When the Cam Clutch engages:

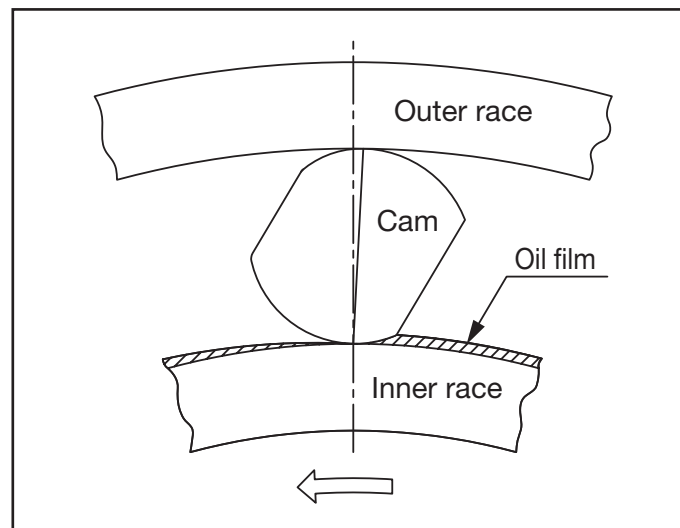
At the contact surfaces of cams and races, the compression stress occurs in direct proportion to engagement torque. Contact surface of inner/outer races move infinitely with respect to each engagement, while that of the cams are almost stable. Therefore, the fatigue caused by this stress will then result in the surface pitting of cams.

Refer to the fatigue life curve, and check the expected life.

Note:

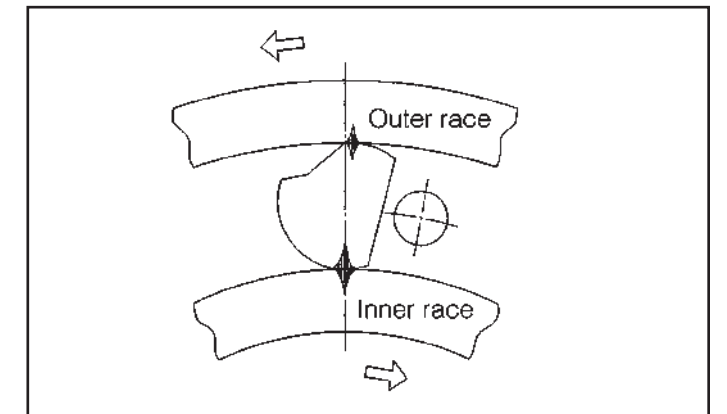
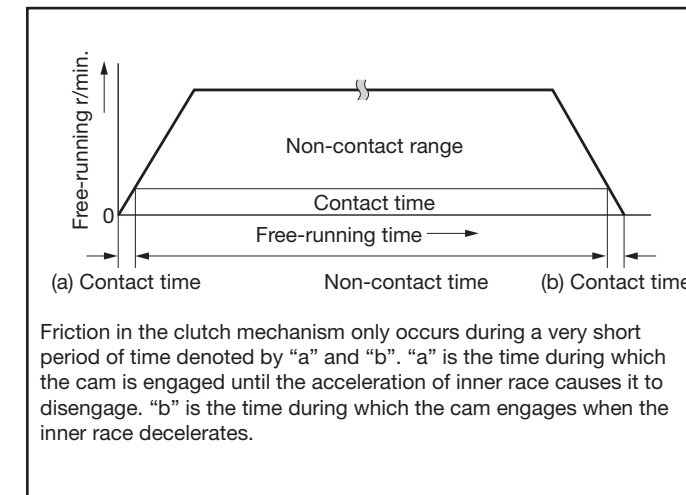
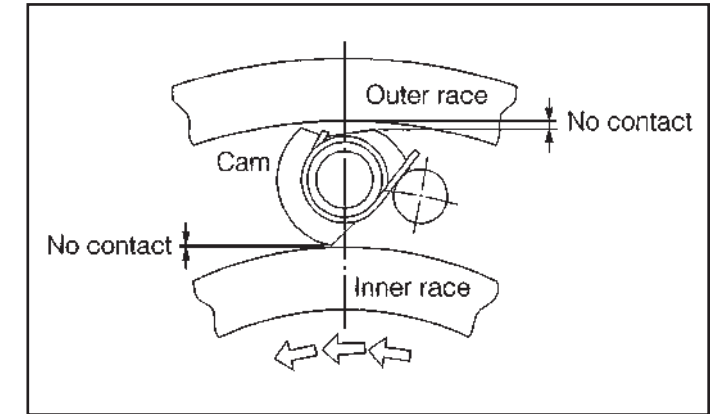
In cases where the load applied to the Cam Clutch changes, or where vibrational loads are encountered, repeated torque loads can be applied during a single clutch engagement. The Variable Load Torque Graph shows the type of repetitive torque loads which can be applied to the Cam Clutch in these cases. Repeated torque loads during a single clutch engagement can have the effect of increasing the overall torque load, and this must also be considered when determining Cam Clutch service life.

Fatigue Service Life Graph

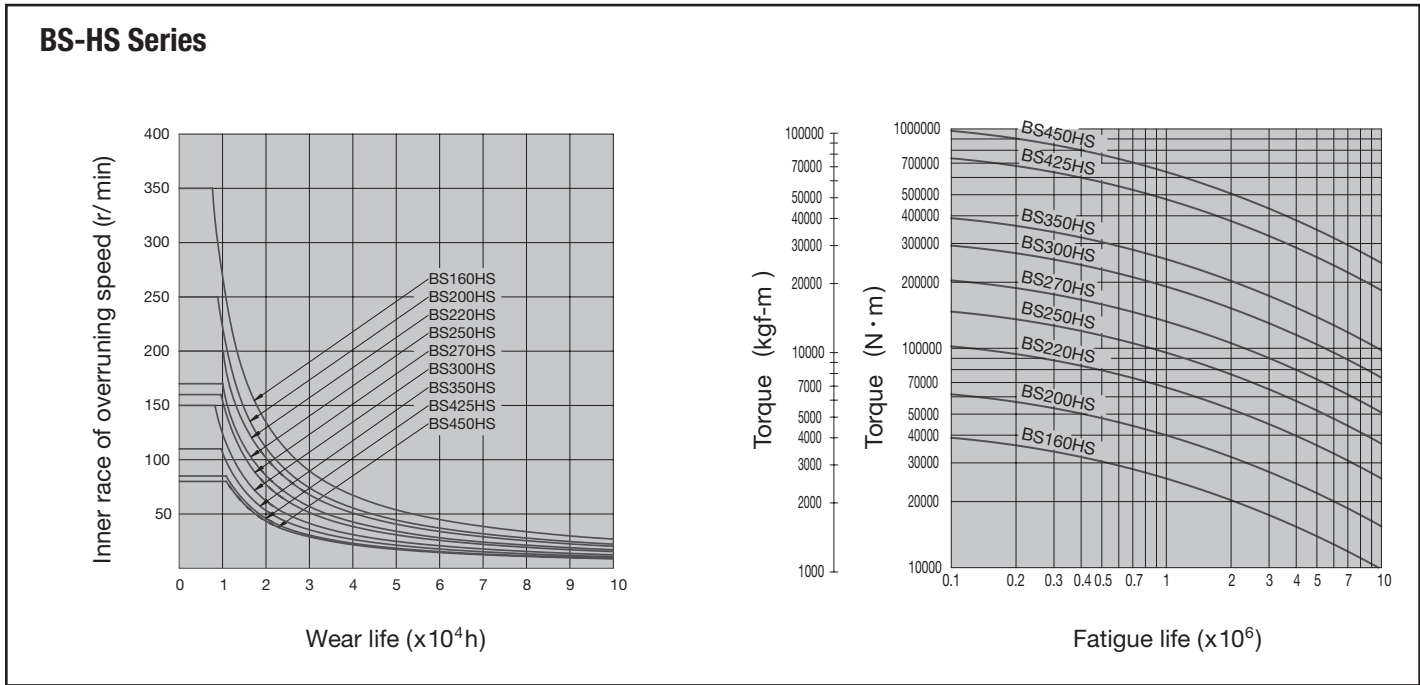
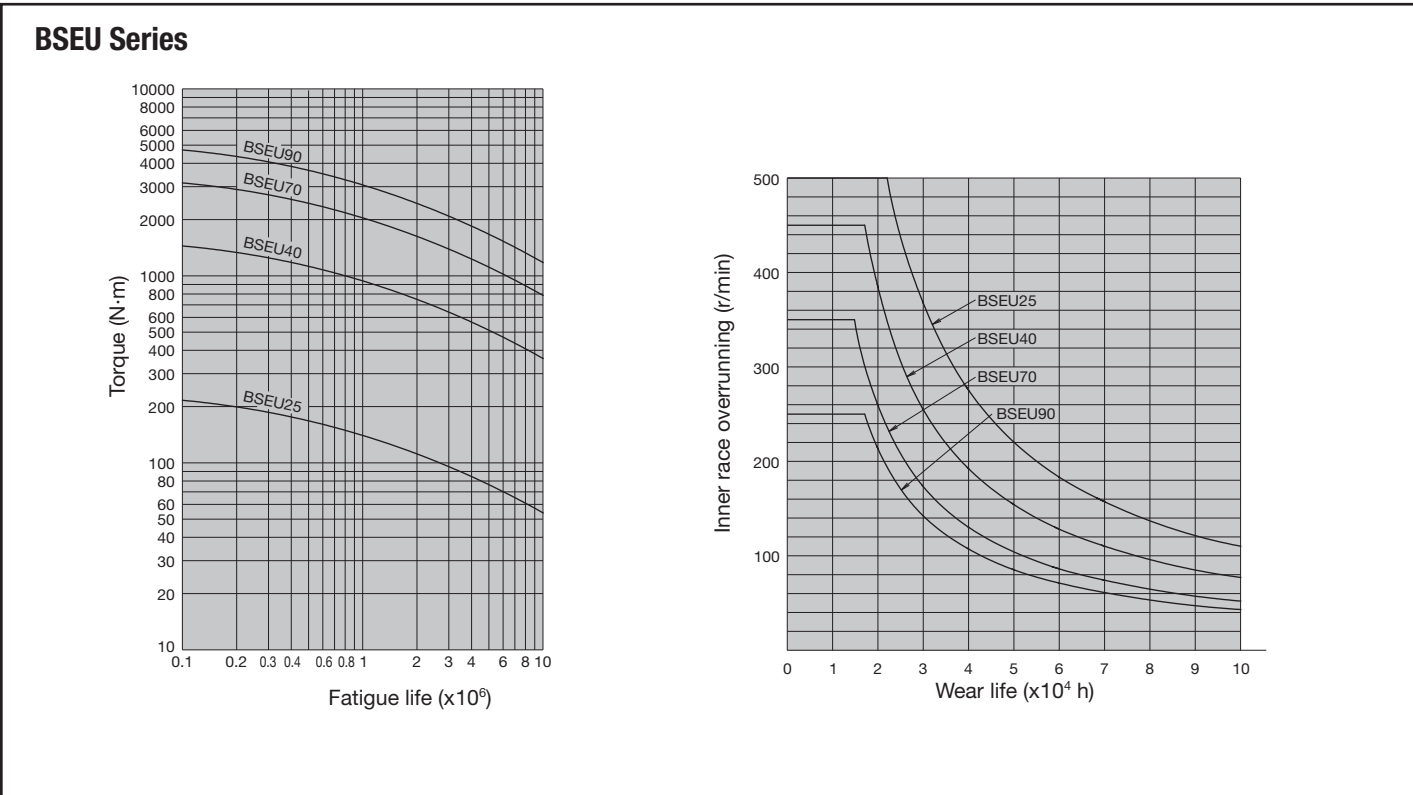
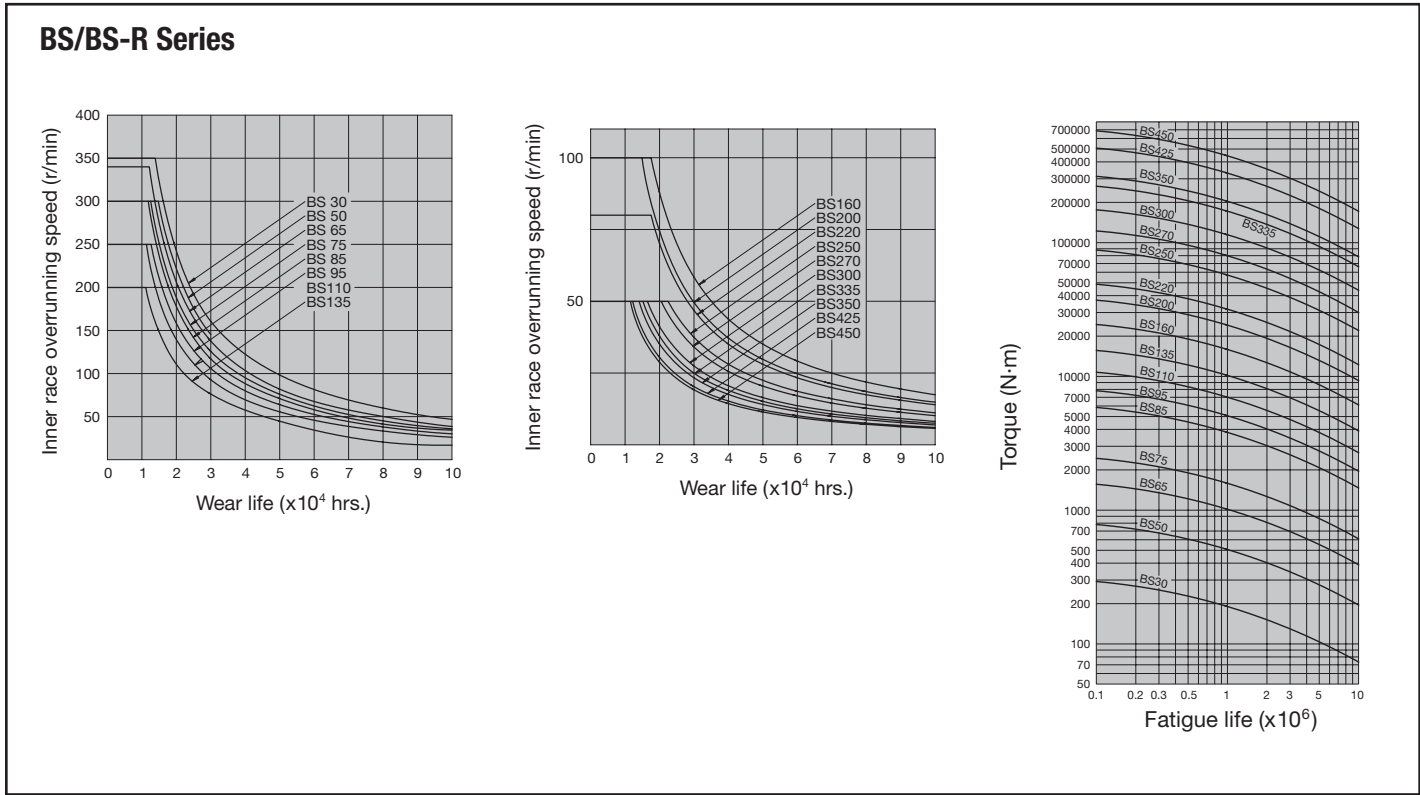
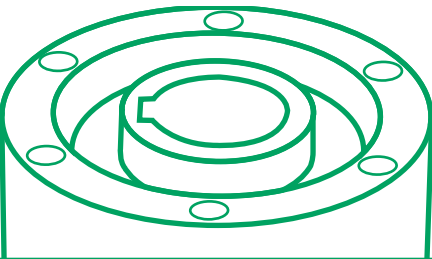


LIFE OF BREU/BR-HT SERIES CAM CLUTCH

The service life of previous TSUBAKI Cam Clutch was determined as the frictional service life during free-running (clutch disengaged) and the fatigue service life of the engaged clutch. However, with the BR Series, free-running frictional service life is not a factor because there is no mechanical contact when the clutch is disengaged. As a result, service life is determined solely by the fatigue life of the engaged clutch.



Calculated Service Life





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/ASME B15.1 - 2000 "Safety Standards for Mechanical Power Transmission Apparatus," and ANSI/ASME B20.1 - 2012 "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 a 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 U.S. 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.



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