Innovation in Motion TSUBAKI

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INSTALLATION MANUAL

SHOCK GUARD TGZ Series

SHOCK GUARD COUPLING TGZ(-C) Series

Safety Guide and Warranty

⚠ **WARNING** **Death or serious injury may result from product misuse due to not following the instructions.**

"Mechanical type Safety and Control devices"

- Begin inspection and maintenance after verifying that no load or rotational force is being applied to the equipment.
- Check the operation of the device periodically so that it can be sure to function properly when overload occurs.

"Electrical type Safety and Control devices"

- When carrying out an operation test or making a periodic inspection, make sure to verify that it functions properly as a protection device.
- Follow the instruction manual when carrying out megger testing because most electrical devices have certain requirements for megger testing.
- Check the operation of the device periodically so that it can be sure to function properly when overloaded occurs.

"Common"

- Comply with the 2-1-1 General Standard of "Ordinance on Labor Safety and Hygiene".
- When performing maintenance or inspections:
  1) Wear proper work clothes and protective equipment (safety devices, gloves, shoes, etc.). To avoid an accident, make sure to perform maintenance and inspections in an appropriate environment.
  2) Make sure the power is switched off, and the machine has stopped completely before carrying out maintenance and inspections. Take the necessary measures to ensure the power is not turned back on.
  3) Follow the instruction manual.
  4) Wire according to the technical standards of Electrical Installation and company regulations. Take note of the cautions in this manual which explain installation direction, clearance and environmental conditions. Make sure to ground the device to prevent electrical shock and to improve noise resistance.
- When using with lifting equipment, install a suitable protection device for safety purposes, otherwise an accident resulting in death, serious injury or damage to the equipment may occur due to a falling accident.

CAUTION **Minor or moderate injury, as well as damage to the product may result from product misuse due to not following the instructions.**

"Mechanical type Safety and Control devices"

- The strength of the equipment should be designed to withstand the load or rotational force when the device is activated due to overload.
- Wear damage may occur depending on the number and frequency of activations. Following the manual, check the functions and operations periodically. If something is not functioning properly, contact the distributor for repair.

"Electrical type Safety and Control devices"

- Consumable parts (tantalum electrolytic capacitors, relays, etc.) are built-in the products. Using the manual, periodically check the functions and operation of the device. If it is not functioning properly, contact the distributor for repair.
- Do not use the device in a corrosive gas environment. Sulphidizing gases (SO_2, H_2S) can especially corrode the copper and copper alloy used on PCBs and parts, and cause a malfunction.

"Common"

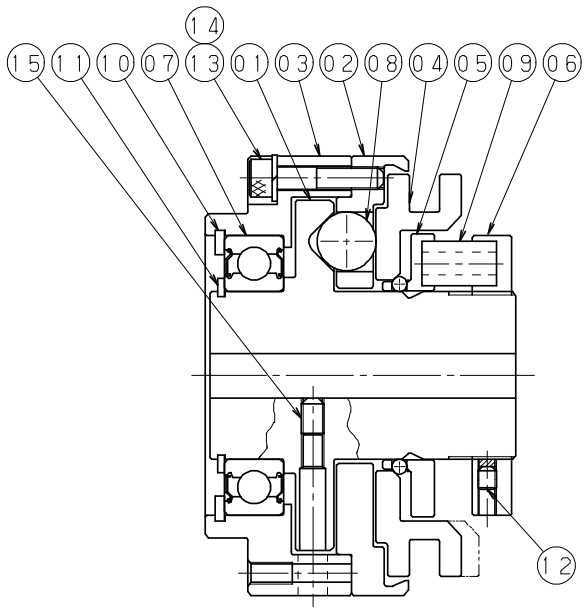
- Read the instruction manual carefully, and use the product properly. In case the instruction manual is not available, request one from the distributor where you purchased the product, or our sales office with the product name and model number.
- Deliver this instruction manual to the final customer who uses the TSUBAKIMOTO CHAIN product.

Thank you for purchasing a Shock Guard TGZ series. Make sure the unit delivered matches your order and no shortages exist in the parts provided. Any such shortages or other delivery errors must immediately be reported to your distributor. This manual should be considered an essential part of the Shock Guard TGZ series and remain with the coupling when redistributed.

To ensure safety, read all instructions thoroughly before installing or working on the equipment.

1. CONSTRUCTION

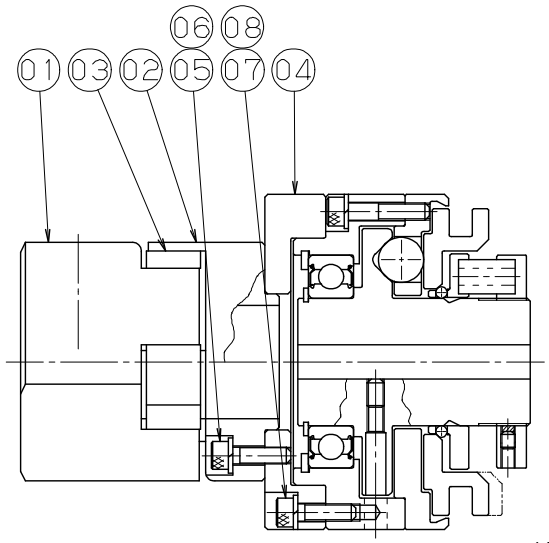
Fig. 1 SHOCK GUARD



PART NO.	NAME OF PART
01	Hub
02	Center Flange
03	Driven Flange
04	Pressure Plate
05	Ball cage
06	Adjustment Nut
07	Ball Bearing (ZZ type)
08	Drive Ball
09	Coil Spring
10	Snap Ring for bore
11	Snap Ring for shaft
12	Lock screw
13	Hexagon Socket Head Cap Bolt
14	Spring Washer
15	Hexagon Socket Set Screw Cup Point

Lock Screw * Attached

Fig. 2 SHOCK GUARD COUPLING



PART NO.	NAME OF PART
01	Coupling Hub A
02	Coupling Hub B
03	Insert
04	Adapter
05	Hexagon Socket Head Cap Bolt
06	Spring Washer
07	Hexagon Socket Head Cap Bolt
08	Spring Washer

2. DISASSEMBLY

Disassembly is necessary before boring.

2－1. Before disassembly

Shock Guard and Shock Guard Coupling are calibrated individually and match marked. Take care not to mix each part, in case disassembly and assembly of plurality of the unit at the same time.

2－2. Shock Guard (TGZ)

(1) Put ⑦ Ball Bearing underneath, then remove ⑥ Adjustment Nut.

(2) Remove ⑨ Coil Spring, then pull ⑤ Ball Cage toward. Take care not to lose balls in the Ball Cage.

(3) Remove ④ Plate and ⑧ Drive Ball, then turn back the Shock Guard.

(4) Loosen and remove ⑬ Bolt at ③ Driven Flange.

(5) Then remove ⑪ Snap Ring for shaft

(6) Remove ③ Driven Flange toward. At this time, remain attached ⑦ Ball Bearing to Driven Flange.

(7) Remove ②Center Flange.

* At process (1), make sure to remove Lock Screw. Otherwise there is a risk that Adjustment Nut can not rotate.

2－3. Shock Guard Coupling (TGZ-C)

(1) Remove ⑦ Bolt to fix ④ Adapter.

(2) Put ⑥ Adjustment Nut upper side, then disassemble it just like Shock Guard.

3. BORING

3－1. Shock Guard

(1) Keyway type

Maximum shaft bore diameter is shown in Table 1.

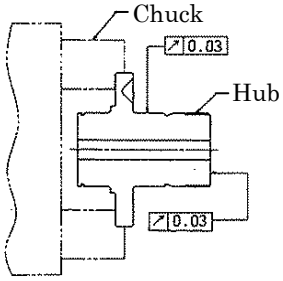
Table 1. Unit: mm

Model No.	Maximum shaft bore diameter	Applied standard
TGZ20	ϕ 20	Parallel key
TGZ30	ϕ 30	
TGZ40	ϕ 40	New JIS
TGZ50	ϕ 50	Old JIS

(2) Alignment

Chuck outer circumference of Hub flange portion, and align in manner shown in Fig. 3.

Fig. 3



(3) Machining

Machine the keyway beneath the tap for set screw of Hub flange portion.

Fig. 4

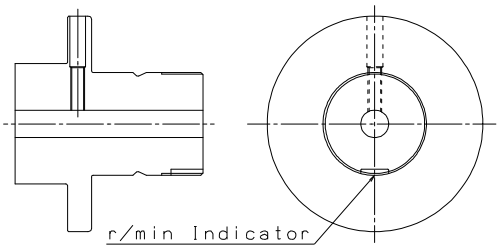


Table 2 Unit: mm

Model No.	A
TGZ20	24.5
TGZ30	27.5
TGZ40	32.5
TGZ50	37.0

3－2. Shock Guard Coupling

(1) Keyway type

Maximum shaft diameter of coupling side is shown in the following Table 3.

In regard to Maximum shaft diameter of Shock Guard Hub is shown in Table 1.

Table 3 Unit: mm

Model No.	Maximum shaft bore diameter	Applied standard
TGZ20	ϕ 35	Parallel key
TGZ30	ϕ 47	
TGZ40	ϕ 58	New JIS
TGZ50	ϕ 63	Old JIS

(2) Alignment

Chuck outer circumference of Coupling Hub, and align in manner shown in Fig. 5.

Refer to the Fig. 5 (F) for recommended dimension of the set screw for Coupling Hub.

Fig. 5 Shaft boring

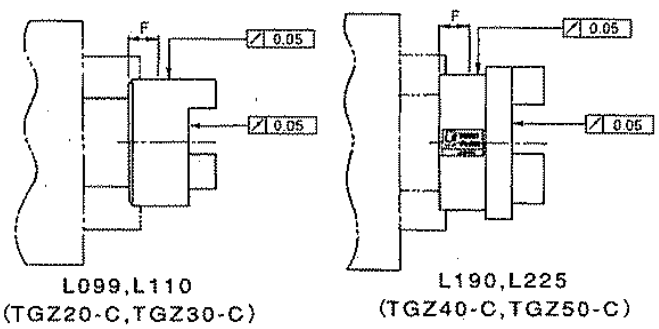


Table 4　Recommended position of the set screw (F dimension)　　Unit: mm

Model No.	Coupling Model No.	F Dimension
TGZ20-C	L099-H	13.5
TGZ30-C	L110-H	20.5
TGZ40-C	L190-H	25.5
TGZ50-C	L225-H	25.5

Coupling hub material;
L099, L110: Sintered alloy steel
L190, L225: Cast iron

* Usage of ultra-hard material (JIS 9-20, 01) bit is recommended due to the material of coupling hub.

4. ASSEMBLY

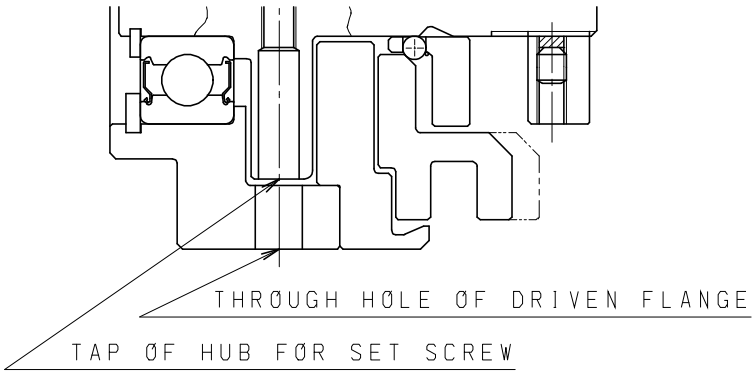
Before assembly;
Clean each part after disassembly and make sure there is no dust or chip.
Apply a thin layer of grease to the balls and bearing.
Recommended grease

Mobil	Showa Shell	JX Energy
Mobilux EP2	Alvania EP Grease 2	Epinoc Grease AP(N)2
Idemitsu	Cosmo	
Daphny Eponex Grease EP No.2	Cosmo Dynamax EP Grease 2	

4－1．Shock Guard

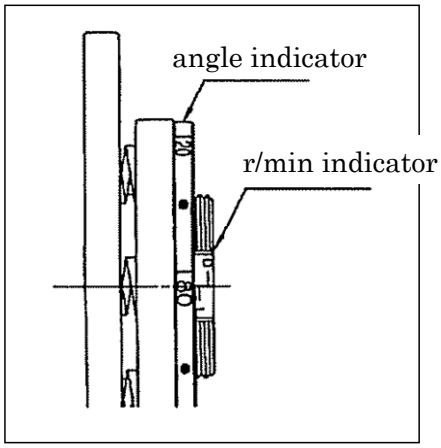
(1) Assembly is inverse order of 2. Disassembly. Tighten ⑫Lock Screw into ⑥Adjustment Nut, however the phase between Drive Ball and pocket is only in one location. Alignment between through hole of Driven Flange and tap for set screw of Hub (hole) is regular position.

Fig. 6



(2) When shipping, all TGZ Series are set at MIN torque.
Make sure angle and r/min indicator show zero when tightening the Adjustment Nut at the last. (Refer to the diagram below)

Fig. 7



4－2． Shock Guard Coupling

Assembly is inverse order of 2. Disassembly. Tighten ⑫Lock Screw into ⑥Adjustment Nut, and fix Adapter and Coupling Hub B to Shock Guard main unit with bolt. Also, adjustment of angle and r/min indicator is same as Shock Guard.

5. TORQUE SETTING

(1) In regard to all TGZ Series, torque is set at MIN point (minimum torque value) before shipment.Make sure both angular and r/min indicator show zero. r/min indicator can be seen at the end face of Adjustment Nut. (Refer to Fig. 7)

(2) Find the tightening angle that corresponds to your required trip torque using the Tightening Angle and Trip Torque graph. First, tighten the Adjustment Nut 60 degrees below the determined value, and perform a trip test. Then gradually increase the trip torque to its optimum value.

(3) Do not exceed the maximum torque on the indicator when tightening the adjustment nut. Otherwise, the unit will not trip when the coil springs are not provided with sufficient space to flex.

(4) After setting the optimum torque by turning the adjustment nut, tighten the lock screw provided to the following values. Note that tightening less than the tightening torques given may cause the screw to loosen during operation. On the other hand, tightening more than those shown may result in a deformed lock screw. Such screw may not be loosened.

There are two positions to tighten the lock screw. In case interference with lacked portion of hub, use the other position.

Apply Loctite 242 or its equivalent to the lock screw to prevent loosening from vibrations.

Tightening Torque

Lock screw M5 : 3.8 N・m {38.7 kgf・cm}

Lock screw M8 : 16　N・m {163 kgf・cm}

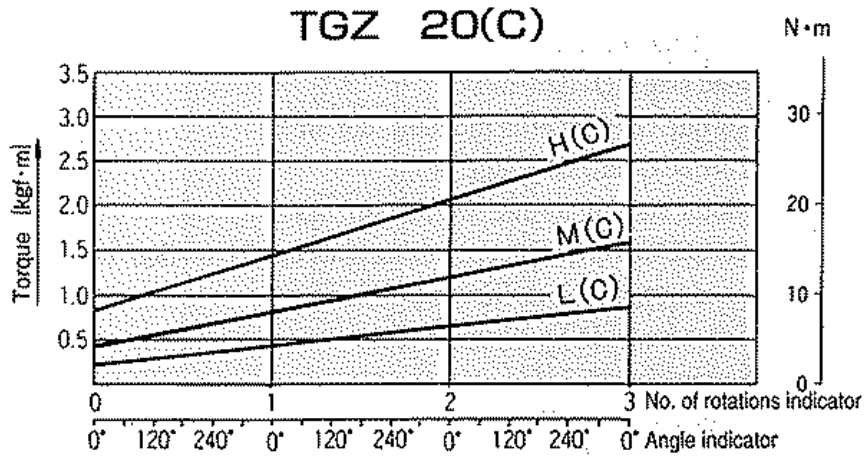
Notes:

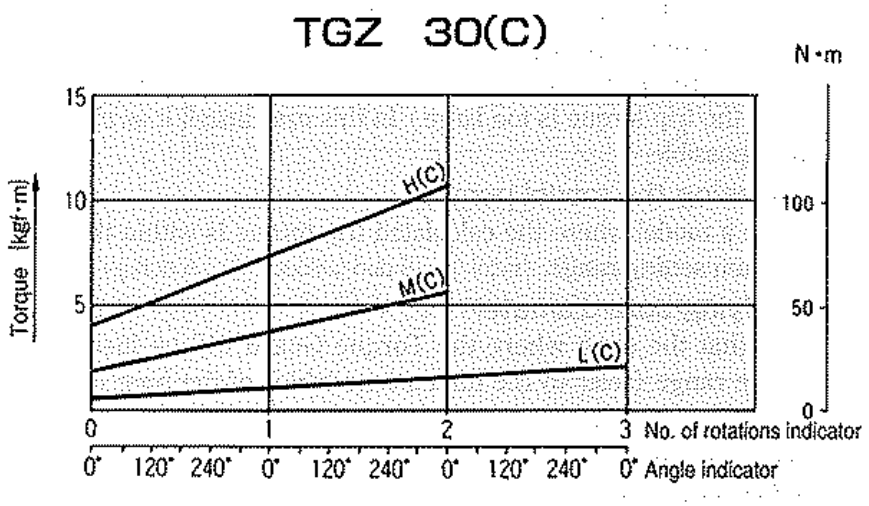
Ensure the following before retightening a lock screw that has been removed.

1. The brass portion is not disengaged from the screw body (the rest of the screw). Using a lock screw whose brass portion and body are disengaged may damage the hub thread.
2. The brass portion is not markedly damaged. If the screw is used under such condition, the hub thread may be damaged.

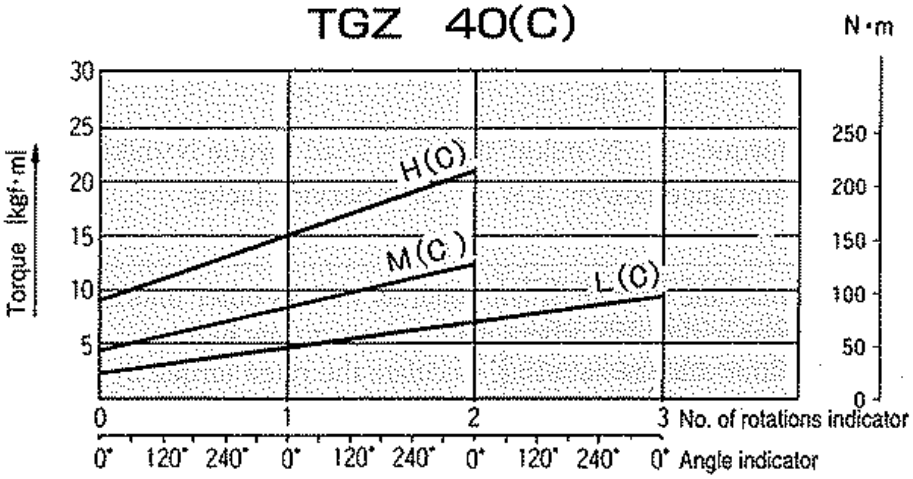
   Replace with a new lock screw if the above or similar conditions apply.

Tightening Angle vs. Trip Torque correlation graph

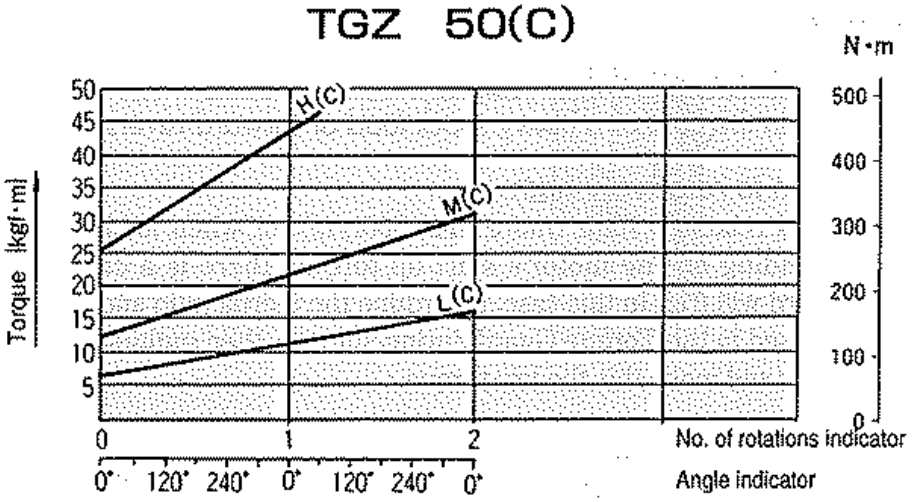




TGZ 40(C)



TGZ 50(C)



6. INSTALLATION

6－1． Shock Guard

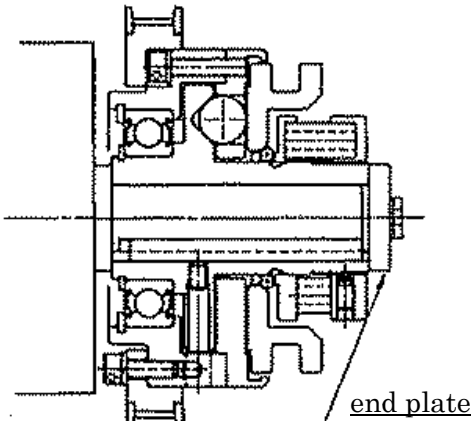
(1) Drive member installation

Install a sprocket, pulley, or gear by fitting (spigot facing) their recessed portion in the OD of center flange. (Refer to Fig. 8)

Tolerance of H6 or H7 is recommended for fitting portion.

Secure with bolts, then apply an anti-loosening agent to the bolts.

Fig. 8



(2) Retaining at the shaft

Make sure to fix to the shaft, retain at the shaft with end plate/snap ring for the shaft.

6－2． Shock Guard Coupling

(1) Alignment

Main unit: same as Shock Guard

When installing to the shaft, put the straight edge to the outer circumference shown Fig. 9, and align at two points 90degree distantly-positioned within the misalignment in the Table 9.

Fig. 9

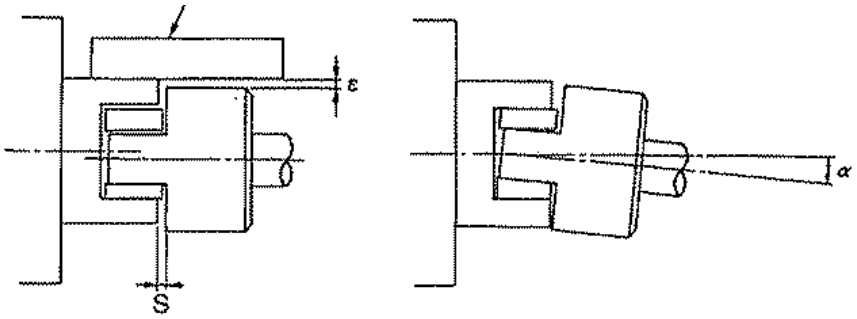


Table 5

Model No.	Allowable Parallel Misalignment (ε)mm	Allowable Angular Misalignment (α°)	(S) Dimension (mm)
TGZ20-C	0.38	0.5	1.7±0.5
TGZ30-C	0.38	0.5	2.3±0.7
TGZ40-C	0.38	0.5	2.3±1.0
TGZ50-C	0.38	0.5	2.3±1.0

7. OVERLOAD DETECTION

(1) The axial movement of the sensor plate is used to determine overload.

(2) The plate moves axially with every trip. Use a proximity switch that can sufficiently detect the sensor plate displacements as shown in the table 6 and 7.

(3) If using a TG sensor, read and follow the instructions provided in its manual.

Installation diagram TGZ Series

Fig.10

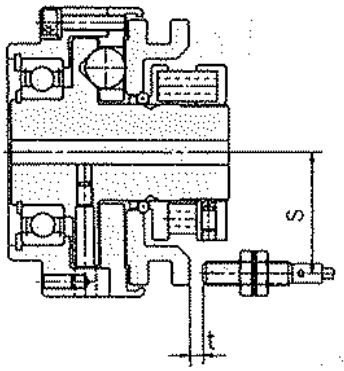


Table 6

Unit: mm

measurement / Model no.	S	t	Amount of plate movement
TGZ20	40	4.2~5.6	4.1
TGZ30	50	4.8~6.2	4.7
TGZ40	66.5	6~7.4	5.9
TGZ50	79	7.1~8.5	7.0

Installation diagram TGZ Series

Fig.11

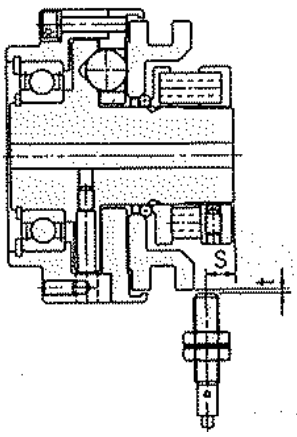


Table 7

Unit: mm

measurement / Model no.	S	t	Amount of plate movement
TGZ20	9.5	1.2	4.1
TGZ30	10.2	1.2	4.7
TGZ40	15	1.2	5.9
TGZ50	12.2	1.2	7.0

8. RESETTING

Align one hole at Driven Flange and set screw position at Hub side. (This is correct phase between pocket and Drive Ball.)

Then, apply the axial load to the Plate and push to the Driven Flange direction, it reset.

Make sure the dimension B in Fig. 12.

Fig.12

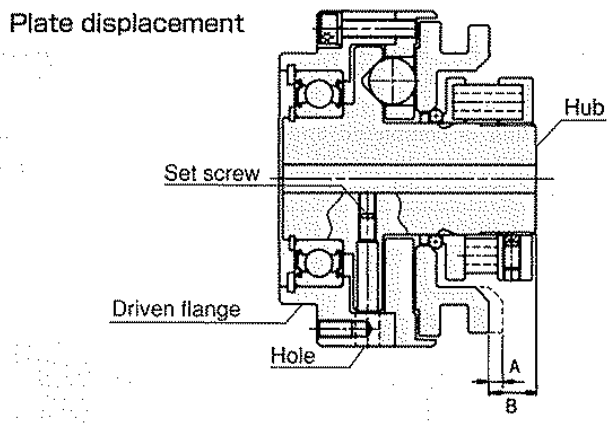


Table.8

Model No.	Axial load N {kgf}	Amount of displacement A mm	B mm
TGZ20-L	49{5}	4.1	13.5
TGZ20-M	88{9}		
TGZ20-H	176{18}		
TGZ30-L	98{10}	4.7	14.5
TGZ30-M	235{24}		
TGZ30-H	470{48}		
TGZ40-L	157{16}	5.9	20.0
TGZ40-M	421{43}		
TGZ40-H	833{85}		
TGZ50-L	451{46}	7.0	18.2
TGZ50-M	902{92}		
TGZ50-H	1382{141}		

9. MAINTENANCE

Apply a thin layer of grease to the Drive Ball and Ball Bearing, once a year or every 1000 trips.

Recommended grease

Mobil	Showa Shell	JX Energy
Mobilux EP2	Alvania EP Grease 2	Epinoc Grease AP(N)2
Idemitsu	Cosmo	
Daphny Eponex Grease EP No.2	Cosmo Dynamax EP Grease 2	

Note

Innovation in Motion TSUBAKI

Warranty:

TSUBAKIMOTO CHAIN CO.: hereinafter referred to as "Seller"

Customer: hereinafter referred to as "Buyer"

Goods sold or supplied by Seller to Buyer: hereinafter referred to as "Goods"

1. Warranty period without charge
   Effective 18 months from the date of shipment or 12 months from the first use of Goods, including the installation of the Goods to the Buyer's equipment or machine - whichever comes first.

2. Warranty coverage
   Should any damage or problem with the Goods arise within the warranty period, given that the Goods were operated and maintained according to the instructions provided in the manual, the Seller will repair and replace at no charge once the Goods are returned to the Seller.

   This warranty does not include the following:
   1) Any costs related to removal of Goods from the Buyer's equipment or machine to repair or replace parts.
   2) Cost to transport Buyer's equipment or machines to the Buyer's repair shop.
   3) Costs to reimburse any profit loss due to any repair or damage and consequential losses caused by the Buyer.

3. Warranty with charge
   Seller will charge for any investigation and repair of Goods caused by:
   1) Improper installation by failing to follow the instruction manual.
   2) Insufficient maintenance or improper operation by the Buyer.
   3) Incorrect installation of the Goods to other equipment or machines.
   4) Any modifications or alterations of Goods by the Buyer.
   5) Any repair by engineers other than the Seller or those designated by the Seller.
   6) Operation in an environment not specified in the manual.
   7) Force Majeure or forces beyond the Seller's control such as natural disasters and injustices inflicted by a third party.
   8) Secondary damage or problems incurred by the Buyer's equipment or machines.
   9) Defective parts supplied or specified by the Buyer.
   10) Incorrect wiring or parameter settings by the Buyer.
   11) The end of life cycle of the Goods under normal usage.
   12) Losses or damages not liable to the Seller.

4. Dispatch service
   The service to dispatch a Seller's engineer to investigate, adjust or trial test the Seller's Goods is at the Buyer's expense.

5. Disclaimer
   1) In our constant efforts to improve, TSUBAKIMOTO CHAIN may make changes to this document or the product described herein without notice.
   2) Considerable effort has been made to ensure that the contents of this document are free from technical inaccuracies and errors. However, any such inaccuracies or errors reported will be gladly examined and amended as necessary.