

Torque Limiter Manual

TL200 (-C), TL250 (-C), TL350 (-C), TL500 (-C), TL700 (-C)

- Thank you for purchasing Torque Limiter.
- Be sure the product delivered matches your order. This will prevent you from accidents, injuries or equipment damage caused by installing the wrong unit. If an incorrect unit is delivered, contact TSUBAKIMOTO CHAIN immediately.
- This manual should remain with the product at all times including when redistributed.
- To ensure safety, this manual should be available to every user.

Safety

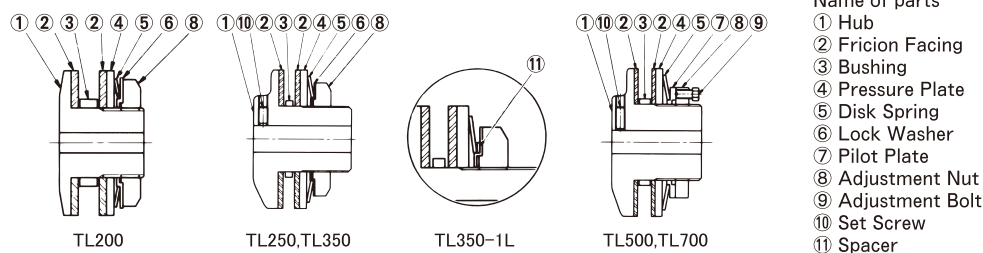
 WARNING	Death or serious injury may result from misusing the product without following the directions given under this sign.
● Before carrying out maintenance, make sure there is no load or turning force applied to the machine. ● Inspect operation periodically for overloads. ● Comply with Ordinance on Labor Safety and Hygiene 2-1-1 general standards. ● Comply with this manual when conducting unit installation, removal, maintenance and inspection. ● When using with lifting equipment, install a suitable protection device for safety purposes. Otherwise the equipment may occur due to a falling accident.	
 CAUTION	Minor or moderate injury, as well as damage to the product may result from misusing the product without following the directions given under this sign.
● Read this manual thoroughly before servicing the unit, and handle the unit correctly. ● Design the equipment so that it can tolerate load and rotational force when overloaded. ● For the slip system, Torque Limiter may become high temperature by the friction heating. Please handle with care. ● Mechanical parts may wear depending on the rotation speed and slipping time. Check the operation periodically, and for any mechanical failure, contact TSUBAKIMOTO CHAIN. ● This manual is an essential part of the unit, and it should remain with the unit at all times including when redistributed.	

Note : Failure take heed of information labeled "CAUTION" may also lead to serious accidents depending on the situation.

Torque Limiter

1. Assembly of Torque Limier

Wipe off oil, rust and dirt from each part before assembling your Torque Limiter. Then, assemble as follows. Note that all units are assembled with a single disk spring. An additional disk spring is packed separately for use as necessary.



※A spacer is inserted between the disk spring and the lock washer for TL200-1L, TL250-1L, TL350-1L.

2. Machining accuracy on center member

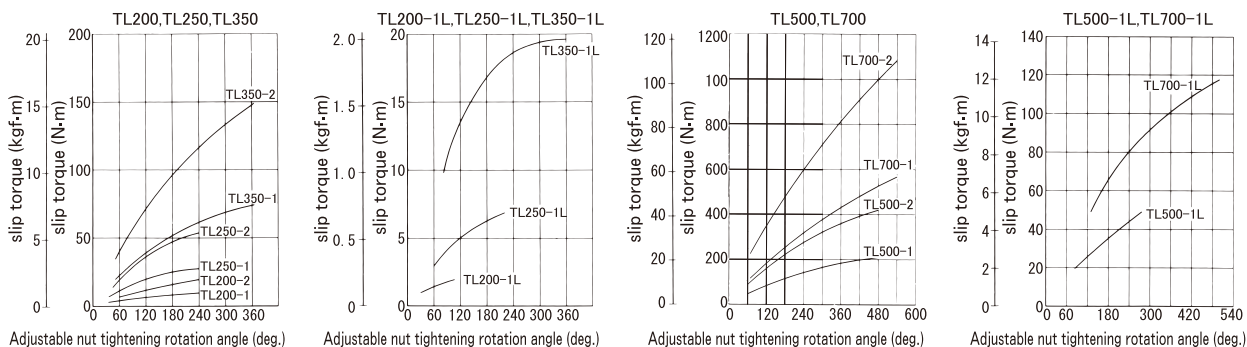
Machine the center member friction surface and bore at 3S~6S. In addition machine the bore diameter of the center member in accordance with the dimensional tolerance in the catalog.

3. Run-in

Usually, run-in operations for the Torque Limiter are not necessary. If a stable slip torque is required, however, make sure to completely hand-tighten the adjustable nut or bolts. Then tighten 60° more and run or rotate the Torque Limiter approximately 500 revolutions. If the rotation speed is high, run-in several times to reach 500 revolutions.

4. Torque setting

After installing the Torque Limiter to your machine, tighten the adjustable nut or bolts but not too tight. Then, test several times by gradually tightening the bolts to find the appropriate tightening value. Correlation between the adjustable nut/bolts tightening value and slip torque are illustrated below. Slip torques vary depending on the friction surface. Graphs only show rough figures, so test with a slightly weaker torque first, then gradually tighten to find the appropriate torque suitable for your machine. This is the most practical way.



※ Tightening angle 0° in the above charts refer to a condition where a disk spring secured by hand-tightening the adjustable nut or bolts.

• Sprocket – mounted finished bore Torque Limiter.

Torque is set at 120° on the “Tightening Amount – Torque Correlation Graph”. Set the torque based on 120° with the adjusting nuts or bolts before use.

5. Tightening method for adjustable nut or bolts

- (1) The adjustable nut for TL200, TL250 and TL350 is a hexagon head nut. Tighten it with a spanner wrench to the rated angle then bend the lock washer to prevent the adjustable nut from loosening.
- (2) The adjustable nut for TL500 and TL700 have 3 pcs. of adjustable bolts. Place the pilot plate and disk spring in contact with each other, and tighten the adjustable nut manually until there is no backlash between their faces. Then retighten the adjustable bolts to the appropriate angle.

6. Replace the friction facing

Change the friction facing when they reach roughly half the thickness of dimension described in the catalog. 1.25 mm for TL200, and 1.6 mm for TL250~TL700.

Before replacing the friction facing, each part must be completely free of oil, rust and dirt. Also, reassemble the Torque Limiter according to the structure drawing.

7. Maintenance and precautions after the replacement procedure

The Torque Limiter continues to slip, and the friction facing is abnormally worn or heated unless the driving source is stopped when overloaded. Stop the driving source immediately in this case, making it necessary to stop the drive source immediately. It allows to automatically stop by using a digital tachometer and proximity switch. Please refer to the catalogue etc.

Periodically inspect the torque setting, for the initial torque setting may be affected by changes in friction, ambient temperature, humidity and other conditions.

Replace the friction facing and bushing if they wear. Their replacement parts are in stock.

Keep the Torque Limiter free from water and oil. This will maintain the effectiveness of torque and prevent the equipment or load from falling, and causing serious accidents.

When sprocket teeth surfaces are induction-hardened. Lubricating paste should be applied to chain after installation and every 1000 hours.

Torque Limiter Coupling

Refer to the above for assembly of Torque Limiter, torque setting and precaution.

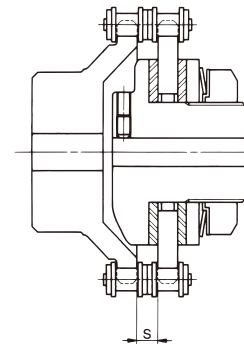
• Installing the Torque Limiter

Align the shaft centers by calibrating the angular and parallel misalignments. Measure by placing the scale by the sprocket teeth.

Adjust the length between the sprockets or dimension S, and their parallelism according to the dimensions provided below.

Then wrap the chain around the sprockets and lock with a joint pin.

Size	TL200-C	TL250-C	TL350-C	TL500-C	TL700-C
S	7.5mm	7.4mm	9.7mm	11.6mm	15.3mm
Max. Angular Misalignment	0.5°	0.5°	0.5°	0.5°	0.5°
Max. Parallel Misalignment	0.25mm	0.25mm	0.3mm	0.38mm	0.5mm



Warranty

TSUBAKIMOTO CHAIN CO.: hereinafter referred to as “Seller”

Customer: hereinafter referred to as “Buyer”

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

1. Warranty period without charge

18 months effective the date of shipment or 12 months effective the first use of Goods, including installation of Goods to Buyer's equipment or machines – whichever comes first.

2. Warranty coverage

Should any damage or problem with the Goods arise within the warranty period, given that the Goods were operated and maintained under instructions provided in the manual, Seller would repair and replace at no charge once the Goods are returned to Seller. The following are excluded from the warranty.

- 1) Any costs related to removing Goods from the Buyer's equipment or machines to repair or replace parts.
- 2) Costs to transport Buyer's equipment or machines to the Buyer's repair shop.
- 3) Costs to reimburse any profit loss due to any repair or damage and consequential losses caused by the Buyer.

3. Warranty with charge

Seller will charge any investigation and repair of Goods caused by:

- 1) Improper installation by failing to follow the instruction manual.
- 2) Insufficient maintenance or improper operation by the Buyer.
- 3) Incorrect installation of Goods to other equipment or machines.

4) Any modifications or alterations of Goods by the Buyer.

5) Any repair by engineers other than the Seller or those designated by the Seller.

6) Operation in an inappropriate environment not specified in the manual.

7) Force Majeure or forces beyond the Seller's control such as natural disasters and injustice done by a third party.

8) Secondary damage or problem incurred by the Buyer's equipment or machines.

9) Defected parts supplied, or specified by the Buyer.

10) Incorrect wiring or parameter setting by the Buyer.

11) The end of life cycle of the Goods under normal usage.

12) Loss or damage not liable to the Seller.

4. Dispatch Service

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

5. Disclaimer

1) In our constant efforts to improve, TSUBAKIMOTO CHAIN may change the contents of this document without notice.

2) Considerable effort has been made to ensure that the contents of this document are free from errors. However, TSUBAKIMOTO CHAIN makes no warranties with respect to the accuracy of information described herein. In the mean time, we would appreciate comments or reports on any inaccuracies or omissions found in this document to help us make timely amendments as necessary. Your cooperation is greatly appreciated.