

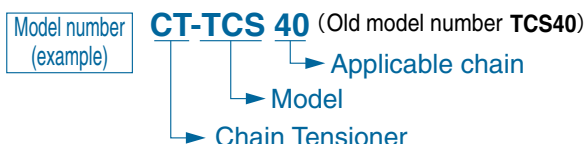


Chain Tensioner

Slackness in the chain can cause chain vibration and noise, and improper engagement with the sprocket, as well as preventing the chain from operating properly. The Tsubaki Chain Tensioner adjusts slackness in the chain to enable continuous and proper chain operation.

There are three types of Tsubaki Chain Tensioners: the TCS Type (swing type, with idler sprocket), the ETS Type (straight type, with idler sprocket), and the TA Type (straight type, with plastic shoe).

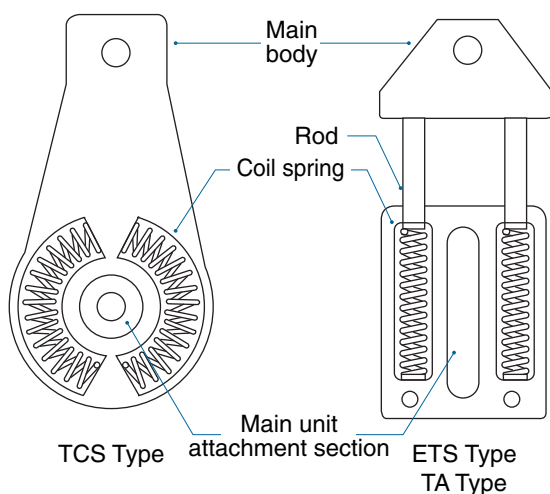
Ordering Specify the code (product code and model number)



Construction

The Tsubaki Chain Tensioner is composed of a main unit and an idler sprocket. (The TA Type is a unitized construction with plastic shoe.) The tensioner's main unit (aluminum) employs the elasticity of a built-in coil spring to tension.

Main unit



Product type

1 TCS Type: Swing type, with idler sprocket



Order placement

Product code	Model number	Qty	Unit
D210001	CT-TCS40	1	K

Idler sprocket

The idler sprocket is composed of a sprocket with a built-in bearing, an attachment bolt, and a washer.

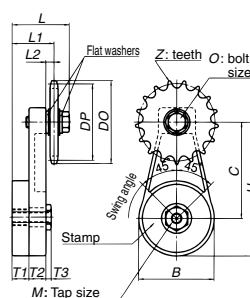
The sprocket teeth undergo induction hardening and are given a black coating.

Model Number	No. of Sprocket Teeth	Sprocket Attachment Bolt			Flat Washer		Tensioner Attachment Bolt	
		Size	Length	Strength Classification	No.	Diameter		No.
CT-TCS40	17	M10	30	10.9	1	10	2	M10
CT-TCS50	15	M10	30	10.9	1	10	2	M10
CT-TCS60	13	M12	35	10.9	1	12	2	M12
CT-TCS80	11	M12	35	10.9	1	12	4	M12
CT-ETS40	17	M10	35	10.9	1	10	2	M10
CT-ETS50	15	M10	35	10.9	1	10	2	M10
CT-ETS60	13	M12	45	10.9	1	12	2	M12
CT-ETS80	11	M12	45	10.9	1	12	4	M12

TA Type main unit attachment bolt

Model Number	Main Unit Attachment Bolt	Model Number	Main Unit Attachment Bolt
CT-TA40	M10	CT-TA60	M12
CT-TA50	M12	CT-TA80	M14

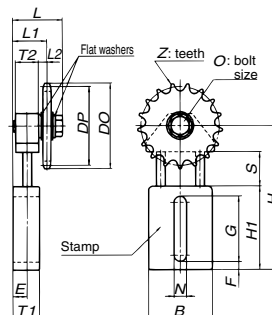
Note: Tensioner attachment bolt not included with tensioner.



Note: Only the CT-TCS80 has two washers installed on each side.

TCS Model Number	Stamp	Applicable Chain	B	C	H	M	T ₁	T ₂	T ₃	Z	DP	DO	O	L	L ₁	L ₂	Plunge Force kN{kgf}	Approximate Mass kg/unit
CT-TCS40	TC-1	RS40-1	69	87.5	122	M10	15.5	15.5	5	17	69.12	75	M10	50.5	37.5	6.5	0{0}~0.15{15}	0.74
CT-TCS50	TC-1	RS50-1	69	87.5	122	M10	15.5	15.5	5	15	76.35	83	M10	50.5	37.5	6.5	0{0}~0.15{15}	0.82
CT-TCS60	TC-2	RS60-1	90	100	145	M12	18	18	7	13	79.60	88	M12	60.5	44.5	8.5	0{0}~0.39{40}	1.30
CT-TCS80	TC-2	RS80-1	90	100	145	M12	18	18	7	11	90.16	101	M12	65.5	47	11	0{0}~0.39{40}	1.52

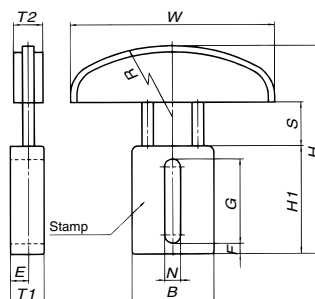
2 ETS Type: Straight type, with idler sprocket



Note: Only the CT-TCS80 has two washers installed on each side.

ETS Model Number	Stamp	Applicable Chain	S	H	H ₁	F	G	B	N	T ₁	T ₂	E	Z	DP	DO	O	L	L ₁	L ₂	Plunge Force kN{kgf}	Approximate Mass kg/unit
CT-ETS40	TO-1	RS40-1	30	129	74	7	58	56.2	11	23	20	12.5	17	69.12	76	M10	42	29	6.5	0.10{10}~0.25{25}	0.60
CT-ETS50	TO-1	RS50-1	30	129	74	7	58	56.2	11	23	20	12.5	15	76.35	84	M10	42	29	6.5	0.10{10}~0.25{25}	0.69
CT-ETS60	TO-2	RS60-1	38	163	87	9	70	70.5	12.5	28	25	15	13	79.60	89	M12	52	36	8.5	0.15{15}~0.39{40}	1.15
CT-ETS80	TO-2	RS80-1	38	163	87	9	70	70.5	12.5	28	25	15	11	90.16	102	M12	57	38.5	11	0.15{15}~0.39{40}	1.37

3 TA Type: Straight type, with plastic shoe



TA Model Number	Stamp	Applicable Chain	S	H	H ₁	F	G	B	N	T ₁	E	W	R	T ₂	Plunge Force kN{kgf}	Approximate Mass kg/unit
CT-TA40	TO-1	RS40-1	30	143	74	7	58	56.2	11	23	12.5	140	120	20	0.10{10}~0.25{25}	0.39
CT-TA50	TO-2	RS50-1	38	164	87	9	70	70.5	12.5	28	15	140	140	22	0.15{15}~0.39{40}	0.65
CT-TA60	TO-2	RS60-1	38	164	87	9	70	70.5	12.5	28	15	140	140	22	0.15{15}~0.39{40}	0.65
CT-TA80	TO-3	RS80-1	44	187	104	9	86	82	14.5	33	17.5	140	160	25	0.29{30}~0.59{60}	0.99

Assembly

Remove the main unit of the TCS or ETS Type tensioner, the idler sprocket, attachment bolt and washers from their packaging, and assemble them as shown in Fig. 1. The plastic shoe for the TA type comes as part of the main unit and no assembly is required.

One flat washer should be installed on each side of the idler sprocket. However, the CT-TCS80 and CT-ETS80 should have two washers installed on each side. The idler sprocket attachment bolt and flat washers are included with the idler sprocket.

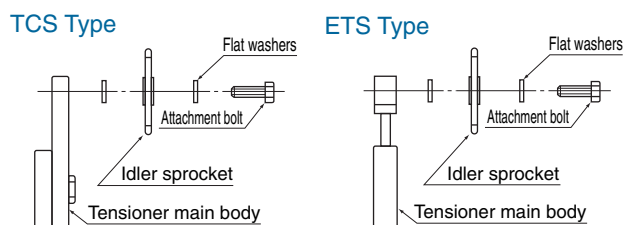


Fig. 1 Chain tensioner assembly

■ Handling Precautions

◁ Bolt tightening torque ▷

When installing the tensioner on a base after attaching the idler sprocket to the tensioner, be sure to fasten the idler sprocket and the tensioner with a bolt. The following table indicates the tightening torque. Be sure to use bolts with a strength classification of 8.8 or more.

◁ Position adjustment ▷

When setting the tensioner, adjust with a shim so that the center of the idler sprocket and chain are aligned.

◁ Checking the rotation of the idler sprocket ▷

If the idler sprocket is anchored in place, check whether or not the sprocket can turn smoothly. If it does not turn smoothly, the bolt may be too tight. Loosen the bolt and then retighten properly.

◁ Lubrication ▷

Lubricate the rod section regularly.

◁ Operating temperature ▷

	Range
TCS Type	-10°C - 100°C
ETS Type	-10°C - 100°C
TA Type	-10°C - 60°C

◁ Attachment bolt locking torque ▷

Unit: kN · m {kgf · m}

	Idler sprocket attachment bolt	Tensioner attachment bolt
CT-TCS40,50	0.02{2.0}	0.04{4.0}
CT-TCS60,80	0.03{3.0}	0.05{5.0}
CT-ETS40,50	0.03{3.0}	0.03{3.0}
CT-ETS60,80	0.04{4.0}	0.04{4.0}
CT-TA40	—	0.03{3.0}
CT-TA50,60	—	0.04{4.0}
CT-TA80	—	0.05{5.0}

■ Installation

◁ Attaching the TCS type tensioner ▷

- 1) Attach the roller chain to the drive and driven sprockets.
- 2) In order to attach the tensioner to the slack side of the roller chain as shown in Fig. 2, first push in on the roller chain with the idler sprocket and determine the attachment position (bolt hole) for the tensioner.

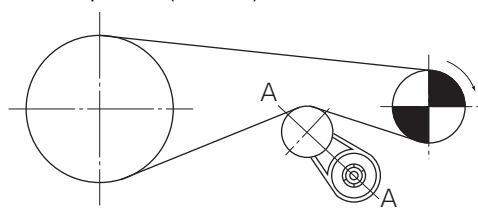


Fig. 2 Tensioner position (front)

- 3) Then, within a range where the roller chain does not contact the tensioner unit, ensure the force of the roller chain moves as perpendicular as possible to the A-A line. (Tensioner is a swing type unit.)

- 4) Adjust with a shim, as shown in Fig. 3, so that the center of the roller chain and idler sprocket are aligned.

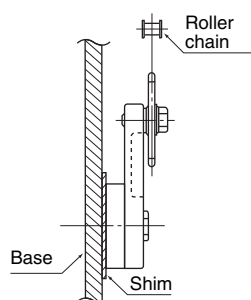


Fig. 3 Tensioner position (side)

- 5) Open a hole in the base that holds the tensioner. (A slotted hole is convenient.)

- 6) Push in on the chain with the tensioner and temporarily tighten the tensioner to the base with a bolt. (Fig. 4) Then tighten the hexagonal screw and anchor so that the swing angle is about 15°.

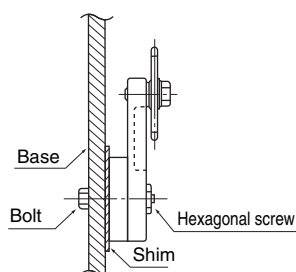


Fig. 4 Tightening the tensioner

- 7) Perform a test operation and check whether the tensioner works properly. If any of the following occurs, reset the tensioner.

- Contacts the side of the idler sprocket: Not centered properly
- Vertical or traverse vibration: Insufficient initial tension
- Increased noise: Excessive initial tension

◁ Attaching the ETS and TA Type tensioners ▷

- 1) Push in on the roller chain with the tensioner's idler sprocket (Fig. 5) and determine the position of the hole on the attachment base.

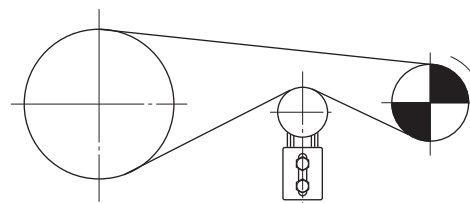


Fig. 5 Tensioner position (front)

- 2) Open a hole in the attachment base. In this case, two bolt holes are required, but a hole that is as long as possible will make positioning simpler, and the re-tensioning operation will be easier when the chain elongates.

- 3) Temporarily tighten the tensioner with two bolts. At this time, adjust with a shim, etc., so that the center of the idler sprocket and roller chain are aligned. (Fig. 6)

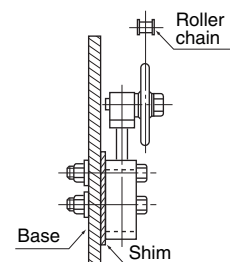


Fig. 6 Tightening the tensioner

- 4) Push in on the chain with the tensioner and, if the amount of slack is appropriate (δ), tighten the nut and anchor the tensioner. Aim for a value less than $\delta = 0.02 \times L$. (Fig. 7)

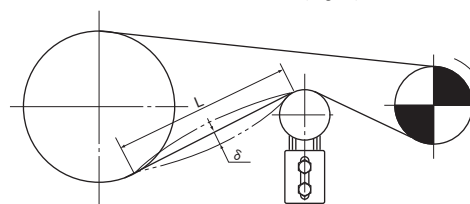


Fig. 7 Tensioner's anchored position

- 5) Perform a test operation and check whether the tensioner works properly. If any of the following occurs, reset the tensioner.

- Contacts the side of the idler sprocket: Not centered properly
- Vertical or traverse vibration: Insufficient initial tension
- Increased noise: Excessive initial tension