

Instruction Manual

ECHT-FLEX COUPLING

Single and Spacer Types

Thank you for purchasing an ECHT-FLEX COUPLING. Make sure the unit delivered matches your order and no shortages exist in the parts provided. Any such shortages or other delivery errors must be reported immediately to your distributor. This manual should be considered an essential part of the ECHT-FLEX COUPLING and remain with the coupling when redistributed. To ensure safety, read all instructions thoroughly before installing or working on the equipment.

Safety precautions in this manual are classified into two categories: “WARNING” and “CAUTION”. These are defined as follows:

 WARNING	Death or serious injury may result from misusing the product without following the instructions.
 CAUTION	Minor or moderate injury, as well as damage to the product may result from misusing the product without following the instructions.

Notice that although categorized under “CAUTION”, subjects discussed may lead to serious results depending on the situation.

 WARNING
<p>(General)</p> <ul style="list-style-type: none"> ● Install a safety cover and prevent access to any rotating parts: otherwise injury may occur. Set a safety mechanism to stop the rotating parts when the cover is lifted. ● Transporting, installing, operating, maintaining or inspecting must be carried out by skilled and professional engineers to avoid mis-handling and hazardous situations. ● When coupling is used with vehicles that carry human, use a device to protect the vehicle: otherwise, accidents and damage may occur. ● When the coupling is used for an elevator, install a safety device on the elevator in order to prevent it from falling, which can cause damage and accidents resulting in death or injury. <p>(Unpacking upon delivery)</p> <ul style="list-style-type: none"> ● If delivered in a wooden case, unpack with care. Sharp nails may cause injury. <p>(Additional machining)</p> <ul style="list-style-type: none"> ● Never modify the coupling; the quality or function of the product may decrease and break or damage the machine or injure the operator. <p>(Transportation)</p> <ul style="list-style-type: none"> ● Never step under the product when it is being elevated for transportation: otherwise, either the product or load may fall, causing accidents resulting in death or injury. <p>(Installation)</p> <ul style="list-style-type: none"> ● Wear appropriate clothing and safety gear (safety goggles, gloves, shoes, etc.). ● Make sure the power is switched off, and the machine is completely stopped before installing. Take caution so that the power does not reconnect accidentally. ● Make sure to tighten and apply sufficient amount of anti-loosening agent to the hexagonal socket head cap screws. <p>(Operation)</p> <ul style="list-style-type: none"> ● Avoid contact with any rotating parts (coupling, shaft, etc.) during operations. Rotating parts can catch approaching objects and cause serious injuries.

(Maintenance and inspection)

- Avoid contact with any rotating parts (coupling, shaft, etc.) during maintenance and inspection. Rotating parts can catch approaching objects and cause serious injuries.
- Make sure the power is switched off, and the machine is completely stopped before carrying out maintenance and inspection.
Take caution so that the power does not reconnect accidentally.
Make sure the driving and driven equipment are also completely stopped.



CAUTION

(General)

- Do not use coupling beyond its capacity as specified in the drawing. Exceeding its capacity can break the machine and cause injuries.
- Do not use damaged couplings. They can break your equipment and cause injuries.

(Transportation)

- Pay extra attention so that the equipment will not fall or rollover during transportations.

(Installation)

- Do not touch the edge and inner diameter of any part with bare hands to avoid possible injury.
- Make sure to align the drive and driven shafts as instructed in the manual when installing the coupling

(Operation)

- Do not touch the coupling during operations to avoid injuries.
- Immediately stop the machine upon any sign of abnormal operation.

(Maintenance and inspection)

- Wear appropriate clothing and safety gear (safety goggles, gloves, shoes, etc.).
- Clean the surrounding area and maintain a clutter-free space to avoid secondary accidents.
- Comply with Ordinance on Labor Safety and Hygiene 2-1-1 general standards.
- Conduct periodic inspections to make sure that the drive and driven shafts are aligned as described in the manual, and that the rubber and plastic parts are not worn or deformed.

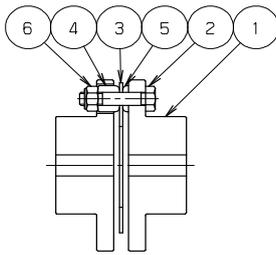
(Environment)

- Coupling scraps should be disposed as general waste by skilled professionals.
- This coupling meets RoHS (Restriction of Certain Hazardous Substances) standards and contains no hazardous chemicals.

1. Structure and Parts

Fig. 1

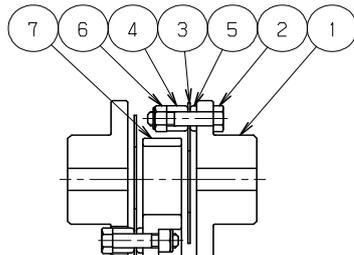
Single Type
NEF02 --- NEF700



- ① Hub
- ② Reamer Bolts
- ③ Disk
- ④ Washer (A)
- ⑤ Washer (B)
- ⑥ U-Nut

Fig. 2

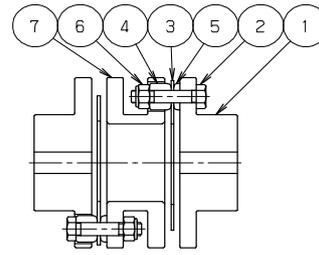
Spacer Type
NEF02W



- ① Hub
- ② Reamer Bolts
- ③ Disk
- ④ Washer (A)
- ⑤ Washer (B)
- ⑥ U-Nut
- ⑦ Spacer

Fig. 3

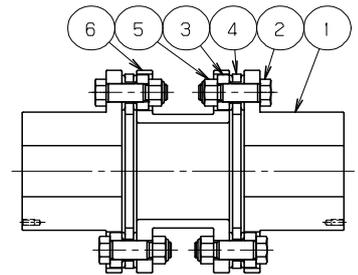
Spacer Type
NEF04W --- NEF700W



- ① Hub
- ② Reamer Bolts
- ③ Disk
- ④ Washer (A)
- ⑤ Washer (B)
- ⑥ U-Nut
- ⑦ Spacer

Fig. 4

Spacer Type
NEH09W --- NEH180W



- ① Hub
- ② Reamer Bolts
- ③ Disk set
- ④ Overload Washer
- ⑤ U-Nut
- ⑥ Spacer

Table 1 Parts List (Number of parts per unit)

	Hub	Disk set	Reamer Bolt	Washer (A)	Washer (B)	Overload Washer	U-Nut	Spacer
Single Type NEF02 ---NEF700	2	1	4	4	4	---	4	--
Spacer Type NEF02W ---NEF700W	2	2	8	8	8	---	8	1
Spacer Type NEH09W	2	2	12	---	---	12	12	1
Spacer Type NEH14W ---NEH180W	2	2	16	---	---	16	16	1

(Note) NEH disk set consists of a disk, bush and collar.

2. Installation

- ① Compare your parts with those listed in Table 1.
- ② The disks in an NEF set are held together by tape. Do not take the tape off and use as is. The disk, bush and collar in an NEH set are built into one unit. Do not disassemble and use as is.
- ③ Make sure there are no burrs, scratches, dirt and dust on the drive/driven shafts and the inner diameter of the hub. Also, be sure the shaft key fits in the keyway of the shaft and hub.
- ④ Fix the hub on each shaft. For a tight fit, heat the hub in oil bath (below 150°) and immediately mount it onto the shafts. Allow hubs to cool before proceeding.
- ⑤ Allocate each part with care and center the space between hubs according to the instructions under Section 3.
- ⑥ Set up the disk set, washer, bolt and the u-nut by referring to Figs 1~4. Both the bolts and disk bores are accurately machined by reamer technique. Tighten the u-nuts instead of the bolts to avoid damage. Make sure to tighten according to the "tightening torque for U-nut" specified in Table 3.

3. Alignment

The greater the accuracy of the initial alignment of the coupling, the less rotational stress it will experience during operations. Wear of the shaft bearing, depression in the mounting surface, changes in conditions due to temperature fluctuation, and shock may all result in shorter life of the coupling as well as your equipment. Adjust regularly as follows.

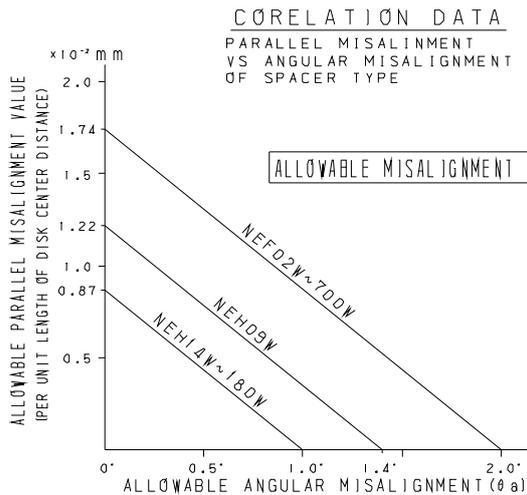
The angular misalignment, parallel misalignment, axial misalignment are interrelated. When adjusting, you must take into account that if one increases, the other will decrease. Conduct the first centering within the recommended values in Table 2 or smaller.

Table 2 Recommended Misalignment

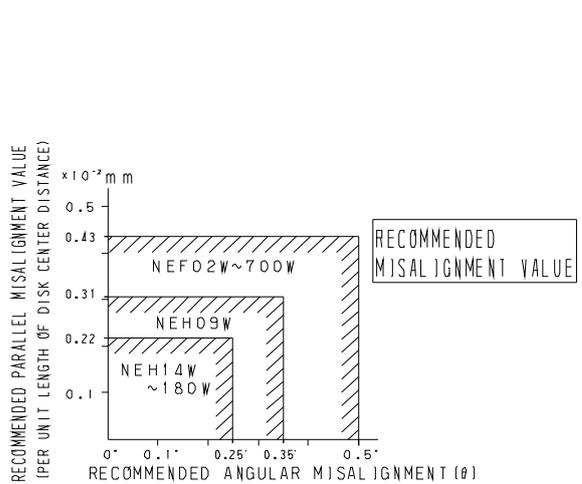
TYPE		Angular Misalignment		Parallel Misalignment ϵ (mm)	Axial Misalignment E (mm)
		θ (deg)	T.I.R (mm)		
Single Type	NEF02	0.25	0.25	--	4.9±0.25
	NEF04	0.25	0.29	--	6.1±0.25
	NEF10	0.25	0.35	--	6.6±0.25
	NEF18	0.25	0.40	--	8.3±0.25
	NEF25	0.25	0.45	--	11.2±0.25
	NEF45	0.25	0.55	--	11.7±0.25
	NEF80	0.25	0.62	--	11.7±0.25
	NEF130	0.25	0.73	--	16.8±0.25
	NEF210	0.25	0.84	--	17.0±0.25
	NEF340	0.25	0.93	--	21.6±0.25
	NEF540	0.25	1.07	--	23.9±0.25
	NEF700	0.25	1.20	--	27.2±0.25
Spacer Type	NEF02W	0.5	0.50	0.075	4.9±0.25
	NEF04W	0.5	0.58	0.13	6.1±0.25
	NEF10W	0.5	0.71	0.14	6.6±0.25
	NEF18W	0.5	0.81	0.17	8.3±0.25
	NEF25W	0.5	0.91	0.18	11.2±0.25
	NEF45W	0.5	1.10	0.22	11.7±0.25
	NEF80W	0.5	1.25	0.25	11.7±0.25
	NEF130W	0.5	1.46	0.27	16.8±0.25
	NEF210W	0.5	1.69	0.31	17.0±0.25
	NEF340W	0.5	1.86	0.33	21.6±0.25
	NEF540W	0.5	2.14	0.37	23.9±0.25
	NEF700W	0.5	2.41	0.46	27.2±0.25
	NEH09W	0.35	1.68	0.30	19.0±0.25
	NEH14W	0.25	1.20	0.30	19.0±0.25
	NEH20W	0.25	1.34	0.33	19.0±0.25
	NEH30W	0.25	1.50	0.36	21.5±0.25
	NEH41W	0.25	1.64	0.43	24.0±0.25
	NEH55W	0.25	1.94	0.50	29.5±0.25
	NEH70W	0.25	2.05	0.51	31.3±0.25
	NEH90W	0.25	2.23	0.55	32.0±0.25
NEH110W	0.25	2.43	0.55	32.5±0.25	
NEH135W	0.25	2.56	0.60	34.0±0.25	
NEH150W	0.25	2.74	0.65	34.5±0.25	
NEH180W	0.25	2.85	0.70	35.5±0.25	

Relationship between parallel misalignment and angular misalignment for Spacer Types

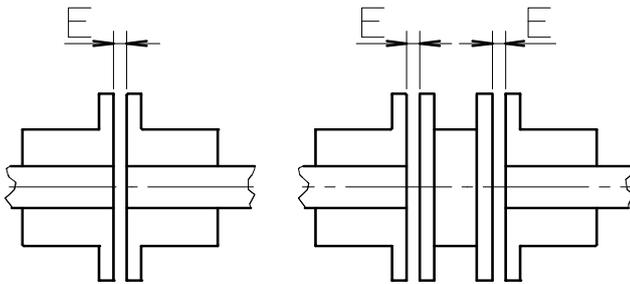
Graph 1



Graph 2

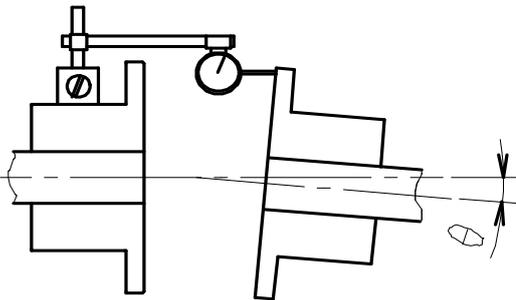


① Adjusting flange surface measurements E (mm)



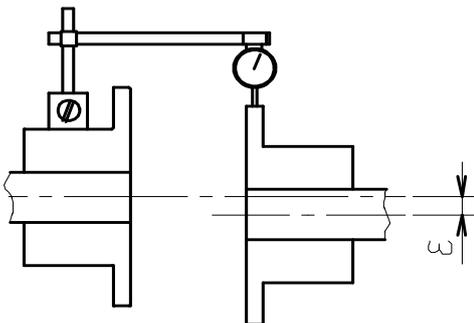
Adjust the position of the hub so that the average of E measurements falls within $E \pm 0.25$ mm. Measure E at 4 positions or at every 90° for both Spacer and Single Types. Consider the degree of possible adjustment for E dimensions first. If the drive/ driven shafts have steps, adjustable range may be limited.

② Angular misalignment θ (deg)



- Fix dial gauge onto either hub as shown above. Then rotate the hub to find the minimum reading on the dial gauge and set at zero.
- Turn the hub on the dial gauge side (left side hub) 360° and read the angular misalignment.
- Adjust with a shim until the dial gauge reading (T.I.R.) falls within the range of values listed in Table 2.

③ Parallel misalignment ϵ (mm)



- Install a dial gauge onto the hub flange as shown above. Turn the hub to find the minimum reading on the dial gauge and set at zero.
- Turn the hub on the dial gauge side (left side hub) 360° and read the parallel misalignment.
- OD run-out of dial gauge at the opening of the Hub will show abnormal values because of the machining process. Avoid measuring at these portions.
- Adjust with a shim until the dial gauge reading (T.I.R.) is within twice as much as the values (ϵ) given in Table 2.
- If the equipment is moved to adjust parallel misalignment, make sure to readjust the angular misalignment.

④ Repeat the above adjustments until all required settings are complete.

⑤ Tighten all the U-nuts at the correct torque strength given in Table 3. The tightness of the nuts determines the amount of static friction produced between the disk and the washer. This friction then translates into the torque transmitted by ECHT-FLEX COUPLING. Be sure to use the tightening torque specified in Table 3.

Table 3 Tightening Torque of U-nuts

TYPE	Tightening Torque for U-nuts N·m{kgf·m}	U-nut Size
NEF02	4.90{0.5}	M5
NEF04	8.82{0.9}	M6
NEF10	8.82{0.9}	M6
NEF18	21.6{2.2}	M8
NEF25	21.6{2.2}	M8
NEF45	41.2{4.2}	M10
NEF80	78.4{8.0}	M12
NEF130	78.4{8.0}	M12
NEF210	177{18.1}	M16
NEF340	177{18.1}	M16
NEF540	470{48.0}	M20
NEF700	657{67.0}	M24
NEH09	470{48.0}	M20
NEH14	568{58.3}	M22
NEH20	784{80.0}	M24
NEH30	1170{119}	M27
NEH41	1590{162}	M30
NEH55	2250{230}	M36
NEH70	2550{260}	M36
NEH90	3230{330}	M39
NEH110	3920{400}	M42
NEH135	4900{500}	M45
NEH150	5490{560}	M48
NEH180	6860{700}	M52

U-nuts can be used up to 20 times after they are removed. Use as spares thereafter.

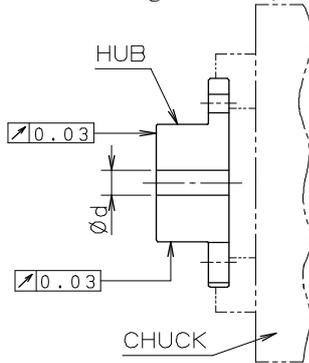
⑥ Caution

After operating for 1-2 hours, re-inspect the angular and parallel misalignments. Also, retighten the bolts and nuts at specified torques (Table 3).

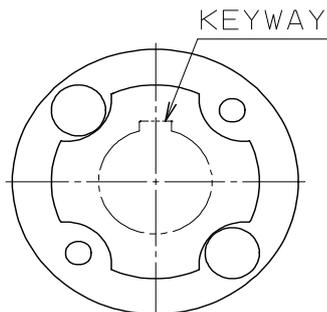
At half-year to year intervals, check for loose U-nuts and other anomalies in parts.

4. Caution on Finishing the Hub Bore

If machining the bore, set the datum plane at flange OD and end face.



Machine keyway at the following position for petal type hubs.



If using a POWER-LOCK (EL Series) for your shaft, see the instruction manual for ECHT-FLEX COUPLING POWER-LOCK Type.

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.



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