

Instruction Manual

ECHT-FLEX COUPLING POWER-LOCK Type

Thank you for purchasing an ECHT-FLEX COUPLING POWER-LOCK Type. 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 is an essential part of the ECHT-FLEX COUPLING, and it should remain with the product at all times including when re-distributed. 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 the coupling is used with vehicles for transporting humans, install a suitable protection device on the vehicle. Otherwise, it could fall and result in accidents and damage the equipments. ● 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 accidents resulting in death, injury or damage to the equipments. <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 may 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 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 protective clothing and gears (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 is not switched back on accidentally. ● Make sure to tighten and apply anti-loosening agent sufficiently.

(Operation)

- 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 is not turned back on accidentally.
Make sure the drive and driven equipments 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 equipments and cause injuries.

(Transportation)

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

(Installation)

- Do not touch the inner diameter and edge of each part with bare hands, and avoid possible injury.
- Align the drive and driven shafts to install the coupling as instructed in the manual.

(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 protective clothing and gears (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.
- Periodically check that the drive and driven shafts are aligned as described in the manual.
In addition, also check that the rubber and plastic parts are not worn or deformed.

(Environment)

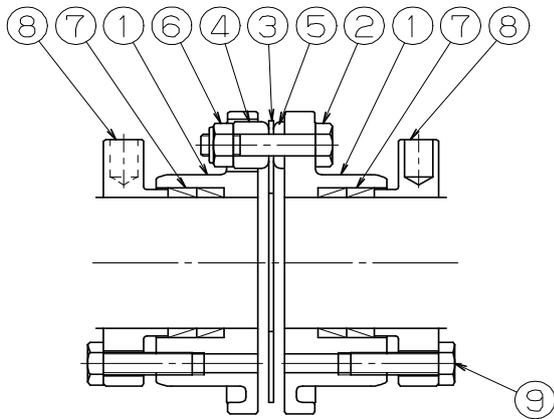
- Coupling scraps should be disposed as general waste by skilled professionals.
- This coupling meets RoHS (Restriction of certain Hazardous Substances) standards and contains no hazardous chemicals.

1. Structure and Parts

Fig. 1

Single type

NEF04 --- NEF700

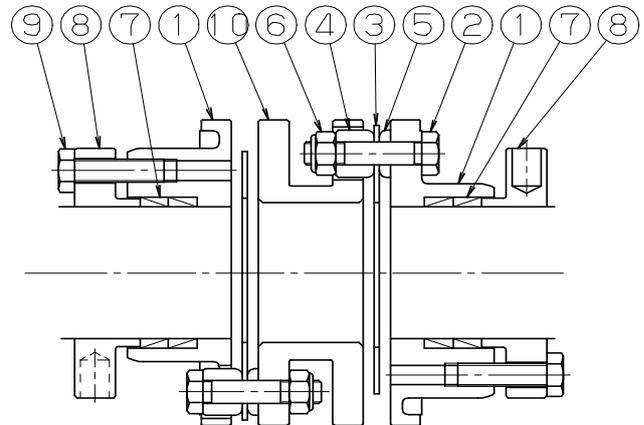


- ① Hub
- ② Reamer Bolt
- ③ Disk
- ④ Washer (A)
- ⑤ Washer (B)
- ⑥ U-Nut
- ⑦ POWER-LOCK
- ⑧ Pressure Flange
- ⑨ Pressure Bolt

Fig. 2

Spacer type

NEF04W --- NEF700W



- ① Hub
- ② Reamer Bolt
- ③ Disk
- ④ Washer (A)
- ⑤ Washer (B)
- ⑥ U-Nut
- ⑦ POWER-LOCK
- ⑧ Pressure Flange
- ⑨ Pressure Bolt
- ⑩ Spacer

(Note) Hubs 10(W), 18(W) and 25(W) are square, except for their flange portions.
Hubs for 04(W), 45(W)---700(W) are petal type.

Table 1 List of components (Part and quantity per unit of coupling)

	Hub	Disk set	Reamer Bolt	Washer (A)	Washer (B)	U-Nut	POWER-LOCK	Pressure Flange	Pressure Bolt	Spacer
Single type NEF04P ---NEF700P	2	1	4	4	4	4	4	2	8	--
Spacer type NEF04WP ---NEF700WP	2	2	8	8	8	8	4	2	8	1

(Note) Number of POWER-LOCK shows series in 2 per Hub.
POWER-LOCK is consisting of Outer and Inner Rings.

2. Installation

- ① Compare your coupling parts with those listed in Table 1.
- ② Contents of disk sets are sustained by tape to prevent individual disks from shifting. Do not take the tape off, and use as is.
- ③ Install Hub to each shaft by POWER-LOCK. Clean the dust on the surface of drive & driven shafts, inner diameter of Hub, Pressure Flange, Pressure Bolt and Inner & Outer Rings of POWER-LOCK, and apply a thin layer of grease or oil.

(Never use oil/ grease containing antifriction molybdenum disulfide lubricant.)

Assemble the unit in the following order:

- (a) Hub
- (b) Outer Ring then Inner Ring
- (c) Pressure Flange

(d) Tighten the Pressure Bolts

Make sure the Bolts turn lightly when assembled.

Tighten the Bolts manually until the Pressure Flange does not turn any more.

Adjust the installation position of Hub and phase.

Tighten at quarter of the tightening torque specified in Table 2.

Finally, tighten the Bolts with torque wrench at full torque specified in Table 2 until the Bolts do not turn any more.

④ Set each part to the correct position, then align the 2 Hubs based on the procedure described in section 3. Alignment.

⑤ Refer to Fig. 1 and 2, assemble the coupling with attention to the allocation of Disk set, Washer, Bolts and U-Nut. Both the bolts and disk openings are accurately machined by reamer technique. Tighten the u-nuts instead of the bolts to avoid damage. Make sure to tighten according to the “U-Nut tightening torque” in Table 4.

Table 2 Pressure Bolts tightening torque

BORE	NEF04		NEF10		NEF18		NEF25		NEF45		NEF80		NEF130		NEF210	
	Nm	kgf-m	Nm	kgf-m	Nm	kgf-m										
10	4.41	0.45														
11	4.51	0.46														
12	4.70	0.48														
13	4.80	0.49														
14	7.74	0.79	7.74	0.79	7.74	0.79										
15	8.72	0.89	8.72	0.89	8.72	0.89										
16	9.02	0.92	9.02	0.92	9.02	0.92										
17	9.21	0.94	9.21	0.94	9.21	0.94										
18	9.51	0.97	9.51	0.97	9.51	0.97	12.9	1.32	12.9	1.32						
19	10.9	1.11	10.9	1.11	10.9	1.11	14.8	1.51	14.8	1.51						
20	11.1	1.13	11.1	1.13	11.1	1.13	15.1	1.54	15.1	1.54	18.7	1.91				
22	9.70	0.99	11.1	1.13	11.1	1.13	15.1	1.54	15.1	1.54	18.6	1.90				
24			11.7	1.19	11.7	1.19	15.9	1.62	15.9	1.62	19.7	2.01				
25			12.4	1.27	12.4	1.27	17.0	1.73	17.0	1.73	21.0	2.14				
28			12.9	1.32	12.9	1.32	17.6	1.80	17.5	1.79	21.8	2.22	21.8	2.22		
30			13.0	1.33	13.7	1.40	19.1	1.95	19.1	1.95	23.6	2.41	23.6	2.41		
32			12.2	1.24	13.7	1.40	19.6	2.00	19.9	2.03	24.7	2.52	24.7	2.52		
35			10.5	1.07	12.4	1.27	24.9	2.54	24.8	2.53	30.8	3.14	30.8	3.14	36.6	3.73
36							26.0	2.65	26.0	2.65	32.1	3.28	32.1	3.28	38.2	3.90
38							25.9	2.64	27.0	2.75	33.4	3.41	33.4	3.41	39.7	4.05
40							27.9	2.85	28.8	2.94	36.1	3.68	36.2	3.69	46.6	4.75
42							24.9	2.54	31.3	3.19	38.6	3.94	38.0	3.88	49.5	5.05
45									34.3	3.50	42.4	4.33	40.7	4.15	54.5	5.56
48									34.3	3.50	45.7	4.66	42.7	4.36	57.0	5.82
50									34.3	3.50	48.0	4.90	44.2	4.51	58.8	6.00
55											55.0	5.61	48.1	4.91	63.2	6.45
56											59.0	6.02	50.0	5.10	65.2	6.65
60											62.6	6.39	53.6	5.47	69.2	7.06
63													56.6	5.78	72.4	7.39
65													58.8	6.00	74.7	7.62
70													67.0	6.84	82.4	8.41
71													67.6	6.90	83.8	8.55
75													67.6	6.90	89.7	9.15
80															104	10.6
85															116	11.8
90																
95																
100																
110																
120																

For pressure bolts, tightening torque is the same for single or multiple power locks.

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 of 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 all relative.

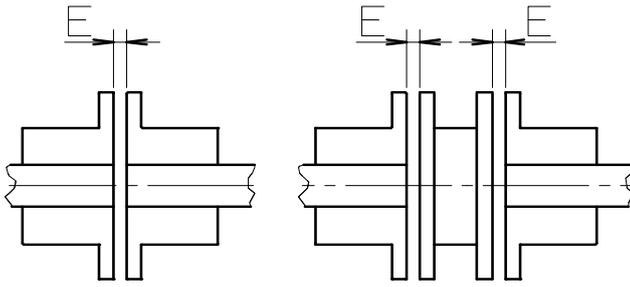
When adjusting, you must take into account that if one increases, the other will decrease.

Align the first centering within the recommended value in Table 3 or smaller.

Table 3 Recommended Misalignment

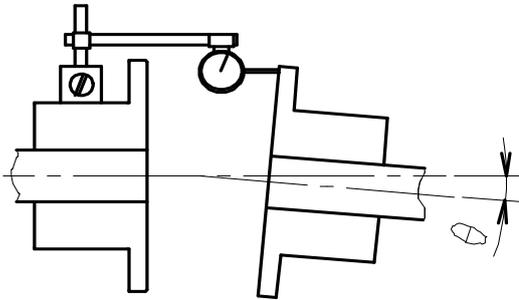
TYPE		Angular Misalignment		Parallel Misalignment	Axial Misalignment
		θ (deg)	T.I.R (mm)	ϵ (mm)	E (mm)
Single type	NEF04	0.25	0.29	--	6.1 ± 0.25
	NEF10	0.25	0.35	--	6.6 ± 0.25
	NEF18	0.25	0.4	--	8.3 ± 0.25
	NEF25	0.25	0.45	--	11.2 ± 0.25
	NEF45	0.25	0.55	--	11.7 ± 0.25
	NEF80	0.25	0.62	--	11.7 ± 0.25
	NEF130	0.25	0.73	--	16.8 ± 0.25
	NEF210	0.25	0.84	--	17.0 ± 0.25
Spacer type	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	1.1	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

① Adjusting flange surface measurements E (mm)



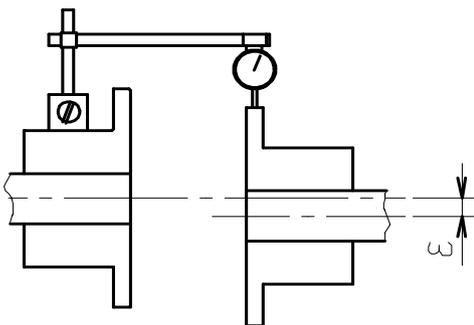
Adjust the position of the Hub so that average of dimension E is within $E \pm 0.25$ mm. Measure E at 4 positions every 90° for both Spacer and Single Types. Consider the adjustability of E dimension first. If the drive/ driven shafts have steps, adjustable range may be limited.

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 3.

③ Parallel misalignment ε (mm)



- Install 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 hole of Hub will show abnormal values. This is due to the deformation caused by machining the hole. 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 3.
- If the equipment is moved to adjust parallel misalignment, make sure to adjust for angular misalignment.

- ④ Repeat the above adjustments until all required settings are complete.
- ⑤ Tighten all the U-nuts at the torque strength given in Table 4. The degree at which the nuts are tightened, 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 follow the tightening torque specified in Table 4.

Table 4 Tightening torque of U-nuts

TYPE	Tightening torque of U-nuts $N \cdot m \{kgf \cdot m\}$	U-nut size
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

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

- ⑥ Caution
After operating for 1- 2 hours, re-inspect the angular and parallel misalignments. Also, re-tighten the bolts and nuts at specified torques (Table 4).
At half-year to year intervals, check for loose U-nuts and other anomalies in parts.

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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