Installation and Operational Instructions for EAS®-dutytorque Type 404_._ _400 Sizes 2 – 9

(B.4.3.1.EN)

Please read these Operational Instructions carefully and follow them accordingly!
Ignoring these Instructions may lead to malfunctions or to clutch failure, resulting in damage to other parts.

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Safety and Guideline Signs

CAUTION

Danger of injury to personnel and damage to machines.

Please Observe!
Guidelines on important points.

Safety Regulations

These Installation and Operational Instructions (I + O) are part of the clutch delivery.
Please keep them handy and near to the clutch at all times.

It is forbidden to start initial operation of the product until you have ensured that all applicable EU directives and directives for the machine or system, into which the product has been installed, have been fulfilled.
At the time these Installation and Operational Instructions go to print, the EAS®-clutches accord with the known technical specifications and are operationally safe at the time of delivery.
Without a conformity evaluation, this product is not suitable for use in areas where there is a high danger of explosion. This statement is based on the ATEX directive.

CAUTION

- ❒ If the EAS®-clutches are modified.
- ❒ If the relevant standards for safety and / or installation conditions are ignored.

User-implemented Protective Measures

- ❒ Cover all moving parts to protect against seizure, dust impacts or foreign body impact.
- ❒ The clutches may not be put into operation without a limit switch unless *mayr*® has been contacted and has agreed otherwise.

To prevent injury or damage, only specialist personnel are allowed to work on the components. They must be familiar with the dimensioning, transport, installation, initial operation, maintenance and disposal according to the relevant standards and regulations.
Please read the Installation and Operational Instructions carefully prior to installation and initial operation of the device.

These Safety Regulations are user hints only and may not be complete!

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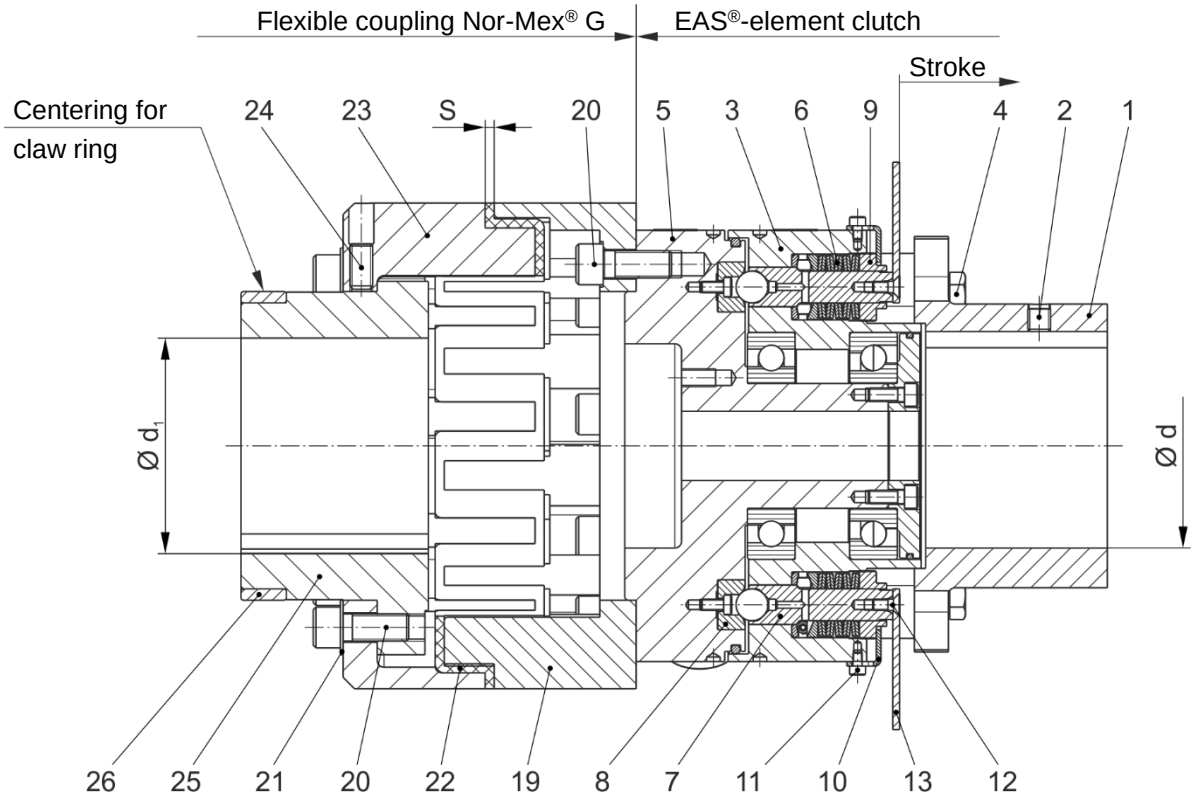

Fig. 1: Type 4043._1400 (Design with switching disk (14))

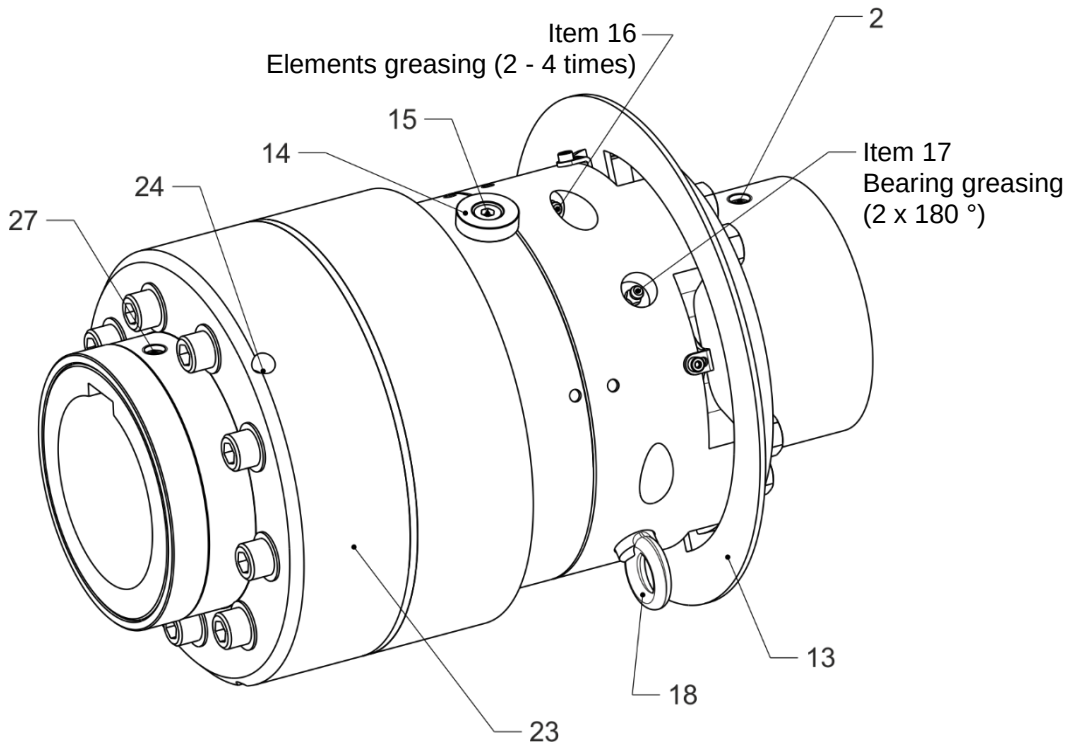

Fig. 2: Type 4043._1400 (Design with switching disk (13))

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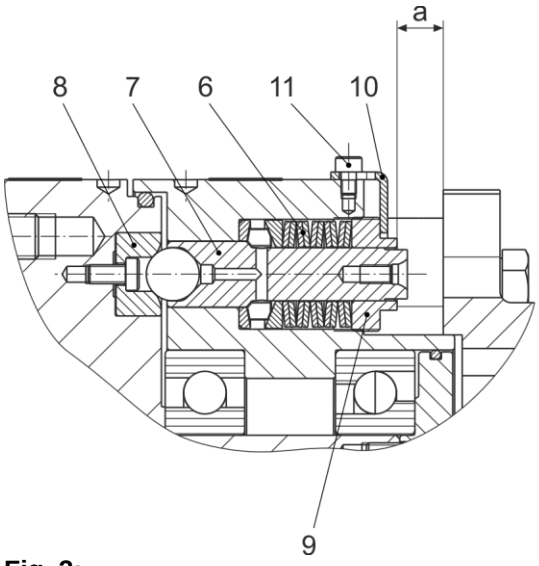

Fig. 3:
Detail overload element (Item 6), Type 404_._0400
(Design without switching disk (13))

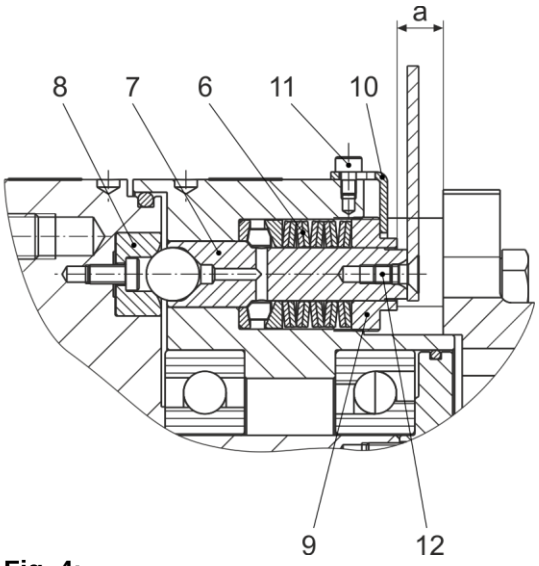

Fig. 4:
Detail overload element (Item 6), Type 404_._1400
(Design with switching disk (13))

Parts List Parts List (Only use *mayr*® original parts)

Item	Name
1	Hub
2	Set screw
3	Element flange
4	Hexagon head screw
5	Pressure flange
6	Overload element
7	Bolt
8	Thrust piece
9	Adjusting nut
10	Lock washer
11	Cap screw
12	Countersunk screw
13	Switching disk [1] (Type 404_._1400)
14	Control flag [2]

Item	Name
15	Cap screw
16	Cone lubricating nipple (elements greasing)
17	Cone lubricating nipple (bearing greasing)
18	Eyebolt
19	Cam ring
20	Cap screw
21	Locking washer
22	Flexible intermediate ring
23	Claw ring
24	Set screw
25	Flange hub
26	Centring ring
27	Set screw

[1] Item 13 for overload recognition using a limit switch

[2] Item 14 for overload recognition using a speed monitoring device

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Table 1: Technical Data of the EAS®-element Clutch

Size	Limit torques for overload M_G				
	Type 404_.3_400 [Nm]	Type 404_.4_400 [Nm]	Type 404_.5_400 [Nm]	Type 404_.6_400 [Nm]	Type 404_.7_400 [Nm]
2	70 – 140	140 – 280	170 – 350	350 – 700	700 – 1400
3	70 – 140	140 – 280	170 – 350	350 – 700	700 – 1400
4	150 – 400	350 – 900	700 – 1400	1400 – 2800	-
5	150 – 400	350 – 900	700 – 1400	1400 – 2800	2000 – 4000
6	150 – 400	350 – 900	700 – 1400	1400 – 2800	2800 – 5600
7	800 – 2000	2000 – 4000	3000 – 6000	6000 – 9000	-
8	800 – 2000	2000 – 4000	3000 – 6000	6000 – 12000	-
9	800 – 2000	2000 – 4000	3000 – 6000	6000 – 12000	8500 - 17000

Table 2: Technical Data of the EAS®-element Clutch

Size	EAS®-elements		Maximum speed [rpm]	Bolt stroke on overload [mm]	Maximum bore Ød [mm]	Permitted ambient temperature
	Size	Pcs.				
2	01	2 / 4 [3]	3500	4	90	-20 °C to +80 °C
3	01	2 / 4 [3]	3000	4	90	-20 °C to +80 °C
4	0	2	3000	6	120	-20 °C to +80 °C
5	0	2	2750	6	120	-20 °C to +80 °C
6	0	2 / 4 [3]	2500	6	120	-20 °C to +80 °C
7	1	3	2250	8	140	-20 °C to +80 °C
8	1	3	2000	8	140	-20 °C to +80 °C
9	1	3	1750	8	140	-20 °C to +80 °C

[3] 4 EAS®-elements on Type 404_.7_400

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Table 3: Technical Data of the Flexible Shaft Coupling

Size	Nominal torque T_N [Nm]	Peak torque T_{KS} [Nm]	Permitted misalignments (Fig. 8) axial ΔK_a [mm]	radial ΔK_r [mm]	angular ΔK_w [mm]	Axial installation backlash (Fig. 1) S [mm]	Maximum bore $Ød_1$ [mm]
2	1650	2400	± 1.5	0.3	0.3	3.5	85
3	2400	4200	± 2.0	0.3	0.3	4	95
4	2400	4200	± 2.0	0.3	0.3	4	95
5	3700	6200	± 2.0	0.3	0.3	4	100
6	5800	8300	± 2.5	0.3	0.3	5.5	115
7	7550	10500	± 2.5	0.3	0.3	8	130
8	9900	14500	± 2.5	0.3	0.3	8	135
9	14000	20000	± 2.5	0.3	0.3	8	160

Table 4: Screws

Size	Cap screws (20) in the claw ring (23) and in the cam ring (19) Pcs.	Wrench opening	Tightening torque [Nm]	Hexagon head screws (4) in the hub (1) Pcs.	Wrench opening	Tightening torque [Nm]	Set screws in the claw ring (23) Pcs. Item 24	in the hub (1) Pcs. Item 2	in the flange hub (25) Pcs. Item 27
2	9 x M10	8	40	8 x M12	19	122	3 x M10	1 x M8 (at Ød ≤ 30) 1 x M10 (at Ød > 30)	1 x M10
3	9 x M12	10	100	8 x M12	19	122	3 x M10	1 x M8 (at Ød ≤ 30) 1 x M10 (at Ød > 30)	1 x M12
4	9 x M12	10	100	8 x M16	24	300	3 x M10	1 x M12	1 x M12
5	10 x M12	10	100	8 x M16	24	300	2 x M10	1 x M12	1 x M16
6	10 x M14	12	160	8 x M16	24	300	3 x M10	1 x M12	1 x M16
7	10 x M14	12	160	9 x M20	30	590	3 x M12	1 x M16	1 x M16
8	10 x M16	14	240	9 x M20	30	590	3 x M12	1 x M16	1 x M16
9	11 x M16	14	240	9 x M20	30	590	3 x M10	1 x M16	1 x M16

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Design

EAS®-dutytorque clutches are mechanically disengaging overload clutches (EAS®- element clutches) with a mounted, plug-in elastomer compensating coupling (flexible coupling Nor-Mex® G).
The overload clutch separates the input and the output on overload.
When disengaged, the clutch slows down freely without any residual torque.
The elastomer compensating coupling is the connection to the output-side shaft end of the system and compensates for misalignments of the shaft ends.
The elastomer compensating coupling consists of the following components: flange hub (25), claw ring (23), flexible intermediate ring (22), cam ring (19) and the cap screws (20).
At the end of the flange hub (25) there is a centring ring (26), which is intended for holding the claw ring (23) in de-installed state.

De-installation of the claw ring (23) is necessary when:

- ❑ the flexible intermediate ring (22) of the coupling must be replaced (see page 9), or
- ❑ the running characteristics of the motor in dry running must be checked; the input and the output can be separated without moving the motor (see page 9).

CAUTION

This operating state is only permitted using suitable protective measures.

Scope of Delivery / State of Delivery

- ❑ The clutch is manufacturer-assembled ready for installation.
- ❑ The torque is set manufacturer-side according to the customer's request (please compare the torque stipulated in the order with the torque imprinted/engraved in the identification).
  Unless the customer requests a particular torque setting when ordering, the clutch must be adjusted to the required torque by using the Adjustment Diagram (attachment) (see section Torque Adjustment).
- ❑ The clutch is balanced with a balance quality of G2.5 at 1500 rpm.

Please check the scope of delivery according to the Parts List as well as the state of delivery immediately after receiving the goods.
mayr® will take no responsibility for belated complaints.
Please report transport damage immediately to the deliverer.
Please report incomplete delivery and obvious defects immediately to the manufacturer.

Function

The clutch protects the drive line from excessively high, unpermitted torque impacts which can occur due to unintentional blockages.
After overload has taken place, the transmitting mechanism is completely disconnected. Only the bearing friction continues to have an effect.
This means that no re-engagement impacts or metallic sliding movements occur on the clutch torque transmission geometries when using this clutch variant.
When in operation, the set torque is transmitted from the hub (1) (input) via the pressure flange (5) or the flange hub (25) (flexible coupling) onto the output.
If the set limit torque is exceeded (overload), the clutch disengages.
On disengagement, the bolts (7) in the overload elements (6) perform an axial movement (stroke) and remain disengaged.
Optionally, a switching disk (13) can be mounted onto Type 404_._1400. The switching disk stroke can be used for overload recognition via the customer-side limit switch.
The limit switch registers the disengagement movement and switches off the drive.
The input and output are separated residual torque-free.
After-acting masses can run free.

The run-out time after disengagement must be max. 10 minutes.

CAUTION

After overload occurrence, the clutch has no load-holding function.

The drive can be switched off electrically via:

- ❑ a speed monitoring device; for this, there are 2 control flags (Item 14, Fig. 2) in the pressure flange (5) or in the element flange (3); or
- ❑ a limit switch
  (only for design with switching disk (13))

In order to prepare the clutch for renewed operation, the bolts (7) must be re-engaged manually (see section Re-engagement, page 10).

General Installation Guidelines

The bore tolerances in the hub (1) and in the flange hub (25) are produced to H7. The surface roughness depth in the bores is produced to Ra 1.6 µm.
Please secure screws with Loctite 243 (medium hard).

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Clutch Installation

The clutch is manufacturer-assembled ready for installation and set to the limit torque stipulated in the order.
The switching disk (Item 13, only for Type 404_._1400) is included loose in delivery.
It is possible to mount the EAS®-dutytorque overload clutch radially without having to move the motor (drive-side) (see section 'Radial Installation').
However, if it is possible to push the input and/or output unit together, the clutch can be mounted "axially" (see section 'Axial Installation').
For speed monitoring, there are two control flags (Item 14, Fig. 2). They can either be screwed into the pressure flange (5) (output-side) or into the element flange (3) using cap screws (15).

Axial Installation

CAUTION

The clutch must not be mounted so that the shaft facing side contacts the bearing cover, as the bearing cover moves at relative speed towards the shaft in case of overload.
A safe distance of 2 mm (Fig. 5) must be maintained.

1) Mount the EAS® part of the clutch incl. the cam ring (19) onto the input shaft using a suitable device, and secure it axially using the set screw (2).
2) Mount the flexible part (flange hub 25 incl. claw ring 23) onto the output shaft using a suitable device, and secure it axially using the set screw (27).
3) The set screws (24) in the claw ring (23) must be secured against being catapulted out or they must be removed from the clutch.
4) Push the input and output shafts together axially and establish the positive locking of the elastomer compensating coupling.
   While doing this, please observe the distance dimension “S” and the permitted misalignment values (see Fig. 1, page 3 and Table 3, page 6).
5) When in position, screw the input and output units together.

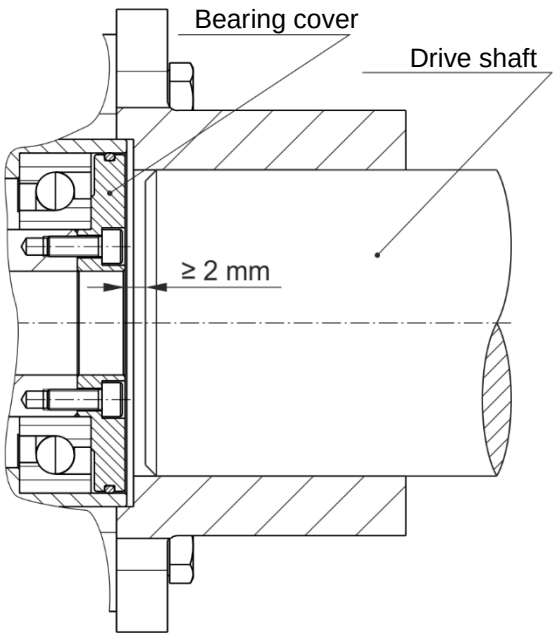

Fig. 5

CAUTION

A press cover for axial securement of the shaft as shown in Fig. 6 is not permitted.

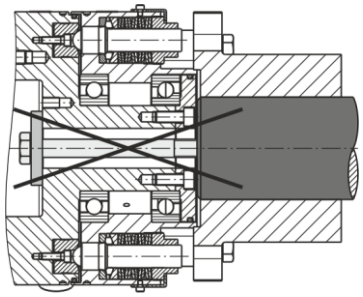

Fig. 6

Radial Installation

1) Loosen the hexagon head screws (4) in the element flange (3).
2) Mount the EAS®-hub (1) onto the input shaft using a suitable device and secure it axially using a set screw (2).
3) Mount the flange hub (25) incl. the claw ring (23) onto the output shaft using a suitable device, and secure it axially using the set screw (27).
4) Loosen the cap screws (20) in the claw ring (23).
5) Pull the claw ring (23) on the centring ring (26) back.
6) Tighten the set screws (24).
   Please observe the tightening torques:
   - for set screw M10: 28 Nm (Sizes 2 to 6 and 9)
   - for set screw M12: 48 Nm (Sizes 7 and 8)
7) Add the remaining clutch part (element flange (3) + pressure flange (5) + cam ring (19)) radially between the input and the output shafts.
8) Tighten the hexagon head screws (4) in the element flange (3).
   Please observe the tightening torque acc. Table 4!
9) Loosen the set screws (24) in the claw ring (23).
   After loosening the set screws (24), they must be secured against being catapulted out or they must be removed from the clutch.
10) Pull the claw ring (23) over the flange hub (25) in the direction of the cam ring (19).
11) Tighten the cap screws (20) in the claw ring (23).
    Please observe the tightening torque acc. Table 4!
12) Establish the positive locking of the elastomer compensating coupling.
    While doing this, please observe the distance dimension “S” and the permitted misalignment values (see Fig. 1, page 3 and Table 3, page 6).

Please observe the screw tightening torques acc. Table 4!

CAUTION

Before initial operation of the clutch, please remove the eyebolt (18) (installation aid).

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Clutch De-installation

Replace the flexible intermediate ring (22) according to the procedure described in section 'Replacing the Flexible Intermediate Ring'.
In order to check the running characteristics of the motor in dry running without moving the motor, please observe section 'Checking the Motor Running Characteristics'.

Replacing the Flexible Intermediate Ring

1) Loosen the cap screws (20) in the claw ring (23).
2) Remove the cap screws and locking washers (20/21) from the clutch.
3) Pull the claw ring (23) back up to the flange hub (25) end on the centring ring (26).
4) Tighten the set screws (24).
   Please observe the tightening torques:
   - for set screw M10: 28 Nm (Sizes 2 to 6 and 9)
   - for set screw M12: 48 Nm (Sizes 7 and 8)
5) The flexible intermediate ring (22) on the coupling can be removed by separating it using a cutting tool (see also section 7, page 17).
6) The new flexible intermediate ring (22) can also only be inserted in separated state.
7) The clutch is ready for operation again after steps 9) to 12) on page 8 have been carried out.

If the clutch part between the input and the output shafts is lifted out radially, the intermediate ring can be replaced axially. (For radial de-installation, steps 1) to 9) in section 'Checking the Motor Running Characteristics' must be carried out and for radial re-installation steps 7) to 12) on page 8 must be carried out).

Checking the Motor Running Characteristics

1) Loosen the cap screws (20) in the claw ring (23).
2) Remove the cap screws and locking washers (20/21) from the clutch.
3) Pull the claw ring (23) back up to the flange hub (25) end on the centring ring (26).
4) Tighten the set screws (24).
   Please observe the tightening torques:
   - for set screw M10: 28 Nm (Sizes 2 to 6 and 9)
   - for set screw M12: 48 Nm (Sizes 7 and 8)
5) Screw the eyebolt (18) into the pressure flange (5).
6) Support the clutch using the eyebolt (18).
7) Loosen the hexagon head screws (4) in the element flange (3).
8) Remove the hexagon head screws (4) from the clutch.
9) Lift the remaining clutch part (element flange (3) + pressure flange (5) + cam ring (19)) radially between the input and the output shafts.

CAUTION

When working on the clutch, the motor must be secured against switch-on.
Suitable protective devices and protective measures spread over the rotating parts must be used to guarantee the safety of the operating personnel.

10) The motor can be checked via temporary acceleration.
11) The clutch is ready for operation again after steps 7) to 12) on page 8 have been carried out.

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Torque Adjustment (Figs. 3 and 4 / Page 4)

Set the limit torque M_G for overload on the clutch by changing the cup spring pre-tension on each overload element (6) according to the Adjustment Diagram.
On the clutches the adjusting nut (9) is adjusted by turning it in the overload element (6) using an open-end wrench.

Wrench opening values of the adjusting nut (9):
Wrench opening 19 for Sizes 2 and 3
Wrench opening 30 for Sizes 4, 5 and 6
Wrench opening 41 for Sizes 7, 8 and 9

During torque adjustment, please ensure that all overload elements (6) on the clutch are evenly adjusted!

Torque Adjustment:

Type 404_._0400 (Fig. 3)

- ❒ Determine the limit torque M_G for overload.
- ❒ Please determine dimension “a” using the Adjustment Diagram included in the clutch delivery.
  This dimension is equal to the required limit torque M_G.
- ❒ Remove the cap screws (11) and the lock washers (10), so that the adjusting nuts (9) can be turned.
- ❒ Set all overload elements (6) by turning the adjusting nut (9) to the dimension “a” found in the Adjustment Diagram.
- ❒ Secure the adjusting nuts (9) against turning using the lock washers (10) and the cap screws (11).
- ❒ Tighten the cap screws (11).

Type 404_._1400 (Fig. 4)

- ❒ Determine the limit torque M_G for overload.
- ❒ Please determine dimension “a” using the Adjustment Diagram included in the clutch delivery.
  This dimension is equal to the required limit torque M_G.
- ❒ Unscrew the switching disk (13) and remove the countersunk screws (12).
- ❒ Remove the cap screws (11) and the lock washers (10), so that the adjusting nuts (9) can be turned.
- ❒ Set all overload elements (6) by turning the adjusting nut (9) to the dimension “a” found in the Adjustment Diagram.
- ❒ Secure the adjusting nuts (9) against turning using the lock washers (10) and the cap screws (11).
- ❒ Tighten the cap screws (11).
- ❒ Screw the countersunk screws (12) via the switching disk (13) in the bolts (7) and tighten them.

Re-engagement (Fig. 7)

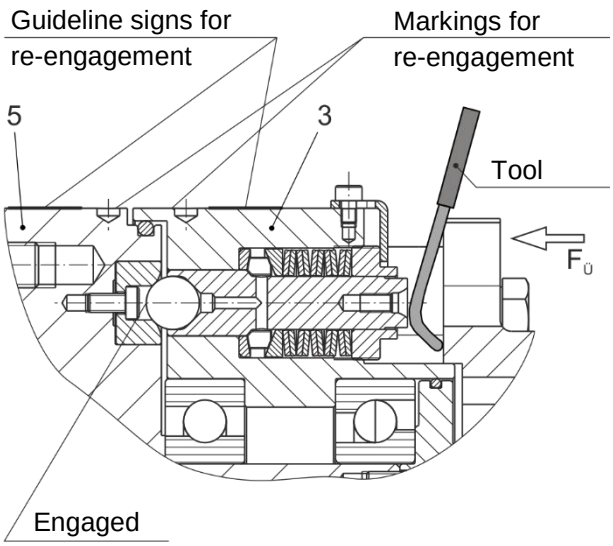

Fig. 7

In order to make the clutch ready for operation again after overload occurrence, the bolts (7) in the overload elements (6) must be re-engaged.
Both of the yellow guideline signs for regaining the synchronous position (due to balance quality) on the outer diameters of the element flange (3) and the pressure flange (5) must align with each other (Fig. 7).
Re-engagement takes place by placing axial pressure on the bolt end of each overload element (6).
Depending on the equipment available, the accessibility of the installation point etc., re-engagement can be carried out in the following ways:

- ❒ Manually, using a suitable tool.
- ❒ By using an engagement mechanism. The engagement procedure can also be automated using pneumatic or hydraulic cylinders.

On Type 404_._1400 (Fig. 4, page 4), re-engagement takes place by placing axial pressure via the switching disk (13) on the bolt end of each overload element.
Inaccurate application of the lever tool onto the bolt end can lead to the switching disk (13) bending.

The level of engagement force required is dependent on the set limit torque for overload, and can be roughly calculated using the following formula:

F_E = 1.5 x M_G [kN]

F_E = Total engagement force of all clutch overload elements [kN].

M_G = Set limit torque for overload [kNm].

$F_Ü$ = Engagement force per overload element [kN].

$$F_Ü = \frac{F_E}{n}$$

n = Number of overload elements

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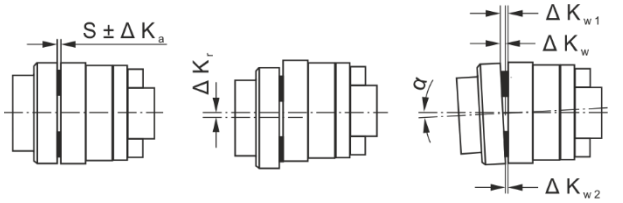
Permitted Shaft Misalignments (Figs. 8 and 9)

The EAS®-dutytorque compensates for axial, radial and angular shaft misalignments, see Fig. 8.
For the maximum permitted shaft misalignments, please see the Table 3, page 6. If more than one kind of misalignment takes place simultaneously, they influence each other. This means that the permitted misalignment values are dependent on one another, see Fig. 9.



Difference dimension $\Delta K_w = \Delta K_{w1} - \Delta K_{w2}$
=> Measure dimensions ΔK_{w1} and ΔK_{w2} vertically and horizontally offset by 180°.

Fig. 8

Example:

EAS®- dutytorque, Size 4:

- Axial displacement occurrence: $\Delta K_a = 0.4$ mm
- Angular misalignment occurrence: $\Delta K_w = 0.09$ mm
- Required: permitted radial misalignment **ΔK_r**

$\Delta K_a = 0.4$ mm
$\Rightarrow$ 20 % of the permitted Table value $\Delta K_{a\,zul.} = 2.0$ mm

$\Delta K_w = 0.09$ mm
$\Rightarrow$ 30 % of the permitted Table value $\Delta K_{w\,zul.} = 0.3$ mm

The permitted radial misalignment in % is determined from Fig. 8:
$\Rightarrow$ **ΔK_r = 50 %**
$\Rightarrow$ 50 % of the permitted Table value $\Delta K_{r\,zul.} = 0.3$ mm means that the permitted radial misalignment in this particular case is **0.15 mm**.

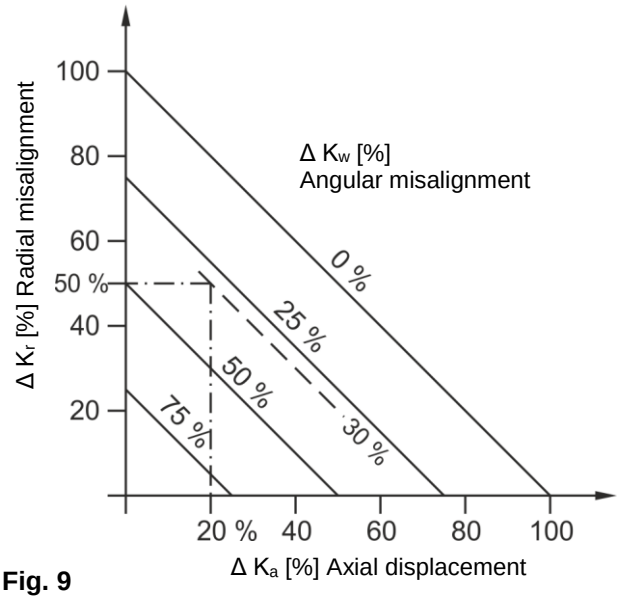


Fig. 9

Clutch Alignment

The elastomer assembly of the EAS®-dutytorque clutch compensates for radial, axial and angular shaft misalignments (please observe the maximum permitted values acc. Table 3). Exact alignment of the clutch minimises the compensating forces having an effect in the drive line, improves the running smoothness of the clutch and reduces the load on the shaft bearings. The clutch service lifetime and therefore also the engagement accuracy in case of overload are also increased. We recommend exact alignment of the clutch to the misalignment values
$\Delta K_r + \Delta K_w \leq 0.15$ mm
using a dial gauge or a special laser alignment device.

Please observe additionally the Operational Instructions of the machine manufacturer.

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Maintenance and Maintenance Intervals

- ❑ Re-greasing the overload elements (6) via the cone lubricating nipples (16) and the bearing via the cone lubricating nipples (17) at least every 20 overload occurrences or 1x per year, with approx. 3 – 4 thrusts of grease (approx. 5 ccm) from a grease gun.
- ❑ Maintenance work, which should be carried out after 1000 disengagements or at the latest after 1 year, includes:
  - ➔ Visual inspection
  - ➔ Functional inspection
  - ➔ Inspection of the shaft-hub connection
  - ➔ Inspection of the screw tightening torques
    The specified tightening torques (see Technical Data / pages 5 and 6) must be maintained.
  - ➔ Inspection of the set torque
  - ➔ Clutch release inspection
  - ➔ Inspection of the bearing or bearing pre-tension
  - ➔ Re-greasing of the bearings via the cone lubricating nipples (17), 2 x 180° offset on the element flange (3), see Fig. 2.
  - ➔ Re-greasing of the contact components of the overload elements (6) and the thrust pieces (8) via the cone lubricating nipple (16), 2 – 4 times on the element flange (3), see Fig. 2 (depending on the number of overload elements (6)).

Clutch re-greasing must only be carried out at the place of manufacture or by specially trained personnel.
For greasing, please use NLGI Class 1.5 grease with a basic oil viscosity of 460 mm^2/s at 40 °C, e.g. Mobilith SHC460.

When re-installing the clutch, please secure all screws with Loctite 243 (medium hard).

On the clutches, the exact angular position between the clutch components must be observed to maintain the balance quality. On the clutches, the components are therefore marked and are, on re-installation, to be screwed together again in the **marked angular position** to the tightening torque according to the Technical Data.

If large amounts of dirt or dust are present or in extreme ambient conditions, it may well be necessary to carry out inspections at shorter maintenance intervals.
We recommend that maintenance work is carried out at the site of manufacture.

Disposal

Electronic components
(Limit switch):
Products which have not been disassembled can be disposed of under Code No. 160214 (mixed materials) or components under Code No. 160216, or can be disposed of by a certified disposal firm.

All steel components:
Steel scrap (Code No. 160117)

Seals, O-rings, V-seals, elastomers:
Plastic (Code No. 160119)

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Installation and Operational Instructions for flexible coupling Nor-Mex® G

1. Function

The Nor-Mex®-coupling G is a torsionally flexible and fail-safe claw coupling with a moveable claw ring. It compensates for angular, radial and axial shaft misalignments within defined tolerances. The torque is transmitted via a flexible intermediate ring onto which pressure is applied.

The flexible intermediate ring made of Perbunan (Pb) damps impacts and torsional vibrations, is oil-resistant and electrically conductive. The coupling can be used in any rotational direction and installation position.

One coupling half is split into two parts and therefore allows problem-free separation of the coupled machines. When the claw ring is pushed back, inspection of the rotational direction of the drive is possible. It is also possible to radially lift a coupling half with the respective aggregate. The flexible intermediate ring can be replaced without moving the machine axially (section 7).

2. Design

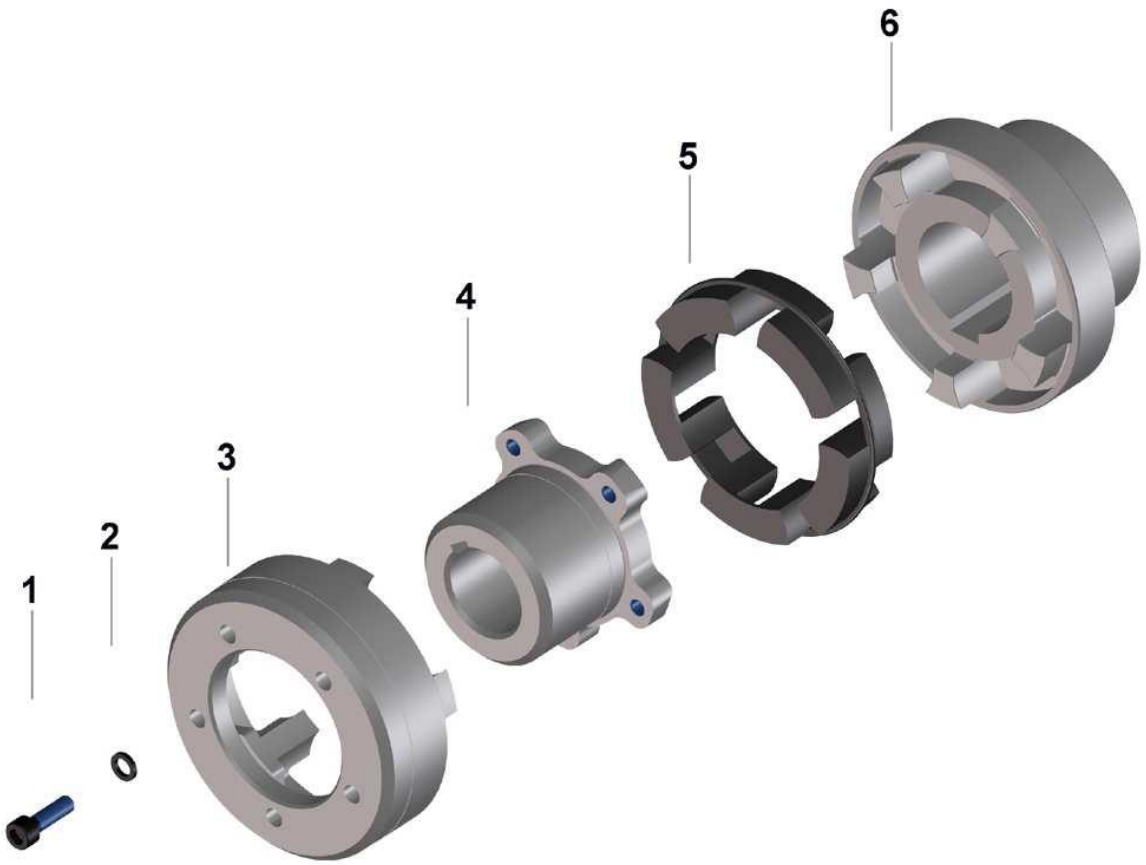

Fig. 10

1 Hexagon socket screw
2 Locking washer
3 Claw ring
4 Flange hub
5 Flexible intermediate ring
6 Coupling hub

The claw ring (Item 3) and the flange hub (Item 4) are screwed together on delivery. The balanced parts are marked to align with each other.

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3. Please Observe Before Installation

CAUTION

Before carrying out any work on the coupling, switch off the motor!
Secure the motor against inadvertent switch-on!

- ❑ Make sure that the intended speed values and torques as well as the ambient temperature do not exceed the permitted values according to the latest TSCHAN Nor-Mex® documentation.
- ❑ The maximum permitted size of the finish bores in the coupling hub as well as the flange hub correspond to the latest TSCHAN Nor-Mex® documentation.
- ❑ The standard tolerances for finish bores correspond to the ISO tolerances H7 (DIN 7161 Sheet 2).
- ❑ The standard keyway corresponds to DIN 6885 Sheet 1.
- ❑ Adjusting screws available on demand.

4. Installing the Coupling

- ❑ Remove the flexible intermediate ring (Fig. 11, Item 1).
- ❑ Clean the coupling hub and the flange hub bores as well as the shaft ends before installation.
- ❑ On larger couplings, please use a suitable installation aid.
- ❑ Mount the coupling hub and the flange hub onto the shaft ends (Fig. 11, Item 2).

In order to make installation easier, heating the hubs evenly to 80 to 120 °C is perfectly legitimate.

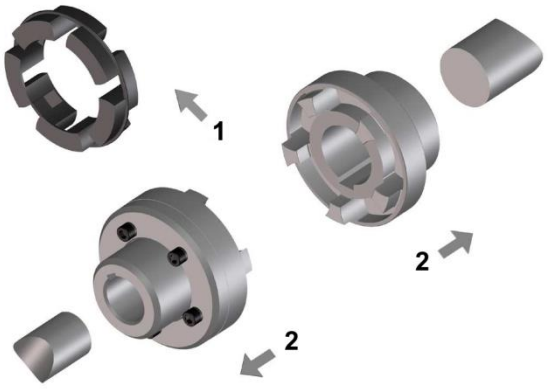

Fig. 11

CAUTION

To protect from hot coupling components, only work with gloves!

- ❑ Mount the flange hub only up to the shaft end being flush with the internal bore opening (Fig. 12).
  Please observe deviating agreements.

CAUTION

The hot hubs must cool down to room temperature before the flexible intermediate ring can be inserted.

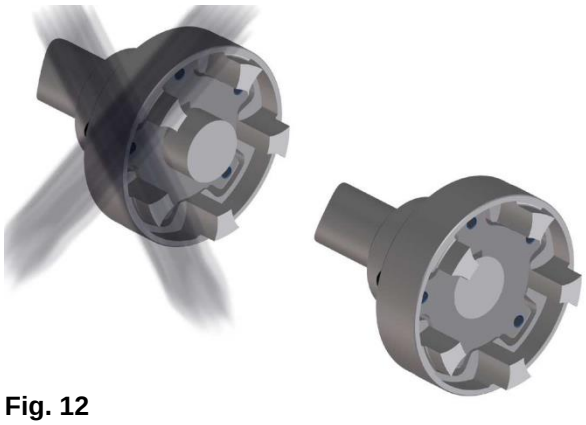

Fig. 12

- ❑ Before inserting it, provide the flexible intermediate ring with a slip additive (e.g. Talcum).
- ❑ Insert the intermediate ring.
- ❑ Join the shafts with the mounted hubs (Fig. 13).

In order to mount an aggregate radially with a coupling half, screw on the claw ring and push it back.
For Installation, see section 7.

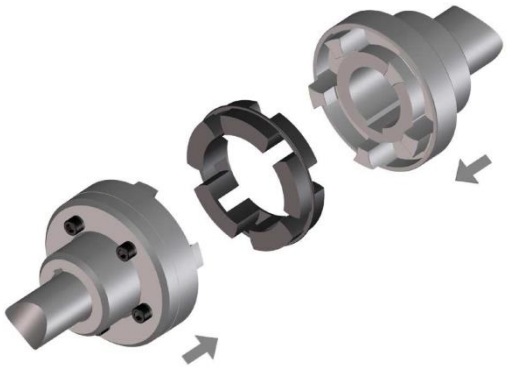

Fig. 13

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5. Aligning the Coupling

CAUTION

Before carrying out any work on the coupling, switch off the motor!
Secure the motor against inadvertent switch-on!

Exact coupling alignment increases the lifetime of the flexible intermediate ring.

The maximum permitted misalignment values stated in Tables 5 to 7 are general guideline values. In special cases with higher demands on smooth running or higher speeds, alignment accuracies ≤ 0.1 mm can be necessary in the three misalignment levels.
For further information, please see the company standard TWN (TSCHAN company).

Recommended Alignment Values - Angular

- ❑ Calibrate one entire rotation (360°). Determine the largest deviation $\Delta K_{w\,1}$ as well as the smallest deviation $\Delta K_{w\,2}$ (Fig. 14). Calculate the angular misalignment $\Delta K_w = \Delta K_{w\,1} - \Delta K_{w\,2}$
- ❑ On alignment, please observe the maximum permitted angular misalignment $\Delta K_{w\,max}$ acc. Table 5. The values acc. Table 5 are valid for a reference speed of 1500 rpm.

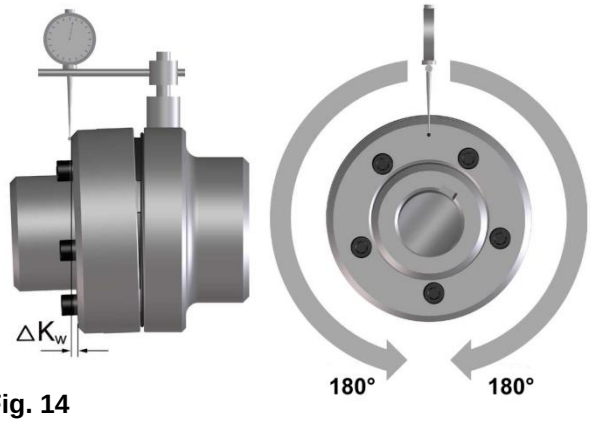

Fig. 14

Table 5

Size		82	97	112	128	148	168	194	214	240	265	295	330	370	415	480	575
$\Delta K_{w\,max}$ [mm]		0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Recommended Alignment Values - Radial

- ❑ Calibrate one entire rotation (360°). Determine the largest deviation $\Delta K_{r\,1}$ as well as the smallest deviation $\Delta K_{r\,2}$ (Fig. 15). Calculate the radial misalignment $\Delta K_r = 0.5 \times (\Delta K_{r\,1} - \Delta K_{r\,2})$.
- ❑ On alignment, please observe the maximum permitted radial misalignment $\Delta K_{r\,max}$ acc. Table 6. The values acc. Table 6 are valid for a reference speed of 1500 rpm.

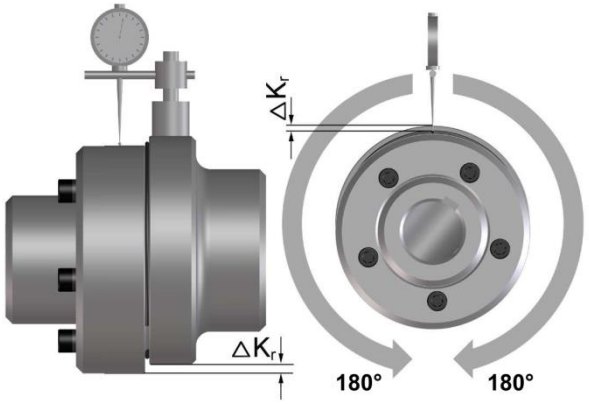

Fig. 15

Table 6

Size		82	97	112	128	148	168	194	214	240	265	295	330	370	415	480	575
$\Delta K_{r\,max}$ [mm]		0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

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Recommended Alignment Values - Axial

- ❑ Measure the axial installation backlash S (Fig. 16).
- ❑ On alignment, please observe the permitted tolerance ΔK_a acc. Table 7.

CAUTION

If larger axial displacement values are expected during operation, please consult the company TSCHAN.

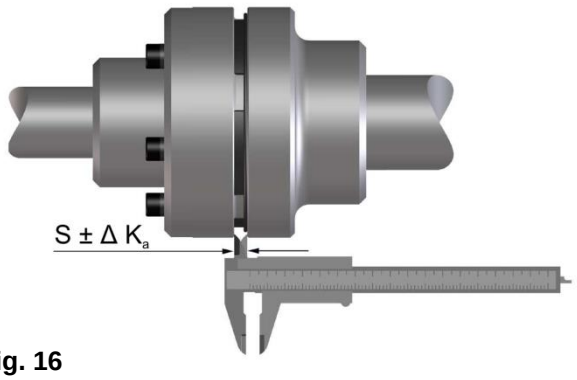

Fig. 16

Table 7

Size		82	97	112	128	148	168	194	214	240	265	295	330	370	415	480	575
S [mm]		3	3	3.5	3.5	3.5	3.5	3.5	4	4	5.5	8	8	8	8	8	8
ΔK_a [mm]		± 1.0	± 1.0	± 1.0	± 1.0	± 1.0	± 1.5	± 1.5	± 2.0	± 2.0	± 2.5	± 2.5	± 2.5	± 2.5	± 2.5	± 2.5	± 2.5

6. Operation

Table 8

Size	82	97	112	128	148	168	194	214	240	265	295	330	370	415	480	575
DIN 912-8.8	M6	M6	M8	M8	M10	M10	M10									
DIN 912-10.9								M12	M12	M14	M14	M16	M16	M16	M20	M20
M_A [Nm]	8.3	8.3	20	20	40	40	40	100	100	160	160	240	240	240	490	490

- ❑ Before rotation direction inspection of the drive, secure the loosened claw ring against axial movement.
- ❑ Before initial operation, please check the screw tightening torques M_A acc. Table 8 (Fig. 17).

CAUTION

Before initial operation, all moveable parts must be covered with stationary protection devices!

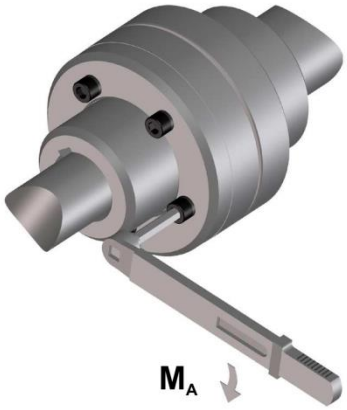

Fig. 17

During operation, the Nor-Mex®-coupling G is low-maintenance.

During routine inspections of the drive, please observe:

- ❑ Coupling alignment
- ❑ Condition of the elastomer

During maintenance work on the drive, at the latest however after 3 years

- ❑ Replace the flexible intermediate ring.

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7. Replacing the Flexible Intermediate Ring

CAUTION

Before carrying out any work on the coupling, switch off the motor!
Secure the motor against inadvertent switch-on!

- ❑ Unscrew the claw ring and push it back (Fig. 18, Item 1).
- ❑ Cut the intermediate ring at a connection bridge.
- ❑ Remove the intermediate ring (Fig. 18, Item 2). Start at the cut-through connection bridge.
- ❑ Before inserting it, provide the new flexible intermediate ring with a slip additive (e.g. Talcum).
- ❑ Cut the new intermediate ring at a connection bridge and insert it between the coupling hub and the flange hub.

CAUTION

The contact surfaces of the claw ring and the flange hub must be clean as well as oil and grease-free.
The balanced parts are marked to align with each other.

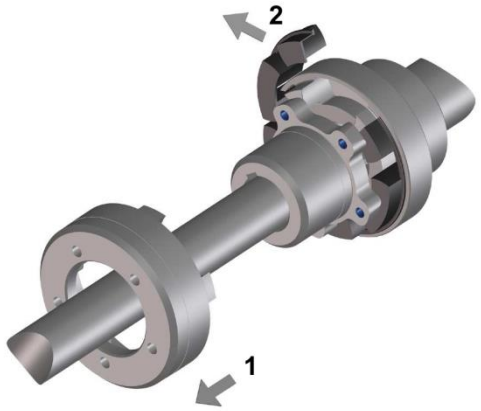

Fig. 18

- ❑ Put the claw ring into the marked position.
- ❑ Tighten the screws evenly and lightly.
- ❑ Tighten the screws to the tightening torques M_A stated in Table 8 (Fig. 17).

CAUTION

Before initial operation, re-mount all protection devices!

If one coupling half with the respective aggregate is lifted out radially, the intermediate ring can be replaced axially. Afterwards, the coupling must be re-aligned (see section 5).

For more information, please see the latest Tschan documentation.

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