

# Centrifugal Brakes FC-G-C410

Service Manual

P-2065-WE  
SM409gb - rev 01/09



 **Warner**<sup>®</sup>  
Electric

*An Altra Industrial Motion Company*

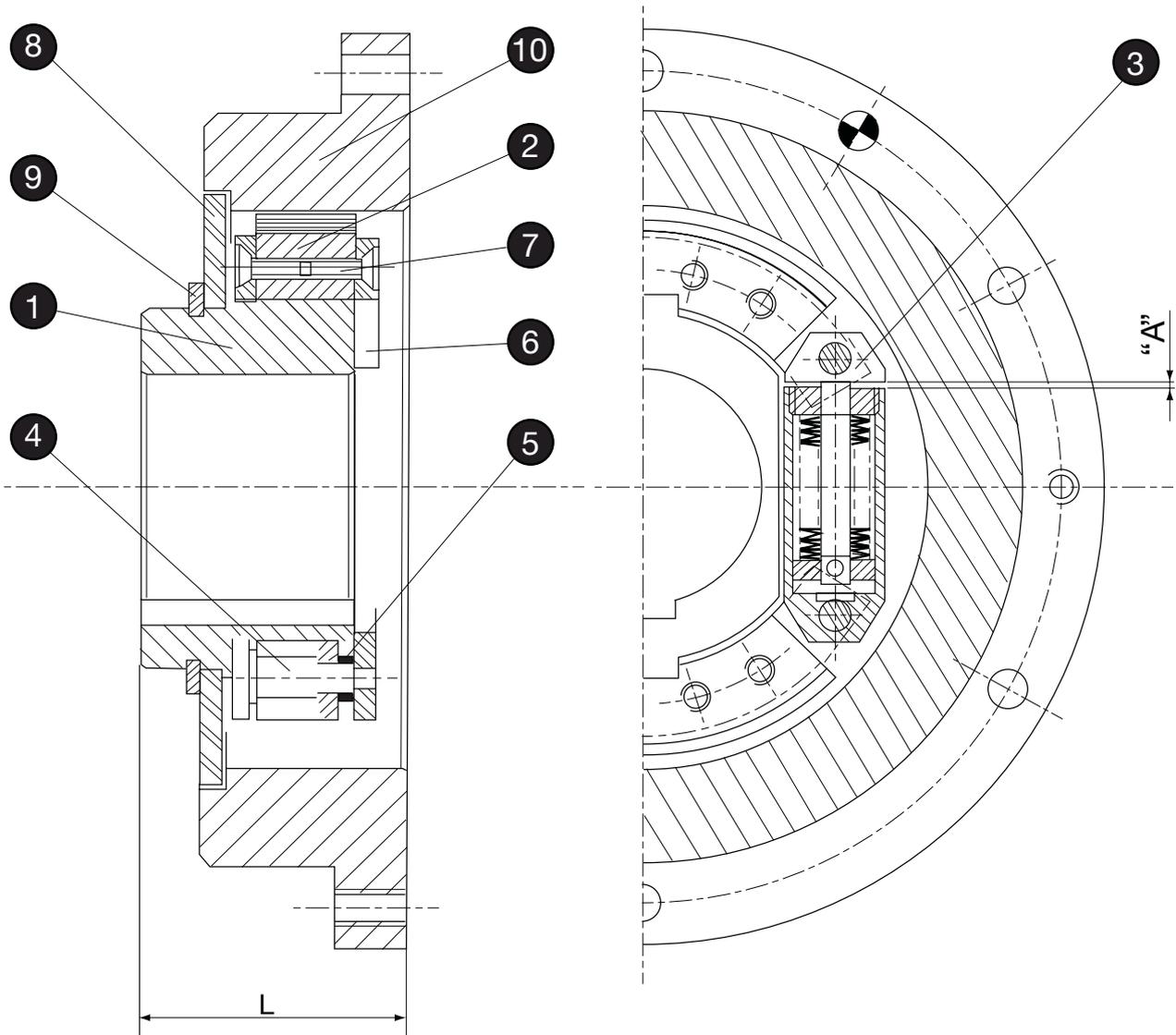
We, **WARNER ELECTRIC EUROPE**, 7, rue Champfleu, B.P. 20095, F-49182 St Barthélemy d'Anjou Cedex declare that the torque limiters made in our factory from St Barthélemy d'Anjou,

and hereafter designated : **FC-G-C410**

are exclusively designed for incorporation into a machine and to be assembled with other equipments to create a machine. The operation of the product is submitted to the conformity of the complete equipment, following the provisions of the machinery directive 98/37/EC Drawn up

in St Barthélemy d'Anjou, July 2002  
E. PRAT, General Managing Director

## 1 Technical specifications



- |                 |                  |
|-----------------|------------------|
| ① Hub           | ⑥ Flange         |
| ② Inertia Block | ⑦ Fixing Screws  |
| ③ Spring        | ⑧ Closing Washer |
| ④ Axle          | ⑨ Safety Ring    |
| ⑤ Spacer        | ⑩ Drum           |

**Fig. 1**

The FC-G - C140 centrifugal brake is a device operating with delayed actuation that is to say, the pressure between the friction surfaces is achieved by the centrifugal force resulting from the rotation of the driving input. The engagement or disengagement is therefore driven only by action upon the input side.

The device has no wear adjustment ; it operates only in dry conditions ; the friction is of cast-iron-against-packing type.

It can be mounted horizontally, vertically or in any other position.

## 2 DESCRIPTION

The device consists of two main parts:

### 2.1 - The driving part includes:

- a hub ❶ fixed on the driving-shaft by means of a key ;
- one, two or three sets of inertia-blocks ❷ (depending on the type) which are made integral with the hub ❶ by means of the teeth ;
- springs ❸, which draw the inertia-blocks ❷ back into the “disengaged or de-braked” position, are articulated on the axles ❹, are laterally kept in position by the spacers ❺ and the flanges ❻ and are fixed on the inertia-blocks ❷ by means of the screws ❼.
- a closing-washer , centered on the hub ❶ and laterally kept in position by the safety-ring ❽.

### 2.2 - The fixed part includes

- a drum ❿ centered on the driven member (clutch use) or the frame of the machine (brake use) and fixed by means of screws.

## 3 OPERATION

The device is rated to a zero torque for rotation speeds of the driving-shaft below “n” revolutions per minute, the inertia-blocks ❷ being kept back by the release springs ❸.

For speeds greater than “n”, the inertia-blocks ❷ are pushed into contact with the drum ❿ as a result of the centrifugal force and the torque gradually grows until it reaches its nominal value for “N” revolutions per minute.

When the speed decreases, the torque gradually decreases until it reaches its zero value for speeds equal to or under “n” revolutions per minute.

**NOTE** - “n” and “N” values are engraved on every device after the name of the type

Example of description for a centrifugal device used as brake with a zero torque at  $n = 1650$  revolutions per minute and a nominal torque of 20 m, daN for  $N = 2700$  revolutions per minute.

Centrifugal brake, type FC 20 G - 1650/2700

## 4 ASSEMBLY

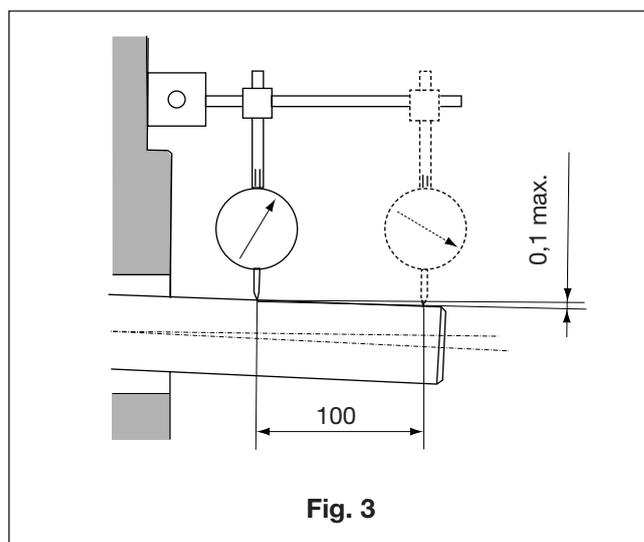
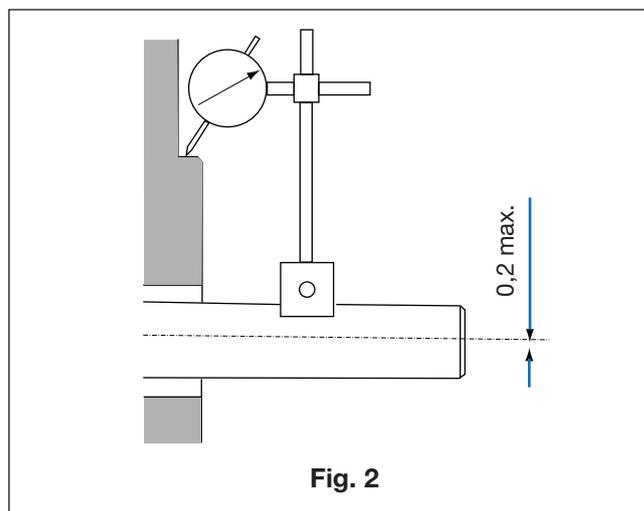
On our devices, hub ❶ and drum ❿ bores have usually a H7 tolerance.

For fitting the device on the shaft, we advise to use the js6 tolerance.

The width of the hub ❶ is key groove has the P9 tolerance.

The g6 tolerance is quite proper for the centering designed to receive the drum ❿.

The shaft should not fall out of alignment with the drum ❿ by a greater value than the one showed in picture 3, while it should not be more eccentric than in picture 2.



The device is supplied assembled.

For the mounting, prepare the unit as follows :

- remove the drum ⑩.
- take the safety-ring ⑨ and the closing-ring from the hub ①.

## Mounting

After fitting the key into its housing :

- slide the driving member consisting of the hub ①, the inertia-blocks ②, the springs ③ etc... on the shaft ;
- stop this block laterally by means of either a nut with its lock washer, or a safety-ring or a ring with a screw, which will have to be locked by using a thermoplastic liquid like for example "LOCTITE brake-normal thread";

## Warning

- For this setting process, never strike on the checks ⑥ and springs ③. Place a piece of soft alloy between the hub ① and the system chosen for pushing the block on the shaft.
- Center the drum ⑩ on the driven member or on the frame of the machine and screw it into place. Lock the screws energetically ; a thermoplastic liquid like for example "LOCTITE brake-normal thread" will provide for their stopping.
- Check in a few places, by using wedges, whether the play between the inertia-blocks ② packing and the internal diameter of the drum ⑩ is roughly regular.
- Fit the closing-washer ⑤ and put the safety-ring ⑨ into its groove. To prevent the closing-washer ⑤ rubbing against the drum ⑩, keep the length "L".
- Counter-bore 2 holes opposite one another in the driven member or in the frame of the machine through the already existing ones in the drum ⑩ and slip elastic pins of, for example, the "MECANINDUS" type into these holes. (except special drum)
- Engage or brake a few times in getting the machine to work.

## 5 NOTES

Keep the inertia-blocks ② packing off grease and water, otherwise a reduction of the braking torque could follow.

## 6 ADJUSTMENT

The centrifugal device FC-G needs no further adjustment since it is originally set for a given torque. The wear of the packing depends on the work absorbed by this device

For replacing of used inertia-blocks, remove the block consisting of the hub ①, the inertia-blocks ②, the springs ③ etc... from the machine.

### 6. 1 – Disassembly

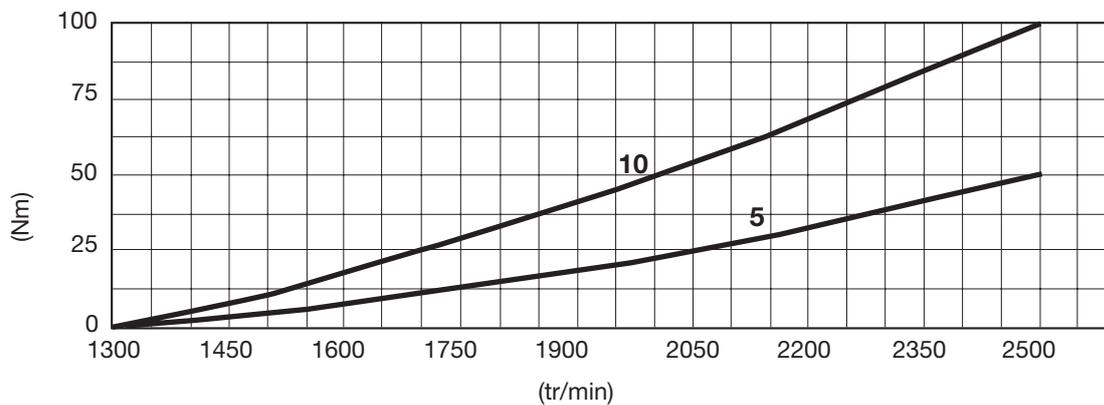
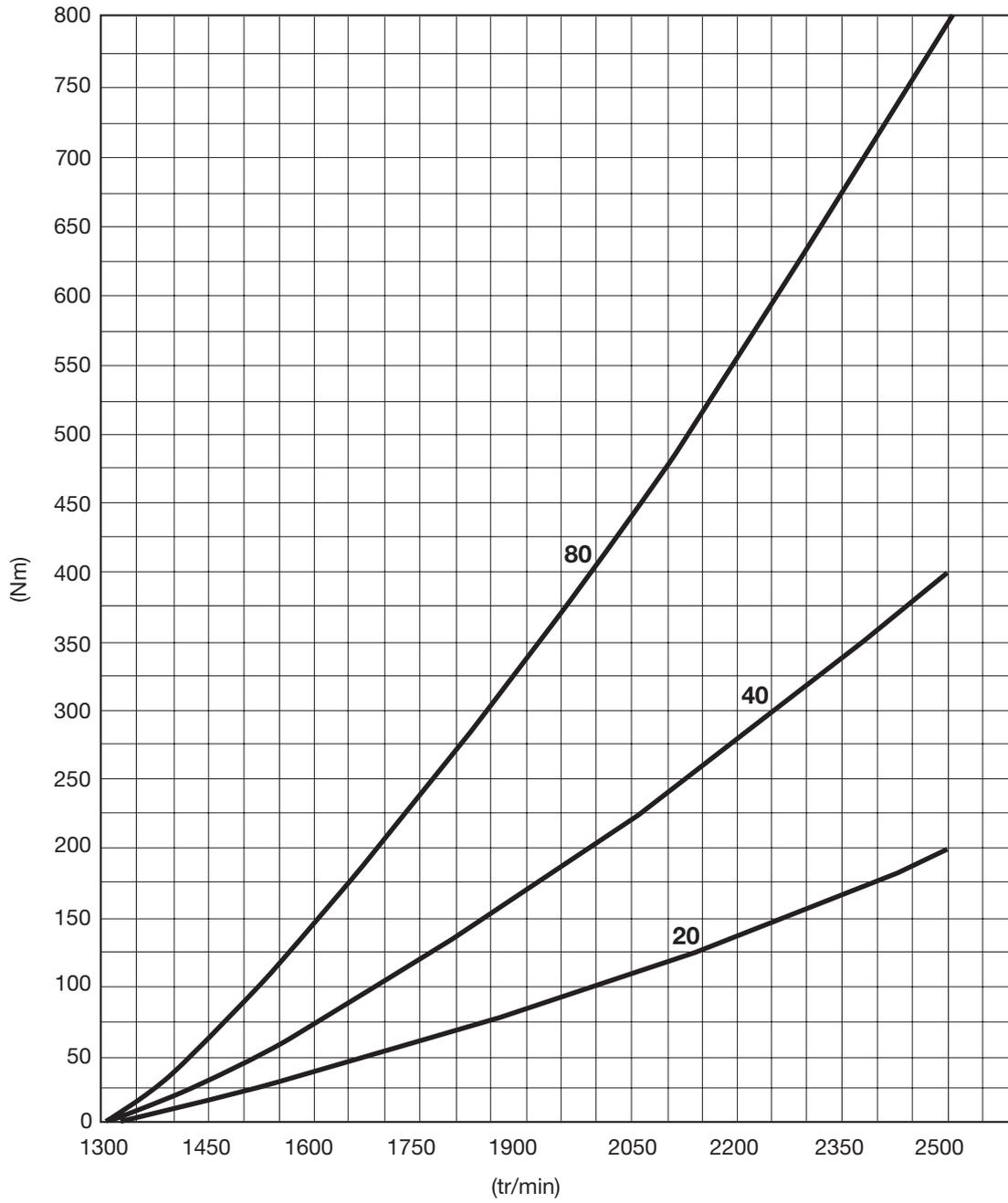
- take away the safety-ring ⑨ and the closing-washer. ⑩
- remove the screws fixing the drum ⑩.
- dismount the drum ⑩ by screwing two of the fixing screws into the tapped holes specially designed for this purpose. (except special drum)
- remove from the shaft, the block consisting of the hub ①, the inertia-blocks ② the springs ③ etc...

### After having removed the above sub-assembly

- Insert conical wedges into space "A", namely between the 2 moving parts of the release-spring ③ so that the inertia-blocks ② do not bear any more on the periphery of the hub ① as a result of the pressure from the springs ③. If the device is equipped with traditional draw springs, stretch these springs with pliers in order to relieve the inertia-blocks from the pressure exerted by the springs.
- Remove the screws ⑦ on each face of the flanges ⑥ and withdraw the used inertia-blocks. Do not reverse the assembling direction of the springs.
- Put the new inertia-blocks ② between the flanges ⑥, install the screws ⑦ while not for getting to lock them by means of a thermoplastic liquid like, for example, "LOCTITE brake-normal thread".
- Drive away the conical wedges or let down the draw-springs ③ in order to bring the inertia-blocks ② into contact with the hub ①.
- Reassemble the device on the machine. For this process, see chapter 4 - ASSEMBLY.

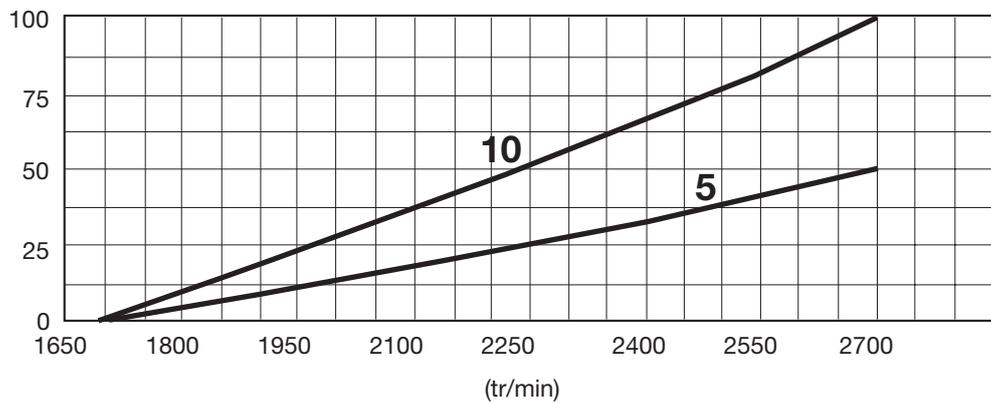
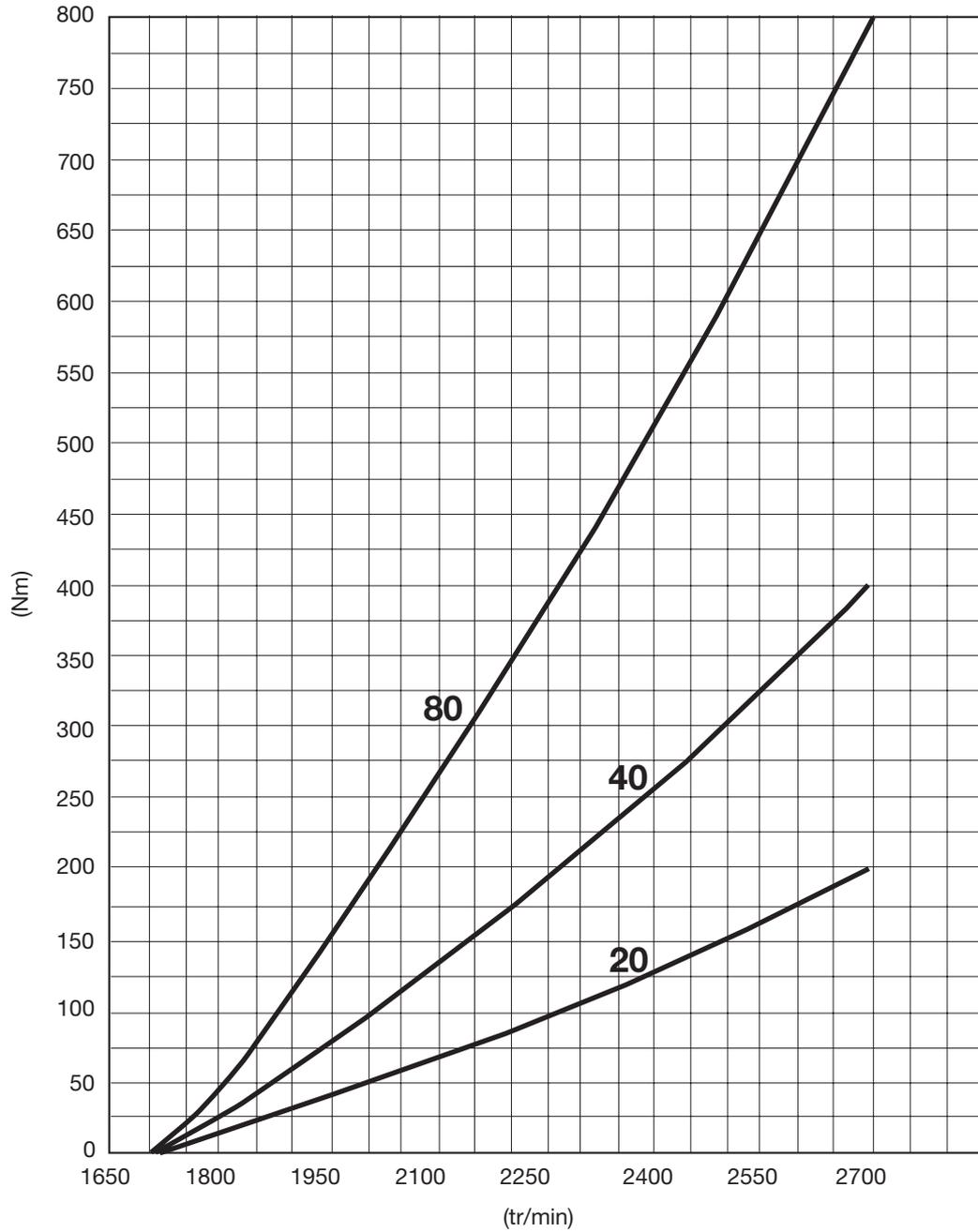
# Theoretical torque / speed

Nil torque	(RPM)	1300
Nominal torque	(RPM)	2500



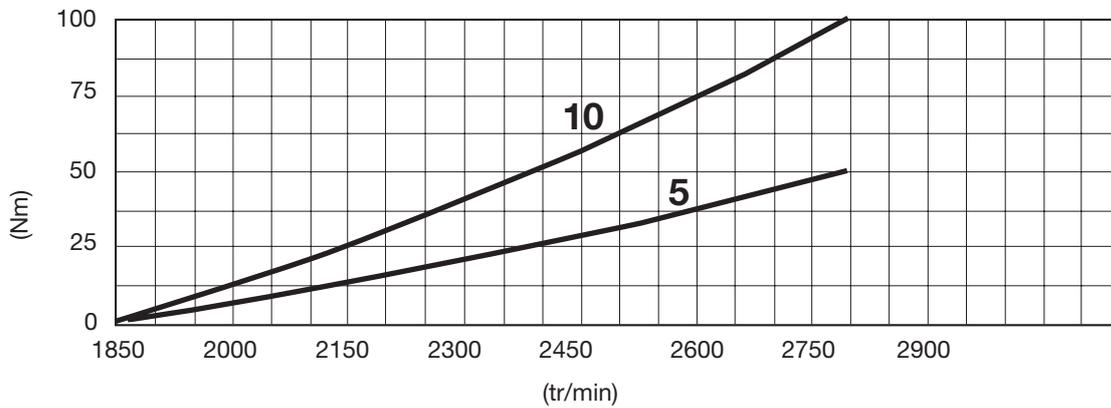
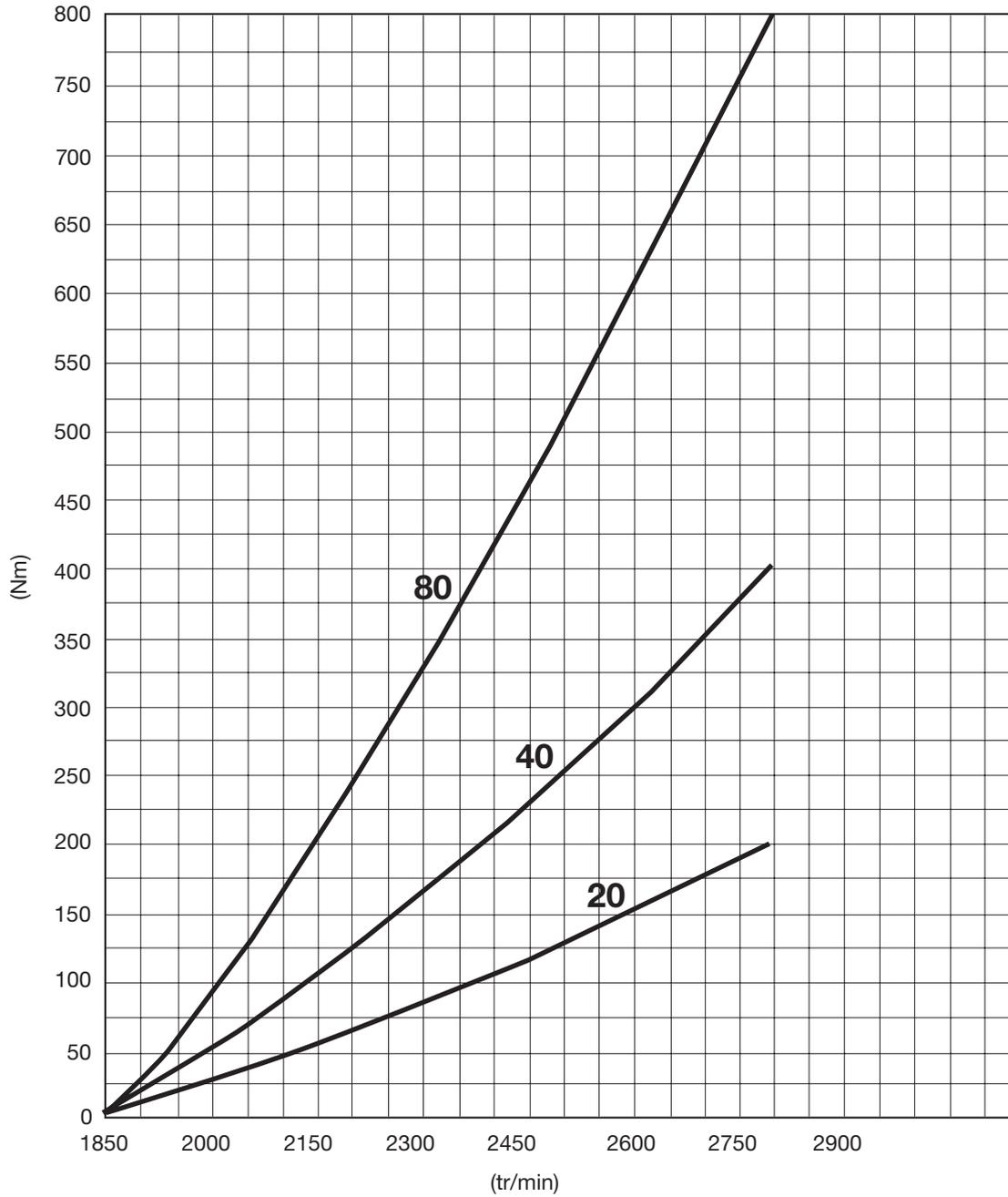
# Theoretical torque / speed

Nil torque (RPM)	1650
Nominal torque (RPM)	2700



# Theoretical torque / speed

Nil torque	(RPM)	1850
Nominal torque	(RPM)	2800



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