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SAFETY  
TROLLI EST19  
FINGERI

Operating Manual



**Imprint**

This operating manual is a translation of the original operating manual. The original operating manual was prepared in the original language and is the legally binding version. In the event of deviations or questions of interpretation, only the original operating manual is authoritative.

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## List of abbreviations

<b>SW</b>	Wrench size
<b>PSA</b>	Personal protective equipment
<b>RBU</b>	Risk assessment
<b>GBU</b>	Hazard assessment
<b>SUU</b>	Safety instruction document
<b>SEU</b>	Safety briefing document
<b>WI</b>	Work Instruction → Work instruction

*Table 1.1: List of abbreviations*

## 1. About this guide

The manufacturer accepts no liability for damage caused by failure to observe this operating manual. Since SAFETYTROLL® cannot control or foresee the conditions under which this product is used, each user must check the information in the specific context of the intended use. In addition to this operating manual, the national statutory regulations and provisions must be observed (accident prevention, environmental protection, safe and professional working practices, obligations of the operating company, etc.).

These instructions must be read carefully by any person using the product prior to any use. The contents must be understood in each case. The instructions must be handed to the operating company of the product or any person who comes into contact with it and must be kept within easy reach near the product.

About this operating manual is also available in digital form as a PDF, which you can download easily and conveniently from our homepage in the product-specific download area.

It is recommended that the user and operating company of a commercial facility or the employer use this operating manual as the basis for the company-specific operating instructions.

## 2. Safety

### 2.1 Definition of terms

For better comprehensibility and functional description and due to the various available handle designs - including, for example MULTIFUNCTION HANDLE and EXTENSION - the term "MULTIFUNCTION HANDLE" is used interchangeably in these instructions. This term includes all functionally equivalent holding functions intended for the Safety use, storage and transportation of the TROLLFINGER - regardless of design, material or execution.

**Definition:  
MARK ONE**

Unlike a human finger, the MARK ONE version of the TROLLFINGER has no ligament or tendon structures to stabilize and connect the individual bone elements. This means that the range of movement of the individual finger joints, especially in the flexion direction, is not naturally limited. In addition, the individual segments can be separated or pulled apart under the effect of force. This must be taken into account when using the product.

### 2.2 Intended use

Safety during use of the TROLLFINGER and the associated multifunction handle is only guaranteed when used as intended.

The TROLLFINGER together with the multifunction handle is an aid that is intended to be used to examine hazardous points and risks on mechanical components, systems or machines and Operating equipment through the physical use of a finger replica and thus to be able to take suitable corrective measures to eliminate hazards and risks.

**Definition:  
Mechanical  
Hazard**

Mechanical hazards are hazards or risks caused by moving or acting parts of mechanical components, machines, systems or Operating equipment. They arise as a result of mechanical influences, in particular forces, movements, masses or edges.

The hazards and risks to be examined can occur at various stages of the product life cycle. Starting with the early stages of development and their prototypes, through commissioning and the associated tests, to design changes and their effects.

In addition, the TROLLFINGER together with its multifunction handle can not only be used in a manufacturer's area of responsibility, but can also support the operating companies of machines and systems in their duties with regard to occupational health and safety.

In addition, the TROLLFINGER can be used for demonstration purposes in the areas of training, instruction and briefing in order to demonstrate the extent of damage to hazardous points and risks to machines as well as to working and Operating equipment. In addition, the worker should be sensitized for the subsequent handling.

The result of such an examination or demonstration is a realistic injury simulation in the form of damage to the TROLLFINGER, for example:

- Bone fractures
- Bone crush injuries
- Cuts
- Shearing injuries
- Draw-in injuries
- Crush injuries

- Abrasions

The user of the TROLLFINGER together with its multifunction handle must be familiar with the operation and handling as well as the resulting possible dangers and risks and must comply with the requirements of this operating manual.

The users are defined from the following professional groups, who have professional experience and recent professional activity in recognizing and assessing hazards and risks:

- CE conformity officers or CE coordinators
- Occupational safety specialists
- Safety officer
- Developers and designers
- Lecturers and lecturers
- Trainers
- Expert and testing Personnel
- Disciplinary superiors
- Instructing and instructing Personnel

Only the tools and aids specified in this documentation may be used.

### 2.2.1 Context of intended use

- Industrial use
- Commercial use
- Industrial training

### 2.2.2 Unintended use

- The TROLLFINGER together with its multifunction handle is not suitable for use in potentially explosive environments
- Improper inspection, preparation; assembly, use and disposal of the TROLLFINGER together with the multifunction handle
- Failure to follow the instructions given in this operating manual
- Unauthorized Modifications to the TROLLFINGER and the multifunction handle
- Use of the TROLLFINGER for testing electrical systems or live parts

Any use beyond that described in the chapter "Intended use" is considered improper. The manufacturer is not liable for any resulting damage. The risk is borne solely by the customer or the operating company of the TROLLFINGER together with its multifunction handle.

### 2.2.3 Foreseeable misuse

- The use of the TROLLFINGER and/or the multifunction handle as a toy of any kind
- Using the TROLLFINGER with holding devices other than the multifunction handle
- Using the multifunction handle for other holding tasks

- The use of the multifunction handle for the storage and storage of unauthorized substances in various states, types and forms other than the TROLLFINGER
- Use without prior shutdown, Fuses or release of hazardous areas and their Environment
- Use outside the defined mechanical application areas
- Use of the TROLLFINGER for testing electrical systems or live parts
- Use in areas with electrical, thermal or chemical hazards for which the product is not designed
- The use of other components that have not been defined and listed in this documentation or in contractually agreed documents
- The use of aids and tools that are not defined and listed in this operating manual, in the technical data or in contractually agreed documents

#### 2.2.4 Warranty and liability

The TROLLFINGER in conjunction with the multifunction handle corresponds to the state of the art and the recognized safety regulations. The information and notes in this operating manual are based on previous experience and knowledge.

Improper use can lead to hazards and damage to mechanical components, systems or machines as well as Operating equipment and other material assets and impair downstream processes. Product liability is excluded for damage resulting from non-compliance with this operating manual.

The TROLLFINGER is used for the examination and demonstration of danger and risk points under realistic conditions. Even when used as intended, material damage may occur that is not due to a product defect but to intended use. This residual risk is accepted by the user.

Responsibilities for conducting examinations or demonstrations lie with the user or operating company.

Suitable protective measures must be defined and implemented by the user or operating company as part of the hazard assessment.

Modifications and alterations that have not been approved in writing by SAFETYTROLL® entail an increased risk potential and lead to exclusion of liability.

Furthermore, the following damage or defects are excluded from the warranty if they are attributable to one or more of the following Causes:

- Improper commissioning, operation, servicing, maintenance, installation and disposal of the product
- Non-observance of the safety instructions in this operating manual
- Damage or defects due to operating errors
- Damage or defects due to Unintended use
- Damage or defects due to natural wear and tear
- Damage or defects due to force majeure
- Damage or defects due to incorrect operation
- Damage or defects due to impermissible ambient conditions

**Spare parts** In order to meet the manufacturer's technical requirements, these may only be purchased from SAFETYTROLL®.

**Contact us**

If you have general, specific questions about the product or spare parts, you are welcome to contact us at any time via the following e-mail address.

**## INFO@SAFETYTROLL.DE ##**

### 2.2.5 Instruction and training of persons

Persons who use the TROLLFINGER together with the multifunction handle must comply with the groups of persons or occupational groups defined in this operating manual and their requirements and must also be regularly trained by the employer or operating company on the dangers involved in handling the TROLLFINGER together with the multifunction handle. These instructions must be documented by the operating company.

All users must have read and understood the operating manual, in particular the Safety chapter, as well as applicable national regulations before using the TROLLFINGER together with the multifunction handle.

The operating manual and applicable national regulations must be kept in such a way that they are accessible at all times.

All information and instructions for using the TROLLFINGER together with the multifunction handle are based on the manufacturer's previous experience and knowledge.

### 2.3 Residual risks

- Risk of injury from sharp edges or breakage on the damaged TROLLFINGER or MULTIFUNCTION HANDLE
- Risk of injury from sharp edges or breakage caused by the use of the TROLLFINGER in addition to the danger and/or risk area
- Danger due to uncontrolled movements or kickbacks during use
- Material damage to mechanical components, machines, systems or Operating equipment as a result of the examination
- Misinterpretation of test results

Suitable protective measures must be defined by the user or operating company as part of the hazard assessment.

## **2.4 Qualification of the personnel**

### **2.4.1 Essential requirements**

Only persons who can be expected to carry out their work reliably are authorized as users. Persons whose ability to react is affected, e.g. by drugs, alcohol, medication or other impairments, are not permitted.

When selecting personnel, the age and job-specific regulations applicable at the place of use must be observed.

### 3. Product description

The overall structure of the TROLLFINGER consists of a finger replica and an embedded bone imitation and thus reflects a detailed replica of a male index finger. The TROLLFINGER corresponds to an average size of the age group 18 - 65 years.

The situation-related behavior of the finger replica in combination with the bone imitation is similar to that of a real finger. The TROLLFINGER is intended to serve as an aid for recognizing the extent of damage by demonstrating or examining danger and risk points and thus initiating necessary preventive steps and deriving suitable measures for danger and risk reduction.

The TROLLFINGER also has a practical multifunction handle that can be used for storage and as a handle.

#### 3.1 Individual parts & conditions - TROLLFINGER & Multifunction handle

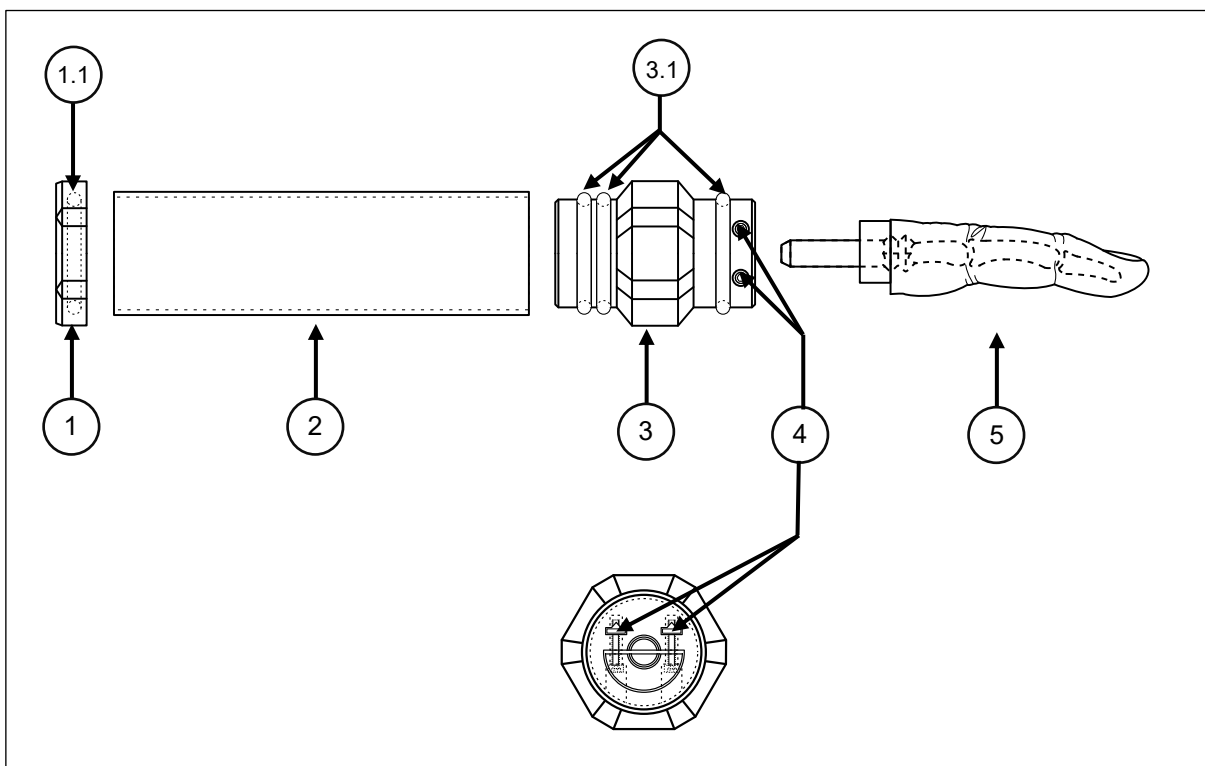


Figure 1: Overall structure

**1 - End cap** The end cap with the built-in locking ring (1.1) prevents the ingress of impurities and also offers the possibility of vertical or upright placement at the desired storage location.

**2 - Handle** The handle has several functions. The main purpose is to ensure a clean and firm grip during transportation and use of the TROLLFINGER. Furthermore, the handle is an essential component of the multifunction handle explained below.

**3 - Holding and closing cap**

The holding and closing cap also has more than one function. The main task is to keep the TROLLFINGER safe during storage, transportation and use. In addition, the holding and closing cap is the counterpart to the end cap, which prevents the ingress of impurities through the installed closing rings (3.1).

#### 4 - Adjustment screws

The adjustment screws (cylinder head screws with hexagon socket / SW 2.5) together with the square nut are used to adjust the pull-out and holding force of the TROLLFINGER from the holding and closing cap to the conditions of the hazard or risk points to be examined.

Adjusting the pull-out and holding force is an additional and supportive measure of human reaction time to support a safe and quick escape from dangerous situations and/or unforeseen events.

For example, the pull-out and holding force must be set so that the TROLLFINGER can be easily pulled out of the holding and closing cap in a high-hazard or high-risk area and only the TROLLFINGER remains in the hazard or high-risk area to ensure the possibility of escape from the hazard zone. In return, a higher pull-out and holding force can be selected for a less dangerous or risky location.

### MANDATORY ACTION

#### Adjusting the holding force



To ensure the possibility of escape at all times, the pull-out and holding force must under no circumstances be such that the TROLLFINGER can no longer be pulled out of the holding and closing cap.

Likewise, the pull-out and holding force between the TROLLFINGER and the holding and closing cap must not be greater than the holding force between the holding and closing cap and the handle.

**5 - TROLLFINGER** The TROLLFINGER is an aid that is intended to be used to demonstrate or examine danger and risk points on mechanical components and/or machines and Operating equipment through the physical use of a finger replica and thus to be able to take suitable corrective measures to eliminate dangers and risks.

**## Multifunctional handle ##** The multifunction handle is made up of the individual parts of the end cap (1), the handle (2) and the holding and closing cap (3). It also serves as a storage option and as a handle for the TROLLFINGER (5) together with the holding and closing cap.

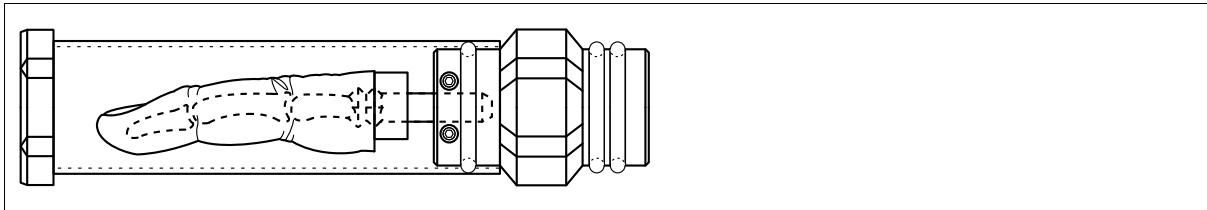


Figure 2: Status closed

**1 - Closed** When closed, the TROLLFINGER together with the multifunction handle can not only be conveniently transported from its storage location to its field of application, but can also be kept and stored neatly for documentation and archiving purposes after use.

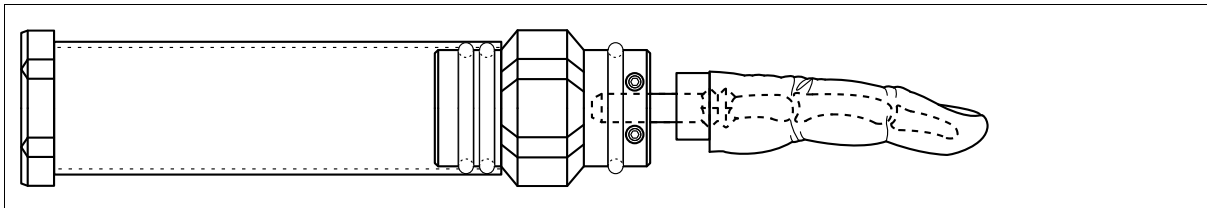


Figure 3: Open status

**1 - Open** When open, the TROLLFINGER is ready for use together with the multifunction handle.

## 4. Use / Operation

The user must read, understand and observe the instructions for use before using the TROLLFINGER together with the multifunction handle.

About this operating manual The aim of this operating manual is to guide the user in the use of the TROLLFINGER together with the multifunction handle. This includes:

- Safe commissioning, use, servicing, maintenance, installation and disposal of the product
- Safe handling and use at the hazard or risk location to be demonstrated and examined

### NOTICE

#### General notes - Operating manual



Only by knowing the contents of this operating manual can errors in handling the TROLLFINGER together with the multifunction handle and dangers and risks for the user as well as resulting damage be avoided.

The manufacturer accepts no liability for damage of any kind or malfunctions resulting from non-compliance with this operating manual.

### NOTICE

#### Note on use & archiving<sup>1</sup>



The use and/or archiving of the TROLLFINGER together with the multifunction handle does not replace the conventional forms of assessment and documentation of hazards and risks and the associated corrective measures.

### MANDATORY ACTION

#### Wear safety goggles



To avoid eye injuries, wear safety goggles during the entire period of use and subsequent examination of the TROLLFINGER together with the multifunction handle.

<sup>1</sup> Archiving refers to the permanent and unaltered storage of the TROLLFINGER together with the multifunction handle after its use in order to be able to access the demonstration and/or examination results generated with the TROLLFINGER at any time.

**MANDATORY ACTION****Field of application & freedom of movement**

Ensure that you always have sufficient freedom of movement and space to escape in the field of application of the TROLLFINGER together with the multifunction handle. In addition, the space for movement or escape must be barrier-free.

This is the only way to ensure that you can escape quickly and at any time in the event of possible and unforeseeable dangerous situations.

**MANDATORY ACTION****Multiple use**

The TROLLFINGER is intended for single use only. Despite thorough examination or inspection for injuries in the form of damage after use, it cannot be guaranteed that the TROLLFINGER has not suffered any hidden injuries in the form of damage.

Undetected injuries in the form of damage can lead to an increased risk for the user during subsequent use and/or the result of the examination losing its significance and clarity.

**MANDATORY ACTION****Check for damage and completeness**

Before each use, the TROLLFINGER and the multifunction handle must be checked for damage of any kind and for completeness of the individual parts to ensure proper functioning. The following list shows possible types of damage and properties to be avoided on the overall structure and the individual components:

- |                            |   |
|----------------------------|---|
| ▪ Cracks                   | ▪ Abrasion                                    |
| ▪ Fractions                | ▪ Cuts  |
| ▪ Missing individual parts | ▪ Impurities                                  |
| ▪ Notches                  | ▪ Loss of clamping, holding and locking force |
| ▪ Screws do not grip       | ▪ etc.  |
| ▪ Sharp edges              |   |

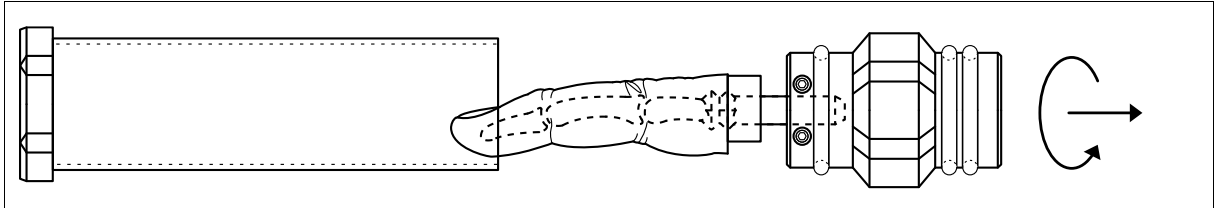
If damage, missing individual parts, soiling, injuries in the form of damage to the TROLLFINGER and/or the multifunction handle and/or limited function can be identified, these must be marked accordingly and removed from use immediately; further use is also strictly prohibited.

Check whether the anomalies or impairments can be eliminated and full functionality restored with the help of the spare parts offered by SAFETY-TROLL®.

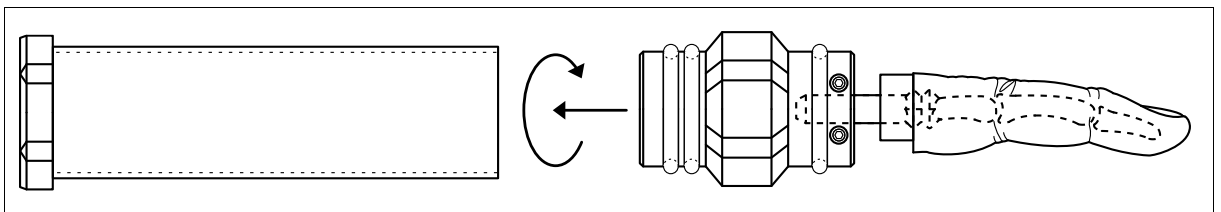
Spare parts may only be purchased from SAFETYTROLL® in order to meet the manufacturer's technical requirements.

#### 4.1 Construction and dismantling (assembly and disassembly)

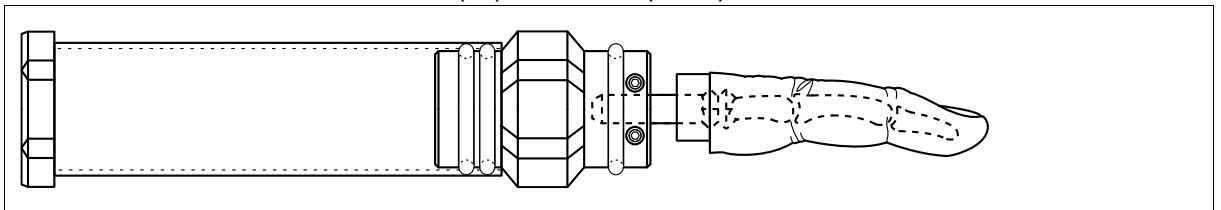
- Structure** 1) To prepare the TROLLFINGER (5) for use, turn the TROLLFINGER (5) including the holding and closing cap (3) out of the handle (2) with a twisting and pulling motion.



- 2) In this step, turn the TROLLFINGER (5) including the holding and closing cap (3) by 180°. The TROLLFINGER (5) including the holding and closing cap (3) is then inserted into the handle (2) with a twisting and pushing movement.



- 3) You have now brought the TROLLFINGER (5) including the multifunction handle (##) into the shape required for use.



- 4) Before using the TROLLFINGER (5) for the examination or demonstration of danger and risk points, adjust the pull-out and holding force with which the TROLLFINGER (5) is to be pulled out of the holding and closing cap (3). To do this, use an Allen key (SW 2.5) to turn the two hexagon socket head cap screws (4) in or out evenly by hand to reduce or increase the pull-out and holding force. **Avoid applying unnecessary force!**
- b) Clockwise screw movement increases the pull-out and holding force
  - c) Counterclockwise screw movement reduces the pull-out and holding force
- 5) Your TROLLFINGER is now ready for use together with the multifunction handle.

- Examination** 6) In order to determine the extent of the damage or the severity of the injury in the form of damage, the TROLLFINGER must be meticulously examined after use. Attention should be paid not only to possible external injuries in the form of damage, such as cuts, shearing, crushing and/or abrasions, but also to possible fractures or crush injuries to the bone or bone imitation. To do this, carefully and carefully detach the finger replica from the imitation bone. Through the examination of the TROLLFINGER and the results and findings obtained, suitable remedial measures can be derived, defined and documented for the elimination of the respective hazard and risk points.

**WARNING****Risk of injury to the user during examination of the TROLLFINGER for damage or injury in the form of damage**

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There is a risk that, after use, pointed and/or sharp edges or other injuries may be found on the TROLLFINGER caused by the application of mechanical force

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Wear suitable Personal protective equipment, such as cut-resistant gloves and safety goggles, during the examination of the TROLLFINGER for injuries in the form of damage.

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- Dismantling** 7) To prepare the TROLLFINGER together with the multifunction handle for storage or archiving following the demonstration or examination, repeat steps one to four in reverse order.

## 5. Servicing and maintenance

The Servicing and maintenance chapter covers the main measures for regular inspection, care and repair of the TROLLFINGER and the multifunction handle. To ensure that they are ready for use and have a long service life, follow the servicing and maintenance recommendations below:

- 1) Checks for visible damage or wear and tear
- 2) Check for contamination
  - See "Chapter 6 - Cleaning"
- 3) Checking the functionality
- 4) Check for completeness and missing individual parts



### NOTICE

#### General notes - Servicing and maintenance - Interval

**Recommendation:**  
Before each use!



### NOTICE

#### General notes - Servicing and maintenance

If abnormalities or impairments are detected during servicing and maintenance work, the TROLLFINGER or the multifunction handle must be removed from service.

Check whether the anomalies or impairments can be eliminated and full functionality restored with the help of the spare parts offered by SAFETY-TROLL®.

Spare parts may only be purchased from SAFETYTROLL® in order to meet the manufacturer's technical requirements.

## 6. Cleaning

Use a cloth moistened with lukewarm Water to remove any dirt from the TROLLFINGER and the multifunction handle.

## 7. Waste disposal

Observe the applicable country-specific, regional and/or local regulations for disposal during disassembly.

- All materials must be disposed of according to type and in accordance with existing regional regulations

**8. Technical data**

	MULTIFUNCTION HANDLE + TROLLFINGER
Closed dimensions (H x W x D):	approx. 180 x 47 x 47 mm
Dimensions open (H x W x D):	approx. 285 x 47 x 47 mm
Dead weight:	approx. 110 g
	EXTENSION + TROLLFINGER
Closed dimensions (H x W x D):	approx. 345 x 47 x 47 mm
Dimensions open (H x W x D):	approx. 445 x 47 x 47 mm
Dead weight:	approx. 165 g
Ambient temperature:	10 °C - 45 °C
Operating temperature	10 °C - 45 °C
Relative humidity:	<70 % (non-condensing)
Storage conditions:	Protect the TROLLFINGER together with the multifunction handle from direct UV radiation, heat, cold and moisture, wetness as well as corrosive and solvent-based substances

## 9. Precautionary measures

The following precautions must be taken to ensure safe use of the TROLL-FINGER together with the multifunction handle.

### 9.1 Before use

- Make sure that future users have read and understood the operating manual
- Before using the TROLLFINGER together with the multifunction handle, prepare a hazard assessment taking into account the contents of this operating manual and the local conditions in the field of application
- Ensure that future users have been informed about the content of the hazard assessment and have been trained and instructed accordingly

### 9.2 During use

- Clearly mark the field of application in which the TROLLFINGER is used together with the multifunction handle
- Block or delimit the field of application in which the TROLLFINGER is used together with the multifunction handle from the area of normal operation
- Protect the field of application in which the TROLLFINGER is used together with the multifunction handle from access by third parties
- Only trained or instructed users or persons may be in the immediate field of application during the examination of danger and risk points
- During a demonstration of danger and risk points, only trained or instructed users may be in the immediate field of application

### 9.3 After use & documentation

Include the results of the examination or demonstration in the following documents to emphasize the need for remedial action:

- RBU - Risk assessment
- GBU - Hazard assessment (process-, area- or workplace-related)
- SUU - Safety instruction document
- SEU - Safety instruction document
- WI - Work Instruction
- Operating instructions
- Company-specific documents/documents

