Tongs BV and WRT® Type Series

Manual and Hydraulic operated

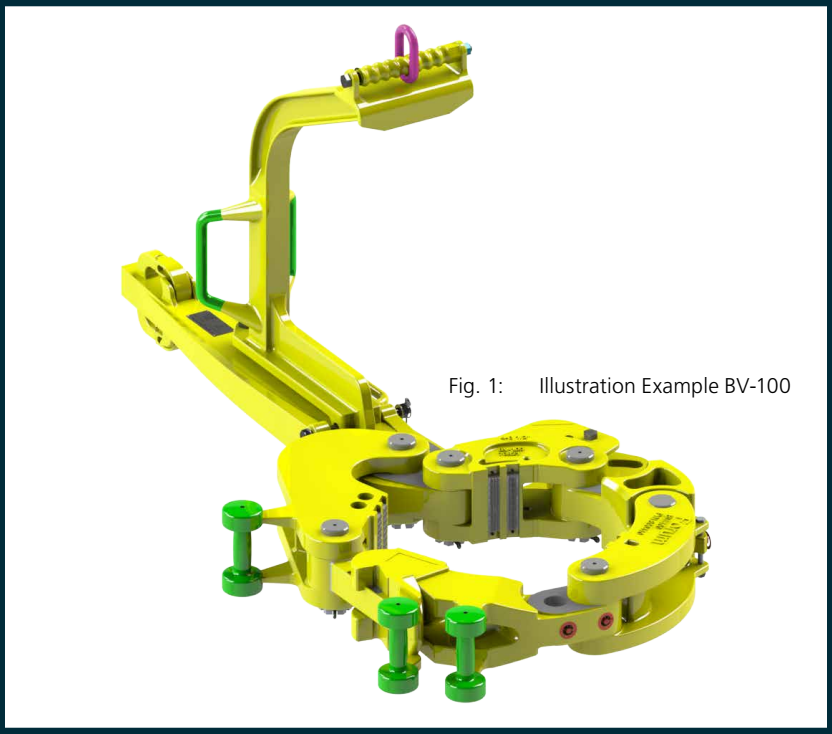

Fig. 1: Illustration Example BV-100

Operating Instructions

Original Operating Instructions

BV Type Series Manual Tongs

Type	P/N
BV-35	70400-S
BV-35	70401-S
BV-35	70402-S
BV-35	70403-S
BV-37	70200-S
BV-55	70600-S
BV-55	70601-S
BV-55	70602-S
BV-55	70603-S
BV-55-C	71600
BV-55-C	71601
BV-57-S	70000-S
BV-65	70700-S
BV-65	70701-S
BV-65	70702-S
BV-65	70703-S
BV-80-S	70100-S
BV-80-S	70101-S

Type	P/N
BV-100	70800
BV-100	70800-S
BV-100	70801-S
BV-100	70805-S
BV-100	71810-S
BV-100	71812-S
BV-100	71814-S
BV-100	71816-S
BV-100	71818
BV-100C	71808
BV-100C	71810-S
BV-100C	71812-S
BV-100C	71814-S
BV-100C	71816-S
BV-100C	71817
BV-100C	71822
BV-100C	71822--S
BV-100C	71823-S
BV-100C	71824-S

WRT® Type Series Manual Tongs

Type	P/N
WRT®-35	800120-S
WRT®-35	800100-S
WRT®-35	800101-S
WRT®-55C	71600-S
WRT®-55C	800250-S
WRT®-55	800201-S
WRT®-55	800200-S
WRT®-135	800500-S
WRT®-160	800500-S

BV-H Type Series Hydraulic Tong Kit

BV-65-H	70700-H
BV-100C-H	71890-1-H
BV-100-H	70800-S-H

Manual PN 70370-D Revision: 11, 07-2018

Revision history

Version	Date	Author	Changes
01	2005-01	B+V OT, ROK	Initial Release
02	2005-10	B+V OT, ROK	Updated Version
03	2006-11	B+V OT, ROK	Updated Version
04	2008-04	B+V OT, ROK	Updated Version
05	2010-08	B+V OT, ROK	Updated Version
06	2011-03	B+V OT, ROK	Updated Version
07	2011-11	B+V OT, ROK	Updated Version
08	2012-02	B+V OT, ROK	Updated Version
09	2012-03	B+V OT, ROK	Updated Version, Last actual Version for BV-25 devices
10	2016-08	FORUM B+V OT, ROK, MH	Updated Version, New Layout, New CD, End of Lifetime for BV-25
11	2018-07	FORUM B+V OT, ROK, St.S	Updated Version, New Layout

Document Approval

Version	Author	Eng. Check	Appoval Check
11	FORUM Handling Tools St.S 07-2018	FORUM Handling Tools as per Rev. 10	FORUM Handling Tools as per Rev. 10

oiltools@f-e-t.com

Table of contents

A. General

I Basic Information

This operating manual refers to the Manual Tongs from FORUM Handling Tools Oil Tools for use on oil drilling platforms and rigs.

The permissible range of application is specified in the technical data.

This manual covers several different FORUM Handling Tools models from the Manual Tongs type series that are all common in use and operation. Most assembly, disassembly, and inspection procedures are the same for all models. However, where there are differences, they are called out separately within the manual.

When installed in potentially explosive atmospheres, the instructions that follow the Ex symbol must be followed. Personal injury and/or equipment damage may occur if these instructions are not followed.

This operating manual contains all information on safe and proper operation of the Manual Tongs. Observance of these instructions is the prerequisite for safe operation.

In addition it is necessary to observe all applicable national and local regulations, e.g. accident prevention regulations and environmental regulations as well as the company's own internal safety regulations.

For installation, maintenance and repair work and proper training of the operating personnel FORUM Handling Tools recommends requesting service from FORUM Handling Tools

itself.

II Intended Use

The FORUM Handling Tools Manual Tongs are designed for making-up and breaking-out connections of tubulars, ranging from light weight tubing/casing to drill pipe and drill collars. The use of multiple latch steps and interchangeable hinge and lug jaw assemblies extends the range of the tongs. Tongs can be assembled for either making-up or breaking-out by removing the hanger and turning the complete tong over.

In addition to observing all instructions in this operating manual, intended use also includes observing all prescribed assembly, disassembly, startup, operating, repair and maintenance work at the specified intervals as well as all safety precautions.

The operation of the Manual Tongs are allowed for their intended use only. Additionally the intended use covers the compliance and observance of all procedures and safety notes of this manual as well as performing all necessary maintenance work in the given intervals.

INFO

In this documentation the abbreviation t and the word tons are used to describe short tons. If the metric ton is referred it will explicit be named in the text or the abbreviation ton.

1 ston	= 2000 lb	= 907,19 kg
1 ton	= 2204,62 lb	= 1000 kg

INFO

Improper use of the Manual Tongs releases FORUM Handling Tools from any liability for personal injury or property damage resulting therefrom.

III Improper Use

The Manual Tongs are intended exclusively for making up and breaking out tubular connections with the given torque rates.

The applied forces at the tong lever has to be monitored and the torque rate has never to be exceeded.
The Tongs must only be used for their designated purpose.

Always observe the specifications in chapter „Technical Data“ on page 17.

The following is specifically prohibited:

- Holding pipe with diameter for which use is not specified.
- Increasing the load limit of the Manual Tongs
- Every use of the Manual Tongs which is not intended.

Moreover operation of the Manual Tongs is prohibited under the following conditions:

- When the Manual Tongs is used for applications other than intended.
- When the hydraulic or pneumatic equipment is not installed properly.
- When the Manual Tongs or parts thereof are damaged or when the additional equipment is not installed properly.
- When protective or safety equipment is damaged, unusable, improperly installed or not present.
- When the Manual Tongs are not operating properly.
- When humans or foreign objects or personnel are located in the hazard area of the Manual Tongs.
- When conversions or modifications have been performed without previous, written approval by FORUM Handling Tools.
- When tools not approved by FORUM Handling Tools are used.
- When the prescribed maintenance intervals have been exceeded.
- When replacement parts not approved by FORUM Handling Tools are used.
- When repair or service work has been performed on the Manual Tongs by companies not authorized by FORUM Handling Tools.
- Observe also the chapter “Warranty and Liability”

IV Warranty and Liability

Liability

The technical information, data and instructions for operation contained in this operating manual correspond to the status at the time of print and are provided according to the best of our knowledge in consideration of our previous experience and know-how.

We reserve all rights to make technical modifications within the scope of technical development of the Manual Tongs treated in this operating manual. Claims or entitlements cannot be deduced or derived from information, illustrations and descriptions in this operating manual.

FORUM Handling Tools is liable for all warranty obligations made within the scope of the contract for any faults or omissions on our part, excluding further claims. Claims for damages suffered are excluded regardless of the legal grounds.

Translations are complete according to best knowledge. We cannot assume any liability for translation errors, even when the translation was accomplished at our order. Only the original text is binding.

The descriptions and illustrations do not necessarily reflect the scope of delivery or any parts orders. The drawings and illustrations are not to scale.

Warranty

FORUM Handling Tools general terms of purchase and delivery apply. Purchasers recognize these conditions on the day the contract is signed at the latest.

The terms and duration of FORUM Handling Tools warranty are specified in the sales documents as well as the order confirmation. These will be submitted to the operating company as information at the time the contract is signed at the latest.

The manufacturer assumes no warranty whatsoever for damage or interruptions in operation resulting from failure to observe the operating instructions.

The operating manual is to be supplemented by the operating company with operating instructions based on existing national regulations on accident and environmental protection, including information on supervisory and reporting obligations taking into consideration operating peculiarities, e.g. in regard to work organization.

Warranty claims, complaints within the scope of the guarantee and liability for personal injury and property damage are excluded, when such result from any of the following causes:

- Any use other then intended;
- Improper installation, operation, maintenance or repair;
- Operation with defective safety equipment or improperly attached or non-operational safety or protective equipment or devices;
- Failure to observe the instructions in the operating manual regarding safe conduct;
- Impermissible structural modifications;
- Use of replacement parts not approved by FORUM Handling Tools ;
- Normal wear or insufficient inspection of components subject to wear;
- External effects or force majeure.
- Greasing the Manual Tongs with other greases as recommended by FORUM Handling Tools

INFO

Any structural modification to the Manual Tongs by the operating company requires previous written approval by FORUM Handling Tools. Failure to obtain such approval voids the warranty as well as the declaration of conformity and releases FORUM Handling Tools from any product liability.

Following modifications or installation of optional equipment all safety equipment must be reinstalled and checked by the operator for proper function.

V Obligations of the Operating Company

Planning and Checking Safety Measures

The obligation of the operating company to due diligence includes planning safety measures and supervising their observance.

All personnel performing work on or with the Manual Tongs must be trained by the operating company for the work performed on the Manual Tongs.

The personnel must have read and understood the operating manual.

Minimizing Risk of Injury

The following principles apply to minimize the risk of injury:

- Ensure that work on the Manual Tongs is performed only by qualified personnel.
- The personnel must be authorized for such work by the operating company.
- The personnel must wear the prescribed protective equipment.
- Procedures, competencies and responsibilities must be clearly defined and established in the area of the Manual Tongs. Proper behaviour in the event of a malfunction must be clear for everyone. The personnel must be given regular training.
- All WARNING signs and information on the Manual Tongs must be complete and easily legible. For this purpose WARNING signs and information are to be cleaned regularly and replaced as required.

Trouble-free Operation

The following principles apply for trouble-free operation:

- Keep the complete operating manual at the location where the Manual Tongs is in operation where it is easily accessible for everyone and in an easily legible condition.
- Use the Manual Tongs exclusively for its intended purpose.
- Use the Manual Tongs only when it is in a perfect operating state.
- Before starting work, check to ensure that it is in a safe operating state and functioning properly.

Requirements for Operator

Basic knowledge of safe handling and use of the Manual Tongs includes knowledge of the general safety precautions.

Ensure that the Manual Tongs is operated only in compliance with the general safety precautions and other instructions in this manual.

Training

The operating company is obligated to organize and hold regular training to ensure that all personnel involved with transporting, installing, operating and/or servicing the Manual Tongs is familiar with the required procedures and safety precautions.

Minimum Qualifications

All work on the Manual Tongs requires special knowledge and qualifications on the part of the operating personnel.

All personnel working on Manual Tongs must have the following qualifications:

- Personal suitability for the work performed.
- Suitable qualifications for the work performed.
- Familiarity with the safety equipment and its function.
- Familiarity with this operating manual–particularly the safety precautions–and all chapters relevant for the work to be performed.
- Familiarity with the elementary instructions on operating safety and accident prevention.

In general all employees must have one of the following minimum qualifications:

- Technical training for independent work on the Manual Tongs.
- Sufficient qualifications for working on the Manual Tongs under supervision and at the instructions of a trained specialist.

User Groups

This operating manual is subdivided into the following user groups:

Personnel	Qualifications
Operating personnel	Sufficiently trained in: • Functional procedures on the Manual Tongs. • Operating procedures. Knowledge: • Competency and responsibility in regard to the work to be performed. • Behaviour in emergencies.
Service personnel	Sound knowledge of: • Mechanics. • Hydraulics. Authorizations (according to standards of safety engineering): • Starting up Manual Tongs. • Grounding Manual Tongs. • Marking of Manual Tongs. • Sound knowledge of installation and operation of the Manual Tongs.

Special Technical Knowledge

The following work should be performed only by specially trained personnel:

Work Performed	Qualifications
Work on hydraulic system	Special knowledge and experience with work on hydraulic systems.
Work on mechanical parts	Personnel qualified or trained in industrial mechanics; work is to be performed only under supervision and on instructions of a person qualified according to generally accepted codes of practice in industrial mechanics.

VI Safety Symbols

The safety precautions in this document contain standardized depictions and symbols. Three hazard classes are distinguished depending on the probability of occurrence and severity of the consequences. Selection of the WARNING category depends on the probability of occurrence and the possible extent of damage.

⚠ CAUTION

Indication of recognizable hazard for humans or possible property damage.

Failure to observe can lead to reversible injuries or property damage!

The symbol as specified in ANSI Z535.6 emphasizes the cause.

Measures for avoiding are listed.

⚠ WARNING

Indication of recognizable hazard for humans.

Failure to observe can lead to irreversible injuries!

The symbol as specified in ANSI Z535.6 emphasizes the cause.

Measures for avoiding are listed.

⚠ DANGER

Indication of imminent hazard for humans.

Failure to observe can lead to irreversible or lethal injuries!

The symbol as specified in ANSI Z535.6 emphasizes the cause.

Measures for avoiding are listed.

Preliminary Safety Precautions

Safety precautions are given in the preceding form at the beginning of complete chapters or sections. They apply for the entire chapter or the entire subsequent section.

Safety Precautions Relevant for Action

If a safety precaution applies only for one single action or a short series of actions, it is integrated into the text preceding the possible hazard point.

For example:

1. Attach hoisting gear to eye bolts in cover.

⚠ **CAUTION** Danger of pinching/crushing hands! The cover can fall shut when the retainer is not engaged. Never open the cover by hand.

2. Open the cover with a crane and suitable hoisting gear.
3. Unscrew the M10 bolts on the hydraulic assembly with a 17 mm box wrench.

Instructions for Safe Procedure

Special work steps to ensure Safe Procedure are depicted as follows (example):

Safe Procedure

1. Shut off &.
2. Disconnect supply lines.
3. Attach & to crane.
4. ...

Linguistic Conventions

This documentation uses terms and symbols intended to help you find information more easily, perform work steps more effectively and recognize dangerous situations more quickly. These symbols and terms are explained below:

All important text sections are printed in bold face.

- Lists without any necessary sequence are marked with a dash (-) at the left side of the column.
- Individual activities to be performed are indicated by a dot (•) to the left of the column.

Relevant consequences of an action or work step are marked with an arrow (>) in the left margin.

Enumerations in a certain sequence (e.g. a series of work steps) are indicated by sequential numbers (1, 2, 3,.) in the left margin.

For example:

1. Unscrew nuts on & feet.
2. Lift &.

For greater clarity the illustrations are located in the right column with the text opposite or directly below the associated text section. Larger illustrations extending over the entire width of the page are located before the explanatory text. The illustrations are provided with captions in telegraph style.

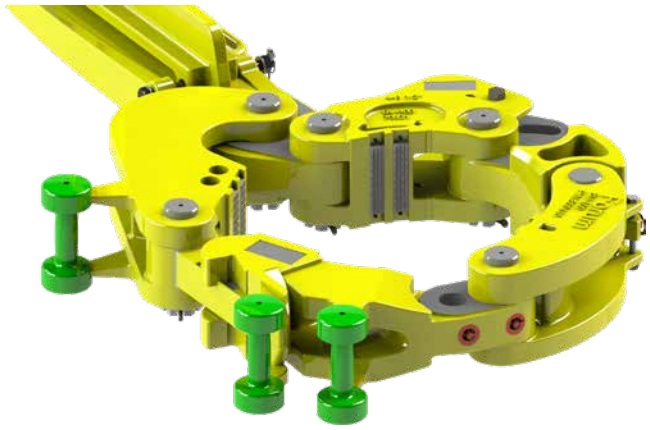

Fig. 2: Illustration Example Manual Tongs

INFO

Additional information and relationships requiring special attention are distinguished in this manner.

VII Personal Protective Equipment (PPE)

The following symbols located at appropriate points in the operating manual indicate that it is mandatory to wear personal protective equipment:

WEAR PROTECTIVE GLOVES!

WEAR EYE PROTECTION!

WEAR SAFETY SHOES!

WEAR PROTECTIVE HELMET!

WEAR EAR PROTECTION!

VIII Conformity

The Manual Tongs satisfies all requirements in applicable directives and standards. A sample of the EC Declaration of Conformity is given in the appendix.

INFO

This operating manual is a part of the technical documentation for the Manual Tongs. The EC Declaration of Conformity is delivered together with the Manual Tongs. Keep these instructions and the associated documents for later use.

IX Contact FORUM Handling Tools worldwide

In the event of problems that cannot be solved with the aid of this manual, please contact one of the following addresses.

FORUM B + V Oil Tools GmbH

Hermann-Blohm-Straße 2
20457 Hamburg
Germany
Tel: + 49.40.37022.6855
Fax: + 49.40.37022.6899

E-Mail: oiltools@f-e-t.com
web: www.f-e-t.com
www.blohmvoss-oiltools.com

FORUM Handling Tools

1023 FORUM Drive
Broussard, LA 70518 USA
Tel: +1.337.373.1800
Fax: +1.337.369.6893

FORUM ENERGY TECHNOLOGIES Drilling-Service-Standorte

Email: ForumDP.Sales@f-e-t.com

Canada

Nr. 106, 3903 - 75 Ave
Leduc, Alberta T9E 0K3
Tel: + 1 780.980.0345
Fax: + 1 780.986.3278

Mexico

Avenida Avante Monterrey N 300
Parqu Industrialxico
Tel: + 52.81.8245.6800

Scotland

Peregrine Road, Westhill
Aberdeenshire, AB32 6JL
Tel: + 44,1224.744000

United Arabic Emirates

Oilfields Supply Center
Building B-45
Jebel Ali Free Zone Dubai UAE
Tel: + 971.4.883.5266

Singapore

No 51 Benoi Road #06-00
Liang Huat Industrial Complex
629908
Tel: + 65.6465.4850
Fax: + 65.6465.4851
Out of hours:
Tel: + 65.913.898.12

X Information on the FORUM Handling Tools homepage

INFO

For further and actual information you can also visit our homepage in the internet.

A digital version of the operation instructions for this product as well as the operation instructions, safety- and update notes for other FORUM Handling Tools products can be reached via the FORUM Handling Tools homepage. To join our internet Technical Documentation service with the latest updates on new technical documentation in a free and easy way, you must register to our service with your email-address and name in the customer-login area ❶ on **www.blohmvoss-oiltools.com**.

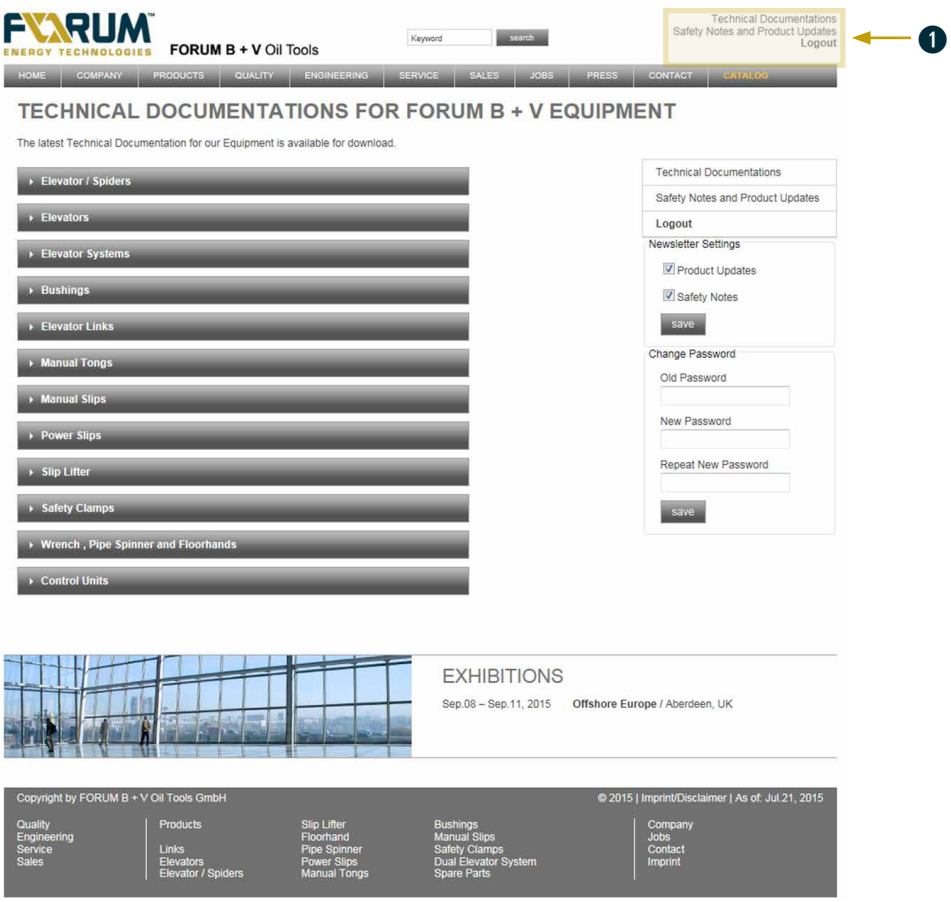

Fig. 3: Illustration Service–Homepage

DESCRIPTION

1 Description

The FORUM Handling Tools Manual Tongs are designed for making up and breaking out tubular connections according to its API 7k load rating and is designed for horizontal use only. The applied forces at the tong lever has to be monitored and the load rating has never to be exceeded. The tongs are designed for making-up and breaking-out connections of tubulars, ranging from light weight tubing/casing to drill pipe and drill collars. The use of multiple latch steps and interchangeable hinge and lug jaw assemblies extends the range of the tongs.

Tongs can be assembled for either making-up or breaking-out by removing the hanger and turning the complete tong over.

The BV-65-H, BV-100 H and BV-100C H are the hydraulic versions of the BV-65, BV-100 and BV-100C manual tong. A hydraulic cylinder is attached to the lever and to the long jaw to open and close the tong. The tong is designed to be pulled by a torque cylinder (supplied by others) attached to the pivoting bearing at the end of lever. Technical Data is comparable with the BV-100 and BV-100C manual tong.

1.1 Conformity

The Manual Tongs satisfy all requirements in applicable directives and standards. A sample of the EC Declaration of Conformity is given in the appendix.

The EC Declaration of Conformity is delivered together with the Manual Tongs. Keep these instructions and the associated documents for later use.

The Manual Tongs are designed and constructed for use in the drilling industry on ships and platforms. The tool complies with the Machinery Directive 2006/42/EC.

The Manual Tongs is approved for operation in explosion hazard areas.
For Manual Tongss containing any hydraulic powered parts, the directive 2006/32/EC "Equipment and protective systems in potentially explosive atmospheres" applies.

The corresponding ATEX certificates are present in the Data book.

The Classification according to CE (with reference to the ATEX guideline) is as followed:

CE Ex c II 2G IIB T5 for hydraulic and pneumatic tools

or

CE Ex c II 2G IIB T6 for manual tools

Explanation

CE	CE- marking (with reference to the ATEX guideline)
Ex	Marking of the equipment for the Ex- range
II	Equipment Group (II)
2	Equipment Category
G	For explosive mixtures of air and combustible gases, mists or vapors (G)
IIB	Category for Gases
T6	Temperature class

1.2 Assemblies and Components

The Manual Tongs consist of the described assemblies. A parts catalogue with general drawings and parts lists for all assemblies for the Manual Tongs are present in the „Drawing, Parts List and Spare Parts" on page 14.

Info

Please note that this illustration does not reflect the scope of delivery (see also Chapter „Warranty and Liability"). FORUM Handling Tools offers slip assemblies and guide plates as accessories to match the specific pipe diameters.

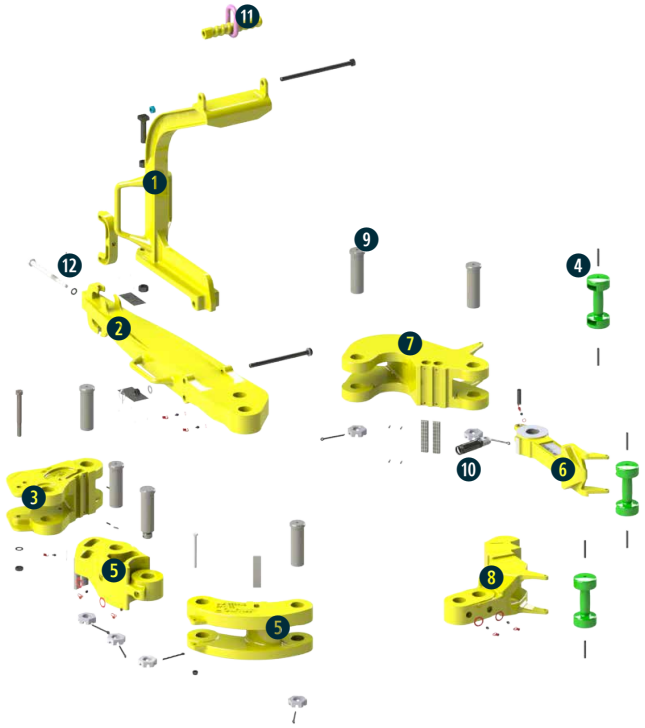

Fig. 4: Manual Tongs Main Assemblies

1	Hanger	2	Lever
3	Short Jaw	4	Safety Handle
5	Hinge Jaw	6	Latch
7	Long Jaw	8	Lug Jaw
9	Bolt	10	Latch catcher
11	Upper hold point	12	Tension point

Hanger Assembly

The Hanger Assembly enables the user the horizontal and vertical positioning of the tong. Therewith, an operation as close as possible to the well center is easily practicable. This also reduces the arc of swing and the distance that the tong must travel to well center. The Hanger Assembly consists of a curved welded construction and a support line, which can be attached to the derrick legs, cranes or other comparable structures.

Info

Depending on the requirements, different versions of the hanger in combination with different versions of the lever for BV, BV-H and WRT® Tongs, are available. See chapter „1.4.1 Manual Tongs type series overview and max. torque rate“ on page 17.

Fig. 5: Hanger of the BV-65

Lever

The Lever generates the required torque for making up and breaking out tubular connections. The pull line must be connected to the end of the lever. A back up line, sized to safely withstand the tong maximum rating, should in all cases be connected to secure safe operation. The pull line must be in a perpendicular position relative to the tong-handle.

Info

Depending on the requirements, different versions of the lever in combination with different versions of the hanger for BV, BV-H and WRT® Tongs, are available.
See chapter „1.4.3 Manual Tongs Lever Dimensions“ on page 21.

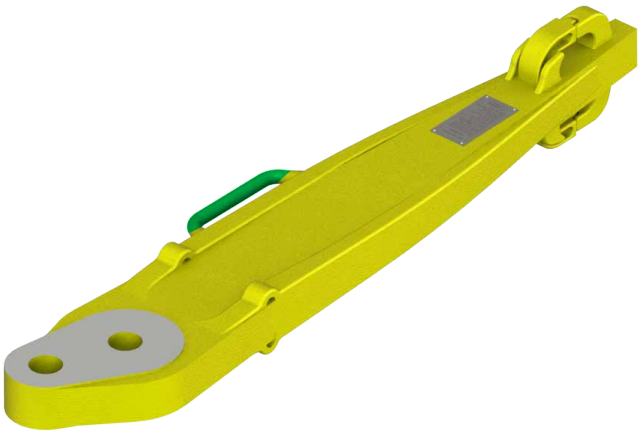

Fig. 6: Lever of the BV-65

Jaw and Latch Assembly

The Jaws are used to enclose and grip tubular structures, by minimizing the possibility of damages to them. The Latch is used to keep the tong in closed position via catch mechanism and additionally holding the Jaw Assembly together. The Latch is pre-tensioned on closing and gives help on swinging the handle to open the Lug Jaw.

Info

Depending on the pipe range, different versions of the Jaws and Latches for BV, BV-H and WRT® Tongs, are available. See chapter „1.6.2 Range overview and tong range assembly“ on page 28.

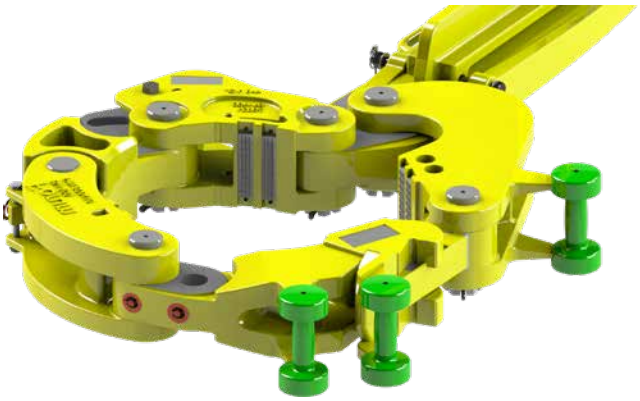

Fig. 7: Jaw and Latch Assembly of the BV-100

Safety Handles

All manual operation points on the tong are made with safety handles to prevent damages, these handles are replaceable and colored in green.

Hydraulic Assembly [Hydraulic BV-H]

The hydraulic type series BV-65-H, BV-100-H and BV-100C-H are operated hydraulically.
The hydraulic system is connected to lever and the hydraulic long jaw.

Info

To operate the FORUM Handling Tools BV-65 H and BV-100C H all lines have to be connected.

1.3 Optional Accessories

To ease the handling and to support the device functions following accessories are available from FORUM Handling Tools for the Manual Tongs. Please contact your local FORUM Handling Tools representant for detailed information.

- **Grease Pump, manual** **P/N 755667-3**
  Manual grease pump to apply grease on the device grease points.
- **Grease Pump, air operated** **P/N 776810**
  Air operated grease pump to apply grease on the device grease points.
- **Inserts driver** **P/N 70327**
  Used to release the inserts.
- **U-Clamp**
  for BV-35, BV-55, BV-55c, BV-65, BV-100, WRT®-35, WRT®-55, WRT®-55c **P/N 70616**
  for BV-80, WRT®-135, WRT®-160 **P/N 70616-8**
- **Tension Load Indicator System** **P/N 70050-15**
  up to- 15,000 lbs. line pull
  Indicates the torque applied to drill pipe, drill collars, tubing, and casing while joints are made — important for reducing drill collar and tool joint failure resulting from improper make-up.

Fig. 8: Manual Grease Pump

Fig. 9: Air Operated Grease Pump

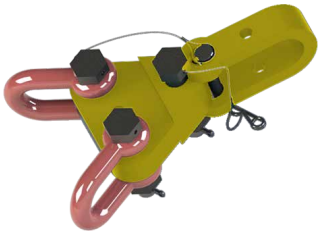

Fig. 10: U-Clamp

1.4 Technical Data

1.4.1 Manual Tongs type series overview and max. torque rate

1.4.1.1 BV-35 and BV-37 Manual Drill Pipe and Casing Tongs - 2.3/8" to 10.3/4"

P/N	Pipe Range	max. torque rate	Description
70400-S	7.5/8" to 10.3/4"	35000 ft lb (47454 Nm)	BV-35 Tong, Long Lever, Standard Hanger (End of Lifetime, please use WRT®-35).
70401-S	2.3/8" to 7"	35000 ft lb (47454 Nm)	BV-35 Tong, Long Lever, Standard Hanger (End of Lifetime, please use WRT®-35).
70402-S	7.5/8" to 10.3/4"	35000 ft lb (47454 Nm)	BV-35 Tong, Short Lever, Standard Hanger (End of Lifetime, please use WRT®-35).
70403-S	2.3/8" to 7"	35000 ft lb (47454 Nm)	BV-35 Tong, Short Lever, Standard Hanger (End of Lifetime, please use WRT®-35).
70200-S	2.3/8" to 10.3/4"	35000 ft lb (47454 Nm)	BV-37 Tong, Long Lever, Standard Hanger (End of Lifetime, please use WRT®-35).

1.4.1.2 BV-55 and BV-57 Manual Drill Pipe and Casing Tongs - 2.7/8" to 13.3/8"

P/N	Pipe Range	max. torque rate	Description
70600-S	3.1/2" to 13.3/8"	55000 ft lb (74570 Nm)	BV-55 Tong, Long Lever, Extra Long Hanger (End of Lifetime, please use WRT®-55).
70601-S	3.1/2" to 13.3/8"	55000 ft lb (74570 Nm)	BV-55 Tong, Short Lever, Short Hanger (End of Lifetime, please use WRT®-55).
70602-S	3.1/2" to 13.3/8"	55000 ft lb (74570 Nm)	BV-55 Tong, Long Lever, Standard Hanger (End of Lifetime, please use WRT®-55).
70603-S	3.1/2" to 13.3/8"	55000 ft lb (74570 Nm)	BV-55 Tong, Short Lever, Long Hanger (End of Lifetime, please use WRT®-55).
70000-S	2.7/8" to 13.3/8"	55000 ft lb (74570 Nm)	BV-57 Tong, Long Lever, Long Hanger (End of Lifetime, please use WRT®-55).

* Less Lug Jaw Assembly.

BV-55 and BV-57 Lug Jaw Assemblies

P/N	Pipe Range	max. torque rate	Description
70680-S	3.1/2" to 5"	55000 ft lb (74570 Nm)	Lug Jaw Assembly.
70681-S	5" to 6.3/4"	55000 ft lb (74570 Nm)	Lug Jaw Assembly.
70682-S	6.3/4" to 9"	55000 ft lb (74570 Nm)	Lug Jaw Assembly.
70683-S	9" to 10.3/4"	55000 ft lb (74570 Nm)	Lug Jaw Assembly.
70684-S	11.3/4"	55000 ft lb (74570 Nm)	Lug Jaw Assembly.
70686-S	12.3/4" to 13"	55000 ft lb (74570 Nm)	Lug Jaw Assembly.
70688-S	13.3/8"	55000 ft lb (74570 Nm)	Lug Jaw Assembly.
70690-S	4" to 5.1/2"	55000 ft lb (74570 Nm)	Lug Jaw Assembly.
70693-S	4.1/4" to 6.3/4"	55000 ft lb (74570 Nm)	Lug Jaw Assembly.

1.4.1.3 BV-55C Manual Casing Tongs - 25.1/2" to 36"

P/N	Pipe Range	max. torque rate	Description
71600*	25.1/2" to 36"	-	BV-55C Tong, Long Lever (End of Lifetime, please use WRT®-55C).
71601*	25.1/2" to 36"	-	BV-55C Tong, Short Lever (End of Lifetime, please use WRT®-55C).

* Less Casing Head Assembly.

BV-55C Casing Assemblies

P/N	Pipe Range	max. torque rate	Description
71609-S	25.1/2" to 27"	25000 ft lb (33895 Nm)	Casing Head Assembly (End of Lifetime).
71610-S	27" to 28.1/2"	25000 ft lb (33895 Nm)	Casing Head Assembly (End of Lifetime).
71611-S	28.1/2" to 30"	25000 ft lb (33895 Nm)	Casing Head Assembly (End of Lifetime).
71612-S	30" to 31.1/2"	25000 ft lbs (33895 Nm)	Casing Head Assembly (End of Lifetime).
71613-S	31.1/2" to 33"	25000 ft lbs (33895 Nm)	Casing Head Assembly (End of Lifetime).
71614-S	33" to 34.1/2"	25000 ft lbs (33895 Nm)	Casing Head Assembly (End of Lifetime).
71615-S	34.1/2" to 36"	25000 ft lbs (33895 Nm)	Casing Head Assembly (End of Lifetime).

1.4.1.4 BV-65 and BV-65-H Manual and Hydraulic Drill Pipe and Casing Tongs - 3.1/2" to 21.1/2"

P/N	Pipe Range	max. torque rate	Description
70700-S*	3.1/2" to 21.1/2"	65000 ft lb (88128 Nm)	BV-65 Tong, Long Lever, Long Hanger.
70701-S*	3.1/2" to 21.1/2"	65000 ft lb (88128 Nm)	BV-65 Tong, Short Lever, Standard Hanger.
70702-S*	3.1/2" to 21.1/2"	65000 ft lb (88128 Nm)	BV-65 Tong, Long Lever, Standard Hanger.
70703-S*	3.1/2" to 21.1/2"	65000 ft lb (88128 Nm)	BV-65 Tong, Short Lever, Long Hanger.
70700-H*	3.1/2" to 21.1/2"	65000 ft lb (88128 Nm)	BV-65 Hydraulic Tong, Long Lever, Long Hanger (End of Lifetime).

* Less Lug Jaw-, Hinge Jaw Assembly.

BV-65 and BV-65-H Hinge Jaw Assemblies, Lug Jaw Assemblies

P/N	Pipe Range	max. torque rate	Description
70780-S	3.1/2" to 8.1/4"	65000 ft lb (88128 Nm)	Lug Jaw Assembly.
70782-S	8" to 11.1/4"	65000 ft lb (88128 Nm)	Lug Jaw Assembly.
70783-S	11.3/4" to 14.3/8"	50000 ft lb (67791 Nm)	Lug Jaw Assembly.
70784-S	16" to 17"	50000 ft lb (67791 Nm)	Lug Jaw Assembly.
70791-S	18.5/8" to 20"	50000 ft lb (67791 Nm)	Lug Jaw Assembly.
70792-S	20" to 21.1/2"	50000 ft lb (67791 Nm)	Lug Jaw Assembly.
70785	11.3/4" to 17"	65000 ft lb (88128 Nm)	Hinge Jaw Assembly.
70787-1	18.5/8" to 20"	50000 ft lb (67791 Nm)	Hinge Jaw Assembly.
70789	18.5/8" to 21.1/2"	50000 ft lb (67791 Nm)	Hinge Jaw Assembly.
70793	18.5/8" to 21.1/2"	50000 ft lb (67791 Nm)	Hinge Jaw Assembly.
70787	20" to 21.1/2"	50000 ft lb (67791 Nm)	Hinge Jaw Assembly.

1.4.1.5 BV-80 Manual Drill Pipe and Casing Tongs - 3.1/2" to 13.3/8"

P/N	Pipe Range	max. torque rate	Description
70100-S*	3.1/2" to 13.3/8"	80000 ft lb (108465 Nm)	BV-80 Tong, Long Lever, Standard Hanger
70101-S*	3.1/2" to 13.3/8"	80000 ft lb (108465 Nm)	BV-80 Tong, Short Lever, Standard Hanger

* Less Lug Jaw Assembly.

BV-80 Lug Jaw Assemblies

P/N	Pipe Range	max. torque rate	Description
70180-S	3.1/2" to 4.1/2"	30000 ft lb (40674 Nm)	Lug Jaw Assembly
70181-S	4" to 5.1/4"	30000 ft lb (40674 Nm)	Lug Jaw Assembly
70182-S	5" to 6"	65000 ft lb (88128 Nm)	Lug Jaw Assembly
70183-S	6" to 7"	65000 ft lb (88128 Nm)	Lug Jaw Assembly
70184-S	7" to 9"	80000 ft lb (108465 Nm)	Lug Jaw Assembly
70185-S	9" to 10.3/4"	50000 ft lb (67791 Nm)	Lug Jaw Assembly
70186-S	10.3/4" to 11.3/4"	50000 ft lb (67791 Nm)	Lug Jaw Assembly
70187-S	13.3/8"	50000 ft lb (67791 Nm)	Lug Jaw Assembly

1.4.1.6 BV-100 Manual Drill Pipe and Casing Tongs - 4" to 21"

P/N	Pipe Range	max. torque rate	Description
70800*	4" to 17"	80000 ft lb (108465 Nm)	BV-100 Tong, Long Lever, Long Hanger (End of Lifetime, please use BV-100 P/N 70800-S or BV-100 P/N 70801-S.
70800-S*	4" to 21"	100000 ft lb (135582 Nm)	BV-100 Tong, Long Lever, Extra Long Hanger
70801-S*	4" to 21"	100000 ft lb (135582 Nm)	BV-100 Tong, Long Lever, Standard Hanger
70805-S*	4" to 21"	100000 ft lb (135582 Nm)	BV-100 Tong, Ultra Short Lever, Standard Hanger (End of Lifetime, please use BV-100 P/N 70800-S or BV-100 P/N 70801-S.
71810-S*	23.4" to 24.4"	100000 ft lb (135582 Nm)	BV-100 Tong, Extended Lever, Standard Hanger (End of Lifetime, please use BV-100 P/N 70800-S or BV-100 P/N 70801-S.
71812-S*	25.3" to 26.3"	100000 ft lb (135582 Nm)	BV-100 Tong, Extended Lever, Standard Hanger (End of Lifetime, please use BV-100 P/N 70800-S or BV-100 P/N 70801-S.
71814-S*	27.4" to 28.4"	100000 ft lb (135582 Nm)	BV-100 Tong, Extended Lever, Standard Hanger (End of Lifetime, please use BV-100 P/N 70800-S or BV-100 P/N 70801-S.
71816-S*	29.5" to 30.6"	100000 ft lb (135582 Nm)	BV-100 Tong, Extended Lever, Standard Hanger (End of Lifetime, please use BV-100 P/N 70800-S or BV-100 P/N 70801-S.
71818*	32.1/16"	100000 ft lb (135582 Nm)	BV-100 Tong, Extended Lever, Standard Hanger (End of Lifetime, please use BV-100 P/N 70800-S or BV-100 P/N 70801-S.

* Less Lug Jaw-, and Hinge Jaw Assembly.

BV-100 Hinge Jaw Assembly and Lug Jaw Assemblies

P/N	Pipe Range	max. torque rate	Description
70880-S	4" to 8.1/2"	100000 ft lb (135582 Nm)	Lug Jaw Assembly
70882-S	8.1/2" to 12"	100000 ft lb (135582 Nm)	Lug Jaw Assembly
70883-S	12" to 15"	75000 ft lb (101686 Nm)	Lug Jaw Assembly
70884-S	15.3/4"	100000 ft lb (135582 Nm)	Lug Jaw Assembly
70885-S	16" to 17"	60000 ft lb (81349 Nm)	Lug Jaw Assembly
70886	8.1/2" to 17"	100000 ft lb (135582 Nm)	Hinge Jaw Assembly
800430-S	18.5/8" 21"	50000 ft lb (67791 Nm)	Hinge Jaw and Lug Jaw Assembly

1.4.1.7 BV-100C, BV-100C-H, BV-100-H Manual and Hydraulic Casing Head Tongs - 23.4" to 42"

P/N	Pipe Range	max. torque rate	Description
71808	20.7" to 21.1/2"	100000 ft lb (135582 Nm)	BV-100C Manual Casing Head Tong (End of Lifetime)
71810-S	23.4" to 24.5"	100000 ft lb (135582 Nm)	BV-100C Manual Casing Head Tong
71812-S	25.3" to 26.3"	100000 ft lb (135582 Nm)	BV-100C Manual Casing Head Tong
71814-S	27.4" to 28.4"	100000 ft lb (135582 Nm)	BV-100C Manual Casing Head Tong
71816-S	29.5" to 30.6"	100000 ft lb (135582 Nm)	BV-100C Manual Casing Head Tong
71817	18.625" to 31.625"	100000 ft lb (135582 Nm)	BV-100C Manual Casing Head Tong (End of Lifetime)
71822	36"	100000 ft lb (135582 Nm)	BV-100C Manual Casing Head Tong (End of Lifetime)
71822-S	35.5" to 36.7"	100000 ft lb (135582 Nm)	BV-100C Manual Casing Head Tong
71823-S	37" to 38"	100000 ft lb (135582 Nm)	BV-100C Manual Casing Head Tong
71824-S	40" to 42"	100000 ft lb (135582 Nm)	BV-100C Manual Casing Head Tong (End of Lifetime)
71890-1-H	37" to 42"	100000 ft lb (135582 Nm)	BV-100C-H Hydraulic Casing Head Tong (End of Lifetime)
70800-S-H	4" to 21"	100000 ft lb (135582 Nm)	BV-100-H Casing Head Tong (End of Lifetime)
71890-H	4" to 21"	100000 ft lb (135582 Nm)	BV-100-H Casing Head Tong (End of Lifetime)

1.4.1.8 WRT®-35 Manual Drill Pipe Tong 2.3/8" to 11"

P/N	Pipe Range	max. torque rate	Description
800100-S	2 3/8" to 11"	35000 ft lb (47454 Nm)	WRT®-35 Tong, Long Lever, Standard Hanger
800101-S	2.3/8" to 11"	35000 ft lb (47454 Nm)	WRT®-35 Tong, Short Lever, Standard Hanger
800120-S	2.3/8" to 11"	35000 ft lb (47454 Nm)	WRT®-35 Tong, Short Lever, Standard Hanger (End of Lifetime, please use WRT®-35 P/N 800100-S or WRT®-35 P/N 800101-S)

* Less Lug Jaw-, Hinge Jaw Assembly.

WRT®-35 Hinge Jaw Assembly, Lug Jaw Assemblies

P/N	Pipe Range	max. torque rate	Description
800105-S	3.1/2" to 7.5/8"	35000 ft lb (47454 Nm)	Lug Jaw Assembly
800107	7.5/8" to 11"	35000 ft lb (47454 Nm)	Hinge Jaw Assembly

1.4.1.9 WRT®-55 Manual Drill Pipe Tong 3.1/2" to 14.3/8"

P/N	Pipe Range	max. torque rate	Description
800200-S*	3.½" to 14.3/8"	55000 ft lb (74570 Nm)	WRT®-55 Tong, Long Lever, Standard Hanger
800201-S*	3.½" to 14.3/8"	55000 ft lb (74570 Nm)	WRT®-55 Tong, Short Lever, Standard Hanger

* Less Lug Jaw-, Hinge Jaw Assembly.

WRT®-55 Hinge Jaw Assembly, Lug Jaw Assemblies

P/N	Pipe Range	max. torque rate	Description
800210-S	3.1/2" to 8.1/4"	55000 ft lb (74570 Nm)	Lug Jaw Assembly
800220-S	8" to 11.1/2"	55000 ft lb (74570 Nm)	Lug Jaw Assembly
800230-S	11.1/2" to 14.3/8"	55000 ft lb (74570 Nm)	Lug Jaw Assembly
800207	11.1/2" to 14.3/8"	55000 ft lb (74570 Nm)	Hinge Jaw Assembly

1.4.1.10 WRT®-55C Manual Casing Tong 13" to 31"

P/N	Pipe Range	max. torque rate	Description
800240*	13" to 31"	-	WRT®-55C Tong, Long Lever, Standard Hanger

* Less Casing Head Assembly.

WRT®-55C Casing Assemblies

P/N	Pipe Range	max. torque rate	Description
800250-S	13" to 14.1/2"	25000 ft lb (33895 Nm)	Casing Head Assembly
800255-S	16" to 17.1/2"	25000 ft lb (33895 Nm)	Casing Head Assembly
800260-S	17.3/4" to 18.7/8"	25000 ft lb (33895 Nm)	Casing Head Assembly
800265-S	18.1/4" to 19.5/8"	25000 ft lbs (33895 Nm)	Casing Head Assembly
800270-S	19.1/2" to 21"	25000 ft lbs (33895 Nm)	Casing Head Assembly
800275-S	20.3/4" to 22.1/4"	25000 ft lbs (33895 Nm)	Casing Head Assembly
800280-S	24" to 25.1/2"	25000 ft lbs (33895 Nm)	Casing Head Assembly
800295-S	30" to 31"	25000 ft lbs (33895 Nm)	Casing Head Assembly

1.4.1.11 WRT®-135 and WRT®-160 Manual Drill Pipe Tong 7.1/2" to 12"

P/N	Pipe Range	max. torque rate	Description
800500-S	7.½" to 12"	135000 ft lbs (183035 Nm)	WRT®-135 Tong, Long Lever, Standard Hanger (End of Lifetime, please use WRT®-160)
800500-S-160	7.½" to 12"	160000 ft lbs (216931 Nm)	WRT®-160 Tong, Long Lever, Standard Hanger

WRT®-135 and WRT®-160 Lug Jaw Assemblies

P/N	Pipe Range	max. torque rate	Description
800510-S-160	7.1/2" to 8.1/2" 9.1/2" to 10.3/4"	160000 ft lbs (216931 Nm)	Lug Jaw Assembly
800520-S-160	8.1/2" to 9.7/8" 10.3/4" to 12"	160000 ft lbs (216931 Nm)	Lug Jaw Assembly

1.4.2 Temperature

Temperature working range ambient*

- 20°C to + 60° C
- 4°F to + 140° F

* Other working ranges available on request.

1.4.3 Manual Tongs Lever Dimensions

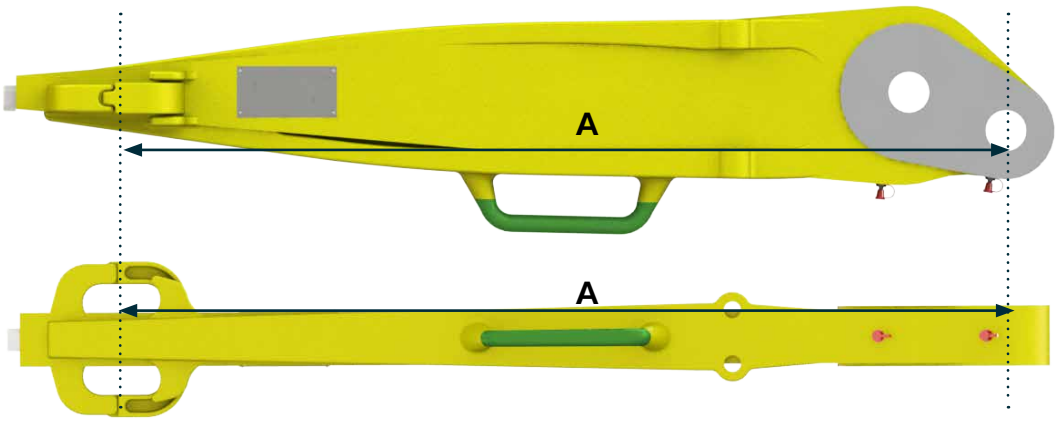

Fig. 11: Manual Tongs Main Dimensions

Lever	Long Version P/N	A - mm [inch]	Short Version P/N	A - mm [inch]
BV-35 and BV-37	70410	968 [38.11]	70491	704 [27.72]
BV-55 and BV-57	70610	1170 [46.06]	70691	7069 [278.31]
BV-55C	70610	1170 [46.06]	70691	7069 [278.31]
BV-65	70710	1170 [46.06]	70712	707 [27.83]
BV-80	70110	1369 [53.9]	70171	7017 [276.26]
BV-100	70810	1200 [47.24]	n/a	n/a
BV-100C	70810	1200 [47.24]	n/a	n/a
WRT®-35	800101	920 [36.22]	800102	700 [27.56]
WRT®-55	800201	1080 [42.52]	800202	945 [37.2]
WRT®-55C	800201	1080 [42.52]	800202	945 [37.2]
WRT®-135 and WRT®-160	800501	1185 [46.65]	n/a	n/a

1.4.4 Manual Tongs Weights

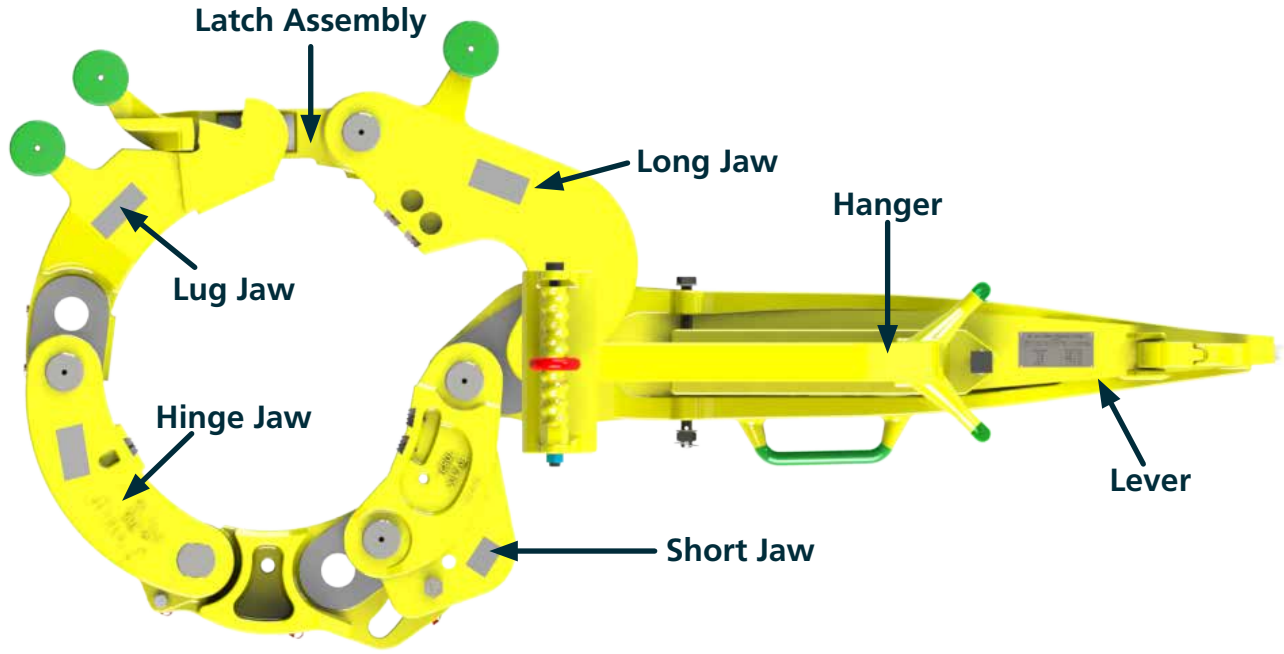

Fig. 12: Manual pipe tongs component overview

BV-35 Manual Drill Pipe and Casing Tong 2.3/8" - 10.3/4"

	Component Weight			kg*
Basic Device	70410	Long Lever		44
	70490	Short Lever		39
	70420	Short Jaw Assembly		15
	70430-S	Long Jaw Assembly		16
	70440-S	Latch Assembly		9
	70450	Hanger BV-35		21
800105-S	Lug Jaw Assembly		2.3/8" - 7.5/8"	22
800107	Hinge Jaw Assembly		7.5/8" - 11"	14
800105-S + 800107	Hinge and Lug Jaw Assembly		7.5/8" - 11"	36

Device Weight	kg*
Basic device (70400-S)	132
2.3/8" - 7"	114
7.5/8" - 10.3/4"	120

WRT®-35 Manual Drill Pipe and Casing Tong 2.3/8" - 11"

	Component Weight			kg*
Basic Device	800101	Long Lever		52
	800102	Short Lever		44
	800106	Short Jaw		19
	800103	Long Jaw		39
	800104	Latch Assembly		11
	70775-1	Safety Standard Hanger		32
800105-S	Lug Jaw Assembly		2.3/8" - 7.5/8"	22
800107	Hinge Jaw Assembly		7.5/8" - 11"	14
800105-S + 800107	Hinge and Lug Jaw Assembly		7.5/8" - 11"	36

Device Weight	kg*
Basic Short (800100-S)	148
2.3/8" - 7.5/8"	175
7.5/8" - 11"	189

* All weights are derived from CAD constructions.

BV-55 Manual Drill Pipe and Casing Tong 2.3/8" - 10.3/4"

	Component Weight			kg*
Basic Device	70610	Long Lever		75
	70691	Short Lever		56
	70775-1	Safety Standard Hanger		32
	70660-S	Latch Assembly		17
	70630	Short Jaw Assembly		21
	70640	Long Jaw Assembly		58
70680-S	Lug Jaw Assembly		3.1/2" - 5"	14
70681-S	Lug Jaw Assembly		5" - 6.3/4"	14
70682-S	Lug Jaw Assembly		6.5/8" - 9"	26
70683-S	Lug Jaw Assembly		9" - 10.3/4"	30

Device Weight	kg*
Basic device (70600)	224
2.3/8" - 10.3/4" (70601)	216
2.3/8" - 10.3/4" (70602)	236
2.3/8" - 10.3/4" (70603)	256

BV-55C Manual Casing Tong 25.1/2" - 36"

	Component Weight			kg*
Basic Device	70610	Long Lever		75
	70691	Short Lever		56
	70775-1	Safety Standard Hanger		32
71609-S	Casing Head Assembly		25.1/2" - 27"	210
71610-S	Casing Head Assembly		27" - 28.1/2"	225
71611-S	Casing Head Assembly		28.1/2" - 30"	235
71612-S	Casing Head Assembly		30" - 31.1/2"	240
71613-S	Casing Head Assembly		31.1/2" - 33"	260
71614-S	Casing Head Assembly		33" - 34.1/2"	280
71615-S	Casing Head Assembly		34.1/2" - 36"	345

Device Weight	kg*
Basic Long (71600)	110
Basic Short (71601)	110
25.1/2" - 27"	317
27" - 28.1/2"	332
28.1/2" - 30"	342
30" - 31.1/2"	347
31.1/2" - 33"	367
33" - 34.1/2"	387
34.1/2" - 36"	452

WRT®-55 Manual Drill Pipe and Casing Tong 3.1/2" - 14.3/8"

	Component Weight			kg*
Basic Device	800201	Long Lever		62
	800202	Short Lever		55
	800203	Long Jaw		60
	800204	Latch Jaw		15
	800206	Short Jaw		26
	70775-1	Safety Standard Hanger		32
800210-S	Lug Jaw Assembly		3.1/2" - 8.3/4"	36
800220-S	Lug Jaw Assembly		8" - 11.1/2"	42
800230-S	Lug Jaw Assembly		11.1/2" - 14.3/8"	39
800207	Hinge Jaw Assembly		11.1/2" - 14.3/8"	21

Device Weight	kg*
Basic Short (800201-S)	188
3.1/2" - 8.1/4"	189
8" - 11.1/2"	195
11.1/2" - 14.3/8"	213

BV-65 Manual Drill Pipe and Casing Tong 3.1/2" - 21.1/2"

	Component Weight			kg*
Basic Device	70711R	Long Lever		78
	70713R	Short Lever		64
	70770	Safety Long Hanger		75
	70730	Long Jaw Assembly		71
	70775-1	Safety Standard Hanger		32
	70720	Short Jaw Assembly		29
	70740	Latch Assembly		15
70780-S	Lug Jaw Assembly		3.1/2" - 8.1/4"	38
70782-S	Lug Jaw Assembly		8" - 11.1/4"	48
70783-S	Lug Jaw Assembly		11.3/4" - 14.3/8"	34
70784-S	Lug Jaw Assembly		16" - 17"	43
70785	Hinge Jaw Assembly		18.5/8" - 21.1/2"	45
70791-S	Lug Jaw Assembly		18.5/8" - 20"	35
70787-1	Hinge Jaw Assembly		18.5/8"	16
70789	Hinge Jaw Assembly		18.5/8" - 21.1/2"	20
70792-S	Lug Jaw Assembly		20" - 21.1/2"	40
70787	Hinge Jaw Assembly		20" - 21.1/2"	47
70793	Hinge Jaw Assembly		18.5/8" - 21.1/2"	85

Device Weight	kg*
Basic Long (70700-S)	268
Basic Short (70701-S)	211
Basic Long/Short (70702-S)	225
Basic Short/Long (70703-S)	254
3.1/2" - 8.1/4"	351
8" - 11.1/4"	361
11.3/4" - 14.3/8"	347
16" - 17"	356
18.5/8" - 20"	388
20" - 21.1/2"	393

* All weights are derived from CAD constructions.

BV-80 Manual Drill Pipe and Casing Tong 3.1/2" - 13.3/8"

	Component Weight		kg*
Basic Device	70110	Long Lever	83
	70170	Short Lever	64
	70130-S	Long Jaw Assembly	60
	70120	Short Jaw Assembly	39
	70140-S	Latch Assembly	18
	70770	SafetyLong Hanger	75
	70150	Safety Standard Hanger	16
70180-S	Lug Jaw Assembly	3.1/2" - 4.1/2"	25
70181-S	Lug Jaw Assembly	8.172" - 12"	22
70182-S	Lug Jaw Assembly	5" - 6"	29
70183-S	Lug Jaw Assembly	6" - 7"	35
70184-S	Lug Jaw Assembly	7" - 9"	33
70185-S	Lug Jaw Assembly	9" - 10.3/4"	42
70186-S	Lug Jaw Assembly	10.3/4" - 11.3/4"	44
70187-S	Lug Jaw Assembly	13.3/8"	48

Device Weight	kg*
Basic Long (70100-S)	275
Basic Short (70101-S)	197
3.1/2" - 4.1/2"	300
4" - 5.1/4"	297
5" - 6"	304
6" - 7"	310
7" - 9"	308
9" - 10.3/4"	317
10.3/4" - 11.3/4"	319
13.3/8"	323

BV-100 Manual Drill Pipe and Casing Tong 4" - 32.1/16""

	Component Weight		kg*
Basic Device	70810	Long Lever	89
	70830	Long Jaw Assembly	62
	70820	Short Jaw Assembly	35
	70840	Latch Assembly	23
	70650	Safety Standard Hanger	28
	70770	Safety Long Hanger	75
70880-S	Lug Jaw Assembly	4" - 8.1/2"	61
70882-S	Lug Jaw Assembly	8.1/2" - 12"	44
70883-S	Lug Jaw Assembly	12" - 15"	60
70884-S	Lug Jaw Assembly	15.3/4"	70
70885-S	Lug Jaw Assembly	16" - 17"	68
70886	Hinge Jaw Assembly	8.1/2" - 17"	53
800430-S	Hinge Jaw Assembly	18 5/8" - 21"	97

Device Weight	kg*
4" - 17" (70800)	257
4" - 21" (70800-S)	200
4" - 21" (70801-S)	270
4" - 21" (70805-S)	300
23.4" - 24.4" (71810-S)	370
25.3" - 26.3" (71812-S)	380
27.4" - 28.4" (71814-S)	385
29.5" - 30.6" (71816-S)	396
32.1/16" (71818)	402

BV-100C Manual Casing Tong 4" - 21"

	Component Weight		kg*
Basic Device	70810	Long Lever	89
	70830	Long Jaw Assembly	62
	70820	Short Jaw Assembly	35
	70840	Latch Assembly	23
	70650	Safety Standard Hanger	28
	70770	Safety Long Hanger	75

Device Weight	kg*
20.7" - 21.1/2" (71808)	336
18.625" - 31.625" (71817)	344
36" (71822)	344
35.5" - 36,7" (71822-S)	351
37" - 38" (71823-S)	385
40" - 42" (71824-S)	351
37" - 42" (71890-1-H)	396
4" - 21" (70800-S-H)	200
4" - 21" (71890-H)	200

* All weights are derived from CAD constructions.

WRT®-135 Manual Drill Pipe and Casing Tong 7.1/2" - 12"

	Component Weight		kg*	Device Weight	kg*
Basic Device	800501	Long Lever	119	Basic device (800500-S-160)	360
	800504-S	Latch Assembly	47		
	70775	Safety Standard Hanger	35		
	800503-S	Long Jaw Assembly	102		
	800506	Short Jaw	61		
800510-S-160	Lug Jaw Assembly	7.1/2" - 8.1/2"	68		
800510-S-160	Lug Jaw Assembly	9.1/2" - 10.3/4"	68		
800520-S-160	Lug Jaw Assembly	8.1/2" - 9.7/8"	104		
800520-S-160	Lug Jaw Assembly	10.3/4" - 12"	104		

WRT®-160 Manual Drill Pipe and Casing Tong 7.1/2" - 12"

	Component Weight		kg*	Device Weight	kg*
Basic Device	800501	Long Lever	119	Basic device (800500-S-160)	360
	800504-S	Latch Assembly	47		
	70775	Safety Standard Hanger	35		
	800503-S	Long Jaw Assembly	102		
	800506	Short Jaw	61		
800510-S-160	Lug Jaw Assembly	7.1/2" - 8.1/2"	68		
800510-S-160	Lug Jaw Assembly	9.1/2" - 10.3/4"	68		
800520-S-160	Lug Jaw Assembly	8.1/2" - 9.7/8"	104		
800520-S-160	Lug Jaw Assembly	10.3/4" - 12"	104		

* All weights are derived from CAD constructions.

1.5 Equipment Markings

The markings are generally used for traceability and provide general information about the component/ device. All markings are in compliance to the latest API 7K 6th Edition and at least include the following information:

General Markings according to API 7K 6th Edition

- API Stamp (API monogram, spec, license)
- Manufacturer's specifications (FORUM logo)
- Production Date (Month / Year)
- Part number (marking P/N before the part number)
- Serial number (marking S/N before the serial number)
- Load Rating (if applicable)
- Own weight
- Maximum weight in kg, if the weight increases by attachments
- CE-ATEX marking (CE Ex II 2G IIB T5 / T6)
- Country of manufacture

Supplementary Requirements - SR

Supplementary Requirements, abbreviated by "SR", are labeled beside the general markings, if additionally ordered. Supplementary Requirements in according to API 7K 6th Edition are:

- SR 1 - Proof Load Testing
- SR 2 - Low-temperature Testing
- SR 3 - Data Book
- SR 4 - Additional Volumetric Examination of Castings
- SR 5 - Volumetric Examination of Wrought Material

Fig. 13: Contact with Technical Support

The email address of the manufacturer is given on the support sticker if service is required.

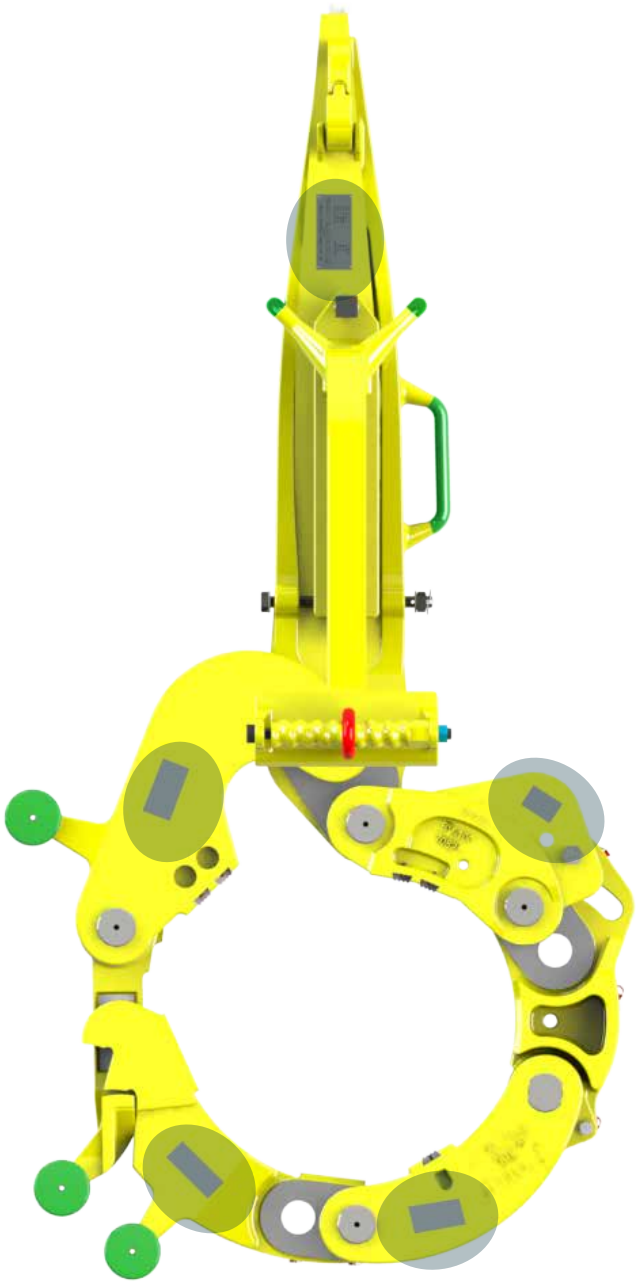

Fig. 14: Manual Tongs markings (for example: BV 100)

Fig. 15: Information placards on Manual Tongs

1.6 Component sizes

The pipe diameters and matching components are listed with part numbers below for precise layout of the tong with the desired drill string. To order components please contact the FORUM Handling Tools Service Department at the address given under Contact.

Manual Tong Dies

⚠ **CAUTION** Always ensure that the right size is installed for each pipe diameter.

Tong Type	Manual Tong Dies Type	
	Qty.	P/N
BV-25	3	70322
WRT®-35	5	70322
WRT®-55	5	70622
BV-65	5	70622
BV-80	4	70622
BV-100	5	70322
WRT®-135	5	70622
WRT®-160	5	70622
BV-55C	2	70622
BV-100C	3	70322
BV-35	4	70322
BV-37	4	70222
BV-55	4	70622
BV-57	4	70622

Special Tools for Die replacement

Die Driver P/N 703207

1.6.1 Range overview and tong range assembly

1.6.1.1 BV-65

Range Overview

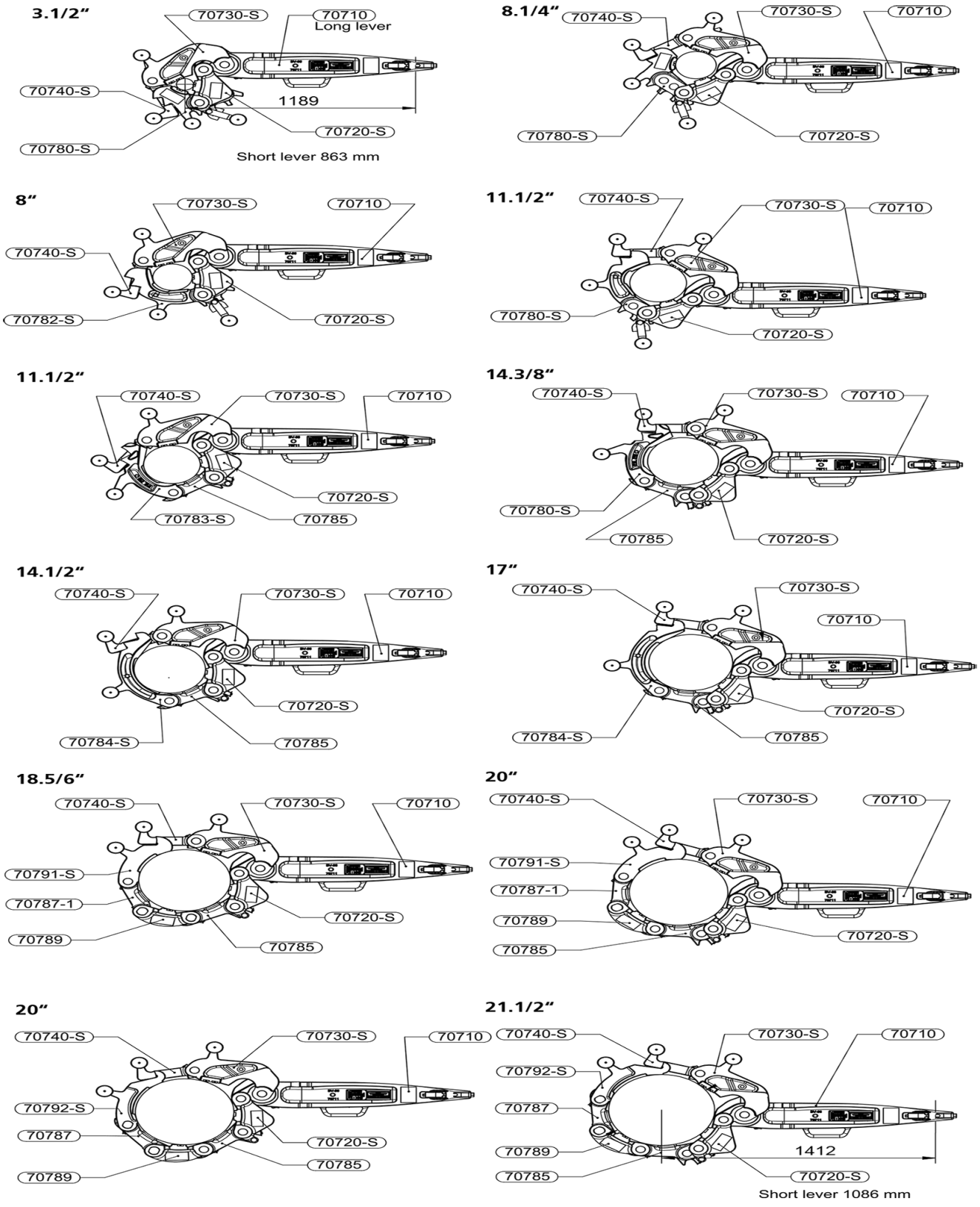

Fig. 16: Range Overview BV-65

Jaw Overview

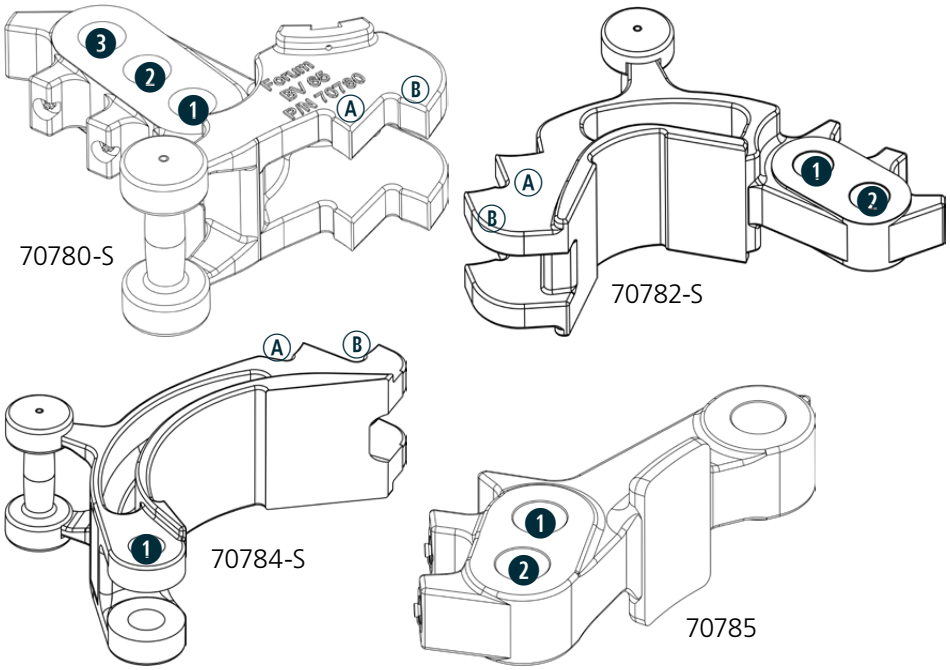

Fig. 17: Gripping Points overview BV 65 part I

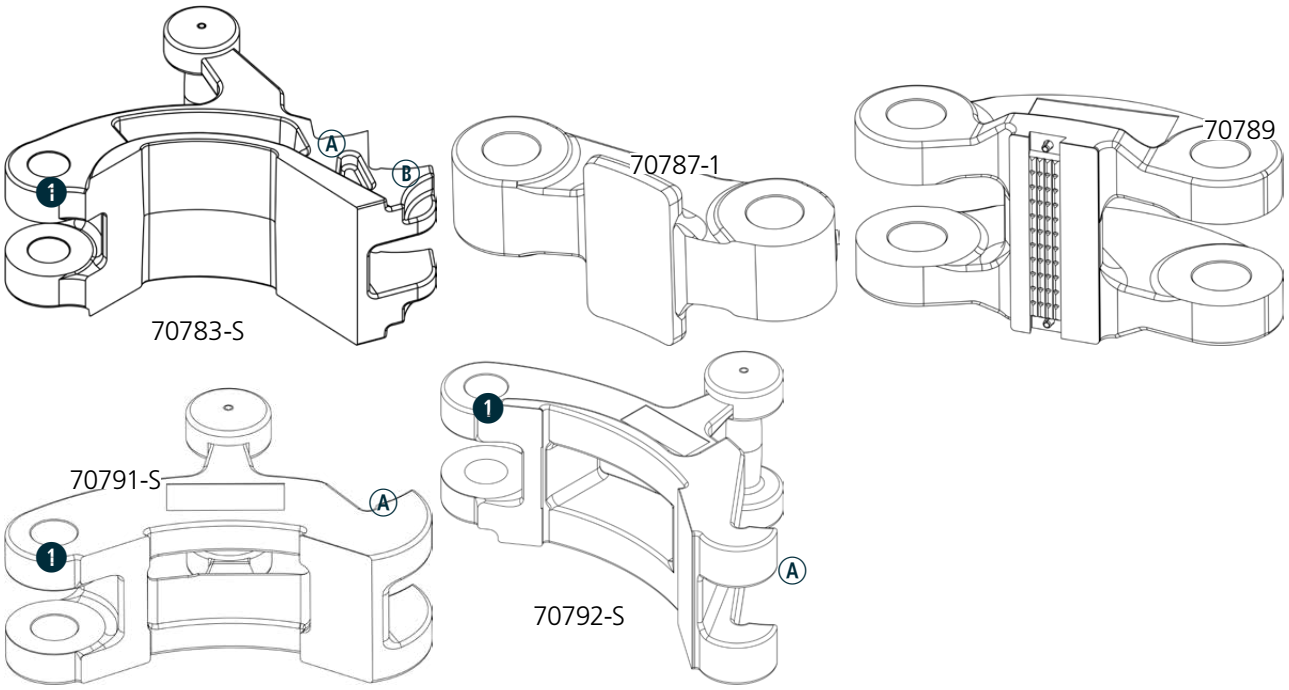

Fig. 18: Gripping Points overview BV-65 part II

Gripping Range assembly

3.1/2" - 8.1/4" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
70710	Lever	n/a	70780-S	1 Ⓐ	3.1/2"	4.3/4"
70720-S	Short Jaw			1 Ⓑ	4.1/2"	6"
70730-S	Long Jaw			2 Ⓐ	n/a	n/a
70740-S	Latch			2 Ⓑ	5.1/2"	7"
				3 Ⓐ	n/a	n/a
				3 Ⓑ	6.1/2"	8.3/4"

8" - 11.1/2" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
70710	Lever	n/a	70782-S	1 Ⓐ	7.1/2"	9.1/2"
70720-S	Short Jaw			1 Ⓑ	n/a	n/a
70730-S	Long Jaw			2 Ⓐ	n/a	n/a
70740-S	Latch			2 Ⓑ	9.1/2"	11.1/2"

11.1/2" - 14.3/8" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
70710	Lever	70785	70783-S	1 Ⓐ	11.1/2"	12.3/4"
70720-S	Short Jaw			1 Ⓑ	12.1/2"	13.1/2"
70730-S	Long Jaw			2 Ⓐ	n/a	n/a
70740-S	Latch			2 Ⓑ	13.3/8"	14.3/8"

14.1/2" - 17" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
70710	Lever	70785	70784-S	1 Ⓐ	14.1/2"	15.1/2"
70720-S	Short Jaw			1 Ⓑ	15.1/2"	16"
70730-S	Long Jaw			2 Ⓐ	n/a	n/a
70740-S	Latch			2 Ⓑ	16"	17"

18.5/8" - 20" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
70710	Lever	70785	70791-S	1	18.5/8"	19"
70720-S	Short Jaw	70789		2	19"	20"
70730-S	Long Jaw	70787-1				
70740-S	Latch					

20" - 21.1/2" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
70710	Lever	70785	70792-S	1	20"	20.1/2"
70720-S	Short Jaw	70789		2	21"	21.1/2"
70730-S	Long Jaw	70787-1				
70740-S	Latch					

1.6.1.2 BV-100

Range Overview

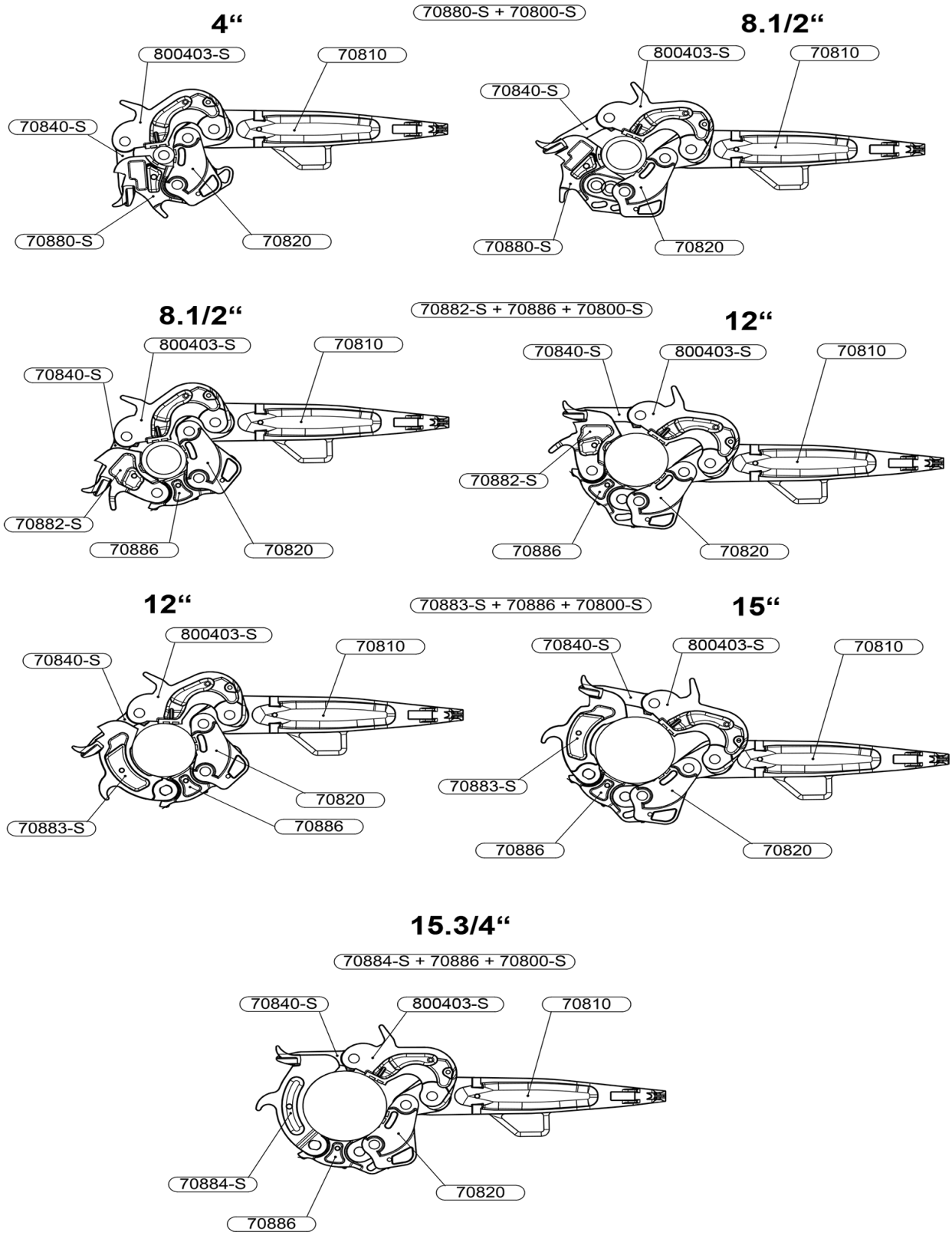

Fig. 19: BV-100 Range Overview

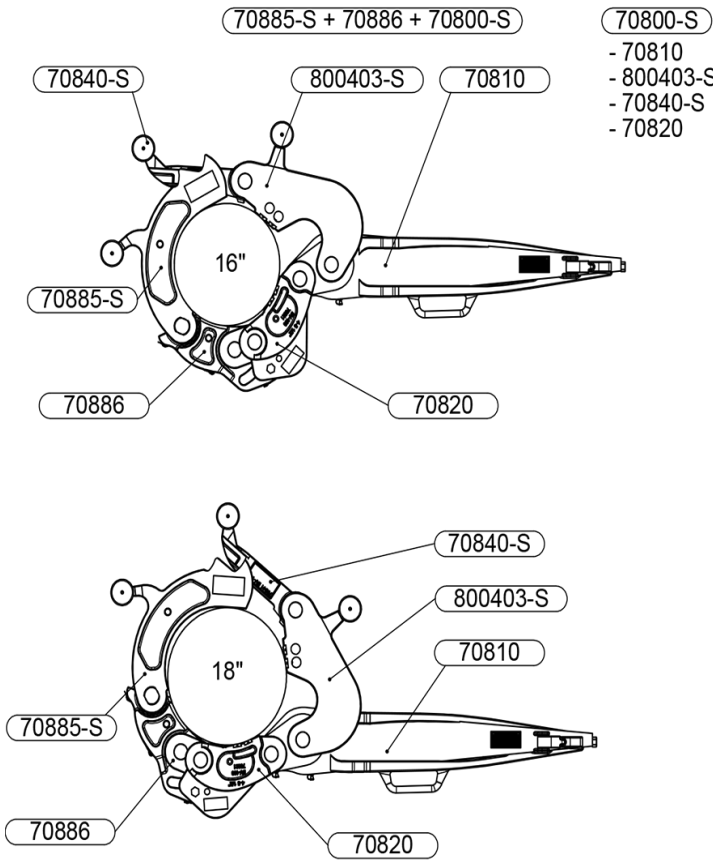

Fig. 20: BV-100 Range Overview

Jaw overview

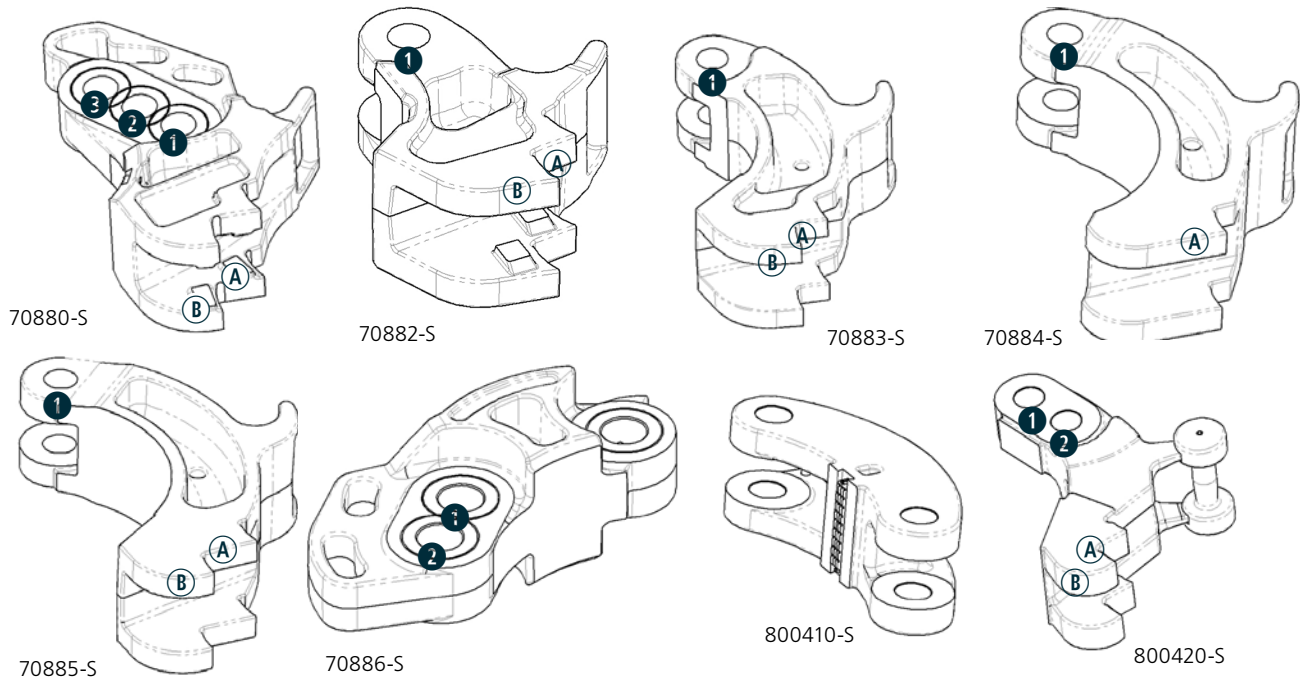

Fig. 21: Gripping Points overview BV-100

Gripping Range assembly

4" - 8.1/2" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
70810	Lever	n/a	70880-S	1 Ⓐ	4"	5"
70820	Short Jaw			1 Ⓑ	5"	6.1/4"
800403-S	Long Jaw			2 Ⓐ	6"	6.1/2"
70840-S	Latch			2 Ⓑ	6"	7"
				3 Ⓐ	7.1/2"	n/a
				3 Ⓑ	7.1/2"	8.1/2"

8.1/2" - 12" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
70810	Lever	70886	70882-S	1 Ⓐ	8.1/2"	9.5/8"
70820	Short Jaw			1 Ⓑ	9.5/8"	10.3/4"
800403-S	Long Jaw			2 Ⓐ	11.3/4"	12"
70840-S	Latch			2 Ⓑ	10"	11.1/2"

12" - 15" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
70810	Lever	70886	70883-S	1 Ⓐ	12"	13"
70820	Short Jaw			1 Ⓑ	13"	14"
800403-S	Long Jaw			2 Ⓐ	14"	14.1/4"
70840-S	Latch			2 Ⓑ	14"	15"

15.3/4" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
70810	Lever	70886	70884-S	2 Ⓐ	15.3/4"	15.3/4"
70820	Short Jaw					
800403-S	Long Jaw					
70840-S	Latch					

16"- 18" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
70810	Lever	70886	70885-S	2 Ⓐ	16"	16.1/2"
70820-S	Short Jaw			2 Ⓑ	16.1/2"	18"
800403-S	Long Jaw					
70840-S	Latch					

18.5/8 - 21" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
70810	Lever	70886	800420-S	1 Ⓐ	18"	18.5/8"
70820-S	Short Jaw	800410-S		1 Ⓑ	18.5/8"	20"
800403-S	Long Jaw			2 Ⓐ	20"	21"
70840-S	Latch			2 Ⓑ	18.5/8"	20"

18" (Special) P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
70810	Lever	7800410-S	780420-S	2 Ⓐ	18	18.1/2"
70820	Short Jaw					
800403-S	Long Jaw					
70840-S	Latch					

BV-100C, 100000 ft lbs torque rating

Casing Diameter	P/N	Lever Assembly 70810	Long Jaw Assembly 71998	Lug Jaw Assembly 71999-S	Short Jaw Assembly 71997	Latch Assembly 71996-S	Hinge Jaw Assembly 72000	Hinge Jaw Assembly 72001	Short JAw Assembly 70820	Hinge Jaw Assembly 70861	Hanger Assembly 70650	1 Pin in Hole (Picture)	Diameter Range
23.4"	71810-S	1	1	1	-	1	1	2	1	7	1	-	22.2" - 23.1"
24.5"	71811-S	1	1	1	-	1	2	1	1	7	1	-	23.4" - 24.4"
25.3"	71812-S	1	1	1	1	1	3	-	-	7	1	1	24.6" - 25.3"
26.3"	71812-S	1	1	1	1	1	3	-	-	7	1	2	25.3" - 26.3"
27.4"	71814-S	1	1	1	1	1	3	-	-	7	1	3	26.4" - 27.4"
28.4"	71814-S	1	1	1	1	1	1	3	-	8	1	3	27.4" - 28.4"
29.5"	71816-S	1	1	1	1	1	2	2	-	8	1	3	28.6" - 29.8"
30.6"	71816-S	1	1	1	1	1	4	-	-	8	1	1	29.5" - 30.6"
35.5"	71822-S	1	1	1	1	1	4	1	-	9	1	2	34.2" - 35.5"
36.7"	71822-S	1	1	1	1	1	5	-	-	9	1	2	35.5" - 36.7"
37"	71823-S	1	1	1	1	1	5	-	-	9	1	3	36.5" - 37.7"

BV-100C Extended, 100000 ft lbs torque rating

Casing Diameter	P/N	Lever Assembly 70810	Long Jaw Assembly 71998	Lug Jaw Assembly 71999-S	Short Jaw Assembly 71997	Latch Assembly 71996-S	Hinge Jaw Assembly 72000	Hinge Jaw Assembly 72001	Short JAw Assembly 70820	Hinge Jaw Assembly 70861	Hanger Assembly 70650	1 Pin in Hole (Picture)	Diameter Range
18.625"	71805-S	1	1	1	-	1	1	1	1	1	6	-	18.4" - 19.4"
18.75"	71806-S	1	1	1	-	1	1	2	-	1	6	-	19.8" - 20.9"
20.3"	71808	1	1	1	-	1	1	-	3	1	4	-	20.7" - 21.6"
20.7"	71808	1	1	1	-	1	1	-	3	1	7	-	20.7" - 21.6"
21.5"	71808	1	1	1	-	1	1	-	3	1	7	-	20.7" - 21.6"
23"	71809	1	1	1	-	1	1	1	2	1	7	-	22.2" - 23.1"
24"	71810-S	1	1	1	-	1	1	2	1	1	7	-	23.4" - 24.4"
25"	71812-S	1	1	1	1	1	1	3	-	-	7	1	24.6" - 25.3"
26"	71812-S	1	1	1	1	1	1	3	-	-	7	2	25.3" - 26.3"
27"	71814-S	1	1	1	1	1	1	3	-	-	7	3	26.4" - 27.4"
28"	71814-S	1	1	1	1	1	1	1	3	-	8	3	27.4" - 28.4"
29"	71816-S	1	1	1	1	1	1	2	2	-	8	3	28.6" - 29.8"
30"	71816-S	1	1	1	1	1	1	4	-	-	8	1	29.5" - 30.6"
35"	71822-S	1	1	1	1	1	1	4	1	-	9	2	34.2" - 35.5"
36"	71822-S	1	1	1	1	1	1	5	-	-	9	2	35.5" - 36.7"
37"	71823		1	1	1	1	1	1	5	-	-	9	36.7" - 37.5"

1.6.1.3 WRT®-55C

Range Overview

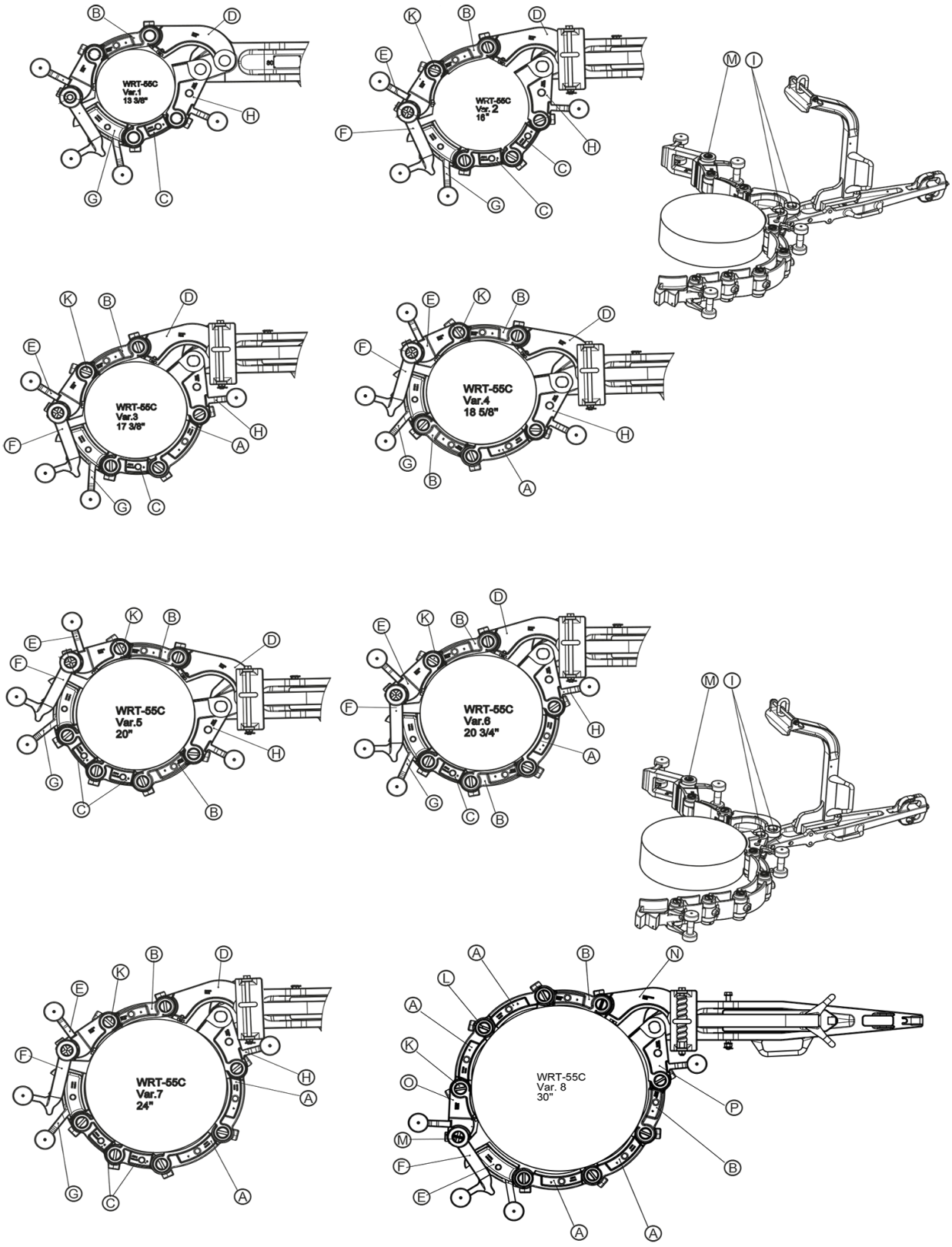

Fig. 22: WRT®-55C Range Overview

Jaw overview

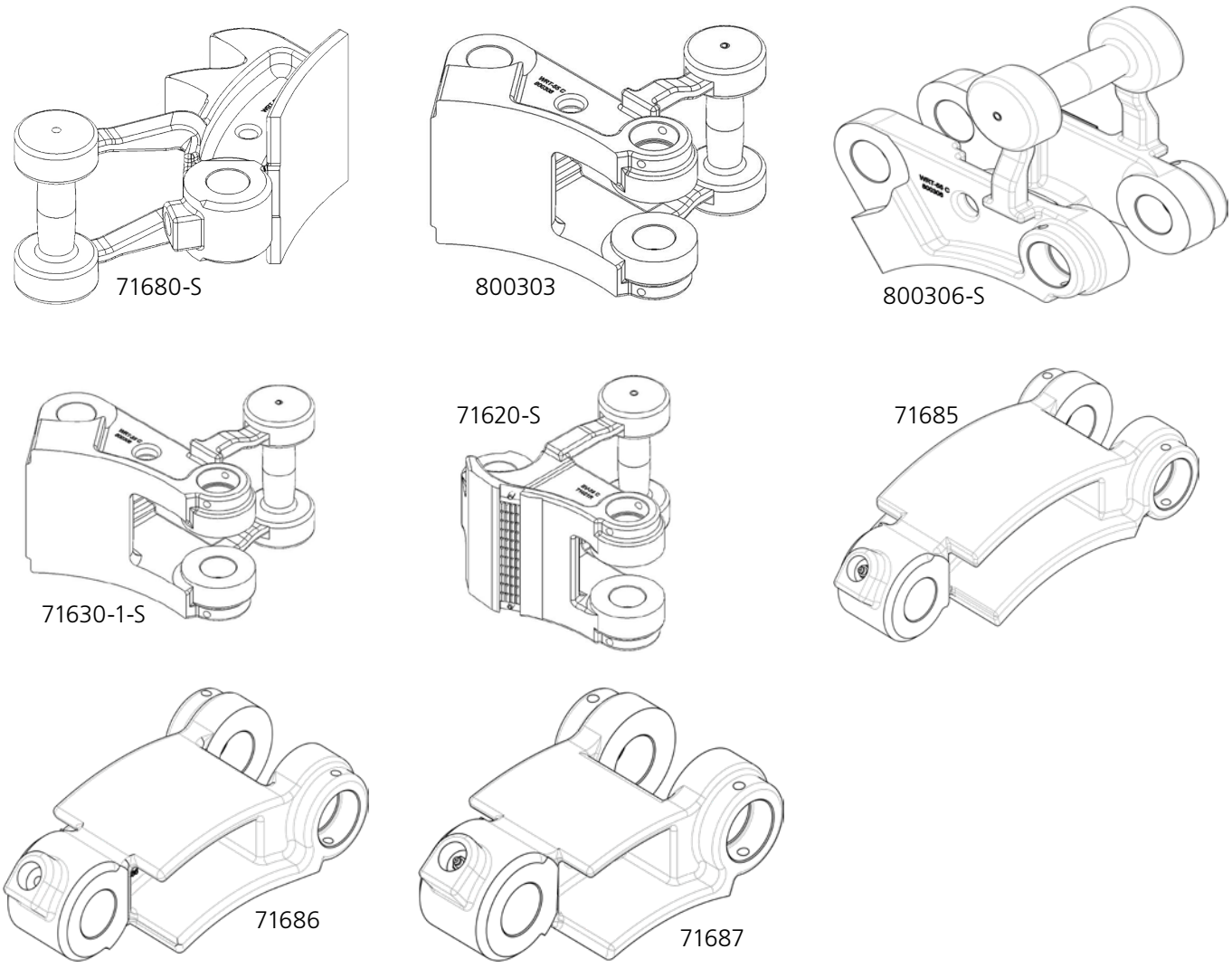

Fig. 23: Gripping Points over view WRT®-55C

Gripping Range assembly

General				Var.1	Var.2	Var.3	Var.4	Var.5	Var.6	Var.7	Var.8
No	P/N	Descript.		Qty.	Qty.	Qty.	Qty.	Qty.	Qty.	Qty.	Qty.
1	70671	Latch Spring		2	2	2	2	2	2	2	2
2	70672	Hinge Pin (Removeable)	K	4	5	5	5	6	6	7	8
3	70673	Hinge Pin (Threaded)	M	1	1	1	1	1	1	1	1
4	70674	Dowel Pin	L	9	11	11	11	13	13	15	17
5	70863	Hinge Pin Nut		2	2	2	2	2	2	2	2
6	70864	Cotter Pin		2	2	2	2	2	2	2	2
7	800208	Hinge Pin	I	2	2	2	2	2	2	2	2

Pipe Range	PN	Ⓐ Hinge Jaw 71685	Ⓑ Hinge Jaw 71686	Ⓒ Hinge Jaw 71687	Ⓓ Latch 70660-1-S	Ⓔ Latch 71680-1-S	Ⓕ Latch 70660-S	Ⓖ Lug Jaw 71680-S	Ⓚ Hinge pin 70672	Ⓛ Dowel Pin 70674	Ⓝ LongJaw 800303	Ⓞ LatchJaw 71620-S	Ⓟ Shortaw 800306-S
13" - 14.1/2"	800250-S	-	1	1	-	-	1	1	4	8	-	-	-
16" - 17.1/2"	800255-S	-	1	2	-	-	1	1	5	10	-	-	-
17.3/4" - 18.7/8"	800260-S	1	1	1	-	-	1	1	5	10	-	-	-
18.1/4" - 19.5/8"	800265-S	1	2	-	-	-	1	1	5	10	-	-	-
19.1/2" - 21"	800270-S	-	2	2	-	-	1	1	6	12	-	-	-
20.3/4" - 22.1/4"	800275-S	1	2	1	-	-	1	1	6	12	-	-	-
24" - 25.1/2"	800280-S	2	1	2	1	1	-	-	7	14	-	-	-
30" - 31"	800290-S	4	2	-	1	1	-	-	8	17	1	1	1

1.6.1.4 WRT®-35

Jaw overview

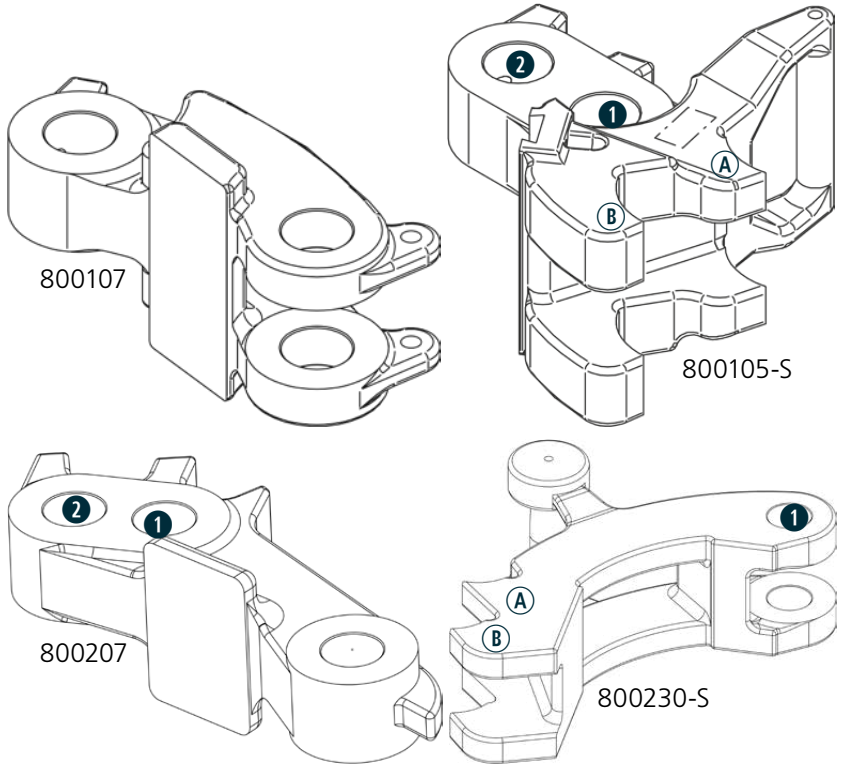

Fig. 24: Gripping Points overview WRT®-35

Gripping Range assembly

2.5/8" - 7.5/8" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
800101	Lever	n/a	800105-S	1 Ⓐ	2.3/8"	4.1/2"
800106	Short Jaw			1 Ⓑ	4.1/2"	6.3/4"
800103-S	Long Jaw			2 Ⓐ	n/a	n/a
800104-S	Latch			2 Ⓑ	5.1/2"	7.5/8"

7.5/8" - 11" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
800101	Lever	800107	800105-S	1 Ⓐ	n/a	n/a
800106	Short Jaw			1 Ⓑ	n/a	n/a
800103-S	Long Jaw			2 Ⓐ	7.5/8"	9.5/8"
800104-S	Latch			2 Ⓑ	9"	11"

1.6.1.5 WRT®-55

Jaw overview

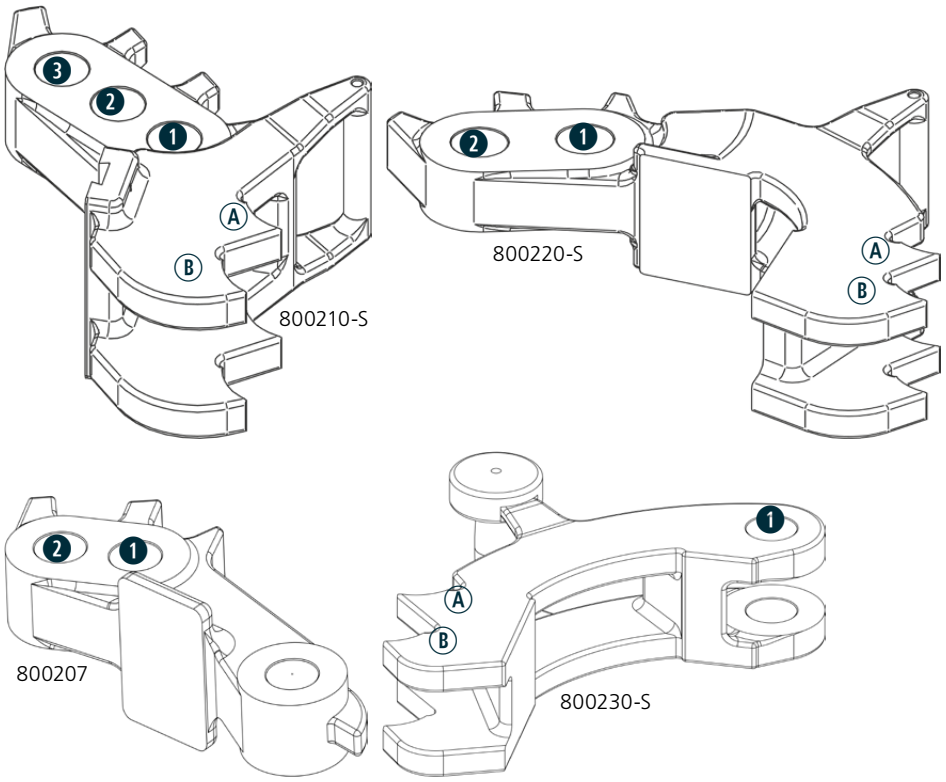

Fig. 25: Gripping Points overview WRT®-55

Gripping Range assembly

3.1/2" - 8.3/4" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
800201	Lever	n/a	800210-S	1 Ⓐ	3.1/2"	4.3/4"
800206	Short Jaw			1 Ⓑ	n/a	n/a
800203-S	Long Jaw			2 Ⓐ	4.1/2"	6"
800204-S	Latch			2 Ⓑ	5.1/2"	7"
				3 Ⓐ	n/a	n/a
				3 Ⓑ	6.1/2"	8.3/4"

7.1/2" - 11.1/2" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
800201	Lever	n/a	800220-S	1 Ⓐ	7.1/2"	9.1/2"
800206	Short Jaw			1 Ⓑ	n/a	n/a
800203-S	Long Jaw			2 Ⓐ	n/a	n/a
800204-S	Latch			2 Ⓑ	9.1/2"	11.1/2"

11.1/2" - 14.3/8" P/N	Description	Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
800201	Lever	800207	800230-S	1 Ⓐ	11.1/2"	12.3/4"
800206	Short Jaw			1 Ⓑ	12.1/2"	14"
800203-S	Long Jaw			2 Ⓐ	n/a	n/a
800204-S	Latch			2 Ⓑ	13.3/8"	14.3/8"

1.6.1.6 WRT®-135 and WRT®-160

Jaw overview

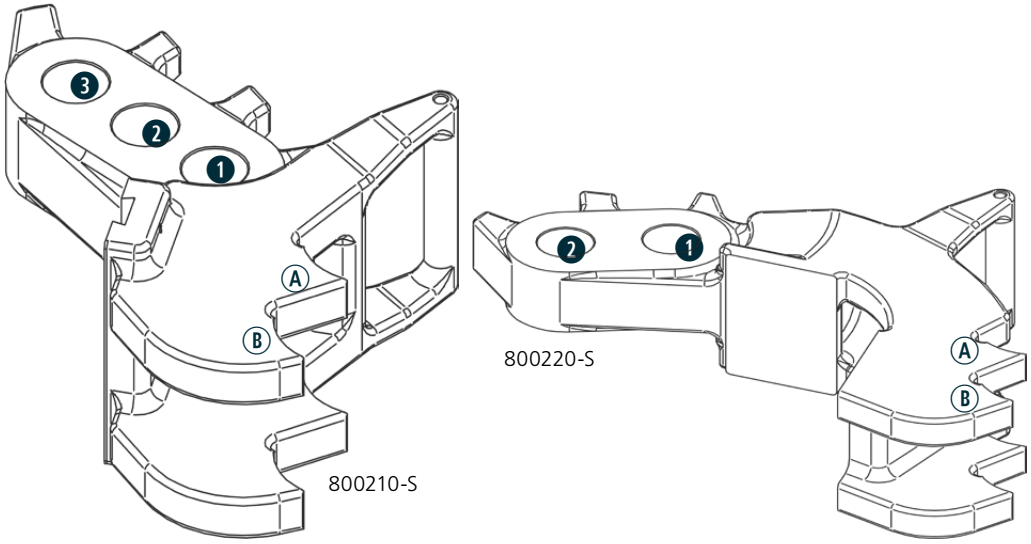

Fig. 26: Gripping Points overview WRT®-135 and WRT®-160

Gripping Range assembly

7.1/2" - 10.3/4" P/N Description		Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
800500-S 800500-S-160	Lever	n/a	800510-S	1 Ⓐ	7"	8.1/2"
800506	Short Jaw			1 Ⓑ	9"	9.5/8"
800503-S	Long Jaw			2 Ⓐ	10"	10.3/4"
800504-S	Latch			2 Ⓑ	11"	12"

7.1/2" - 12" P/N Description		Hinge Jaw	Lug Jaw	Gripping Point	Min OD inch	Max OD inch
800500-S 800500-S-160	Lever	n/a	800520-S	1 Ⓐ	8"	9.7/8"
800506	Short Jaw			n/a	n/a	n/a
800503-S	Long Jaw			2 Ⓐ	9"	10.3/4"
800504-S	Latch			n/a	n/a	n/a

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SAFETY

2 Safety

The Manual Tongs was designed and produced according to the state-of-the-art and in consideration of all required safety precautions.

Failure to observe the safety precautions and operating instructions specified in the present operating manual, can lead to hazardous situations when operating the Manual Tongs. Notwithstanding the fact that it is not possible to completely exclude hazardous situations during operation.

Use the Manual Tongs only for the intended purpose when it is in a technical safe state.

Rectify all faults immediately which could have a negative effect on the Manual Tongs safety.

2.1 General Safety Precautions

Ensure that work on the Manual Tongs, particularly installation, maintenance and repair work, is performed only by personnel with the necessary qualifications and who are familiar with the associated risks (see Chapter „V Obligations of the Operating Company“ on page 7).

For safe and proper operation of the Manual Tongs it is essential that all personnel working on the Manual Tongs take the prescribed safety measures and observe the safety precautions specified in this operating manual.

Before switching on and before working on the Manual Tongs always ensure that no one is put in a hazardous situation.

All safety features must be installed completely before switching on the Manual Tongs.

Safety features may be released only when:

1. The entire Manual Tongs is switched off and
2. switching back on unintentionally is not possible.

The Manual Tongs contains components subject to wear (e.g. Pins). After longer periods of operation the safety can be reduced due to wear. Service the Manual Tongs regularly in compliance with the maintenance chart (see Chapter „6.3 Inspections“ on page 116) to ensure that all safety requirements are always fulfilled. Check the specified wear limits regularly. Replace worn or defective parts immediately with new parts.

If safe operation is no longer guaranteed, switch off the Manual Tongs and secure it against being switched back on unintentionally. Advise the responsible service organization.

Rectify every fault, which affects the safety, immediately.

2.2 Safety Equipment

The Manual Tongs is equipped with various safety features for protection of the operating personnel:

- Hazard points on the Manual Tongs are marked with signs (see Chapter 2.4.1), indicating the type and consequences of a hazard as well as measures to prevent it.
- All components, particularly parts requiring replacement during conversion work when changing pipe sizes, are equipped with threaded holes for screwing in load bolts or with fixed load bolts.

Never put the safety equipment [like the green safety handles] out of operation or replace it with equipment not approved by FORUM Handling Tools.

Failure to observe can lead to hazardous situations, for which FORUM Handling Tools cannot be held responsible.

Always keep all safety equipment in perfect condition and check regularly.

2.3 Organisational Measures

The operating company is responsible for ensuring that all legally and officially prescribed approvals for operation of the Manual Tongs are present in compliance with national laws and regulations.

The required personal protective equipment (see Chapter „VII Personal Protective Equipment (PPE)“ on page 10) must be provided by the company operating the Manual Tongs.

All safety features present must be checked regularly in compliance with national and local requirements.

Warning signs and safety notices on the Manual Tongs must be easily legible at all times and replaced as required.

The operating instructions must be kept so that they are available to those operating the Manual Tongs at all times.

Personal Protective Equipment

The required Personal Protective Equipment (PPE) must be used when operating the Manual Tongs. This is to be provided by the operating company.

The following PPE is recommended:

- Oil resistant protective clothing,
- Protective gloves,
- Eye protection,
- Safety shoes,
- Protective helmet.

All parts of the protective equipment must be checked regularly for damage in compliance with the specific national regulations and replaced as required.

2.4 Safety Precautions

⚠ Warning

Reuse of safety components can cause accidents.

» Never reuse safety-relevant parts (such as securing cables or plates, discs or washers).

» Replace such components with new safety parts.

⚠ Caution

The operating company is responsible for ensuring safe and correct use of the equipment within the sense of the hazard and risk analysis. The operating company is also obligated to issue and supervise observance of operating instructions on safe use as well as to observe the instructions in this operating manual.

2.5 Warning Signs

The safety precautions in this operating manual are indicted using standardized depictions and symbols. Chapter 1 describes general depiction of safety precautions. Concrete examples of the symbols and terms used in this manual are explained below. These are used in the form shown wherever possible hazards are present.

⚠ DANGER

Suspended load!

This indicates injury risks from transporting heavy components.

⚠ WARNING

Danger of pinching/crushing hands!

This indicates injury risks from moving parts, which pose a hazard of pinching or crushing hands.

⚠ WARNING

Danger of pinching/crushing feet!

This indicates injury risks from moving parts, which pose a hazard of pinching or crushing feet.

⚠ WARNING

Danger of pinching/crushing body!

This indicates injury risks from moving parts, which pose a hazard of pinching or crushing the body.

⚠ Caution

Risk of stumbling/tripping!

This symbol warns of tripping hazards, which can lead to stumbling resulting in injuries.

2.6 Hazardous Locations

This section shows hazardous locations.

⚠ **CAUTION** The entire area around the pipe tongs can be a dangerous place

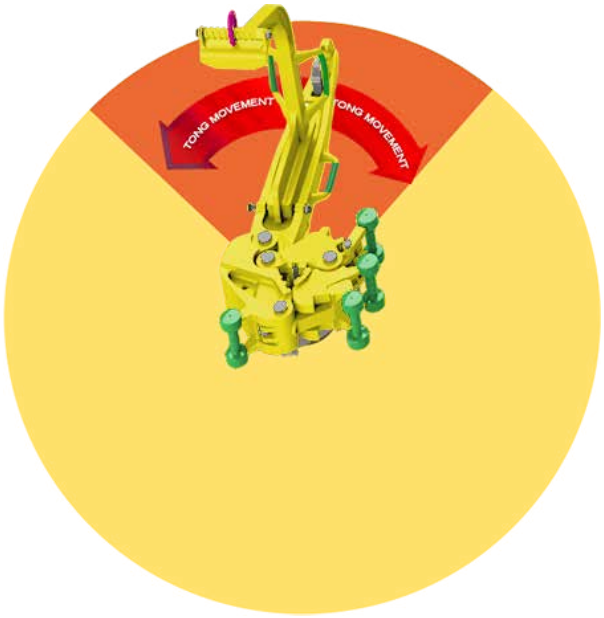

Fig. 27: Manual TongsHazardous Locations (top view)

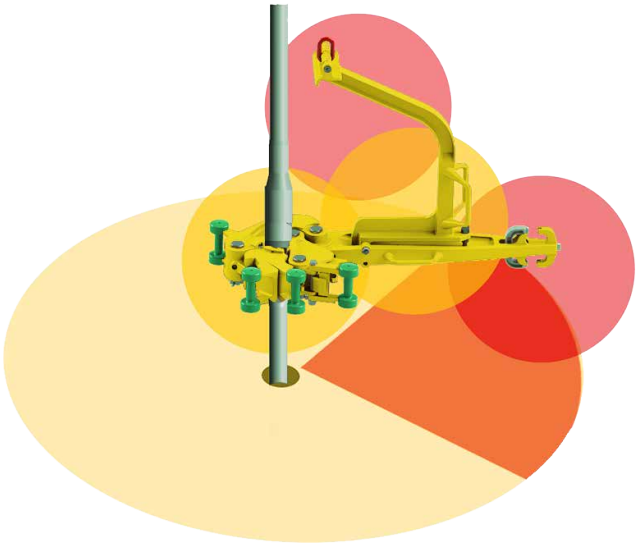

Fig. 28: Manual TongsHazardous Locations (side view)

2.7 Warning and Safety Instructions on Manual Tongs

Hazard points are indicated by special stickers on the Manual Tongs. Ensure that these are always kept in an easily legible state and replaced as required.

⚠ NOTE 1

Lifting point locations are marked on the device, where slings can be securely fastened. Thus, the safe transport of FORUM Handling Tools equipment is ensured.

2

WARNING

THIS PRODUCT COULD BE HAZARDOUS IF IMPROPERLY USED. MISUSE OF THIS TOOL COULD CAUSE SERIOUS INJURY TO PERSONNEL. THIS MUST BE PROPERLY INSTALLED AND MAINTAINED IN FIRST CLASS CONDITION. DO NOT REMOVE OR ALTER ANY PARTS. DO NOT WELD OR ALTER WITHOUT FACTORY AUTHORIZATION. ALL REPLACEMENT PARTS MUST BE OF FORUM HANDLING TOOLS MANUFACTURE.

Warning sign
General warning
PN 671638

⚠ WARNING 3

Danger of pinching/ crushing hands!

Keep clear of moving parts during operation.

Warning sign
"Hazard - Hand Injury"
ANSI Z535.4
PN 671640-1

4 **⚠ WARNING**

Danger of pinching/ crushing body!

Keep clear of moving parts during operation.

Warning sign
"Pinching/crushing hazard for body"
ANSI Z535.4
PN 671641

2.8 Safety Precautions against Remaining Hazards

This Manual Tongs was designed and produced according to the state-of-the-art in consideration of the safety precautions specified in EC Directive 2006/42/EC on Machinery.

The Manual Tongs may be used only for:

- Its intended purpose (see Chapter 1).
- When it is in a technically safe state.

Nevertheless it is not possible to completely exclude all hazardous situations which could arise when the Manual Tongs is used. Reference is made to these remaining risks at the beginning of each chapter and at the corresponding points in the description and measures for avoiding these risks are explained.

⚠ WARNING

Mechanically generated sparks.

In the processing of incidents such as clamping components, sparks can be generated with the use of metal hammers.

- The use of metallic hammers in hazardous areas has therefore be prohibited by the operating company.

» For loosening of clamping components only nonmetallic (plastic) hammer, which are approved for use in hazardous areas, may be used.

Info

The operating company is responsible for ensuring that all personnel working on the Manual Tongs is familiar with the remaining risks and observe the appropriate safety precautions.

2.8.1 Risk of Stumbling/Tripping

⚠ Caution

Risk of stumbling/tripping!

When WRT is installed and lines are routed openly.

» DO NOT run.

The Manual Tongs is working above the rig floor in the installed state. Nevertheless the incoming and outgoing hydraulic lines could pose a stumbling/tripping hazard.

Never run during work.

2.8.2 Danger of Pinching/Crushing

⚠ WARNING

Danger of pinching/crushing hands!

Moving parts pose a hazard during assembly, set-up and conversion work as well as during operation.

» NEVER reach between moving components.

⚠ WARNING

Danger of pinching/crushing feet!

Moving parts pose a hazard during assembly, set-up and conversion work as well as during operation.

» NEVER stand below moving components.

⚠ WARNING

Danger of pinching/crushing body!

Moving parts pose a hazard during assembly, set-up and conversion work as well as during operation.

» NEVER stand between moving components.

During assembly, set-up and conversion work as well as during operation pinching/crushing hazards can be posed. Pay attention to hands, feet and body when performing the work specified. Always ensure that no one is in a hazardous position. Always wear your personal protective equipment.

2.8.3 Handling of Hydraulic Equipment

[BV-100-H and BV-100C-H only]

⚠ WARNING

Health hazards from service products!

This symbol warns of health hazards resulting from contact of service products (e.g. lubricants, hydraulic fluids) with the skin, mucous membranes, eyes and respiratory paths.

⚠ WARNING

Defective hydraulic lines pose an injury hazard!

» Route hydraulic lines safely and check regularly for damage.

» Provide lines with chafe protection.

» Replace defective lines immediately.

⚠ WARNING

Separated hydraulic lines pose an injury hazard!

Hydraulic fluid can escape under high pressure. Always relieve pressure in hydraulic equipment before working on Manual Tongs.

» Check hydraulic connections regularly to ensure that they are properly fastened.

⚠ WARNING

Hydraulic fluid can pose a health hazard!

Hydraulic fluids can lead to skin and eye injury and poisoning symptoms upon contact.

» Avoid direct contact with hydraulic fluids.

WEAR EYE PROTECTION!

WEAR PROTECTIVE GLOVES!

Hydraulic lines which are weakened due to incorrect routing or damage can burst under load. The hydraulic fluid then escapes under pressure resulting in a powerful jet, which can lead to skin or eye injury.

For this reason always

- Lay hydraulic lines so that they are not kinked or pinched.
- Check regularly for damage and replace as required.

Always wear your personal protective equipment.

Hydraulic system safety instructions

1. Release the pressure in all lines carrying hydraulic oil prior to any maintenance and repair work.

» Lower all hydraulically controlled components to the ground.

» Move all control levers of the hydraulic control valves several times.

2. Hydraulic oil escaping under high pressure can penetrate the skin and cause serious injuries. Always consult a doctor immediately even if the wound seems insignificant – otherwise serious infections could set in!
3. Replace the hose or line if one of the problems mentioned below is detected.

» Damaged or leaky hydraulic seals.

» Worn or torn shells or uncovered reinforcement branches.

» Expanded shells in several positions.

» Foreign bodies jammed or stuck in protective layers.

4. Retighten leaking screwed fittings and hose connections only when the system is not under pressure; i.e. release the pressure before working on pressurised lines!
5. Never weld or solder damaged or leaking pressure lines and screw connections. Replace damaged parts with new ones!
6. Never search for leaks with your bare hands, always wear protective gloves!

» Use paper or wood to check for minor leaks.

7. Leaks and damaged pressure lines must be immediately repaired or replaced.

2.8.4 Human Error

Ignorance of hazards, inattentiveness and limited reactions can lead to hazard situations while working with the Manual Tongs.

Safe Work

1. All personnel working on the Manual Tongs are responsible for paying attention to their colleagues.
2. Consumption of alcohol and drugs is prohibited.
3. Work on the WRT is not permissible after taking medication which reduces reactions.
4. AT LEAST visual contact must exist between the operator and the personnel at the WRT, to allow communication via hand signals.
5. The personal protective equipment must always be kept and used in perfect condition.
6. All personnel working on the Manual Tongs, must be familiar with and observe the safety precautions in this instruction manual and on the Manual Tongs.
7. The instructions for handling and maintenance intervals specified in this operating manual must be observed.
8. Keep a copy of this operating manual in the vicinity of the Manual Tongs, where it is accessible at all times.

Manual Tong “DO and DO NOT””

- **DO** Training and Risk assessment.
  - Train Personnel and log competency..
- **DO** equipment checks.
  - Check tong with checklist before operation.
- **DO** practice safe handling.
  - Train Personnel and log competency.
- **DO NOT** place Hands incorrect.
  - Hand positions are marked.
- **DO NOT** assist tong by hand.
  - Places around the Latch head are pitch points!.
- **DO NOT** trip over tong lines.
  - Wait for tong to be unlatched.

2.9 Accidents, Fire

⚠ WARNING

Health endangering hydraulic fluids / lubricants!

BEFORE performing first-aid following contact with service products observe the safety data sheet published by the manufacturer.

Basic rules in event of accidents or fire

1. Move accident victims out of hazard area and switch off Manual Tongs immediately.
2. Administer first-aid.
3. Alarm rescue services and fire department immediately and inform supervisor.

In addition all national, local and internal plant regulations for fire fighting in explosion hazard areas apply.

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TRANSPORT/ INSTALLATION

3 Transport / Setup

Ensure that setup and installation work are accomplished only by sufficiently qualified and trained personnel.

Read these instructions carefully before setting up the Manual Tongs and putting it into service.

3.1 Delivery

The Manual Tongs and all accessory parts are shipped in a transport packages. Transport the packed Manual Tongs as specified in these instructions.

3.1.1 Scope of Delivery

Info

The contract documents and shipment papers specify the precise scope of delivery. Check these documents carefully on delivery. In the event of any discrepancies, please contact the FORUM Handling Tools representative specified in Chapter „Contact worldwide“ on page 11 immediately.

The scope of delivery includes all components required for the intended operation of the Manual Tongs as described in Chapter „1 Description“

Fig. 29: Typical transport and conservation packing for Manual Tongs

3.1.2 Unpacking and Disposal of Packing Material

Remove the transport packaging and transport aids before hoisting the Manual Tongs.

Info

» Do not remove transport retainers.

» The transport retainers should be removed only at the installation site just before startup.

Check scope of delivery.

1. Is any transport damage visible?
2. Is the shipment complete? Compare the scope of delivery with the specifications in the shipping documents.

If the Manual Tongs has been damaged during transport or the shipment is incomplete, please notify the manufacturer immediately (see Chapter „IX Contact worldwide“).

Dispose of the packaging material ecologically in compliance with all applicable regulations.

3.1.3 Intermediate Storage

If intermediate storage of the Manual Tongs is necessary, observe the following:

- Leave the Manual Tongs it its transport packaging. This provides sufficient protection against external influences.
- Secure the Manual Tongs to prevent it from slipping or falling due to motion.

3.2 Transport

⚠ DANGER

Suspended load!

The falling load can cause severe, even lethal injuries.

» NEVER stand beneath or in the swing area of lifted loads or loads suspended from a crane.

WEAR PROTECTIVE HELMET!

WEAR PROTECTIVE GLOVES!

WEAR SAFETY SHOES!

WEAR EYE PROTECTION!

Principles for transport

1. Ensure that transport routes are sufficiently dimensioned.
2. Always use pallets for longer transport distances.
3. The total weight (object to be transported + means of transport, e.g. forklift) must not exceed the supporting capacity of the subsurface.
4. Ensure that such work is performed only by sufficiently qualified personnel.
5. Always shut off Manual Tongs before transport and secure against starting back up unintentionally. Start deinstallation only after residual energy has been dissipated.
6. Ensure that visual and audio contact exists between the crane operator and operating personnel.
7. Secure the area against unauthorized entry. If necessary mark the area with information signs to warn of maintenance and repair work.
8. Secure moving parts in suitable manner
9. Use only approved slinging and transport equipment, which is in perfect condition and suitable for the intended purpose. Observe specified load limits.
10. Secure Manual Tongs against slipping/sliding. Observe Manual Tongs weight. Observe center of gravity.
11. Never stand under suspended loads.
12. Transport the Manual Tongs carefully. Do not fasten, lift or pull Manual Tongs on parts, that could be damaged. Avoid sudden stops.
13. Always use hoisting equipment (slings, hoisting cables, shackles, etc.), which has been inspected and is sufficiently dimensioned.
14. Ensure that all installation and hoisting procedures are accomplished in compliance with recognized rules of practice and industrial standards.

3.2.1 Weights

» Detailed weight specifications are given in the Chapter „1.4 Technical Data“ on page 17.

3.2.2 Transport to Installation Site

Hoist the Manual Tongs safely

1. Attach the Manual Tongs only at the lifting ear provided for transport.
2. Use wire ropes with circular slings with a load carrying capacity appropriate to the weight of the Manual Tongs.
3. Attach the hoisting ropes so that they are tensioned straight without kinks.
4. Use hoisting cables and load hooks with sufficient supporting capacity.

1. Fasten the lifting ropes on Manual Tongs lifting point.
2. Lift the Manual Tongs slightly to tension the hoisting cables.

⚠ WARNING Danger of collision with swinging loads!
Ensure that no one is present in the swing range of the Manual Tongs.

3. Lift the Manual Tongs.
4. Move the Manual Tongs to the installation location.
5. Set the Manual Tongs down carefully on a suitable subsurface.

Info

Lifting Points!

Lifting point locations are marked on the device, where slings can be securely fastened. Thus, the safe transport of FORUM Handling Tools equipment is ensured.

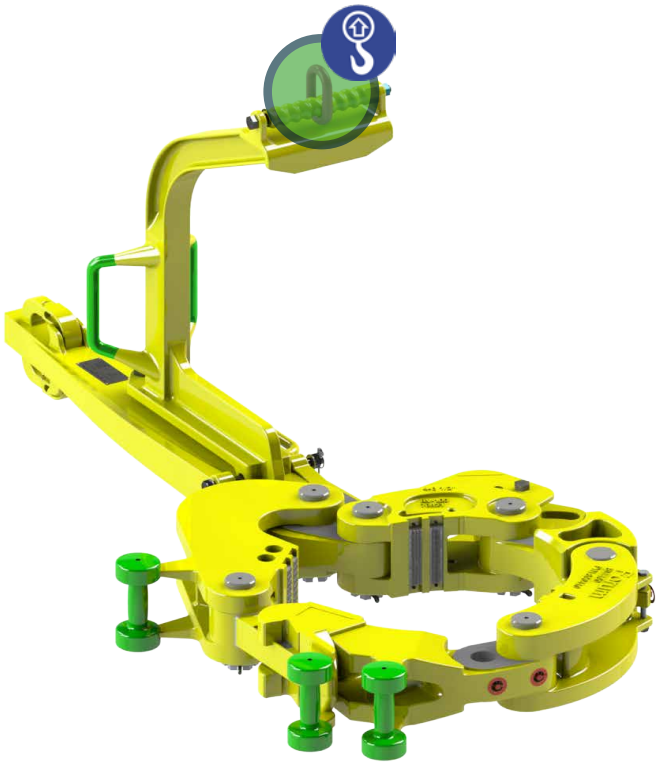

Fig. 30: Hoisting Eyes for Transport

3.3 Setup

⚠ DANGER

Suspended load!

The falling load can cause severe, even lethal injuries.

» NEVER stand beneath or in the swing area of lifted loads or loads suspended from a crane.

WEAR PROTECTIVE HELMET!

WEAR PROTECTIVE GLOVES!

WEAR SAFETY SHOES!

WEAR EYE PROTECTION!

The Manual Tongs is completely preassembled before shipment, so that it can be installed immediately after unpacking at the installation site.
[The hydraulic Manual Tongs is ready for operation after connecting to the hydraulic system].

3.3.1 Supply Connections

[BV-65 H, BV-100 H and BV-100C H only]

Working pressure	Min 140 bar (2030 Psi), Max 210 bar (3046 Psi)
Required Flow rate	Min 6 Gpm (22 l/m) Max 10 Gpm (37 l/m)
BV-65-H	1/4" female Connection
BV-100-H	3/8" female connection

3.3.2 Space Requirement

Following space requirements are needed during operation and maintenance for Manual Tongs use.

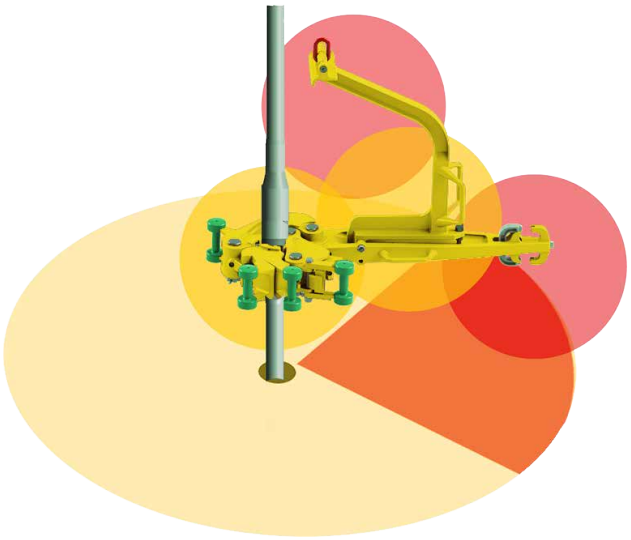

Fig. 31: Space requirements (operation,lifting)

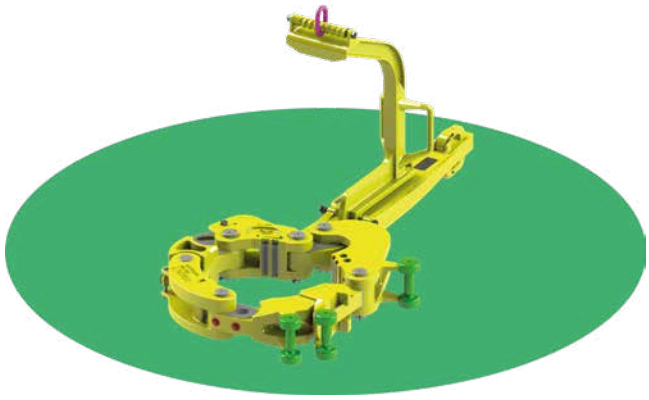

Fig. 32: Space requirements (storage)

Maintenance work

- A free space of approx. 4 m² around the Manual Tongs is required for work (e.g. maintenance work).

Lifting and Operation

- A free space of approx. 2 m around the Manual Tongs is required for Lifting and operation .
  Stay additionally away from the Lifting ears and torsion ropes.

Operation

- A free space of approx. 2 m around the Manual Tongs is required for operation.
  Stay additionally away from swing area.

3.4 Installation and Arrangement

⚠ WARNING

Pinching/crushing hazard from lowering!

Severe pinching/crushing up to loss of limbs.

» NEVER step over edge of rotary table with feet.

WEAR PROTECTIVE HELMET!

WEAR PROTECTIVE GLOVES!

WEAR SAFETY SHOES!

WEAR EYE PROTECTION!

Common Injuries and safety

1. Mashed hands and fingers

» Keep your body, hands and fingers away from pinch points.

» Always use safety handles and safe points to touch the tong.

2. Being struck by the pipe tongs.

» Don't get caught between the tongs and Rig floor equipment.

3. Small particles of tong die shrapnel embedded in the face or eyes.

» Wear your PSE

4. Deaths or serious injuries resulting from tong failure caused by unrecognized failures by use without daily inspection.

» Inspect tongs at beginning of work.

Installation of BV and WRT® tongs

1. Connect the tong support line to the suspension ring.
2. Install the right lug and/or hinge jaw, to cover the size range of the pipe to be connected.
3. Ensure that the tong is capable of handling the torque required.

» For easy tong operation, freely suspend the tong by the tong support line as close to the well center as conveniently possible. This reduces the arc of swing and the distance that the tong must travel to the well center.

4. Open Lug Jaw and balance the tong.

» Perform this from lever to latch and from side to side by adjusting the hanger adjustment bolt ❶ and/or balancing screw ❷. For best operation the long jaw ❸ should be about 1" lower then the short jaw ❹.

5. The pull line must than be connected to the end of the lever. A back up line, sized to safely withstand the tong maximum rating, should in all cases be connected to secure safe operation
6. The pull line must be in a perpendicular position relative to the tong-handle

Test installation

1. Move tong with lug jaw safety handle into position around the pipe.
2. Press the tong with short jaw safety handle firmly against the pipe.
3. The tong latches.
4. Inspect latch status of tong.

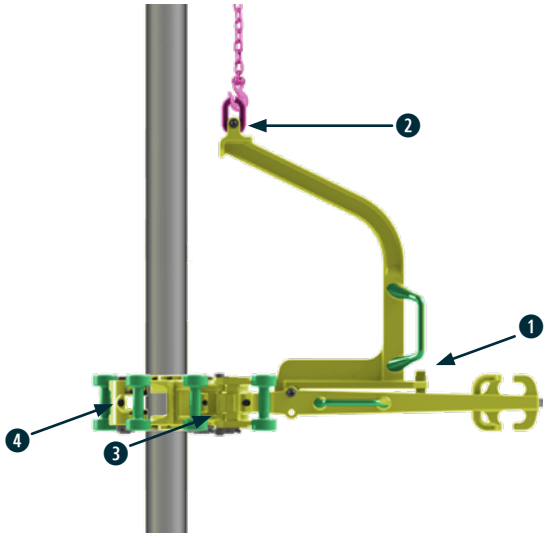

Fig. 33: Manual Tongs Make up method (example)

3.5 Installing hydraulic tongs

[BV-100-H and BV-100C-H only]

1. To install the BV-100-H and BV-100C-H Tong, the tong support eye on the left side of the lever is to be connected to the suspension structure.
2. Connect the torque cylinder to the pivoting bearing at the end of the lever.
3. Install the right lug and/ or hinge jaw and make sure that the Cylinder Mounting Pin is put in the right position to cover the size range of the pipe to be connected.
4. For pipe with a diameter from 4" to 21" the BV-100-H Long Jaw (P/N 800403-H) is to be used.
5. Pipe which incorporates a diameters from 4" to 6.½" are to be handled with the Cylinder Mounting Pin at position 1, pipes with a diameter from 6.½" to 21" are to be handled with the Cylinder Mounting Pin in position 2.
6. Pipe from a diameter of 23.4" to 42" can be handled using the BV-100C H Long Jaw (P/N 71998-H), which is equipped with just one bore.
7. Ensure that the tong is capable of handling the required torque.
8. The torque cylinder connected to the end of the lever must be in a perpendicular position relative to the lever.

WARNING It is mandatory that the pre-clamping cylinder is in floating position when making up or braking out. Failure in doing so may result in damage to the equipment.

WARNING Before every maintenance and repair all seven hydraulic connections to the control unit must be disconnected. Otherwise a hazard for personnel will be created and the equipment could be damaged.

WARNING Before the Manual Tongs is to be connected to the main control system make sure that all parts are properly attached and all connections are in good condition.

WARNING Before the connecting of the screw joints, the hydraulic lines must be de-pressurized!

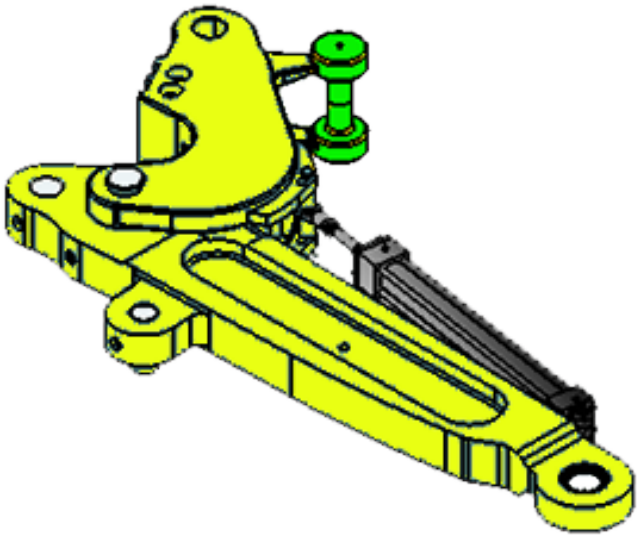

Fig. 34: WRT® Side view

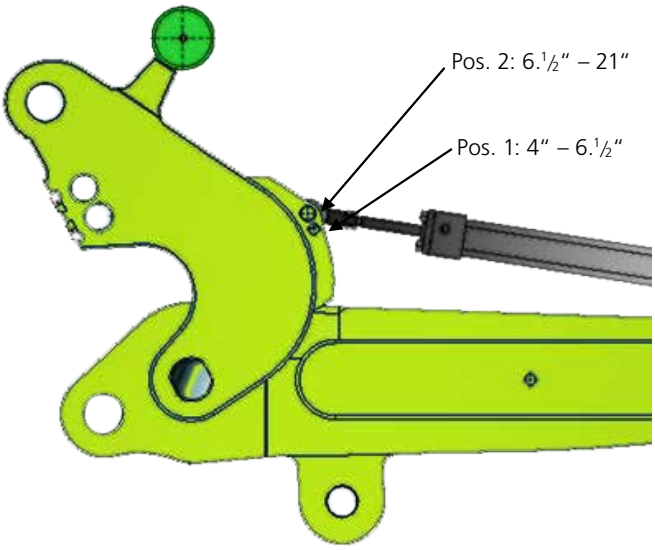

Fig. 35: WRT® connection point 1 and 2

3.6 Installation Checklist

Basically the Manual Tongs have to be installed as shown in the manual.
The drilling pipe might slip through if the grip on the tool joint on make-up or break out torque processes is weak.

General

- ☐ Make sure the tong is installed balanced
- ☐ Open the jaws of the pipe tongs and clean the tong dies (wire brush or steam)
- ☐ Inspect the dies for wear.
- ☐ Look for cracked, chipped or uneven wear of tong dies
- ☐ Check greasing condition on greasing points.
- ☐ Examine tong dies for sharpness.

Hydraulic Connections [BV-100 H and BV-100C H only]

- ☐ Make sure the controls are connected to the Hydraulic Power Supply
- ☐ Make sure all connections are made properly

Function test

- ☐ Close Tong
- ☐ Open Tong

COMMISSIONING/ OPERATION

4 Commissioning and Operation

Ensure that the Manual Tongs are operated only by personnel trained for this work and familiar with the risks involved in operating the &.

Read these instructions carefully before setting up the & and putting it into service.

4.1 Commissioning

⚠ WARNING

Danger of pinching/crushing feet!

Transporting and setting down heavy components.

» NEVER step below moving & parts.

⚠ WARNING

Health hazards from service products!

This symbol warns of health hazards resulting from contact of service products (e.g. lubricants, hydraulic fluids) with the skin, mucous membranes, eyes and respiratory paths.

⚠ DANGER

Suspended load!

The falling load can cause severe, even lethal injuries.

» NEVER stand under suspended loads.

» NEVER stand in the swing area of suspended loads.

⚠ WARNING

Danger of pinching/crushing body!

» DO NOT step between the unsecured shells of the clamps.

» DO NOT stand within the opening range of the clamps during opening or closing!

⚠ WARNING

Danger of pinching/crushing hands!

Always use hand areas (green marked) to handle the Manual Tongs.

» DO NOT touch inside of Jaws.

» ALWAYS use handles (green marked).

⚠ WARNING

Always give tongs a through inspection before use

» Examine the tong underside.

» Check seat of securing tong pins and safety pins.

» Clean and grease the tongs as part of your daily routine.

WEAR EYE PROTECTION!

WEAR PROTECTIVE HELMET!

WEAR PROTECTIVE GLOVES!

WEAR SAFETY SHOES!

4.1.1 Safety Considerations

Safety considerations

1. Do not touch the Manual Tongs in operation
2. During operation keep a safe distance from the Manual Tongs.
3. Before initial start-up and before every start of operation, check for the proper function in order to avoid accidents during operation!

Safety Rules for Commissioning and Operation

» Always keep the common tong injuries in mind:

- Mashed hands and fingers.
- Being struck by the pipe tongs .
- Small particles of tong die shrapnel embedded in the face or eyes.
- Deaths or serious injuries resulting from tong or tong head failure caused by unrecognized failures by use without daily inspection.

» Use general safety rules

- Keep your body, hands and fingers away from pinch points.
- Don't get caught between the tongs and Rig floor equipment.
- Inspect tongs at beginning of work.

» Use care inspecting tongs

- Open the jaws of the pipe tongs and clean the tong dies (wire brush or steam).
- Inspect the dies for wear.
- Look for cracked, chipped or uneven wear of tong dies
- Examine tong dies for sharpness.
- The drilling pipe might slip through if the grip on the tool joint on make-up or break out torque processes is weak.
- Check that die retainers are in place (usually small nuts and bolts).
- Check greasing condition on greasing points.

» Use care changing and installing tong dies

- Move tong in steady position and remove tong die retainers
- Remove die downwards with the aid of a plastic hammer and a die driver.
- Clean and lubricate the surface of the tong die slots.
- Install new tong die with the aid of a plastic hammer and a die driver.
- Reinstall all retainers.

4.1.2 Installation Considerations

Installation considerations

1. The BV is installed with holding line connected to a suspension ring.
2. Install the matching lug and/or hinge jaw, to cover the correct size range.
3. Ensure that the tong is capable of handling the torque required.
4. To optimize tong operation install the suspend tong close to the center of the rotary table to reduce the swing area of the tong and the length of the torque pull line.
5. The suspended tong is levelled with the jaws. Adjusting level with the hanger adjustment screw and the balancing screw on the lever.
6. The pull line is connected to the end of the lever.

- In order to shield the lever it is advised to use a u-clamp for the pull line.

Info

FORUM Handling Tools recommends having the Manual Tongs put into service by FORUM Handling Tools.

4.1.3 Safety checks before initial operation

Safety checks before initial operation

1. All screw and/or pin connections are tightened properly.
2. All safety hand shields are attached and secured.
3. Jaw and Hinge assembly correspond to type/size of pipe used.
4. All holding equipment is correctly connected and securely laid.
5. The torque pull is correctly connected, covers no damage and is securely laid.
6. All lubrication points lubricated properly (see Chapter „Lubrication points“ on page 115).

Safety Check Procedure

- Ensure that required operating data is observed:
- Remedy all defects noted during checks.

⚠ CAUTION Never attempt to start up when defective.

Functional checks before initial operation

1. Check the torque pull line is in approach at 90° from the lever center line.
2. Check that the Manual Tongs in levelled in the hanger.
3. Check required Jaw and Hinge assembly are installed before first use.
1. Open the jaws of the pipe tongs and clean the tong dies (wire brush or steam).
2. Inspect the dies for wear. Look for cracked, chipped or uneven wear of tong dies.
3. Check that die retainers are in place (usually small nuts and bolts).
4. Check all safety equipment and handles are present.
5. Clamp a pipe and check that tong dies bite the pipe.
6. Check That latch closes correctly.
7. Remedy all defects noted during checks.

4.2 Operation of the Manual Tongs

⚠ DANGER

Suspended load!

The falling load can cause severe, even lethal injuries.

» NEVER stand under suspended loads.

» NEVER stand in the swing area of suspended loads.

WEAR EYE PROTECTION!

WEAR PROTECTIVE HELMET!

WEAR PROTECTIVE GLOVES!

WEAR SAFETY SHOES!

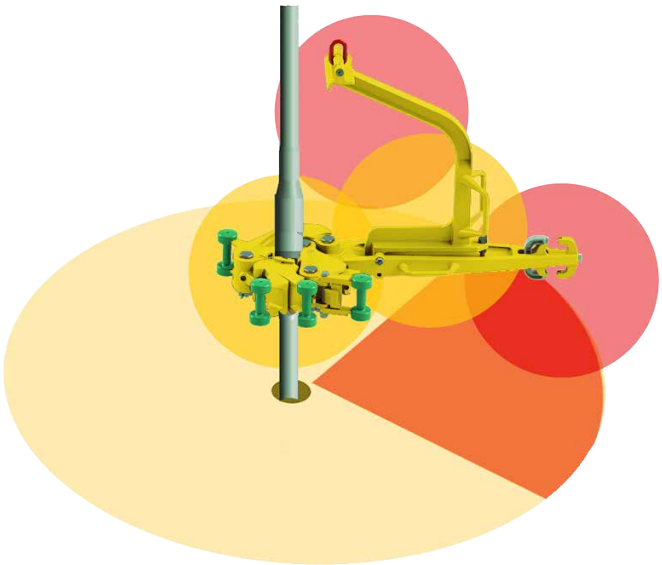

Fig. 36: Dangerous areas horizontal View

4.2.1 Functional overview

Manual Tongs are used to screw up or unclamp the screws of drill pipe and casing joint or coupling.

» The Manual Tongs can be adjusted to the used tubular by changing latch lug jaws and latch shoulder.

» They are used for turning the tubular when making up or breaking out drill pipe, casing, tubing, or other pipe.

» Manual Tongs are critically loaded equipment when torquing up tubulars.

» To generate and determine the optimal allowable torque for the pull line on lever should ideally be or approach at 90° from the lever center line.

» Torque on the tong must not exceed manufacturers rating at any time. To avoid injury in case the tong slips, releases or fails. Rig personnel must be out of tong's travel area on the rig floor.

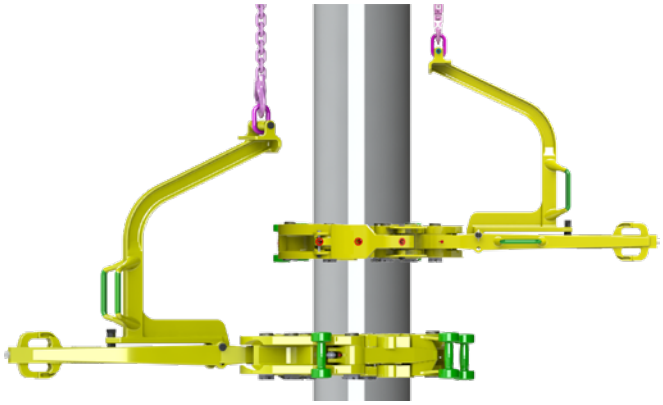

Fig. 37: Manual Tongs Make up method (example)

» The entire area around the pipe tongs can be a dangerous place.

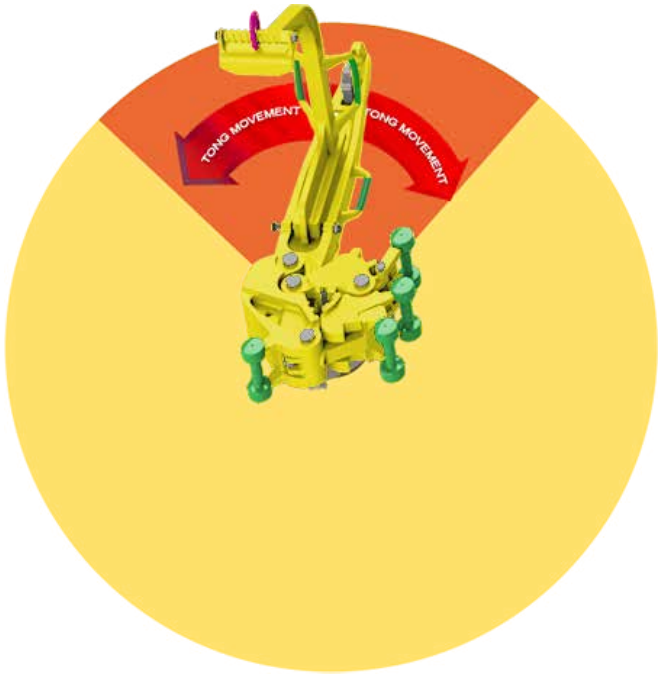

Fig. 38: Danger areas top view

Handling and pinch points overview

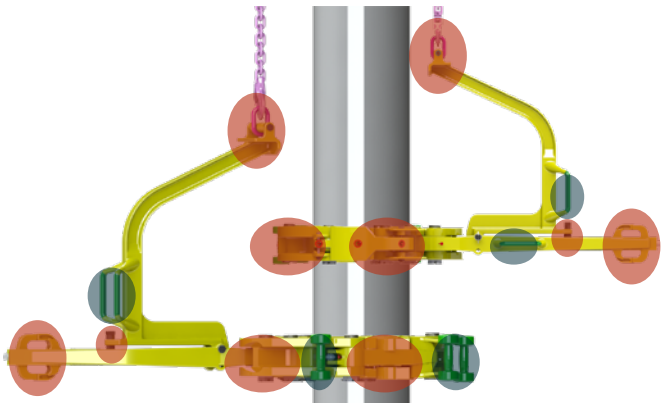

Fig. 39: Handling and pinch points overview

Handling Point **Pinch Point**

4.2.2 Operational Workflow

Safe operational Workflow

1. Install and justify Manual Tongs.
- Check that manual tong is installed in level and that the torque pull line is in approach at 90° from the lever center line.
2. To Install tong around tubular, wrap jaws around tubulars.
- Guide tong on safety handles only!
3. Close and check latch jaw.
4. Perform torque sequence on tong to tighten or loosen tubulars.
- Move out of reach of tong moving area before initiating the torque sequence.
5. Open tong on latch safety handle.
- Be aware of pre-tensioned latch mechanism, tong will open half automatic.
6. Guide tong away from tubular.
- Guide tong on safety handles only!
7. Continue with DRIP-in resp. DRIP-out process, if necessary.
8. Repeat step 2 to 7 with next tubular segment.

4.2.3 Make-Up / Break-Out torque rates for Manual Tongs

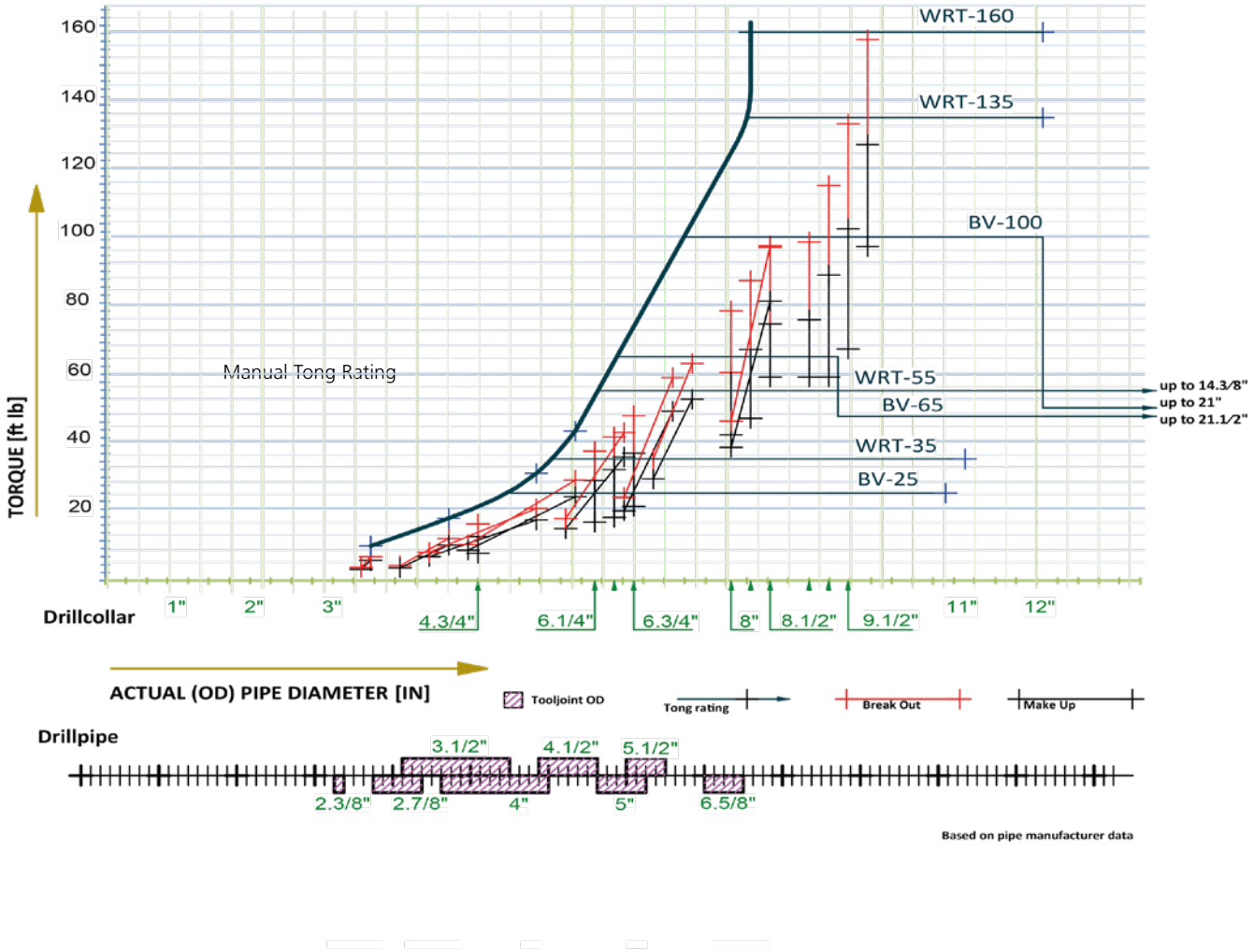

Fig. 40: Make-Up Break-Out requirements overview

4.3 Changing components

⚠ WARNING

Danger of pinching/crushing body!

» DO NOT step between the unsecured shells of the Manual Tongs .

» DO NOT stand within the opening range of the Manual Tongs while it is being opened or closed!

⚠ WARNING

Danger of pinching/crushing hands!

» The Manual Tongs can fall shut.

WEAR PROTECTIVE HELMET!

WEAR PROTECTIVE GLOVES!

WEAR SAFETY SHOES!

Changing dies/inserts

Procedure

1. Move tong in steady position.
2. Remove the retaining pins by taking out the cotter pin
3. Remove tong die retainers
4. Remove die downwards with the aid of a plastic hammer and a die driver.
5. Clean and lubricate the surface of the tong die slots.
6. Install new tong die with the aid of a plastic hammer and a die driver.
7. Reinstall all retainers.

4.3.1 Lug- and Hinge jaw removal for changing sizes

Procedure

1. Remove the hinge pin by unscrewing the hinge pin nut and unlocking pin.
2. Take out the lug/hinge jaw and replace by correct sized lug jaw needed.
3. Relock the pin

4.3.2 Disassembly of the hanger and lever assembly

Procedure

1. Disconnect the hanger assembly from the lever by removing the hanger bolt and nut
2. Complete disassembly of the hanger and lever can be carried out by removing all nuts and bolts.

⚠ **CAUTION** Ensure that the orientation of the parts is correct while assembling the tong. For proper order of installation of parts, see exploded views in chapter 6.

⚠ WARNING

Safe die fastening!

There are two types of fasteners utilized, depending upon the size of the bore in the products jaw:

Type A 10mm bore Fastening and securing with a bolt splint combination.
Type B 6mm bore Fastening with a spring type pin.

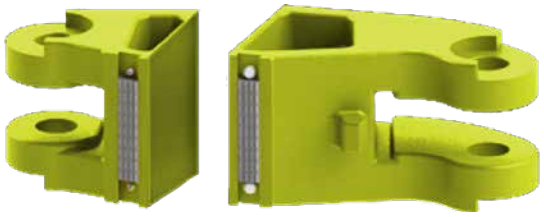

Fig. 41: Fastening type installed sample view

Die fastening material

Component	TYPE B Spring Type (6mm) P/N	Name	TYPE A Screw Type (10mm) P/N	Name
BV55 Manual Tong	70123	Spring type straight Pin	70323	Die Retainer Pin
Manual Tong Type series	621438	Spring type straight Pin	70324	Cotter Pin

4.4 Troubleshooting for Manual Operated Tongs

Common Symptoms	Useful steps for troubleshooting: Wear data tolerances are not exeeded? Tongdies are worn?	Is the tong dressed correctly for respective pipe size?	Are there elongated holes?	Are there damaged, loose, warped or untightened mechanics (hanger, jaws...)?	Is there dirt or other objects in the working area?	Exceeded working range?	Is the Tong installed and used as recommend by FORUM Handling Tools?"	Lubrication points are lubricated as recommend by FORUM Handling Tools?	Are there blocked grease nipples?	Further help: Contact Technical Support in case of an emergency, for advanced help and tips and especially if troubleshooting is without succes!
Tong does not close.		✔		✔	✔		✔	✔		!
Tong does not open.		✔		✔	✔		✔	✔		!
The Jaws are not able to grip the tube tightly.	✔	✔		✔	✔		✔			!
The Tong hangs and works irregular.	✔	✔	✔	✔	✔	✔	✔	✔		!
Tong mechanics are jamming.	✔			✔	✔		✔	✔		!
Device is grease dry unless lubrication has been performed.									✔	!

! FORUM Handling Tools recommends to follow this step in case of unsolvable problems!

✔ FORUM Handling Tools recommends to follow this shown step.

NOTE This table doesn't show all possible common symptoms. It can not be excluded that different symptoms may occur in combination. Therefor it is necessary to go through troubleshooting in a useful order. Troubleshooting can be also an exhausting and frustrating process. FORUM Handling Tools recommends to call the Technical Support early before loosing too much time for troubleshooting. Always consider the recommend safety notes while troubleshooting. Do not make any form of troubleshoot while the device is under load. Don't forget to switch off pressure before installing new components or manometer. Do not make any form of reparation, expansions or changes which are not recommend and supported by FORUM Handling Tools. Contact technical support, If there are single components or assemblies which have to be replaced!

Ensure that troubleshoot work is accomplished only by sufficiently qualified and trained personnel.

4.5 Troubleshooting for Hydraulic Operated Tongs

Common Symptoms	Useful steps for troubleshooting: Wear data tolerances are not exeeded?	Is the tong dressed correctly for respective pipe size?	Are there elongated holes?	Are there damaged, loose, warped or untightened mechanics (hanger, jaws...)?	Is there dirt or other objects in the working area?	Exceeded working range?	Is the Tong installed and used as recommend by FORUM Handling Tools?"	Lubrication points are lubricated as recommend by FORUM Handling Tools?	Are there blocked grease nipples?	Is the correct working pressure set?	Are there loose, untightened, caved or damaged hoses, fittings or cylinders?	Further help: Contact Technical Support in case of an emergency, for advanced help and tips and especially if troubleshooting is without succes!
Tong does not close.		✔		✔	✔		✔	✔		✔	✔	!
Tong does not open.		✔		✔	✔		✔	✔		✔	✔	!
The Jaws are not able to grip the tube tightly.		✔		✔	✔		✔					!
The Tong hangs and works irregular.	✔	✔	✔	✔	✔	✔	✔	✔		✔	✔	!
Tong mechanics are jamming.	✔			✔	✔		✔	✔				!
Device is grease dry unless lubrication has been performed.									✔			!

! FORUM Handling Tools recommends to follow this step in case of unsolvable problems!

✔ FORUM Handling Tools recommends to follow this shown step.

NOTE This table doesn't show all possible common symptoms. It can not be excluded that different symptoms may occur in combination. Therefor it is necessary to go through troubleshooting in a useful order. Troubleshooting can be also an exhausting and frustrating process. FORUM Handling Tools recommends to call the Technical Support early before loosing too much time for troubleshooting. Always consider the recommend safety notes while troubleshooting. Do not make any form of troubleshoot while the device is under load. Don't forget to switch off pressure before installing new components or manometer. Do not make any form of reparation, expansions or changes which are not recommend and supported by FORUM Handling Tools. Contact technical support, If there are single components or assemblies which have to be replaced!

⚠ WARNING

Separated hydraulic lines pose an injury hazard!

Hydraulic fluid can escape under high pressure.

» ALWAYS relieve pressure in & before performing maintenance work.

Ensure that troubleshoot work is accomplished only by sufficiently qualified and trained personnel.

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SERVICE

SERVICE

5 Service

INFO

Operational safety and readiness of the equipment do not only depend on your skill, but also on maintenance and servicing of the equipment. Insist on using original spare parts when carrying out maintenance and repair work. This ensures operational safety and readiness of your &, and maintains its value.

5.1 Malfunction

If a malfunction occurs or the equipment does not operate as expected, trouble shoot as follows:

If the cause of the malfunction cannot be determined and remedied, contact FORUM Handling Tools Technical Support.

1. Check that actual installation matches the size/type of pipe used.
2. Check for proper lubrication of the equipment.
3. Collect all information on the malfunction and define the problem.
4. Attempt to find a quick solution to the problem.
5. Check the last changes/modifications.
6. Isolate the problem.
7. Replace any defective components.

INFO

In the event of problems, which cannot be remedied with the aid of this manual, please contact the FORUM Handling Tools Technical Support or one of the authorized service companies specified in Chapter 1.9.

5.2 Repair

5.2.1 Repair by Customer

It is only permissible for the customer/company operating the & to replace defective parts with OEM (Original Equipment Manufacturer) parts approved by FORUM Handling Tools in conformance with the present operating instructions. Use of parts not approved by FORUM Handling Tools voids the guarantee.

5.2.2 Repair by Manufacturer

Ensure that any repair work required on the equipment is performed only by FORUM Handling Tools or an authorized service company.

INFO

Please contact the FORUM Handling Tools Technical Support or one of the authorized service companies specified in Chapter 1.9 to perform repair or maintenance work.

5.3 Drawings, Parts lists and Spare Parts lists

Info

Please contact the FORUM Handling Tools Technical Support or one of the authorized service companies specified in Chapter 1.9 to order replacement parts or in the event of any questions.

5.3.1 Safety parts

All tongs contain safety handles which are not specified in the individual parts lists. These tong parts are identified by a "-S" behind the part number.

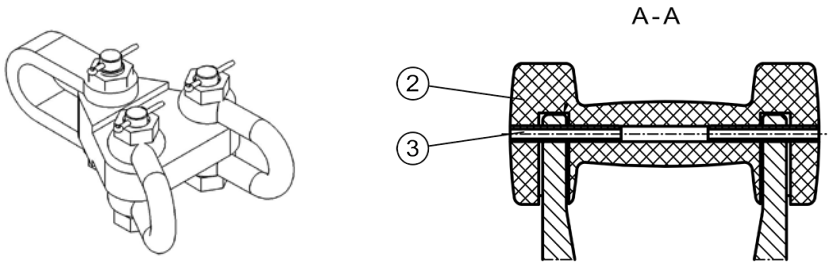


Fig. 42: Safety Parts

Pos.	Qty.	Part No.	Description
1	1	70616	U-Clamp II for BV $^{35}/_{55/65/100}$
1	1	70616-8	U-Clamp II for BV80, WRT®135, WRT®-160
2	1	70751	Safety Handle
3	2	70752	Spring Type Pin

SERVICE

5.3.2 BV-35 Type Series

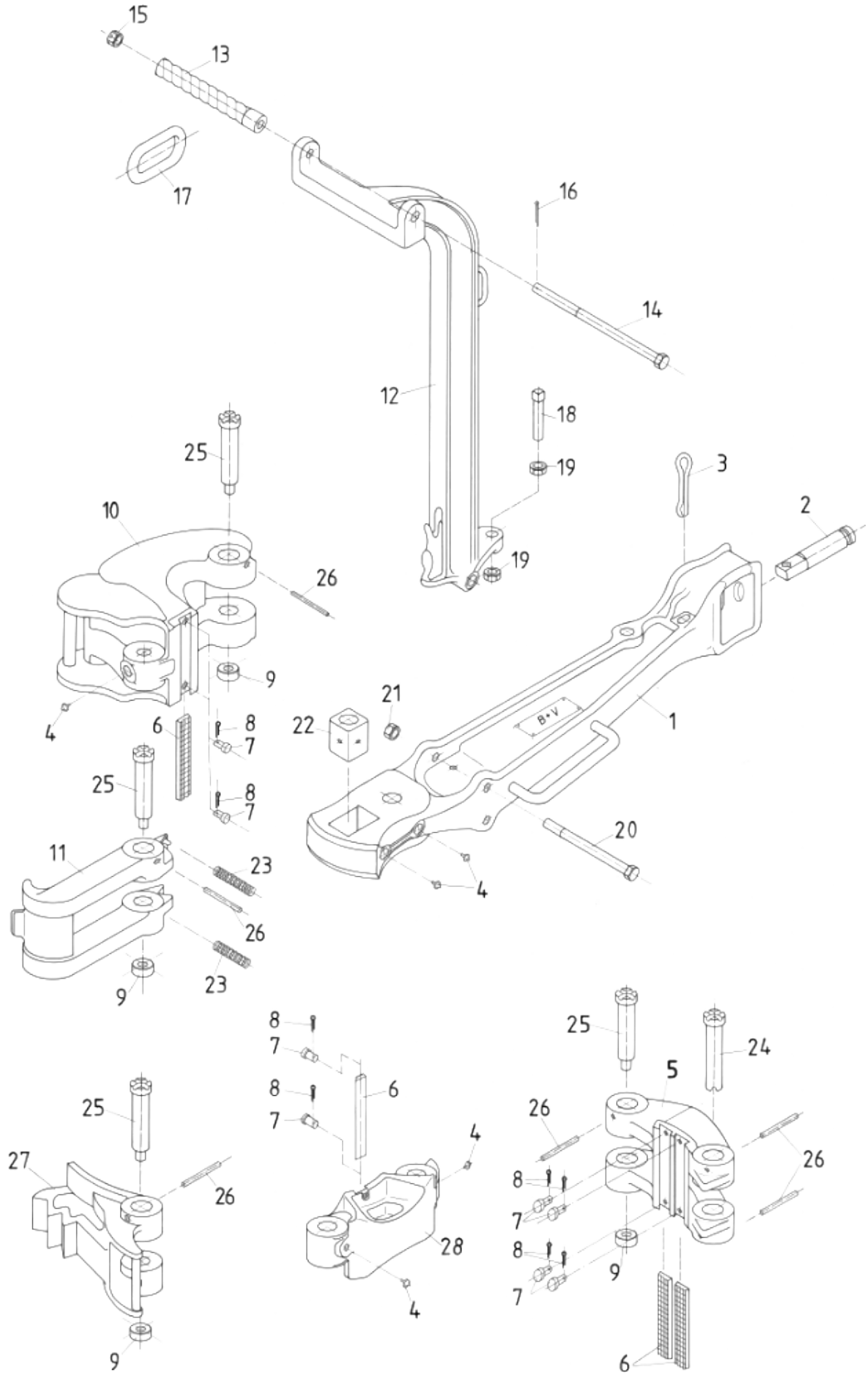


Fig. 43: BV-35 Type Series

Parts list for BV-35 (70400-S, 70401-S, 70402-S, 70403-S)

Pos.	Qty.	Part No.	Description
		70400-S	Tong complete with Standard Lever + Standard Hanger
		70401-S	Tong complete with Long Lever + Standard Hanger
		70402-S	Tong complete with Short Lever + Standard Hanger
		70403-S	Tong complete with Short Lever + Standard Hanger
	1	70410	**Lever Assembly for 70400-S, 70401-S**
	1	70490	**Lever Assembly for 70402-S, 70403-S**
1	1	70410-BF	Lever for 70400-S, 70401-S
1	1	70490-BF	Lever for 70402-S, 70403-S
2	1	70412	Tong Line Pin
3	1	70613	Tong Line Pin Retainer
- *	4	70900	Groove Pin with Round Head
4	1	70064	Grease Nipple
- *	1	70464	Identification Plate
22	1	70460	Lever Hinge Pin Block
	1	70420	**Short Jaw Assembly for 70400-S, 70402-S**
	1	70425	**Short Jaw Assembly for 70401-S, 70403-S**
5	1	70420-BF	Short Jaw for 70400-S, 70402-S
5	1	70425-BF	Short Jaw for 70401-S, 70403-s
6	2	70322	Die
- *	4	70323	Die Retainer Pin
- *	4	70324	Split Pin
9	1	70423	Hinge Pin Nut
- *	1	70626	Set Screw
24	1	70461	Hinge Pin (Removeable)
25	1	70462	Hinge Pin (Threaded)
	1	70430-S	**Long Jaw Assembly for all models**
10	1	70430-BF	Long Jaw
6	2	70322	Die
- *	2	70323	Die Retainer Pin
- *	2	70324	Split Pin
9	1	70423	Hinge Pin Nut
4	1	70064	Grease Nipple
- *	1	70626	Set Screw
25	1	70462	Hinge Pin (Threaded)
	1	70440-S	**Latch Assembly for all models**
11	1	70440-BF	Latch
9	1	70423	Hinge Pin Nut
- *	1	70626	Set Screw
- *	1	70751	Safety Handle
23	2	70752	Spring Type Straight Pin
- *	2	70671	Latch Spring
- *	5	70463	Spring Type Straight Pin
25	1	70462	Hinge Pin (Threaded)
	1	70450	**Hanger Assembly for all models**
12	1	70451R	Hanger
13	1	70652R	Balancing Screw
14	1	70652-2	Screw
15	1	70652-3	Nut
17	1	70654	Suspension Ring
18	1	70655	Screw
19	2	70655-1	Hanger Jam Nut
20	1	70153	Hanger Bolt
21	1	70113	Nut
16	1	752339	Split Pin

* Not shown in drawing

5.3.3 BV-37 Type Series

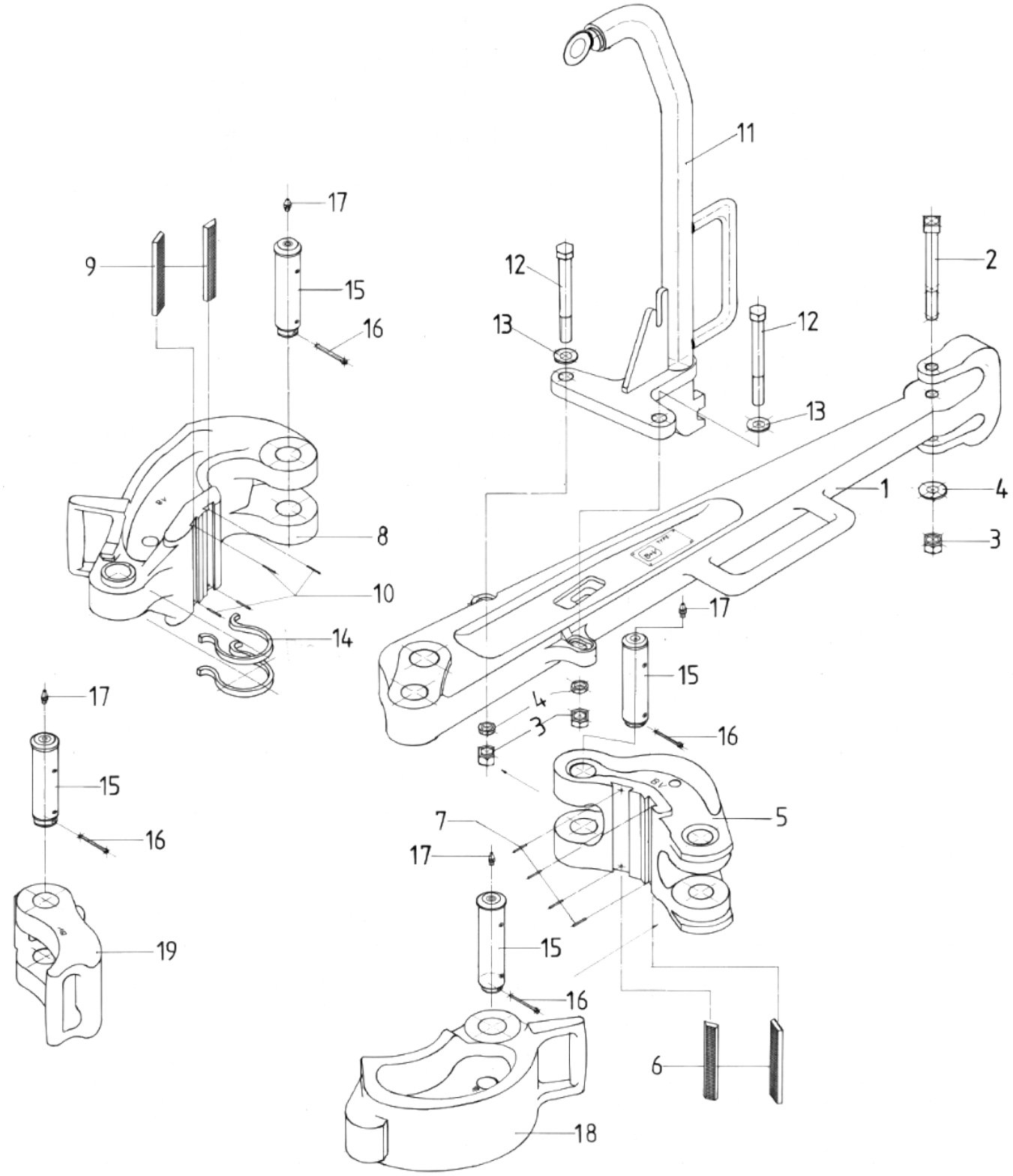


Fig. 44: BV-37 Type Series

Parts list for BV-37 (70200-S)

Pos.	Qty.	Part No.	Description
		70200-S	Tong complete with Long Lever + Standard Hanger
	1	70210-S	**Lever Assembly**
1	1	70210-BF	Lever
2	1	70112	Screw
3	1	612976	Nut
4	1	752327	Spring Washer
- *	4	70900	Groove Pin with Round Head
- *	1	70751	Safety Handle
- *	2	70751-1	Fix Plates
- *	2	70752	Spring Type Straight Pin
	1	70220-S	**Short Jaw Assembly**
5	1	70220-BF	Short Jaw
6	2	70222	Die
7	4	70223	Die Retainer Pin
- *	1	70751	Safety Handle
17	1	70064	Grease Nipple
15	1	70262	Hinge Pin
16	1	70263	Split Pin
	1	70230-S	**Long Jaw Assembly**
8	1	70230-BF	Long Jaw
6	2	70222	Die
7	4	70223	Die Retainer Pin
10	2	70752	Spring Type Straight Pin
17	1	70064	Grease Nipple
15	1	70262	Hinge Pin
16	1	70263	Split Pin
	1	70240-S	**Latch Assembly**
19	1	70240-BF	Latch
- *	1	70751	Safety Handle
- *	2	70752	Spring Type Straight Pin
- *	2	70260	Latch Spring
17	1	70064	Grease Nipple
15	1	70262	Hinge Pin
16	1	70263	Split Pin
	1	70150	**Hanger Assembly**
11	1	70151	Hanger
12 + 13	2	70152	Hanger Adjustment Bolt And Nut

* Not shown in drawing

5.3.4 BV-55 Type Series

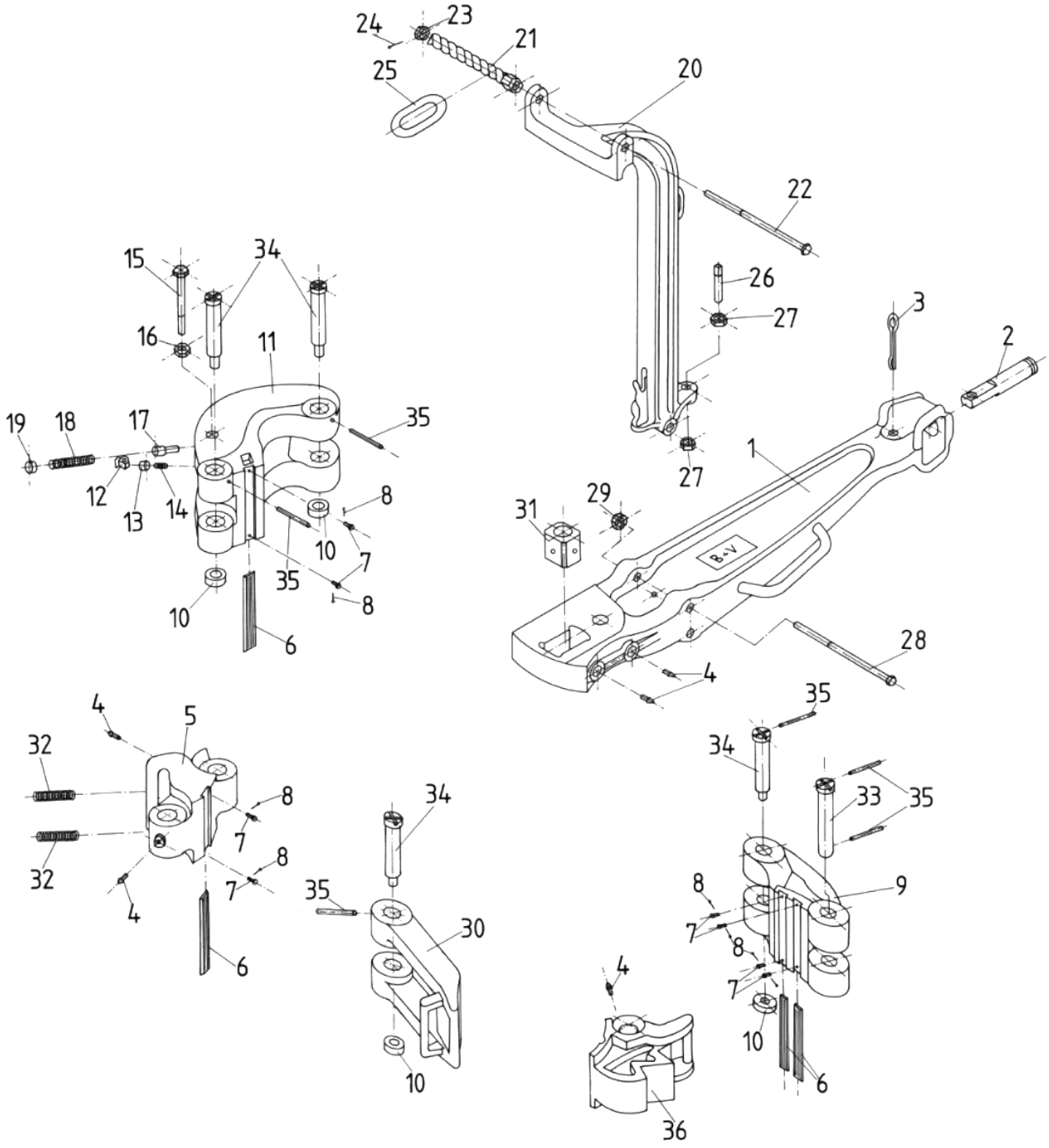


Fig. 45: BV-55 Type Series

Parts list for BV-55 (70600-S, 70601-S, 70602-S, 70603-S)

Pos.	Qty.	Part No.	Description
		70600-S	Tong complete with Long Lever + Extra Long Hanger
		70601-S	Tong complete with Short Lever + Short Hanger
		70602-S	Tong complete with Long Lever + Standard Hanger
		70603-S	Tong complete with Short Lever + Long Hanger
	1	70610	**Lever Assembly for 70600-S, 70602-S**
	1	70691	**Lever Assembly for 70601-S, 70603-S**
1	1	70610-BF	Lever for 70600-S, 70602-S
1	1	70691-BF	Lever for 70601-S, 70603-S
2	1	70612	Tong Line Pin
3	1	70613	Tong Line Pin Retainer
- *	4	70900	Groove Pin with Round Head
4	2	70064	Grease Nipple
- *	1	70699	Identification Plate
- *	1	70698	Instruction Plate
31	1	70670	Lever Hinge Pin Block
	1	70630	**Short Jaw Assembly for all models**
9	1	70630-BF	Short Jaw
6	2	70322	Die
7	4	70323	Die Retainer Pin
35	4	70324	Split Pin
9	1	70423	Hinge Pin Nut
- *	1	70626	Set Screw
33	1	70672	Hinge Pin
34	1	70673	Hinge Pin
	1	70640	**Long Jaw Assembly for all models**
11	1	70640-BF	Long Jaw
- *	1	70642	Adjustable Stop
- *	1	70643-2	Booster Spring Retainer Plug
- *	1	70643-1	Booster plunger Spring
- *	2	70324	Split Pin
7	2	70323	Die Retainer Pin
10	2	70625	Hinge Pin Nut
- *	1	70642-1	Adjustable Stop Plunger
6	1	70622	Die
15	1	70153	Screw
16	1	70113	Nut
- *	2	70626	Set Screw
34	2	70673	Hinge Pin
	1	70660-S	**Latch Assembly for all models**
30	1	70660-BF	Latch
10	1	70625	Hinge Pin Nut
- *	1	70626	Set Screw
- *	1	70751	Safety Handle
- *	2	70752	Spring Type Straight Pin
- *	1	70671	Latch Spring
- *	1	70674	Spring Type Straight Pin
34	1	70673	Hinge Pin
	1	70770	**Hanger Assembly for 70600-S**
	1	70775-1	**Hanger Assembly for 70601-S**
	1	70775	**Hanger Assembly for 70602-S**
	1	70770-1	**Hanger Assembly for 70603-S**
20	1	70771	Hanger for 70600-S
20	1	70774-1	Hanger for 70601-S
20	1	70774	Hanger for 70602-s
20	1	70771-1	Hanger for 70603-S
21	1	70652	Balancing Screw
22	1	70652-2	Screw
23	1	70652-3	Nut
25	1	70654	Suspension Ring
26	1	70655	Screw
27	2	70355-1	Hanger Jam Nut

Pos.	Qty.	Part No.	Description
28	1	70655-5	Screw
29	1	70113	Nut
- *	2	752836	Washer
24	1	70655-6	Linch Pin
	1	70620-S	**Latch Jaw Assembly for all models**
5	1	70620-BF	Latch Jaw
6	1	70622	Die
7	2	70323	Die Retainer
- *	2	70324	Split Pin
- *	2	70064	Grease Nipple
- *	1	70751	Safety Handle
- *	1	70752	Spring Type Straight Pin

* Not shown in drawing

Parts list for BV-55 Lug Jaw Assemblies

Pos.	Qty.	Part No.	Description
	1	70680-S	**Lug Jaw Assembly 3.1/2" - 5"**
36	1	70680-BF	Lug Jaw
4	1	70064	Grease Nipple
- *	1	70751	Safety Handle
- *	2	70752	Spring Type Straight Pin
	1	70681-S	**Lug Jaw Assembly 5" - 6.3/4"**
36	1	70681-BF	Lug Jaw
4	1	70064	Grease Nipple
- *	1	70751	Safety Handle
- *	2	70752	Spring Type Straight Pin
	1	70682-S	**Lug Jaw Assembly 6.5/8" - 9"**
36	1	70682-BF	Lug Jaw
4	1	70064	Grease Nipple
- *	1	70751	Safety Handle
- *	2	70752	Spring Type Straight Pin
	1	70683-S	**Lug Jaw Assembly 9" - 10.3/4"**
36	1	70683-BF	Lug Jaw
4	1	70064	Grease Nipple
- *	1	70751	Safety Handle
- *	2	70752	Spring Type Straight Pin
	1	70684-S	**Lug Jaw Assembly 11.3/4"**
36	1	70684-BF	Lug Jaw
4	1	70064	Grease Nipple
- *	1	70751	Safety Handle
- *	2	70324	Split Pin
- *	2	70752	Spring Type Straight Pin
6	1	70622	Die
7	2	70323	Die Retainer Pin
	1	70686-S	**Lug Jaw Assembly 12.3/4" - 13"**
36	1	70686-BF	Lug Jaw
4	1	70064	Grease Nipple
- *	2	70324	Split Pin
- *	1	70751	Safety Handle
- *	2	70752	Spring Type Straight Pin
6	1	70622	Die
7	2	70323	Die Retainer Pin
	1	70688-S	**Lug Jaw Assembly 9" - 10.3/4"**
36	1	70688-BF	Lug Jaw
4	1	70064	Grease Nipple
- *	1	70751	Safety Handle
- *	2	70752	Spring Type Straight Pin
- *	2	70324	Split Pin

* Not shown in drawing

5.3.5 BV-55C Type Series

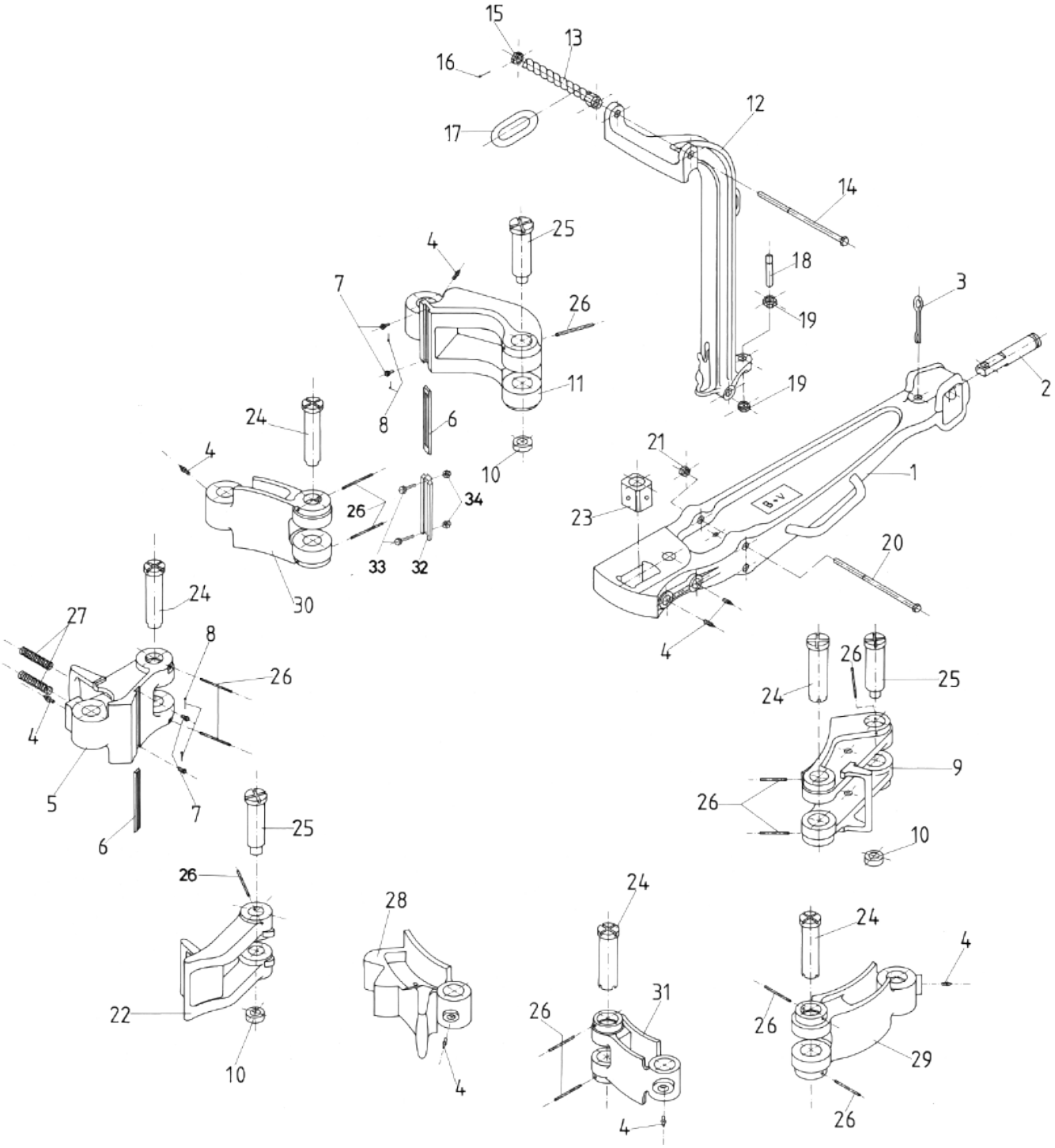


Fig. 46: BV-55C Type Series

Parts list for BV-55C (71600, 71601)

Pos.	Qty.	Part No.	Description
		71600	Tong complete with Long Lever + Standard Hanger
		71601	Tong complete with Short Lever + Standard Hanger
	1	70610	**Lever Assembly for 71600**
	1	70691	**Lever Assembly for 71601**
1	1	70610-BF	Lever for 71600
1	1	70691-BF	Lever for 71601
23	1	70670	Lever Hinge Pin Block
2	1	70612	Tong Line Pin
3	1	70613	Tong Line Pin Retainer
4	2	70064	Grease Nipple
- *	4	70900	Grooved Pin With Round Head
- *	1	70698	Instruction Plate
- *	1	70699	Identification Plate
	1	70775	**Hanger Assembly for all models**
12	1	70774	Hanger
13	1	70652	Balancing Screw
14	1	70652-2	Screw
15	1	70652-3	Nut
17	1	70654	Suspension Ring
18	1	70655	Screw
19	2	70655-1	Hanger Jam Nut
20	1	70655-5	Screw
21	1	70113	Nut
- *	2	752836	Washer
16	1	70655-6	Linch Pin

* Not shown in drawing

5.3.6 BV-55C Casing Head Assemblies

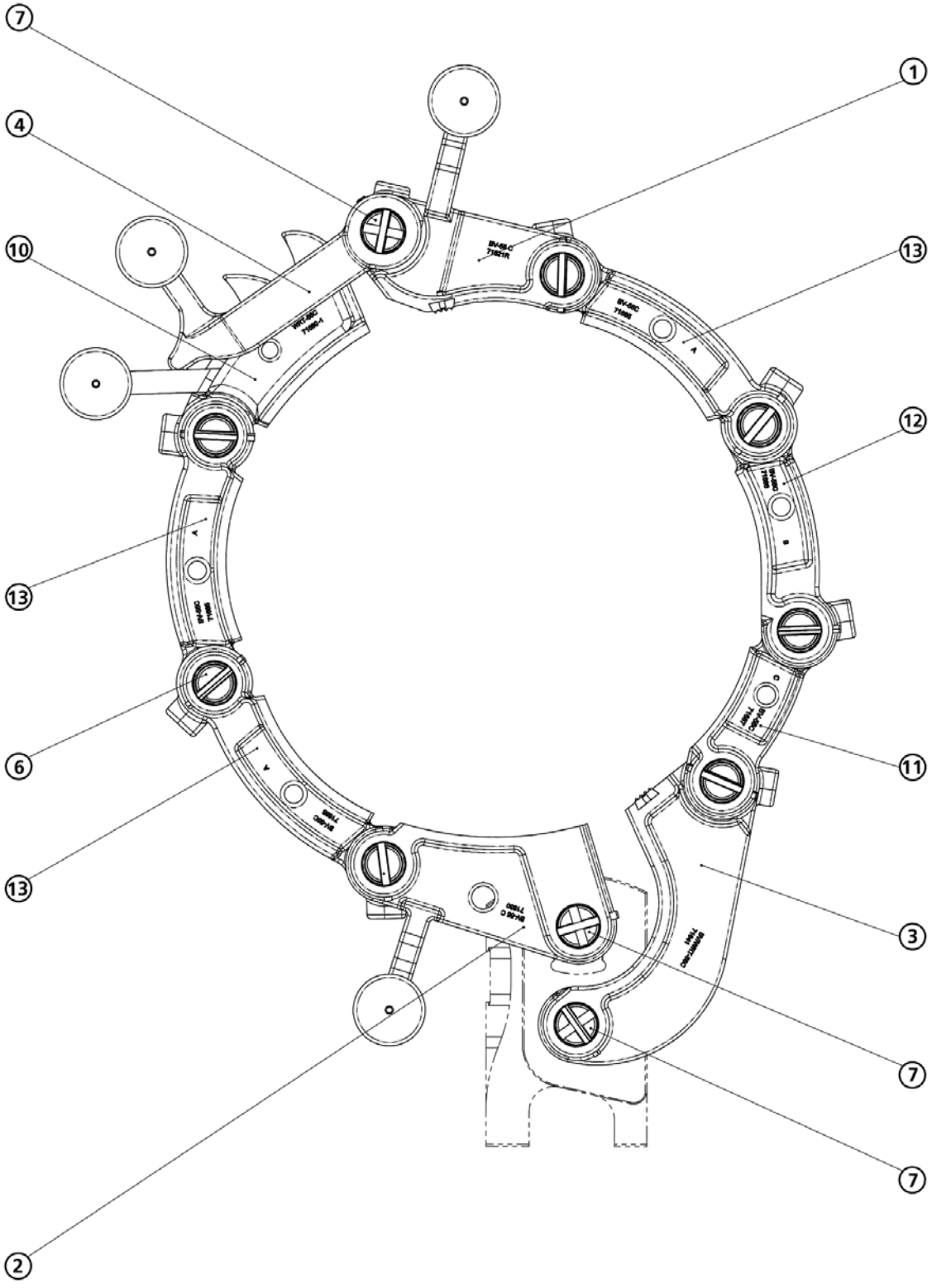


Fig. 47: BV-55C Casing Assembly example (71609-S)

Parts list for BV-55c Casing Head Assemblies

Pos.	Description	P/N	71609-S	71610-S	71611-S	71612-S	71613-S	71614-S	71615-S
1	Latch Jaw Assembly	71620-S	1	1	1	1	- **	- **	1
2	Short Jaw Assembly	71630-S	1	1	1	1	- **	- **	1
3	Long Jaw Assembly	71640	1	1	1	1	- **	- **	1
4	Latch Assembly	70660-1-S	1	1	1	1	- **	- **	1
6	Hinge Pin	70672	7	8	8	10	- **	- **	10
7	Hinge Pin	70673	3	3	3	3	- **	- **	3
- *	Spring Type Straight Pin	70674	17	19	19	23	- **	- **	23
- *	Latch Spring	70671	2	2	2	2	- **	- **	2
10	Lug Jaw Assembly	71680-1-S	1	1	1	1	- **	- **	1
11	Hinge Jaw Assembly "C"	71687	1	2	1	-	- **	- **	2
12	Hinge Jaw Assembly "B"	71686	1	3	2	2	- **	- **	4
13	Hinge Jaw Assembly "A"	71685	3	1	3	4	- **	- **	2

* Not shown in drawing

** Please contact the FORUM Handling Tools Technical Support or one of the authorized service companies, if you need exact unit numbers.

5.3.7 Advanced Drawings for BV-55c Casing Head Assemblies

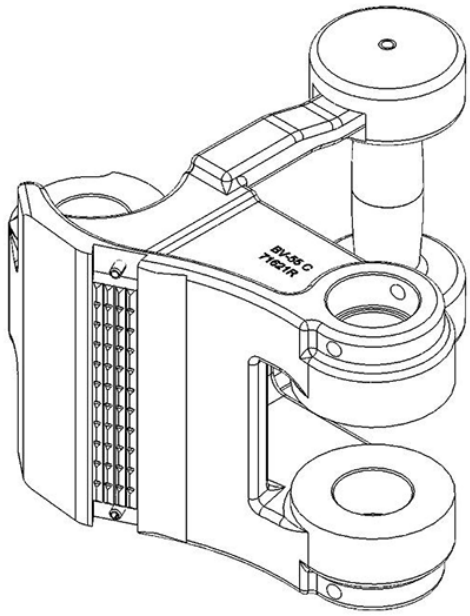


Fig. 48: Latch Jaw Assembly (71620-S)

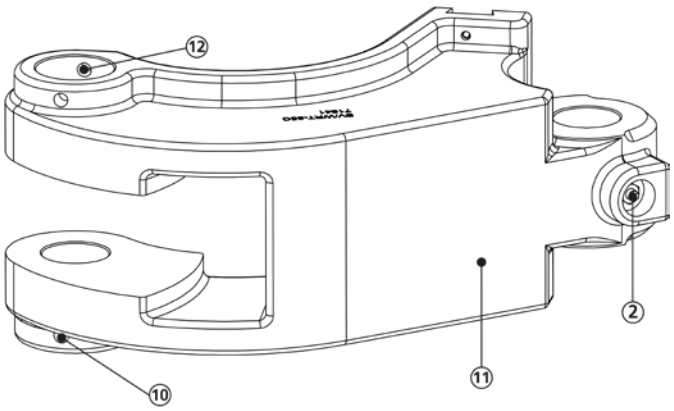


Fig. 49: Long Jaw Assembly (71640)

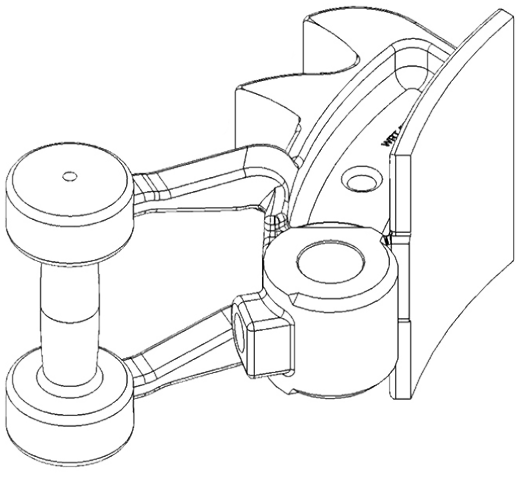


Fig. 50: Lug Jaw Assembly (71680-1-S)

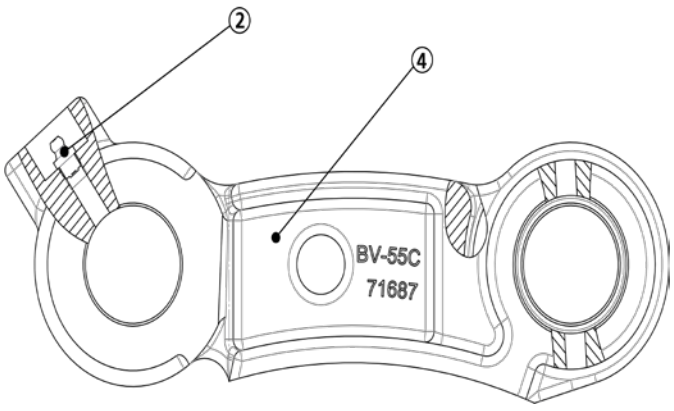
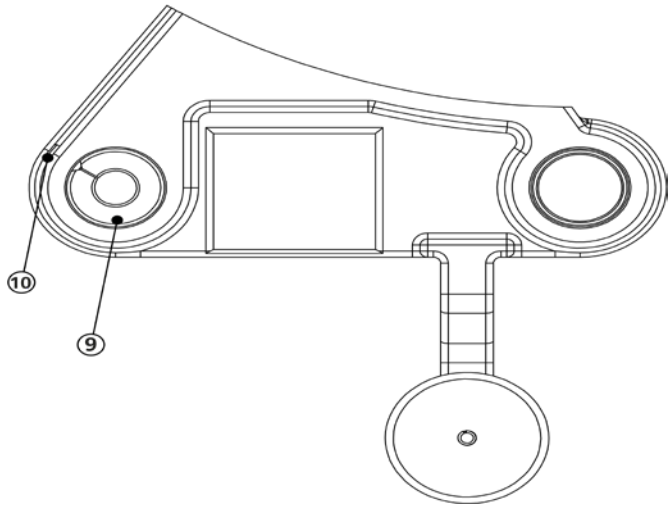


Fig. 51: Hinge Jaw Assembly “C” (71687)



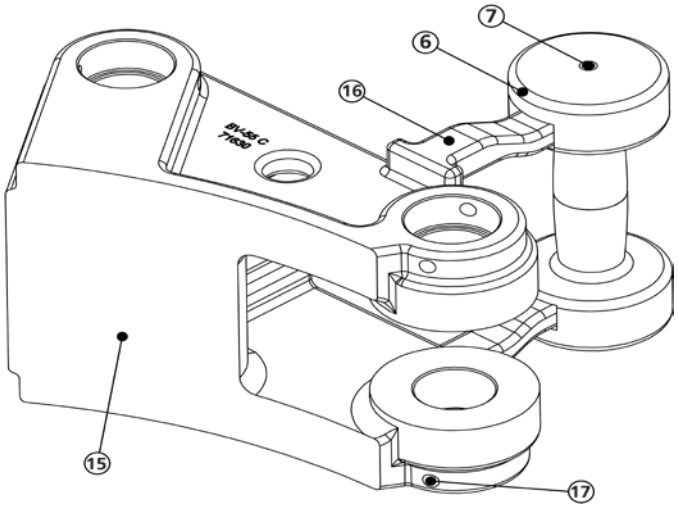


Fig. 52: Short Jaw Assembly (71630-S)

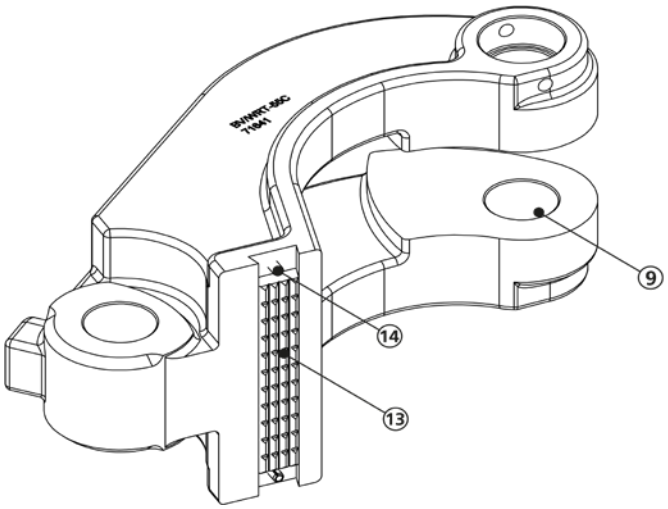


Fig. 53: Long Jaw Assembly (70640)

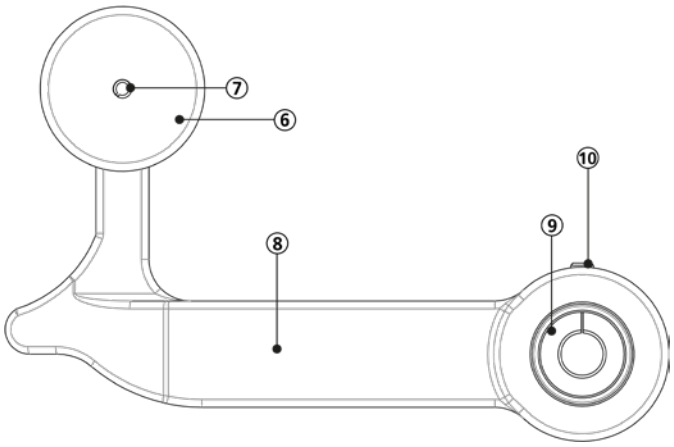


Fig. 54: Latch Assembly (70660-1-S)

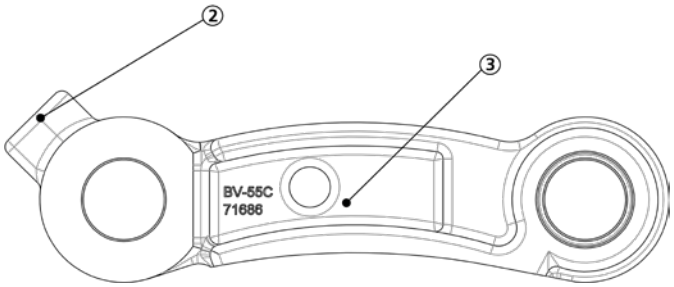


Fig. 55: Hinge Jaw Assembly “B” (71686)

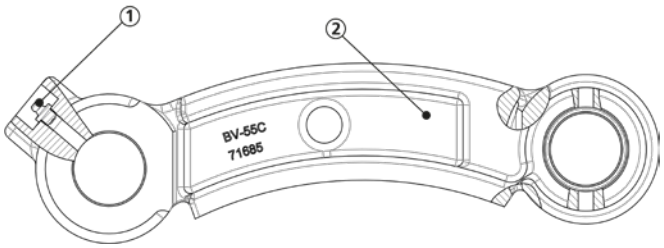


Fig. 56: Hinge Jaw Assembly “A” (71685)

Parts list for advanced BV-55c Casing Head Assemblies

Pos.	Qty.	Part No.	Description
		71685	**Hinge Jaw Assembly "A"**
1	1	71685-BF	Hinge Jaw
2	1	70064	Grease Nipple
		71686	**Hinge Jaw Assembly "B"**
3	1	71686-BF	Hinge Jaw
2	1	70064	Grease Nipple
		71687	**Hinge Jaw Assembly "C"**
4	1	71687-BF	Hinge Jaw
2	1	70064	Grease Nipple
		71680-1-S	**Lug Jaw Assembly**
5	1	71687-BF	Lug Jaw
2	1	70064	Grease Nipple
6	1	70751	Safety Handle
7	2	70752	Spring Type Straight Pin
		70660-1-S	**Latch Assembly**
8	1	71687-BF	Latch
9	1	70625	Hinge Pin Nut
6	1	70751	Safety Handle
7	2	70752	Spring Type Straight Pin
10	1	70626	Set Screw
		70640	**Long Jaw Assembly**
11	1	70640-BF	Long Jaw
9	1	70625	Hinge Pin Nut
2	1	70064	Grease Nipple
10	1	70626	Set Screw
12	2	70324	Split Pin
13	1	70622	Die Pyramid
14	2	70323	Die Retainer
		70630-S	**Short Jaw Assembly**
15	1	70630-BF	Short Jaw
6	1	70751	Safety Handle
16	2	70751-1	Fix. Plates
7	2	70752	Spring Type Straight Pin
17	3	70674	Spring Type Straight Pin
9	1	70625	Hinge Pin Nut
10	1	71626	Set screw
		71620-S	**Latch Jaw Assembly**
18	1	71620-BF	Latch Jaw
13	1	70622	Die Pyramid
14	2	70232	Die Retainer
19	2	621438	Spring Type Straight Pin
2	1	70064	Grease Nipple
6	1	70751	Safety Handle
7	2	70752	Spring Type Straight Pin

* Not shown in drawing

5.3.8 BV-65 type series

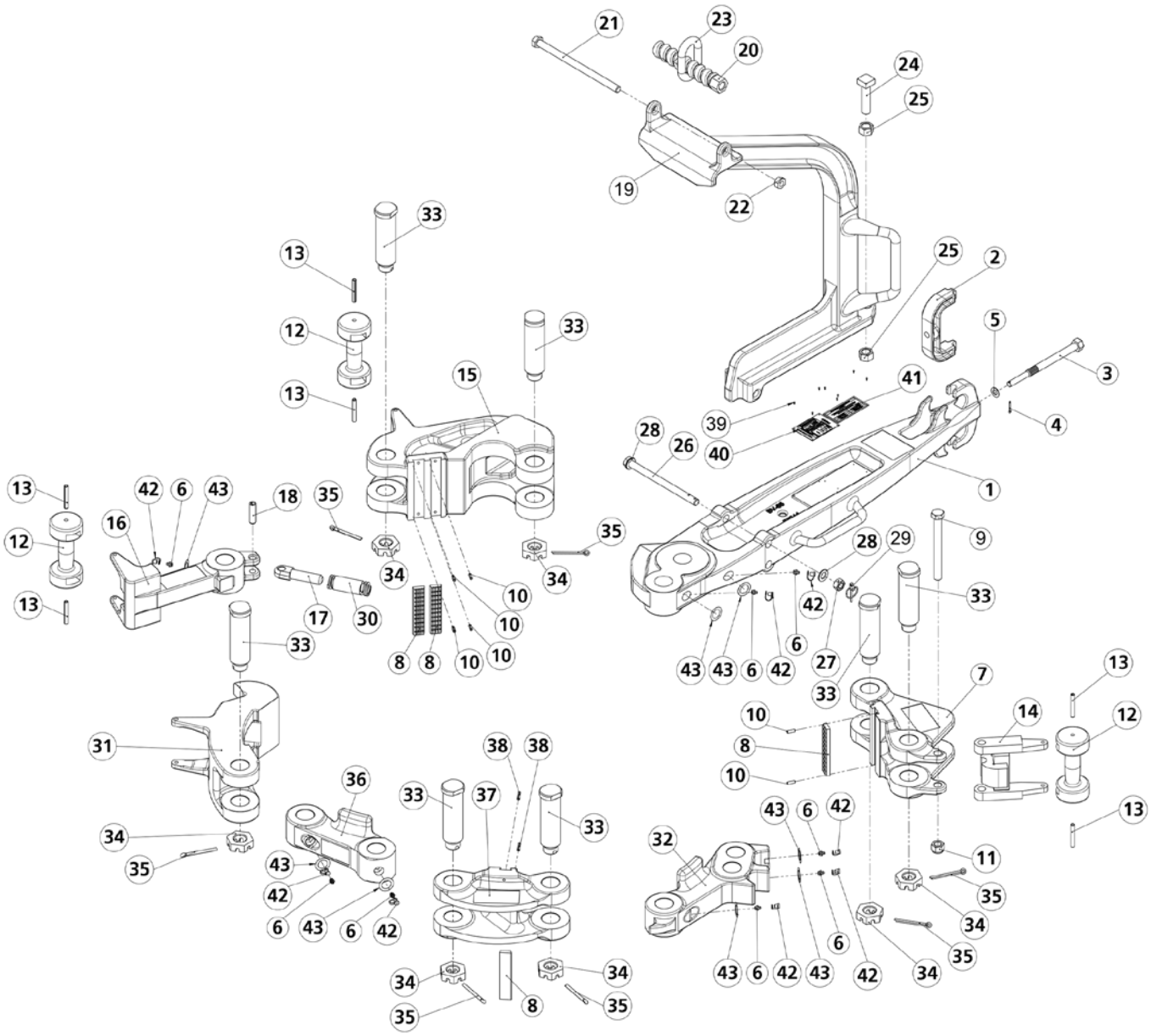


Fig. 57: BV-65 Type Series

Parts list for BV-65 (70700-S, 70701-S, 70702-S, 70703-S)

Pos.	Qty.	Part No.	Description
		70700-S	Tong complete with Long Lever and Long Hanger
		70701-S	Tong complete with Short Lever and Standard Hanger
		70702-S	Tong complete with Long Lever and Standard HAnger
		70703-S	Tong complete with Short Lever and Long Hanger
	1	70710	**Lever Assembly for 70700-S**
	1	70713	**Lever Assembly for 70701-S, 70703-S**
	1	70711	**Lever Assembly for 70702-S**
1	1	70710-BF	Lever for 70700-S
1	1	70713-BF	Lever for 70701-S, 70703-S
1	1	70711-BF	Lever for 70702-S
2	1	70812	Tong Line Retainer
3	1	70813	Tong Line Retainer Bolt
4	1	70814	Split Pin
5	1	70815	Washer
6	2	70064	Grease Nipple
41	1	70773	Identification Plate
39	8	70900	Grooved Pin With Round Head
40	1	70772	Instruction Plate
42	2	612518	Protection Cap
43	2	612530-3	Marking Point
	1	70730-S	**Long Jaw Assembly for all models**
15	1	70730-BF	Long Jaw
8	2	70622	Die Pyramid
10	4	621438	Spring Type Straight Pin
12	1	70751	Safety Handle
13	2	70752	Spring Type Straight Pin
	1	70720-S	**Short Jaw Assembly for all models**
7	1	70720-BF	Short Jaw
8	1	70622	Die Pyramid
9	1	70723	Screw
10	2	621438	Spring Type Straight Pin
11	1	70726	Nut
12	1	70751	Safety Handle
13	2	70752	Spring Type Straight Pin
14	1	70722-1	Safety Handle
	1	70740-S	**Latch Assembly for all models**
16	1	70740-BF	Latch
17	1	70842	Latch Spring Plunger
18	1	70742	Spring Type Straight Pin
6	1	70064	Grease Nipple
12	1	70751	Safety Handle
30	1	70860	Latch Spring
13	2	70752	Spring Type Straight Pin
42	1	612518	Protection Cap
43	1	612530-3	Marking Point
	1	70650	**Hanger Assembly for 70700-S**
	1	70775-1	**Hanger Assembly for 70701-S**
	1	70775	**Hanger Assembly for 70702-S**
	1	70770-1	**Hanger Assembly for 70703-S**
19	1	70650-BF	Hanger for 70700-S
19	1	70774-1	Hanger for 70701-S
19	1	70774	Hanger for 70702-S
19	1	70770-1	Hanger for 70703-S
20	1	70652	Balancing Screw
21	1	70652-2	Screw
22	1	70652-3	Nut
29	1	752339	Split Pin
23	1	70654	Suspension Ring
24	1	70655	Screw
25	2	70655-1	Hanger Jam Nut
26	1	70655-3	Screw
27	1	70113	Nut
33	4	70762	Hinge Pin
34	4	70863	Hinge Pin Nut
35	4	70864	Split Pin

Parts list for BV-65 Lug Jaw Assemblies

Pos.	Description	P/N	70780-S	70782-S	70783-S	70784-S	70785	70791-S	70792-S	70793*
31	Lug Jaw	-	70780-BF	70782-BF	70783-BF	70784-BF	-	70791-BF	70792-BF	-
32	Lug Jaw	-	-	-	-	-	70785-BF	-	-	-
36	Hinge Jaw	-	-	-	-	-	-	-	-	70787-1
36	Hinge Jaw	-	-	-	-	-	-	-	-	70787
37	Hinge Jaw	-	-	-	-	-	-	-	-	70789
8	Die Pyramid	70622	1	-	-	-	-	-	-	-
10	Spring Type Straight Pin	621438	2	-	-	-	-	-	-	-
6	Grease Nipple	70064	3	2	-	-	3	-	-	-
12	Safety Handle	70751	1	1	1	1	-	1	1	-
13	Spring Type Straight Pin	70752	2	2	2	2	-	2	2	-
42	Protection Cap	612518	3	2	-	-	3	-	-	-
43	Marking Point	612530-3	3	2	-	-	3	-	-	-
33	Hinge Pin	70762	-	-	-	-	1	1	1	1
34	Hinge Pin Nut	70863	-	-	-	-	1	1	1	1
35	Split Pin	70864	-	-	-	-	1	1	1	1

*This Hinge Jaw assembly consits of three separate assemblies also. Further information can be found in the following next table.

Pos.	Description	P/N	70787-S	70787-1-S	70789
36	Hinge Jaw	-	70787-BF	70787-1-BF	-
37	Hinge Jaw	-	-	-	70789-BF
6	Grease Nipple	700064	3	2	-
42	Protection Cap	612518	3	2	-
43	Marking Point	612530-3	3	2	-
8	Die Pyramid	70622	-	-	1
10	Spring Type Straight Pin	70123	-	-	2
33	Hinge Pin	70762	-	-	1
34	Hinge Pin Nut	70863	-	-	1
35	Split Pin	70864	-	-	1

5.3.9 BV-65-H Type Series

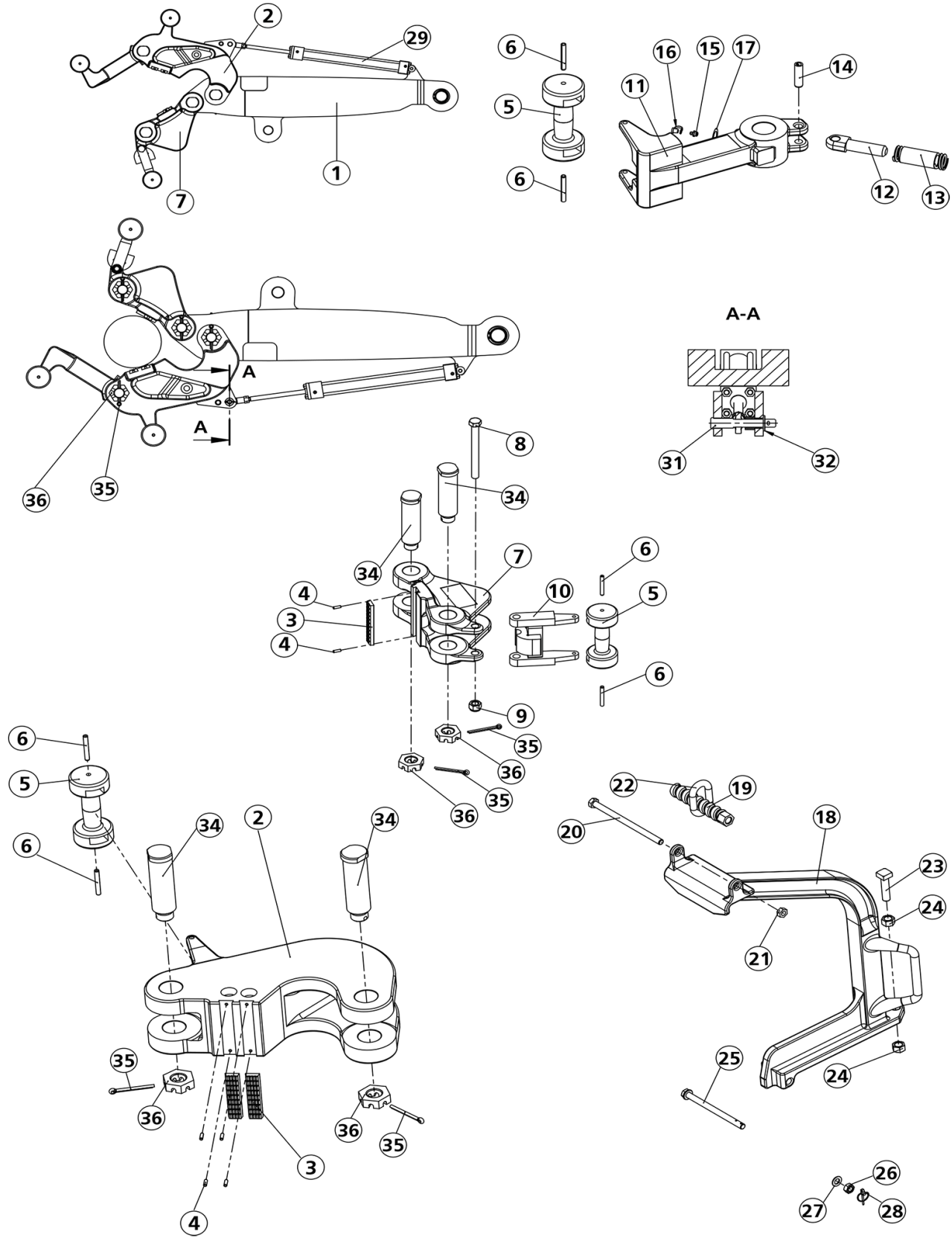


Fig. 58: BV-65-H Type Series

Parts list for BV-65-H (70700-H)

Pos.	Qty.	P/N	Description
1	1	70711-H	Lever
	1	70730-H	**Long Jaw Assembly**
2	1	70730-BF	Long Jaw
3	2	70622	Die Pyramid
4	4	621438	Spring Type Straight Pin
5	1	70751	Safety Handle
6	2	70752	Spring Type Straight Pin
	1	70720-S	**Short Jaw Assembly**
7	1	70720-BF	Short Jaw
3	1	70622	Die Pyramid
8	1	70723	Screw
4	2	621438	Spring Type Straight Pin
9	1	70726	Nut
5	1	70751	Safety Handle
6	2	70752	Spring Type Straight Pin
10	1	70722-1	Handle
	1	70740-S	**Latch Assembly**
11	1	70740-BF	Latch
12	1	70842	Latch Spring Plunger
14	1	70742	Spring Type Straight Pin
15	1	70064	Grease Nipple
5	1	70751	Safety Handle
6	2	70752	Spring Type Straight Pin
16	1	612518	Protection Cap
17	1	612530-3	Marking Point
	1	70775	**Hanger Assembly**
18	1	70774	Hanger
19	1	70652	Balancing Screw
20	1	70652-2	Screw
21	1	70652-3	Nut
22	1	70654	Suspension Ring
23	1	70655	Screw
24	2	70655-1	Hanger Jam Nut
25	1	70655-5	Screw
26	1	70113	Nut
27	2	752836	Washer
28	1	70655-6	Linch Pin
29	1	612916	Hydraulic Cylinder
30	2	710025	Screw
31	2	752338	Cylinder Pin
32	8	612679	Washer
33	1	725274	Split Pin
34	4	70762	Hinge Pin
35	4	70864	Split Pin
36	4	70863	Hinge Pin Nut
13	1	70860	Latch Spring
-*	1	752301	Safety Spring
-*	1	643801	Wire line
-*	2	643801-11	Wire Line Clamp

* Not shown in drawing

5.3.10 BV-80 Type Series

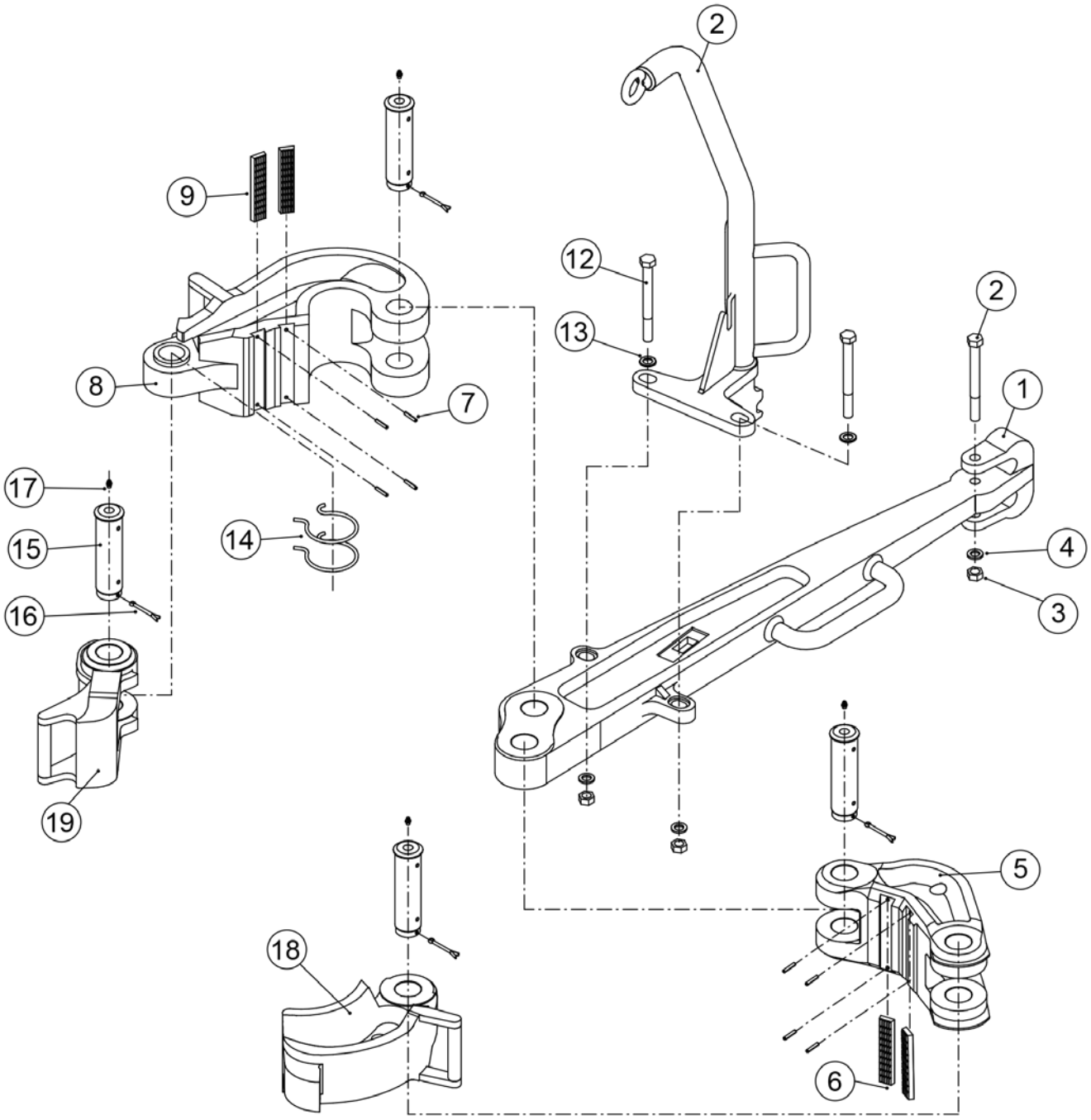


Fig. 59: BV-80 Type Series

Parts list for BV-80 (70100-S, 70101-S)

Pos.	Qty.	P/N	Description
		70100-S	Tong complete with Long Lever and Long Hanger
		70101-S	Tong complete with Short Lever and Standard Hanger
	1	70110	**Lever Assembly for 70100-S**
	1	70170	**Lever Assembly for 70101-S**
1	1	70110-BF	Lever fpr 70100-S
1	1	70170-BF	Lever for 70101-S
2	1	70112	Screw
3	1	612976	Nut
4	1	752327	Spring Washer
-*	1	70164	Identification Plate
-*	4	70900	Grooved Pin With Round Head
	1		**Hanger Assembly for all models**
11	1	70151	Hanger
12 + 13	2	70152	Hanger Adjustment Bolt And Nut
	1	70130-S	**Long Jaw Assembly for all models**
8	1	70130-BF	Long Jaw
9	2	70622	Die Pyramid
10	4	70123	Spring Type Straight Pin
-*	1	70751	Safety Handle
-*	2	70752	Spring Type Straight Pin
	1	70120-S	**Short Jaw Assembly for all models**
5	1	70120-BF	Short Jaw
9	2	70622	Die Pyramid
10	4	70123	Spring Type Straight Pin
	1	70140-S	**Latch Assembly for all models**
19	1	70140-BF	Latch
-*	1	70751	Safety Handle
-*	2	70752	Spring Type Straight Pin
	4	70161	**Hinge Pin Assembly**
15	1	70162	Hinge Pin
17	1	70064	Grease Nipple
16	1	70163	Split Pin
-*	2	70160	Latch Spring

* Not shown in drawing

Parts list for BV-80 Lug Jaw Assemblies

Pos.	Description	P/N	70180-S	70781-S	70182-S	70183-S	70184-S	70185-S	70186-S	70187-S
	Lug Jaw	-	70180-BF	70781-BF	70182-BF	70183-BF	70184-BF	70185-BF	70186-BF	70187-BF
-*	Safety Handle	70751	1	1	1	1	1	1	1	1
-*	Spring Type Straight Pin	70752	2	2	2	2	2	2	2	2

* Not shown in drawing

5.3.11 BV-100 Type Series

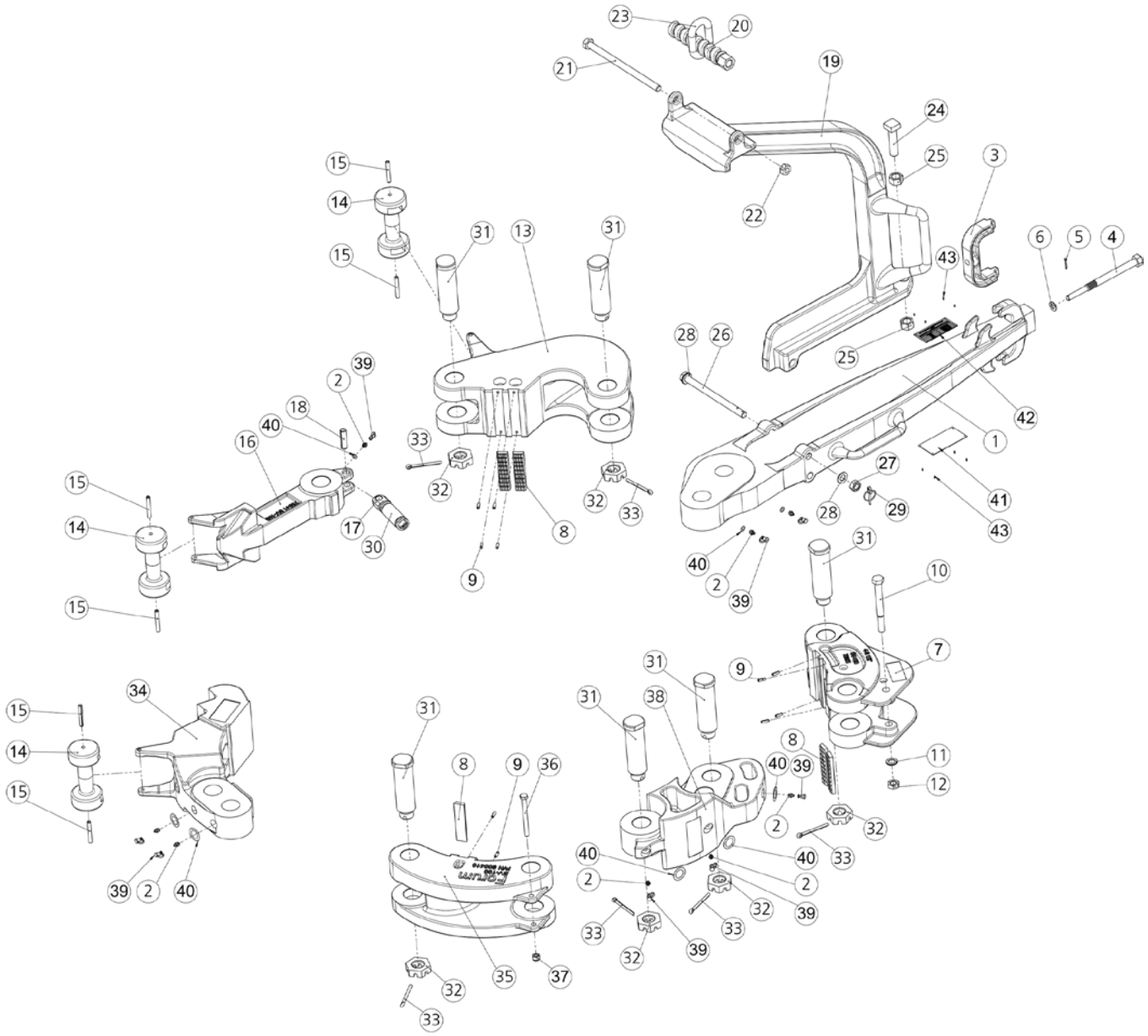


Fig. 60: BV-100 Type Series

Parts list for BV-100
(70800, 70800-S, 70801-S, 70805-S, 71810-S, 71812-S, 71814-S, 71816-S, 71818)

Pos.	Qty.	P/N	Description
		70800	Tong complete with Long Lever and Long Hanger
		70800-S	Tong complete with Long Lever and Extra Long Hanger
		70801-S	Tong complete with Long Lever and Standard Hanger
		70805-S	Tong complete with Long Lever and Ultra Short Hanger
		71810-S	Tong complete with Extended Lever and Standard Hanger
		71812-S	Tong complete with Extended Lever and Standard Hanger
		71814-S	Tong complete with Extended Lever and Standard Hanger
		71816-S	Tong complete with Extended Lever and Standard Hanger
		71818	Tong complete with Extended Lever and Standard Hanger
	1	70810	**Lever Assembly for all models**
1	1	70810-BF	Lever
2	2	70064	Grease Nipple
3	1	70812	Tong Line Retainer
4	1	70813	Tong Line Retainer Bolt
5	1	70814	Split Pin
41	1	70887	Instruction Plate
42	1	70888	Identification Plate
43	8	70900	Grooved Pin With Round Head
6	1	70815	Washer
40	2	612530-9	Marking Point
39	2	612518	Protection Cap
	1	70830-S	**Long Jaw Assembly for 70800, 70800-S, 70801-S, 70805-S**
13	1	70830-BF	Long Jaw
8	2	70322	Die
9	4	70323	Die Retainer Pin
14	1	70751	Safety Handle
15	2	70752	Spring Type Straight Pin
	1	71998	**Long Jaw Assembly for 71810-S, 71812-S, 71814-S, 71816-S, 71818**
13	1	71998-BF	Long Jaw
8	2	70322	Die
9	4	621438	Die Retainer Pin
	1	70820	**Short Jaw Assembly for 70800, 70800-S, 70801-S, 70805-S, 71810-S**
7	1	70820-BF	Short Jaw
8	2	70322	Die
9	4	621438	Spring Type Straight Pin
10	1	70835	Stop Bolt
11	1	792172	Washer
12	1	612976	Nut
	1	71997	**Short Jaw Assembly for 71812-S, 71814-S, 71816-S, 71818**
7	1	71997-BF	Short Jaw
8	1	70322	Die
9	2	621438	Spring Type Straight Pin
	1	71999-S	**Lug Jaw Assembly for 71810-S, 71812-S, 71814-S, 71816-S, 71818**
34	1	71999-S-BF	Lug Jaw Assembly
8	1	70322	Die
-*	2	70614	Screw
-*	2	89125	Nut
2	1	70064	Grease Nipple
14	1	70751	Safety Handle
9	2	70752	Spring Type Straight Pin
	1	72000	**Hinge Jaw Assembly for 71810-S, 71812-S, 71814-S, 71816-S, 71818**
35	1	72000-BF	Hinge Jaw
2	1	70064	Grease Nipple
	1	72001	**Hinge Jaw Assembly for 71810-S, 71814-S**
35	1	72001-BF	Hinge Jaw
2	1	70064	Grease Nipple
	1	70840-S	**Latch Assembly for 70800, 70800-S, 70801-S, 70805-S**
	1	71966-S	**Latch Assembly for 71810-S, 71812-S, 71814-S, 71816-S, 71818**
16	1	70840-BF	Latch for 70800, 70800-S, 70801-S, 70805-S
16	1	71996-BF	Latch for 71810-S, 71812-s
14	1	70751	Safety Handle
15	2	70752	Spring Type Straight Pin
17	1	70842	Latch Spring Plunger
18	1	70742	Spring Type Straight Pin
2	1	70064	Grease Nipple

39	1	612518	Protection Cap
40	1	612530-9	Marking Point
		70861	**Hinge Pin Assembly for 71810-S, 71812-S, 71814-S, 71816-S, 71818**
31	1	70862	Hinge Pin
32	1	70863	Hinge Pin Nut
33	1	70864	Split Pin
	1	70775	**Hanger Assembly for 70800, 70801-S, 71710-S, 71812-S**
	1	70770	**Hanger Assembly for 70800-S**
	1	70775-4	**Hanger Assembly for 70805-S**
19	1	70774	Hanger for 70800, 70801-S, 71810-S, 71812-S
19	1	70771	Hanger for 70800-S
19	1	70774-1	Hanger for 70805-S
20	1	70652	Balancing Screw
21	1	70652-2	Screw
22	1	70652-3	Nut
23	1	70654	Suspension Ring
24	1	70655	Screw
25	2	70655-1	Hanger Jam Nut
26	1	70655-5	Screw
27	1	70113	Nut
28	2	752836	Washer
29	1	70655-6	Linch Pin
31	4	70862	Hinge Pin
30	1	70860	Latch Spring
32	4	70863	Hinge Pin Nut
33	4	70864	Split Pin

* Not shown in drawing

5.3.12 BV-100 Lug Jaw and Hinge Jaw Assemblies

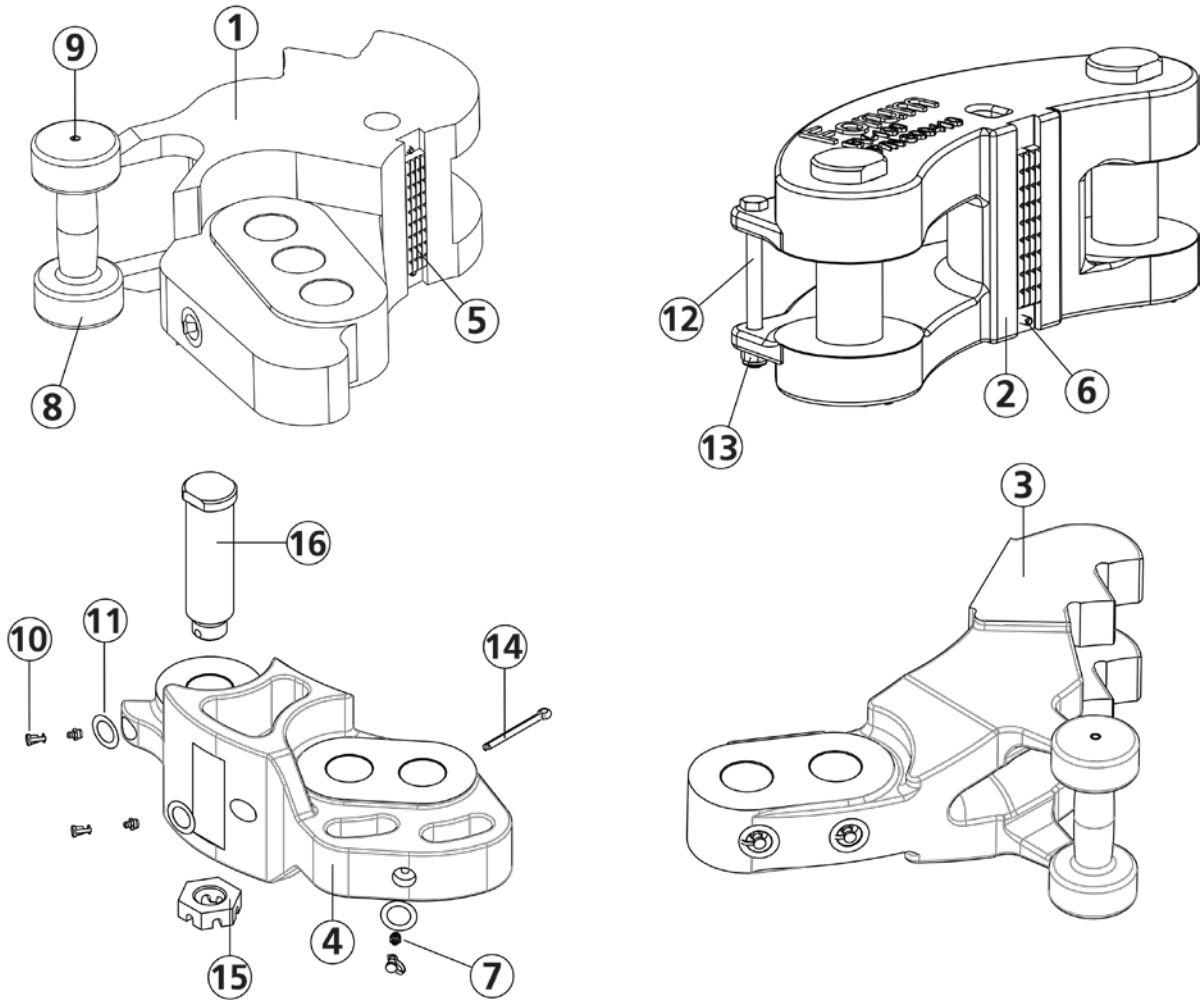


Fig. 61: Drawings of Lug Jaw and Hinge Jaw Assemblies

Parts list for BV-100 Lug Jaw and Hinge Jaw Assemblies

Pos.	P/N	Description	70880-S	70882-S	70883-S	70884-S	70885-S	70886	800430-S	
									800410	800420-S
1	70880-BF	Lug Jaw	1	1	1	1	1	-	-	-
2	800410-BF	Extended Hinge Jaw	-	-	-	-	-	-	1	-
3	800420-BF	Extended Lug Jaw	-	-	-	-	-	-	-	1
4	70886-BF	Hinge Jaw	-	-	-	-	-	1	-	-
5	70322	Die	1	-	-	-	-	-	1	-
6	621438	Spring Type Straight Spring	2	-	-	-	-	-	2	-
7	70064	Grease Nipple	3	-	-	-	-	3	-	2
8	70751	Safety Handle	1	1	1	1	1	-	-	1
9	70752	Spring Type Straight Spring	2	2	2	2	2	-	-	2
10	612518	Protection Cap	3	-	-	-	-	3	-	2
11	612530-3	Marking Point	3	-	-	-	-	3	-	2
12	612008	Screw	-	-	-	-	-	-	1	-
13	650218-5	Nut	-	-	-	-	-	-	1	-
14	70864	Split Pin	-	-	-	-	-	1	2	-
15	70863	Hinge Pin Nut	-	-	-	-	-	1	2	-
16	70862	Hinge Pin	-	-	-	-	-	1	2	-

5.3.13 BV-100-H Kit

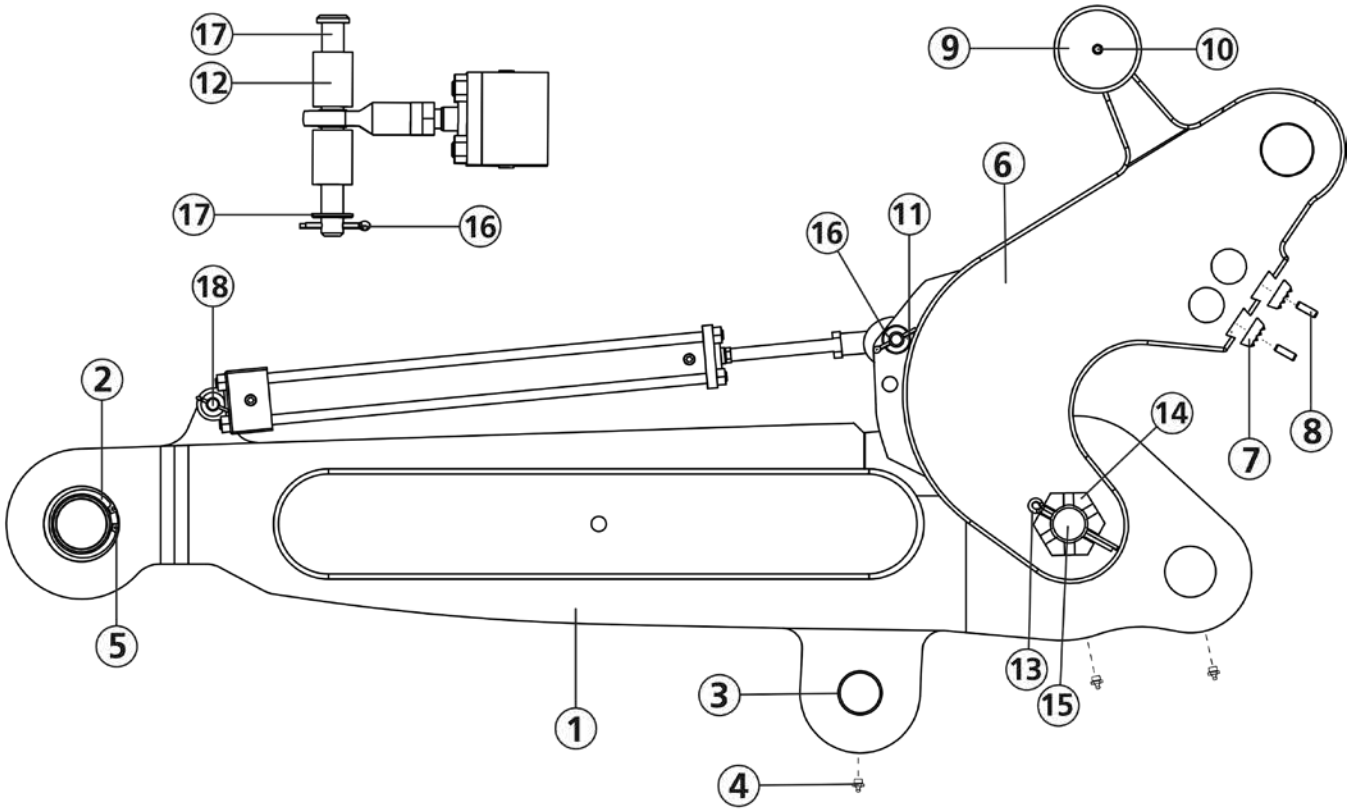


Fig. 62: BV-100-H Kit

The Cylinder ist not part of the delivery and is used for illustrative purposes only.

SERVICE

Parts list for BV-100-H (71890-H)

Pos.	Qty.	P/N	Description
	1	70811-H	**Lever Assembly**
1	1	70811-H-BF	Lever
2	1	71891	Radial Hinge Bearings
3	1	71892	Wrapped Bushes
4	3	70064	Grease Nipple
5	2	71895	Retaining Ring
	1	800403-H	**Long Jaw Assembly**
6	1	800403-BF	Long Jaw
7	2	70322	Die
8	4	621438	Spring Type Straight Pin
9	1	70751	Safety Handle
10	2	70752	Spring Type Straight Pin
11	1	80340-1	Split Pin
12	2	800403-3	Cylinder Mount Bushing
13	1	70864	Split Pin
14	1	70863	Hinge Pin Nut
15	1	70862	Hinge Pin
16	1	725274	Split Pin
17	1	70815	Washer
18	1	800403-2	Pin

5.3.14 BV-100-H Type Series

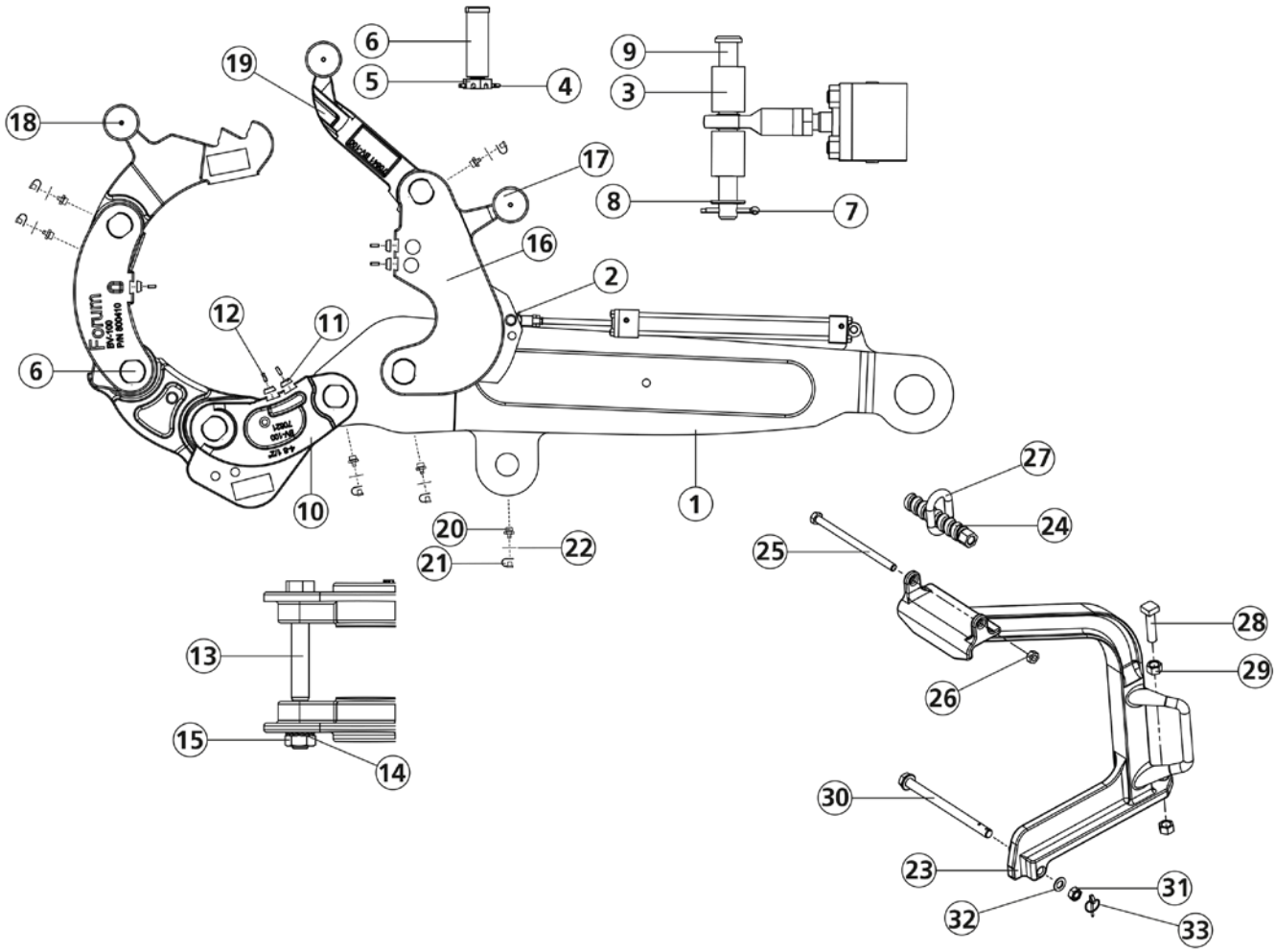


Fig. 63: BV-100-H Type Series

Parts list for BV-100-H (70800-S-H)

Pos.	Qty.	P/N	Description
	1	71890-H	**Extended Tong Hydraulik Kit**
1	1	70811-H	Lever
2	1	80340-1	Split Pin
3	2	800403-3	Cylinder Mount Bushing
4	1	70864	Split Pin
5	1	70863	Hinge Pin Nut
6	1	70862	Hinge Pin
7	1	725274	Split Pin
8	1	70815	Washer
9	1	800403-2	Pin
	1	70820	**Short Jaw Assembly**
10	1	70820-BF	Short Jaw
11	2	70322	Die
12	4	621438	Spring Type Straight Pin
13	1	70835	Stop Bolt
14	1	792172	Washer
15	1	612976	Nut
	1	800403-H	Long Jaw Assembly
16	1	800403-BF	Long Jaw
11	2	70322	Die
12	4	621438	Spring Type Straight Pin
17	1	70751	Safety Handle
18	2	70752	Spring Type Straight Pin
	1	70840-S	**Latch Assembly**
19	1	70840-BF	Latch
17	1	70751	Safety Handle
18	2	70752	Spring Type Straight Pin
-*	1	70842	Latch Spring Plunger
-*	1	70742	Spring Type Straight Pin
20	1	70064	Grease Nipple
21	1	612518	Protection Cap
22	1	612530-9	Marking Point
	1	70775	**Standard Hanger Assembly**
23	1	70774	Standard Hanger
24	1	70652-BF	Balancing Screw
25	1	70652-2	Hexagon Head Bolt
26	1	70652-3	Nut
27	1	70654	Suspension Ring
28	1	70655	Screw
29	2	70655-1	Hanger Jam Nut
30	1	70655-5	Screw
31	1	70113	Nut
32	2	752836	Washer
33	1	70655-6	Linch Pin
-*	2	710025	Screw
-*	2	752338	Castle Nut
-*	8	612679	Washer
-*	1	725274	Split Pin
6	4	70762	Hinge Pin
4	4	70864	Split Pin
5	4	70863	Hinge Pin Nut
-*	1	70860	Latch Spring
-*	1	752301	Safety Spring
-*	1	643801	Wire line
-*	2	643801-11	Wire Line Clamp
-*	1	660414-1	Eye Screw
-*	2	643801-1	Rope Clamp

* Not shown in drawing

5.3.15 BV-100C Type Series

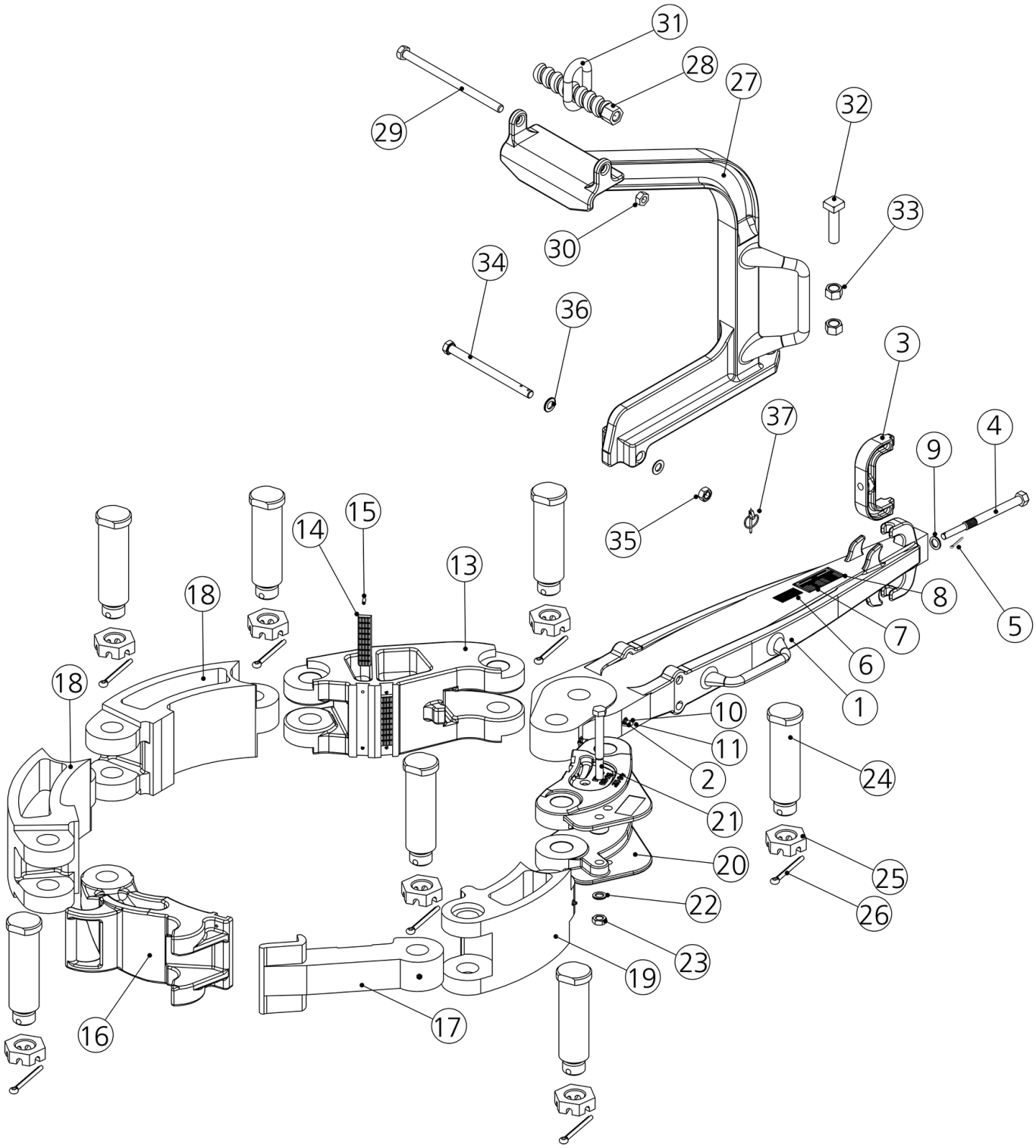


Fig. 64: BV-100C Type Series

Parts list for BV-100C (71808, 71810-S, 71812-S, 71814-S, 71816-S, 71817, 71822, 71822-S, 71823-S, 71824-S)

Pos.	Qty.	P/N	Description
		71808	BV-100C Manual Casing Head Tong (End of Lifetime)
		71810-S	BV-100C Manual Casing Head Tong
		71812-S	BV-100C Manual Casing Head Tong
		71814-S	BV-100C Manual Casing Head Tong
		71816-S	BV-100C Manual Casing Head Tong
		71817	BV-100C Manual Casing Head Tong (End of Lifetime)
		71822	BV-100C Manual Casing Head Tong (End of Lifetime)
		71822-S	BV-100C Manual Casing Head Tong
		71823-S	BV-100C Manual Casing Head Tong
		71824-S	BV-100C Manual Casing Head Tong (End of Lifetime)
	1	70810	**Lever Assembly for all types**
1	1	70810-BF	Lever
2	2	70064	Grease Nipple
3	1	70812	Tong Line Retainer
4	1	70813	Tong Line Retainer Bolt
5	1	70814	Split Pin
6	1	70887	Warningplate
7	1	70888	Identification Plate
8	8	70900	Grooved Pin With Round Head
9	1	70815	Washer
10	2	612530-9	Marking Point
11	2	612518	Protection Cap
	1	71998	**Long Jaw Assembly for all types**
12	1	71998-BF	Long Jaw
13	2	70322	Die
14	4	621438	Spring Type Straight Pin
	1	71999-S	**Lug Jaw Assembly for all types**
16	1	71999-S-BF	Lug Jaw
13	1	70322	Die
*	2	70614	Screw
*	2	89125	Nut
2	1	70064	Grease Nipple
*	1	70751	Safety Handle
*	2	70752	Spring Type Straight Pin
	1	71996-S	**Latch Assembly for all types**
17	1	71996-BF	Latch
2	1	70064	Grease Nipple
*	1	70751	Safety Handle
*	2	70752	Spring Type Straight Pin
	1	72000	**Hinge Jaw Assembly for 71810-S, 71812-S, 71816-S, 71817, 71822, 71822-S, 71823-S, 71824-S**
18	1	72000-BF	Hinge Jaw
2	1	70064	Grease Nipple
	1	72001	**Hinge Jaw Assembly for 71808, 71810-S, 71823-S**
19	1	72001-BF	Hinge Jaw
2	1	70064	Grease Nipple
	1	70820	**Short Jaw Assembly for 71808, 71810-S**
20	1	70820-BF	Short Jaw
13	2	70322	Die
14	4	621438	Spring Type Straight Pin
21	1	70835	Stop Bolt
22	1	792172	Washer
23	1	612976	Nut
	1	71997	**Short Jaw Assembly for 71812-S, 71814-S, 71816-S, 71817, 71822, 71822-S, 71823-S**
20	1	71997-BF	Short Jaw
13	2	70322	Die
14	4	621438	Spring Type Straight Pin
	6	70861	**Hinge Pin Assembly for all types**
24	1	70862	Hinge Pin
25	1	70863	Hinge Pin Nut
26	1	70864	Split Pin
		70650	**Hanger Assembly for 71808, 71817, 71822**
27	1	70651-BF	Hanger
28	1	70652-BF	Balancing Screw
29	1	70652-2	Screw

SERVICE

Pos.	Qty.	P/N	Description
30	1	70652-3	Nut
37	1	752339	Split Pin
31	1	70654	Suspension Ring
32	1	70655	Screw
33	2	70655-1	Hanger Jam Nut
34	1	70655-3	Screw
35	1	70113	Nut
		70775	**Hanger Assembly for 71810-S71812-S, 71814-S, 71816-S, 71822-S, 71823-S, 71824-S**
27	1	70774	Hanger
28	1	70652-BF	Balancing Screw
29	1	70652-2	Screw
30	1	70652-3	Nut
31	1	70654	Suspension Ring
32	1	70655	Screw
33	2	70655-1	Hanger Jam Nut
34	1	70655-5	Screw
35	1	70113	Nut
36	2	752836	Washer
37	1	70655-6	Linch Pin

* Not shown in drawing

5.3.16 BV-100C-H kit

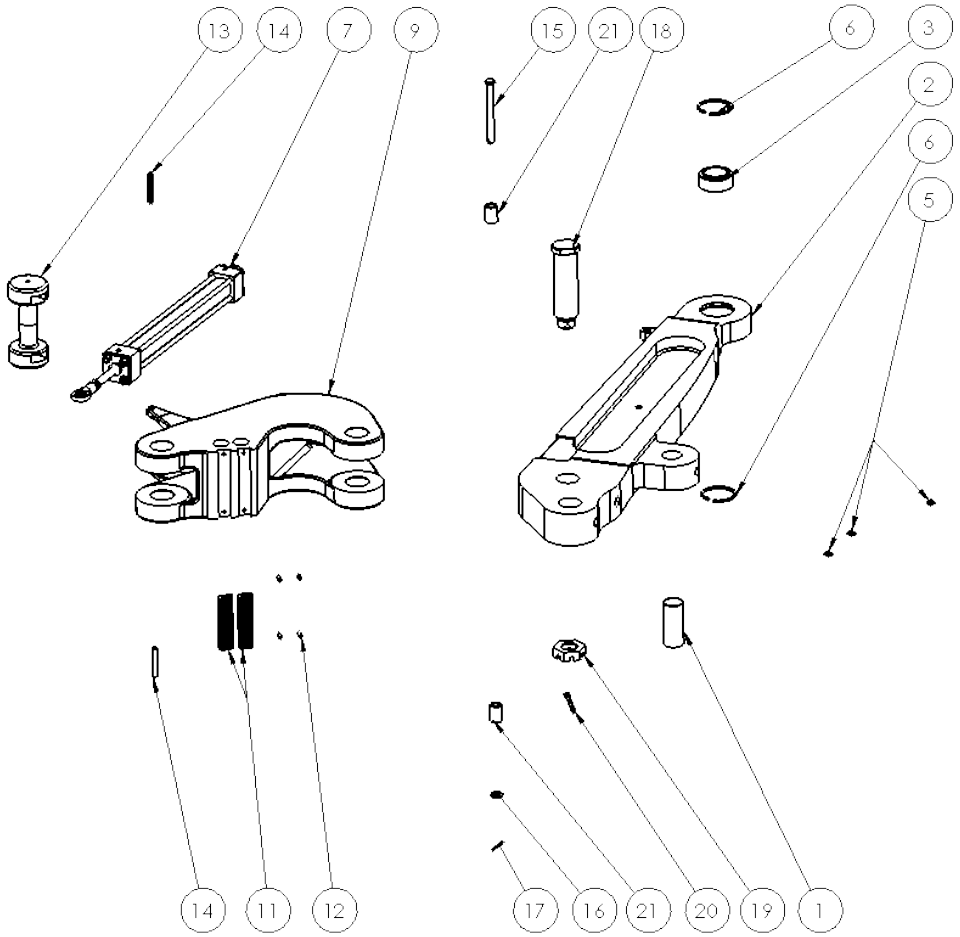


Fig. 65: BV-100C-H kit

Parts lists for BV-100C-H (71890-1-H)

Pos.	Qty.	P/N	Description
1	1	71892	Bushing
2	1	70711-BF	Lever
3	1	71891	Pivoting Bearing
5	3	700064	Grease Nipple
6	2	71895	Retaining Ring
9	1	71998-H	Long Jaw
11	2	70322	Tong Die
12	4	621438	Dowel Pin
13	1	70751	Safety Handle
14	2	70752	Spring Type Pin
15	1	800403-2	Pin
16	1	70815	Washer
17	1	725274	Cotter Pin
18	1	70862	Hinge Pin
19	1	70863	Hinge Pin Nut
20	1	70864	Cotter Pin
21	2	800403-3	Bushing for Cylinder Mount
-*	1	70811-H	Lever Assembly
-*	1	71998-S-H	Long Jaw Assembly

* Not shown in drawing

5.3.17 WRT®-35 Type Series

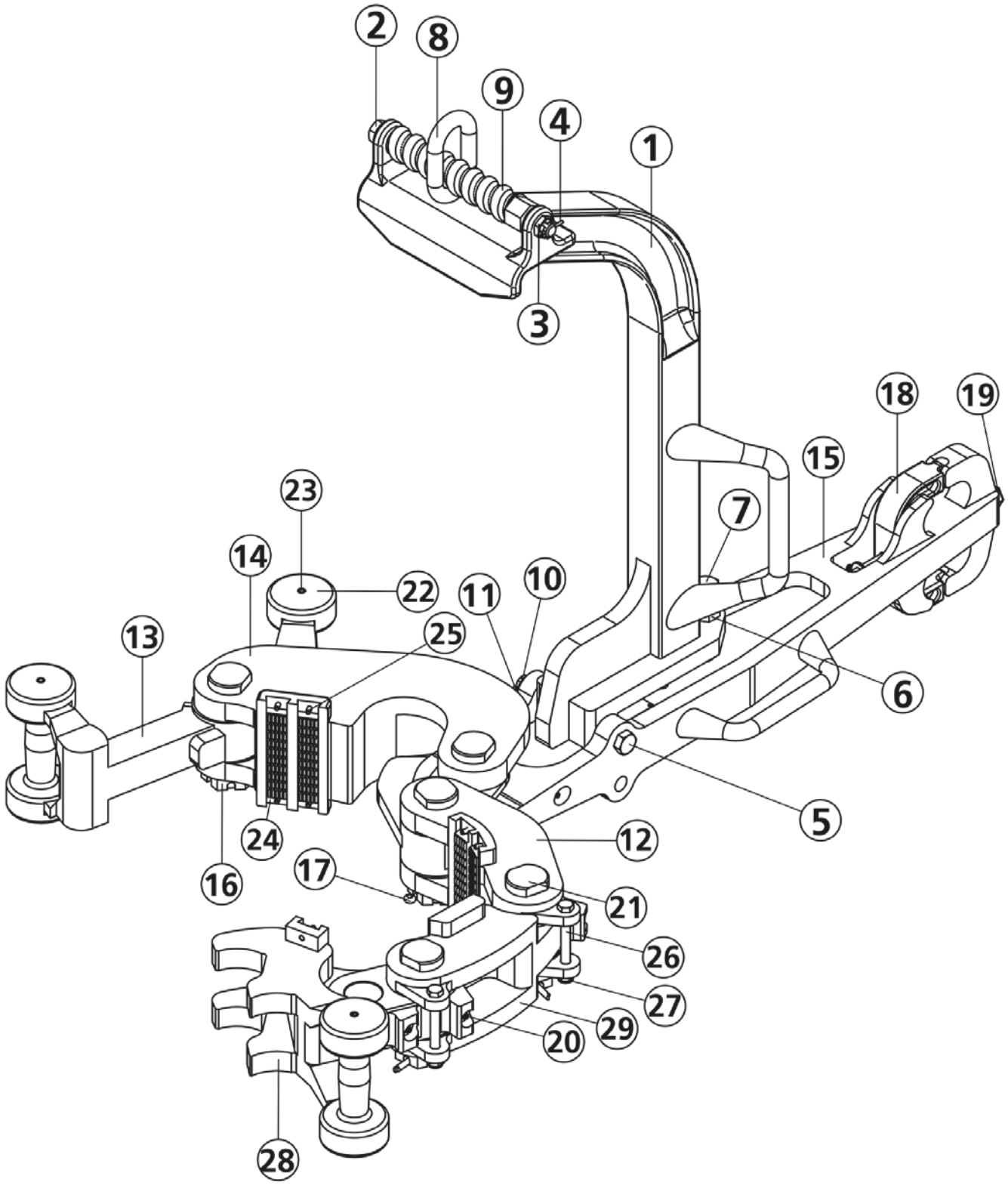


Fig. 66: WRT® 35 type series

Parts list for WRT®-35 (800100-1, 800101-S, 800120-S)

Pos.	Qty.	P/N	Description
		800100-S	Tong Complete With Long Lever and Standard Hanger
		800101-S	Tong Complete With Short Lever and Standard Hanger
		800120-S	Tong Complete With Short Lever and Standard Hanger
1	1	70774-1	Short Hanger
2	1	70652-2	Hexagon Head Bolt
3	1	70652-3	Nut
4	1	70655-6	Linch Pin
5	1	70655-5	Screw
6	2	70655-1	Hanger Jam Nut
7	1	70655	Screw
8	1	70654	Suspension Ring
9	1	70652-BF	Balancing Screw
10	1	70113	Nut
11	2	752836	Washer
12	1	800106-BF	Short Jaw
13	1	800104-BF	Latch
14	1	800103-BF	Long Jaw
15	1	800101-BF	Long Lever for 800100-S
15	1	800102-BF	Short Lever for 800101-S, 800120-S
16	4	70863	Hinge Pin Nut
17	4	70864	Split Pin
-*	1	800111	Spring
18	1	70812	Tong Line Retainer
19	1	70813	Tong Line Retainer Bolt
-*	1	70814	Split Pin
-*	1	70815	Washer
20	3	70064	Grease Nipple
21	4	800108	Hinge Pin
-*	4	70900	Grooved Pin With Round Head
-*	1	800114	Identification Plate
22	2	70751	Safety Handle
23	2	70752	Spring Type Straight Pin
24	4	70322	Die
25	8	621438	Spring Type Straight Pin
-*	1	800109	Latch Spring Plunger
-*	1	70742	Spring Type Straight Pin
26	1	87551-4	Screw
27	1	650218-5	Nut

* Not shown in drawing

Parts list for WRT®-35 Lug Jaw and Hinge Jaw Assemblies

Pos.	P/N	Description	800105-S	800107
28	800105-BF	Lug Jaw	1	-
29	800107	Hinge Jaw	1	1
24	70322	Die	1	-
25	621438	Spring Type Straight Pin	2	-
20	70064	Grease Nipple	2	1
22	70751	Safety Handle	1	-
23	70752	Spring Type Straight Pin	-	-
16	70863	Hinge Pin Nut	-	1
17	70864	Split Pin	-	1
26	87551-4	Screw	-	1
27	650218-5	Nut	-	1

5.3.18 WRT®-55 Type Series

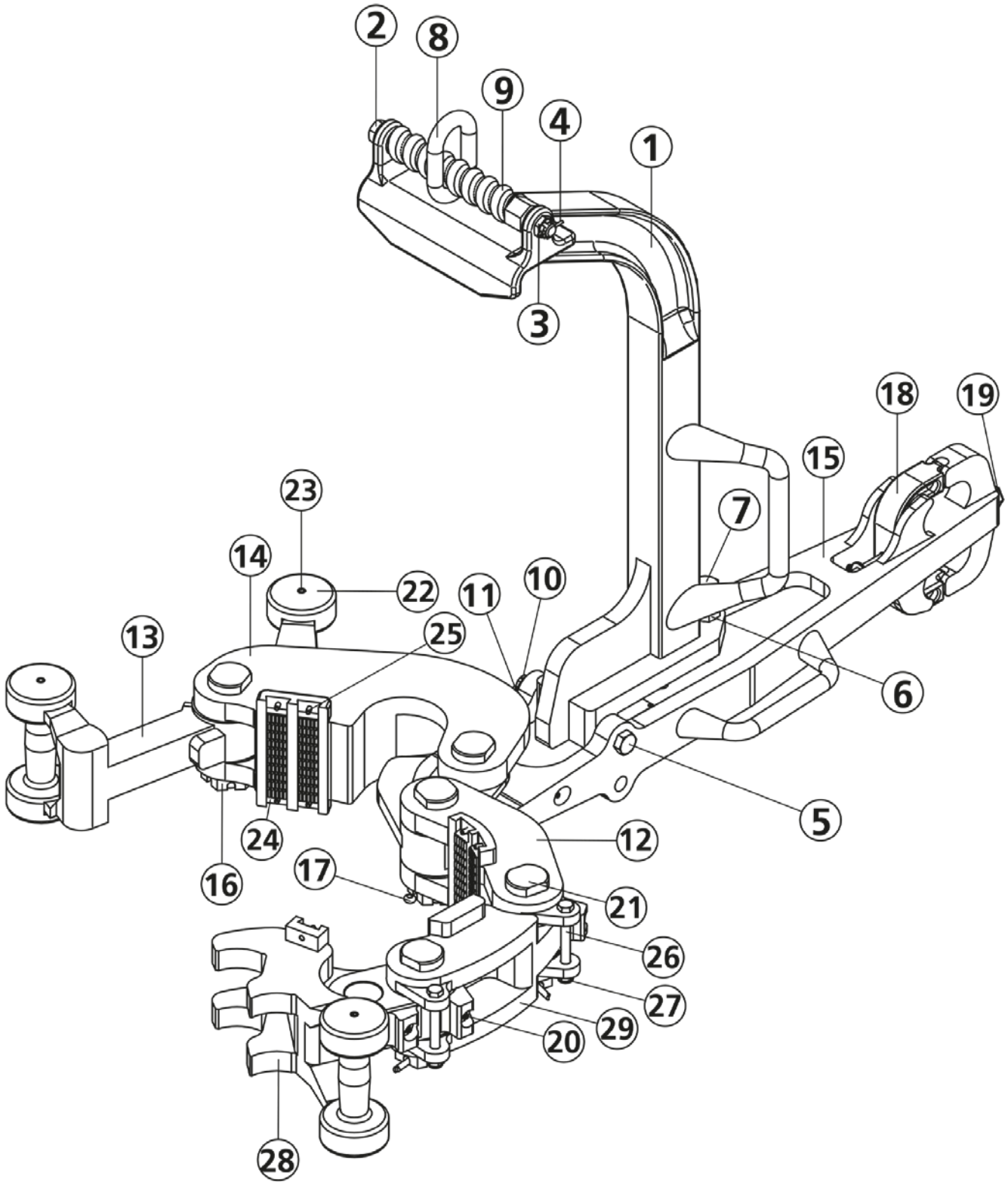


Fig. 67: WRT®-55 Type Series

Parts list for WRT®-55 (800200-S, 800201-S)

Pos.	Qty.	P/N	Description
		800200-S	Tong Complete With Long Lever and Standard Hanger
		800201-S	Tong Complete With Short Lever and Standard Hanger
15	1	800201-BF	Lever for 800200-S
15	1	800202-BF	Lever for 800201-S
14	1	800203-BF	Long Jaw
13	1	800204-BF	Latch Jaw
12	1	800206-BF	Short Jaw
21	4	800208	Hinge Pin
18	1	70812	Tong Line Retainer
19	1	70813	Tong Line Retainer Bolt
-*	1	70814	Split Pin
-*	1	70815	Washer
20	3	70064	Grease Nipple
-*	4	70900	Grooved Pin With Round Head
-*	1	800214	Identification Plate
24	3	70622	Die
25	3	621438	Spring Type Straight Pin
22	2	70751	Safety Handle
23	4	70752	Spring Type Straight Pin
-*	1	70842	Latch Spring Plunger
-*	1	70742	Spring Type Straight Pin
-*	1	800111	Spring
26	1	70727	Screw
27	1	70726	Nut
1	1	70774	Standard Hanger
9	1	70652R	Balancing Screw
2	1	70652-2	Hexagon Head Bolt
3	1	70652-3	Nut
8	1	70654	Suspension Ring
7	1	70655	Screw
8	2	70655-1	Hanger Jam Nut
5	1	70655-5	Screw
-*	1	70113	Nut
10	2	752836	Washer
11	1	70655-6	Linch Pin
17	4	70864	Split Pin
16	4	70863	Hinge Pin Nut

* Not shown in drawing

Parts list for WRT®-55 Lug Jaw and Hinge Jaw Assemblies

Pos.	P/N	Description	800210-S	800220-S	800230-S	800207-S
28	800210-BF	Lug Jaw	1	-	-	-
28	800220-BF	Lug Jaw	-	1	-	-
28	800230-BF	Lug Jaw	-	-	1	-
29	800207	Hinge Jaw	-	-	-	1
22	70751	Safety Handle	1	1	1	-
23	70752	Spring Type Straight Pin	2	2	2	-
24	70622	Die	1	-	-	-
25	621438	Spring Type Straight Pin	2	-	-	-
20	70064	Grease Nipple	3	2	-	1
16	70863	Hinge Pin Nut	-	-	-	1
17	70864	Split Pin	-	-	-	1
26	87551-4	Screw	-	-	-	1
27	650218-5	Nut	-	-	-	1

5.3.19 WRT®-55C Type Series

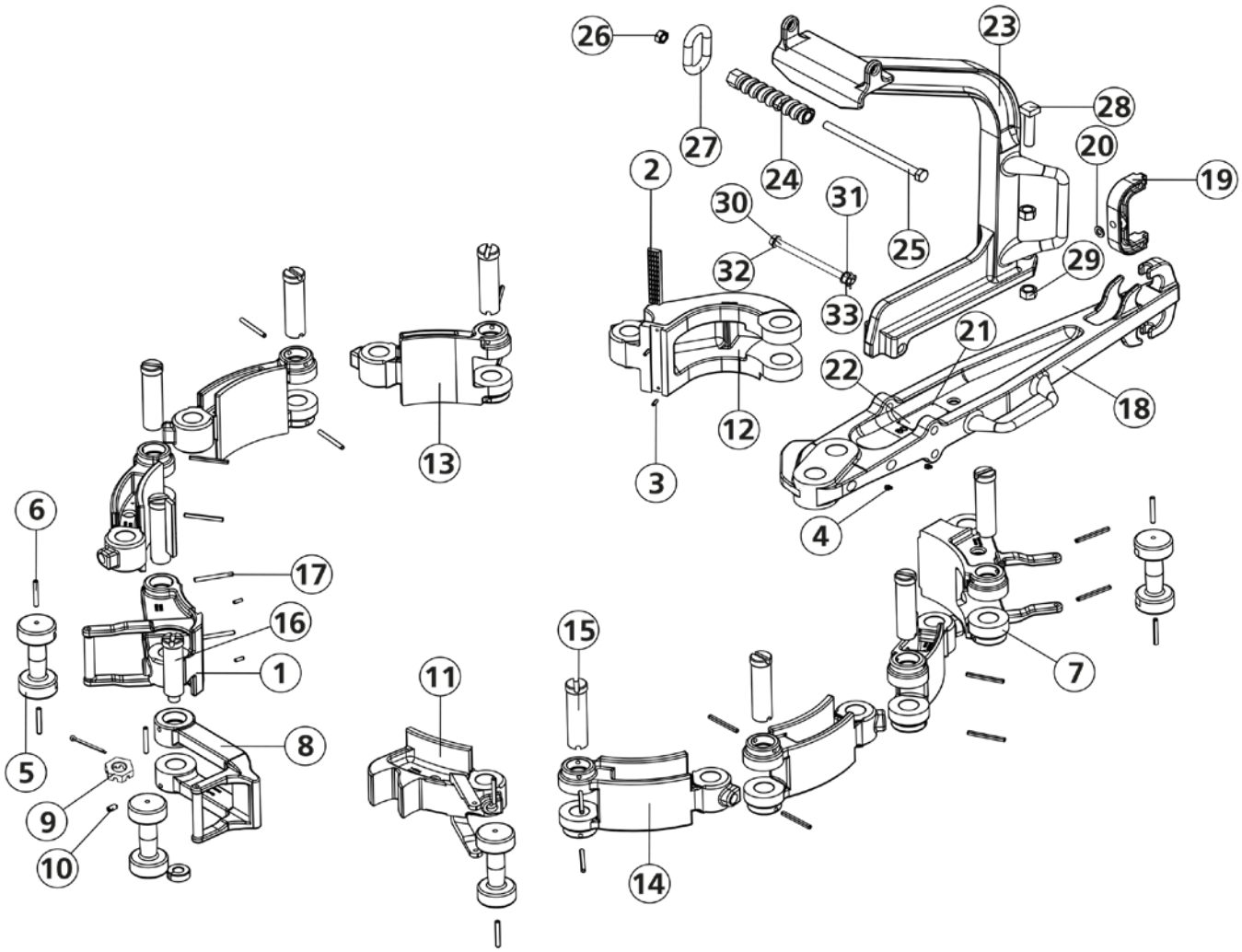


Fig. 68: WRT®-55C Type Series

Parts list for WRT®-55C (800250-S, 71600-S)

Pos.	Qty.	P/N	Description
		800250-S	Tong Complete With Long Lever and Casing Head
		71600-S	Tong Complete With Long Lever and Casing Head
	1	71620-S	**Latch Jaw Assembly for all devices**
1	1	71620-BF	Latch Jaw
2	1	70622	Die
3	2	621438	Spring Type Straight Pin
4	1	70064	Grease Nipple
5	1	70751	Safety Handle
6	2	70752	Spring Type Straight Pin
	1	800306-S	**Short Jaw Assembly for all devices**
7	1	800306-BF	Short Jaw
5	1	70751	Safety Handle
6	2	70752	Spring Type Straight Pin
	1	70660-S	Latch Assembly Assembly
8	1	70660-BF	Latch
9	1	70625	Hinge Pin Nut
10	1	70626	Set screw
5	1	70751	Safety Handle
6	2	70752	Spring Type Straight Pin
	1	71680-S	**Lug Jaw Assembly for all devices**
11	1	71680-BF	Lug Jaw
4	1	70064	Grease Nipple
5	1	70751	Safety Handle
6	2	70752	Spring Type Straight Pin
	1	800303	**Long Jaw Assembly for all devices**
12	1	800303-BF	Long Jaw
2	1	70622	Die
3	2	621438	Spring Type Straight Pin
4	1	70064	Grease Nipple
	1	71686	**Hinge Jaw Assembly for all devices**
13	1	71686-BF	Hinge Jaw
4	1	70064	Grease Nipple
	1	71687	**Hinge Jaw Assembly for all devices**
14	1	71687-BF	Hinge Jaw
4	1	70064	Grease Nipple
-*	2	70671	Latch Spring
15	4	70672	Hinge Pin
16	1	70673	Hinge Pin
17	9	70674	Spring Type Straight Pin
	1	800201	**Lever Assembly for 800250-S**
	1	70610	**Lever Assembly for 71600-S**
18	1	800201-BF	Lever for 800250-S
18	1	70610-BF	Lever for 71600-S
19	1	70812	Tong Line Retainer
*	1	70813	Tong Line Retainer Bolt
*	1	70814	Split Pin
20	1	70815	Washer
4	2	70064	Grease Nipple
21	4	70900	Grooved Pin With Round Head
22	1	800214	Identification Plate
	1	70775	**Hanger Assembly for 800250-S**
	1	70770	**Hanger Assembly for 71600-S**
23	1	70774	Hanger for 800250-S
30	1	70771	Hanger for 71600-S
24	1	70652-BF	Balancing Screw
25	1	70652-2	Hexagon Head Bolt
26	1	70652-3	Nut
27	1	70654	Suspension Ring
28	1	70655	Screw
29	2	70655-1	Hanger Jam Nut
30	1	70655-5	Screw
31	1	70113	Nut
32	2	752836	Washer
33	1	70655-6	Linch Pin

* Not shown in drawing

5.3.20 WRT®-135 Type Series

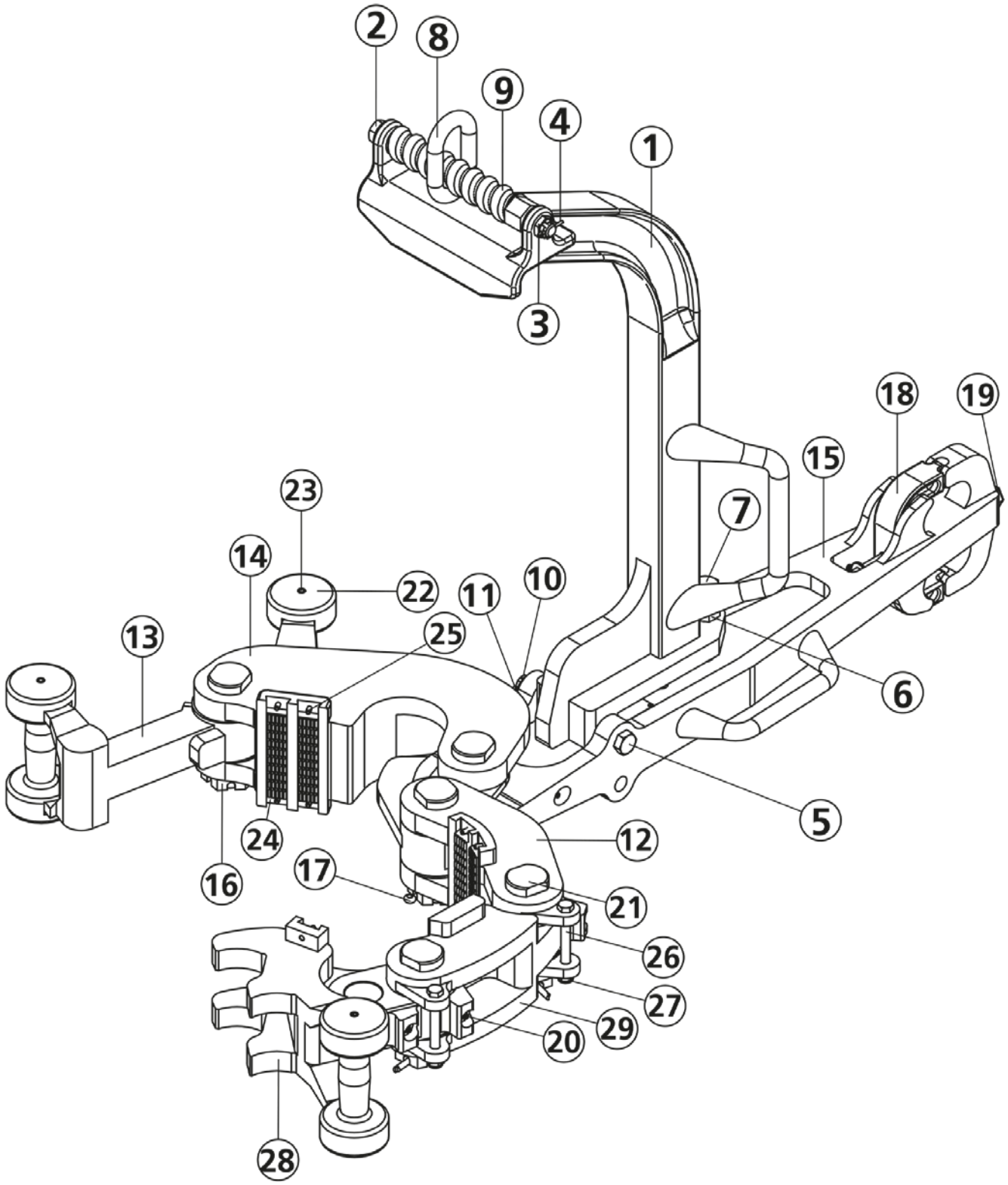


Fig. 69: WRT®-135 Type Series

Parts lists for WRT®-135 (800500-S)

Pos.	Qty.	P/N	Description
	1	800501	**Long Lever Assembly**
15	1	800501-BF	Lever
18	1	70812	Tong Line Retainer
19	1	70813	Tong Line Retainer Bolt
-*	1	70814	Split Pin
-*	1	70815	Washer
20	2	70064	Grease Nipple
-*	1	800110	Identification Plate
-*	4	70900	Grooved Pin With Round Head
	1	800503-S	**Long Jaw Assembly**
14	1	800503-BF	Long Jaw
24	2	70622	Die
25	4	621438	Spring Type Straight Pin
22	1	70751	Safety Handle
23	2	70752	Spring Type Straight Pin
	1	800504-S	**Latch Jaw Assembly**
13	1	800504-BF	Latch Jaw
-*	1	70842	Latch Spring Plunger
-*	1	70742	Spring Type Straight Pin
20	1	70064	Grease Nipple
22	1	70751	Safety Handle
23	2	70752	Spring Type Straight Pin
-*	1	70860	Latch Spring
	1	800506	**Short Jaw Assembly**
12	1	800506-BF	Short Jaw
24	1	70622	Die
25	2	621438	Spring Type Straight Pin
26	1	70724	Screw
27	1	70726	Nut
	1	70775	**Hanger Assembly**
1	1	70774	Standard Hanger
9	1	70652-BF	Balancing Screw
2	1	70652-2	Hexagon Head Bolt
3	1	70652-3	Nut
8	1	70654	Suspension Ring
7	1	70655	Screw
6	2	70655-1	Hanger Jam Nut
5	1	70655-5	Screw
10	1	70113	Nut
-*	2	752836	Washer
11	1	70655-6	Linch Pin
21	4	800508	Hinge Pin
16	4	800511	Nut
17	4	70864	Split Pin

* Not shown in drawing

Parts list for WRT®-135 Lug Jaw Assemblies

Pos.	P/N	Description	800510-S	800520-S
28	800510-BF	Lug Jaw	1	-
28	800520-BF	Lug Jaw	-	1
22	70751	Safety Handle	1	1
23	70752	Spring Type Straight Pin	2	2
24	70622	Die	1	1
25	621438	Spring Type Straight Pin	2	2
20	70064	Grease Nipple	2	2

5.3.21 WRT®-160 Type Series

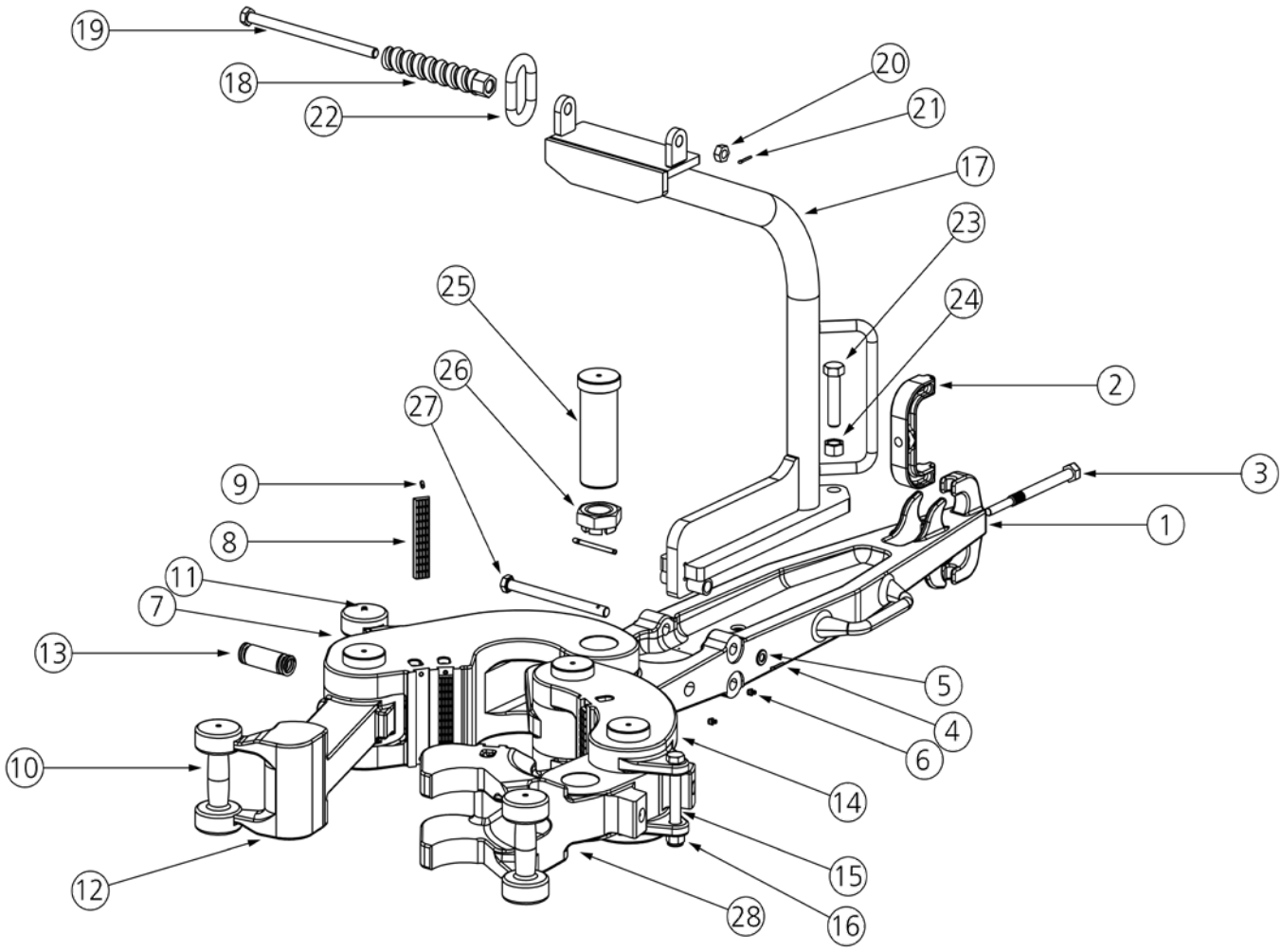


Fig. 70: WRT®-160 Type Series

Parts list for WRT®-160 (800500-S-160)

Pos.	Qty.	P/N	Description
	1	800501	**Lever Assembly**
1	1	800501-BF	Lever
2	1	70812	Tong Line Retainer
3	1	70813	Tong Line Retainer Bolt
4	1	70814	Cotter Pin
5	1	70815	Washer
6	2	70064	Grease Nipple
-*	1	800110	Identification Plate
-*	4	70900	Half Round Grooved Pin
	1	800503-S	**Long Jaw Assembly**
7	1	800503-BF	Long Jaw
8	2	70623	Die Pyramid
9	4	621438	Straight Pin
10	1	70751	Handle for Tongs
11	2	70752	Dowel Pin
	1	800504-S	**Latch Jaw Assembly**
12	1	800504-BF	Latch Jaw
-*	1	70842	Latch Spring Plunger
-*	1	70742	Dowel Pin
6	1	70064	Grease Fitting
10	1	70751	Safety Handle
11	2	70752	Dowel Pin
13	1	70860	Latch Spring
	1	800506	**Short Jaw Assembly**
14	1	800506-BF	Short Jaw
8	2	70623	Die Pyramid
9	2	621438	Straight Pin
15	1	70724	Screw
16	1	70726	Nut
	1	70775	**Standard Hanger Assembly**
17	1	70774	Standard Hanger
18	1	70652R	Balancing Screw
19	1	70652-2	Bolt
20	1	70652-3	Nut
21	1	752339	Cotter Pin
22	1	70654	Suspension Ring
23	1	70655	Hanger Adjustment Screw
24	2	70655-1	Hanger Jam Nut
-*	1	70655-3	Screw
-*	1	70113	Bolt Nut
25	4	800508	Hinge Pin
26	4	800511	Nut
27	4	70864	Cotter Pin
	1	800510-S	**Lug Jaw Assembly**
28	1	800510	Lug Jaw
8	1	70623	Die Pyramid
9	2	621438	Dowel Pin
6	2	70064	Grease Fitting
10	1	70751	Handle for Tongs
11	2	70752	Dowel Pin
	1	800520-S	**Lug Jaw Assembly**
28	1	800520-BF	Lug Jaw
8	1	70623	Die Pyramid
9	2	621438	Dowel Pin
6	2	70064	Grease Fitting
10	1	70751	Handle for Tongs
11	2	70752	Dowel Pin

* Not shown on WRT®-160 Drawing.

5.4 Recommended Spare parts

FORUM Handling Tools recommended spare parts provide a list of potential wear items that may be beneficial to keep on hand for repair and maintenance.

5.4.1 Recommended Spare Parts for WRT®-35

Pos.	Qty.	P/N	Description
23	20	70752	Spring Type Straight Pin
22	10	70751	Handle for Tongs
21	5	800108	Hinge Pin
24	20	70322	Die
- *	40	70323	Die Retainer Pin
25	40	621438	Spring Type Straight Pin
16	5	70863	Hinge Pin Nut
17	20	70864	Split Pin
20	20	70064	Grease Nipple
- *	2	800109	Latch Spring Plunger
- *	2	70742	Spring Type Straight Pin
- *	2	800111	Spring

* Not shown in drawing

5.4.2 Recommended Spare Parts for Type WRT®-55

Pos.	Qty.	P/N	Description
21	4	800208	Hinge Pin
16	4	70863	Hinge Pin Nut
17	20	70864	Split Pin
24	12	70622	Die
25	40	621438	Spring Type Straight Pin
22	12	70751	Safety Handle
23	30	70752	Spring Type Straight Pin
27	4	70726	Nut
26	4	70727	Screw
-*	2	70860	Latch Spring
-*	2	70842	Latch Spring Plunger
-*	2	70742	Spring Type Straight Pin
-*	5	70113	Nut
11	5	70655-3	Screw
8	5	70655-1	Hanger Jam Nut
7	5	70655	Screw
8	5	70654	Suspension Ring
-*	20	752339	Split Pin

* Not shown in drawing

5.4.3 Recommended Spare Parts for Type BV-55C

Pos.	Qty.	P/N	Description
23	1	70670	Lever Hinge Pin Block
7	3	70673	Hinge Pin
6	7	70672	Hinge Pin
- *	17	70674	Spring Type Straight Pin
- *	2	70671	Latch Spring
6**	4	70751	Safety Handle
7**	8	70752	Spring Type Straight Pin
13**	10	70622	Die
14**	20	70323	Die Retainer Pin
2**	10	70064	Grease Nipple

* Not shown in drawing

** See chapter 5.3.7.1 and 5.3.8.1

5.4.4 Recommended Spare Parts for Type BV-55

Pos.	Qty.	P/N	Description
- *	20	70752	Spring Type Straight Pin
- *	10	70751	Handle for Tongs
33	2	70672	Hinge Pin
34	8	70673	Hinge Pin
10	4	70625	Hinge Pin Nut
- *	4	70671	Latch Spring
6	20	70622	Die
7	40	70323	Die Retainer Pin
35	40	70324	Split Pin
- *	20	70064	Grease Nipple
- *	5	70626	Set screw
- *	2	70642	Adjustable Stop

* Not shown in drawing

5.4.5 Recommended Spare Parts for Type BV-57

Pos.	Qty.	P/N	Description
- *	20	70752	Spring Type Straight Pin
- *	10	70751	Handle for Tongs
- *	5	70062	Hinge Pin
- *	20	70622	Die
- *	40	70123	Spring Type Straight Pin
- *	20	70363	Split Pin
- *	20	70064	Grease Nipple
- *	2	70260	Latch Spring

* Not shown in drawing

5.4.6 Recommended Spare Parts for Type BV-65

Pos.	Qty.	P/N	Description
13	20	70752	Spring Type Straight Pin
12	10	70751	Safety Handle
33	5	70762	Hinge Pin
8	20	70622	Die
-*	40	70323	Die Retainer Pin
-*	40	70324	Split Pin
34	5	70863	Hinge Pin Nut
35	20	70864	Split Pin
6	20	70064	Grease Nipple
17	2	70842	Latch Spring Plunger
18	2	70742	Spring Type Straight Pin
30	2	70860	Latch Spring
10	40	621438	Spring Type Straight Pin

* Not shown in drawing

5.4.7 Recommended Spare Parts for Type BV-65-H

Pos.	Qty.	P/N	Description
15	20	70064	Grease Nipple
-*	1	70812	Tong Line Retainer
-*	1	70813	Tong Line Retainer Bolt
5	5	70751	Handle for Tongs;
6	10	70752	Spring Type Straight Pin
3	10	70622	Die
4	20	70323	Die Retainer Pin
-*	20	70324	Split Pin
-*	1	70722-1	Handle
12	1	70842	Latch Spring Plunger
29	1	612916	Hydraulic Cylinder
34	5	70762	Hinge Pin
36	5	70863	Hinge Pin Nut
13	1	70860	Latch Spring
-*	1	752301	Safety Spring

* Not shown in drawing

5.4.8 Recommended Spare Parts for Type BV-80

Pos.	Qty.	P/N	Description
-*	20	70752	Spring Type Straight Pin
-*	10	70751	Safety Handle
15	4	70162	Hinge Pin
16	10	70163	Split Pin
9	20	70622	Die
10	40	70323	Die Retainer Pin
-*	40	70324	Split Pin
10	40	70123	Spring Type Straight Pin
17	20	70064	Grease Nipple
-*	2	70160	Latch Spring
15	20	621438	Spring Type Straight Pin
-*	5	70762	Hinge Pin
-*	5	70863	Hinge Pin Nut
-*	1	70860	Latch Spring
-*	1	752301	Safety Spring

* Not shown in drawing

5.4.9 Recommended Spare Parts for Type BV-100

Pos.	Qty.	P/N	Description
15	20	70752	Spring Type Straight Pin
14	10	70751	Safety Handle
31	5	70862	Hinge Pin
30	2	70860	Latch Spring
32	5	70863	Hinge Pin Nut
33	20	70864	Split Pin
8	20	70322	Die
9	40	70323	Die Retainer Pin
5	40	70324	Split Pin
2	20	70064	Grease Nipple
17	2	70842	Latch Spring Plunger
18	2	70742	Spring Type Straight Pin
9	40	621438	Spring Type Straight Pin

5.4.10 Recommended Spare Parts for Type BV-100C

Pos.	Qty.	P/N	Description
8	20	70752	Spring Type Straight Pin
-*	10	70751	Safety Handle
29	5	70862	Hinge Pin
30	5	70863	Hinge Pin Nut
31	20	70864	Split Pin
7	20	70322	Die
-*	40	70323	Die Retainer Pin
4	40	70324	Split Pin
5	20	70064	Grease Nipple

* Not shown in drawing

5.4.11 Recommended Spare Parts for Type WRT®-135 and WRT®-160

Pos.	Qty.	P/N	Description
23	20	70752	Spring Type Straight Pin
22	10	70751	Safety Handle
21	4	800508	Hinge Pin
24	20	70622	Die
-*	40	70323	Die Retainer Pin
25	40	621438	Spring Type Straight Pin
-*	20	70864	Split Pin
20	20	70064	Grease Nipple
-*	2	70742	Spring Type Straight Pin
-*	2	70860	Latch Spring

* Not shown in drawing

INSPECTION / MAINTENANCE

6 Inspection / Maintenance

Ensure that setup and installation work are accomplished only by sufficiently qualified and trained personnel.

Read these instructions carefully before setting up the & and putting it into service.

⚠ WARNING

Separated hydraulic lines pose an injury hazard!

Hydraulic oil can escape under high pressure.

» ALWAYS relieve pressure in & before performing maintenance work.

WEAR EYE PROTECTION!

WEAR PROTECTIVE HELMET!

WEAR PROTECTIVE GLOVES!

WEAR SAFETY SHOES!

Instructions for inspection and maintenance

1. In the event of visible damage or excessive wear contact the FORUM Handling Tools Service Department or an authorized repair company.
2. Ensure that welding work on cast parts is performed exclusively by the FORUM Handling Tools Service Department or an authorized repair company observing the FORUM Handling Tools welding instructions.
3. Ensure that all other maintenance work is performed only by personnel trained for this work and familiar with the risks involved in operating the &.
4. Ensure that all repair work not performed by FORUM Handling Tools is nevertheless accomplished in compliance with the manufacturer's specifications and instructions.
5. Small cracks and irregularities, which do not affect the safety or proper operation of the Manual Tongs can be removed by grinding (see Critical Areas).
6. After repair always check the repaired part in a suitable manner to ensure that the defect has been remedied.

Prerequisites for maintenance work

1. Ensure that the Manual Tongs is set down on a good supporting surface so that it cannot tip.
2. Provide for sufficient lighting at the workplace.
3. Ensure that & is disconnected from hydraulic system.

Trouble shooting

In all events where the tong function are not as expected, following checks must be carried out to identify the cause.

1. Check all hydraulic connections for proper condition.
2. Check proper lubrication.
3. Check jaw assembly size and installation

⚠ **CAUTION** Never exceed torque rating.

⚠ **CAUTION** Always pull at 90 degrees.

⚠ **CAUTION** Tongs should hang level.

6.1 Lubrication

⚠ WARNING

Lubricants can pose a health hazard!

Lubricants irritate skin and eyes.

» Avoid contact with lubricants.

WEAR EYE PROTECTION!

WEAR PROTECTIVE GLOVES!

The Manual Tongs are supplied with lubrication nipples to apply grease manually by a grease gun.

When the tool is in use, the following lubrication procedure should be performed daily or as inspection indicates.

DO NOT APPLY GREASE TO:

» Back side of Inserts

» Contact area of insert with pipe (Slip Assembly inside)

Insert contact areas are NEVER not to be treated with Grease.

» Use a waxy anti corrosion protection like CORROFERN VL.

6.1.1 Lubrication Intervals

Lubrication points must be lubricated at least once each day with one of the specified lubricants. The lubrication requirement can be higher depending on the conditions of use.

6.1.2 Lubrication points

All Lubrication points are marked with a red circles.
To ease lubrication all lubrication points are equipped with grease nipples. The grease nipple will protect the lubrication points against dirt and humidity and provide a· standardized connection to the grease gun.

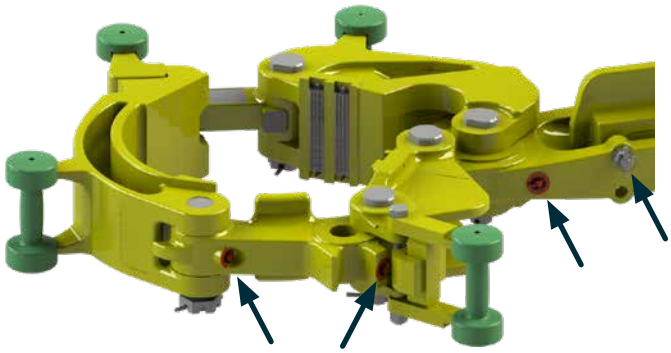


Fig. 71: Lubrication points I

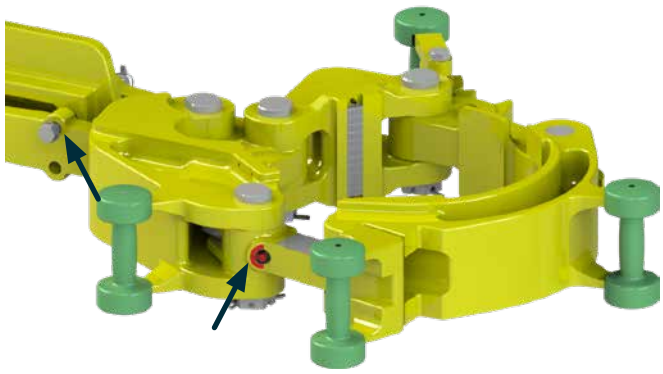


Fig. 72: Lubrication points II

6.2 Inspections

Perform inspections in compliance with API RP 7 at specified intervals and in inspection categories. Otherwise the frequency of required inspections is dependent on the conditions of use of the &.

Shut off the & and disconnect the hydraulic connections before performing an inspection.

Before inspection remove all foreign material such as dirt, paint, lubricants, oil, abrasion, etc. from the affected parts. Use suitable methods such as stripping off paint, steam cleaning, sand blasting, etc.

After an operating inspection the scope and results of the tests performed should be documented.

Periodic inspections and inspections following critical assignments should be accomplished at the operating location by the operators under the supervision of a supervisor.

In the event of cracks, excessive wear, etc. contact FORUM Handling Tools or an authorized service company.

INFO

The specified maintenance intervals are recommended for the Manual Tongs during its service life. The necessity of inspections depends primarily on the following conditions:

- Ambient conditions
- Load cycles
- Regulatory requirements
- Period of use
- Tests
- Repairs
- Overhauls

6.2.1 Inspection of Hydraulic Equipment

Check the hydraulic equipment daily for leakage. If unacceptably high leakage occurs internally or externally contact FORUM Handling Tools or an authorized service company.

6.2.2 Inspection Following Critical Loads

Perform an inspection IMMEDIATELY following any critical or unexpected loads. Critical loads could be:

- Loads resulting from shock when the drill pipe wedges,
- Pulling wedged drill strings,
- Holding heavy drill pipes / drill strings
- Jarring
- Operation at very low ambient temperatures (<-20 °C / -4 °F).

6.2.3 Inspection Following Removal

Generally the Manual Tongs should be inspected immediately before it is taken out of service temporarily or stored.

Moreover it should be inspected before putting back into service.

- It is necessary to disassemble the Manual Tongs in an appropriately equipped workshop to check for excessive wear, deformation, cracks and other damage.
- Perform repair work only in compliance with the manufacturer's recommendations. These are available from FORUM Handling Tools.
- Ensure that welding work on cast parts is accomplished only by FORUM Handling Tools or an authorized service company in compliance with the welding specifications issued by FORUM Handling Tools.
- If the field inspection indicates that further inspection work is required, remove the Manual Tongs and have it inspected in an appropriately equipped workshop.
- Check carefully for visible wear and material fatigue.

Inspection Intervals

Category	Interval	Preparatory measures
I	Daily	- Manual Tongs in working environment.
II	Weekly	- Manual Tongs on workspace.
III	Semi-annually	- Manual Tongs on workspace. - Manual Tongs disassembled.
IV	Every 1 years	- Manual Tongs on workspace. - Manual Tongs disassembled.

INFO

The above-mentioned inspection intervals refer to a 100% use of the Manual Tongs on each day of a week (24 / 7).

Personal inspection intervals may vary according to the type and extent of use and may need to be adjusted.

All inspection categories are in accordance with the latest API RP 8B.

6.3 Inspection Categories

Always perform a complete inspection according to the instructions in Categories III or IV before AND after critical loads (see Chapter 6.3.2).

INFO

Inspection categories acc. to API RP 7L.

6.3.1 Inspection Category I

This category consists of observing the & during operation for signs of inadequate operation.

Scope/Prerequisites

- During operation check the & daily for visible damage such as cracks, breaks, loose connecting elements and oBVious signs of wear.

Procedure:

- Visual check.
- Put all parts indicating such signs out of service and check for proper function.
- Ensure that this check is accomplished by a person with appropriate technical knowledge.

6.3.2 Inspection Category II

Category II includes additional tests not included in Category I inspections.

Scope/Prerequisites

- Check for signs of corrosion, deformation, loose or missing parts, aging processes, proper lubrication, externally visible cracks and adjustment work.

Procedure:

- Category II inspections may require removal of certain parts to assess the wear limits according to the specified tolerances.

6.3.3 Inspection Category III

Category III includes additional tests not included in Category II inspections.

Scope/Prerequisites

- Before inspection remove all foreign material such as dirt, paint, lubricants, oil, abrasion, etc. from the affected parts. Use suitable methods such as stripping off paint, steam cleaning, sand blasting, etc.

Procedure:

- Non-destructive testing (NDT) is required in critical areas as well as removal of certain parts to determine the wear limits according to the specified tolerances.

6.3.4 Inspection Category IV

In addition to the inspections in Category III, Category IV includes removal of all primary, load-bearing parts for non-destructive testing (NDT).

Scope/Prerequisites

- Appropriately equipped workshop
- Remove all primary load-bearing parts or parts critical for operation to such an extent that complete inspection is possible.
- Inspect all parts for excessive wear, cracks, deformation and other damage
- in critical areas as well as removal of certain parts to determine the wear limits according to the specified tolerances

Procedure:

- Ensure that all tests are performed according to the manufacturer's specifications.
- Before inspection remove all foreign material such as dirt, paint, lubricants, oil, abrasion, etc. from the affected parts. Use suitable methods such as stripping off paint, steam cleaning, sand blasting, etc.

6.4 Check list for Inspection

INFO

The following check lists serve as copy templates for inspections to be performed in compliance with API 7L and are required to file performed inspections as defined in the user manual [„6.6 Inspection Intervals and Inspection Tasks“ on page <ÜS>]

Ensure that maintenance work is accomplished only by sufficiently qualified and trained personnel.

Model

Serial number

☐ **Inspection Category I**

Date / Place of Inspection	Checked OK	Checked NOK	Name of Inspection Operator / Supervisor	Sign.
	☐	☐		

Remarks:

☐ **Inspection Category II**

Date / Place of Inspection	Checked OK	Checked NOK	Name of Inspection Operator / Supervisor	Sign.
	☐	☐		

Remarks:

☐ **Inspection Category III**

Date / Place of Inspection	Checked OK	Checked NOK	Name of Inspection Operator / Supervisor	Sign.
	☐	☐		

Remarks:

☐ **Inspection Category IV**

Date / Place of Inspection	Checked OK	Checked NOK	Name of Inspection Operator / Supervisor	Sign.
	☐	☐		

Remarks:

6.5 Inspection Intervals and Inspection Tasks

Pos.	Task / Interval	Daily	Weekly	6 Monthly	1 Year
1	Ongoing observation • Ongoing cleaning. • Check visible surface of body and Dies for damages. • [Check for loose fittings, cylinder, valves and leaks.] • Visual check for correct seat of the hanger line. • Visual check check for availability and good readability of placards. • Check function of Tong as a whole.	✔	✔	✔	✔
2.	Grease all grease points and check state of lubrication	✔	✔	✔	✔
3.	Check function of • Latch engagement on lugs of Jug Law. • [Cylinder]. • Un/ Clamping.	!	✔	✔	✔
4.	Check for loose items, especially on: • Shafts, bolts, retainers, screws, nuts, washers, springs.	!	✔	✔	✔
5.	Check for audible noises from the bearings and gearings, which may indicate damages.	✗	!	✔	✔
6	Check presence and condition of dies. (clean and brush tong for inspection)	✗	!	✔	✔
7.	Visual check for Cracks, Breaks, Elongation, Corrosion, Damages or wear on • Hinges and Pins in Cover, Body and Guide Plates. • Lifting Eyes. » Change all defective parts/ components.	✗	!	✔	✔
8.	[Visual Check of Hydraulic system] • Check all lines and couplings/ components for tightness and condition. • Check for leakages of lines. » Change all defective parts/ components.	✗	!	✔	✔
9.	Check parts for wear according to allowable tolerances.	✗	✗	!	✔
10.	[Hydraulic system replacement/ check] • Replace all hoses and fittings. • Check condition of valves and cylinder and replace, if required. • Check condition of pipes and replace, if required.	✗	✗	✗	!
11.	Perform NDT testing on all primary-loadcarrying components	✗	✗	✗	!

✔ **Necessary** ! **Safety task! Take out of Service for repair, if NOK!** ✗ **Not necessary**

Ensure that maintenance work is accomplished only by sufficiently qualified and trained personnel.

INFO

NDT Non-destructive testing

- Magnetic Particle Inspection (MPI)
- Ultrasonic Measurement Methods (UT)
- Eddy Current Testing (ET)
- Dye Penetrant Inspection (DPI)

6.6 Measuring of wear

It is oBVious that a visual inspection is not enough to check a Manual Tongs.
To measure link ears it is necessary to use callipers and a ruler.

Significant wear is restricted to the top link ear, it is here that the measurement is taken.

Hinge Pins, Latch Pins and socket holes are not normally measured for wear in the field. When it becomes apparent that the Hinge or Latch Pins have more tolerances, the elevator should be dismantled for general engineering check up.

6.6.1 Preventive Maintenance

A regular preventive maintenance program should be established for all tongs. Written maintenance procedures should be given to the crew or maintenance personal. Care should be taken by instruction plates and warning labels. They should not be missing, damaged or illegible.

6.6.1.1 Proper Repairs

Repairs, which are not performed by Blohm + Voss Oil Tools, should be made in accordance with methods or procedures approved by Blohm + Voss Repair GmbH

Minor cracks or defects, which may be removed without reducing safety or operation of the tong, can be removed by grinding. Following the repair, the part should again be inspected by an appropriate method to insure, the defect has been completely removed.

6.6.1.2 Beyond Repair

If the manual tong or parts of it are defective beyond repair, it should be taken out of service.

6.6.2 Critical Areas

Check critical areas shown according to inspection check lists.

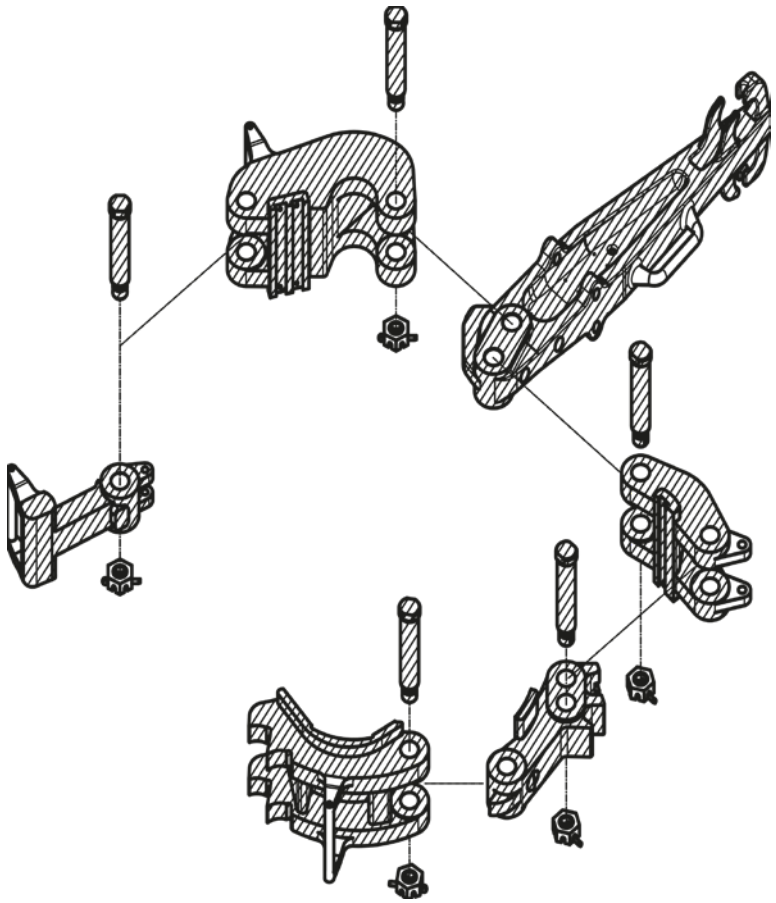


Fig. 73: Critcal areas

6.6.3 Wear data for components

Maximum allowable wear

Next table shows the maximum allowable wear to maintain 100 % torque rating.

Deterioration of Equipment

Normal wear in the course of use will eventually lead to taking the manual tong out of service and the replacement of worn components.

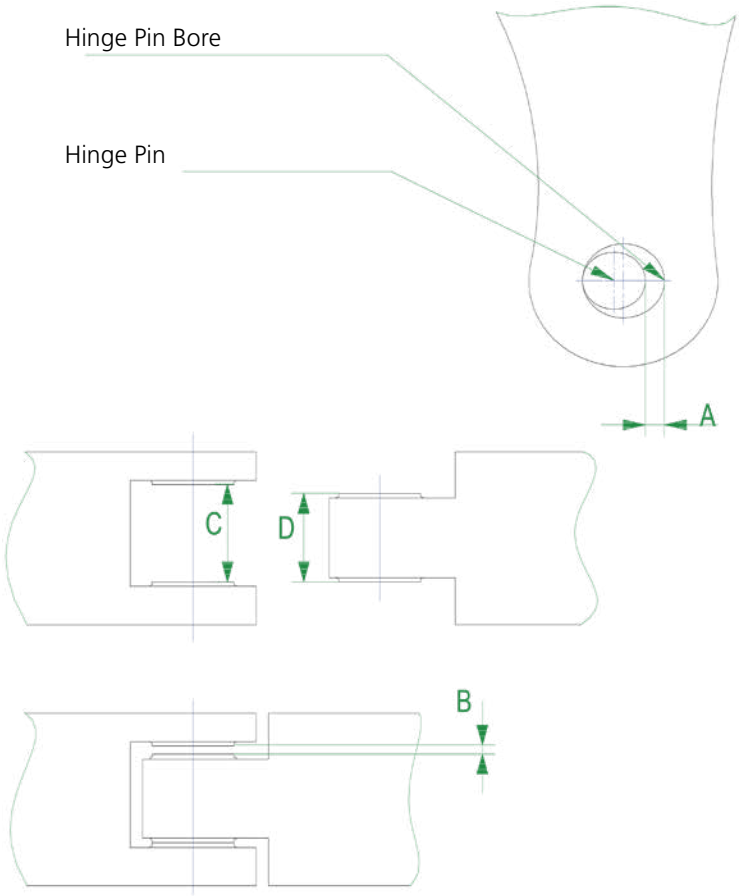


Fig. 74: Wear dimension measurement points

Tong Type	Dimension A Maximum clearance WORN	NEW Diameter Hinge Pin	NEW Diameter Bore for Pin	Dimension B Maximum clearance WORN	Dimension C (new machined)	Dimension D (new machined)
BV-35	0,64			0,8		
maximum		38,05	38,162		63,8	63,5
minimum		38,011	38,1		63,6	63,3
BV-37	0,64			1,6		
maximum		38,05	38,162		76,8	75,8
minimum		38,011	38,1		76,6	75,6
BV-55	0,64			1,4		
maximum		44,4	44,512		76,6	75,8
minimum		44,361	44,45		76,4	75,6
BV-55c	0,64			1,4		
maximum		44,4	44,512		76,6	75,8
minimum		44,361	44,45		76,4	75,6
BV-57	0,89			1,6		
maximum		44,4	44,512		76,8	75,8
minimum		44,361	44,45		76,6	75,6
BV-65	0,89			1,2		
maximum		47,55	47,662		76,8	76,2

Tong Type	Dimension A Maximum clearance WORN	NEW Diameter Hinge Pin	NEW Diameter Bore for Pin	Dimension B Maximum clearance WORN	Dimension C (new machined)	Dimension D (new machined)
minimum		47,511	47,6		76,6	76,0
BV-80	0,89			1,6		
maximum		50,74	50,874		76,8	75,8
minimum		50,694	50,8		76,6	75,6
BV-100	1,14			1,2		
maximum		50,74	50,874		76,8	76,2
minimum		50,694	50,8		76,6	76,0
BV-100C	1,14			1,2		
maximum		50,74	50,874		76,8	76,2
minimum		50,694	50,8		76,6	76,0
WRT®-35	0,65			1,2		
maximum		45,2	45,5		60,5	60,0
minimum		45,1	45,4		60,3	59,8
WRT®-55	0,9			1.2		
maximum		47,4	47,7		70,5	70
minimum		47,3	47,6		70,3	69,8
WRT®-135	1,2			1.2		
maximum		69,8	70,1		90,5	90
minimum		69,7	70,0		90,3	79,8
BV65 H	1,14			1,2		
maximum		50,74	50,874		76,8	76,2
minimum		50,694	50,8		76,6	76,0
BV100 H	1,14			1,2		
maximum		50,74	50,874		76,8	76,2
minimum		50,694	50,8		76,6	76,0
BV100C H	1,14			1,2		
maximum		50,74	50,874		76,8	76,2
minimum		50,694	50,8		76,6	76,0

6.7 Cleaning

⚠ WARNING

Health hazards from service products!

Splashes of diluted drilling mud and small parts.

» ALWAYS wear your personal protective equipment.

WEAR EYE PROTECTION!

WEAR PROTECTIVE GLOVES!

The operating conditions and operating environment result in contamination on the Manual Tongs. Remove this contamination regularly to prevent incrustation and ensure safe operation of the &.

To clean shut off the Manual Tongs, disconnect from hydraulic system and lift out of rotary table. Remove upper ring and slip assembly.

6.7.1 Time of Cleaning

Clean contamination from drilling from the Manual Tongs regularly. The & should be cleaned thoroughly at the end of each shift at the latest.

6.7.2 Procedure and Cleaning Agents

FORUM Handling Tools recommends cleaning the Manual Tongs with a high pressure steam cleaner.

Use it to clean the body and jaw assembly thoroughly from inside and outside.

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STORAGE / DISPOSAL

7 Storage / Disposal

7.1 Storage

Storage procedure

1. Store the equipment on a pallet located on an even, supporting surface.

» Observe the weight specifications in the technical data.

2. Ensure that the equipment is stored so that no person can be injured by moving parts or sharp edges.
3. Secure the equipment with tensioning cables or in another manner to prevent it from slipping or tipping when moved.
4. Lubricate the equipment as described in section “Lubrication”.
5. Conserve all bare metal surfaces. FORUM Handling Tools recommends the use of a lubricant or Tectyl.

» These surfaces should be checked periodically to be sure that no corrosion has occurred.

6. Protect the equipment against water penetration with a plastic tarp

Intermediate Storage	
Protection of equipment	• Clean the equipment roughly. • Apply lubricant to all bare surfaces (e.g. cylinder). • Protect all other bare surfaces with Tectyl Type 864 or an equivalent agent. • Place Manual Tongss only on surrounded pallets and secure them with tensioning cables and anti-slip mat.
Ambient Conditions	• Store in dry surroundings (maximum humidity 80%).

Longer Storage	
Protection of equipment	• Clean the equipment carefully and thoroughly. • Apply lubricant to all bare surfaces (e.g. cylinder). • Protect all other bare surfaces with Tectyl Type 864 or an equivalent agent. • Place Manual Tongss only on surrounded pallets and secure them with tensioning cables and anti-slip mat. • Protect the Manual Tongs against water penetration with a plastic tarp. • Drain the hydraulic oil, if applicable.
Ambient Conditions	• Store in dry surroundings (maximum humidity 80%).

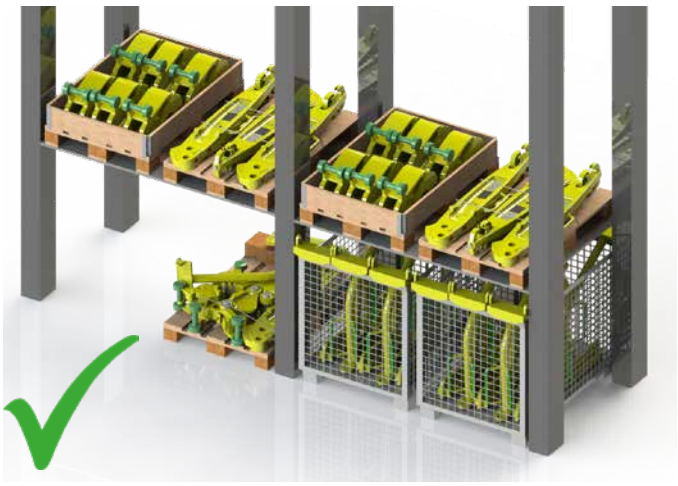

Fig. 75: Correct storage example I

Fig. 76: Correct storage example II

Fig. 77: Correct storage example III

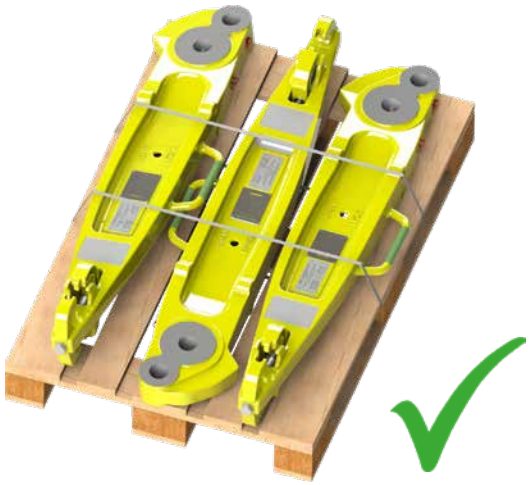

Fig. 78: Correct storage example IV

Fig. 79: Incorrect storage example

7.2 Disposal

When used properly the Equipment does not pose any hazard for users or the environment.

However, operation of FORUM Handling Tools equipment requires use of hydraulic fluids, lubricants and/or cleaning agents, which can pollute the environment. For this reason always ensure that such substances are disposed of properly in accordance with international, national and local regulations.

Never dispose of hydraulic fluids, oils, lubricants, oily cleaning rags or oily water together with industrial or domestic wastes.

Observe the safety data sheets published by the manufacturers on environmental hazards and disposal of the service and operating products used.

Ensure that all service and operating products as well as replacement parts are disposed of safely and ecologically.

Please note specifically that FORUM Handling Tools is not obligated to take back used equipment.

List of Service Products Used

The Safety Data Sheets on the service products used are included in the appendix to this operating manual.

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APPENDIX

8 Appendix

A. Sample of EC Declaration hydraulic Tong

FORUM B + V Oil Tools GmbH

EC-DECLARATION OF CONFORMITY

We, **FORUM B + V Oil Tools GmbH**
Hermann-Blohm-Strasse 2
20457 Hamburg / Germany

declare that the products: **Hydraulic Operated Tongs BV-65-H, BV-100-H**

which is the subject of this declaration, fulfils all of the relevant requirements of:

2006/42/EC	Machinery Directive
2014/34/EC	ATEX Directive of Equipment for use in hazardous areas

Amongst others following harmonized and technical standards and specifications were used:

API 7K, 6. Edition	Specification for Drilling and Well Servicing Equipment
DIN EN ISO 13535	Petroleum and natural gas industries - Drilling and well-servicing equipment
DIN EN ISO 12100	Safety of machinery, Risk assessment and Risk Reduction
DIN EN ISO 80079-36	Non-electrical equipment for use in potentially explosive atmospheres

Description of Product:

The following named lifting accessory will be described in more detail in the accompanying Data Book and/or certificate and the associated Technical Documentation

Product / Device Type:	[refer to data book]
Rated Capacity:	[refer to data book]
Part Number:	[refer to data book]
Serial Number:	[refer to data book]
Delivery date:	[refer to data book]
Order No.:	[refer to data book]
Marking:	CE Ex II 2G T6

The Engineering Manager of FORUM B + V Oil Tools GmbH, Hermann-Blohm-Strasse 2, 20457 Hamburg, Germany, is authorized to compile the technical files. Documents in accordance to Directive 2014/34/EU Article 13 (1) b) ii) have been deposit at the notified body IBExU - Institut fur Sicherheitstechnik GmbH, Fuchsmühlenweg 7, D-09599 Freiberg, Notified Body No. 0637, reference IB-14-6-001/200, Archive-No. 219/14. FORUM B + V Oil Tools has established a quality assurance system in accordance to ISO 9001 and API 01 approved by API Quality Registrar, Washington D.C./USA, Registration No. 2850 + 01-2769.

Hamburg, issued on [refer to data book]

Authorized Representive Name Matthias Theiss
Position Managing Director

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Tax-No.: 46/722/02375, VAT-ID. No.: DE 294 745 990
Banking: HSBC Trinkaus & Burkhardt AG
BIC / SWIFT: TUBD DE DD XXX
EUR-Acc.: IBAN: DE73 3003 0880 0012 8350 19
USD-Acc.: 401 / 2835 / 006 / IBAN: DE50 3003 0880 4012 8350 06
14.09.2017

Fig. 80: EC Certificate of Conformity Sample

B. Third Party Documents

I Safety Data-Sheet

Material Name	Link to file
[Aerosol] Krylon Paint Aerosols	
[Aerosol] Rust O Leum Paint Aerosols	
[Hydraulic Fluid] Aral Vitam GF 32	
[Hydraulic Fluid] Citgo AW 68	
[Hydraulic Fluid] Conoco Megaflow AW 32 68	
[Hydraulic Fluid] Shell Tellus S2 M 32	
[Hydraulic Fluid] Shell Tellus S2 M 68	
[Hydraulic Fluid] Shell Tellus S2 V 15	
[Hydraulic Fluid] Shell Tonna S2 M 68	
[Lubricant] Buster 2007	
[Lubricant] AVIATICON FETT XRF	
[Lubricant] KO5	
[Lubricant] Lubrimatic Multipurpose Lithium	
[Lubricant] MasterPro Hi Temp WB	
[Lubricant] Mobil CM L	
[Lubricant] Mystik JT 6 Multi purpose #2	
[Lubricant] Permatex 767 Anti Seize Lubricant	
[Lubricant] Shell Gadus S2 V220 2	
[Lubricant] Shell Stamina RLS 2	
[Lubricant] Sprayon LU 100 White Lithium	
[Lubricant] Super S Hi Temp Red	
[Lubricant] Thermaplex Hi Temp Bearings	

Material Name	Link to file
[Paint] Paint Gallon	
[Paint] Paint Marker	
[Paint] Paint Marking Ink	
[Paint] Ruthless Paint and Varnish Remover	
[Paint] Startex Paint Thinner	
[Paint] Uni Paint Markers	
[Safety adhesive] Loctite 242 Threadlocker	
[Safety adhesive] Loctite 262 (High Strength)	
[Safety adhesive] Loctite 515 Gasket Eliminator	
[Safety adhesive] Loctite Clover Compound	
[Safety adhesive] Loctite Silver Grade Anti Seize	

II Components

Component Name	Link to file
[Safety Washer] NordLock	
[Lifting] RUD VRS Starpoint	
[Lifting] RUD VLBG Load Ring	

Our goal is to become the leading provider of mission critical oilfield products and related services in terms of customer satisfaction, safety and financial performance.

Our experienced management team and employees are dedicated to solving our customers' problems. We invest in long term relationships and cooperate on product development with our clients, we consider them our partners.

OUR CORE VALUES

Integrity:	In everything we do, in every interaction, both internally and externally, we strive to operate with the upmost integrity and mutual respect.
Customer focused:	Our products enhance our customer's performance and we listen to their needs and work with them to solve their challenges.
Good place to work:	We are committed to creating a workplace that fosters innovation, teamwork and pride. Every team member is integral to our success and is treated equally and fairly.
No one gets hurt:	The safety of our employees and customers is our first priority coupled with a healthy respect for the environment.

FORUM™
ENERGY TECHNOLOGIES

FORUM Handling Tools

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