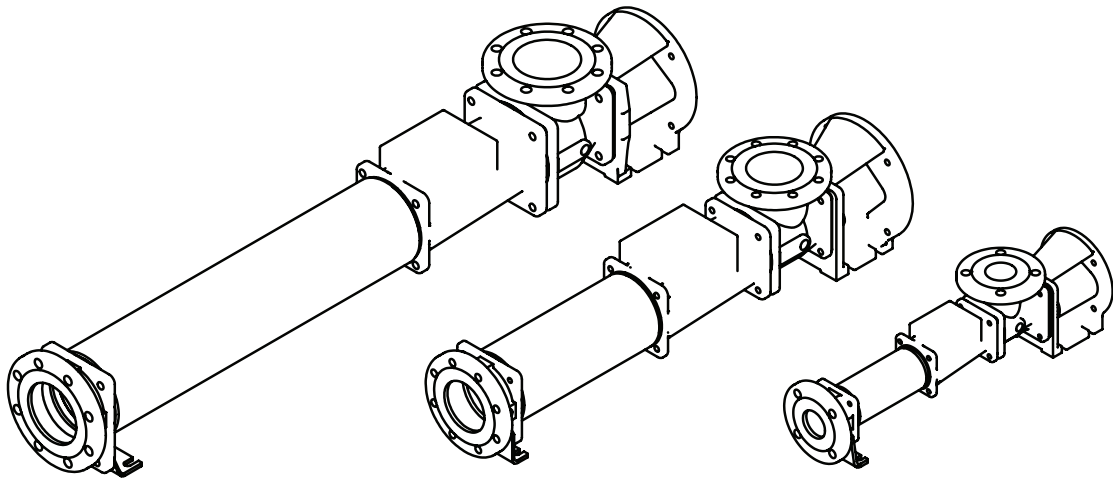


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## PC Transfer Pump

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1299-00



**EN: Declaration of Conformity**  
**DE: Konformitätserklärung**  
**FR: Déclaration de Conformité**  
**ES: Declaración de Conformidad**  
**IT: Dichiarazione di conformità**  
**NL: Overeenkomstigheidsverklaring**  
**SV: Försäkran om överensstämmelse**  
**NO: Samsvarserklæring**  
**FI: Vaatimustenmukaisuusvakuutus**  
**RU: Заявление о соответствии**

EN: Manufacturer / Address:	IT: Costruttore / Indirizzo:	NO: Produsent / Adresse:
DE: Hersteller / Adresse:	NL: Fabrikant / Adres:	FI: Valmistaja / Osoite:
FR: Fabricant / Adresses:	SV: Tillverkare / Adress:	RU: Изготовитель / Адрес
ES: Fabricante / Dirección:		

Sulzer Pump Solutions Ireland Ltd. / Clonard Road, Wexford, Ireland.

**EN: Name and address of the person authorised to compile the technical file to the authorities on request:**  
**DE: Name und Adresse der Person, die berechtigt ist, das technische Datenblatt den Behörden auf Anfrage zusammenzustellen:**  
**FR: Nom et adresse de la personne autorisée pour générer le fichier technique auprès des autorités sur demande:**  
**ES: Nombre y dirección de la persona autorizada para compilar a pedido el archivo técnico destinado a las autoridades:**  
**IT: Il nome e l'indirizzo della persona autorizzata a compilare la documentazione tecnica per le autorità dietro richiesta:**  
**NL: Naam en adres van de persoon die geautoriseerd is voor het op verzoek samenstellen van het technisch bestand:**  
**SV: Namn och adress på den person som är auktoriserad att på begäran utarbeta den tekniska dokumentationen till myndigheterna:**  
**NO: Navn og adresse på den personen som har tillatelse til å sette sammen den tekniske filen til myndighetene ved forespørsel:**  
**FI: Viranomaisten vaatiessa teknisten tietojen lomaketta lomakkeen valtuutetun laatijan nimi ja osoite:**  
**RU: Ф.И.О и адрес лица, уполномоченного составлять техническую документацию по требованию органов власти:**

James Wall,  
 Head of Product Safety and Regulations Flow Equipment,  
 Sulzer Management AG,  
 Neuwiesenstrasse 15,  
 8401 Winterthur,  
 Switzerland.

**EN: Declare under our sole responsibility that the products:**  
**DE: Erklärt eigenverantwortlich, daß die Produkte:**  
**FR: Déclarons sous notre seule responsabilité que les produits:**  
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**NO: Erklærer på eget ansvar, at følgende produkter:**  
**FI: Vakuutamme yksinomaan omalla vastuullamme, että seuraavat tuotteet:**  
**RU: Заявляем со всей полнотой ответственности, что изделия:**

<b>EN:</b> PC Transfer Pump	<b>NL:</b> PC excenterwormpomp
<b>DE:</b> PC Transferpumpe	<b>SV:</b> PC transferpump
<b>FR:</b> Pompe de transfert PC	<b>NO:</b> PC transportpumpe
<b>ES:</b> Bomba PC de cavidad progresiva	<b>FI:</b> Siirtopumppu PC
<b>IT:</b> PC pompa monovite	<b>RU:</b> Винтовой насос PC

**EN:** To which this declaration relates are in conformity with the following standards or other normative documents

**DE:** Auf die sich diese Erklärung bezieht, den folgenden und/oder anderen normativen Dokumenten entsprechen

**FR:** Auxquels se réfère cette déclaration sont conformes aux normes ou à d'autres documents normatifs

**ES:** Objeto de esta declaración, están conformes con las siguientes normas u otros documentos normativos

**IT:** Ai quali questa dichiarazione si riferisce sono conformi alla seguente norma o ad altri documenti normativi

**NL:** Waarop deze verklaring betrekking heeft, zijn in overeenstemming met de volgende normen of andere normatieve documenten

**SV:** Som omfattas av denna försäkran är i överensstämmelse med följande standarder eller andra regelgivande dokument

**NO:** Som dekkes av denne erklæringen, er i samsvar med følgende standarder eller andre normative dokumenter

**FI:** Joihin tämä vakuutus liittyy, ovat seuraavien standardien sekä muiden sääntöamääräviin asiakirjojen mukaisia

**RU:** К которым применимо данное заявление, соответствуют следующим стандартам или нормативным документам.

**EN:** As defined by Machinery Directive 2006/42/EC, Low Voltage Directive 2014/35/EU, Outdoor Noise Directive 2000/14/EC amended by 2005/88/EC, RoHS 2011/65/EU and (EU) 2017/2102, WEEE 2012/19/EU.

**DE:** Wie definiert in Maschinenrichtlinie 2006/42/EG, Niederspannungsrichtlinie 2014/35/EU, Richtlinie 2000/14/EG über Geräuschemissionen geändert durch Richtlinie 2005/88/EG, RoHS 2011/65/EU und (EU) 2017/2102, WEEE 2012/19/EU.

**FR:** Comme définie par directive Machines 2006/42/CE, directive Basse tension 2014/35/UE, Directive sur le bruit extérieur 2000/14/CE, amendée par la directive 2005/88/CE, RoHS 2011/65/UE et (UE) 2017/2102, DEEE 2012/19/UE.

**ES:** Como se establece en Directiva sobre maquinaria 2006/42/EC, Directiva sobre bajo voltaje 2014/35/UE, Directiva sobre el ruido 2000/14/CE enmendada por 2005/88/CE, RoHS 2011/65/UE y (UE) 2017/2102, RAEE 2012/19/UE.

**IT:** Come definito in Direttiva Macchina 2006/42/CE, Direttiva Bassa tensione 2014/35/UE, Direttiva sull'emissione acustica ambientale 2000/14/CE modificata dalla direttiva 2005/88/CE, RoHS 2011/65/UE e (UE) 2017/2102, RAEE 2012/19/UE.

**NL:** Zoals gedefinieerd door de machinerichtlijn 2006/42/EC, laagspanningsrichtlijn 2014/35/EU, Geluidsemissierichtlijn 2000/14/EG gewijzigd door 2005/88/EG, RoHS 2011/65/EU en (EU) 2017/2102, AEEA 2012/19/EU.

**SV:** Såsom definierats av Maskindirektiv 2006/42/EG, Direktiv om lågspänning 2014/35/EU, Utomhusbullerdirektivet 2000/14/EC ändrat av 2005/88/EC, RoHS 2011/65/EU och (EU) 2017/2102, WEEE 2012/19/EU.

**NO:** I henhold til maskindirektiv 2006/42/EF, lavspenningsdirektivet 2014/35/EU, Utendørsstøydirektiv 2000/14/EU endret av 2005/2005/88/EU, RoHS 2011/65/EU og (EU) 2017/2102, WEEE 2012/19/EU.

**FI:** Määritetty näissä normeissa: Konedirektiivi 2006/42/EY, Matalajännittdirektiivi 2014/35/EU, Ulkona käytettävien laitteiden melupäästöjä koskeva direktiivi 2000/14/EY, jota on muutettu direktiivillä 2005/88/EY, RoHS 2011/65/EU ja (EU) 2017/2102, WEEE 2012/19/EU.

**RU:** В соответствии с директивой по механическому оборудованию 2006/42/EC, директивой по низковольтным устройствам 2014/35/EU, Директива по внешнему шуму 2000/14/EC, дополненная 2005/88/EC, RoHS 2011/65/EU и (EU) 2017/2102, WEEE 2012/19/EU.

EN ISO 12100:2010, EN 809:1998 + A1:2009 + AC:2010

Brendan Sinnott  
General Manager,  
Sulzer Pump Solutions Ireland Ltd.  
25-07-2023

## UKCA Declaration of Conformity

**Manufacturer:** Sulzer Pump Solutions Ireland Ltd.

**Address:** Clonard Road, Wexford, Ireland

**Declare under our sole responsibility that the product:**

PC Transfer Pump

**To which this declaration relates is in conformity with the following standards or other normative documents as defined by:**

Supply of Machinery (Safety) Regulations 2008, S.I. 2008 No 1597

Electrical Equipment (Safety) Regulations 2016, S.I. 2016 No 1101

Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001, S.I. 2001 No 3957

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012, S.I. 2012 No 3133

The Waste Electrical and Electronic Equipment (Amendment) (No. 2) Regulations 2018, S.I. 2018 No 1214

BS EN ISO 12100:2010, BS EN 809:1998 + A1:2009 + AC:2010



Brendan Sinnott  
General Manager,  
**Sulzer Pump Solutions Ireland Ltd.**  
04-02-2022

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**Symbols and notices used in this booklet:**

Presence of dangerous voltage.



Non-compliance may result in personal injury.

**NOTE**

*Important information for particular attention.*

**1 ATEX warning statements****1.1 Pumps and pump units**

1. Where a pump or pump unit is to be installed in a potentially explosive atmosphere ensure that this has been specified at the time of purchase and that the equipment has been supplied accordingly and displays an ATEX nameplate or is supplied with a certificate of conformity. If there is any doubt as to the suitability of the equipment please contact Sulzer before commencing with installation and commissioning.
2. Process liquids or fluids should be kept within specified temperature limits otherwise the surface of pump or system components may become an ignition source due to temperature rises. Where the process liquid temperature is less than 90 °C the maximum surface temperature will not exceed 90 °C provided the pump is installed, operated and maintained in accordance with this manual. Where the process fluid temperature exceeds 90 °C the maximum surface temperature will be equal to the maximum process fluid temperature.
3. Cavities that could allow the accumulation of explosive gases, such as under guards, should where possible, be designed out of the system. Where this is not possible they should be fully purged before any work is carried out on the pump or system.
4. Electrical installation and maintenance work should only be carried out by suitably qualified and competent persons and must be in accordance with relevant electrical regulations.
5. All electrical equipment, including control and safety devices, should be suitably rated for the environment into which they are installed.
6. Where there may be a risk of an accumulation of explosive gases or dust, non-sparking tools should be used for installation and maintenance.
7. In addition to causing permanent damage to the stator, dry-running of the pump could generate a rapid rise in the temperature of the stator tube or barrel, which could become an ignition source. It is therefore essential that a dry-run protection device be fitted. This must shut the pump down immediately should a dry-run situation occur. Details of suitable devices are available from Sulzer.
8. To minimise the risk of sparking or temperature rises due to mechanical or electrical overload the following control and safety devices should be fitted in addition to a dry-run protection system:
  - (a) a pressure relief system whereby the pump can not generate pressures in excess of the maximum rated pressure or an over-pressure device which should shut the pump down when the maximum discharge pressure is exceeded.
  - (b) a control system that will shut the pump down if the motor current or temperature exceed specified limits.
  - (c) an isolator switch that will disconnect all electrical supply to the motor and ancillary electrical equipment and be capable of being locked in the off position.All control and safety devices should be fitted, operated and maintained in accordance with the manufacturer's instructions. All valves on the system should be open when the pump is started, otherwise serious mechanical overload and failure may result.
9. It is important that the pump rotates in the direction indicated on the nameplate. This must be checked on installation and commissioning and after any maintenance has been carried out. Failure to observe this may lead to dry-running or mechanical or electrical overload.
10. When fitting drives, couplings, belts, pulleys and guards to a pump or pump unit it is essential that these are correctly fitted, aligned, and adjusted, in accordance with the manufacturer's instructions. Failure to do so may result in sparking due to unintended mechanical contact or temperature rises due to mechanical or electrical overload or slipping of drive belts. Regular inspection of these parts must be carried out to ensure they are in good condition and replacement of any suspect part must be carried out immediately.

11. Mechanical seals should be suitably rated for the environment. The seal and any associated equipment, such as a flushing system, must be installed, operated, and maintained in accordance with the manufacturer's instructions.
12. Where a packed gland seal is fitted this must be correctly fitted and adjusted. This type of seal relies on the process liquid to cool the shaft and packing rings, so a constant drip of liquid from the gland section is required. Where this is undesirable an alternative seal type should be fitted.
13. Failure to operate or maintain the pump and ancillary equipment in line with the manufacturer's instructions may lead to premature and potentially dangerous failure of components. Regular inspection, and where necessary replacement, of bearings and lubrication is essential.
14. The pump and its components have been designed to ensure safe operation within the guidelines covered by legislation. Accordingly, Sulzer have declared the machine safe to use for the duty specified as defined by the Declaration of Conformity that is issued with this instruction manual.
15. The use of replacement parts that are not manufactured by or approved by Sulzer may affect the safe operation of the pump and it may therefore become a safety hazard to both operators and other equipment. In these circumstances the Declaration provided will become invalid. The guarantee referenced on the Terms and Conditions of Sale will also be invalidated.

## 2. Installation

### 2.1 Installation and safety recommendations

In common with other items of process plant a pump must be installed correctly to ensure satisfactory and safe operation. The pump must also be maintained to a suitable standard. Following these recommendations will ensure that the safety of personnel and satisfactory operation of the pump is achieved.

#### 2.1.1 General

When handling harmful or objectionable materials, adequate ventilation must be provided in order to disperse dangerous concentrations of vapours. It is recommended that wherever possible, Sulzer pumps should be installed with provision for adequate lighting, thus ensuring that effective maintenance can be carried out in satisfactory conditions. With certain product materials, a hosing down facility with adequate draining will simplify maintenance and prolong the life of pump components.

Pumps operating on high temperature duties should be allowed to cool sufficiently before any maintenance is carried out.

#### 2.1.2 System design & installation

At the system design stage, consideration must be given to provision of filler plugs, and the installation of non-return and/or isolating valves. Pumps cannot be reliably used as non-return valves. Pumps in parallel and those with high static discharge head must be fitted with non-return valves.

The pumps must also be protected by suitable devices against over-pressure and dry-running.

##### i. Horizontal mounting

Sulzer PC pumps are normally installed in a horizontal position with baseplates mounted on a flat surface, grouted-in and bolted, thus ensuring firm fixing and a reduction in noise and vibration.

The unit should be checked after bolting down to ensure that the alignment of the pump to its prime mover is correct.

##### ii. Vertical mounting

If it is intended to mount any pump in a vertical position, please consult Sulzer prior to ordering. Where a mechanical seal is fitted it must be provided with a suitable quench system.

## 2.2 Handling



**During installation and maintenance, attention must be paid to the safe handling of all items.**

For safe handling of both bareshaft pumps and pump units (pump/gearbox/motor etc.) slings should be used. The position of the slings will depend upon the specific pump/unit construction and should be carried out by personnel with the relevant experience to ensure that the pump is not damaged and injury to personnel does not occur.



If eyebolts do exist then these should only be used for lifting the individual components for which they are supplied.

**ATTENTION!** *Observe the total weight of the Sulzer units and their attached components! (see nameplate for weight of base unit).*

The duplicate nameplate provided must always be located and visible close to where the pump is installed (e.g. at the terminal boxes / control panel where the pump cables are connected).

**NOTE:** *Lifting equipment must be used if the total unit weight and attached accessories exceeds local manual lifting safety regulations.*

The total weight of the unit and accessories must be observed when specifying the safe working load of any lifting equipment! The lifting equipment, e.g. crane and chains, must have adequate lifting capacity. The hoist must be adequately dimensioned for the total weight of the Sulzer units (including lifting chains or steel ropes, and all accessories which may be attached). The end user assumes sole responsibility that lifting equipment is certified, in good condition, and inspected regularly by a competent person at intervals in accordance with local regulations. Worn or damaged lifting equipment must not be used and must be properly disposed of. Lifting equipment must also comply with the local safety rules and regulations

**NOTE!** *The guidelines for the safe use of chains, ropes and shackles supplied by Sulzer are outlined in the Lifting Equipment manual provided with the items and must be fully adhered to.*

## 2.3 Storage and infrequent operation

The situation where a pump is used infrequently is also covered by the instructions in this section.

### 2.3.1 Short term storage

Where a pump has to be stored for six months or less then the following steps are advised:

1. Store pump inside wherever possible or if this is not feasible then provide protective covering. Do not allow moisture to collect around the pump.
2. Remove the drain plug if fitted. Any inspection plates fitted should also be removed to ensure that the suction housing can drain and dry completely.
3. Loosen the packed gland and inject sufficient grease into the stuffing box. Tighten the gland nut hand tight. If a water flush system is to be used do not grease. A small amount of light oil is recommended for these.
4. See manufacturers instructions for motor/gearbox/drive instructions for storage procedures.

### 2.3.2 Long term storage

If the pump is to be kept in storage for more than six months, then in addition to the above, the following procedures should be carried out regularly (every 2 - 3 weeks if possible):

1. If practicable rotate the pump at least three quarters of one revolution to avoid the rotor setting in the stator.
2. Note, however, that the pump is not to be rotated for more than two revolutions each time because damage could be caused to the rotor/stator elements.



**Before installing the pump after storage please ensure that all plugs and inspection plates are replaced and that excess grease/oil is removed from the stuffing box.**

## 2.4 Electrical



**Electrical connection should only be made using equipment suitable for both rating and environment.**

**Where any doubts exist regarding the suitability of equipment, Sulzer should be consulted before proceeding. Normally the Sulzer pump should be installed with starting equipment arranged to give direct-on-line starting.**

**Earthing points will be provided on electric drives (if supplied) and it is essential that these are correctly connected. When the motor is being wired and checked for rotation, the start/stop sequence must be instantaneous to prevent dry running (see Section 3) or pressurising upstream equipment (check direction arrow on pump nameplate). The electrical installation should include appropriate isolating equipment to ensure that the pump, drive and motor, or macerator grinder motor is safe to work on.**

## 2.5 Pressure relief valves and non-return valves

1. It is recommended that a suitable safety device is installed on the discharge side of the pump to prevent over-pressurisation of the system.
2. It is also recommended that a non-return valve is installed on the discharge side of the pump to prevent reverse flow through the system.

When both are installed it is advised that the relief valve is positioned closer to the pump than the non-return valve.



**The pump must never run against a closed inlet or outlet valve, as this could result in mechanical failure.**

## 2.6 General safety



**All guards and removable maintain-in-place covers must be in place and securely fitted while the machine is running.**



**Great care must be taken to protect all electrical equipment from splashing when hosing down. Where Sulzer have supplied a bareshaft pump the onus is on the user to fit adequate guards in compliance with the requirements of the relevant regulations.**



**Inspection port covers/ports must not be opened while the machine is running.**

All nuts and bolts, securing flanges and base mounting fixtures must be checked for tightness before operation. To eliminate vibration, the pump must be correctly aligned with the drive unit, and all guards must be securely fixed in position. When commissioning the plant, all joints in the system must be checked thoroughly for leakage.

If, when starting, the pump does not appear to operate correctly (see Section 3), the plant must be shut down immediately and the cause of the malfunction established before operations are recommenced. It is recommended that, depending upon plant system operation, either a combined vacuum and pressure gauge or a vacuum gauge only be fitted to the pump inlet port, and a pressure gauge fitted to the outlet port. These will then continuously monitor the pump operating conditions.

May contain substances from the ECHA SVHC Candidates List (REACH - Regulation (EC) No. 1907/2006).

## 2.7 Duty conditions

Pumps should only be installed on duties for which Sulzer have specified the materials of construction, flow rates, pressure, temperature, speed etc. Where dangerous materials are to be pumped, consideration must be given to the safe discharge from relief valves, gland drains etc.



**If the duty should be changed, Sulzer should be contacted and their recommendations sought in the interest of application, safety of plant, efficiency, and pump life.**

## 3 Start-up procedure

Pumps must be filled with liquid before starting. The initial filling is not for priming purposes, but to provide the necessary lubrication of the stator until the pump primes itself. When the pump is stopped, sufficient liquid will normally be trapped in the rotor/stator assembly to provide lubrication upon re-starting.

If however, the pump has been left standing for an appreciable time, moved to a new location, or has been dismantled and re-assembled, it must be refilled with liquid and given a few turns before starting. The pump is normally somewhat stiff to turn by hand owing to the close rotor/stator fit. However, this stiffness disappears when the pump is running normally against pressure.

### 3.1 Dry running



**Never run the pump in a dry condition even for a few revolutions or the stator will be damaged immediately. Continual dry running could produce some harmful or damaging effects.**

### 3.2 Pump rotation details

PC transfer pumps are bi-directional. Anti-clockwise determines that the inlet is at the drive end.



**Before the direction of rotation is changed, Sulzer must be consulted so that the suitability of the pump can be confirmed when operating on the new duty.**

### 3.3 Gland packing

Where a pump is supplied fitted with gland packing (manufactured from a non-asbestos material), the gland will require adjustment during the initial running-in period. Newly packed glands must be allowed to run-in with only finger-tight compression on the gland follower nuts. This should continue for about three days. The gland follower should be gradually tightened over the next week to achieve a leakage rate as shown in the table below. Gland followers should be adjusted at regular intervals to maintain the recommended leakage flow rate.

Under normal working conditions a slight drip from the gland under pressure assists in cooling and lubricating the packing. A correctly adjusted gland will always have a small leakage of fluid.



**When properly adjusted, packed gland sealing systems will always have a small leakage of potentially hazardous fluid. Adequate personal protective equipment must be worn at all times to prevent injury from hazardous leakage.**

Typical leakage rates from packed glands:

Up to 50mm shaft diameter	2 drops per minute
50 ... 75mm shaft diameter	3 drops per minute
75 ... 100mm shaft diameter	4 drops per minute
100 ... 125mm shaft diameter	5 drops per minute
125 ... 160mm shaft diameter	6 drops per minute

A gland drip is, however, undesirable when handling corrosive, degreasing, or abrasive materials. Under these conditions the gland must be tightened the minimum amount whilst the pump is running, to ensure satisfactory sealing when under pressure, or to stop entry of air when under suction conditions.

The gland leakage of toxic, corrosive or hazardous liquids can cause problems of compatibility with the construction materials of the pumps.

Provision of a gland drain should be considered, especially for the leakage of hazardous products.



**Care is required when adjusting the gland whilst the pump is running.**

### 3.4 Mechanical seals - all pumps

When a mechanical seal is fitted to the pump it may be necessary to provide a barrier fluid to some part of the seal. This should be provided in line with the seal manufacturers instructions.

Where a pump is supplied without a drive, it is necessary to fit the mechanical seal (supplied separately) prior to fitting the gearbox and motor.

### 3.5 Guards



**In the interests of safety, all guards must be replaced after necessary adjustments have been made to the pump.**

### 3.6 Warning / Control device

Prior to operating the pump, if any warning or control devices are fitted, these must be set in accordance with their specific instructions.

### 3.7 Pump operating temperature

The range of temperatures the pump surfaces will develop is dependent upon factors such as product temperature and ambient temperature of the installation. There may be instances where the external pump surface can exceed 50 °C.

In these instances, personnel must be made aware of this and suitable warnings/guarding used.

### 3.8 Noise levels

1. The sound pressure level should not exceed 85dB at one metre distance from the pump.
2. This is based on a typical installation and does not necessarily include noise from other sources or any contribution from building reverberation or installation pipework.
3. It is recommended that the actual pump unit noise levels are ascertained once the unit is installed and running at duty conditions.

### 3.9 Lubrication

Pumps fitted with bearings should be inspected periodically to see if grease replenishment is necessary, and if so, grease should be added until the chambers at the ends of the bearing spacer are approximately one third full.

Periodic bearing inspection is necessary to maintain optimum bearing performance. The most expedient time to inspect is during periods of regular scheduled equipment downtime for routine maintenance, or downtime for any other reason.

Under tropical or other arduous conditions however, a more frequent examination may be necessary. It is therefore advisable to establish a correct maintenance schedule or periodic inspection.

BP LC2 / Mobilgrease XHP 222 or their equivalent must be used for replenishment.

### 3.10 Pump units

Where a pump unit is dismantled and re-assembled, consideration must be given to ensure that where appropriate the following steps are covered.

1. Correct alignment of pump/gearbox.
2. Use of appropriate couplings and bushes.
3. Use of appropriate belts and pulleys correctly tensioned.

### 3.11 Cleaning prior to operation

#### i. Non-food use

During the commissioning of a new pump or re-commissioning of an overhauled pump, it is advisable to clean the pump prior to the initial operation of the pump in the process.

#### ii. Food use

When a pump has been supplied for a food application, it is important to ensure that the pump is clean prior to initial operation of the pump.

Therefore, it is important that a clean-in-place treatment is executed on the pump at the following times:

1. When the pump is first commissioned for use.
2. When any spare components are fitted into the wetted area of the pump.

#### **A recommended CIP procedure is as follows:**

Caustic wash: LQ94 ex Lever Diversey or equivalent 2% concentration.

Acid wash: P3 Horolith 617 ex Henkel Ecolab or equivalent 1% concentration.

Procedure:

1. Caustic wash @ 75 °C for 20 mins
  2. Water rinse @ 80 °C for 20 mins
  3. Acid wash @ 50 °C for 20 mins
  4. Water rinse @ 80 °C for 20 mins
- CIP flow rates (hence pump speeds) should be maximised to achieve highest level of cleanability. A C.I.P. liquid velocity of 1.5 to 2.0 m/s is required for removal of solids and soiling. Pumps fitted with CIP by-pass ports will permit higher flow rates without the need to increase pump speed.
  - The use of neat active caustic and acid chemicals is not recommended. Proprietary cleaning agents should be used in line with manufacturers instructions.
  - All seals and gaskets should be replaced with new if disturbed during maintenance.
  - Pump internals should be regularly inspected to ensure hygienic integrity is maintained, especially with respect to elastomeric components and seals, and replaced if necessary. The four stages constitute one cycle and we recommend that this cycle is used to clean the pump before use on food.

Once the pump has been commissioned, the cleaning process will depend upon the application. The user must therefore ensure that their cleaning procedures are suitable for the duty for which the pump has been purchased.

### 3.12 Explosive products/hazardous atmospheres

In certain instances the product being pumped may well be of a hazardous nature.

In these installations consideration must be given to provide suitable protection and appropriate warnings to safeguard personnel and plant.

### 3.13 Access ports



**Where access ports are fitted then the following steps must be followed prior to removal:**

1. Pump must be shut down and the electrical supply isolated.
2. Protective clothing should be worn, especially if the pumped product is obnoxious.
3. Remove access plate with care, utilising where possible, drip trays to collect product leakage.

Access ports are included to assist in removing blockages and to allow a visual check on the components within the suction chamber. It is not to be considered as an additional method in dismantling the pump. Re-assembly of the plate should be completed using new gaskets prior to the pump being switched on.

### 3.14 Adjustable stators

If adjustable stators are fitted then the following steps must be followed for adjusting the clamping devices.

The adjustable stator assembly is designed to give an even compression around the stator circumference. It is designed to be used when pump performance reduces through wear to an unacceptable level, to restore the required flow rate.

The stator compression is increased using the following steps:

1. Release the six locking screws half a turn.
2. Tighten the eight clamp screws until adjustment allowed by releasing the lock screws has been taken up.
3. Repeat steps 1 and 2 until the pump performance has been restored to its former level.

#### **NOTE**

***It is imperative that when adjusting the stator, only sufficient pressure is placed on the stator to enable the capacity of the pump to be reinstated. Over-tightening of the stator could easily result in damage to the driver by overload and so extreme care must be taken when carrying out these adjustments. It is therefore advisable to make the adjustment while the pump is running and power readings can be monitored.***

Removal of adjustable stator :

The procedure for removal of an adjustable stator is the same as that of a standard one, except it is necessary to remove the clamp plates before the stator can be twisted off the rotor.

This can be done by undoing the clamp screws; then releasing the clamp plate by using the locking screws as jacking screws to remove the clamp plates.

Re-assembly will be done using the reverse procedure.

### 3.15 Maintenance of wearing components

#### 3.15.1 Rotor and stator

The wear rate on these components is dependent on many factors, such as product abrasivity, speed, pressure etc. When pump performance has reduced to an unacceptable level one or possibly both items will need replacing.

#### 3.15.2 Drive shaft - packed gland

The wear rate of the gland area is dependent on many factors such as product abrasivity and speed. Regular gland maintenance will maximise the life of the shaft. Replacement of both the gland packing and shaft will be necessary when shaft sealing becomes difficult to achieve.

### 3.15.3 Coupling rod joints

Regular maintenance and lubrication will maximise life of the joints.

Replacement of one or both joint assemblies, and possibly the coupling rod, may be necessary when wear is apparent.

To ensure maximum life, it is essential to replace all the joint items with genuine Sulzer parts.

### 3.15.4 Flexishaft drive pumps

With this design there are no wearing items to replace in the drive train, however, if during routine inspection the shaft is visibly damaged / distorted or the protective coating is damaged, then this item should be replaced to avoid unexpected breakdowns.

## 3.16 Mechanical speed variators

Refer to the manufacturers instructions.

These machines require regular maintenance, which typically includes weekly adjustment through the full speed range.

## 4 Assembly and dismantling

Sections 14 and 15 contain the steps to dismantle and re-assemble the pump. All fastenings must be tightened securely and when identified the appropriate torque figures should be used (see Section 13).

### 4.1 Use of items not approved or manufactured by Sulzer

The pump and its components have been designed to ensure that the pump will operate safely within the guidelines covered by legislation.

As a consequence, Sulzer have declared the machine safe to use for the duty specified as defined by the Declaration of Conformity that is issued with this Instruction Manual.

The use of replacement items that are not approved by or manufactured by Sulzer may affect the safe operation of the pump and it may therefore become a safety hazard to both operators and other equipment. In these instances the declaration provided will therefore become invalid. The guarantee referenced in the Terms and Conditions of Sale will also be invalidated if replacement items are used that are not approved or manufactured by Sulzer.

### 4.2 Disposal of worn components



When replacing wearing parts, please ensure disposal of used parts is carried out in compliance with local environmental legislation. Particular care should be taken when disposing of lubricants.



## 5 Pump coding

<b>Range</b>	Transfer		<b>C</b>					
	Transfer Square Inlet		<b>S</b>					
<b>Size</b>	1.3 m³/h @ 1750 rpm			<b>1</b>				
	3.3 m³/h @ 1750 rpm			<b>2</b>				
	10 m³/h @ 1500 rpm			<b>3</b>				
	13 m³/h @ 1500 rpm			<b>X</b>				
	22 m³/h @ 1000 rpm			<b>4</b>				
	37 m³/h @ 800 rpm			<b>5</b>				
	57 m³/h @ 700 rpm			<b>6</b>				
	79 m³/h @ 600 rpm			<b>7</b>				
	97 m³/h @ 500 rpm			<b>8</b>				
	125 m³/h @ 450 rpm			<b>9</b>				
	165 m³/h @ 400rpm			<b>A</b>				
	225 m³/h @ 350 rpm			<b>B</b>				
	440 m³/h @ 270 rpm			<b>C</b>				
	310 m³/h @ 250 rpm			<b>D</b>				
	450 m³/h @ 250 rpm			<b>E</b>				
<b>Stages (max. pressure)</b>	Single stage extended pitch, 4 - 6 Bar				<b>L</b>			
	Single stage, 6 Bar				<b>1</b>			
	Two stage, 12 Bar				<b>2</b>			
	Four stage, 24 Bar				<b>4</b>			
<b>Casing Material</b>	Cast Iron					<b>C</b>		
	Stainless steel					<b>S</b>		
<b>Rotating Parts</b>	Alloy steel with HCP						<b>1</b>	
	Stainless steel AISI 316						<b>2</b>	
	Stainless steel AISI 316 + HCP						<b>3</b>	
<b>Rotor Size</b>	Mk 0 (oversized)							<b>Z</b>
	Mk 1 (standard)							<b>A</b>
	Mk 3 (temperature)							<b>C</b>
	Mk 5 (temperature)							<b>E</b>
<b>Stator Material</b>	Natural							<b>A</b>
	EPDM							<b>E</b>
	High nitrile							<b>J</b>
	Nitrile NBR							<b>R</b>
	Fluoroelastomer / Viton							<b>V</b>
	Hypalon							<b>H</b>
	White NBR							<b>W</b>
	Polyester based urethane							<b>K</b>
	Polyether based urethane							<b>Y</b>
<b>Seal Type</b>	Mechanical seal							<b>M</b>
	Packed gland							<b>P</b>
<b>Build Option</b>	A-size body							<b>1</b>
	B-size body							<b>2</b>

Example:

**C X L C 3 A R M 2**

**6 Recommended lifting points**

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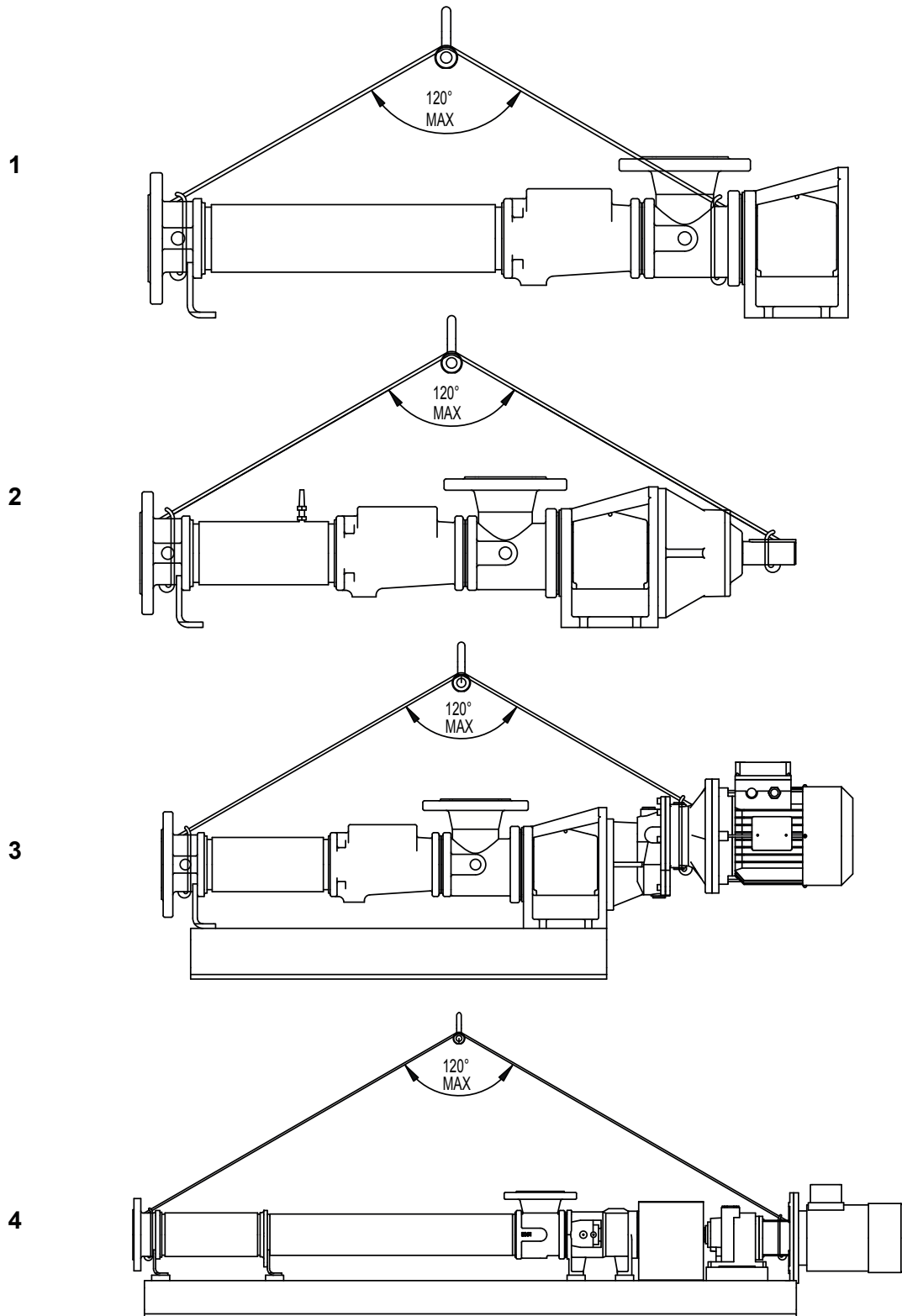


Figure 1. recommended lifting points

\* Choke

## 7 Pump and wear part weights (kg)

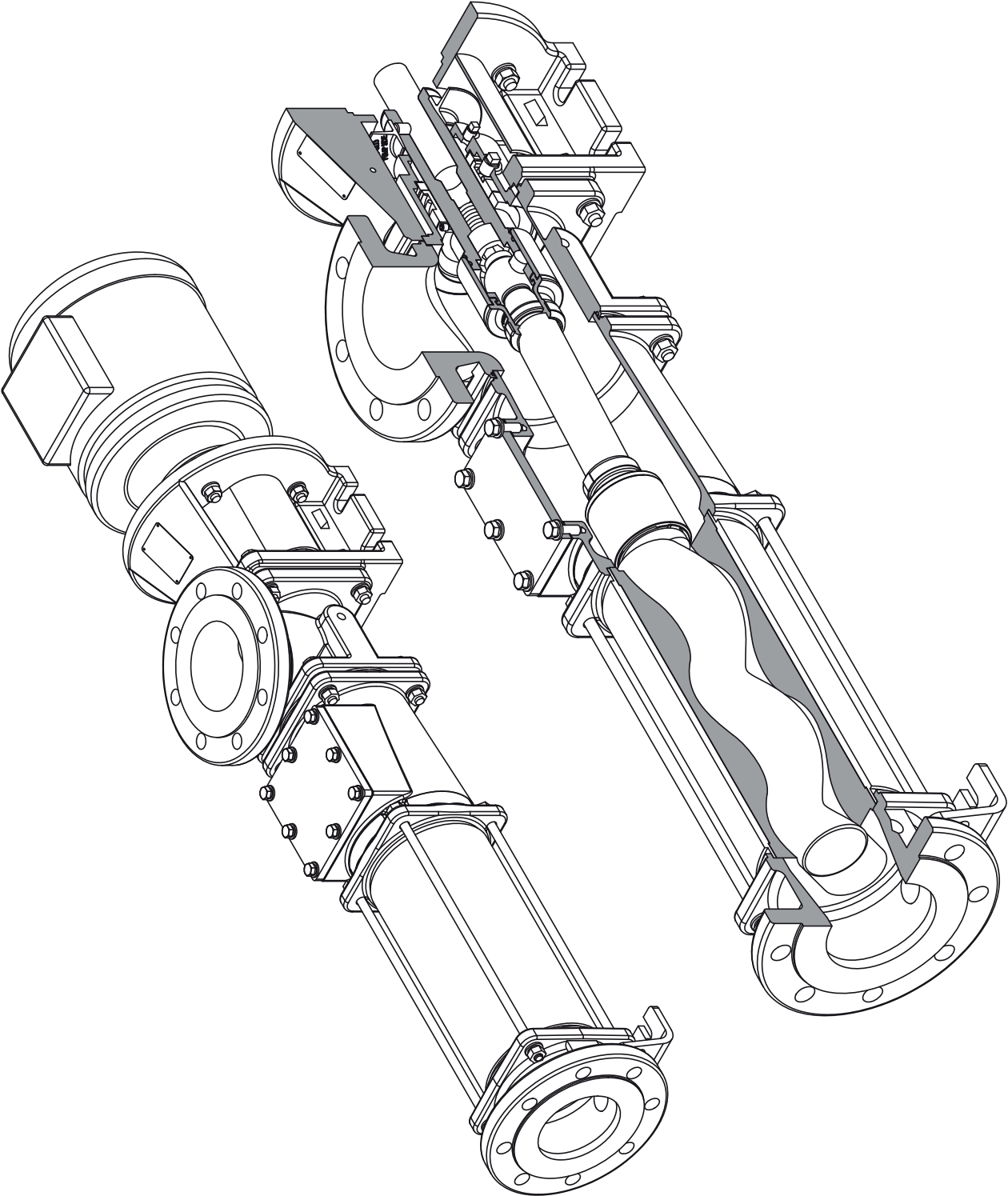
Model	Pump	Stator	Rotor	Coupling Rod / Joint	Shaft
C12	12.5	1.2	0.4	0.2	0.6
C14	14.5	2.6	0.8	0.2	0.6
C21	12.5	1.2	0.4	0.2	0.6
C22	14.5	2.6	0.8	0.2	0.6
C24	23	5.5	1.6	0.4	0.7
C31	18	1.3	1.5	0.4	0.7
C32	20	2.6	1.5	0.4	0.7
C3L	20	2.6	1.5	0.4	0.7
C34	32	5.3	2.9	1.2	1.7
CX1	28	2.1	1.6	0.4	0.7
CX2	31	5.6	2.8	0.4	0.7
CX4	57	10.4	5.5	2.6	3.1
CXL	32	5.1	2.7	0.4	0.7
C41 / S41	34 / 36	3.5	2.6	1.2	1.7
C42	46	7.1	4.5	1.2	1.7
C44	72	14.0	9.2	2.4	3.1
C4L / S4L	42 / 50	7.1	4.5	1.2	1.7
C51 / S51	50 / 49	6.3	4.9	1.2	1.7
C52	70	12.4	9.1	2.4	3.1
C54	106	24.5	18.0	4.9	4.4
C5L / S5L	57 / 56	12.3	8.8	1.2	1.7
C61 / S61	77 / 75	11.0	8.4	2.4	3.1
C62	102	21.5	15.4	4.9	4.4
C64	180	42.5	30.2	12.3	8.7
C6L / S6L	94 / 84	5.0	15.3	2.4	3.1
C71 / S71	107 / 103	17.4	13.3	4.9	4.3
C72	150	34.3	24.5	4.6	4.3
C74	252	68.0	48.9	15.3	8.7
C7L / S7L	148 / 146	34.3	24.5	4.6	4.3
C81 / S81	113 / 108	23.1	17.9	6.2	4.3
C82	170	24.6	33.7	12.3	8.7
C84	291	87.0	65.7	15.3	9.5
C8L / S8L	172 / 167	45.0	33.0	6.2	4.3
C91	175	41.7	25.8	12.3	8.7
C92	286	65.9	47.6	12.3	8.7
C9L	270	67.2	47.6	12.3	8.7
CA1	215	37.4	38.8	12.3	8.7
CA2	355	74.4	72.4	15.3	9.5
CAL	301	74.4	71.4	12.3	8.7
CB1	349	64.5	68.1	15.3	9.5
CB2	650	130.0	132.5	21.7	35.4
CBL	473	122.9	126.8	15.3	9.5
CC1	650	85.0	129.1	21.7	35.4
CC2	950	186.1	263.6	21.9	35.4
CCL	950	186.1	263.8	21.9	35.4
CD1	680	121.4	171.3	21.7	35.4
CD2	862	176.0	186.0	21.7	35.4
CE2	1213	451.0	262.0	21.7	35.4

## 8 Diagnostic chart

Symptoms	Possible causes
1. NO DISCHARGE	1. 2. 3. 7. 26. 28. 29.
2. LOSS OF CAPACITY	3. 4. 5. 6. 7. 8. 9. 10. 22. 13. 16. 17. 21. 22. 23. 29
3. IRREGULAR DISCHARGE	3. 4. 5. 6. 7. 8. 13. 15. 29.
4. PRIMING LOST AFTER START	3. 4. 5. 6. 7. 8. 13. 15
5. PUMP STALLS AT START UP	8. 11. 24.
6. PUMP OVERHEATS	8. 9. 11. 12. 18. 20
7. MOTOR OVERHEATS	8. 11. 12. 15. 18. 20.
8. EXCESSIVE POWER ABSORBED BY PUMP	8. 11. 12. 15. 18. 20
9. NOISE AND VIBRATION	3. 4. 5. 6. 7. 8. 9. 11. 13. 15. 18. 19. 20. 22. 23. 27. 31
10. PUMP ELEMENT WEAR	9. 11.
11. EXCESSIVE GLAND OR SEAL WEAR	12. 14. 25. 30.
12. GLAND LEAKAGE	13. 14.
13. SEIZURE	9. 11. 12. 20.
List of causes	Remedial actions
1. Incorrect direction of rotation	1. Reverse motor
2. Pump unprimed	2. Bleed system of air/gas
3. Insufficient NPSH available	3. Increase suction head or reduce speed/temp.
4. Product vaporising in supply line	4. Increase NPSH available (see 3 above)
5. Air entering supply line	5. Check pipe joints/gland adjustment
6. Insufficient head above supply vessel outlet	6. Raise vessel/increase pipe size
7. Foot valve/strainer obstructed or blocked	7. Clean out suction line/valves
8. Product viscosity above rated figure	8. Decrease pump speed/increase temp.
9. Product temp. above rated figure	9. Cool the product
10. Product viscosity below rated figure	10. Increase pump speed/reduce temp.
11. Delivery pressure above rated figure	11. Check for blockages in delivery line
12. Gland overtight	12. Adjust gland
13. Gland undertight	13. Adjust gland
14. Gland flushing inadequate	14. Check fluid flows freely into gland
15. Pump speed above rated figure	15. Decrease pump speed
16. Pump speed below rated figure	16. Increase pump speed
17. Belt drive slipping	17. Re-tension belts
18. Coupling misaligned	18. Check and adjust alignment
19. Insecure pump/drive mounting	19. Check and tighten all pump mountings
20. Shaft bearing wear/failure	20. Replace bearings
21. Worn pump element	21. Fit new parts
22. Relief valve chatter	22. Check condition of valve/renew
23. R.V. incorrectly set	23. Re-adjust spring compression
24. Low voltage	24. Check voltage/wiring sizes
25. Product entering packing area	25. Check packing condition and type
26. Drive train breakage	26. Check and replace broken components
27. Negative or very low delivery head	27. Close delivery valve slightly
28. Discharge blocked/valve closed	28. Reverse pump/relieve pressure/clear blockages
29. Stator turning	29. Replace worn parts/tighten up stator bolts
30. Stuffing box 'eats' packing	30. Check for worn shaft and replace
31. Vee belts	31. Check and adjust tension or replace

**9 Cross-sectional drawings**

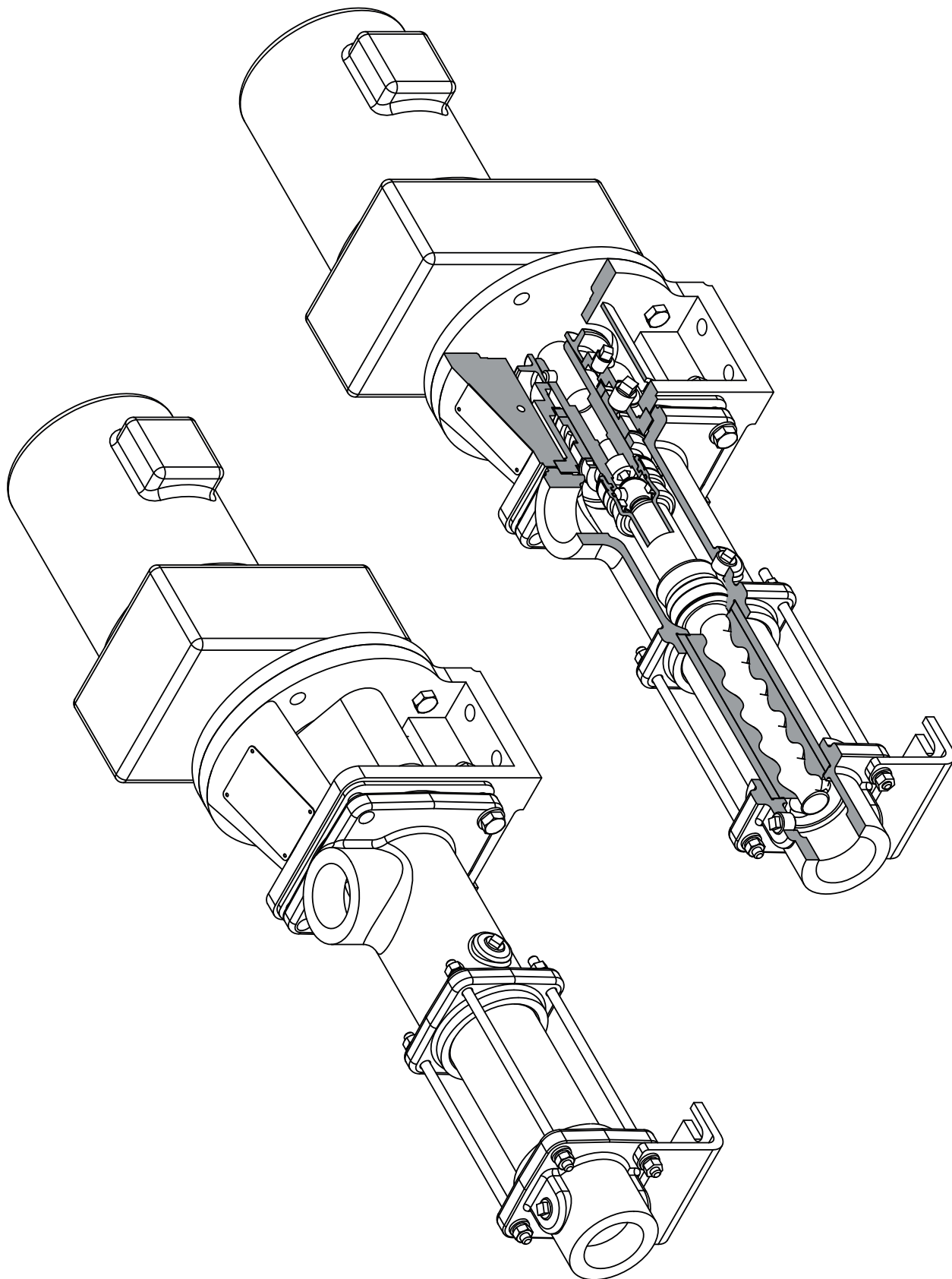
**9.1 CXL and above**



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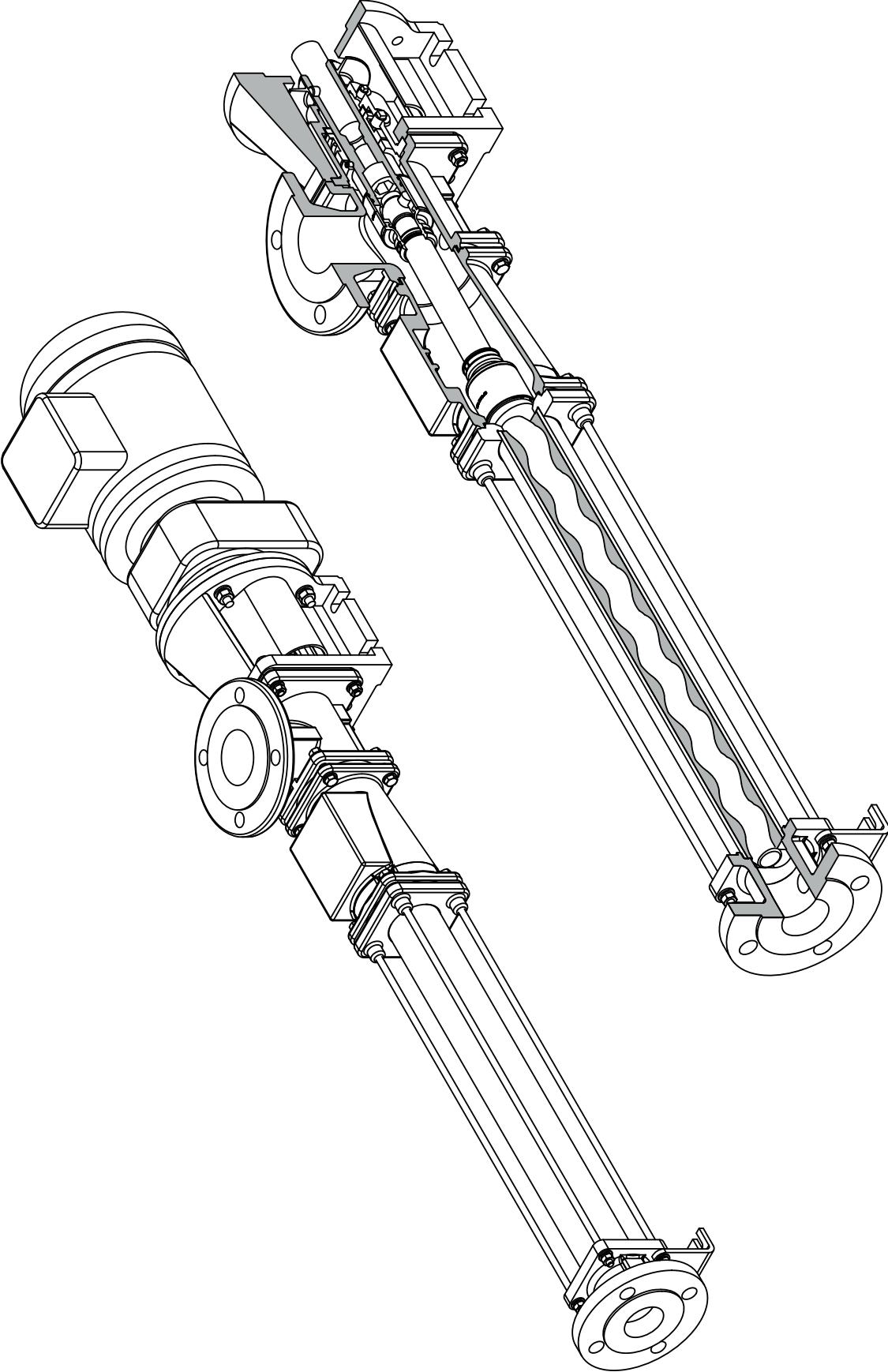
**9.2 C12 - C22**

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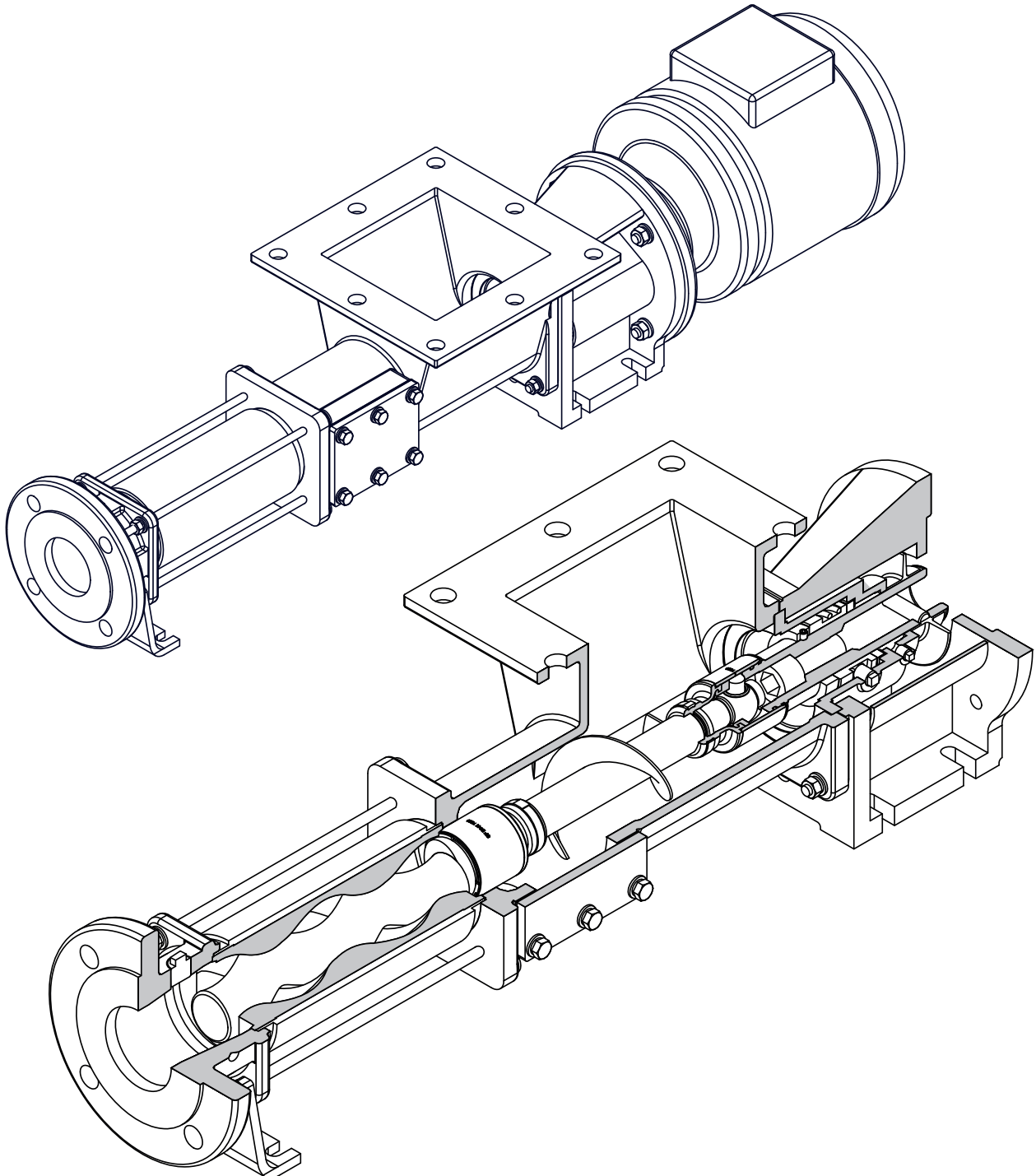
9.3 All 4-stage models C34 - C84



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**9.4 Square inlet models**

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## 10 Drawing reference numbers

### 10.1 CXL and above excluding 4-stage models

Drawing reference	Description	Drawing reference	Description
01A	Body-std C.I.	P201	Taper plug
06A	Nameplate (SOG)	P202	Taper plug
06B	Nameplate (DOG)	P203	Hex socket setscrew
10A	Mechanical seal		
15A	Thrower guard	P401	Toroidal seal ring
20B	Gasket-gland	P402	Toroidal seal ring
22A	Stator-MTM nitrile rubber	P403	Spiral retaining ring
23A	Suction chamber	P404	Spiral retaining ring
23B	Suction chamber extension	P405	Tie-sealing cover
24A	End cover	P406	Tie-sealing cover
25A	Rotor		
26A	Coupling rod	P501	Taper plug
28A	Sealing cover	P502	Taper plug
28B	Sealing cover	P503	Hex nut
29A	Coupling rod pin	P504	Washer
29B	Coupling rod pin	P505	Single coil spring washer
29C	Shaft pin	P506	Hex nut
32A	Drive shaft	P507	Washer
42A	Thrower	P508	Single coil spring washer
47A	Adaptor plate	P509	Toroidal seal ring
47B	Adaptor plate	P510	Toroidal seal ring
62A	Support foot	P519	Taper plug
65A	Mechanical seal carrier	P520	Hex HD. bolt
66A	Abutment ring	P521	Hex nut
74A	Sleeve (rotor shaft)	P522	Washer
74B	Sleeve (rotor shaft)	P523	Single coil spring washer
95A	Tie rod		
		P601	Hex HD. bolt
P104	Hex HD. bolt	P602	Single coil spring washer
P105	Hex nut	P603	Washer
P106	Washer	P604	Hex nut
P107	Single coil spring washer		
P109	Hex nut		

**10.2 4-stage models C34 to C84**

<b>Drawing reference</b>	<b>Description</b>	<b>Drawing reference</b>	<b>Description</b>
01A	Body	P501	Hex nut
01B	Bearing housing	P502	Spring washer
01C	Body adaptor	P503	Plain washer
06A	Nameplate (SOG)	P504	Plain washer
06B	Nameplate (DOG)	P505	Spring washer
10A	Mechanical seal/gland packing	P506	Hex nut
15A	Thrower guard	P507	Hex head screw
20A	Gasket gland	P508	Plain washer
20B	Gasket gland	P509	Plain washer
22A	Stator	P510	Spring washer
23A	Suction chamber	P511	Hex nut
23B	Suction chamber extension	P512	Stud
24A	End cover	P513	Plain washer
25A	Rotor	P514	Spring washer
26A	Coupling rod	P515	Hex nut
28A	Sealing cover	P516	Head screw
28B	Sealing cover	P517	Plain washer
29A	Coupling rod pin	P518	Plain washer
29B	Coupling rod pin	P519	Spring washer
29C	Shaft pin	P520	Hex nut
32A	Drive shaft	P522	Plain washer
42A	Thrower	P526	Taper plug
62A	Support foot	P527	Taper plug
65A	Mechanical seal carrier/gland section	P528	Taper plug
66A	Abutment ring	P529	Seal ring
75A	Rotor/shaft sleeve	P530	Stud
75B	Rotor/shaft sleeve	P531	Spring washer
76A	Adaptor flange	P532	Plain washer
95A	Tie bar	P533	Hex nut
		P534	Stud
P104	Hex head bolt	P535	Hex nut
P105	Hex nut	P536	Plain washer
P106	Plain washer	P537	Spring washer
P107	Spring washer	P538	Toroidal seal ring
P108	Spring washer	P539	Toroidal seal ring
P109	Hex nut		
		P601	Hex head bolt
P201	Taper plug	P602	Spring washer
P202	Taper plug	P603	Plain washer
		P604	Hex nut
P401	Seal ring		
P402	Seal ring		
P403	Spiral retaining ring		
P404	Spiral retaining ring		
P405	Tie-sealing cover		
P406	Tie-sealing cover		

## 10.3 CX2 and below, excluding 4-stage models

Drawing reference	Description	Drawing reference	Description
01A	Body	P201	Plug
06A	Nameplate (SOG)	P202	Plug
06B	Nameplate (DOG)		
10A	Mechanical seal	P401	Seal ring
15A	Thrower guard assembly	P402	Seal ring
20A	Gasket gland	P403	Spiral retaining ring
20B	Gasket gland	P404	Spiral retaining ring
20C	Seal ring	P405	Tie
22A	Stator	P406	Tie
23A	Suction chamber		
23B	Suction chamber extension	P501	Plug
24A	End cover	P502	Plug
25A	Rotor	P503	Plug
26A	Coupling rod	P504	Hex nut
28A	Sealing cover	P505	Spring washer
28B	Sealing cover	P506	Flat washer
29A	Coupling rod pin	P507	Hex nut
29B	Coupling rod pin	P508	Spring washer
29C	Shaft pin	P509	Flat washer
32A	Drive shaft	P510	Hex head bolt
42A	Thrower	P511	Spring washer
47A	Adapter plate	P512	Flat washer
47B	Adapter plate	P513	Hex nut
62A	Support foot	P515	Seal ring
65A	Mechanical seal carrier/gland section		
66A	Abutment ring	P601	Hex head bolt
75A	Sleeve	P602	Spring washer
75B	Sleeve	P603	Flat washer
95A	Tie bar	P604	Hex nut
P101	Hex head bolt		
P102	Flat washer		
P104	Hex head bolt		
P105	Hex nut		
P106	Flat washer		
P107	Spring washer		
P108	Flat washer		
P109	Hex nut		

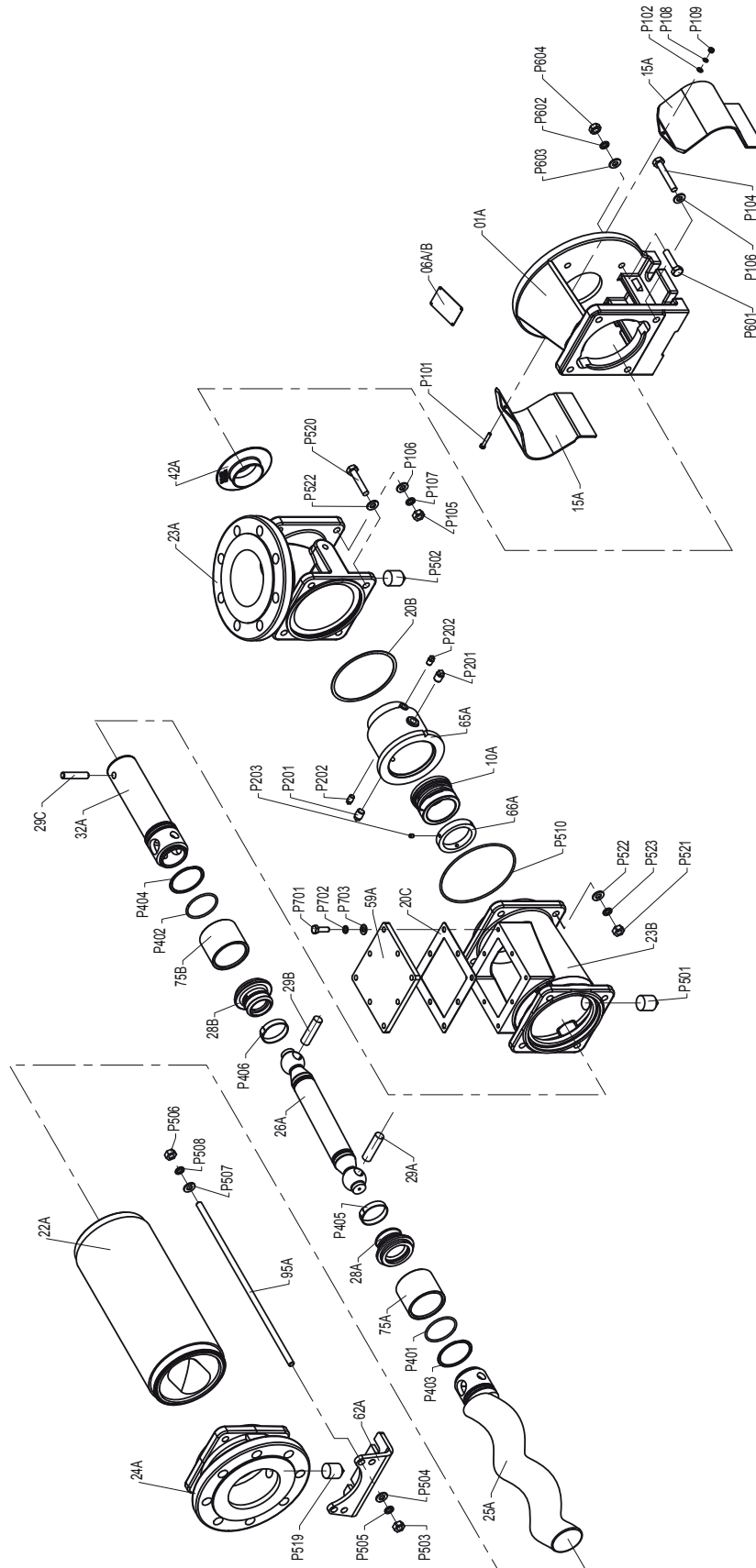
**10.4 Square inlet - all models**

<b>Drawing reference</b>	<b>Description</b>	<b>Drawing reference</b>	<b>Description</b>
01A	Body	P101	Hex screw
06A	Nameplate	P102	Flat washer
10A	Mechanical seal	P103	Stud
15A	Thrower guard	P104	Hex head bolt
20A	Inspection cover gasket	P105	Hex nut
20B	Gasket gland	P106	Flat washer
22A	Stator	P107	Spring washer
23A	Throat	P108	Flat washer
24A	End cover	P109	Hex nut
25A	Rotor		
27A	Coupling rod bush	P201	Taper plug
27B	Coupling rod bush	P202	Taper plug
28A	Sealing boot	P203	Grub screw
28B	Sealing boot		
29A	Coupling rod pin	P401	O ring
29B	Coupling rod pin	P402	O ring
32A	Drive shaft	P403	Spiral retaining ring
38A	Conveyor	P404	Spiral retaining ring
42A	Thrower	P405	Sealing boot tie
59A	Inspection cover	P406	Sealing boot tie
62A	Support foot		
65A	Gland section	P501	Taper plug
66A	Abutment ring	P503	Hex nut
75A	Shaft sleeve	P504	Flat washer
75B	Rotor sleeve	P505	Spring washer
95A	Stator tie bar		



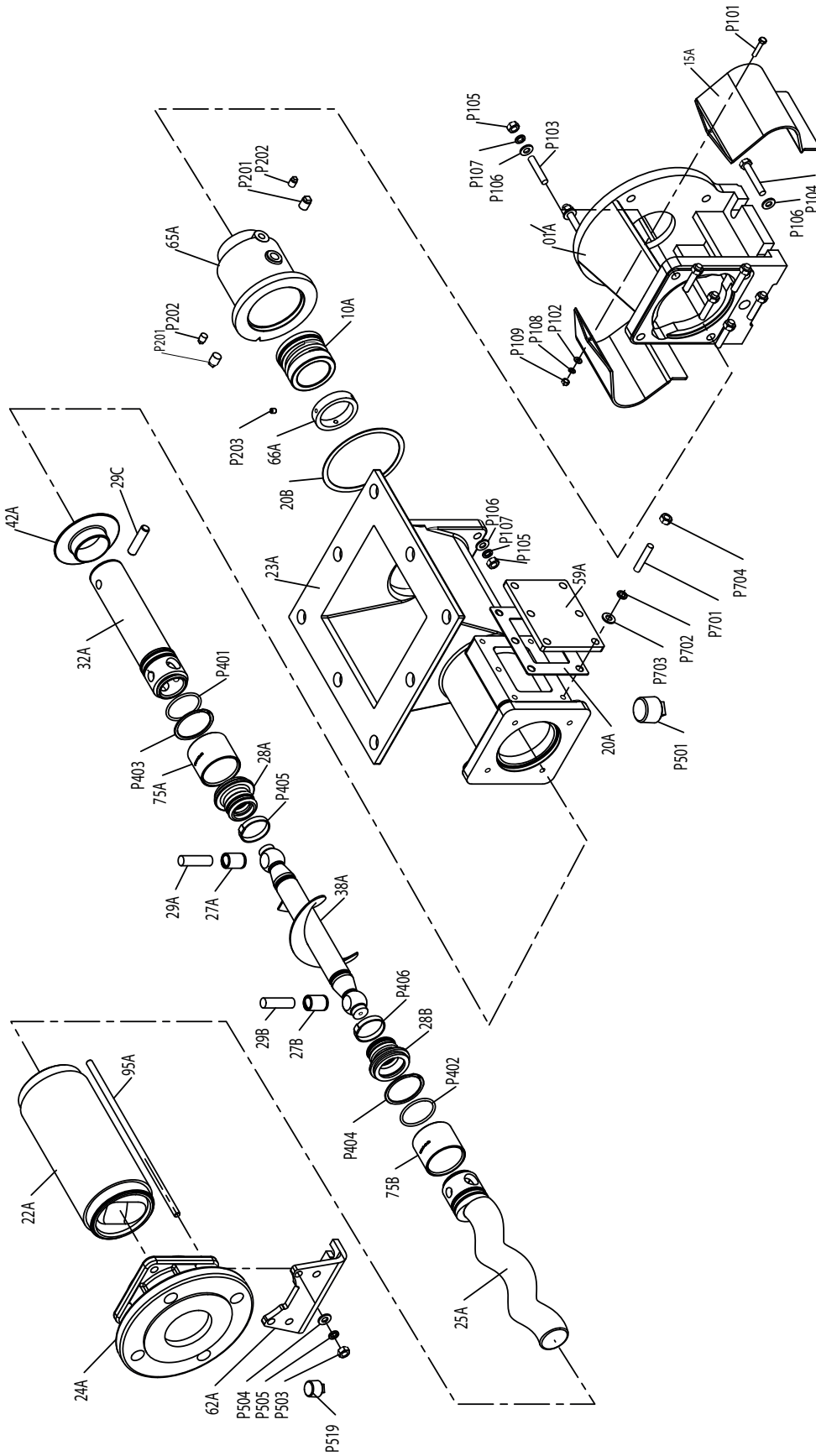
## 11 Exploded view drawings

### 11.1 CXL and above, excluding C82, CA2, CB1 & CBL



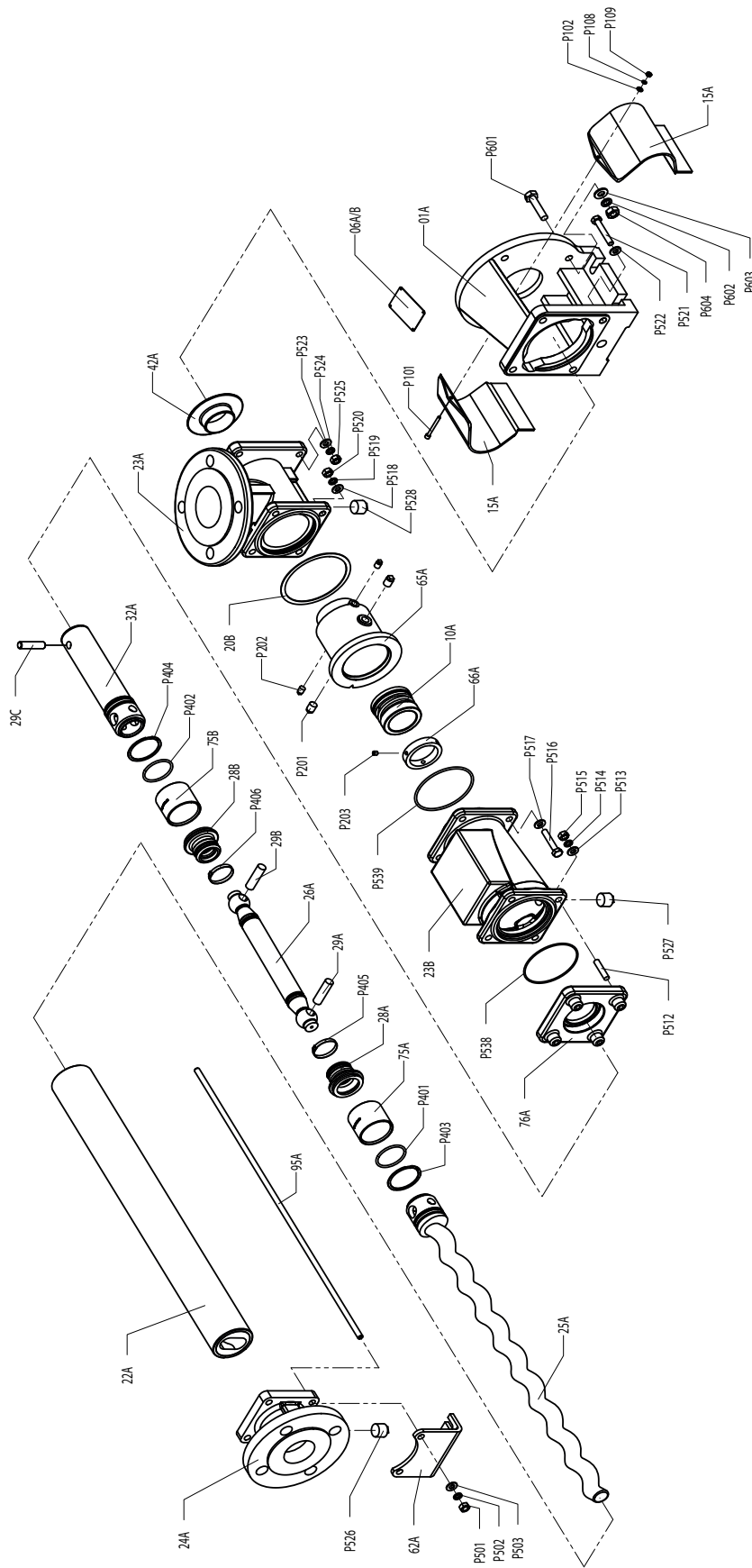
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**11.2 Square inlet**



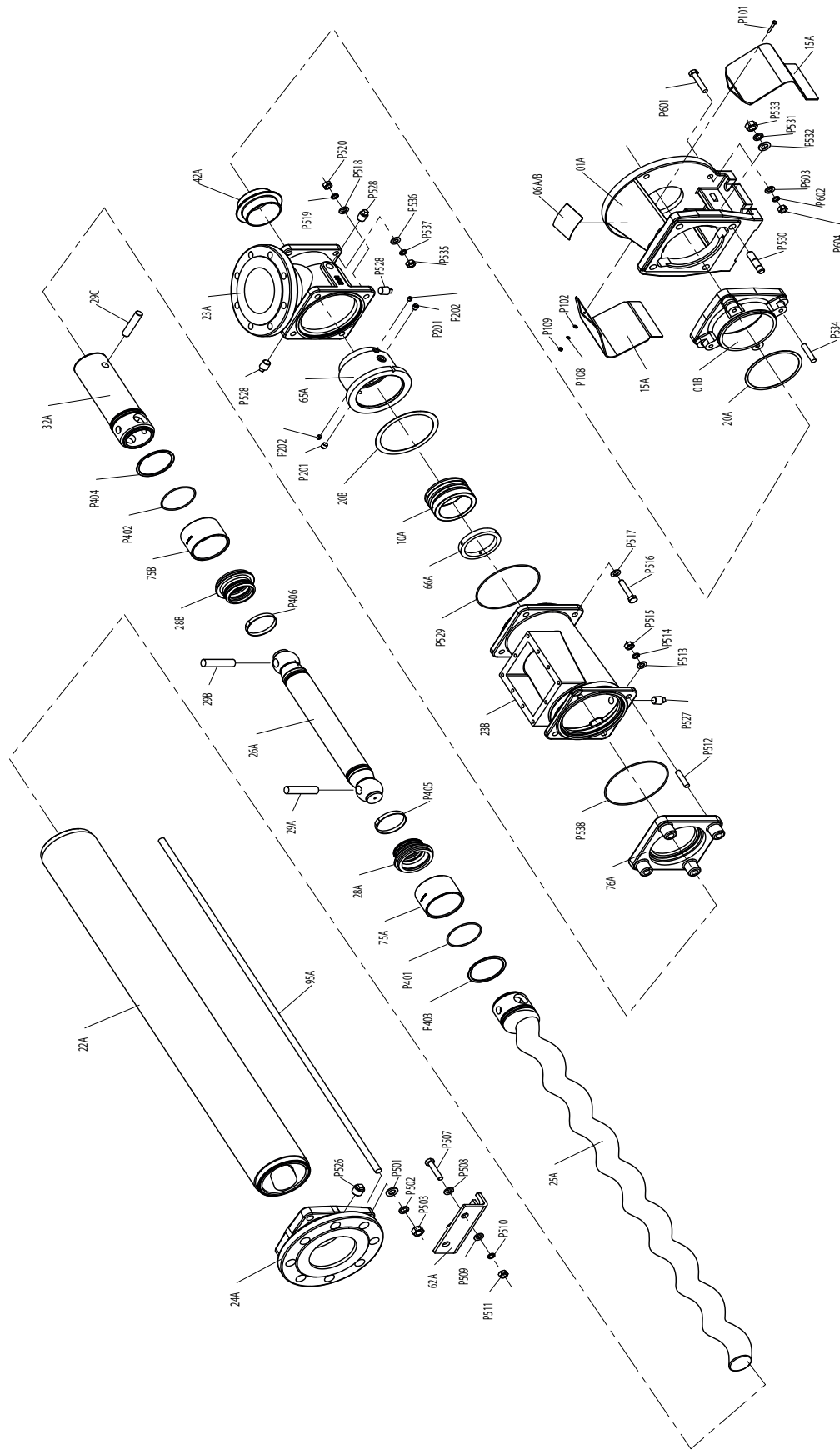
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## 11.3 4-Stage C34 - C84, excluding C64



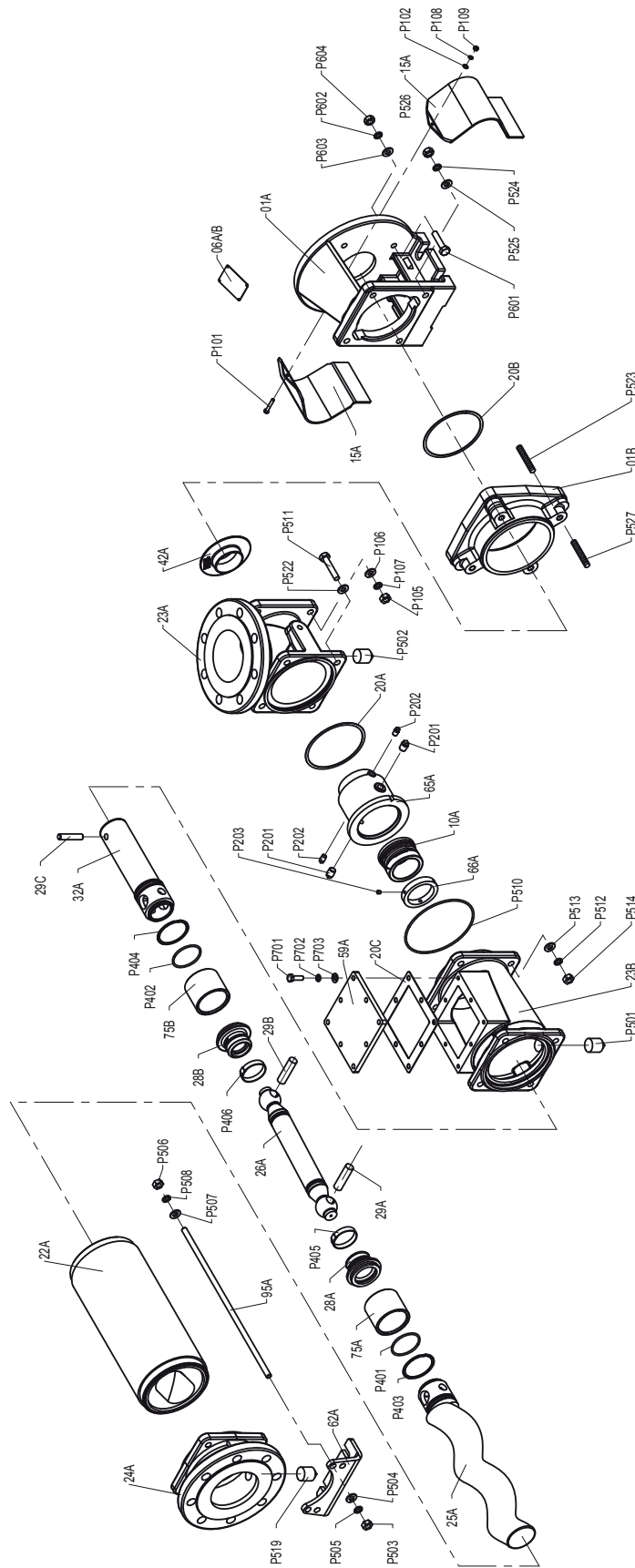
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11.4 4-stage C64



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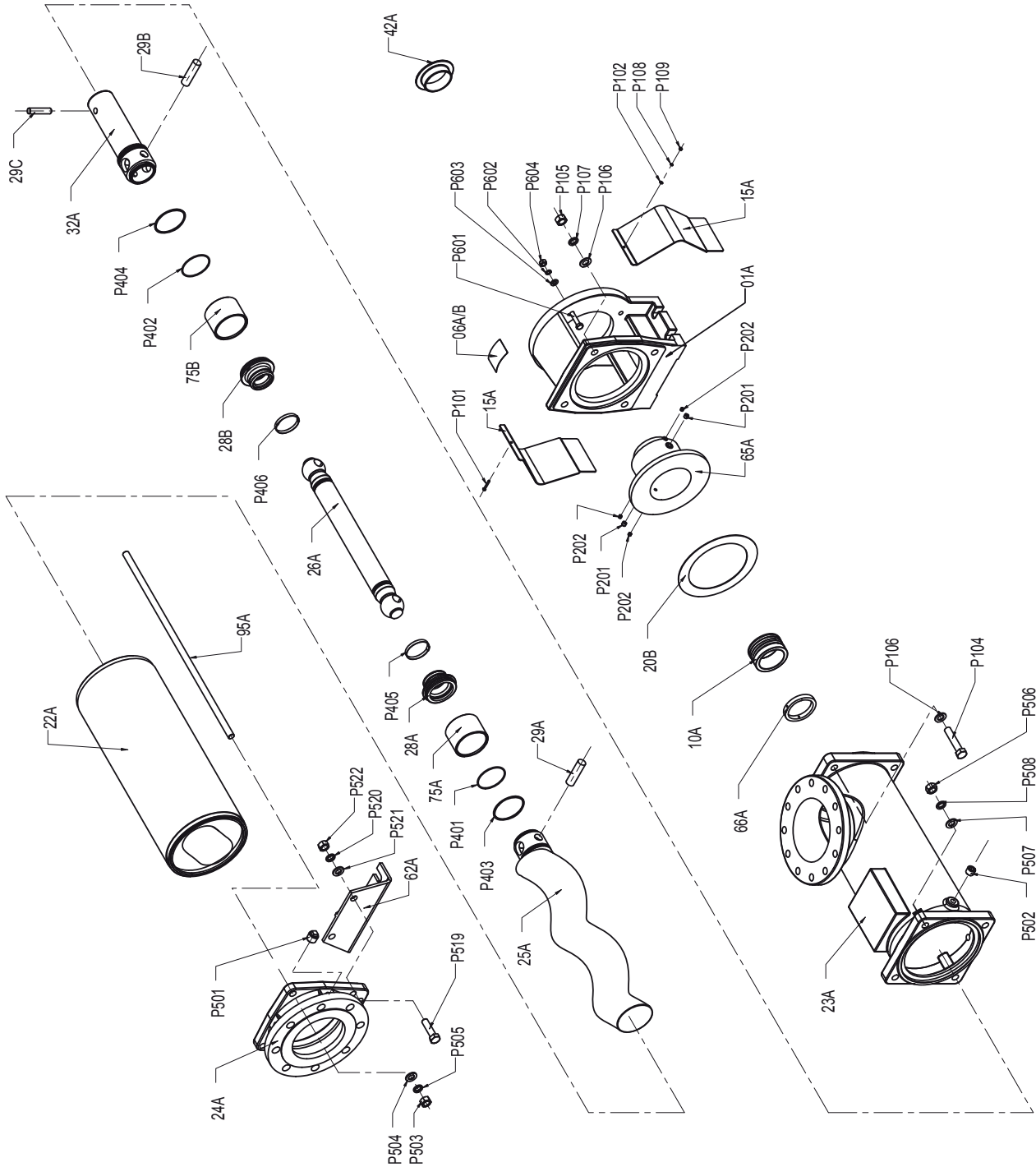
## 11.5 C82



1250-00

11.6 CA2

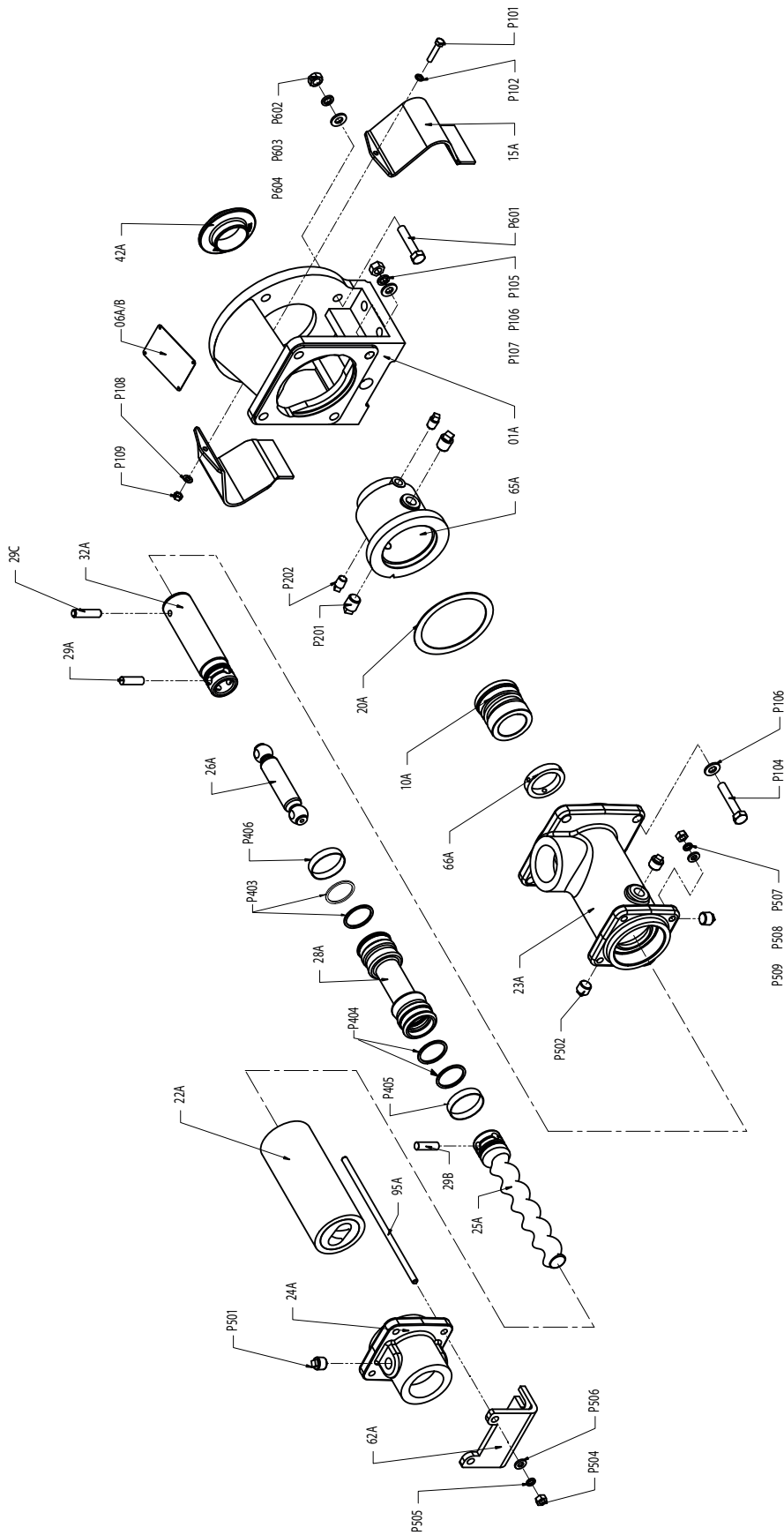
1251-00





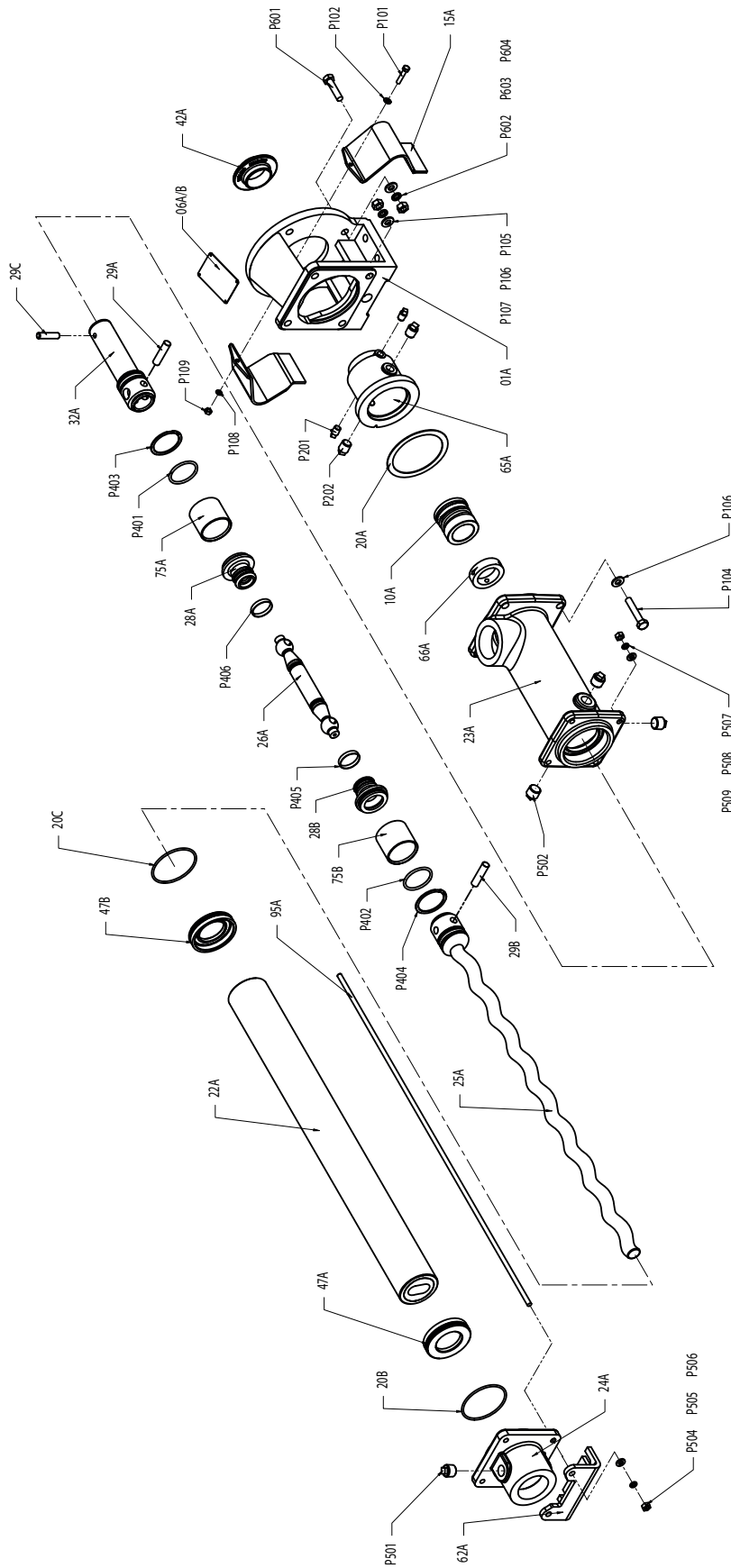


11.8 C12 - C22



1.253-00

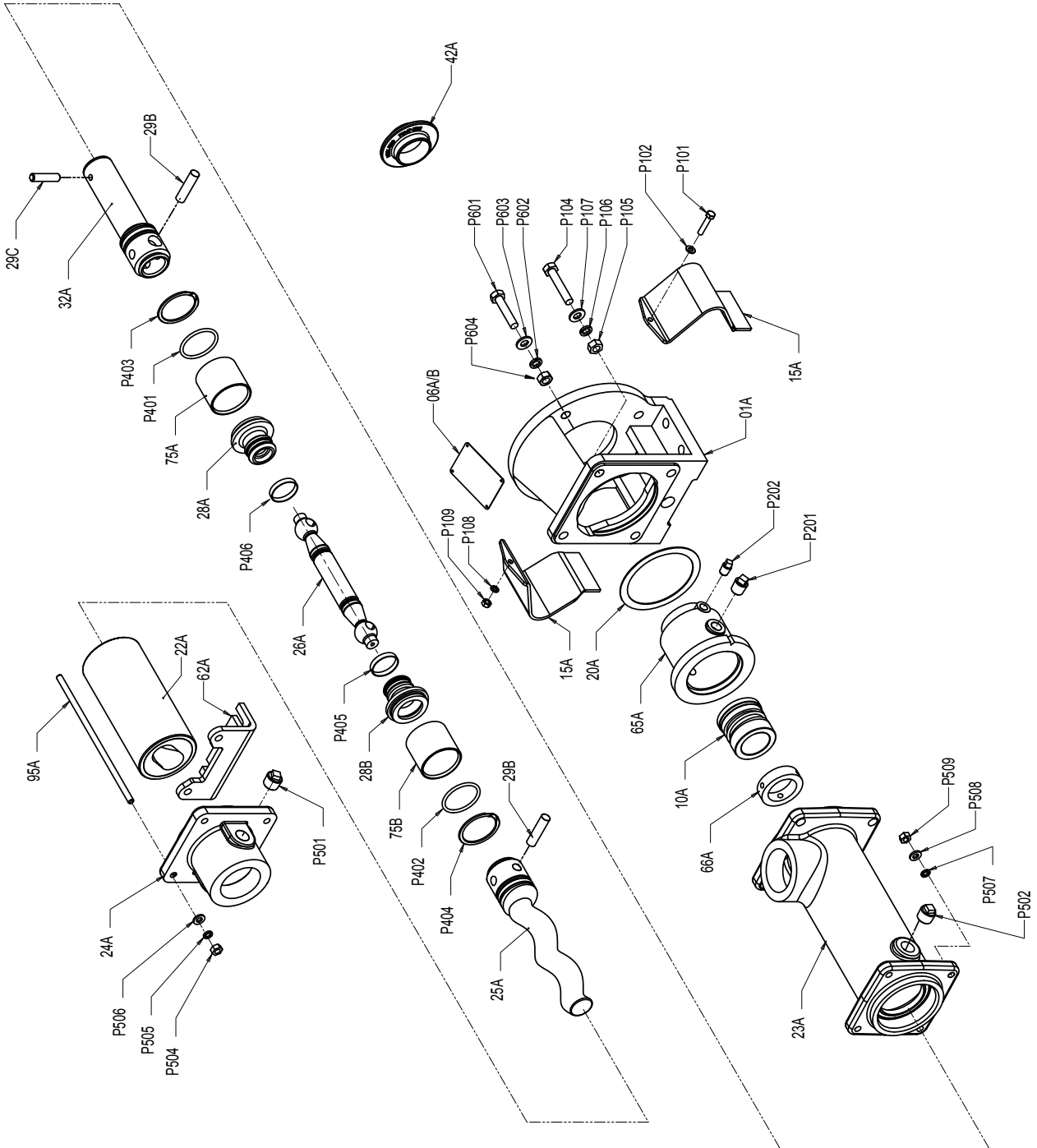
## 11.9 C24



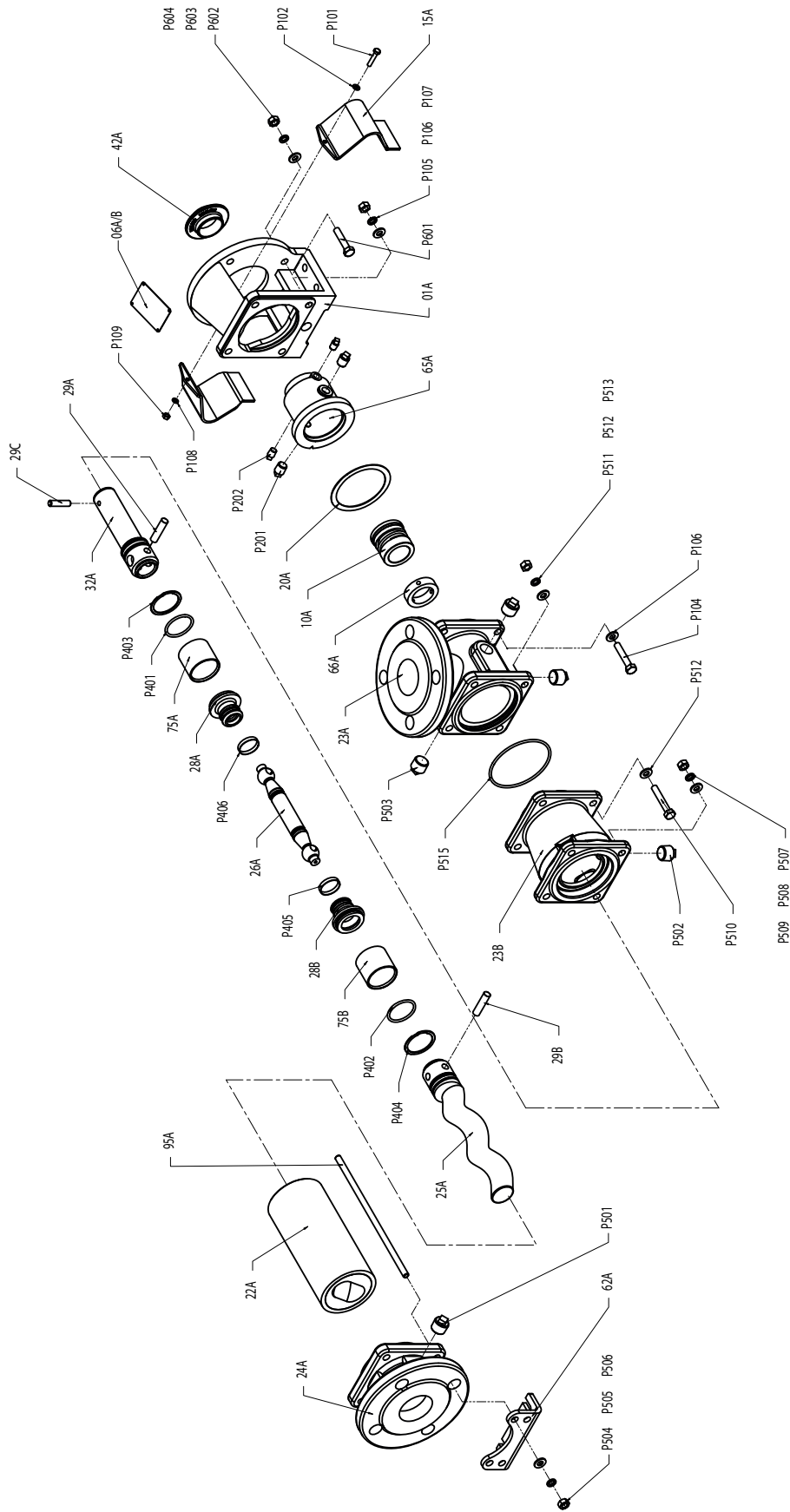
1254-00

11.10 C31 - C3L

1.255-00

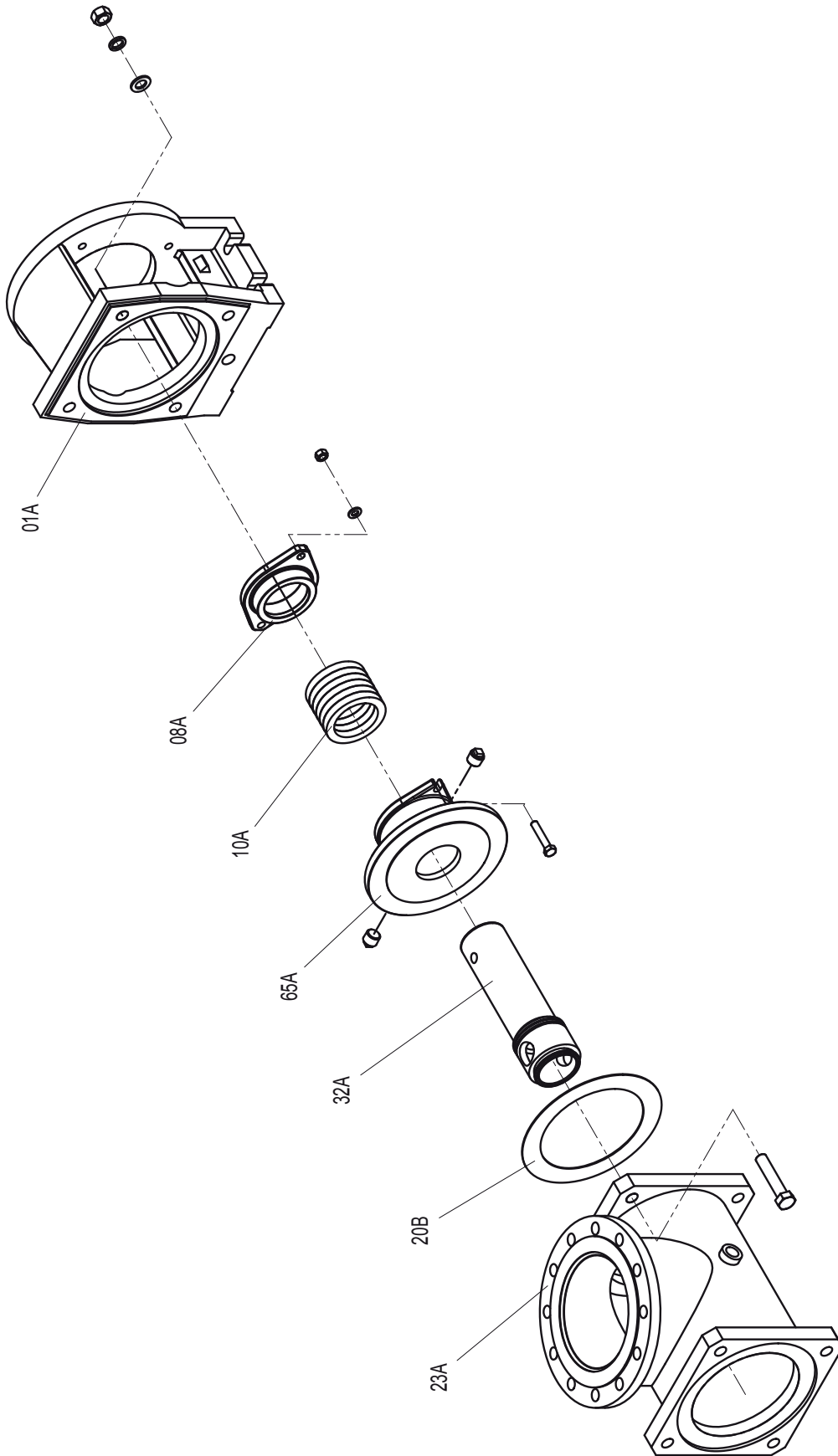


## 11.11 CXI - CX2



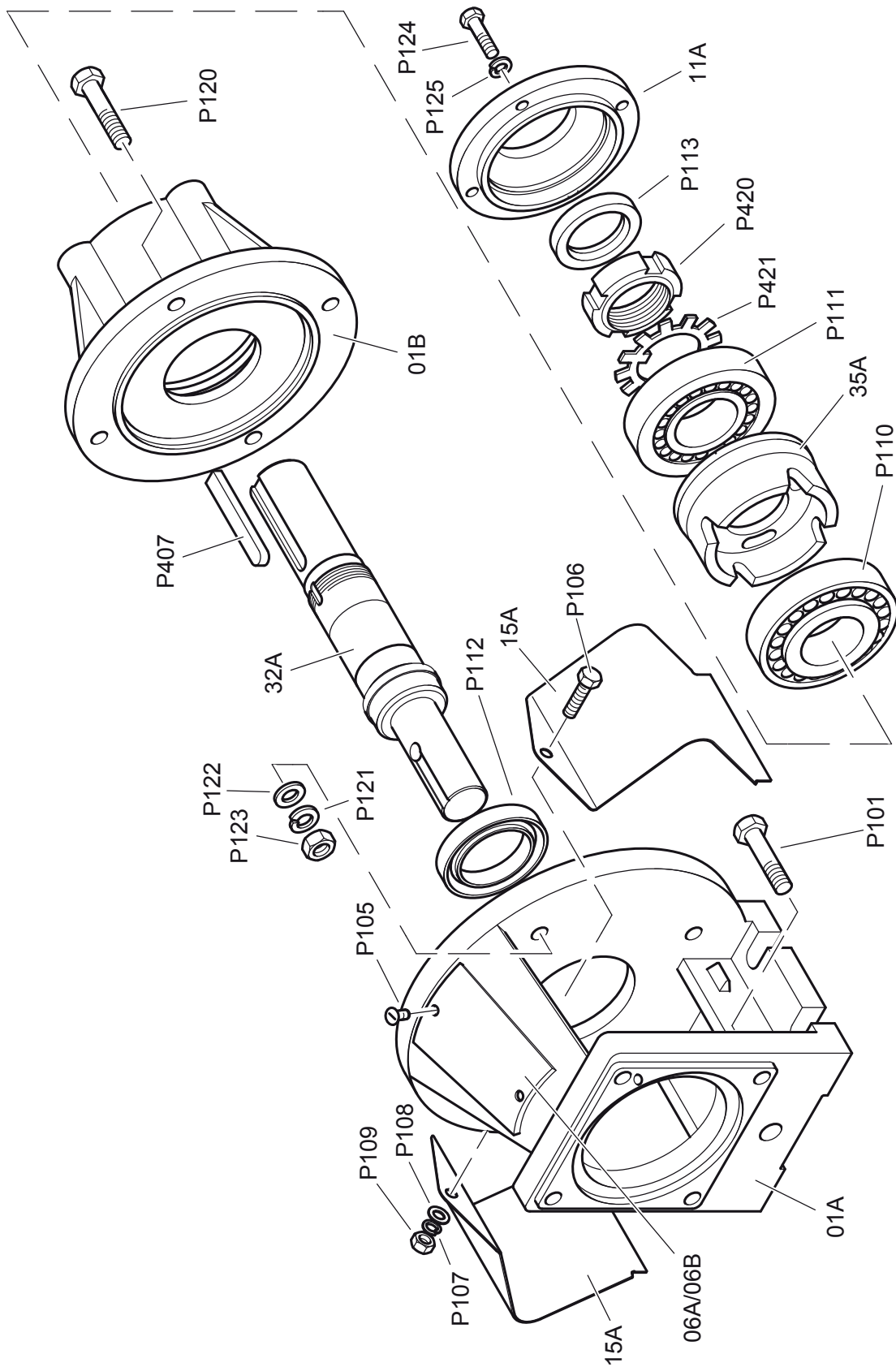
1256-00

**11.12 Packed gland**



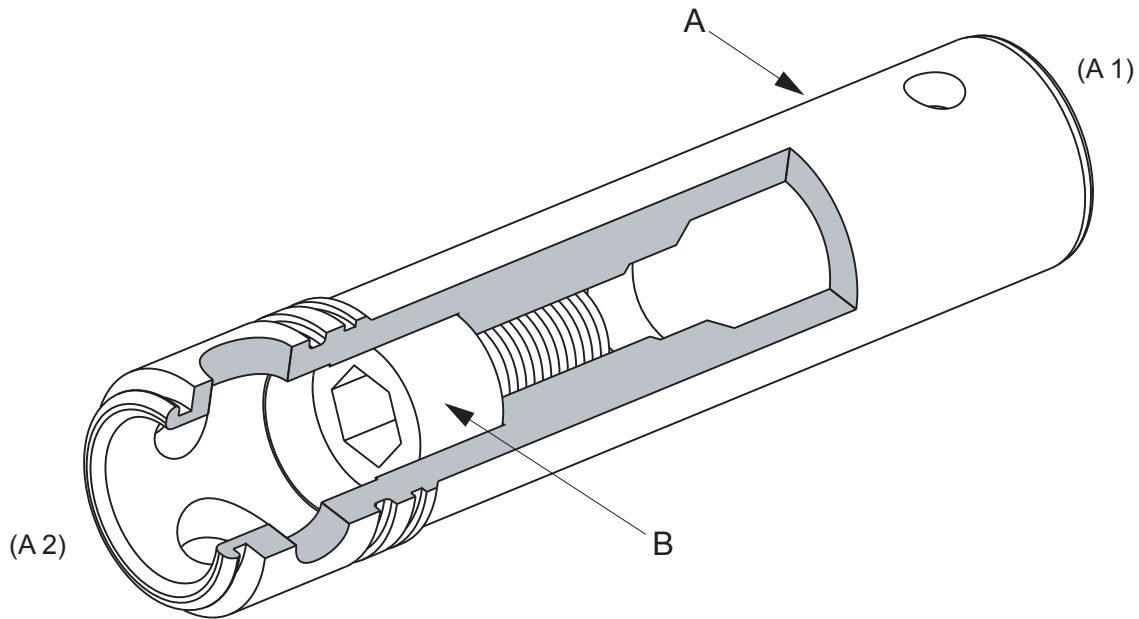
1257-00

## 11.13 Bearing housing only





## 12 Drive shaft assembly with plug



**A: Drive shaft.**

A1 = Motor shaft end, A2 = Coupling rod end.

**B: Cap head screw (grade 12.9).**

Threads to be sealed with Loctite 5910 or equivalent

**Note:** this screw may be removed to allow a jacking bolt to be used to aid removal of the drive shaft from the gearbox shaft.

**NOTE**                    *Ensure the cap head screw is tightened and sealed before assembling with coupling rod.*

## 13 Tightening torques (Nm)

### 13.1 4-stage C34 - C84

Pump size	Body / Suction chamber			Stator tie bars	Adaptor flange	Suction chamber / suction chamber extension
	P533	P105	P535	P501	P515	P520
C34		11		11	11	11
CX4		21		11	11	11
C44		21		21	11	11
C54		40		40	21	21
C64	50		40	75	40	40
C74		176		75	75	
C84		176		120	75	

## 13.2 CXL and above

Pump size	Body / Suction chamber			Stator tie bars
	P533	P105	P535	P501
CXL		10		10
C41		11		11
C4L		11		11
C42		11		11
C51		11		11
C5L		21		11
C52		21		11
C61		21		24
C6L		21		24
C62		36		24
C71		36		24
C7L		36		24
C72		36		24
C81		36		40
C8L		36		40
C82	50		36	40
C91		90		75
C9L		90		75
C92		90		75
CA1		90		75
CAL		90		75
CA2		90		75
CB1		176		120
CBL		176		120

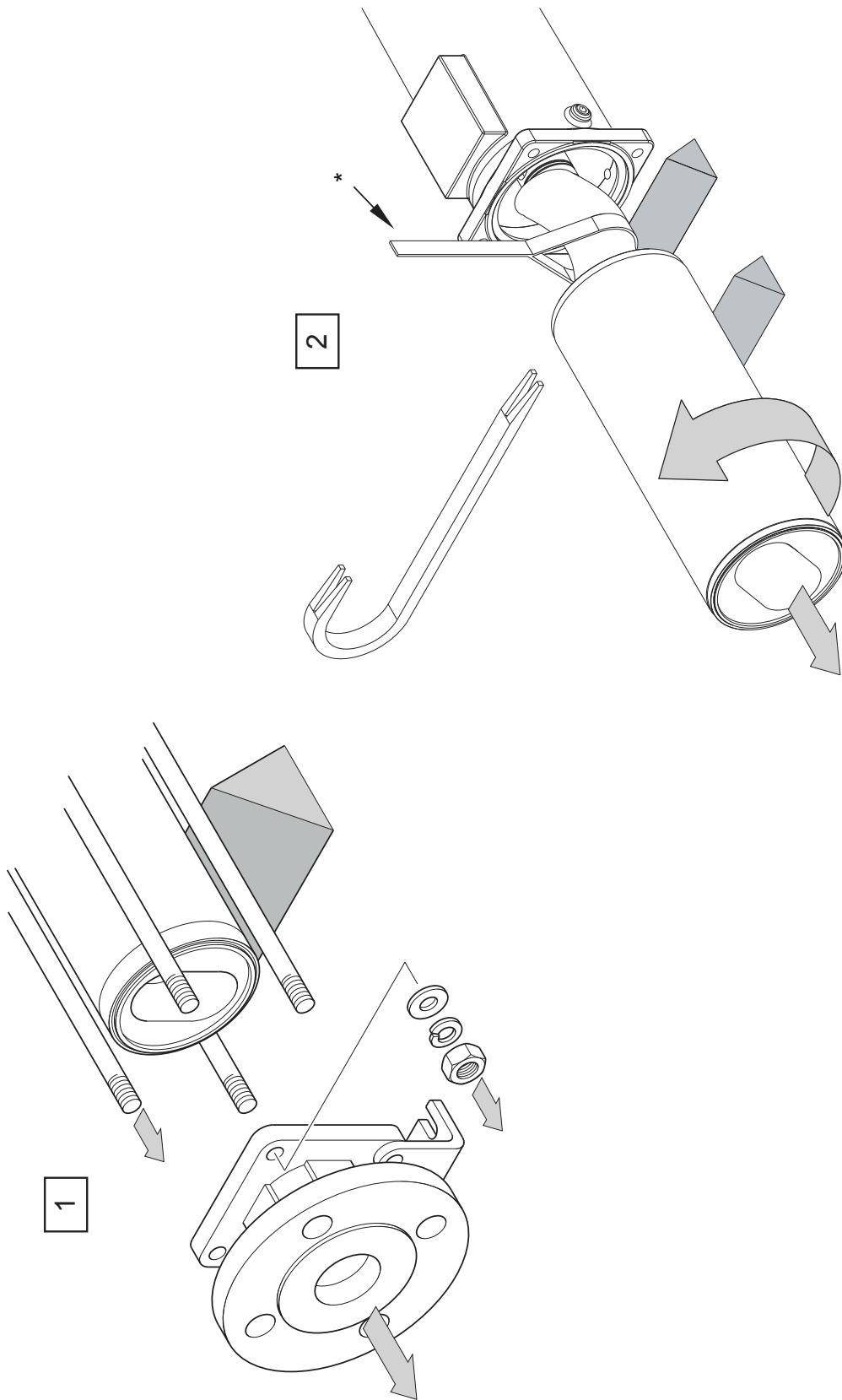
## 13.3 CX2 and below

Pump size	Suction chamber / suction chamber extension	Stator tie bars
	P105	P504, P507
C12	10	4
C14	10	4
C21	10	4
C22	10	4
C24	10	4
C31	10	4
C32	10	4
C3L	10	4
CX1	10	10
CX2	11	10

**NOTE:** Torque tolerances are +/-5% of stated nominal figures.

## 14 Dismantling procedures

### 14.1

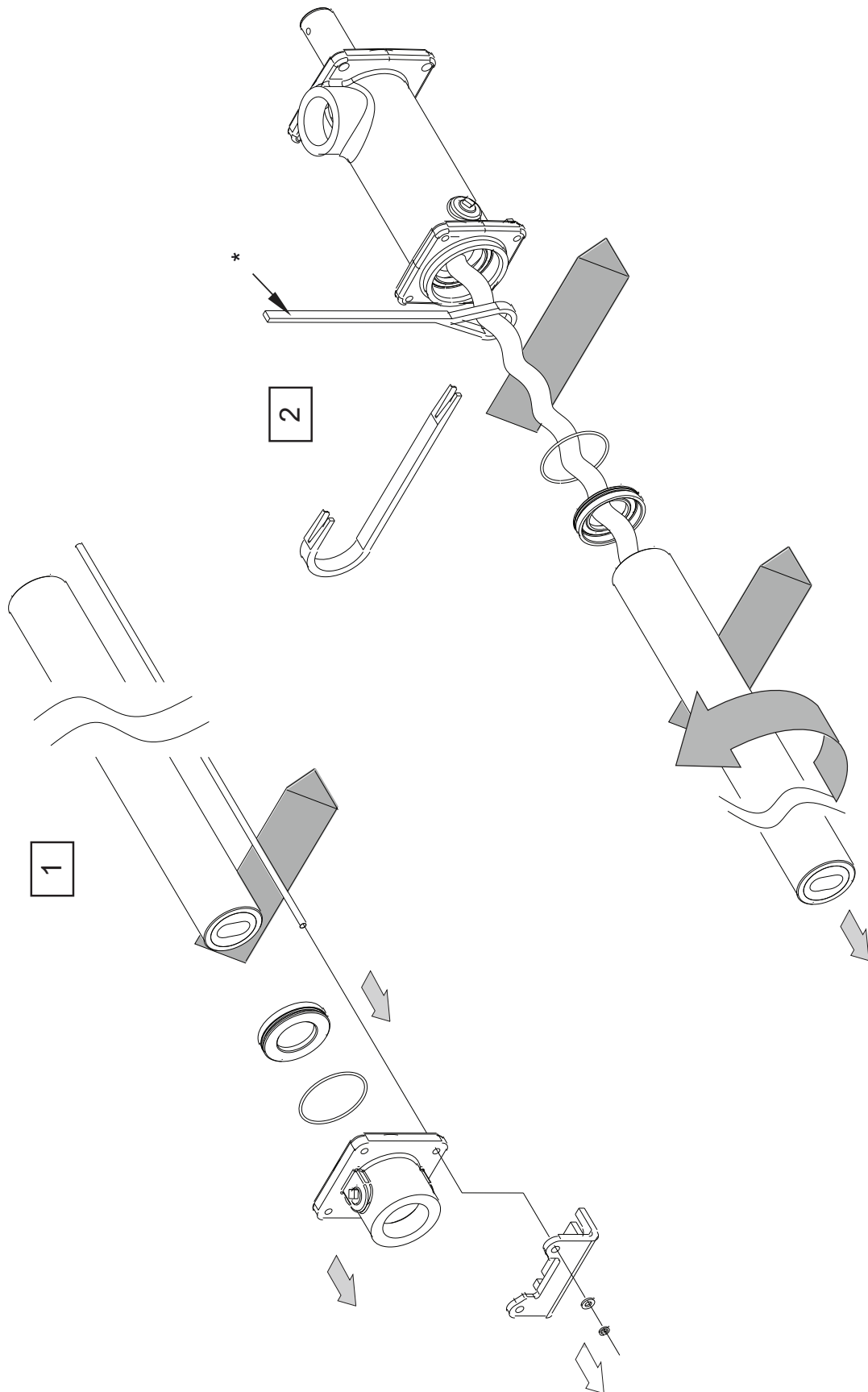


1255-00

\* Support / sling

## 14.2 C24

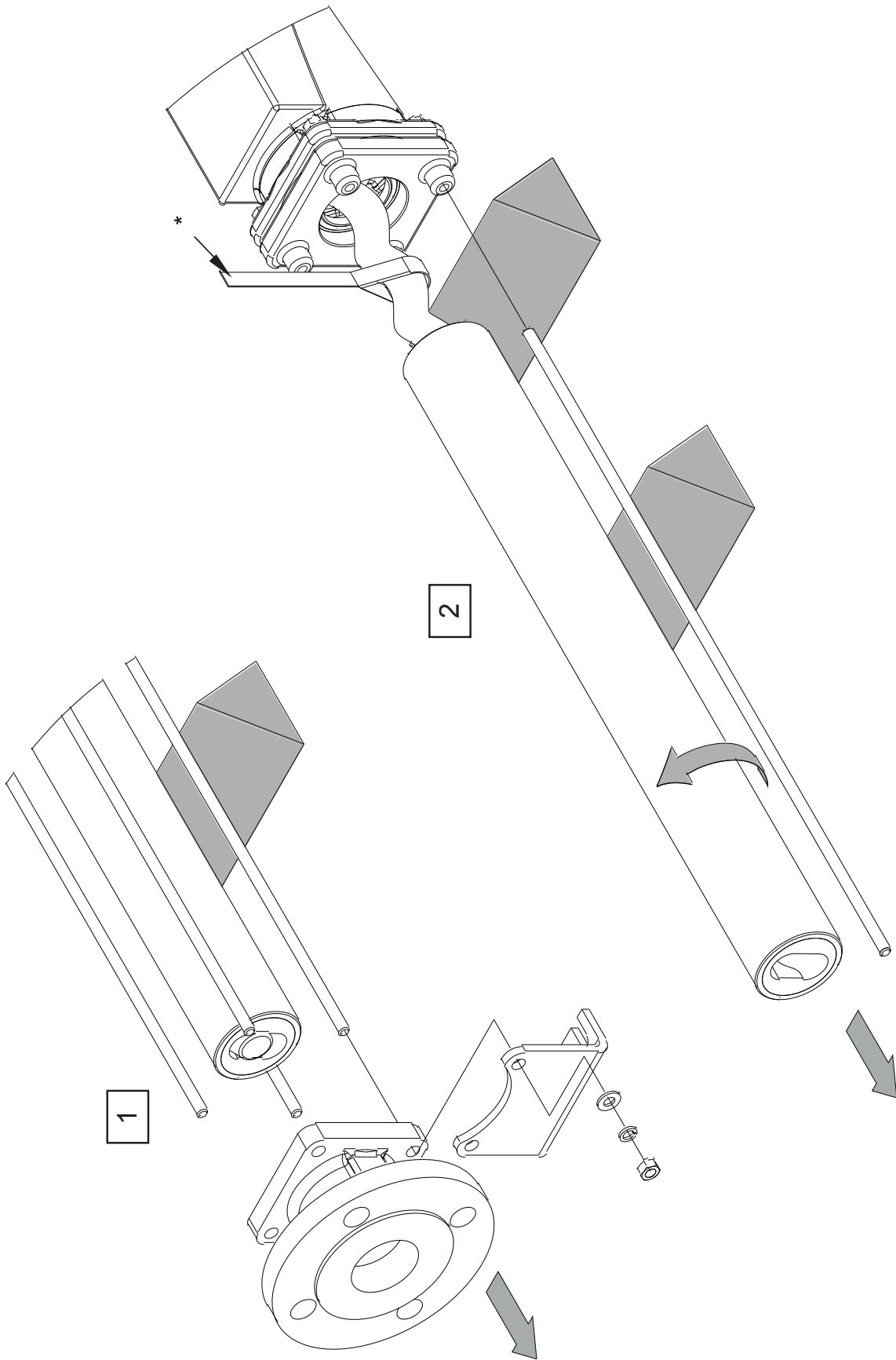
1280-00



\* Support / sling

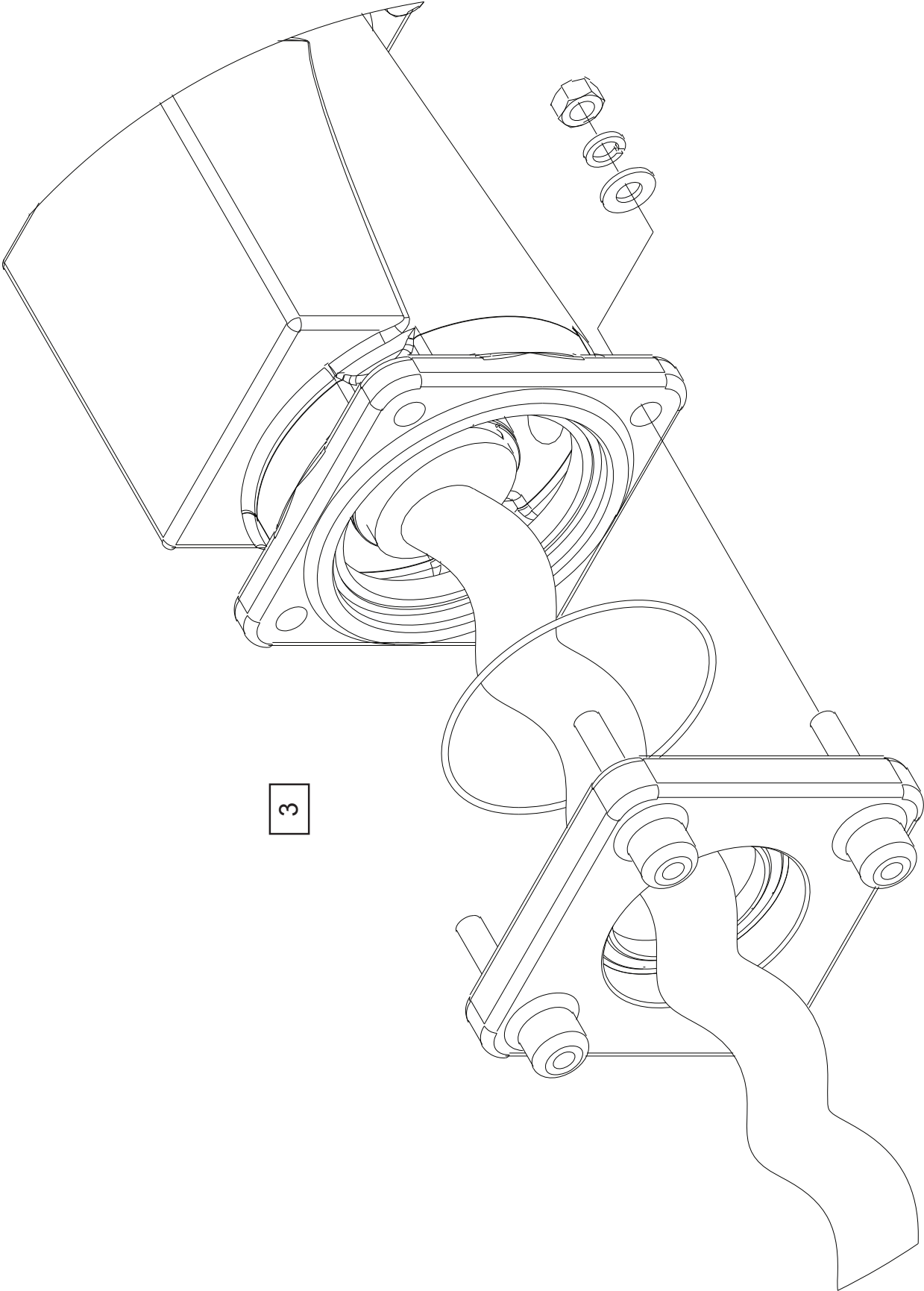
**14.3 C34 - C84**

1261-00



\* Support / sling

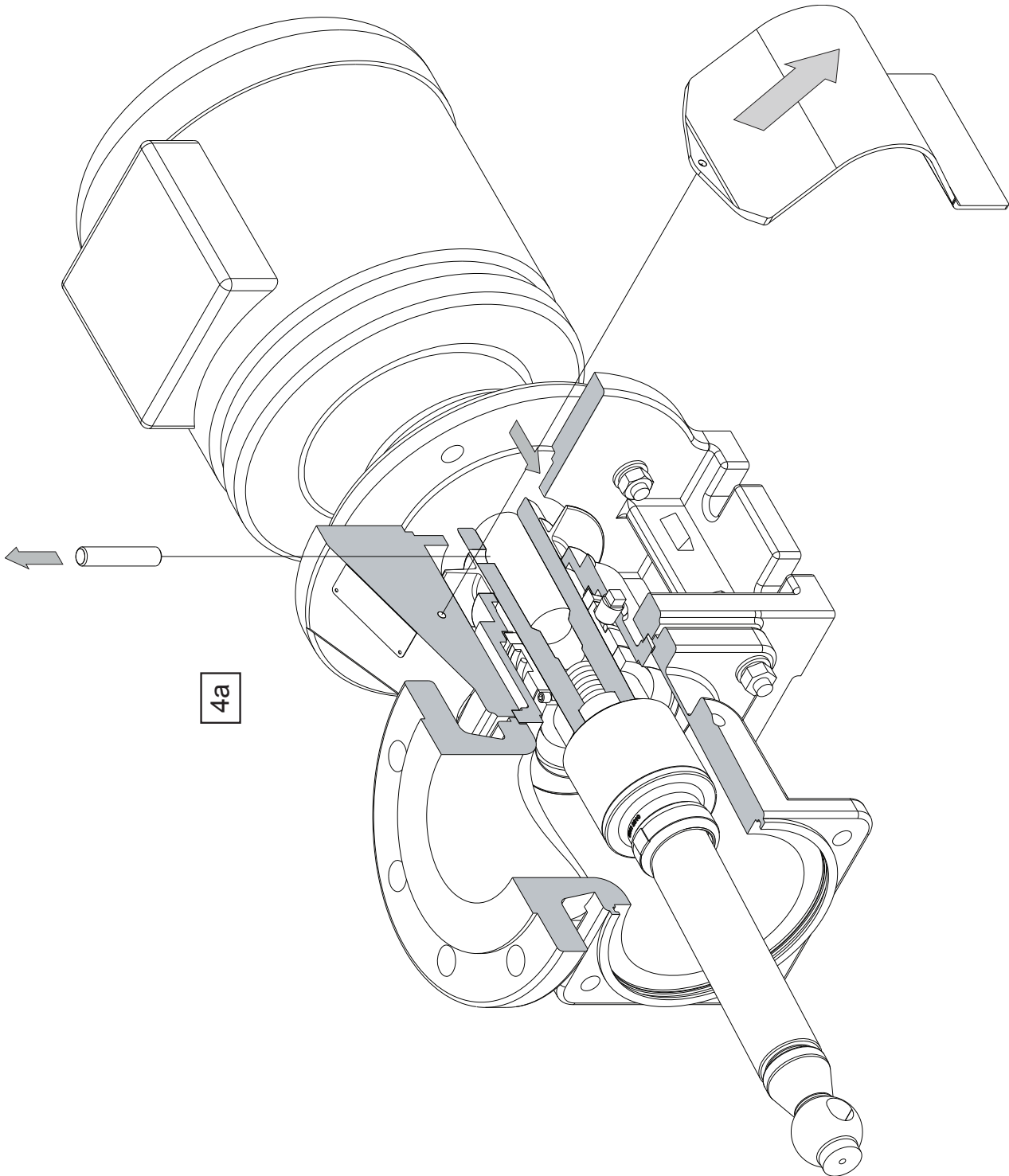
14.4 4-stage models only



1262-00

14.5

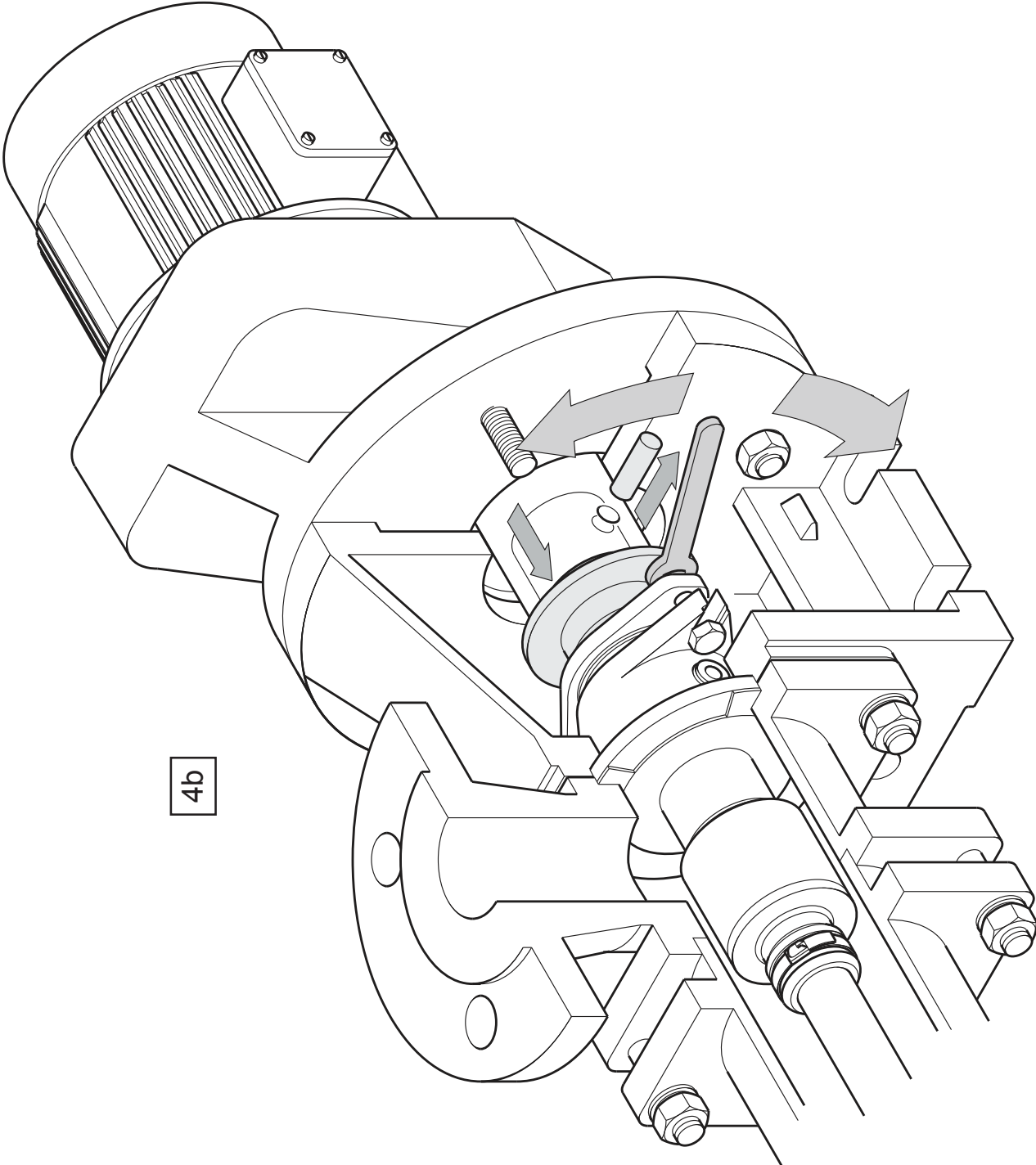
1.263-00





14.6

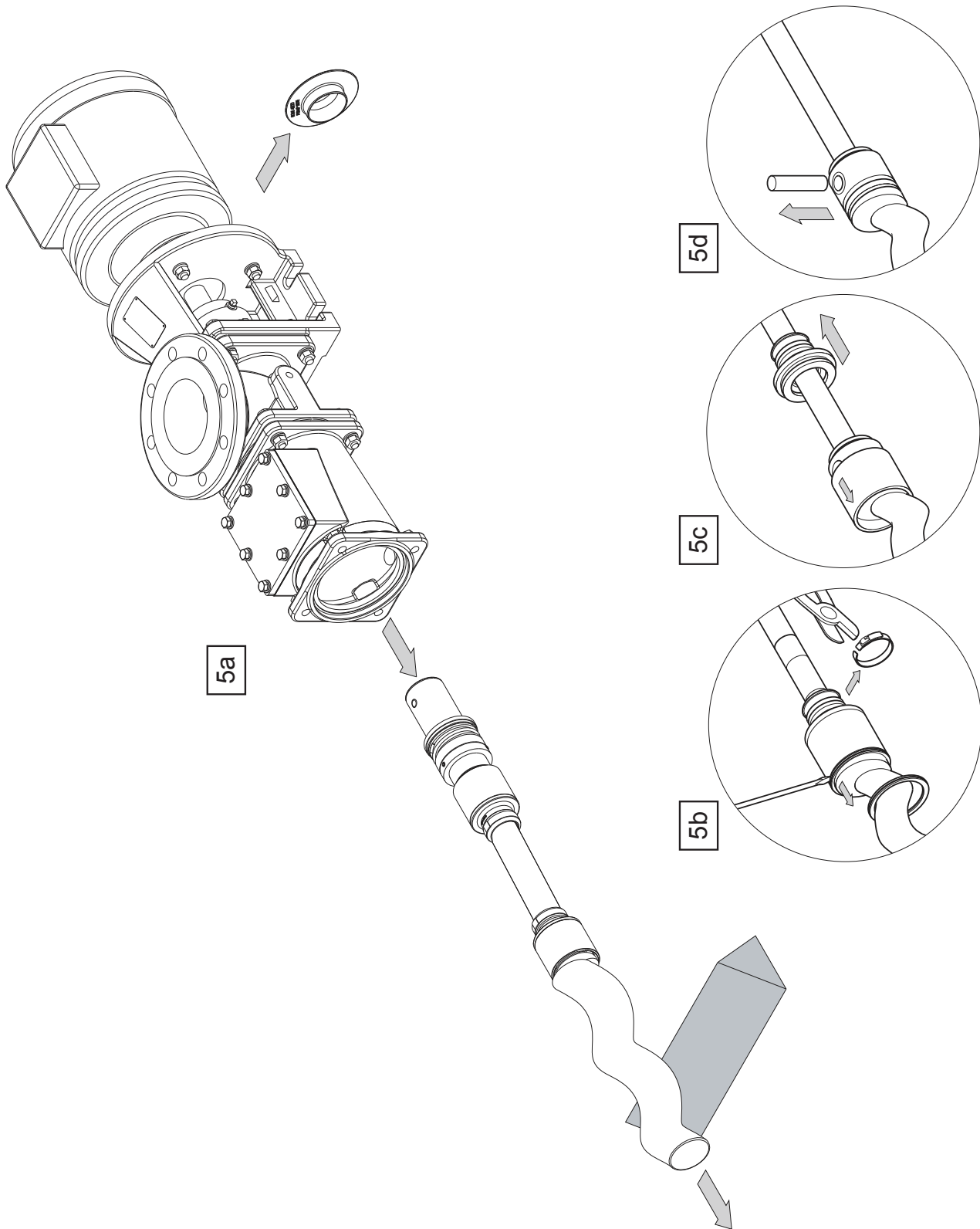
1284-00



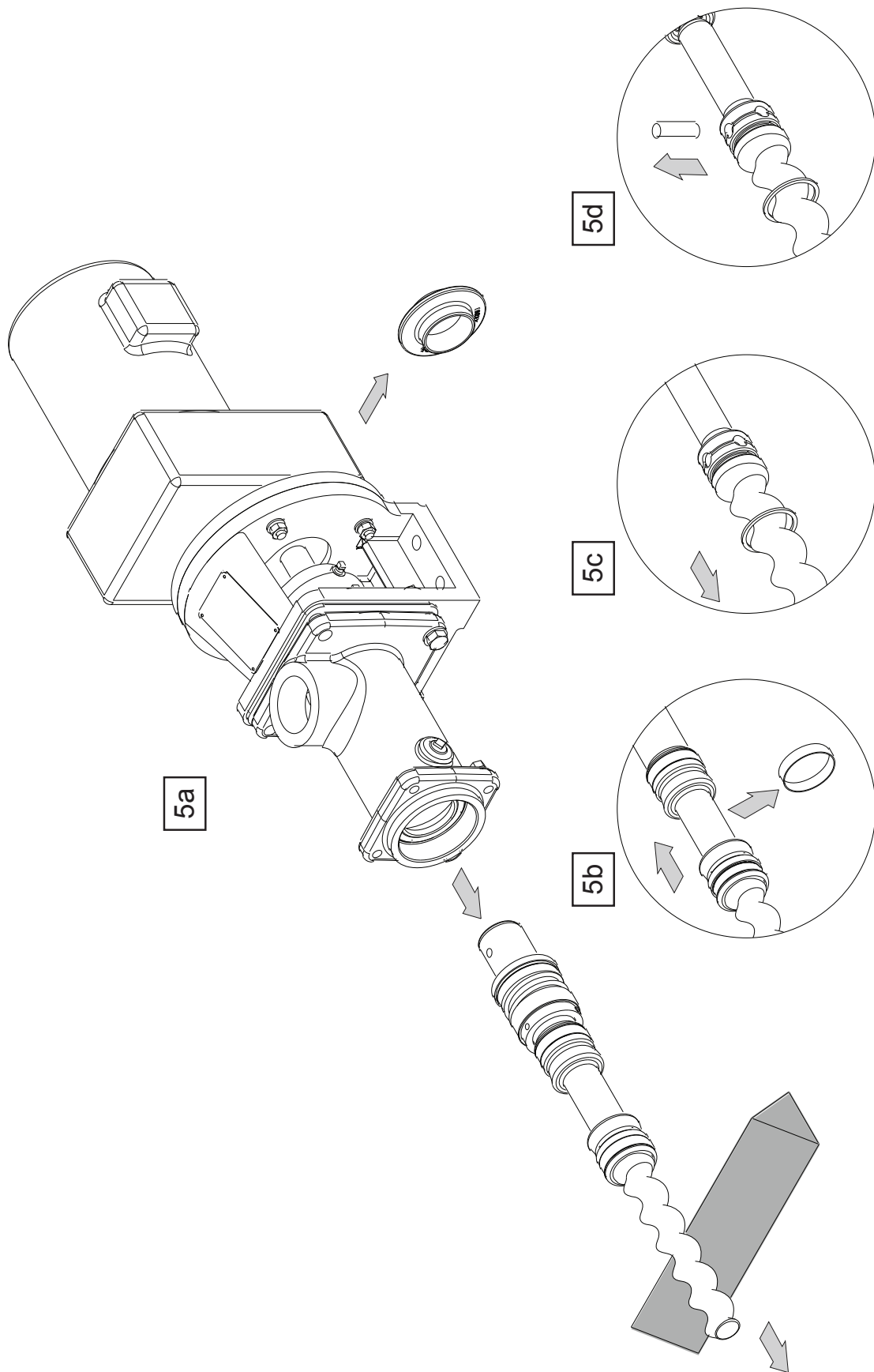
Only applicable if using packed gland pump

14.7 CXL and above

1265-00



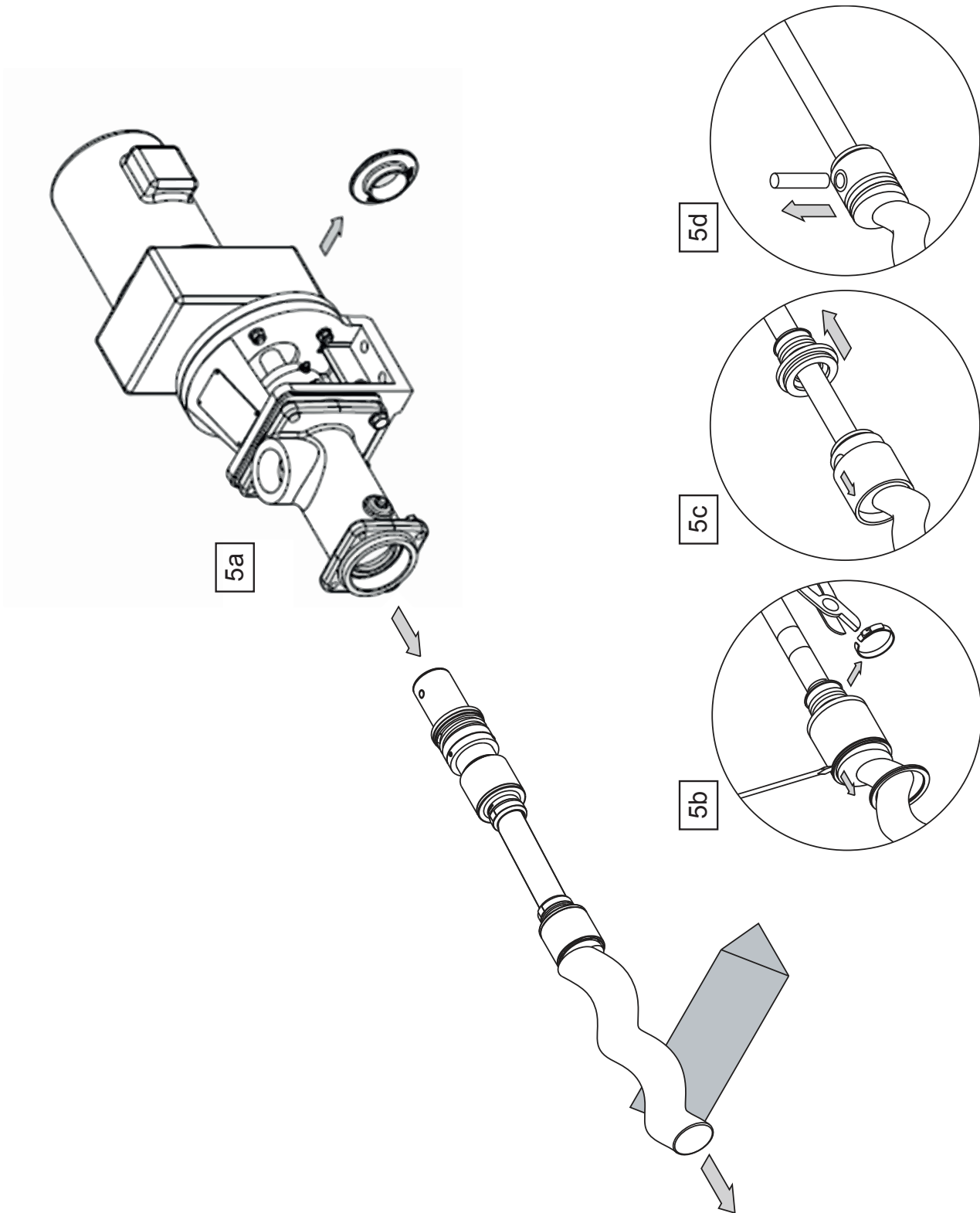
## 14.8 C12 - C22



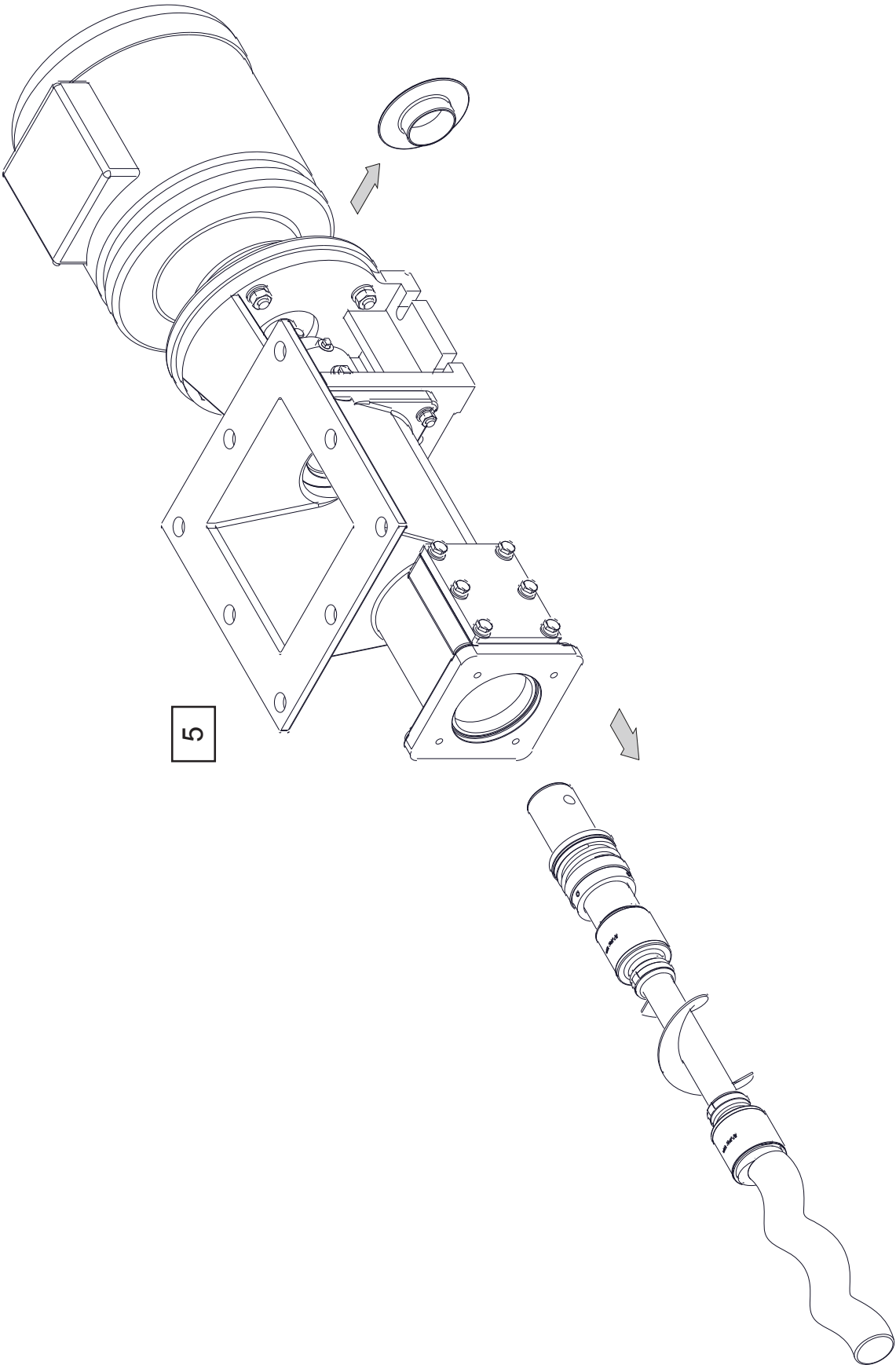
1286-00

14.9 C31

1.267-00



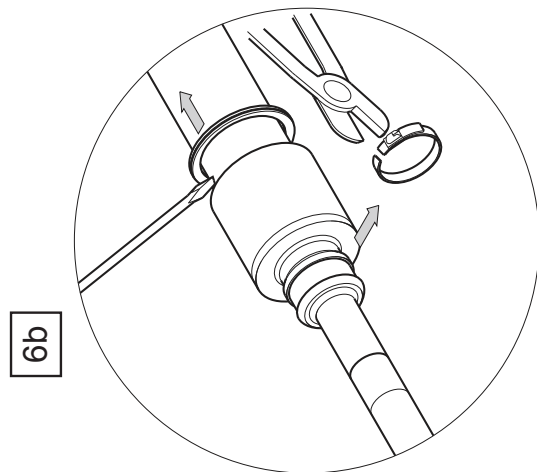
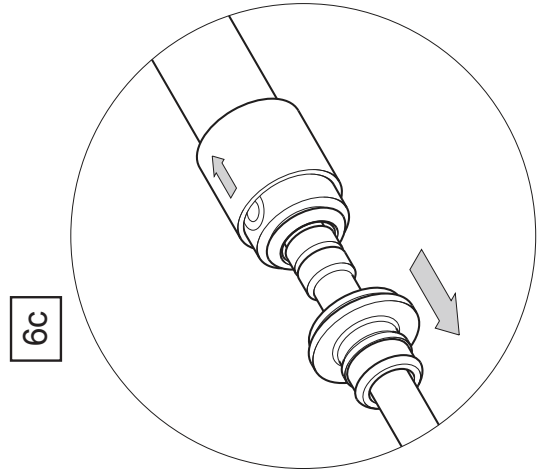
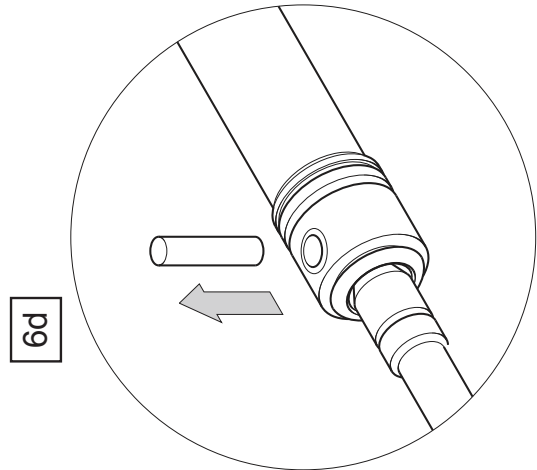
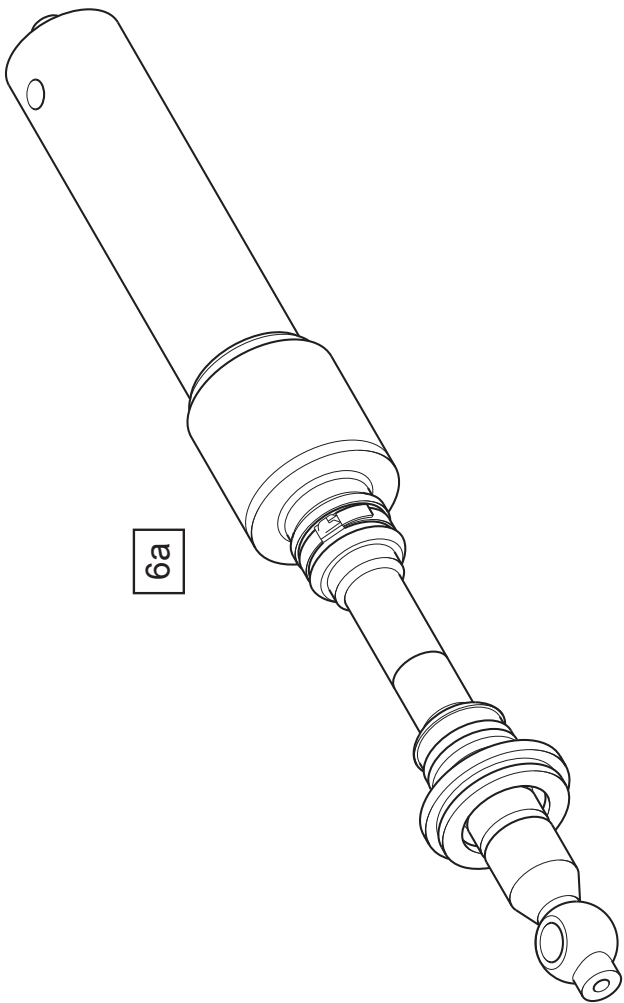
**14.10 Square inlet**



1268-00

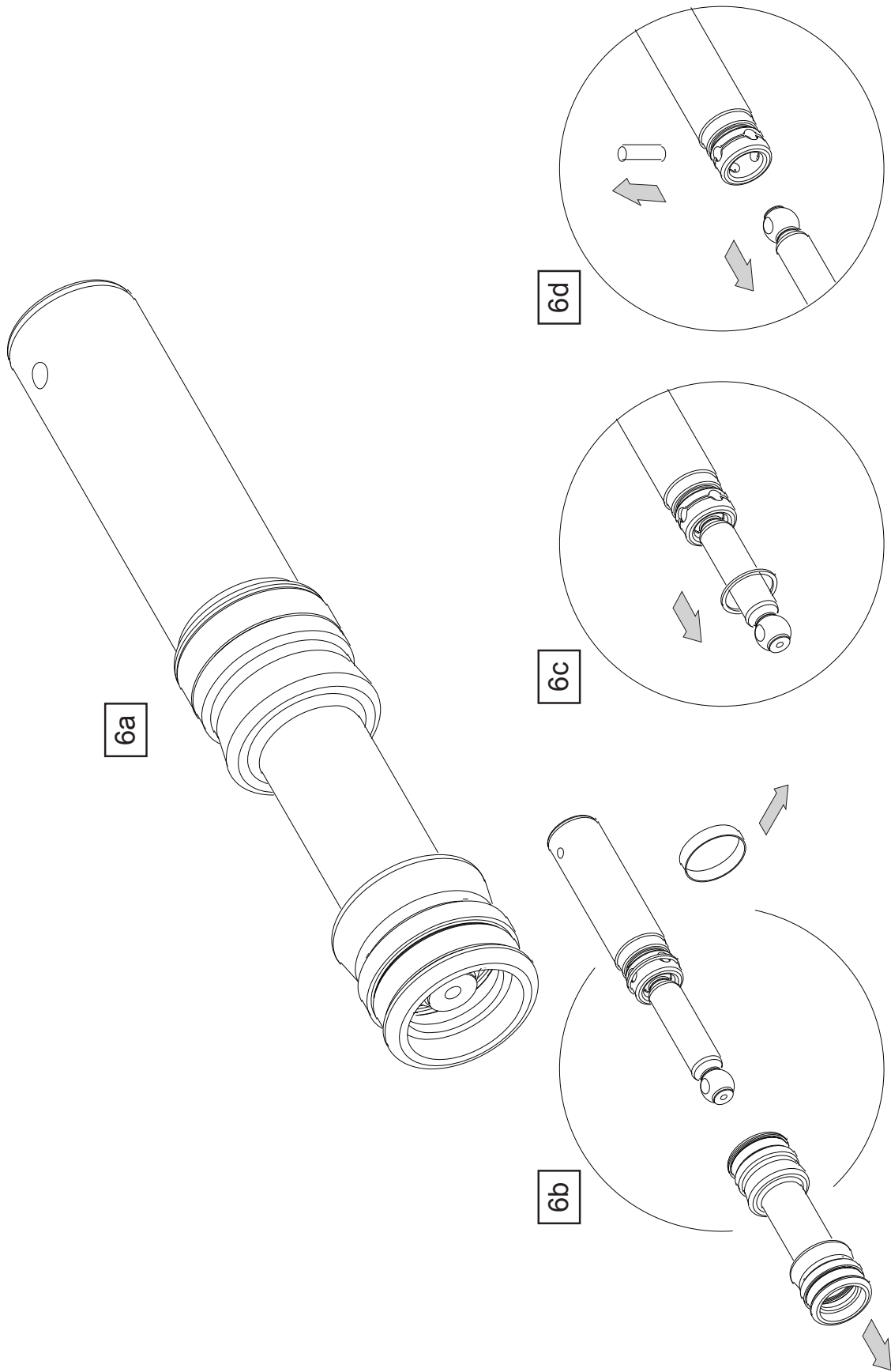
**14.11 CXL and above**

1269-00



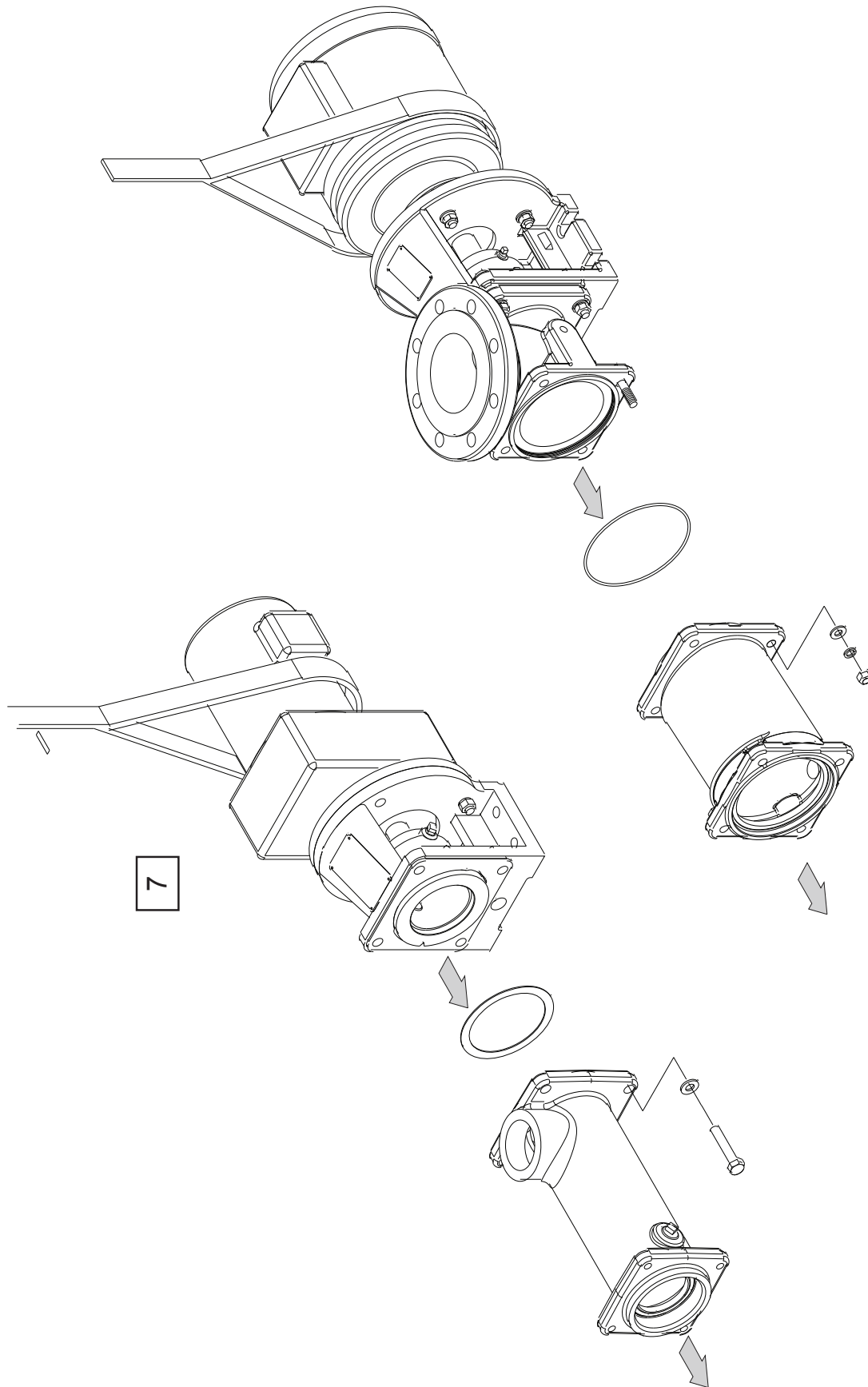
## 14.12 C12 - C22

1270-00





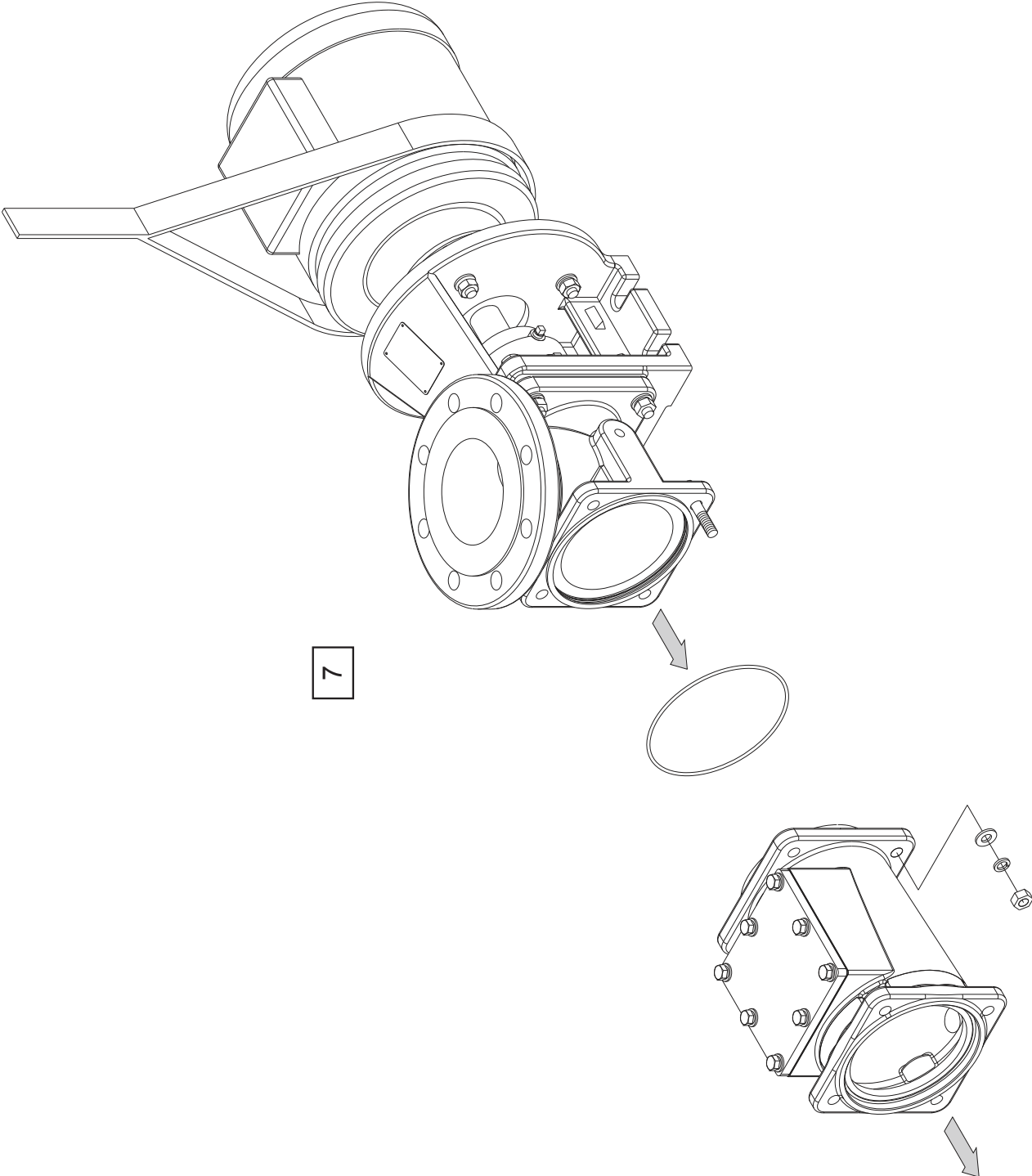
**14.13 C12 - C3L (top) and CX1 - CX2 (bottom)**



1271-00

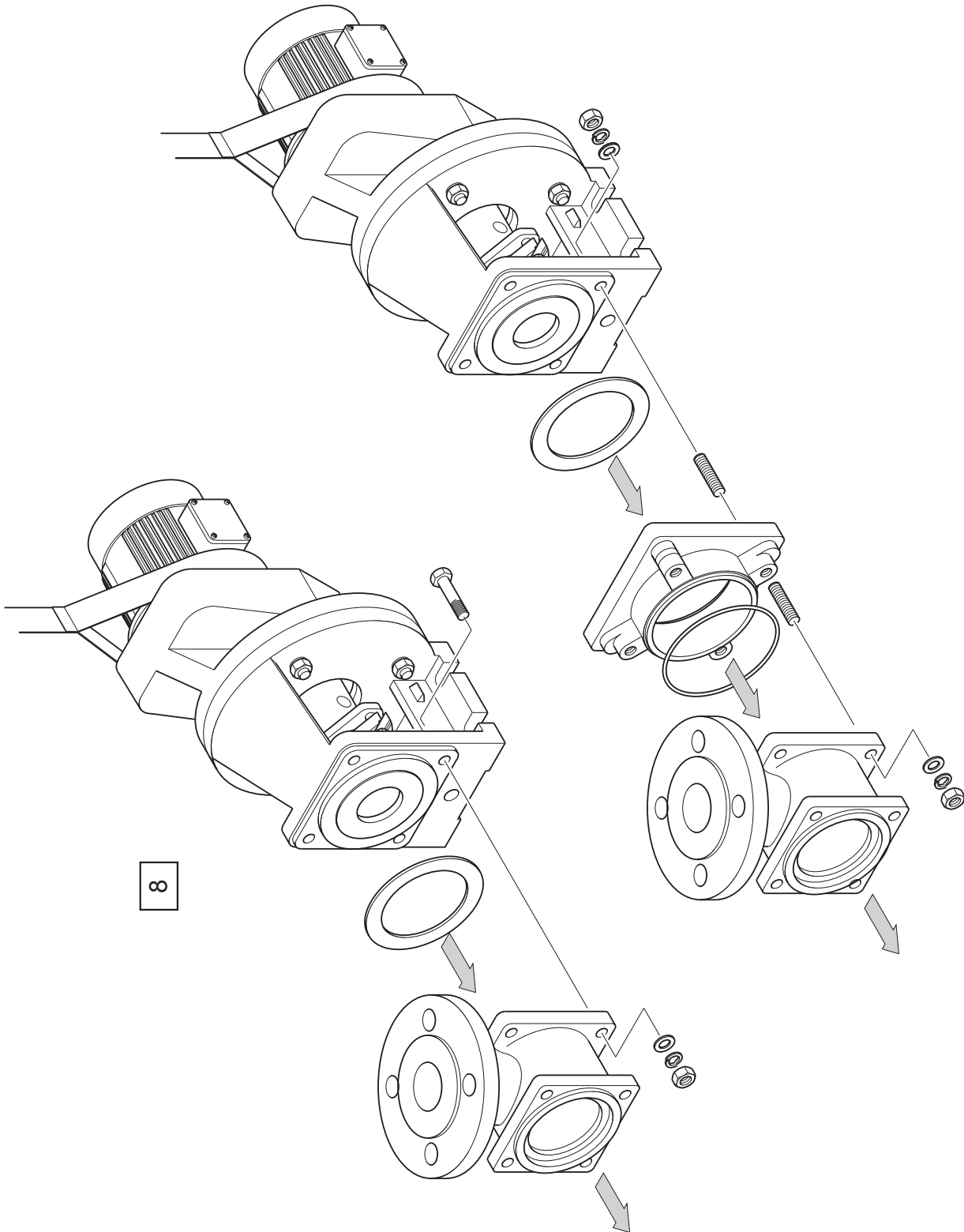
14.14 Not applicable to sizes below CXL

1272-00



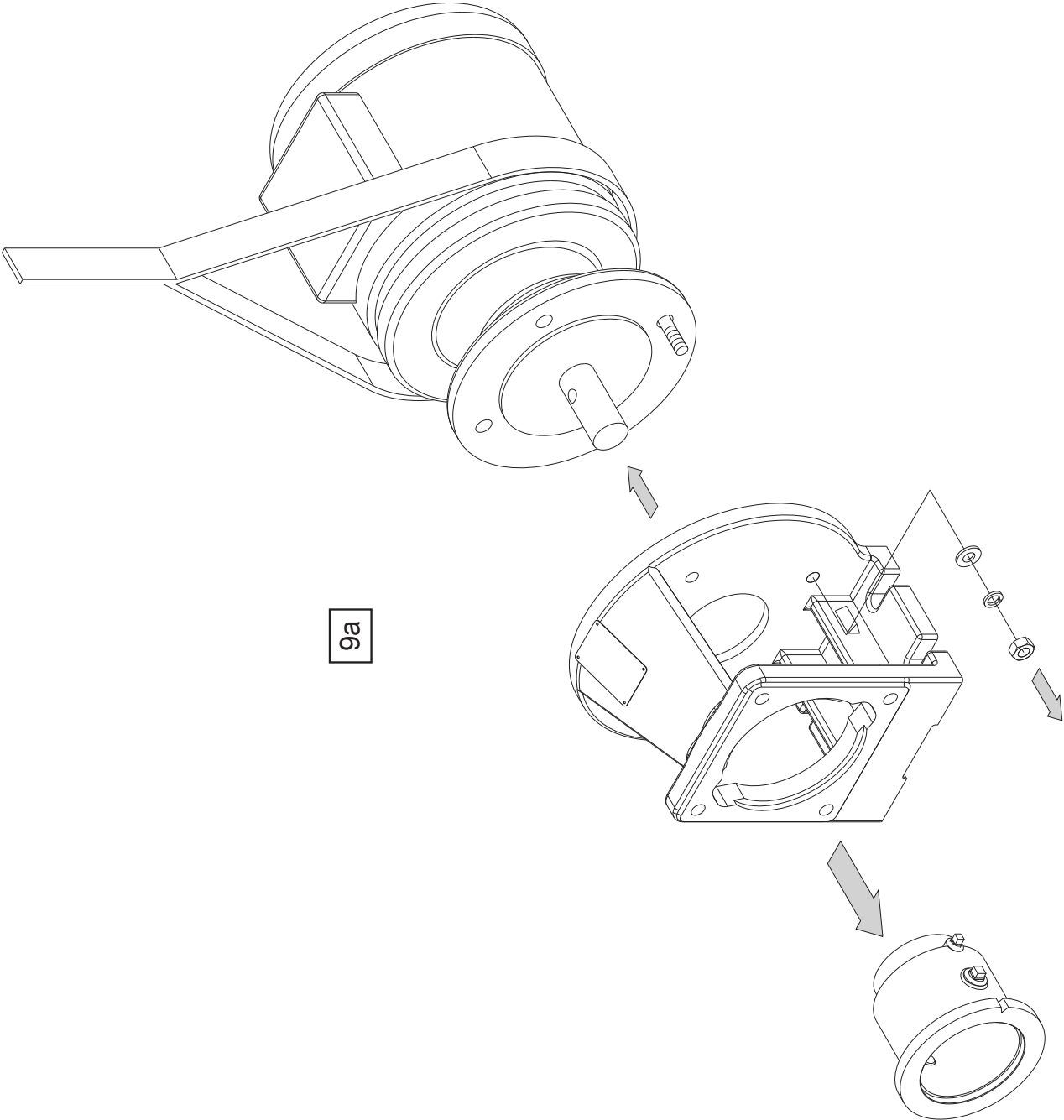
**14.15 C82 and C64 only (with or without bearing housing)**

1273-00

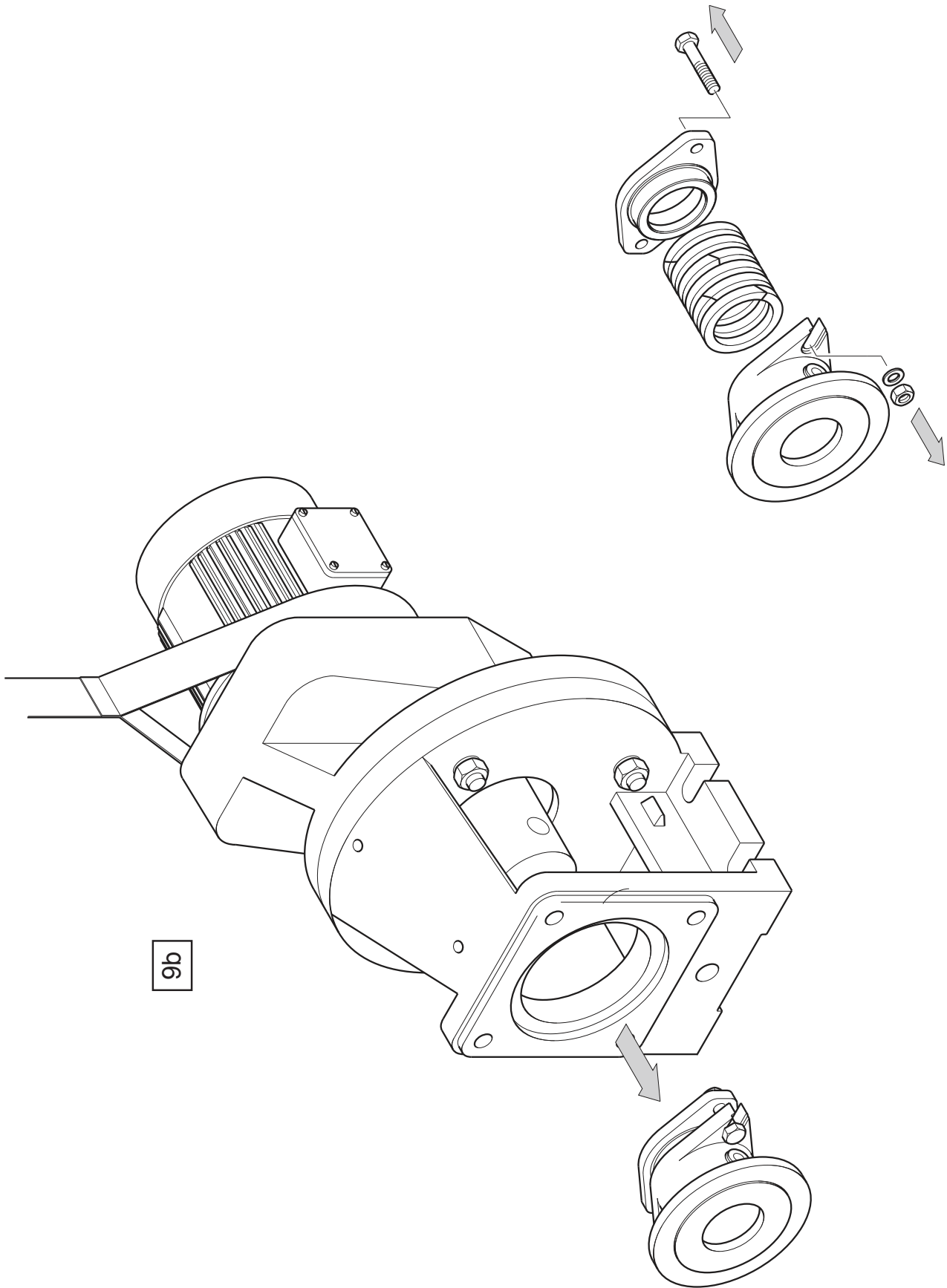


14.16

1274-00



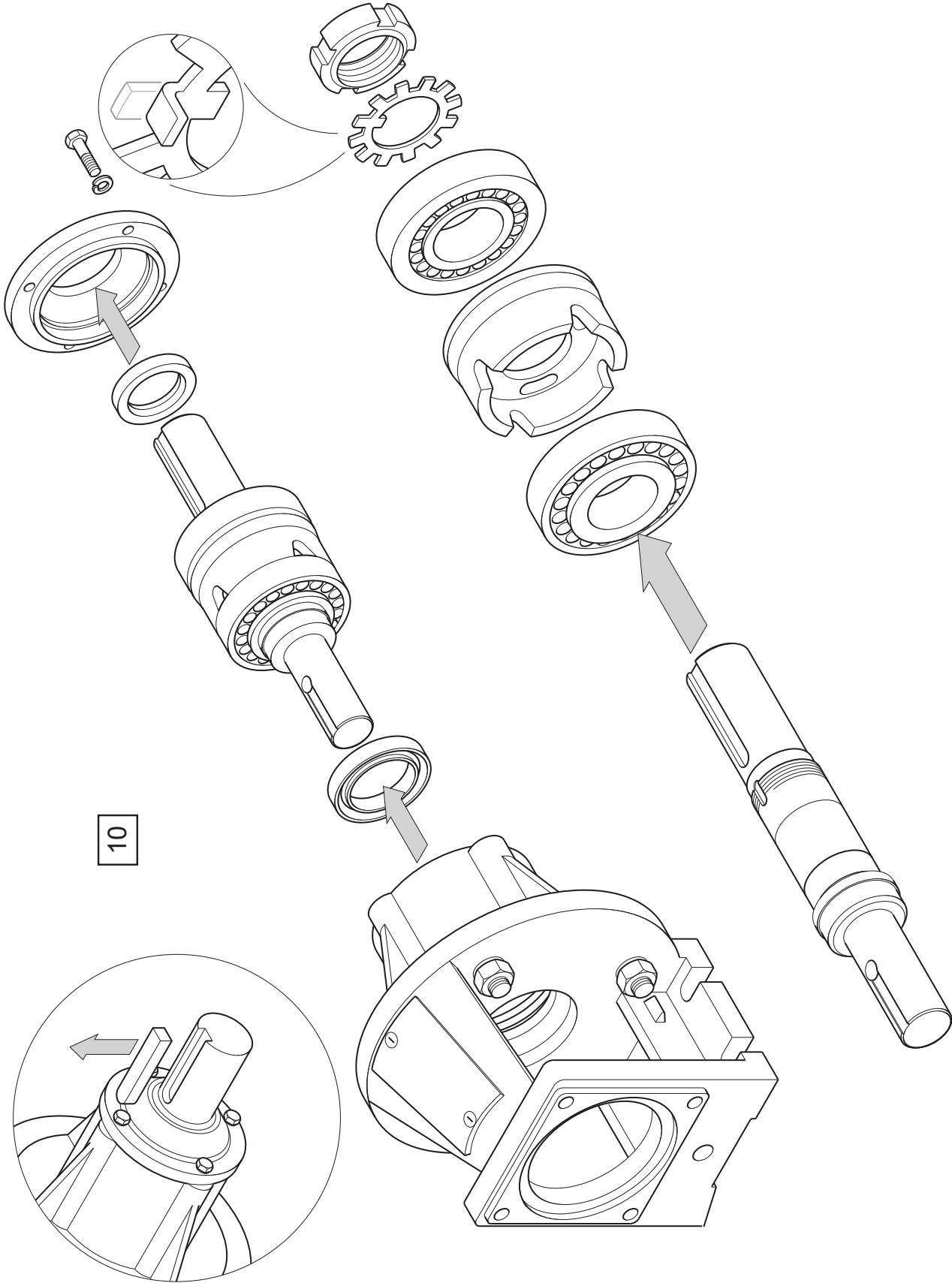
14.17



1276-00

Only applicable if using packed gland pump.

**14.18 Bareshaft only**

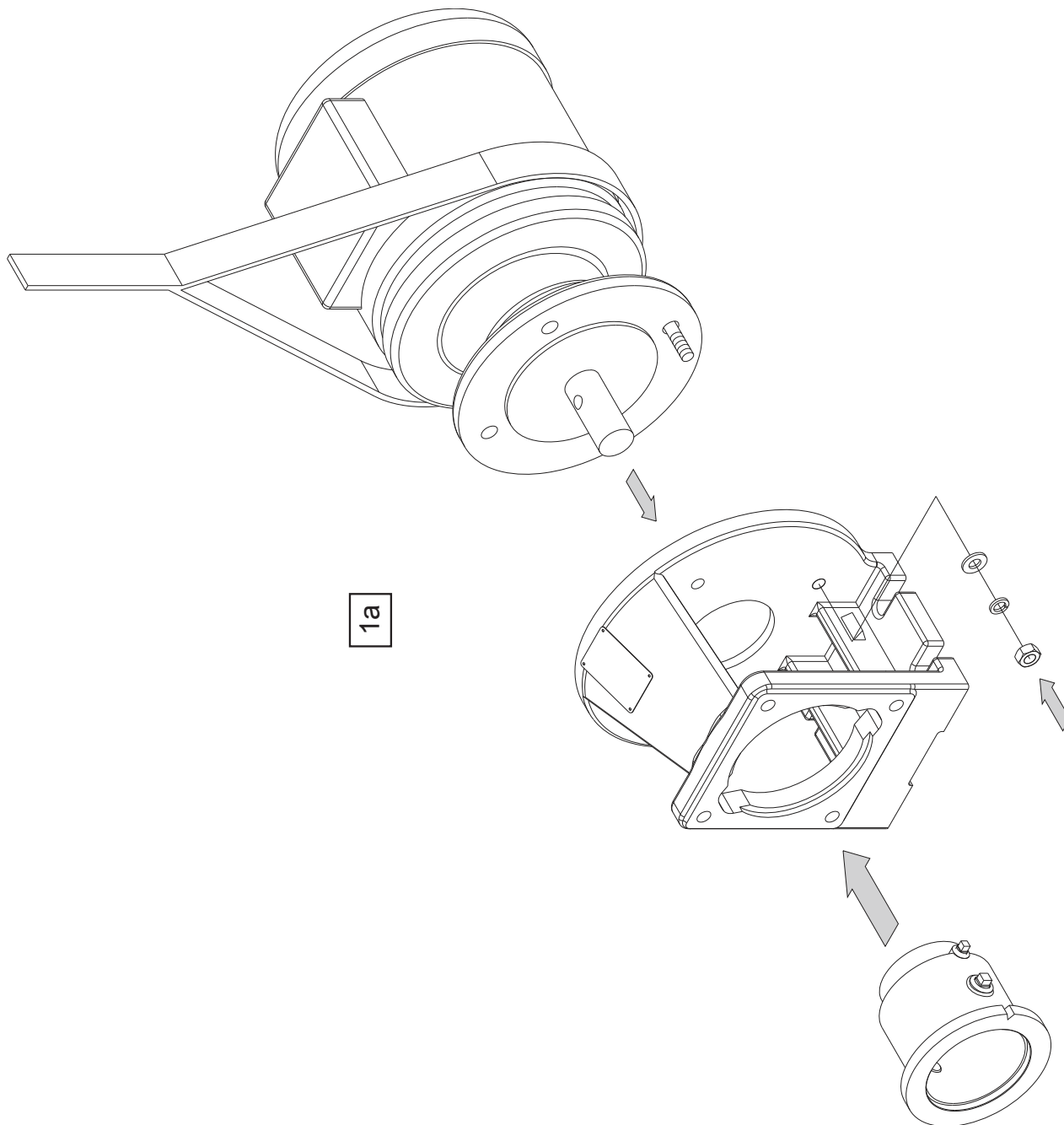


1276-00

## 15 Assembly procedures

### 15.1

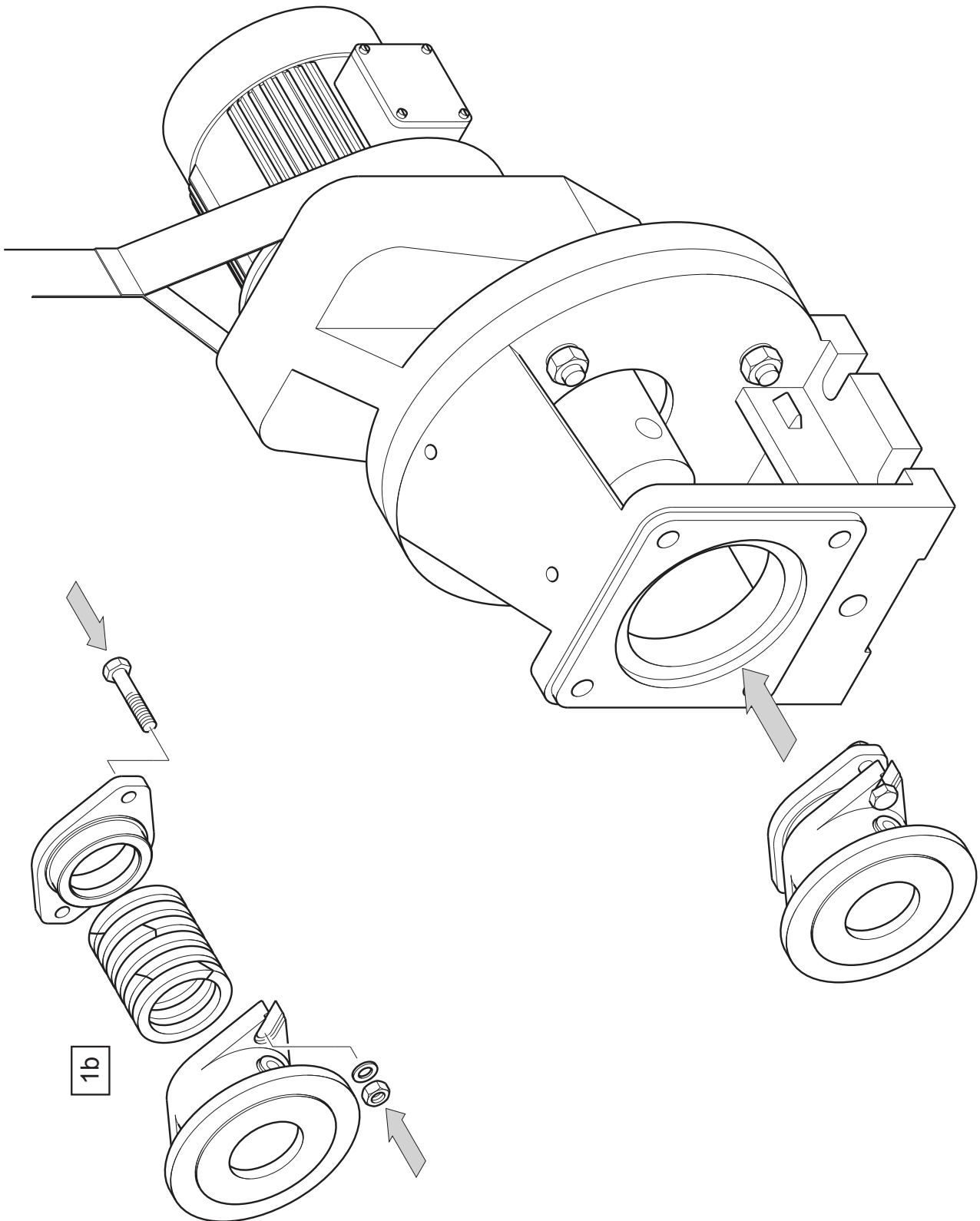
1277-00





## 15.2

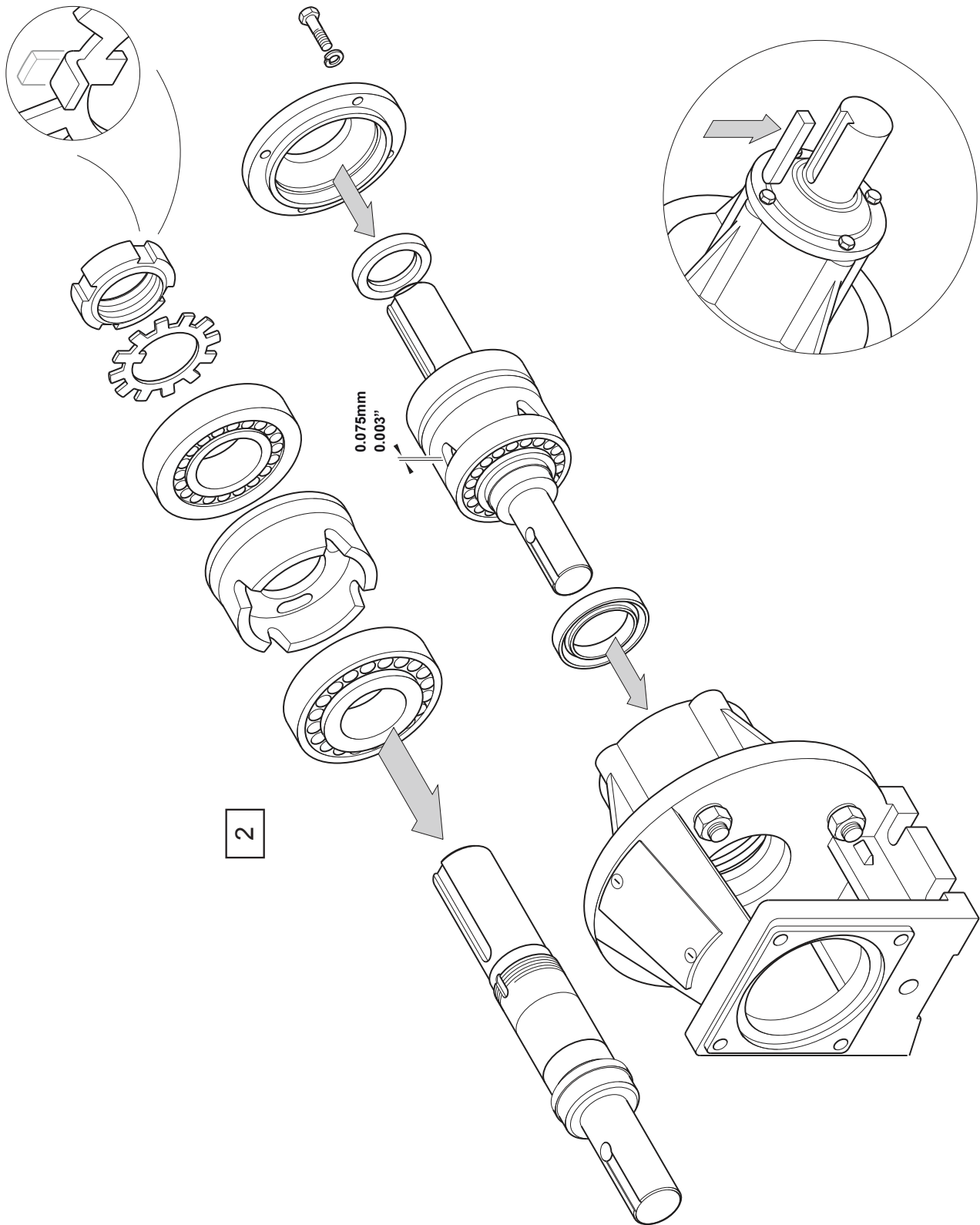
1278-00



Only applicable if using packed gland pump.

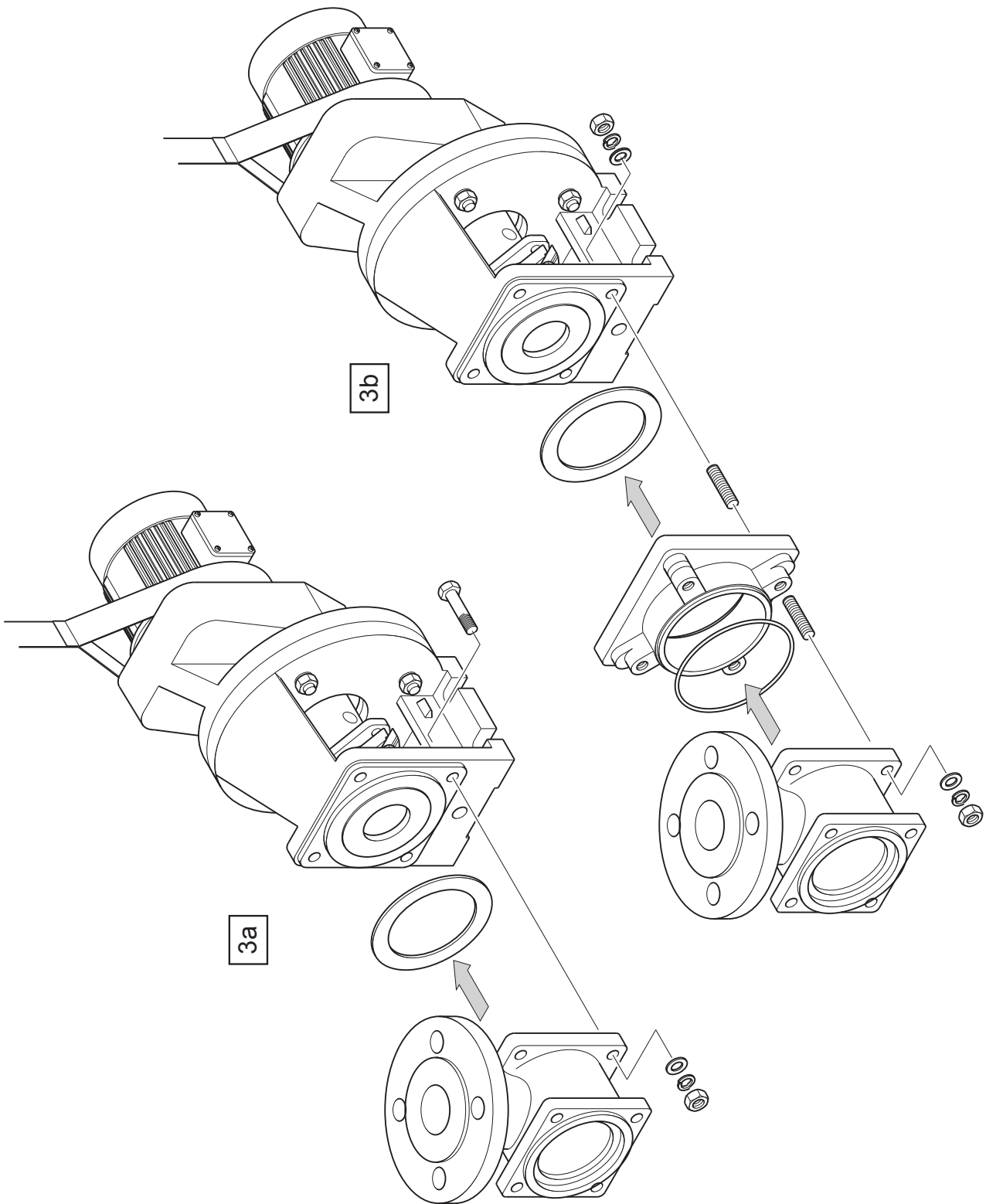
**15.3 Bareshaft only**

1279-00



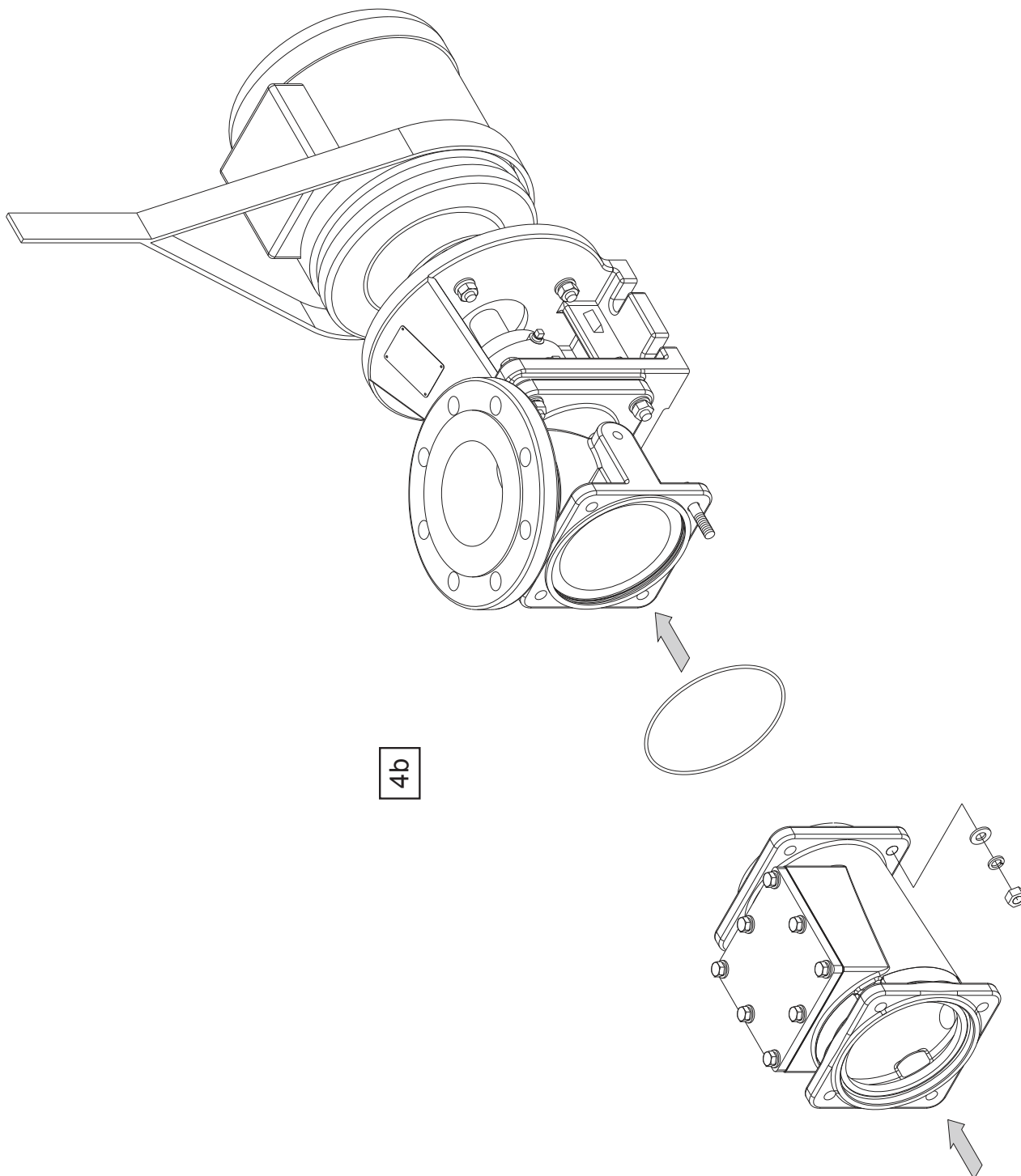
## 15.4 C82 and C64 (with or without bearing housing)

1280-00



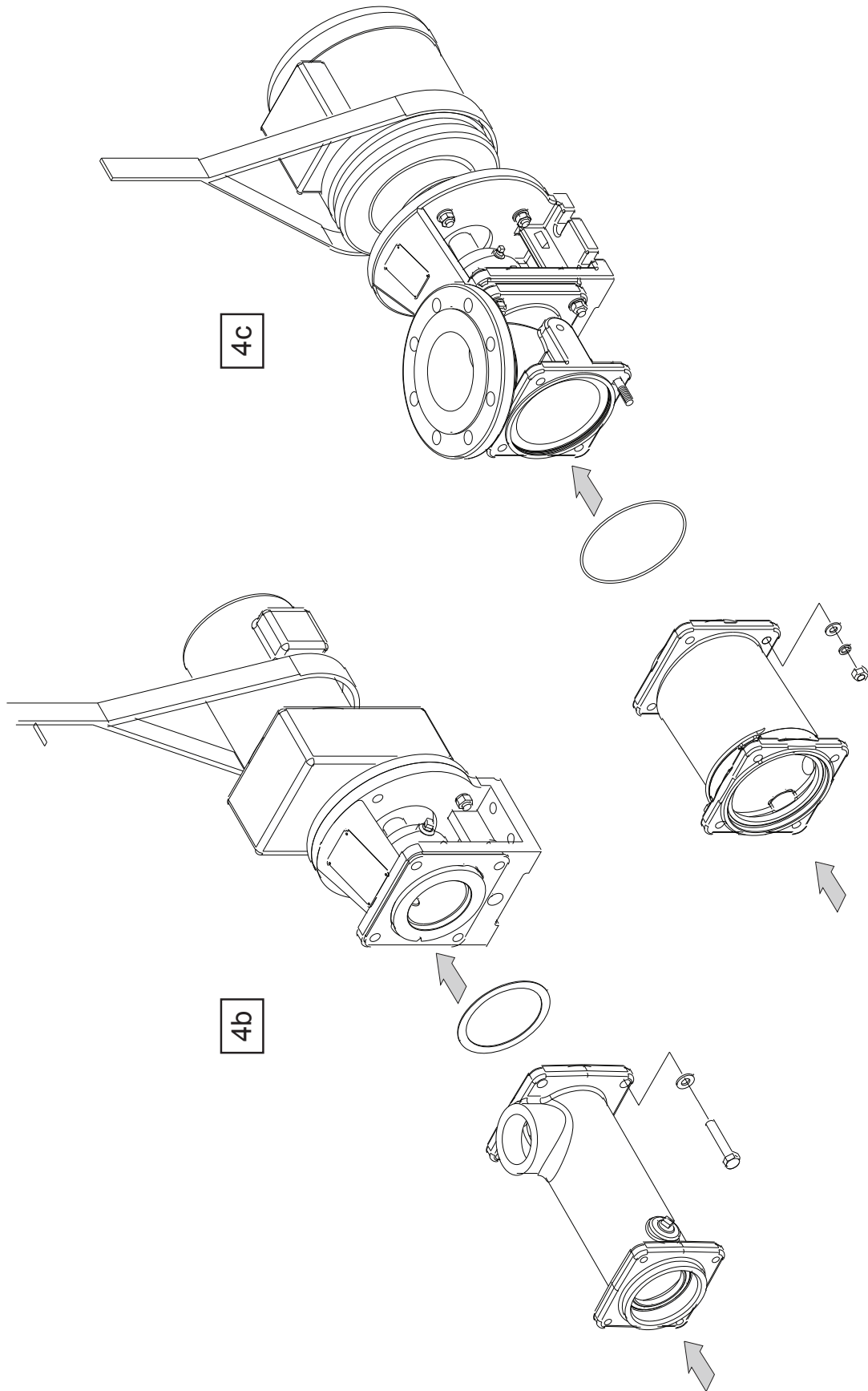
**15.5 Not applicable to sizes below CXL**

1281-00

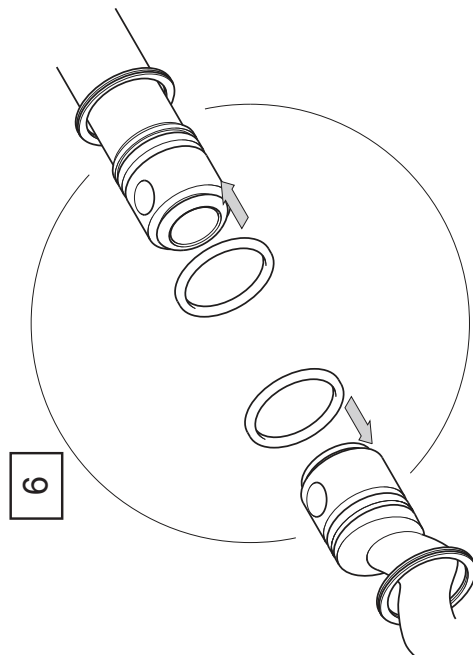
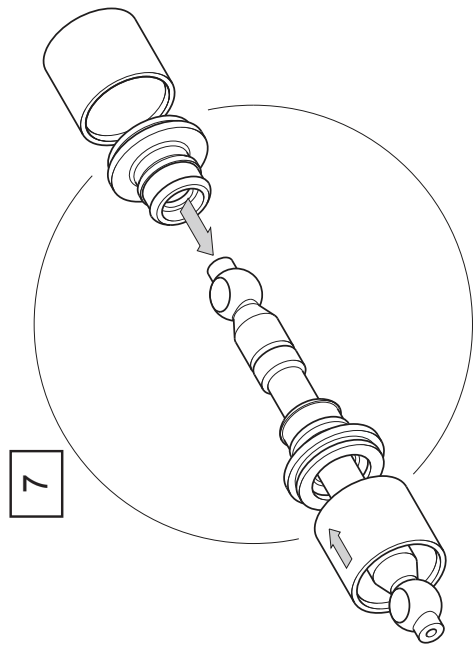
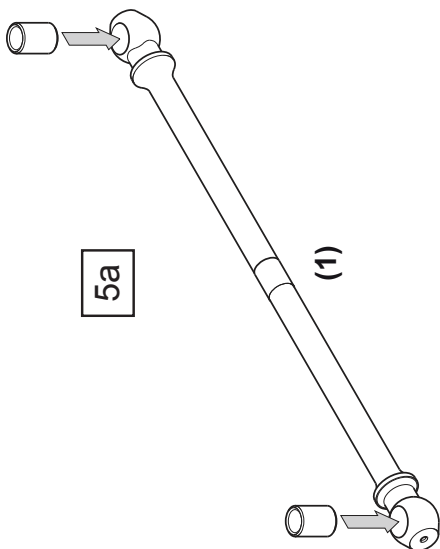
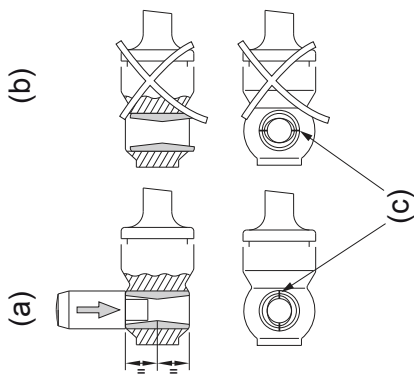
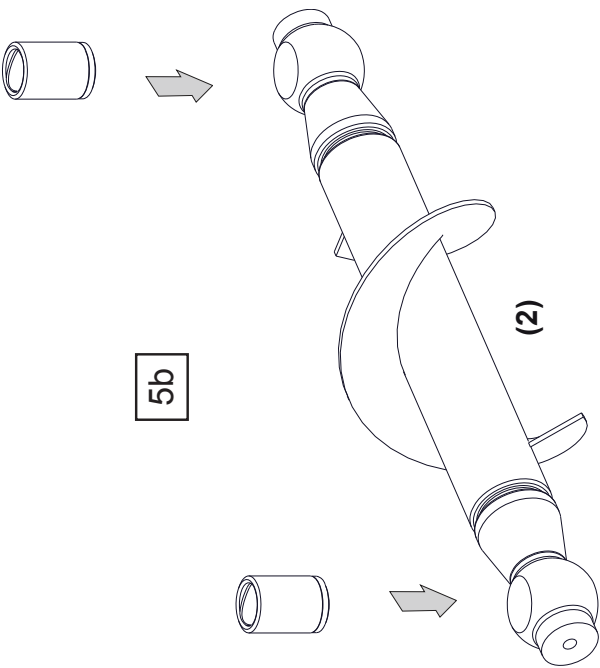


## 15.6 C12 - C3L or CX1 - CX2

1282-00



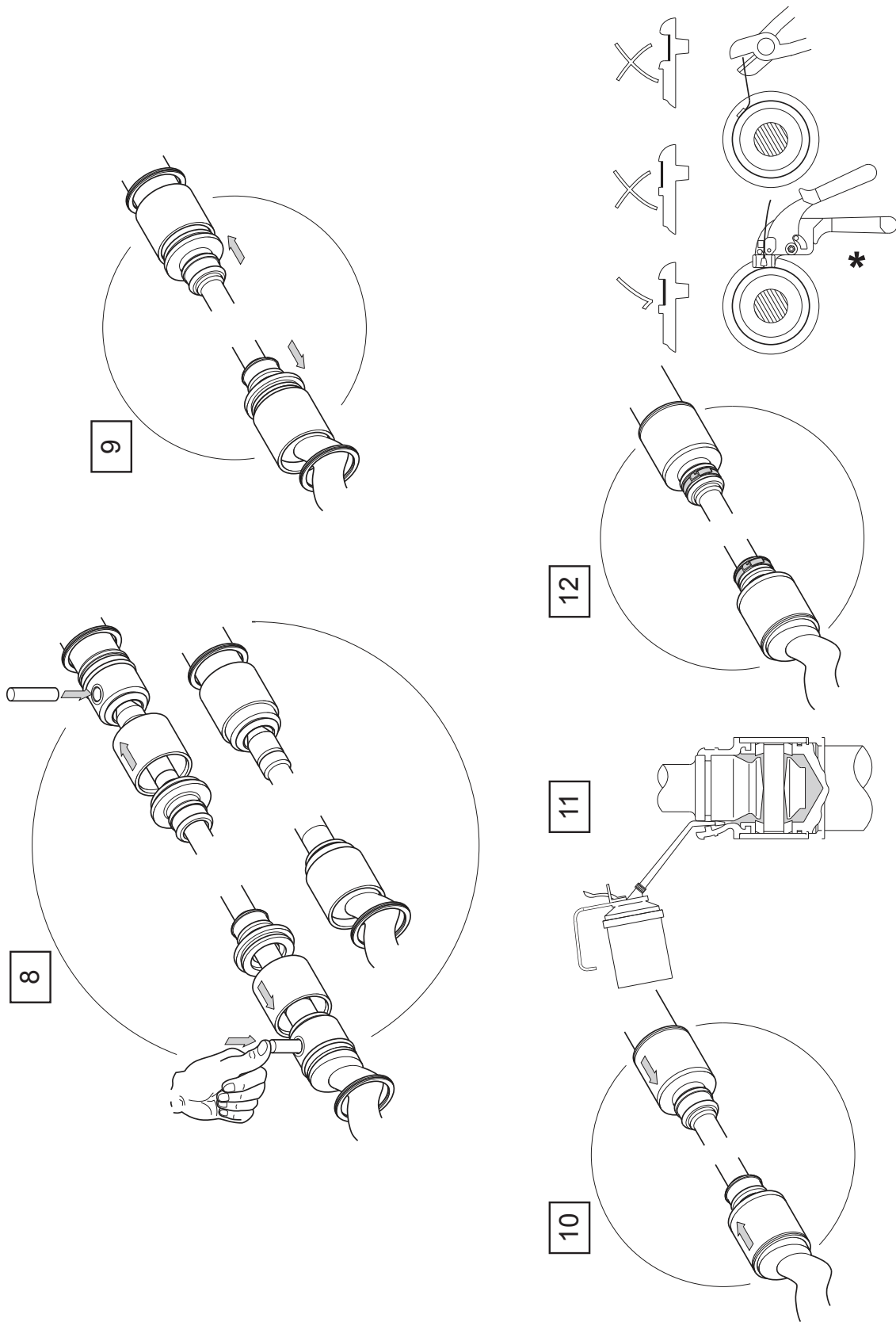
**15.7 Excluding C12 - C22**



1285-00

(1) Stainless steel coupling rod or flighted coupling rod. (2) Square inlet models.  
 (a) Correct (b) Incorrect (c) Alignment marks

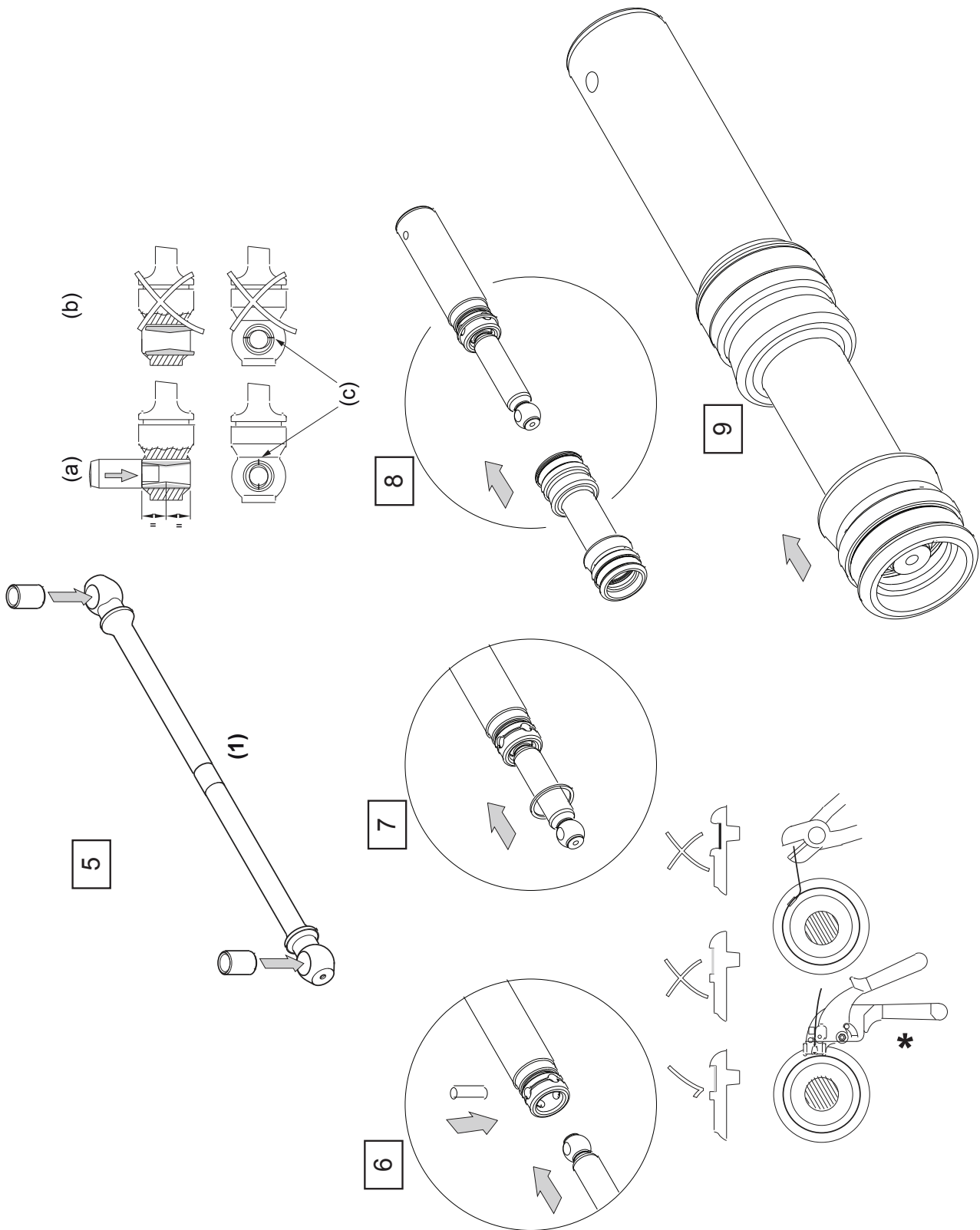
## 15.8 Excluding C12 - C22



1284-00

**15.9 C12 - C22 only**

1285-00

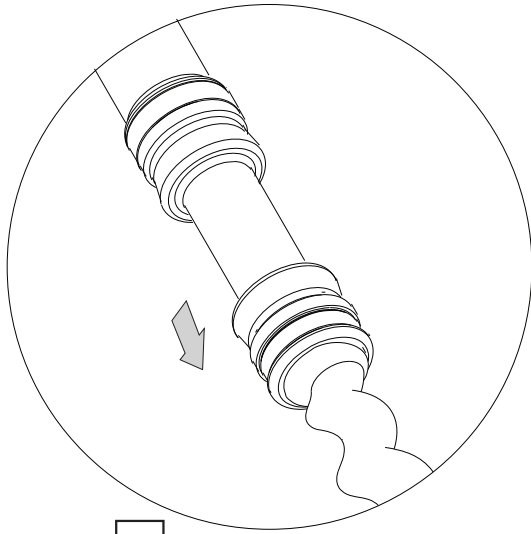


(1) Only applicable if using stainless steel coupling rod.

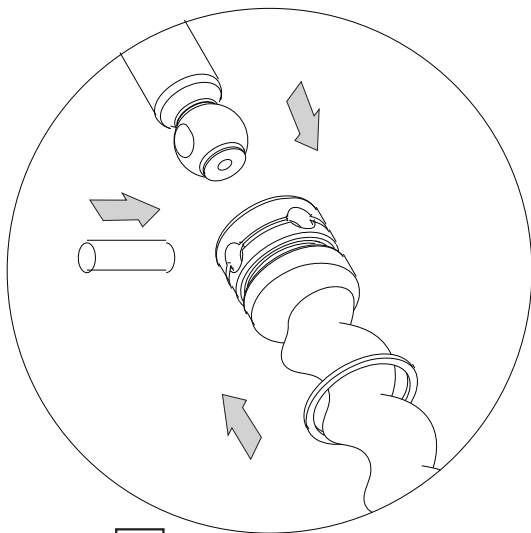
(a) Correct (b) Incorrect (c) Alignment marks



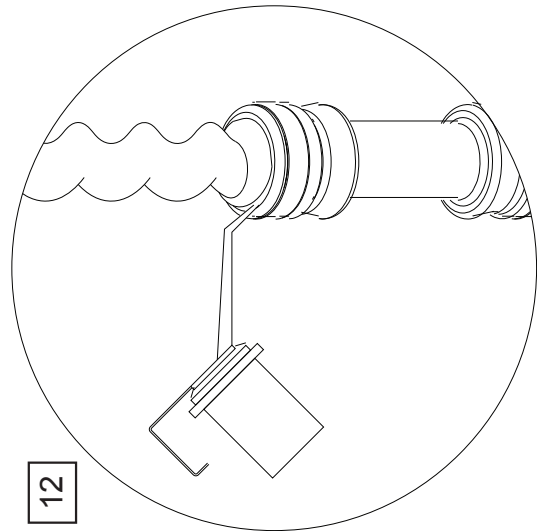
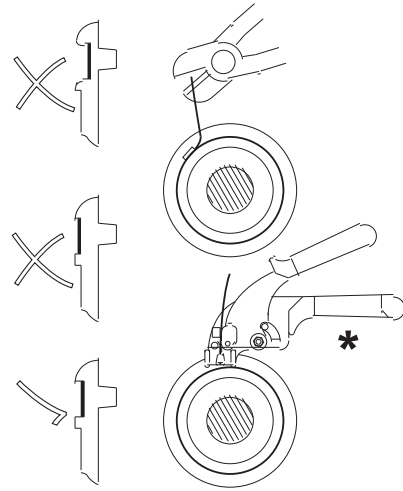
## 15.10 C12 - C22 only



11

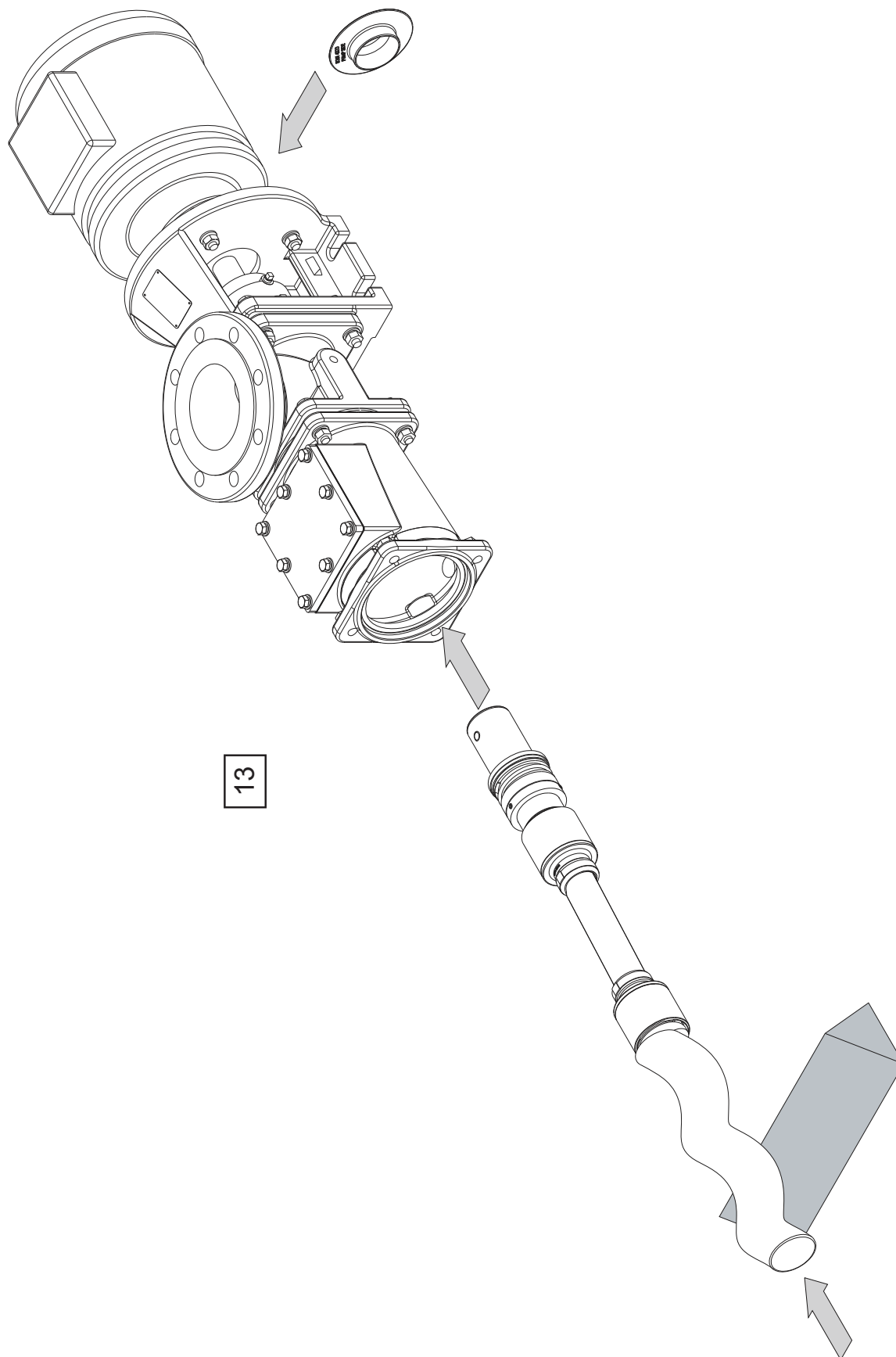


10



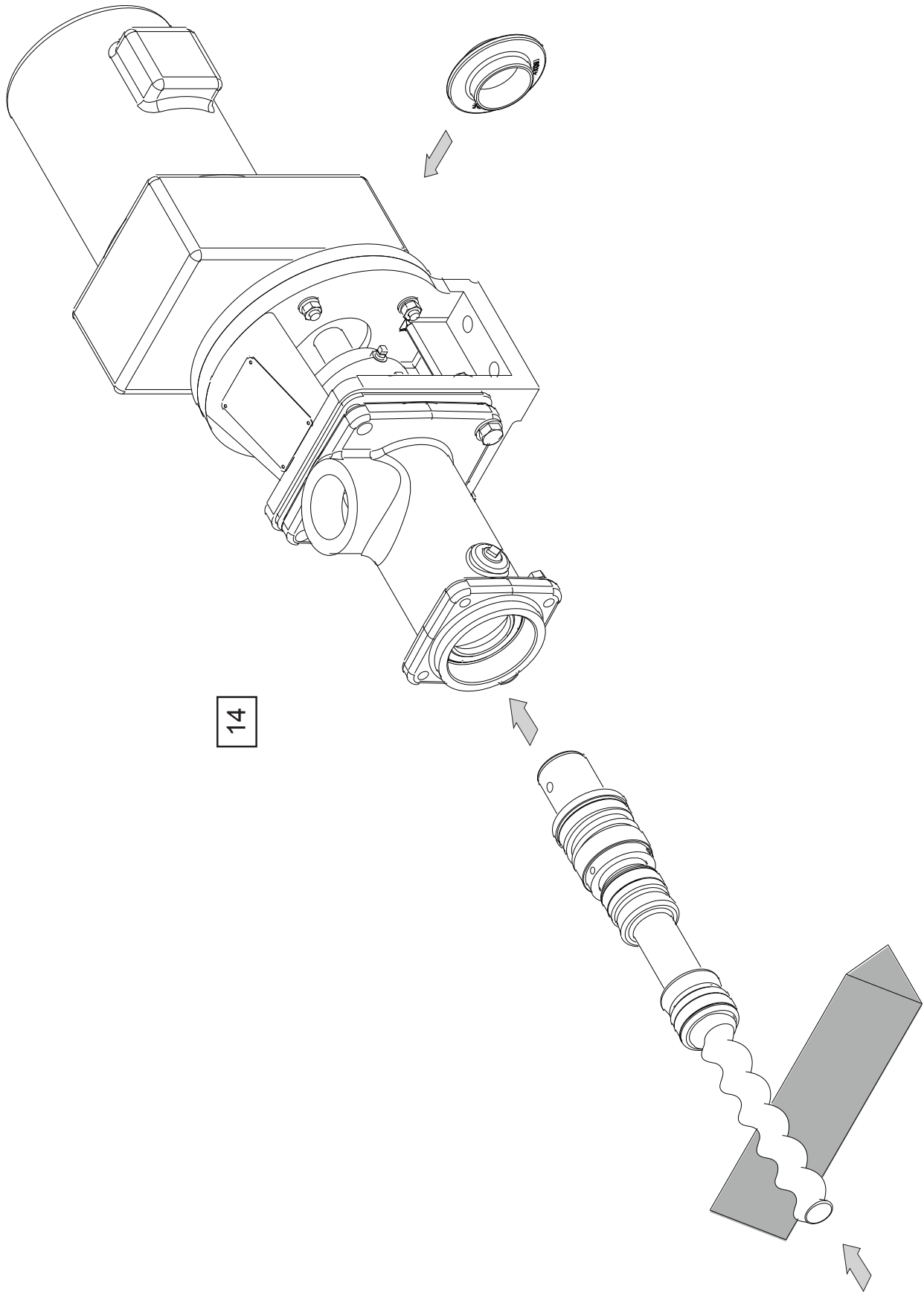
12

**15.11 CXL and above**



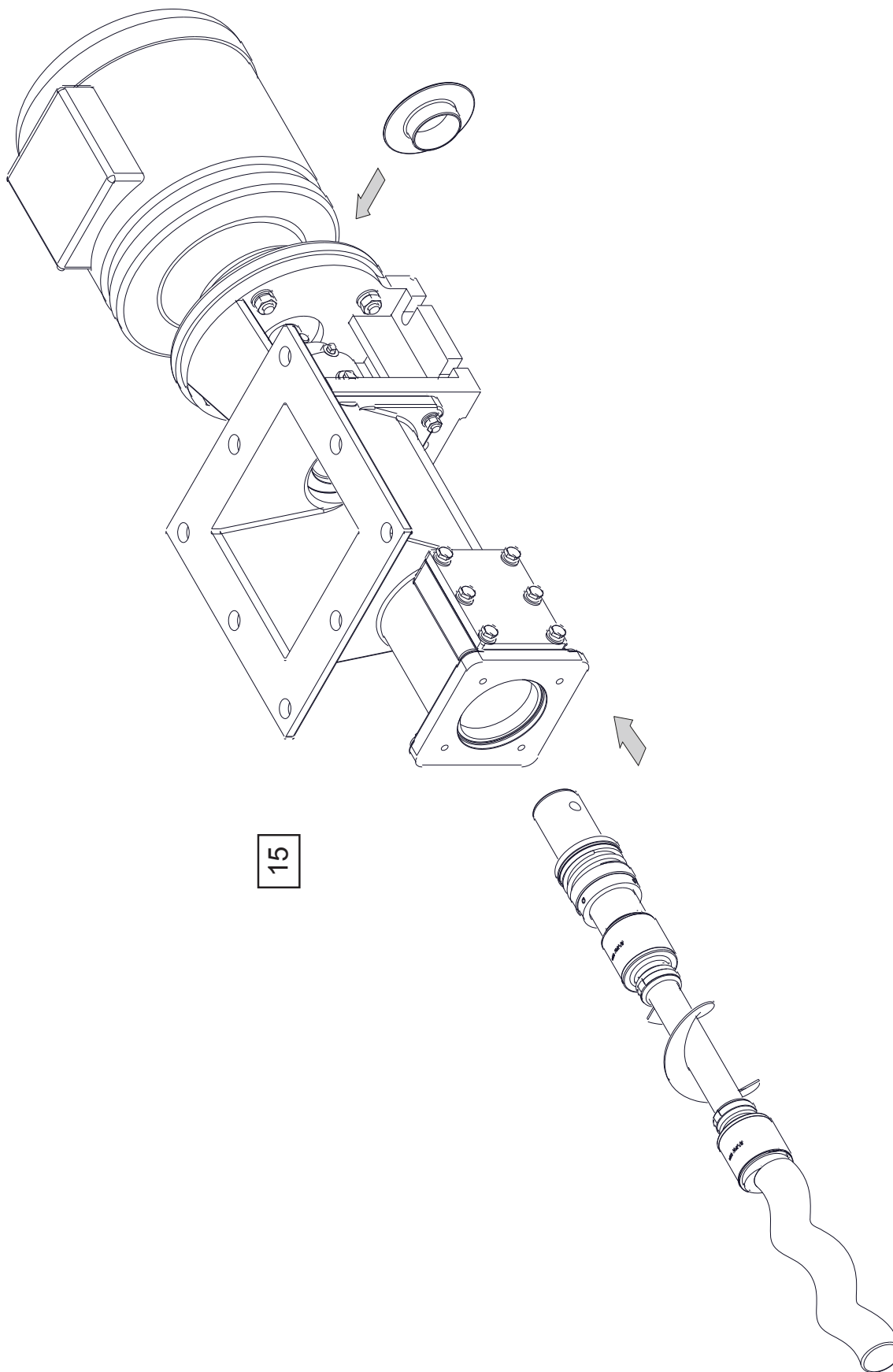
1287-00

## 15.12 C12 - C22 only



1285-00

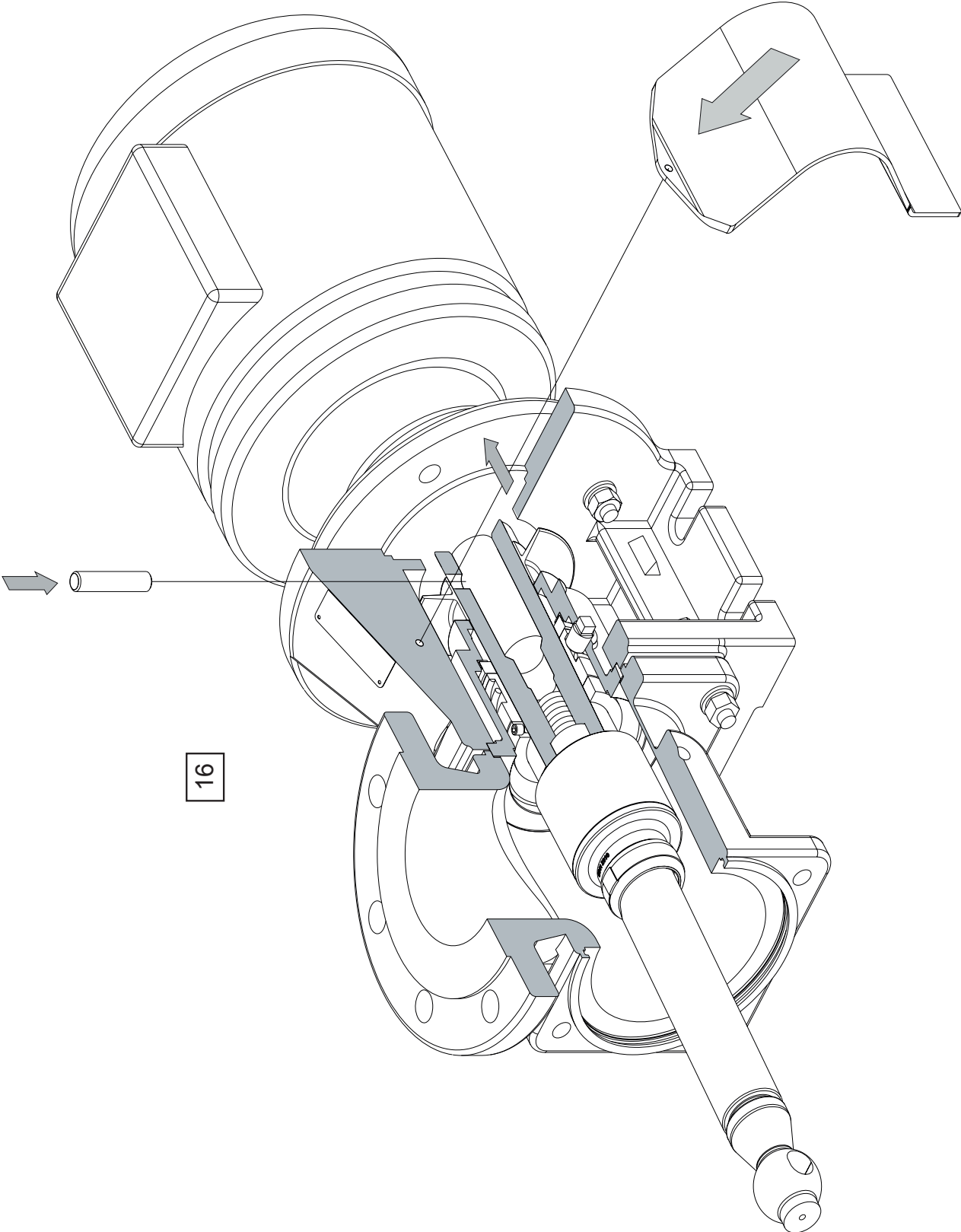
**15.13 Square inlet only**



1289-00

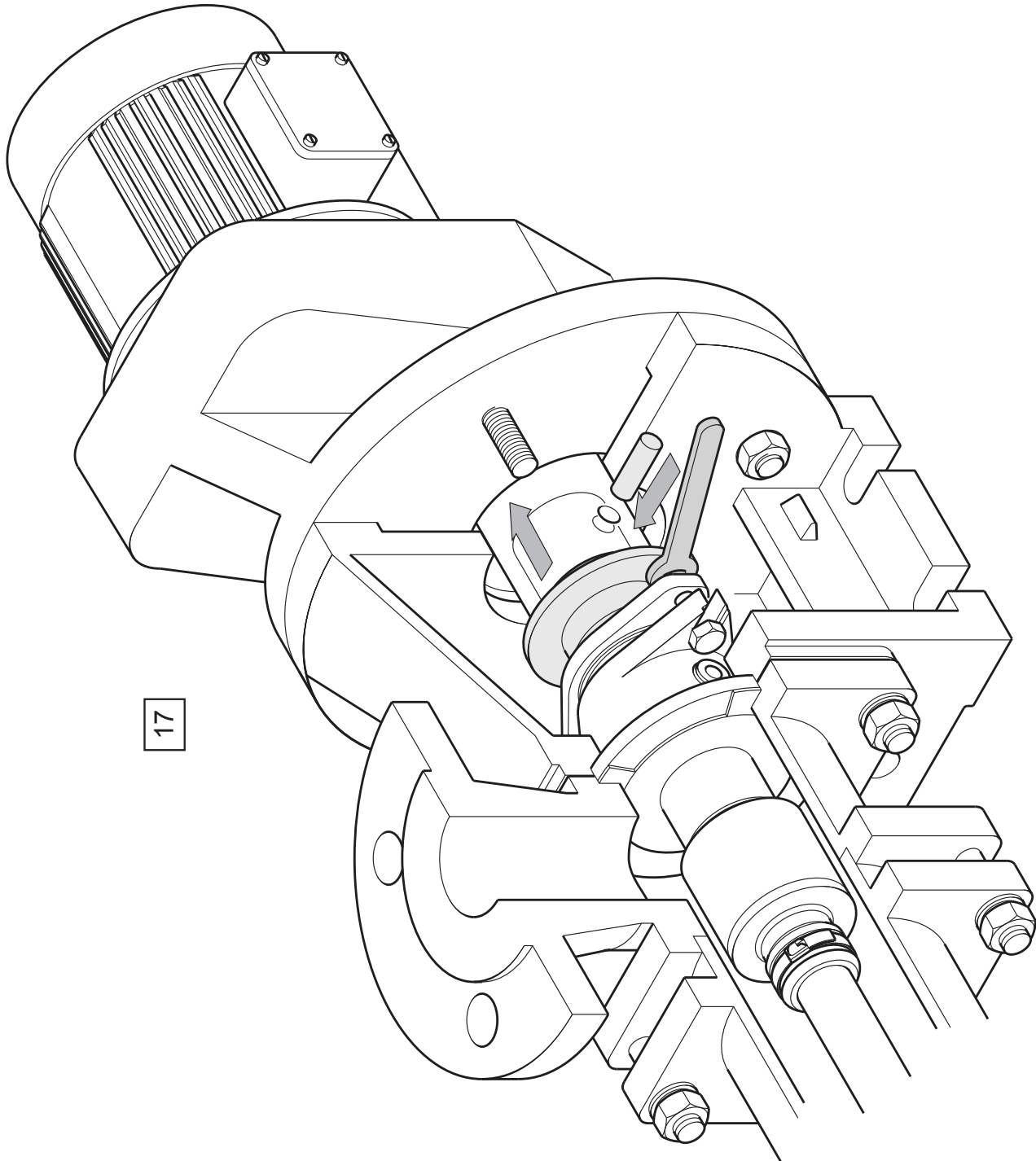
15.14

1290-00



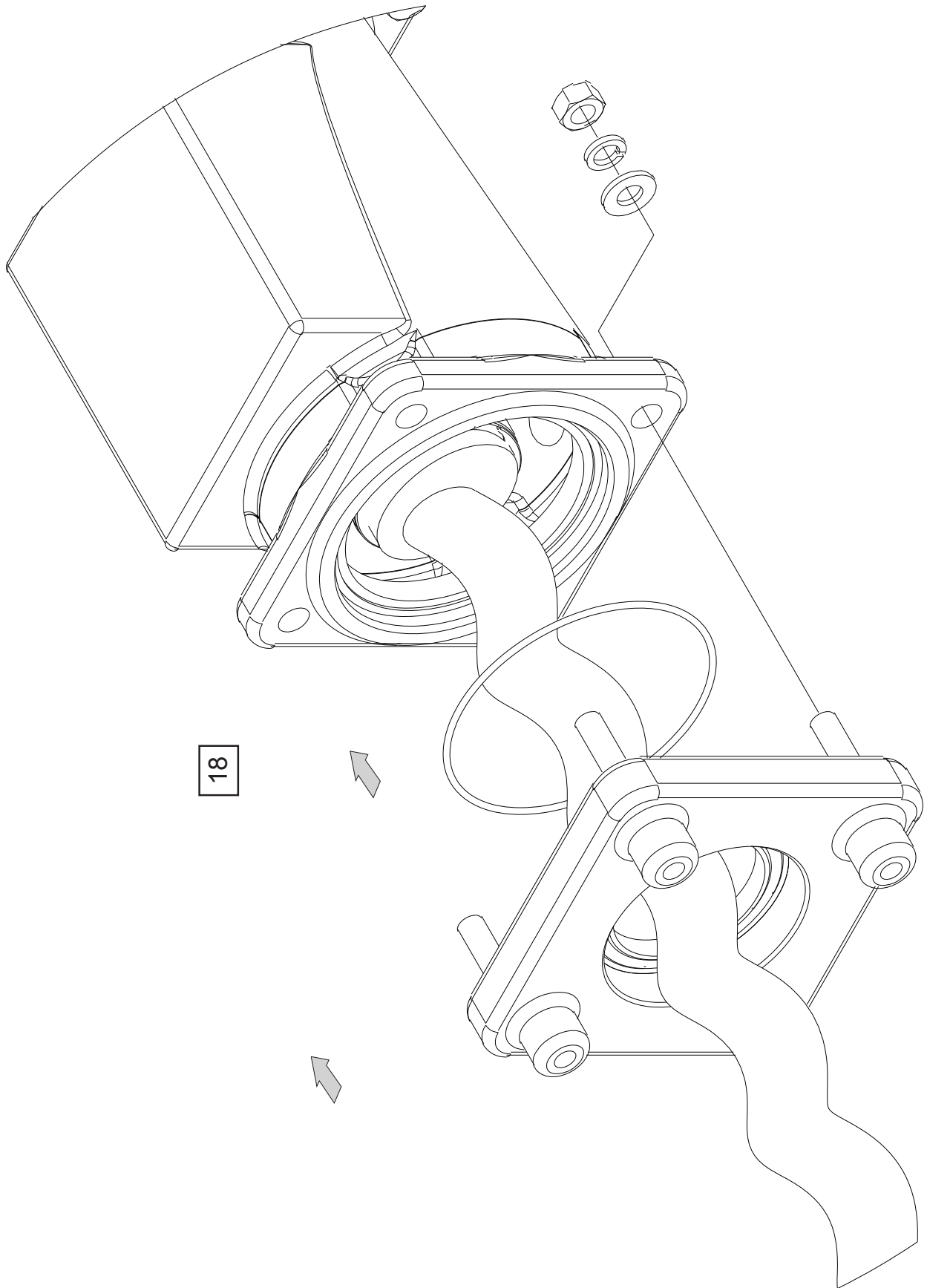
**15.15**

1291-00



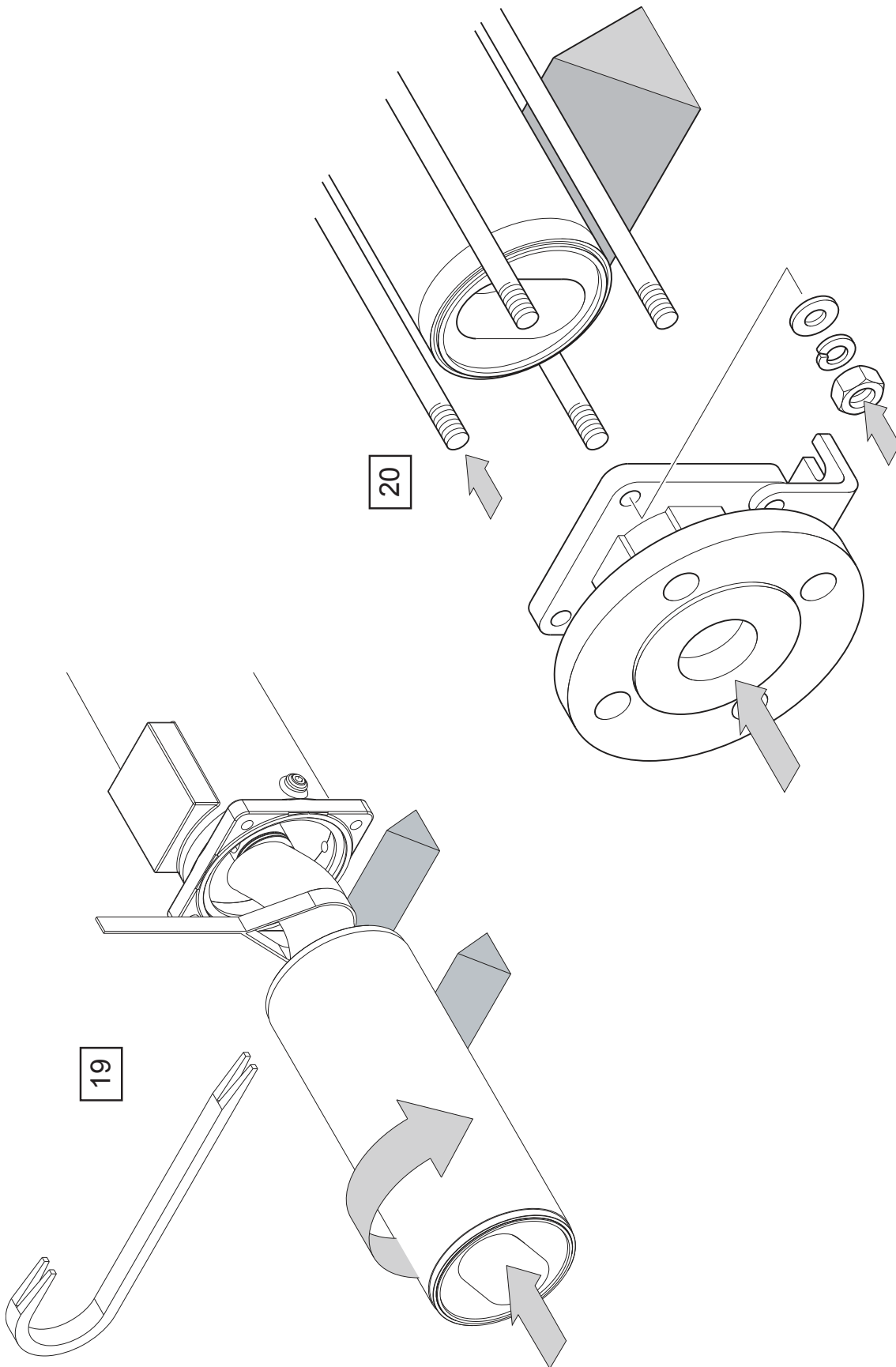
Only applicable if using packed gland pump.

## 15.16 4-stage models only



1292-00

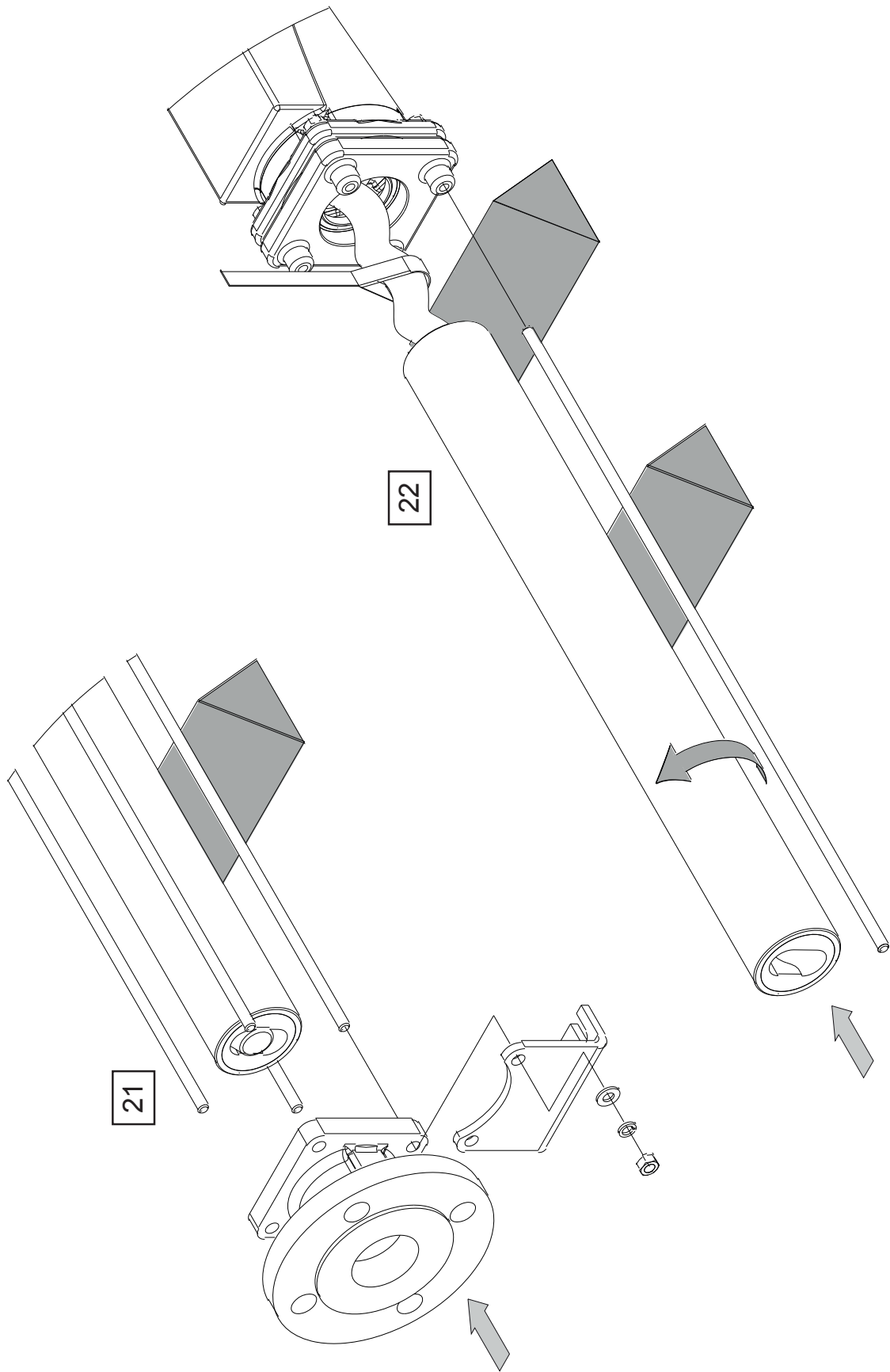
**15.17 CXL and above**



1299-00

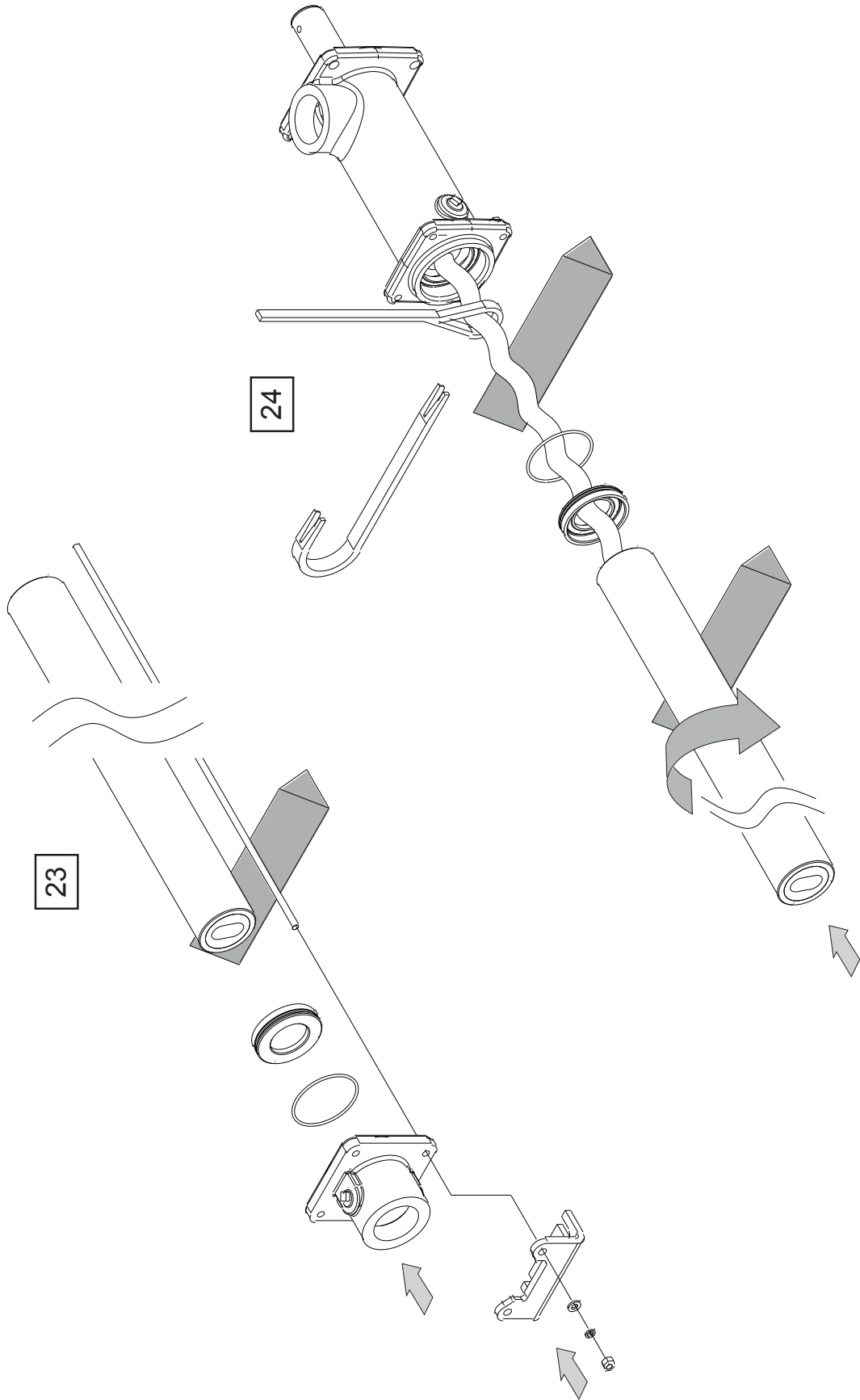


## 15.18 4-stage models



1294-00

**15.19 C24**



1295-00

## 16 Pin joint lubrication

Model	Joint lubrication capacity per joint (ml approx.)	Non-food applications		Food applications			
		Recommended	Suitable alternative				
C12 C14 C21 C22	6		MOBIL GEAR OIL SHC 320  MOBILITH SHC 007 SEMI-FLUID GREASE  SHELL RETINAX CSZ				
C24 C31 C32 C3L CX1 CX2 CXL	12						
C34 C41 C42 C4L C51 C5L	22						
CX4 C44 C52 C61 C6L	45						
C54 C62 C71 C72 C7L C81 C8L	55				KLUBERSYNTH GH6-460 OIL	KLUBEROIL 4 UHI 460	
C64 C82 C91 C92 C9L CA1 CAL	95					MOBIL GEAR OIL SHC 320	
C74 C84 CA2 CB1 CBL	175						
CB2 CC1 CD1	620						
CC2 CCL CD2 CE2	1600						

**17 Recommended lubrication and service intervals**

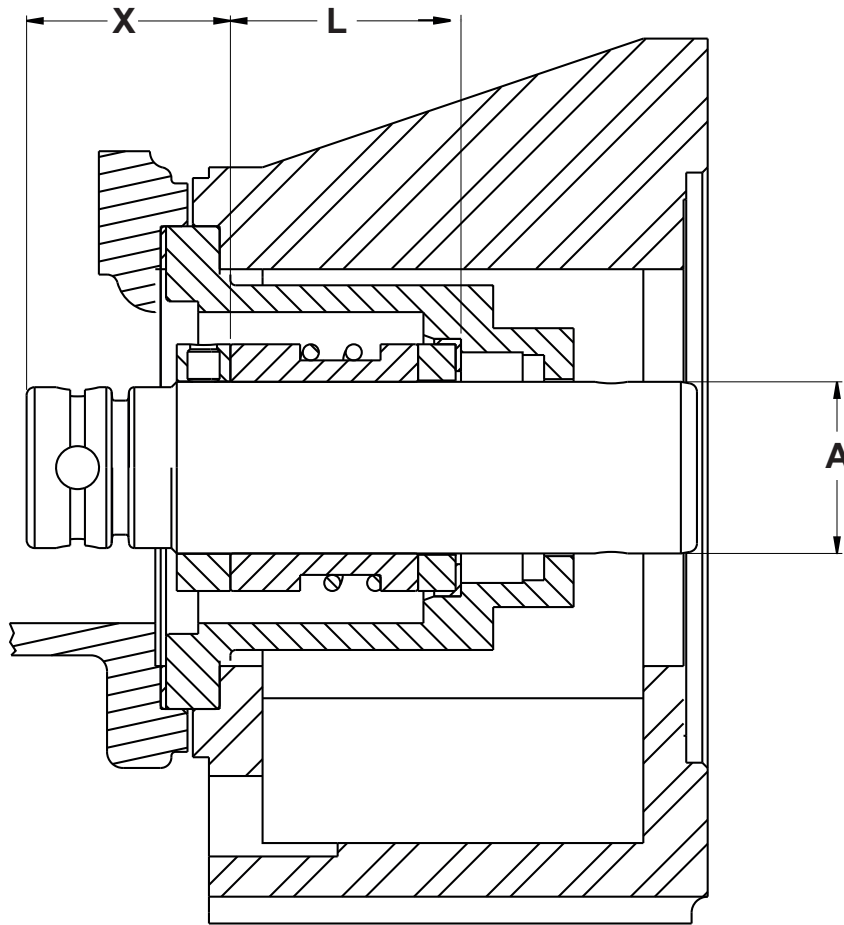
Components	Lubrication	Service comments
<b>Pump drive joints</b>	See section 16	Inspect and lubricate as necessary every 4000 operating hours.
<b>Pump bearings (where fitted)</b>	BP Energrease LC2 or Equivalent	Inspect and re-grease if necessary every 12 months.
<b>Geared drivers (where fitted)</b>	As recommended by the manufacturer	



Above service and lubrication intervals are for guidance only to ensure maximum component life. Pump will operate for considerably longer periods without attention depending on service conditions.

## 18 Setting lengths for mechanical seals

### 18.1 C12 - C22

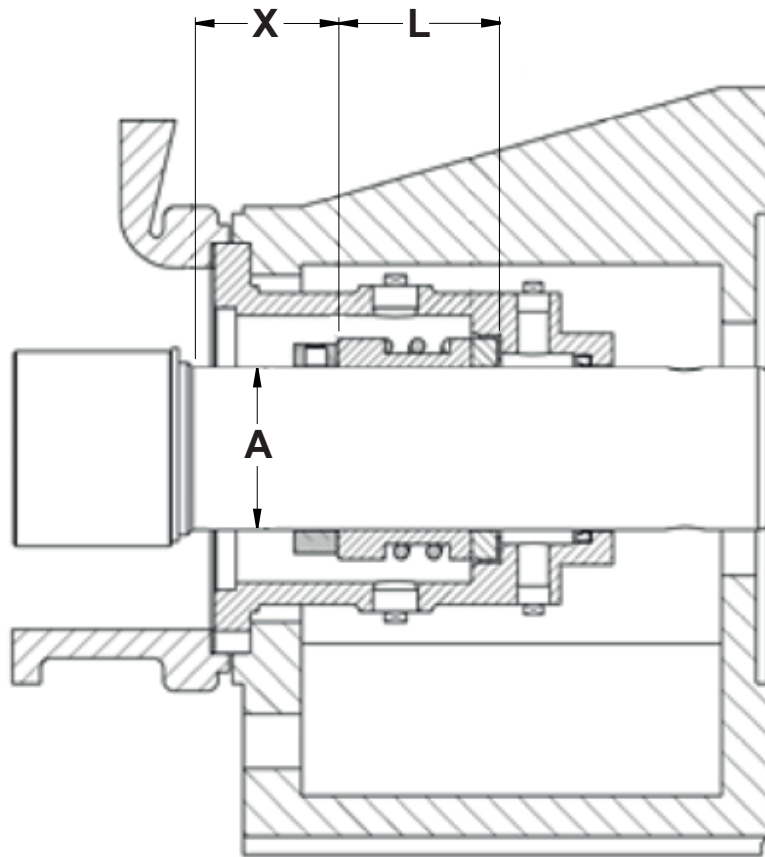


1297-00

Pump size	Drive type	A Shaft diameter mm	Seal part no.	L Seal working length mm	X Setting distance mm
C12 C14 C21 C22	Pin joint	32	M032139G	42.5	38

#### NOTE

*All seal working lengths are to DIN L1K dimensions. This table is not to be used for standard or DIN L1N working length seals. All seals use 'M' type seat except for 85 mm (3.35") which uses 'BS' type or 'M' type. This table is not necessarily compatible with any other seal type - please check with Sulzer.*

**18.2 C24 - C6L**

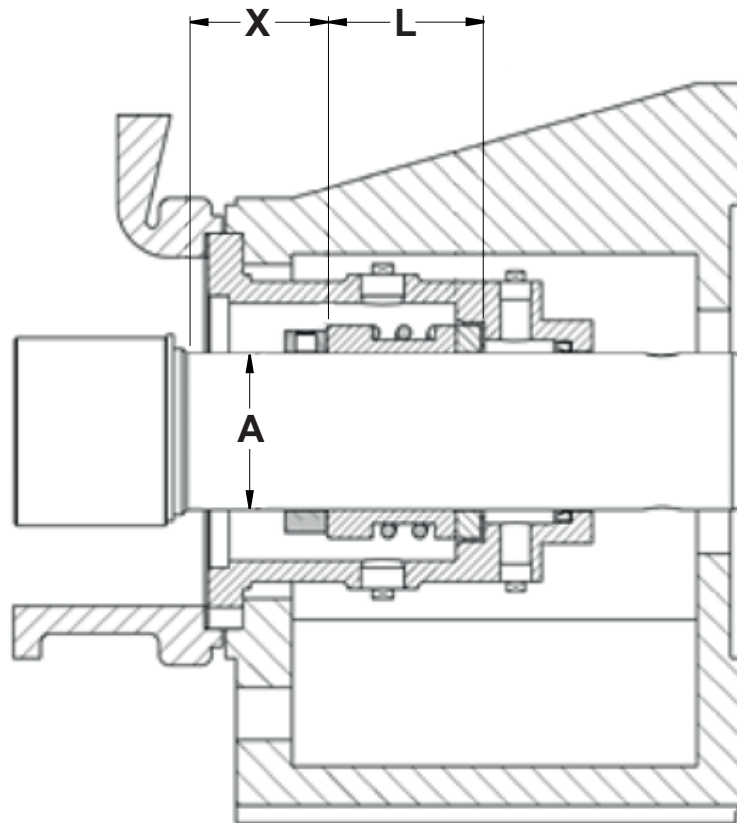
1298-00

Pump size	Drive type	A Shaft diameter mm	Seal part no.	L Seal working length mm	X Setting distance mm
C24 C31 C32 C3L CX1 CX2 CXL	Pin joint	32	M032139G	42.5	16
C34 C41 C42 C4L C51 C5L	Pin joint	45	M045139G	45.0	41
CX4 C44 C52 C61 C6L	Pin joint	55	M055139G	47.5	34.5

**NOTE**

*All seal working lengths are to DIN L1K dimensions. This table is not to be used for standard or DIN L1N working length seals. All seals use 'M' type seat except for 85 mm (3.35") which uses 'BS' type or 'M' type. This table is not necessarily compatible with any other seal type - please check with Sulzer.*

## 18.3 C54 - CBL



1298-00

Pump size	Drive type	A Shaft diameter mm	Seal part no.	L Seal working length mm	X Setting distance mm
C54 C62 C71 C72 C7L C81 C8L	Pin joint	65	M065139G	52.5	33.5
C64 C82 C91 C92 C9L CA1 CAL	Pin joint	85	M085139G	60.0	33.0
C74 CA2 CB1 CBL	Pin joint	85	M085139G	60.0	58.0

### NOTE

*All seal working lengths are to DIN L1K dimensions. This table is not to be used for standard or DIN L1N working length seals. All seals use 'M' type seat except for 85 mm (3.35") which uses 'BS' type or 'M' type. This table is not necessarily compatible with any other seal type - please check with Sulzer.*

