English

Original Instructions

Installation, Operation and Maintenance Instructions

TR Muncher - Mono™

WD127/18
Rev 18, June 2015

Revisions

Rev.	Date dd/mm/yyyy	Reason for Issue	Prepared By	Checked By	Approved By
12	31/10/2013	Revision sheet added. Constant level oil cooler added. Note added to Maintenance section for periodical inspection of trash trap. Nameplate removed from Introduction page. Dual dimensioning added.	M. Bailey	A. Morris	A. Morris
13	19/05/2014	CT200 Model added	G. Wrafter	A. Morris	A. Morris
14	26/06/2014	Coding sheet changed for machine types C/D/E	M. Bailey	A. Morris	A. Morris
15					
16					
17	08/01/2015	P118 added to table for CT200 on Section 4 Page 3. New diagrams added to page sect 5 page 1 through to sect 5 page 10. Section 6 page 1 amended to include P118. Sect 4 page 3 tightening torques amended for P109. Sect 5 pages 1-1 inc updated diagrams. Sect 6 page 1 P118 added.	M. Bailey	J. Chan	A. Morris
18	12/06/2015	Section 8 page 2 - Dimensions & weights revised.	M. Bailey	M. Bailey	C. Griffiths
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Tools

For servicing and maintenance work on the
Muncher the following tools are recommended.

SB Muncher;

Metric Hexagon Keys - Range 6mm-8mm (0.24”-0.31”)
Metric Spanners - Range 10mm-36mm (0.39”-1.42”)
Torque Wrench

Series A Muncher;

Metric Hexagon Keys - Range 6mm-8mm (0.24”-0.31”)
Metric Spanners - Range 10mm-36mm (0.39”-1.42”)
Torque Wrench

Series F Muncher;

Metric Hexagon Keys - Range 6mm-8mm (0.24”-0.31”)
Metric Spanners - Range 10mm-36mm (0.39”-1.42”)
Torque Wrench
Your Supplier’s Locknut Key - Item No.s MQ F06A 9750, CF F06A 9755 and MM F06A 9760

TR Muncher;

Metric Hexagon Keys - Range 6mm-14mm (0.24”-0.55”)
Metric Spanners - Range 10mm-36mm (0.39”-1.42”)
Torque Wrench

Series R Muncher;

Metric Hexagon Keys - Range 5mm-14mm (0.20”-0.55”)
Metric Spanners - Range 10mm-36mm (0.39”-1.42”)
Torque Wrench

All equipment should be in good working condition with no signs of excessive wear.

ATEX Warning Statements

GRINDERS

Due to the nature and design of grinding and macerating equipment it is possible that certain objects may enter the cutters, from the process stream, with the potential to cause sparking or jamming of the cutter assembly.

Where a grinder 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 your Supplier before commencing with installation and commissioning.

Process liquids or fluids should be kept within specified temperature limits otherwise the surface of grinder or system components may become an ignition source due to temperature rises. Where the process liquid temperature is less that 90ºC (194ºF) the maximum surface temperature will not exceed 90ºC (194ºF) provided the grinder is installed, operated and maintained in accordance with this manual. Where the process fluid temperature exceeds 90ºC (194ºF) the maximum surface temperature will be equal to the maximum process fluid temperature.

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 grinder or system.

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.

All electrical equipment, including control and safety devices, should be suitably rated for the environment in to which they are installed.

Where there may be a risk of an accumulation of explosive gases or dust non-sparking tools should be used for installation and maintenance.

To minimise the risk of sparking or temperature rises due to mechanical or electrical overload the following control and safety devices should be fitted. A control system that will shut the grinder down if the motor current or temperature exceed specified limits or a jam of the cutter stack occurs. This may include a system that reverses the machine in order to clear any such jam. 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.

It is important that the grinder rotates in the correct direction to give an efficient grinding operation. This must be checked on installation and commissioning and after any maintenance has been carried out. Failure to observe this may lead to mechanical or electrical overload.

When fitting drives, couplings, and guards to a grinder unit it is essential that these are correctly fitted, aligned and adjusted in accordance with the O&M instructions. Failure to do so may result in sparking due to unintended mechanical contact or temperature rises due to mechanical or electrical overload.

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.

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.

Failure to operate or maintain the grinder 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, seals, other wearing parts and lubrication is essential.

The grinder and its components have been designed to ensure safe operation within the guidelines covered by legislation. Accordingly your Supplier has declared the machine safe to use for the duty specified as defined by the Declaration of Incorporation or Conformity that is issued with this instruction manual. The use of replacement parts that are not manufactured by or approved by your Supplier may affect the safe operation of the grinder 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.

Introduction

TR Muncher

This information and all the information contained herein, are the exclusive property of your Supplier, and contain information of a proprietary nature. It is provided for the sole purpose of transmitting the information contained to the designated recipient.

This information is to be used only as specified in the instrument of transmittal. It is not to be reproduced, copied in whole, or in part, nor is information it contains to be disclosed in any manner without the written consent of your Supplier. Its use for any other reason than the specified shall be a violation of the agreement with the recipient concerning the legal rights of your Supplier.

Your Supplier reserves the right to make changes, which may obsolete certain parts of this manual.

The manual gives a guide to the operation and maintenance of the TR Muncher given that all Health and Safety and good engineering practices are observed.

The information below is for contract No.
and gives the duty for which the equipment is supplied.

EC Declaration as defined by Machinery Directive 2006/42/EC.

The following harmonised standards are applicable: BS EN 809, BS EN ISO 12100 Parts 1 & 2

EC Declaration of Incorporation

This declaration is only valid when partly completed machinery has been supplied.

In this case, the machinery meets the requirements of the said directive and is intended for incorporation into other machinery or for assembly with other machinery in order to constitute relevant machinery as defined by the said directive including any amendments, which are valid at the time of supply.

IMPORTANT

This machinery must not be put into service until the relevant machinery into which it is to be incorporated has been declared in conformity to the said directive.

This declaration is only valid when the machinery has been installed, operated and maintained in accordance with these instructions and safety guidelines contained within as well as instructions supplied for equipment assembled with or intended for use with this equipment.

EC Declaration of Conformity

This declaration is not valid for partly completed machinery that has been supplied.

In this case the machinery meets the requirements of the said directive including any amendments which are valid at the time of supply.

We further declare that, where applicable, said machinery also meets the requirements of:

The EMC Directive 2004/108/EC
The Low Voltage Directive 2006/95/E
The Pressure Equipment Directive 2005/88/EC
The Outdoor Noise Directive 2000/14/EC
and subsequent amemdments
The Drinking Water Directive 98/83/EC

IMPORTANT

This declaration is only valid when the machinery has been installed, operated and maintained in accordance with these instructions and safety guidelines contained within as well as instructions supplied for equipment assembled with or intended for use with this equipment.

Mr A. Morris - Engineering Manager - PDS
for Mono Pumps Limited, Greengate Way, Middleton,
Manchester, England, M24 1SA.

1.0 INSTALLATION

1.1 INSTALLATION & SAFETY RECOMMENDATIONS

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

1.1.1 OPERATING PRINCIPLE

The Muncher is a slow speed, high torque grinder designed to operate in the water, waste and biowaste industries. All Munchers have two shafts operating at differential speeds. Each shaft is fitted with identical interleaving cutters and spacers.

1.2 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, your Supplier's Munchers 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 the Muncher components.

1.3 SYSTEM DESIGN AND INSTALLATION

At the system design stage, consideration must be given to the provision of filler plugs, and the installation of non-return and/or isolating valves where applicable.

Series 'F' AND 'H' Munchers are horizontal dry waste machines and must be fixed rigidly and horizontally either to the ground, or to a rigid system.

TR Pipeline models are designed for horizontal installation only.

Series 'A', SB and 'R' open channel models do not require fixing to the ground and can be supported either by the concrete channel or by steel supports bolted to the concrete channel walls.

Series 'A', SB and 'R' pipeline models can be installed at any attitude.

Pipework to and from the unit should be independently supported and not rely on the Muncher as a means of support. Wherever possible when installed in a vertical pipe system the Muncher unit should be independently supported.

1.4 HANDLING

During installation and maintenance, attention must be paid to the safe handling of all items. Where a Muncher or its components weigh in excess of 20kg (45lb) it is recommended that suitable lifting tackle should be used to ensure that personal injury or damage to components does not occur.

A weight table is included at the end of this section.

Lifting illustrations are contained in this document -Section 8.

NOTE

DO NOT ATTEMPT TO LIFT MUNCHER USING ONLY ONE LIFTING LUG. EXTREME CAUTION SHOULD BE OBSERVED FOR PERSONNEL SAFETY WHEN LIFTING HEAVY OBJECTS.

BY DESIGN THE CUTTERS HAVE SHARP EDGES.

GREAT CARE MUST BE TAKEN WHEN HANDLING. THE USE OF PROTECTIVE GLOVES IS RECOMMENDED.

1.5 STORAGE

Munchers are dispatched from our factory with the cutter chamber sprayed with a moisture repellent coating and ready for immediate installation and operation.

Should the machine be stored or left stationary for any length of time it is recommended that the cutter bank is re-sprayed with anti-rust lubricant and that the shafts are rotated monthly.

Removing the motor cowl and turning the fan by hand is the easiest way to rotate the shafts.

Failure to do this may result in a higher frequency of reversals and in extreme cases the machine to seize due to the tight running clearances of the individual cutting elements during commissioning and initial start-up.

The starter panel if supplied should be stored in a controlled dry environment to prevent moisture build-up causing corrosion of contactors and other metallic components.

See manufacturer instructions for motor/gearbox/drive and panel storage procedures.

NOTE:

The Muncher must be protected by a PLC control unit set up to the correct operating philosophy. Only PLC's supplied or approved by your Supplier should be used. Failure to observe this requirement may cause premature machine failure and could invalidate the warranty of the machine. It is also important that the PLC be correctly wired into the panel.

Please refer to Wiring Diagram – Section 4, Page 1.

IMMEDIATELY PRIOR TO INSTALLATION AND STARTING

Before installing the Muncher please ensure that all plugs and inspection plates are replaced.

For TR Munchers please see section 1.9.1 prior to starting for instructions on how to fit constant level oilers.

1.6 ELECTRICAL

Electrical connection should only be made using equipment suitable for both rating and environment. Where any doubts exist regarding the suitability of equipment, your Supplier should be consulted before proceeding.

Earthing points will be provided on electric drives (if supplied) and it is essential that these are correctly connected. The electrical installation should include appropriate isolating equipment to ensure that the unit is safe to work on.

1.7 GENERAL SAFETY

GREAT CARE MUST BE TAKEN TO PROTECT ALL ELECTRICAL EQUIPMENT FROM SPLASHING WHEN HOSING DOWN. WHERE YOUR SUPPLIER HAS SUPPLIED A BASIC MUNCHER THE ONUS IS ON THE USER TO FIT ADEQUATE GUARDS IN COMPLIANCE WITH THE REQUIREMENTS OF THE RELEVANT REGULATIONS.

All nuts and bolts, securing flanges and base mounting fixtures must be checked for tightness before operation. When commissioning the plant, all joints in the system must be checked thoroughly for leakage.

If, when starting, the Muncher does not appear to operate correctly, the plant must be shut down immediately and the cause of the malfunction established before operations are recommenced.

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

NOTE:

NEVER inspect or work on or near the cutter chamber without first isolating and locking the machine.

GUARDS

In the interests of safety, and in accordance with relevant legislation, all guards must be replaced after necessary adjustments have been made.

It is strongly recommended that a Series 'F' or 'H' horizontal dry Muncher system should incorporate: -

a) A steel (or similar) feed hopper with a minimum base to top height of 1.0 metre or a minimum height of 1.5 metres from floor level.

b) A steel (or similar) lower delivery chute, which is inaccessible without tools.

c) A protective grid mounted over the Muncher and conveyor system, especially where overhead walkways are present.

d) Emergency stop buttons positioned within easy reach of all operating staff.

The recommended extent of enclosure is illustrated in this document - Section 8.

1.7.1 WARNING /CONTROL DEVICE

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

1.7.2 NOISE LEVELS

The noise sound pressure level will not exceed 70dB at one metre distance from the Muncher. This is based on a typical installation and does not necessarily include noise from other sources or any contribution from building reverberation.

1.8 EXPLOSIVE PRODUCTS/ HAZARDOUS ATMOSPHERES

In certain instances the product being treated 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.

1.9 LUBRICATION

The gearmotor(s) is supplied with the correct type and quantity of lubricant in the gearbox but should be checked before use. For further data see separate information supplied by manufacturer.

Series ‘F’ and ‘H’ bearings and rotary shaft seals are lubricated via greasing points on each bearing housing. The correct quantity of grease is reached when excess can be seen around the outer lipseal. Other models have sealed for life bearings that do not require maintenance.

Gears should be inspected periodically to see if grease replenishment is necessary, and if so, grease should be added via the grease nipple until the housing is two thirds full.

Only use recommended lubricant shown below for Muncher shaft gears, bearings and rotary seals.

BP Energrease LC2 (-30°C to 180°C) (-22°F to 356°F).

At the following intervals, bearings, gears and seal assembly inspection should take place along with lubricant replenishment;
Series ‘F’, ‘H’, ‘R’ - 7,500 hrs
Series ‘A’, SB, TR - 10,000 hrs

PIPELINE MUNCHERS SHOULD BE ISOLATED BY CLOSING LINE VALVES PRIOR TO SERVICING.

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

1.9.1 All CT203 & CT205 TR Munchers require 2 constant level oilers to be fitted to the bearing housing in order to prevent the mechanical seals dry-running. The oilers will be supplied loose with the Muncher to avoid damage during transit, so upon receipt of the equipment they will need to be installed prior to operation. Instructions for fitting the oilers are as follows:

- Completely fill the two mechanical seal cavities through the upper ¼” BSP ports on the bearing housing with mineral oil so that no air is left surrounding the mechanical seals. The two cavities are connected however it may be necessary to fill with oil through both ports due to the intricate path between the two mechanical seal cavities.
- Before attaching the oilers to the bearing housing, ensure the ¼” male nipple is fitted to each oiler and proceed to completely fill the oilers with mineral oil.
- Attach the oilers to the ¼” BSP ports and tighten until no oil leaks from the connection.
- Note the level of oil in the oiler and regularly check the oilers to ensure they have not emptied.

Because mechanical seals do have an expected leak rate the oilers will need to be re-filled with oil periodically. The precise level of oil in the oilers is not critical because as long as there is oil visible in the oiler then the seals will be quenched with oil

Weights

Muncher	Type	Gear Unit / Class	M/C Size (kW)	Weight (kg)	M/C Size (HP)	Weight (lb)
Series A	CA202AA CA203AA CA205AA CA206AA CA210AA CA215AA	TEFC	1.5	531 553 608 630 773 881	2	1170 1219 1340 1389 1704 1942
	CA202AB CA203AB CA205AB CA206AB CA210AB CA215AB	TEFC	2.2	559 582 626 648 813 967	3	1232 1283 1380 1428 1792 2131
	CA202AC CA203AC CA205AC CA206AC CA210AC CA215AC	TEFC	4	584 606 650 672 837 992	5	1287 1336 1433 1481 1845 2186
Series F	CF306RJS7B2 CF310RMS7B2	TEFC	11 7.5 & 11	1719 2601	15 10 & 15	3789 5733
Series H	CH06 CH09 CH12	TEFC	11 & 15 / 15 & 22	3968 5070 6172	15 & 20 / 20 & 30	8745 11174 13603
SB	Pipeline CB201	TEFC	1.1 1.5 2.2	451 456 537	1.5 2 3	994 1005 1184
		Submersible	1.1 1.5 2.2	458 537 546	1.5 2 3	1009 1184 1203
	Channel CB201A	TEFC	1.1 1.5 2.2	341 418 429	1.5 2 3	752 921 946
		Submersible	1.1 1.5 2.2	440 496 573	1.5 2 3	970 1093 1263
TR	CT200	TEFC	0.75	80	1	176
	CT203P	TEFC	1.5 2.2 / 4	639 749	2 3 / 5	1408 1651
	CT203Q	TEFC	11 7.5 & 11	639 749	15 10 & 15	1408 1651
	CT203R	TEFC	11 7.5 & 11	639 749	15 10 & 15	1408 1651
	CT203S	TEFC	11 7.5 & 11	760 859	15 10 & 15	1675 1893
	CT203T	TEFC	11 7.5 & 11	760 859	15 10 & 15	1675 1893
R	CR145A	TEFC	7.5	1763	10	3886

2.0 START-UP PROCEDURE

By the nature of the equipment and its operating environment the Muncher can be an extremely dangerous machine. It is vital that operators are conversant with these Operation and Maintenance Instructions prior to working with the machine.

Where applicable:

1) Check the foundation bolts are secure once the machine is installed in its correct operating position.

2) Check the gearbox lubricant, remove the plug and fit the air vent to prevent gearbox pressurisation. Not applicable to submersible drive units.

3) Check all electrical connections for continuity and earthing and that installation is in accordance with relevant regulations and circuit diagrams.

4) If a feed hopper is fitted, check that it is secure and installed correctly, and that no personnel can gain access to the moving parts of the machine.

5) Always ensure that machine is guarded in accordance with PD5304: 2000 Safety of Machinery requirements before any attempt is made to operate.

6) Prior to start up ensure all CT203 & CT205 TR Munchers have constant level oilers fitted as per section 1.9.1.

7) On start-up check the direction of rotation of the cutters. The cutters should rotate towards the centre when viewed from the inlet side.

NOTE:

If it is necessary to remove any inspection cover to observe the action – EXTREME CARE should be observed when carrying out this procedure.

8) Check that the Muncher stops when “STOP” button(s) are activated.

9) Check for reverse rotation of cutters when “REVERSE” button is activated.

10) Start up the machine. On initial start-up, allow machine to run for approximately 45 minutes.

11) Start the feed system to the machine. Care should be taken not to overburden the machine. Adjust feed to maintain only the smallest practical reservoir of material in cutter banks.

12) After a further 10 minutes of running, stop the machine, switch off and lock the main isolator. Check the tightness of all securing bolts. Recheck every 500 hours of operating time.

13) Check the tightness of all cables and connections. Re-check every 500 hours of operating time.

14) Observe manufacturers guidelines with regard to gearbox lubricant initial renewal and subsequent intervals.

15) In the event of machine overload (jam), the controller is programmed to activate the following procedure:-

i) Momentarily reverse rotation to clear the condition, then return to normal operation

ii) If overload re-occurs within 60 seconds, reverse rotation to clear the condition, then return to normal operation.

iii) If a third overload occurs within 60 seconds of the first, machine shutdown in reverse mode and energise alarm circuit.

15) After machine shutdown, isolate and lock off. Inspect machine, removing any obstruction and press the “RESET” button.

16) The machine can now be re-started as 9) above.

NEVER inspect or work on or near the cutter chamber without first isolating and locking the machine.

3.0 DISMANTLING AND ASSEMBLY

Section 3 contains the steps to dismantle and reassemble the Muncher. All fastenings must be tightened securely and where identified the appropriate torque figures should be used.

3.1 USE OF ITEMS NOT APPROVED OR MANUFACTURED BY YOUR SUPPLIER

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

As a consequence your Supplier has declared the machine safe to use for the duty specified as defined by the Declaration of Incorporation or Conformity that is issued with this Instruction Manual.

The use of replacement items that are not approved by or manufactured by your Supplier may affect the safe operation of the machine 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 your Supplier.

3.2 DISMANTLING ADVICE

(Refer to specified drawings).

CAUTION: When servicing the Muncher, be certain that the mains isolator is off and padlocked. Serious injury could result from accidental start-up.

1) Disconnect wiring at motor(s) terminal box(es) and tag leads for identification.

2) Pipeline models - Isolate the Muncher pipeline by closing line valves before and after the machine.

3) If necessary, the Muncher may be completely removed from installation using the recommended lifting equipment.

4) Pipeline models - Replace the pull back assembly with the maintenance period screen (MPS) if required.

5) When dismantling cutters and spacers, take careful note of the position and orientation of each component.

3.3 CLEANING / INSPECTION

It is important to periodically inspect (timeframe dependant on usage) the trash trap for any grit build up. If grit is present in the trash trap the grit should be removed and cleaned to ensure optimal care and working performance. See section 3 pages 2 and 3 for more details.

1) Steam clean and disinfect all parts of the Muncher excluding motor, seal assemblies, gear drive unit and bearings.

2) Remove any gasket material from joint faces.

3) Housings should be cleaned thoroughly.

4) Inspect all parts for excessive wear and replace if necessary.

5) Sealed bearings cannot be re-greased, replace if necessary.

6) Check and if necessary replace the internal ‘O’rings, lipseals and mechanical seals.

7) Inspect gears for wear and damage and replace if necessary.

8) All cutters and spacers must be clean and free from cracks or excessive wear.

9) Shafts should be clean and any burrs filed off for easier stacking. Inspect shafts for excessive wear of hexagonal portion. Replace if necessary.

3.4 REASSEMBLY ADVICE

1) Lubricate all bores, shafts and seals on reassembly.

2) Lubricate gears on re-assembly with the specified lubricant.

3) Reconnect wiring at motor(s) terminal box(es) using tag leads for identification.

4) Re-open system isolation valves.

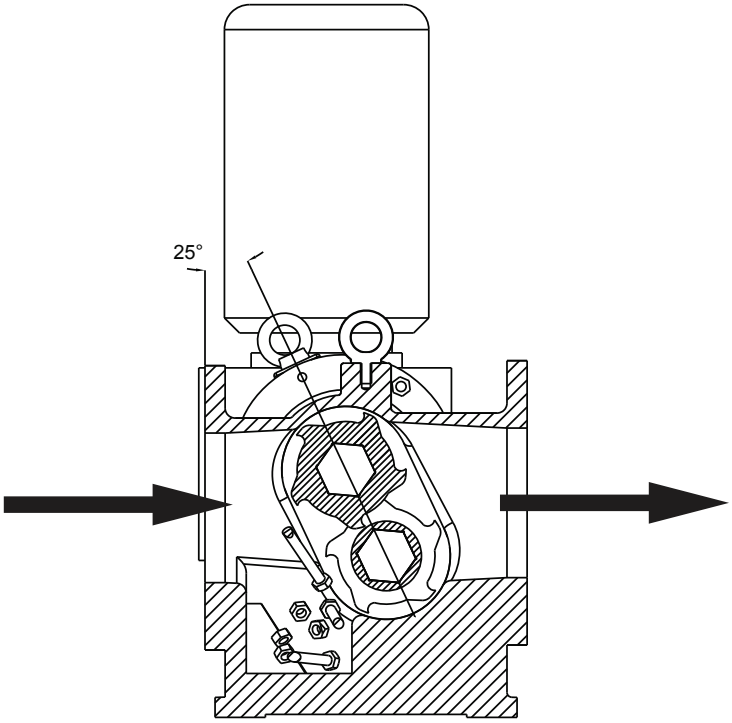
5) On completion of assembly, run through the ‘initial start-up’ procedure in section 2.

25° CUTTER STACK AND TRASH TRAP (CT201,CT206 & CT205 ONLY)

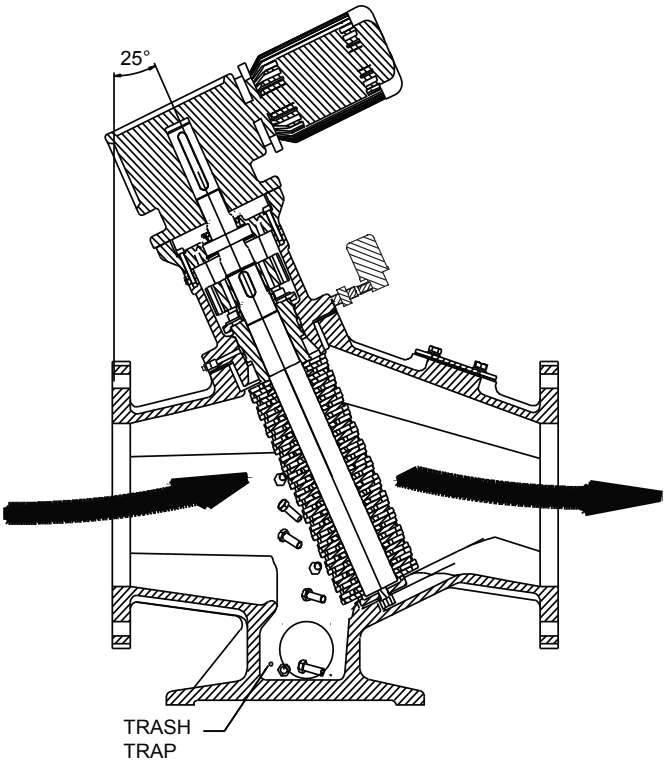
The cutter stack is inclined at 25° from the vertical axis to allow any unbreakable solids to drop clear of the cutters into the trash trap on reversal side of the cutter stacks. the solids can then be manually removed once the machine has been isolated (mechanically and electrically).

The unique internal trash trap built into the main body of the machine (patent pending), has access covers placed on either side for easy clean out.

Access cover plates drilled to suit standard NP16 50mm diameter flange to allow hosetail or similar to be fitted for flushing exercise when required.



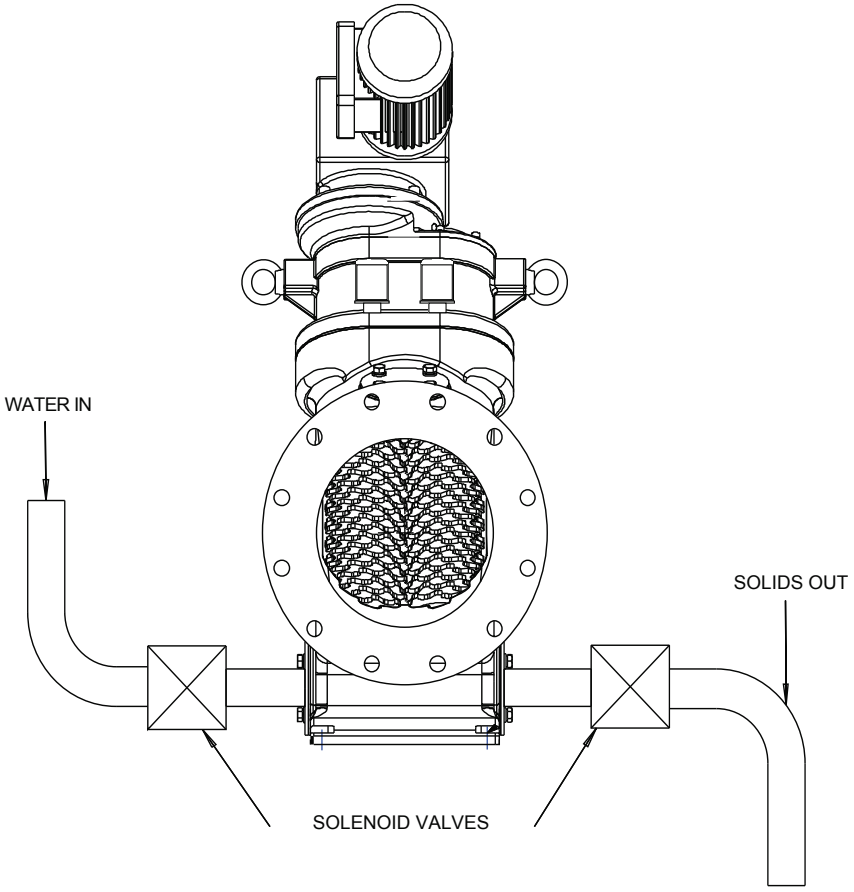
CT201



CT203 & CT205

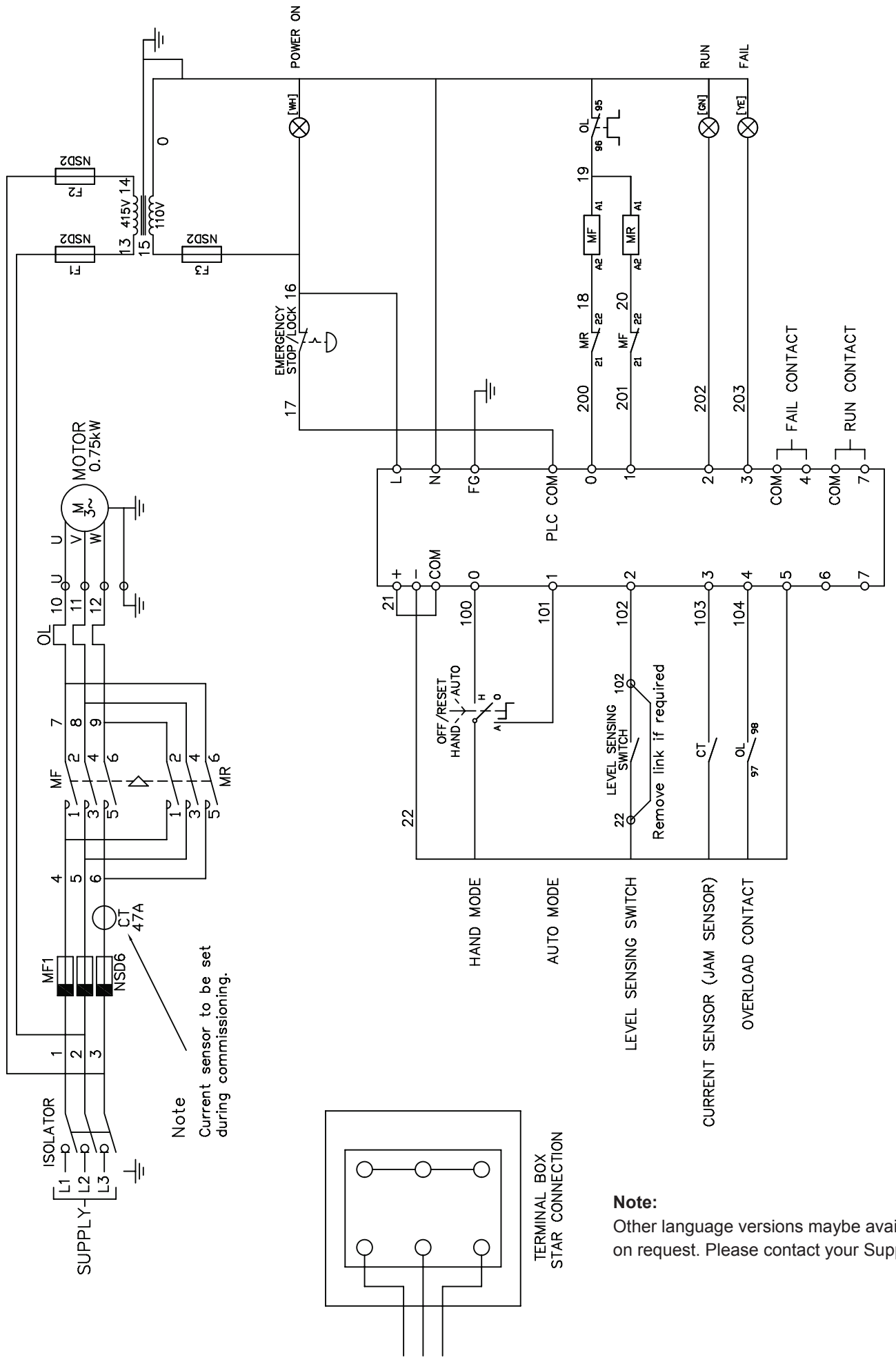
CLEAN OUT FACILITY

Using the two clean out access ports, flanged hoses and valves can be fitted to give an automatic flushing sequence at sites where grit/solids are known to cause problems.



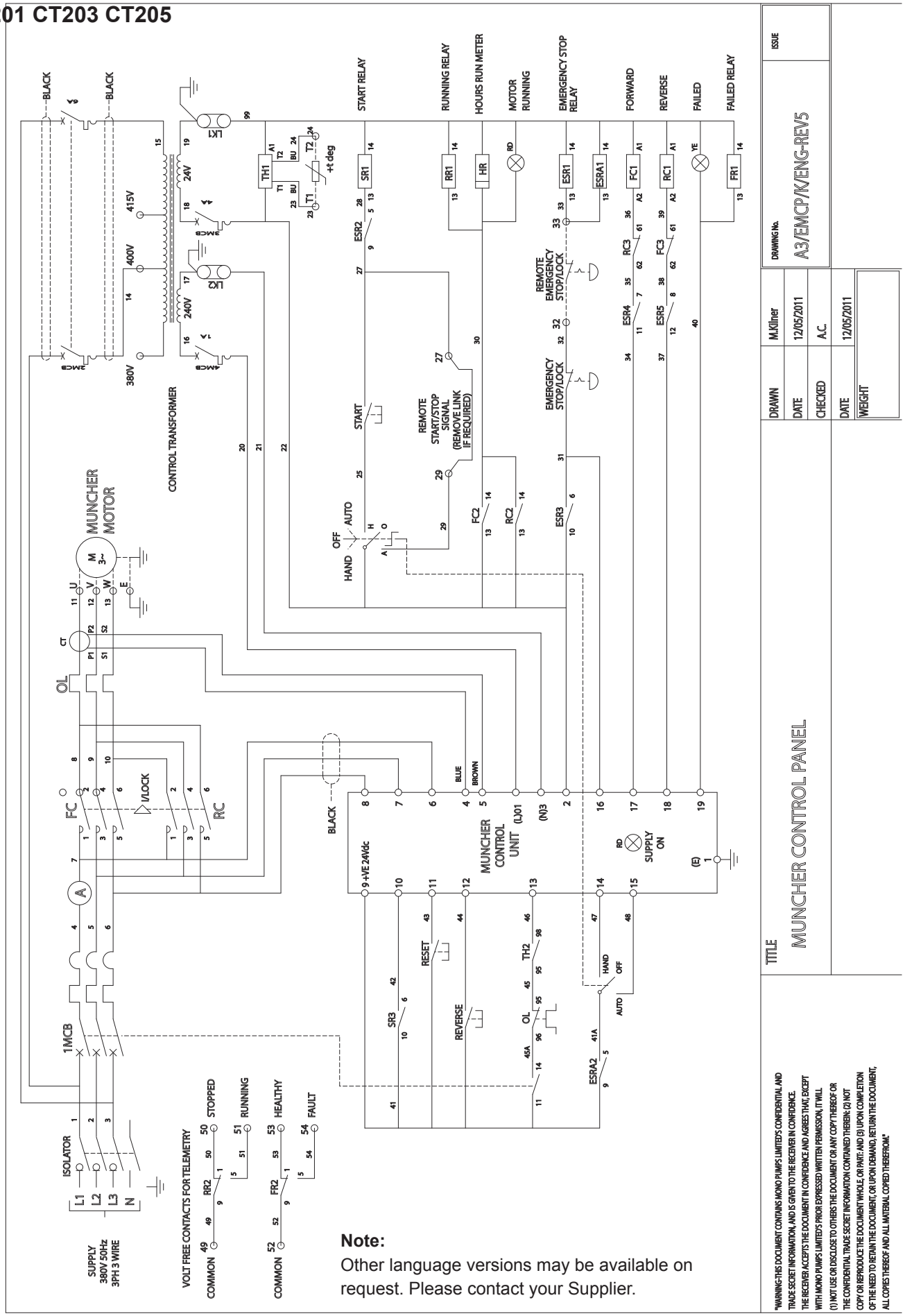
Wiring Diagrams

CT200



Note:
Other language versions maybe available on request. Please contact your Supplier.

CT201 CT203 CT205



Note:
Other language versions may be available on request. Please contact your Supplier.

Drawing Reference Numbers

CT200

DRG. REF.	DESCRIPTION
0300	MAIN/ BODY HOUSING
0100	GEAR/ MECH. SEAL. HOUSING
1100	TOP COVER PLATE/ BEARING HOUSING
3200	DRIVE SHAFT
3250	DRIVEN SHAFT
7800	DRIVE GEAR (20 TEETH)
7801	DRIVEN GEAR (25 TEETH)
2500	DRIVE CUTTER (5 TEETH, 5 THICK)
2501	DRIVEN CUTTER (9 TEETH, 5 THICK)
3500	CUTTER SPACER (5 THICK)
4702	COMPRESSION DISC
4750	SHAFT END WASHER
2900	DOWEL PIN (Ø10x45)
4700	DRIVE SPACER
4701	DRIVEN SPACER
9500	STUD (M10x80)
9501	STUD (M10x90)
0600	NAME PLATE
7700	LIFTING LUG
6200	FOOT
2017	GASKET

DRG. REF.	DESCRIPTION
P101	M8 x 15 HEX HEAD SCREW
P102	M8 SPRING WASHER
P103	M8 FLAT WASHER
P104	M8 x 25 SOCKET HEAD CAP SCREW
P105	M8 SPRING WASHER
P106	M8 x 15 HEX HEAD SCREW
P107	M8 SPRING WASHER
P108	M8 FLAT WASHER
P109	M12 x 20 HEX HEAD SCREW
P110	M12 SPRING WASHER
P111	DRIVE KEY (8x7x25)
P112	DRIVEN KEY (8x7x35)
P113	DRIVEN BEARING NU 1005 EC (47x25x12)
P114	DRIVE BEARING NU 1009 EC (75x45x16)
P115	EXTERNAL HD CIRCLIP Ø28mm
P116	MECHANICAL SEAL
P117	GIBB HEAD KEY (M/30307)
P118	1/8” GREASE NIPPLE
P401	M10 SPRING WASHER
P402	M10 FLAT WASHER
P403	M10 NUT

DRG. REF.	DESCRIPTION
P501	M10 x 25 HEX HEAD BOLT
P502	M10 SPRING WASHER
P503	M10 FLAT WASHER

IMPORTANT NOTE: -
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Torque Tightening Table for Fasteners

DESCRIPTION	THREAD SIZE	PART No	MAX TIGHTENING TORQUE	
			Nm	lbf.ft
BEARING HOUSE SCREW	M8 x 1.25	P104	40	30
FOOT SCREW	M8 x 1.25	P106	28	20
MECHANICAL SEAL HOUSING SCREW	M8 x 1.25	P101	28	20
MOTOR BOLT	M10 x 1.5	P501	56	41
CUTTER CARTRIDGE NUT	M10 x 1.5	P403	56	41
CUTTER SCREW	M12 x 1.75	P109	54	40

Torque tolerances are +/- 5% of stated values.

Assembly/Re-Assembly Advice

1. Use anti-seize compound on shafts.
2. Ensure correct orientation of bearing housing drain holes.
3. When viewed from drain holes side, drive shaft is to the right.
4. Where necessary use jacking screw holes to remove difficult components.
5. Observe the cutter stacking table guidelines below.

CUTTER STACKING TABLE

MODEL / TOOTH WIDTH	DRIVE SHAFT				DRIVEN SHAFT			
	CUTTERS	SPACERS	START TOP	FINISH BOTTOM	CUTTERS	SPACERS	START TOP	FINISH BOTTOM
CT200 -T E2	10	10	CUTTER	SPACER	10	10	SPACER	CUTTER

Drawing Reference Numbers

CT201

DRG. REF.	DESCRIPTION
0100	GEAR HOUSING
0300	MAIN BODY
0600	MUNCHER NAMEPLATE
1100	BEARING HOUSING
2010	GASKET
2016	GASKET
2017	GASKET
2500	CUTTER
3200	DRIVE SHAFT
3250	DRIVEN SHAFT
3500	SPACER
4700	BACK UP WASHER
4702	RETAINING WASHER
4750	LOCK WASHER
5900	END COVER
5901	INSPECTION COVER
6200	SUPPORT FOOT
7700	LIFTING LUG
7701	LIFTING LUG
7800	DRIVE GEAR
7801	DRIVEN GEAR

DRG. REF.	DESCRIPTION
P101	M10 x 30 STUD
P102	M10 x 35 STUD
P103	M10 SPRING WASHER
P104	M10 HEX NUT
P105	M10 x 30 HEX SOCKET CAPSCREW
P106	M10 x 35 HEX SOCKET CAPSREW
P107	M10 SPRING WASHER
P108	INT CIRCLIP 75MM
P109	EXTERNAL CIRCLIP - 40mm
P110	LIPSEAL 35 x 62 x 7
P111	RECT PAR KEY - 10 x 8 x 55
P112	M8 x 16 HEX SOCKET CAPSCREW
P113	M8 SPRING WASHER
P114	BEARING - 35 x 72 x 17
P115	EXTERNAL CIRCLIP - 35mm
P116	MECH SEAL
P117	M24 NYLOC NUT
P118	1/8” GREASE NIPPLE
P119	MI0 SPRING WASHER
P400	M8 x 20 HEX SOCKET CAPSCREW
P401	M8 SPRING WASHER

DRG. REF.	DESCRIPTION
P500	RECT PAR KEY - 10x8x45
P501	M10 x 30 HEX HD SCREW
P502	M10 SPRING WASHER
P503	M10 HEX NUT
P504	M12 COLLARED EYEBOLT

IMPORTANT NOTE: -
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Torque Tightening Table for Fasteners

DESCRIPTION	THREAD SIZE	PART No	MAX TIGHTENING TORQUE	
			Nm	lbf.ft
MAIN BODY / INSPECTION COVER NUT	M10 x 1.5	P103	56	41
TOP COVER PLATE BOLT	M10 x 1.5	P104	56	41
NYLOC NUT	M24 x 3	P106	230	170
MOTOR MOUNTING BOLT	M10 x 1.5	P501	56	41

Torque tolerances are +/- 5% of stated values.

Assembly/Re-Assembly Advice

1. Use anti-seize compound on shafts.
2. Ensure correct orientation of bearing housing drain holes.
3. When viewed from drain holes side, drive shaft is to the right.
4. Where necessary use jacking screw holes to remove difficult components.
5. Observe the cutter stacking table guidelines below.

CUTTER STACKING TABLE

MODEL / TOOTH WIDTH	DRIVE SHAFT				DRIVEN SHAFT			
	CUTTERS	SPACERS	START TOP	FINISH BOTTOM	CUTTERS	SPACERS	START TOP	FINISH BOTTOM
CT201 -W A2	14	15	CUTTER	SPACER	14	15	SPACER	SPACER
CT201 -W B2	10	10	SPACER	CUTTER	10	10	CUTTER	SPACER

Drawing Reference Numbers

CT203 & CT205

DRG. REF.	DESCRIPTION	DRG. REF.	DESCRIPTION
		P108	EXTERNAL CIRCLIP-55mm
0100	BEARING HOUSING	P109	RECT PAR KEY - 16x10x47
0200	DATUM TUBE	P110	LIPSEAL - 50x65x8
0300	MAIN BODY	P111	10x25 DOWEL
0600	MUNCHER NAMEPLATE	P112	8x25 DOWEL
1100	TOP COVER PLATE	P113	BEARING - 50x90x20
1160	SEAL RETAINING PLATE	P114	MECH SEAL -60mm
2000	MAIN BODY GASKET	P115	M16x45 HEX SOCKET CAP SCREW
2010	INSPECTION COVER GASKET	P116	M16 SPRING WASHER
2500	CUTTER	P117	M16x45 HEX SOCKET CAP SCREW- L.H.
3200	DRIVE SHAFT	P118	M16 SPRING WASHER
3250	DRIVEN SHAFT	P119	M12x25 HEX HEAD SCREW
3500	SPACER	P120	M12 SPRING WASHER
3650	SHAFT ENDCAP	P121	WARNING LABEL
4750	SEAL RETAINING WASHER	P122	No. 0 x 3/16” HD DRIVE SCREW
5900	INSPECTION COVER	P123	No. 0 x 3/16” HD DRIVE SCREW
7800	DRIVE GEAR	P124	1/8” GREASE NIPPLE
7801	DRIVEN GEAR	P400	SEAL PLATE BOLT
P101	M8x55 HEX SOCKET CAP SCREW	P401	SEAL PLATE WASHER
P102	M8 SPRING WASHER	P402	SEAL PLATE SPRING WASHER
P103	M8x30 HEX SOCKET CAP SCREW	P500	RECT PAR KEY - 14x9x105
P104	M8 SPRING WASHER	P501	M12 x 30 HEX HEAD SCREW
P105	M12x50 HEX SOCKET CAP SCREW	P502	M12 SPRING WASHER
P106	M12 SPRING WASHER	P503	M20 EYEBOLT
P107	INTERNAL CIRCLIP-90mm	P504	¼” BSP TAPER PLUG
		P505	CONSTANT LEVEL OILER

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Torque Tightening Table for Fasteners

DESCRIPTION	THREAD SIZE	PART No.(s)	MAX. TIGHTENING TORQUE	
			Nm	lbf.ft.
TOP COVER PLATE BOLT	M8x1.25	P101	29	22
TOP COVER PLATE BOLT	M8x1.25	P103	29	22
BEARING HOUSING BOLT	M12x1.75	P105	101	76
DRIVESHAFT BOLT	M16x2	P115	125	92
DRIVEN SHAFT BOLT	M16x2 (L.H.)	P117	125	92
SEAL PLATE BOLT	M12x1.75	P119	101	76
INSPECTION COVER BOLT	M16x2	P400	125	92
MOTOR MOUNT BOLT	M12x1.75	P501	101	76

Torque tolerances are +/- 5% of stated values.

Assembly/Re-Assembly Advice

1. Use anti-seize compound on shafts.
2. Ensure correct orientation of bearing housing drain holes.
3. When viewed from drain holes side, drive shaft is to the right.
4. Where necessary use jacking screw holes to remove difficult components.
5. Observe the cutter stacking table guidelines below.

CUTTER STACKING TABLE

MODEL / TOOTH WIDTH	DRIVE SHAFT				DRIVE SHAFT			
	CUTTERS	SPACERS	START TOP	FINISH BOTTOM	CUTTERS	SPACERS	START TOP	FINISH BOTTOM
CT203-W A2	22	21	CUTTER	CUTTER	21	22	SPACER	SPACER
CT203-W B2	51	51	SPACER	CUTTER	51	51	CUTTER	SPACER
CT205-W A2	36	35	CUTTER	CUTTER	35	36	SPACER	SPACER
CT205-W B2	52	52	SPACER	CUTTER	52	52	CUTTER	SPACER

Muncher Coding

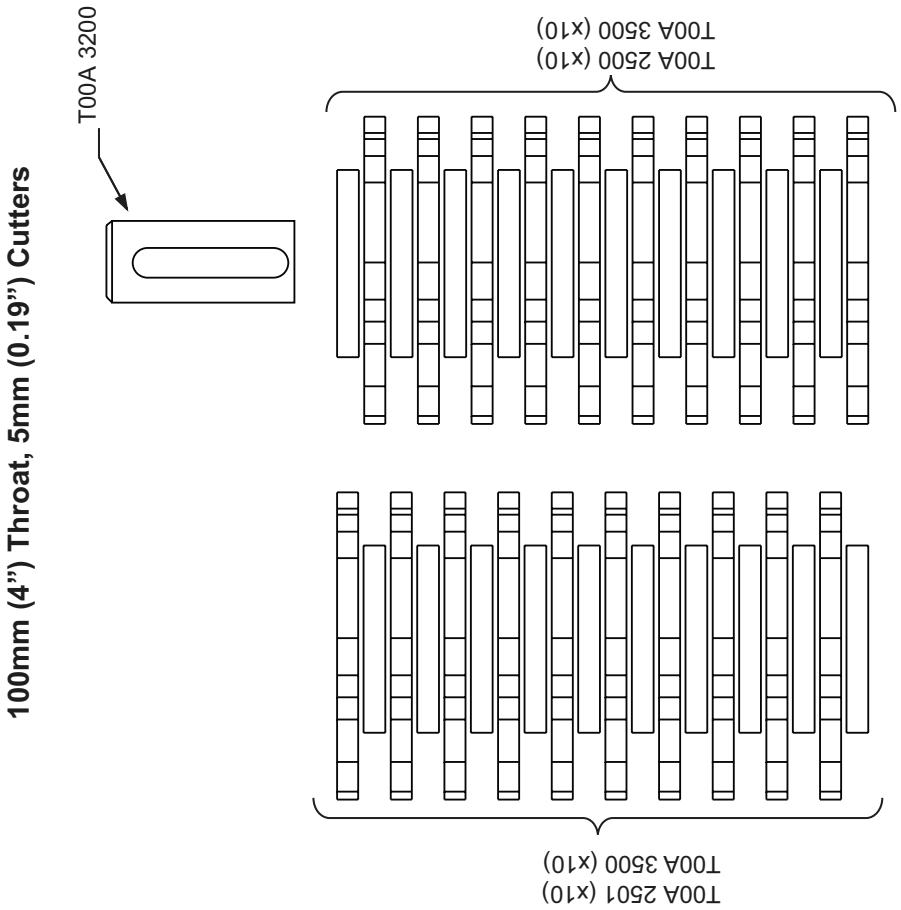
Features	Description	Basic Code												Variation		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Body Material	Cast Iron	C														
	Stainless Steel	S														
Product	TR Muncher		T													
Mark No.	1996			2												
Throat Size	100mm (4”)				0	0										
	150mm (6”)				0	1										
	300mm (12”)				0	3										
	500mm (20”)				0	5										
Machine Type & Flange Bore (Metric Flanges Drilled to BS4504 PN16 & Imperial Flanges Drilled to ANSI B16.5 Class 150)	Pipeline 100 N.B. to BS4504						C	CT200, CT201 & CT203 ONLY								
	Pipeline 150 N.B. to BS4504						D	CT201 & CT203 ONLY								
	Pipeline 200 N.B. to BS4504						E	CT203 ONLY								
	Pipeline 250 N.B. to BS4504						F	CT205 ONLY								
	Pipeline 300 N.B. to BS4504						G	CT205 ONLY								
	Pipeline 4” N.B. ANSI						P	CT203 ONLY								
	Pipeline 6” N.B. ANSI						Q	CT201 & CT203 ONLY								
	Pipeline 8” N.B. ANSI						R	CT203 ONLY								
	Pipeline 10” N.B. ANSI						S	CT205 ONLY								
	Pipeline 12” N.B. ANSI						T	CT205 ONLY								
Motor	Gear Unit c/w 1.5kW Motor							A								
	Gear Unit c/w 2.2kW Motor							B								
	Gear Unit c/w 4kW Motor							C								
	Gear Unit c/w 2HP Motor							D								
	Gear Unit c/w 3HP Motor							E								
	Gear Unit c/w 5HP Motor							F								
	Gear Unit c/w 0.75kW Motor							G								
Cutter	ETOS								W							
	NON ETOS								T							
No. of Teeth	5									5						
	7									7						
	9									9						
	11									1						
	5 (DRIVE) & 9 (DRIVEN)									2						
Thickness	5.5mm (0.2165”)										A					
	8.0mm (0.3150”)										B					
	4.9mm (0.1929”)										E					
Material (Cutters)	Stainless Steel											1				
	Chromium Molybdenum Steel											2				
Oblique													/			
Field Variation														V	A	R
Typical Code		C	T	2	0	3	D	*	T	1	B	2	/	1	2	3

Note: “X” in any column denotes a special variation.

CT201D available with 100NB reducing spool pieces

Please note - 100NB flanges are available on CT201D but require flange adaptors which will affect the length

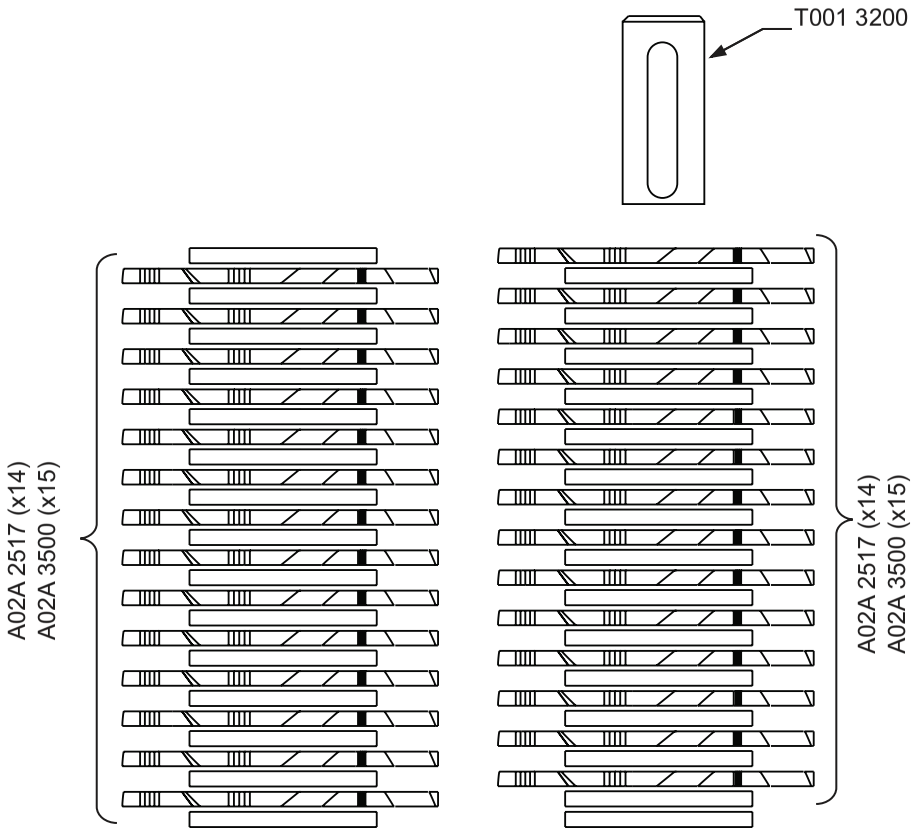
Stacking Arrangement



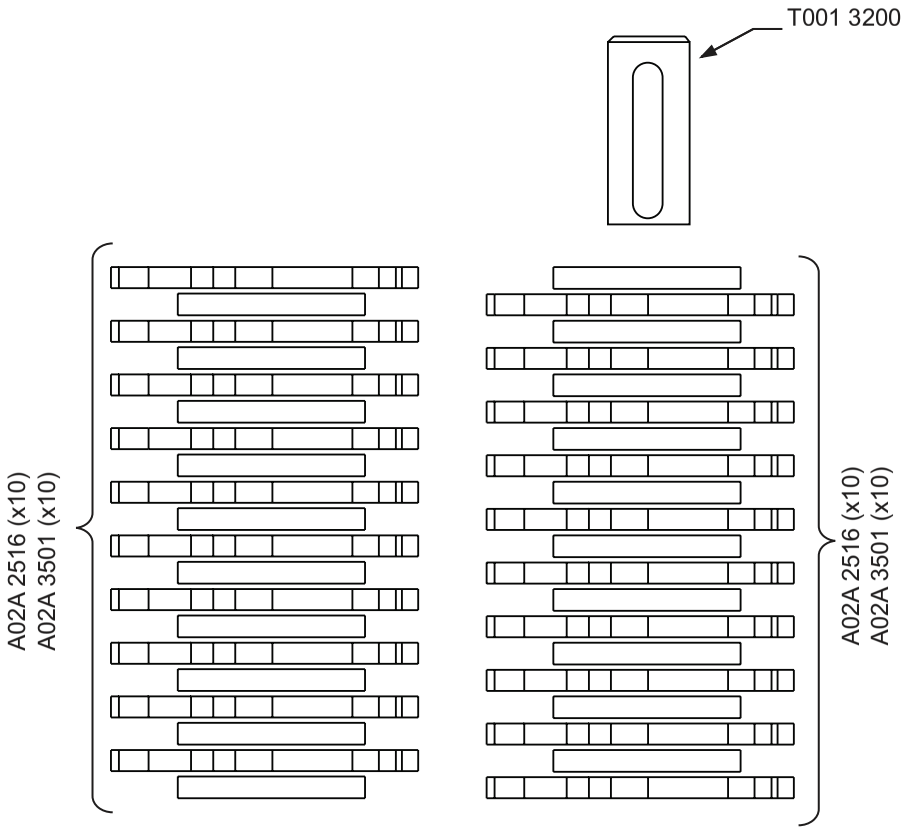
Cutter Stacks

Cutter Stacks

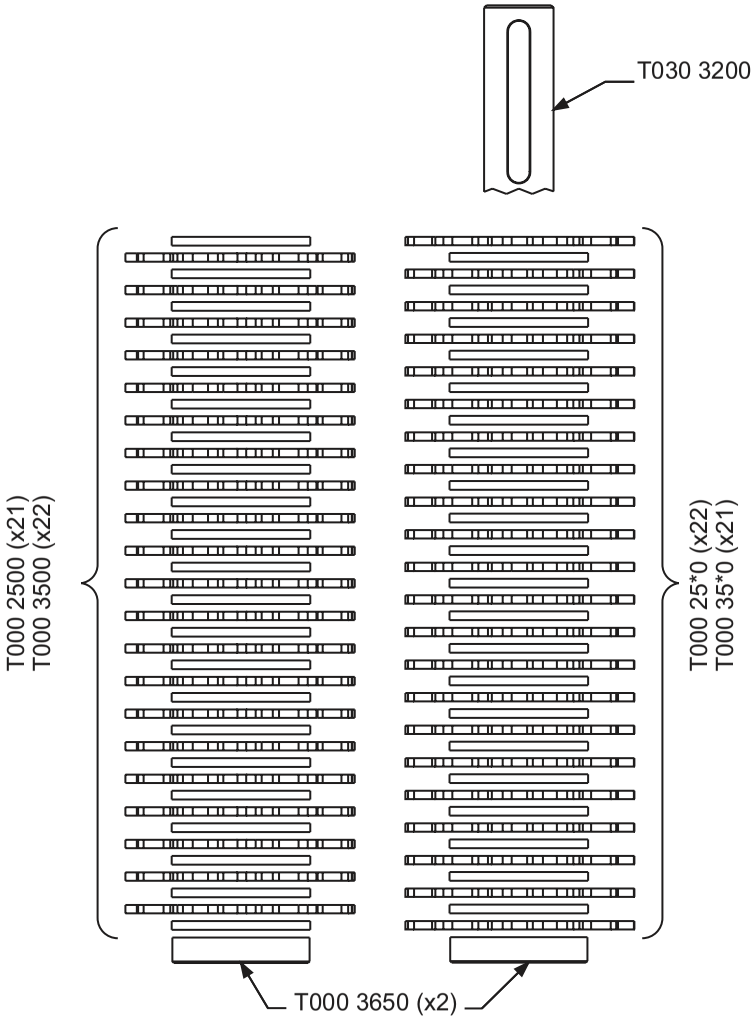
150mm (6”) Throat, 5.5mm (0.21”) Cutters



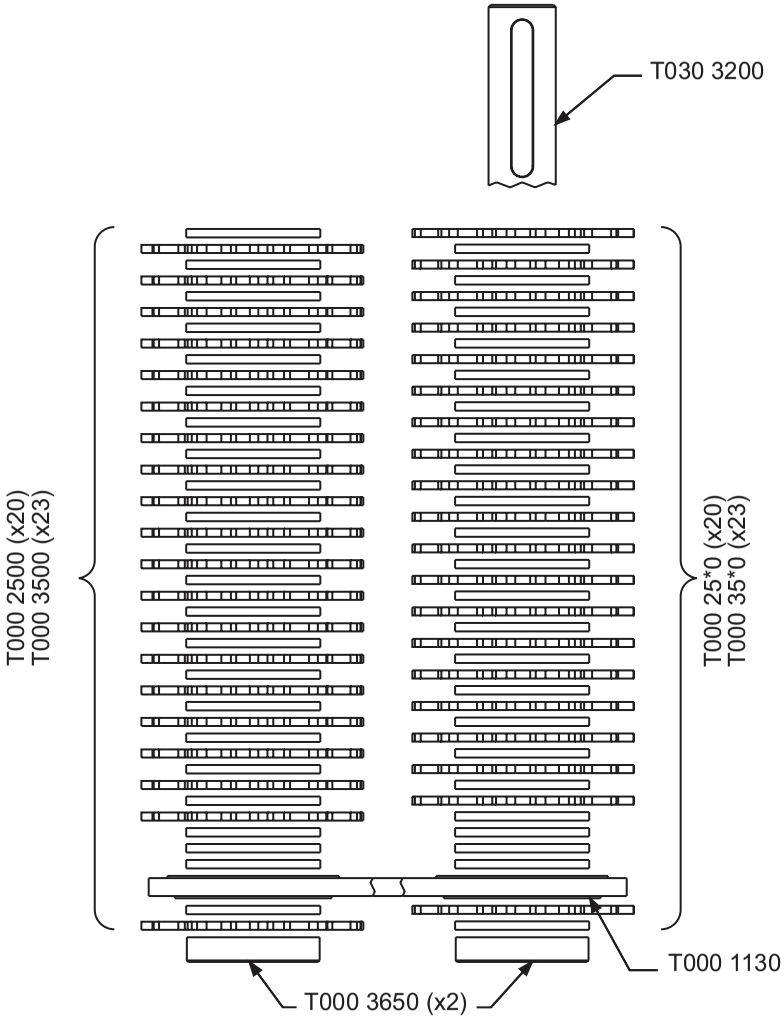
150mm (6”) Throat, 8mm (0.31”) Cutters



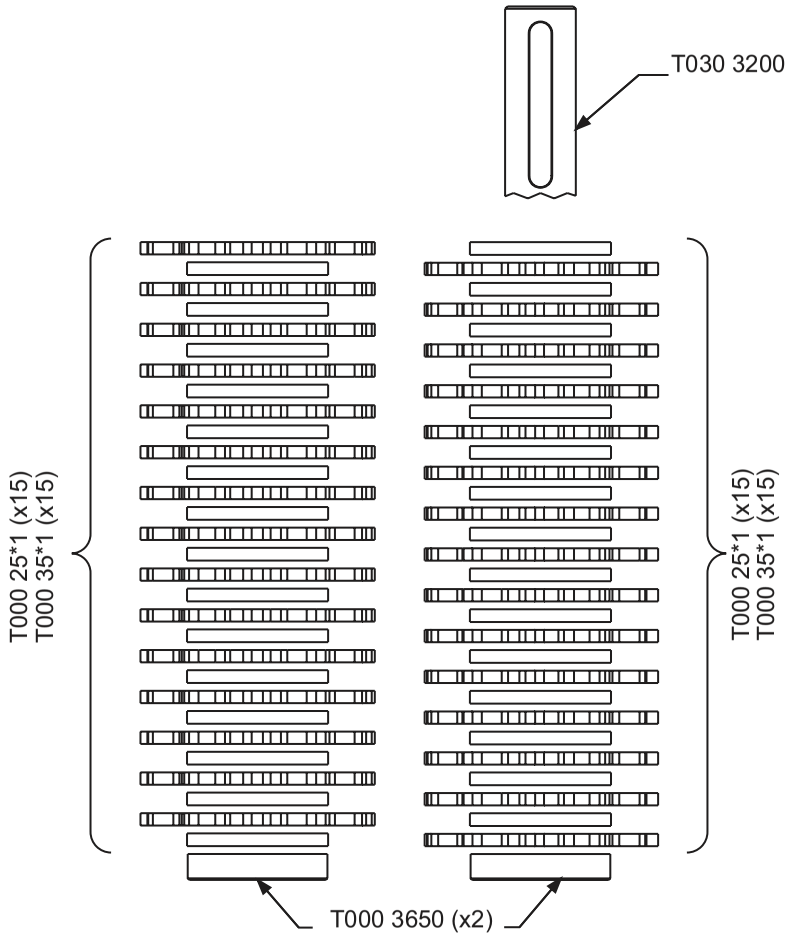
300mm (12”) Throat, 5.5mm (0.21”) Cutters



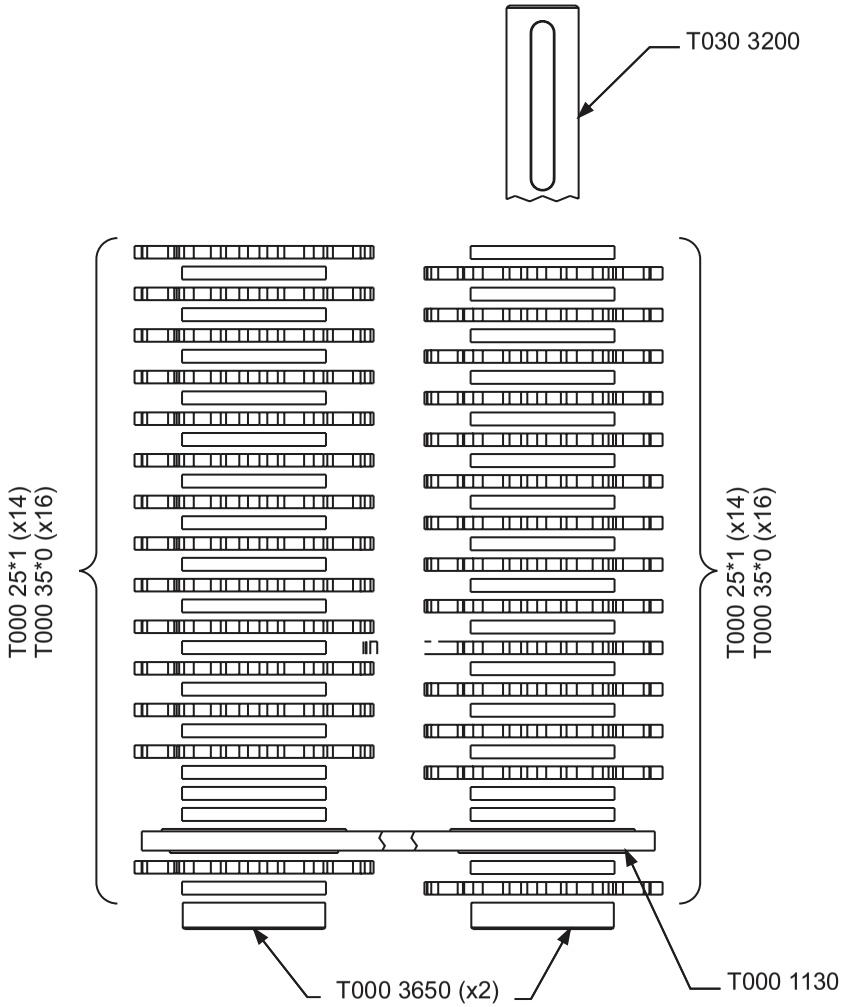
305mm (12”) Throat, 5.5mm (0.21”) Cutters with Bottom Support Bearing



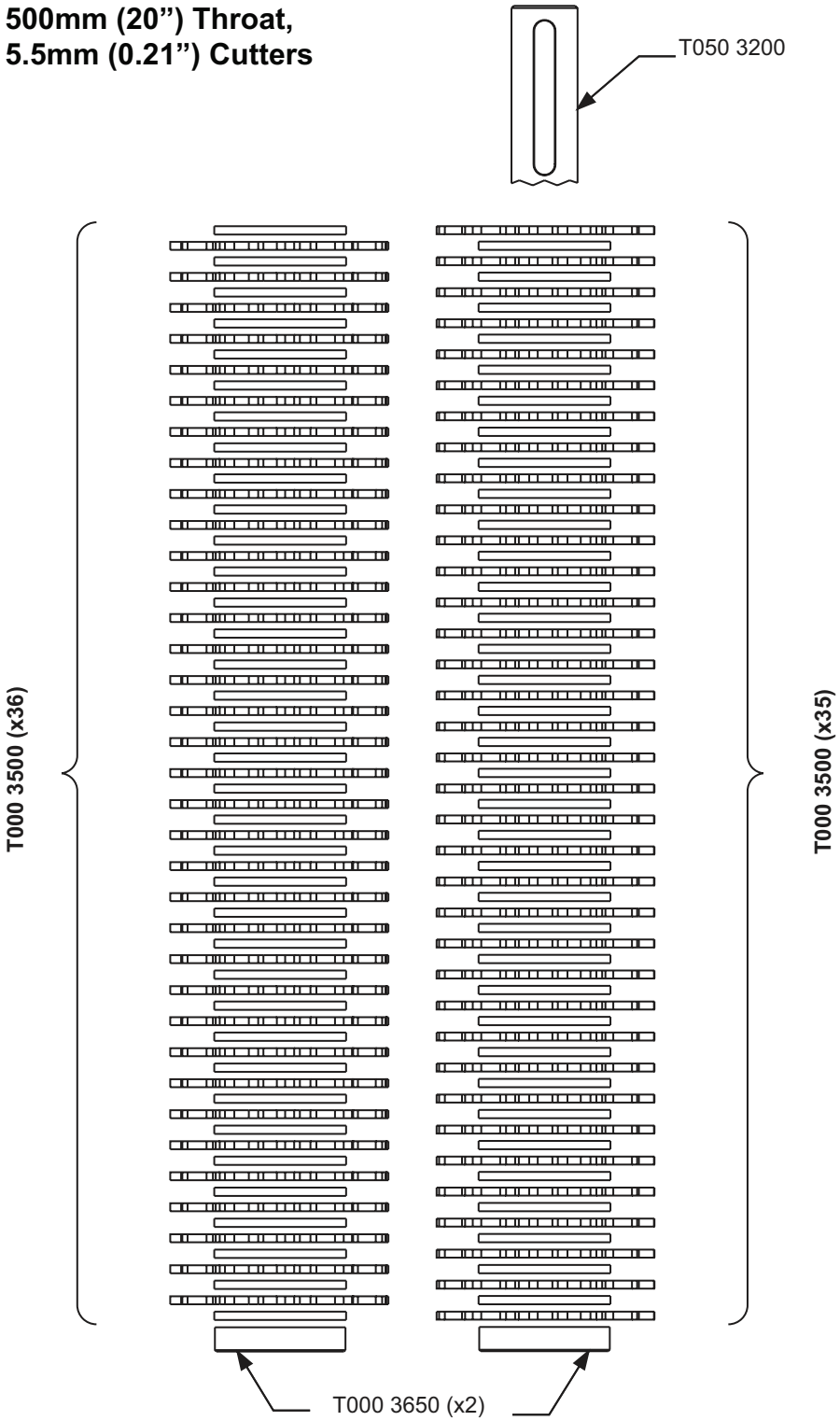
305mm (12”) Throat, 8mm (0.31”) Cutters



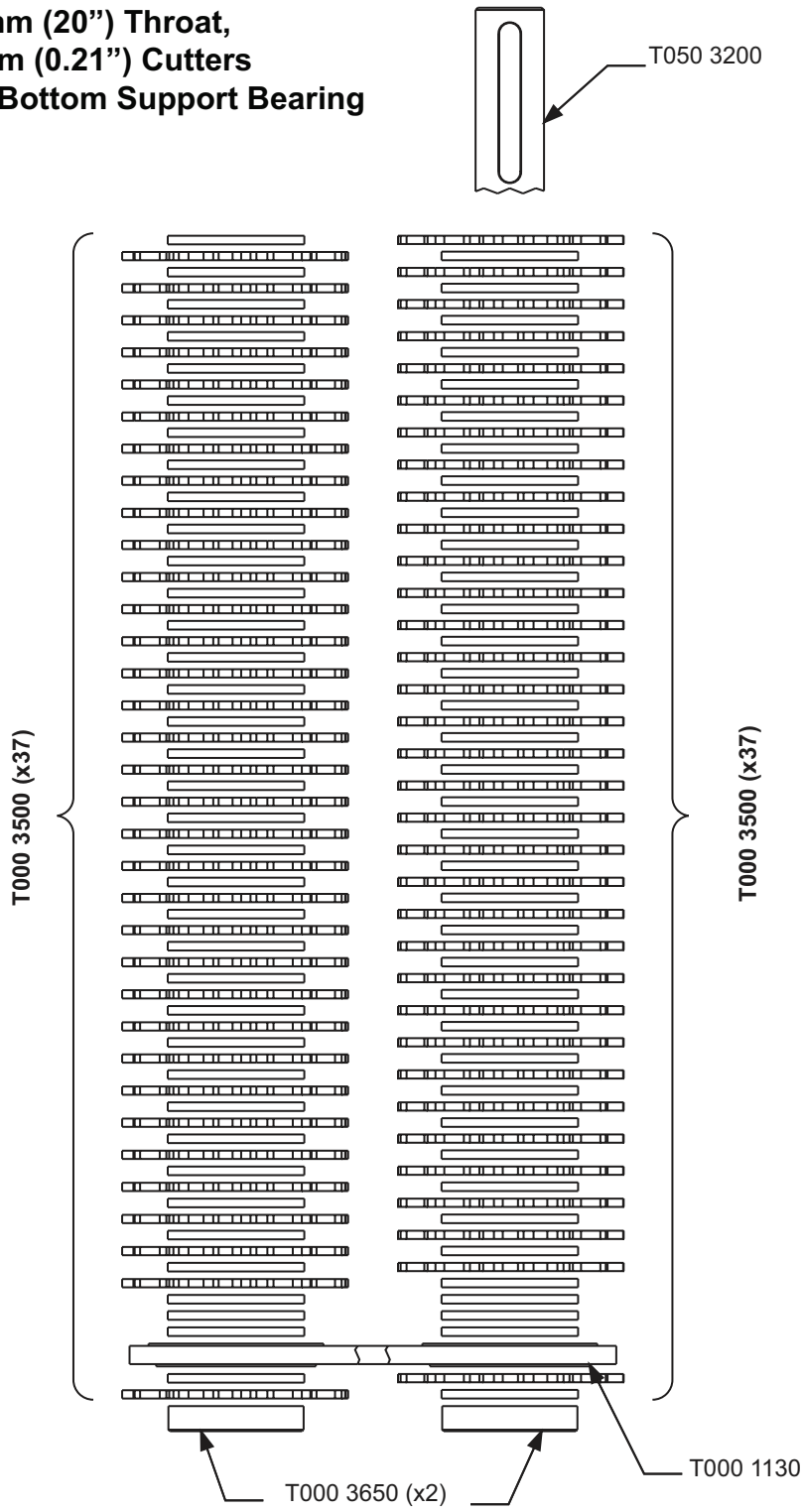
305mm (12”) Throat, 8mm (0.31”) Cutters with Bottom Support Bearing



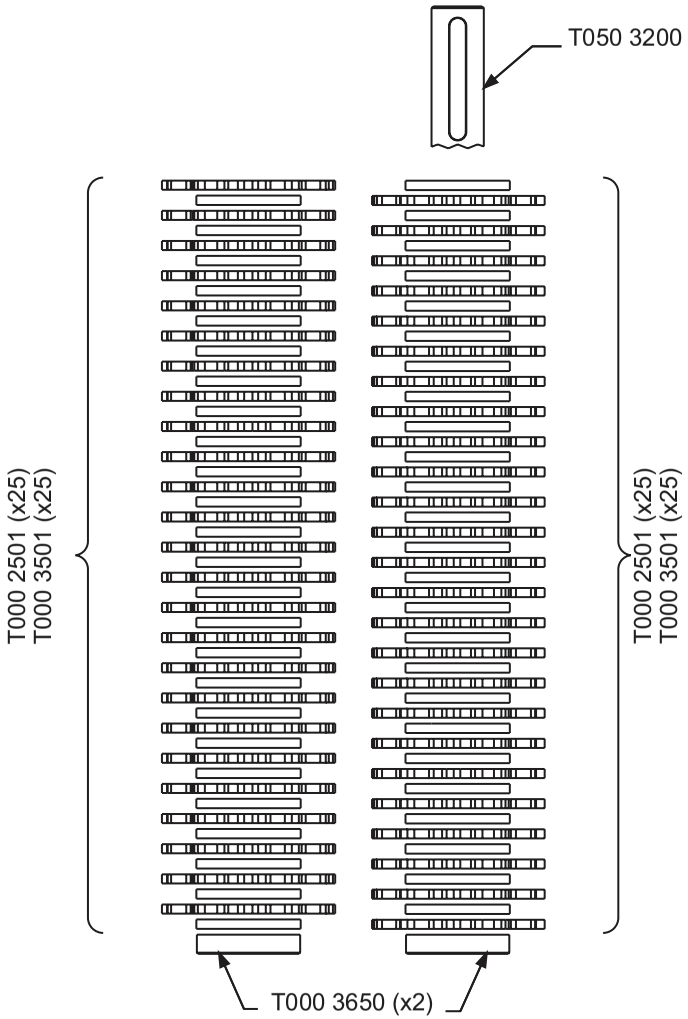
500mm (20”) Throat,
5.5mm (0.21”) Cutters



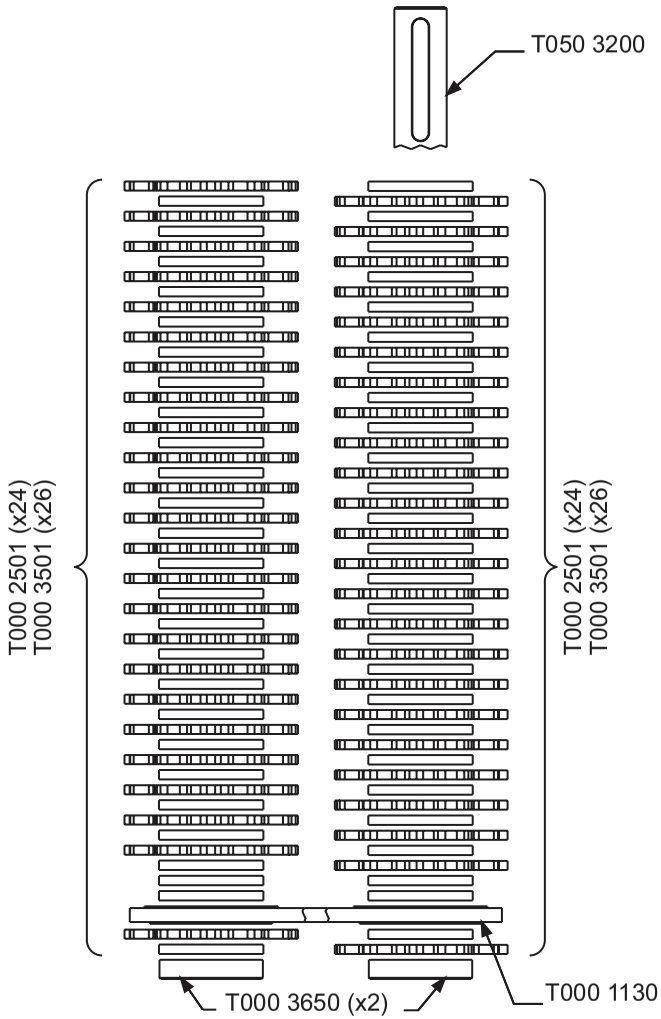
500mm (20”) Throat,
5.5mm (0.21”) Cutters
with Bottom Support Bearing



500mm (20”) Throat, 8mm (0.31”) Cutters

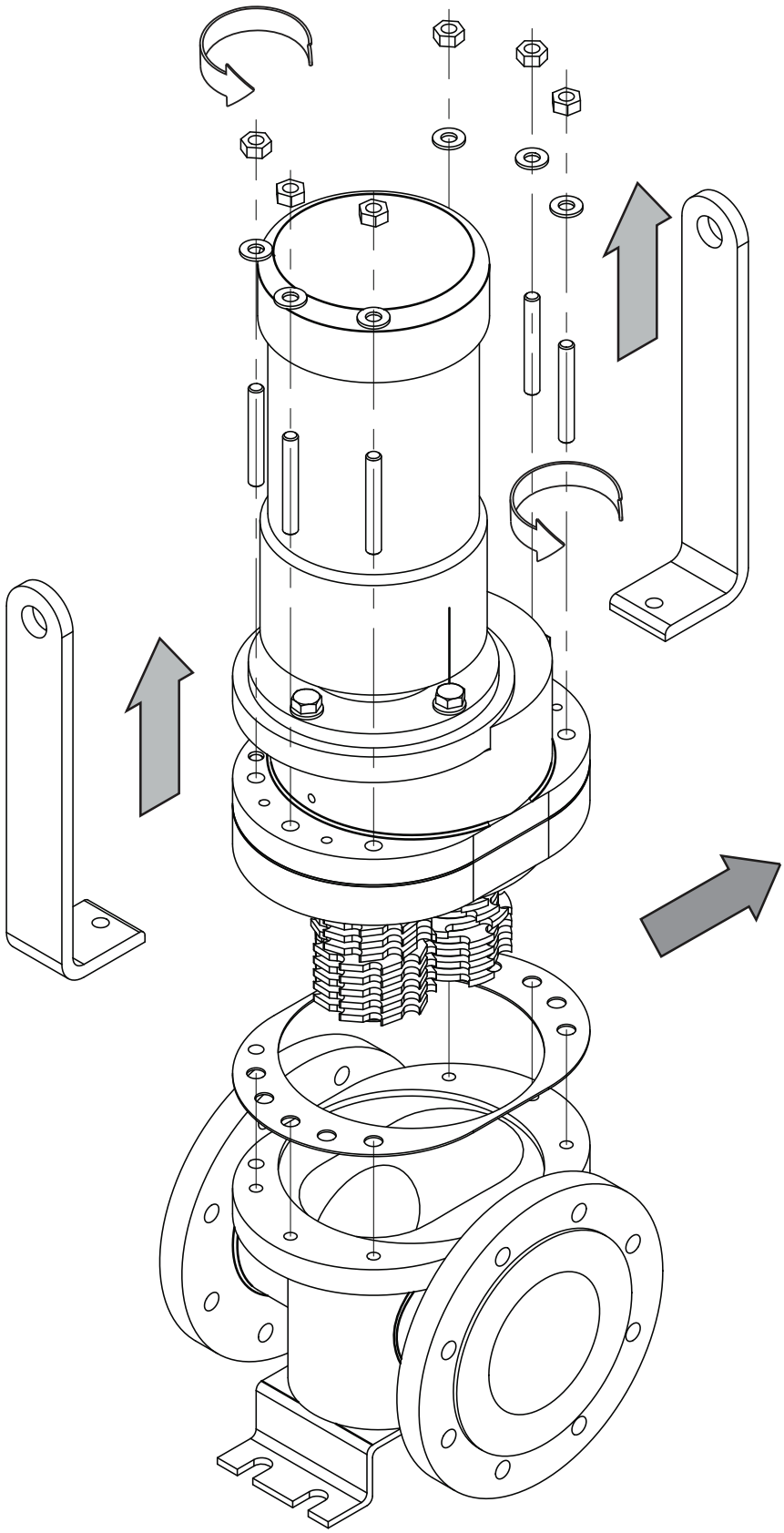


500mm (20”) Throat, 8mm (0.31”) Cutters with Bottom Support Bearing



Dismantling Diagrams

CT200



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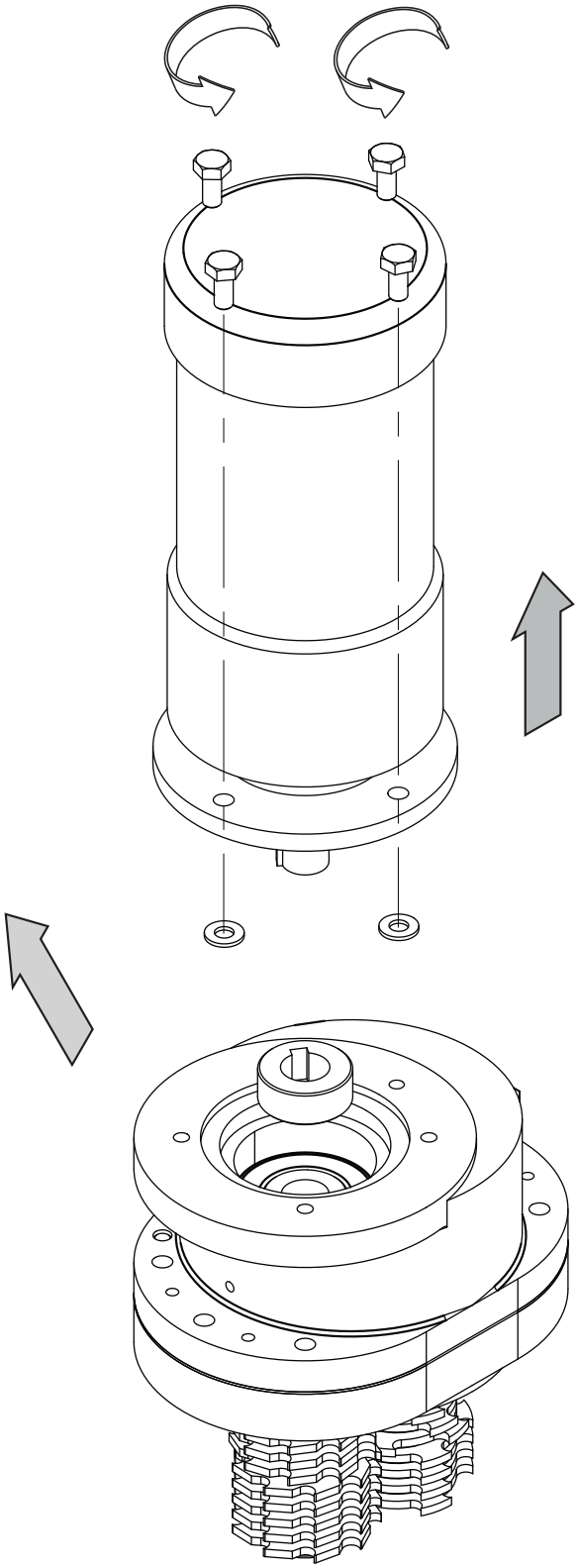

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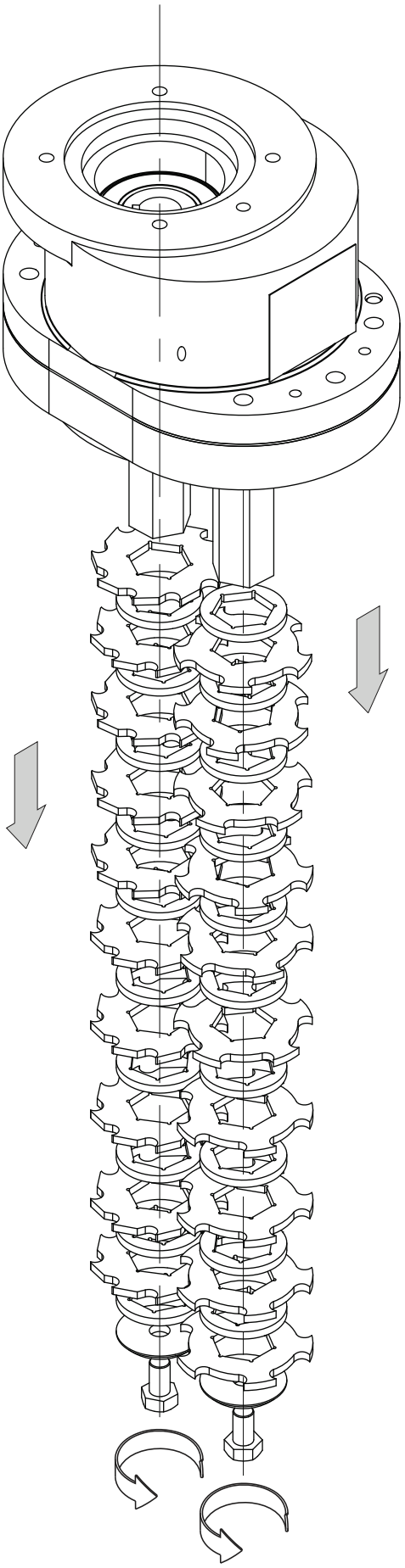

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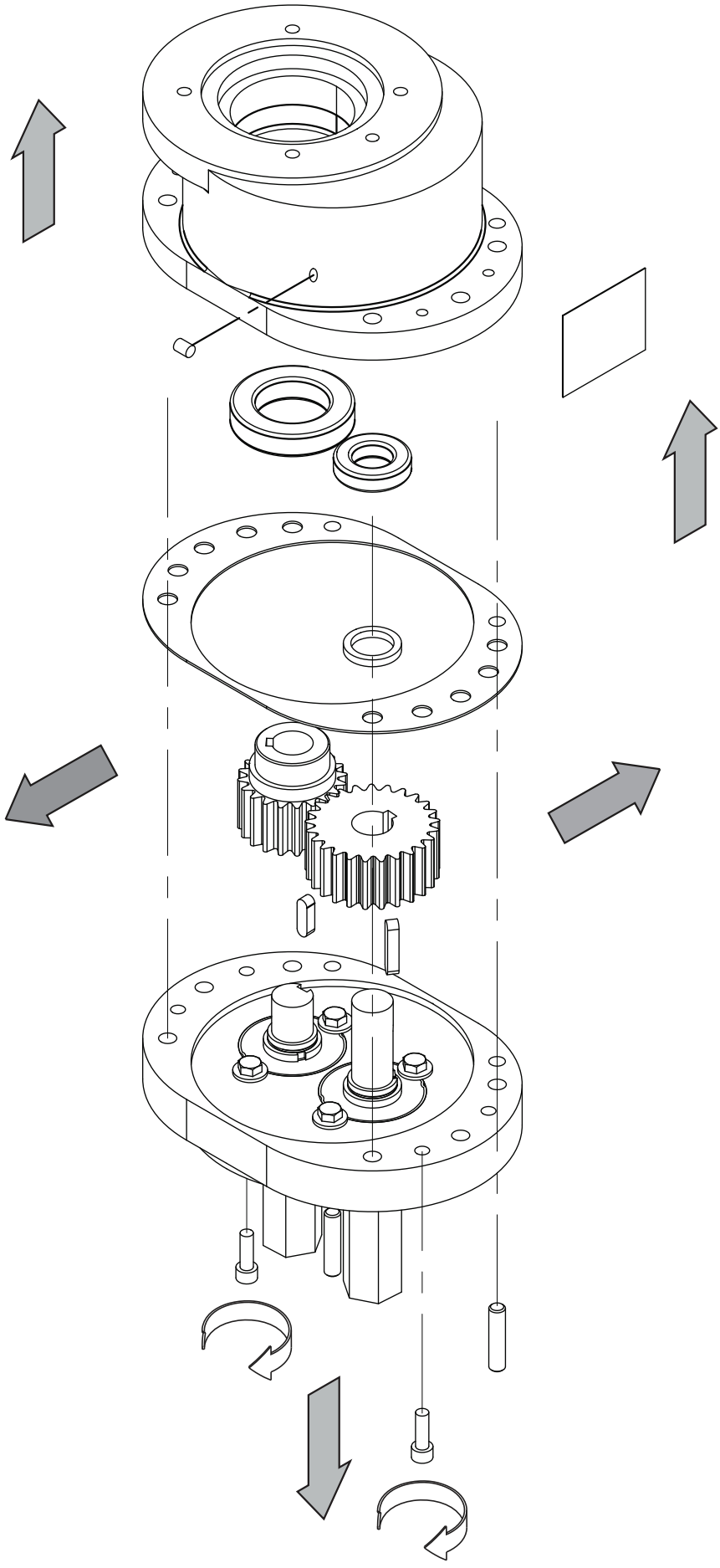

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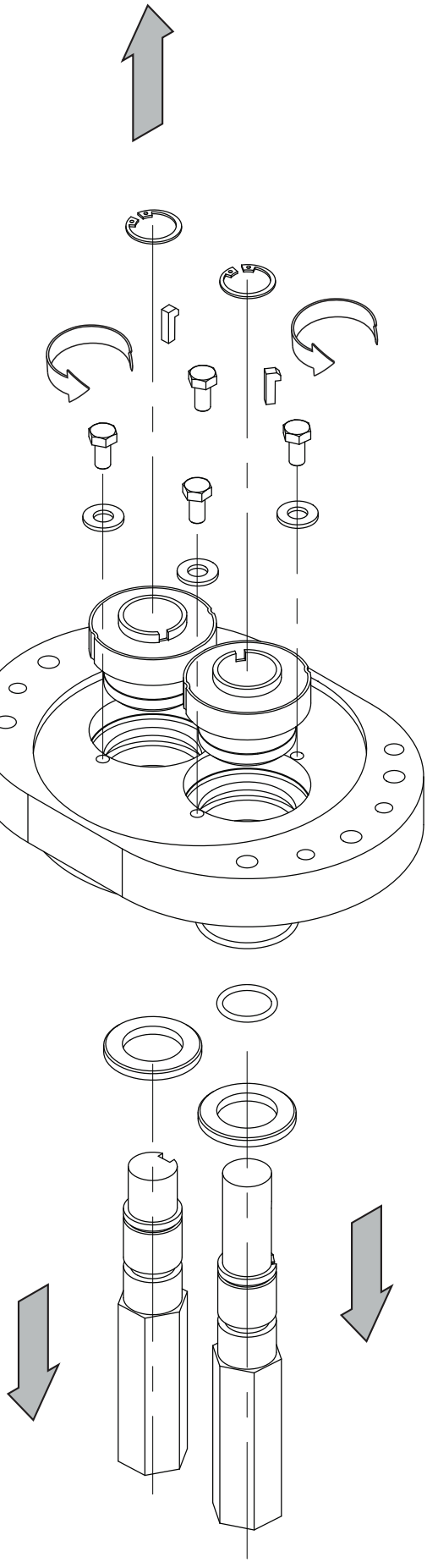
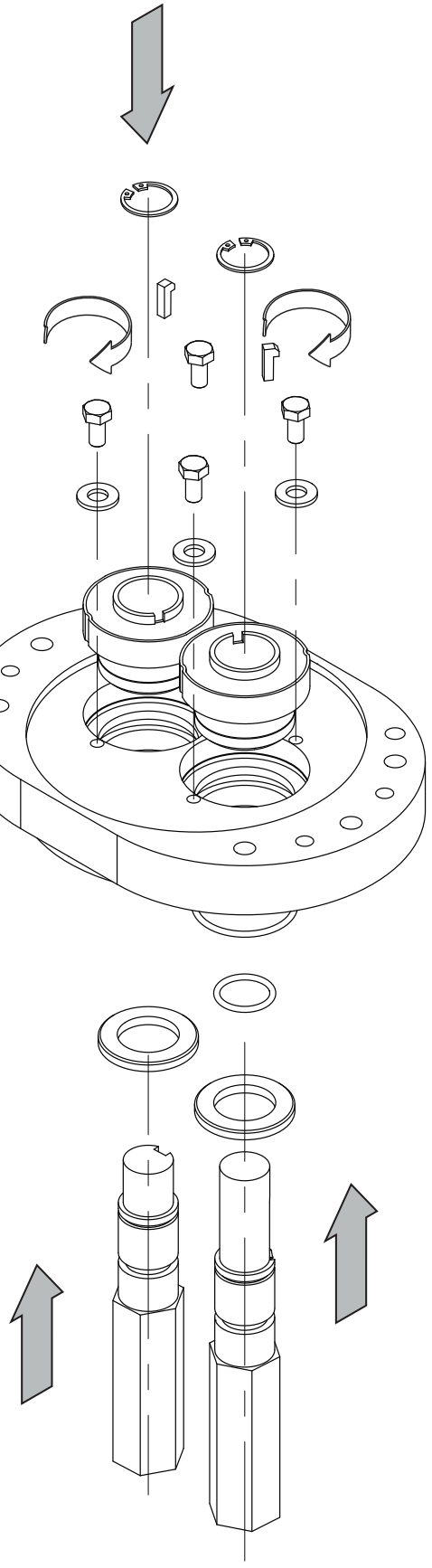


Assembly Diagrams

ASSEMBLY

CT200



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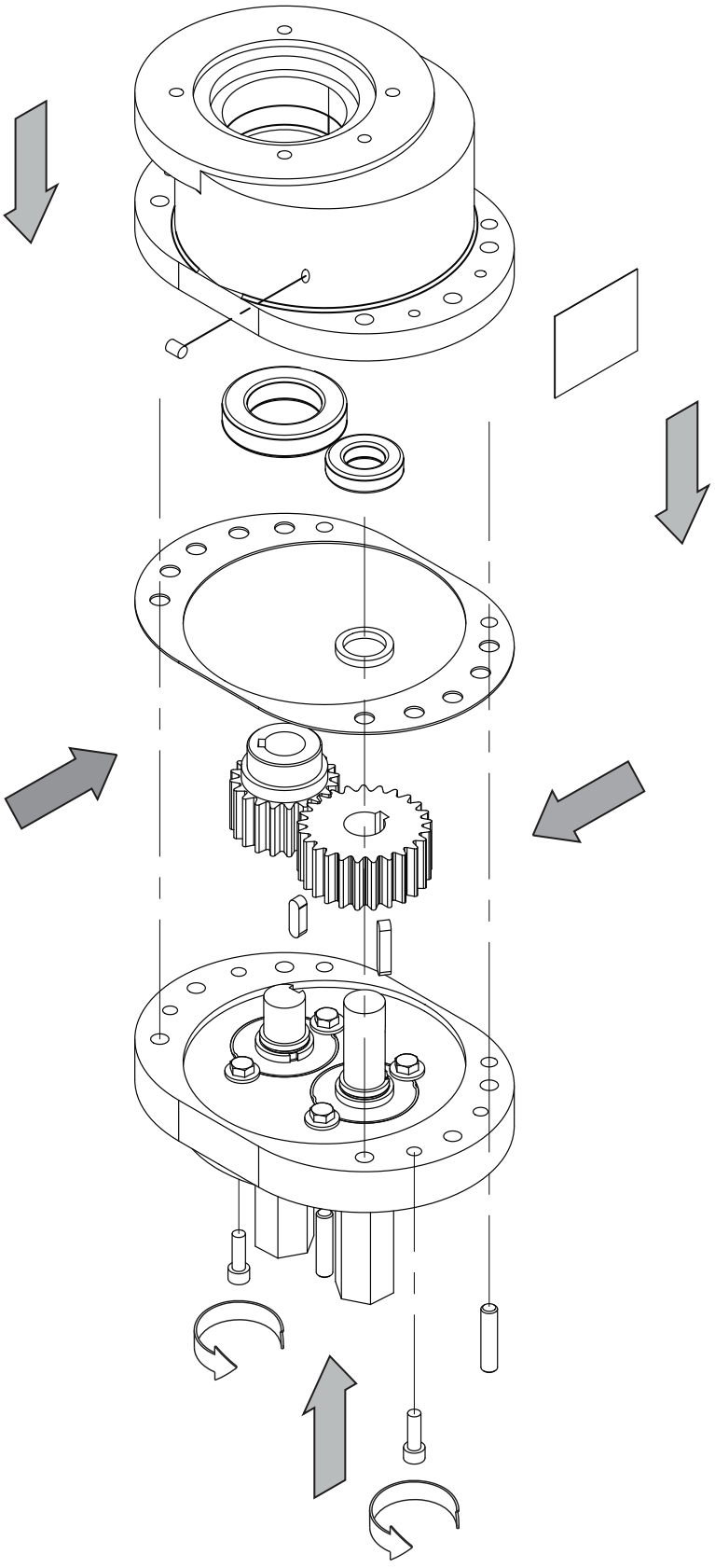

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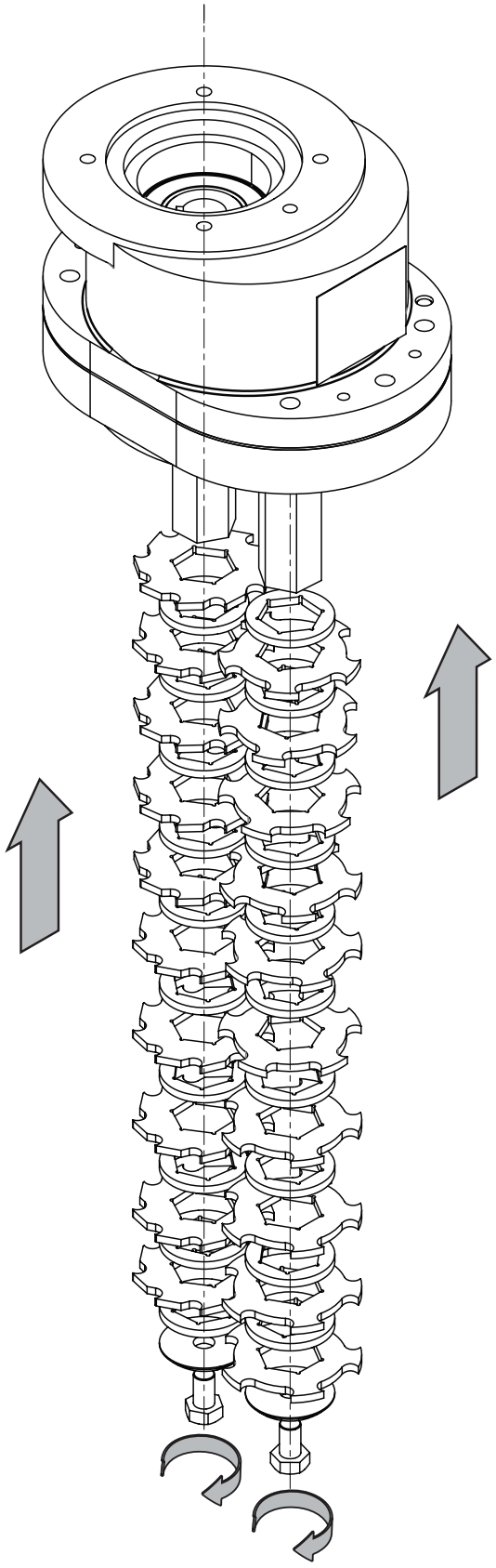

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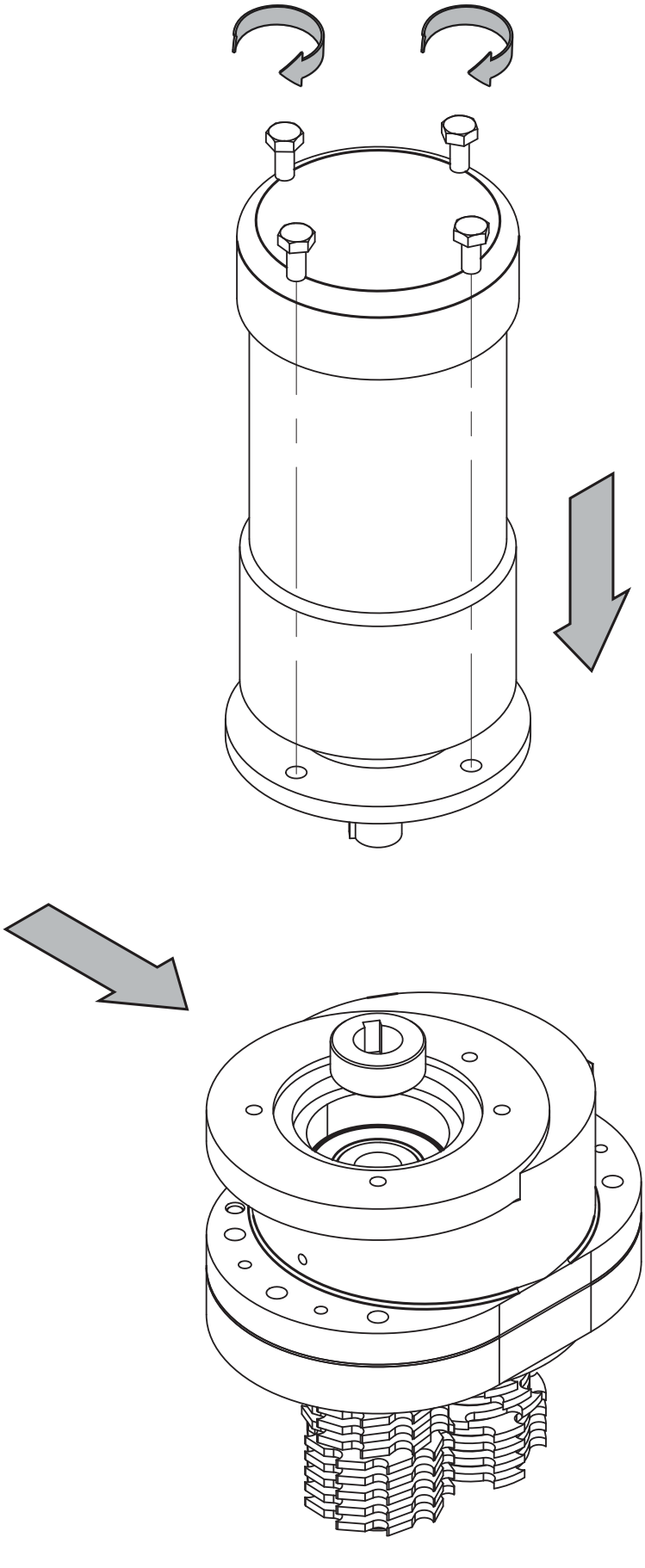

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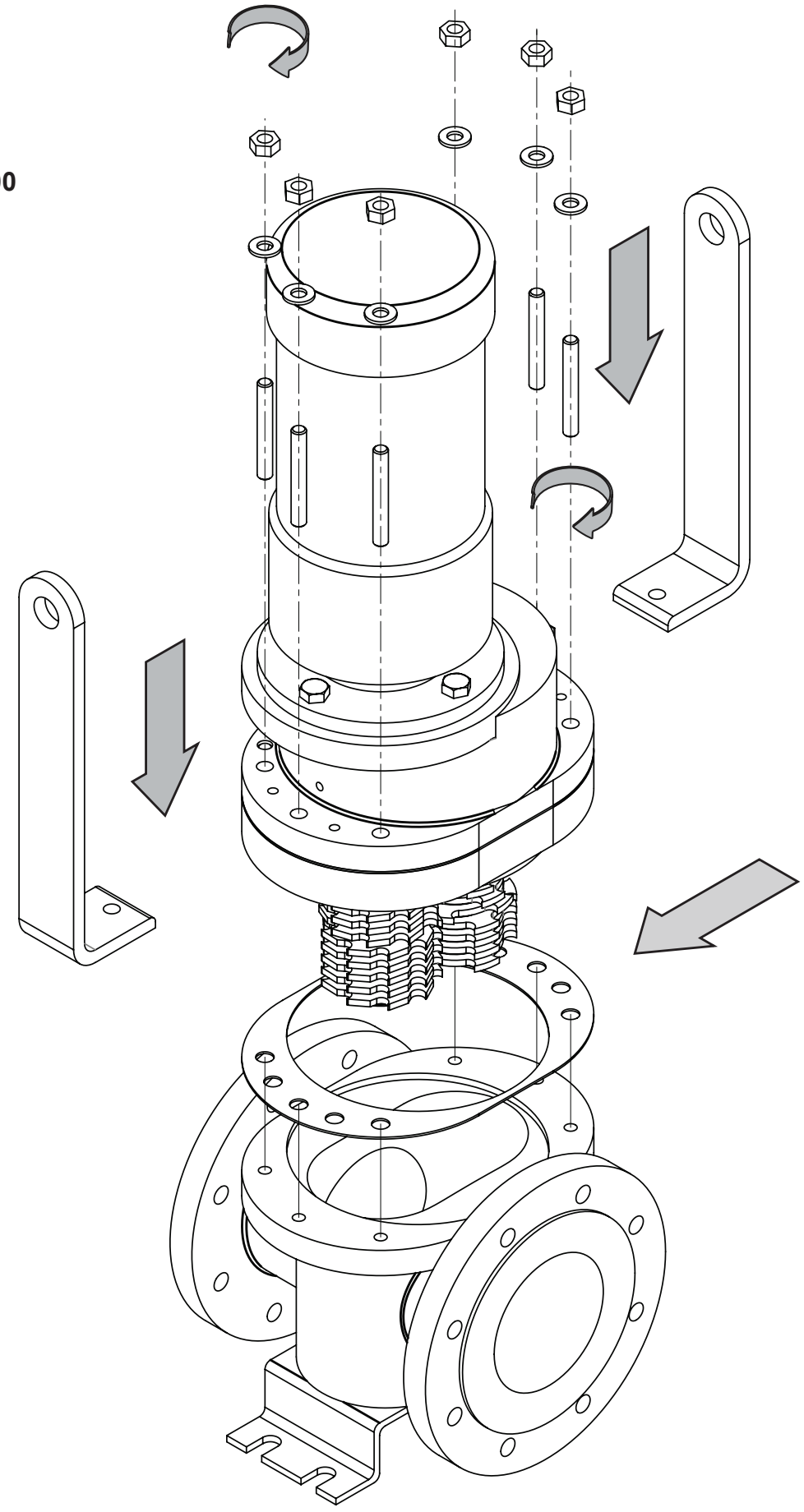
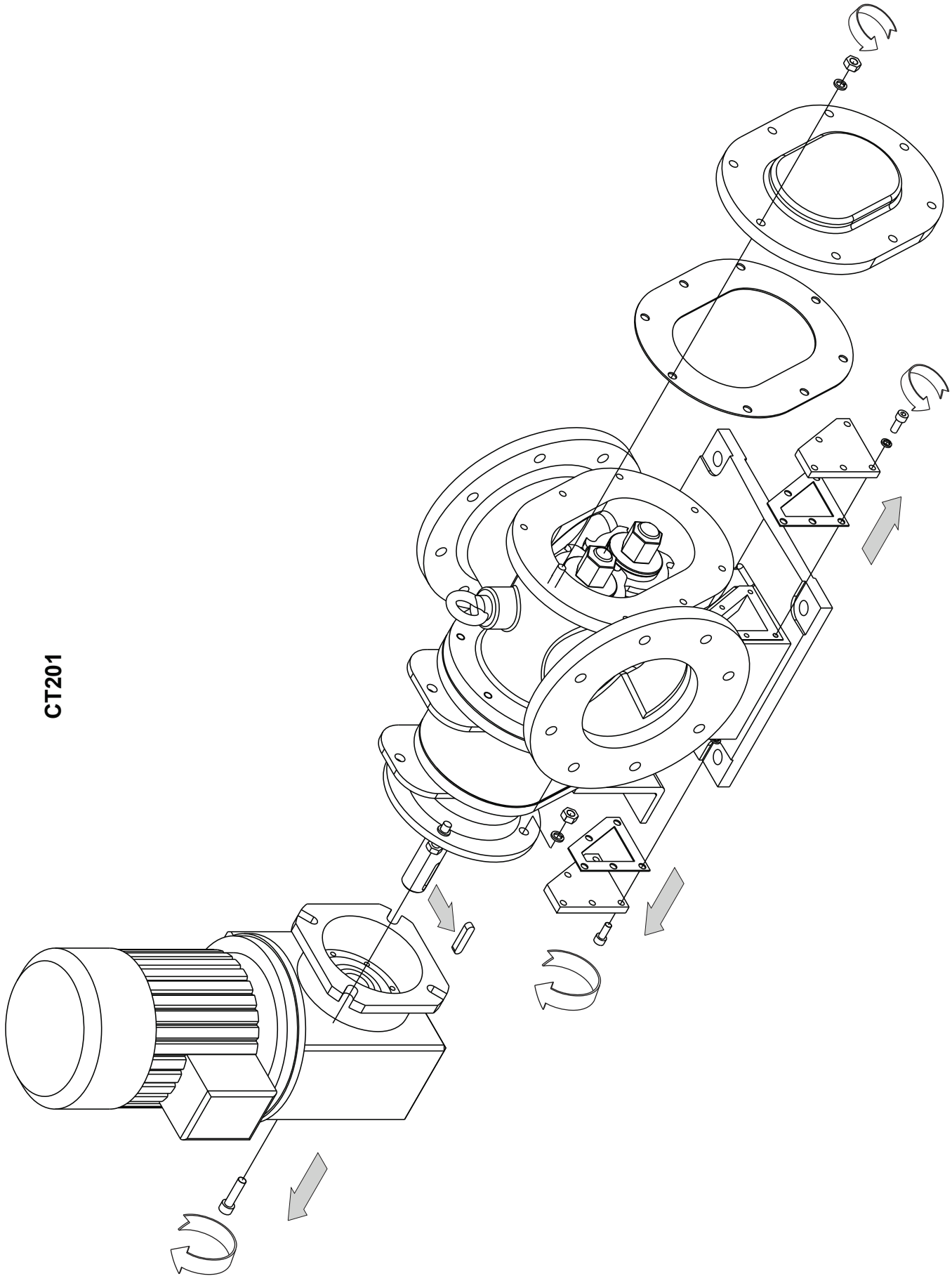
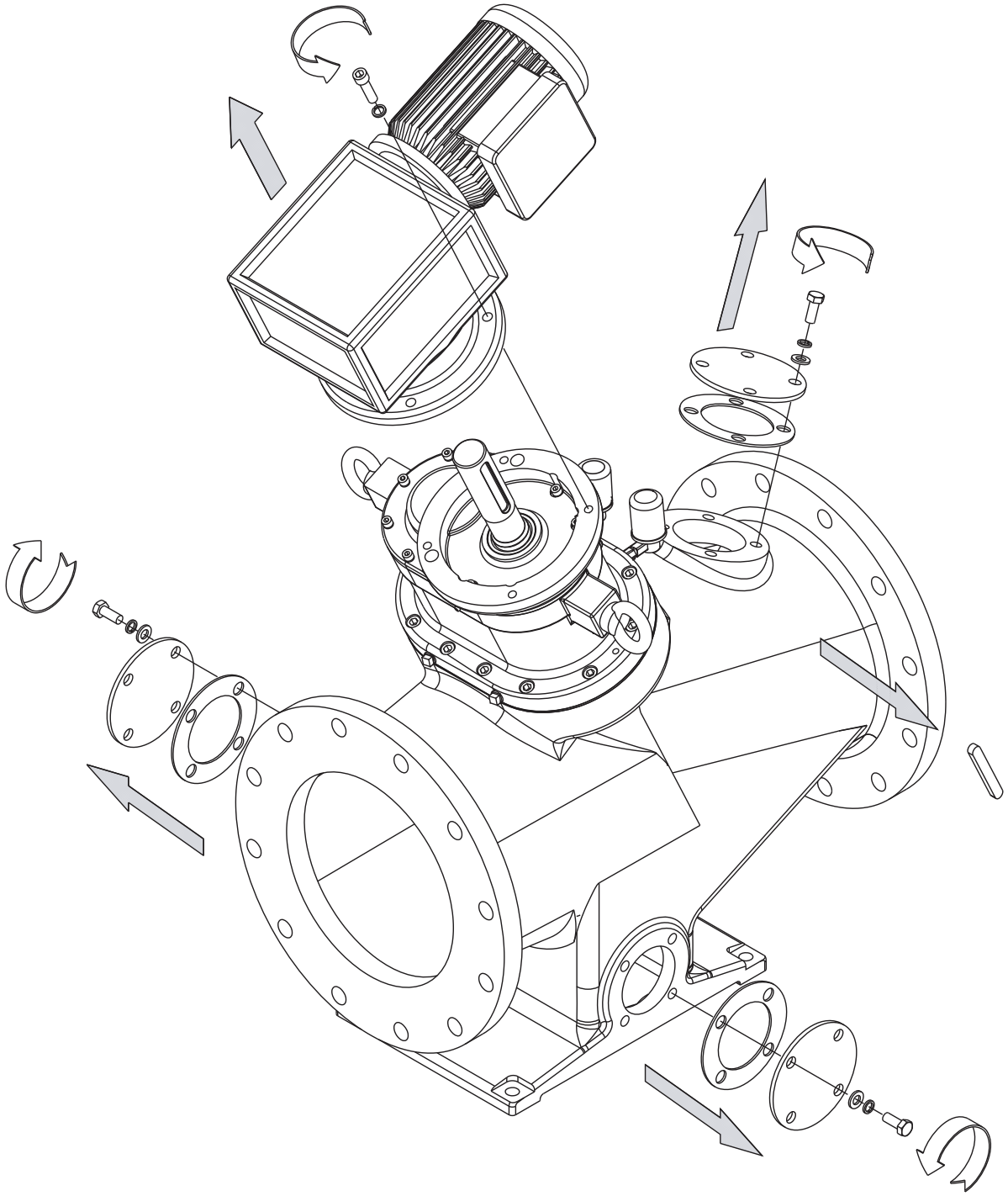


Dismantling Diagrams



CT201 & CT205



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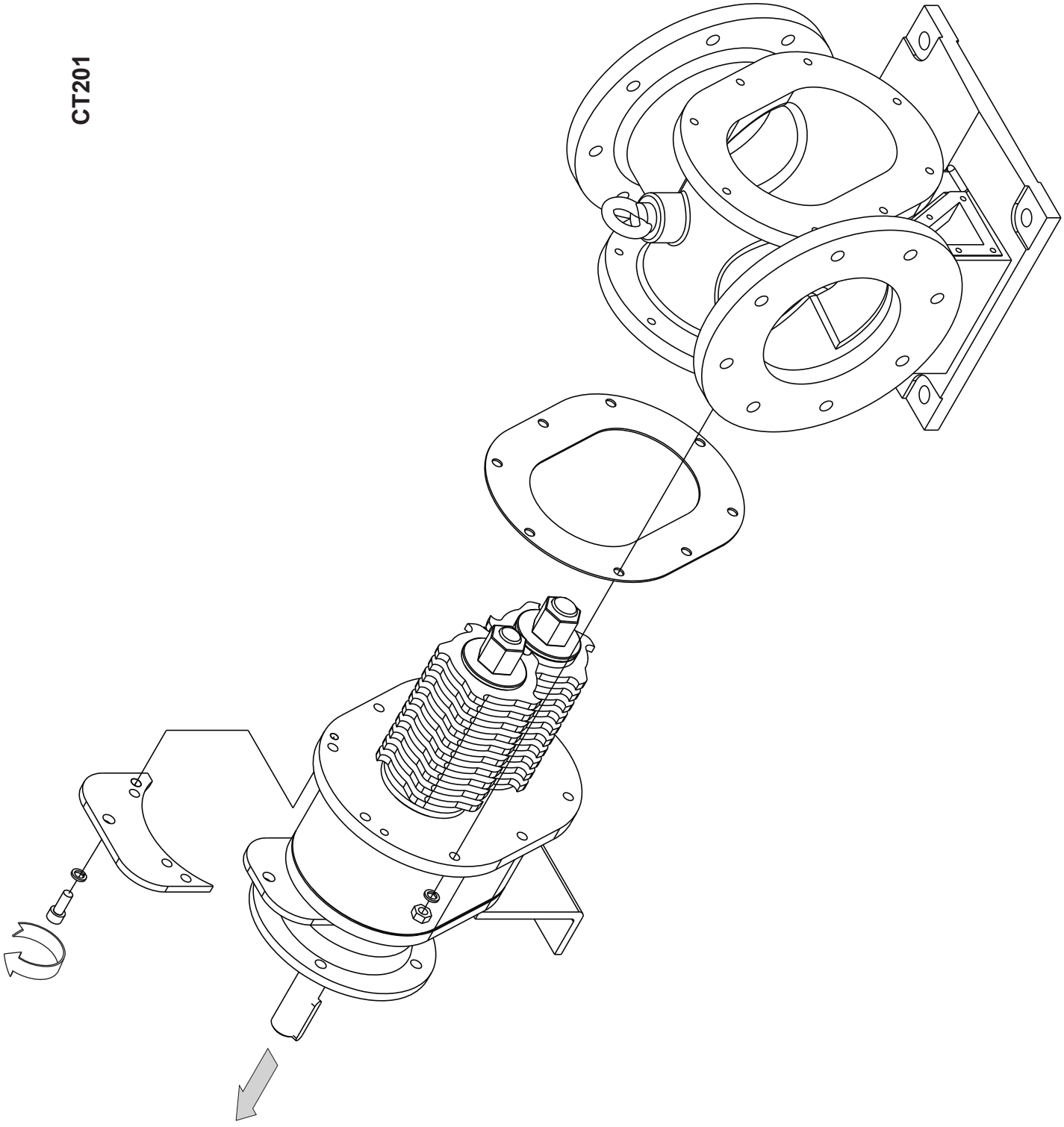
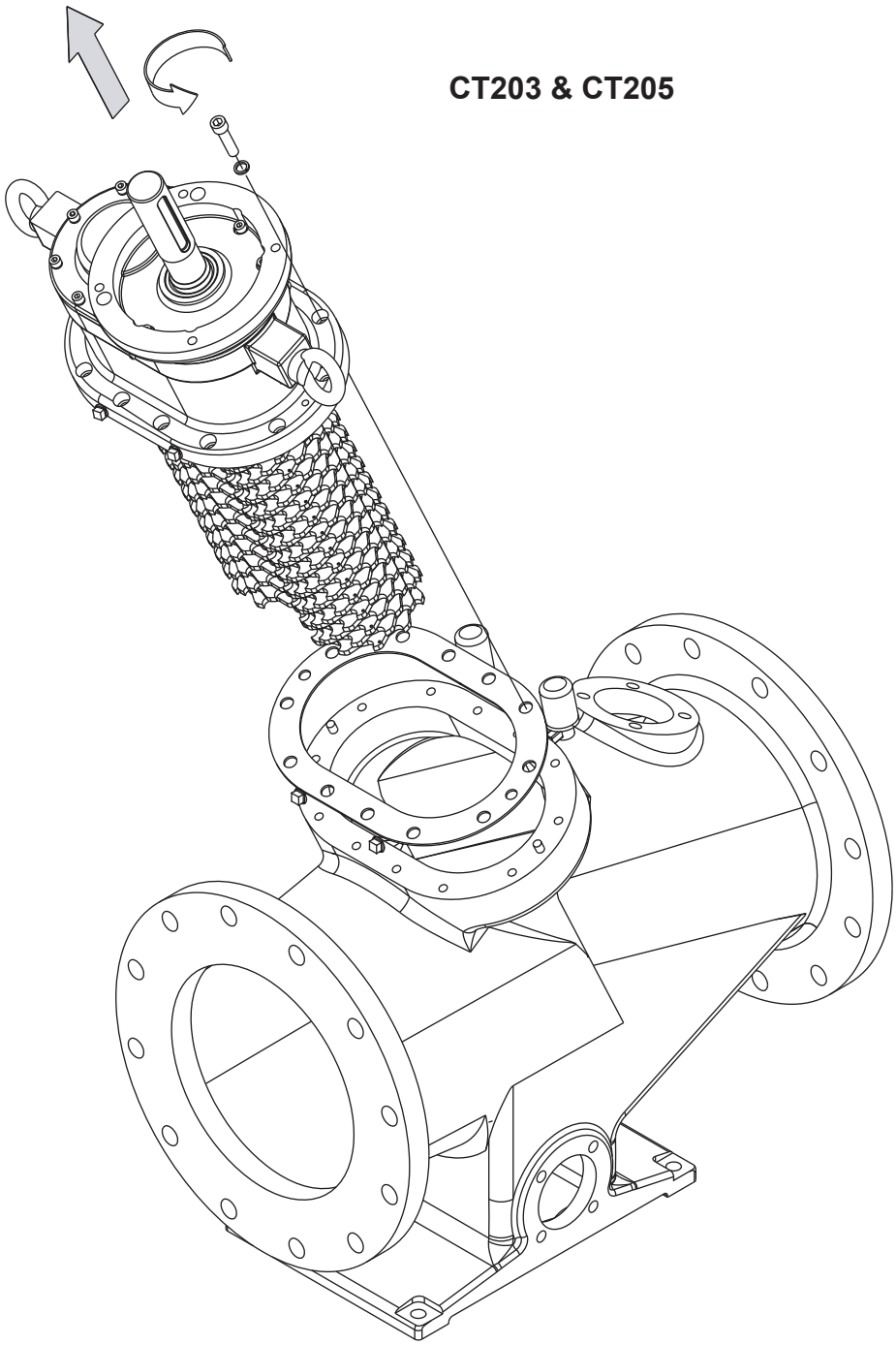
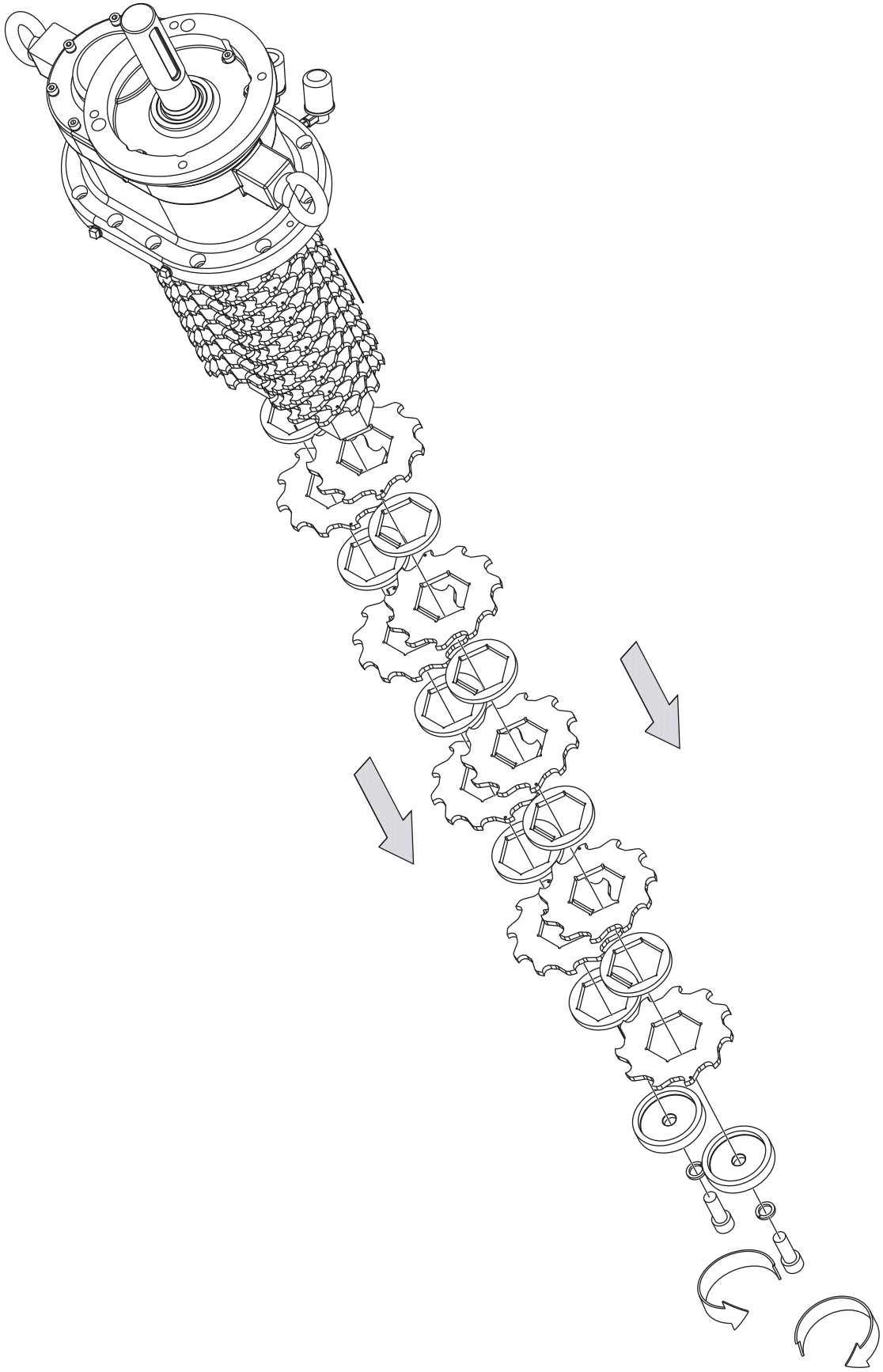


CT203 & CT205



CT201

CT203 & CT205



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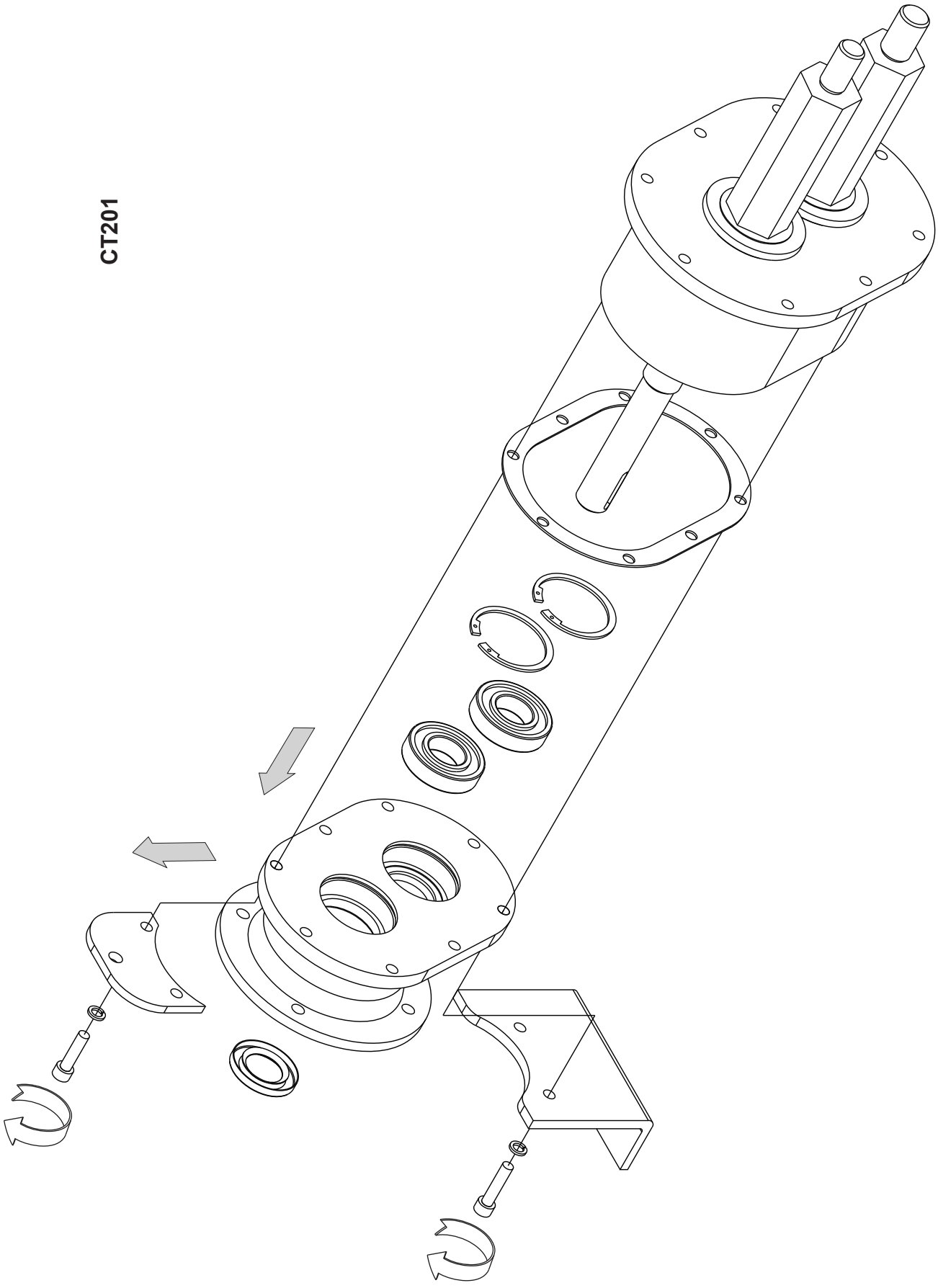
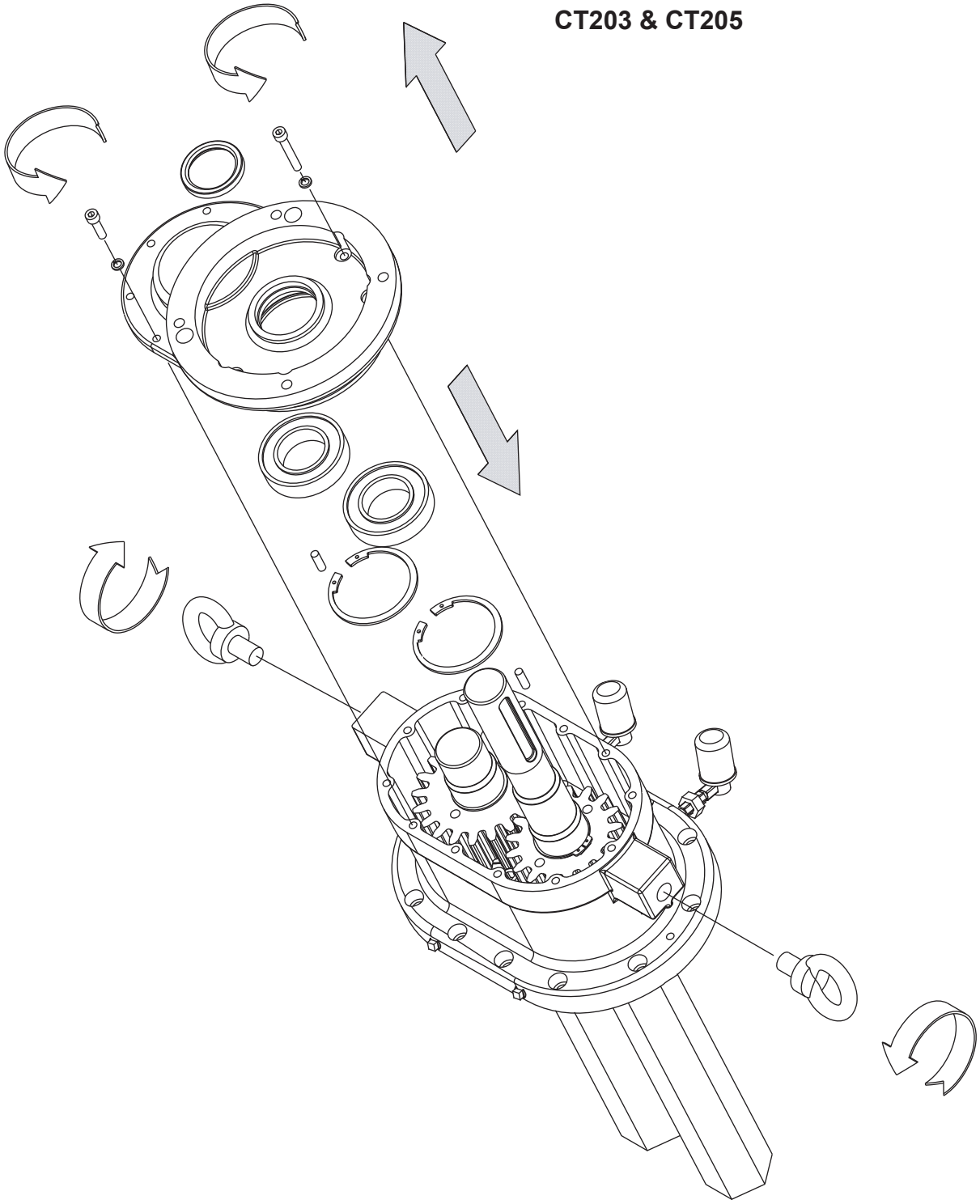


CT203 & CT205



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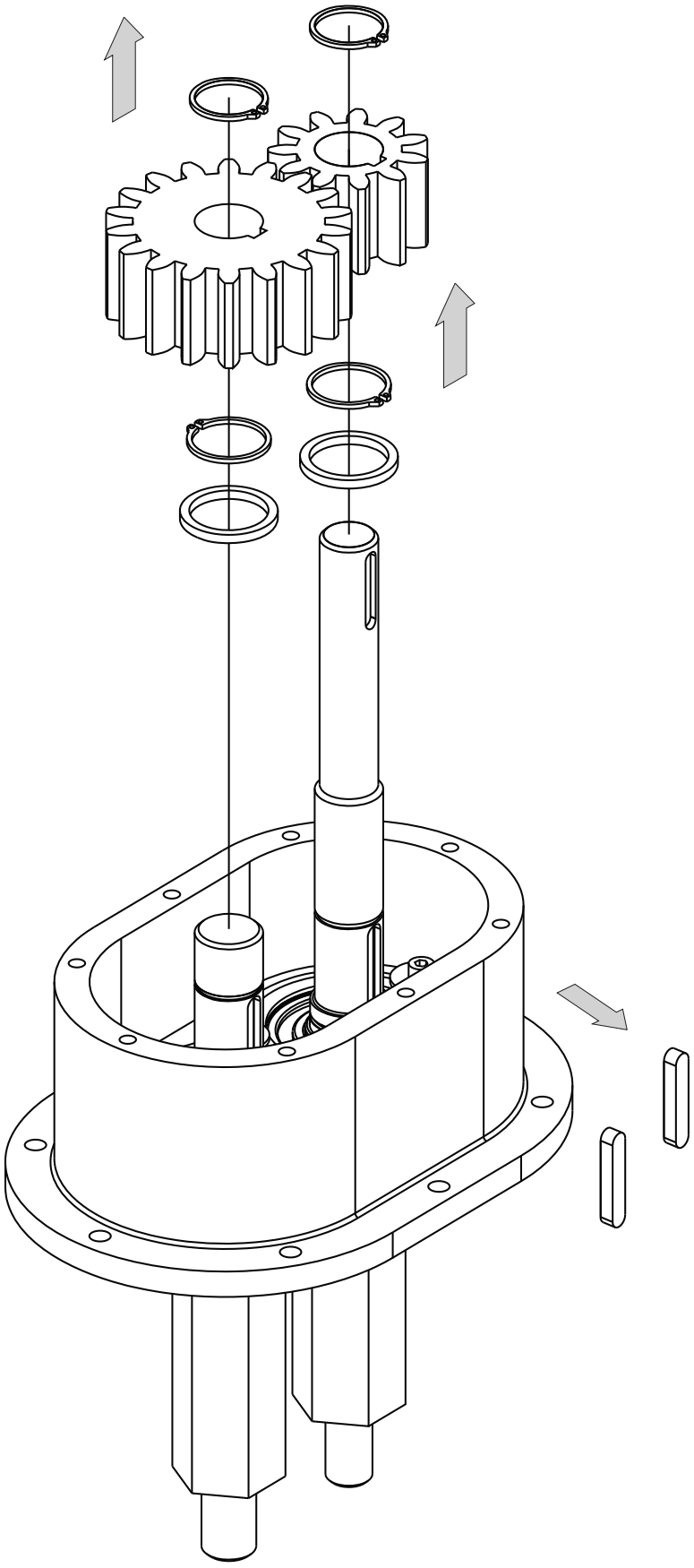
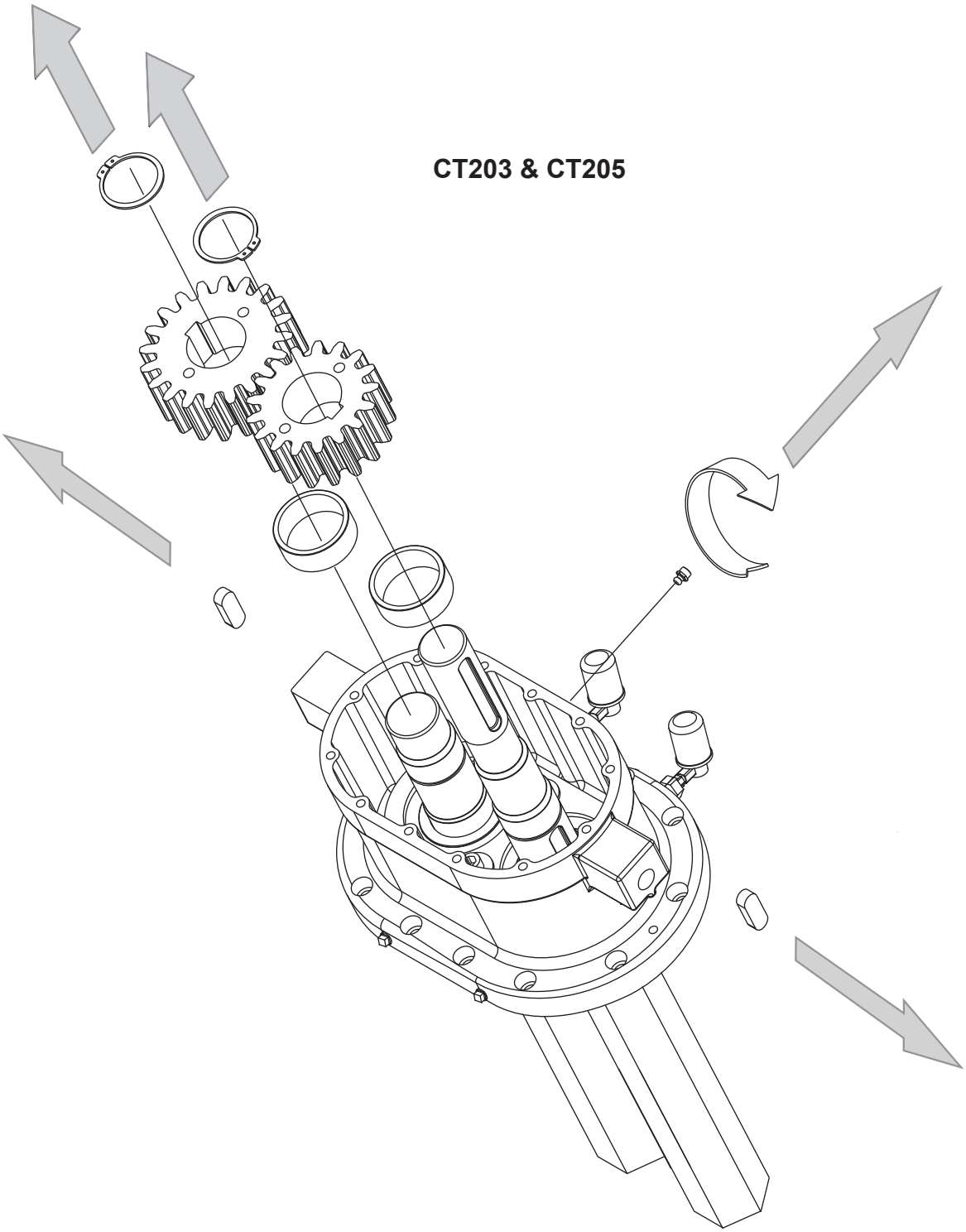
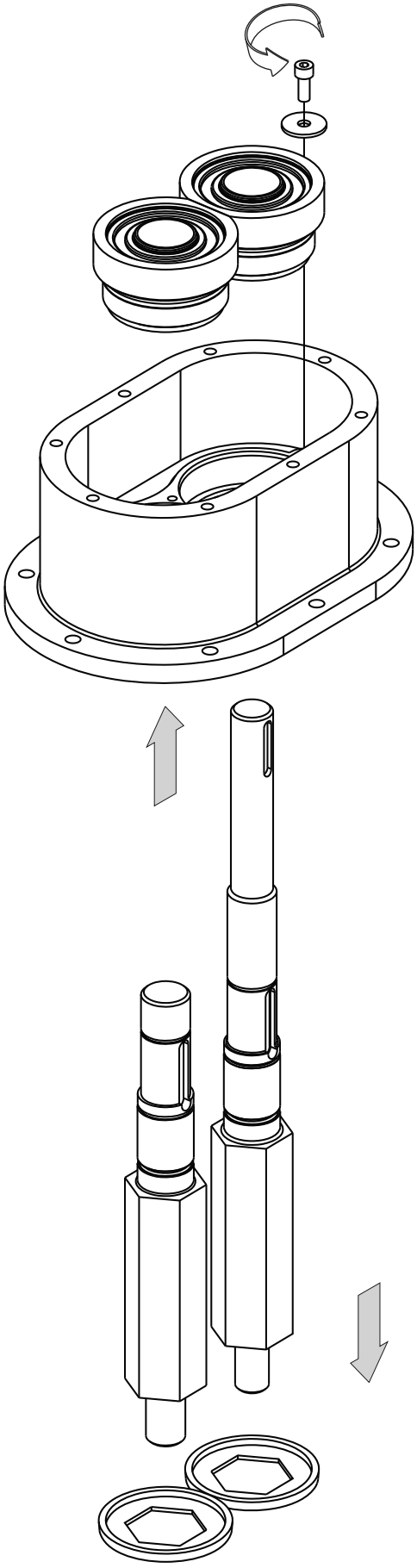


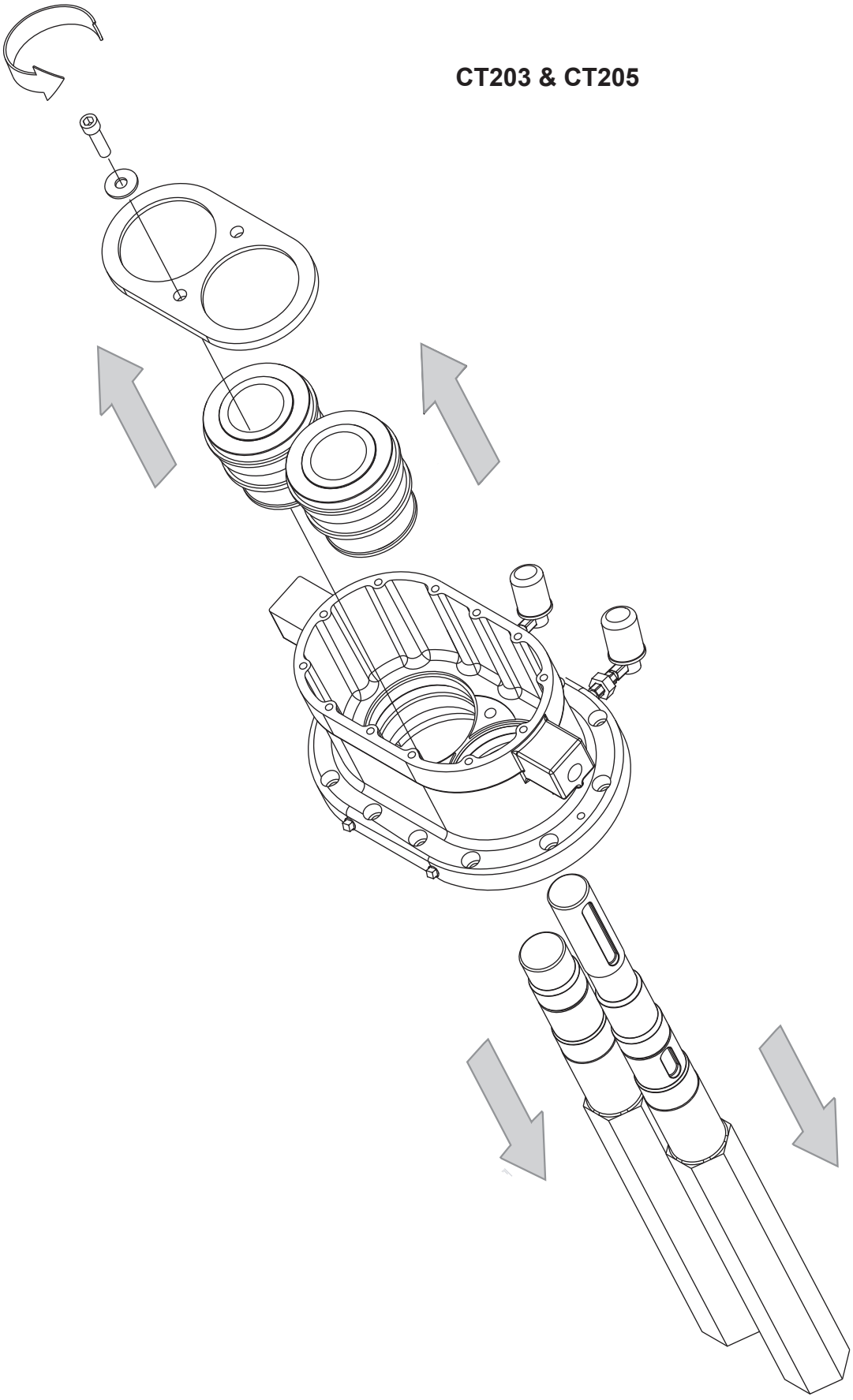
CT203 & CT205



CT201

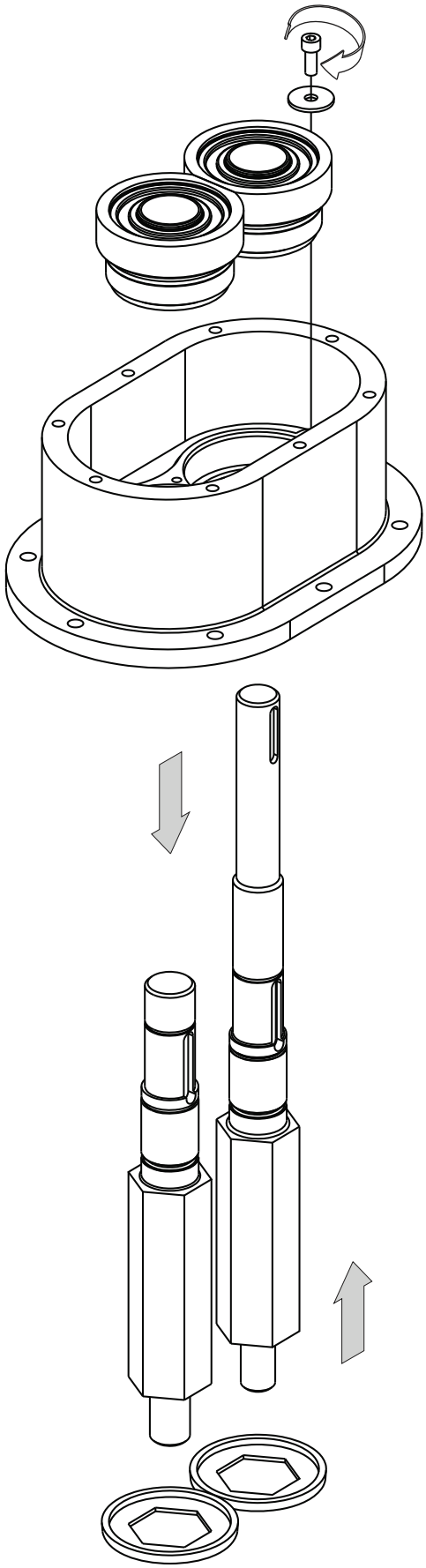


CT203 & CT205



Assembly Diagrams

CT201



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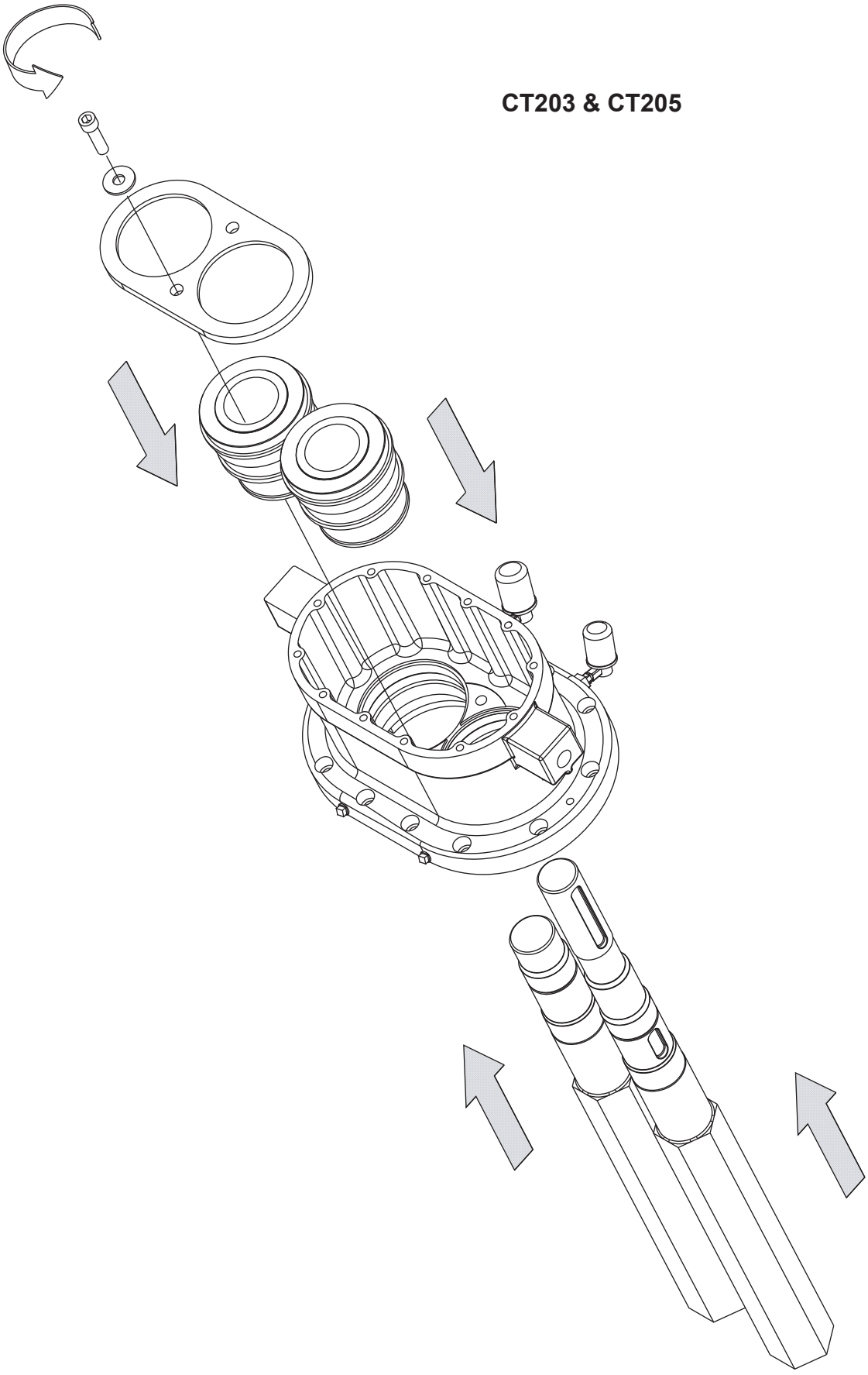

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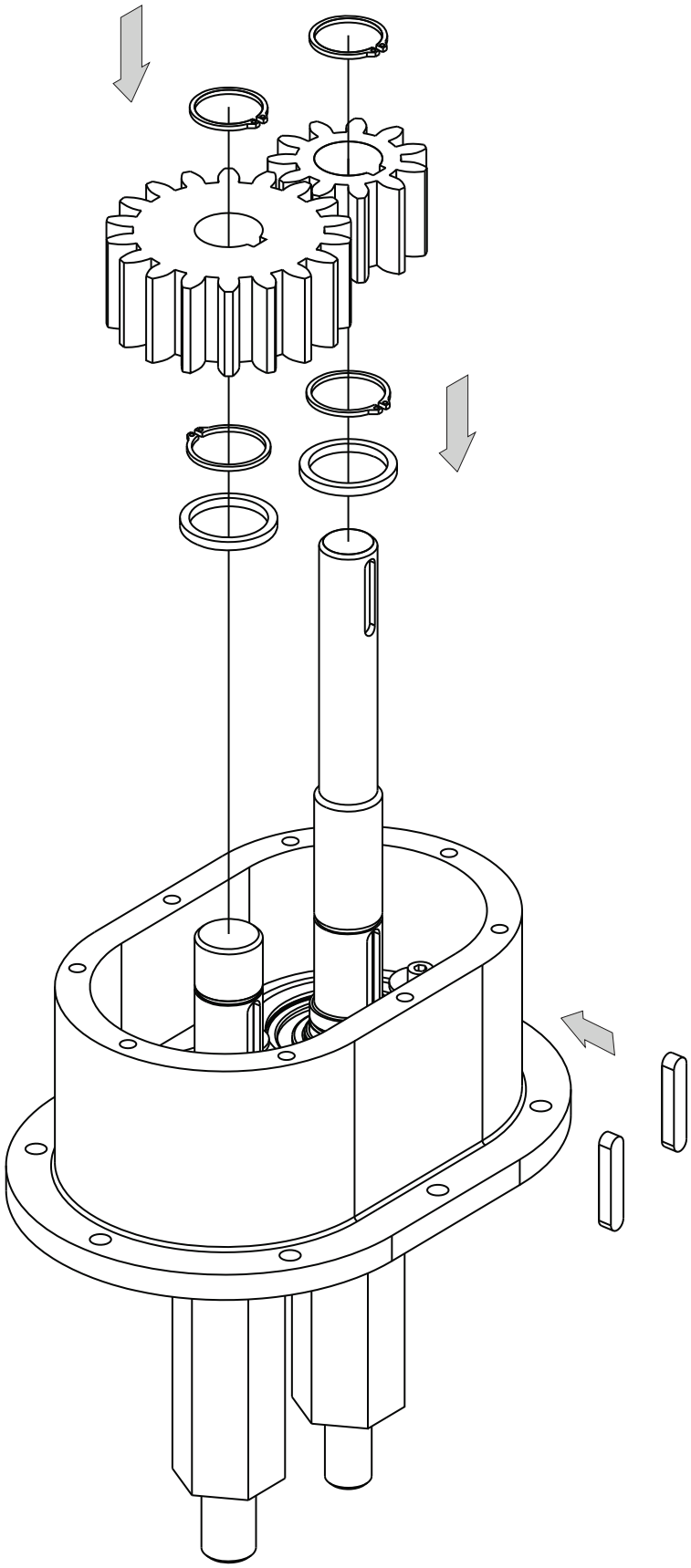

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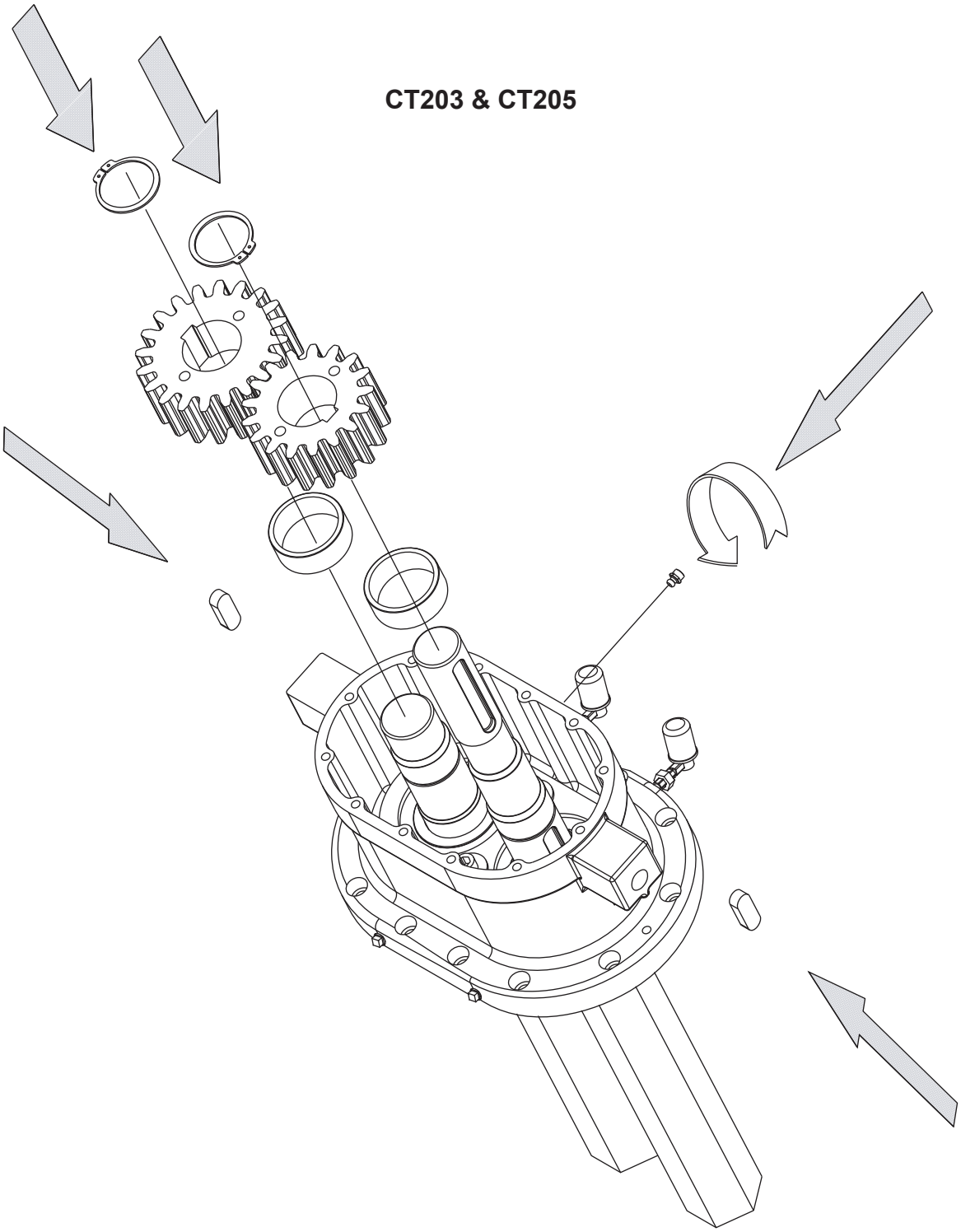

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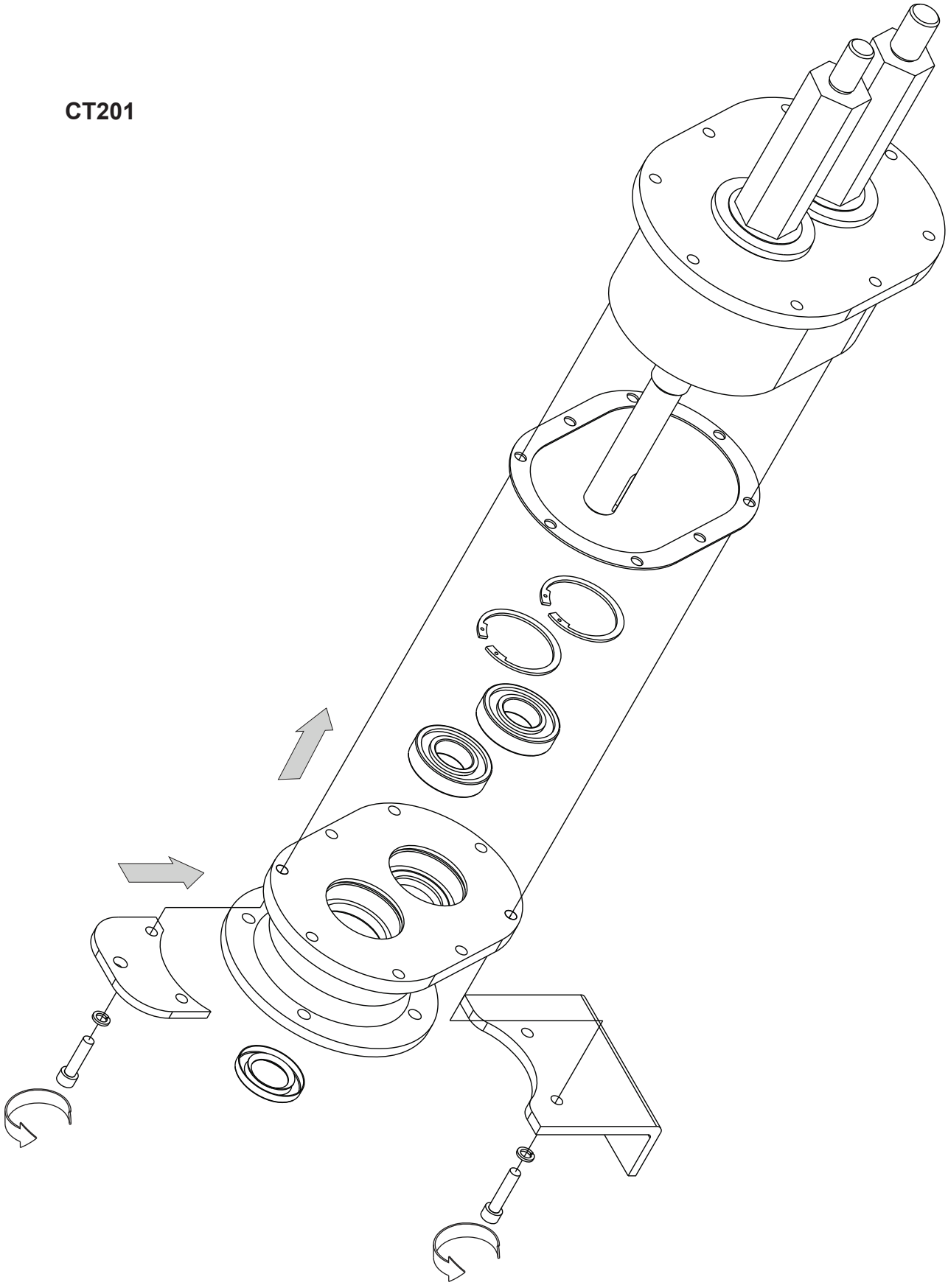

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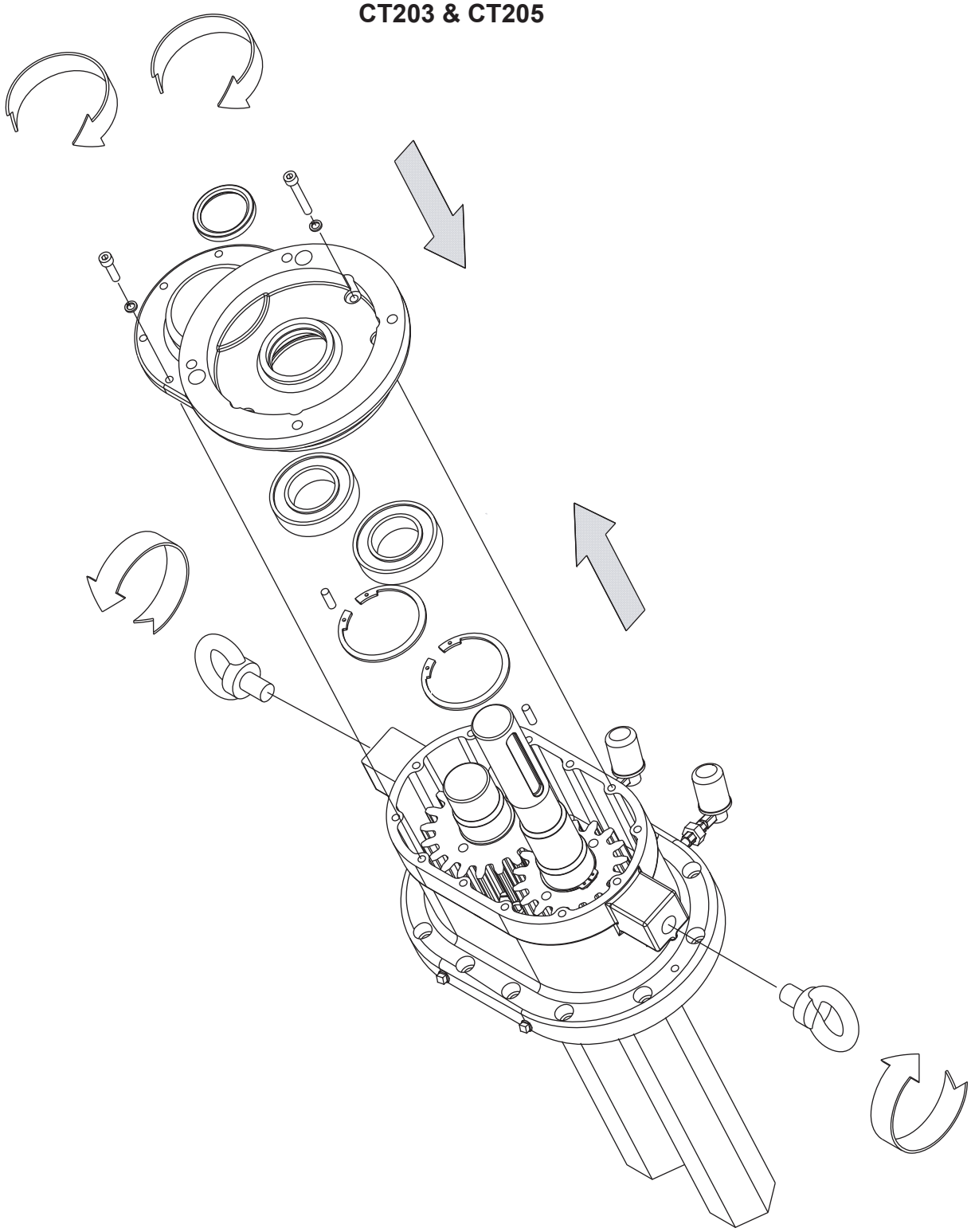

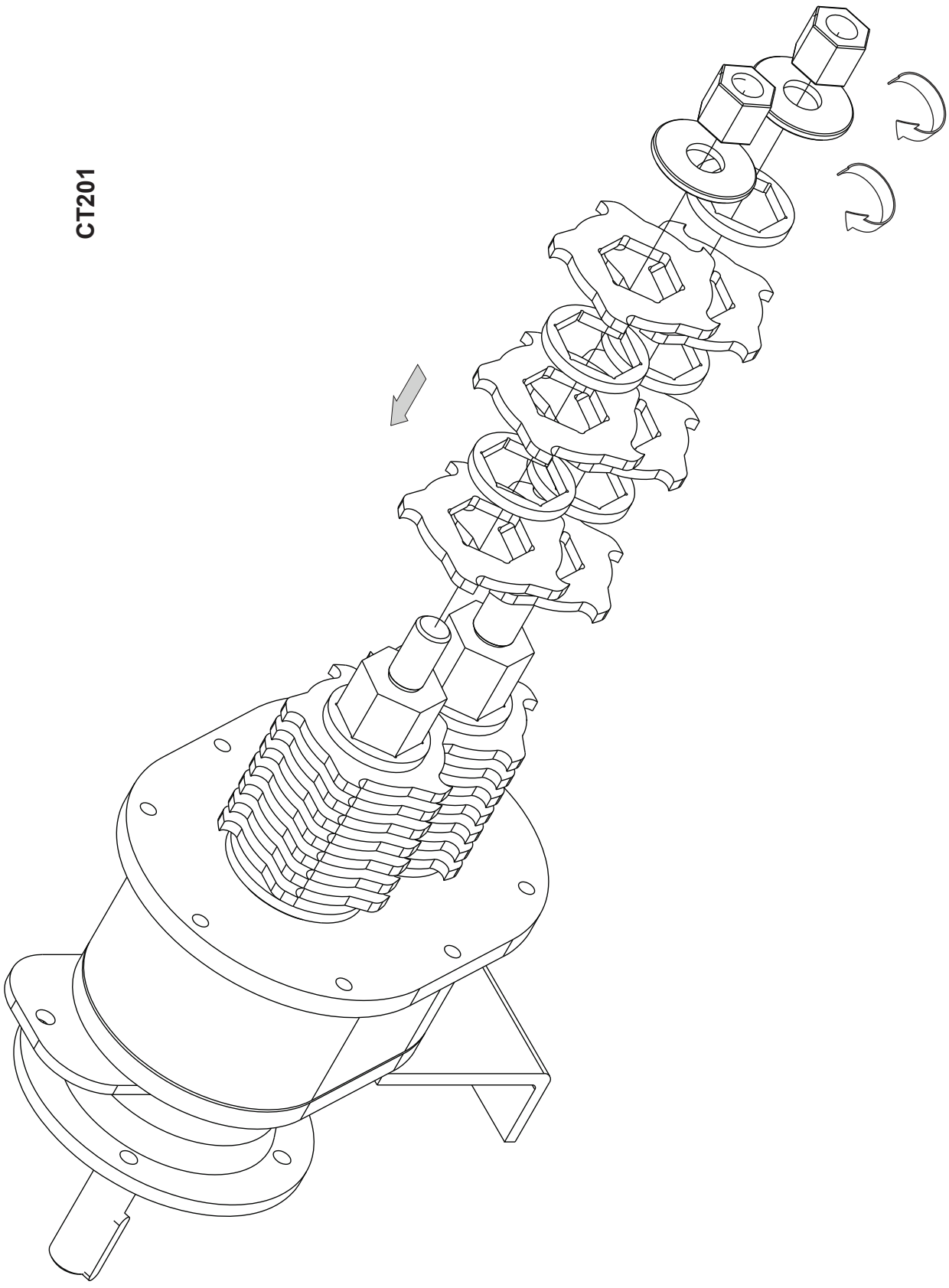
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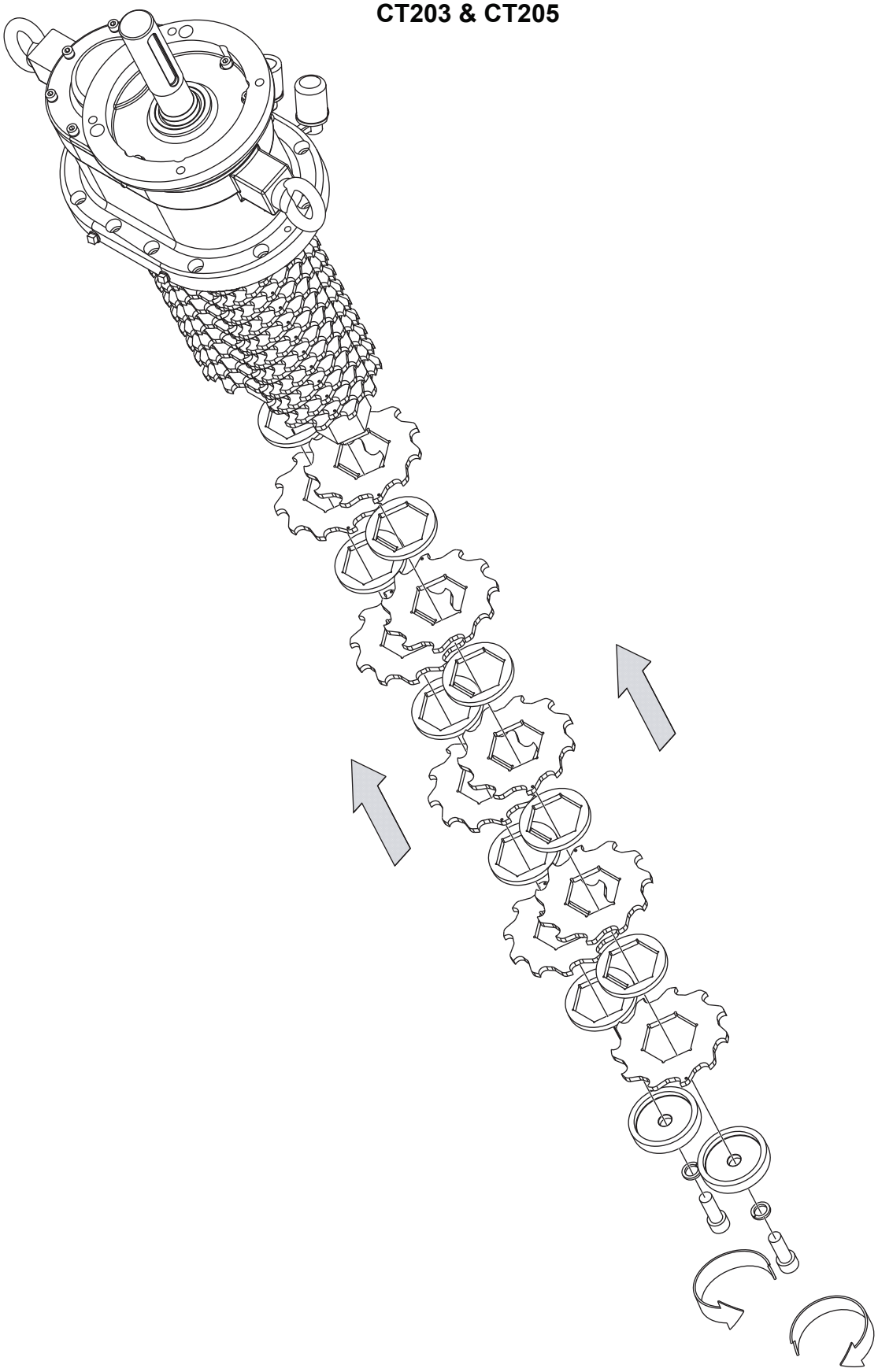
CT203 & CT205



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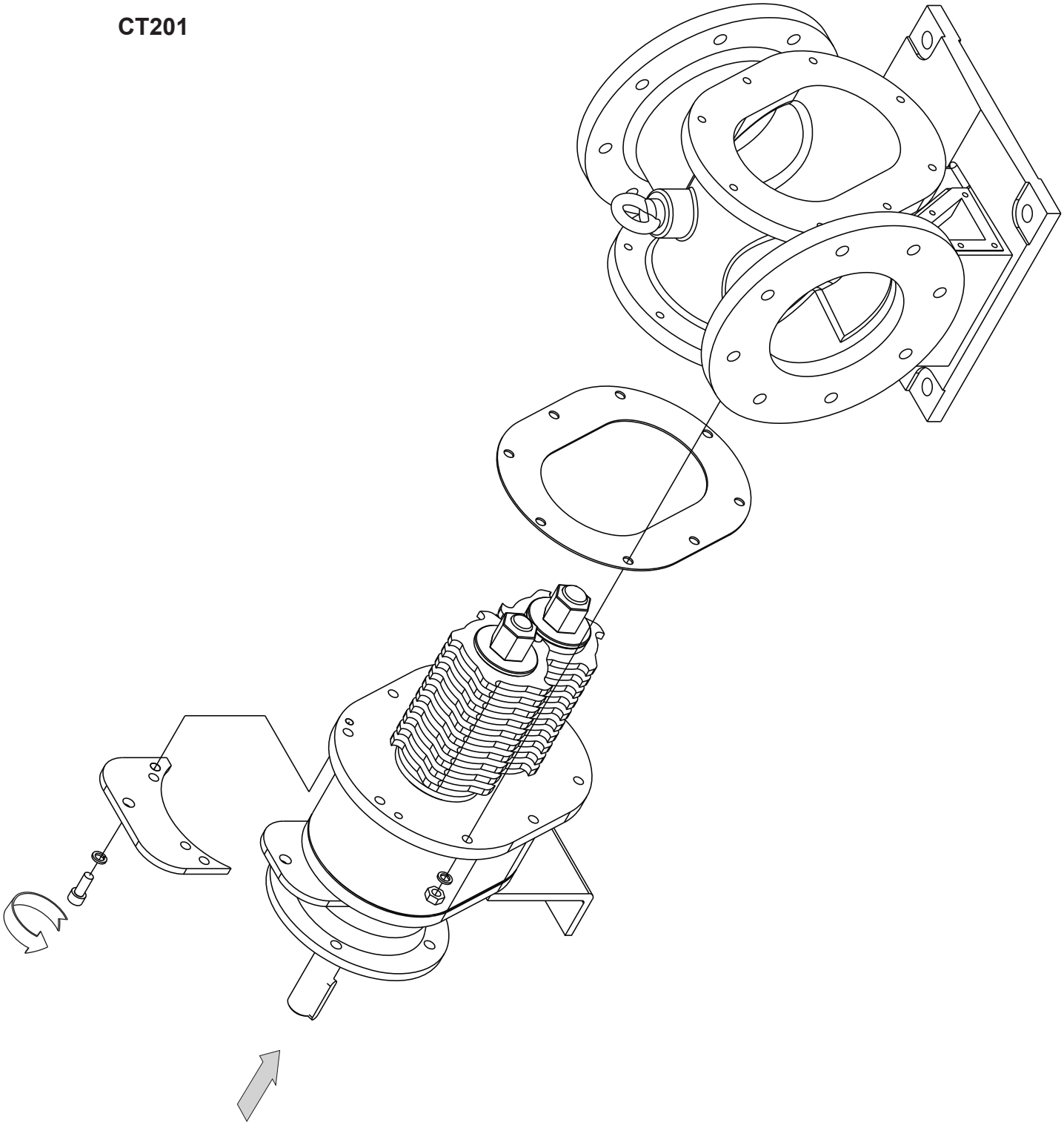

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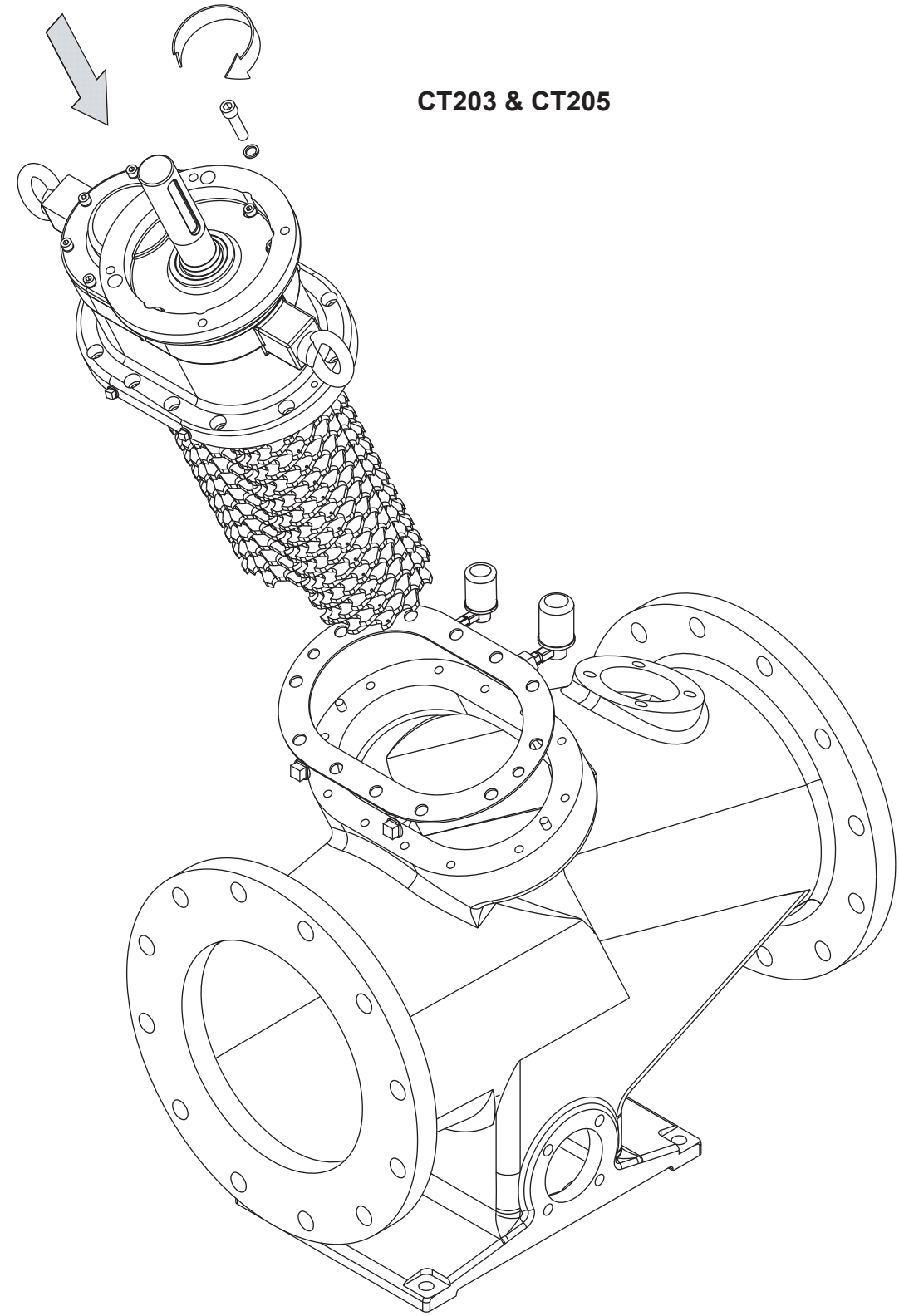

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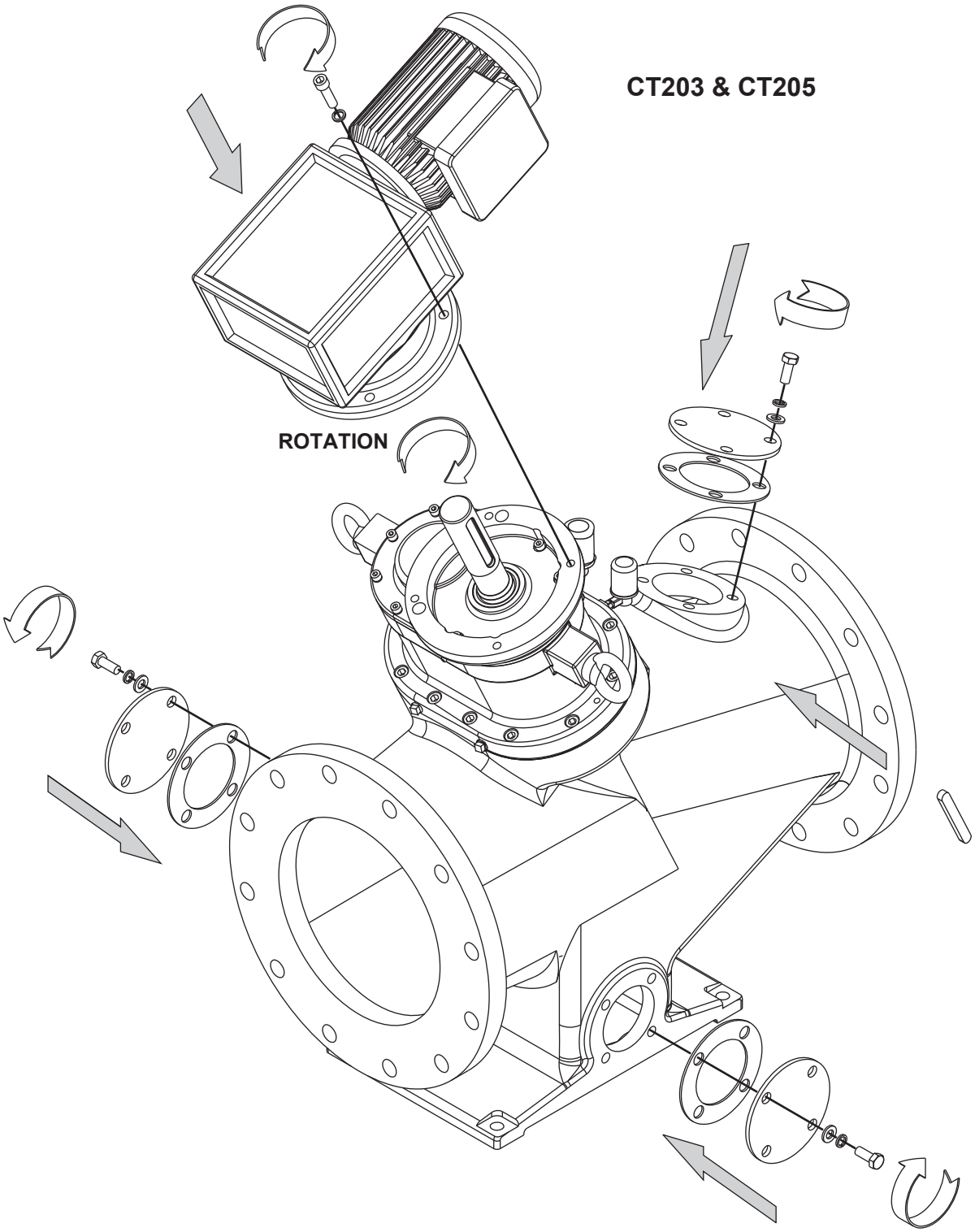
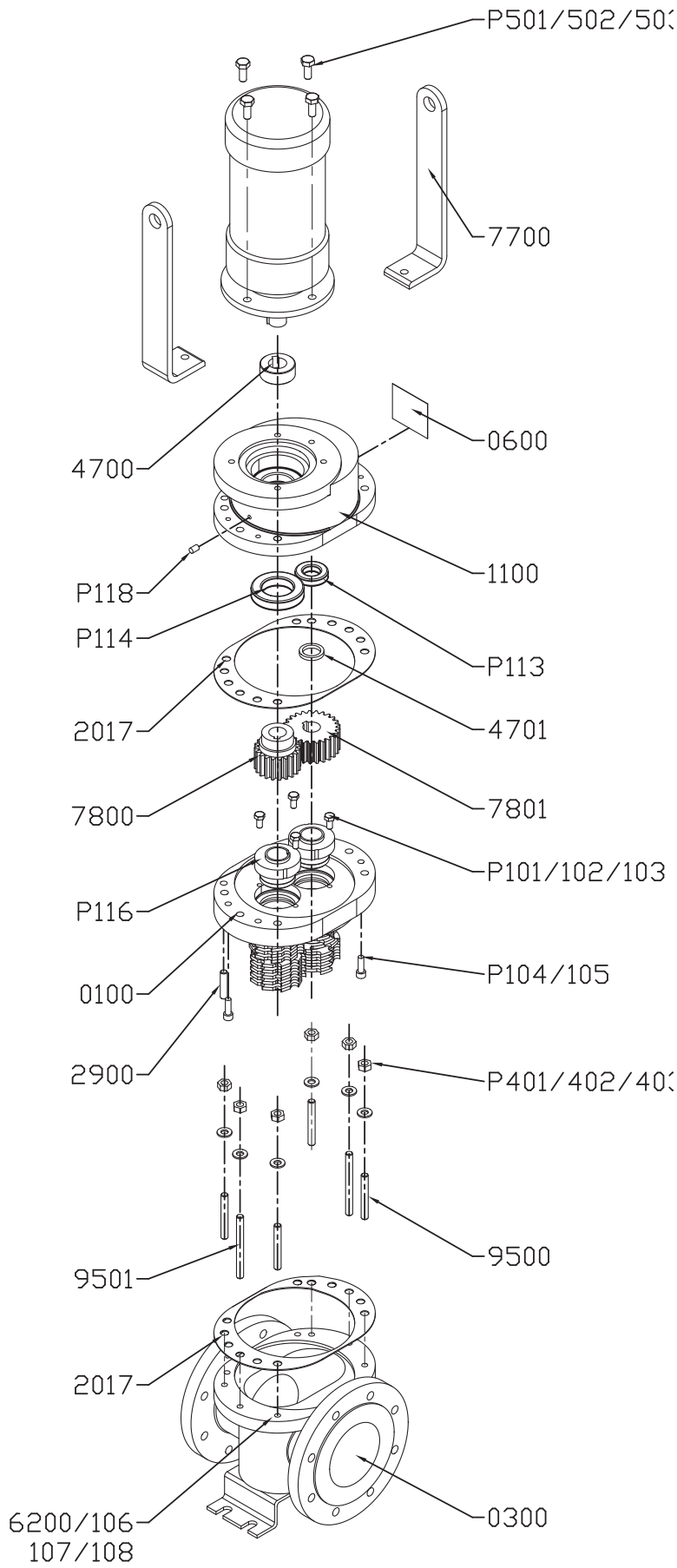

CT203 & CT205
ROTATION

Exploded Views

CT200



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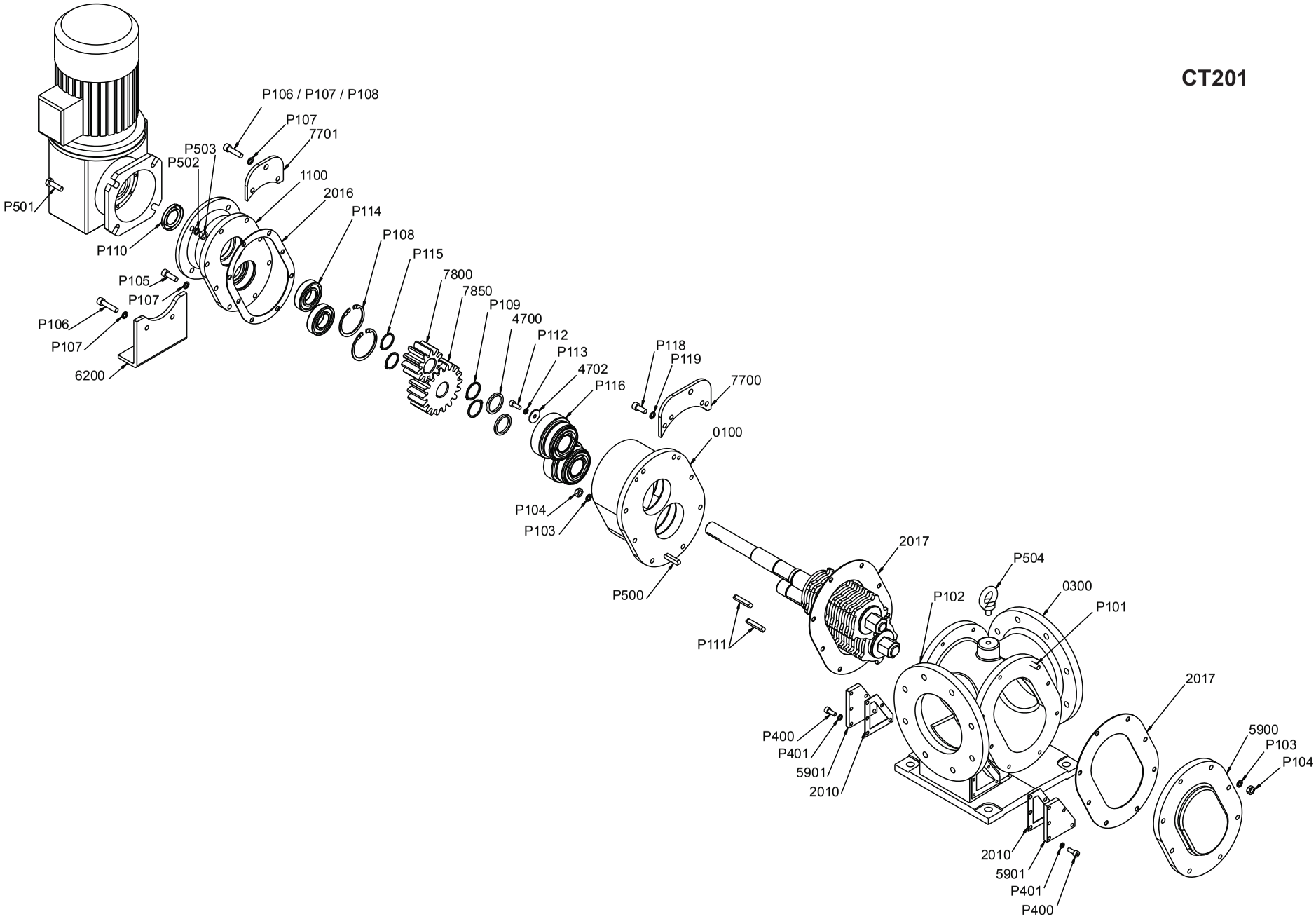
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P107
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P503
P502
1100
2016
P501
P114
P110
P108
P115
P105
7800
P107
7850
P106
P109
4700
P107
P112
P113
6200
4702
P118
P116
P119
7700
0100
P104
P103
P500
2017
P504
P111
P102
0300
P101
2017
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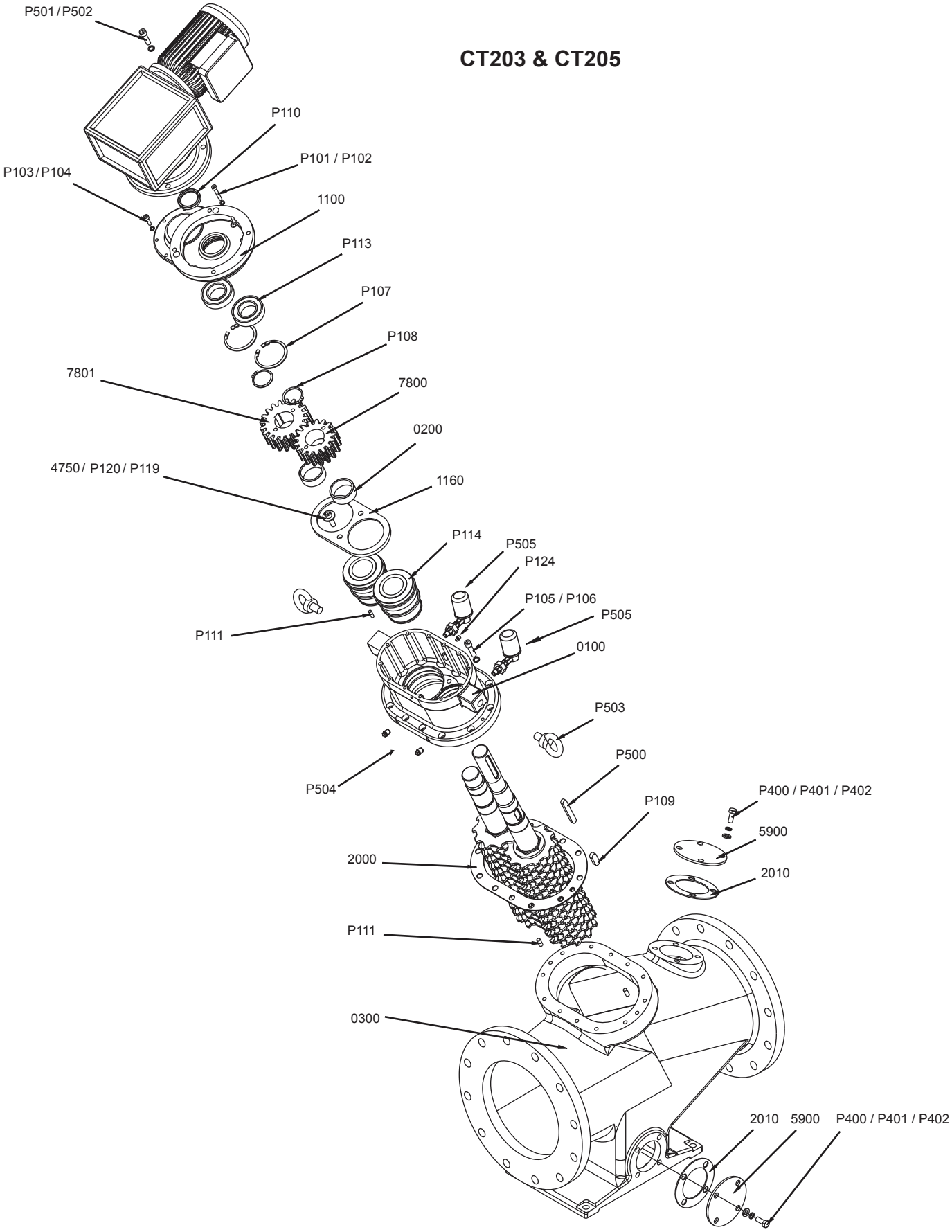
2010
5900
P103
P104
2010
5901
P401
P400

CT203 & CT205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P101 / P102
P103 / P104
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P108
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7800
0200
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1160
P114
P505
P124
P105 / P106
P505
P111
0100
P503
P500
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P111
0300
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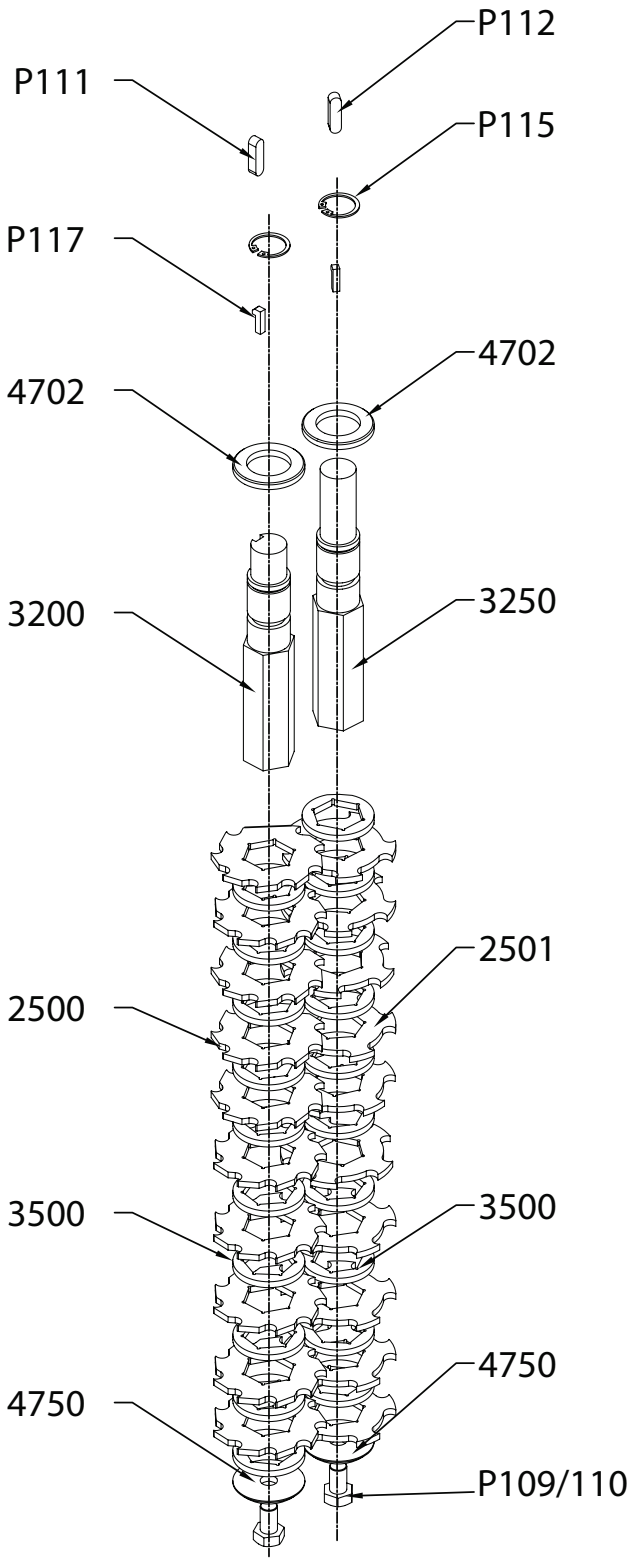
5900
P400 / P401 / P402

CT200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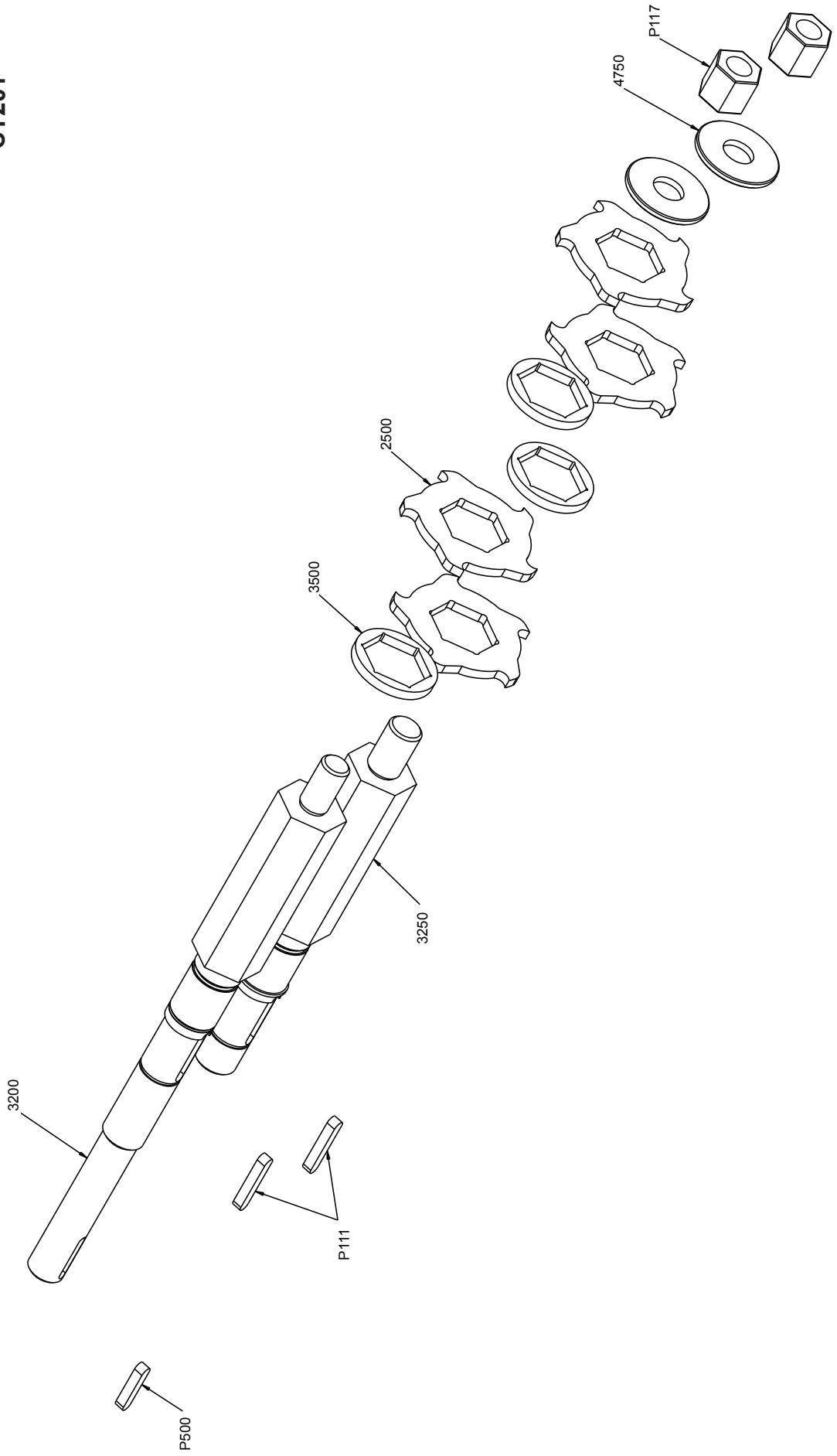
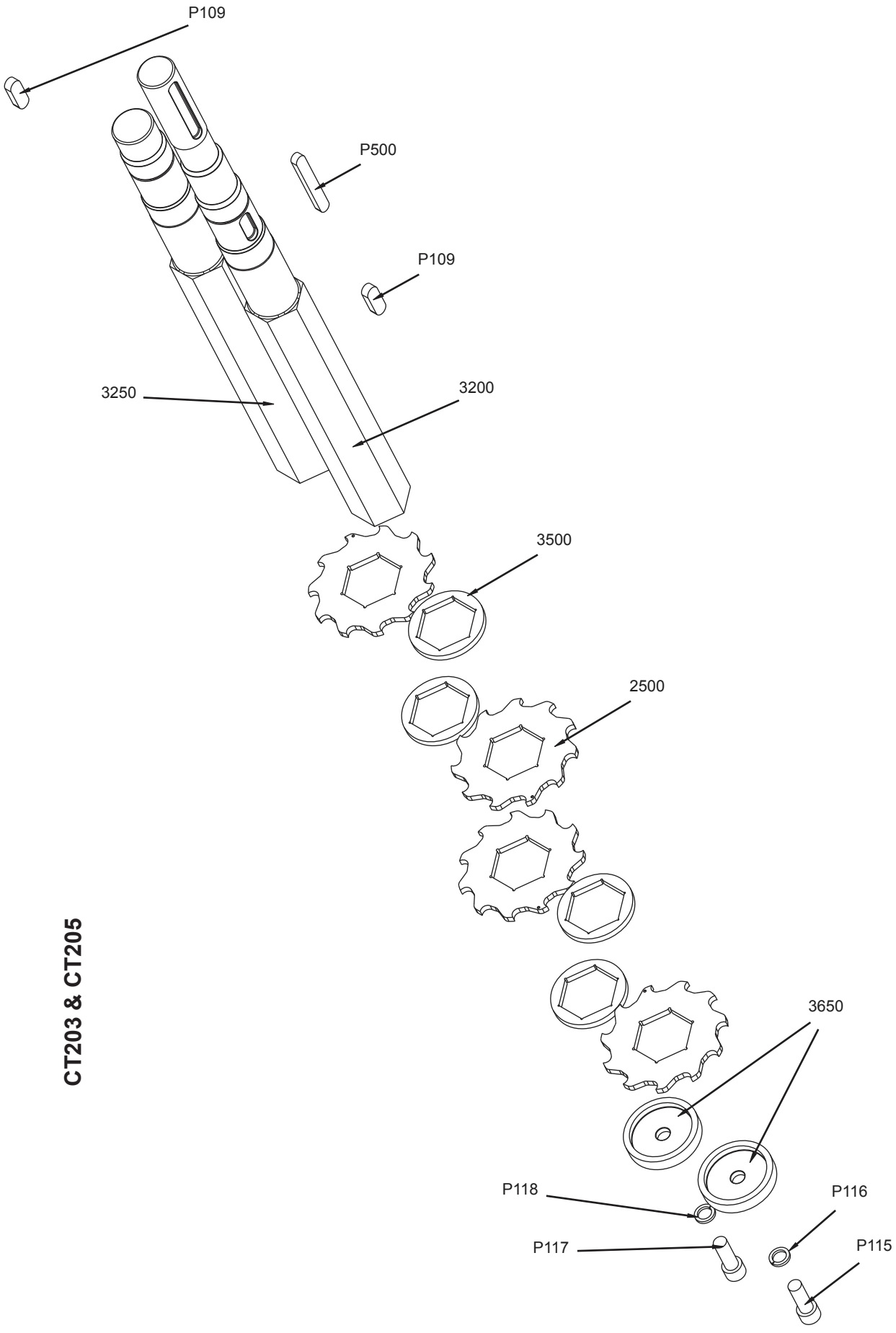
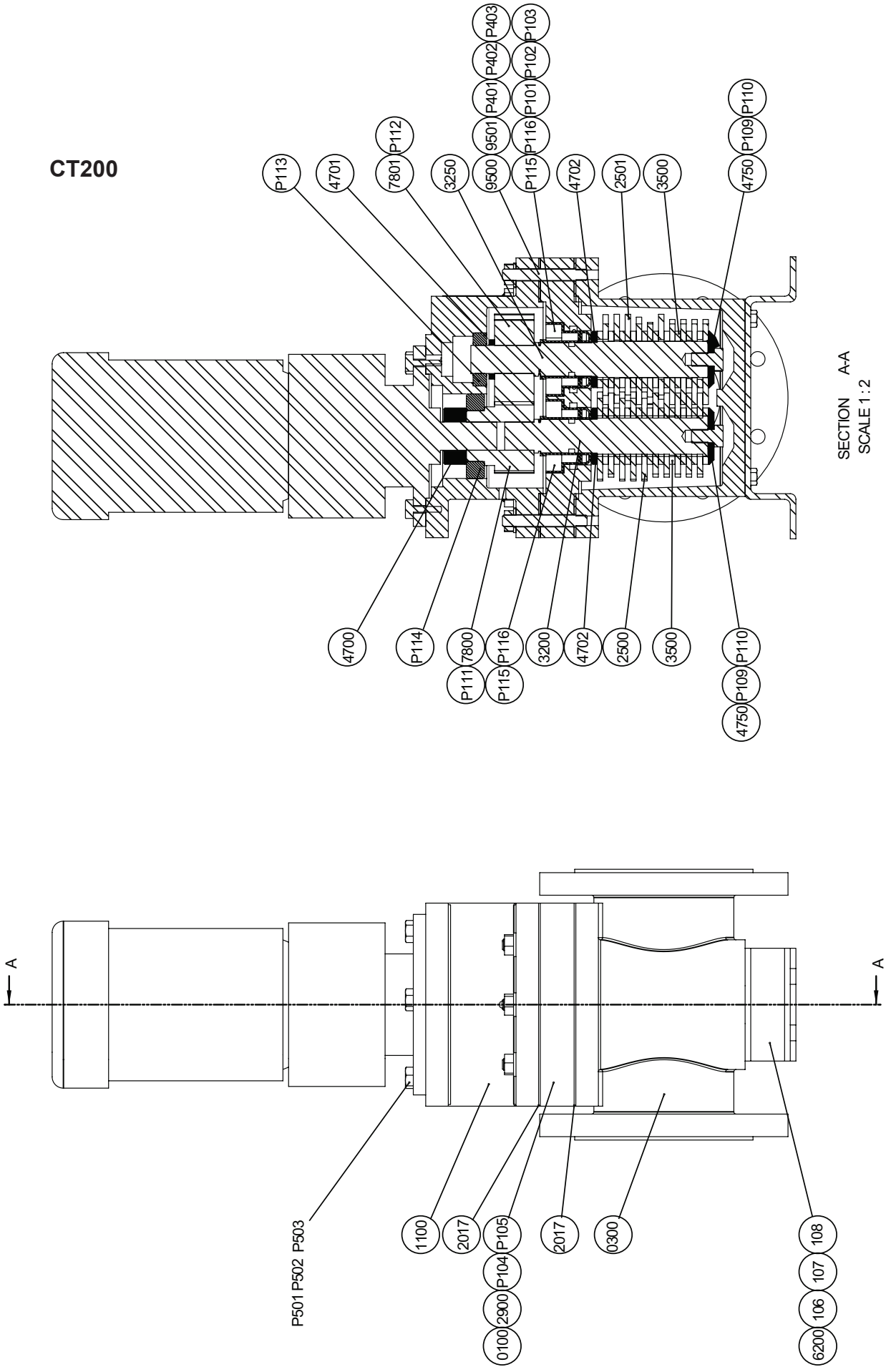
CT201





CT203 & CT205

Sectional Arrangements



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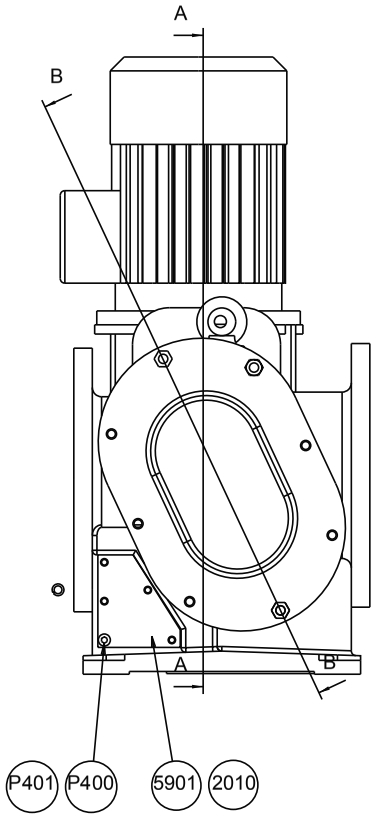
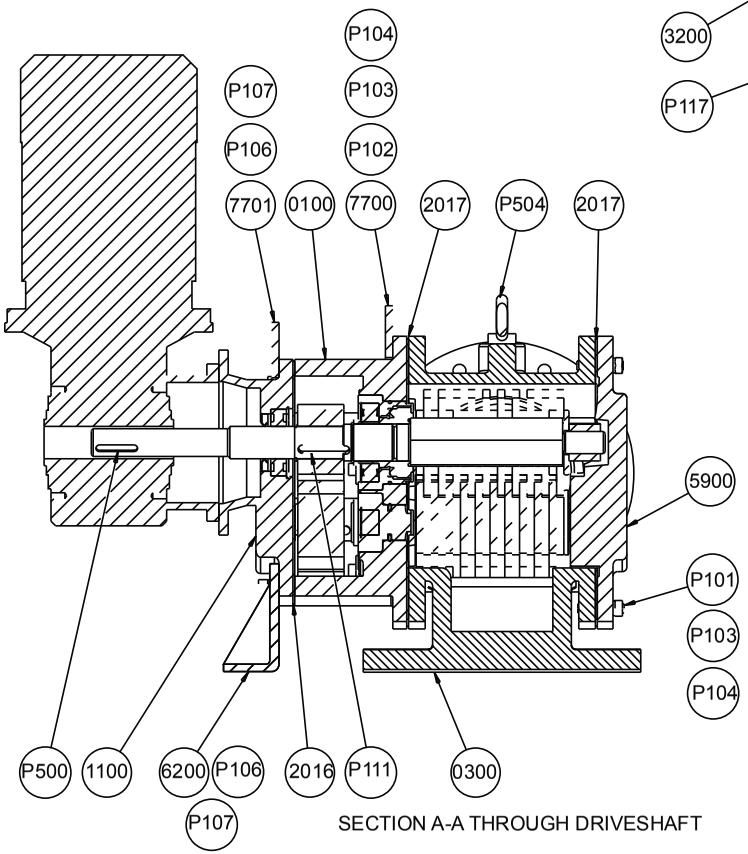
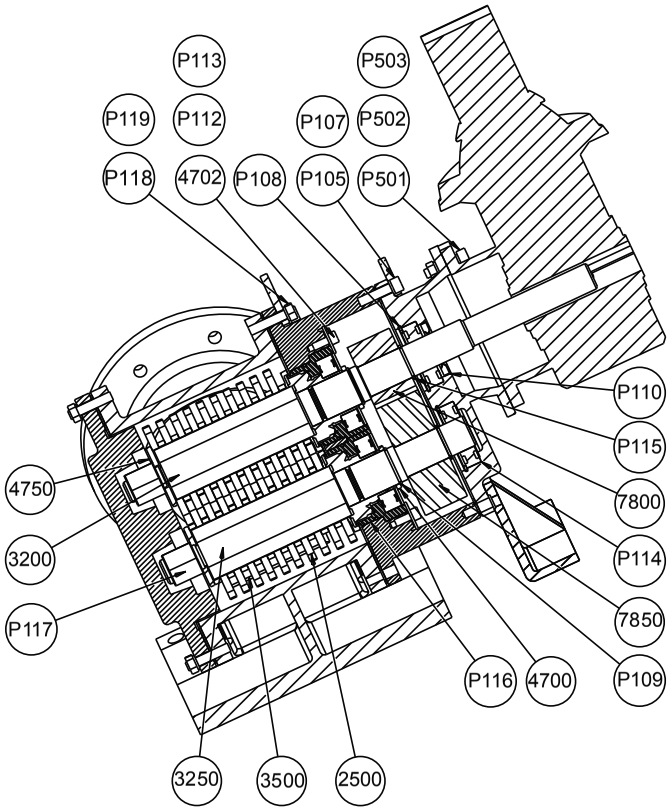


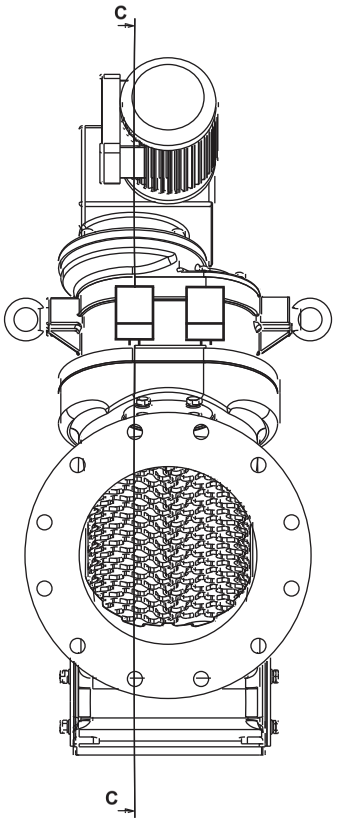


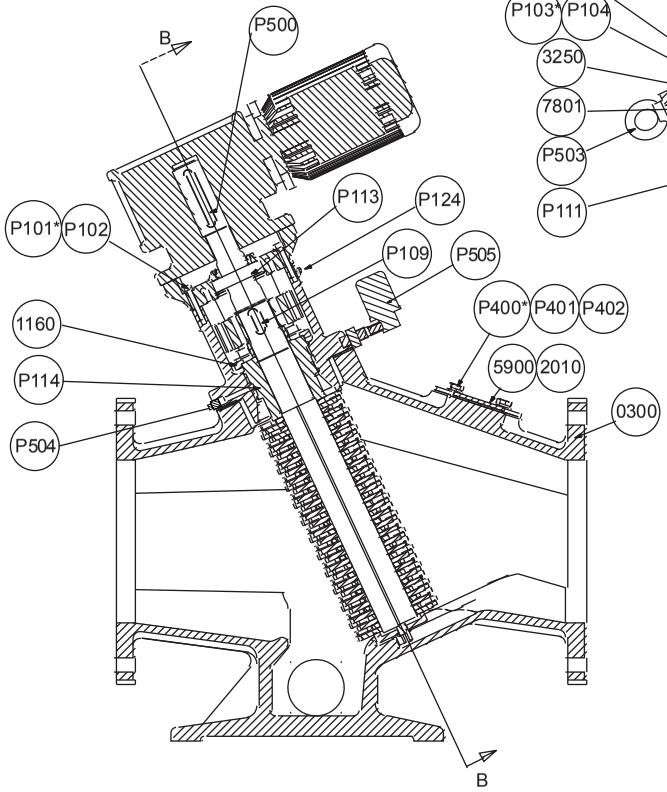
SECTION A-A THROUGH DRIVESHAFT



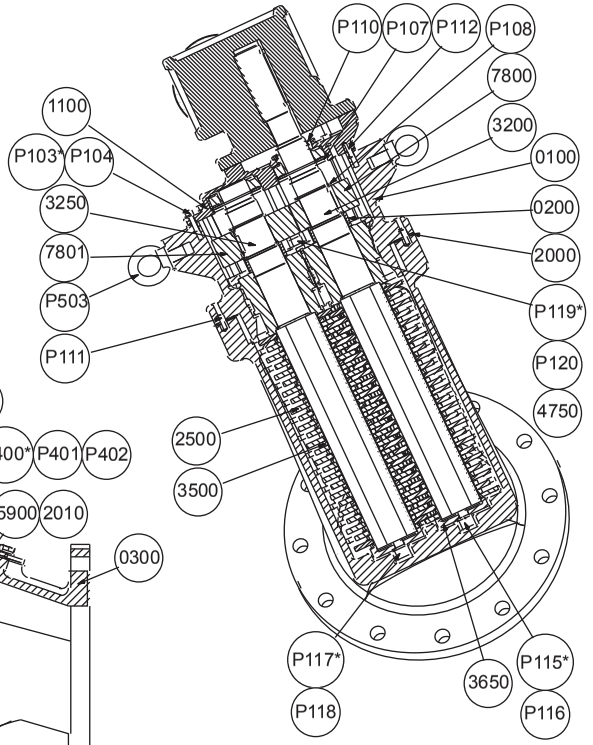
SECTION 'B-B' THROUGH

CT203 & CT205

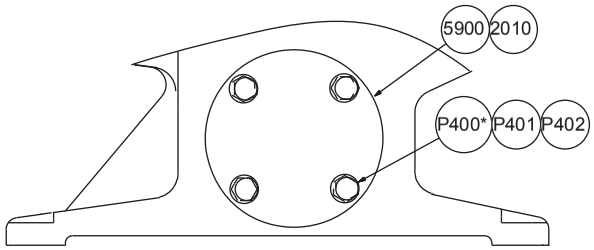




C-C - SECTION THROUGH DRIVESHAFT



B-B - ALIGNED SECTION THROUGH SHAFTS

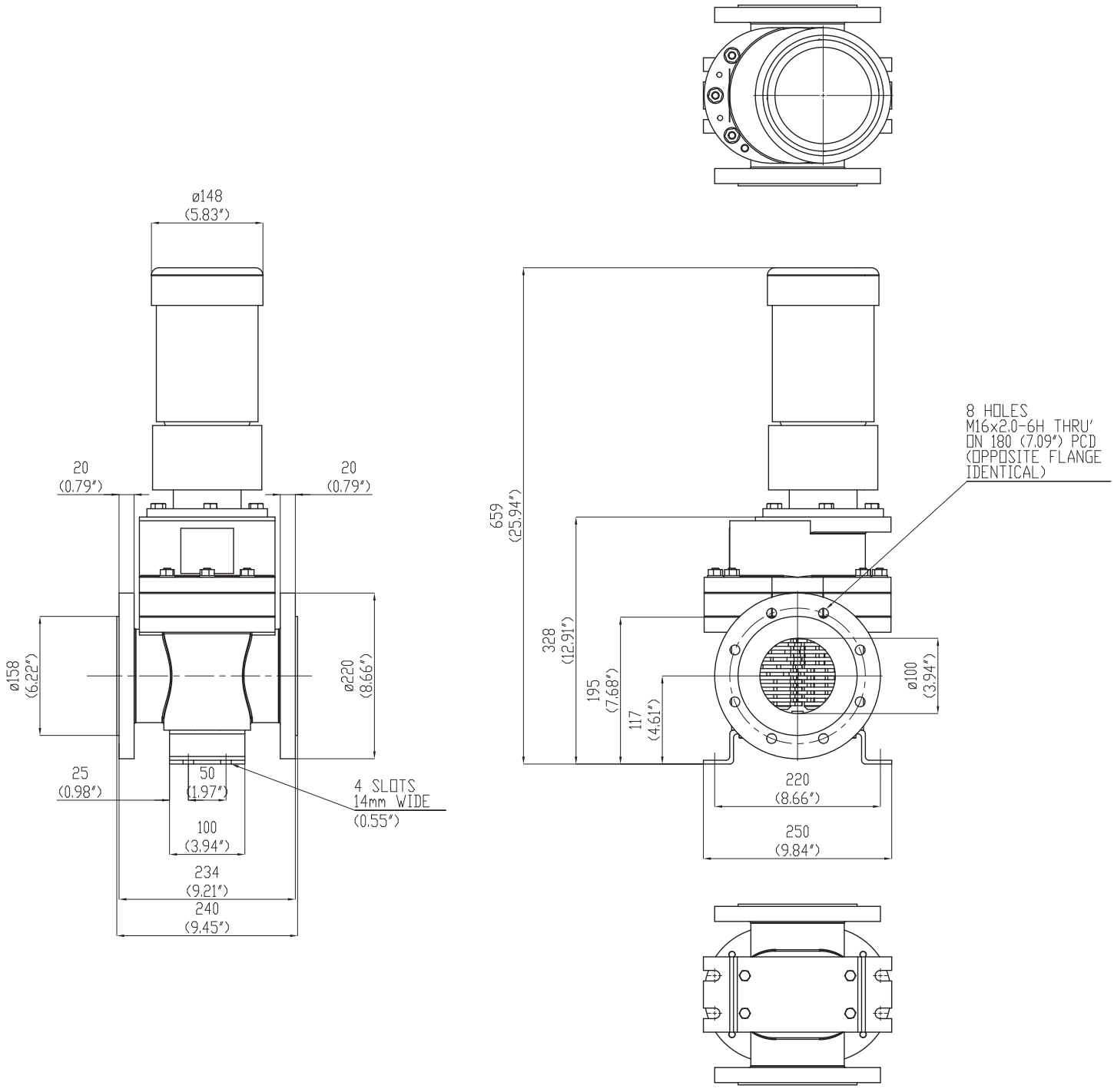


INSPECTION COVER DETAILS

Drawing Number T000 9800

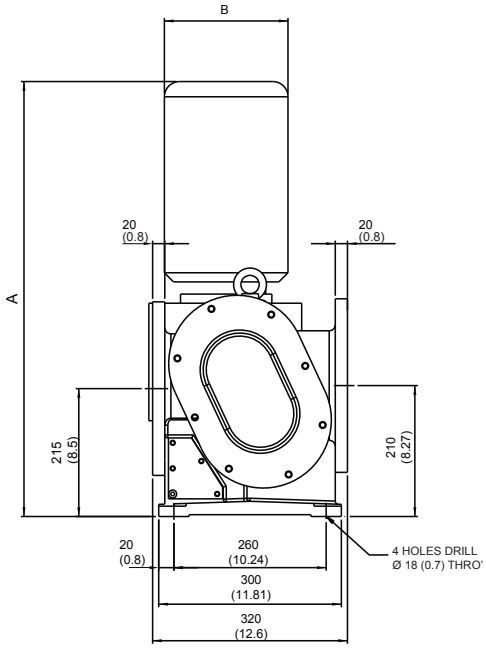
General Arrangements

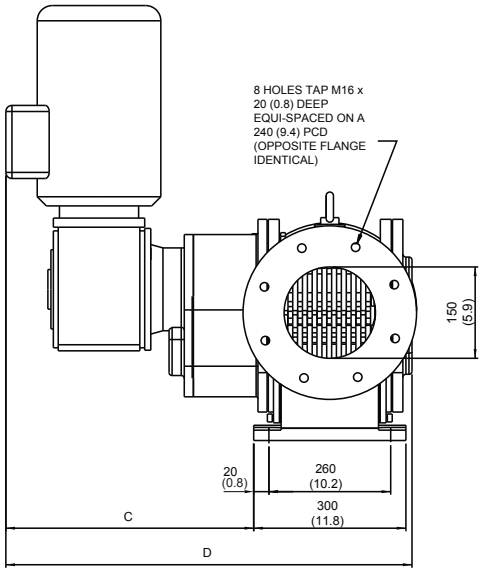
CT200



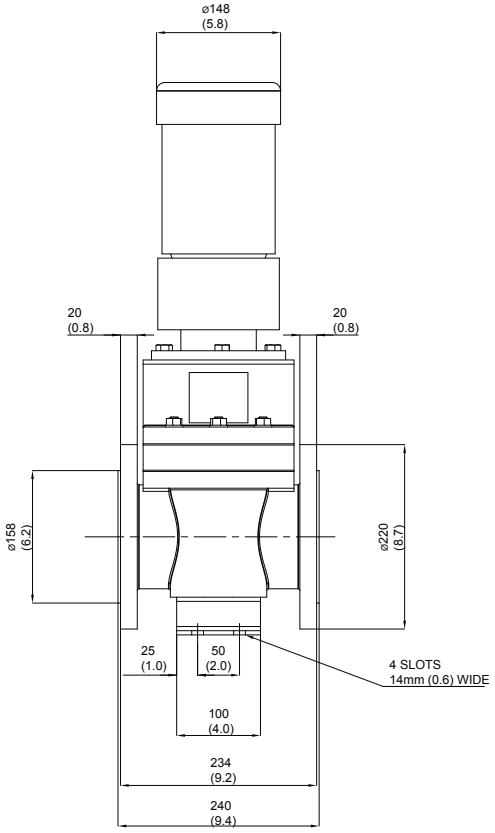
TOTAL WEIGHT inc MOTOR - 80kg (175lbs)

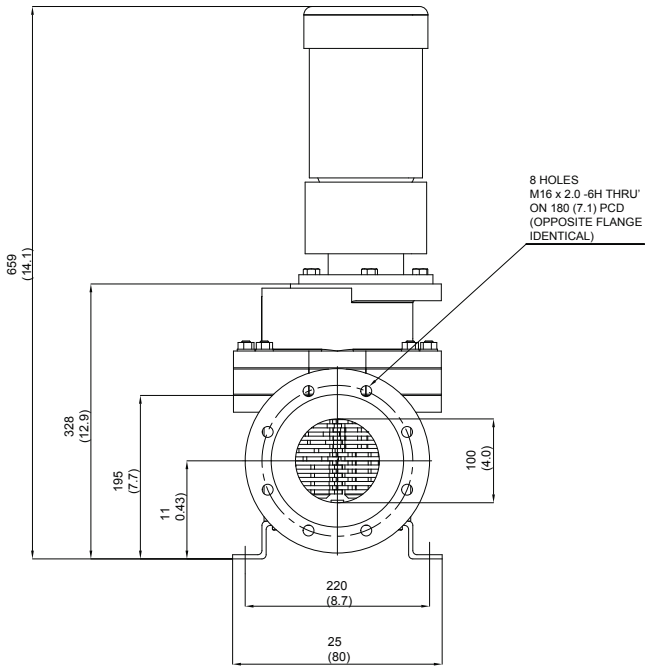
CT201



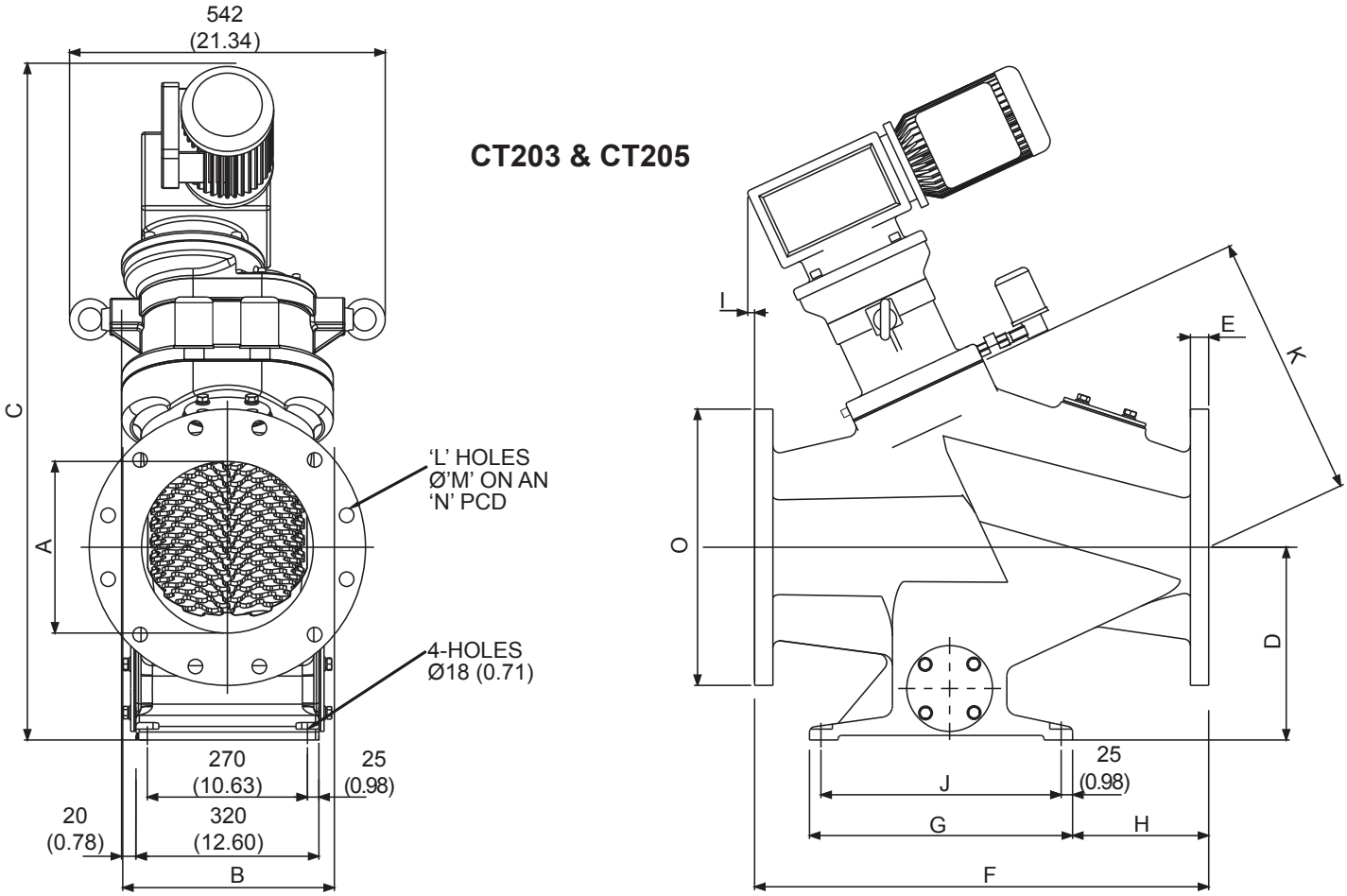


Model No	kW	HP	A (mm)	A (inch)	B (mm)	B (inch)	C (mm)	C (inch)	D (mm)	D (inch)	Wt Kg (lb) (Approx)
CT201D	1.5	2.0	700	27.6	186	7.3	400	15.7	700	27.6	140 (308.6)
CT201D	2.2	3.0	715	28.1	203	8.0	430	16.9	730	28.7	175 (385.7)





CT203 & CT205

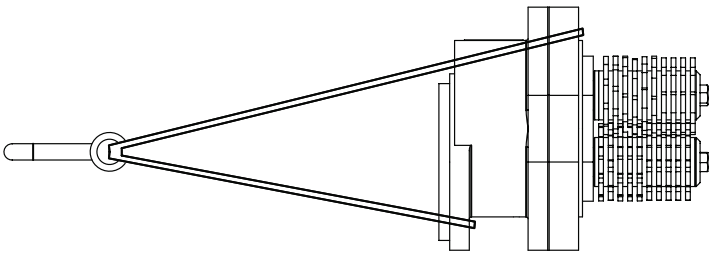


MODEL No.	kW	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Wt. lb
CT203C	1.5	100	370	1020	205	24	489	410	124	140	360	363	8	18	180	220	290
CT203D		150	370	1050	230	25	540	410	155	40	360	354	8	22	240	285	290
CT203E		200	370	1050	256	29	591	410	205	16	360	341	12	22	295	343	290
CT205F		250	370	1190	281	32	692	460	205	30	410	494	12	26	355	406	345
CT205G		300	370	1190	332	32	794	460	263	-17	410	472	12	26	410	488	345
CT203C	2.2 - 4.0	100	395	1130	205	24	489	410	124	169	360	363	8	18	180	220	340
CT203D		150	395	1170	230	25	540	410	155	97	360	354	8	22	240	285	340
CT203E		200	395	1170	256	29	591	410	205	72	360	341	12	22	295	343	340
CT205F		250	395	1310	281	32	692	460	205	87	410	494	12	26	355	406	390
CT205G		300	395	1310	332	32	794	460	263	40	410	472	12	26	410	488	390

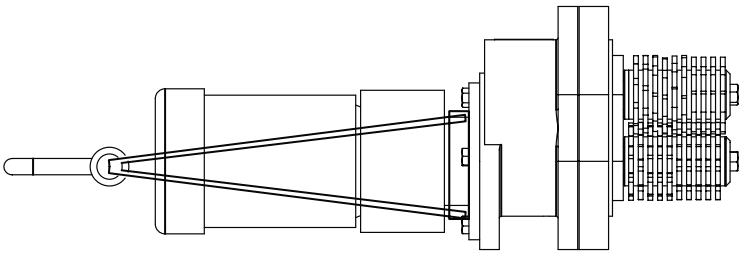
MODEL No.	Hp	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Wt. lb
CT203P	2.00	3.94	14.57	40.16	8.07	0.94	19.25	16.14	4.88	5.51	14.17	14.29	0.31	0.71	7.09	8.66	639
CT203Q		5.91	14.57	41.34	9.06	0.98	21.26	16.14	6.10	1.57	14.17	13.94	0.31	0.87	9.45	11.22	639
CT203R		7.87	14.57	41.34	10.08	1.14	23.27	16.14	8.07	0.63	14.17	13.43	0.47	0.87	11.61	13.50	639
CT205S		9.84	14.57	46.85	11.06	1.26	27.24	18.11	8.07	1.18	16.14	19.45	0.47	1.02	13.98	15.98	760
CT205T		11.81	14.57	46.85	13.07	1.26	31.26	18.11	10.35	-0.67	16.14	18.58	0.47	1.02	16.14	19.20	760
CT203P	2.9 - 5.3	3.94	15.55	44.49	8.07	0.94	19.25	16.14	4.88	6.65	14.17	14.29	0.31	0.71	7.09	8.66	749
CT203Q		5.91	15.55	46.06	9.06	0.98	21.26	16.14	6.10	3.82	14.17	13.94	0.31	0.87	9.45	11.22	749
CT203R		7.87	15.55	46.06	10.08	1.14	23.27	16.14	8.07	2.83	14.17	13.43	0.47	0.87	11.61	13.50	749
CT205S		9.84	15.55	51.57	11.06	1.26	27.24	18.11	8.07	3.43	16.14	19.45	0.47	1.02	13.98	15.98	860
CT205T		11.81	15.55	51.57	13.07	1.26	31.26	18.11	10.35	1.57	16.14	18.58	0.47	1.02	16.14	19.20	860

FLANGES DRILLED TO BS4504 (ANSI B16.5) ***Drawing Number T000 9900***

Lifting & Guarding Diagrams



Cartridge Without Drive



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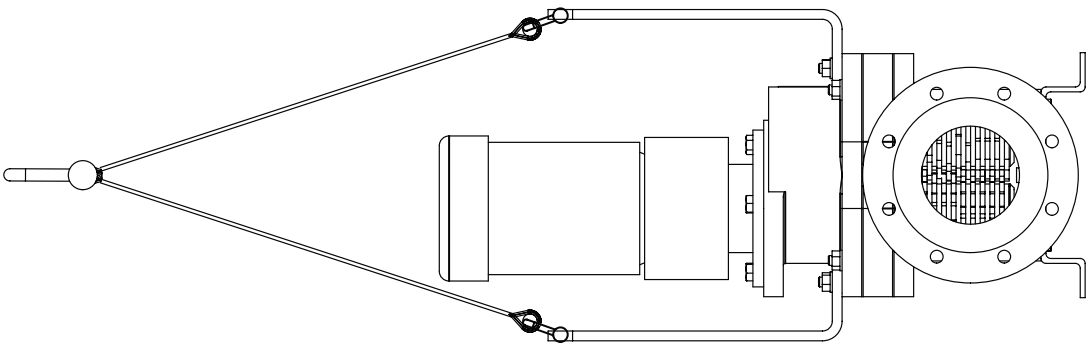
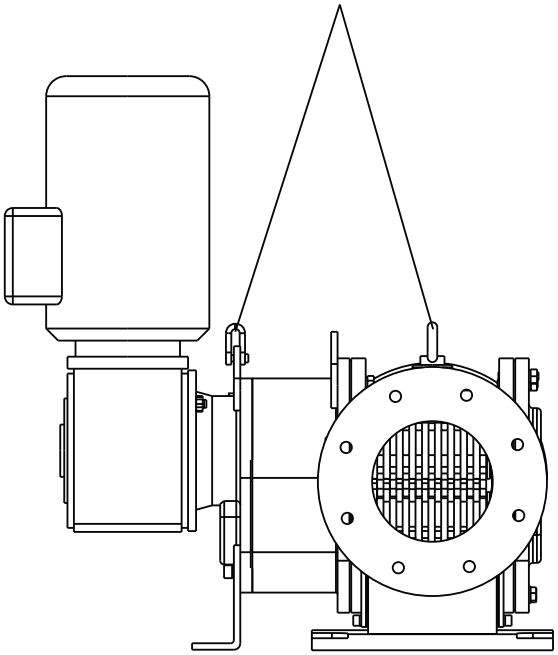


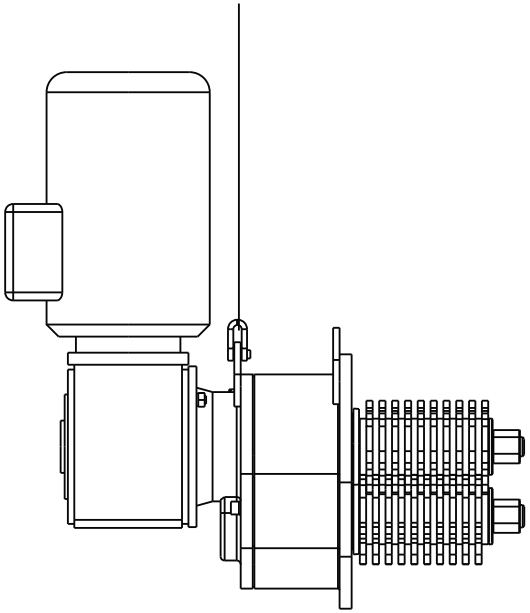
Full Muncher Assembly

CT200

CT201



Full Muncher Assembly



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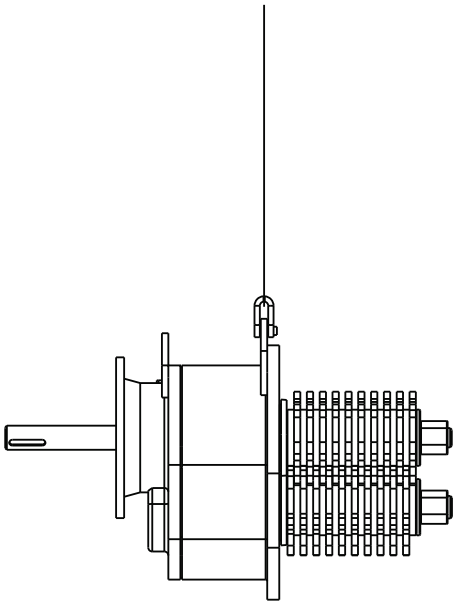

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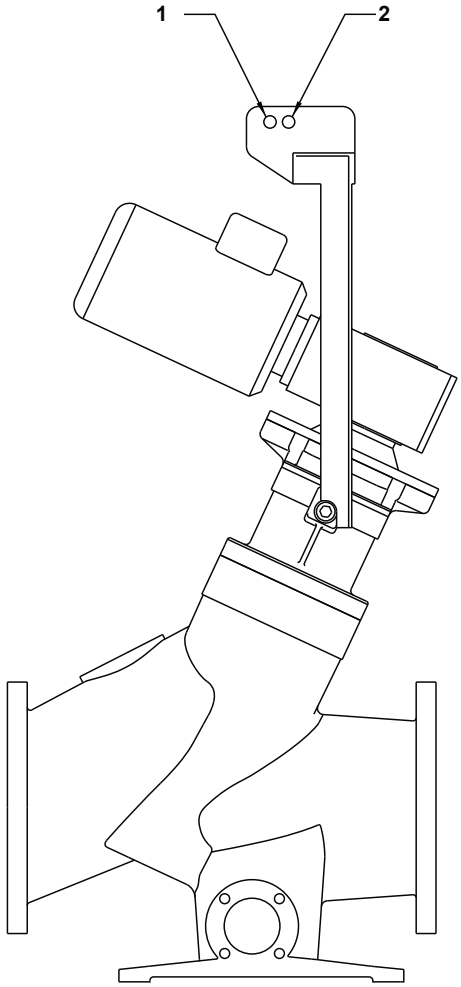

	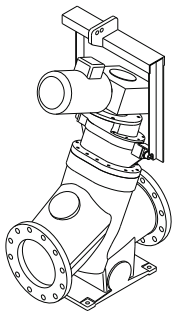	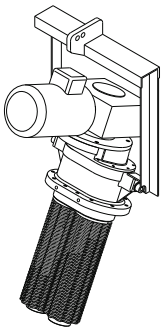	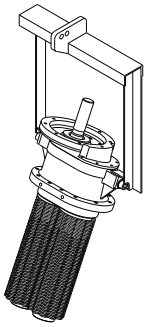
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CT205	345-390	195-240	145-190

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