



Original
Instructions

Installation, Operation and Maintenance Instructions

Series F Muncher

Revisions

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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
Metric Spanners - Range 10mm-36mm
Torque Wrench

Series A Muncher;

Metric Hexagon Keys - Range 6mm-8mm
Metric Spanners - Range 10mm-36mm
Torque Wrench

Series F Muncher;

Metric Hexagon Keys - Range 6mm-8mm
Metric Spanners - Range 10mm-36mm
Torque Wrench
NOV Process and Flow Technologies Locknut Key - Item No.s MQ F06A 9750, CF F06A 9755 and MM F06A 9760

TR Muncher;

Metric Hexagon Keys - Range 6mm-14mm
Metric Spanners - Range 10mm-36mm
Torque Wrench

Series R Muncher;

Metric Hexagon Keys - Range 5mm-14mm
Metric Spanners - Range 10mm-36mm
Torque Wrench

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



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 than 90°C (194°F) the maximum surface temperature will not exceed 90°C (194°F) provided the grinder is installed, operated and maintained in accordance with this manual. Where the process fluid temperature exceeds 90°C (194°F) 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

Series 'F' Muncher

This information and all the information contained herein, are the exclusive property of NOV Process and Flow Technologies, 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 NOV Process and Flow Technologies. Its use for any other reason than the specified shall be a violation of the

agreement with the recipient concerning the legal rights of NOV Process and Flow Technologies.

NOV Process and Flow Technologies 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 Series 'F' 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.

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

The following harmonised standards are applicable: BS EN ISO 12100: 2010

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 2014/30/EU
The Low Voltage Directive 2014/35/EU
The Pressure Equipment Directive 2014/68/EU

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.



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Installation, Operation & Maintenance Instructions

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

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, NOV Process and Flow Technologies 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.

Installation, Operation & Maintenance Instructions

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 NOV Process and Flow Technologies 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. NOV Process and Flow Technologies 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 NOV PROCESS AND FLOW TECHNOLOGIES HAVE 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 steel (or similar) feed hopper with a minimum base to top height of 1.0 metre (3.3 feet) or a minimum height of 1.5 metres (4.9 feet) from floor level.
- A steel (or similar) lower delivery chute, which is inaccessible without tools.
- A protective grid mounted over the Muncher and conveyor system, especially where overhead walkways are present.
- 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.

Installation, Operation & Maintenance Instructions

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.

Weights

Muncher	Type	Gear Unit / Class	M/C Size (kW)	Weight (kg)							
Series A	CA202AA CA203AA CA205AA CA206AA CA210AA CA215AA	IP55	1.5	241 251 276 286 351 400							
	CA202AB CA203AB CA205AB CA206AB CA210AB CA215AB			IP55	2.2	254 264 284 294 369 439					
	CA202AC CA203AC CA205AC CA206AC CA210AC CA215AC					IP55	4.0	265 275 295 305 380 450			
	Series F							CF306RJS7B2 CF310RMS7B2	Nord IP55	11 7.5 & 11	780 1180
	Series H							CH06 CH09 CH12	Nord IP55	11 & 15 15 & 22	1800 2300 2800
	SB							Pipeline CB201	IP55	1.1 1.5 2.2	205 207 244
		IP55	1.1 1.5 2.2							208 244 248	
			IP55	1.1 1.5 2.2	155 190 195						
				IP67 & IP68	1.1 1.5 2.2	200 225 260					
		TR			CT203C	IP55	1.5 2.2 / 4.0		290 340		
			CT203D		IP55		1.5 2.2 / 4.0		290 340		
			CT203E	IP55		1.5 2.2 / 4.0	290 340				
			CT205F		IP55	1.5 2.2 / 4.0	345 390				
	CT205G		IP55	1.5 2.2 / 4.0		345 390					
	R	CR145A		IP55	7.5	800					

Weights

Muncher	Type	Gear Unit / Class	M/C Size (HP)	Weight (lb)			
Series A	CA202AA CA203AA CA205AA CA206AA CA210AA CA215AA	TEFC	2	531 553 608 630 773 881			
	CA202AB CA203AB CA205AB CA206AB CA210AB CA215AB	TEFC	3	559 582 626 648 813 967			
	CA202AC CA203AC CA205AC CA206AC CA210AC CA215AC	TEFC	5	584 606 650 672 837 992			
	Series F	CF306RJS7B2 CF310RMS7B2	TEFC	15 10 & 15	1719 2601		
	Series H	CH06 CH09 CH12	TEFC	15 & 20 / 20 & 30	3968 5070 6172		
	SB	Pipeline CB201	TEFC	1.5 2 3	451 456 537		
			SUBMERSIBLE	1.5 2 3	458 537 546		
				Channel CB201A	TEFC	1.5 2 3	341 418 429
		SUBMERSIBLE			1.5 2 3	440 496 573	
			TR		CT203P	TEFC	2 3 / 5
				CT203Q	TEFC	15 10 & 15	639 749
		CT203R		TEFC	15 10 & 15	639 749	
		CT203S		TEFC	15 10 & 15	760 859	
	CT203T	TEFC		15 10 & 15	760 859		
	R	CR145A	TEFC	10	1763		

Installation, Operation & Maintenance Instructions

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.

Installation, Operation & Maintenance Instructions

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 NOV PROCESS AND FLOW TECHNOLOGIES

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 NOV Process and Flow Technologies have 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 NOV Process and Flow Technologies 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 NOV Process and Flow Technologies.

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.

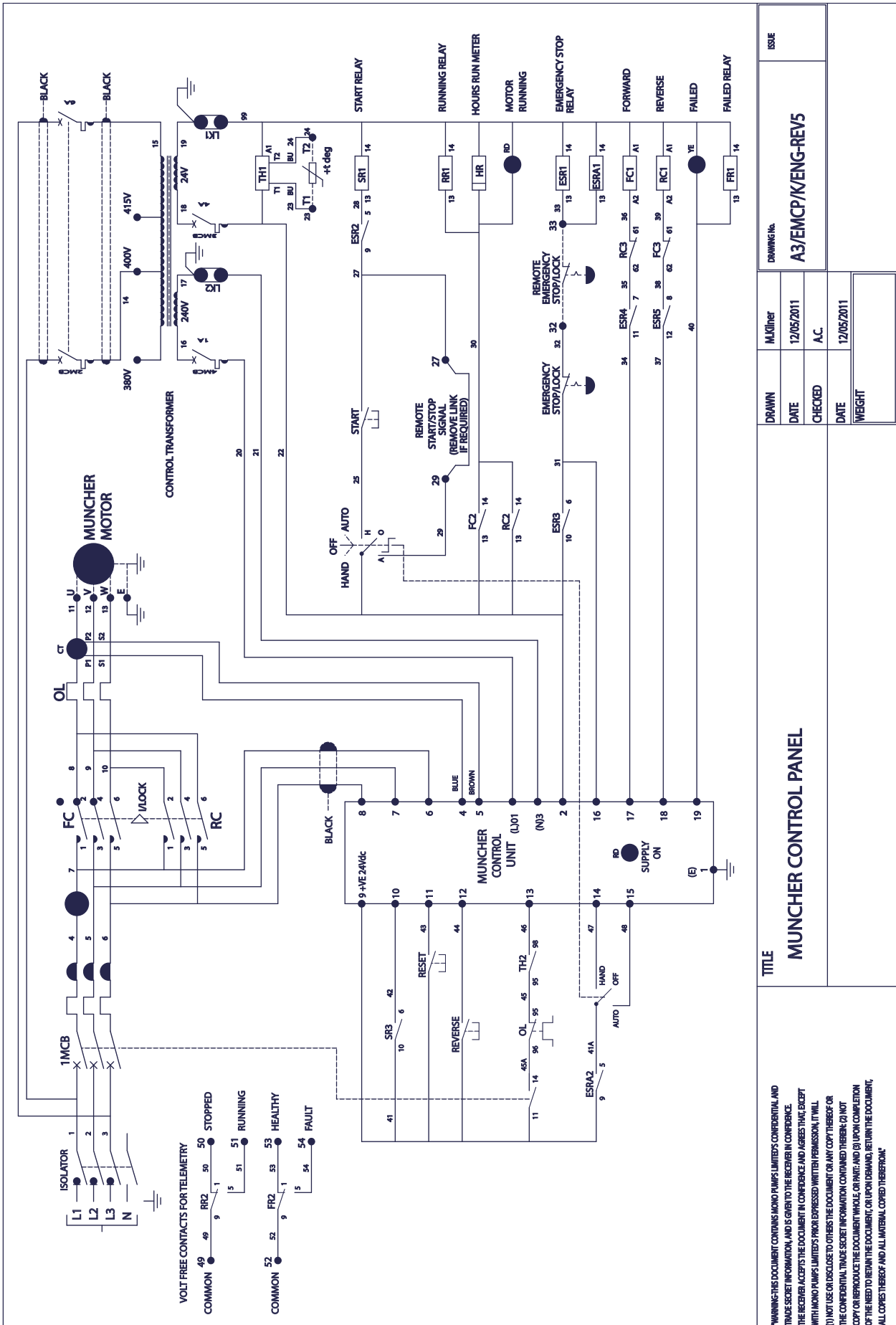
3.3 CLEANING / INSPECTION

- 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.

Wiring Diagram



Note:

Other language versions may be available on request.
Please contact NOV Process and Flow Technologies.



Drawing Reference Numbers

DRG. REF.	DESCRIPTION	DRG. REF.	DESCRIPTION
01A	BEARING HOUSING	P130	C/SUNK SCREW - M10
02A	GEAR HOUSING	P140	CAP HEAD SCREW - M8
02B	GEAR HOUSING COVER	P143	SPRING WASHER - M8
11A	CHEEK PLATE	P147	LIPSEAL
11B	BEARING COVER	P150	HEX HEAD SCREW - M8
11C	BLANKING COVER	P152	FLAT WASHER - M8
11D	GEARBOX END COVER	P170	HEX HEAD BOLT - M12
15A	COUPLING GUARD	P171	HEX NUT - M12
21A	SIDERAIL	P172	FLAQT WASHER - M12
21B	SIDERAIL	P173	SPRING WASHER - M12
22A	COMB BAR	P180	EYE BOLT - M20
22B	COMB BAR	P190	HEX HEAD BOLT - M12
22C	COMB BAR	P191	FLAT WASHER - M12
25A	CUTTER	P192	SPRING WASHER - M12
25B	CUTTER	P195	HEX HEAD SCREW - M20
27A	SEAL PLATE	P196	SPRING WASHER - M20
32A	DRIVE SHAFT	P197	SPRING WASHER - M20
32B	DRIVEN SHAFT	P211	LOCK NUT
32C	DRIVE SHAFT	P212	LOCK WASHER
35A	SPACER	P217	O RING
35B	SPACER	P218	BEARING
40A	LANTERN RING	P310	HEX HEAD BOLT - M24
47A	LIPSEAL SLEEVE	P311	HEX NUT - M24
59A	CUTTER GUARD	P312	FLAT WASHER - M24
59C	CUTTER GUARD	P313	SPRING WASHER - M24
60A	BASE	P319	KEY
60B	BASE	P320	HEX HEAD SCREW - M12
78A	DRIVE GEAR	P322	FLAT WASHER - M12
78B	DRIVE GEAR	P323	SPRING WASHER - M12
P110	HEX HD BOLT- M20	P410	GRUB SCREW - M12
P112	FLAT WASHER - M20	P419	KEY
P113	SPRING WASHER - M20	P420	C/SUNK SCREW - M8
P115	GREASE NIPPLE	P430	HEX HEAD SCREW - M8
P117	LIPSEAL	P432	FLAT WASHER - M8
P120	HEX HD BOLT- M20	P610	HEX HEAD BOLT - M12
P121	HEX NUT - M20	P611	HEX NUT - M12
P122	FLAT WASHER - M20	P612	FLAT WASHER - M12
P123	SPRING WASHER - M20	P613	SPRING WASHER - M12
P126	DOWEL - ϕ 10		

IMPORTANT NOTE: -
PLEASE REFER TO THE EXPLODED VIEWS IN SECTION 6.

Torque Tightening Table for Fasteners

LOCATION	THREAD SIZE	PART No.(s)	MAX. TIGHTENING TORQUE	
			Nm	lbf.ft.
UPPER MECH SEAL CARTRIDGE	M6	P122	6.5	5
TOP/BOTTOM BEARING COVER	M10	P102/P104	106	78
TOP/BOTTOM SEAL BLOCK	M12	P105/P106	54	40
SIDERAILS/LIFTING LUGS	M16	P107/P111	133	98
SHAFT STACK TENSION	M60	P211	250	185

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

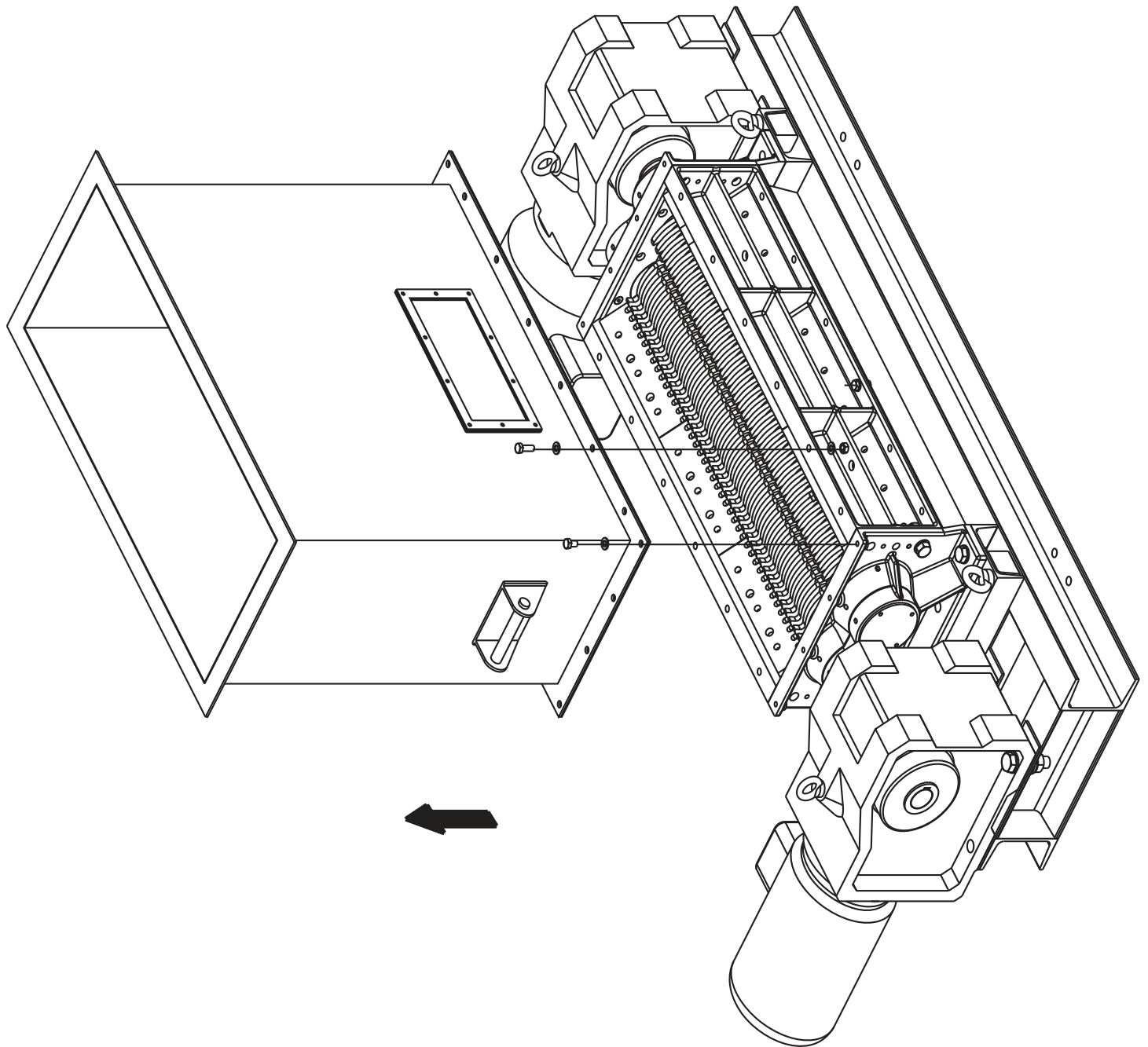
Muncher Coding

Features	Description	Basic Code												Variation			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Body Material	Ductile Cast Iron (CF)	C															
	Stainless Steel	S															
Series	180mm Dia Cutters		F														
Mark No.	Mark 3			3													
Throat Size	600mm (24")				0	6											
	1000mm (40")				1	0											
Machine Type	No comb bars						P										
	Fitted with Comb Bars						R										
Drive Configuration	Single Drive (600mm only)							J									
	Dual Drive (1000mm only)							M									
Cutter Type	Saw Tooth								S								
*Cutter Teeth x Thickness	7 x 12mm (0.5") (standard)									7	D						
	3 x 12mm (0.5") (option)									3	D						
	7 x 8mm (0.3") (option)									7	B						
Cutter Material	Stainless Steel											1					
	Alloy Steel											2					
Oblique													/				
Field Variation														V	A	R	
Typical Code		C	F	3	1	0	R	M	S	7	D	2	/	1	2	3	

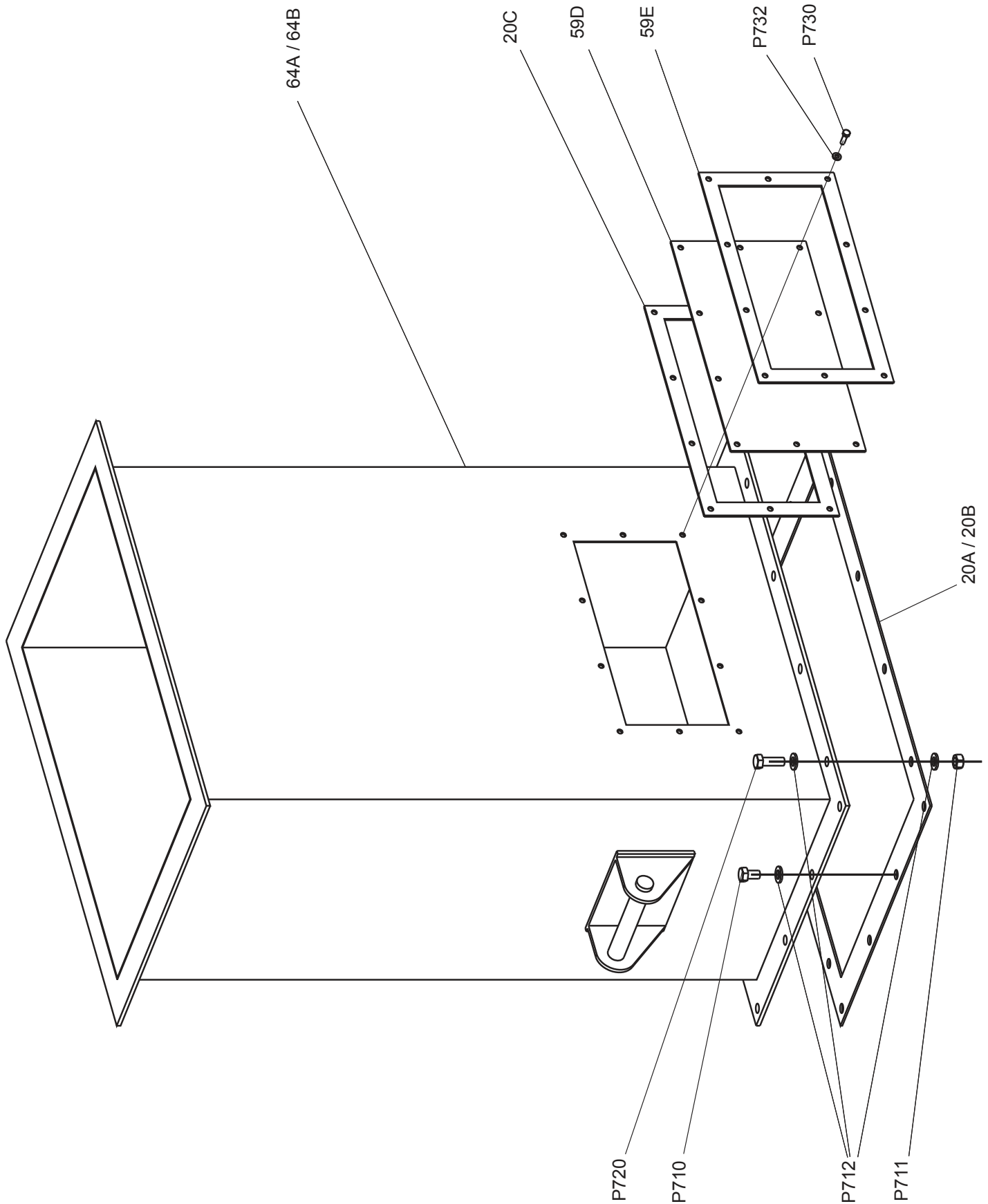
“X” Denotes special build variation

Note: 12mm (0.5") cutters for general applications
8mm (0.3") cutters for fine or pre-screened material

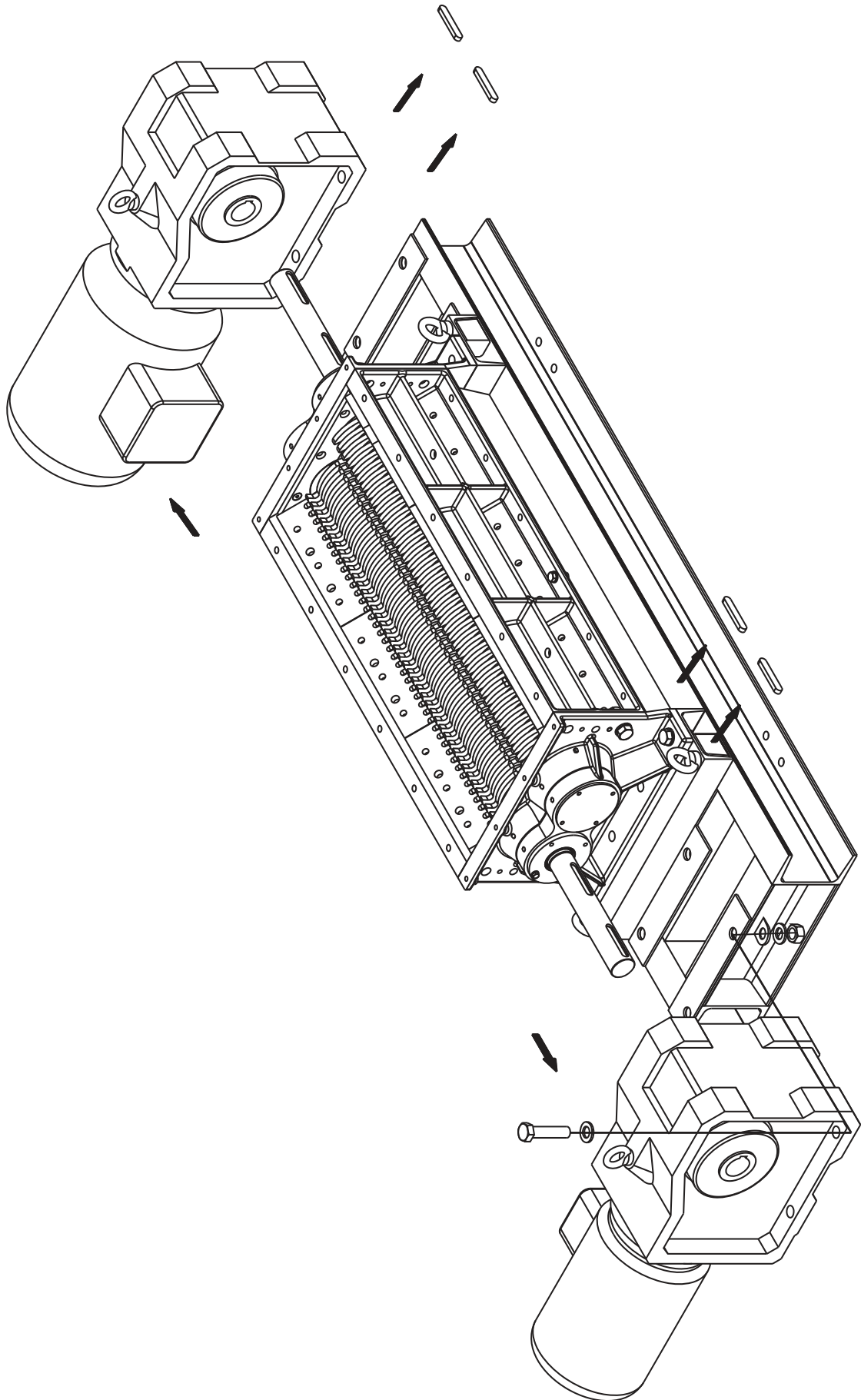
Dismantling & Assembly Diagrams



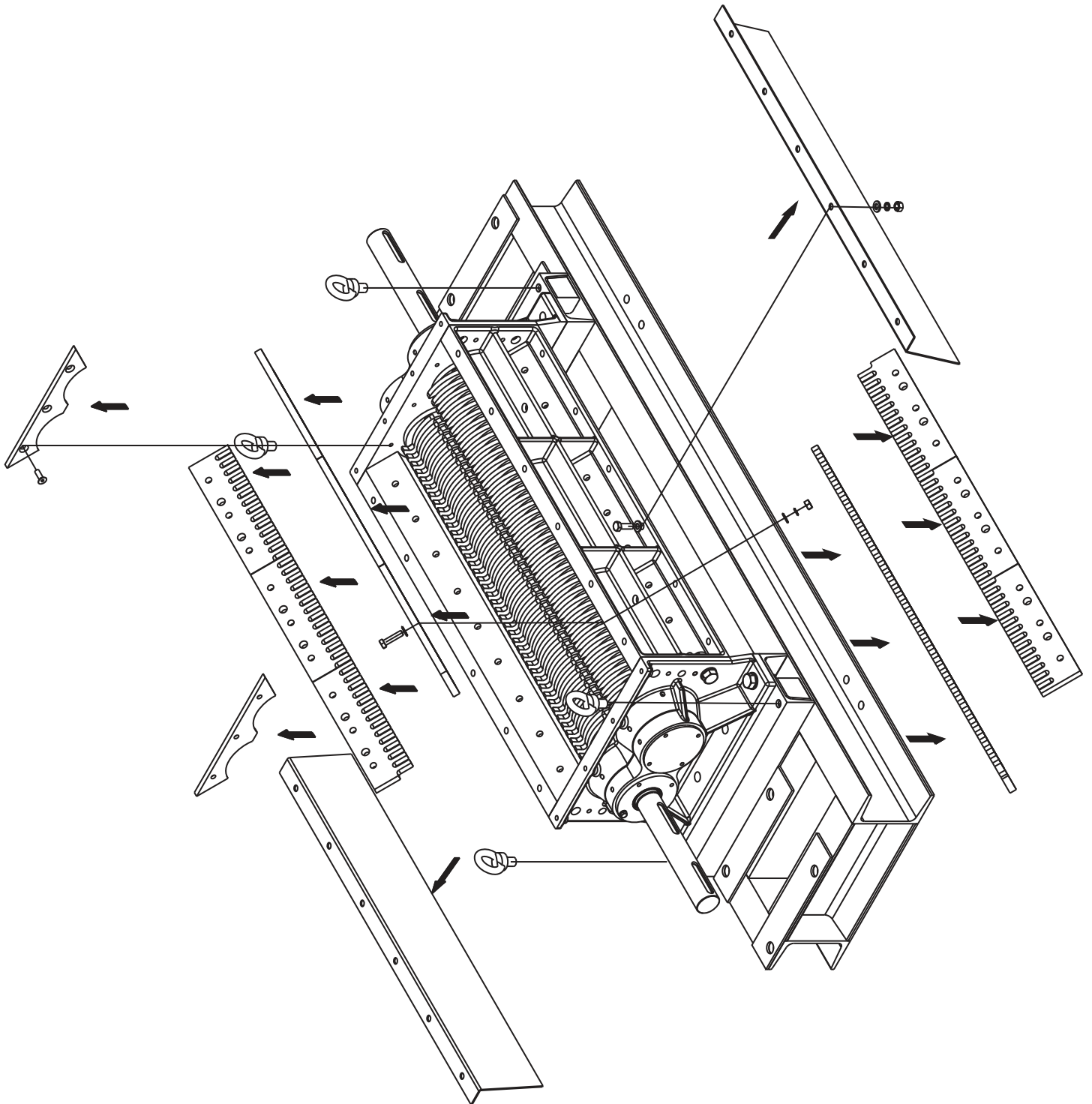
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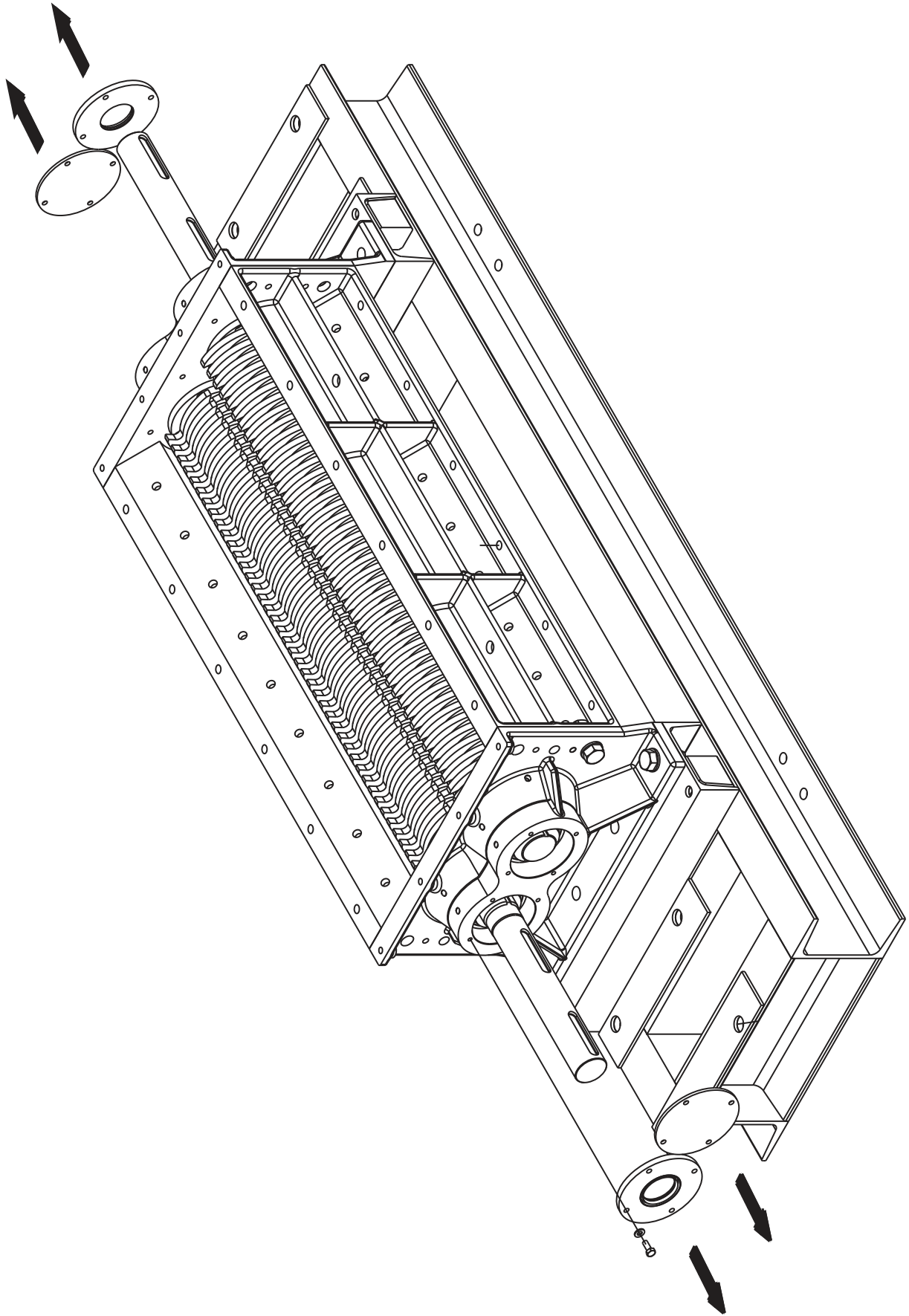
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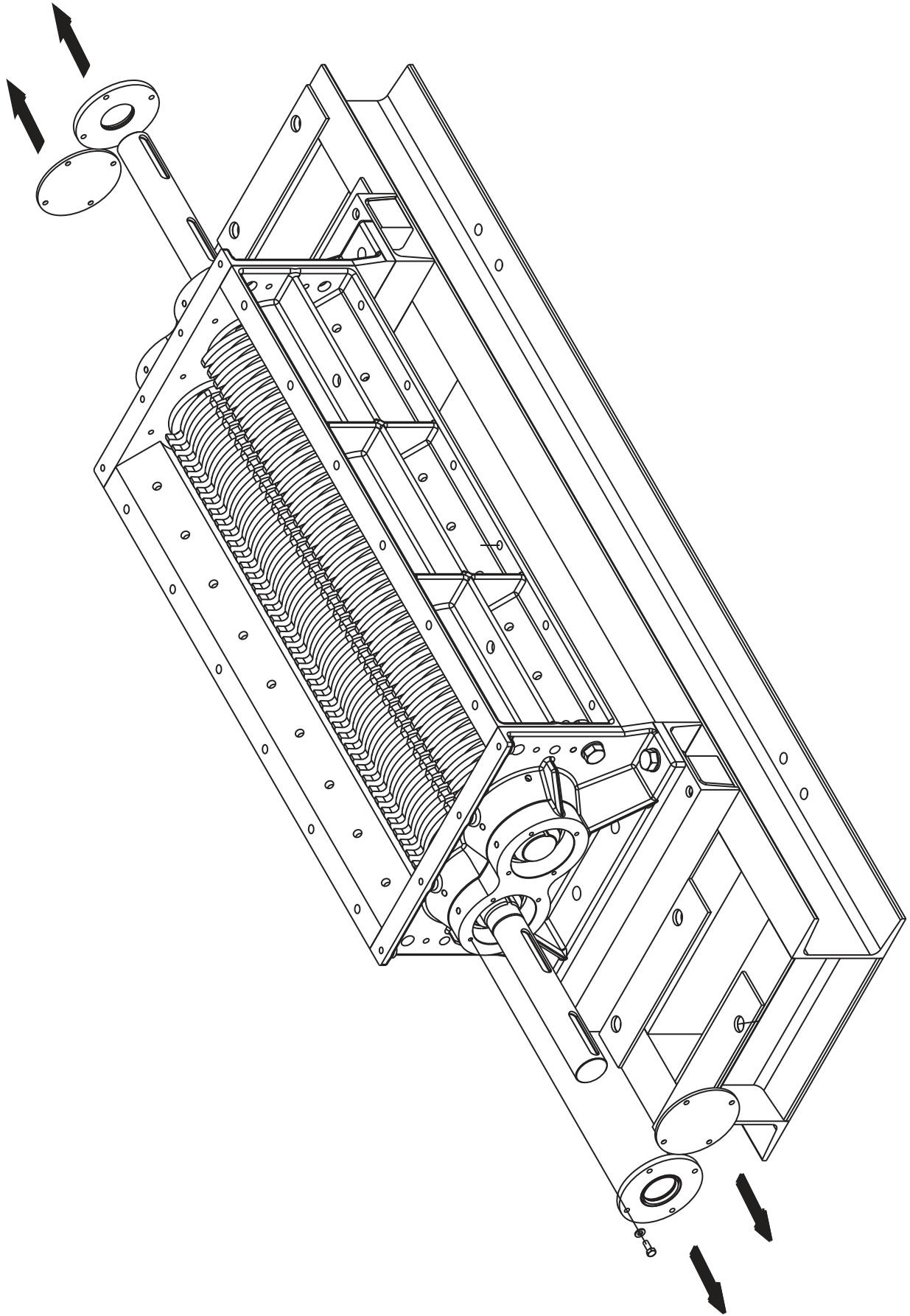
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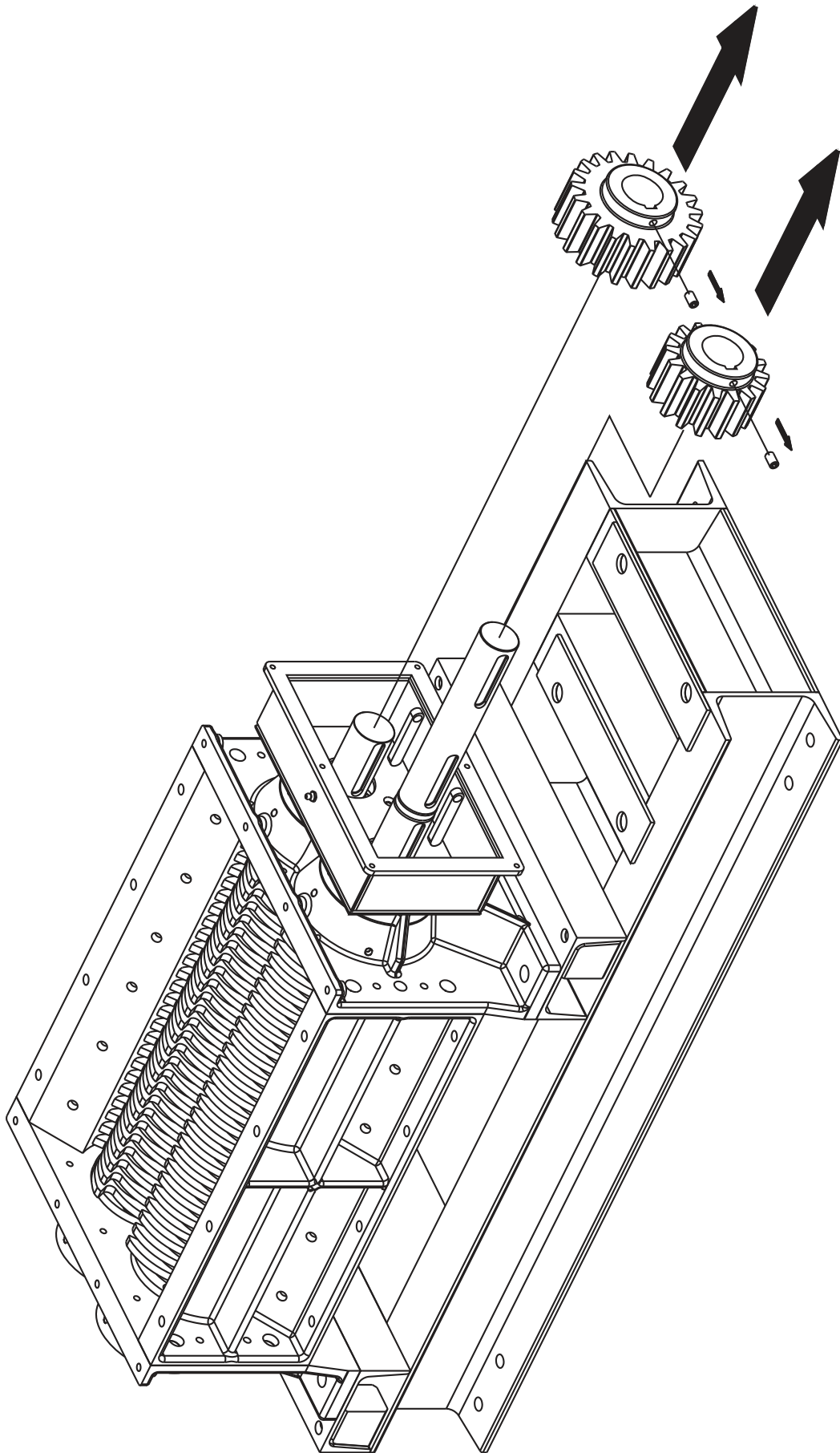
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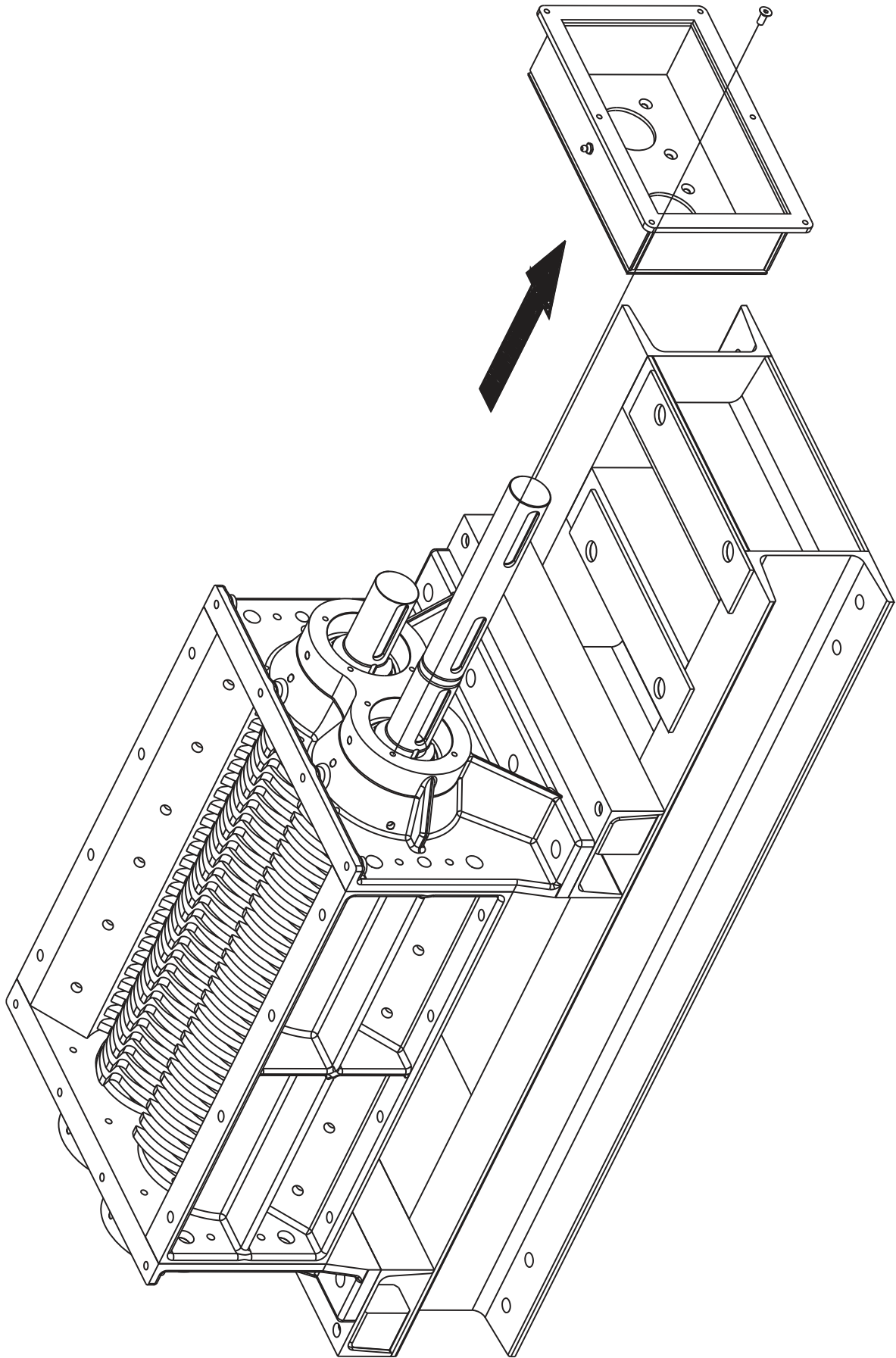
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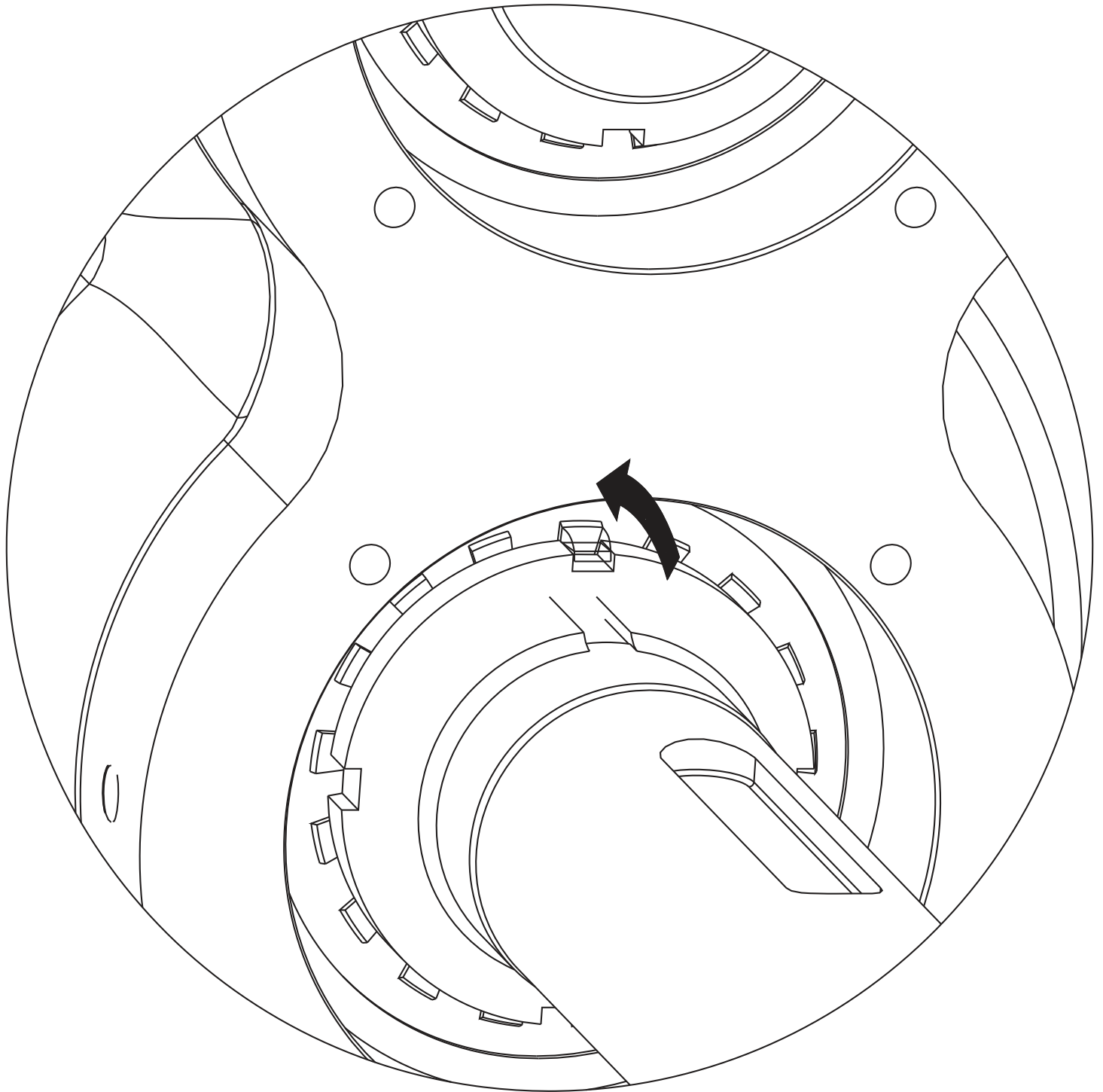
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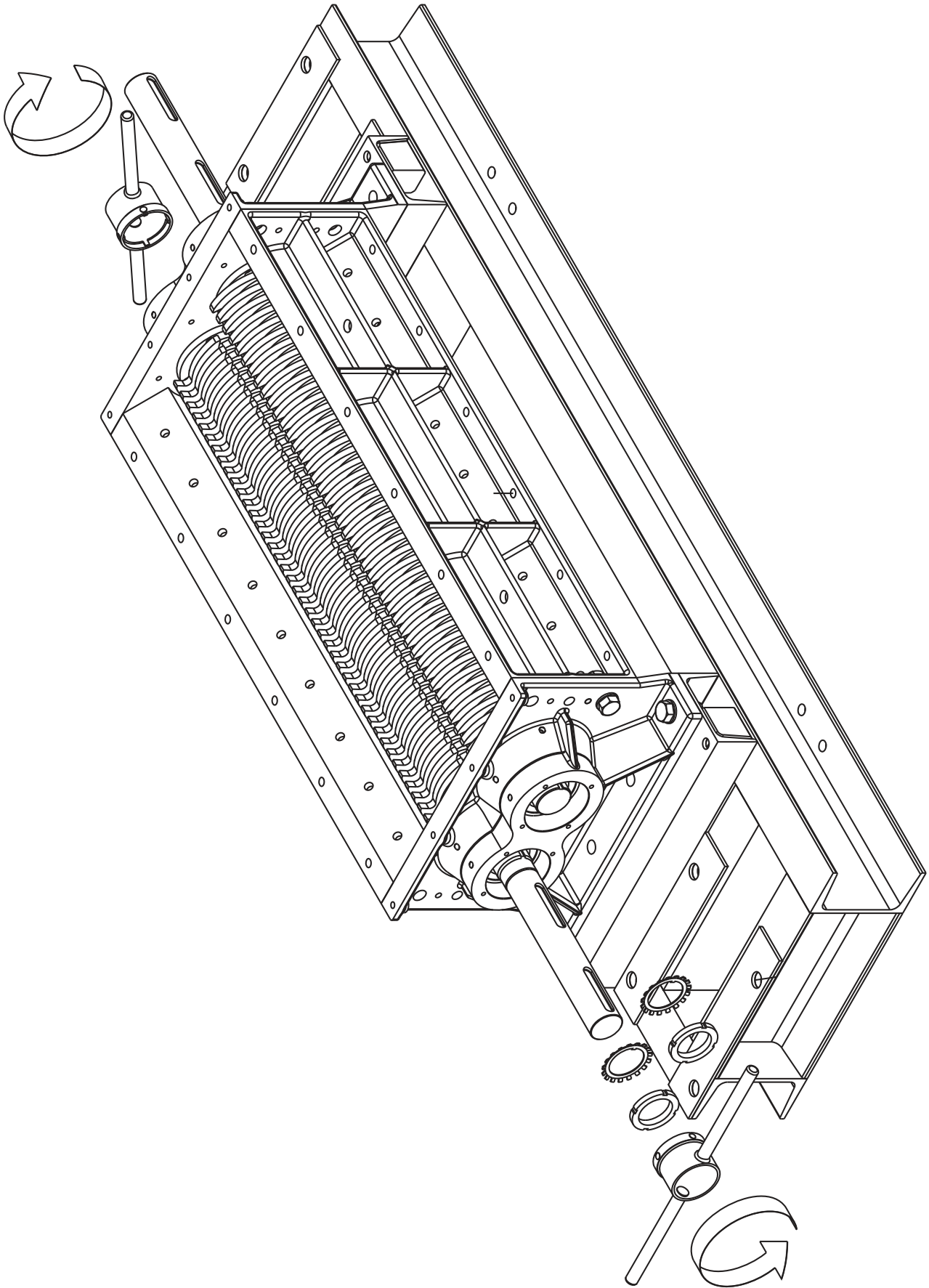
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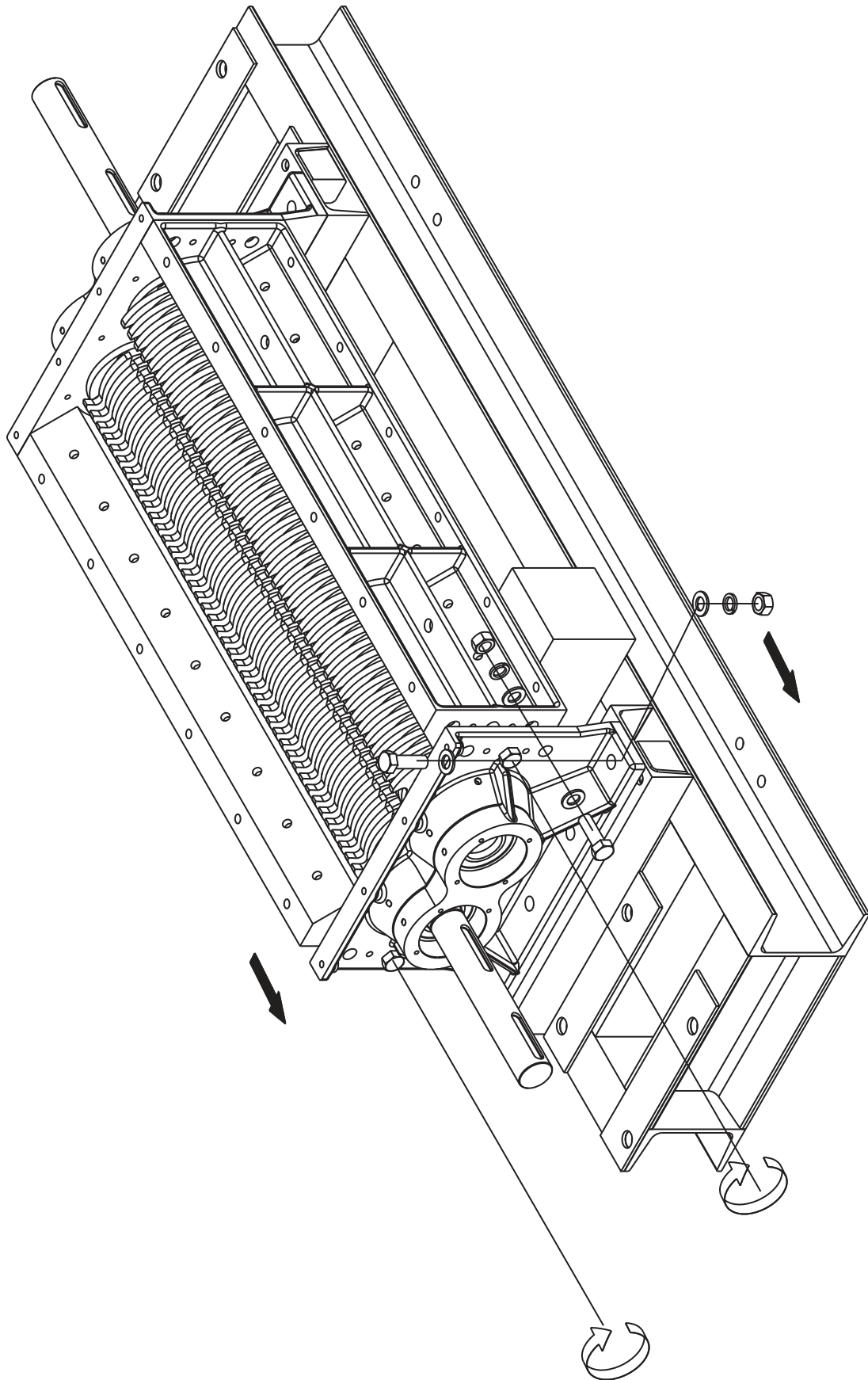
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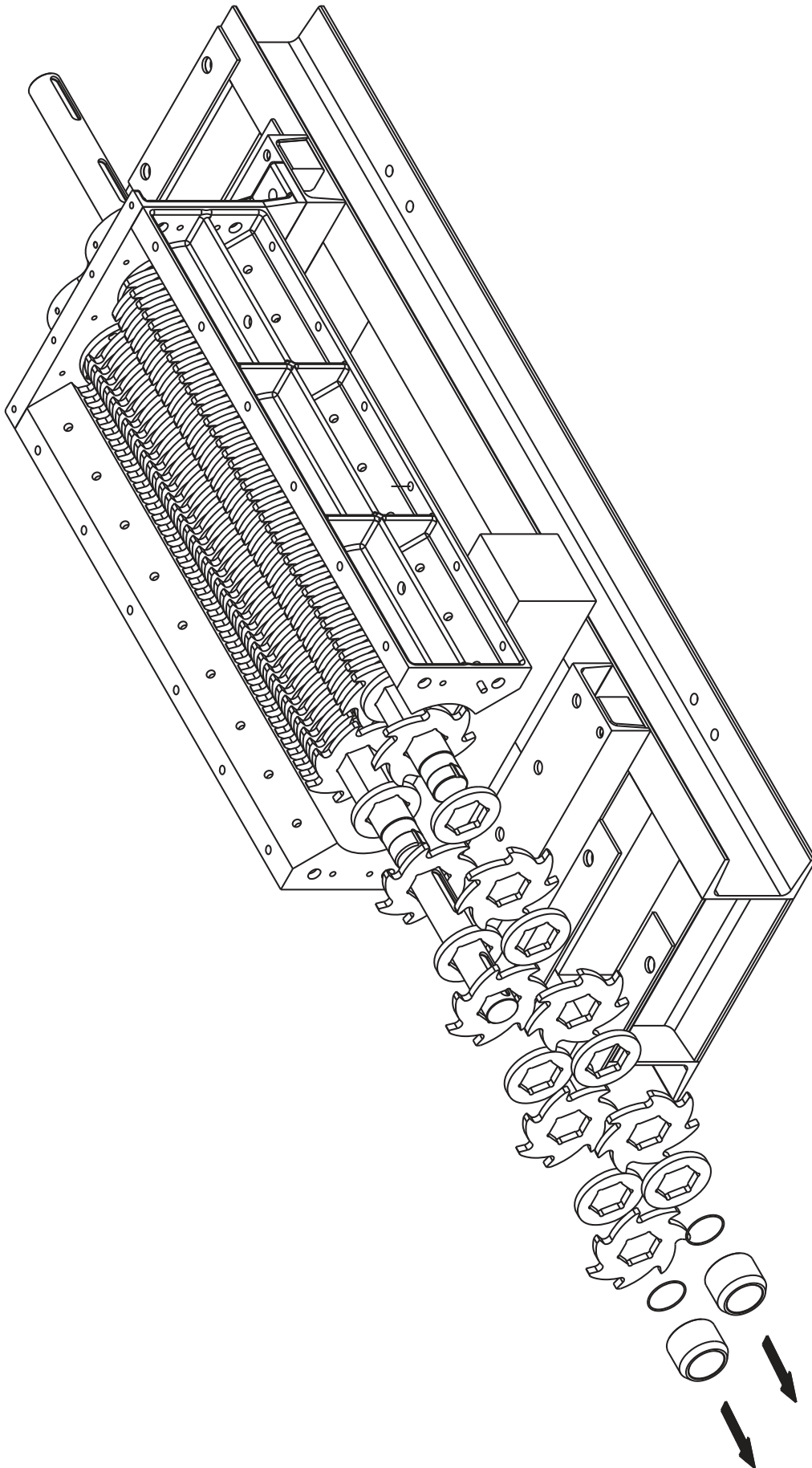
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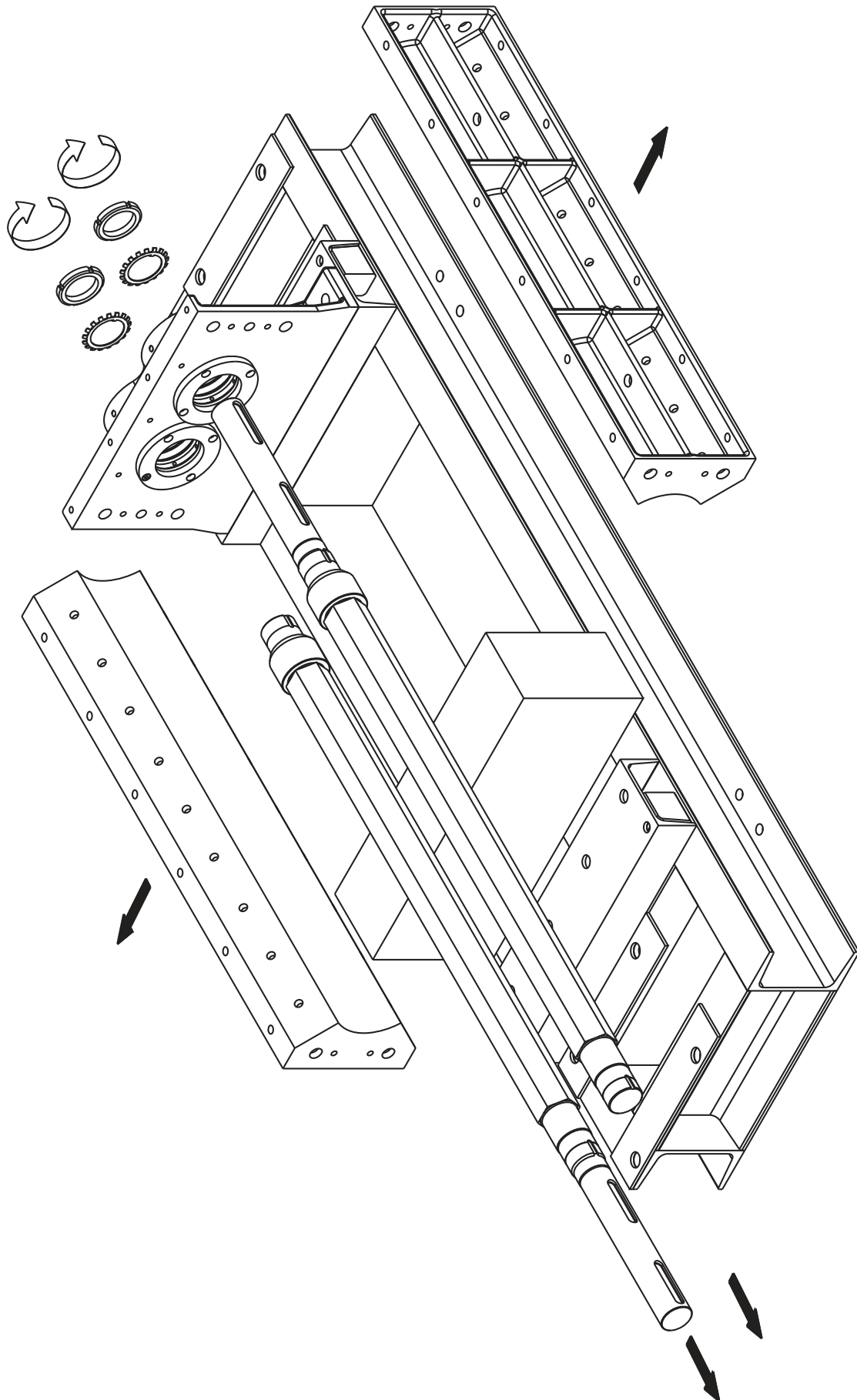
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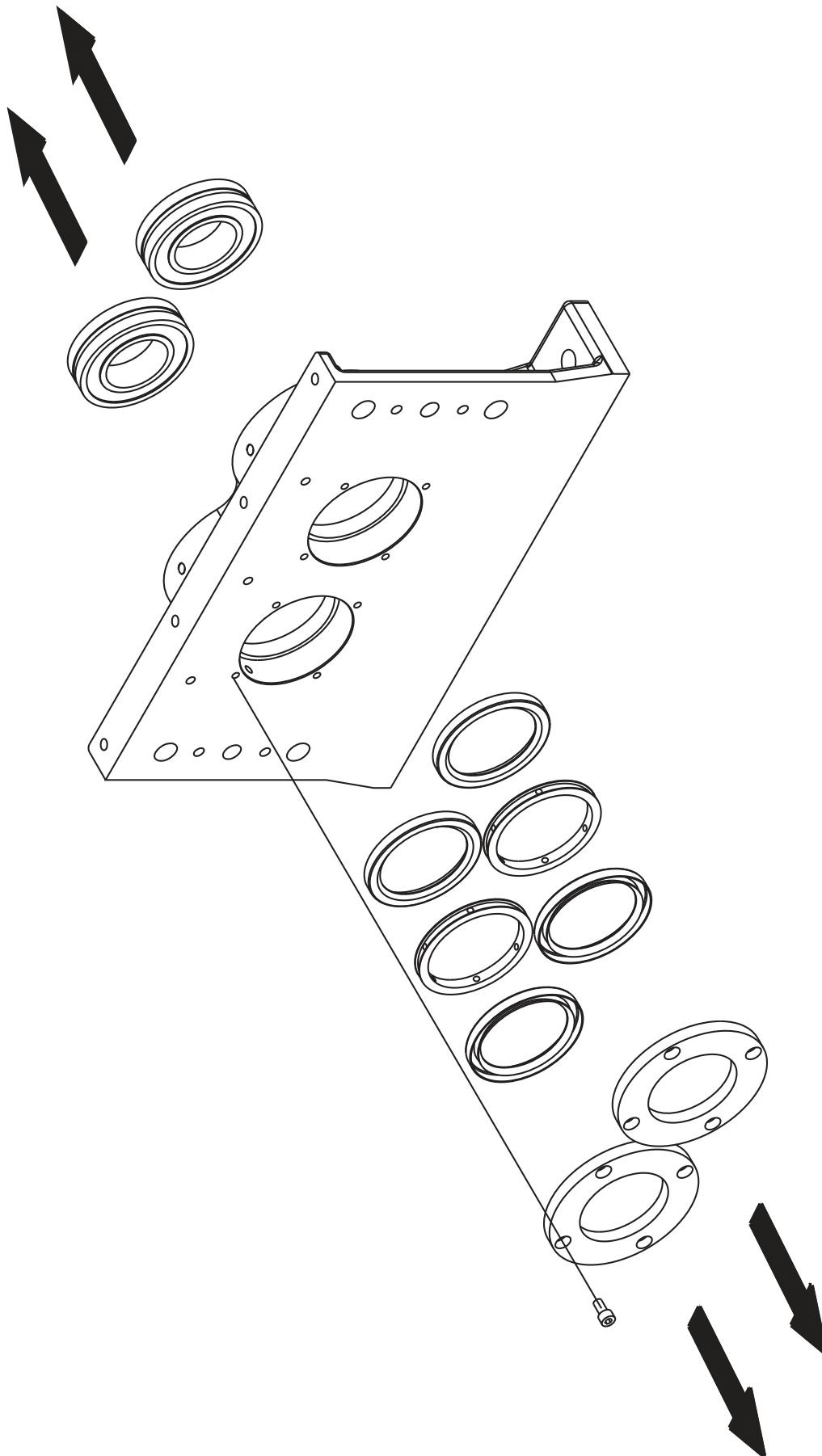
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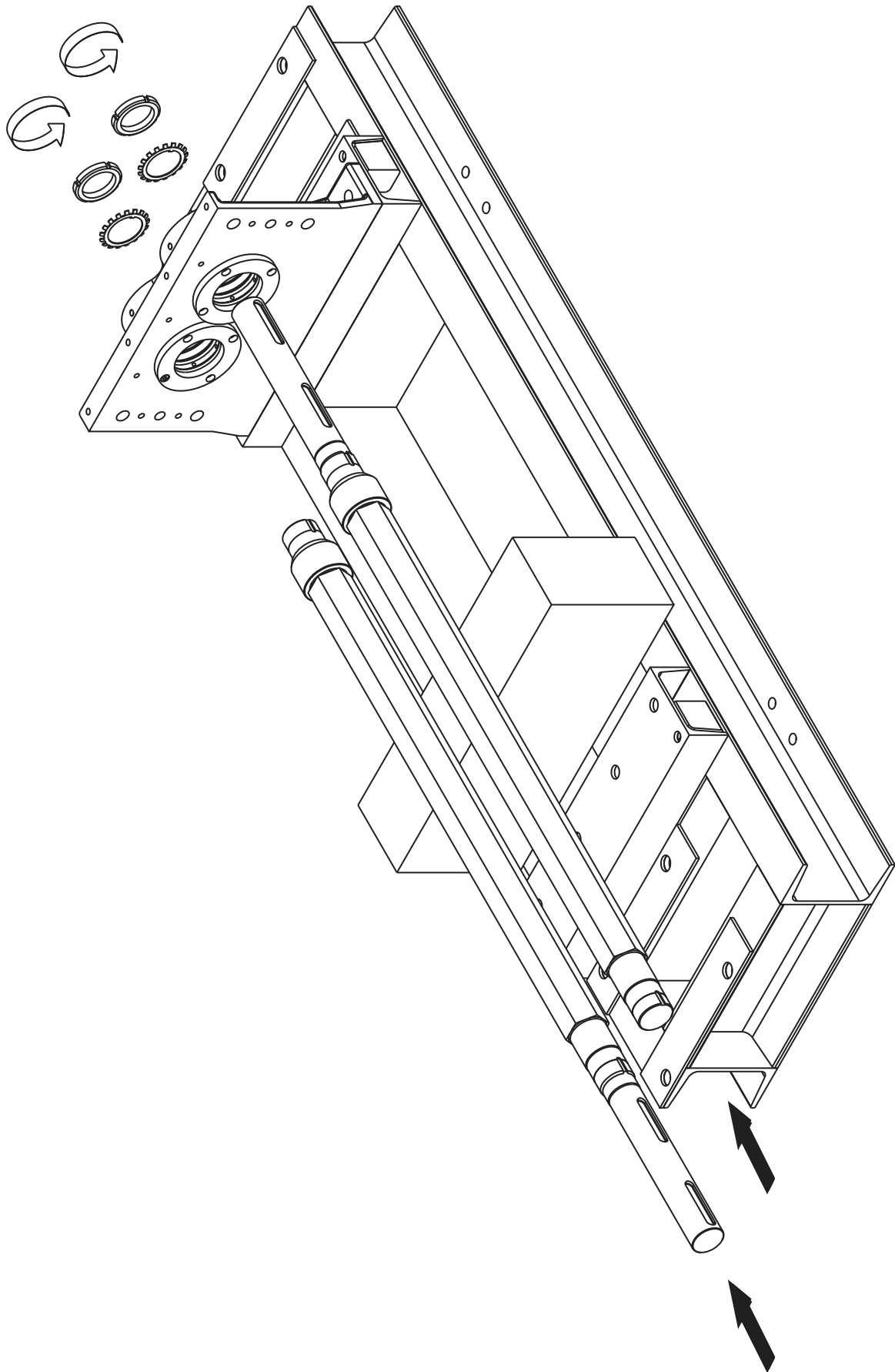
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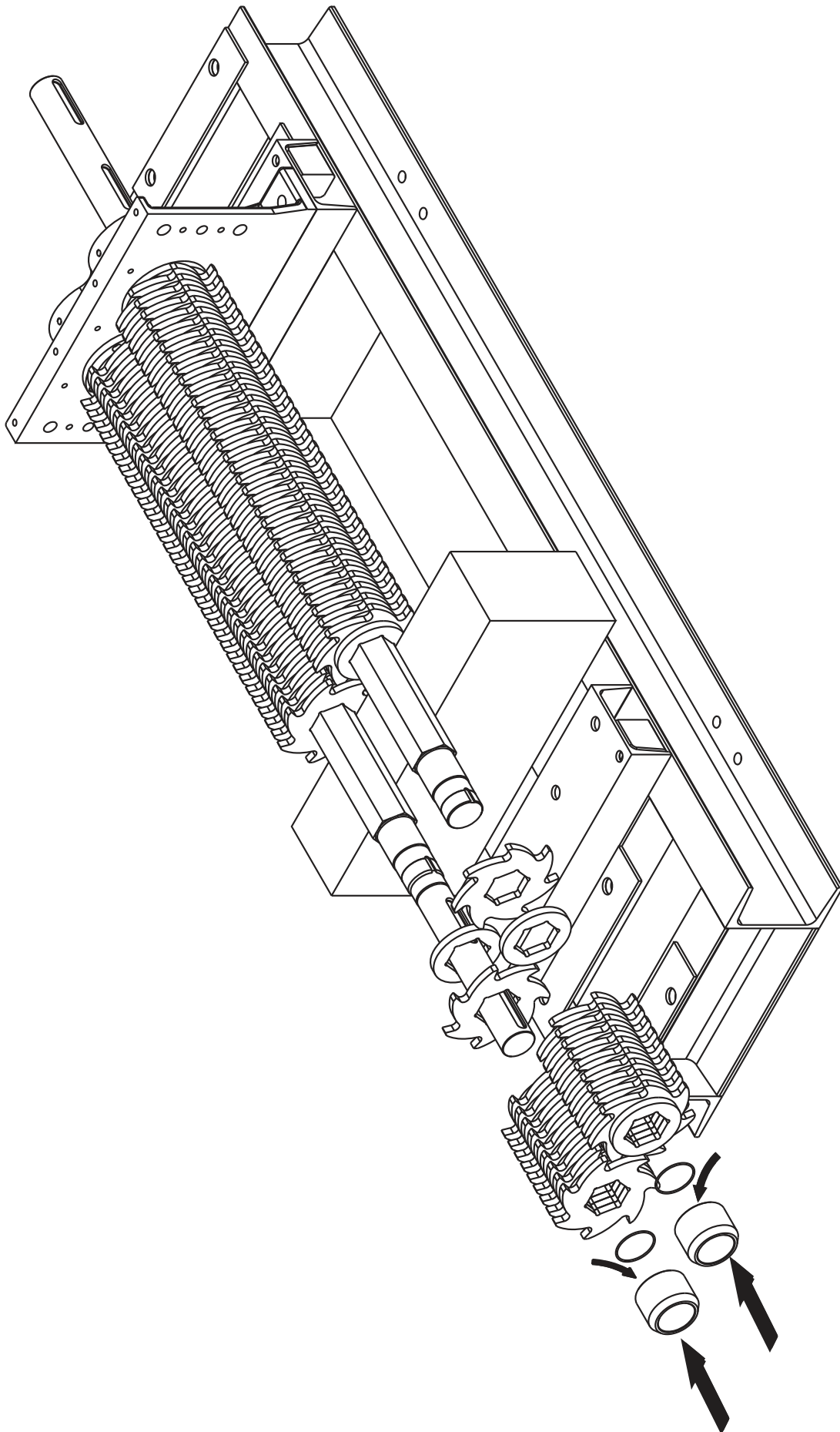
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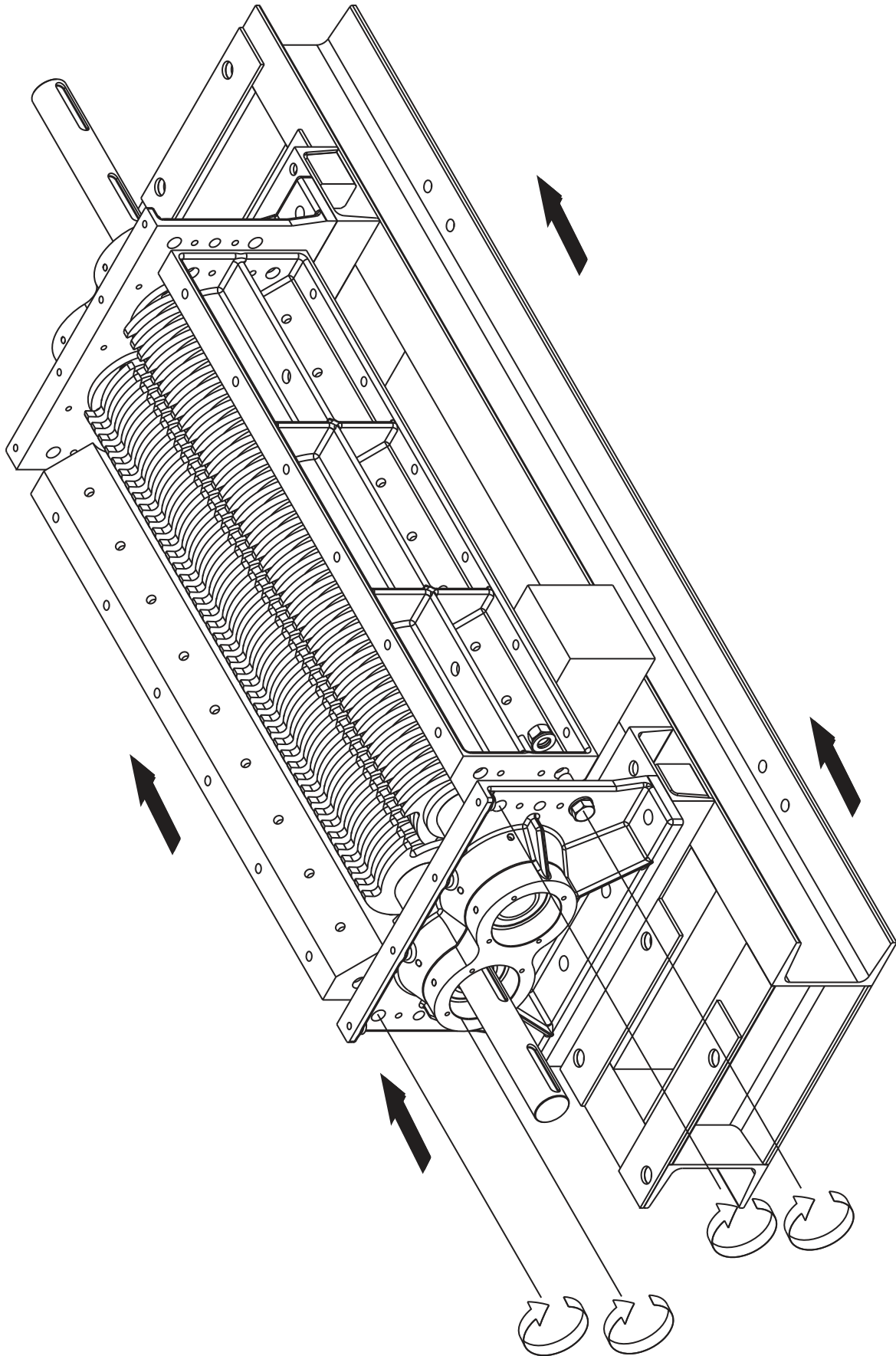
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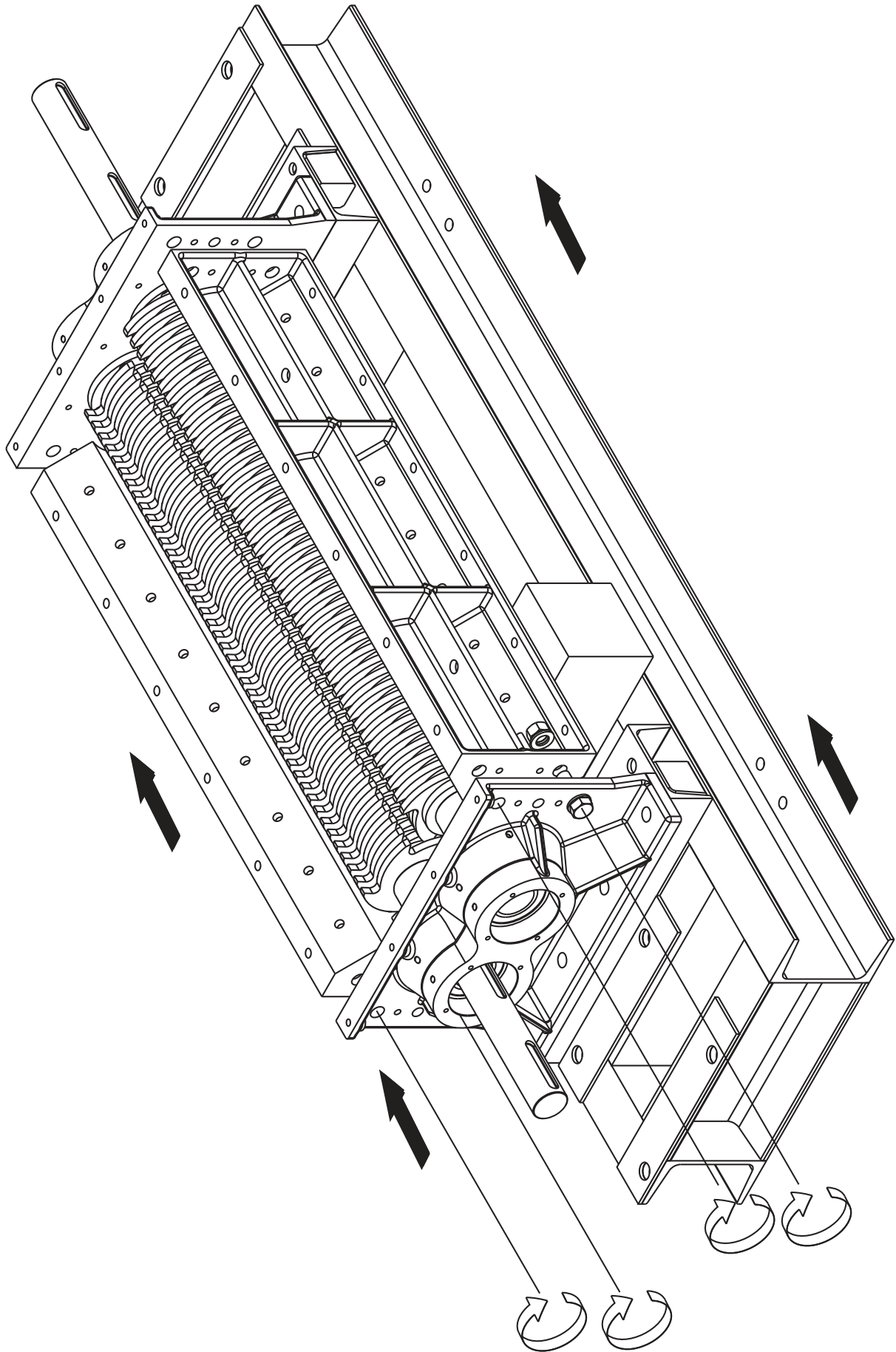
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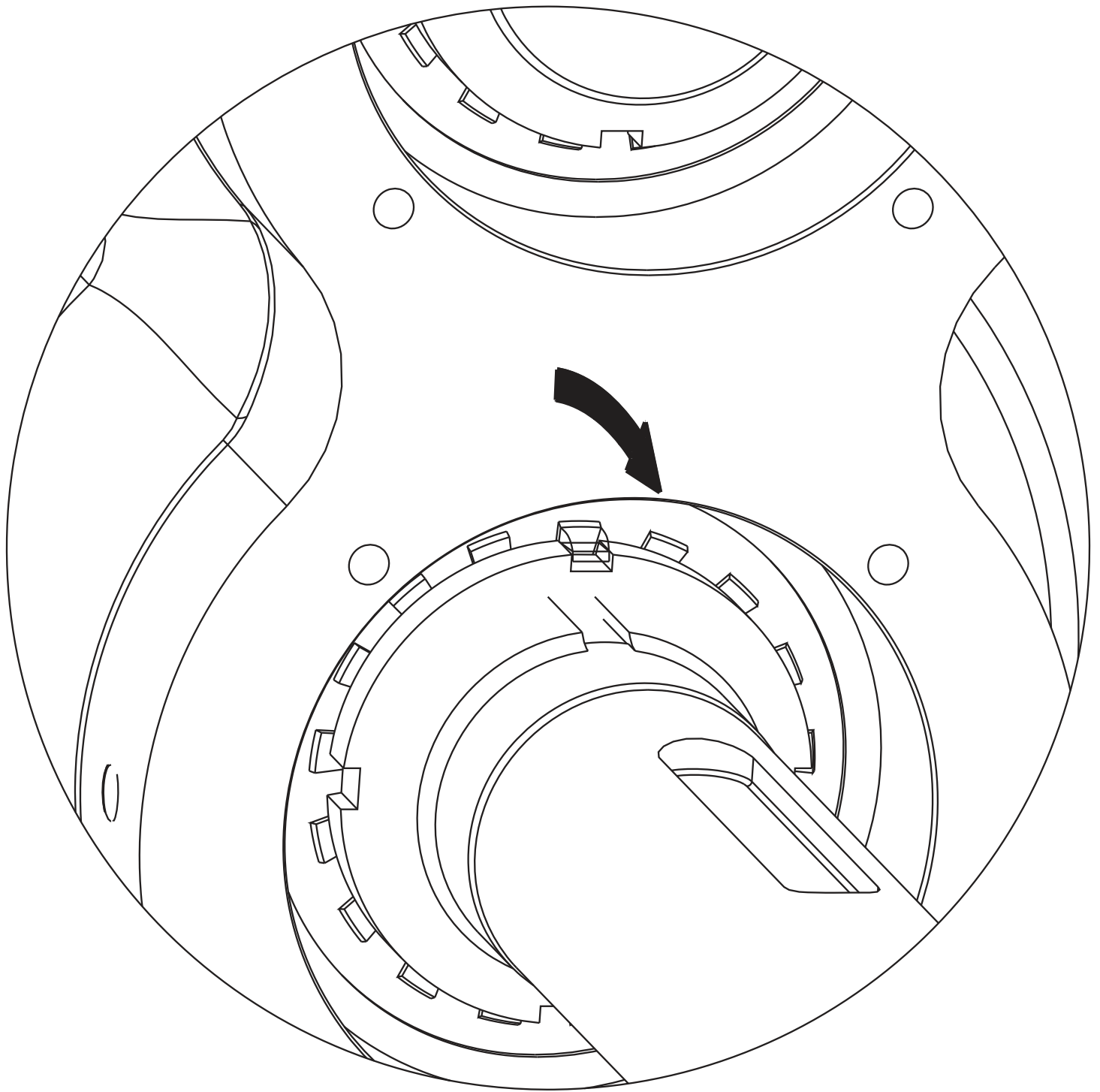
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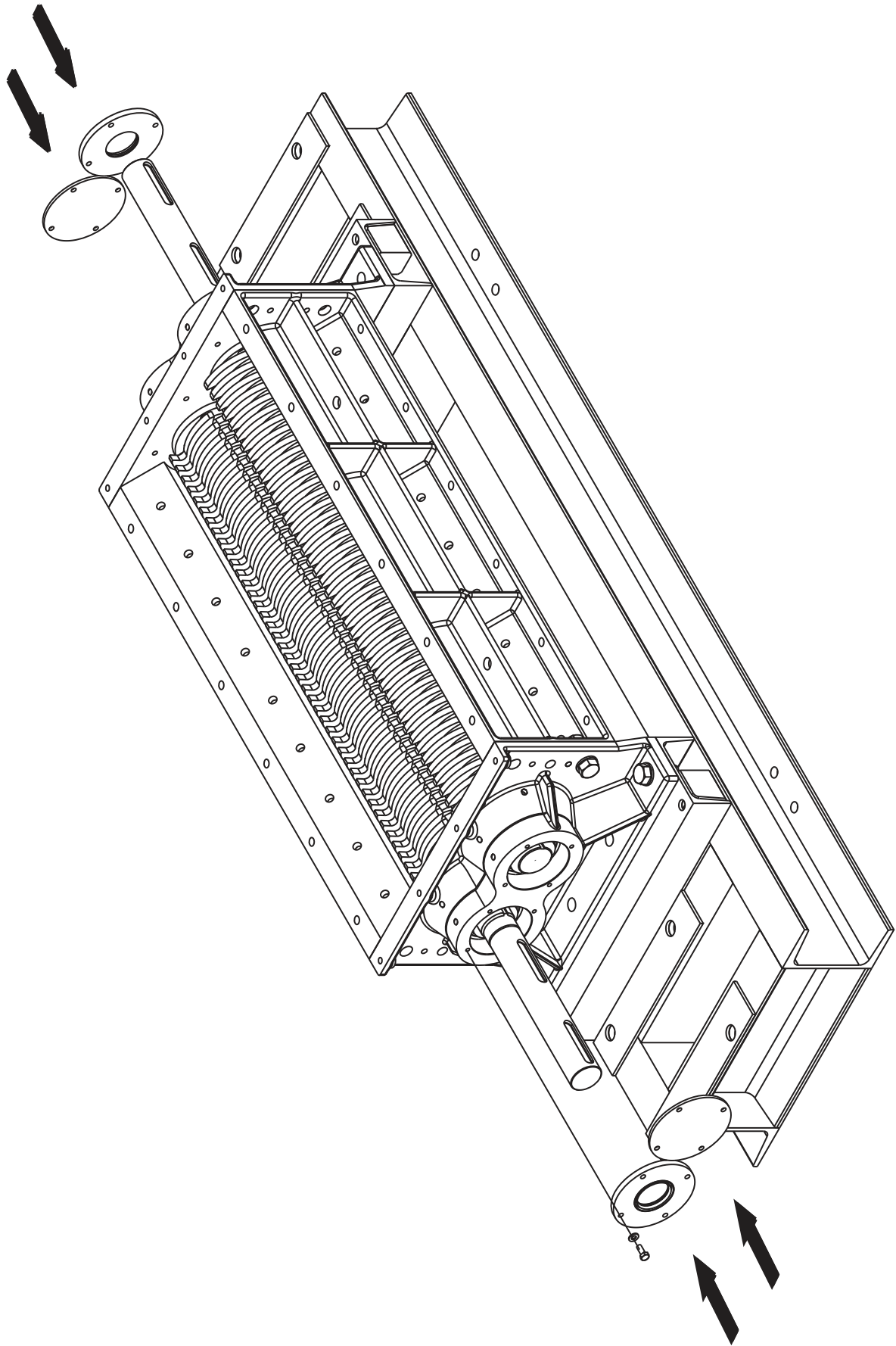
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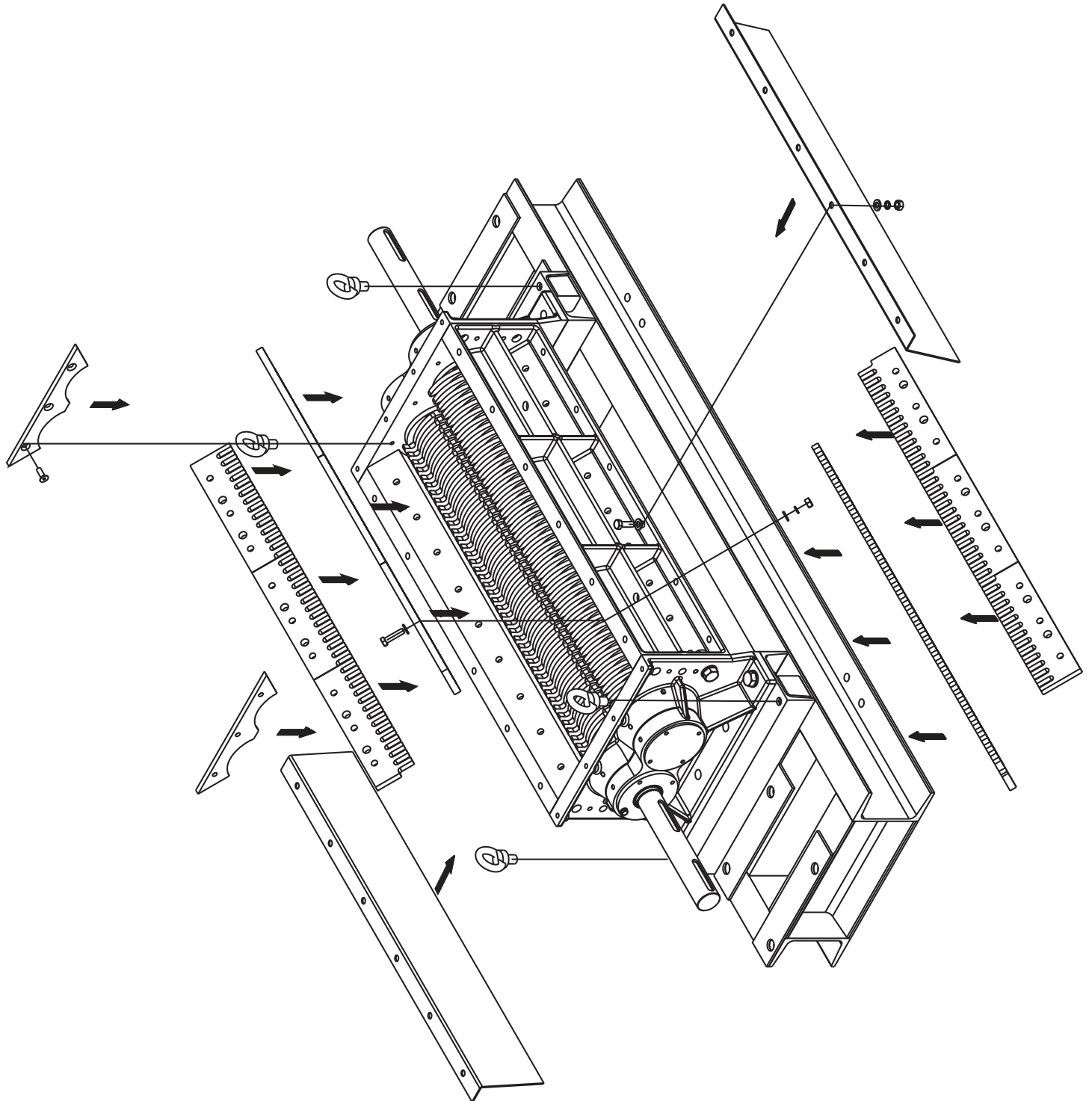
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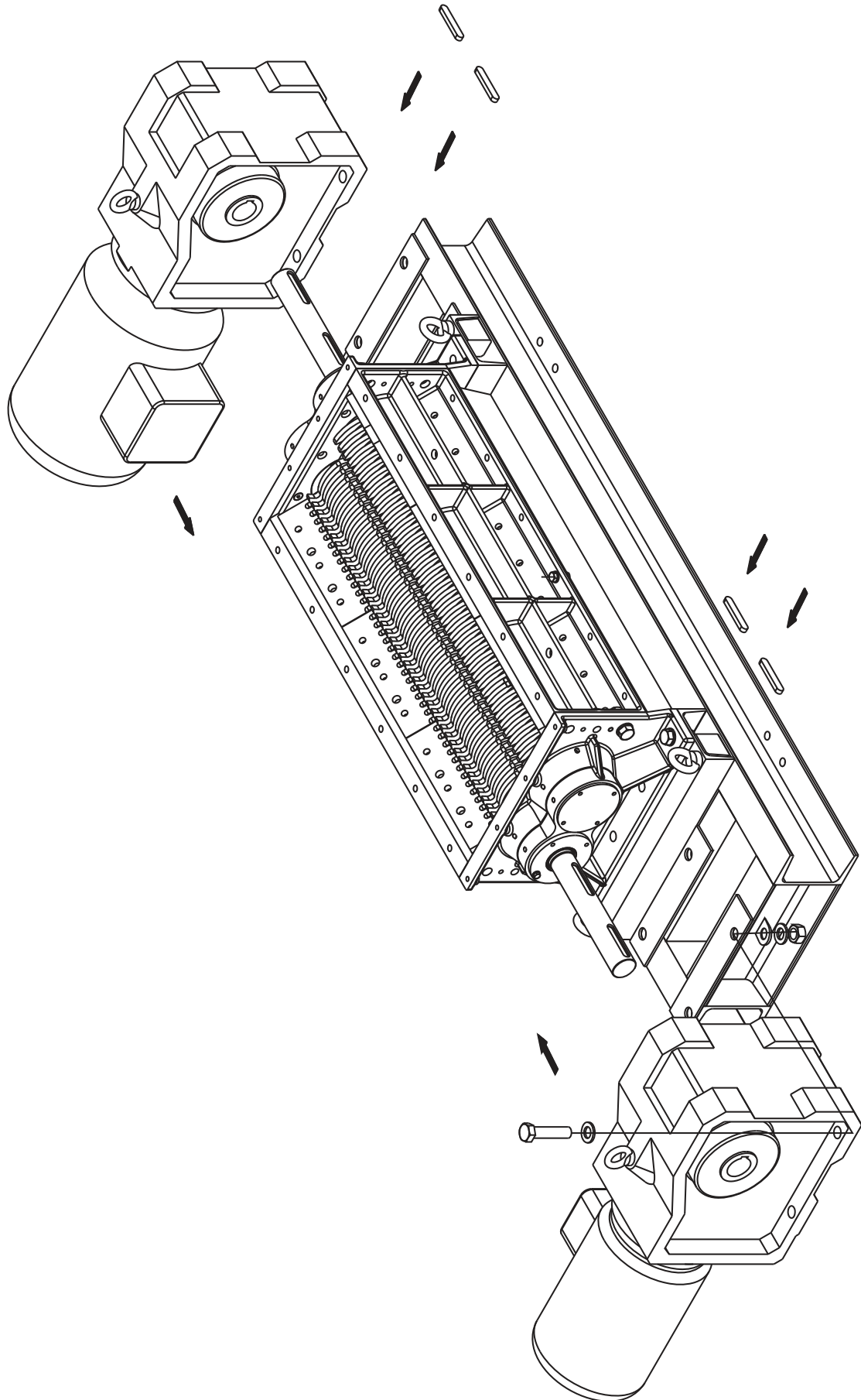
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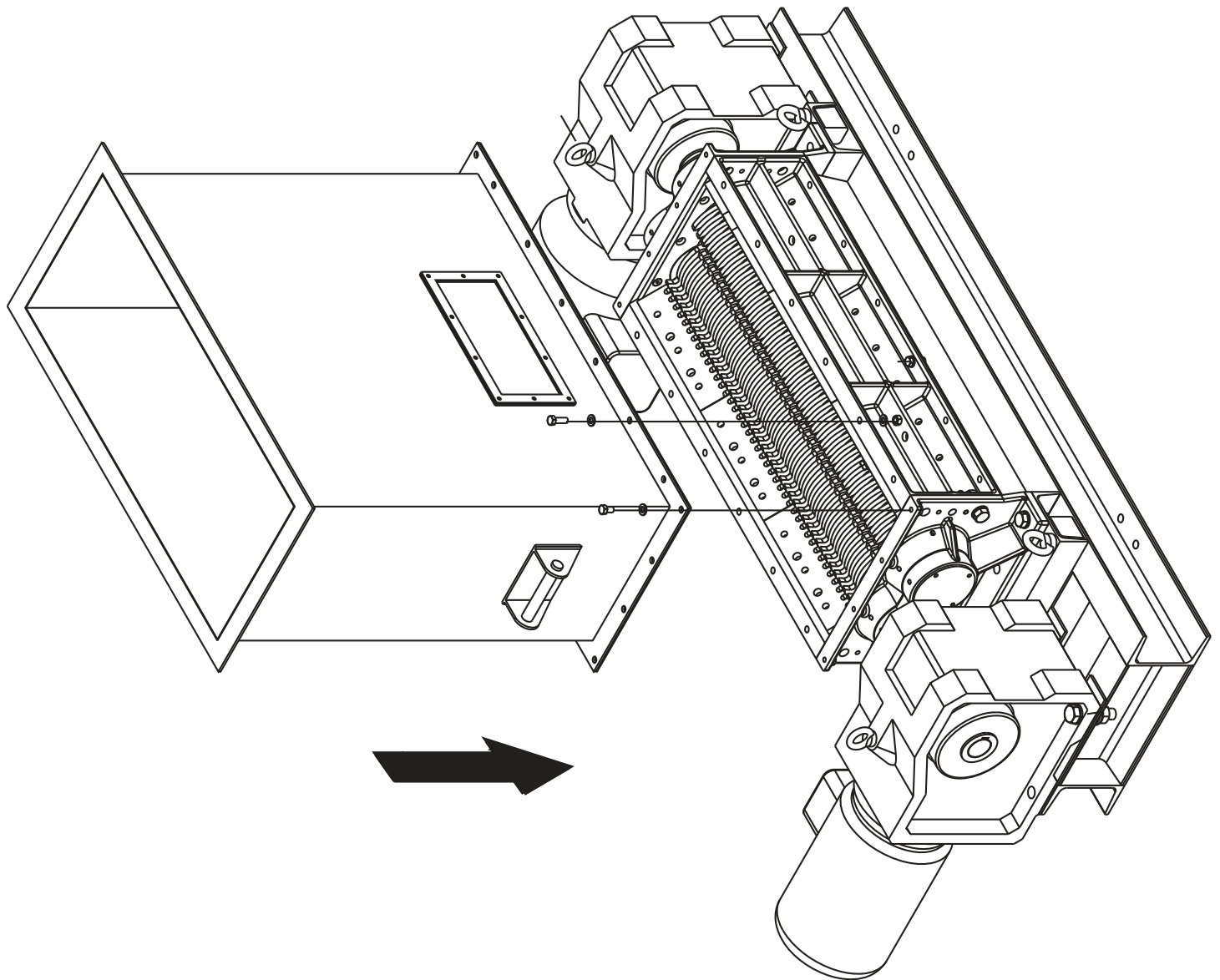
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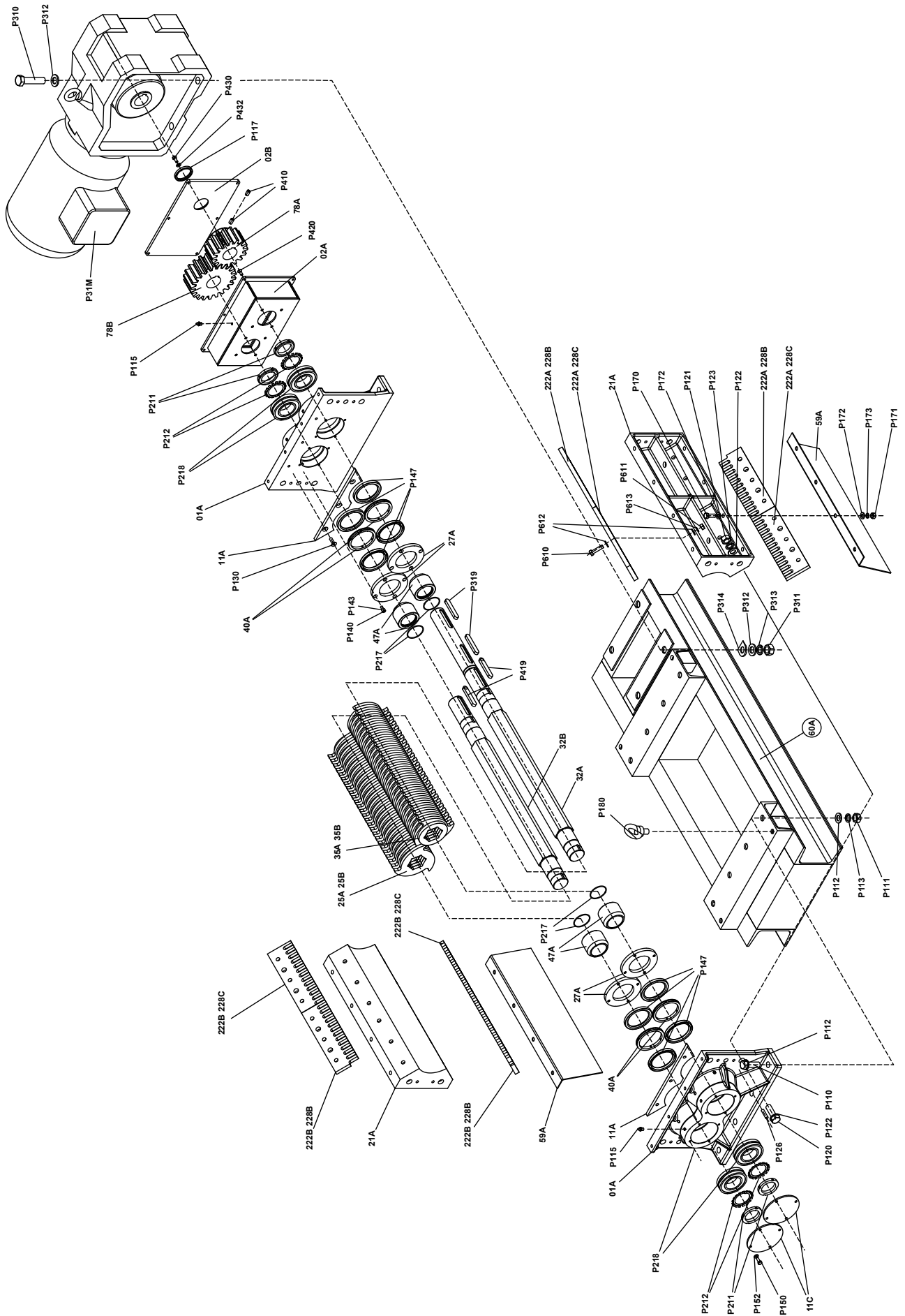
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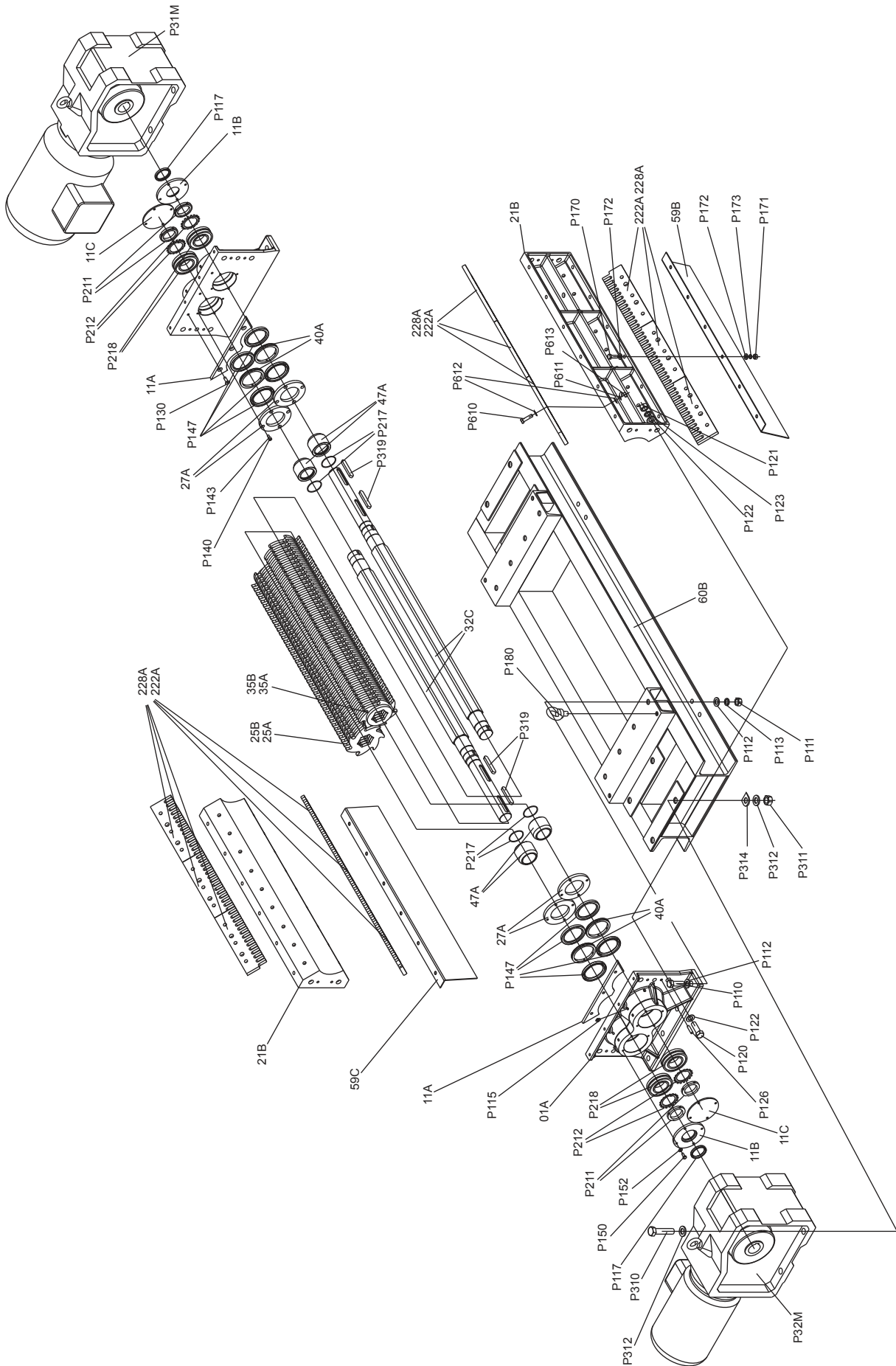
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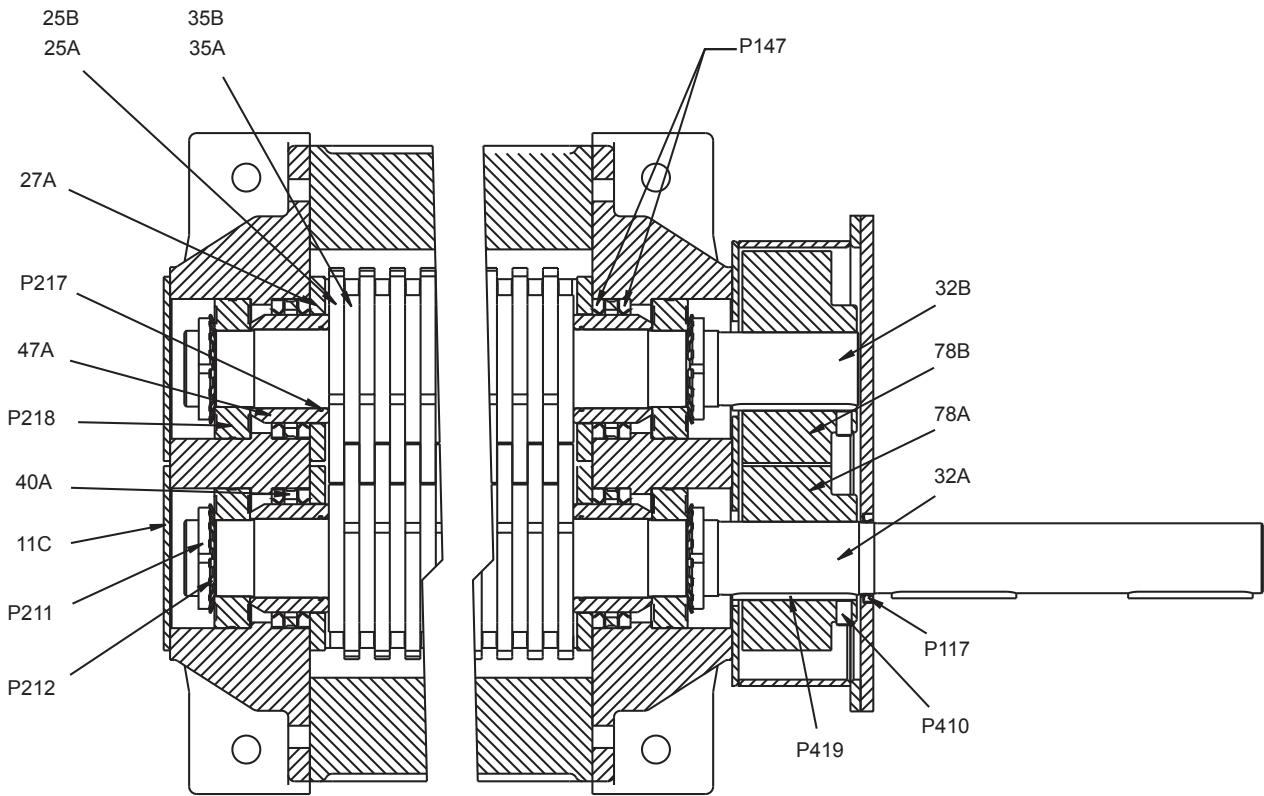
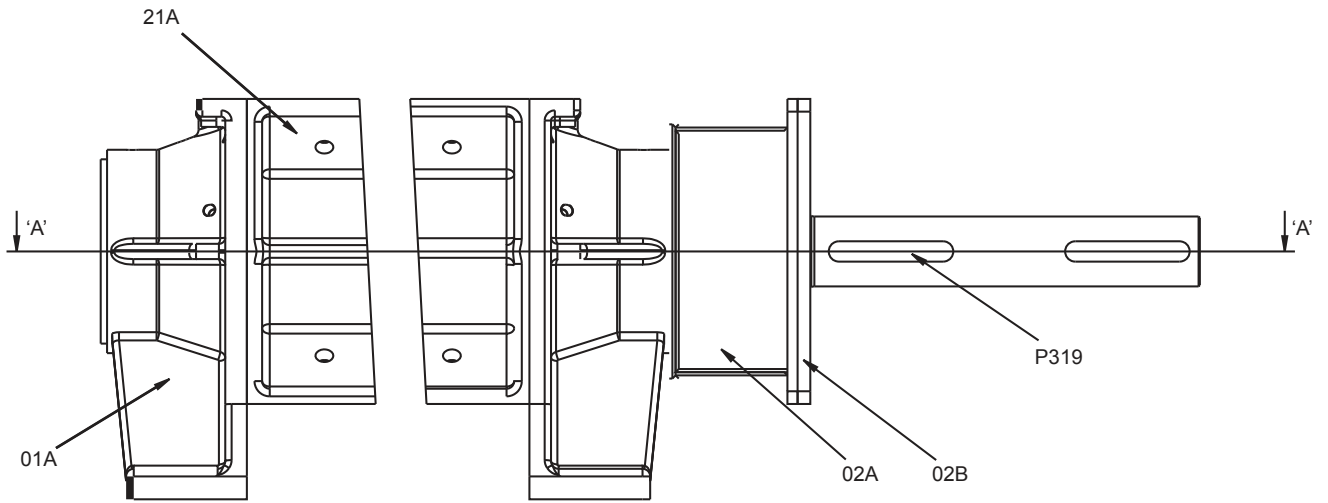
Exploded Views



Exploded Views



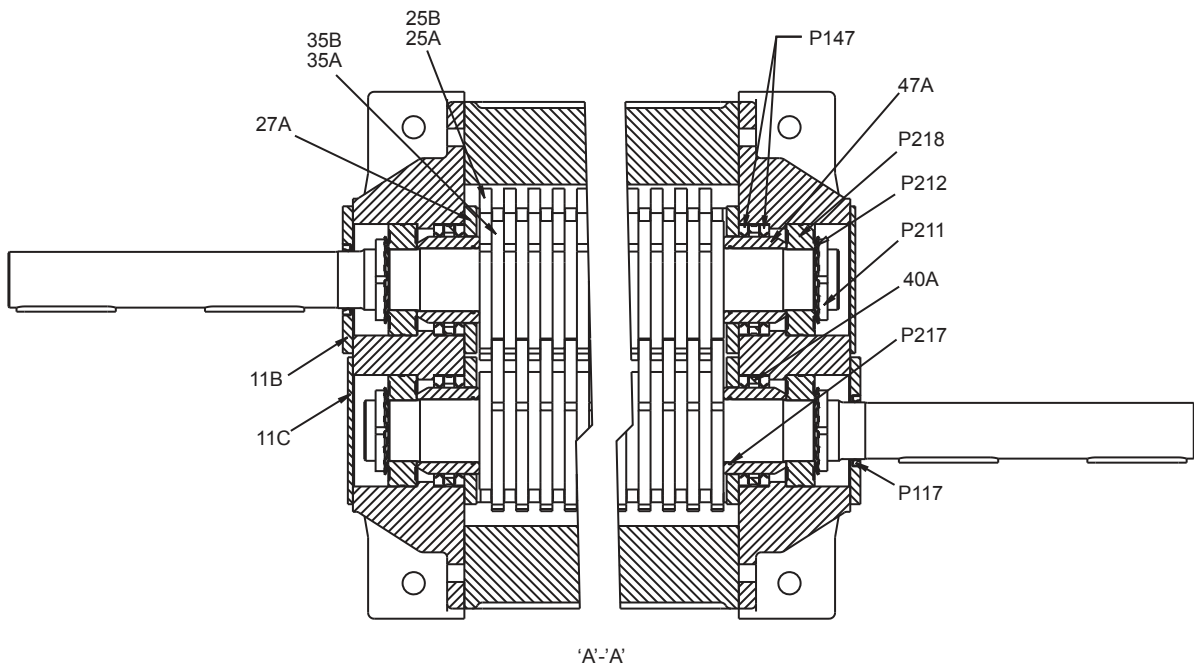
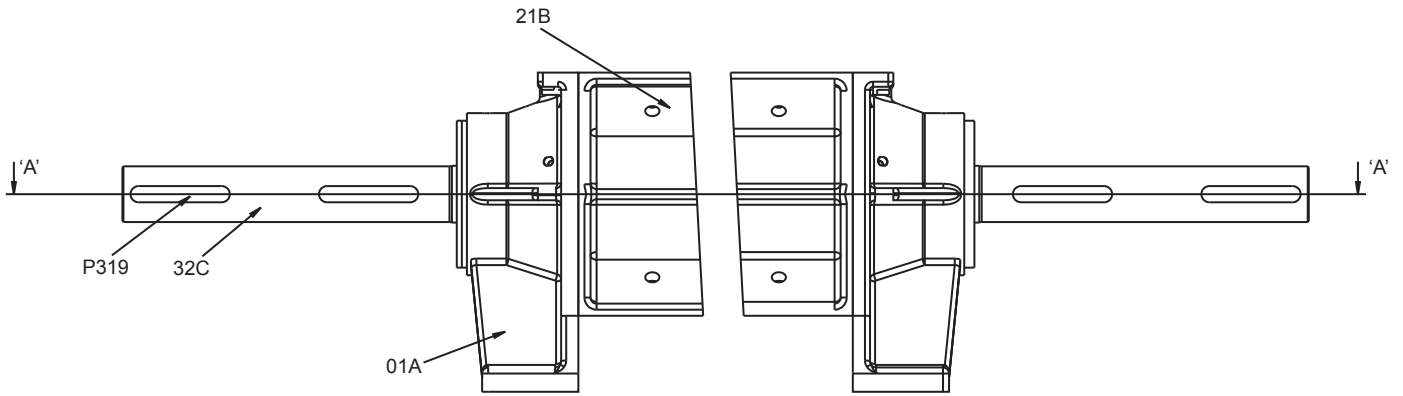
Sectional Arrangement



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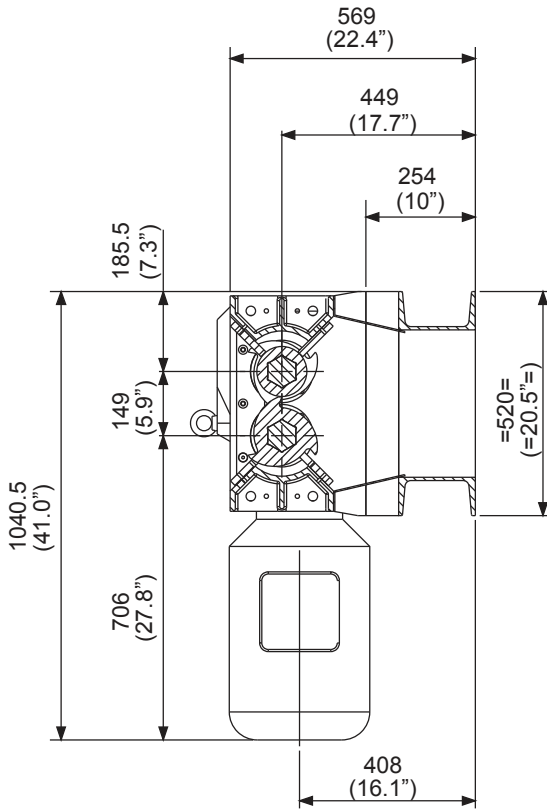
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Sectional Arrangement

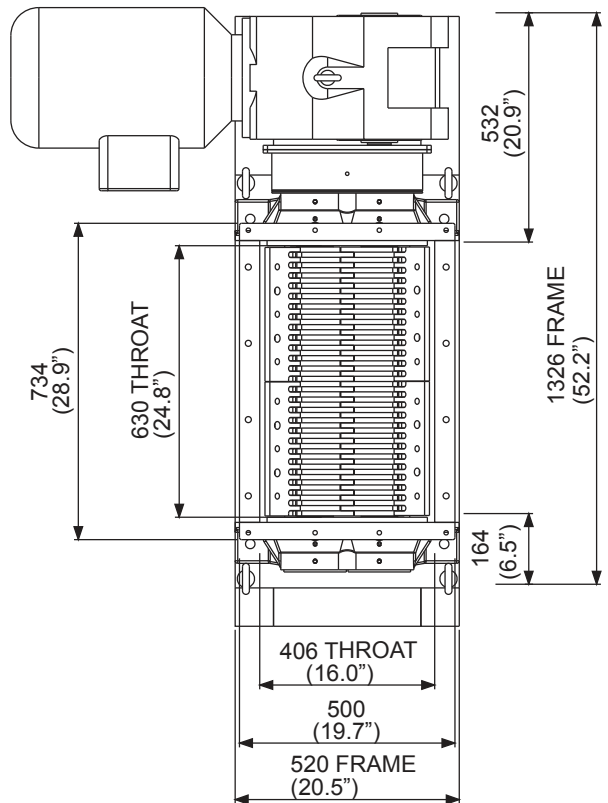
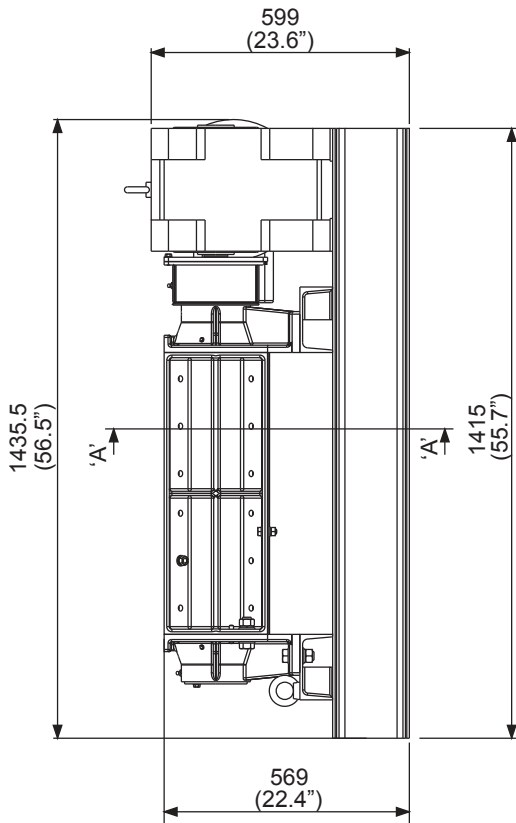
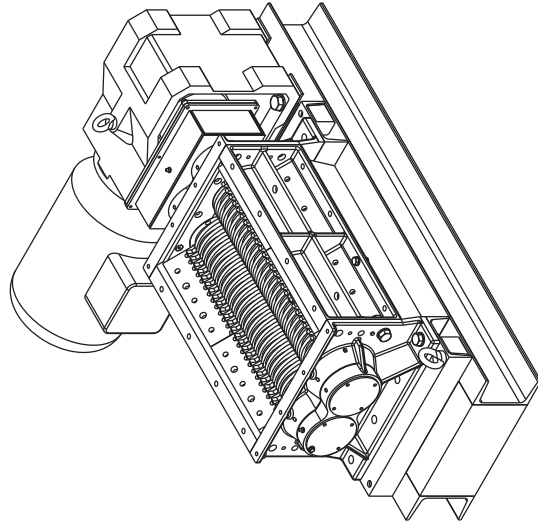


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General Arrangement

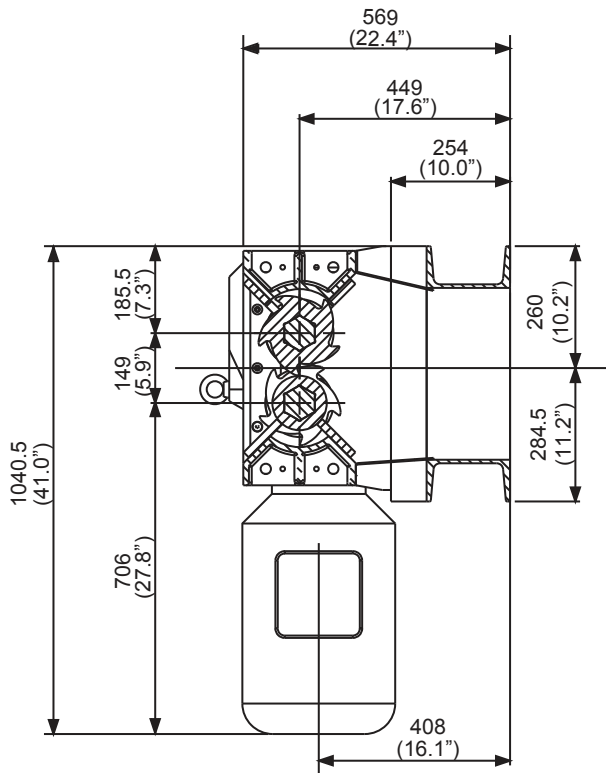


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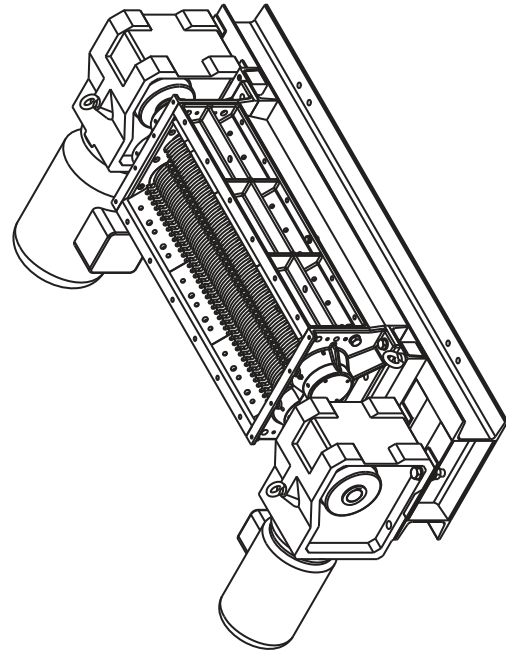


Drawing Number F06A 9910

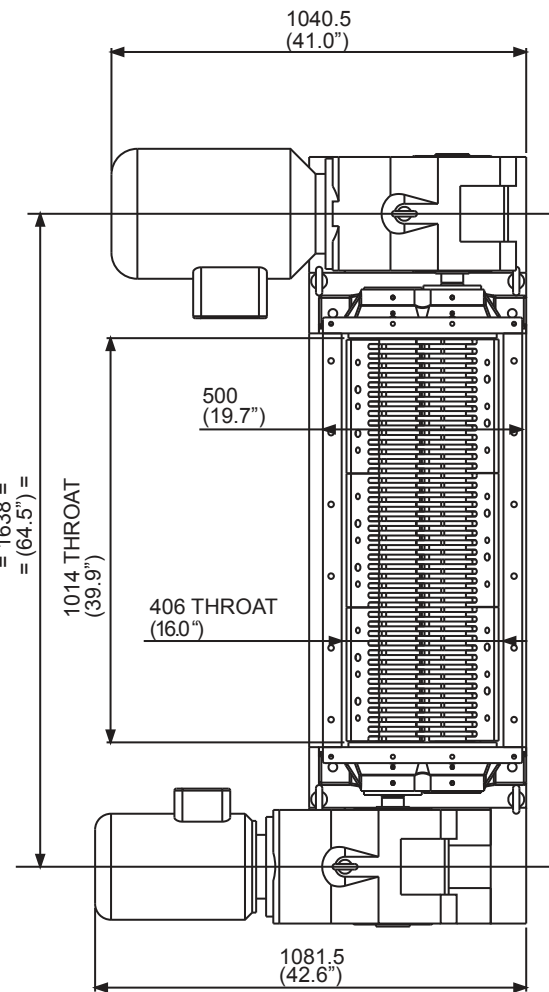
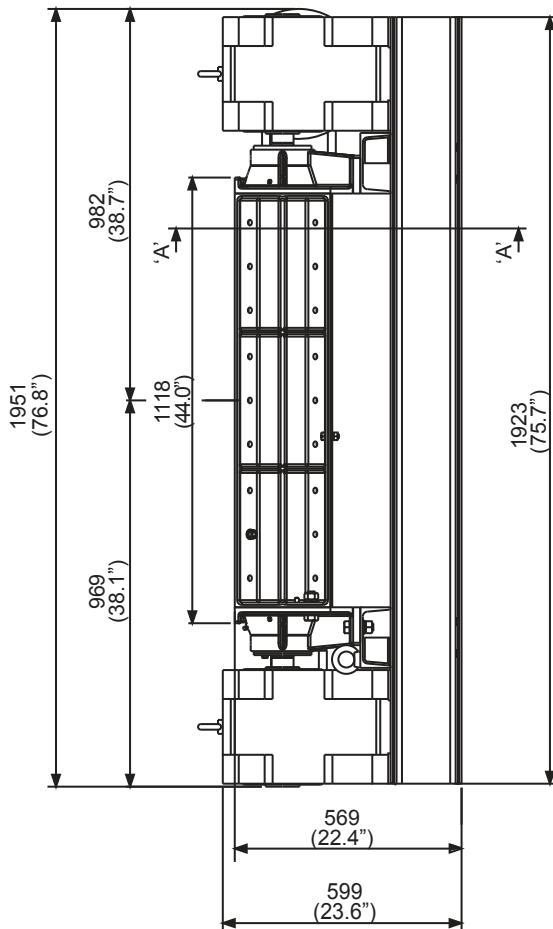
General Arrangement



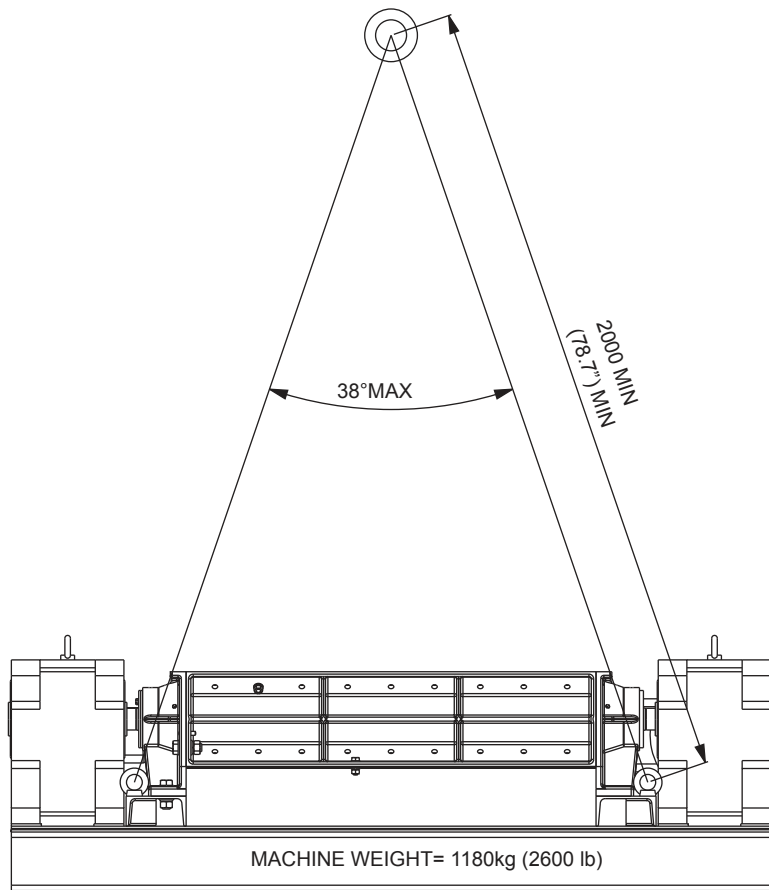
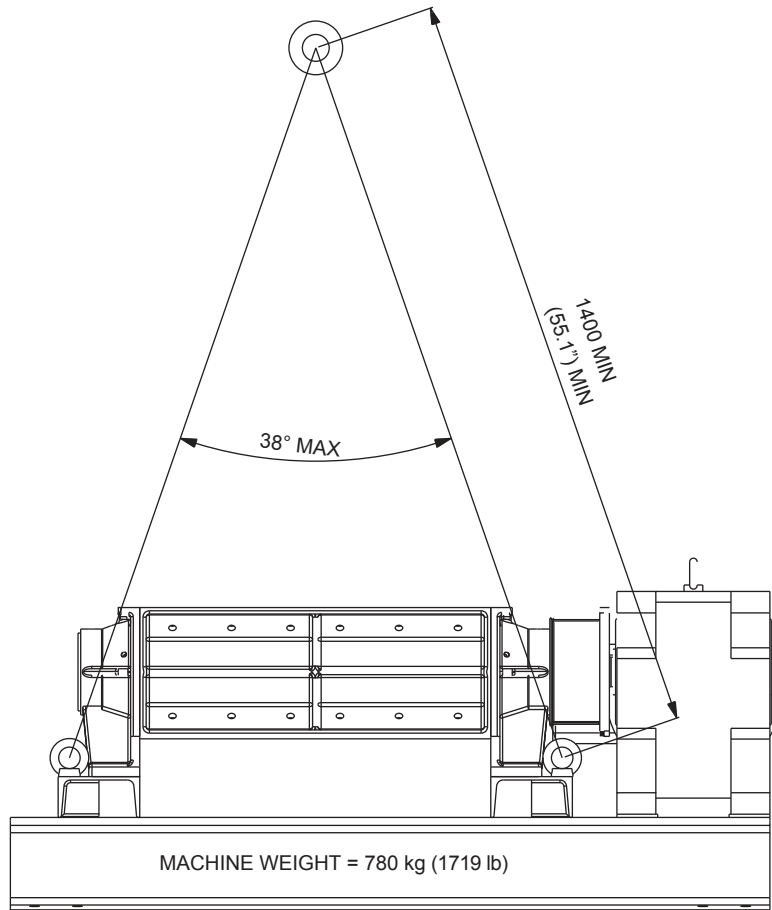
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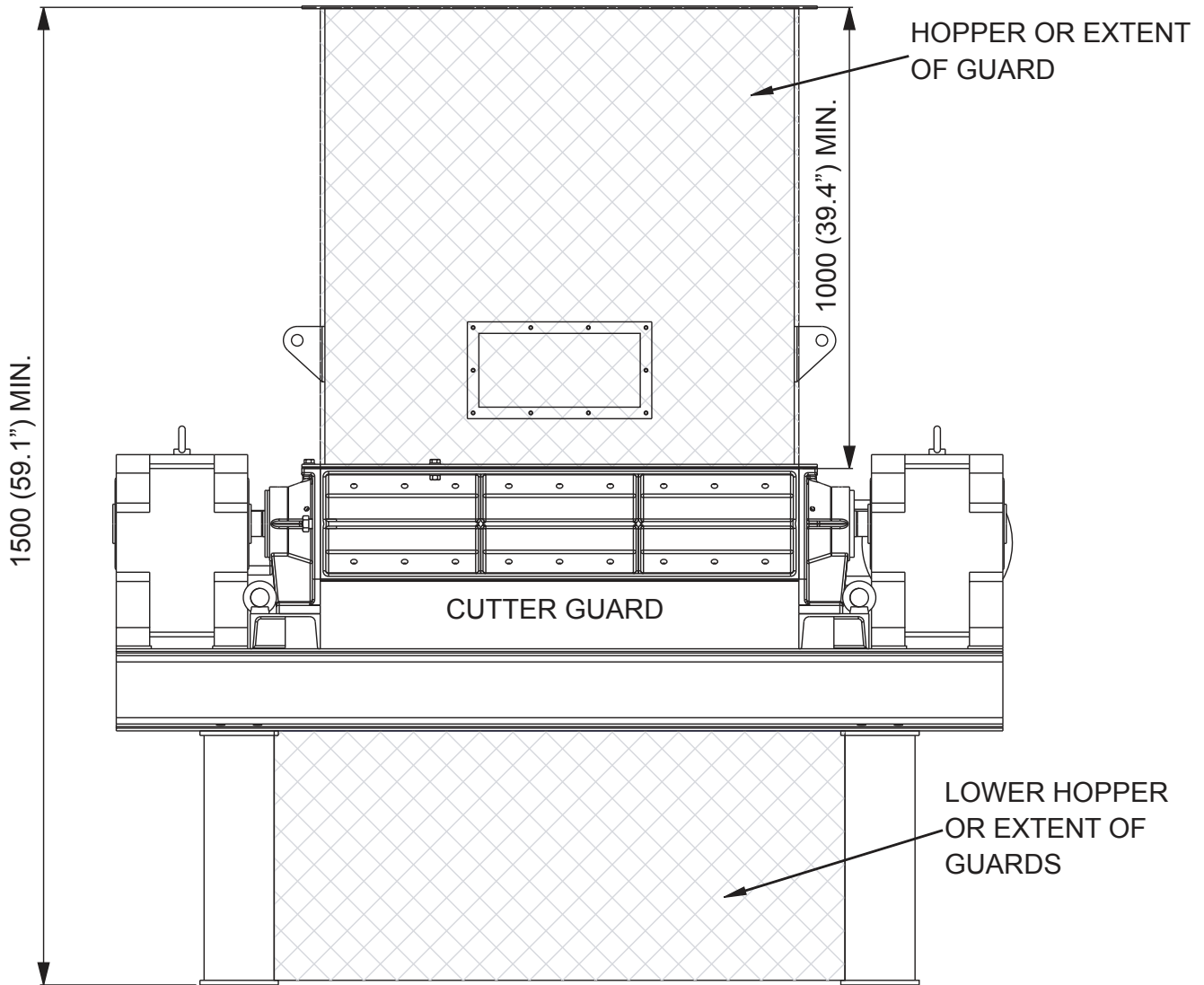
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Lifting and Guarding Diagrams



Lifting and Guarding Diagrams





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