INSTRUCTION MANUAL
ALLU PROCESSOR.

ALLU Stamix Oy

Jokimäentie 1, 16320 Pennala FINLAND
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1 INTRODUCTION

1.1 Description

The ALLU PROCESSOR mixing tool is a hydraulic excavator attachment.

2 GENERAL

All persons responsible for the commissioning, use, servicing or maintenance of the ALLU PROCESSOR mixer must read and understand the relevant parts of these instructions.

This user and maintenance manual or a copy of it must be stored in a place where it is easily available to the operator and/or maintenance staff.

The mixer may only be handed over to the user after the user has read and understood the content of the user manual.

In the event of any problems related to the commissioning, use, maintenance, repair, transport, storage or disposal of the machine that cannot be solved with the help of this manual, contact the seller, importer or manufacturer for assistance.

	**⚠ WARNING** COMPLIANCE WITH INSTRUCTIONS Read the manual before use or maintenance work, and always comply with the instructions provided. Incorrect handling of the machine may lead to a risk of death or serious injury.	

The user must comply with the instructions provided in this manual.

It is forbidden to make any such changes to the device or settings that are not permitted in this manual without written permission from the manufacturer.

2.1 The purpose of the instructions

The instructions are intended to promote safety and the appropriate, correct and cost-efficient use of the machine. This manual will help the user to identify, avoid and prevent dangerous situations and their consequences.

Operations must comply with these instructions; obey all locally applicable laws, decrees and regulations; and employ all locally dictated protective measures (such as practices for safe work methods).

Read this manual carefully and follow the instructions meticulously. If something is unclear, ask your employer or your nearest ALLU representative for clarification. Each part of this manual contains information that is important for your safety.

These instructions are also used in user training. Compliance with these instructions helps to keep maintenance costs and downtime to a minimum and the machine's reliability and durability optimal.

2.2 Identification

The mixer's model and serial number can be found on the machine plate. Check that the model matches the model list in this manual. It is important to indicate the serial number in any discussion about the machine – such as when ordering spare parts.

The machine plate is located on the top part of the frame on the right side of the machine.

Figure 1. The machine plate and its location on the machine

2.3 Manufacturer

This ALLU PROCESSOR mixer was manufactured by:
ALLU Stamix Oy
Jokimäentie 1
16320 Pennala
FINLAND
Telephone: + 358 3 882 140
Fax: +358 3 882 1440
Internet: www.allu.net
Email: info@allu.net

2.4 CE marking and declaration of conformity

The CE marking can be found on the machine plate. As it leaves the factory, this mixer meets all the health and safety requirements set forth in the Machinery Directive. The EC Declaration of Conformity is included in the machine's technical folder.
Store the EC Declaration of Conformity appropriately and ensure that it is also passed on to any new owner of the machine.

The content of the EC Declaration of Conformity

EC Declaration of Conformity

(2006/42/EY, Appendix II A, Directive 2000/14/EY)

The manufacturer: ALLU Stamix Oy

Of the address: Jokimäentie 1, 16320 Pennala, FINLAND

Declares that the ALLU Processor 300/500 HD, serial number ZZZ

conforms with the terms of the Machinery Directive (2006/42/EY)

and conforms with the terms of the Noise Emission Directive (2000/14/EY).

This conformity declaration is valid if the machine has not undergone any changes not approved by the manufacturer in writing.

N.N., authorised to compile the technical specifications for this machine

N.N., authorised to prepare this conformity declaration

Date: dd.mm.yy

Place: Jokimäentie 1, 16320 Pennala, FINLAND

2.5 The scope of the manual

This manual contains instructions for safety and on the use, transport, lubrication and maintenance of this machine in the state it was in when released from the factory.

This manual and the safety instructions, in particular, along with the EC declaration of conformity, are valid only if changes not approved by the manufacturer have not been made to the machine.

A different machine model may have been used for some of the manual's illustrations, or some covers or similar parts may have been removed to allow for clearer depiction of the situation.

Because the product undergoes continuous improvement and development work, some changes might have been made to it that are not reflected in this manual.

If you have any questions on the product or this manual, please contact your local ALLU representative.

2.6 The Processor models covered by this manual

PROCESSOR 300 - The mixer's frame is 300 cm long.
PROCESSOR 500 - The mixer's frame is 500 cm long.

This instruction manual applies to mixers manufactured after January 2018.

2.7 Copying

2.8 Definitions, terms and abbreviations

PROCESSOR	A hydraulic excavator attachment mixer designed for mixing binders.
Base machine	Excavator
Terminating resistor	CAN bus end terminal
Grid	Area on the worksite that is being processed
Binder	Additive used in the processing of material
Safety valve	A mechanical valve that restricts the pressure in the hydraulic system
Back pressure	Pressure that occurs at the processing depth inside the material

3 SAFETY AND THE ENVIRONMENT

3.1 Safety notations

The following safety notations are used in this manual:

DANGER

The danger sign refers to an imminent dangerous situation that causes a risk of death or serious injury unless steps are taken to avert it.

WARNING

The warning sign refers to a potentially dangerous situation that causes a risk of death or serious injury unless steps are taken to avert it.

	**⚠ CAUTION** The caution sign refers to a potentially dangerous situation that causes a risk of slight or moderate injury or damage unless steps are taken to avert it.

	**NOTE** A note contains instructions or describes pertinent regulations.

3.2 Explanations for symbols

Warning signs:

				
General danger	Hydraulic system max. 8 bar	Danger related to an exploding hose	Danger of crushing	Danger related to high-pressure oil spray

		
Hot surfaces	Risk of electric shock	Danger related to crushing of the hands or other body parts

DO NOT signs:

	
No unauthorised persons permitted in the danger zone	Do not put hands or fingers between moving parts

DO signs:

			
Read and observe the instructions for use	Maintain a safe distance	Use safety goggles	Use a respirator

			
Wear a safety helmet	Use hearing protectors	Use protective gloves	Wear protective clothing

3.3 Safety markings on the mixer

The following warning markings must be displayed on the Processor mixer. Any damaged or loose warning labels must be replaced.

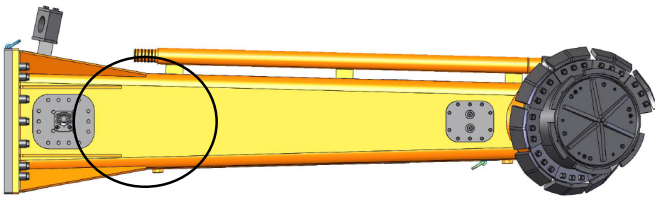


Figure 2. Warning labels on the mixer frame

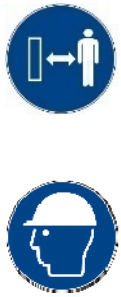
DANGER

RISK OF BEING CRUSHED OR FALLING UNDER A MACHINE

There is a risk of being crushed under a falling machine or component in the immediate vicinity of a machine during lifting operations!

RISK OF BEING CRUSHED OR FALLING UNDER A CYLINDER

There is a risk of being crushed under a falling machine or between a machine and an object in the immediate vicinity of machines!



WARNING

COMPLIANCE WITH INSTRUCTIONS

Read the manual before use or maintenance work, and always comply with the regulations and instructions indicated.

WARNING

HOT SURFACES

Always use personal protective equipment. Touching hot surfaces creates a risk of serious injury!

WARNING

HIGH PRESSURE

Switch off the base machine's motor and depressurise the compressed air and hydraulic system before connecting hoses or performing service operations.

	**WARNING** USE PERSONAL PROTECTIVE EQUIPMENT Exposure to noise, dust or flying objects may cause a risk of serious injury!	

	**WARNING** RISK OF HANDS GETTING CAUGHT BETWEEN MOVING PARTS Do not put hands or fingers between moving parts!	

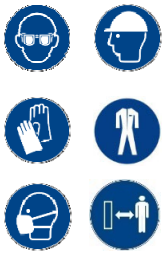
	**WARNING** HIGH-PRESSURE SPRAY Always use personal protective equipment. Depressurise the compressed air and hydraulic system before connecting hoses or performing service operations.	

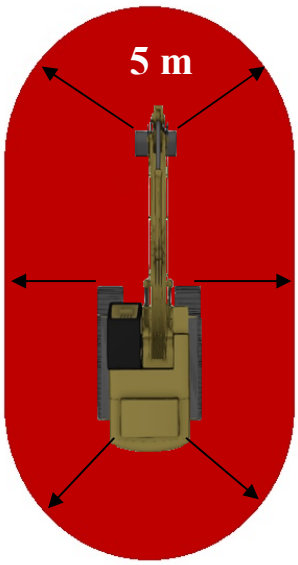
	**WARNING** RISK OF ELECTRIC SHOCK Always use personal protective equipment. Switch off the motor and remove batteries before maintenance.	

3.4 Danger zones and exposure to dangers during work

3.4.1 Danger zone I (5 m)

	**DANGER** Stop working immediately if you observe another person in danger zone I. Being crushed by the cylinder during operation or a work machine during a lifting operation creates a risk of death or serious injury within this zone. During a lifting operation, do not enter underneath the mixer while the machine is elevated!	

	**WARNING** Exposure to high-pressure binder spray within danger zone I causes a risk of death or serious injury. Remain at a safe distance from the feeding hose while the binder is being fed. Before connecting or inspecting the hoses, make sure the line is not pressurised.	

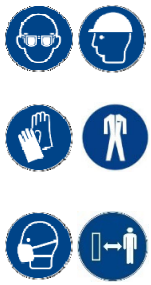


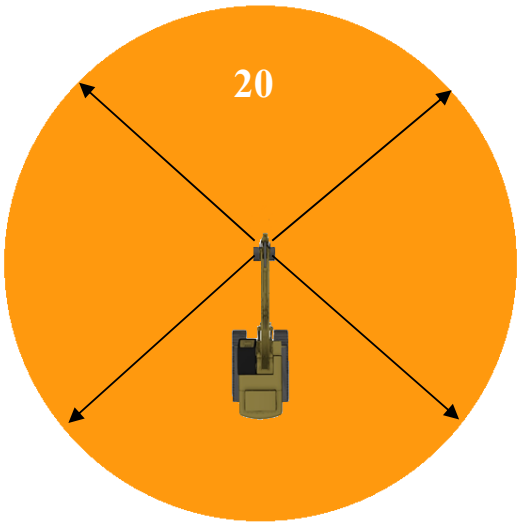
Danger zone I covers an area five metres in every direction from the mixer and the binder feeding hose. No unauthorised persons may enter the danger zone while the binder is being fed. Anyone within five metres of the machine is at risk from dangers related to binder dust, high-pressure oil spray, and machines moving or falling over. The user must observe the surroundings continuously and stop working immediately if an unauthorised person enters the area within five metres from the mixer or the binder feeding hose.

Figure 3. Danger zone I (5 m)

A protective structure must be installed for open-top base machines to protect the user from falling and flying objects.

3.4.2 Danger zone II (20 m)

	WARNING	
	Stop working immediately if you observe an unauthorised person in danger zone II. Exposure to high-pressure binder spray within danger zone II causes a risk of death or serious injury. Remain at a safe distance from the feeding hose while the binder is being fed.	



Danger zone II covers an area 20 metres in every direction from the mixer and the binder feeding hose. No unauthorised persons may enter the danger zone while the material is being mixed. Anyone within 20 metres of the machine is at risk from dangers related to noise generated by the base machine and binder dust. The user must observe the surroundings continuously and stop working immediately if an unauthorised person enters the area within 20 metres from the pressure feeder or the binder feeding hose.

Figure 4. Danger zone II (20 m)

If, under exceptional circumstances, another person has to enter the danger zones, the user must be made aware of this, so that they can take extra care when operating the mixer.

3.5 Exposure to dangers in connection with transport, use and maintenance

3.5.1 The device tipping over or falling

	DANGER	
	Comply with the instructions for lifting and transport, and use suitable and approved equipment when lifting the device. No one is allowed within five metres of a mixer that is being lifted or transferred. A mixer falling or toppling over causes a risk of death or serious injury!	

3.5.2 High-pressure spray

	WARNING	
	Switch off the base machine's motor and depressurise the binder feeding line and the hydraulic system from the pressure relief valve or by opening the connections carefully before connecting hoses or performing service operations. Exposure to high-pressure oil spray causes a risk of death or serious injury.	

3.5.3 Risk of explosion

	WARNING	
	RISK OF EXPLOSION Always use personal protective equipment. Remain at a safe distance from the feeding hose while the binder is being fed. Before connecting or inspecting the hoses, make sure the line is not pressurised.	

Seek medical assistance immediately if any binder or hydraulic oil comes into contact with your eyes or high-pressure spray penetrates your skin.

3.5.4 Electrical system

	WARNING	
	Switch off the base machine's motor and remove batteries before maintenance. Always use personal protective equipment. An electric shock creates a risk of death or serious injury!	

In the event of electric shock, seek medical assistance immediately!

3.5.5 Noise level

	WARNING	
	THE NOISE LEVEL MAY EXCEED 85 dB (A) Always use personal protective equipment. Exposure to loud noise creates a risk of serious injury!	

3.5.6 Hot surfaces

	**⚠ WARNING** Switch off the base machine's motor and wait for the surfaces to cool down before maintenance. Touching hot surfaces creates a risk of serious injury! Always use personal protective equipment.	

In the event of a burn, seek medical assistance immediately!

3.5.7 Environmental damage

	**⚠ CAUTION** Stop working immediately if you observe leakage of oil or another lubricant. Switch off the base machine's motor and depressurise the compressed air and hydraulic system. The compression air system can be depressurised from the pressure relief valve or by opening connections carefully.	

Minimise environmental damage by using solid material such as sand or peat to absorb the leaking lubricant or by placing a basin underneath the leak. Dispose of the contaminated sand or other material in an appropriate manner.

3.6 User responsibilities and general safety instructions

	**⚠ WARNING** The Processor mixing tool should only be installed, used and serviced by a person who has read and understood this manual and has the knowledge, skills and experience required for safe and appropriate work methods. Always adhere to all general and specific safety regulations and take the relevant measures. Incorrect installation, inappropriate use, or incorrectly performed maintenance of the machine creates a risk of death or serious injury!	

The user must find out in advance any country- or project site-specific safety regulations on the use of protective personal equipment, safety of the machines and work methods when using the mixer and must comply with the said regulations. This owner's manual must be kept in a documentation box stored in the cabin of the base machine, so that the instructions are readily available.

Special attention must also always be paid to the safe use of the Processor mixer. Some important safety matters are listed below.

The following are general regulations, prohibitions and instructions to which the user must adhere:

- Read this manual carefully before starting any operation.
- Do not perform any measures if you are not certain of the consequences.
- The user must familiarise themselves with the features of the mixer, including depressurisation of the hydraulic system and the binder feeding function.
- The mixer must never be used when under the influence of alcohol or illegal substances.
- The mixer must never be used for transporting people.
- The mixer must never be used for transporting objects.
- The mixer must never be used as a support pillar for the base machine.
- All general work safety and fire safety regulations must be complied with when using, maintaining, repairing, transporting or cleaning the Processor mixing tool, for example.
- Ensure that the Processor mixing tool is properly mounted onto the excavator and that it will not cause any danger to people or damage any objects, even if it comes loose.
- Before detaching the Processor mixing tool, ensure that the machine is on a flat surface and that it cannot fall or tilt, causing danger to the person detaching it.
- Before using the Processor mixing tool, ensure that the excavator meets the requirements set in this manual.
  If a party other than ALLU or the customer performs the settings or adjustments before this instruction manual is available, all the settings and adjustments must be inspected afterwards in collaboration with the party in question.
- The mixer must never be serviced, inspected, repaired or inspected while the base machine's motor is running.
- Before disconnecting hydraulic pipes or hoses, ensure that the line is not pressurised.
- Before disconnecting the binder feeding hose connections, ensure that the line is not pressurised.
- The mixer is operated from the excavator cabin.
- Do not exit the cabin while the drums are rotating.
- Allow the hot hydraulic oil and hydraulic motor and other hot surfaces to cool down prior to commencing any service, maintenance, cleaning or other similar work.
- Remember that the safety area must extend 20 metres in all directions of the Processor mixing tool.
- The operator must always stop working when another person enters the danger zones.
- Keep all hatches and covers fastened while the machine is in operation.
- The user must inform other persons on the project site when, for instance, the machine is being moved to a different location or is being transferred, to prevent people from unintentionally entering the danger zones.
- The operator must always use the personal protective equipment required by the operating environment, conditions and regulations.

3.7 Intended use and operating environment

3.7.1 Purpose of use

The Processor mixing tool is designed for mixing different binder materials together with soft materials.
The mixer is operated from the base machine's cabin. During mixing, the mixer should move up and down at a constant speed without quick accelerations, collisions or strikes. During mixing, keep the tool in a vertical position.

3.7.2 Operation range

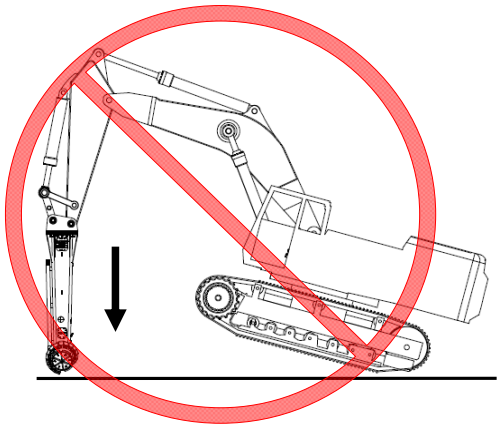
 	**⚠ DANGER** Do not use the mixer in an environment with an ignition or combustion risk! A fire or explosion resulting from a spark causes a risk of death or serious injury!

- The mixer is only to be operated outdoors and in indoor spaces suitable for work with such machines.
- The device's intended operating temperature range is -10 °C to 45 °C.
- Use of the mixer partially underwater is forbidden without project site-specific risk assessment and safety measures, due to the risk of an oil leak.
- In work with hazardous or toxic materials, the appropriate safety measures and personal protective equipment must be in use.
- The windows and doors of the base machine must be kept closed to reduce exposure to dust.

3.7.3 Unanticipated and incorrect use

The mixer is intended for the mixing of various binders with soft soil materials being processed, as described in this manual. 'Unanticipated and incorrect use' refers to all use that is not in line with this manual.

- The mixer must not be used for moving, transporting or lifting objects
- The mixer must not be used for felling or crushing trees
- The mixer must not be used for crushing stones
- The mixer must not be used as a support when turning the excavator
- Hydraulic power that exceeds the limit set for the hydraulic system must not be used with the mixer



All operations that are prohibited or warned against or that are not specified as anticipated use in this manual are deemed examples of incorrect use.
Use that violates work or fire safety instructions and unanticipated use are also considered to constitute incorrect use.

3.7.4 Repairs and changes

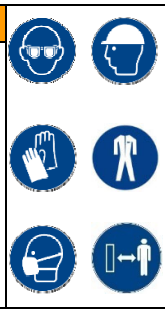
These devices are only to be repaired and equipped with genuine ALLU spare parts and accessories.
It is forbidden to make any changes to the mixer without written permission from the manufacturer.

Hydraulic connections must always be opened with great care.
Use the protective personal equipment required by the working conditions and project site-specific regulations.
High-pressure hydraulic fluid jets can penetrate the skin and cause severe blood poisoning.

The feeding hoses and pipes for the binder must be inspected regularly. Replacing hose clamps in conjunction with the replacement of hoses is recommended. Any hose clamps that are in poor condition must also be replaced.

Before disconnecting the binder supply hoses, the system must be inspected to ensure that it is not pressurised.

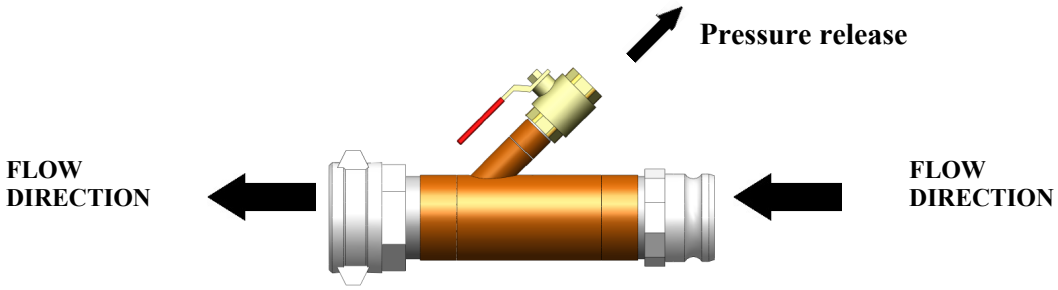
3.8 Safety equipment

	⚠ **WARNING** A binder feeding component that is worn or damaged may result in a risk of a serious injury. Always use safety equipment intended for the feeding line! Always use personal protective equipment!	

The maximum pressure for the binder feeding line is 8 bar. Because of this, it is essential that safety instructions are complied with and that appropriate care is taken when operating the mixer.

The feeding line may be clogged. The reason for the pipes becoming blocked may be lumpy or poor-quality binder that contains stones of various sizes or alternatively the mixer's nozzle may be blocked.
Pressure release pipes can be used to ensure that the feeding line connectors can be disconnected safely. These pipes are delivered as part of the Processor mixing tool's safety equipment (see the figure below). Before disconnecting the feeding hose connectors, ensure that the line is not pressurised by opening the pressure relief valve.

The pressure release pipe is installed on the joints of the binder feeding hose, as shown in the figure below. If you suspect that the feeding line is clogged, you must open the pressure relief valve to release air pressure before disconnecting the connectors. After this, the connectors can be disconnected safely.



Pressure release pipe

The safety equipment also includes safety cables (see the figure below).

Safety cable

Safety cables must be used in the binder feeding line in the areas of the hose connectors to prevent the hose from swaying if the hose or the connector unexpectedly becomes loose.

The safety cables' loops must be placed on either side of the feeding hose connections. The safety cable keeps the feeding hose ends together if the joint becomes loose accidently and reduces the risk of injury on the worksite.

4 TRANSPORT, LIFTING AND STORAGE

4.1 Transfer, short distances (with the excavator)

When the excavator is transported to a new place, the Processor mixing tool can be transported while attached to it without any special measures. However, it is recommended that the Processor mixing tool is kept vertical when the excavator is moved. Do not use the Processor mixing tool as a support pillar when you turn the excavator.

4.2 Lifting

	DANGER	
 	RISK OF BEING CRUSHED OR FALLING UNDER A MACHINE There is a risk of being crushed under a falling machine in the immediate vicinity of a machine during lifting operations! Do not go underneath the mixer while the machine is elevated!	 

The mixer may only be lifted using the lifting fixtures on its frame. Lifting equipment must be used as shown in the figure in the section 'Transport'.

The operator must prepare a lifting plan prior to the lifting operation.

Always use lifting equipment of the correct size that is in good condition.

The operator must ensure that no unauthorised persons are present in the danger zone because being crushed under the machine or between the mixer and another object causes a risk of death or serious injury.

4.3 Transfer, long distances (detached from the excavator)

WARNING! Before detaching the Processor mixing tool, ensure that the machine is on a flat surface and that it cannot fall or tilt, causing danger to the person detaching it.

NOTE! When the Processor mixing tool is detached from the base machine, the hydraulic fittings and hoses must be plugged to prevent hydraulic oil from draining from the hydraulic motor and dirt from entering the hydraulic system.

When the Processor mixing tool is transported without the excavator, make sure that it is properly secured to the platform.
Transferring and securing the load for transport is the sole responsibility of the transport vehicle's driver.
Before the Processor mixing tool is used after transport, all the measures specified in the section 'Commissioning inspection' must be carried out.

4.4 Transport on a trailer

	DANGER	
 	RISK OF BEING CRUSHED OR FALLING UNDER A MACHINE There is a risk of being crushed under a moving machine or between a machine and an object in the immediate vicinity of machines!	 

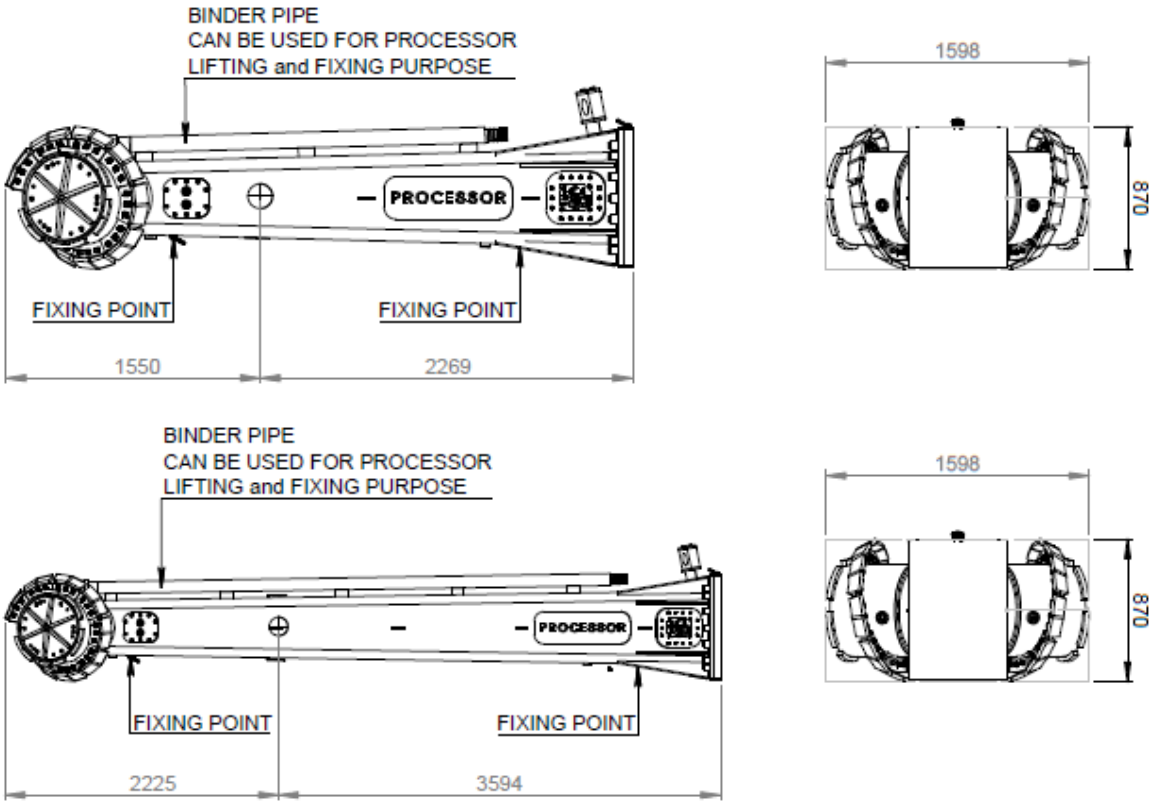


Figure 1. Transport position, transport dimensions, and attachment and lifting fixtures

Processor	300	500
Dead weight	2,200	2,570
Base plate	200	200

Lifting equipment is selected on the basis of the total weight.

Local regulations must be complied with in transport, and when necessary a special transport permit must be applied for. The transport platform must be sufficiently long.

The mixing tool must be transported in a horizontal position, with the binder feeding pipe facing upwards. When necessary, the mixer can be transported with the binder feeding pipe facing downwards.

The mixer can be secured using the attachment fixtures on the left-hand side of the body, lifting loops underneath the body, binder feeding pipe attached to the body or the body itself, with the help of cargo straps.

Always use load securing equipment of the correct size that is in good condition.

The operator must ensure that no unauthorised persons are present in the danger zone. Being crushed under the mixing tool or between the mixer and another object causes a risk of death or serious injury.

Prior to using the mixing tool after transfer, the commissioning measures must be carried out.

4.5 Long-term storage

Store the mixer so that it is kept at a constant temperature. After finishing work, clean the feeding line with pressurised air and wash the body, drums and the space between the drum and the body with water. After washing, grease the space between the body and the drums. More detailed instructions for greasing are provided in the section 'Maintenance and cleaning'.
Storage temperature range: -40 °C – +80 °C
NOTE. The operating temperature differs from the storage temperature.

Before long-term storage:

- Wash the body, drums and the space between the drum and the body with water
- Grease the space between the body and the drums
- Check the hydraulic hoses and connections for leaks
- Plug any open hydraulic connections
- Repair any worn or damaged patches on the surface by painting
- Clean bare metal surface and protect them against corrosion

4.6 Deployment of the machine after storage

After long-term storage:

- Check the amount of oil in the drum seal
- Change the gearbox oil
- Check the condition of all hydraulic hoses and connections
- Check the condition of the binder feeding hose, connectors and clamps
- Replace the return oil filter
- Check the tightness of the adapter's mounting bolts
- Check the condition and attachment of the electric cables
- Check the warning labels and replace as required

4.7 New users and procedures before use

4.7.1 Commissioning inspection

Upon receipt of the Processor mixing tool, inspect it for any damage caused by transport. If you detect any damage, contact the driver and the delivery company that delivered the Processor mixing tool. In addition, inform the Processor mixing tool's dealer or importer about any damage.

When you receive a new Processor mixing tool, make sure it is accompanied by the following documents:

- Instruction manual
- Spare parts list
- Warranty registration form and warranty terms

Fill in the warranty registration form and send it to your ALLU representative.

5 CONNECTING THE PROCESSOR MIXER TO THE EXCAVATOR

5.1 Mechanical mounting

The Processor mixing tool is mounted on the base machine with an adapter.
The mixer can be delivered with a base plate or an adapter that is compatible with the base machine for mounting on the excavator boom. Welding other holders or fittings to the Processor mixing tool is prohibited.

When installing the adapter and connecting the mixer to the excavator boom, ensure that the binder feeding pipe faces away from the excavator.

	**⚠ WARNING** Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface. Falling under the machine and being crushed creates a risk of death or serious injury!

	**⚠ WARNING** Always mount the adapter carefully, complying with the instructions in order to ensure the required strength. Attach all the bolts, and always use stretch sleeves, suitable bolts, and the correct tightening torque. The Processor mixer coming loose and falling causes a risk of death or serious injury!	

	**⚠ WARNING** RISK OF HANDS GETTING CAUGHT BETWEEN MOVING PARTS Do not put hands or fingers between moving parts!	

Before mounting the device on the excavator boom, ensure that the machine is stable and positioned on a solid surface.

First, an adapter that is compatible with the excavator model is mounted on the device.
The adapter is attached to the frame with 23 bolts (M24 x 110 10.9) using a torque of 700 Nm.
Stretch sleeves must be used under the bolts.

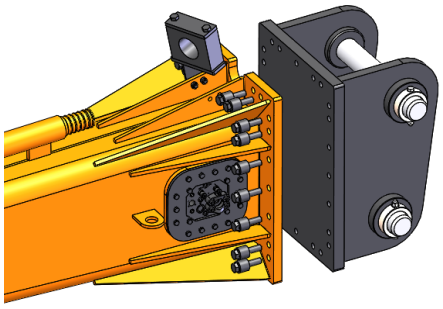


Figure 5. Mounting of the adapter on the Processor mixer.

Next, the adapter and the excavator boom are connected. Start from the bottom pin. Once the first pin is in place, install the stud's locking screw and nut.

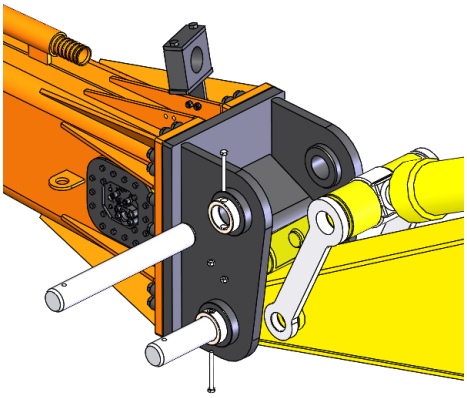


Figure 6. Installation of the adapter's bottom pin.

Place the loop on the excavator boom and the adapter's top pin in line with one another.
Use tools for this work stage to ensure that the loop and the pin's central axis are in line.

WARNING Hands or fingers getting caught between moving parts causes a risk of a serious injury!

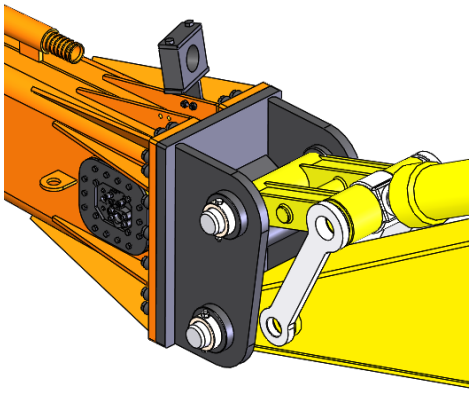


Figure 7. Mounting of the adapter on the excavator boom:

Once the second pin is in place, install the pin's locking screw and nut.

5.2 Safety connection

To secure the bolt joint, a safety chain or cable can be placed between the mixer and the adapter. The base plate and the mixer frame are equipped with welded lifting loops that can be used for installing the safety chain.

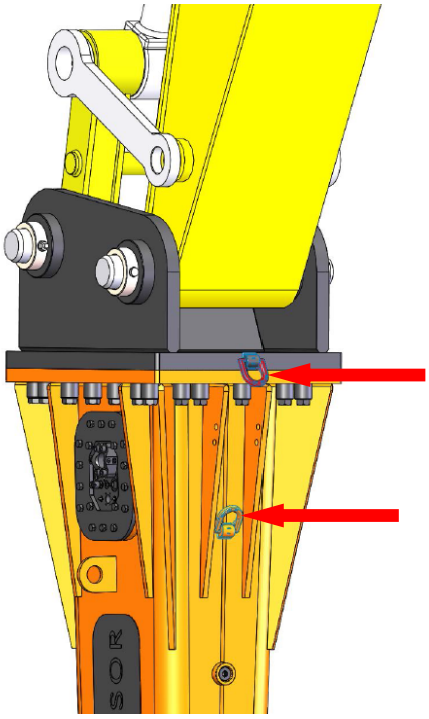


Figure 8. Attachment points for the safety chain.

The safety chain or cable capacity must be equal to or greater than the total weight of the mixer.

5.3 Hydraulic connections and hydraulic system

5.3.1 Hydraulic schematic

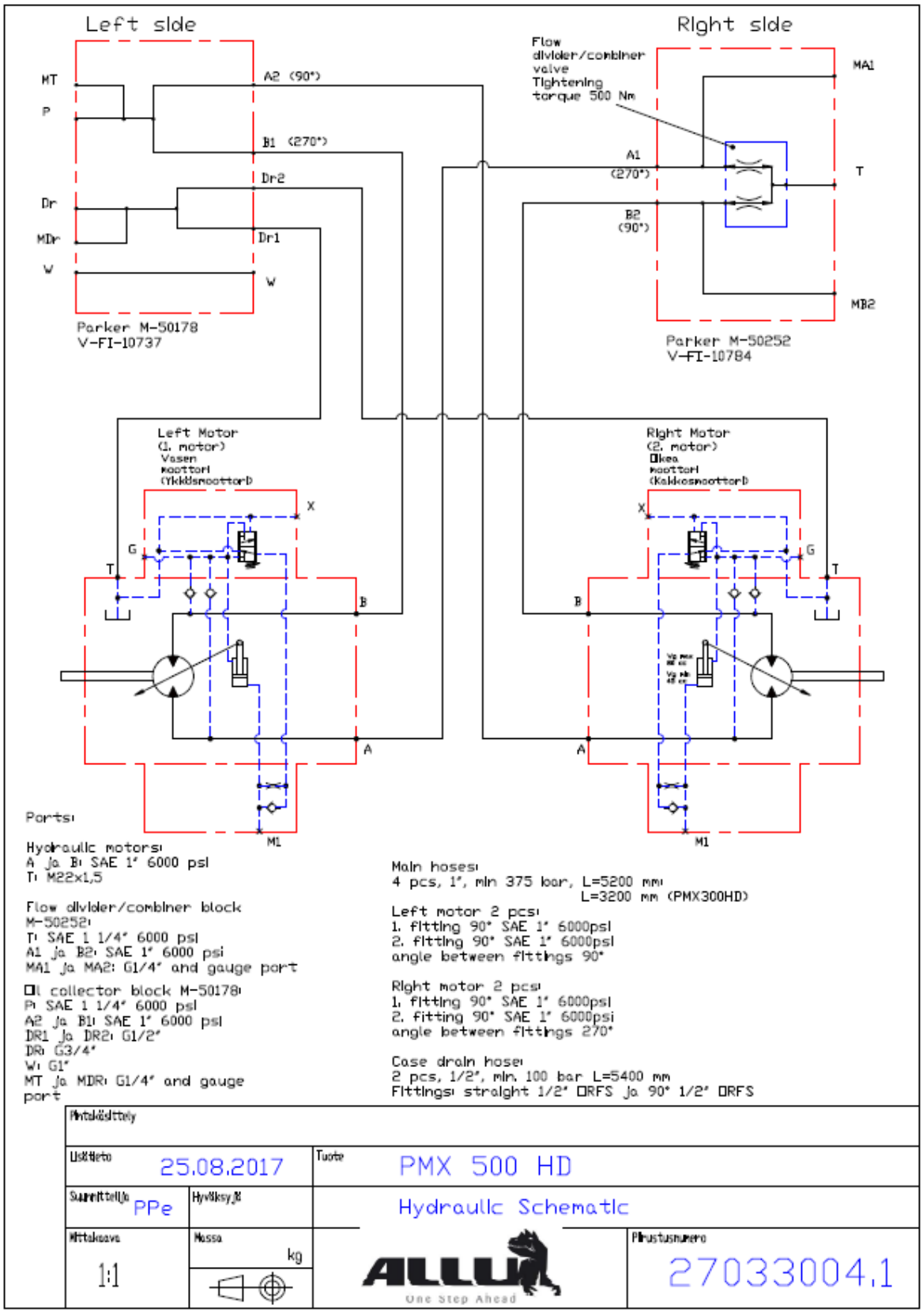


Figure 9. Hydraulic schematic.

5.3.2 Hydraulic connections

To function, the Processor mixer requires two high-pressure hoses and one non-pressurised drain oil hose to enable drums to rotate in both directions.

⚠ WARNING

Before connecting or disconnecting the hydraulic system, turn off the base machine and depressurise the hydraulic system by moving the control lever of the auxiliary hydraulic system with only the starter motor turned on.

Exposure to high-pressure oil spray from a pressurised connection causes a risk of death or serious injury.

⚠ WARNING

Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface.

Falling under the machine and being crushed creates a risk of death or serious injury!

⚠ CAUTION

Minimise the risk of hydraulic oil entering the environment by providing basins and material for absorbing any leaks while making connections!

Table 4. Hydraulic connections outside the machine.

	Recommend min. hose diameter	*Hydraulic ports in the Processor mixer*	*Spiral wrap protector*
Working lines	1¼"	SAE 1¼" 6,000 psi	yes
Drain line	3/4"	G3/4	yes

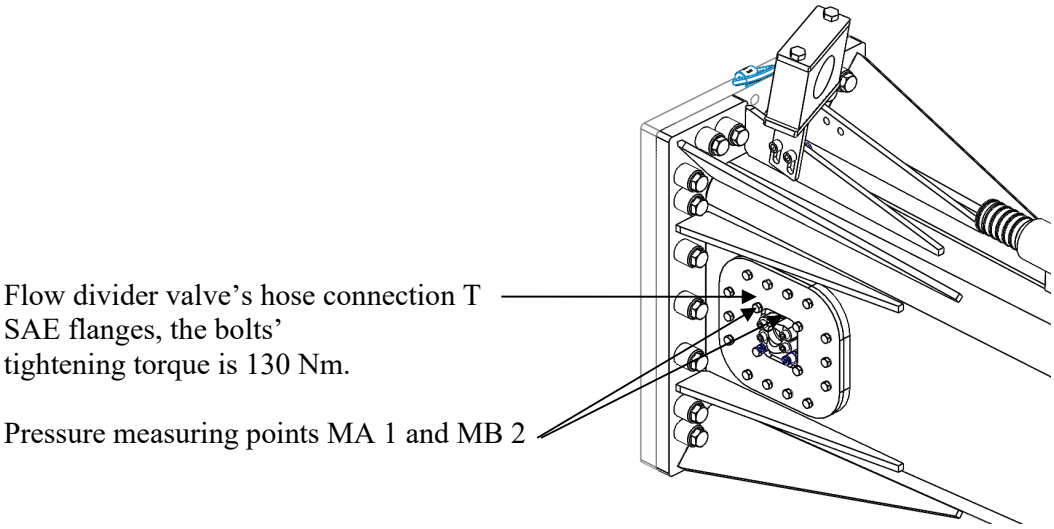


Figure 10. Hose connection, oil flow divider valve

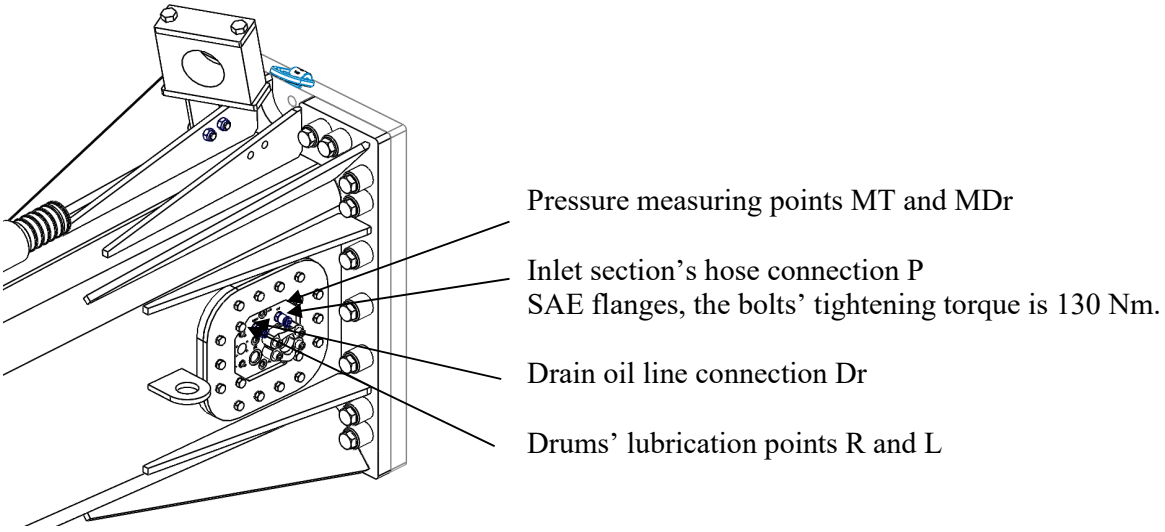


Figure 11. Hose connections, flow inlet section.

Hydraulic hoses are not included in the delivery. Hydraulic hoses are positioned and dimensioned in a way that prevents them from rubbing against sharp edges of the adapter or another structure. When necessary, use 45° or 90° hose fittings.

After completing the connections, run the mixer through its entire range of positions to ensure that the hoses do not stretch or become crushed in any of the positions.

- Choose the type of hose according to the type of the hydraulic fluid used
- The hose's pressure rating must be higher than the maximum system pressure
- We do not recommend fast coupling in the drain oil line because an improper fast coupling or connection may prevent the oil from flowing through the coupling, causing damage to the hydraulic motor
- Written permission from the importer or the manufacturer is required for any connections that are not in compliance with the instructions

	NOTE Prevent any dirt from entering the hydraulic oil by keeping the connections clean and covered, and by preventing open connections from coming into contact with the ground. Dirt is harmful to all components of the hydraulic system and shortens their service life.

5.3.3 Drain line

The hydraulic hose for the drain line is not included in the delivery. The hydraulic hose is positioned and dimensioned in a way that prevents it from rubbing against sharp edges of the adapter or another structure. When necessary, use 45° or 90° hose fittings.

After completing the connections, run the mixer through its entire range of positions to ensure that the hoses do not stretch or become crushed in any of the positions.

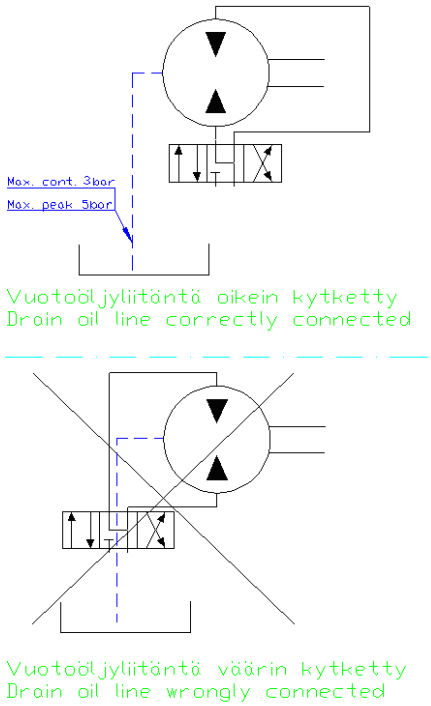


Figure 12. Drain oil line connection.

NOTE! The hydraulic motor's drain oil hose must be connected via a separate drain line filter to a hydraulic tank.

The drain oil line must not be connected through any valve, throttle valve, return line or similar, so that the counter pressure will not be too high. Make sure the max. continuous pressure of 3 bar and max. peak pressure of 5 bar is not exceeded. The hydraulic motor may get damaged if it is installed improperly.
The filter in the drain line may only be used for processing the Processor mixer's hydraulic oil.

NOTE

The drain oil line must not be connected through any valve, throttle valve, return line or similar, so that the counter pressure will not be too high. Make sure the max. continuous pressure of 3 bar and max. peak pressure of 5 bar is not exceeded. The hydraulic motor may get damaged if it is installed improperly.

5.3.4 Requirements for the excavator's hydraulic system

Processor requires two-way hydraulics to allow the drums to rotate in both directions. Adjust the base machine hydraulic flow as indicated.

Maximum settings for the excavator's hydraulic system:

Max. pressure:	350 bar
Max. Flow:	300 l/min
Recommended flow:	250-300 l/min

In the adjustment of the settings for the excavator's hydraulic system, please note the following instructions:

- To ensure flawless operation, it is necessary to use a hydraulic system that enables the simultaneous operation of the excavator boom cylinders and Processor's hydraulic motors.
- Make all hydraulic measurements on the tip of the excavator boom (as close to Processor as possible).
- Processor is designed for use with a pressure of 350 bar. When the excavator's maximum pressure remains below 350 bar, it does not need to be restricted.
- The excavator's hydraulic tank must be equipped with a level indicator. A leak in the Processor boom causes a risk of the hydraulic tank draining. The level indicator raises an alarm if the level of hydraulic oil in the tank is too low.

NOTE

Set the base machine's hydraulic flow to be as low as possible without affecting the capacity. An unnecessarily high rotation speed increases fuel consumption, causes heating of the hydraulic oil, and speeds up the wearing of the motor and wear parts.

5.3.5 Hydraulic oil requirements for the excavator

A high-quality, mineral-based hydraulic oil with additives that has been approved by the manufacturer of the base machine and the hydraulic motor must be used for the mixer. The viscosity class of the hydraulic oil must be selected such that, at normal operating temperature, the oil's viscosity is as close to the recommended value as possible. If the viscosity differs from the recommended values, the service life of the motor becomes shorter.
The limit values for situations in which a hydraulic oil based on high-quality mineral oil is being used are specified below.

Table 1. Values for hydraulic oil:

Permitted operating temperature for the oil	-20–90 °C
Recommended oil viscosity	15–30 mm2/s
Permitted viscosity	15–150 mm2/s

Table 2. Recommendations for hydraulic oil

Operating temperature range	ISO class
30–60 °C	32
40–70 °C	46
50–80 °C	68
60–90 °C	100

5.3.6 Settings for the excavator's hydraulic system

Processor can be used with a wide range of excavators. It is evident that hydraulic power of 120 kW cannot be achieved with the smaller excavators. Approximate available hydraulic power for the attachment tool for excavators of varying sizes:

- 25 tonne excavator: 80 kW
- 30 tonne excavator: 100 kW
- 35 tonne excavator: 120 kW

Recommended flow and pressure values for the excavator attachment's hydraulic settings in excavators of varying sizes:

- 25 tonne excavator: flow 200 l/min. with pressure of 250 bar
- 30 tonne excavator: flow 240 l/min. with pressure of 250 bar
- 35 tonne excavator: flow 290 l/min. with pressure of 250 bar

NOTE! NOTE The maximum allowed pressure is 350 bar and maximum allowed flow is 300 l/min.

5.3.7 Tips for adjusting the hydraulic system settings

The optimal way to adjust the pressure and flow settings is shown in Figure 19. Connect the hydraulic hoses of the excavator boom to a throttle valve (part 1 in Figure Adjustment of the

hydraulics). Then tighten the throttle valve (part 1). The maximum setting for the flow meter (part 2) is 300 l/min. and the pressure difference between the pressure line gauge P_1 (part 3) and the return line gauge P_2 (part 4) (p_1-p_2) is 350 bar.

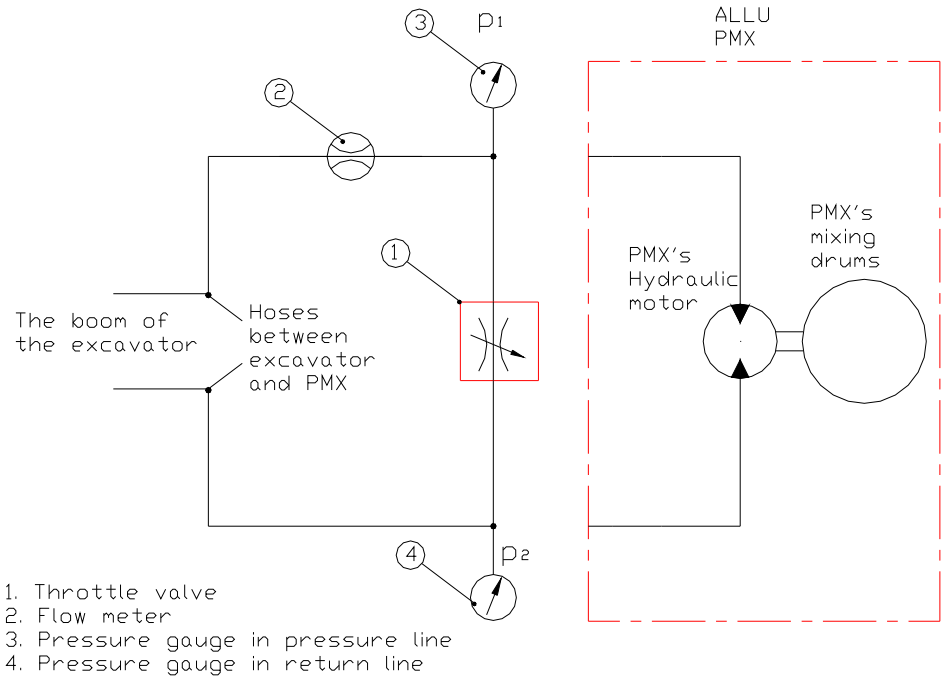


Figure 13. Adjustment of the hydraulics.

5.3.8 The filtering and cooling of hydraulic oil

The maximum rate of hydraulic oil contamination allowed in accordance with ISO 4406 is 17/15/12. We recommend a filter cartridge of at least 10 µm to ensure trouble-free operation of the whole system. The hydraulic motors' drainage filter is included in the delivery.

The mixer may generate a large quantity of heat, which is mainly transferred to the base machine's hydraulic system. Therefore, it is recommended that the base machine has a cooling system for hydraulic oil.

5.4 Installation of the binder feeder hose and connectors

	WARNING	
	COMPRESSED AIR SYSTEM Always use personal protective equipment. Depressurise the compressed air and hydraulic system before connecting hoses or performing service operations.	

	WARNING USE PERSONAL PROTECTIVE EQUIPMENT Exposure to noise, dust or flying objects may cause a risk of serious injury!	

A wear-resistant, conductive hose is used as the binder feeding hose. Such a hose is flexible and no special tools are required for installation. The hose is pushed over the hose spindle and tightened with at least two hose clamps with double bolts.

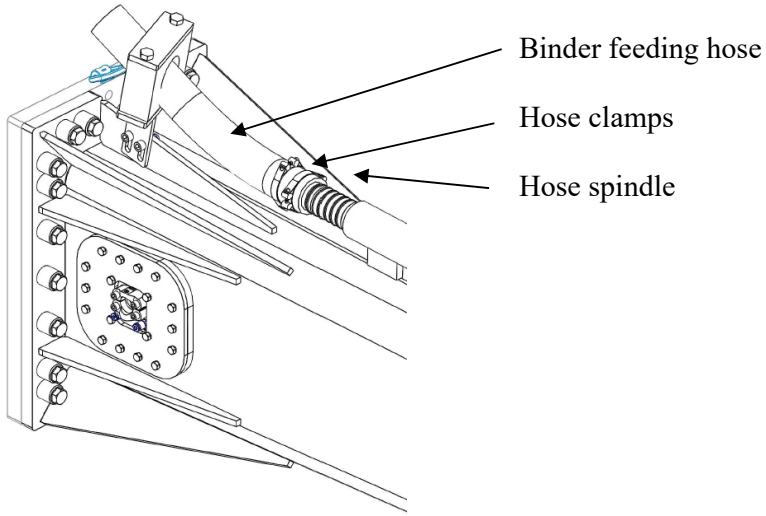


Figure 14. Installation of the hose.

Proceed carefully in situations in which a binder feeding line connection must be disconnected. The hose may be pressurised, for example, if the feeding line nozzle is clogged. To ensure that the connectors can be loosened safely, a pressure release pipe must be installed on the feeding line. Prior to disconnecting the hose connectors, the ball valve in the pressure release pipe must be opened to ensure that the pipe is depressurised.

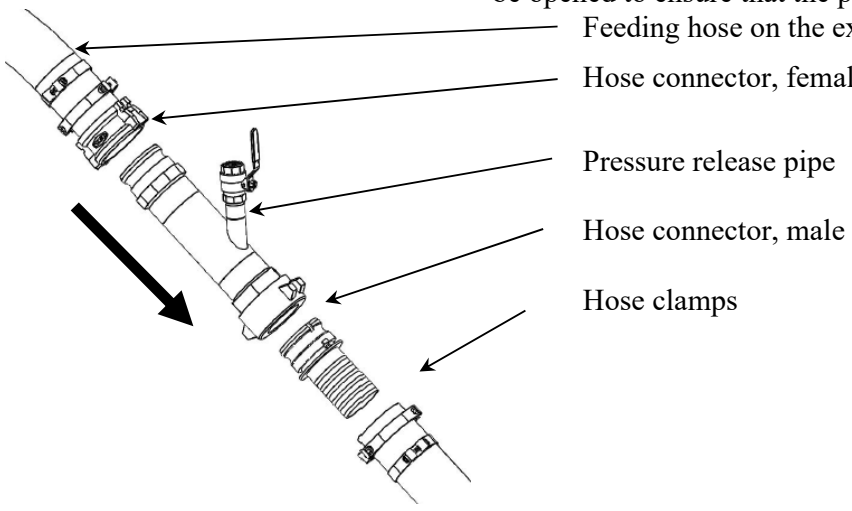


Figure 15. Installation of the pressure release pipe and flow direction.

A safety cable must be installed in the feeding hose's connection point. The safety cable's loops are placed behind the feeding line's hose connectors. The safety cable holds the hose ends together if the connection accidently becomes loose as a result of pressure.

Figure 16. Safety cable.

The feeding hose may contain remainders of binder after use. Always use personal protective equipment when you disconnect or install the feeding hose.

Damaged hose clamps and connectors and ones in poor condition must always be replaced. Wear on the feeding hose must be monitored in accordance with the maintenance instructions.

5.5 Electrical connections and components

In the processing of various material, the information on drum speed and temperature must be available to ensure a successful mixing process and to protect the gears. To this end, the Processor mixing tool machine is equipped with two temperature sensors (in the planetary gear) and two drum speed sensors.
To prevent oil leaks, an oil leak indicator has been installed inside the body. All the sensor information is relayed to the display via the control module. The control module is installed inside the mixer's frame. The display is designed for installation in the excavator cabin to enable the operator to monitor the mixer's process values.

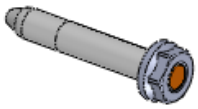


Figure 17. Speed sensor.

Figure 18. Temperature sensor.

Figure 19. Display.

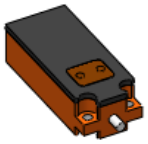


Figure 20. Oil leak indicator.

Figure 21. Control module.

5.6 Display

From the display, the operator can view the rotation speed of both mixing drums, the working temperature of both gearboxes, time and accumulated work time. The sensors are connected to the control module, which is located inside the Processor mixing tool's frame. The control module and the display located in the cabin are connected to one another via a CAN bus.

Figure 22. The display's operating view.

You can move from the display's operating view to the main view by clicking on the Menu button.

Figure 23. The display's main view.

From the main menu, you can move to other menus where you can either change or view settings.

All parameters are set at the ALLU factory. After replacing the display, you should check and adjust the parameters. The factory settings are as follows:

1. The maximum speed that causes an alarm 110 rpm
2. The maximum temperature that causes an alarm 90° C
3. The number of rpm sensor pulses per 120 rpm 24
4. The temperature sensor value, min. 1,128 mV
5. The temperature sensor value, max. 2,198 mV

Adjust = adjustment of parameters
Measure = choice of metric or imperial temperature system
Preference = date, time and language settings
Info = Processor's serial number

The display program's version and the ALLU Processor mixing tool's serial number can be found by clicking on the Info icon.
The mixer's machine-specific operating hours are recorded in the display's memory. Because of this, it is important that the serial number shown on the display matches the serial number of the mixer being used.
The display's date, time and language settings can be changed in the Preferences section.

5.6.1 Error Messages

When an error occurs, an error message appears on the display. A list of error messages is provided below.

- OIL LEAK
  An error message indicating an oil leak is displayed when oil has leaked inside the mixer body, for example, in the event of a motor fault or a loose hydraulic line connector. If this message is displayed, work must be stopped immediately to prevent the leak from becoming worse.

- DRUM OVERSPEED
  An error message indicating overspeed is displayed if the drum speed exceeds 110 rpm. This may signal flow that is outside the range.

- DRUM OVERHEATING
  An error message denoting overheating of the gears is displayed when the temperature of one or both of the gears exceeds 90 °C. This may happen if the binder reacts with water or dirt enters the gear. The operator must determine the reason for overheating.

- THE MODULE IS NOT CONNECTED
  This error message signals that the display is not connected to the CAN bus and therefore sensor data is not available.

Press OK (F2) to reset the error.

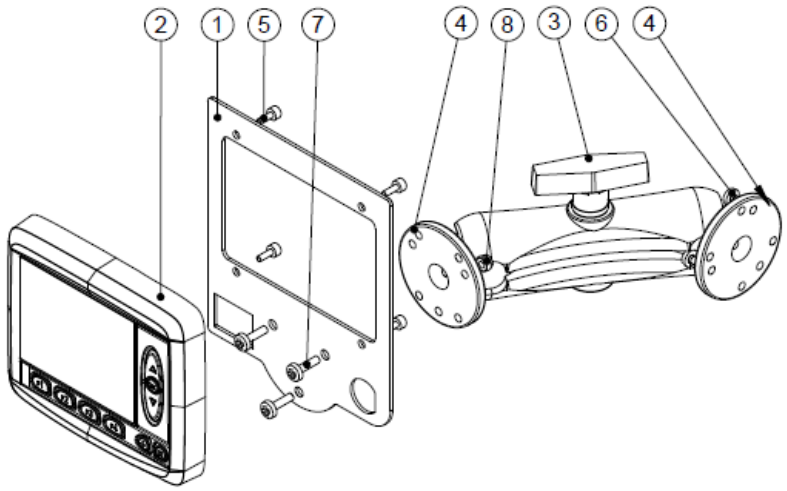
5.6.2 Display mounting

	⚠ WARNING	
	RISK OF ELECTRIC SHOCK Always use personal protective equipment. Switch off the motor and remove batteries before installation or maintenance.	

The display is installed in the excavator cabin. The location should be selected so that the display is clearly visible but does not prevent the operator from monitoring other gauges and displays. A possible installation location is the A pillar on the right-hand side of the cabin.

Figure 24. Example of the installation of the display.

The display's installation height must be determined on the basis of the operator's sitting posture. All the components required for installation are included in the delivery.



1. Installation plate
2. Display
3. Installation arm
4. Round ball plate
5. Screw M4x10
6. Screw M5x10
7. Screw M5x16
8. Locking nut M5

Figure 25. Installation of the display.

After installation, the electrical cable 45490009-02 is connected to the display (see section Cable connections).
A cable distributor is connected to the excavator's 24 V system. The distributor is equipped with a fuse. Cable connections should be carried out so that the system's power supply can be switched off from the excavator's power switch.

5.7 Control module

The control module is installed inside the mixer body, below the adapter plate, at the factory. Cables that come from the sensors are connected to the control module in line with the electrical drawing (see section 'Cable connections').

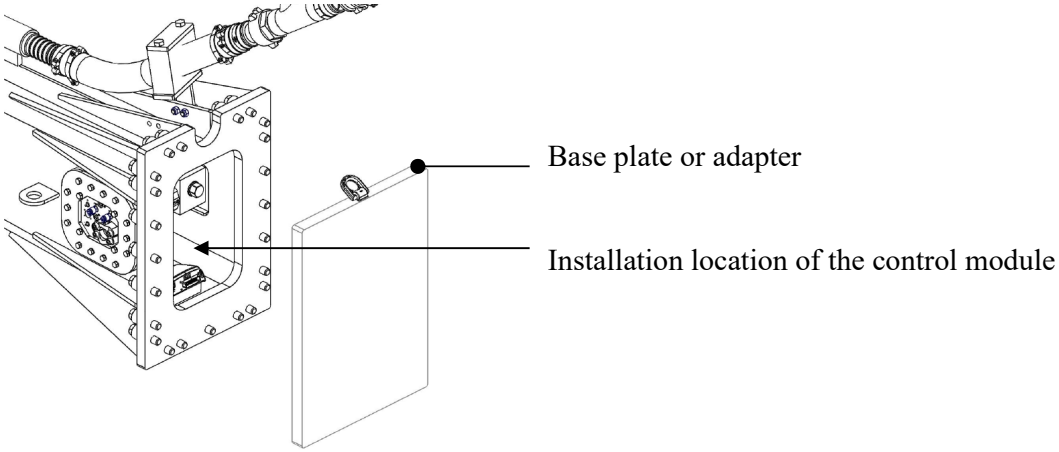


Figure 26. Control module location and installation.

⚠ WARNING

Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface.

Falling under the machine and being crushed creates a risk of death or serious injury!

⚠ WARNING

RISK OF ELECTRIC SHOCK

Always use personal protective equipment. Switch off the excavator's motor and remove batteries before installation or maintenance.

When replacing the control module, you have to remove either the base plate or the adapter from the machine to gain access to the module's installation location. Use lifting equipment to remove and reinstall the base plate or adapter. The base plate's dead weight is 190 kg.

The module delivered as a spare part is ready to use and does not require programming or other measures before commissioning. The module is installed inside the body with connectors facing downwards.

When putting the base plate or the adapter back in place, use the tightening torque for mounting bolts specified in the section 'Mechanical installation'.

NOTE

Use lifting equipment to lift heavy parts and components.

5.8 Speed sensor

The machine is equipped with two speed sensors, one per drum. The speed sensor relays information on the drum speed to the display. Drum speed is measured from the drum's mounting bolts.

⚠ WARNING

Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface.

Falling under the machine and being crushed creates a risk of death or serious injury!

	⚠ CAUTION
	Minimise the risk of oil entering the environment by providing basins and material for absorbing any leaks while making connections!

When the sensor is replaced, the drum, drum seal, planetary gear and the flange that is fixed to the mixer body must be removed from the machine to gain access to the sensor's installation location.

More detailed instructions on the dismantling and assembly are provided in the section 'Maintenance and cleaning'.

Use lifting equipment to remove and re-install parts and components.

	NOTE
	Use lifting equipment to lift heavy parts and components.

The speed sensor delivered as a spare part is secured with a bolt and an adapter to the flange that is fixed to the mixer body. First, an adapter sleeve with a G1" external thread and M12 internal thread is fixed to the flange. The sleeve is tightened as far as it goes and secured in place with threadlocker.

Twist the sensor in place so that the identification surface extends 10 mm from the sleeve. After this, the sensor is fixed with a locking nut (tightening torque of 30 Nm), which also serves a seal.

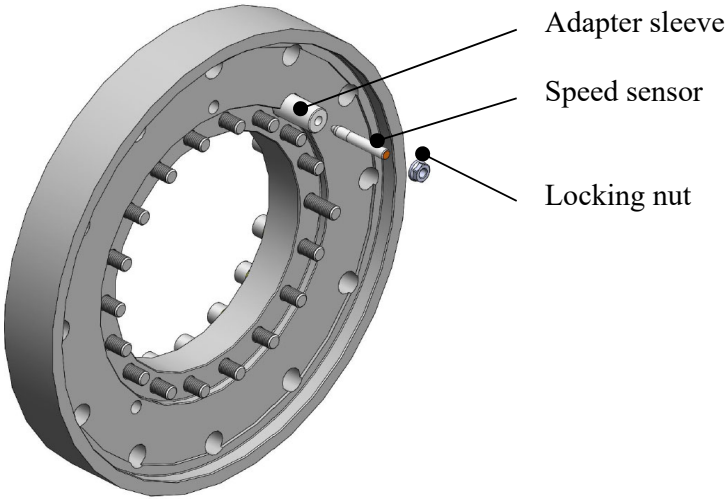


Figure 27. Installation of the speed sensor.

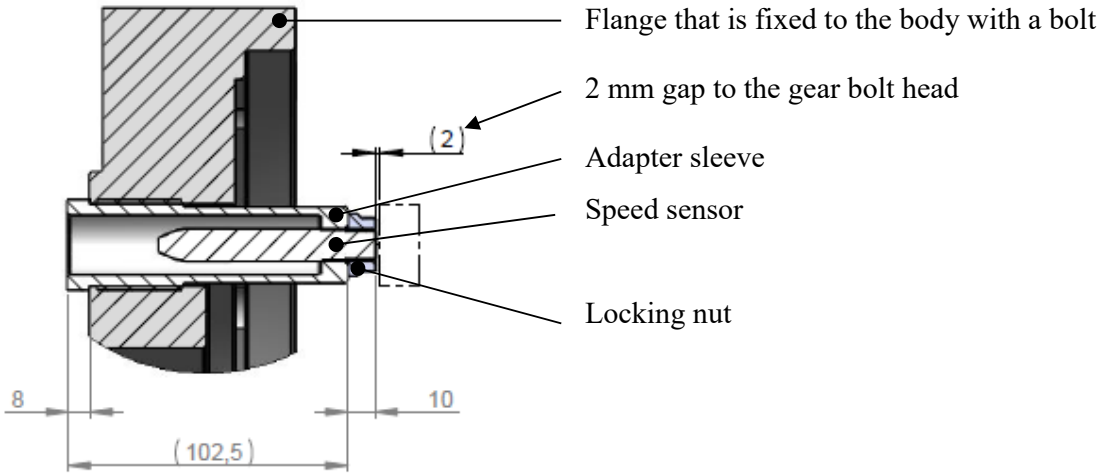
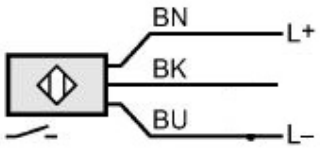


Figure 28. Dimensions of the speed sensor installation.

The spare sensor is delivered from the factory in the manufacturer's packaging. Before mounting the sensor on the machine, shorten its wire so that it is 300 mm in length and install a Deutsch DT06-3S connector to its end.

Wiring diagram	rpm sensor	Deutsch DT06-3S connector
Wire colours BK black BN brown BU blue		1 A 3 C 2 B

Drum speed information disappearing from the display signals a disruption in the cable connection to the sensors or a flaw in the sensor(s). Identify and rectify the problem as soon as possible because operating the machine without drum speed information results in a risk of damage to the gears. The minimum drum speed is 25 rpm.

5.9 Temperature sensor

The machine is equipped with two temperature sensors, one for each gear. The temperature sensor relays information on gear temperature to the display. The sensor is installed with adapter fitting and two usit seals directly to the 7/16 - 20 UNF thread on the side of the hydraulic motor (tightening torque of 25 Nm).

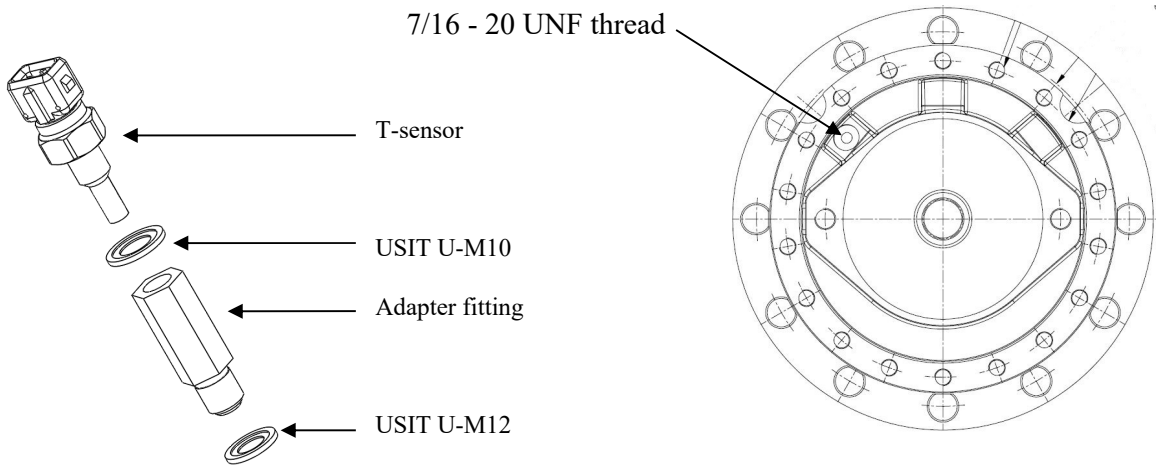


Figure 29. Installation location of the temperature sensor.

	**⚠ WARNING** Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface. Falling under the machine and being crushed creates a risk of death or serious injury!

	**⚠ CAUTION** Minimise the risk of oil entering the environment by providing basins and material for absorbing any leaks while making connections!

When the sensor is replaced, the drum, drum seal, planetary gear and the flange that is fixed to the mixer body must be removed from the machine to gain access to the sensor's installation location.

More detailed instructions on the dismantling and assembly are provided in the section 'Maintenance and cleaning'.

Use lifting equipment to remove and re-install parts and components.

	**NOTE** Use lifting equipment to lift heavy parts and components.

Drum temperature information disappearing from the display signals a disruption in the cable connection to the sensors or a flaw in the sensor(s). Identify and rectify the problem as soon as

possible because operating the machine without drum temperature information results in a risk of damage to the gears. The maximum drum operating temperature is 90 °C.
The temperature sensor delivered as a spare part is ready to use.

5.10 Oil leak indicator

	**⚠ WARNING** Before connecting or disconnecting the hydraulic system, turn off the base machine and depressurise the hydraulic system by moving the control lever of the auxiliary hydraulic system with only the starter motor turned on. Exposure to high-pressure oil spray from a pressurised connection causes a risk of death or serious injury.	

	**⚠ WARNING** Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface. Falling under the machine and being crushed creates a risk of death or serious injury!

	**⚠ CAUTION** Minimise the risk of hydraulic oil entering the environment by providing basins and material for absorbing any leaks while making connections!

The machine comes with a single oil leak indicator. The indicator relays information on any oil leaks within the frame to the display after a couple of litres of oil has leaked. The leak must be localised and repaired as soon as possible.

The indicator is installed between the frame's drums. The indicator is set in place from underneath the rack plate.

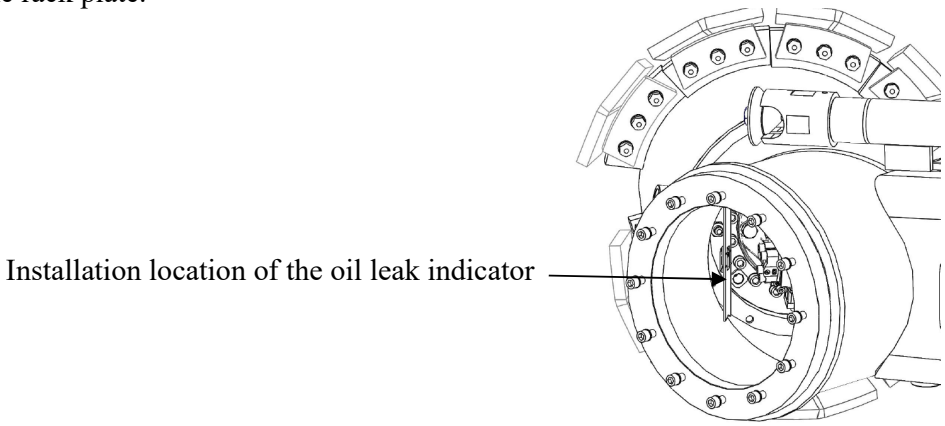


Figure 30. Installation of the oil leak indicator.

The oil leak indicator delivered from the factory as a spare part is ready to use.

When the indicator is replaced, the drum, drum seal, planetary gear and the flange that is fixed to the mixer body must be removed from the machine to gain access to the indicator's installation location.

More detailed instructions on the dismantling and assembly are provided in the section 'Maintenance and cleaning'.

Use lifting equipment to remove and re-install parts and components.

	NOTE Use lifting equipment to lift heavy parts and components.

5.11 Installation of the cable rack

Installation of the mixer's accessories encompasses cable installation. The cables are connected in line with the connection drawing's installation order 27021684.

A rack for a cable connector must be mounted on the end of the excavator boom. The rack can be mounted in the space above the hydraulic line connections as shown in the picture below. A plate with threaded holes for the rack is delivered with the rack. This plate can be welded to the boom. Remember to repair-paint the boom and the installation plate after welding.

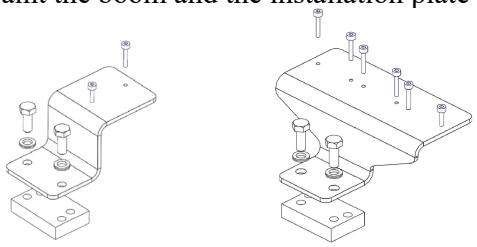


Figure 31. Cable connector installation rack for one or three connectors.

Figure 32. The connectors and the rack mounted on the excavator boom.

5.12 Installation of the cables

Once the Processor mixing tool has been connected to the excavator and the display has been mounted in the cabin, connect cables so that sensor information is shown on the display.
The following cables must be installed between the mixer and the display:

1. 3,000 mm cable - Inlet section / connector installation tray
2. 17,000 mm cable - Connector installation tray / cabin
3. 3,000 mm cable - Installation of the display inside the cabin

The cables are fixed to the machine's structures, such as hydraulic pipes, with cable ties or other similar ties. The cable should be fixed at intervals of 500 mm. Before fixing the cables to the boom, test the mixer's and the boom's full range of movement to ensure that the cable does not come into contact with any structures or get crushed between structures.

The cable is installed in the cabin. Usually, cabins have inlets that can be used for installing mixer cables. The inlets may be located behind hatches underneath or behind the cabin. These have to be opened or loosened, if they are fixed with bolts, to gain access to the inlets. Once the cable is installed, the excess length can be tied to the bottom of the cabin.

NOTE

Use a work platform or a personnel lift when installing cables on top of the excavator.

5.13 Cable connections

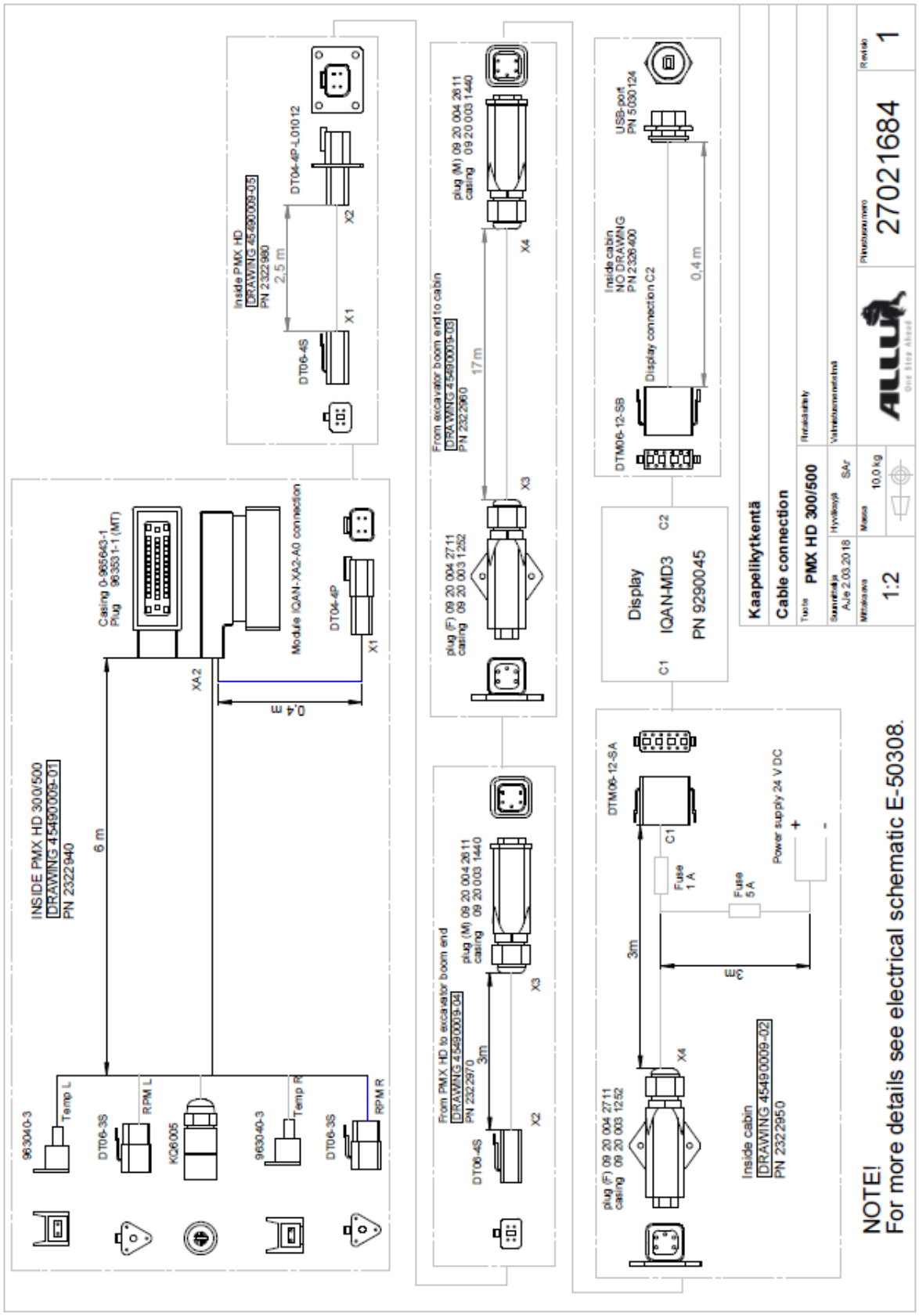


Figure 33. Cable connections

5.14 Electrical diagram

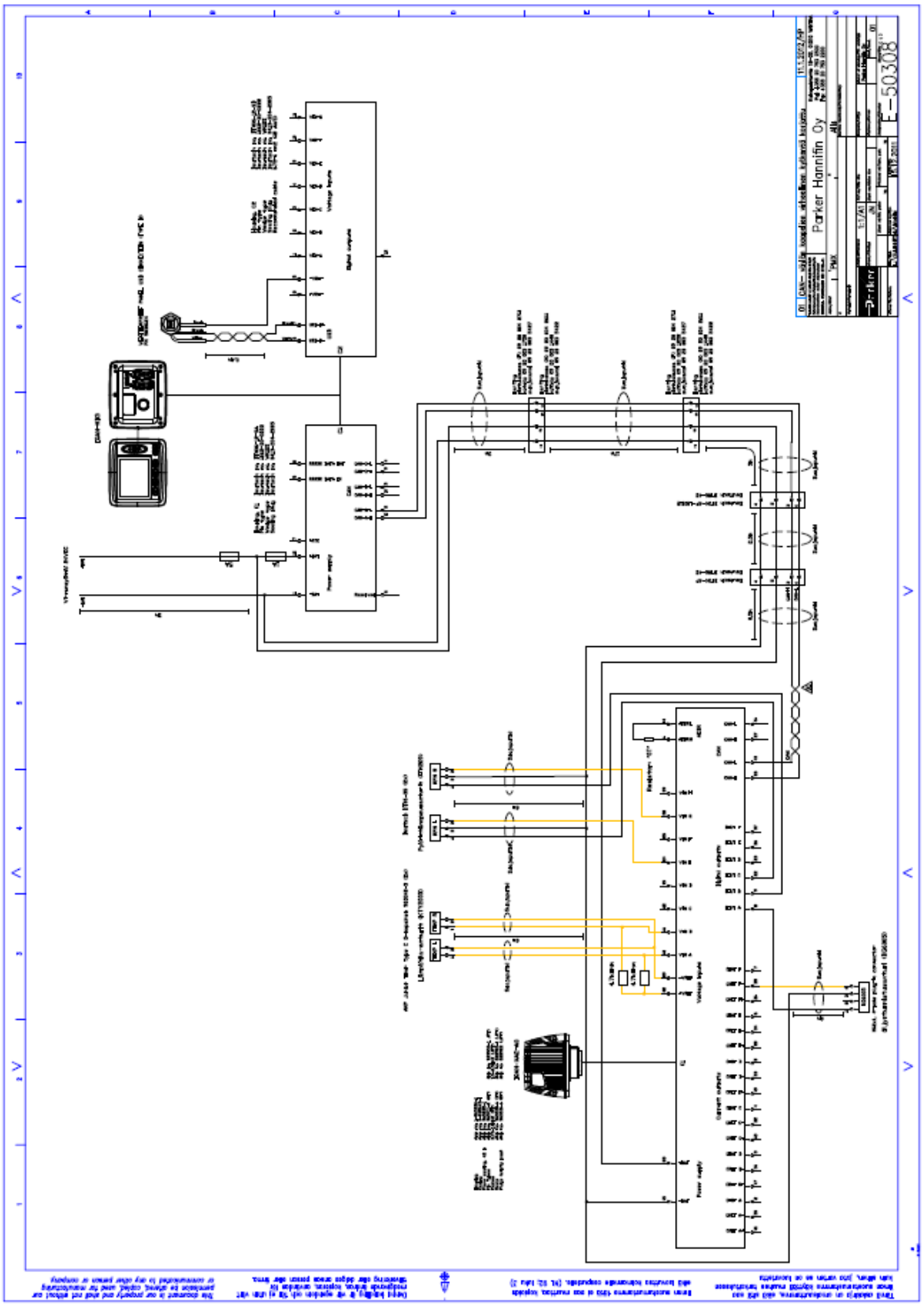


Figure 34. Electrical diagram

5.15 First start

	**WARNING** COMPLIANCE WITH INSTRUCTIONS Read the manual before use or maintenance work, and always comply with the regulations and instructions indicated.	

	**WARNING** USE PERSONAL PROTECTIVE EQUIPMENT Exposure to noise, dust or flying objects may cause a risk of serious injury!	

When you receive a new ALLU Processor mixing tool, make sure it is accompanied by the following documents:

- Instruction manual
- Spare parts list
- Warranty registration form and warranty terms

Fill in the warranty registration form and send it to your ALLU representative.

Read the manual before using the machine for the first time.

A checklist for the first start-up:

1. Inspect all the bolt and nut joints, etc.
2. Inspect the level of the gearbox oil
3. Check the amount of oil in the drum seal
4. Inspect the drain line and check that the clamps are tightened and that the shut-off valve is OPEN
5. Connect the cable between the Processor mixing tool and the excavator and check that the display functions properly
6. Switch on the excavator's motor
7. Tilt the Processor mixing tool in various positions and make sure that the mechanical connection functions appropriately. Check also that the binder feeding hose and hydraulic hoses can move freely
8. Rotate the drums in the standard operating direction.
9. Bleed air from the hydraulic system by rotating the drums for about 5 minutes without load
10. Switch off the mixing drums and the excavator's motor.
11. Check the hydraulic connections for leaks. Inspect mechanical connections

6 DAILY USE

6.1 The operating principle of the Processor mixer.

The mixer is a hydraulic excavator accessory that can be used for processing soft materials. Such materials include soft soil, contaminated soil, dredged sludge or any other material to be mixed.

The processing takes place with the assistance of drums rotating in opposite directions, powered by two hydraulic motor-planetary gear combinations. There is one hydraulic motor-planetary gear combination per drum. The drums' rotation direction and speed and the mixer's movements are controlled with the excavator's controls. During processing, the material is mixed by the rotating drums.

6.2 Inspections before use

- Check that the steel frame is not bent or cracked. Repair any damage before using the machine
- Check the Processor mixing tool's mechanical connection to the excavator
- Inspect the hydraulic system for leaks
- Inspect the binder feeding hose and connections
- Ensure that feasible sensor information is shown on the display

6.3 General work instructions

THE ALLU PROCESSOR IS A WORK MACHINE. TO ENSURE A LONG AND EFFECTIVE SERVICE LIFE, IT MUST BE HANDLED CAREFULLY.

THE ALLU PROCESSOR IS A MIXER, NOT A CRUSHER OR A GRINDER.
THE ALLU PROCESSOR MUST NOT BE USED FOR CRUSHING OR GRINDING.

DO NOT USE THE ALLU PROCESSOR FOR SUPPORT WHEN MOVING THE EXCAVATOR BECAUSE ITS STRUCTURE IS NOT DESIGNED FOR THIS PURPOSE.

The best way to learn how to use the machine is to work with it. However, the following tips and instructions are designed to make getting started easier:

1. Do not change the rotation direction too quickly; instead let the drums stop first. Quick changes cause a high level of strain on the hydraulic motor, the power transmission and the hydraulic hoses, which shortens the machine's lifespan
2. Do not stop the drums when they are immersed in the material being processed. Starting the drums while they are immersed in the material or moving the Processor mixing tool without rotating the drums puts the mechanical components under strain.
3. Monitor the drum speed and maintain it above 25 rpm
4. Do not use excessive force when manoeuvring the Processor mixing tool inside the material
5. While processing the material, keep the Processor mixing tool in an upright position to avoid strain to the frame
6. Because the appropriate rate of movement for the excavator boom depends on the material being processed, movement speed must be tested to avoid strain to the frame and power transmission.
7. Using appropriate speed ensures the best mixing result. Try to avoid handling stones or other hard materials because they can cause wear and tear to the drum's mixing blades.

8. When the mixing blades get worn, the mixing result deteriorates and the material begins to cause more damage to the mixing drum. Therefore, the mixing blades should be replaced before they become too worn.
9. Do not rotate the Processor drums against hard surfaces or stones

6.4 The Processor mixing tool and its correct use

The goal of these instructions is to extend the Processor mixing tool's service life. The mixing tool operates in challenging conditions. Processing of viscous materials can be classified as challenging conditions.

The correct procedure:

- Manoeuvre the mixing tool slowly and smoothly inside the material
- The mixing tool must be moved up and down in an upright position
- The mixing tool must be kept in an upright position
- The mixing tool must move at a speed that allows the drums to dig into the material
- During mixing, the drums' rotation speed should be no less than 25 rpm
- Do not use excessive force when manoeuvring the mixing tool inside the material
- Do not rotate the Processor drums against a hard surface or stones
- Grease the drums at the end of each working day. Rotate drums slowly while you grease them. Grease should squeeze out through the drum and the frame
- Check the seal oil after every 40 working hours
- The gearbox temperature must remain below 90 ºC
- The maximum drum speed is 100 rpm, while the standard speed is 50–80 rpm
- The maximum continuous pressure for the drain line is 3 bar

6.5 Working methods

6.5.1 Rotation direction and speed

The correct rotation direction of the mixing drums is away from the excavator cabin, as shown in the picture below.
Rotating the drums in the correct direction is important because it ensures a homogenous mixing result and proper functioning of the mixing blades.

IMPORTANT
During mixing, the drums' rotation speed should be no less than 25 rpm.
If the rotation speed drops below 25 rpm, the force pushing down must be reduced. Make sure that the drums rotate all the time during mixing. The mixing drums' rotation speed can be monitored in the display inside the cabin.

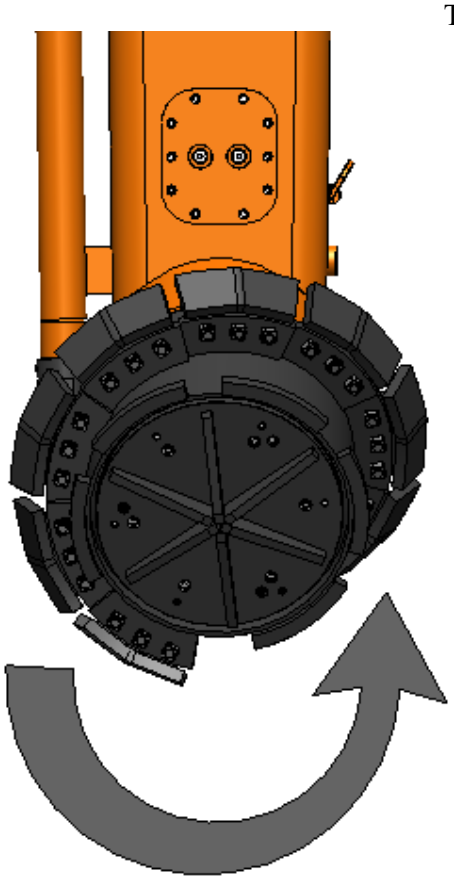


Figure 35. Correct direction for rotation.

6.5.2 Processing In Situ

This is the most commonly used method. It can be used when the material is sufficiently soft for the Processor mixer to penetrate into the material (incl. peat bog, mud and clay).
The total processing area is divided into blocks of 8 to 30 square metres. On a worksite, the blocks can be marked with sticks or flags to make it easier for the operator to distinguish them.
When the volume of the area being processed decreases, the operator must take the depth of the material into account.

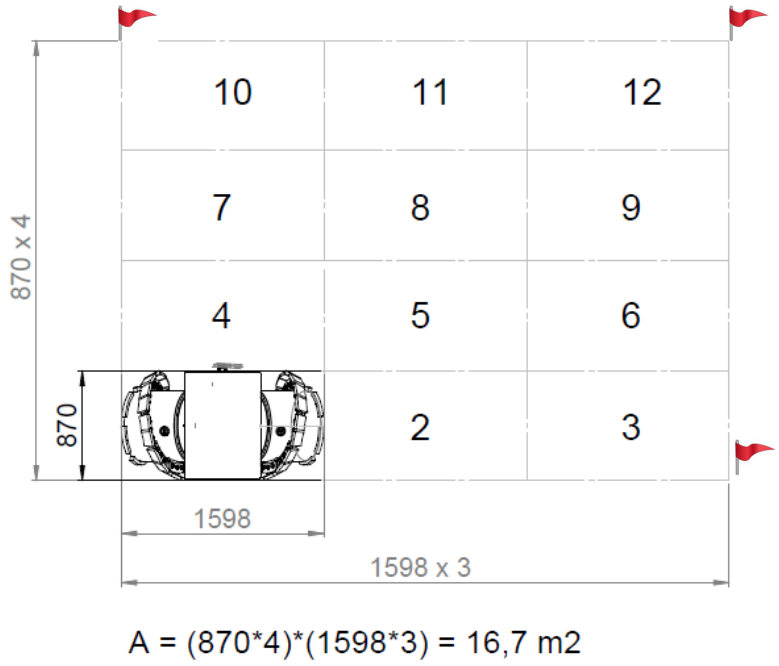


Figure 36. Example of a worksite grid.

The area is stabilised, one block at a time, moving the Processor mixing tool slowly up and down, while spraying the binding agent to the mixing drums.

The maximum depth of stabilisation is determined by the length of the Processor mixing tool. To achieve the best mixing result, it is important to mix the entire block carefully to the correct depth.

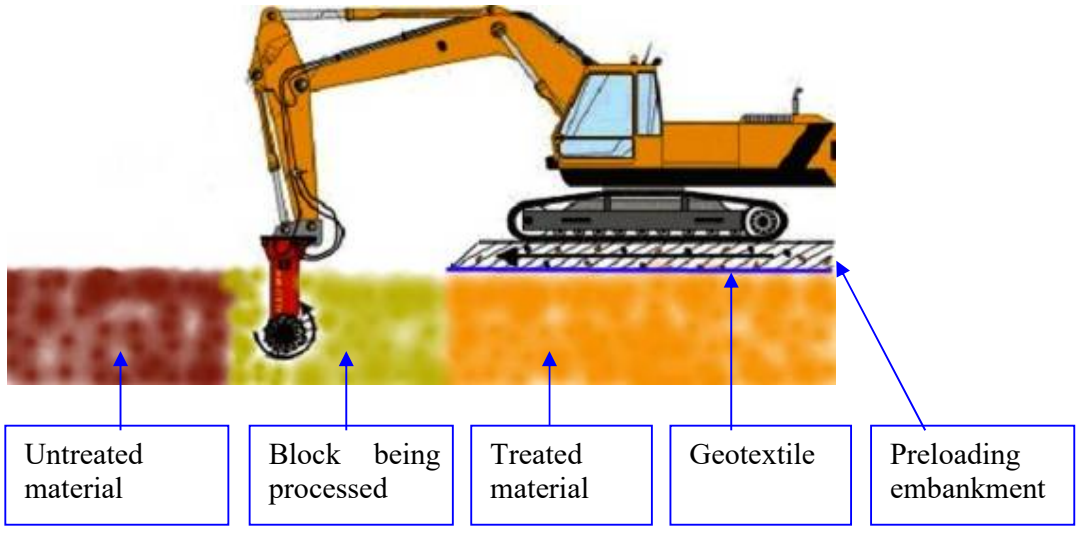


Figure 37. Processing of the material in the blocks.

6.5.3 Stabilisation in basins

The mixing of the material can be carried out as a separate processing method in metal or concrete containers (Figure 38). The material is processed in smaller batches inside the basin.

The basin is filled with material by pumping, for example, if the material is watery, or by scooping.
The basin is emptied with the scoop of the excavator.

With this method, it is possible to achieve an extremely accurate binder content and a mixing result of even quality.

	NOTE Protective equipment must be used for the drums when the mixing takes place in a basin.

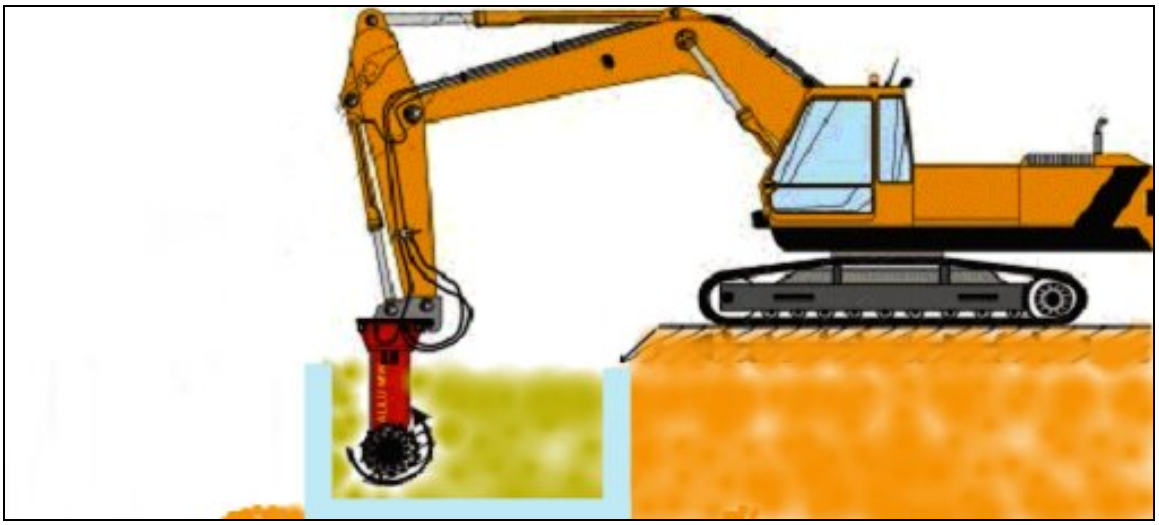


Figure 38. Processing of material in a basin.

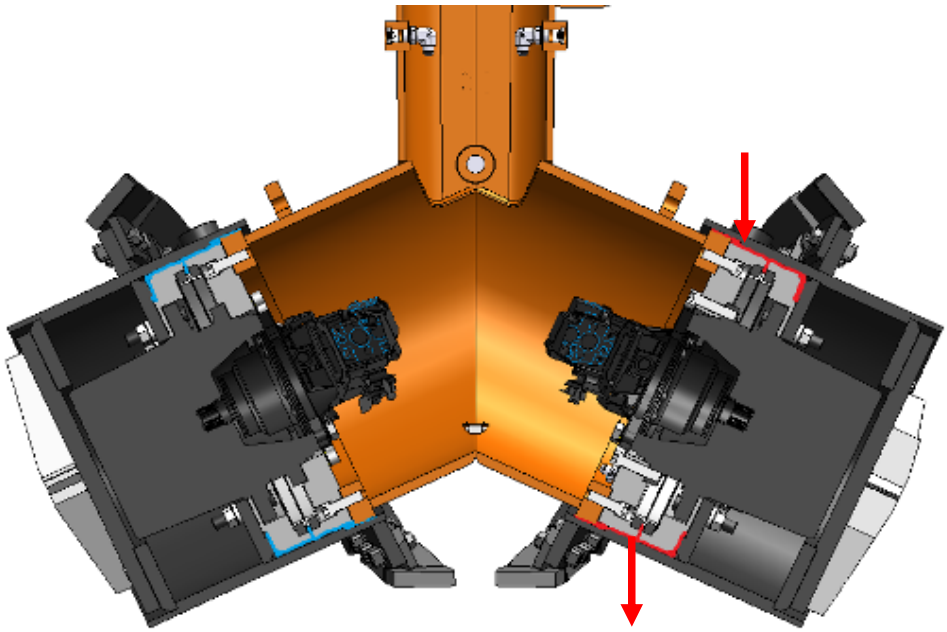
6.6 Ending the work

NOTE! FILL THE SPACE BETWEEN THE FRAME AND THE MIXING DRUM WITH GREASE AT THE END OF THE WORKING DAY.
NOTE! ALWAYS CLEAN AND GREASE THE SPACE BETWEEN THE FRAME AND THE MIXING DRUM BEFORE LONG–TERM STORAGE.

Keeping the space between the frame and the drums clean ensures that the machine starts easily in the morning and that the mechanical face seals remain in good condition.
Rinse the space between the drums and the frame through the 1¼" plugs (torque 200 Nm) with water, as shown in the picture below. Fill this space with grease by pumping grease through the greasing lines on the left- and right-hand sides.
Use a pressure washer for cleaning the Processor mixing tool from the outside and use compressed air for cleaning its binder feeding line from the inside.

Fill with grease.

Rinse with water at a maximum pressure of 1 bar.



Picture 31. Rinsing and greasing of the space between the drums and the body.

Make sure that no binder remains inside the binder feeding hose and pipe. Binder may react to humidity and solidify inside the feeding line. Solidified binder may slow down or prevent the feeding of binder.

6.7 Detaching the Processor mixing tool from the excavator

	**⚠ WARNING** Before connecting or disconnecting the hydraulic system, turn off the base machine and depressurise the hydraulic system by moving the control lever of the auxiliary hydraulic system with only the starter motor turned on. Exposure to high-pressure oil spray from a pressurised connection causes a risk of death or serious injury.	 

	**⚠ WARNING** Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface. Falling under the machine and being crushed creates a risk of death or serious injury!

	WARNING USE PERSONAL PROTECTIVE EQUIPMENT Exposure to noise, dust or flying objects may cause a risk of serious injury!	

	CAUTION Minimise the risk of hydraulic oil entering the environment by providing basins and material for absorbing any leaks while making connections!

Detach the mixer from the excavator as follows:
Place the Processor mixing tool on a flat surface (e.g. flat ground, floor or pallet) and make sure it stays firmly in its place.

Detach all electrical, hydraulic and mechanical couplings and binder feeding lines.

7 DESCRIPTION OF THE ALLU PROCESSOR AND TECHNICAL SPECIFICATION

7.1 General description

The ALLU Processor mixing tool is a hydraulic accessory for excavators and it is designed for mixing soft materials.

The mixing drums operate with a hydraulic motor-planetary gear combination. The rotation direction and speed are controlled with the excavator’s hydraulic system.

7.2 Technical data ALLU PROCESSOR 500 HD

Operation range:	Standard operating temperature	0°C – +30°C (32–104 °F).
	Min / max operating temperature	-10 °C – +45 °C 14 113 °F.
	Operating depth	0 m– 5 m (0 yd–5.47 yd)
	Excavator range	30 – 35 t
Technical data:		
Frame	Welded steel construction. Wear-resistant steel.	
Drums	Max. rotating speed	100 rpm
	Min. rotating speed	25 rpm
	Max. drum operating temperature	+90 ºC (194 °F)
	Drum inclination	25 º
	Standard drum diameter	870 mm (34.25 inches)
	Drums changeable on site Standard mixing drums	
Feeding line	3’’ Variation is possible.	
Hydraulics	Double planet gearbox and hydraulic motor with automatic torque adjustment. Flow divider/combiner valve. max. power 160 kW max. constant power 120 kW max. torque per drum 18,000 Nm @ 350 bar max. pressure 350 bar (5,100 PSI) max. oil flow 300 l/min (80 gallon US/min)	
Control system	Display inside the excavator cabin Speed sensor • Indicates drum’s rotation speed. Temperature sensor • Indicates planetary gear temperature Capacitive sensor • Indicates any oil leaks inside the frame	
	Voltage	24 V
Dimensions	L x W x H	5,800 x 1,598 x 870 228.35 in x 62.91 in x 34.25 in
Weight	2,770 kg with a base plate (6,107 lb) 2,570 kg (5,666 lb) without a base plate	
Options	Welded steel adapter for the excavator.	

7.3 Technical data ALLU PROCESSOR 300 HD

Operation range:	Standard operating temperature	0°C – +30°C (32 –104 °F).
	Min / max operating temperature	-10 °C – +45 °C 14 –113 °F.
	Operating depth	0 m – 3 m (0 yd – 3.28 yd)
	Excavator range	25 – 35 t
Technical data:		
Frame	Welded steel construction. Wear-resistant steel.	
Drums	Max. rotating speed	100 rpm
	Min. rotating speed	25 rpm
	Max. drum temperature	+90 ºC (194°F)
	Drum inclination	25º
	Standard drum diameter	870 mm (34.25 inches)
	Drums changeable on site Standard mixing drums	
Feeding line	3’’ Variation is possible.	
Hydraulics	Double planetary gearbox and hydraulic motor with automatic torque adjustment. Flow divider/combiner valve. max. power 160 kW max. constant power 120 kW max. torque per drum 18,000 Nm @ 350 bar max. pressure 350 bar (5,100 PSI) max. oil flow 300 l/min (80 gallons/min)	
Control system	Display inside the excavator cabin Speed sensor • Indicates drum’s rotation speed. Temperature sensor • Indicates planetary gear temperature Capacitive sensor • Indicates any oil leaks inside the frame	
	Voltage	24 V
Dimensions	L x W x H	3,800 x 1,598 x 870 149.61 in x 62.91 in x 34.25 in
Weight	2,400 kg with a base plate (5,291 lb) 2,200 kg (4,850 lb) without a base plate	
Options	Welded steel adapter for the excavator.	

7.4 Main components

The main components of the Processor mixer are displayed in the picture below.

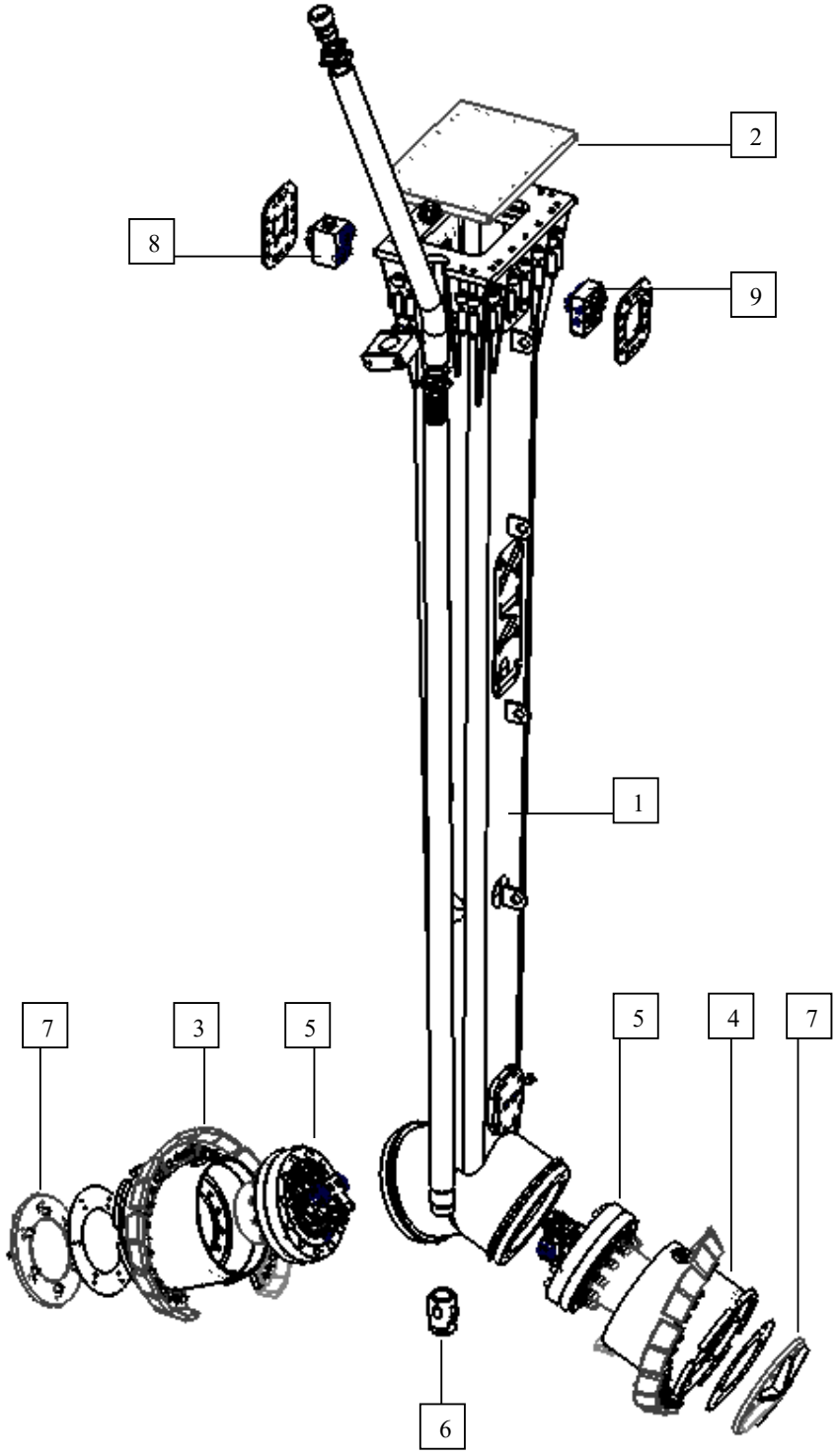


Figure 39. Main components.

Table 1. Main components

POS	ITEM
1	BODY
2	BASE PLATE
3	RIGHT DRUM
4	LEFT DRUM
5	GEARBOX
6	NOZZLE
7	DRUM COVER
8	OIL FLOW DIVIDER VALVE
9	OIL INLET VALVE

7.5 Operating temperature

Ambient operating temperature: -10 °C – +45 °C
Hydraulic or gearbox oil may restrict the temperature range.
Maximum working temperature for the gearbox: +90 °C

NOTE! When working in temperatures below 0 °C, the Processor mixing tool must be stored at temperatures above 0°C so that water or material inside the drum does not freeze at any time. In the morning, warm up the drums by rotating them slowly before commencing work.

The space between the drum and the body must be greased at the end of the working day. Frozen material inside the drum or the body may cause damage.

7.6 Dimensions and weights PROCESSOR 500 HD

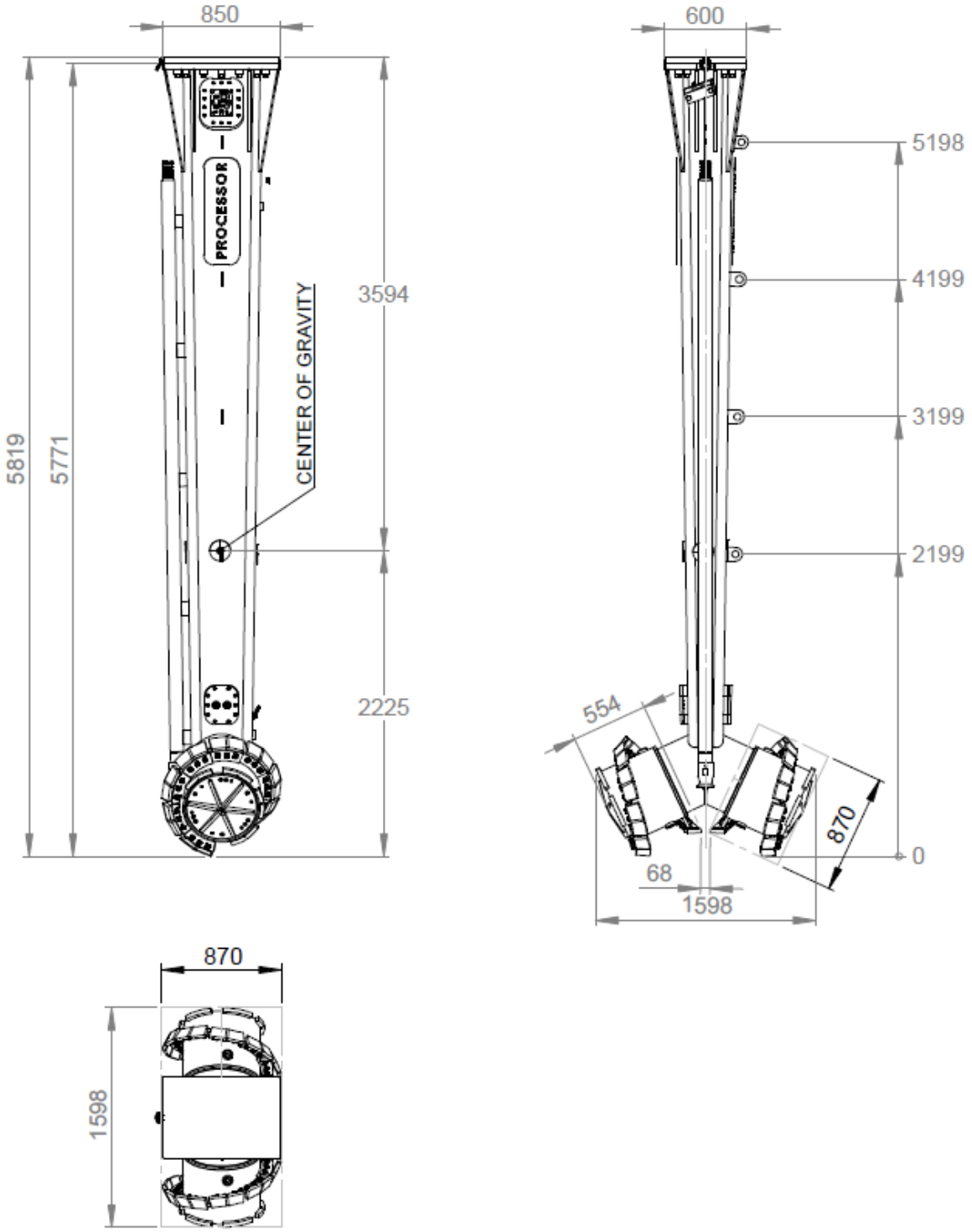


Figure 40. ALLU PROCESSOR 500 HD main dimensions.

Table 3. ALLU PROCESSOR 500 HD main dimensions and weight without a base plate.

MODEL	WEIGHT (kg)	LENGTH x WIDTH x HEIGHT (mm)
PROCESSOR 500 HD	2,570	5,771 x 1,598 x 870

7.7 Dimensions and weight of ALLU PROCESSOR 300 HD

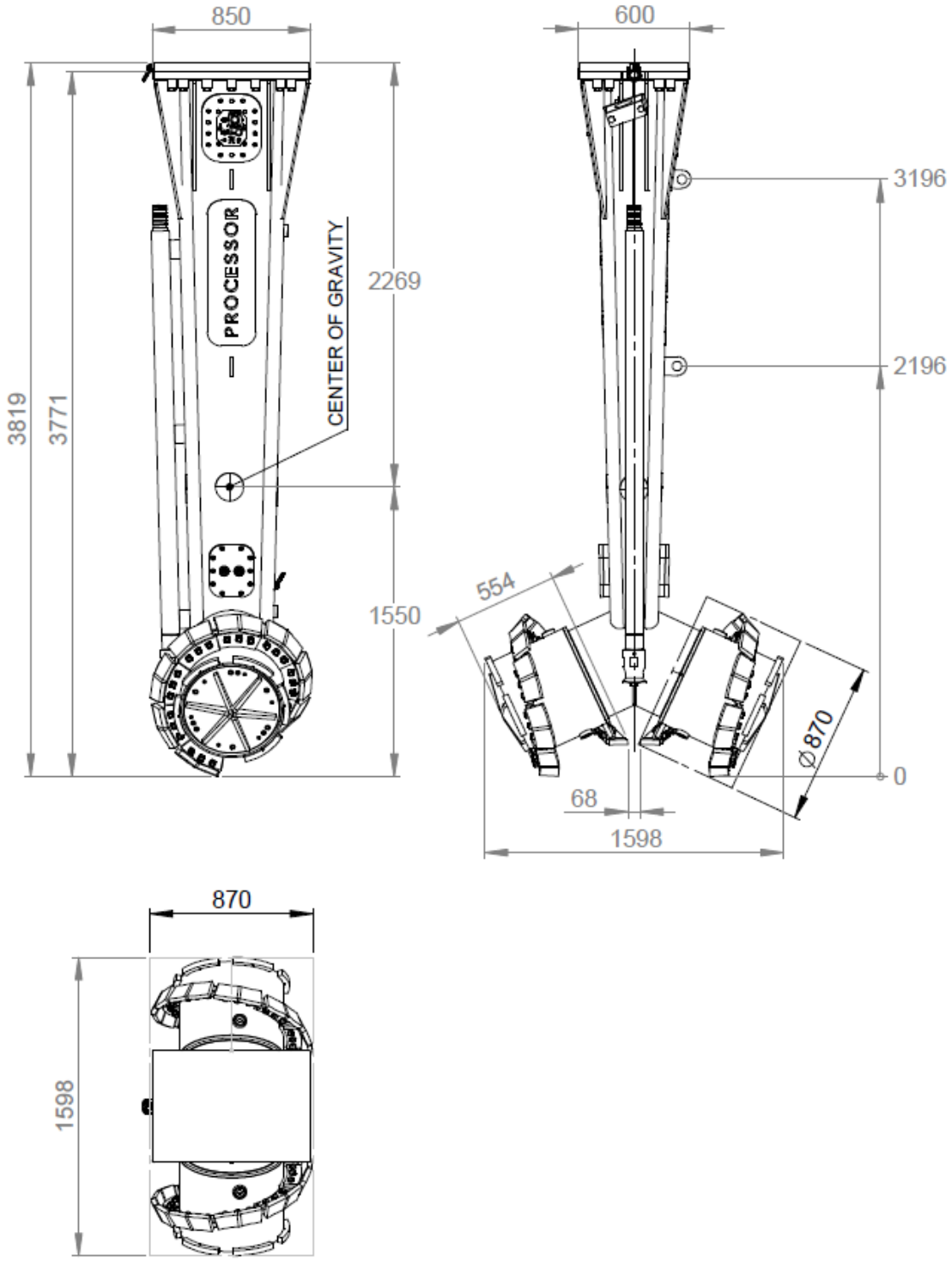


Figure 41. ALLU PROCESSOR 300 HD main dimensions.

Table 4. ALLU PROCESSOR 300 HD main dimensions and weight without base plate.

MODEL	WEIGHT (kg)	LENGTH x WIDTH x HEIGHT (mm)
PROCESSOR 300 HD	2,200	3,771 x 1,598 x 870

8 ACCESSORIES

8.1 Extension module 2M

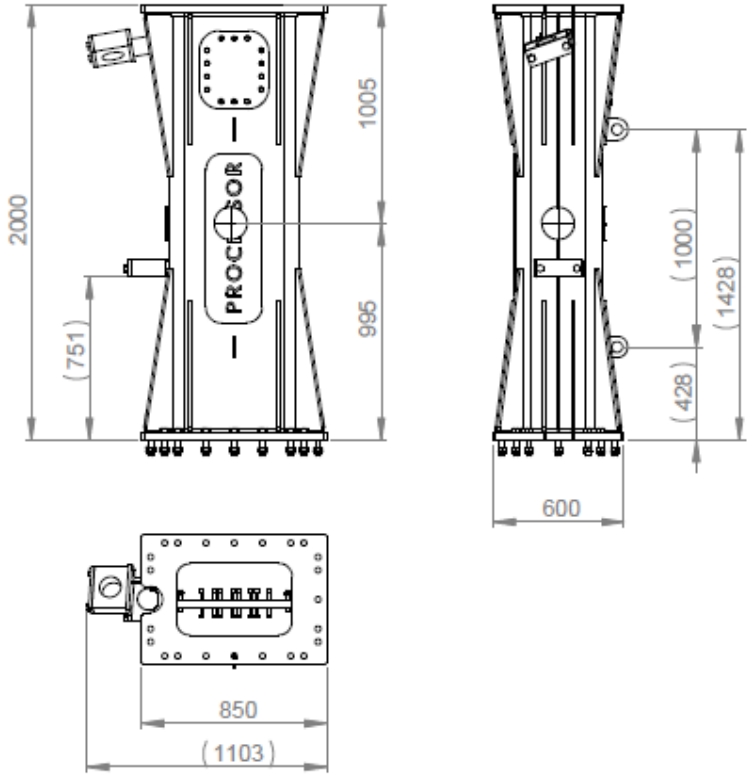


Figure 42. Extension module 2M

Table 5. Module 2M main dimensions and weight.

MODEL	WEIGHT (kg)	LENGTH x WIDTH x HEIGHT (mm)
MODULE 2M	670	2,000 x 600 x 850

The extension module for the Processor body is made of wear-resistant steel. It is 2,000 mm long and weighs 670 kg.
There are two depth markings on the left-hand side of the module, which, depending on the mixer model, denote the processing depths of 5 or 7 metres.

8.2 Preparations for installation

⚠ WARNING

Before connecting or disconnecting the hydraulic system, turn off the base machine and depressurise the hydraulic system by moving the control lever of the auxiliary hydraulic system with only the starter motor turned on.

Exposure to high-pressure oil spray from a pressurised connection causes a risk of death or serious injury.

⚠ WARNING

Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface.

Falling under the machine and being crushed creates a risk of death or serious injury!

⚠ WARNING

USE PERSONAL PROTECTIVE EQUIPMENT

Exposure to noise, dust or flying objects may cause a risk of serious injury!

⚠ CAUTION

Minimise the risk of hydraulic oil entering the environment by providing basins and material for absorbing any leaks while making connections!

Before installation, the Processor mixer should be positioned on a flat surface and fastened well to ensure that it cannot turn or roll over. Next, disconnect the Processor mixing tool from the excavator.
Clean up the top area, adapter, hydraulic hoses and binder hose carefully to prevent dirt from entering the Processor body during the installation of the extension module. Disconnect the binder hose, hydraulic hoses and electrical cable that run between the excavator and the Processor mixing tool. Remember to plug the ends of the hydraulic hoses.

8.3 Installation of the extension module 2M

The extension module is installed in stages.

8.3.1 Stage one

Disconnect the base plate, electrical cable and divider and inlet valves, as shown in the picture below.

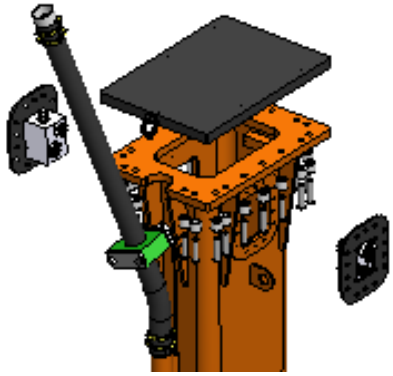


Figure 43. 2M Stage 1.

8.3.2 Stage two

Place the extension module near the Processor mixing tool as shown in the picture below. Connect electrical cables as shown in the electrical drawing. Connect the cable inside the Processor body to the cable inside the extension module.

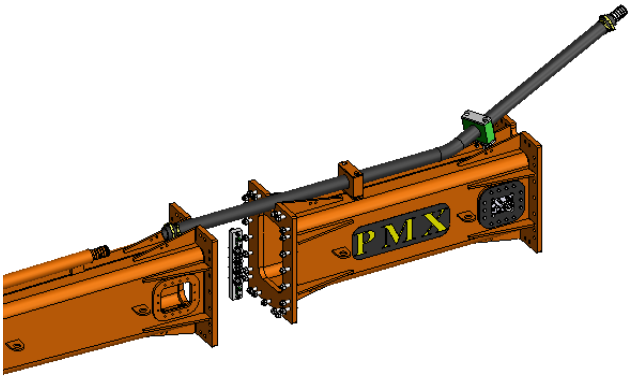


Figure 44. 2M Stage 2.

Connect the hydraulic hoses using a connector block as shown in the hydraulic drawing and the picture below.

The hoses connected to the left and right drums may not cross over one another.

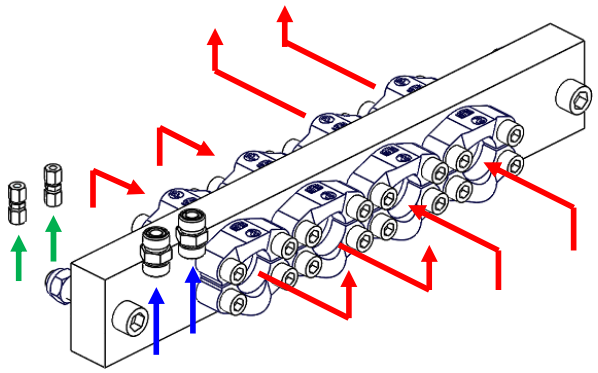


Figure 45. Extension and connection of the hydraulic and grease hoses to the connector block.

Red line – 1" hydraulic hose The tightening torque of the SAE flanges' 1" bolts is 130 Nm.
Blue line – ½" drain line
Green line – 6 mm grease hose

8.3.3 Stage 3

Connect the extension module to the Processor mixing tool's body and secure with bolts. The tightening torque for the M24 8.8 bolts and for nuts is 700 Nm.
Connect the extension module's hose the Processor mixing tool's feeder pipe.

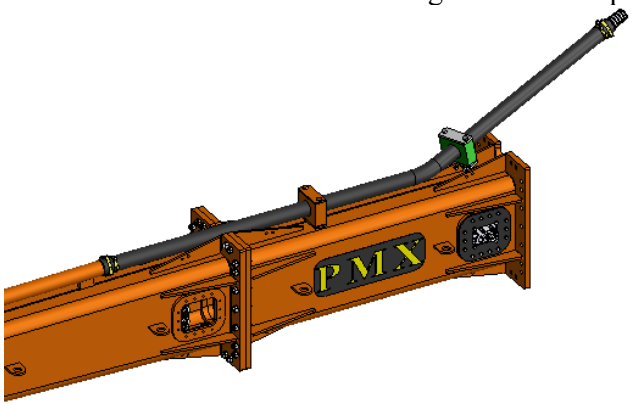


Figure 46. 2M Stage 3.

8.3.4 Stage 4

Install the enclosed cover plates to the areas of the Processor body where the flow divider and inlet valves were located. The tightening torque for bolt M12 8.8 is 85 Nm.
Install the base plate or a ready-made adapter in the extended Processor mixing tool as shown in the picture below. The tightening torque for the M24 8.8 bolts (23 pcs) is 700 Nm.

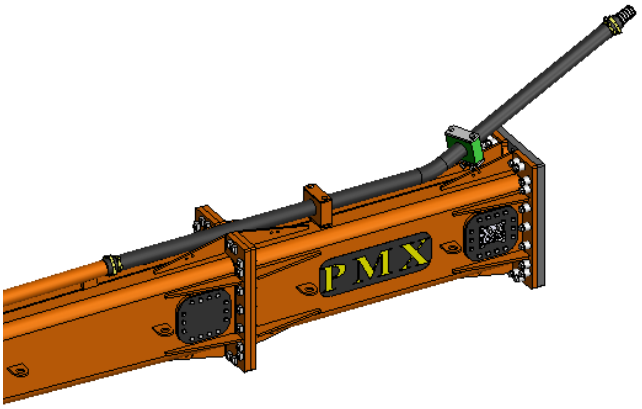


Figure 47. 2M Stage 4.

Before using the Processor mixing tool for the first time, double check all connections and joints. Comply with the instructions provided in the section ‘First start’.
Connect hydraulic hoses to the excavator and bleed air from the hydraulic system by rotating the drums for about five minutes without a load.

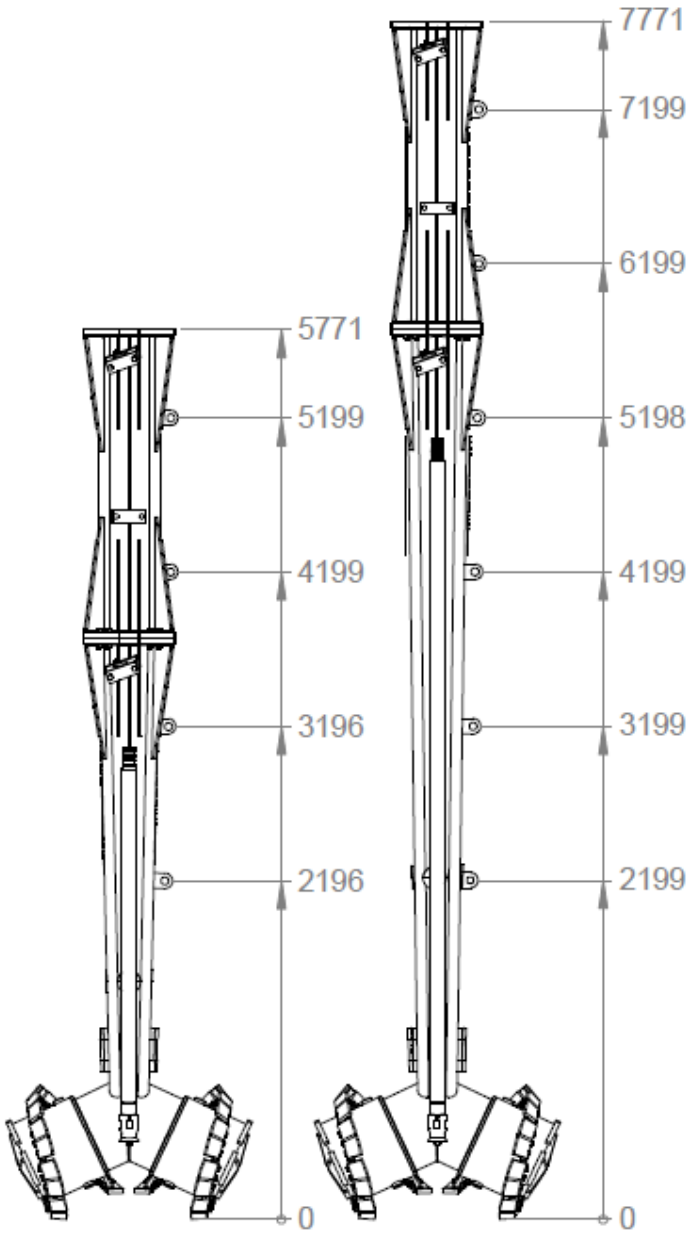


Figure 48. Depths ALLU PROCESSOR 300 / 500 and Module 2M.

8.4 Extension module 3M

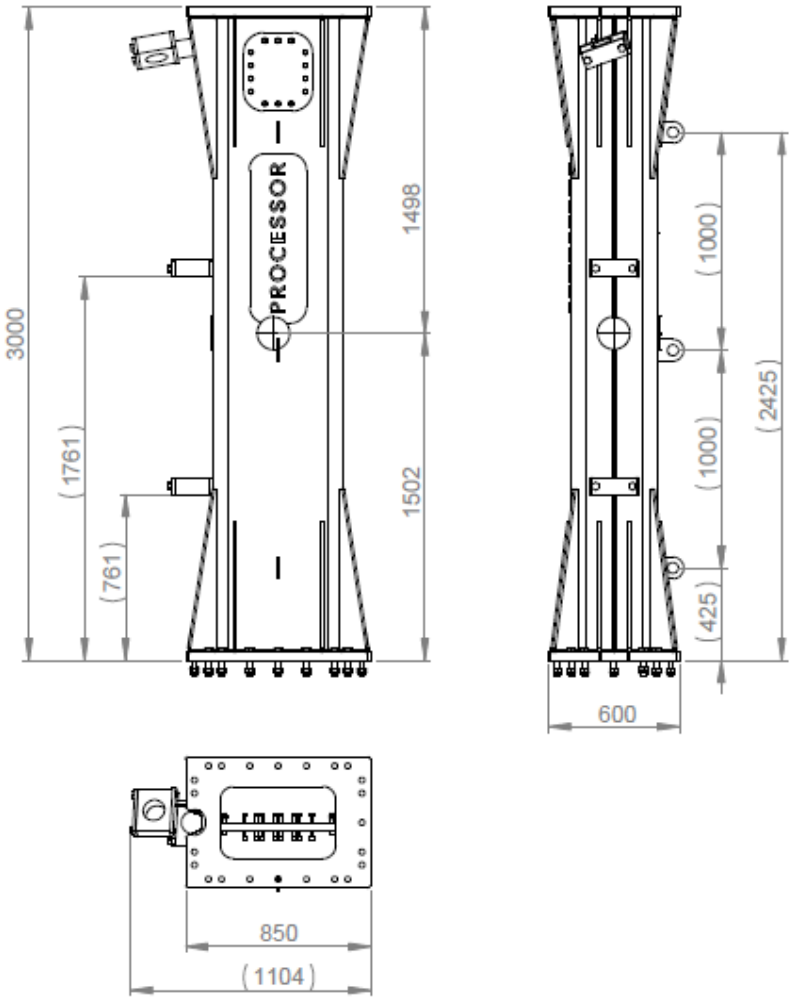


Figure 49. Main dimensions of the extension module 3M

Table 6. Module 3M main dimensions and weight.

MODEL	WEIGHT (kg)	LENGTH x WIDTH x HEIGHT (mm)
MODULE 3M	842	3,000 x 600 x 850

The extension module for the Processor body is made of wear-resistant steel. It is 3,000 mm long and weighs 842 kg.
There are three depth markings on the left-hand side of the module, which, depending on the mixer model, denote the processing depths of 6, 7 or 8 metres.

8.5 Preparations for installation

⚠ WARNING

Before connecting or disconnecting the hydraulic system, turn off the base machine and depressurise the hydraulic system by moving the control lever of the auxiliary hydraulic system with only the starter motor turned on.

Exposure to high-pressure oil spray from a pressurised connection causes a risk of death or serious injury.

⚠ WARNING

Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface.

Falling under the machine and being crushed creates a risk of death or serious injury!

⚠ WARNING

USE PERSONAL PROTECTIVE EQUIPMENT

Exposure to noise, dust or flying objects may cause a risk of serious injury!

⚠ CAUTION

Minimise the risk of hydraulic oil entering the environment by providing basins and material for absorbing any leaks while making connections!

Before installation, the Processor mixer should be positioned on a flat surface and fastened well to ensure that it cannot turn or roll over. Next, disconnect the Processor mixing tool from the excavator.
Clean up the top area, adapter, hydraulic hoses and binder hose carefully to prevent dirt from entering the Processor body during the installation of the extension module. Disconnect the binder hose, hydraulic hoses and electrical cable that run between the excavator and the Processor mixing tool. Remember to plug the ends of the hydraulic hoses.

8.6 Installation of the extension module 3M

The extension module is installed in stages.

8.6.1 Stage 1

Disconnect the base plate, electrical cable and divider and inlet valves, as shown in the picture below.

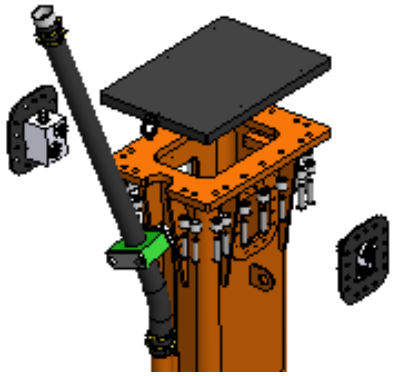


Figure 50. 3M Stage 1.

8.6.2 Stage 2

Place the extension module near the Processor mixing tool as shown in the picture below. Connect electrical cables as shown in the electrical drawing. Connect the cable inside the Processor body to the cable inside the extension module.

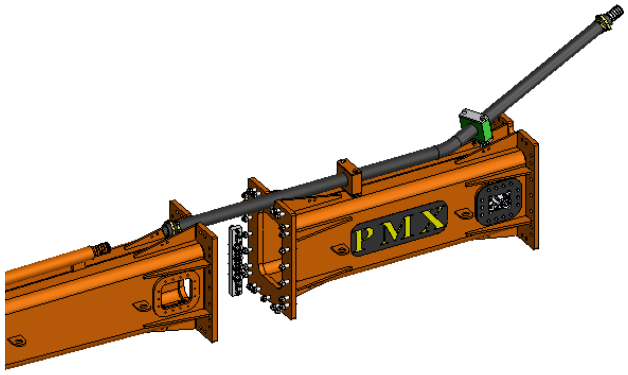


Figure 51. 3M Stage 2.

Connect the hydraulic hoses using a connector block as shown in the hydraulic drawing and the picture below. The hoses connected to the left and right drums may not cross over one another.

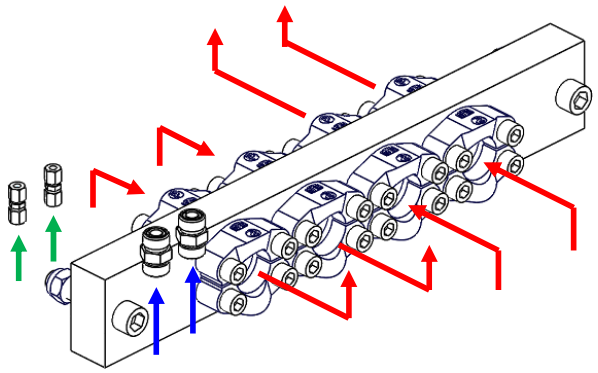


Figure 52. Extension and connection of the hydraulic and grease hoses to the connector block.

Red line – 1" hydraulic hose The tightening torque of the SAE flanges' 1" bolts is 130 Nm.
Blue line – ½" drain line
Green line – 6 mm grease hose

8.6.3 Stage 3

Connect the extension module to the Processor mixing tool's body and secure with bolts. The tightening torque for the M24 8.8 bolts and nuts is 700 Nm.
Connect the extension module's hose the Processor mixing tool's feeder pipe.

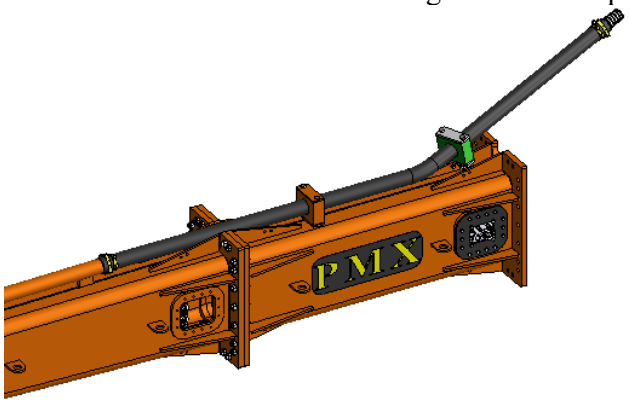


Figure 53. 3M Stage 3.

8.6.4 Stage 4

Place the enclosed cover plates in the areas of the Processor body where the flow divider and inlet valves were located. The tightening torque for bolt M12 8.8 is 85 Nm.
Install the base plate or a ready-made adapter in the extended Processor mixing tool as shown in the picture below. The tightening torque for the M24 8.8 bolts (23 pcs) is 700 Nm.

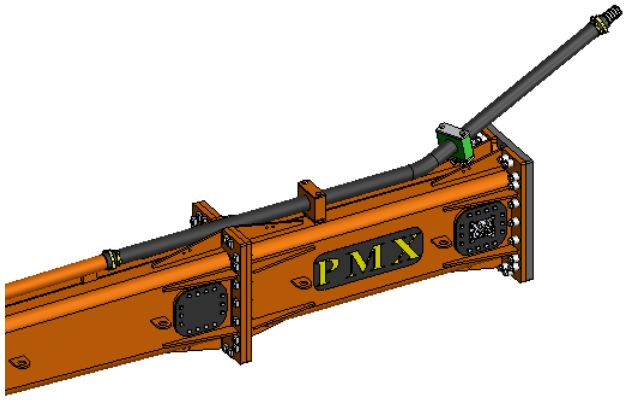


Figure 54. 3M Stage 4.

Before using the Processor mixing tool for the first time, double check all connections and joints. Comply with the instructions provided in the section ‘First start’.
Connect hydraulic hoses to the excavator and bleed air from the hydraulic system by rotating the drums for about five minutes without a load.

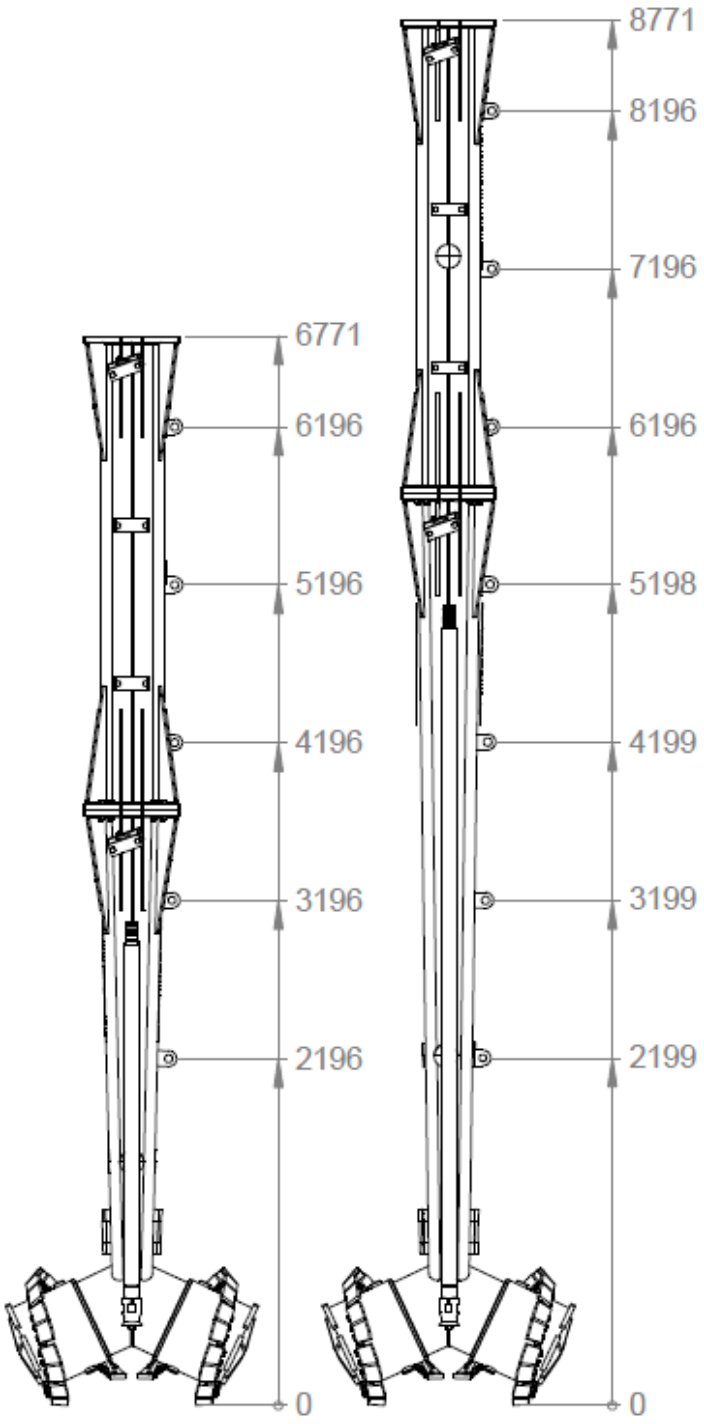


Figure 55. Depths ALLU PROCESSOR 300 / 500 and Module M3.

⚠ WARNING

Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface.

Falling under the machine and being crushed creates a risk of death or serious injury!

⚠ WARNING

USE PERSONAL PROTECTIVE EQUIPMENT

Exposure to noise, oil or flying objects may cause a risk of serious injury!

⚠ CAUTION

Minimise the risk of coolant or transmission or hydraulic oil entering the environment by providing basins and material for absorbing any leaks while adding or draining coolant!

9.1 Cleaning

Cleaning the machine regularly is permitted. Whenever possible, wash the machine from the outside with a pressure washer and use compressed air to clean the binder hose daily.
Do not use a pressure washer to clean any sensitive parts, such as hydraulic hoses, seals or electrical couplings.

Oil leaks, welding seam damage and loose bolt connections are easier to detect when the machine is dry and clean.

The space between the body and the drum must be washed before placing the machine in long-term storage.
Wash the machine before commencing maintenance and clean parts and components removed from the machine before they are reinstalled.

9.2 Service table

Perform all service measures and update a service diary daily in line with the table below. Make a record of all maintenance measures in a diary and plan upcoming service measures in accordance with the Processor mixer's work hour counter. The hourly intervals provided are maximum values when materials with a flow angle are processed. Certain maintenance procedures will be needed more frequently when wet materials without a flow angle are processed or when materials are mixed underwater. If any defects are found, they must be repaired before use.

Table 7. Service table.

TYPE OF THE MACHINE: ALLU PROCESSOR HD SERVICE SHEET						
Procedure	**Daily 8 h**	**Weekly 40 h**	**Every 250 h**	**Once in six months**	**Once a year**	**As required**
TRANSMISSION						
Check oil quality			*			
Change oil			1) 2)			
SEALING						
Check oil		3)				
Change oil			4)			
Check seals			5)			
HYDRAULICS						
Check hydraulic hoses		*				
Check system for leaks		*				
OTHERS						
Check bolt joints		6)				
Check drum blades and bolts		*				
Check binder feeding hose		*				
Check hose couplings		*				
Grease drums	*7)					
Wash gaps between drums and frame		* 8)				*

1) Change oil first time after 150 h. Use synthetic oil VG 220. Amount of oil per gear box 4,0 l.
2) Change oil every 250 h or once a year.
3) Check oil every week (NOTE PROCESSOR HD Manual).
4) Change oil every 250 h or once a year. Use oil SAE 80 or 90 (or same oil as in planetary gear). Amount of oil per seal 5,0 l.
5) Check seals every 250 h or once in 6 months. (NOTE PROCESSOR HD Manual).
6) Check and tighten the bolt joints every 40 h or each service time.
7) Grease nipple is near hydraulic hose couplings. Rotate drums slowly while greasing. Grease should come out between drum and frame. Grease both drums. Use NLGI2 grease.
8) Wash gaps with pressure washer. Do this if there will be a few days break, like weekend. In some cases, it is needed to wash more often. For example, when cement tends to harden inside the gap. Grease drums after washing.

NOTE! The service intervals must be shorter in the very severe conditions.

SERVICE DATE	NOTE	SIGN

9.3 Removal of the hydraulic oil flow divider valve

⚠ WARNING

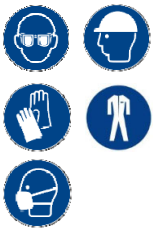
Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface.

Falling under the machine and being crushed creates a risk of death or serious injury!

⚠ WARNING

USE PERSONAL PROTECTIVE EQUIPMENT

Exposure to noise, dust or oil may cause a risk of serious injury!



⚠ CAUTION

Minimise the risk of coolant entering the environment by providing basins and material for absorbing any leaks while adding or draining coolant!

The oil flow divider valve distributes the hydraulic oil flow evenly to both mixing drum hydraulic motors.

The oil flow divider valve is located on the right side of the mixer, below the adapter plate.

The total weight of the parts is 40 kg. Use lifting equipment and ensure that the parts are properly secured to prevent them from falling while they are being removed.

First, the flow divider valve section must be removed from the machine. The section is fixed to the flange plate, which is mounted on the body. All the mounting bolts of the flange are loosened and the flange is removed from the machine together with the flow divider valve section.

The following are used to fix the flange plate to the body:

Threadlocker			
Hexagon bolt M12x30 8.8	14 pcs	wrench opening 19 mm	tightening torque 80 Nm
Lock plate NL12	14 pcs		

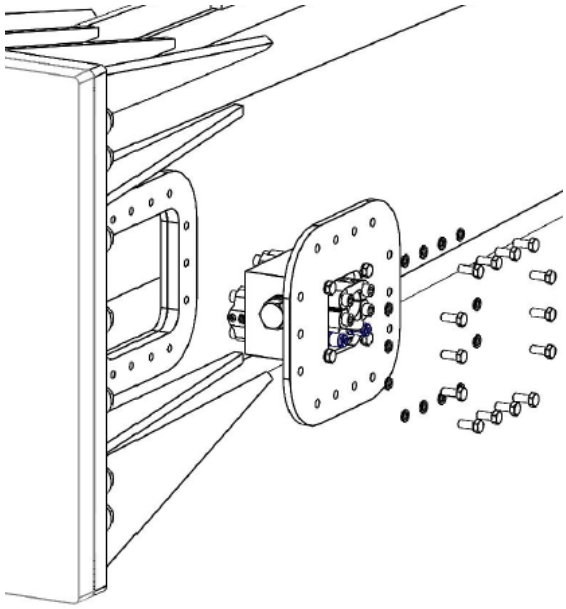


Figure 56. Detaching the flow divider valve section from the body.

To detach the flow divider valve, the hydraulic hoses must be disconnected from the section and the section must be moved to the vice. The flow divider valve secured to the vice. Ensure that the surroundings of the valve are clean and that no dirt can enter the flow divider valve section when a new valve is installed.

	NOTE Use lifting equipment to lift heavy parts and components.

NOTE All maintenance work on the hydraulic system must be performed in a clean environment and dirt must be prevented from entering the system. Even small amounts of dirt in the hydraulic system may interfere with its functioning.

The tightening torque of the flow divider valve is 475–500 Nm.

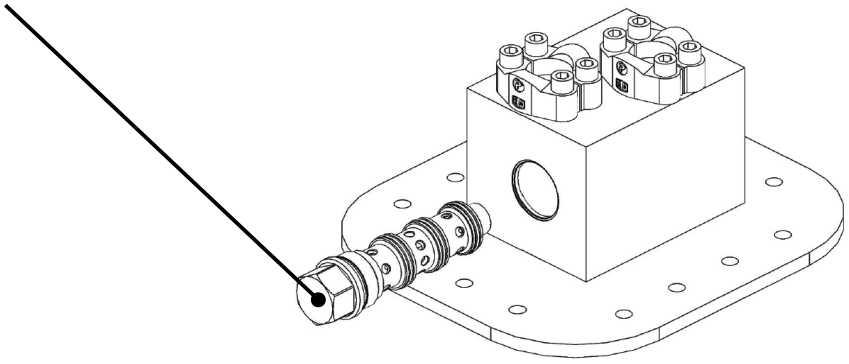
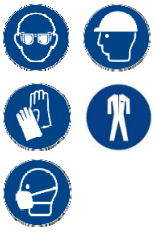


Figure 57. Removing the flow divider valve from the section.

9.4 Coolant

	**⚠ WARNING** Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface. Falling under the machine and being crushed creates a risk of death or serious injury!

	**⚠ WARNING** USE PERSONAL PROTECTIVE EQUIPMENT Exposure to noise, dust or oil may cause a risk of serious injury!	

	**⚠ CAUTION** Minimise the risk of coolant entering the environment by providing basins and material for absorbing any leaks while adding or draining coolant!

Is some cases, coolant can be poured inside the drum to cool the gearbox. The volume of coolant per drum is 10 l of 50/50 antifreeze/water blend.

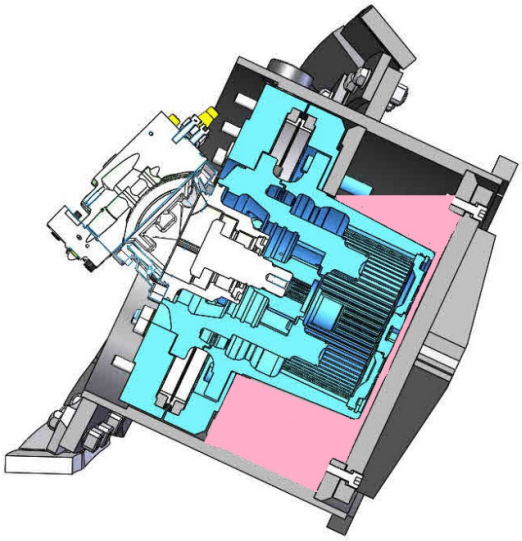


Figure 58. In the figure, the mixing drum's coolant is shown in pink.

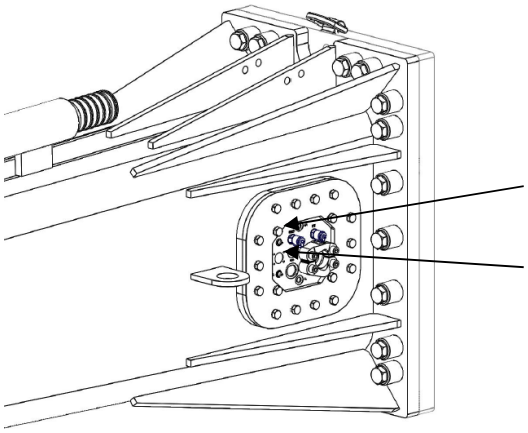
Before taking off the drums' covers, coolant must be drained. Loosen the bolts and allow the coolant to drain out.
After the inspection and maintenance, remember to refill the drums with coolant. The drum is filled via the top two fixing bolt holes in the cover. To speed up the process, use a clean oil pump.

NOTE! THERE IS NO COOLANT IN THE STANDARD EQUIPMENT

Figure 59. Use a clean oil gun to add coolant.

9.5 Greasing the drum

The space between the drum and the body must be greased at the end of the working day. Greasing prevents dirt from drying up and makes the drum easier to start up at the beginning of the shift.



R – grease nipple for the right drum

L – grease nipple for the left drum

The grease must be of GLNI2 quality

Figure 60. Grease nipples.

The grease nipples are located in the inlet section and they are marked with the letters R (right drum) and L (left drum). When greasing the drums, rotate the drums slowly and grease on the drums, one at a time.
Grease should squeeze out through the drum and the body. Grease both drums. Use grease of the NLGI2 class.

9.6 Changing transmission oil

⚠ WARNING

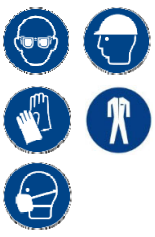
Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface.

Falling under the machine and being crushed creates a risk of death or serious injury!

⚠ WARNING

USE PERSONAL PROTECTIVE EQUIPMENT

Exposure to noise, oil or flying objects may cause a risk of serious injury!



⚠ CAUTION

Minimise the risk of gearbox oil entering the environment by providing basins and material for absorbing any leaks while replacing the oil!

Change the gearbox oil for the first time after 150 hours of operation. After that, change the oil every 250 hours or at least once a year.
When the gearbox oil is inspected or changed, the Processor mixing tool should be secured in a horizontal position. The drum cover must be removed to gain access to the holes for adding and draining oil.

More detailed instructions on the removal and installation of the cover are provided in the section ‘Removal and installation of the cover’.

Oil must not contain any impurities or steel particles. If the oil contains dirt or steel particles, the gearbox must be inspected and serviced.
To drain and add oil, follow the instructions in the diagrams below.

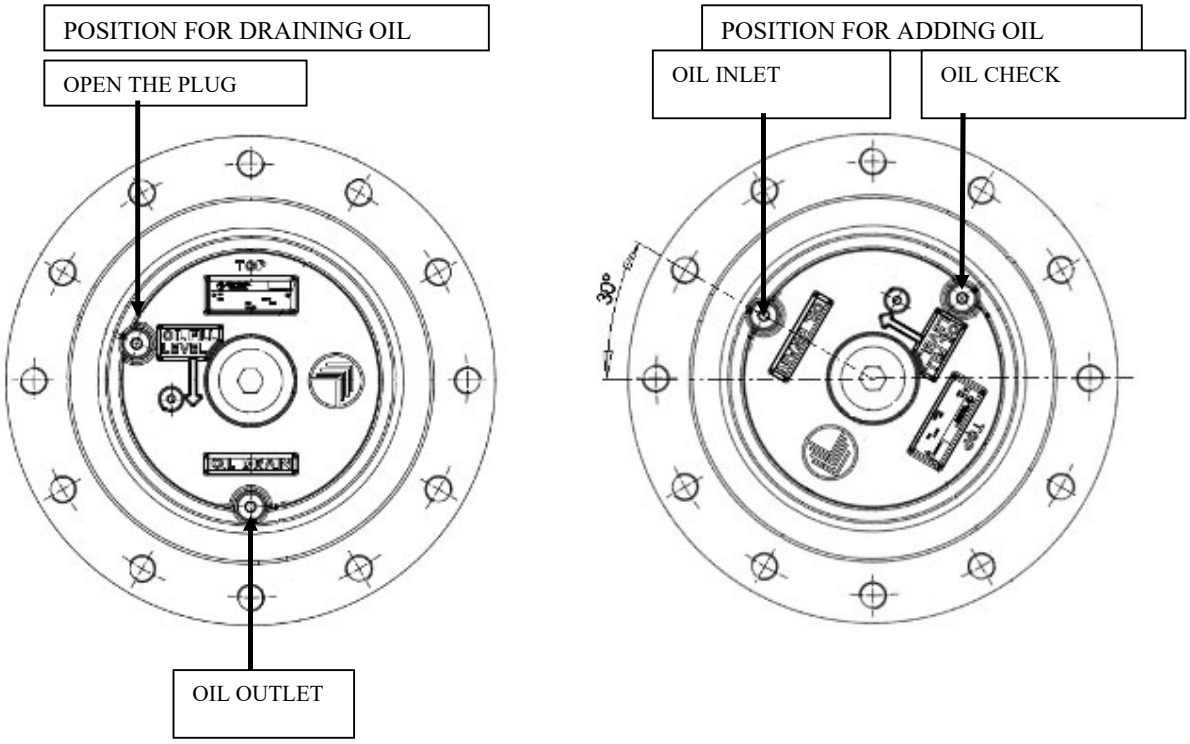


Figure 61. Changing transmission oil.

Oil type:	ISO VG 220 Synthetic transmission oil
Amount of oil per gearbox:	4.0 l
The tightening torque for the M18 plugs:	40 Nm

Figure 62. Use an oil gun in the planetary gear’s oil maintenance.

For adding oil, an M18 adapter, which comes as accessory with the mixer, is installed in the oil gun.

9.7 Adding and replacing drum seal oil

⚠ WARNING

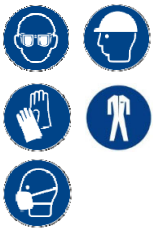
Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface.

Falling under the machine and being crushed creates a risk of death or serious injury!

⚠ WARNING

USE PERSONAL PROTECTIVE EQUIPMENT

Exposure to noise, oil or flying objects may cause a risk of serious injury!



⚠ CAUTION

Minimise the risk of sealant oil entering the environment by providing basins and material for absorbing any leaks while replacing the oil!

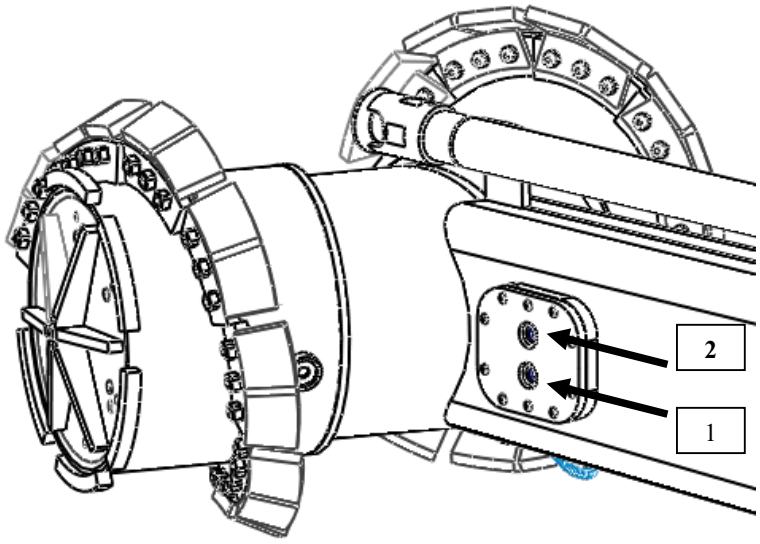


Figure 63. Inspection and inlet/outlet holes for the drum seal oil.

1. Fill-up/draining hole – 1/2''. Oil quality SAE 80 / 90
2. Inspection hole – 1/2''. Oil quantity 5.0 l / gear

The Processor mixing tool's transmission is covered by a seal, which is intended to provide additional protection for the planetary gears. A mechanical face seal is used as the seal. To function appropriately, this seal type needs to be lubricated with oil.

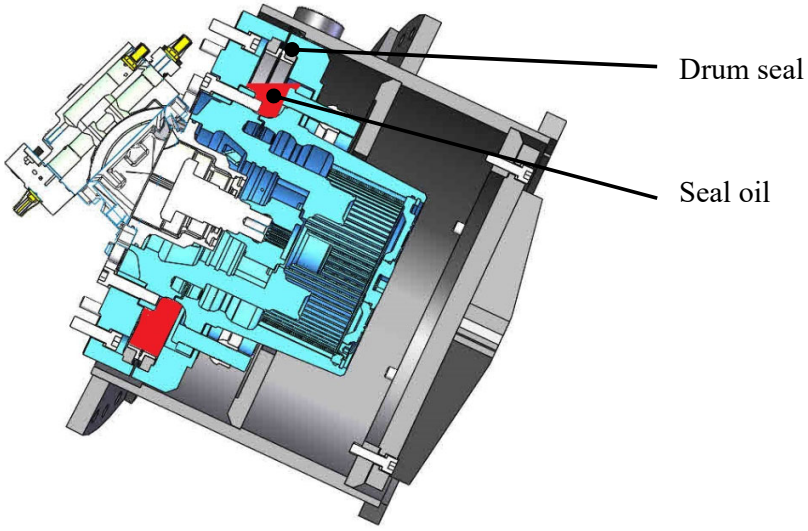


Figure 64. Drum seal and its lubrication.

The condition and level of the oil in the mechanical face seal must be checked from each side of the Processor mixing tool after every 40 working hours or once a week.

For oil check, the machine must be placed in a horizontal position.

Loosen the plugs 1 and 2. Place a full oil gun in the inlet hole. Add oil until it begins to trickle out of the inspection hole. Use the inlet hole for adding oil and check the inspection hole to see when oil begins to come out.

Figure 65. Use an oil gun for the face seal's oil maintenance.

The leaking oil may appear dark and it may contain small quantities of impurities. If the oil performs its lubrication task and remains runny, it does not need to be changed; instead the oil compartment can just be filled up.

After this, both oil holes must be plugged. The plugs' tightening torque is 90 Nm.

The mechanical face seal's oil is changed in conjunction with the maintenance of the seal. For the oil change, the machine must be placed in a horizontal position. First, oil is drained out through hole 1 (figure 63). After this, new oil is added through the same hole with an oil gun. Add oil until it begins to trickle out of the inspection hole (about 5.0 litres). The oil must be of SAE 80 or 90 quality.
If the outflowing oil is not clean but contains dirt or metal particles, the seal may become damaged and must be replaced.

9.8 Cross-section of the mixing drum

A cross-section of a mixing drum is presented in this section. The goal of the figure is to illustrate the drum structure and to facilitate dismantling, installation and maintenance.

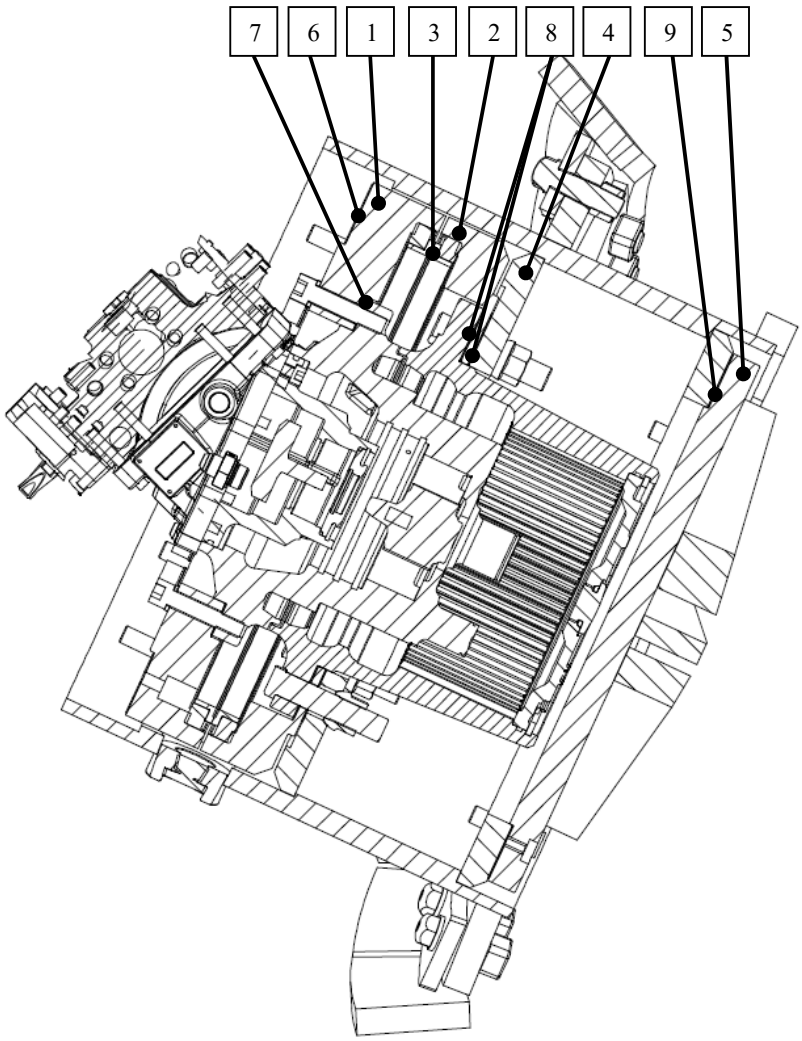


Figure 66. Cross-section of the mixing drum.

1. Flange that is fixed to the body with a bolt
2. Drum flange
3. Mechanical face seal
4. Drum
5. Drum cover
6. Gasket 1
7. Gasket 2
8. Gasket 3
9. Gasket 4

9.9 Removal and installation of the cover

⚠ WARNING

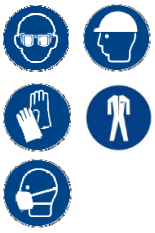
Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface.

Falling under the machine and being crushed creates a risk of death or serious injury!

⚠ WARNING

USE PERSONAL PROTECTIVE EQUIPMENT

Exposure to noise, oil or flying objects may cause a risk of serious injury!



The first stage is cleaning the drum and removing the cover. The following are used to fix the cover:

1.	M16x50 8.8 hexagonal screw	DIN 912	6 pcs	Key 14 mm	210 Nm
2.	NL16 lock plate		6 pcs		
3.	M16x20 set screw	DIN 913	3 pcs	Key 8 mm	
4.	16x50 spring pin	DIN 1481	6 pcs		
5.	Gasket				
6.	Threadlocker				

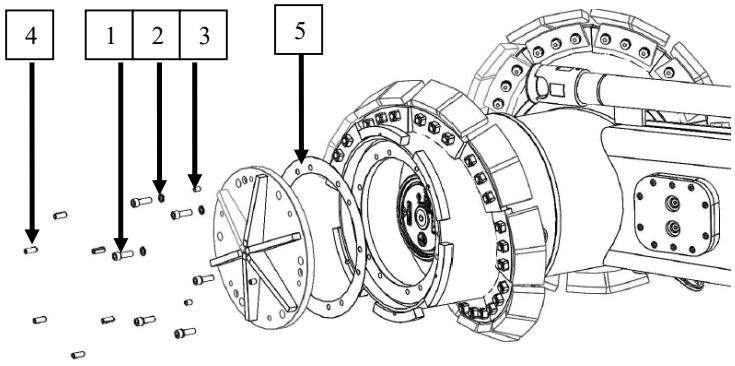


Figure 67. Installation fixtures of the drum cover.

First, loosen the hexagonal screws. Next, twist in the set screws carefully so that they push the cover off the drum.

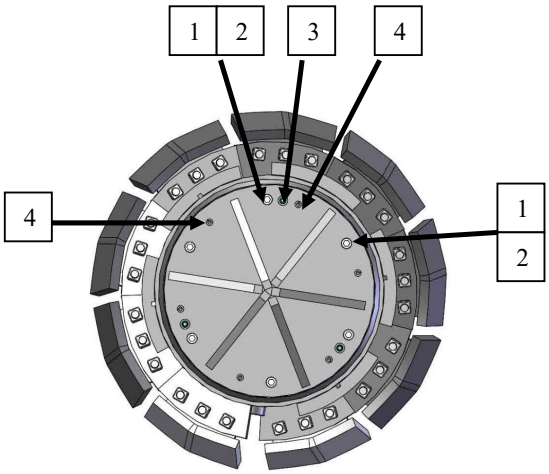


Figure 68. Mounting fixtures for the cover.

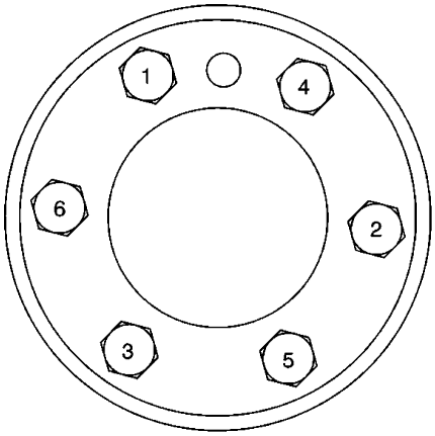


Figure 69. Tightening order for the cover bolts.

As the drum cover weighs 57 kg, lifting equipment must be used. Lifting equipment can be attached to the holes in the cover.

	NOTE Use lifting equipment to lift heavy parts and components.

The spring pins and the gasket underneath the cover must be removed and replaced with new ones before the cover is reinstalled. In addition, the hexagonal screws, lock plates and screws used for pushing the cover out that are worn must be replaced.

9.10 Removal and installation of the drum

⚠ WARNING

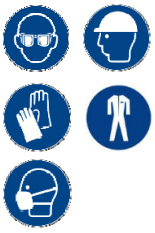
Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface.

Falling under the machine and being crushed creates a risk of death or serious injury!

⚠ WARNING

USE PERSONAL PROTECTIVE EQUIPMENT

Exposure to noise, oil or flying objects may cause a risk of serious injury!



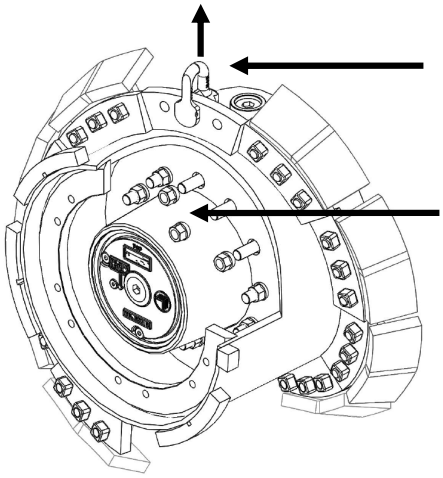
At the second stage, the drum is removed. The planetary gear has twelve M22 headless bolts. The drum is fixed with headless bolts and secured with a ball head nut.

Because the drum weighs 250 kg, lifting equipment must be used to lift and support it.

Mounting fixtures for the drum:

Threadlocker	
M22x1.5 ball head nut	12 pcs socket 30 mm 650 Nm
Gasket, between the drum flange and the gear	1 pc

Rotate the drum so that mixing blade 5 faces upwards. Detach mixing blade 5 from the drum and use the middle slot for attaching a lifting loop. The drum must be supported so that it does not fall off and remains at the same height while elevated. Pull the drum off the gearbox by gently tapping the inner end of the drum.



The drum remains steady during lifting if the lifting loop is attached to the slot for mixing blade 5.

M22 ball head nut
Socket Wrench Head 30 mm - tightening torque 650Nm

Figure 70. Drum tightening nuts and lifting loop location

Before the drum is reinstalled, it must be cleaned, and the condition of the installation surfaces must be inspected. A new gasket must be placed between the drum and the flange.

NOTE The Processor mixer has a left- and right-handed drum. Handedness is determined from the operator's seat in the excavator cabin. When in operation, the right-hand side drum moves material left and correspondingly, the left-hand side drum moves material right.

The tightening torque for the ball head nuts is 650 Nm.
The nuts must be tightened in a certain order, which is shown in the figure below.

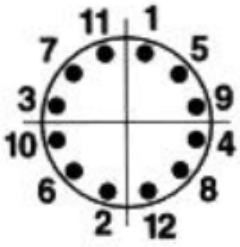
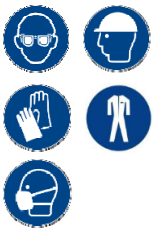


Figure 71. The tightening order of the ball head nuts.

9.11 Removal and installation of the drum flange

	⚠ WARNING
	Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface. Falling under the machine and being crushed creates a risk of death or serious injury!

	⚠ WARNING	
	USE PERSONAL PROTECTIVE EQUIPMENT Exposure to noise, oil or flying objects may cause a risk of serious injury!	

	⚠ CAUTION
	Minimise the risk of coolant or transmission or hydraulic oil entering the environment by providing basins and material for absorbing any leaks while adding or draining coolant!

The drum flange keeps the mechanical face seal in place. The flange is fixed to the gear with two screws.

As the flange weighs 35 kg, lifting equipment must be used to lift and support it.

The following are used to fix the flange:

M8x20 DIN7991 8.8 Hexagonal screw, 2 pcs

Tightening torque of 24 Nm

Gasket, between the drum flange and the gear

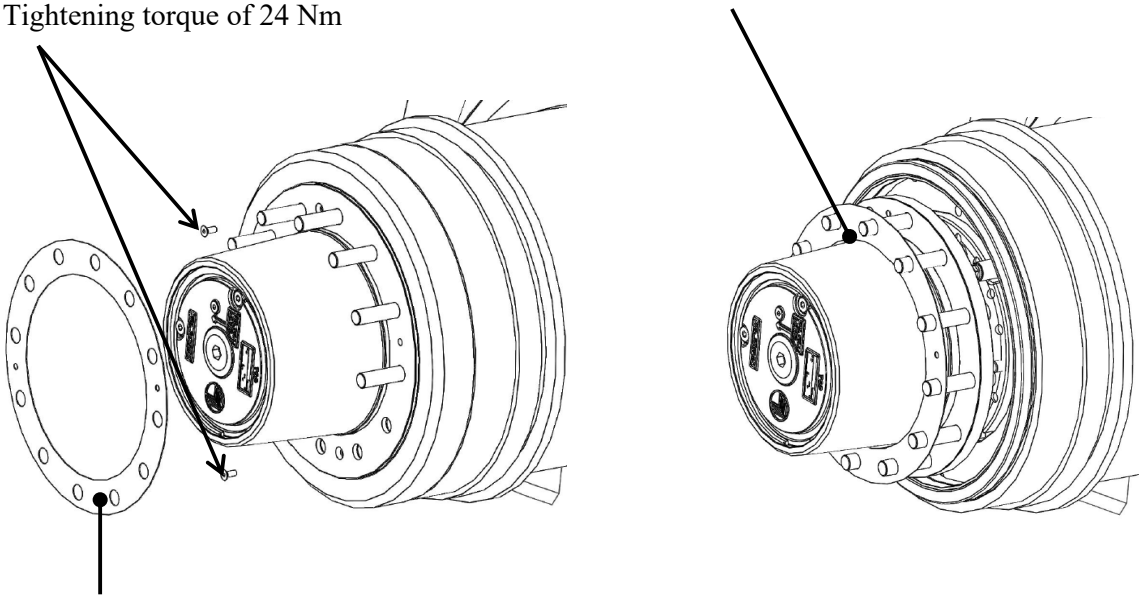


Figure 72. Removal of the drum flange

The drum flange has two M12 threaded holes through which the flange can be pushed out. Any M12 screw can be used for the purpose. Twist the screws in carefully until the flange comes off.

Clean the flange and check that the surfaces are in good condition before re-installation.

9.12 Removal and installation of the mechanical face seal

⚠ WARNING

Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface.

Falling under the machine and being crushed creates a risk of death or serious injury!

⚠ WARNING

USE PERSONAL PROTECTIVE EQUIPMENT

Exposure to noise, oil or flying objects may cause a risk of serious injury!

⚠ CAUTION

Minimise the risk of sealant oil entering the environment by providing basins and material for absorbing any leaks while replacing the oil!

After every 250 working hours, the condition of the mechanical face seal must be inspected. For this, the mechanical face seal must be dismantled and a caliper must be used to measure wear on the steel rings. The steel ring halves wear reserve is 1.5 mm. If more than half of this layer has worn off, the mechanical face seal must be replaced. The drum and drum flange must be removed to enable the removal and installation of the seal.

The seal consists of two symmetrical halves, each composed of a steel and rubber ring. These halves are not attached to one another and they are removed from the drum flange and the flange fixed to the body with a bolt by pulling them off by hand.

After removal, the installation flanges of the seal halves, the drum flange and the flange fixed to the body with bolts must be cleaned carefully and all the installation surfaces must be inspected. If the installation surfaces are damaged, we recommend using a replacement part.

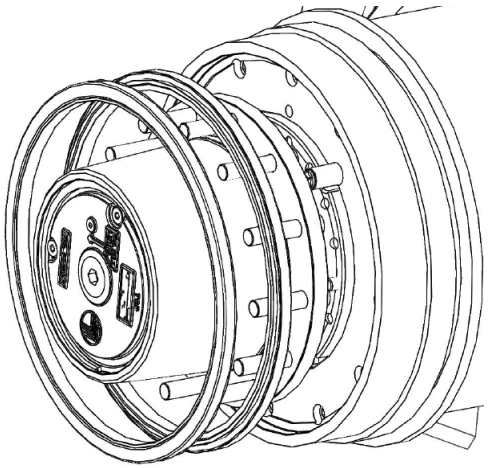


Figure 73. Removal of the mechanical face seal.

A new seal is installed in reverse order. The sliding surfaces of the metal halves must be lubricated with oil and the metal rings are mounted, together with the rubber rings, in the hollows in the flanges intended for the seals. Great care must be taken during installation not to damage the steel or rubber rings.
The drum flange is mounted on the gear so that the holes for flathead screws in the flange, gasket and the gear are in line with one another. Remember to use a new gasket. Check that the seal halves are securely in place and pull the flanges together by tightening the screws with the appropriate tightening torque.

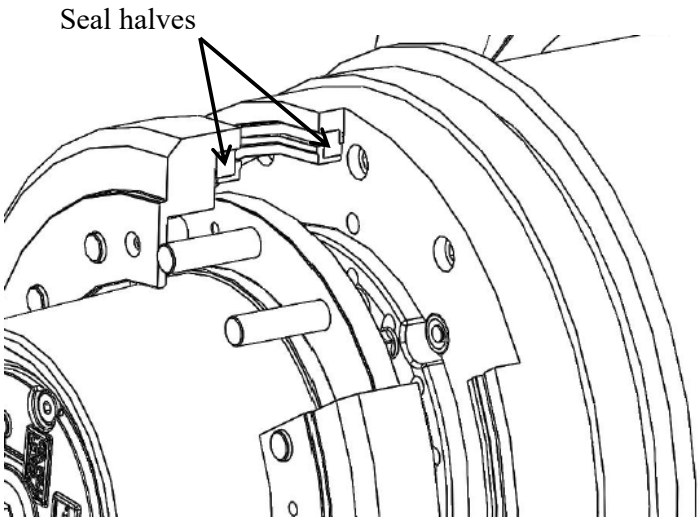


Figure 74. Installation of seal halves.

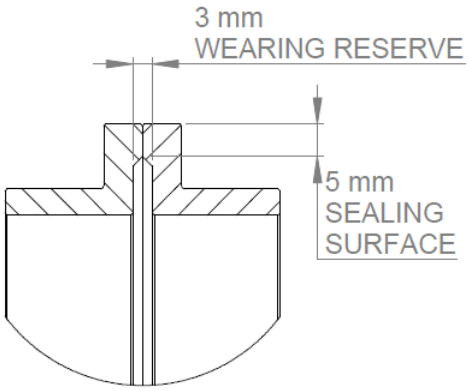


Figure 75. A cross-section of the seal's steel ring and wearing reserve.

A cross-section of the mechanical face seal is presented in the figure above. The steel ring's seal surface is 5 mm wide and the seal has to be changed once 1.5 mm of this surface has worn off.

The type of the material being processed has an impact on how quickly the seal wears. Because of this, the replacement interval may be longer than 250 operating hours.

9.13 Removal and installation of the planetary gear

	⚠ **WARNING**
	Before commencing installation or maintenance, ensure that the machine is stable and positioned on a solid surface. Falling under the machine and being crushed creates a risk of death or serious injury!

⚠ WARNING

USE PERSONAL PROTECTIVE EQUIPMENT

Exposure to noise, oil or flying objects may cause a risk of serious injury!

⚠ CAUTION

Minimise the risk of coolant or transmission or hydraulic oil entering the environment by providing basins and material for absorbing any leaks while adding or draining coolant!

The planetary gear is mounted on the mixer with the flange fixed with bolts. First, all the mounting bolts in the frame flange must be loosened. Make sure that the gearbox is secured to prevent it from falling.

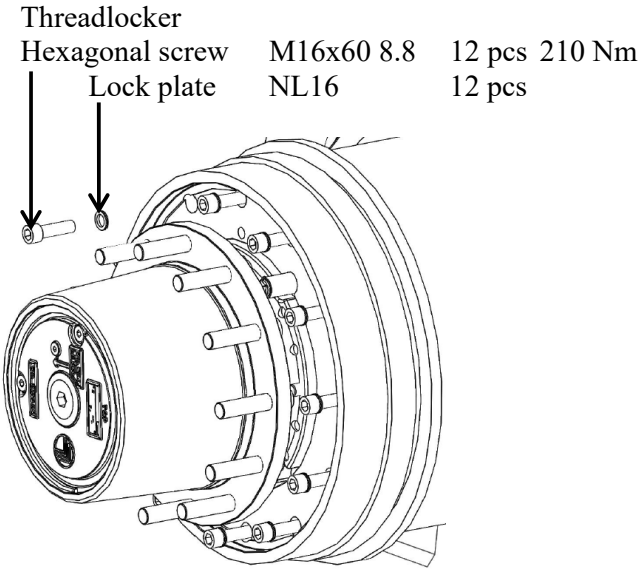


Figure 76. Loosening of the frame flange bolts.

Loosen the twelve M16x60 bolts and remove the planetary gear, with its flange, from the frame. Next, disconnect the A and B hoses and the drain hose from the hydraulic motor.
Attach RPM and T sensor connectors.

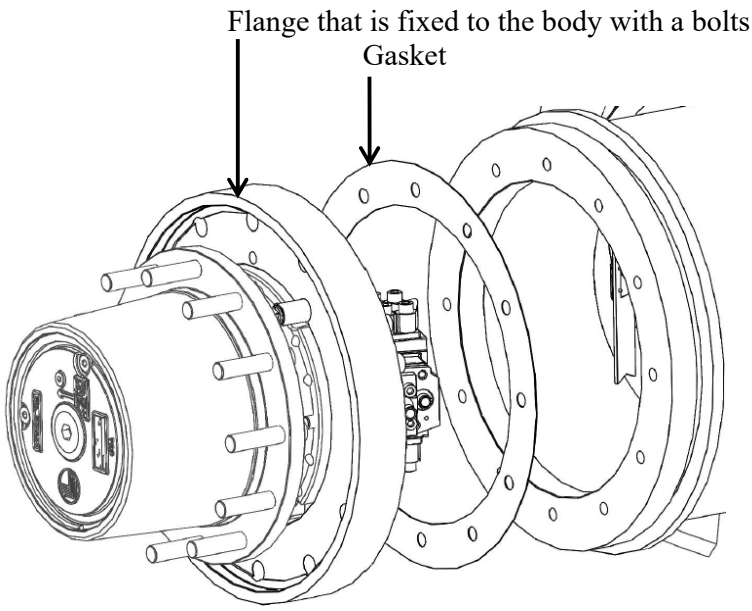


Figure 77. Removal of the gear and flange from the body.

Place the planetary gear on a flat surface with the flange fixed to the frame facing upwards. Loosen the motor's mounting bolts and remove the hydraulic motor from the planetary gear.

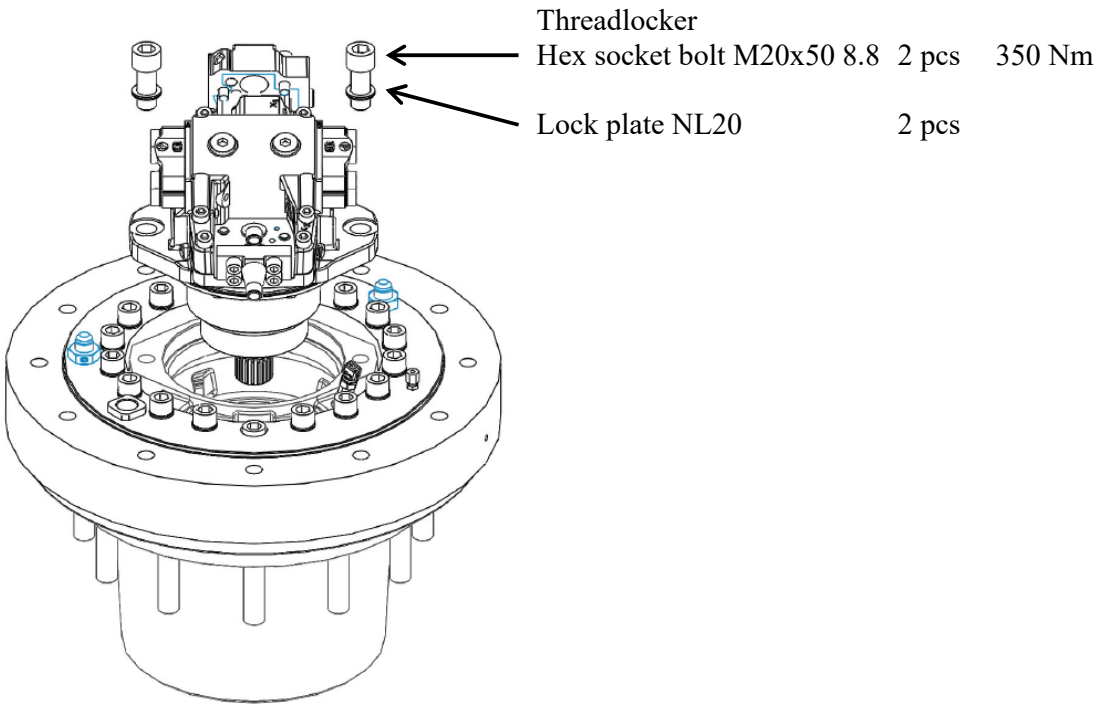


Figure 78. Removal of the hydraulic motor from the planetary gear.

Next, the frame flange must be detached from the gear.

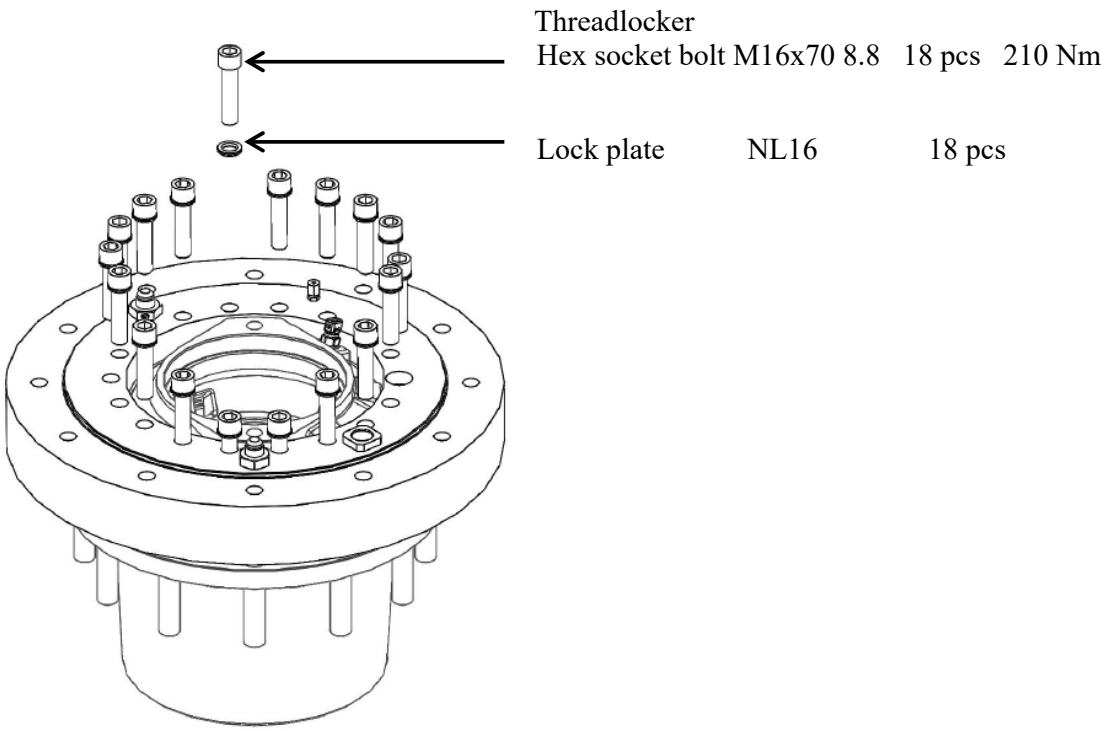


Figure 79. Removal of the planetary gear's mounting bolts from the frame flange.

Loosen all the 18 frame flange mounting bolts and remove the flange from the planetary gear as shown in the figure below.

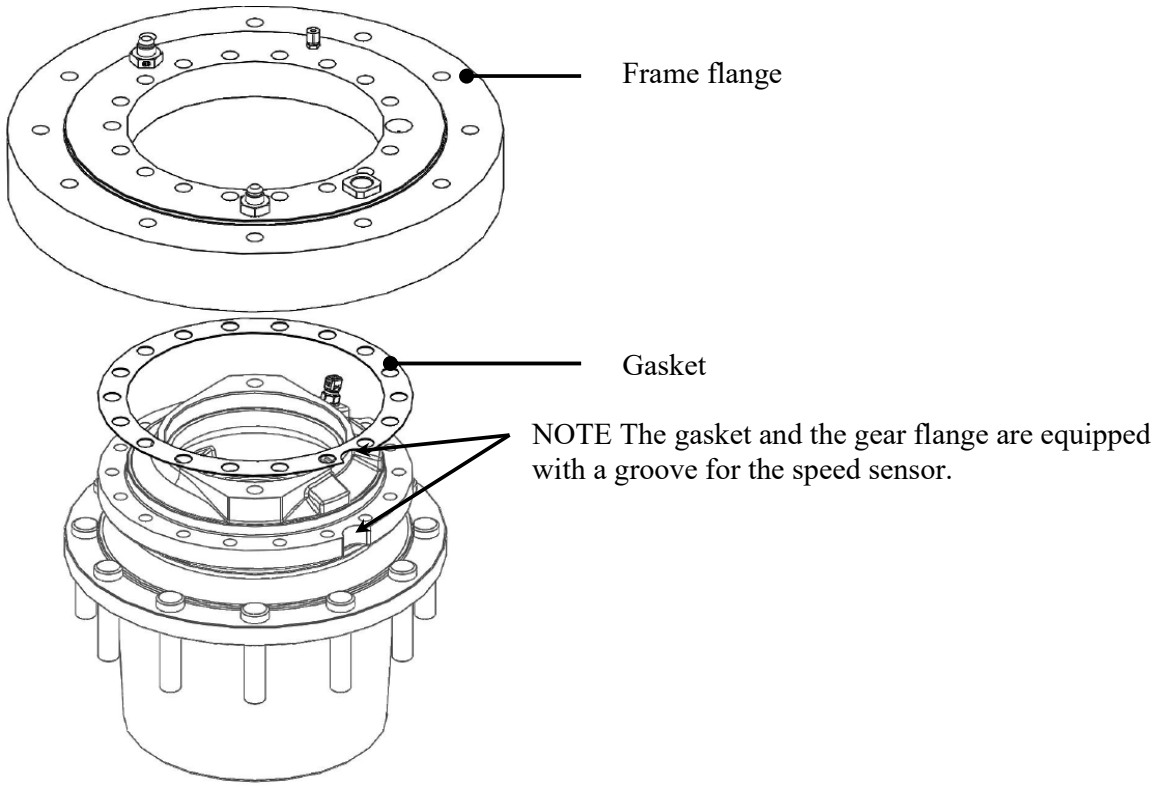


Figure 80. Removal of the drum flange from the planetary gear.

Clean all the installation surfaces after servicing the gearbox. Reinstall the gearbox and the drum in reverse order. Do not use the flange, washers or the bolts again if they are damaged. Always replace damaged parts with new ones.

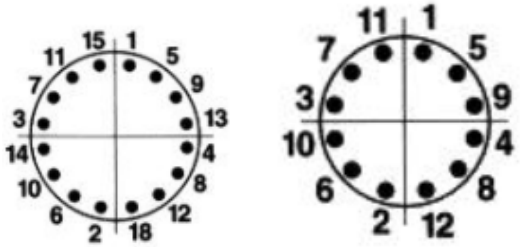


Figure 81. tightening order of bolts 18 and 12.

Remember to use new lock plates and threadlocker when you reinstall the parts. Replace the bolts when necessary.

The tightening torque for the M16 8.8 bolt is 210 Nm.
The tightening torque for the M20 8.8 bolts is 350 Nm.

9.14 Parts to be installed on the frame flange

The mounting of the mixing drum begins with the installation of the frame flange. The following components are mounted on the flange:

			Tightening	
1. Grease connector, straight	1 pcs	-	2–3 rounds	Threadlocker
2. Basic connector	2 pcs	-	90 Nm	Threadlocker
3. Temperature sensor	1 pcs	-	17 Nm	Threadlocker
4. Speed sensor adapter	1 pcs			Threadlocker
5. Speed sensor	1 pcs			Threadlocker
6. Speed sensor locking nut	1 pcs	-	30 Nm	Threadlocker
7. Planetary gear	1 pcs			
8. Hexagonal screw M16x70 8.8	18 pcs	-	210 Nm	Threadlocker
9. Lock plate NL16	18 pcs			

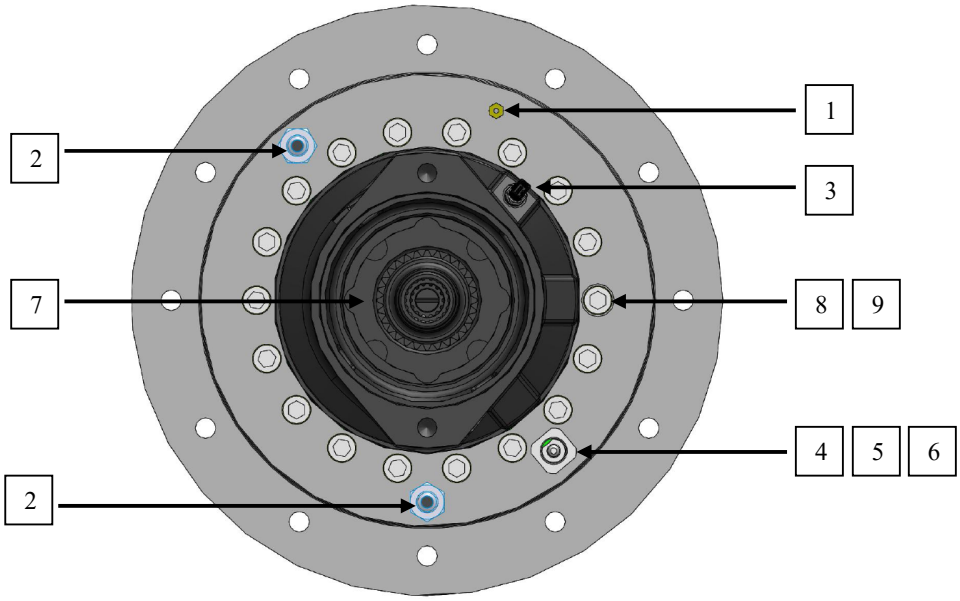
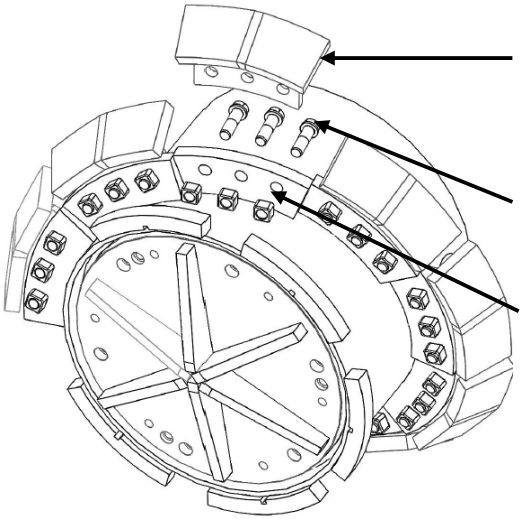


Figure 82. Parts to be installed on the frame flange.

9.15 Removal and replacement of mixing blades

The mixing drum blades are manufactured of wear-resistant steel and they must be replaced before the blade holder begins to show signs of wear. If the processed material is abrasive, we recommend that the blades, blade holders and the surface of the drums have a hard coating. The figure below illustrates how to change the blades.



Mixing blade – standard 7 pcs
Mixing blade – hard welded 2 pcs
first and last

Hexagonal bolt M22x65 12.9 27 pcs
Wrench opening 27 mm - tightening torque 850 Nm

Bolt M22 27 pcs
Wrench opening 30 mm

Figure 83. Replacement of mixing blades.

The bolt heads and nut may be worn, making them impossible to loosen with a wrench. In this case, you can use a flame cutter to remove them.

NOTE Regardless of the blade model, the new drum blade is installed on the side of the blade holder where the material flows.

When installing a new blade, make sure that the installation surfaces are clean. Use new M22x65 12.9 bolts and nuts (tightening torque of 850 Nm).

9.16 Removal and replacement of the nozzle

The binder feeding line's nozzle is made of wear-resistant steel. The nozzle replacement intervals cannot be pre-determined because the nozzle is exposed to a varying degree of wear and tear, depending on the work method, material being processed, binder and binder feeding rate.

The nozzle should be monitored for wear and replaced when necessary.

In some cases, it may be necessary to install a separate feeding pipe. For further instructions, contact the manufacturer.

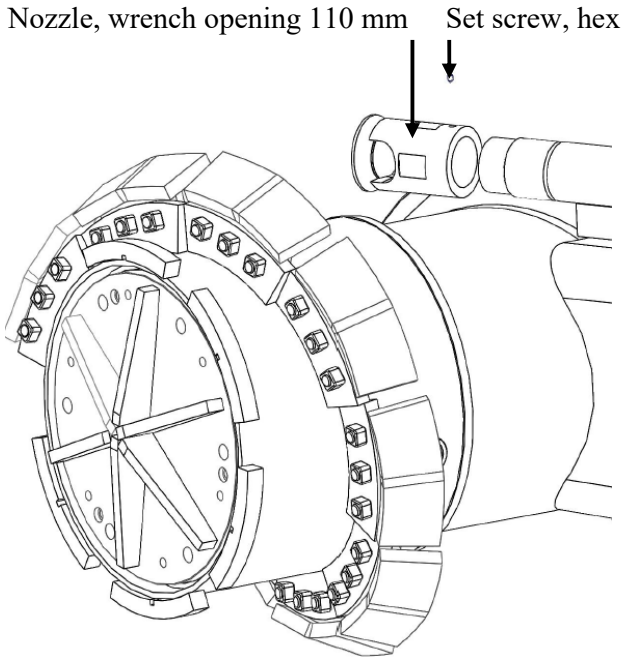


Figure 84. Removal of the nozzle.

To begin removing the nozzle, loosen the set screw, which prevents the nozzle from rotating along its thread. Next, use a key to remove the nozzle from the binder feeder tube. If the nozzle and its thread are damaged, use a flame cutter to cut the nozzle off. Perform flame-cutting carefully to avoid damage to the feeder pipe's external thread so that a new nozzle can be put in place without the need to repair the thread.

The new nozzle is put in place so that the binder outlet holes face towards the drums. The nozzle is secured in this position with a set screw.

⚠ WARNING

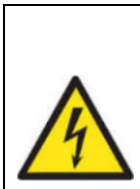
Before inspecting, opening or attaching hose connections or performing inspection of moving components, turn off the base machine and depressurise the hydraulic system by moving the control lever of the auxiliary hydraulic system with only the starter motor turned on. Under no circumstances should you place your hands between rotating or moving parts while the mixer is attached to the base machine.

Exposure to high-pressure oil spray or getting caught between rotating parts causes a risk of death or serious injury.

Take the appropriate precautions when inspecting the machine in a danger zone!

⚠ CAUTION

Minimise the risk of gearbox and hydraulic oil entering the environment by providing basins and material for absorbing any leaks while connecting the hydraulic system and performing inspections!



⚠ WARNING

RISK OF ELECTRIC SHOCK

Always use personal protective equipment. Switch off the excavator's motor and remove batteries before installation or maintenance.

⚠ WARNING

USE PERSONAL PROTECTIVE EQUIPMENT

Exposure to noise, oil or flying objects may cause a risk of serious injury!

Table 8. Troubleshooting table.

DISTURBANCE	POSSIBLE CAUSE	CORRECTIVE MEASURE
The drum does not rotate at the beginning of the shift	Dried binder is lodged between the frame and the drum and prevents rotation	Open the drum's cleaning plugs. Check the space between the drum and the frame and clean when necessary
The drum stops during operation	Flaw in the planetary gear or hydraulic motor	Check the display for the temperature of the drum that does not operate
		Measure the pressure and flow in the drum
The drum operates intermittently	The hydraulic oil flow divider valve does not function properly	Rotate the drums in the other direction
The gear overheats	The binder reacts with humidity	Use of refrigerant inside the mixing drum
		Cooling of the drums in a basin of water
The display does not switch on	Power supply is disrupted	Check the power cable
		Check the fuse
The drum's temperature information is not displayed	The sensor does not function or the cable connection is disrupted	Check the cable connection and the sensor
The drum's speed information is not displayed	The sensor does not function or the cable connection is disrupted	Check the cable connection and the sensor
The display issues a warning about an oil leak	Oil leak inside the frame	Open the inspection hatches on the frame to locate the leak

11 STORAGE

11.1 Storing environment

Temperature: -40°C – + 60°C
Note! Operation temperatures are different from these values
Relative humidity: below 60%

11.2 Daily storage (when attached to the excavator)

If possible, keep the Processor mixing tool stored in a warm, dry place. Clean/wash the Processor mixing tool after use and grease the space between the drums and the body to prevent the binder or other materials from getting lodged in the mixer's drums or body Do not use a pressure washer to clean any sensitive parts, such as hydraulic hoses, seals or electrical couplings.

11.3 Long-term storage

If possible, store the Processor mixing tool in a warm, dry place.
Clean/wash the space between the drums and the body of the Processor mixing tool before placing the machine in storage.
Grease the space between the drums and the body before placing the machine in storage.
Disconnect the Processor mixing tool from the excavator.
Cover the hydraulic couplers with blind plugs.
Replace the gearbox oil.
Remove all rust, and paint the exposed areas with protective paint.
Protect all metal surfaces against corrosion.

11.4 Preliminaries for operation after a long storage period

Comply with the instructions provided in the section 'First start'.

⚠ CAUTION

Minimise the risk of transmission and hydraulic oil and lubricants entering the environment by providing basins and material for absorbing any leaks while disconnecting the hydraulic system and dismantling the mixer!

Disposal

The machine must be disposed of in line with local laws and regulations.
Sorting of waste:

- Metals are recycled
- Plastic parts and rubber seals according to regulations (disposed of)
- Hydraulic liquid according to regulations

Disposal of hazardous waste

The Processor mixing tool does not contain hazardous waste, except a small quantity of oil inside the hydraulic system and transmission.

EC Declaration of conformity for machinery

(Directive 2006/42/EC, Appendix II A., Directive 2000/14/EC)

Manufacturer: ALLU STAMIX OY
Address: Jokimäentie 1
16320 Pennala
FINLAND

Declares that

the ALLU Processor 300 HD Serial number 19PMX300002

conforms with the terms of the Machinery Directive (2006/42/EC) and
conforms with the terms of the Noise Emission Directive (2000/14/EC).

This conformity declaration is valid if the machine has not undergone any changes not approved by the manufacturer in writing.

Sami Arola, authorised to compile the technical specifications for this machine.

Sami Arola, authorised to prepare this conformity declaration.

Pennala, 1.4.2019

Sami Arola
Technical Director

NOTES