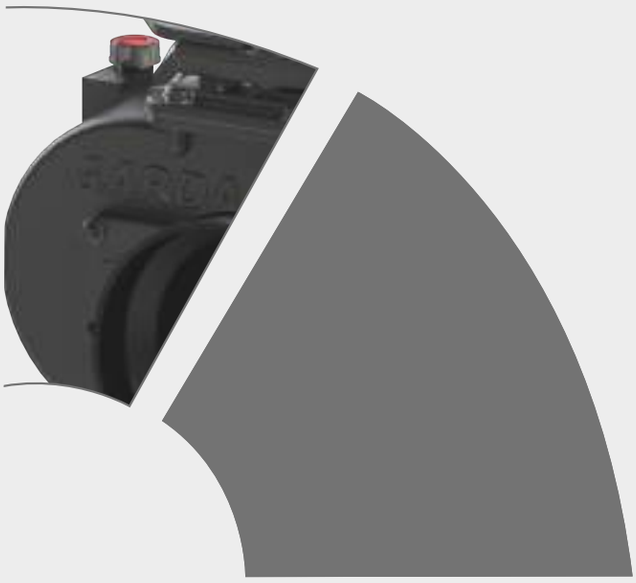


IT **MANUALE ISTRUZIONI PER L'USO E LA MANUTENZIONE**

GB **INSTRUCTION MANUAL FOR USE AND MAINTENANCE**

FR **NOTICE D'EMPLOI ET D'ENTRETIEN**

DE **GEBRAUCHS-UND WARTUNGSANLEITUNGEN**

ES **MANUAL DE INSTRUCCIONES DE USO Y MANTENIMIENTO**

Battioni ®
Pagani

GARDA EVO

INTRODUCTION

The combined groups of the Garda EVO series were designed and constructed in compliance with the EEC safety regulations and were assessed for risks according to the standard UNI EN ISO 12100:2010; in particular they are in conformity with machinery directive 2006/42/CE and subsequent modifications and additions.
This manual contains the declaration of incorporation of partly completed machinery and all the instructions required by the users and by the manufacturers of systems to use our products safely; therefore, the manual must always be kept near the group.
Carefully read the instructions in this manual before attempting any operation with and on the group.

This danger symbol in the manual means that important instructions relating to safety are being provided. The operators are the first recipients of this information and are responsible for compliance, not only in relation to themselves, but also in relation to other persons exposed to the risks associated with use.

The descriptions and illustrations in this manual are purely indicative.
The manufacturer reserves the right to make any type of change to this manual at any time.

WARRANTY

Upon receipt of the product, check that the combined groups are complete with all their parts.
Any anomalies or missing parts must be notified within 8 days of receipt.
The Supplier guarantees that the product sold is free from defects and undertakes to repair or, by final decision, to replace the faulty parts only if the defects are clearly attributed to the manufacturing process or to the materials used. In any case the costs of labour, travel and transport, and any customs expenses, shall be paid by the Purchaser. The vendor is not obliged to pay damages except in the case of fraud or serious offence. All parts subject to normal wear are excluded from the warranty.
The warranty will cease to be valid if:

- the faults reported are the result of accidents or obvious carelessness or negligence by the Purchaser,
- the parts have been modified, repaired or fitted by persons not authorised by the vendor,
- the failures and breakages have been caused by use that is unsuitable or heavier than that provided for by the vendor,
- the Purchaser has failed to make the payments as agreed under the contract

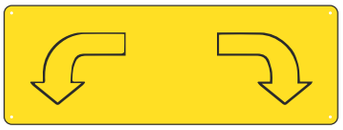
The Purchaser loses the right to warranty if the defects are not notified within eight days from the discovery, notwithstanding art. 1512 of the Italian Civil Code. The Vendor reserves the right to make changes or improvements to its products without any obligation to make such changes or improvements to the units already previously produced and/or delivered. The Vendor reserves the right to make changes or improvements to his/her products without being obliged to make the same changes or improvements to the units already produced and/or delivered previously.

Thank you for choosing Battioni Pagani®.

Battioni Pagani®

MANDATORY SAFETY SIGNS THAT THE MANUFACTURER OF THE SYSTEM MUST DISPLAY IN THE WORKPLACE AND AROUND THE GARDA EVO COMBINED GROUPS

PERSONAL PROTECTIVE EQUIPMENT THAT MUST BE USED



INDICATION OF THE DIRECTION OF ROTATION

CONDITIONS AND LIMITS OF USE – LIST OF DANGERS

In the Common Market countries, the installation must comply with directive 2006/42/CE and subsequent modifications while in the other countries it must comply with local safety regulations.
This rotary blades vacuum pump fitted on the combined group has been designed to create a vacuum or pressure inside a tank connected to it. The centrifugal pump on a combined group has the function of emptying the tank from the sewage content and spreading it over a distance. The high pressure pump on a combined group is typically used for cleaning. The spline or keyed shaft is used to convey motion to the other products.

No solid materials of any type of size greater than the output hole of the swivel jet must enter the centrifugal pump, in any case.
Any other use of the centrifugal pump, excluding the use specified above, is strictly forbidden, not provided for by the manufacturer and therefore extremely dangerous.
Do not use the centrifugal pump to handle flammable and/or explosive liquids and materials or for materials that release flammable gasses.
Do not use the centrifugal pump in potentially explosive atmospheres.
Never remove the guards fitted on the centrifugal pump and always check their efficiency every time the machine is used.
The direction of rotation of the splined and keyed shafts in output is opposite to that in input. Any work on the machine must be carried out while it is not running.

See the Instruction Manual for use and maintenance of the rotary blades vacuum pump.
See the Instruction Manual for use and maintenance of the high pressure pump.

Failure to comply with the instructions provided in this manual may result in the following dangers:
- Danger of being crushed by the weight of the combined group during handling and transport;
- Danger of becoming entangled in the shaft transmission parts if the necessary guards are removed;
- Acoustic danger due to the noise generated and to failure to use personal means of protection;
- Danger of severing for the operator during testing with the suction and delivery tubes detached from the centrifuge pump and/or from the rotary blades vacuum pump;
- Danger of being knocked down by the outgoing sewage, due to the rotary motion of the swivel jet.
- Risk of the projection of solid and liquid material in the event of serious breakage of the centrifuge, of the high pressure pump or of the rotary blades vacuum pump.

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GENERAL INFORMATION

The GARDA EVO Group is composed of a gearbox, an application of a centrifuge pump or high pressure pump and a rotary blades vacuum pump or of splined or keyed shafts. Through one or two selectors, it is possible to use, at separate times, the rotary blades vacuum pump and a centrifuge pump/high pressure pump.
The two selectors allow the use in combination of the rotary blades vacuum pump and the centrifuge pump/high pressure pump / splined or keyed shafts.

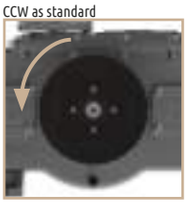
The GARDA EVO group can be fitted, at the top, with a hydraulic pump for control of the hydraulic mechanisms (KP 30.27 SAE "B" 2-4 holes) always driven.

STANDARD VERSIONS

- PTO 1000 Rpm

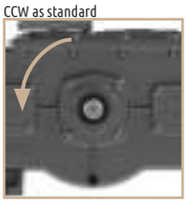
1 - VERSIONS OF THE COMBINED GROUP

CCW as standard



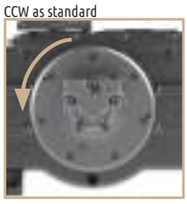
Version D
Splined shaft
1"3/4 - Z6 ISO 500

CCW as standard



Version P
Cylindrical Shaft J 40,
length 79 mm
tab UNI 6604

CCW as standard



H Version
129 cc/rev - Pmax 400 bar - In G 1" - Out G 1"
240 cc/rev - Pmax 350 bar - In G 1" - Out G 1"

In version H, it is not possible to install
high pressure pumps of 1500-2300 rpm

1.1 IDENTIFICATION LABEL

Each combined group is supplied with an identification label, indicating:
- combined group model
- serial number
- production year
- max relative pressure
- max vacuum
- max absorbed power
- max r.p.m.
- max rate of flow
- weight

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Sorbolo (PARMA)
ITALIA
Made in Italy

GARDA-EVO CENTR/D AFI27 / W -RAPP.1:3,35

s/n 491684 YEAR 2017

Max Rel. Pressure (bar)	Max Vacuum (bar)	Max Power (kW)	Max Revs (rpm)	Max Capacity (l/min)	Weight (kg)
14	0	106	1000	3500	153

IDENTIFICATION PLATE
WITH PROTECTIVE FILM FOR PAINTING
PROTETTIVA PER
VERNICIATURA

Each identification plate is protected by a special film, to remove after painting.
This film has been introduced to guarantee the tracing of the pump for warranty purposes.

ENGLISH

INSTRUCTIONS FOR USE AND MAINTENANCE

2 -PACKAGING, STORAGE, HANDLING AND TRANSPORTATION

2.1 PACKAGING

The GARDA EVO combined groups are supplied unpacked. On request the following packaging can be used:

- wooden base and shrink-wrap;
- wooden cases and shrink-wrap for shipment by sea or air.

2.2 - STORAGE

For correct storage of the combined groups, they must be kept:

- indoors, sheltered from adverse weather conditions;
- resting horizontally on the four feet.

2.3 - HANDLING AND TRANSPORT

The combined groups must be:
• Harnessed by means of metal hooks inserted in the hole for gripping, or a sling;
• Lifted by means of a forklift truck (if on a pallet), bridge crane, crane.
The combined groups, version D, are supplied with a guard that is in compliance with the EC directive. This guard should be installed by the fitter using the screws supplied before commissioning.

2.4 - INDIVIDUAL MEANS OF PROTECTION TO BE USED

When operating the Group, it is necessary to use the personal protective equipment prescribed by the Manufacturer of the machine on which the Group has been installed.

The Group, when being installed on a machine, must be equipped with a protective device to isolate the moving parts and to prevent access to them by the operators.

3 - START-UP, SETTING UP, TESTING, RUNNING

3.1 - DIRECTION OF ROTATION

Before starting the garda EVO combined group make sure that the P.T.O. shaft turns freely and that the direction of rotation is the same as the one indicated by the arrow.

The direction of rotation of the GARDA EVO groups is left only.
Never for any reason allow the GARDA EVO group to turn in the direction of rotation opposite to the one for which it was designed (indicated by the arrow) as this could damage certain components as well as prevent operation of the rotary blades vacuum pump, of the centrifuge and of the high pressure pump.

3.2 - RECOMMENDED OIL

Lubrication of the gears of the gearbox takes place through circulation of the oil contained in the box itself. The gearbox is provided with an oil level plug, located on the side of the gear, which allows the level to be checked. To ensure correct lubrication, the oil should always be visible in the oil level.
The lubricating oil must be poured into the gearbox through the oil filler cap on the top of the gearbox.

IMPORTANTE: The type of oil to use is an additive mineral oil ISO VG 460. Perform the initial oil change after approximately 100 hours of actual work and perform subsequent changes after approximately every 300 hours of actual work.

If the oil level is particularly low after an inspection, add some.

ATTENTION: it is possible to use ecological oil as long as it has the same ecological characteristics as the recommended mineral oil. Do not use detergent or hydraulic oil for lubrication.

3.3 - TEST

To carry out testing of the Group verify the previous steps, possibly using a workbench. Make sure that the shaft of the power take-off (PTO) turns freely and that the direction of rotation is the same as that indicated by the arrow. In case of verification of operation of the centrifuge without connection to the intake/discharge pipes, there is a danger of shearing for the operators due to access to the inside of the centrifuge through the slurry inlet and outlet openings. There is also danger under the same conditions of the intake of foreign objects inside the machine. Check the functionality of the gear lever and the handle for the suction and compression of the pump.

3.4 - RUNNING IN

A running in period is not needed.
The recommended operating rpm is 800 rpm per minute for all the EVO Garda versions.

4 - START, OPERATION, STOP

4.1 - START

The Group does not have a start command. To start it, therefore, simply start the tractor's power take-off after connecting it via the cardan shaft for version D. Start the hydraulic pump after connecting it to the GARDA EVO hydraulic motor for version H. Start the drive pulley after connecting it via the belts to the GARDA EVO driven pulley for version P. Before starting up, make sure that the rotary blades vacuum pump and the gearbox have sufficient oil for internal lubrication.

Before starting the Group, make sure that the guards on all the moving parts are in place and efficient. Any damaged or missing components must be replaced and installed correctly before using the transmission.

4.2 - GARDA EVO OPERATION

Do not use the rotary blades vacuum pump, the centrifuge pump and the high pressure pump at pressures greater than those specified in the user and maintenance manual. During use, do not exceed the conditions of speed and power established by the manuals supplied.

1) Fill the tank normally with the decompresser;

2) When the tank is full stop the PTO and close the rear gate valve;

3) Turn the handle of the rotary blades vacuum pump into a central position, selecting the neutral position;

EMPTYING OF THE TANK WITH CENTRIFUGAL PUMP	EMPTYING OF THE TANK WITH VACUUM PUMP
4) Turn the GARDA EVO gear lever to the right to select the centrifugal pump; 5) Open the gate valve located on the centrifugal pump; Operate the power takeoff to spread the slurry with the jet;	4) Turn the handle of the vacuum pump into the compression position; 5) Open the rear gate valve of the tank; Spread the slurry

4.3 - GARDA EVO GROUP OPERATING PARAMETERS

Operating time: the recommended maximum operating time must not exceed 30 minutes to avoid excessive heating of the gearbox. Do not exceed the operating time of the coupled pumps as shown in their instruction manual.

4.3.1 - ROTARY BLADES VACUUM PUMP

The operating parameters of the rotary blades vacuum pumps are provided in the individual use and maintenance manuals.

4.3.2 - HIGH PRESSURE PUMP

The operating parameters of the rotary blades vacuum pumps are provided in the individual use and maintenance manuals.

4.3.3 - CENTRIFUGE PUMP

Hydraulic connection diagram of the operation of the centrifuge is represented in Figure 1 where the entry of liquid/slurry "B" and the exit of the liquid/slurry "A" are highlighted.

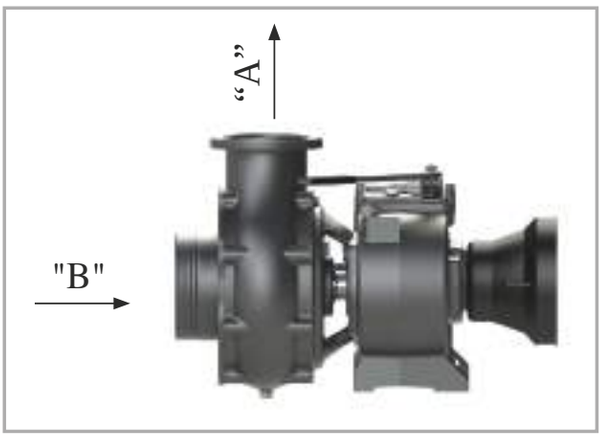


Figure 1

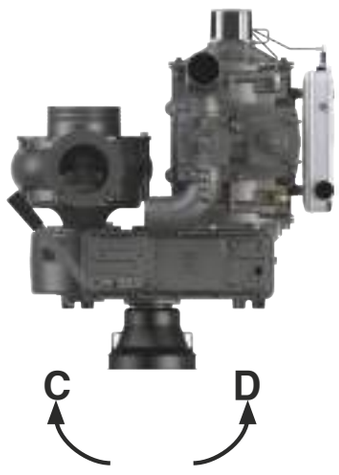
WARNING: the centrifuge is not self-priming. Do not use the centrifuge dry, otherwise the mechanical seal could burn.

Centrifuge	Geometric Flow Rate				Max rev operating speed garda evo (rpm)	Max rev operating speed centrifuge (rpm)	Max absolute pressure		Absorption		Weight (kg)
	m³/h	l/min	US gpm	cfm			Bar	PSI	kW	hp	
CENTRIFUGE DODA AFI-27	210	3500	924.6	123	1000	2300	6.5	94	70	94	153
CENTRIFUGE DODA AFI-27 HS	132	2200	581	77	1000	3350	14	202	105	141	153
CENTRIFUGE DODA AFI-35	270	4500	1188.8	159	1000	2300	11	160	130	174	165
CENTRIFUGE GARDA 6500	390	6500	1717	229	1000	2400	7	101	60	80.4	132

Table 1

4.4 CONTROL DEVICES

To operate the rotary blades vacuum pump turn the lever on the gearbox to the right (position "D").
To operate the centrifuge, turn the handle on the gearbox to the left (position "C").
Selection of the position "C" or "D" of the Garda Evo group must be performed when the PTO is not energised. To control the suction and compression phases of the rotary blades vacuum pump it is possible to use the handle located on the manifold, adjustable by hand. To select the phases of suction and compression turn the handle in the directions indicated in the manual of the individual pumps.



The suction-compression selection performed with the handle of the rotary blades vacuum pump must be carried out with the pump not activated.

5 - ASSEMBLY, FITTING, INSTALLATION

When carrying out maintenance operations, inspections, checks or repairs it is advisable to wear the individual protective devices listed in this manual.

All maintenance operations, inspections, checks and repairs should be carried out with the greatest care and with the power take-off disconnected.

The combined groups must be assembled and installed using the following procedure:

1) Install the GARDA EVO groups horizontally with the feet facing downwards. The assembly position on the vehicle should be easy to access and be protected. There must be sufficient space for the suction and discharge lines. A 5° maximum longitudinal slope of the GARDA EVO group with respect to the horizontal plane must not be exceeded.
2) Bolt the gearbox of the group by means of the screws and nuts through the holes provided in the feet of the GARDA EVO gearbox.
3) The centrifugal pump, connected to the gearbox, does not feature support means;
4) Connect the centrifuge pump to the tank via a flexible coupling connection;
5) Connect the centrifuge pump to the swivel jet via a metal pipe of 3" or 4" gas, on which must be fitted a flexible connection joint and a gate valve that must be closed during filling of the tank-car;
6) The high pressure pump connected to the gearbox must be supported and secured to the support plate of the GARDA EVO group, as indicated in the instruction manual of the pump.
7) The rotary blades vacuum pump only needs to be supported by a metal sheet of suitable thickness and a layer of rubber between the metal sheet and the feet of the same rotary blades vacuum pump to prevent breakage due to vibrations of the Group. Do not fix the rotary blades vacuum pump with screws to the support plate.
8) Connect the suction/compression tube of the tank to the rotary blades vacuum pump as described in the "Instructions manual for use and maintenance" of the individual pumps.
9) Connect the drive shaft of the tractor to the PTO of the GARDA EVO group for version D.
10) Connect the hydraulic pump to the hydraulic motor of the GARDA EVO group for version H.
11) Connect the drive pulley belts to the driven pulley of the GARDA EVO group for version P.

The maximum permissible angle of the drive shaft is 15°. For no reason must this inclination be exceeded.

The centrifugal pump, when being installed on a machine, must be equipped with protective devices to isolate the moving parts and to prevent the operators from accessing.

When operating the centrifuge pump, the high pressure pump and the rotary blades vacuum pump, it is necessary to use the individual means of protection prescribed by the Manufacturer of the machine on which the pump itself is installed.

6 - INSTRUCTIONS FOR FIRST START-UP

GARDA EVO CENTR/H C6500/A

DESCRIPTION AND CHARACTERISTICS

Garda Evo is a combined group consisting of a gearbox that allows the activation of two outputs (blade pumps, blowers, centrifugal pumps, high pressure pumps and PTO) alternate or simultaneously, from a single PTO. This information relating to initial start applies to the Garda Evo, consisting of gearbox, hydraulic drive, centrifugal pump (output A) and Aida blower (output B).

Parameters		Work parameters:	Max Parameters
HYDRAULIC MOT. RPM *	[rpm]	850 ÷ 900	1000
RPM OUTPUT A	[rpm]	-	2388
RPM OUTPUT B	[rpm]	-	3000
BLOWER PRESSURE	[bar]	0,5 ÷ 1	1.5
BLOWER VACUUM	[bar]	-0.5 ÷ -0.8	-0.9
Garda Evo lubricating oil and Aida blower multiplier			
ISOVG460			
8.7÷9 litres			
Aida blower rear tank lubricating oil			
ISO VG 220 synthetic			
0.7 litres			
Oil change 300 hours /12 months			

*The input speed affects the speed in output A/B.

HOW TO SELECT THE OUTPUTS

I:Anti-clockwise hydraulic motor (standard).
A:output A (centrifugal pump).
B:output B (AIDA blower).

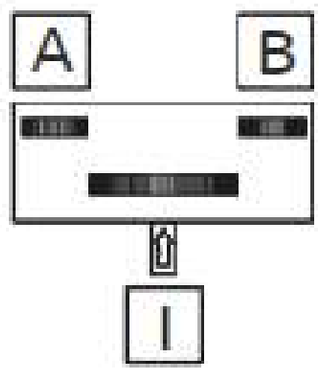


Figure 1 Garda Evo layout

Figure 2 Output B selected

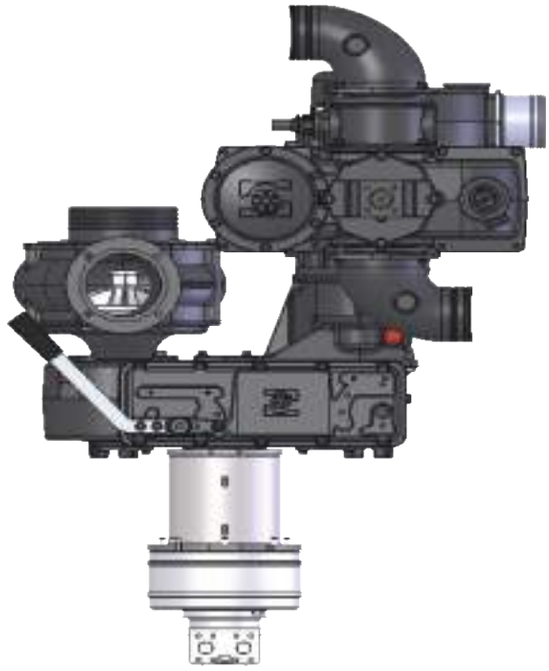


Figure 3 Output A selected

The position of the manual lever described above is also valid with hydraulic and pneumatic rotary cylinder.

INSTALLATION

The Garda Evo group must be installed rigidly on a planar frame (sized to prevent vibrations and buckling) with a MAX tilt of 3°. Ensure sufficient space for the circulation of cooling air and to reach the lubrication points (oil levels, grease nipples, etc.). Leave room to manoeuvre the selection levers. Secure to the frame before the most rigid part (Garda Evo box) and then the blower. If necessary reposition the feet with the relevant spacers. The support of the hydraulic motor is fitted with a bracket. This must be suitably attached to the frame, avoiding tensions on the bell itself.

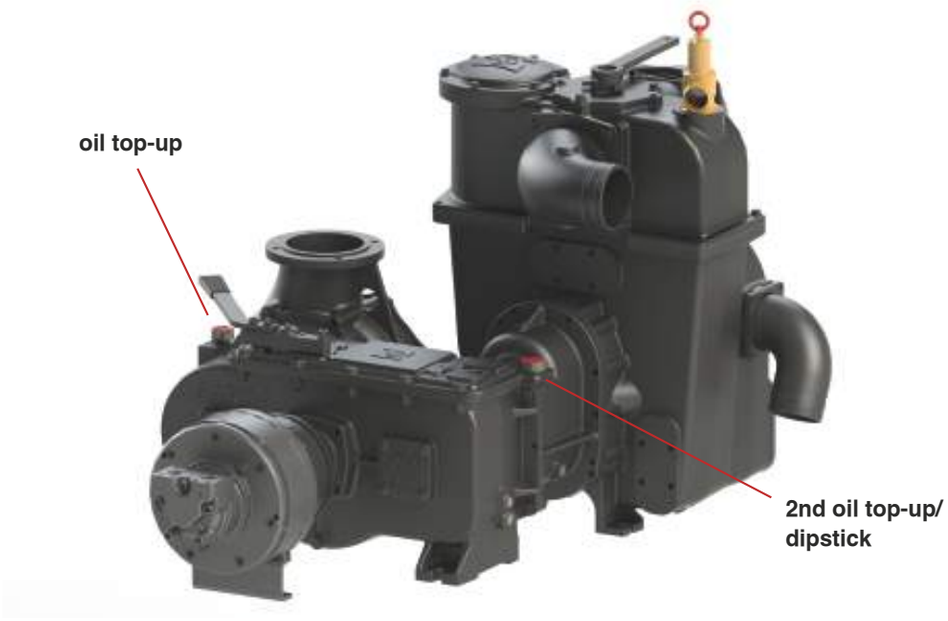


Figure 4 Oil top-up/inspection (sheet parameters above)

GEARBOX LUBRICATION

The toothed wheels in the gearbox are lubricated from splashes. Ensure filling with the correct quantity of oil as specified above.

- First oil change between 100/200 hours and then every 300 hours (see above)
- Check oil level before using the combined group
- Maximum temperature of the oil of 95°C during operation

START/USE/STOP

1. Connect the hydraulic motor to the system
2. Select the desired output lever
3. Output selection (A or B) must be made with the hydraulic motor off.
4. To complete the operations stop the hydraulic motor.

HYDRAULIC MOTOR INSTALLATION

The installed hydraulic motor can work both with open and closed circuit. The hydraulic motor is connected to the shaft of the gearbox with a flexible coupling which protects the motor from vibrations and misalignments of assembly (the polymer constituting the joint is subject to wear. Its duration also depends on the relevant environmental conditions of use).

GENERAL INFORMATION

- Prevent cavitation in the hydraulic motor
- Given the maximum capacity of the hydraulic motor, the tubes (in addition to the fittings, valves, etc.) must be at least 1". If the pipes are very long it may be useful to increase them
- Avoid high back pressure to the motor
- Before starting the motor it is necessary to fill the oil casing. It is also necessary to use the output for drainage that remains high (with motor mounted) to ensure that the casing remains filled with oil.
- Filter the hydraulic oil with a filter of 25 μm or finer
- We recommend keeping oil with a viscosity of at least 20 cSt. In the case of ISO VG 46 oil, this means that the temperature must not exceed 70°C in the motor. In the case of such a risk it would be necessary to create a motor casing flow (we recommend 20 l/min of cooled oil).

Motore	Portata [l/min]	Pressione [bar]	Potenza [kW]	Coppia [N*m]	RPM-PTO
TF 1.5 240Cc	240	330	110	1110	1000
	240	185	60	625	1000
	240	210	62	710	1000
	215	185	55	625	850
P. Max cont. [bar]					
350					
P. Max picco [bar]					
450					
RPM. Max cont.					
1000					
RPM. Max picco.					
1300					

6.1 - INSTRUCTIONS FOR FIRST START-UP

GARDA EVO CENTR/D C6500/A

DESCRIPTION AND CHARACTERISTICS

Garda Evo is a combined group consisting of a gearbox that allows the activation of two outputs (blade pumps, blowers, centrifugal pumps, high pressure pumps and PTO) alternate or simultaneously, from a single PTO. This information relating to initial start applies to the Garda Evo, consisting of gearbox, PTO drive, centrifugal pump (output A) and Aida blower (output B).

Parameters		Work parameters:	Max Parameters
RPM PTO *	[rpm]	850 ÷ 900	1000
RPM OUTPUT A	[rpm]	-	2388
RPM OUTPUT B	[rpm]	-	3000
BLOWER PRESSURE	[bar]	0,5 ÷ 1	1.5
BLOWER VACUUM	[bar]	-0.5 ÷ -0.8	-0.9
Garda Evo lubricating oil and Aida blower multiplier			
ISO VG 460			
8.7÷9 litres			
Aida blower rear tank lubricating oil			
ISO VG 220 synthetic			
0.7 litres			
Oil change 300 hours /12 months			

*The input speed affects the speed in output A/B.

HOW TO SELECT THE OUTPUTS

I:PTO anti-clockwise (standard).
A:output A (centrifugal pump).
B:output B (AIDA blower).

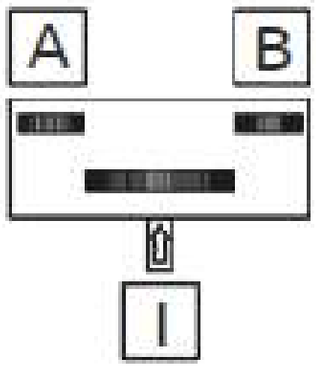


Figure 1 Garda Evo layout

Figure 2 Output A selected

Figure 3 Output B selected

The position of the manual lever described above is also valid with hydraulic and pneumatic rotary cylinder.

INSTALLATION

The Garda Evo group must be installed rigidly on a planar frame (sized to prevent vibrations and buckling) with a MAX tilt of 3°. Ensure sufficient space for the circulation of cooling air and to reach the lubrication points (oil levels, grease nipples, etc.). Leave room to manoeuvre the selection levers. Secure to the frame before the most rigid part (Garda Evo box) and then the blower. If necessary reposition the feet with the relevant spacers.

Figure 4 Oil top-up/inspection (sheet parameters above)

GEARBOX LUBRICATION

The toothed wheels in the gearbox are lubricated from splashes. Ensure filling with the correct quantity of oil as specified above.

- First oil change between 100/200 hours and then every 300 hours (see above)
- Check oil level before using the combined group
- Maximum temperature of the oil of 95°C during operation

START/USE/STOP

1. Connect the cardan shaft to the tractor PTO and to the splined shaft 1” 3/4 of the Garda Evo group.
2. Select the desired output lever.
3. Output selection (A or B) must be made with the PTO stopped.
4. To finish the operations disconnect the PTO of the tractor.

ENGLISH

6.2 - INSTRUCTIONS FOR FIRST START-UP
GARDA EVO CENTR/D AFI27/W

DESCRIPTION AND CHARACTERISTICS

Garda Evo is a combined group consisting of a gearbox that allows the activation of two outputs (blade pumps, blowers, centrifugal pumps, high pressure pumps and PTO) alternate or simultaneously, from a single PTO. This initial start information applies to Garda Evo AFI 27-D-W, consisting of gearbox, PTO drive and centrifuge pump (output A) and rotary blade vacuum pump (MEC II / BALLAST / KTS etc.) (output B).

Parameters		Work parameters:	Maximum parameters
REVS PTO *	[rpm]	850 ÷ 900	1000
ROTARY BLADES VACUUM PUMP PRESSURE	[bar]	0.5 ÷ 1	1.5
ROTARY BLADES VACUUM PUMP	[bar]	-0.5 ÷ -0.8	-0.95
HYDRAULIC RAM	[rpm]	*	2380÷3350
CENTRIFUGAL PUMP PERFORMANCE		Þ (SEE ATTACHED GRAPHS)	
Lubrication oil rotary blades vacuum pumps			
ISO VG 100			
Lubricating oil Garda Evo			
ISO VG 460			
3.8÷4.2 litres			
Oil change 300 hours /12 months			

∗The input speed affects the speed in output A/B.

HOW TO SELECT THE OUTPUTS

I:PTO anti-clockwise (standard).
A:output A (centrifugal pump).
B: output B (rotary blades vacuum pump).

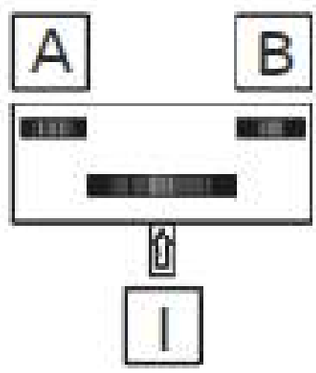


Figure 1 Garda Evo layout

Figure 2 Output A selected

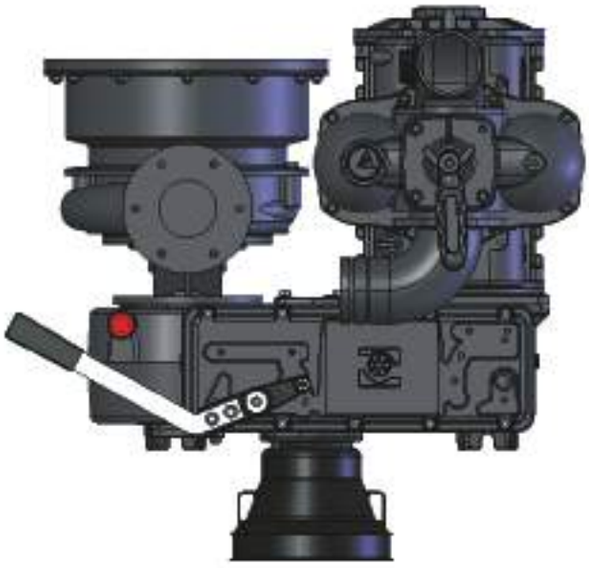


Figure 3 Output B selected

The position of the manual lever described above is also valid with hydraulic and pneumatic rotary cylinder.

INSTALLATION

The Garda Evo group must be installed rigidly on a planar frame (sized to prevent vibrations and buckling) with a MAX tilt of 3°. Ensure sufficient space for the circulation of cooling air and to reach the lubrication points (oil levels, grease nipples, etc.). Leave room to manoeuvre the selection levers. Secure to the frame before the most rigid part (Garda Evo box) and then, if necessary, reposition the feet of the vacuum pump with the relevant spacers.

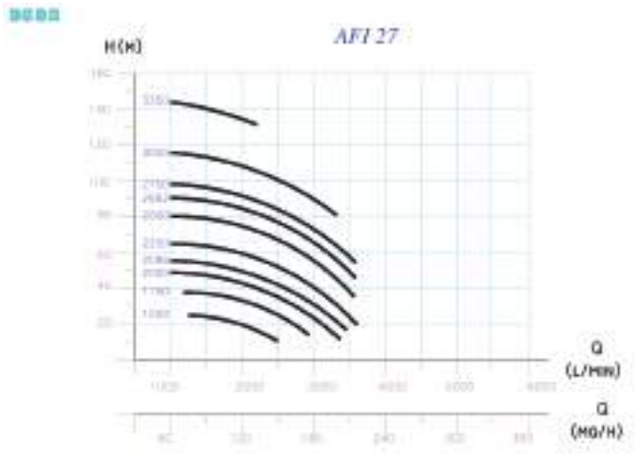
Figure 4 Oil top-up/inspection (sheet parameters above)

GEARBOX LUBRICATION

The toothed wheels in the gearbox are lubricated from splashes. Ensure filling with the correct quantity of oil as specified above.

- First oil change between 100/200 hours and then every 300 hours (see above)
- Check oil level before using the combined group
- Maximum temperature of the oil of 95°C during operation

Þ) Doda AFI-27 Charts



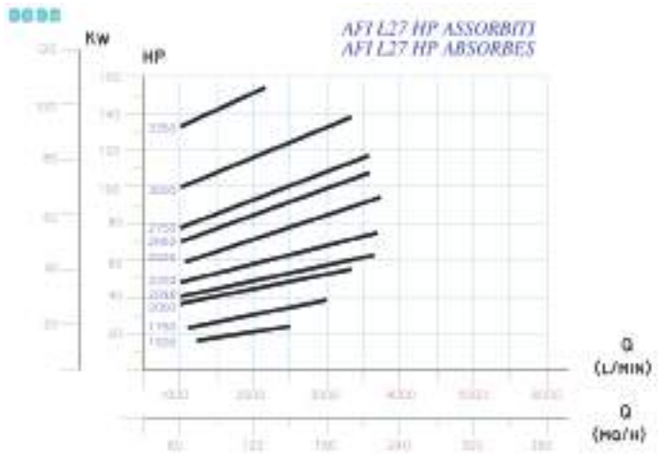


Figure 5 performance Figure 6 power consumption

The Doda AFI 27 centrifuge is available on the GARDA EVO with two different drive ratios:
τ 1: 2,38 e τ 1: 3.35.

START/USE/STOP

1. Connect the cardan shaft to the tractor PTO and to the splined shaft 1” 3/4 of the GARDA EVO group.
2. Select the desired output lever and start slowly until reaching the desired RPM
3. Output selection (A or B) must be made with the PTO stopped.
4. To finish the operations disconnect the PTO of the tractor.

6.3 - INSTRUCTIONS FOR FIRST START-UP

GARDA EVO CENTR/D C6500/W

DESCRIPTION AND CHARACTERISTICS

Garda Evo is a combined group consisting of a gearbox that allows the activation of two outputs (blade pumps, blowers, centrifugal pumps, high pressure pumps and PTO) alternate or simultaneously, from a single PTO. This initial start information applies to Garda Evo centr.-D-W, consisting of gearbox, PTO drive and centrifuge pump (output A) and rotary blade vacuum pumps (MEC II / BALLAST / KTS etc.) (output B).

Parameters		Work parameters:	Max Parameters
RPM PTO *	[rpm]	850 ÷ 900	1000
ROTARY BLADES VACUUM PUMP PRESSURE	[bar]	0.5 ÷ 1	1.5
ROTARY BLADES VACUUM PUMP	[bar]	-0.5 ÷ -0.8	-0.95
CENTRIFUGAL PUMP	[rpm]	*	2390
Lubrication oil rotary blades vacuum pumps			
ISO VG 100			
Lubricating oil Garda Evo			
ISO VG 460			
3.8÷4.2 litres			
Oil change 300 hours /12 months			

*The input speed affects the speed in output A/B.

HOW TO SELECT THE OUTPUTS

I:PTO anti-clockwise (standard).
A:output A (centrifugal pump).
B: output B (rotary blades vacuum pump).

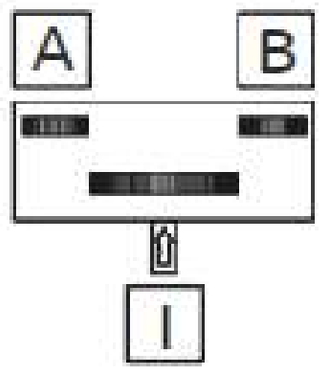


Figure 1 Garda Evo layout

Figure 2 Output A selected

Figure 3 Output B selected

The position of the manual lever described above is also valid with hydraulic and pneumatic rotary cylinder.

INSTALLATION

The Garda Evo group must be installed rigidly on a planar frame (sized to prevent vibrations and buckling) with a MAX tilt of 3°. Ensure sufficient space for the circulation of cooling air and to reach the lubrication points (oil levels, grease nipples, etc.). Leave room to manoeuvre the selection levers. Secure to the frame before the most rigid part (Garda Evo box) and then, if necessary, reposition the feet of the vacuum pump with the relevant spacers.

Figure 4 Oil top-up/inspection (sheet parameters above)

GEARBOX LUBRICATION

The toothed wheels in the gearbox are lubricated from splashes. Ensure filling with the correct quantity of oil as specified above.

- First oil change between 100/200 hours and then every 300 hours (see above)
- Check oil level before using the combined group
- Maximum temperature of the oil of 95°C during operation

START/USE/STOP

1. Connect the cardan shaft to the tractor PTO and to the splined shaft 1” 3/4 of the GARDA EVO group.
2. Select the desired output lever and start slowly until reaching the desired RPM
3. Output selection (A or B) must be made with the PTO stopped.
4. To finish the operations disconnect the PTO of the tractor.

ENGLISH

6.4 - INSTRUCTIONS FOR FIRST START-UP

GARDA EVO CENTR/DT C6500/W

DESCRIPTION AND CHARACTERISTICS

Garda Evo is a combined group consisting of a gearbox that allows the activation of two outputs (blade pumps, blowers, centrifugal pumps, high pressure pumps and PTO) alternate or simultaneously, from a single PTO. This initial start information applies to Garda Evo centr.-DT-W, consisting of gearbox, PTO drive and centrifuge pump (output A) and rotary blade vacuum pumps (MEC II / BALLAST / KTS etc.) (output B).

Parameters		Work parameters:	Max Parameters
RPM PTO *	[rpm]	850 ÷ 900	1000
ROTARY BLADES VACUUM PUMP PRESSURE	[bar]	0.5 ÷ 1	1.5
ROTARY BLADES VACUUM PUMP	[bar]	-0.5 ÷ -0.8	-0.95
HYDRAULIC RAM	[rpm]	*	2390
Lubrication oil rotary blades vacuum pumps			
ISO VG 100			
Lubricating oil Garda Evo			
ISO VG 460			
3.8÷4.2 litres			
Oil change 300 hours /12 months			

*The input speed affects the speed in output A/B.

HOW TO SELECT THE OUTPUTS

I:PTO anti-clockwise (standard).
A:output A (centrifugal pump).
B: output B (rotary blades vacuum pump).

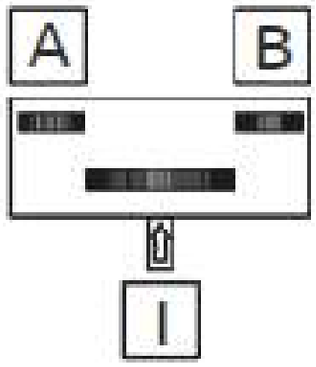


Figure 1 Garda Evo layout

Figure 2 Output A selected

Figure 3 Output B selected

Figure 4 Exit A+B selected

The position of the manual lever described above is also valid with hydraulic and pneumatic rotary cylinder.

INSTALLATION

The Garda Evo group must be installed rigidly on a planar frame (sized to prevent vibrations and buckling) with a MAX tilt of 3°. Ensure sufficient space for the circulation of cooling air and to reach the lubrication points (oil levels, grease nipples, etc.). Leave room to manoeuvre the selection levers. Secure to the frame before the most rigid part (Garda Evo box) and then, if necessary, reposition the feet of the vacuum pump with the relevant spacers.

Figure 5 Oil top-up/inspection (sheet parameters above)

GEARBOX LUBRICATION

The toothed wheels in the gearbox are lubricated from splashes. Ensure filling with the correct quantity of oil as specified above.

- First oil change between 100/200 hours and then every 300 hours (see above)
- Check oil level before using the combined group
- Maximum temperature of the oil of 95°C during operation

START/USE/STOP

1. Connect the cardan shaft to the tractor PTO and to the splined shaft 1” 3/4 of the GARDA EVO group.
2. Select the desired output lever and start slowly until reaching the desired RPM
3. Output selection (A or B or A + B) must be made with the PTO stopped.
4. To finish the operations disconnect the PTO of the tractor.

6.5 - INSTRUCTIONS FOR FIRST START-UP

GARDA EVO CENTR/P AFI35/W

DESCRIPTION AND CHARACTERISTICS

Garda Evo is a combined group consisting of a gearbox that allows the activation of two outputs (blade pumps, blowers, centrifugal pumps, high pressure pumps and PTO) alternate or simultaneously, from a single PTO. This initial start information applies to Garda Evo AFI35 -P-W, consisting of gearbox, PTO drive and centrifuge pump (output A) and rotary blade vacuum pumps (MEC II / BALLAST / KTS etc.) (output B).

Parameters		Work parameters:	Max Parameters
RPM PTO *	[rpm]	850 ÷ 900	1000
ROTARY BLADES VACUUM PUMP PRESSURE	[bar]	0.5 ÷ 1	1.5
ROTARY BLADES VACUUM PUMP	[bar]	-0.5 ÷ -0.8	-0.95
HYDRAULIC RAM	[rpm]	*	2380
CENTRIFUGAL PUMP PERFORMANCE		Þ (SEE ATTACHED GRAPHS)	
Lubrication oil rotary blades vacuum pumps			
ISO VG 100			
Lubricating oil Garda Evo			
ISO VG 460			
3.8÷4.2 litres			
Oil change 300 hours /12 months			

*The input speed affects the speed in output A/B.

HOW TO SELECT THE OUTPUTS

I:PTO anti-clockwise (standard).
A:output A (centrifugal pump).
B: output B (rotary blades vacuum pump).

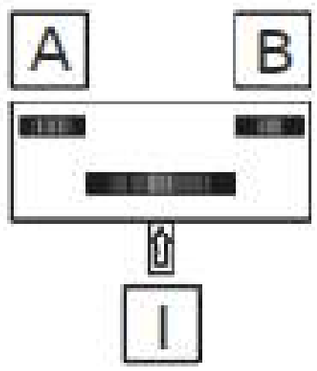


Figure 1 Garda Evo layout

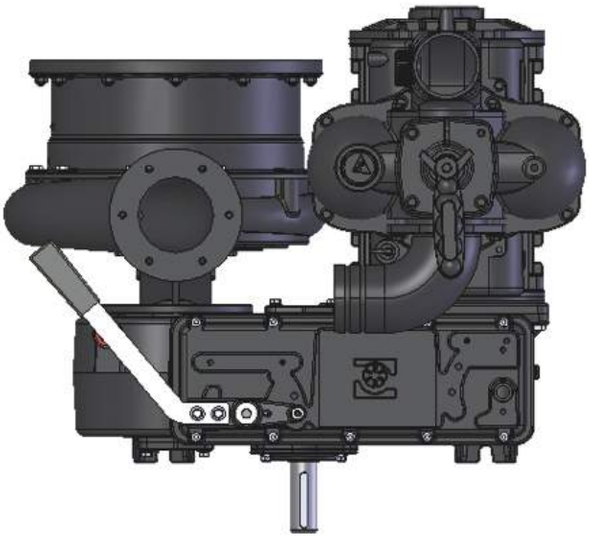


Figure 2 Output A selected

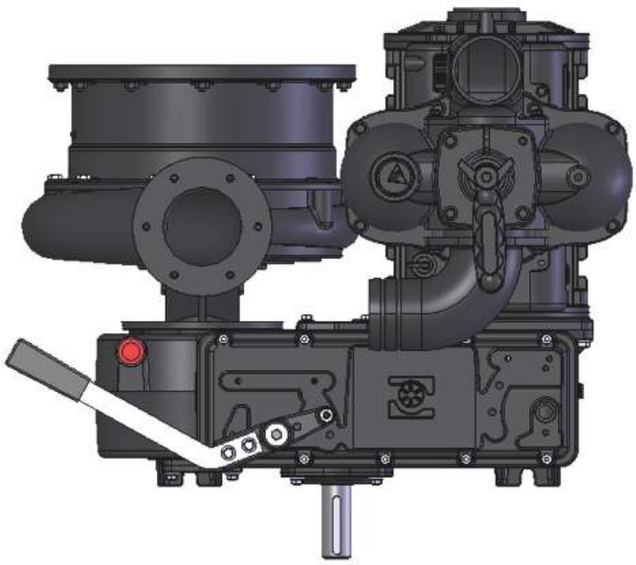


Figure 3 Output B selected

The position of the manual lever described above is also valid with hydraulic and pneumatic rotary cylinder.

INSTALLATION

The Garda Evo group must be installed rigidly on a planar frame (sized to prevent vibrations and buckling) with a MAX tilt of 3°. Ensure sufficient space for the circulation of cooling air and to reach the lubrication points (oil levels, grease nipples, etc.). Leave room to manoeuvre the selection levers. Secure to the frame before the most rigid part (Garda Evo box) and then, if necessary, reposition the feet of the vacuum pump with the relevant spacers.

Figure 4 Oil top-up/inspection (sheet parameters above)

GEARBOX LUBRICATION

The toothed wheels in the gearbox are lubricated from splashes. Ensure filling with the correct quantity of oil as specified above.

- First oil change between 100/200 hours and then every 300 hours (see above)
- Check oil level before using the combined group
- Maximum temperature of the oil of 95°C during operation

START/USE/STOP

1. Connect the Garda Evo driven pulley via the straps to the drive pulley
2. Select the desired output lever and start slowly until reaching the desired RPM
3. Output selection (A or B) must be made with the drive pulley stopped.
4. To complete the operations stop the drive pulley.

Þ) AFI-35 Charts

ENGLISH

6.6 - INSTRUCTIONS FOR FIRST START-UP

GARDA EVO CENTR/DT C6500/P2300

DESCRIPTION AND CHARACTERISTICS

Garda Evo is a combined group consisting of a gearbox that allows the activation of two outputs (blade pumps, blowers, centrifugal pumps, high pressure pumps and PTO) alternate or simultaneously, from a single PTO. This information relating to initial start applies to the Garda Evo centr.-DT-P, consisting of gearbox, PTO drive, centrifugal pump (output A) and splined shaft (output B).

Parameters		Work parameters:	Max Parameters
RPM PTO *	[rpm]	850 ÷ 900	1000
OUTPUT A	[rpm]	-	2388
OUTPUT B	[rpm]	-	2388
Lubricating oil Garda Evo			
ISO VG 460			
3.7÷4.2 litres			
Oil change 300 hours /12 months			

*The input speed affects the speed in output A/B.

HOW TO SELECT THE OUTPUTS

I:PTO anti-clockwise (standard).
A:output A (centrifugal pump).
B:output B (PTO).

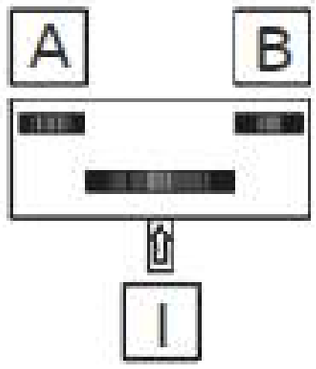


Figure 1 Garda Evo layout

Figure 2 Output A selected

Figure 3 Output B selected

Figure 4 Output A+B selected

The position of the manual lever described above is also valid with hydraulic and pneumatic rotary cylinder.

INSTALLATION

The Garda Evo group must be installed rigidly on a planar frame (sized to prevent vibrations and buckling) with a MAX tilt of 3°. Ensure sufficient space for the circulation of cooling air and to reach the lubrication points (oil levels, grease nipples, etc.). Leave room to manoeuvre the selection levers. Secure to the frame before the most rigid part (Garda Evo box).

Figure 5 Oil top-up/inspection (sheet parameters above)

GEARBOX LUBRICATION

The toothed wheels in the gearbox are lubricated from splashes. Ensure filling with the correct quantity of oil as specified above.

- First oil change between 100/200 hours and then every 300 hours (see above)
- Check oil level before using the combined group
- Maximum temperature of the oil of 95°C during operation

START/USE/STOP

1. Connect the cardan shaft to the tractor PTO and to the splined shaft 1” 3/4 of the GARDA EVO group.
2. Select the desired output lever and start slowly until reaching the desired RPM
3. Output selection (A or B or A + B) must be made with the PTO stopped.
4. To finish the operations disconnect the PTO of the tractor.

6.7 - INSTRUCTIONS FOR FIRST START-UP

GARDA EVO JET/DT H.P. PUMP 1000/W

DESCRIPTION AND CHARACTERISTICS

Garda Evo is a combined group consisting of a gearbox that allows the activation of two outputs (blade pumps, blowers, centrifugal pumps, high pressure pumps and PTO) alternate or simultaneously, from a single PTO. This initial start information applies to Garda Evo JET-W, consisting of gearbox, PTO drive, high pressure pump (output A) and rotary blade vacuum pump (output B).

Parameters		Work parameters:	Max Parameters
RPM PTO *	[rpm]	850 ÷ 900	1000
ROTARY BLADES VACUUM PUMP PRESSURE	[bar]	0.5 ÷ 1	1.5
ROTARY BLADES VACUUM PUMP	[bar]	-0.5 ÷ -0.8	-0.95
HIGH PRESSURE PUMP**		-	-
RPM OUTLET A - HIGH PRESSURE PUMP	[rpm]	-	1000
Lubricating oil rotary blades vacuum pump			
ISO VG 100			
Lubricating oil Garda Evo			
ISO VG 460			
3.7÷4.2 litres			
Oil change 300 hours /12 months			

*The input speed affects the speed in output A/B.
** For the high pressure pump consult the instruction manual for use and maintenance.

HOW TO SELECT THE OUTPUTS

I:PTO anti-clockwise (standard).
A:output A (high pressure pump).
B: output B (rotary blades vacuum pump).

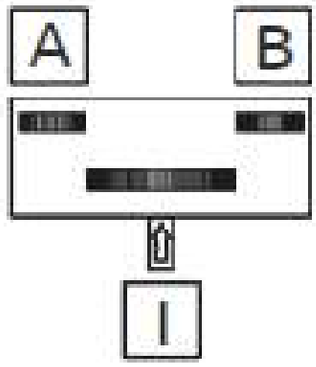


Figure 1 Garda Evo layout

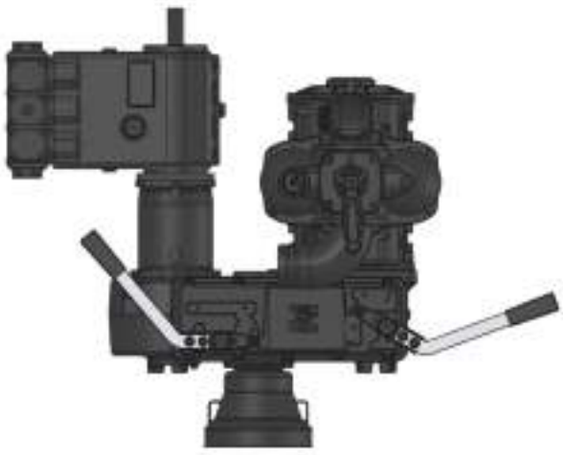


Figure 2 Output A selected

Figure 3 Output B selected

Figure 4 Output A+B selected

The position of the manual lever described above is also valid with hydraulic and pneumatic rotary cylinder.

INSTALLATION

The Garda Evo group must be installed rigidly on a planar frame (sized to prevent vibrations and buckling) with a MAX tilt of 3°. Ensure sufficient space for the circulation of cooling air and to reach the lubrication points (oil levels, grease nipples, etc.). Leave room to manoeuvre the selection levers. Secure to the frame before the most rigid part (Garda Evo box).

INSTALLATION HIGH PRESSURE PUMP

The high pressure pump is connected to the gearbox with a support (see Figure above) and the two shafts are connected by a coupling connection (as shown in Figure 5). The high pressure pump must be secured to the frame according to the instructions listed in the annexed "Instructions manual" annex. Also for the hydraulic connections, consult the instructions manual attached.

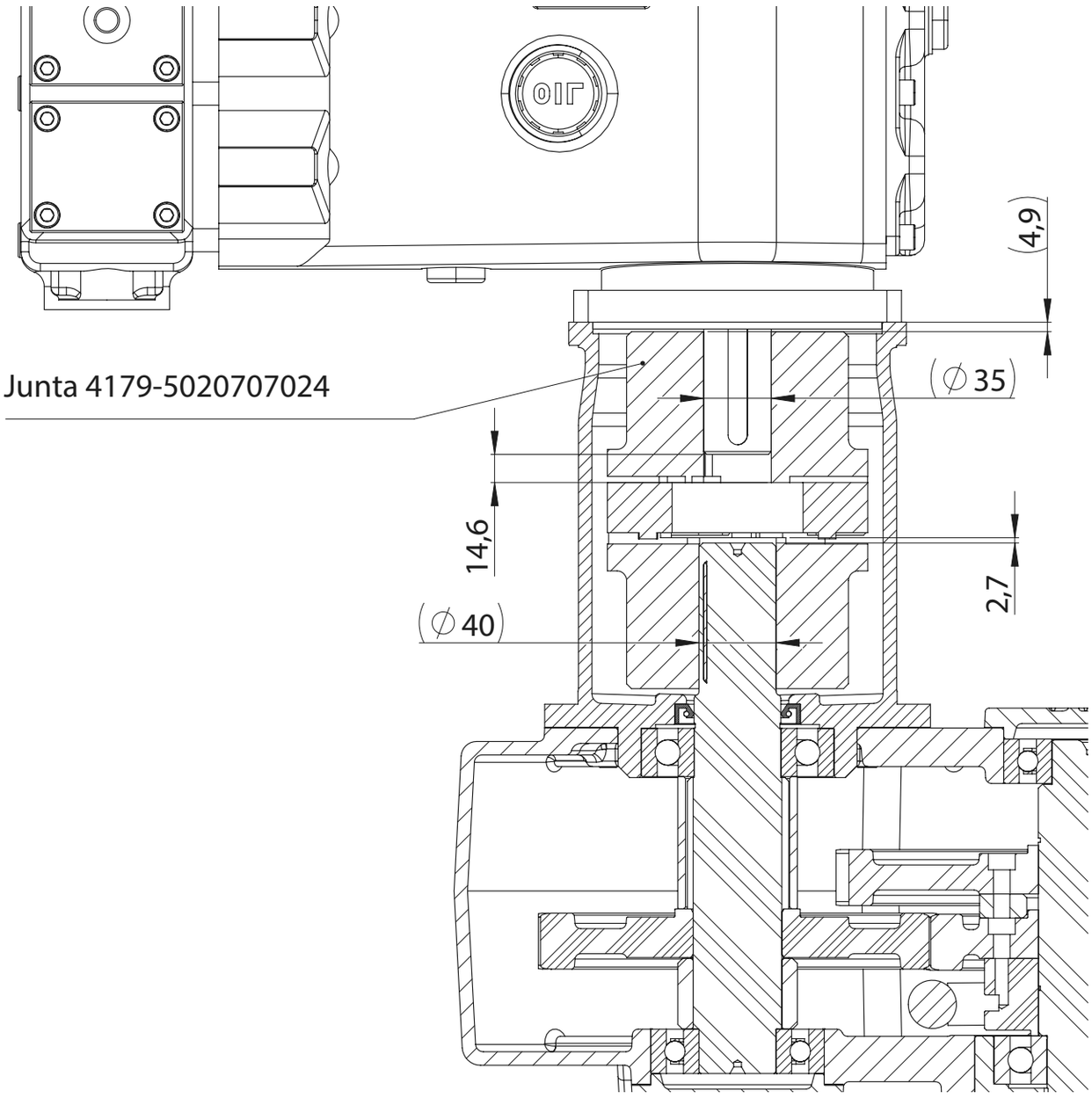


Figure 5 Flexible coupling connection

Figure 6 Oil top-up/inspection (sheet parameters above)

GEARBOX LUBRICATION

The toothed wheels in the gearbox are lubricated from splashes. Ensure filling with the correct quantity of oil as specified above.

- First oil change between 100/200 hours and then every 300 hours (see above)
- Check oil level before using the combined group
- Maximum temperature of the oil of 95°C during operation

START/USE/STOP

1. Connect the cardan shaft to the tractor PTO and to the splined shaft 1” 3/4 of the GARDA EVO group.
2. Select the desired output lever and start slowly until reaching the desired RPM
3. Output selection (A or B or A + B) must be made with the PTO stopped.
4. To finish the operations disconnect the PTO of the tractor.

6.8 - INSTRUCTIONS FOR FIRST START-UP

GARDA EVO JET/DT H.P. PUMP 800/W

DESCRIPTION AND CHARACTERISTICS

Garda Evo is a combined group consisting of a gearbox that allows the activation of two outputs (blade pumps, blowers, centrifugal pumps, high pressure pumps and PTO) alternate or simultaneously, from a single PTO. This initial start information applies to Garda Evo JET-W, consisting of gearbox, PTO drive, high pressure pump (output A) and rotary blade vacuum pump (output B).

Parameters		Work parameters:	Max Parameters
RPM PTO *	[rpm]	850 ÷ 900	1000
VANE PUMP PRESSURE	[bar]	0.5 ÷ 1	1.5
VANE PUMP VACUUM	[bar]	-0.5 ÷ -0.8	-0.95
HIGH PRESSURE PUMP**		-	-
RPM OUTLET A-HIGH PRESSURE PUMP	[rpm]	-	820
Lubricating oil rotary blades vacuum pump			
ISO VG 100			
Lubricating oil Garda Evo			
ISO VG 460			
4÷4.5 litres			
Oil change 300 hours /12 months			

* The input speed affects the output speed A/B.

** For the high pressure pump consult the instruction manual for use and maintenance.

HOW TO SELECT THE OUTPUTS

I:PTO anti-clockwise (standard).
A:output A (high pressure pump).
B:output B (vane pump).

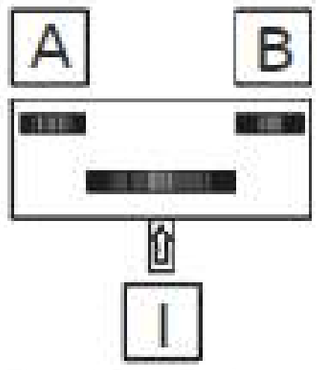


Figure 1 Garda Evo layout

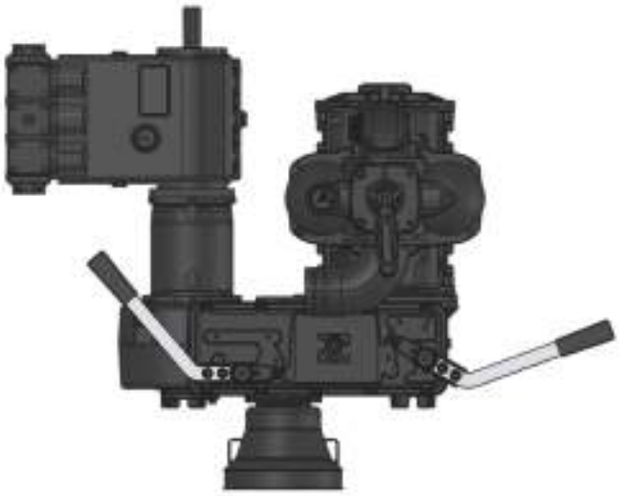


Figure 2 Output A selected

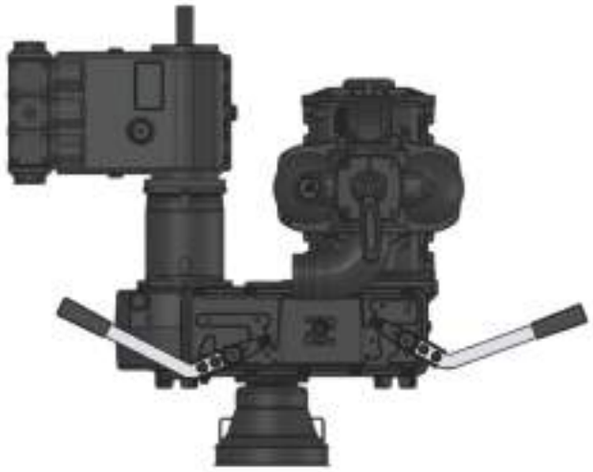


Figure 3 Output B selected

Figure 4 Output A+B selected

The position of the manual lever described above is also valid with hydraulic and pneumatic rotary cylinder.

INSTALLATION

The Garda Evo group must be installed rigidly on a planar frame (sized to prevent vibrations and buckling) with a MAX tilt of 3°. Ensure sufficient space for the circulation of cooling air and to reach the lubrication points (oil levels, grease nipples, etc.). Leave room to manoeuvre the selection levers. Secure to the frame before the most rigid part (Garda Evo box) and then the pump installed in output. If necessary reposition the feet with the relevant spacers.

INSTALLATION HIGH PRESSURE PUMP

The high pressure pump is connected to the Garda Evo box through a bell (section below) and the two shafts are connected by a flexible joint (Figure 5). The high pressure pump must be secured to the frame according to the instructions in the "Instructions manual" (annexed). For the hydraulic system refer to the "Installation diagram" shown in the manual.

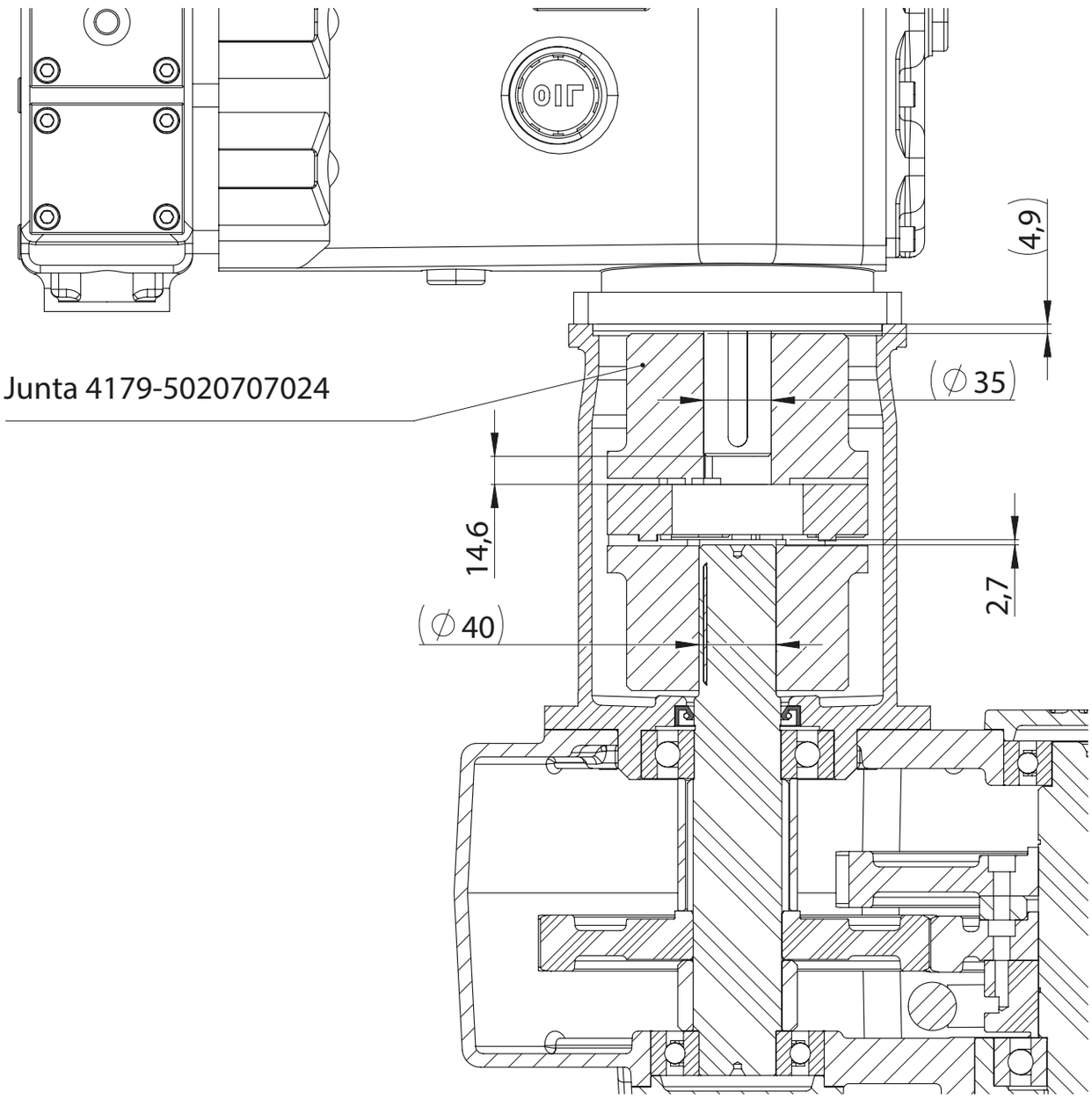


Figure 5 Flexible coupling connection

Figure 6 Oil top-up/inspection (sheet parameters above)

GEARBOX LUBRICATION

The toothed wheels in the gearbox are lubricated from splashes. Ensure filling with the correct quantity of oil as specified above. The high pressure pump and the vane pump are equipped with independent lubrication circuits. Refer to the "Operating and maintenance manual" of each pump.

- First oil change between 100/200 hours and then every 300 hours (see above)
- Check oil level before using the combined group
- Maximum temperature of the oil of 95°C during operation
- For prolonged continuous use (within and no beyond the instructions in the "Operating manuals" for each pump) it is recommended to install a Garda Evo box lubrication oil cooling system

START/USE/STOP

1. Connect the cardan shaft to the tractor PTO and to the splined shaft 1” 3/4 of the GARDA EVO group.
2. Select the desired output lever and start slowly until reaching the desired RPM
3. Output selection (A or B or A + B) must be made with the PTO stopped.
4. To finish the operations disconnect the PTO of the tractor.

6.9 - INSTRUCTIONS FOR FIRST START-UP

GARDA EVO CENTR/H 130CC C6500/W

DESCRIPTION AND CHARACTERISTICS

Garda Evo is a combined group consisting of a gearbox that allows the activation of two outputs (blade pumps, blowers, centrifugal pumps, high pressure pumps and PTO) alternate or simultaneously, from a single PTO. This initial start information applies to Garda Evo Centr.-H-W, consisting of gearbox, hydraulic drive, centrifuge pump (output A) and rotary blade vacuum pump (output B).

Parameters		Work parameters:	Max Parameters
RPM HYDRAULIC MOTOR*	[rpm]	850 ÷ 900	1000
RPM CENTRIFUGAL PUMP	[rpm]	-	2388
ROTARY BLADES VACUUM PUMP PRESSURE	[bar]	0.5 ÷ 1	1.5
ROTARY BLADES VACUUM PUMP	[bar]	-0.5 ÷ -0.8	-0.95
Lubricating oil rotary blades vacuum pump			
ISO VG 100			
Lubricating oil Garda Evo			
ISO VG 460			
3.8÷4.2 litres			
Oil change 300 hours /12 months			

* The input speed affects the output speed A/B.

HOW TO SELECT THE OUTPUTS

I: CCW hydraulic motor (standard).
A: outlet A (centrifugal pump).
B: output B (rotary blades vacuum pump).

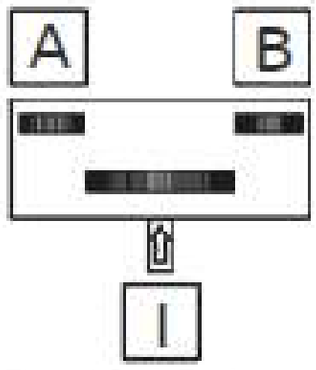


Figure 1 Garda Evo layout

Figure 2 Output A selected

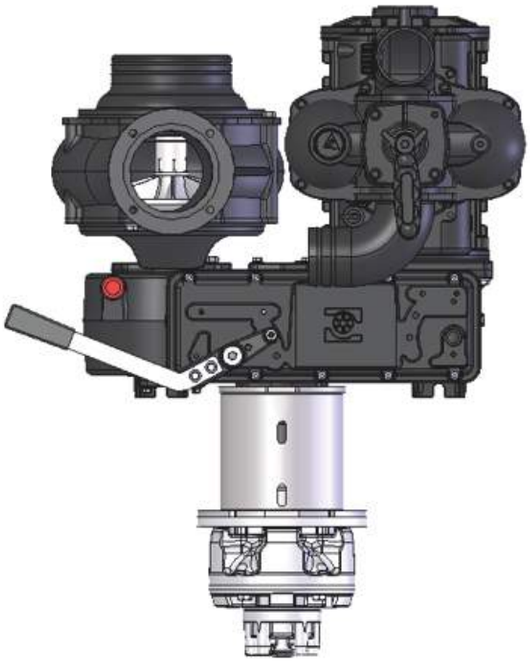


Figure 3 Output B selected

The position of the manual lever described above is also valid with hydraulic and pneumatic rotary cylinder.

INSTALLATION

The Garda Evo group must be installed rigidly on a planar frame (sized to prevent vibrations and buckling) with a MAX tilt of 3°. Ensure sufficient space for the circulation of cooling air and to reach the lubrication points (oil levels, grease nipples, etc.). Leave room to manoeuvre the selection levers. Secure to the frame before the most rigid part (Garda Evo box).

Figure 4 Oil top-up/inspection (sheet parameters above)

GEARBOX LUBRICATION

The toothed wheels in the gearbox are lubricated from splashes. Ensure filling with the correct quantity of oil as specified above.

- First oil change between 100/200 hours and then every 300 hours (see above)
- Check oil level before using the combined group
- Maximum temperature of the oil of 95°C during operation

START/USE/STOP

1. Connect the hydraulic motor to the system
2. Select the desired output lever
3. Output selection (A or B) must be made with the hydraulic motor off.
4. To complete the operations switch off the hydraulic motor.

HYDRAULIC MOTOR INSTALLATION

The installed hydraulic motor can work both with open and closed circuit. The hydraulic motor is connected to the shaft of the gearbox with a flexible coupling which protects the motor from vibrations and misalignments of assembly (the polymer constituting the joint is subject to wear. Its duration also depends on the relevant environmental conditions of use).

GENERAL INFORMATION

- Prevent cavitation in the hydraulic motor
- Given the maximum capacity of the hydraulic motor, the tubes (in addition to the fittings, valves, etc.) must be at least 1". If the pipes are very long it may be useful to increase them
- Avoid high back pressure to the motor
- Before starting the motor it is necessary to fill the oil casing. It is also necessary to use the output for drainage that remains high (with motor mounted) to ensure that the casing remains filled with oil.
- Filter the hydraulic oil with a filter of 25 μm or finer
- We recommend keeping oil with a viscosity of at least 20 cSt. In the case of ISO VG 46 oil, this means that the temperature must not exceed 70°C in the motor. In the case of such a risk it would be necessary to create a motor casing flow (we recommend 20 l/min of cooled oil).

Motore	Portata [l/min]	Pressione [bar]	Potenza [kW]	Coppia [N*m]	RPM-PTO
GS1 130Cc	130	380	70	730	1000
	130	320	60	583	1000
	130	280	52	510	1000
	114	280	44	510	850
P. Max cont. [bar]					
300					
P. Max picco [bar]					
400					
RPM. Max cont.					
1000					
RPM. Max picco.					
2000					

6.10 - INSTRUCTIONS FOR FIRST START-UP

GARDA EVO JET/DT KF36/W

DESCRIPTION AND CHARACTERISTICS

Garda Evo is a combined group consisting of a gearbox that allows the activation of two outputs (blade pumps, blowers, centrifugal pumps, high pressure pumps and PTO) alternate or simultaneously, from a single PTO. This initial start information applies to Garda Evo JET-W, consisting of gearbox, PTO drive, high pressure pump (output A) and rotary blade vacuum pump (output B).

Parameters		Work parameters:	Max Parameters
RPM PTO *	[rpm]	850 ÷ 900	1000
ROTARY BLADES VACUUM PUMP PRESSURE	[rpm]	0.5 ÷ 1	1.5
ROTARY BLADES VACUUM PUMP	[bar]	-0.5 ÷ -0.8	-0.95
HIGH PRESSURE PUMP**		-	1000
Lubricating oil rotary blades vacuum pump			
ISO VG 100			
Lubricating oil Garda Evo			
ISO VG 460			
3.7÷4.2 litres			
Oil change 300 hours /12 months			

*The input speed affects the speed in output A/B.
** For the high pressure pump consult the instruction manual for use and maintenance.

HOW TO SELECT THE OUTPUTS

I: CCW hydraulic motor (standard).
A: outlet A (high pressure pump).
B: output B (rotary blades vacuum pump).

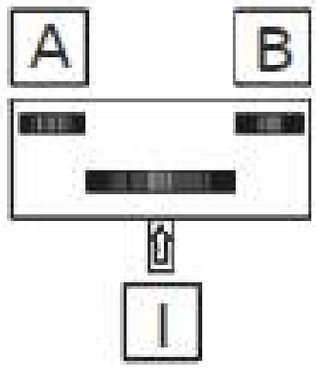


Figure 1 Garda Evo layout

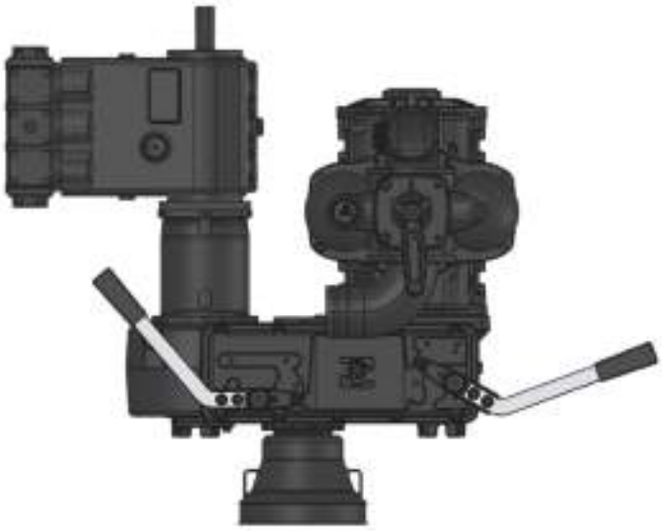


Figure 2 Output A selected

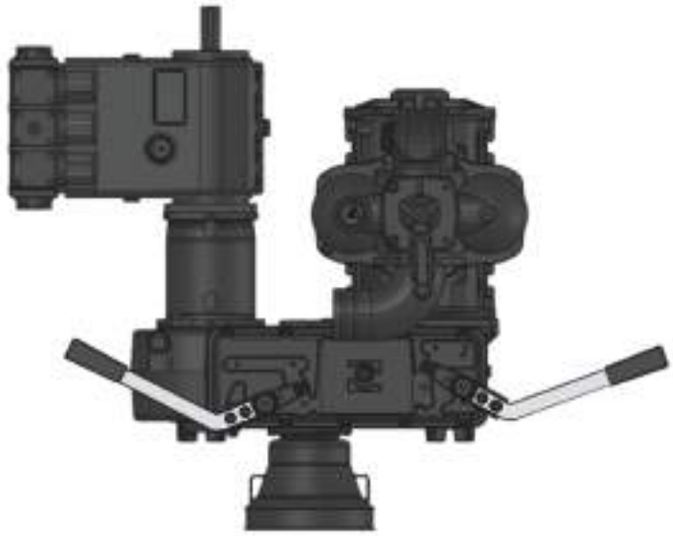


Figure 3 Output B selected

Figure 4 Output A+B selected

The position of the manual lever described above is also valid with hydraulic and pneumatic rotary cylinder.

INSTALLATION

The Garda Evo group must be installed rigidly on a planar frame (sized to prevent vibrations and buckling) with a MAX tilt of 3°. Ensure sufficient space for the circulation of cooling air and to reach the lubrication points (oil levels, grease nipples, etc.). Leave room to manoeuvre the selection levers. Secure to the frame before the most rigid part (Garda Evo box).

INSTALLATION HIGH PRESSURE PUMP

The high pressure pump is connected to the gearbox with a support (see Figure above) and the two shafts are connected by a coupling connection (as shown in Figure 5). The high pressure pump must be secured to the frame according to the instructions listed in the annexed "Instructions manual" annex. Also for the hydraulic connections, consult the instructions manual attached.

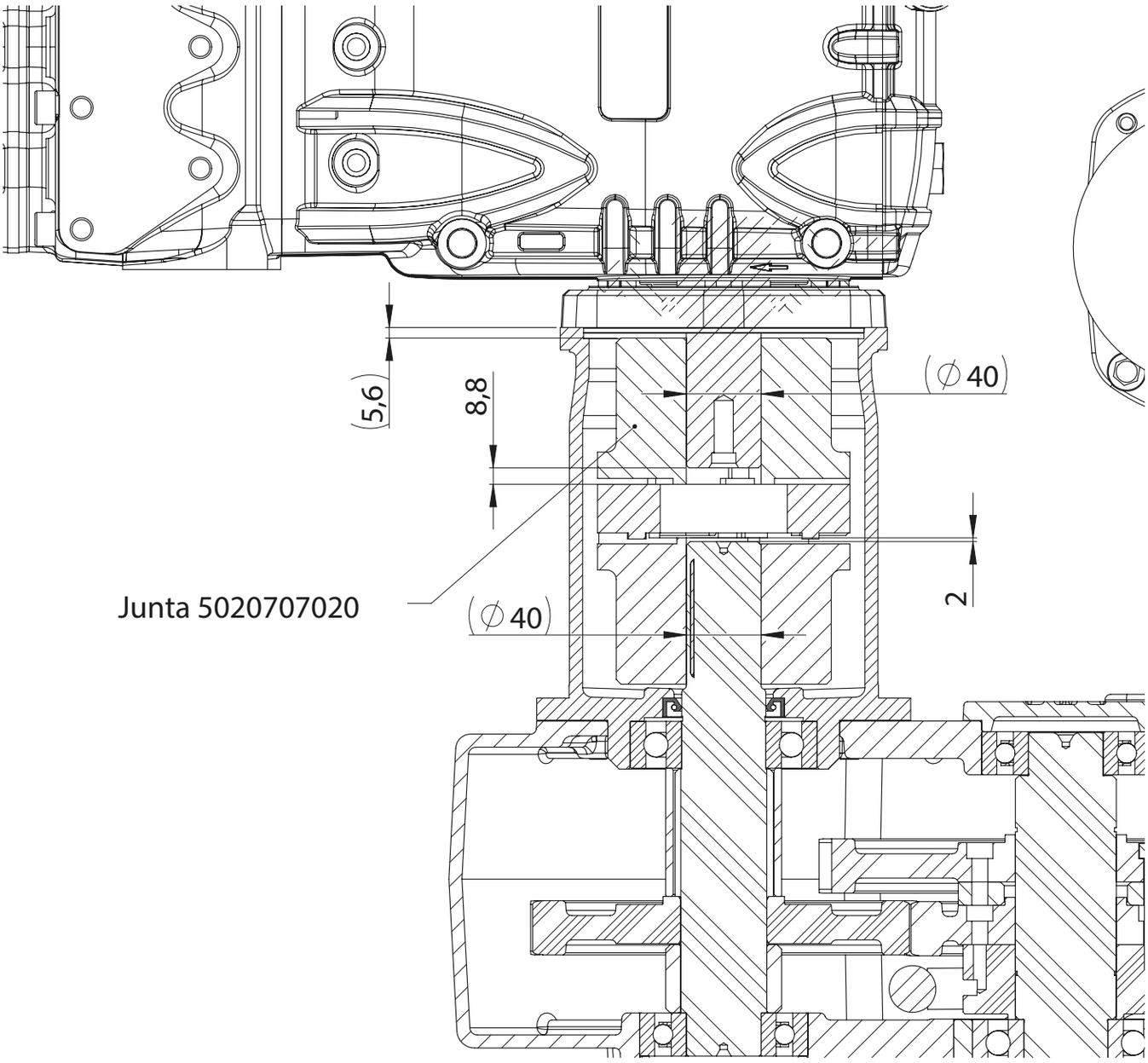


Figure 5 Flexible coupling connection

Figure 6 Oil top-up/inspection (sheet parameters above)

GEARBOX LUBRICATION

The toothed wheels in the gearbox are lubricated from splashes. Ensure filling with the correct quantity of oil as specified above.

- First oil change between 100/200 hours and then every 300 hours (see above)
- Check oil level before using the combined group
- Maximum temperature of the oil of 95°C during operation

START/USE/STOP

1. Connect the cardan shaft to the tractor PTO and to the splined shaft 1” 3/4 of the GARDA EVO group.
2. Select the desired output lever and start slowly until reaching the desired RPM
3. Output selection (A or B or A + B) must be made with the PTO stopped.
4. To finish the operations disconnect the PTO of the tractor.

6.11 - INSTRUCTIONS FOR FIRST START-UP

GARDA EVO GK/DT 1000/W

DESCRIPTION AND CHARACTERISTICS

Garda Evo is a combined group consisting of a gearbox that allows the activation of two outputs (blade pumps, blowers, centrifugal pumps, high pressure pumps and PTO) alternate or simultaneously, from a single PTO. This initial start information applies to Garda Evo DT/GK/W, consisting of gearbox, PTOdrive and PTO of 1”3/4 (output A) and rotary blade vacuum pumps (MEC II / BALLAST / KTS etc.) (output B).

Parameters		Work parameters:	Max Parameters
RPM PTO *	**[rpm]**	**850 ÷ 900**	**1000**
VANE PUMP PRESSURE	**[bar]**	**0.5 ÷ 1**	**1.5**
BLADES VACUUM PUMP	**[bar]**	**-0.5 ÷ -0.8**	**-0.95**
RPM PTO OUTPUT A	**[rpm]**	*	**1000**
Blades lubricating oil			
ISO VG 100			
Lubricating oil Garda Evo (Figure 5 below)			
ISO VG 460			
6.1÷6.3 litres			
Oil change 300 hours /12 months			

*The input speed affects the speed in output A/B.

HOW TO SELECT THE OUTPUTS

I:PTO anti-clockwise (standard).
A:output A (PTO 1”3/4).
B: output B (rotary blades vacuum pump).

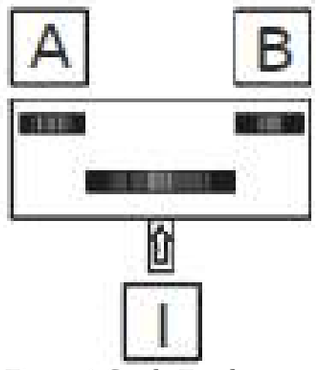


Figure 1 Garda Evo layout

Figure 2 Output A selected

Figure 3 Output B selected

Figure 4 Output A+B selected

The position of the manual lever described above is also valid with hydraulic and pneumatic rotary cylinder.

INSTALLATION

The Garda Evo group must be installed rigidly on a planar frame (sized to prevent vibrations and buckling) with a MAX tilt of 3°. Ensure sufficient space for the circulation of cooling air and to reach the lubrication points (oil levels, grease nipples, etc.). Leave room to manoeuvre the selection levers.

Figure 5 Oil top-up/inspection (sheet parameters above)

GEARBOX LUBRICATION

The toothed wheels in the gearbox are lubricated from splashes. Ensure filling with the correct quantity of oil as specified above.

- First oil change between 100/200 hours and then every 300 hours (see above)
- Check oil level before using the combined group
- Maximum temperature of the oil of 95°C during operation

START/USE/STOP

1. Connect the cardan shaft to the tractor PTO and to the splined shaft 1” 3/4 of the GARDA EVO group.
2. 4. Select the desired output lever and start slowly until reaching the desired RPM
3. Output selection (A or B or A + B) must be made with the PTO stopped.
4. To finish the operations disconnect the PTO of the tractor.

7 - DISASSEMBLY AND ASSEMBLY INSTRUCTIONS

The following disassembly operations must only be carried out by designated and qualified personnel.
Disassembly personnel must use the specified personal protective equipment.

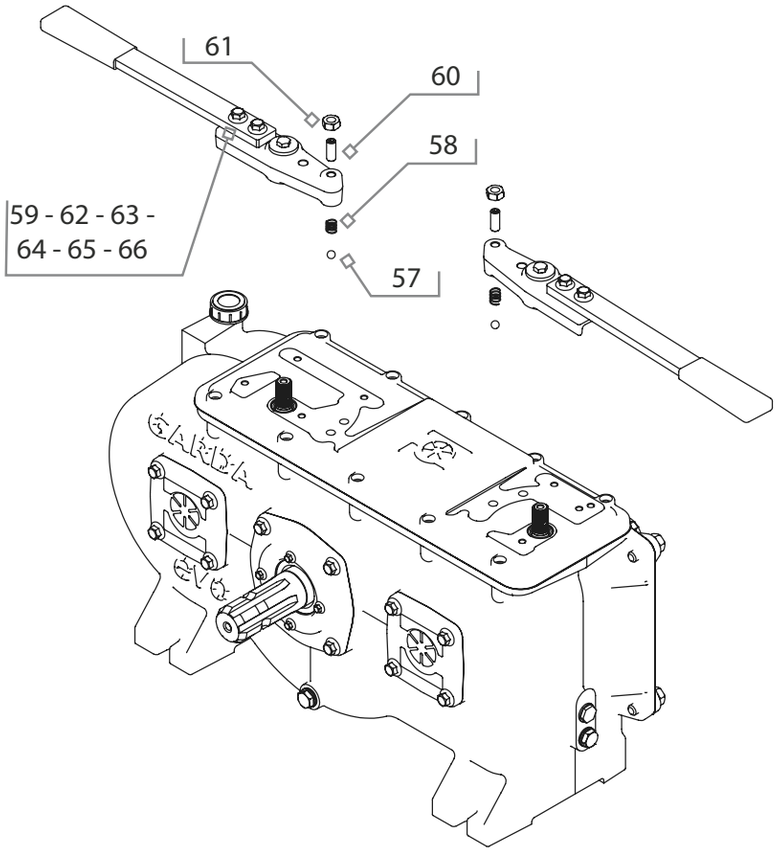
PPE to be used during these maintenance operations

7.1 - UNINSTALLATION

The GARDA EVO group must be uninstalled using the following procedure:
1) stop the PTO of the tractor.
2) remove the cardan shaft from the PTO in version D or disconnect the hydraulic motor in the H version or remove the transmission belts in case of version P;
3) remove the connecting pipe that connects the rotary blades vacuum pump to the tank, as described in the "Instructions manual for use and maintenance" of the individual pumps;
4) remove any hydraulic connections;
5) disconnect the centrifugal pump from the tank;
6) remove the fixing screws from the gearbox;
7) uninstall the GARDA EVO Group;

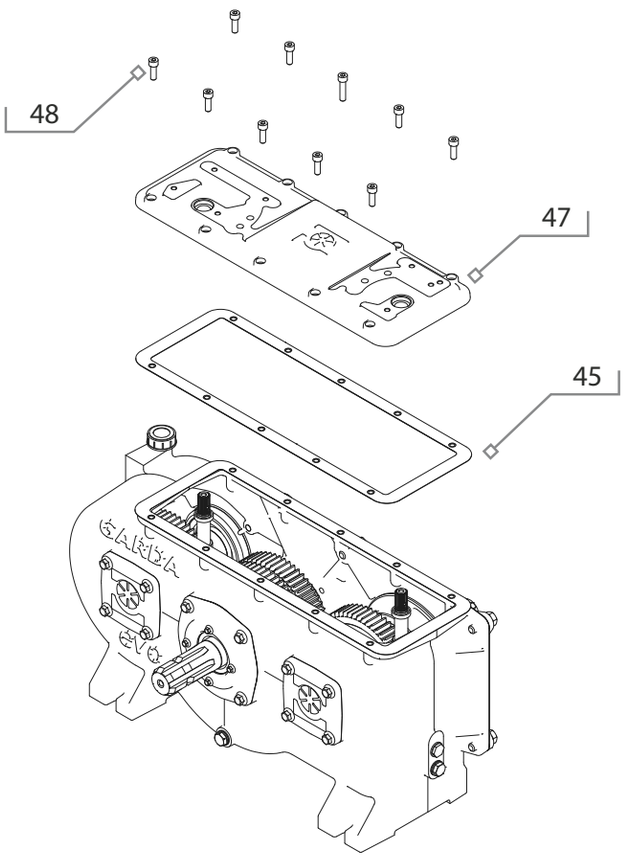
Fig. 1

7.2 - DISASSEMBLY INSTRUCTIONS COMMON TO EACH CONFIGURATION OF GARDA EVO



Unscrew the nuts 61 and remove the levers (consisting of 59 - 62 - 63 - 64 - 65 - 66) from the respective shafts.

Remove the screws 60, the springs 58 and the balls 57.



Loosen the 10 screws 48.

Remove the cover 47 and the seal 45.

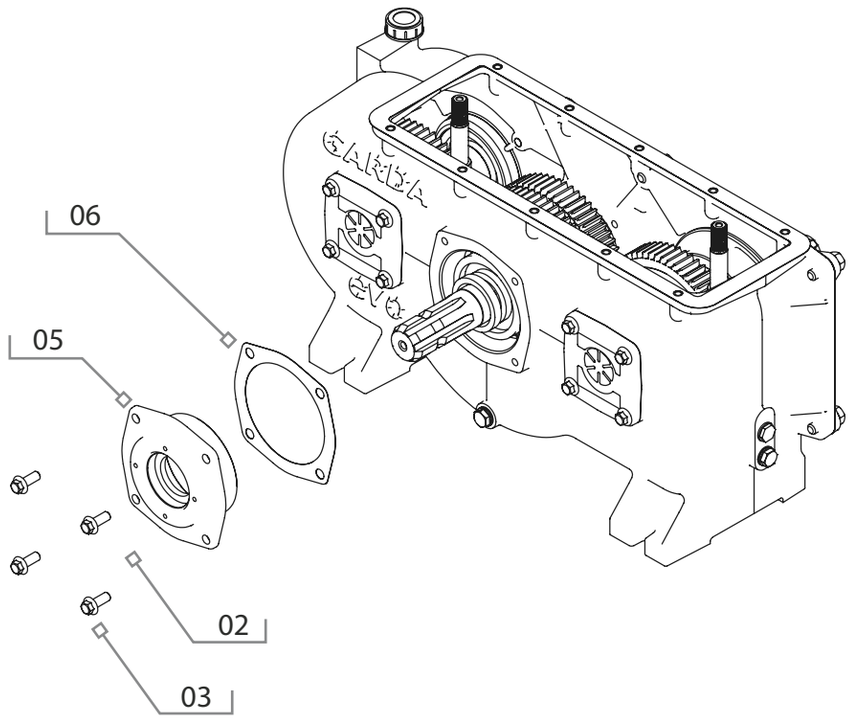
Check the seal and if necessary replace it.

Loosen the 4 screws 02.

Loosen the 4 screws 03.

Remove the support 05 and the seal 06.

Check the seal and if necessary replace it.



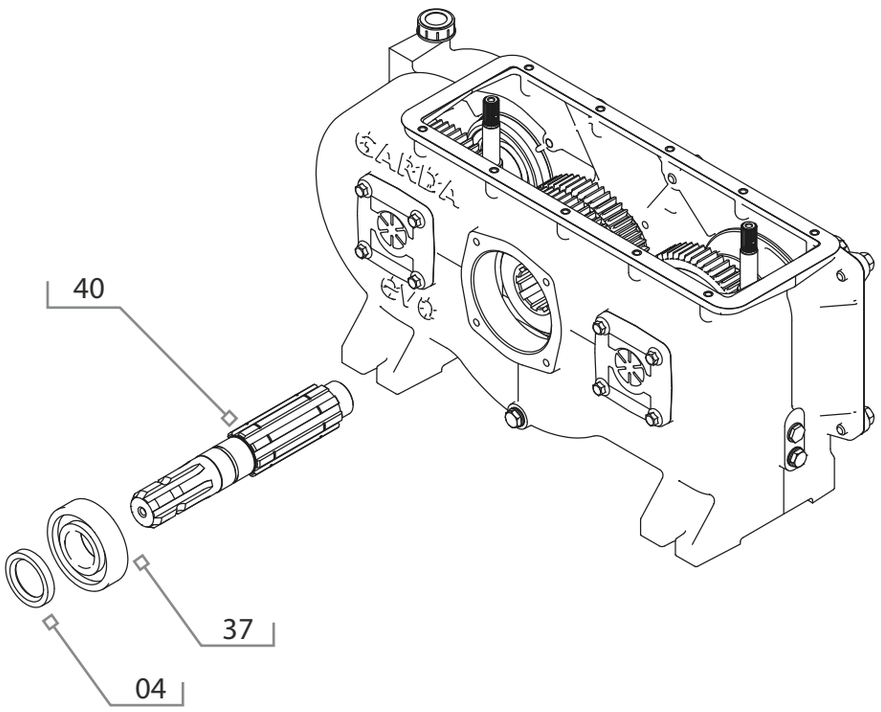
Remove the shaft 40.

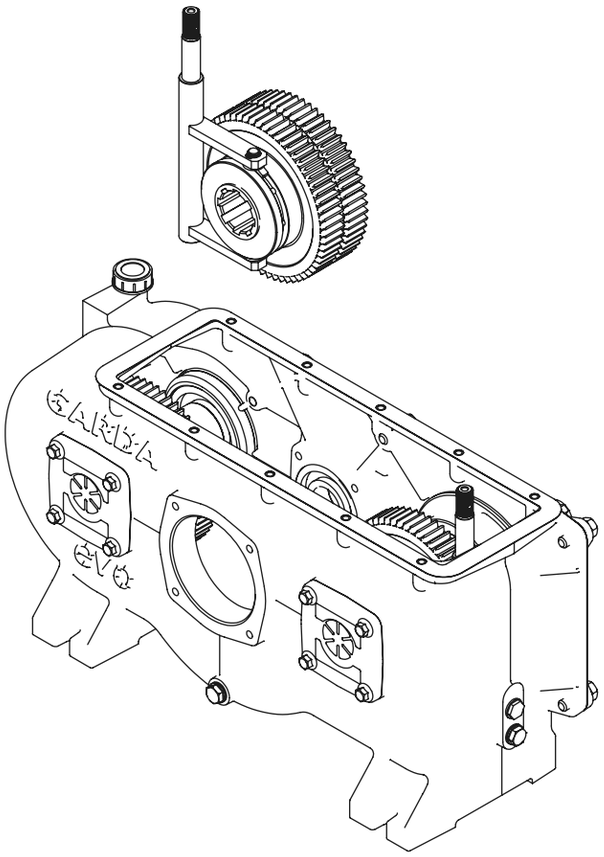
Remove the oil seal 04.

Remove the bearing 37.

Check the oil seal and if necessary replace it.

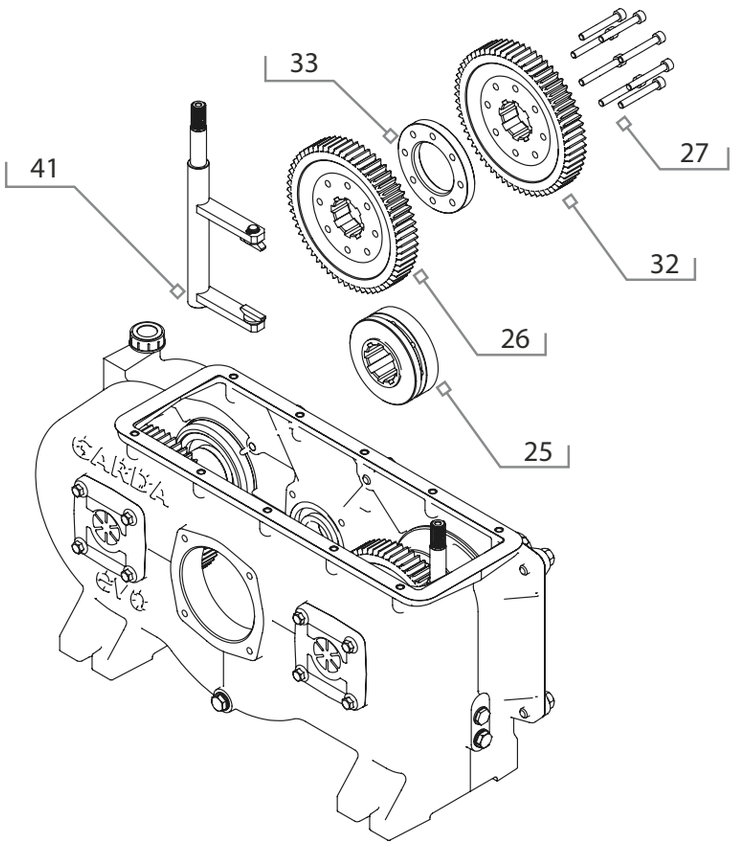
Check the bearing and if necessary replace it.





Pay attention when removing the block.

Remove the block, consisting of crowns and lever rod, to then disassemble it.



Remove the shaft 41 of the lever from the Sliding Hub 25.

Loosen the 8 screws 27.

Disassemble the two toothed wheels 26 – 32 and the spacer 33.

Check the toothed wheels and if necessary replace them.

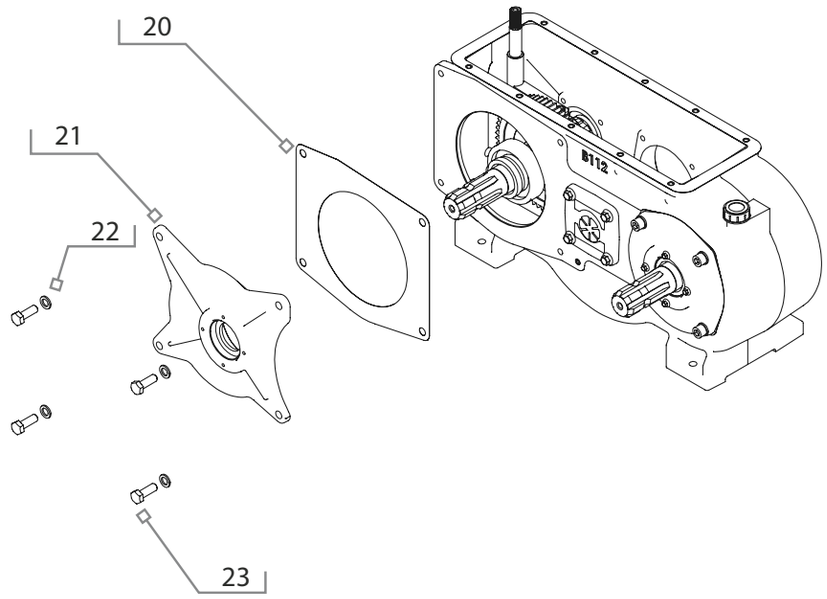
ENGLISH

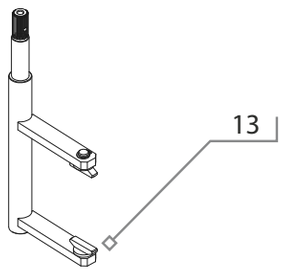
7.3 DISASSEMBLY INSTRUCTIONS OF GARDA EVO IN CONFIGURATION GK USCITA “B”

Loosen the 4 screws 23 and remove the 4 washers 22.

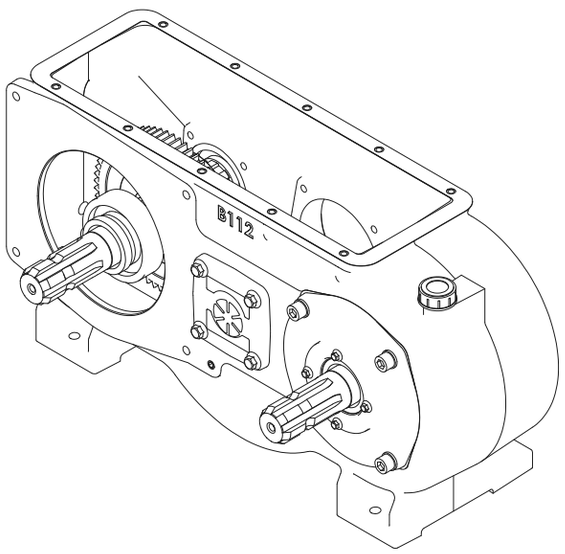
Remove the cover 21 and the seal 20.

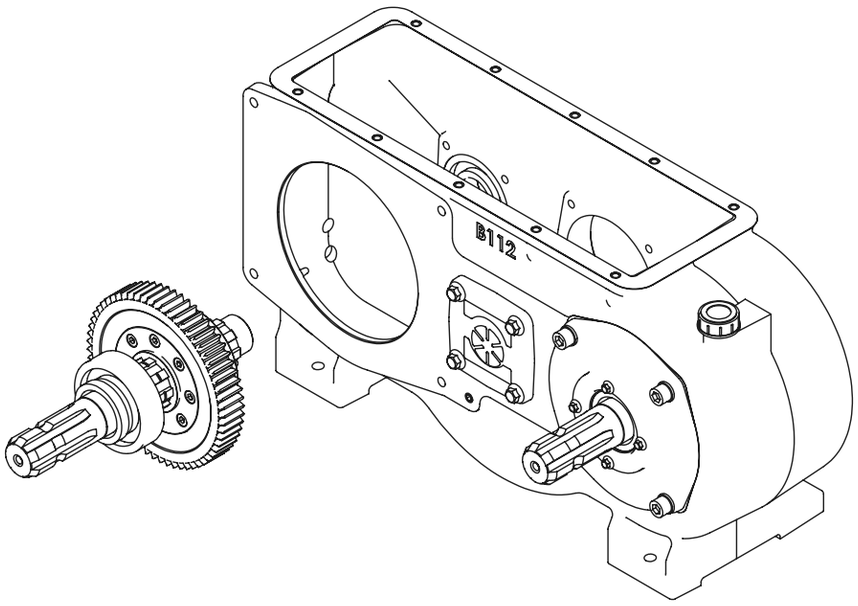
Check the seal and if necessary replace it.



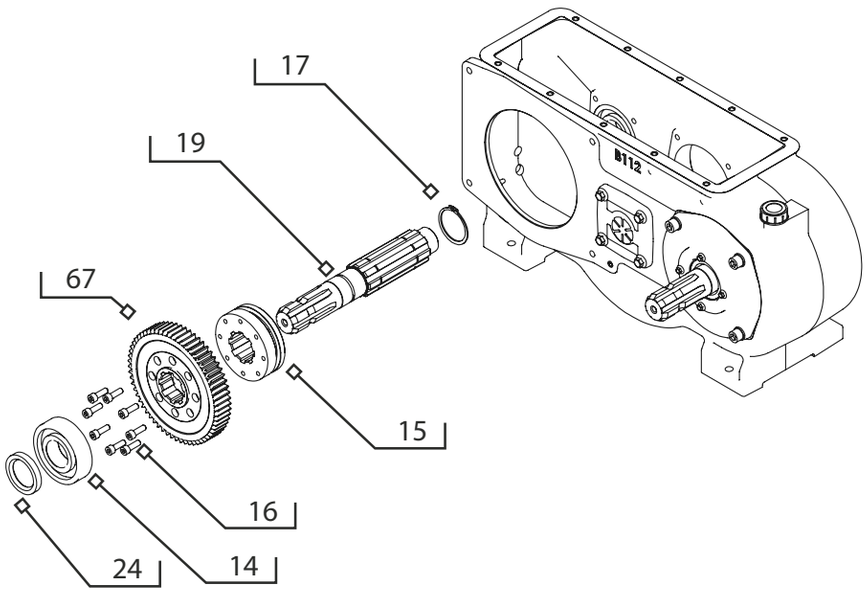


Remove the shaft 13 of the lever from the block.





Remove the block through the hole of the frame.



Disassemble the block removing the oil seal 24 and the bearing 14.

Remove the shaft 19.

Detach the Seeger 17.

Loosen the 8 screws 16.

Remove the toothed wheel 67 and the sliding hub 15.

Check the oil seal and if necessary replace it.

Check the toothed wheel and if necessary replace it.

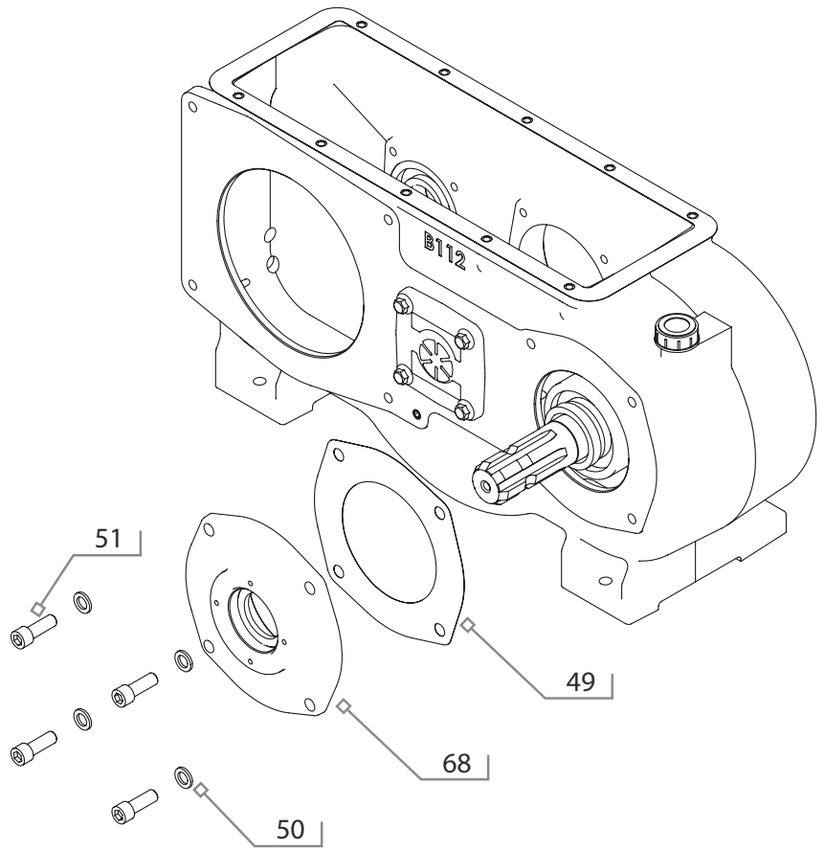
Check the bearing and if necessary replace it.

7.4 DISASSEMBLY INSTRUCTIONS OF GARDA EVO IN CONFIGURATION GK OUTPUT "A"

Loosen the 4 screws 51 and remove the 4 washers 50.

Remove the support 68 and the seal 49.

Check the seal and if necessary replace it.



Remove the shaft 40.

Remove the toothed wheel 39.

Remove the oil seal 53.

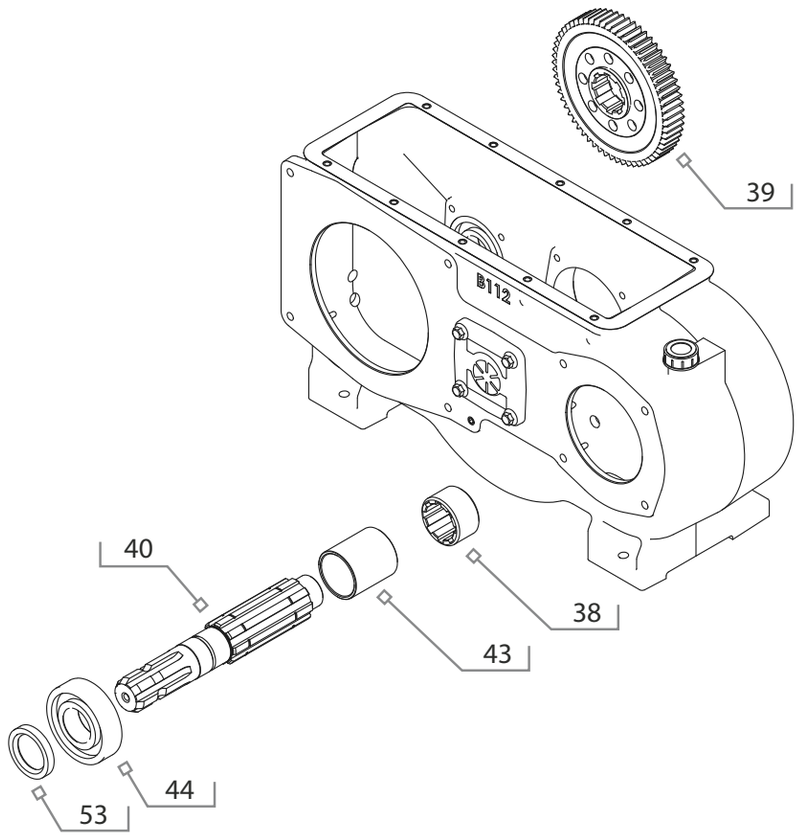
Remove the bearing 44.

Remove the bushings 38 and 43.

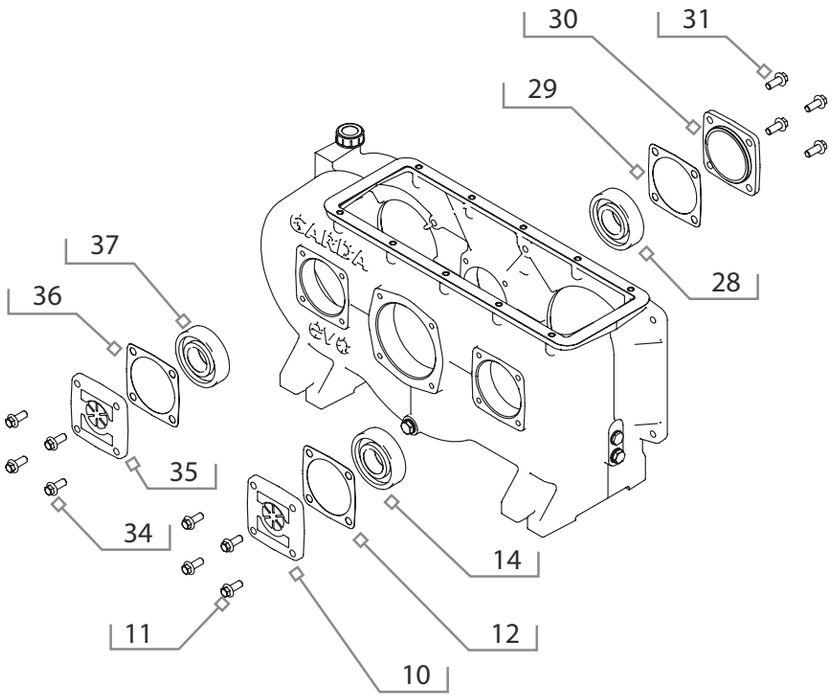
Check the oil seal and if necessary replace it.

Check the toothed wheel and if necessary replace it.

Check the bearing and if necessary replace it.



7.5 - DISASSEMBLY INSTRUCTIONS OF COVERS OF GARDA EVO COMMON TO EACH CONFIGURATION



Loosen the 4 screws 31.

Remove the cover 30 and the seal 29.

Remove the bearing 28.

Remove the 4 screws 34.

Remove the cover 35 and the seal 36.

Remove the bearing 37.

Remove the 4 screws 11.

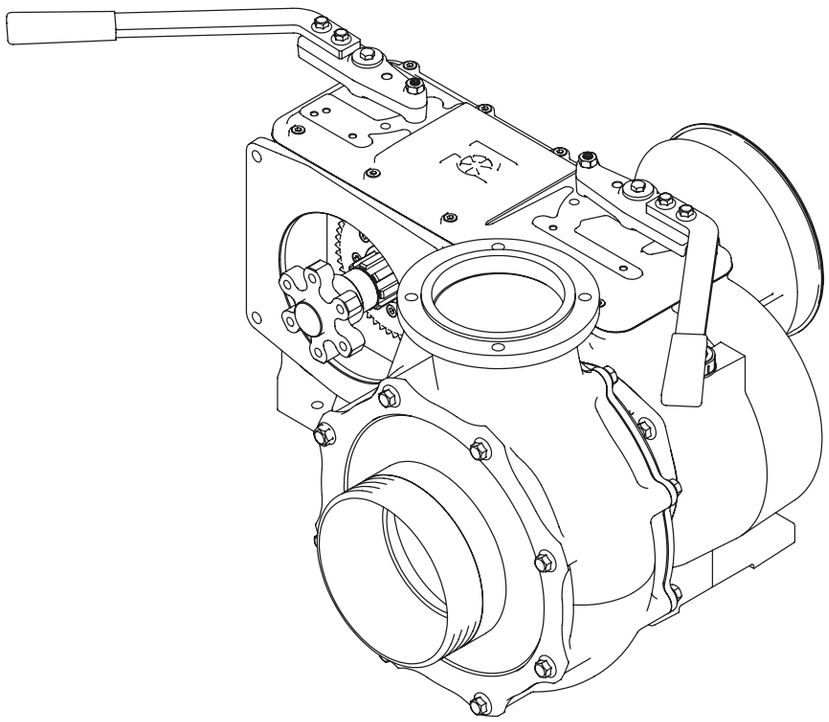
Remove the cover 10 and the seal 12.

Remove the bearing 14.

Check the seals and if necessary replace them.

Check the bearings and if necessary replace them.

7.6 DISASSEMBLY INSTRUCTIONS OF GARDA EVO IN CONFIGURATION REAR CENTRIFUGE ON OUTPUT "A"

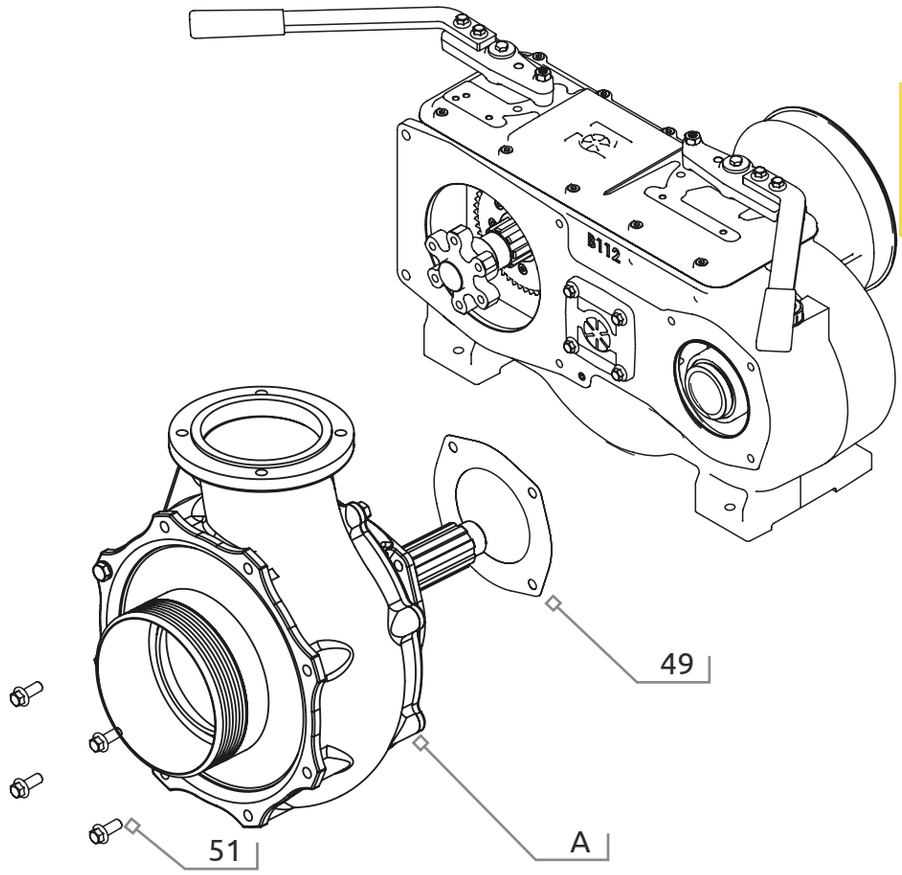


Remove the 4 screws 51.

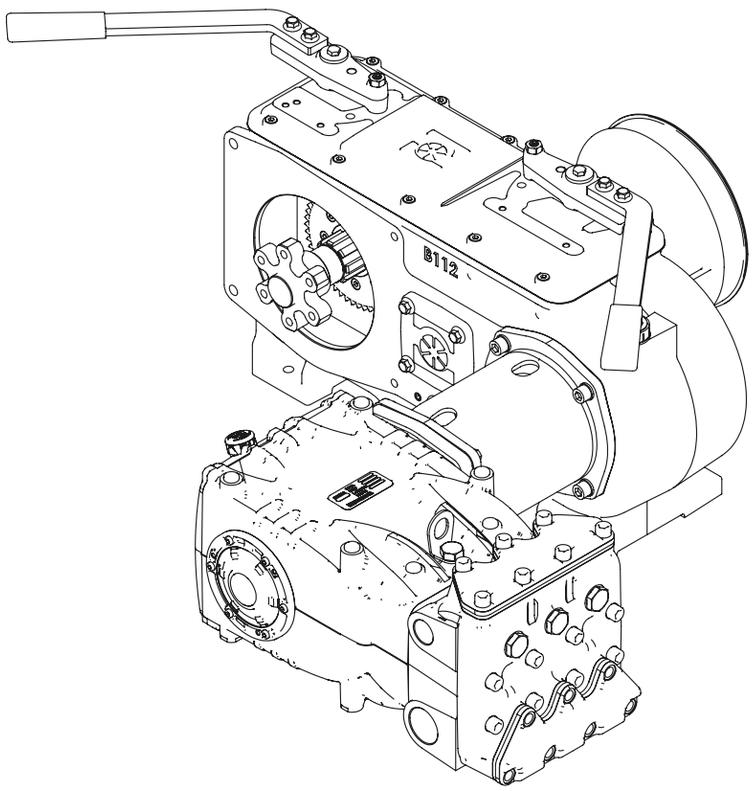
Remove the rear centrifuge “A”.

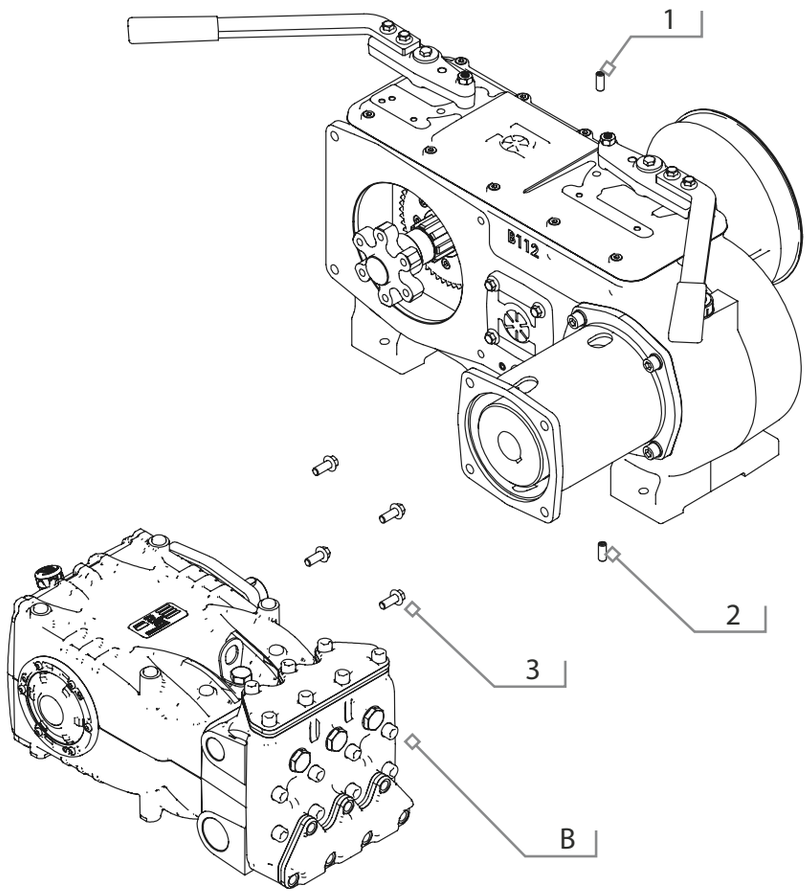
Remove the seal 49.

Check the seal and if necessary replace it.



7.7 - DISASSEMBLY INSTRUCTIONS OF GARDA EVO IN HIGH PRESSURE PUMP CONFIGURATION ON OUTPUT "A"

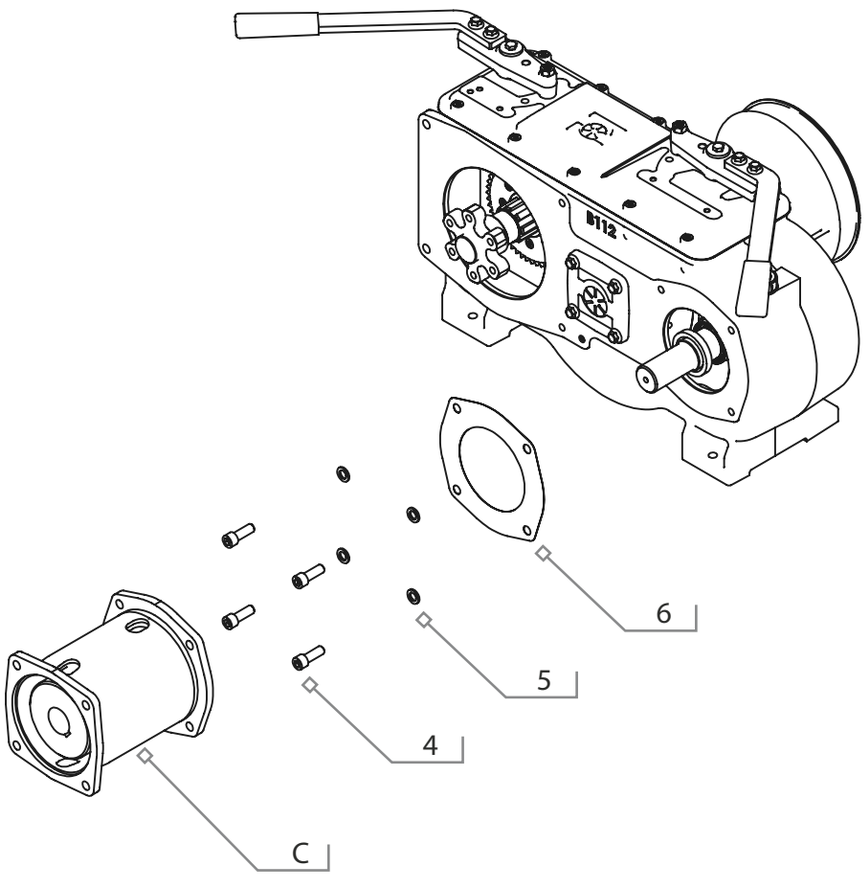




Remove the dowels of the flexible coupling 1 and 2.

Remove the 4 screws 51 and the washers 50.

Remove the high pressure pump “A”.

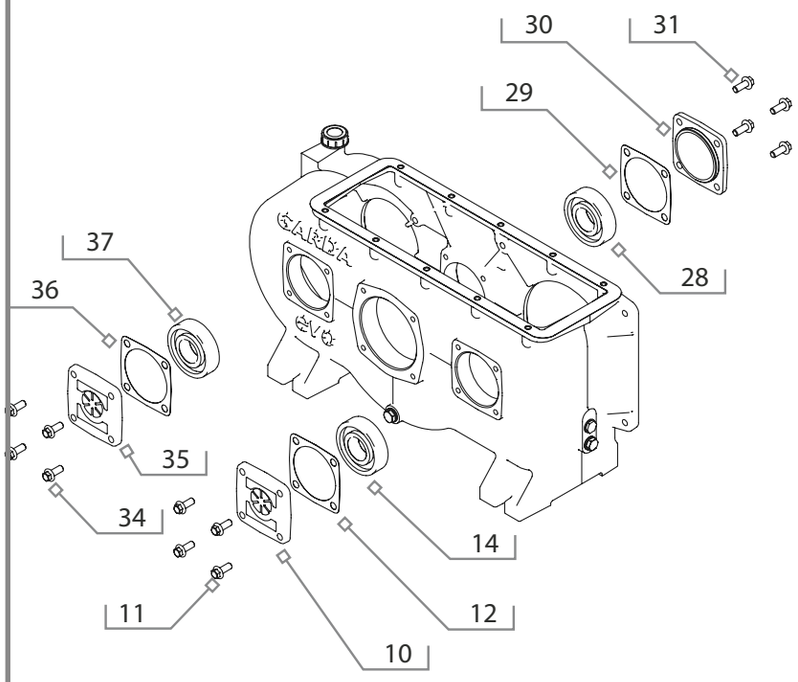


Remove the four screws 4 and remove the relative four washers 5.

Remove the support B.

Remove the seal 6.

7.8 - ASSEMBLY INSTRUCTIONS OF COVERS OF GARDA EVO COMMON TO EACH CONFIGURATION



Insert the seal 29 into the cover 30.

Insert the bearing 28 into the cover 30.

Secure the cover 30 on the body, tightening the 4 screws 31.

Insert the seal 36 into the cover 35.

Insert the bearing 37 into the cover 30.

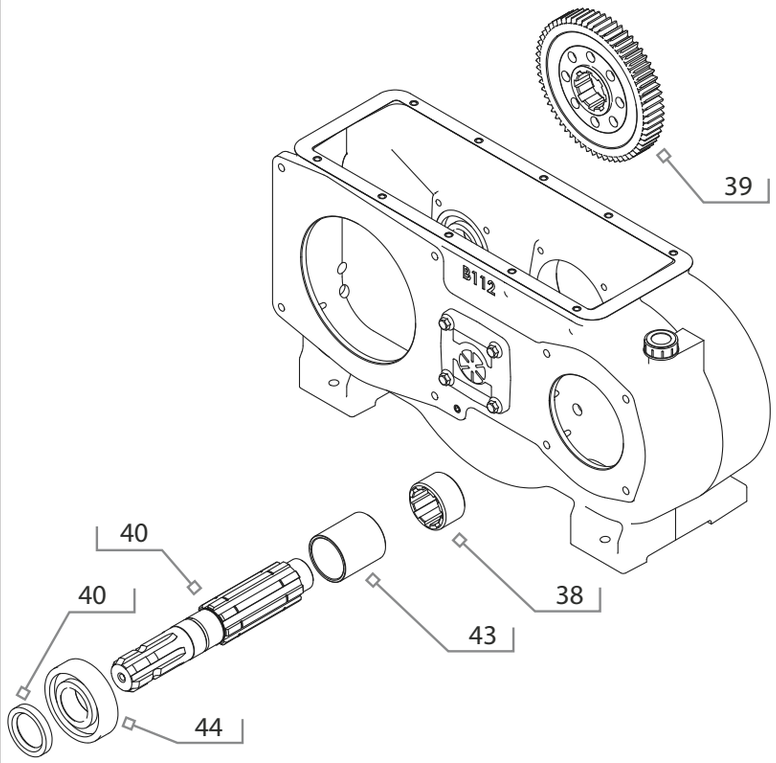
Secure the cover 35 onto the body tightening the 4 screws 34.

Insert the seal 12 into the cover 10.

Insert the bearing 14 into the cover 10.

Secure the cover 10 onto the body tightening the 4 screws 11.

7.9 ASSEMBLY INSTRUCTIONS OF GARDA EVO IN CONFIGURATION GK OUTPUT “A”



Insert the shaft 40 into the bushing 43.

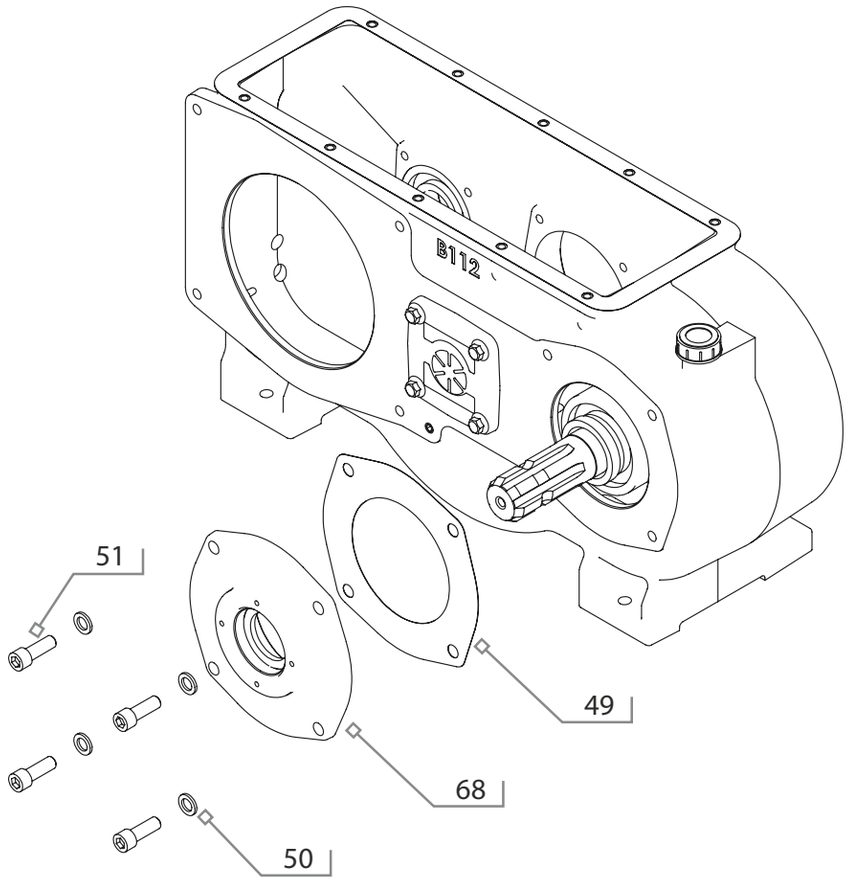
Place the toothed wheel 39 into the body and insert the shaft into the bushing 38 crossing the toothed wheel 39.

Insert the group just assembled into the bearing inserted into the cover of output “A”.

Insert onto the shaft the bearing 44 and the oil seal 53.

Insert the seal 49 onto the cover 68.

Secure the cover 68 onto the body using the 4 screws 51 and the 4 washers 50.

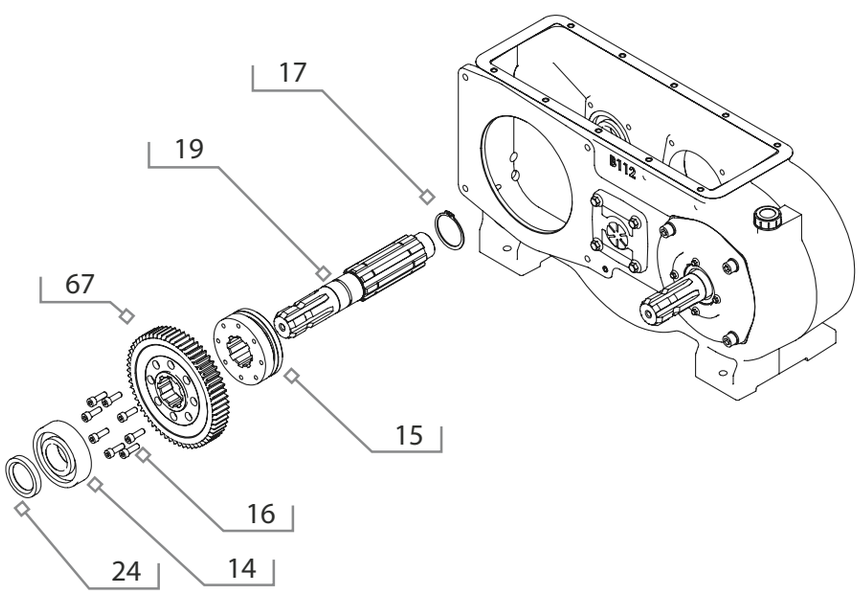


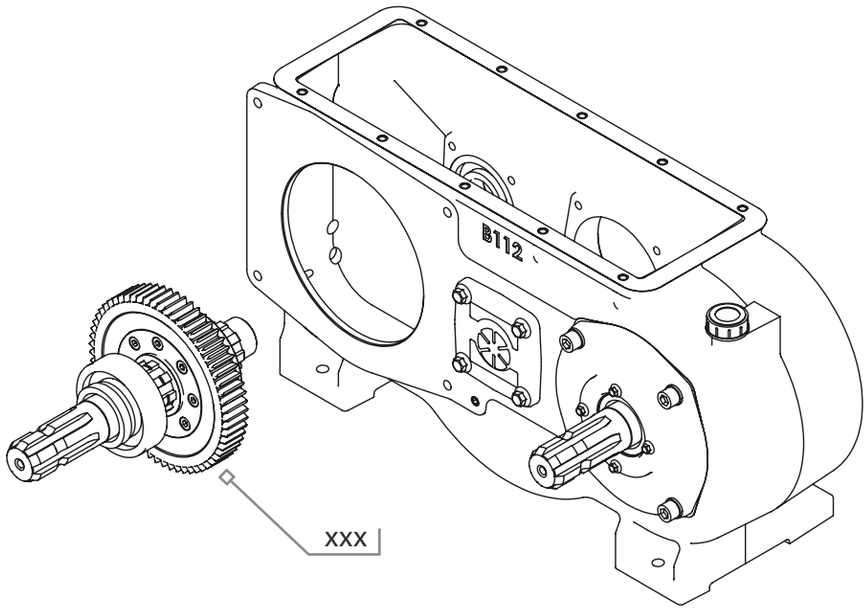
7.10 ASSEMBLY INSTRUCTIONS OF GARDA EVO IN CONFIGURATION GK USCITA “B”

Insert the shaft 19 through the sliding hub 15 and the toothed wheel 67 and fix the latter with the eight screws 16.

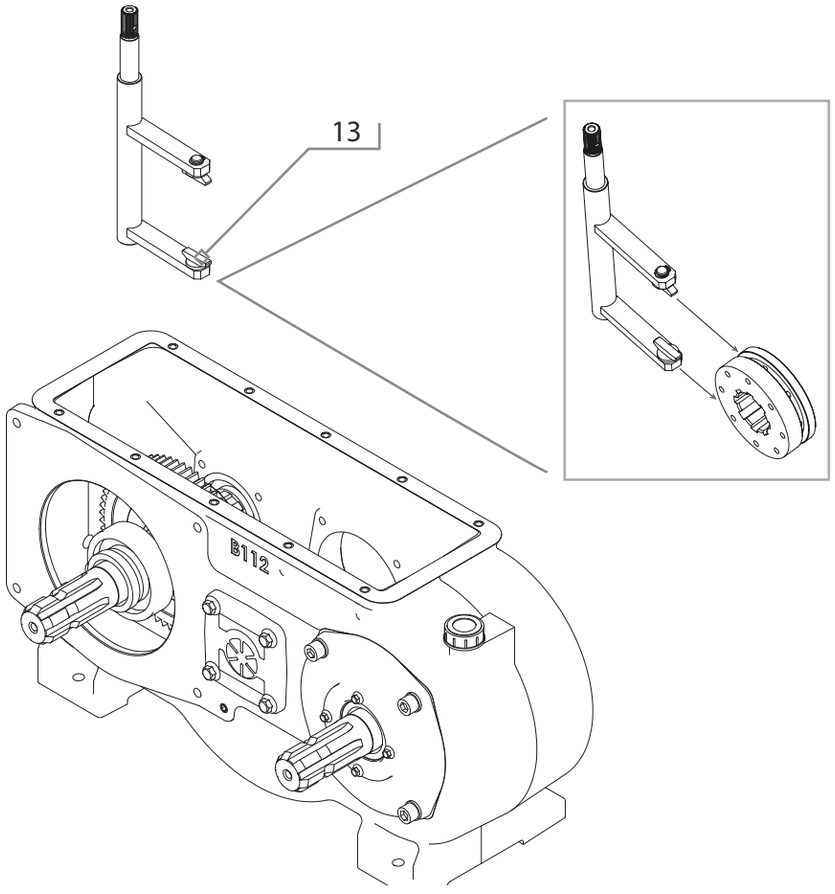
Insert the bearing 14 and the oil seal 24 onto the shaft 15.

Attach the Seeger 17 onto the relevant grooving of the shaft 19.



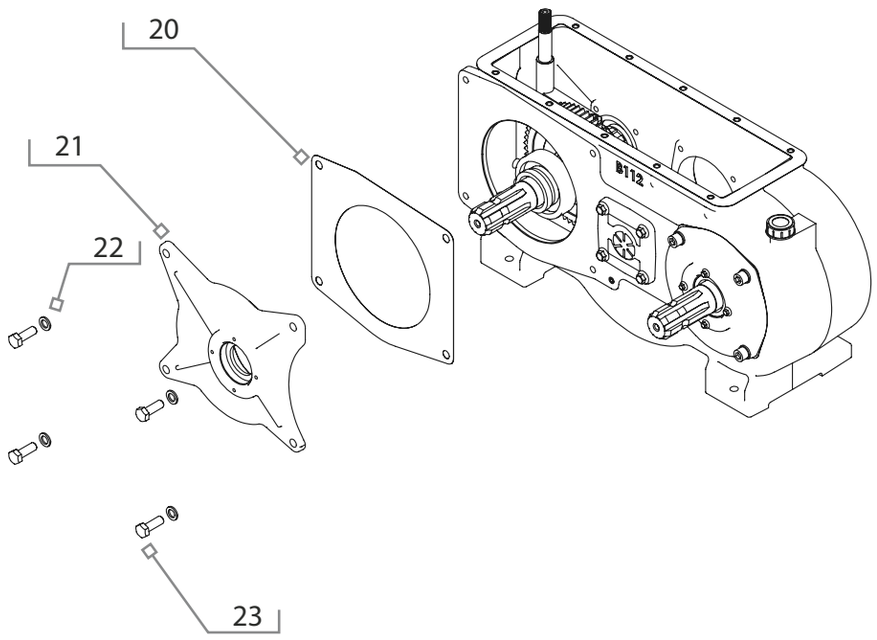


Insert the block inside the body, inserting it into the bearing inside the cover of output “B”.



Keeping the block in axis with the bearing, introduce the shaft of the lever 13 onto the sliding hub of the block just assembled, as shown in the figure.

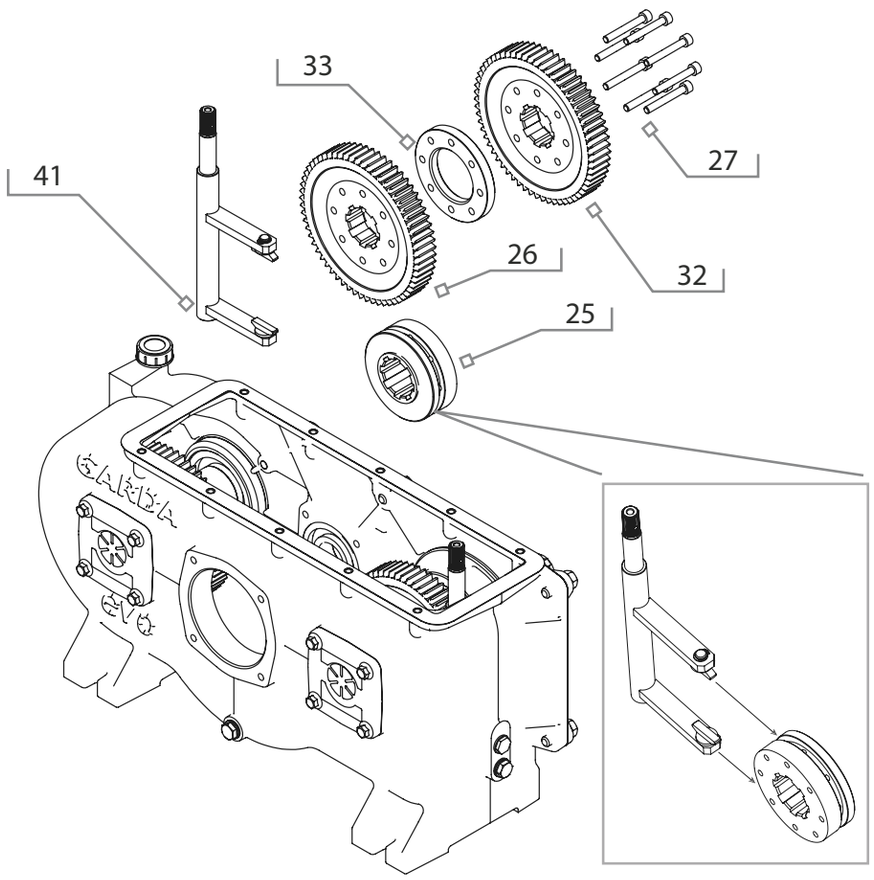
Secure the seal 20 and the cover 21 onto the body, using the 4 screws 23 and the 4 washers 22.

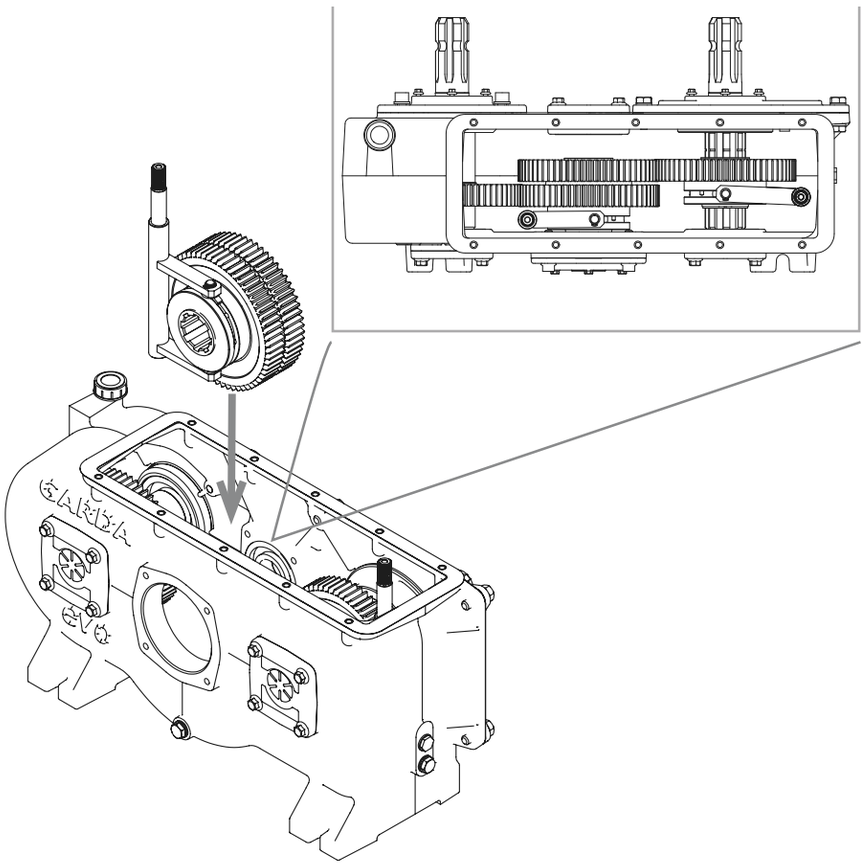


7.2 - ASSEMBLY INSTRUCTIONS COMMON TO EACH CONFIGURATION OF GARDA EVO

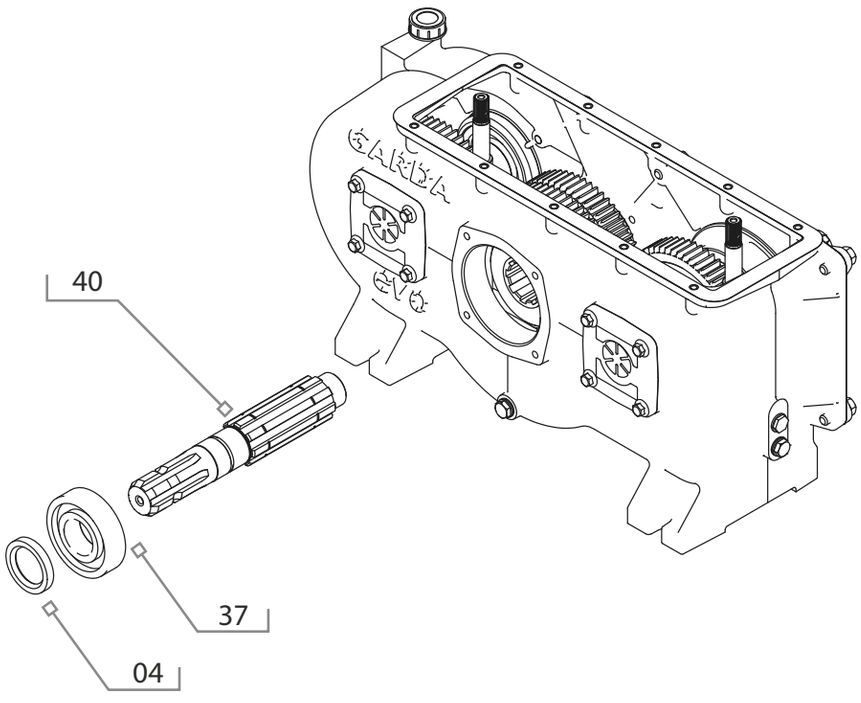
Assemble the toothed wheels 32 and 26 and the spacer 33, securing them with the 8 screws 27.

Introduce the shaft of the lever 41 inside the sliding hub 25, as shown in the figure.





Insert into the body the block just assembled, as shown in the figure.



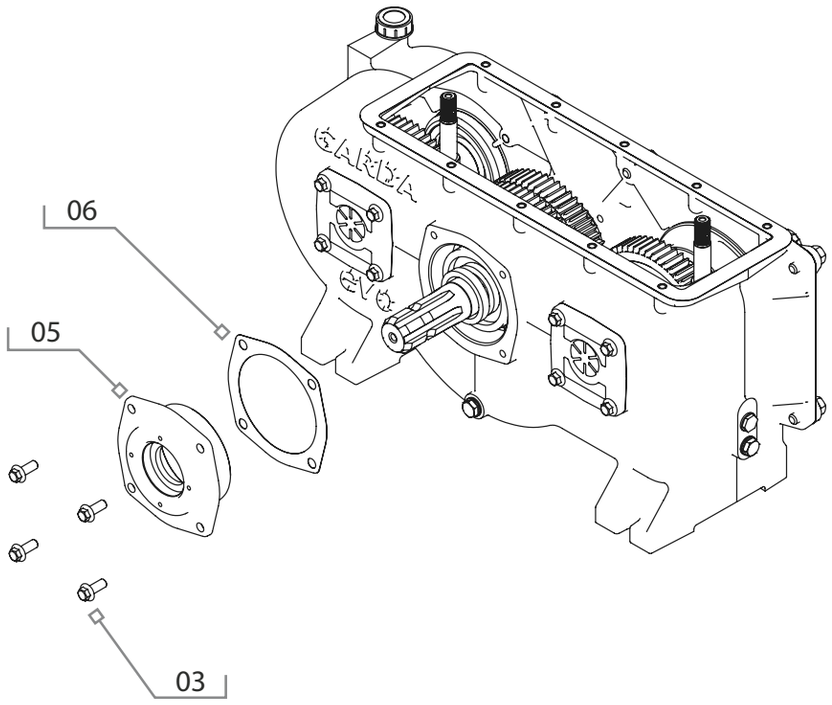
Insert the shaft 40 through the block until it is inserted inside the grease cover of the combined group.

Insert the bearing 37 onto the shaft 40.

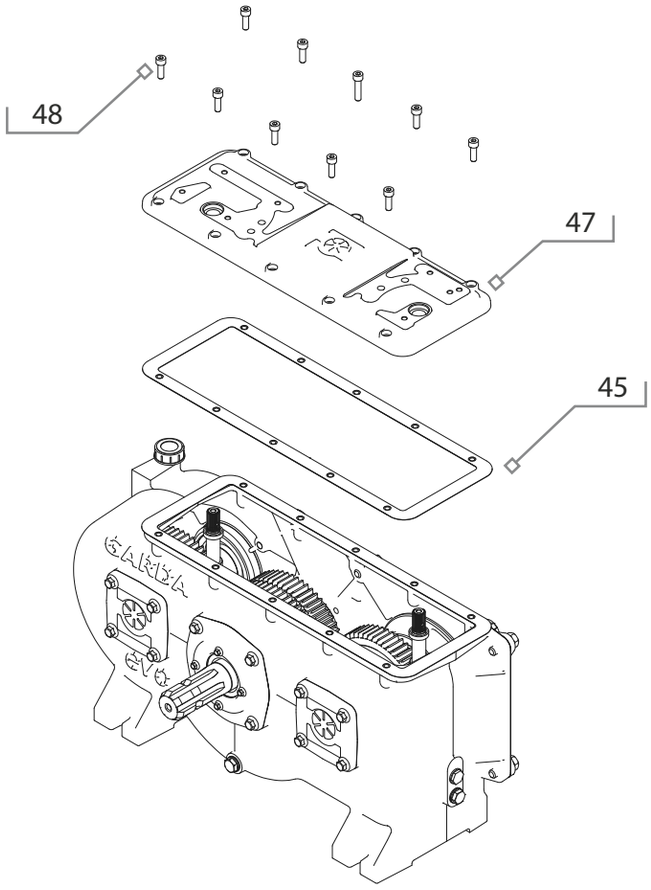
Insert the oil seal 04 onto the shaft 40.

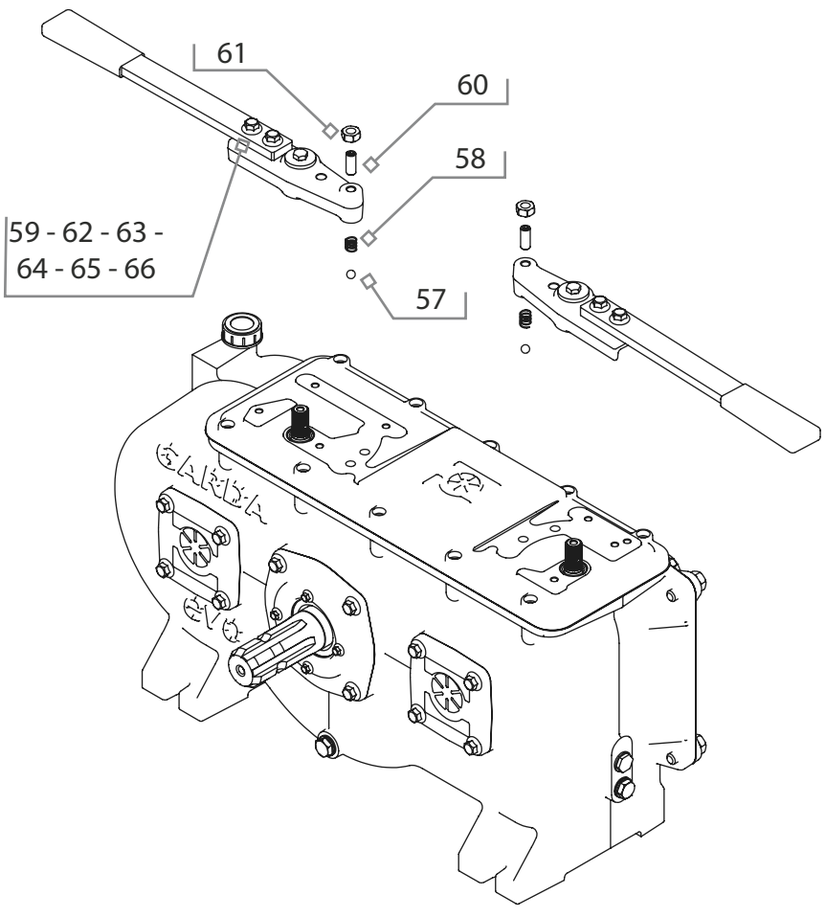
Insert the seal 06 onto the cover 05.

Secure the cover 05 onto the body using the 4 screws 03.



Secure the cover 47 and the seal 45 using the 10 screws 48.





Insert the dowels, the springs 58 and the balls 57 into the levers (consisting of 59 – 62 - 63 – 64 – 65 – 66) and then screw the nuts 61.

8 - MAINTENANCE, INSPECTIONS AND CHECKS, REPAIRS,

When carrying out maintenance operations, inspections, checks or repairs it is advisable to wear the individual protective devices listed in this manual. All maintenance operations, inspections, checks and repairs should be carried out with the greatest care and with the tractor not running and the power take-off disconnected according to the version of the GARDA EVO group. The operations must be performed by competent personnel. In the case of painting of the GARDA EVO group do not paint the identification plate, taps, oil sight glass and the vent plugs. Immediately replace safety devices that are fully or partially damaged.

8.1 - PERIODIC MAINTENANCE

MAINTENANCE TO BE PERFORMED	METHODOLOGY OF EXECUTION	FREQUENCY
Check the oil level in the Garda Evo gearbox.	Use the oil level plug	Once a month
Wash the gearbox	See paragraph 8.2 washing the gearbox	Once a year
Change the oil in the gearbox	Open the oil drain plug, close it and introduce new oil through the oil filling plug	Every 300 hours of actual work

8.2 - WASHING THE GEARBOX

At least once a year, wash the gearbox.

- Remove the oil from the gearbox;
- Remove the cover from the gearbox;
- Wash the gearbox using suitable solvents;
- Top up the lubricating oil;
- Return the cover of the gearbox.

9 - MALFUNCTION, FAULT, FAILURE, PROBLEM, CAUSE AND SOLUTION

DETECTED FAULT	CAUSE	SOLUTION
Irregular outflow of sewage from the supply pipe of the centrifugal pump	The sewage is too thick	Dilute the sewage
	Air infiltration	Eliminate infiltration
Irregular outflow of sewage from the supply pipe of the centrifugal pump	Irregular outflow of sewage from the supply pipe of the centrifugal pump	Position the handle
	The supply piping is blocked	Eliminate blockages
	The gate valve lever located above the centrifugal pump is closed.	Open the gate valve
The mechanical seal whistles	The mechanical seal is burned due to insufficient slurry.	Replace the mechanical seal
The supply pressure of the centrifugal pump does not reach the operating values	The impeller blades are worn or broken	Replace the impeller
	Rate of revs is too low	Increase rate of revs
	The PTO of the tractor does not have enough power to reach the maximum pressure	Increase power
	The diameter of the output hole of the nozzle of the swivel jet is too wide	Decrease the diameter of the output hole
The gearbox is cracked	A turn was made without removing the cardan shaft.	Disconnect the cardan shaft before performing any manoeuvre and replace the gearbox.
The rotary blades vacuum pump does not turn	Overly abrupt starting has broken the key connecting the rotor shaft with the pinion of the rotary blades vacuum pump.	Replace the key and where necessary the rotor and the pinion.

9.1 - PUTTING OUT OF SERVICE AND DEMOLITION OF THE GARDA EVO COMBINED GROUP

Before demolishing the combined group, the following materials must be separated:
- lubricating oil;
- rubber and plastic parts;
- cast iron and steel parts;

and disposed of correctly.
Do not dispose of the combined group into the environment.
For disposal of the lubricating oil make use of specialised treatment services.

10 - DECLARATION OF INCORPORATION OF PARTLY COMPLETED MACHINERY

Below is an example of the declaration of incorporation of the partly completed machinery which you will find attached to this manual:

DECLARATION OF INCORPORATION OF PARTLY COMPLETED MACHINE

The Manufacturer
BATTIONI PAGANI POMPE S.p.A.
Via Cav. E. Ferrari, 2
43058 Ramoscello di Sorbolo (PR) - Italy

The undersigned Federico Zanotti, as Managing Director of the company
BATTIONI PAGANI PUMPS S.p.A. declares that the partly partly completed machine of own construction:

- complies with the EC Directive 2006/42/EC and with the national transpositions of implementation;
- complies with the European Directives: 2000/14/EC - environmental noise emission of machines and equipment intended for outdoor use;
- complies with the following standards:
  UNI EN ISO 12100 - Risk assessment and risk reduction
  UNI EN ISO 3744 - Determination of sound power levels and sound energy levels of sources of noise using sound pressure measurement.
- The relevant technical documentation has been compiled in accordance with Annex VII B.

The person authorised to compile the relevant technical documentation is:: Federico Zanotti

- In response to a reasoned request by the national authorities, the company is committed to transmitting the relevant information on the partly completed machine in question. This includes the methods of transmission and does not affect the intellectual property rights of the manufacturer of the partly completed machinery.
- The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity, where applicable, with the provisions of Directive 2006/42/EC

Machine description and identification

General and Commercial Name: **GARDA EVO**

Function: filling of agricultural tank and slurry spreading

Model:

Type:

Serial number:

The main technical data is shown on the identification plate.

Ramoscello di Sorbolo, date

Battioni Pagani Pompe S.p.A.
Managing Director
Federico Zanotti

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Pagani

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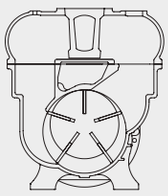
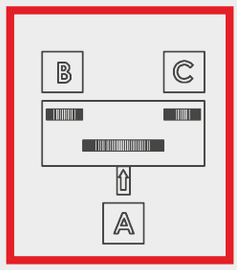
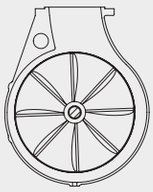


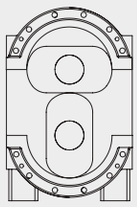
Rotary vanes
vacuum pump



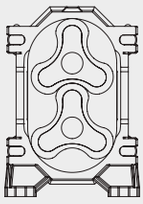
Combined
Groups



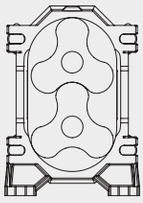
Centrifugal pump



Rotary postive displacement
lobes pump



Rotary postive displacement
lobes pump



Rotary lobes
vacuum pump

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