



**GAUSSMAGNETI**

MAGNETIC EQUIPMENT FOR MATERIAL HANDLING  
AND RECYCLING TECHNOLOGY

# Overbelt magnetic separator **SM-NS**



## MAINTENANCE MANUAL

**Manual Code:** S10-80-SM-NS-e-rev14.docx Rev.14, 06-09-2021

## 6 - MAINTENANCE


### 6.1 Safety Precautions


Safety precautions contained in this paragraph shall always be strictly observed during maintenance in order to avoid injury to personnel and the separator.

	The personnel involved in the separator maintenance must be well trained, have read this publication and have a thorough knowledge of safety regulations.	
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	Unauthorized personnel must remain outside of the working area during operations.	
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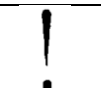

These precautions are repeated and further detailed in this chapter, every time that a procedure is required that risks damage or injury, through the notes of **WARNING** and **DANGER**:

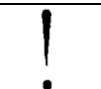

	<b>WARNING</b> notes prior to an operation that, if not correctly followed, could result in damage to the separator.
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	<b>DANGER</b> notes prior to an operation that, if not correctly followed, could result in injury to the operator.
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
#### 6.1.1 Cautions and warnings



	Attention to the following during the maintenance of the separator!
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	Before trying to operate the separator, after a failure, it must thoroughly check by qualified personnel and the procedure for commissioning must be repeated - test as described in section 4.5.	
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	Never work, unless specifically required for the elimination of failure, on adjustment and positioning of safety devices: their manipulations can cause serious damage to the separator.	
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#### 6.1.2 DANGER notes



	Attention to the following hazards during maintenance of the separator!
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	Always exclude all separator sources of energy, before performing maintenance. Affix the sign with the words: <b>MACHINE MAINTENANCE - DO NOT PLUG IN THE POWER</b>	
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	Never remove safety devices and protective devices installed on the separator. If this becomes necessary, report with appropriate warning signs and proceed with the utmost caution.	
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	Always make sure of the presence of ground connections and their relevance legislation. Not grounding of electrical equipment can cause serious injuries.	
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	Avoid the use of flammable or toxic solvents (petrol, ether, alcohol, etc.). Avoid prolonged contact with solvents and inhalation of their vapours. Avoid use near an open flame, ensure adequate ventilation.	
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	Always make sure, before starting the separator, the maintenance staff is at a safe distance and tools or materials have not been left on the machine or equipment.	
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	Always use protective gloves during maintenance operations.	
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	All moving parts and mechanical transmission must be protected against accidental contacts. Therefore, make sure that all guards are properly relocated before trying to operate the separator.	
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	<b>Never use water jets in case of fire; disconnect all power and use appropriate fire extinguishers.</b>	
	<b>Make sure the tools to be used are in perfect conditions and are fitted with insulating handles, where required.</b>	



## 6.2 Qualification of maintenance personnel

To be able to solve any problem in the field of maintenance of the separator the maintenance personnel must:

- \* Know the laws in force relating to the prevention of accidents during work carried out on machines with motor drive and be able to apply them;
- \* Have read and understood the chapter 3 "Safety and Security";
- \* Know how to use and refer to these documents;
- \* Be interested in the operation of the separator;
- \* Note irregularity of operation and if necessary, take appropriate action.

Upon customer request, the Gauss Magneti Srl may provide the necessary training.

**The professionals appointed and authorized to act in the separator are:**

	<b>Operator assigned to the use of the plant, which include the separator.</b>	
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- \* **Typical activities:**
  - \* Use of the separator in its normal state of operation (automatic operation) and repair work after the emergency intervention;
  - \* Taking the necessary measures to maintain quality of the service;
  - \* Cleaning and lubrication of the parts of the separator, with which he is normally in contact (buttons) and performing maintenance tasks simple realization (lubrication);
  - \* Collaboration with the staff responsible for maintenance and repair activities.
- \* **Technical skills required:**
  - \* Knowledge of the functions and the use of the separator;
  - \* Knowledge of the lubricant used in the separator and the hazards associated with their use.
- \* **Qualification required:**
  - \* Ability to work in relation to the specific operational and environmental characteristics.

	<b>Maintenance M</b>
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- \* **Typical activities:**
  - \* Cleanliness of the separator, with particular regard to the rollers, the gear motor and the bearings;
  - \* Verifying the integrity of the moving parts;
  - \* Verifying the integrity of the belt (with the possible removal of the material penetrated in the separator);
  - \* Proof of normal operation;
  - \* Control of the mechanical play and wear of the components (shafts, bearings, etc.);
  - \* Any repairs mechanical units damaged.
- \* **Technical skills required:**
  - \* Good knowledge of mechanical systems with moving motor;
  - \* Good knowledge of the safety devices employed in the separator (skid control, etc.);
  - \* Basic knowledge of the techniques of control and regulation of electric moderate difficulty (high pass adjustment, replacement fuses, motor connection, etc.);
  - \* Knowledge of the methods of measurement and testing to determine the actual status of the conditions of the separator (check bearing wear, checks abnormal noise, etc.);
  - \* Logical research of not complex damages and evaluation of results;
  - \* Ability to organize measures to restore the separator in its capacity / performance;
  - \* Ability to draw up a statement of maintenance.
- \* **Qualification required:**
  - \* Comprehensive training as an industrial mechanic with expertise and experience in maintenance of machines and material handling systems.

	<b>Maintenance Electrician</b>	
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- \* **Typical maintenance activities:**
  - \* Action on electrical equipment since the functional diagrams;
  - \* Audit of the movements and electric adjustment of safety devices;
  - \* Check the wear of the electrical components (contacts of the electrical equipment);
  - \* Any repair damaged electrical components and accessories.
- \* **Technical skills required:**
  - \* Good knowledge of plants and electrical installations;
  - \* Good knowledge of the electrical components and the safety devices employed in the separator (skid control, etc.);
  - \* Knowledge of the techniques of control and regulation of electrical medium (replaced in accordance with the original design of motors, switches, buttons, controllers, cables, etc.);
  - \* Fundamental knowledge of control techniques and mechanical adjustment of moderate difficulty (verification wear, adjustment mechanical stops, etc.);
  - \* Knowledge of the methods of measurement and testing to determine the actual status of the conditions of the separator (verification efficiency and reliability of electrical equipment);
  - \* Knowledge of the methods of fault finding and electrical failures and experience on electrical systems of command and control of industrial machinery;
  - \* Ability to organize measures to restore the separator in its capacity / performance;
  - \* Ability to draw up a statement of maintenance.
- \* **Qualification required:**
  - \* Comprehensive training as electric industrial specialization and experience in maintenance of machines an industrial system.




	<b>Maintenance Electromechanical:</b> He is an operator whose professional profile includes and synthesizes the skills and technical skills required in mechanical maintenance, in addition to those typical of electrical maintenance.	
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	<b>Mechanical technician</b>	
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- \* **Typical technical activities:**
  - \* Mechanical adjustment of safety devices, calibration and testing (load testing);
  - \* Routine maintenance and repairs, excluded the repair of mechanical parts, complex and / or critical for safety, not listed and not explained hereunder;
  - \* Repairs of structural parts with overlay welding, machining on the machine, etc.
- \* **Technical skills required:**
  - \* Excellent knowledge of mechanical systems used in industrial machinery;
  - \* Specific knowledge, obtained by way of formation, the characteristics of the separator and of the safety devices employed in the same;
  - \* Basic knowledge of techniques for controlling and regulating power;
  - \* Specific expertise about the methods of measurement and testing to determine the actual status of the conditions of the separator;
  - \* Specific expertise about the research methods of logic faults and evaluation of results;
  - \* Ability to direct measures to bring the separator in function and performance;
  - \* Ability to draw up a statement of maintenance.
- \* **Qualification required:**
  - \* Comprehensive training as a mechanical engineer.

	<b>Electrical / electronic Technician</b>	
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- \* **Typical maintenance activities:**
  - \* Electrical adjustment of safety devices, calibration and testing (load testing);
  - \* Normal maintenance operations prior replacement of complex electrical parts and / or critical parts for the purposes of security (motors, etc.);
  - \* Repair of electrical groups prior operations of extraordinary maintenance (repair of electric motors with partial substitutions, replacement skid control with adaptations, etc.).
- \* **Technical skills required:**
  - \* Excellent knowledge of plants and electrical installations of industrial machinery;
  - \* Specific knowledge obtained through training, the characteristics of the separator and safety devices used in the same;
  - \* Experience in the techniques of control, electric adjustments and programmable logic / PLC (ability to intervene in the original scheme for improvements or updates of control panels, software etc.).
  - \* Knowledge of techniques for controlling and adjusting mechanical (wear occurs, verification performance mechanical components, adjustable mechanical stops, verification noise, etc.);
  - \* Specific expertise about the methods of measurement and testing to determine the actual status of the conditions of the separator (verification efficiency and reliability of electrical and electronic equipment);
  - \* Specific expertise about research methods logic of all failures and evaluation of results on electrical and electronic equipment for command and control;
  - \* Ability to direct measures to bring the separator in function and performance;
  - \* Ability to draw up a statement of maintenance.
- \* **Qualification required:**
  - \* Comprehensive training as industrial electrical technician.



	<b>Electromechanical / mechatronics Technician:</b> <b>He is a highly skilled operator whose professional profile includes and summarizes the skills and knowledge required of the mechanical engineer, in addition to those typical of technical electrical / electronic.</b>	 
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### 6.3 Recommendations for maintenance

It is well to remember that maintenance carried out properly can minimize downtime after a failure. A repair done in a timely manner prevents further deterioration. Use original spare parts or those with the same characteristics.






To put in a state of maintenance, always observe the following guidelines:

- \* The staff responsible for performing ordinary and extraordinary maintenance must have read and understood all the instructions contained in this chapter and in Chapter 3.
- \* The actions of ordinary and extraordinary maintenance must only be carried out by authorized and qualified personnel.

 	<b>Maintenance work must be carried out with the unit off (turn off the main switch) and safely, using appropriate equipment and appropriate personal protective equipment, as required by the regulations, and putting in the vicinity of the separator and of the control panel a signal with the warning: "MACHINE MAINTENANCE".</b> <b>For problems that may arise or to order spare parts, refer to the manufacturer / installer.</b>
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### 6.4 Plan of routine and periodic maintenance

The maintenance plan includes ordinary interventions, which include inspections, audits and verifications performed by the operator expert in the use of the separator and / or qualified service personnel for normal corporate servicing and for periodic servicing, including replacement operations, registration and lubrication carried out by expert personnel for the purpose through specific training courses or publications.







	<ul style="list-style-type: none"> <li>* <b>When maintenance operations are carried out at a dangerous height, relative to the ground, the personnel must have suitable means (scaffolding, platform, stairs, etc.) Making it possible to carry out the activity in conditions of safety.</b></li> <li>* <b>Staff should also be equipped with appropriate personal protective equipment (DPI) required by the laws in force.</b></li> </ul>	   
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#### 6.4.1 Routine Maintenance


Includes maintenance operations that can be performed by the operator, expert in the use of the separator, or by qualified personnel, as prescribed in this publication and/or in the accompanying documentation and does not require the use of special tools and equipment.

The routine maintenance operations are divided into:

	<b>Daily interventions by the operator expert in the use of the separator:</b> <ul style="list-style-type: none"> <li>* general visual inspections;</li> <li>* functional tests (test engines, test buttons "start / stop" and other functions of the panel); verify belt centring.</li> <li>* verify the absence of ferromagnetic intrusions between the belt and magnetic plate (at the end of workday, remove the protective casing to see them); to remove any intrusion from belt, if present, use non ferromagnetic tools, which otherwise would be attracted by the plate</li> </ul>	
	<b>Weekly interventions by qualified personnel:</b> <ul style="list-style-type: none"> <li>* visual inspection of each mechanism and search for possible loss of lubricant;</li> <li>* visual inspection wear/damage to the belt;</li> <li>* check that there is no noise and/or vibrations;</li> <li>* if any, control the correct operation of skid control sensors (with separator stopped, manually activate the devices, controlling the ignition of the relevant alarm on panel);</li> <li>* control functionality and integrity of buttons and control devices.</li> </ul>	
	<b>Monthly interventions by qualified personnel:</b> <ul style="list-style-type: none"> <li>* verification efficiency and wear of: bearings, chains and suspension hooks;</li> <li>* verification of lubrication;</li> <li>* visual verification inside the electric cabinet to ascertain the possible presence of dust and to remove it if any;</li> <li>* verification and cleaning of the electrical connectors;</li> <li>* verification of efficiency and integrity of the supply line.</li> </ul>	







#### 6.4.2 Periodic Maintenance

Includes maintenance performed by personnel trained by means of this publication, with respect to controls, recordings and any replacements, in relation to the deadlines in the maintenance schedule as shown in Table 1 "Periodic intervention of maintenance and lubrication" (par.6.4.4).

	All operations of periodic review, control, repair, replace of structural parts, electromechanical and electronic components, <u>must</u> be performed by qualified and trained for the purpose and recommended that they be recorded in the register control.
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#### 6.4.3 Testing the efficiency of the parts and components of the separator


For the individual parts of the separator observe the following guidelines:

	<b>Check the efficiency of structural elements:</b>	
<p>The metallic structures, in addition to the normal deterioration due to environmental factors, may be subject, even inadvertently or during the operating phases of movement, shocks, or sliding contacts with other equipment or also to abnormal stress which can cause damage to the frames of carpentry, the welds and to the pins. Therefore, the structures, after cleaning, should be subject to regular and thorough checks to assess their suitability and, if necessary, remedy any damage.</p>		
	<b>Repair facilities and hinged elements, or replace them, if they occur:</b> <ul style="list-style-type: none"> <li>• <b>deformation:</b> stretching, crushing, dents, bends;</li> <li>• <b>wear:</b> worn parts, section reductions, cuts, abrasions, corrosion, oxidation, scratches, peeling paint;</li> <li>• <b>broken:</b> cracks welds, cracks, cuts or incisions, broken parts;</li> <li>• <b>changes in the section, or in diameter or thickness.</b></li> </ul>	
	<b>Verification of the BELT PULLER:</b>	

The extractor belt must be checked periodically to assess its state of wear and promptly carry out repairs. If a ferromagnetic part slips into the space between belt puller and the active face of the magnet, you can have very rapid wear of the belt.

Periodically, therefore, verify and ensure the cleanliness of the active face of the magnet, protecting your hands with protective gloves and, if necessary, using only non-magnetic tools (wood, brass, copper, aluminium, stainless steel AISI 304 or 316).



The check should be carried out every week.



	<b>Verification of the GEAR MOTOR:</b>	
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Check the level and condition of oil of gear motor, for which it is still appropriate to use the additional information provided by its manufacturer (in the case of gear motor lubricated for life, it is not necessary to lubricate).

Check that the noise of the gear does not vary in intensity.



Excessive noise or vibration results in excessive wear of the teeth or the failure of a bearing.



	<b>In the event of a fault:</b> * It is forbidden to intervene on gearboxes with corrective maintenance. * Any extraordinary maintenance operation on the gear must be carried out by customer service GAUSS MAGNETI Srl or persons authorized by GAUSS MAGNETI Srl.	
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	<b>Check the efficiency of engine and power-up:</b>	
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Clean the engine eliminating the dust that settles on the casing.

Periodically check the good condition of the cables and their correct connection to the terminal; **check to be carried out every 6 months.**

	<b>In the event of a fault:</b> * it is forbidden to intervene on the engines with corrective maintenance, contact Gauss Magneti Srl for replacement (if under warranty) or the motor manufacturer.	
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	<b>Check the tightness of bolted joints:</b>	
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- After disassembly, tighten the bolted joints without exceeding the torque provided below for bolt specific category.



	<b>Verification of bearings and supports:</b>	
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\* Check that the bearing noise does not vary in intensity;



\* Check that the bearing temperature does not exceed 90°C;



\* Any loss of oil or grease, indicates damages to the bearing seals.

	<b>Replace bearings:</b> * When present: abnormal noise, uneven running, excessive play; * When hot; * When you have completed the Nr. of operating hours under the life cycle (see the attachment, if any technical faults and remedies of bearings).	
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	<b>Check painted parts:</b>	
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- Check that the painted parts do not show peeling or deterioration of surfaces.

	<b>Remove, by brushing, any rusty spots and repaint with an equivalent product.</b>	
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	<b>Check the electrical system:</b>	
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- Where provided, check the integrity and performance of devices and electrical accessories.

	<ul style="list-style-type: none"> <li>Do not hesitate to replace the electrical components, if the latter are no longer able to offer sufficient guarantees of functional reliability.</li> <li>Never carry out improvised repairs.</li> <li>Use compatible spare parts.</li> </ul>	
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	<b>For the maintenance of specific components, available on market, see the technical documentation of the respective manufacturers (e.g., on website).</b>	
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#### 6.4.4 Periodicity and schedule of maintenance

The frequency of maintenance operations which are indicated in Table 1 refer to a machine subject to a service working under normal conditions of 1 (a) daily work shift of **8 (eight) hours**.

If there are different working conditions, the frequency of maintenance should be increased in relation to the actual use. If the use of the separator is normal and correct, its revision may occur after a period of use of **20,000 hours of service at full load**, corresponding to about 10 years.



**Table 1 - PERIODIC MAINTENANCE**

O = operator assigned by the use of the separator M = by specialized maintenance

Checks and controls to be performed	Daily	Weekly	Monthly (*)	Half-yearly (*)	Change
Visual check	O				
General Testing	O			M	
Control of corrosion absence		O	M		
Check tightness of bolts and screws			M		
Cleaning and removing of ferromagnetic pieces	O				
Plate's readability		O	M		If illegible
Rollers (motor and driven)		O		M	
Belt check		O	M		If worn or damaged
Chains		O	M		If worn or damaged
Gear motor		O	M		
Supports and bearings			M		
Electrical control panel				M	
Structure				M	
Sealing rings check			M		
Cleaning and lubrication		M			
Oil level and topping up (if applicable) of the gearmotor			M		

NOTE: (\*) The maintenance operations, where required, shall be recorded in the control register (Chapter 7).

#### 6.4.5 Cleaning the separator



	<b>Cleaning can be carried out by qualified personnel and is periodically required to release the structure, mechanisms, control devices and control accumulation of dust or dirt and / or sludge caused by excessive lubricant.</b>	
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\* Cleaning can be done simply with the use of tools, equipment and detergents commonly used in general cleaning of industrial equipment (avoiding the use of acids, solvents, or strong detergents to base such as caustic soda).

\* Clean removing any foreign substances and staining with vacuum cleaners, dish towels, etc.

\* Remove the grease and / or excess oil on the parts.


#### 6.4.6 Lubrication

	<b>The careful management of the lubrication of the separator mechanisms is the necessary condition to ensure effective compliance with the service to which it is addressed, as well as its duration.</b>	
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Lubrication of moving parts is necessary to reduce wear. The most favourable conditions are obtained by using the least quantity of lubricant to obtain an effective lubrication.

Over time, the lubricant is consumed, so lubricants must be restored or renewed.

The lubrication of the separator is relatively simple but must be carried out by specialized personnel, scrupulously following the instructions contained in this manual and carrying out the necessary checks and top-ups, following the frequencies indicated in the following points.

	<ul style="list-style-type: none"> <li>* <b>Lubricants, solvents and detergents are toxic / harmful to health:</b> <ul style="list-style-type: none"> <li>* If in direct contact with the skin may cause irritation;</li> <li>* If inhaled can cause severe poisoning;</li> <li>* If ingested can result in death.</li> </ul> </li> <li>* <b>Handle them with care using appropriate personal protective equipment (PPE).</b></li> <li>* <b>Do not pollute the environment, dispose of them in accordance with the laws in force in local waste toxic / harmful.</b></li> </ul>
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## LUBRICATION OF GEARMOTORS

Generally, gear motors are permanently lubricated and do not require the replacement of lubricants; in the case of non-lubricated for life gear motors, an oil change should be done every two years for use over 8 hours working day, using the appropriate types of lubricants and in compliance with the following recommendations:

- \* Dry excess oil with a clean cloth;
- \* The draining and filling plugs should not remain open any longer than necessary.

It is advisable to check the level of the oil through the spy-hole, as proper lubrication depends on the good performance and life of the motor.



**CAUTION!!!** Lubricate the gear motors only with the machine stopped and the panel switched off.

## LUBRICATION OF BEARINGS AND SUPPORTS

The bearings of the supports are filled at source the correct amount of grease and are ready for immediate use. In normal working conditions, the original charge of grease is sufficient for a long period of operation. In the bearings of the UC, UK and HC series there is the possibility of periodic lubrication through the special greaser (see Fig. 8 and 9), depending on the operating conditions (see table No. 2). For lubrication, use a lithium soap grease for rolling bearings, in compliance with consistency class 2 of DIN 51818 (see table No. 3).

**Table 2**

Work environment	Bearing temperature [°C]	Lubrication Intervals
CLEAN	<50	12÷24 months
	<70	3÷8 months
	<100	20÷90 dd
	>100	7÷15 dd
DUSTY	<70	7÷30 dd
	>70	1÷15 dd
VERY HUMID	<100	1÷15 dd

For proper lubrication:

- never lubricate during the first assembly;
- introduce grease very slowly, with constant pressure (the quantity must not exceed 3-4cm<sup>3</sup> at a time) possibly during operation;
- abundant greasing is harmful; preferably grease frequently and in small quantities;
- **never lubricate with oil**, but only with grease (do not mix different types of lubricants, grease with oil).

**Table 3**

Recommended lubricants	
Brand	Type
Esso	Beacon 2
Aral	HL2
Mobil	Mobilix 2
Shell	Alvania R2
BP	Energrease LS2

The supports are designed for operation from -15 ° C to +80 ° C.

All the supports have the greasing valves clearly visible.

Internal bearings have grease valves located on the heads of the magnetic rotor shaft.

NOTE: The measures suggested in this section assume the fact that they are taken respecting the safety rules for personnel and procedures set forth in other sections of this guide.

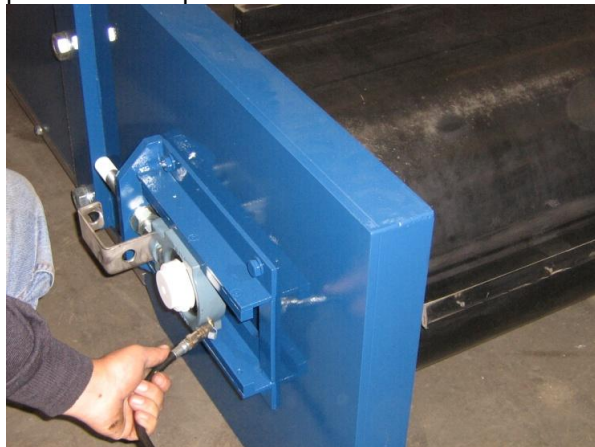


Figure 8 - Grease pair of rear bearings



Figure 9 - Grease pair of front bearings

## 6.5 Recordings and adjustments

The separator must be positioned at a distance from the conveyor belt, as contractually specified.

Its extraction power is conditional on this distance, because the variation of the magnetic field is a function of its distance from the magnetic plate: therefore, this must be as close as possible to the material to be treated.

The adjustment of this distance is adjusted by turning the tie rods to support the seal.

## 6.6 Replacement of parts and components

### 6.6.1 Changing the belt

It is recommended to use a closed belt with non-magnetic metal joints, which allows the rapid replacement of the belt, without requiring disassembly of the separator.

Alternatively, you can replace the belt with a closed-loop one, or request the intervention of a company specialized in repair work, which can provide a new belt and seal it directly onto the separator, with vulcanized joints.

	<b>To work with the maximum safety of operators, the separator should be placed on the ground. IT IS HIGHLY RECOMMENDED NOT TO CARRY OUT THE REPLACEMENT OF THE BELT AT THE HEIGHT OF THE INSTALLATION.</b>	
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Action to be taken for **BELT JUNCTIONS (or in the case of on-site repair)**:

- 1 - Remove the power supply to the control panel, make sure that the magnetic separator cannot be accidentally started and disconnect the electric supply to the gear motor;
- 2 - Set the separator to the ground and place it on two wooden support joists (thicker than the strips of the belt), arranged parallel to each other and at a distance such as to have a stable support of the separator, so that its weight is supported by the magnetic plate itself;
- 3 - Loosen the belt, acting on the belt tensioner supports, as far as is possible, so that the damaged belt is no longer under tension (Fig.10);



Figure 10 – Adjustment of the belt tensioners.

- 4 - Cut the worn belt;
- 5 - Lift the separator to a sufficient height, enough to pull out the damaged belt and the installation of the new one;
- 6 - Remove the belt;
- 7 - Clean the separator, removing all intrusions present;
- 8 - Place the new belt lying on the strips;
- 9 - Place the separator onto the new belt;
- 10 - Wrap the new belt and connect the 2 parts of the joint through the appropriate hinge (in the case of vulcanization, carry out the vulcanization in position);
- 11 - Tension the belt using the special tensioners;
- 12 - Reinstall the separator on site (the final centring must be performed as described at par.6.6.3).

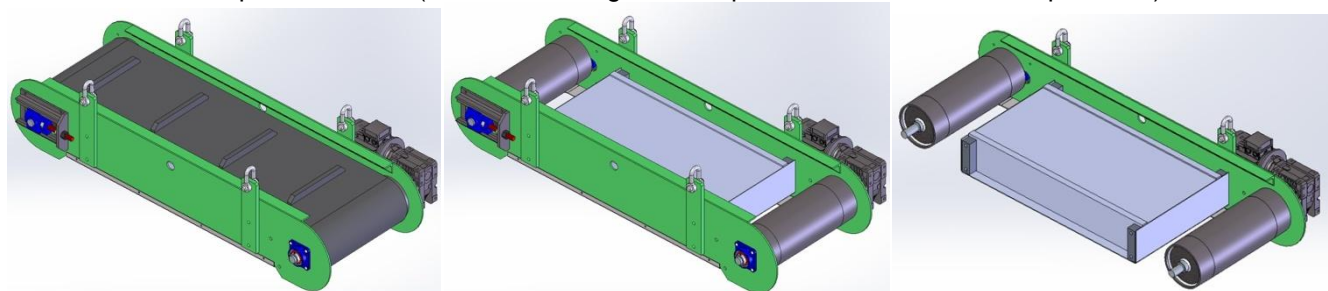


Figure 11 - SM Separator with and without belt and without shoulder.

Action to be taken to **CLOSED BELT LOOP**:

- 1- Remove the power supply to the control panel (not supplied), make sure that the magnetic separator cannot be started accidentally and disconnect from the electric motor;

- 2- Place the separator on the ground and place it on two wooden joists support (thicker than the strips of the belt), arranged parallel to each other and at a distance such as to have a stable support of the separator, so that its weight is supported by the magnetic plate itself;
- 3- Loosen the belt, acting on the belt tensioner supports, as far as is possible, so that the damaged belt is no longer under tension (Fig.10);
- 4- Remove any protective cover on the opposite side to the gear motor and that lower, on motor side (fig. 11);
- 5- Cut the worn belt;
- 6- With the forklift lift the separator (putting the forks from the side of the gear motor, just under the magnetic plate) to a sufficient height, enough to pull out the damaged belt and the installation of the new one;
- 7- Remove the belt;
- 8- Clean the separator, removing all intrusions present;
- 9- Place the magnetic plate on two wooden joists support (thicker than the strips of the belt), arranged parallel to each other and at a distance such as to have a stable support of the separator, and on other two horizontal wooden joists, of the same thickness of the first 2 and perpendicular to them, in support of these and positioned under the rollers;
- 10- Interpose between 2 rollers and the magnetic plate other wooden spacer blocks, in the vicinity of the side to be removed (the opposite side to the gear motor); these spacers must have a thickness as much as possible equal to the distance between the rollers and the plate, for avoid the approach of the rollers to the plate due to magnetic effect;
- 11- Disconnect the shoulder opposite to the gear motor (by unscrewing the 4 bolts securing the shoulder to the magnetic plate) and loosen the bearings (or unscrewing the ring nut loosening the grub screws shaft);
- 12- Remove the side, pulling it out from the shafts and away from the zone of influence of the magnetic plate;
- 13- Use 2 steel tubes with an internal diameter equal to the shaft diameter and length of at least 0.4 m higher than the width of the belt, with a thickness suitable for load lifting of the rollers, and couple them to the shafts;
- 14- Insert the new belt closed in these two tubes;
- 15- Raise the separator of a few cm, enough to let the belt pass;
- 16- Raise the 2 rollers through the steel pipes of a few cm, sufficient for the passage of the belt;
- 17- Remove all wooden beams support and spacers;
- 18- Slide in the new belt and centre it with respect to the rollers;
- 19- Replace the vertical spacing between the rollers and plate, as well as the horizontal rafters, as in step 8;
- 20- Place the separator on the joists, remove the lifting tubes and pull the forks of the forklift;
- 21- Replace the previously removed shoulder;
- 22- Tighten the bearings and tighten the bolts;
- 23- Tension the belt using the special tensioners;
- 24- Replace the covers removed earlier.
- 25- Reinstall the separator on site (the final centring of the belt should be carried out according to point 6.6.3)

### 6.6.2 Replacement of rollers

Action to be taken:

- 1 - **Do not approach the magnetic plate with ferromagnetic tools;**
- 2- Remove the power supply to the control panel, make sure that the magnetic separator cannot start accidentally and disconnect from the electric motor;
- 3- Place the separator on the ground and place it on two wooden joists support (thicker than strips of belt), arranged parallel to each other and at a distance such as to have a stable support of the separator, so that its weight is supported by the magnetic plate itself;
- 4- Loosen the belt, acting on the belt tensioner supports, as far as is possible, so that the belt is no longer under tension (Fig.10);
- 5- Remove any protective cover on the opposite side to the gear motor and that lower, on motor side (fig. 11);
- 6- With the forklift lift the separator (putting the forks from the side of the gear motor, just under the magnetic plate) to a sufficient height, enough to pull out the belt;
- 7- Remove the belt;
- 8- Clean the separator, removing all intrusions present;
- 9- Place the magnetic plate on two wooden joists supports and on other horizontal 2 wooden joists, of the same thickness of the first 2 and perpendicular to them, in support of these and positioned under the rollers;
- 10- Interpose between 2 rollers and the magnetic plate some wooden spacer blocks, in the vicinity of the side to be removed (the opposite side to the gear motor); these spacers must have a thickness as much as possible equal to the distance between the rollers and the plate, for avoiding the approach of the rollers to the plate for magnetic effect;
- 11- Disconnect the side opposite to the motor by unscrewing the 4 bolts securing the shoulder to the magnetic plate, loosen the bearings (or unscrewing the ring nut loosening the grub screws shaft);



- 12- Remove the side, pulling it out from the shafts and away from the zone of influence of the magnetic plate;
- 13- Loosen the lock nut of the roller to be replaced also by the side of the shoulder still mounted and in the case of the drive roller, also disassemble the gear motor, then remove the roller to replace;
- 14- Check the integrity of the shaft still mounted, of the motor and of the supports (both ends);
- 15- Fit the new roller, centring on the separator, keeping the same distance from the side of the other roller;
- 16- Use 2 steel tubes with an internal diameter equal to the shaft diameter and length of at least 0.4 m higher than the width of the belt, with a thickness suitable for load lifting of the rollers, and couple them to the shafts;
- 17- Insert the belt in these two tubes.
- 18- Raise the separator of a few cm, enough to let the belt pass;
- 19- Raise the 2 rollers through the steel pipes of a few cm, sufficient for the passage of the belt;
- 20- Remove all wooden beams support and spacers;
- 21- Slide the belt on the separator to centre it with respect to the rollers;
- 22- Replace the vertical spacing between the rollers and plate, as well as the horizontal rafters, as in step 8;
- 23- Place the separator on the joists, remove the lifting tubes and pull out the forks of the forklift;
- 24- Put the shoulder previously removed and tighten the 4 bolts fixing the shoulder to the magnetic plate;
- 25- Tighten the bearings;
- 26- Tension the belt using the special tensioners;
- 27- Replace the covers removed earlier.
- 28- Reinstall the separator on site, using the lifting point provided (the final centring must be performed as described at par.6.6.3).

### 6.6.3 Adjusting the tension and centring of the belt

- A. With the machine off, pull the belt through the sliding support on the side towards which the belt approaches, or if the belt is already sufficiently tight, loosen the same by means of the sliding support on the opposite side;
- B. reboot the machine and determine whether the belt is centered; if it is not, repeat the process described in paragraph A; small adjustments may be necessary to realign the belt as desired.

### 6.6.4 Replacing the gear motor

If for any reason the gearbox had been removed or replaced, care must be given to its installation: in order to avoid any possible vibrations, search for the best alignment condition of the gearbox, the correct installation of the cap level, venting and oil drain, in order to obtain a perfect operating position.

### 6.6.5 Replacement of bearings

Mode of action:

- 1 - Place the machine on the ground and loosen the belt as much as possible, by acting on the tensioners supports;
- 2 - Place some woods under the roller, to which you want to replace the supports, near the end of the roller, so that the roller is supported on the wooden thickness.

#### In case you need to replace bearings of the driven roller:

3A-disassemble the ring of the bearings, loosening the 2 fixing grains (Fig. 12);

4A-disassemble the sled with the threaded rod of the conveyor belt tensioner, by unscrewing the 4 bolts of the slide (fig. 13);

5A-removing the support from the shaft.

Fig. 12 – Removing the bearings ring of the driven roller



Fig.13- Removing the slide and support



#### In case you need to replace bearings of the drive roller:

3B- for changing the motor side support, unscrew the screw on the gear motor and the fixing nut of the torque arm and remove the gear motor (Fig. 14);

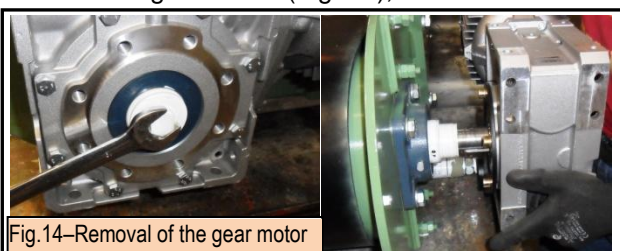


Fig.14-Removal of the gear motor

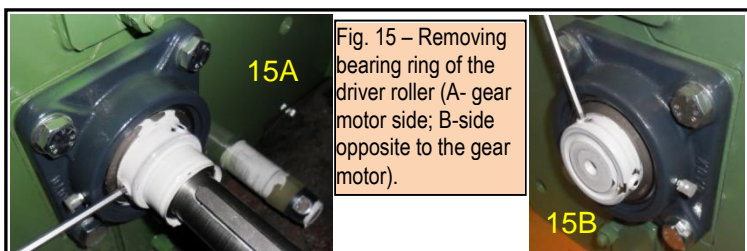


Fig. 15 – Removing bearing ring of the driver roller (A- gear motor side; B-side opposite to the gear motor).

4B-disassemble the ring of the bearing, loosening the 2 set grains (Fig. 15 A-B);

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- 5B-unscrew the 4 bolts holding the support to the side (Fig. 16 A-B);  
6B-remove the damaged support from the shaft.

Fig. 16 – Removing support of the driver roller (A- gear motor side; B-side opposite to the gear motor).



- 7- assemble the new support, verifying that the bearing is mounted in the correct position, that is with the extended part of the inner ring projecting from the side greaser;  
8 - proceed to the reassemble, in reverse order.

## 6.7 Parts and wear materials

<b>!</b>	<b>The Overbelt magnetic separators made by GAUSS MAGNETI LTD are designed and constructed so as to have a long life, if used properly with proper maintenance as described in this manual. The belt is considered a wearing part, the duration of which depends on factors related to the specific conditions of use. Parts or components subject to normal wear or deterioration due to the use can be obtained from the manufacturer for a minimum period of 10 years and are specified in the following list.</b>
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Where necessary, replace worn or damaged parts, it is recommended to use original spare parts to be ordered directly from:

	<b>GAUSS MAGNETI SRL</b> Via Scaroni, 1 – 25131 BRESCIA Tel. 030-2680641 Fax. 030-3580517 - e-mail: <a href="mailto:info@gaussmagneti.it">info@gaussmagneti.it</a>
	* <b>Do not hesitate to replace the part and / or component in question, if the latter is unable to offer sufficient guarantees of safety and / or functional reliability</b> * <b>Never carry out improvised repairs!</b>
<b>!</b>	<b>The use of non-original parts, as well as voiding the warranty, may affect the proper functioning of the separator.</b>

### LIST OF RECOMMENDED SPARE PARTS:

- Nr. 1 conveyor junction belt (for the early restoration of the machine);
- Nr. 1 set of supports and bearings;
- Nr. 1 gear box.