RAIL GRINDING MACHINE

MPR 4000 M - MPR 4000 P - MPR 4000 D - MPR 4000 E

COMPANY WITH CERTIFIED QUALITY CONTROL SYSTEM





Dear Customer,

we would like to take this opportunity to thank you for choosing an FCS srl product. We are pleased to supply you this manual to allow you to obtain optimal use of our product.

We invite you to read carefully the recommendations that follow and provide this manual to the personnel that will deal with the operation and the maintenance of the machine.

FCS srl. Is at your beck and call for all the clarification you will need, both in the initial stage and during the use of the machine.
In case of extraordinary and ordinary repairs, FCS srl provides its personnel to give you all the services and spare parts you will need.

This document contains all the necessary information to start using the machine, according to safety guidelines and for maintenance of the machine.

We suggest to respect the instruction written here, and to store it in an accessible place for future reference.

We suggest to contact FCS srl in case of spare parts, advice in choosing particular equipment and for all future eventualities.
We suggest the machine's owner to fill the lines below as they are essential data to request services and spare parts.

Machine's model: .....

Machine's serial number: .....

Engine serial number: .....

Year of construction: .....

Date of purchase:.....

Manual Code: M-MPR4000-05/17

Revision no: 001

Document date:..... 28-09-2020

Author last revision: ..... C. Bido

Traduction by: ..... C. Bido

Original drafting of the manual in Italian

Index

1 PREFACE

1.1 MANUAL'S AIM

This manual is an integral part of the machine and is aimed to give all the necessary information for:

- The raise awareness of the operators for safety issues.
- Machine's handling, packed and unpacked in safety conditions;
- Machine's correct installation;
- The depth knowledge of its work and of its limits;
- Its correct use in safety conditions;
- To do maintenance request interventions, in a correct and safet way;
- To break up the machine in safet conditions and according to guidelines for workers and environmental protection.

The responsible of the staff department, when this machine will be installed, according to guidelines, having read carefully this manual and have to make the operators and the maintenance personnel read it for the parts that are up to them, to conductors and maintenance personnel in charge, for the parts that interest them.

The time spent doing this will be rewarded by the correct operation of the machine and by its safe use.

This document presumes that, in the establishment in which the machine is designed for, are applied the safety and hygiene of the work guidelines.

The instructions, the pictures and the documents that are in this manual are confidential and must not be reproduced in any way, both in full and in part.

The customer has also the responsibility to be sure that, if this document will be modified by the author, only the update versions are present in the point in which the machine is used.

NOTE: It is forbidden to reproduce or translate in full or in part this manual without the authorization written by FCS srl.

1.2 HOW TO READ THE MANUAL

This manual is divided in chapters, each one is referred to a specific operator (installation personnel, conductor and maintenance personel), for which are be defined the necessary qualifications to operate on the machine in a safe manner.

The sequence of the chapters corresponds to the machine's life time logic.

To ease the immediate understanding of the text, we use terms, abbreviations and pictograms, which meaning is indicated at paragraph 1.6.

The manual has a cover, an index and a series of chapters (sections). In the initial page there are machine's and model's identification data, and eventually the serial number, the revision of the manual and a picture/design of the described machine, to ease the reader to identify the machine and its manual.

UNIT OF MEASUREMENT

The unit of measurement are those provided in the **I**nternational **S**ystem (**IS**).

1.3 RETENTION OF THE MANUAL

The manual has to be keep in safe and must be with the machine in each transfer of property that it would have during its life.

The storage of the manual should be carried out with care, with clean hands and without putting it on dirty surface.

You must not remove or modify any part. The manual must be filed in an environment without damp and heat and near to the machine. The author, under user's request, can give further copies of the manual.

1.4 MANUAL UPDATE METHOD

The author has the right to modify the project of the machine and improve it without communicating it to customers, and without updating the manual already given to the user.

In addition, in case of modifications in the machine installed, according with the author and that need the modification of one or more chapters of the manual, it will be up to the constructor to send manual's owner the chapters that have to be modified, with its new model of revision.

The user, according to the indications that are in the upgrade document, has to substitute in all the copies the old chapters, the initial page and the index with those of the new level of revision.

The manufacturer is responsible of the descriptions in the Italian version; some translations couldn't be verified at all, so if there is an inconsistency, you have to make reference to the Italian version and eventually call up our counting house that will do the appropriate modification.

1.5 ADRESSEE

This manual is for the install personnel, the operator and the trained personnel for the machine's maintenance.

EXPOSED PERSON

Every person who is, completely or in part, in a dangerous area.

OPERATOR

The officer that has to install, operate, adjust, clean, repair and move a machine and has to do its maintenance.

TRAINED PERSONNEL – TRAINED OPERATOR

Who had attend a training course, a specialisation course, etc., and are experienced in installation, operation and maintenance and machine's transport.

Adressee's qualification (see paragraph 1.6)

The machine is intended for industrial use, so its use could be entrust to qualified personnel, in particular:

- Be of age;
- Physically and psychically able to do work that is particularly technical difficult;
- Adequately trained about the use and about machine's maintenance;
- Been judged able by the employer to execute the entrusted task;
- Able to understand and interpret the manual of the operator and the safety guidelines;
- Knowledge of the emergency procedures and their accomplishment;
- Able to put in action the specific type of equipment;
- Are confident with the specific guidelines;
- Have understood the operating procedures defined by the manufacturer of the machine.

1.6 GLOSSARY AND PICTOGRAMS

In this paragraph are listed in non common terms or with a different from common meaning.

Here follows the abbreviations that are used and the meanings of the pictograms to indicate the qualification of the operator and the machine's status, its use allows to, rapidly and univocally, give necessary information for the correct use of the machine in safety conditions.

GLOSSARY (All. I p. 1.1.1 Dir. 2006/42/CE)

DANGER

A likely source personnel injury or injury to other workers;

DANGER AREA

Every area inside and/or near to a machine where the presence of a person is a risk for safety and health;

EXPOSED PERSON

Every person that is totally or in part in a danger area;

OPERATOR

People entrusted to install, operate, adjust, clean, repair and move the machine and do the maintenance;

RISK

Combination of probability and seriousness of a injury that could arise in a dangerous situation;

SHELTER

Machine's element that is specifically used to guarantee the protection throughout a material crash barrier;

SECURITY DEVICE

Device (different from a shelter) that reduces the risk, alone or associated with a crash barrier**;**

EXPECTED USE

Machine's use according to information given in the manual;

INCORRECT USE

A machine's use, different from that given in the manual.

OTHER DEFINITIONS

PERSONEL - MACHINE INTERACTION

Any situation in which the operator interacts with the machine in any operative stage in any moment of its life;

OPERATOR QUALIFICATION

Minimum level of ability that the operator has to have to execute the described operation;

NUMBER OF OPERATORS

Number of operators adequate to execute in an optimal way the described operation and results from a careful analysis made by the author, so a use made by a different number of operators could obstacle the expected result or could endanger personnel involved;

MACHINE'S STATUS

Machine's status involves operation modalities, for example automatic gear, maintened action control (jog), stop, etc., the conditions of Securities present in the machine as protections included, except protections, pressed emergency stop, type of thermal insulation etc.

RESIDUAL RISK:

Risk that continues inspite of protection measures built into the machine.

SECURITY COMPONENT PART

Component part:

– Designed for execute a security function;
– Its break down and/or malfunctioning, endanger people (ex: lifting equipment; fixed protector; mobile, adjustable, etc, electronic and electric device, optical pneumatic, hydraulic, that interstops a protector, etc.).
–

PICTOGRAMS

Descriptions anticipated by this symbol have: very important information/prescription, in particularly about safety.

The failed respect could carry:

- Dangers for operators' safety;
- Loss of contractual warranty;
- Discharge of constructor's duty.

Its functions is to give relevance to particular information as:

DANGER

It refers to dangers dealing with the described activity. When there is “DANGER” we refer to activities that could occur while using the machine and could endanger people.

ATTENTION

It refers to dangers dealing with the described activity. When there is “ATTENTION” we refer to activities that could occur while using the machine and could endanger the machine.

WARNING

We refer to integrations or suggestions for a correct use of the machine and to illustrate basic characteristics.

SECURITY’S PICTOGRAMS

- Pictograms inside a triangle indicate DANGER.
- Pictograms inside a circle impose a PROHIBITION/OBLIGATION.

Pictograms	Description
	Danger electric tension.
	Arms crushing.
	Hitching on.
	Dragging.

	Generic danger.
	No entry for not authorized personnel.
	Don’t remove security devices.
	Don’t clean, oil, grease, repair or adjust working parts by hand.
	Don’t execute works before remove tension.
	Obligatory protection gloves.
	Obligatory safety footwear.
	Obligatory safety helmet.

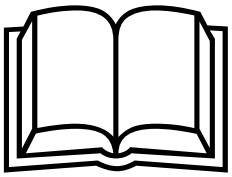
UNIFIED SYMBOLS ON THE MACHINE

Unified symbols that follows indicate danger operation or situations that could occur while using the machine.

ATTENTION

If the decals (illustrated above) are not legible, you have to substitute them with new ones.

This symbol indicates that you have to consult the manual.



This symbol is applied near grip devices used for lifting.

This symbol indicates burn danger due to high temperature near thermic engine (silencer, manifold, etc.).

This symbol is applied next to the fuel's tank's socket with mixture engine

MIXTURE 4 %

This symbol is applied next to the fuel's tank's socket with petrol engine

PETROL

This symbol is applied next to the fuel's tank's socket with diesel engine

DIESEL

2 GENERAL INFORMATION

2.1 MANUFACTURES IDENTIFICATION DATA

MANUFACTURER:

FCS srl

REGISTERED OFFICE – ADDRESS:

Via Enzo Ferrari, 30 - 45038 Polesella (RO) - Italy

AFTER-SALE/SPARE PARTS' SERVICE

Phone number: *+39 0425* 947707

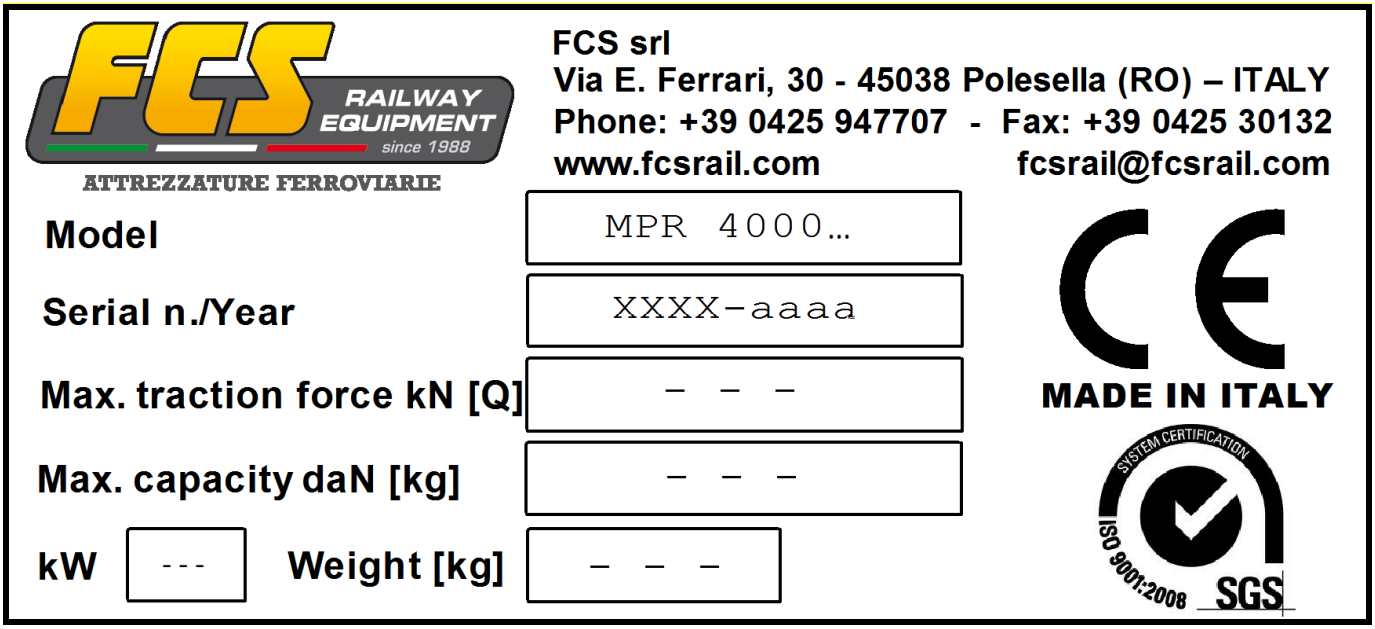
Fax:+39 0425 30132

E-mail: fcsrail@fcsrail.com

2.2 IDENTIFICATION DATA AND MACHINE'S PLATE

Every machine is identified by a CE plate on which are written, in a permanent way, its data.

While communicating with the manufacturer or with the service department you have always to quote them.



2.3 DECLARATIONS

The machine is realized according to the main requirements envisaged by the EU directives, that could be applied when put on the market. **ANNEX IV Directive 2006/42/CE** The machine isn't included in the mentioned in ALL.IV of the Directive 2006/42/CE.

ATTREZZATURE FERROVIARIE

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www.fcsrail.com fcsrail@fcsrail.com

DECLARATION OF CONFORMITY CE

(All. IIA DIR. 2006/42/CE)

THE MANUFACTURER

The company FCS srl, located in Via Enzo Ferrari 30, cap 45038, Polesella (RO) Italy

IT IS HEREBY CERTIFIED THAT THE MACHINE

Machine **Rail grinding machine** Model **MPR 4000**

Serial number**.....** Year of manufacture**.....**

Commercial Name **Rail grinding machine** Destination **Railway**

IS COMNFORMABLE TO INSTRUCTIONS

Directive 2006/42/CE of European Parliament and of the Council of 17 May 2006 for the machines and amendment the directive 95/16/CE.

Directive 2014/30/UE of European Parliament and of the Council, about the reapproaching of the regulations of the members countries about to electromagnetic compatibility.

The machine is conformable at legislative decree 81/2008 and next modification of integrations.

Norme armonizzate applicate:
- UNI EN ISO 12100:2010
- UNI EN 894-1
- UNI EN ISO 13977
- UNI EN ISO 13857

AND AUTHORIZE

Mr. **Fabio Coltro**

Address **Via Enzo Ferrari, 30** CAP **45038**

City **Polesella (RO)** Country **Italy**

TO KEEP THE TECHNICAL FILE

Polesella,

Fabio Coltro

President

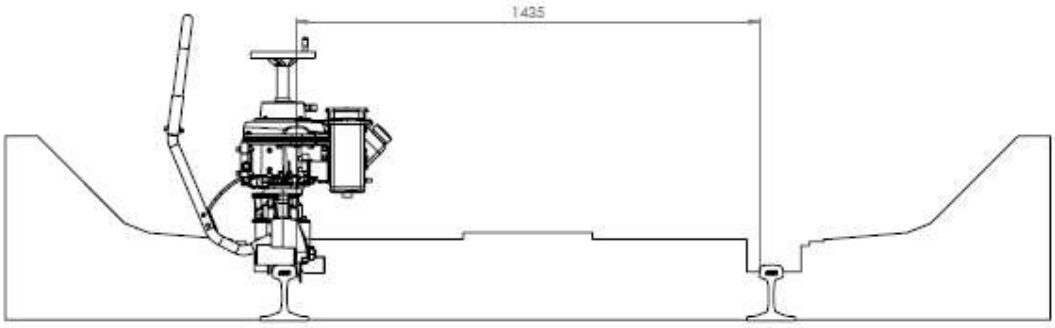
CERT. N° IT05/0072

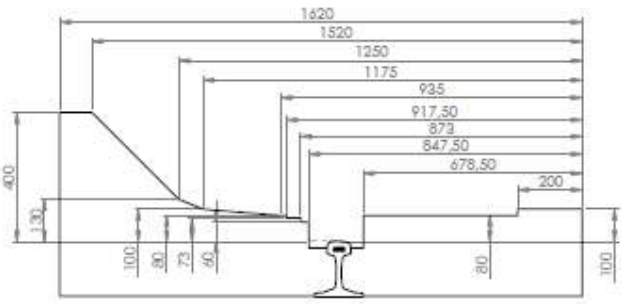
2.4 STANDARDS

UNI EN ISO 12100-1	Machine safety - Basic concepts, general design principles - Part 1: Basic terminology, methodology
UNI EN ISO 12100-2	Machine safety - Basic concepts, general design principles - Part 2: Technical principles
UNI EN ISO 14121-1	Machine safety - Risk assessment - Part 1: Principles
UNI EN 894-1	Machine safety - Ergonomic requirements for the design of information and control devices - General principles for human interaction with information and control devices
UNI EN ISO 13857	Machine safety - Safety distances to prevent reaching dangerous areas with upper and lower limbs
UNI EN ISO 13977	Railway Applications - Track - Safety requirements for portable machines and trolleys for construction and maintenance.

Ref. Paragraph 5.17 of UNI EN ISO 13977

Special care should be taken to avoid collisions with devices if they are present near the working area





Ref. Paragraph 5.2 of UNI EN ISO 13977

It is recommended that the machine must be lifted by means of appropriate lifting equipment, of adequate capacity, alternatively it is equipped with special handles and can be lifted by 4 persons from the four points highlighted above.

2.5 WARRANTY AND TECHNICAL SUPPORT

The materials provided by FCS srl enjoy of a 12-months warranty accrue from put on work, established by the bill given to the client.

Warranty application is regulated by FCS srl's terms of sale and use .

FCS srl reserves to repair or substitute parts we retain defective during warranty period. With the substitution od the retire defective part, FCS srl reserve free from any expenditure made by the Dealer or by the Client of the Dealer as presumed break down, present or future, ex. failed gain, conventional penalty, etc.

Ordinary and extraordinary maintenance have to happen according to manual's instructions. Warranty doesn't cover parts that are prone to normal wear and tear and declension. The equipment not build by FCS srl are prone to their constructor's warranty. Warranty will cease :

- If the Client doesn't obey to the payment contract;
- If the machine is used in a non conventional way instead of Sign's indications (machine's alteration, manoeuvre errors, overloaded, fuel use, hydraulic oil, improper lubricating or cooling water, non-observance of maintenance's rules also for non utilization periods, etc.);
- If the failure is due to the installation made by FCS srl's non authorized equipment or if the machine has been modified o repaired without FCS srl's authorization
- If are used non original spare parts or the extraordinary maintenance interventions and/or reparations are not made by FCS srl's non authorized personnel;

For all non included cases and for all kind of service we recommend to directly call FCS srl by recorded delivery or by fax, in case of phone arrangements.

FCS srl doesn't reserve any responsibility for delays or failed interventions

FCS srl is not responsible for breaks down or malfunctions due to technical interventions done on the machine by non authorized personnel.

2.6 RESPONSIBILITY

FCS srl is dispensed from any responsibility and obligations about any kind of accident to people and things, that could occur for:

- Failed observance of the instructions written in this manual concerning the conduction, the transport, the use and the maintenance of the machine
- Violent actions or incorrect manoeuvre during the transport, use and maintenance of the machine
- Made modifications to the machine without FCS srl authorization
- Events that doesn't deal with the normal and correct use of the machine

Anyway, if the user would attribute the accident to a machine's fault, would have to demonstrate that the occurred damage was a main and direct consequence of this "fault".

The responsibility of the formation, education, training and retraining of the personnel that uses the machine described in this manual, is exclusively depend on owner/user of the machine.

ATTENTION

For the maintenance and repairs you have to use only original spare parts. FCS srl declines all the responsibility for damages that could occur for non-fulfilment for what said before.

The machine is guaranteed according to contract stipulated during the sales.

Warranty is null if rules and instructions written in this manual haven't been obeyed.

3 SAFETY

3.1 GENERAL WARNING

The machine has been designed and made by FCS srl according to design and rules in force of the tecnique with the use described in this manual.

We observe rules, dispositions, prescriptions, ordinances, guidelines in force for this kind of machine.

The materials used and the equipment's parts, and the production processes, are warranted and quality checked to satisfy the maximum safety and reliability needs.

If you use the machine for the specified aims in this manual, if you use it with the required care, if you execute a careful maintenance and revisions professional made, you can expect high performance, long and continue life of the machine.

Experience allows FCS srl to have, for its products, high safety during the work. Nevertheless, these security conditions during the work can't be completely realized without the help of the operators and their assistant that had to always keep in mind general safety rules, here follows the main ones.

The machine could be used on rails with a maximum banking of 200 mm, and a maximum slope of 4%. If you lean to the ground this machine, it remains bridled avoiding run a way movements or if you use on sloping ground the machine must be used with a safety lanyard to avoid accidental runaway.

3.2 REQUIRED OPERATOR'S TRAINING

Every operator must read entirely with full attention this manual and respect what is written.

The Employer is obliged to verify that the operator owns all the abilities required for the operation of the machine and has carefully reviewed the manual and has to give to machine's user devices for personal protection (gloves, shoes, clothes, etc.) according to rules in force.

The endothermic engine and the parts near it reach high temperatures during the operation of the machine that may cause severe burns. Use extreme care not to come into contact with these parts.

3.3 NOISE

The level of pressure and acoustic power that follows have been done with the machine's engine at the maximum speed.

Level of acoustic pressure continue equivalent thought out LPA in the work place at 85dB (A)

Level of acoustic power continue equivalent thought out LWA in the work place at 100 dB (A).

3.4 EXPECTED USE

The machine has been designed and made by FCS srl for rail grinding and profiling

There must be carefully respected safety prescriptions passed from Railway Administrations for works on rails and near them. You have to start working only after the officials in charge for safety have given their go ahead.

You have quickly and carefully execute the guidelines conveyed by the Site Manager or the safety responsible. Always leave devices and material in a way that these ones can't collide with other railway vehicles. In case of use in the presence of the third rail, it is essential to make sure that the third rail is isolated otherwise do not work.

3.5 NOT EXPECTED USE

Not observe the prescribed limits is equivalent to an improper use of the machine. If this happens, FCS srl will not assume any liability for accidents to persons or damage to property or the machine itself. Is void the warranty on the machine.

3.6 WORKING SAFELY

FCS srl doesn't answer for accidents, working's anomalies and/or damages during the machine's use, due to user's non observance of laws, prescriptions, dispositions and rules in force.

The use of the machine is allowed only at the trained personnel. Only authorized people can stay near the machine. You have always to stay by safety distances from mobile parts and check that during its work normal safety prescriptions are respected. You always have to assure that advertisement given to other people are understand and executed.

Dangers that couldn't be deleted from safety measures adopted by the constructor couldn't be caused by an incorrect use of the machine or by a failed respect, due to the user, of the rules described in this manual.

3.7 BASIC SAFETY INSTRUCTIONS

BASIC SAFETY INSTRUCTIONS FOR THE USE OF THE MACHINE

1. The operator and all the personnel that interact with the machine must be equipped of specific individual protection's devices (DPI).
2. Machine's movement and use are reserved only for personnel in charge.
3. Before starting the engine, make sure that the throttle of the engine is a little more than the minimum, and that the grindstone is in the fully raised position.
4. Before starting the movement you have to ensure that in the sphere of activity of the machine there aren't people. If you need, signal the start of the operation.
5. You constantly have to check the working area to identify dangerous situation as an area where means or people pass.
6. Before performing maintenance operations, stop the engine
7. Perform fuelling only with off engine
8. Don't use the machine in a room or close place to avoid inhaling poison gases.
9. Never work without the protection of the grindstone and without the protective cover of the pulleys
10. Gradually lower the grindstone down until it is closet to the working area avoiding sharp blows to the cup grindstone
11. After the cup wheel replacement, make the machine idle (without grinding) at working rotation speed for 5 minutes
12. Don't move the machine with on engine.
13. Avoid make the cup grindstone to be close to any material to avoid that this one is thrown
14. Lift the machine with care and only throughout the special prone handles
15. Adequately light the working area

ATTENTION

It is impossible to list all the possible safety rules, so we entrust operator good sense, who, if he works with care and caution, guarantees the best safety against every kind of accident.

3.8 STANDARD ENVIROMENTAL CONDITIONS

The machine in standard configuration is designed to be used in these environmental conditions:

– Work temperature: -10° C + 40° C

ATTENTION

It is forbidden the use of the machine in standard execution in areas that are different from the listed above.

3.9 PROHIBITED USES

- Use the machine for aims that are different from those it is designed for
- Not correctly or moved and started according to its safety/service rules
- Carelessness and/or absence of maintenance as prescribed or use of non original spare parts
- Use of the machine out of allowable environmental conditions

- Use the machine with excluded or damaged safety devices
- Use the machine modified in any of its parts without a written FCS srl authorization
- Use of the machine on rails without respect the rules of the railway body owner of the railway
- Use of the machine on rails open to traffic
- Use of the machine on track circuit
- Use the machine in presence of a third rails
- Use the machine in presence of inclination superior or equal to 4%
- Go away from the machine leaving the engine running
- Not under the influence of drugs or alcohol.

3.10 ALLOWED USES

- Use the machine built only with the compatible equipment, in specific working conditions.
- Use the machine only on non open traffic rails.

3.11 MAINTENANCE

To execute maintenance and repairs, you have to move the machine in a place authorized by the team leader of the yard.

To maintain the machine clean, never use liquids easy flammable and corrosive products.

Stop the engine before every repair, maintenance and fuelling work. After fuelling screw on the top of the tank. Avoid fuelling with hot engine. If necessary leave the maximum level at ¾ of its capacity.

If the fuel leaks don't start the engine but clean the area tainted by the fuel. Periodically verify that there aren't fuel leaks. In case of any leaks or bad functioning stop the machine and repair when the engine is cold.

Observe the normal fire rules and fuelling with engine off, always keeping in mind tank's capacity to avoid fuel spilling, in particular with hot engine.

Execute check and maintenance work prescribed according to the engine's maintenance table, as well as all the little repairs and check tightening of bolts.

The eventual lifting of the machine should be made only using the handles. For the maintenance is fundamental the use of suitable tools.

ATTENTION

It is impossible to list all the possible safety rules, so we entrust operator good sense, who, with care and caution, guarantees the best safety against every kind of accident.

3.12 RESIDUAL RISK

Dangers that couldn't be deleted from safety measures adopted by the manufacturer couldn't be caused by an incorrect use of the machine or by a failed respect, due to the user, of the rules described in this manual.

The personnel in charge of the machine must be equipped of specific individual protection's devices required by law.

DANGER

During every kind of work pay attention of high voltage line, if you are next to them could cause DEATH.

4 MACHINE'S DESCRIPTION

4.1 GENERAL

The rail grinding machine is a machine with a mechanical function for the grinding of the rail head after the weld. The machine is made of a strong aluminium frame which supports a thermic or an electric engine that throughout a V-belt transmits the movement to the chuck equipped with a cup grindstone. A steering wheel allows to adjust the vertical position of the grindstone. Clockwise increases the penetration of the wheel counter-clockwise decreases it. A lever blocks the movement of the steering wheel. On the two ends of the frame there are two rollers that allow the longitudinal displacement of the machine, two side supports that ensure the stability of the machine during the grinding operation when the set angle varies on the railhead.

The machine is equipped with a handlebar in order to allow the operator the grinding operations of the upper part of the rail head or of the side of the rail head, tilting the machine and having full control of the same. The protected action of the grindstone ensures operator safety.

4.2 OPTIONAL OF THE MACHINE

- Emergency button (for petrol version only). In case of emergency, the operator can immediately turn off the machine, thanks to the emergency button on the handlebar. The MPR 4000 E version has the emergency button as standard equipment.
- Kickstand. The machine is equipped with a kickstand to park it on the ballast, sleepers and on the ground.Turn the machine towards the operator with the appropriate lever to make sure that the same is in a safe position. The kickstand must be planted in the ground, as in the figure below and in a suitable position in order to maintain safe the machine and the personnel near it.

DANGER

The operator should never leave the machine while the engine is running.

- Engine protection. The machine is equipped with a strong steel protection which protect the engine compartment and the fuel tank from any accidental drops.

4.3 TECHNICAL CHARACTERISTICS

	MPR 4000 M	MPR 4000 D	MPR 4000 P	MPR 4000 E
Width	700 [mm]	703 [mm]	685 [mm]	600 [mm]
Length	1000 [mm]	1000 [mm]	1000 [mm]	1000 [mm]
Height	829 [mm]	829 [mm]	829 [mm]	829 [mm]
Dry weight	64.5 [daN] [kg]	71 [daN] [kg]	68 [daN] [kg]	65 [daN] [kg]
Weight in working condition	70,5 [daN] [kg]	77 [daN] [kg]	74 [daN] [kg]	65 [daN] [kg]
Engine Brand	Minsel	Yanmar	FCS	CME
Model	M165L2	L48V6CF1T8AA	FCS 195	100 A/2
Cycle	2 strokes	4 strokes	4 strokes	---
Cylinder number	1	1	1	---
Bore x Run	61 x 54 mm	70 x 57 mm	70 x 50 mm	---
Displacement	158 cm^3	219 cm^3	192 cm^3	---
Max power	4,9 kW [6,6 CV]	3,3 kW [4,5 CV]	4,2 kW [5,7 CV]	3 Kw [4,0 CV]
Speed setting	4500 rpm	3600 rpm	3600 rpm	2880 rpm
Max torque	12 Nm a 2500rpm	11 Nm a 2600rpm	12,3 Nm a 2400 rpm	12 Nm a 2880 rpm
Cooling	Air	Air	Air	Air
Air filter	Dry	Dry	Dry	---
Engine compartment	Soundproofed with the engine mounted on elastic vibration supports			isolated
Fuel	Mixture 4% *See engine's manual*	Diesel *See engine's manual*	Petrol *See engine's manual*	Electricity 380 V
Fuel tank's capacity	5 litres	1,9 litres	3,9 litres	---
Fuel usage per hour	1 – 2 litres	0.8 – 1,5 litres	0.8 – 1,5 litres	---
Acustic power LWA dB(A)	102 dB	102 dB	102 dB	102 dB
Sound levels – acustic pressure level Lpa(dB)	85 dBA	85 dBA	85 dBA	85 dBA
Vibration levels	< 2,5 m/s²	2,5 m/s²	1,97 m/s²	2,5 m/s²
TOOL				
Trasmission of motion	Trapezoidal belt	Trapezoidal belt	Trapezoidal belt	Trapezoidal belt
Rotation speed of grindstone	4500 [rpm]	3600 [rpm]	3600 [rpm]	2880 [rpm]
Wheel's dimensions	150X73X57 [mm]			
Grinding wheels life	40-50 [grinds]			

5 INSTALLATION

5.1 TRANSPORT AND MOVEMENT

The lifting of the machine can be done only by using highlighted devices' grips that are on the machine.

ATTENTION

Lifting operations have to be done with engine off.

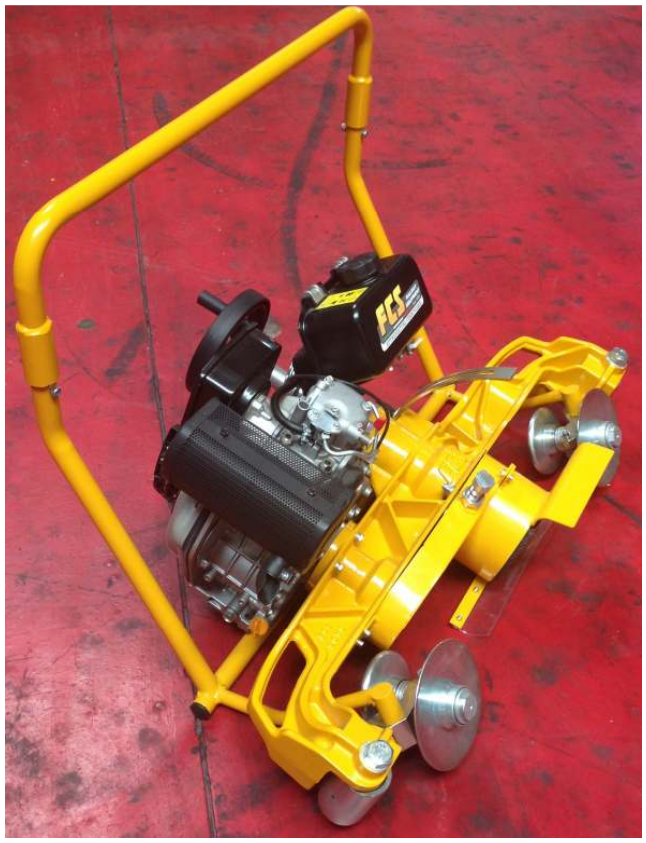
It is forbidden to lift the machine hooking it from the handlebar.

We recommend to use expected personal safety devices as: gloves, safety footwear with steel toe and overalls.

During the movement, the machine must be located in a position as in the picture.

DANGER

Bump and crushing danger. During the lifting and moving you have to operate carefully.



REST POSITION

5.2 COMMISSIONING

5.2.1 FIRST START

At the first start of the machine you have to execute checks that follow:

1. Verify that the machine has:
   - Declaration of conformity CE
   - Engine Use and Maintenance's manual
   - Engine's manual (where expected)
   - Equipment's handbook
2. General visual check of the machine
3. Check and verification of the presence of identification's plate and of safety labels
4. Check and verify oil level in the engine
5. Check and verification of:
   - Fuel' s level;
   - Machine's operation buttons on the switchboard.
6. Verify electric cables's status (check the eventual presence of scratches, weakens, spelled wires or shealts,etc.)
7. Check the functionality of safety and emergency devices
8. Check commands and indicators' efficiency
9. Varnishing's check
10. Execute a functioning's test to idle in every expected operative conditions
11. After executing tests verify if there are lacks
12. Operate the machine only after an adequate warming-up period.

ATTENTION

Before starting the machine the operator in charge has to read completely this manual

5.2.2 CHECKS AT THE BEGINNIG OF EVERY WORKING DAY

Before the start of every working day you have to check:

1. General check of the machine in particular verify if there are liquids' lacks (fuel, etc.)
2. Verify the electric cables (check the eventual presence of scratches, weakens, spelled wires or shealts,etc.)
3. Check the functionality of safety and emergency devices
4. Check commands and indicators' efficiency
5. Varnishing's check
6. Oil level check
7. Fuel level check

If one or more described points are damaged, don't use the machine and provide for re-establish the machine in efficiency conditions.

If there are any anomalies that the operator couldn't solve, contact FCS srl

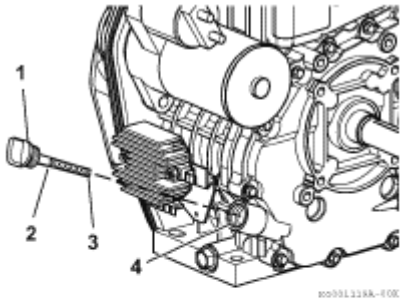
5.2.3 RIGHT POSITION OF THE YANMAR ENGINE TO CHECK THE OIL LEVEL MPR 4000 D

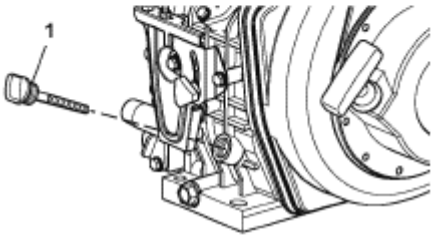
Position the machine with the engine base horizontal respect to the ground.

Remove the oil cap and place a tray to collect any leaks.

Top up the engine oil level up to the upper limit and no more than 0.8 liters in total.

Close the oil cap.





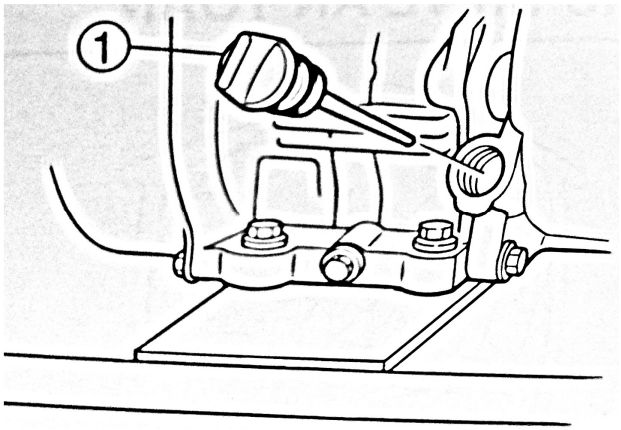
5.2.4 USE AND MAINTENANCE FOR FCS 195 ENGINE FOR MPR 4000 P

5.2.4.1 CHANGING AND REFILL ENGINE OIL:

When refill and replacing engine oil, follow the procedures described below.

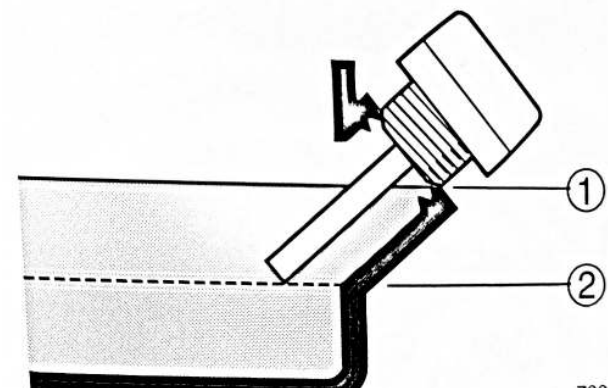
Position the machine with the engine base horizontal respect to the ground.

The oil gauge (1) accessible on both sides makes it easy to check the oil level.

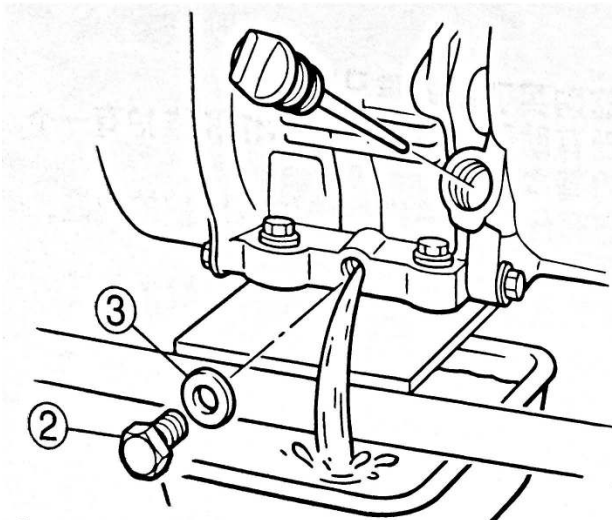


The sticker (1) indicates the correct oil level that the machine must have.

The sticker (2) indicates an oil level that is too low and therefore it is necessary to refill it.



Remove the oil cap (2-3) and place a tank to collect any leaks. Clean any leaks with a clean cloth.

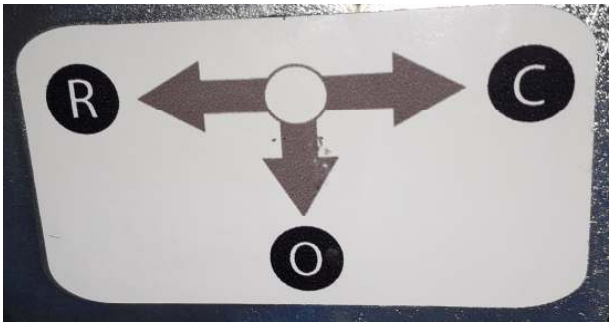


Refill the engine oil level up to the upper limit and no more than 0.6 total liters.

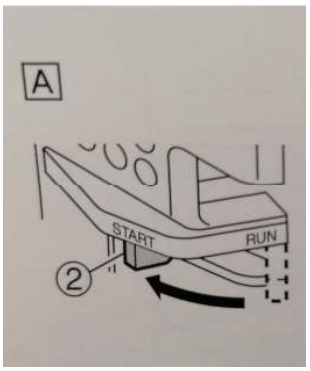
Close the oil cap.

5.2.4.2 STARTING THE ENGINE:

The first thing to do before starting the engine is to check that the fuel tap located under the tank is positioned on "O" which indicates open.

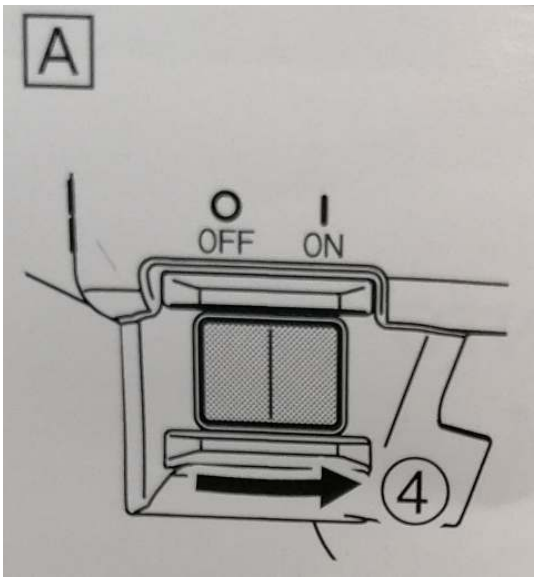


Move the choke lever to the "RUN" position.



Adjust the accelerator lever to half of its travel.

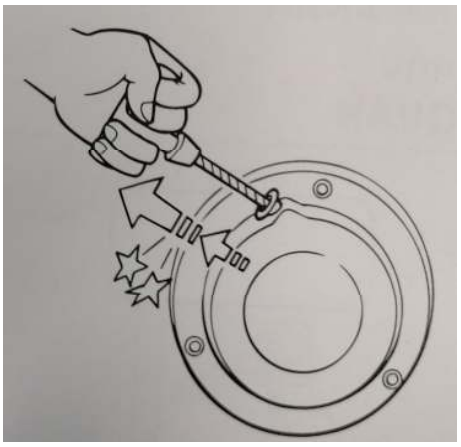
Activate the power button by moving the switch to "ON" position.



Pull the rope slowly until the motor gives some resistance.

At that point give the rope a vigorous pull.

Repeat the operation until the engine has been started.

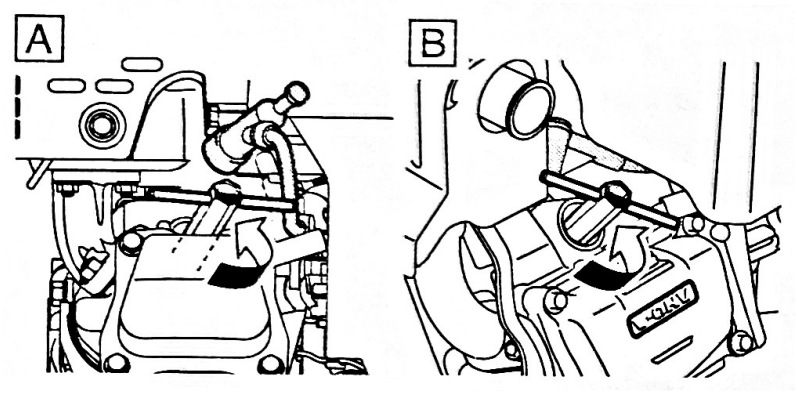


After ignition, close the air and adjust the accelerator lever to its maximum stroke.

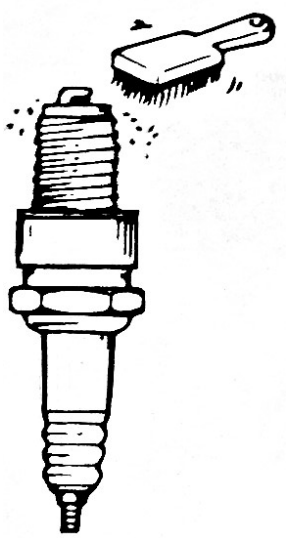
N.B. In case of difficulty in the ignition phase, try to move the machine from the rest position to the working position a couple of times and then repeat the ignition procedures described above.

5.2.4.3 SPARK PLUG MAINTENANCE:

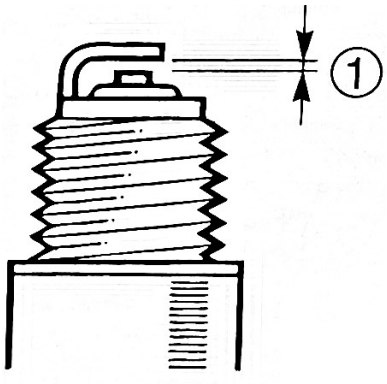
First of all, remove the cap and unscrew the spark plug with a special wrench.



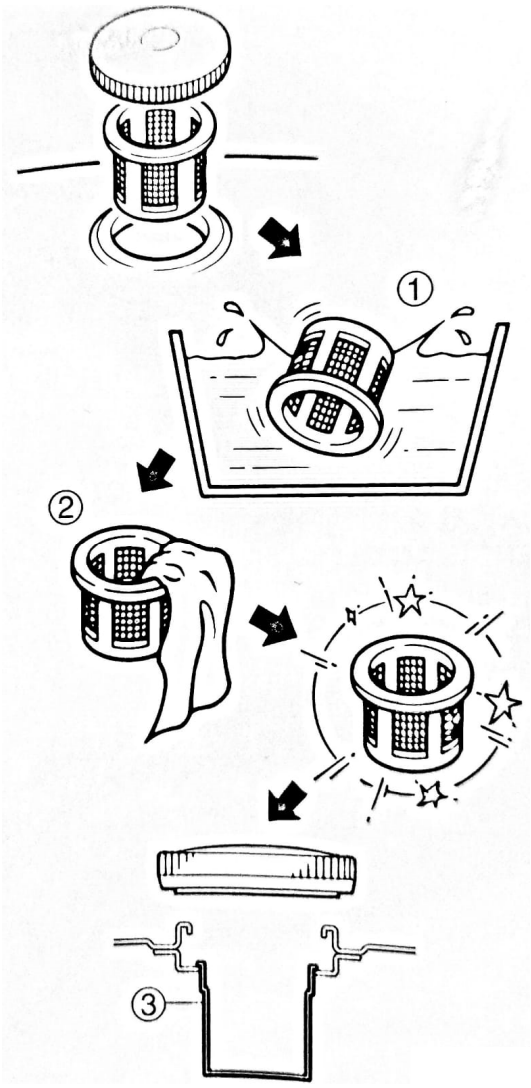
Remove combustion residues with a special metal brush.



Before reassembling the spark plug, check that the electrode distance is between 0,6 – 0,7mm.



5.2.4.4 FUEL FILTER MAINTENANCE:



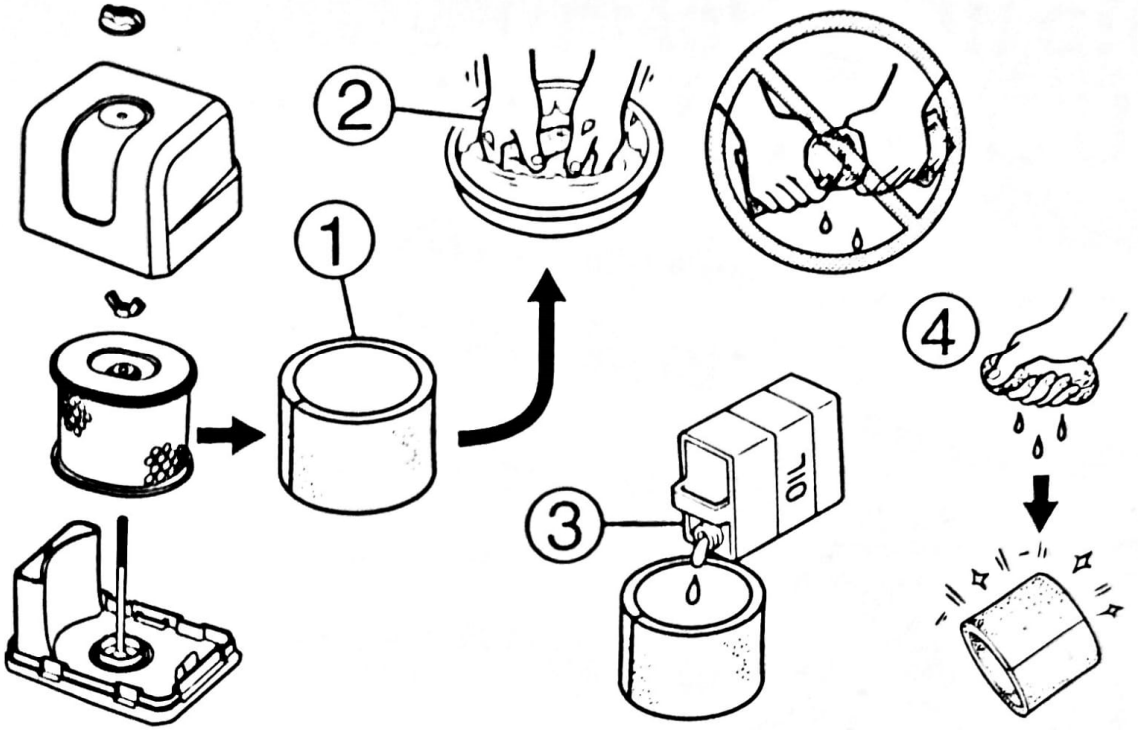
First unscrew the tank cap and remove the fuel filter.

Wash the filter by immersing it in petrol (1).

With a clean cloth, dry the filter by removing any remaining residues (2).

Reassemble the filter inside the tank before refueling (3).

5.2.4.5 AIR FILTER MAINTENANCE:



Disassemble the plastic casing and remove the sponge filter.

Wash the plastic parts with water, the sponge part must be cleaned with compressed air.

Wet the sponge part with engine oil and squeeze it to remove excess oil.

Reassemble everything before starting the engine again.

5.3 PROTECTION AND STORING

When it is expected that the machine has to remain idle for a quite long period, it is necessary to take precautions to preserve machine's functionality.

ATTENTION

When you store the machine, you have to close the fuel cap and locate the machine with the engine head facing upward.

5.3.1 IN PREPARATION FOR A SHORT INACTIVITY

1. Put the machine in a way that can guarantee an adequate safety.

5.3.2 STORING AND PREPARATION FOR A LONG INACTIVITY

As above, also:

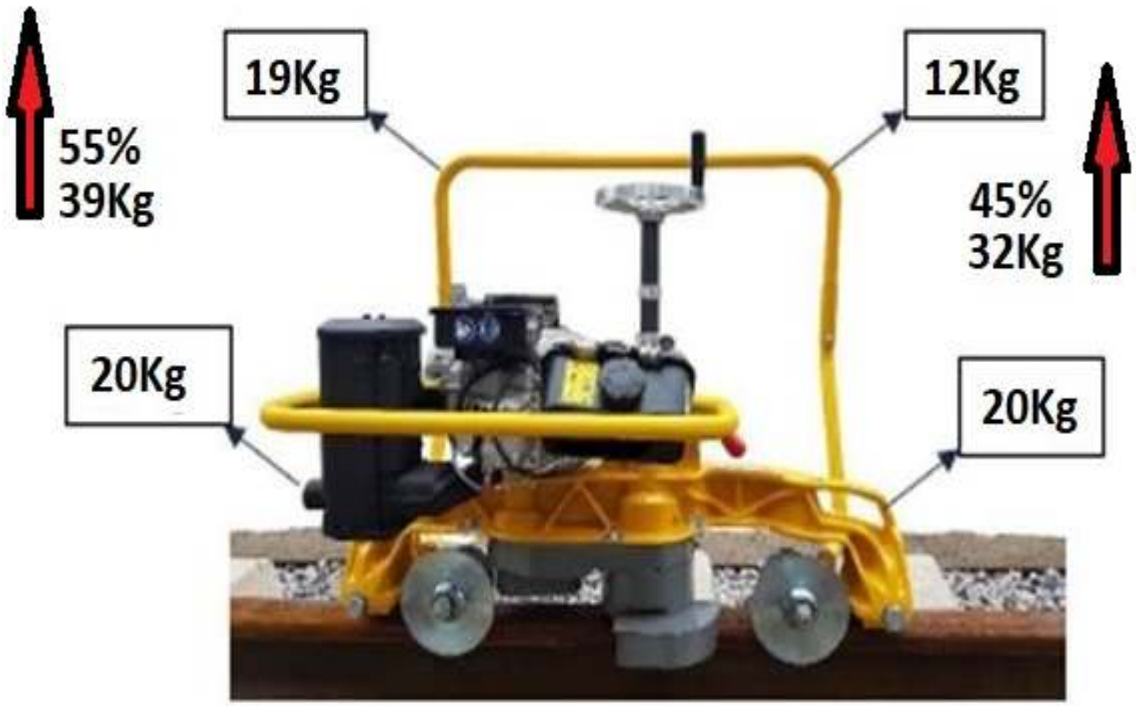
1. Clean the air filter of the engine
2. Protect the muffler to avoid that foreign bodies could enter
3. Cover the machine with a protective oil.
4. If possible store the machine in a covered place, dry and non dusty, or protect the machine with a plastic sheet to avoid storm damages

5.3.3 RECLAMATION AFTER A LONG INACTIVITY

1. Carefully clean the machine
2. Remove the protection on the muffler
3. Verify fuel's level
4. Open the tap of the fuel tank
5. Start the engine and idle it for some minutes
6. Check the functionality of safety and emergency devices
7. Check commands and indicators' efficiency

5.4 LIFTING THE MACHINE

Use lifting points shown by arrows below.



ATTENTION

Lifting operations shall be carried out when the engine is switched off. It is recommended to wear the personal protective equipment provided, such as: gloves, safety shoes with steel tip and overalls.

ATTENTION

Lifting operations shall be carried out when the engine is switched off. It is recommended to wear the personal protective equipment provided, such as: gloves, safety shoes with steel tip and overalls.

DANGER

Danger of impact and crushing. Care should be taken during lifting and transport.

5.5 MACHINE'S REMOVAL AWAY FROM RAILS

Removal operation of the machine from rails must be done this way:

1. Switch off the machine.
2. Lift the machine using lifting points.

The necessary time to do the machine's removal manoeuvre from rails is approximately 40 seconds, in normal operative conditions. The number of necessary operators for machine's removal from rails is 2.

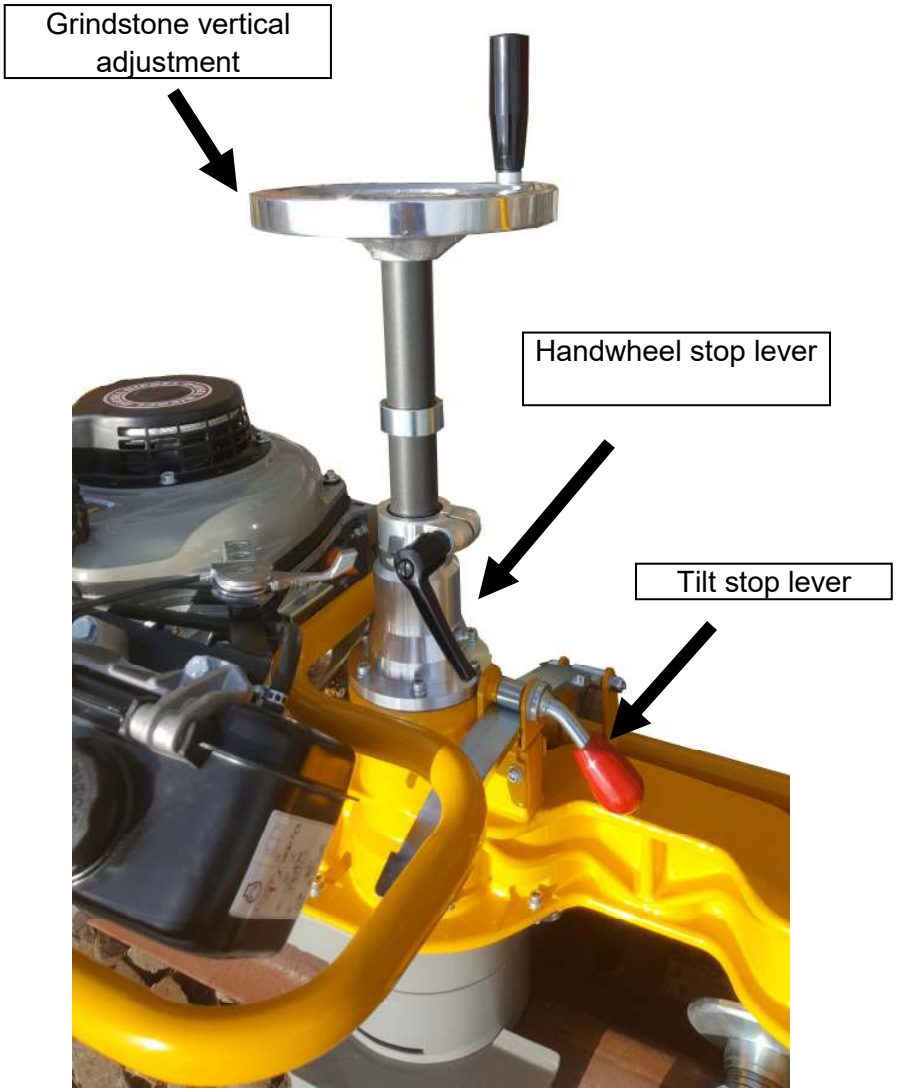
ATTENTION

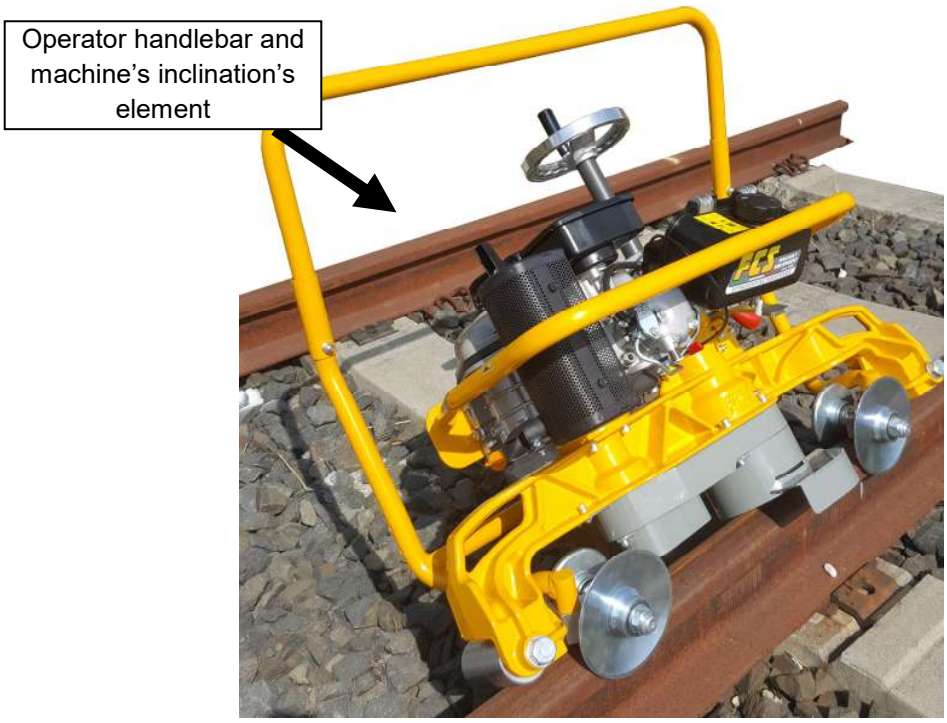
Lifting operations must be done with engine off. We recommend to use of personal safety devices as: gloves, safety footwear with steel toe and overalls.

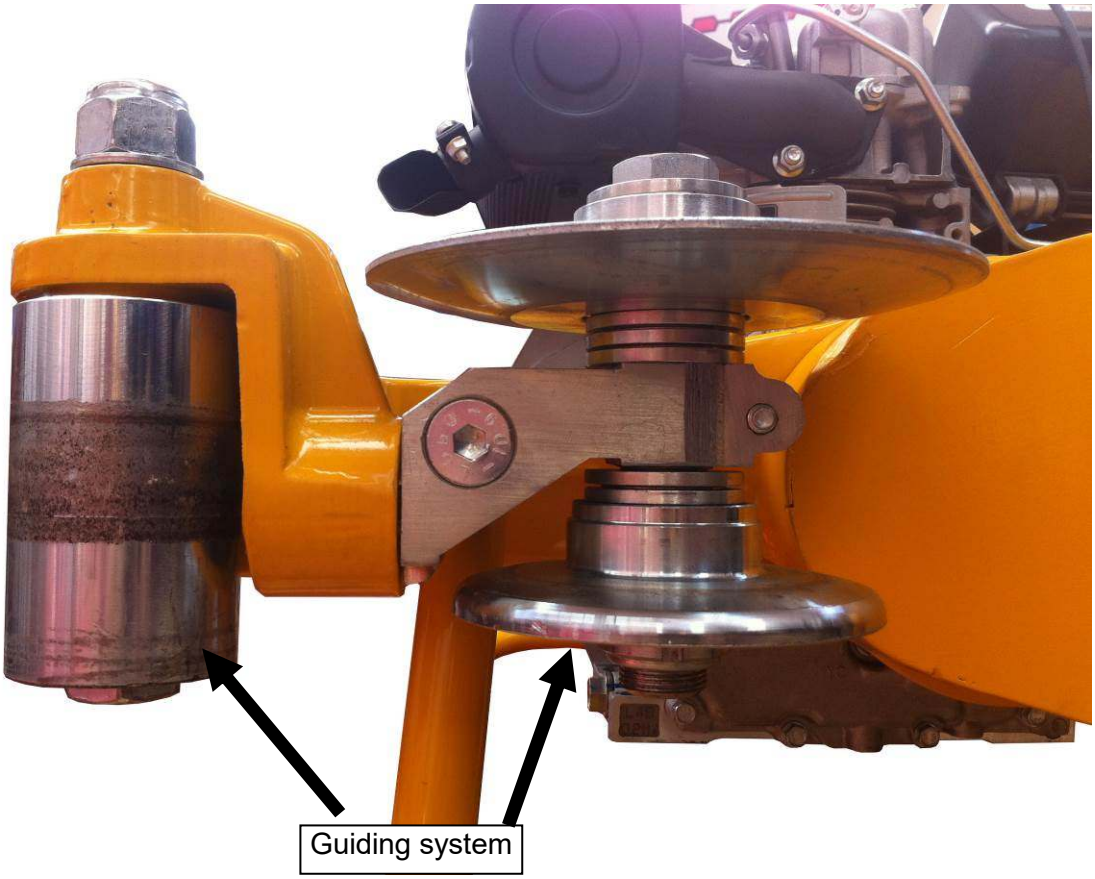
6 MACHINE'S USE

6.1 HOW TO USE THE MACHINE


Conbustion engine and fuel tank
Tensioner belt adjuster
Belt and grindstone protection


Grindstone vertical adjustment
Handwheel stop lever
Tilt stop lever

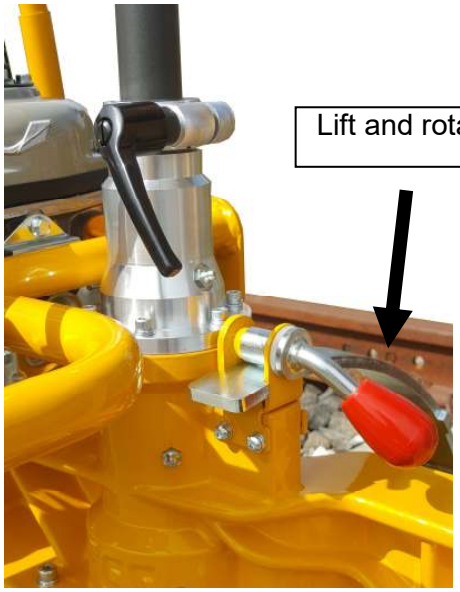

Operator handlebar and machine's inclination's element



- Verify the integrity of the steel sparks guard .
- Place the machine on the rail to let it run freely on the head, lay both rollers on the rail and drive supporting laterally the machine through the operator handlebar
- Start the engine (see engine instructions). Regarding the MPR 4000 E version, you have to push the green START button.
- Start grinding the welded part of the rail, moving the machine in oscillatory way during the process. If the grinding of the weld isn't enough you have to increase the penetration of the grindstone throughout the special steering wheel. A complete run of the wheel corresponds to 2,5 mm of displacement of the grind stone. To unlock the wheel you must use the wheel blocking lever. The weld on the rail will become smooth when you reach the same level of the rail before and after the weld.
- It's possible to tilt the machine of 90° (polishing stone perpendicular to the part to grind) and in this new position you can grind the internal and external part of the head rail. With the block tilting lever you can adjust the tilting of the machine respect to the operator handlebar, so as to allow the operator to maintain the best working position. The block oscillation lever of the machine must be used in the following way:

- Turn the lever, when finished the free angle, lift the handle following its axis, turn it and release the handle which, thanks to an internal spring, returns into its place to be ready to continue to screw and unscrew.
- Apply the screwing and unscrewing torque to the handle only after it is returned in its place not to endanger its operating. Simply loosen the screw to tilt the machine.
- It is wrong to loosen the lever almost completely and then tilt the machine.
- It is wrong to tilt the machine towards the opposite side of the operator.

- Before turning the machine, to grind the external part, you have to lift up the smoothing stone in the highest position, and once you've turned the machine the grindstone will gradually go down.
- The handlebar allows to steer the machine in safety and with extreme precision.
- Once finishing the grinding of the rail, you have to switch off the machine bringing it to the minimum and moving the selector in off position (for petrol and diesel version only) or pushing the red stop-button (electric version).



ATTENTION

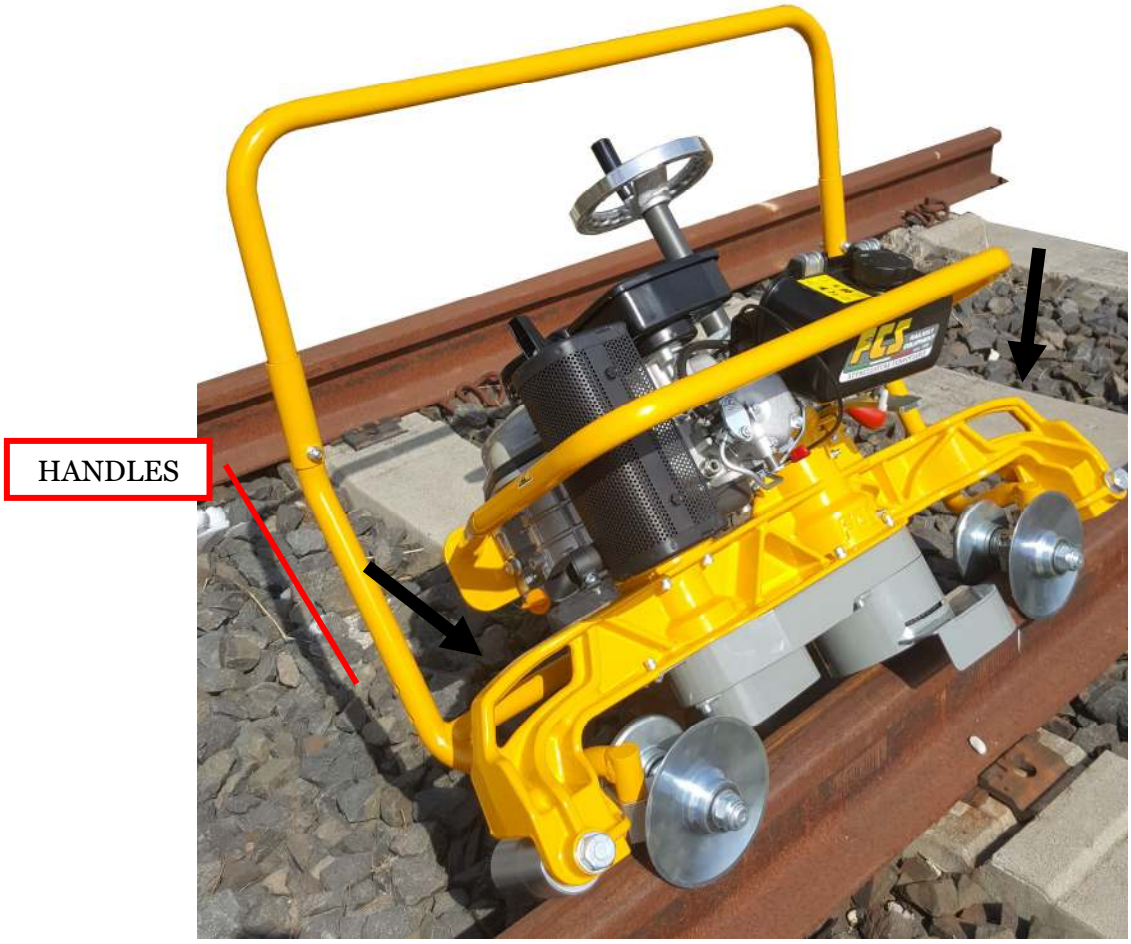
Execute the oscillation of the machine from vertical position to inclined position and vice-versa slowly and in a controlled way, this allow the internal lubrication of the engine to operate in the best way slightly increasing the life of the engine and of the machine.

ATTENTION

The machine must always be used with the engine head positioned upwards or in a horizontal position.

6.2 ROTATION OF THE MACHINE DURING USE

For working on the opposite profile with respect to the positioning of the machine, rotate the machine, taking care to completely lift it from the rail, using the appropriate handles. The number of operators necessary for removing the machine from the rail is 2.



ATTENTION

The machine must not be rotated using as a fulcrum point the rolls on the rail, this can damage the bearings of the machine.

ATTENTION

The structure of this type of machine, requires special attention during grinding.

In the event of improper use of the above listed, FCS srl is not liable for any problems and / or malfunctions.

NOT ALLOWED OPERATION

NOT ALLOWED OPERATION

NOT ALLOWED OPERATION

ATTENTION

Tilt the machine from the vertical position and vice versa in a slow and controlled way. In this manner, the internal lubrication of the engine will be able to operate in an optimal way, significantly increasing the engine and the machine life.

ATTENTION

The machine must always be used with the engine head pointing upwards or in a horizontal position.

6.3 REFUELLING

Always consult the engine use manual to identify the correct fuel to use.

Engine tank has to be filled throughout the socket indicated on the tank and indicated on the machine by the special decal (see paragraph “UNIFIED SYMBOLS ON THE MACHINE”).

After fuelling close the tap of the fuel tank. Avoid spilling fuel on hot engine. If necessary leave the maximum level at ¾ of its capacity.

If the fuel leaks don’t start the engine but clean the area effected by the fuel. Periodically verify that there aren’t leaks of fuel. In case of any anomaly or bad functioning stop the machine and repair when the engine is cold.

Observe the normal fire rules when adding fuel with engine off, always keeping in mind tank’s capacity to avoid leaks of fuel, in particular with hot engine.

DANGER

Petrol is extremely inflammable and explosive. A fire or an explosion could burn you and others.

Fill the tank in open space, at cold engine, and clean the accidental leaks or spills.

Do not handle petrol near to free flames or sparks.

ATTENTION

The structure of this kind of machine needs a particular care during fuelling operation.

For the approach to fuelling’s points, use only scales that refers to safety guidelines given from D.Lgs 81/2008.

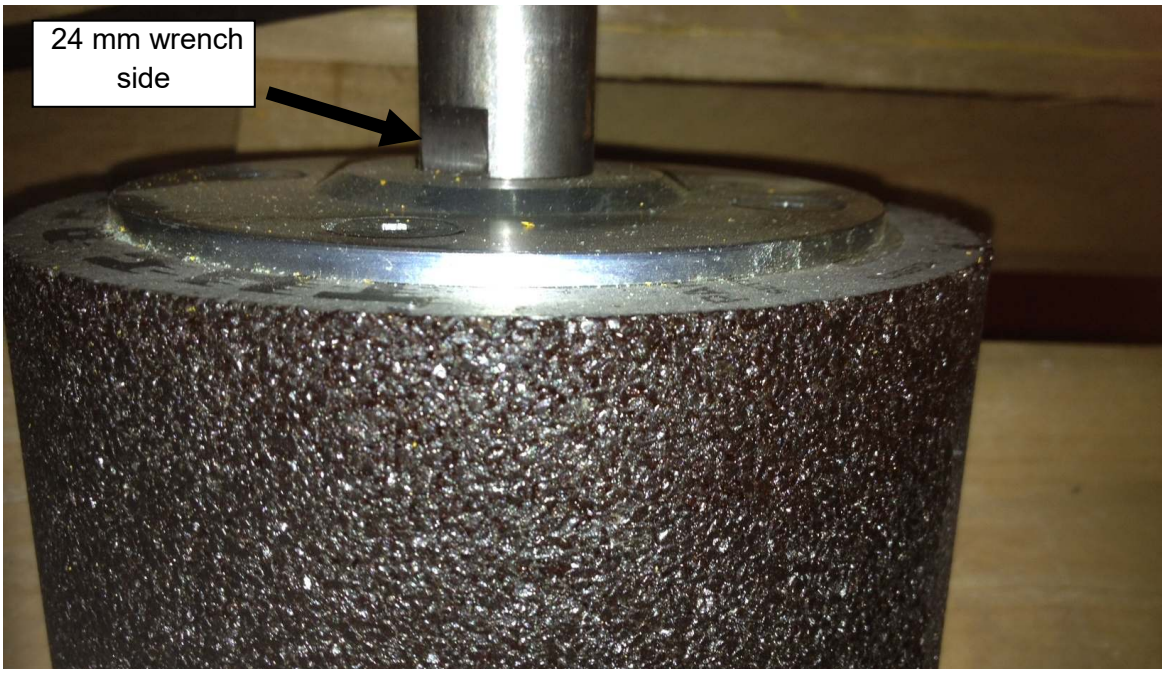
If the fuelling is done throughout cans, remember that the capacity of each can has to be of a maximum of 25 l.

6.4 GRINDSTONE SUBSTITUTION

For the replacement of the cup grindstone you have to remove the grindstone protection's block, bring down the grindstone with the wheel to insert the 24 mm hexagonal wrench to take firm the shaft. Remove the grindstone with a 5 mm socket-head screw, unlock the 4 screws and install the new grindstone by reversing the procedure. Tighten the screws of the grindstone and raise it with the wheel. Reassemble the grindstone protection's block.

Then you have to assure throughout soft hits the sound that the stone gives off, it must be the characteristic sound of a compact mass.

Assemble the grindstone in the machine and idle the engine for 5 minutes at working speed without grinding. Ensure the integrity of the spark protection block.



6.5 ADJUSTMENT BELT TENSION (FOR THE MACHINES WITH BELT TENSIONER ONLY)

For the correct functioning of the machine and to avoid the early damage of the engine transmission's belt, it should be run at midrange rpm.

The machine is equipped with an automatic belt-tension system.

6.6 TENSIONING

- Loosen the screws of the belt tensioner with a 5 mm wrench;
- Remove the carter of the belt tensioner;
- Loosen the screw TE M10 of about 7 mm for removing the belt tensioner from its location. In this way, the tensioner can be removed from the anti-rotation pin in the carter of the belt and it can rotate around the axis of the screw;
- Use the CH24 wrench on the hexagonal nut CH24 that is below the locking screw as above;

- Rotate the wrench clockwise, until the white sign in the tie reaches the green part (look at figures 1-3 and 1-4);
- At this point, push the tensioner to the belt carter so as maintain into position the anti-rotation pin;
- Tighten again the screw TE M10 with an hexagonal screw CH17.

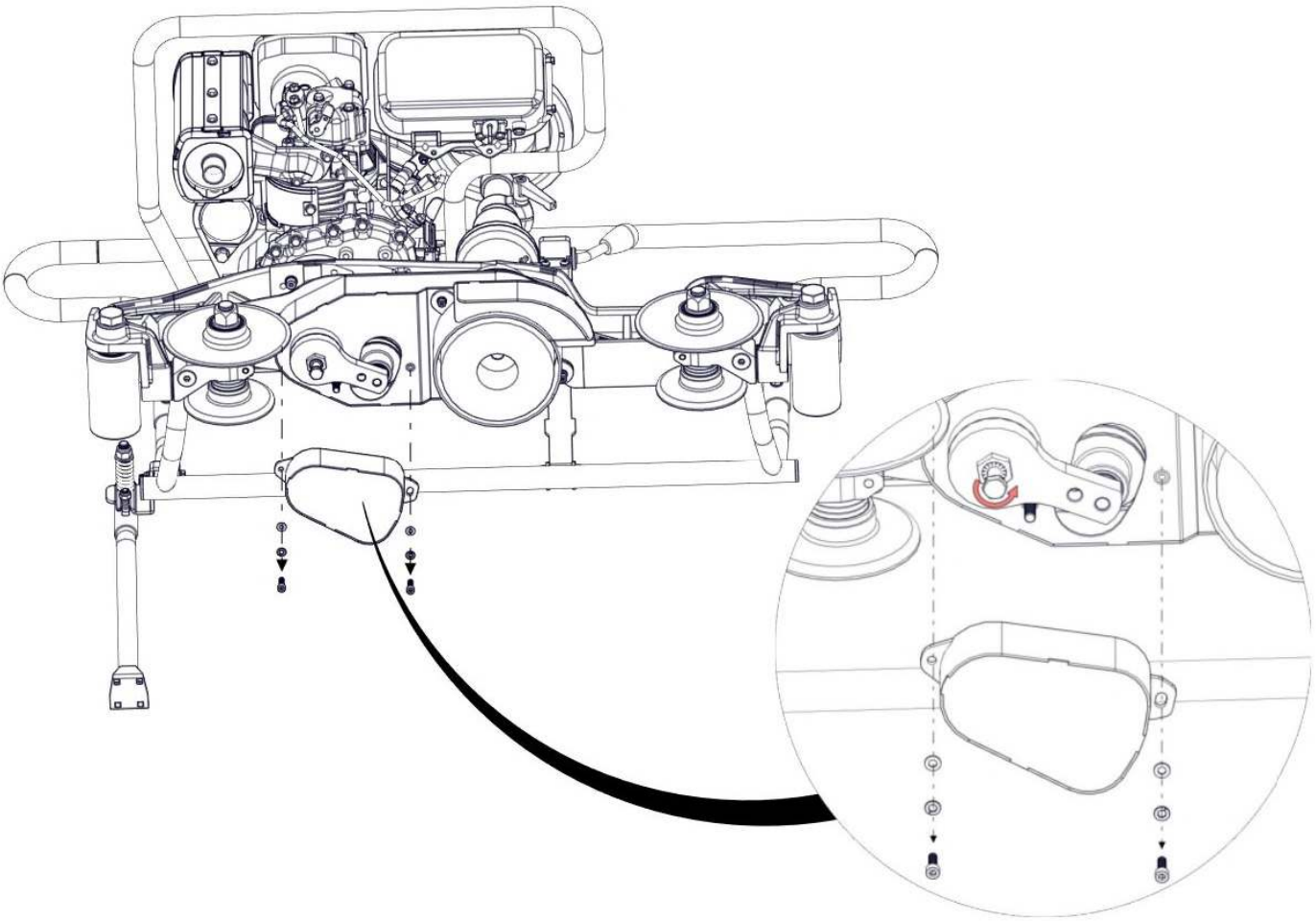


Figure 1-1

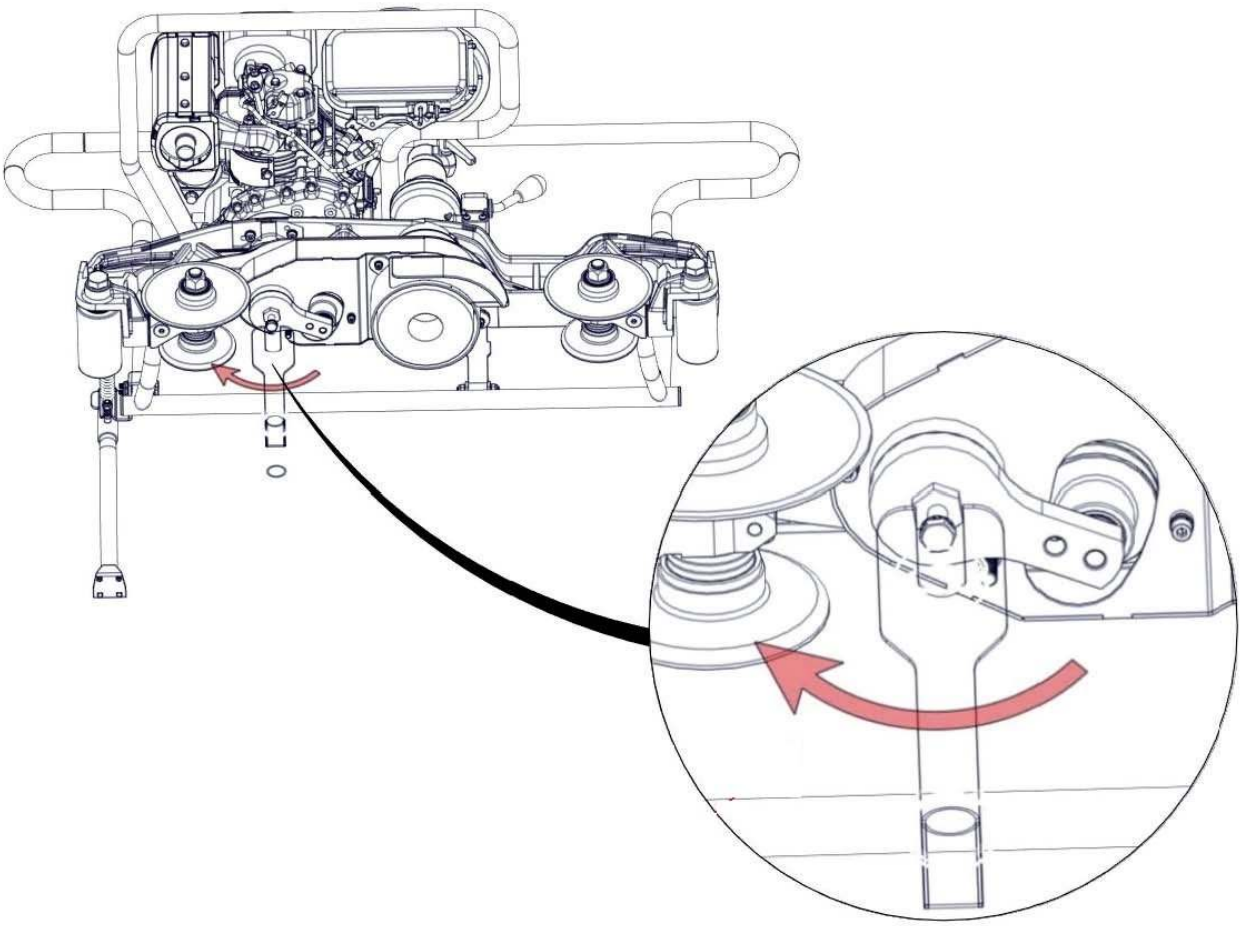


Figure 1.2

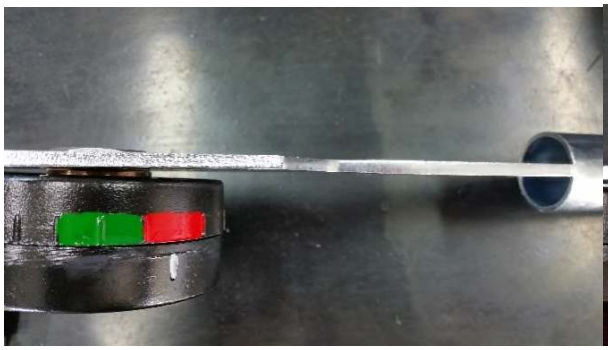


Figure 1-3 Not sufficient tensioning

Figure 1-4 Correct tensioning

The tighten allows to change the position of the hole, positioning the pin in the hole under the tie (F) (fig. 1.5). Once finish this operation (after tighten the screw TE M10), check again the position of the white sign, making sure that it is in the green part (look at figure 1-4).

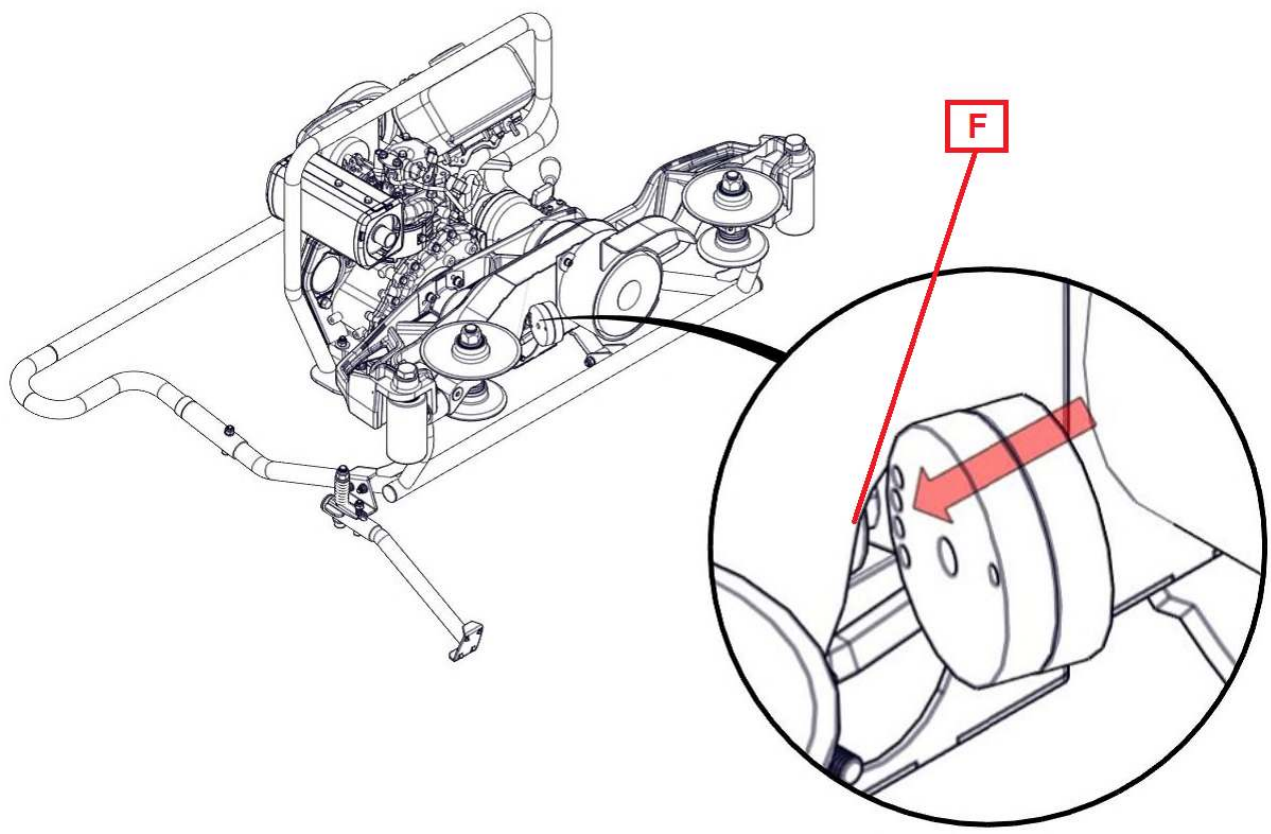
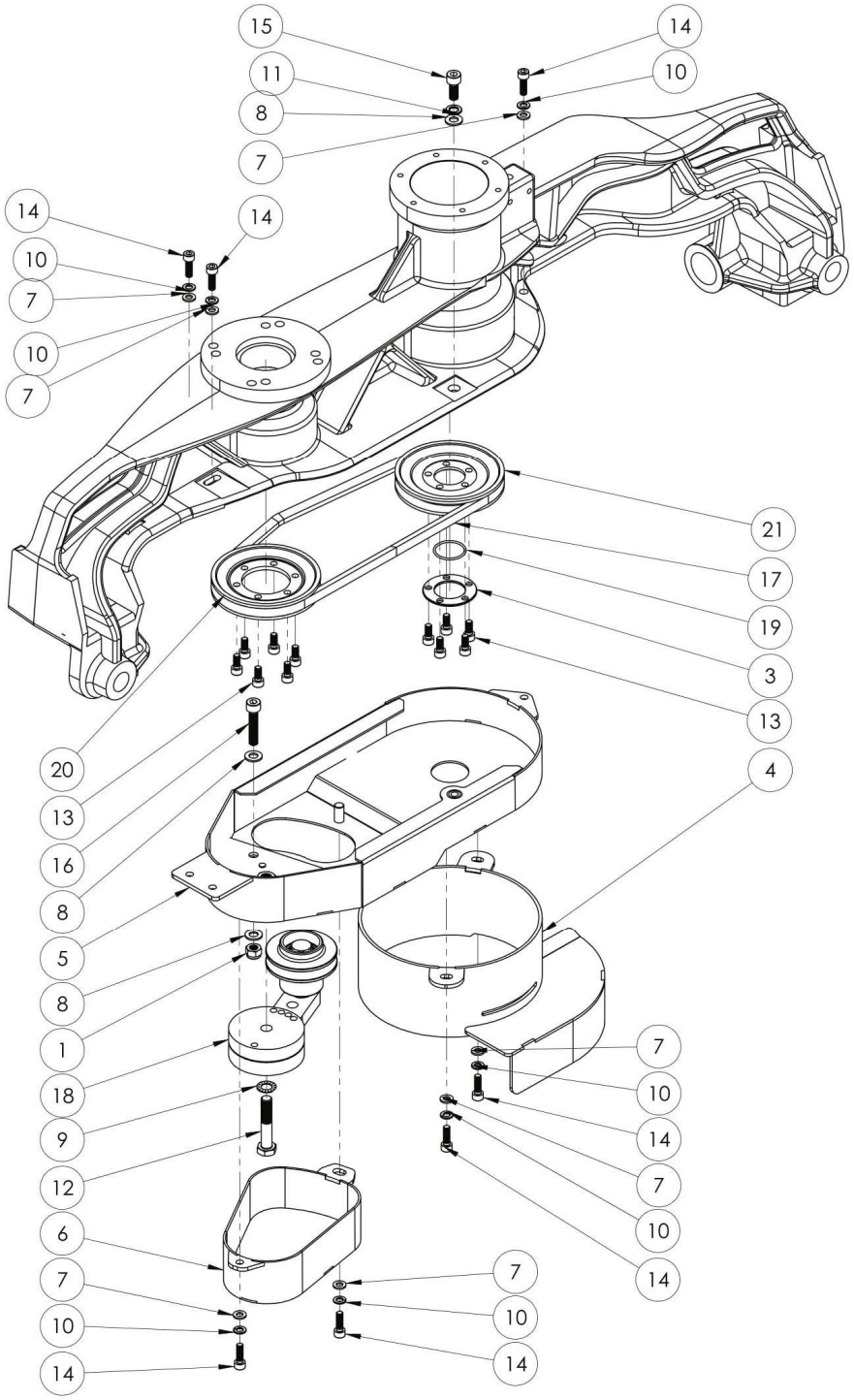


Figure 1.5

6.7 BELT REPLACEMENT

TRANSMISSION AREA – COD. GRI.4.X.0000001



Loosen the carter of the belt tensioner (fig. 1-1), removing the two screws TCEI M6 (n. 14 exploded drawing) and also the screws (n. 14 exploded drawing) of the grindstone carter (n. 4) .

Completely loosen the grindstone and the support M20 from grindstone shaft.

Loosen the three screws TCEI M6 (n. 14) of the belt carter (n. 5) and also the screw TCEI M8 (n. 15) and remove the carter.

Remove the worn belt (n. 17).

6.8 ADJUSTMENT OF THE GUIDE ROLLERS

To adjust the guide rollers you have to add or to remove the washers between the disk and the guide.

For the different types of rail, you have to add or to remove the washers until you have a 5 to 10mm play between the disk and the rail. Using all the spacer washers in the kit, the maximum grinding width of the head is 80mm, taking into consideration the necessary clearance for the correct operation of the machine. However, FCS reserves the right to verify the correct operation of the machine in every limit situation upon sending the construction drawing of the rail.

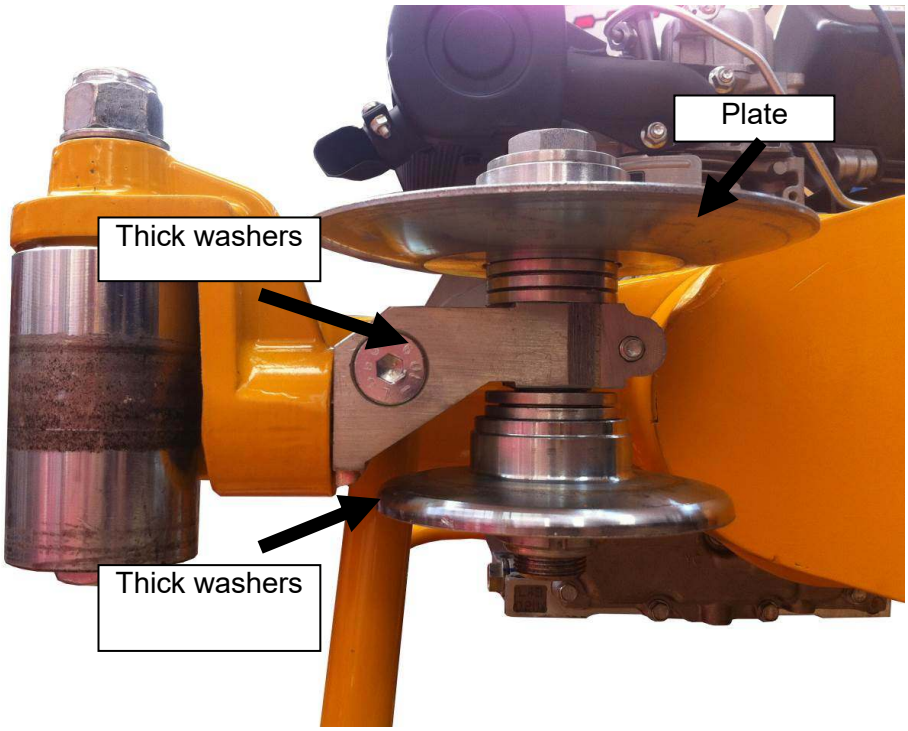
The removed washers have to added on the external side of the big disk and consecutively lock the nuts.

In this adjustment there must be maintained the axis of symmetry of the lane respect to the revolution axis of the disk-driving to the correct grinding of the machine on its working positions.

In this setting the thick washers should be adjusted in equal amounts on the side of the larger plate and part of the smaller plate. In the case of thicknesses is different put one more on the side of the larger plate.

In the case of rails with a head wider than the 80mm above mentioned, it is possible to request a kit of rollers for grinding rails with a head width up to 130mm, always maintaining the necessary clearance between the rail head and the plate. Also in this case, in order to verify the correct operation of the machine, FCS reserves the right to verify it, after sending the construction drawing of the rail to be grind.

In case the customer requires the machine insulation, FCS srl has the opportunity to offer as an option a kit insulated rollers introducing a plastic bushing between the wheels and the metal-metal parts in contact. In this way the machine will be isolated in case of voltage on the railway section where it will work. It is however recommended to always work interrupting the tension on the railway section in which you go to act.



ATTENTION

Maintenance operations have to de executed only by FCS srl's Customer Service or by qualified personnel

7 PREFACE

In order to obtain best performances and to assure all the elements the maximum life, is necessary that use and maintenance's rules are carefully followed by the operators in charge. For this we suggest to Customers, in their interest, to carefully read these notes and to consult the manual every time they need suggestions to avoid eventual drawbacks.

For further clarifications call up our customer care:

- All the maintenance's operations have to be performed with engine shut off.
- Ordinary maintenance includes all the necessary information for the good functioning and preservation of the machine.
- We suggest to let the same operator do maintenance operations, he is familiar with the machine how it works and has to know what is in the manual.
- Check of lubricant's levels must be done at cold machine and set on a lever place. Before checking levels, carefully clean areas to inspect to avoid foreign bodies enter. In case of re-establishment, use clean bins and assure that foreign bodies don't enter in the lubricant.
- Some maintenance's interventions to the engine must be researched in the specific manual.
- During the disassembling and re-assembling you always have to use the extractor, keys and suitable equipment to avoid deteriorate parts.
- To unlock parts solidly adherent, use copper's hammer or suitable tools.
- Separate clearly elements of various groups and screw back the nut in part on its pins or studs. Clean the parts with a rag and then clean with de-grease blowing off residuals with compressed air.
- After grinding process or remachining with abrasive bodies , carefully clean the parts or blow them with compressed air assuring the complete aspiration of the abrasive dust.
- During the re-assembling of various parts, assure that they are clean and then carefully lubricate.

Ordinary maintenance's operations indicated on the table that follows must have the same frequency of the machine's working hours indicated on the column at the right, under period.

8 MAINTENANCE TABLE

Nº	OPERATION	PERIOD
1	Check the correct engine oil lever and eventual top up (only petrol and diesel version). For MPR 4000 E version, check the status of the electrical connections and of the console	**Before every use**
2	Replacement of the engine oil diesel engine	1 TIME AFTER 20 HOURS – AND SUBSEQUENTLY AFTER EVERY 50 HOURS
3	Replacement of the engine oil petrol engine	1 TIME AFTER 15 HOURS – AND SUBSEQUENTLY AFTER EVERY 50 HOURS
4	Check the trapezoidal belt tension (if there is a belt tensioner)	40 HOURS
5	Grease the machine with grease SYLAN 3	40 HOURS
6	Check and eventual clean the air filter of the engine	CHECK AFTER EVERY 50 HOURS
7	Replacement of the air filter of the engine	AFTER 200 HOURS
8	Check and eventually replace the spark plug of the engine (only petrol and mixture version)	As needed
9	Check of the fuel filter of the engine	EVERY 20 HOURS
10	Replacement of the fuel filter of the engine	AFTER 200 HOURS
11	Check of the rubber gasket integrity	3 months
12	Replacement of the rubber gasket	AFTER 2 YEARS
13	Check of the power plant	EVERY 50 HOURS
14	Replacement of the power plant	EVERY 2 YEARS
15	Check of the tightening of the bolts	1 time after 16 hours – and subsequently after 80 hours
16	Check of the thermic engine fixing	1 time after 16 hours – and subsequently after 80 hours

ATTENTION

To increase the life of the engine and then the machine it is advisable to change the engine oil every 50 hours, thus decreasing the amount of time recommended on the manual of use and maintenance of the engine (only with petrol and diesel engine)

ATTENTION

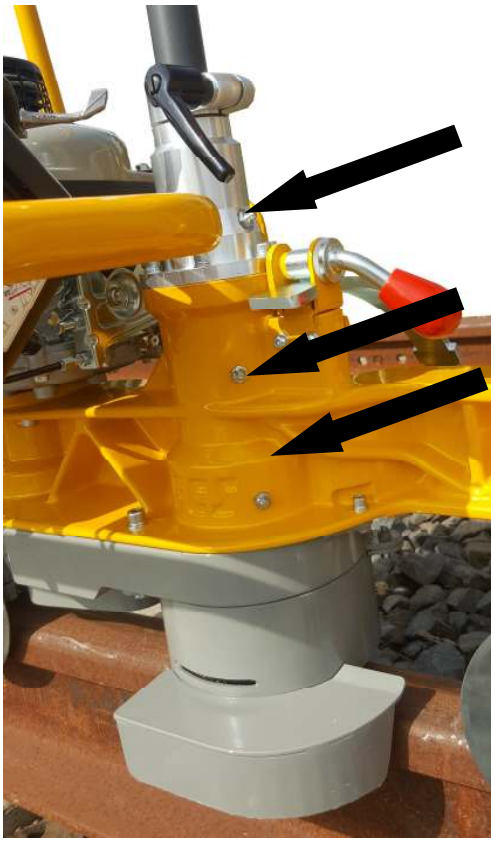
Refuel and substitute the engine oil till the correct level placing the machine as the engine sump is in the lower position as possible and parallel to the ground

ATTENTION

For the maintenance engine refer to the manual of use and maintenance of the same engine.

8.1 MACHINE GREASING POINTS

Grease the machine respecting the maintenance interval reported in the table to the point using the greasers installed on the machine. The greasing points are A , B, C, shown in the figure. The type of grease to use is bearing grease type SYLAN.The amount of grease is indeterminable because it depends on how much you consume during work. As an indication, it can be asserted that for each greasing point it is necessary to pump about 3 cm of fat (equivalent to about 3-5 pumped with a greasing pump). Keep in mind that the indication absolutely to follow is that in the phase of "refill fat" of the fat must not "exceed" with the force exerted on the lever of the greaser equipment. The fat must flow freely within the mechanisms.



9 FIRE

In case of start of a fire, use a CO2 extinguisher (not supplied) according to guidelines in force.

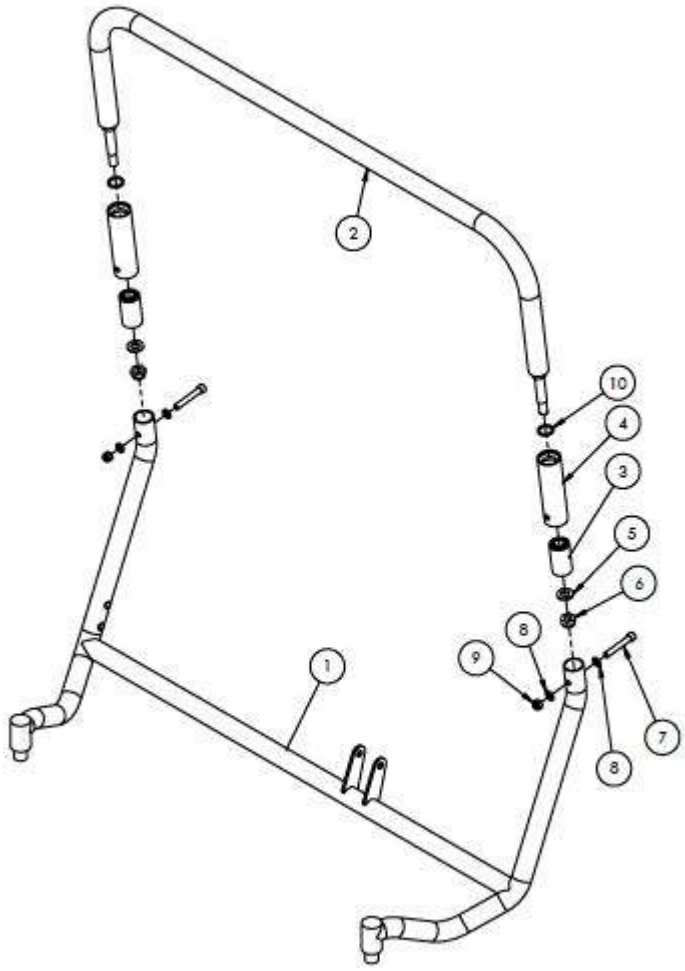
In case of machine's fire or if the machine is near a fire, give the alarm in the yard and call the fire brigade.

10 BREAKING UP AND DISPOSAL

At the end of machine's life, remember that the owner of the machine must provide for its dismantling for the machine disposer according to guidelines in force.
Remember that every time that you substitute oil, hose and every machine's detail prone to different disposal, you always need to make reference to rules in force and to authorized disposals.

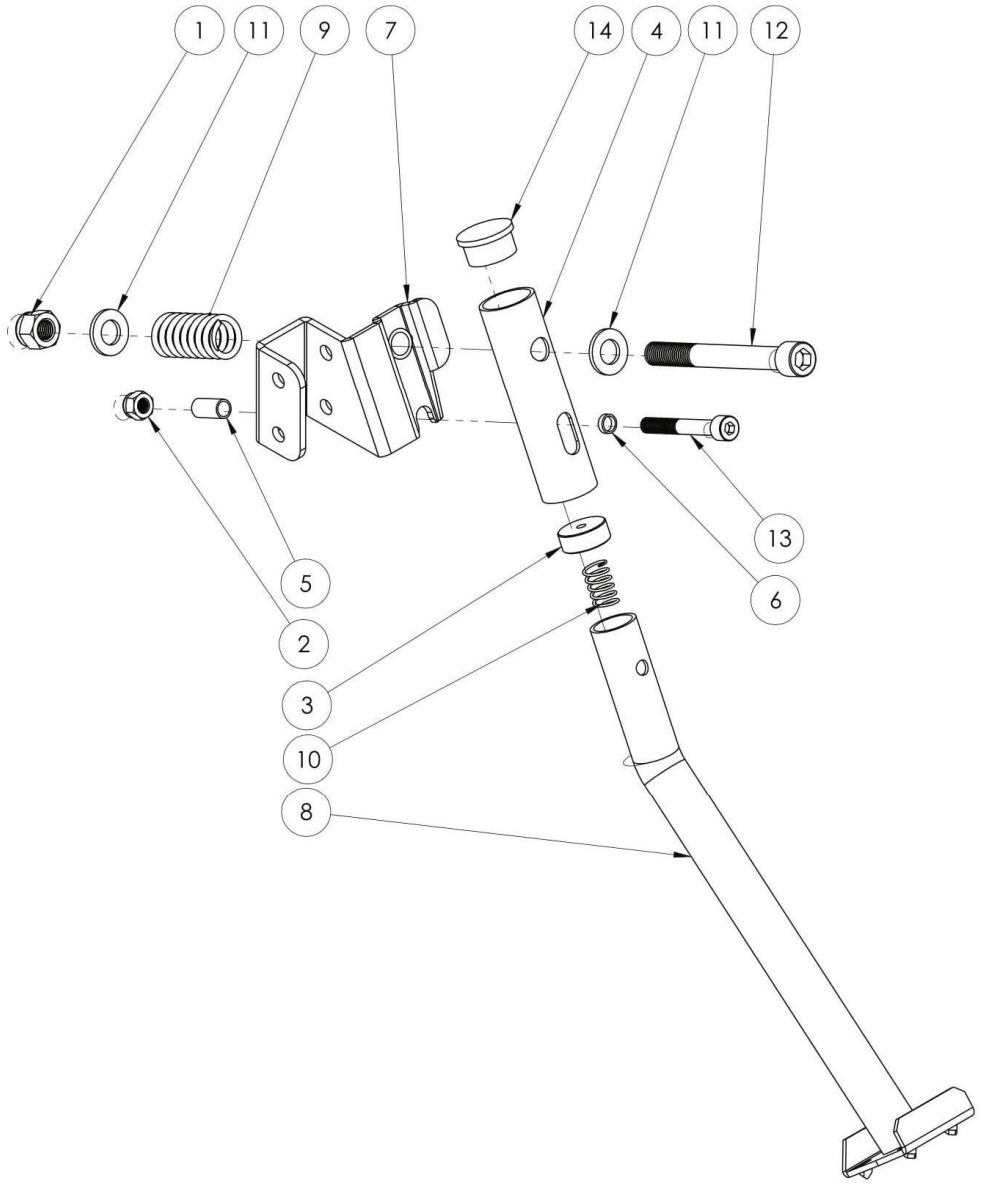
11 EXPLODED DRAWINGS AND SPARE PARTS

OVERALL SHAPE OF HANDLE – COD. AS003157



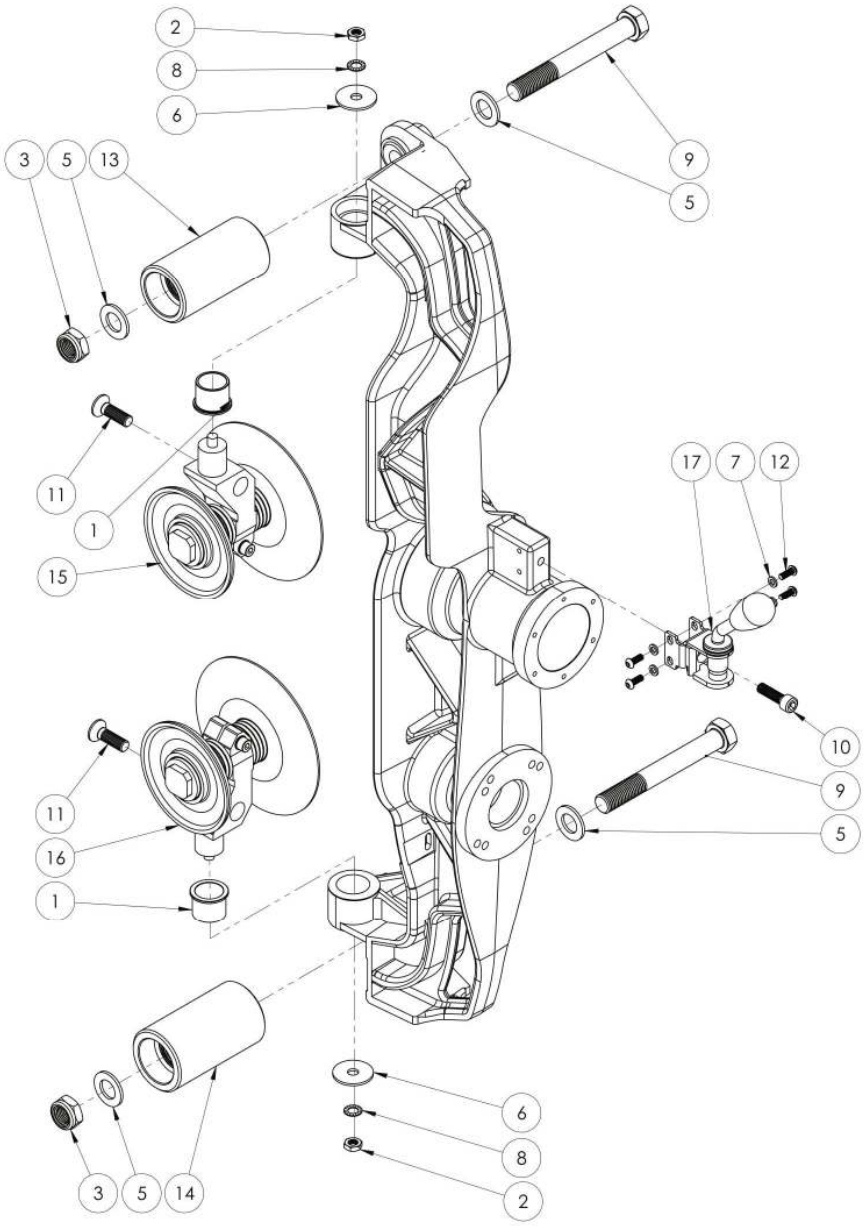
Pos.	Code	Description	Quantity
1	MPR44560	Lower handlebar frame	1
2	AS003393	Upper handle	1
3	G0022869	Antivibration	2
4	MPR44564	Anti-vibration connection	2
5	R0013008	Washer	2
6	D0013012	Nut	2
7	V0013081	Screw	2
8	TFF05092	Washer	4
9	D0013004	Nut	2
10	GU004572	O-Ring	2

OVERALL STAND – COD. MPR44592



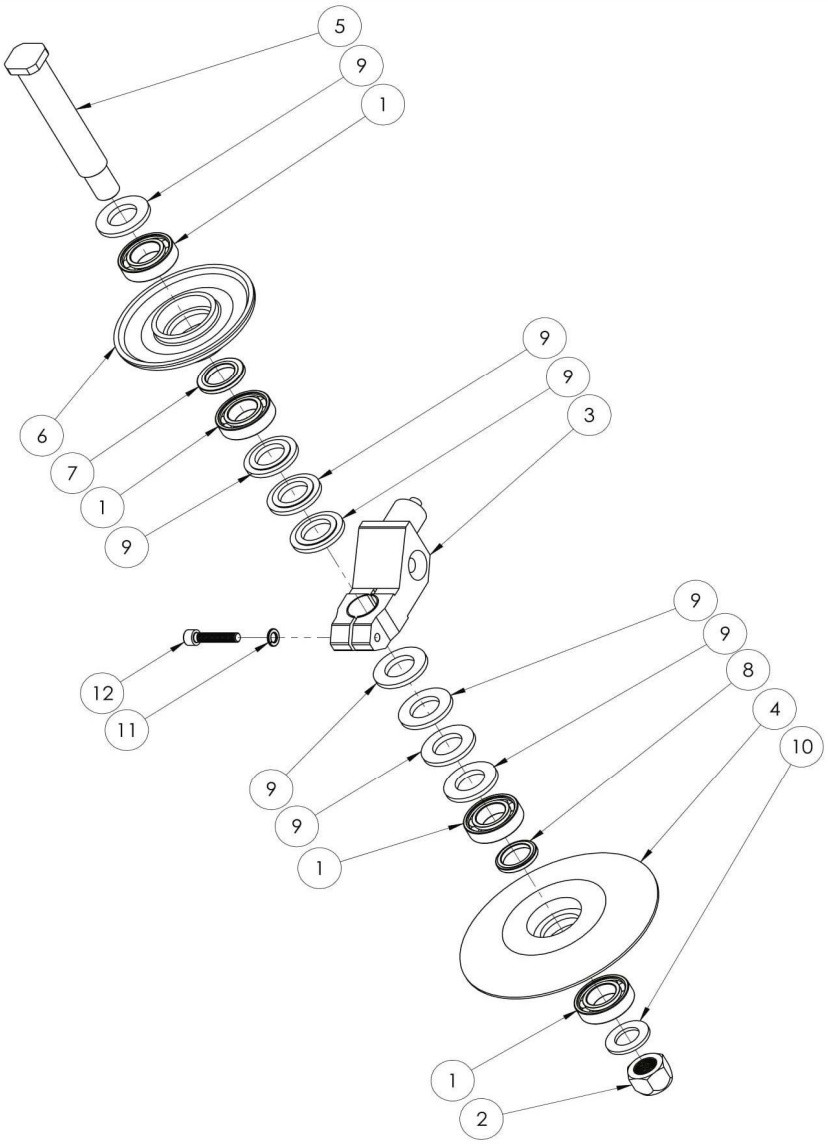
Pos.	Codice	Descrizione	Q.tà
1	D0013012	Nut	1
2	D0013004	Nut	1
3	MPR44701	Spring plate	1
4	MPR44702	Upper leg	1
5	MPR44704	Spacer	1
6	MPR44703	Spacer	1
7	MPR45481	Overall support	1
8	MPR45480	Overall lower leg	1
9	MPR44697	Spring	1
10	MPR44698	Spring	1
11	R0013008	Washer	2
12	V0016471	Screw	1
13	V0016472	Screw	1
14	G0022949	Tap	1

FRAME AREA – COD. GRI.2.A.0000001



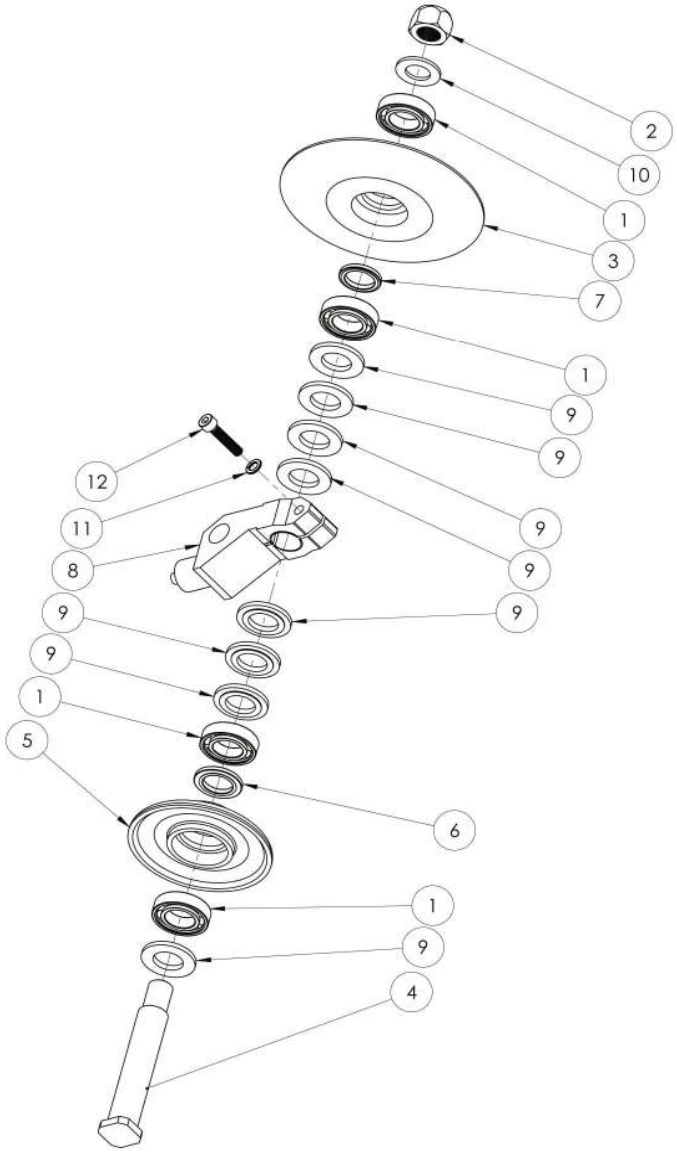
Pos.	Code	Description	Q.ty	Pos.	Code	Description	Q.ty
1	MPR45384	Balance bushing	2	10	V0013038	Screw	1
2	D0013005	Nut	2	11	V0013010	Screw	2
3	D0013001	Nut	2	12	TFF05112	Screw	4
5	R0013008	Washer	4	13	MPR44581	Roll Ø63	1
6	R0013035	Washer	2	14	MPR44582	Roll Ø67	1
7	R0013006	Washer	4	15	MPR45484	Right support	1
8	R0012219	Washer	2	16	MPR45485	Left support	1
9	V0013079	Screw	2	17	MPR44591	Overall smart locking	1

RIGHT WHEEL ASSEMBLY – COD. MPR45485



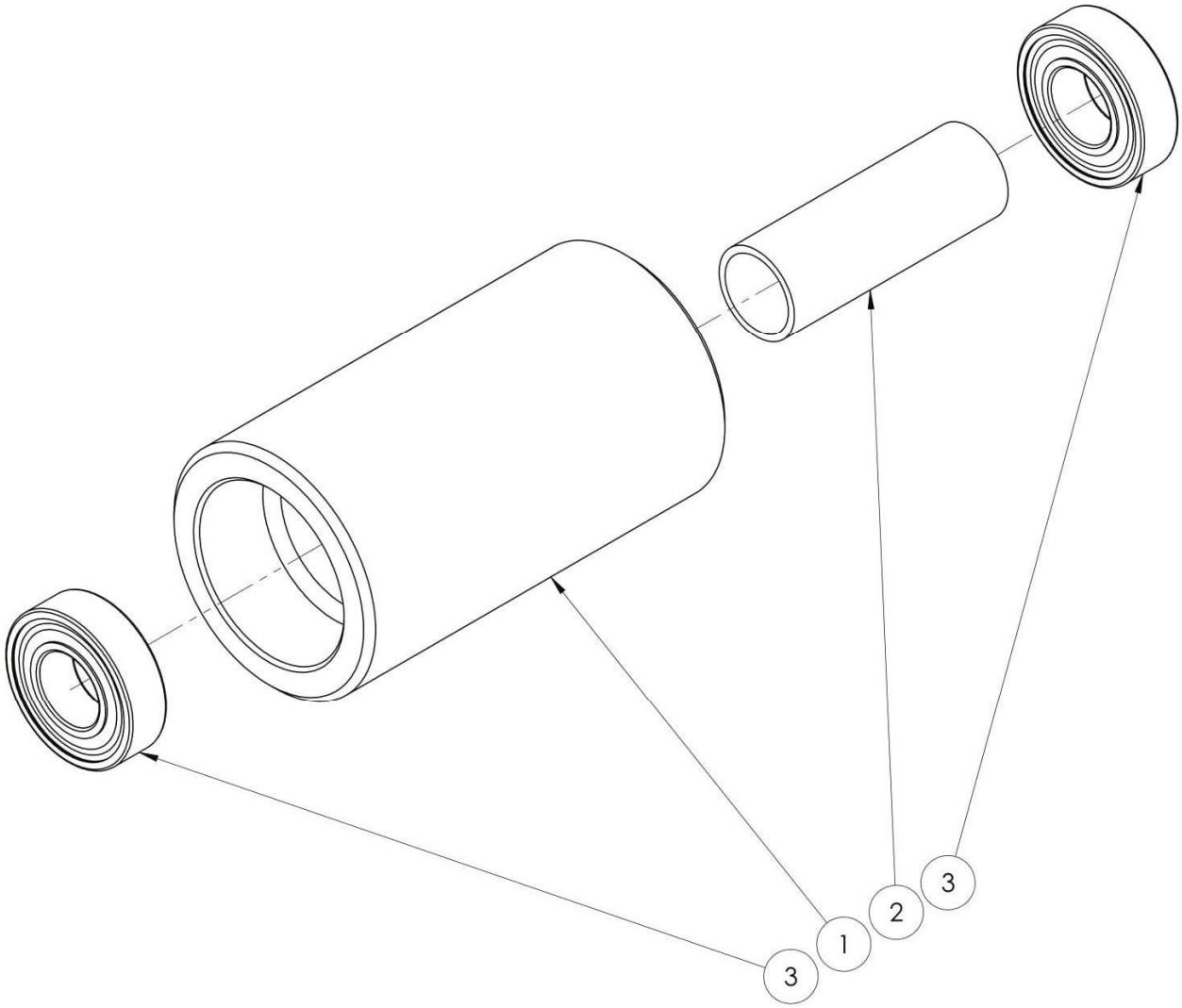
Pos.	Code	Description	Q.ty
1	CU012408	Bearing	4
2	D0016469	Nut	1
3	MPR45482	Right Balance	1
4	RU002108	Top wheel	1
5	MPR44535	Pivot	1
6	RU002117	Bottom wheel	1
7	MPR44536	Bottom wheel spacer	1
8	MPR44537	Upper wheel spacer	1
9	D0112122	Spacer	8
10	R0013000	Washer	1
11	R0013017	Washer	1
12	V0013000	Screw	1

LEFT WHEEL ASSEMBLY – COD. MPR45484



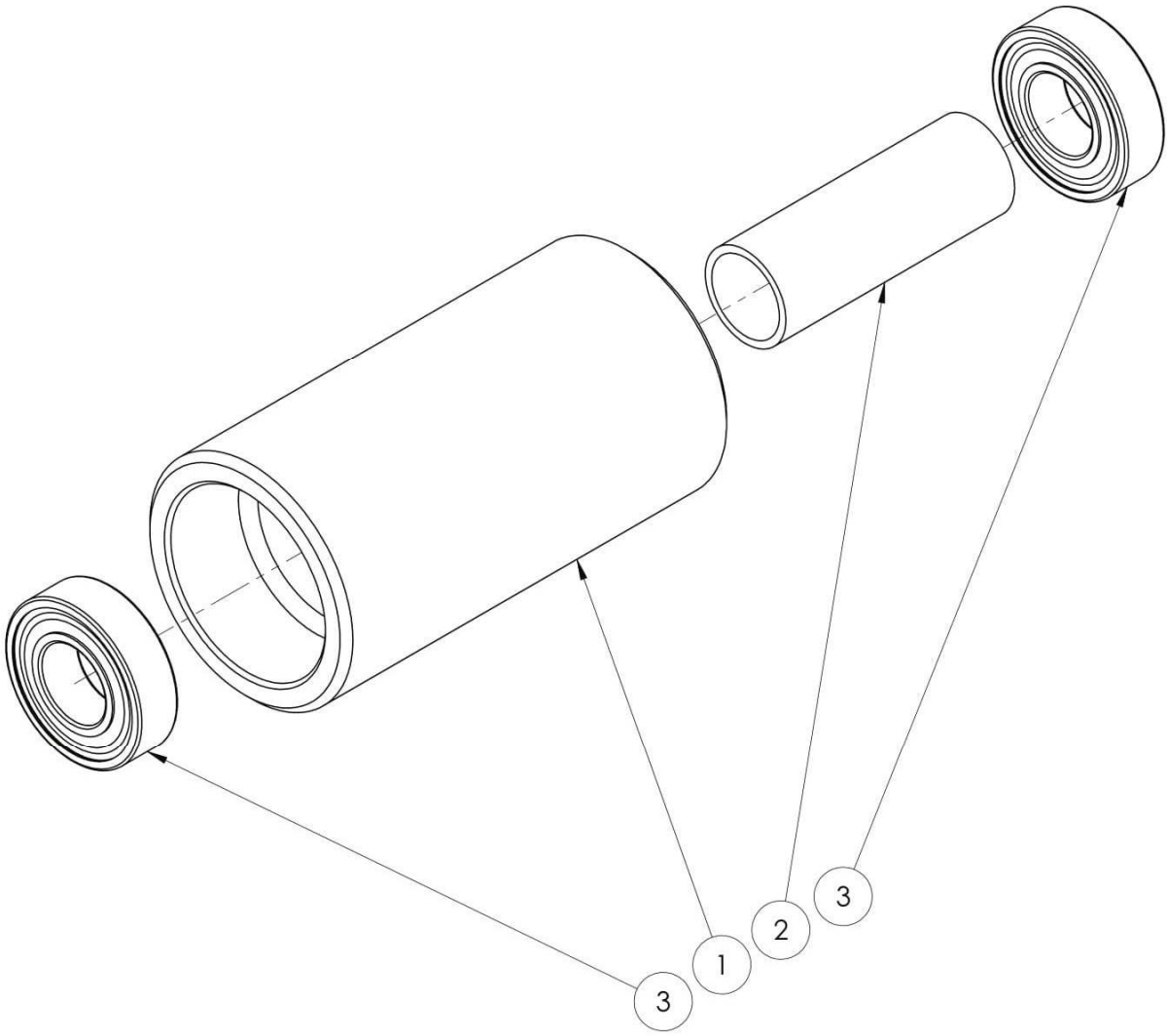
Pos.	Code	Description	Q.ty
1	CU012408	Bearing	4
2	D0016469	Nut	1
3	RU002108	Top wheel	1
4	MPR44535	Pivot	1
5	RU002117	Bottom wheel	1
6	MPR44536	Bottom wheel spacer	1
7	MPR44537	Upper wheel spacer	1
8	MPR45483	Left balance	1
9	D0112122	Spacer	8
10	R0013000	Washer	1
11	R0013017	Washer	1
12	V0013000	Screw	1

RIGHT ROLLER ASSEMBLY – COD. MPR44582



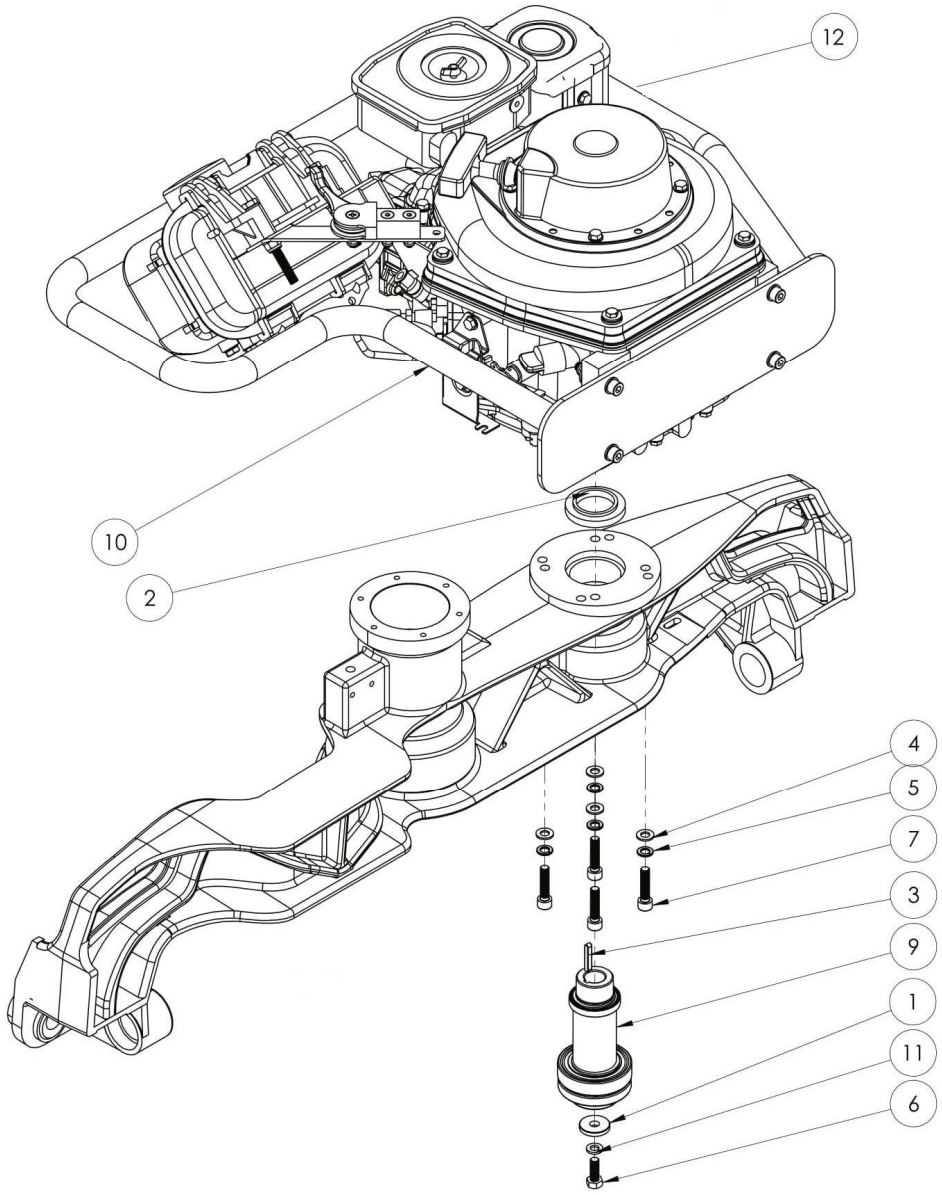
Pos.	Codice	Descrizione	Q.tà
1	MPR44552	Wheel Ø67	1
2	D0112125	Spacer	1
3	CU012409	Bearing	2

LEFT ROLLER ASSEMBLY – COD. MPR44581



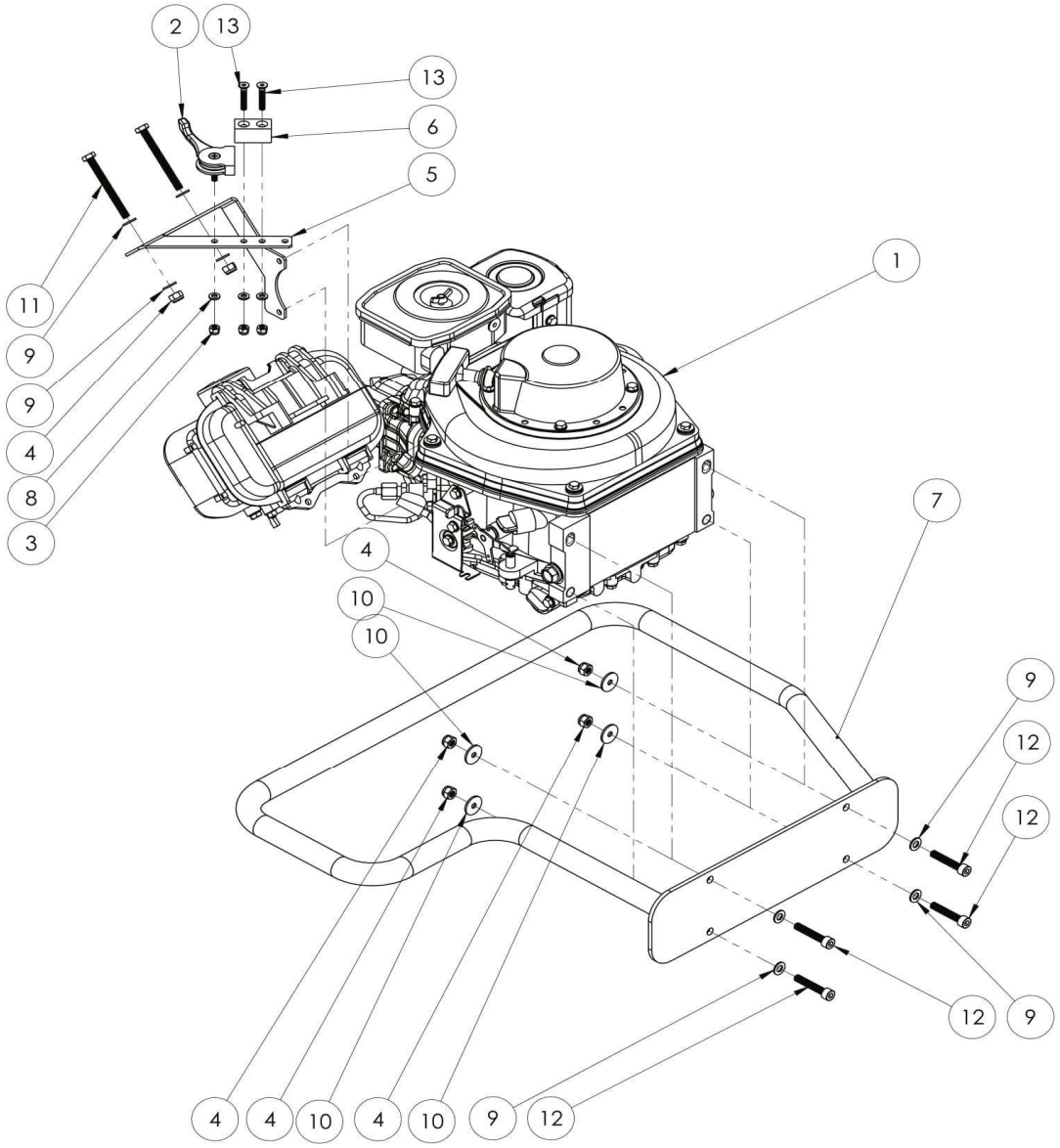
Pos.	Code	Description	Q.ty
1	MPR44551	Wheel Ø63	4
2	D0112125	Spacer	1
3	CU012409	Bearing	1

YANMAR ENGINE AREA– COD. GRI.3.A.0000001



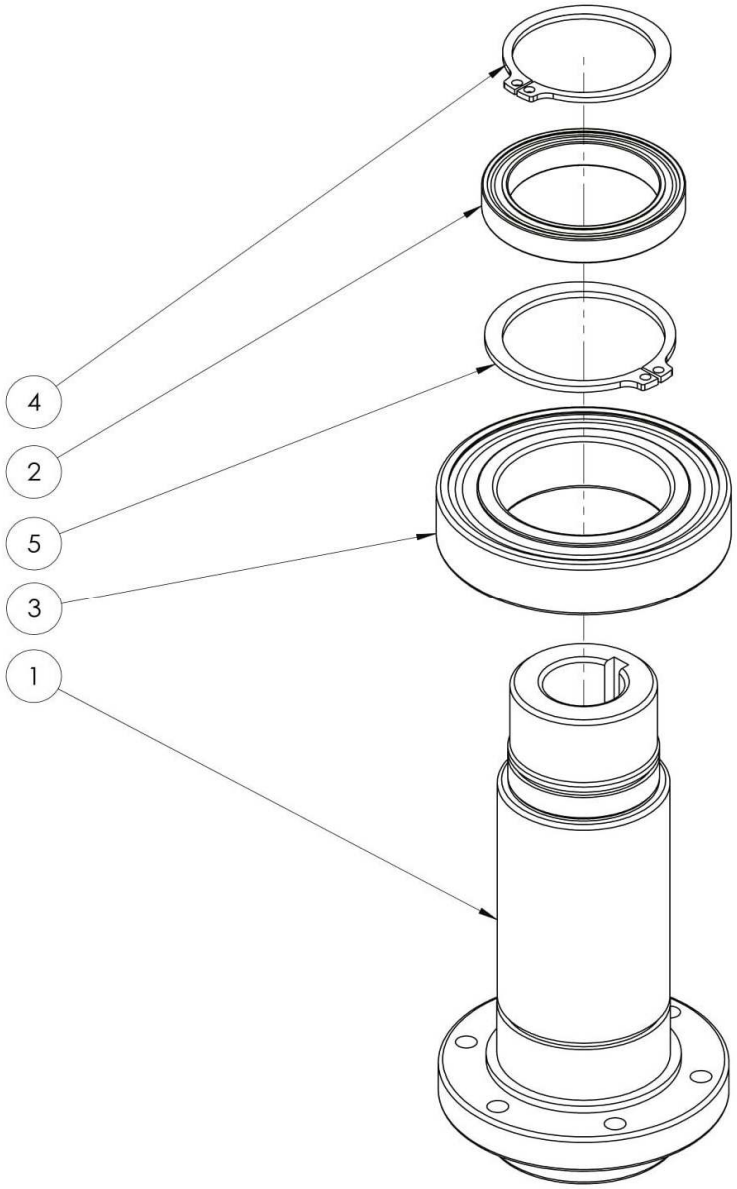
Pos.	Codice	Descrizione	Q.tà
1	GRI.3.M.0000006	Thickness of crankshaft	1
2	A0012115	Engine reduction	1
3	CM003524	Wedge	1
4	R0013002	Washer	4
5	R0013017	Washer	4
6	CM003525	Screw	1
7	V0013001	Screw	4
9	MPR46860	Crankshaft assembly	1
10	AS003135	Engine protection	1
11	R1025ZZ15	Washer	1
12	AS002354	Yanmar engine assembly	1

YANMAR ENGINE ASSEMBLY– COD. GRI.3.A.0000002



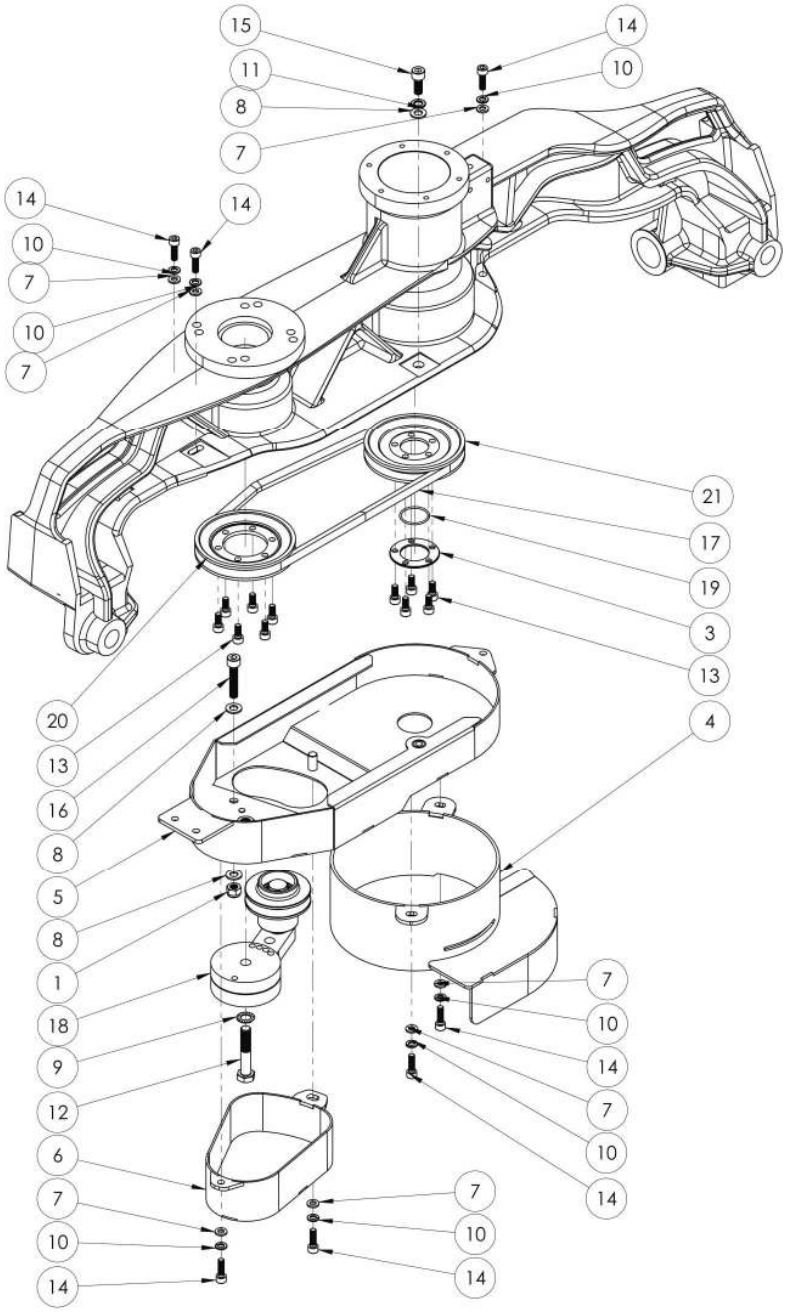
Pos.	Code	Description	Q.ty
1	AS006722	Yanmar engine L48V	1
2	CM003166	Hand throttle	1
3	D0013009	Nut	3
4	D0013015	Nut	6
5	L0012394	Tank support bracket	1
6	B0004226	Accelerator block	1
7	AS003135	Engine protection	1
8	R0013006	Washer	3
9	R0013002	Washer	8
10	R0013016	Washer	4
11	V0016477	Screw	2
12	V0013074	Screw	4
13	V0013025	Screw	2

YANMAR CRANKSHAFT ASSEMBLY – MPR46860



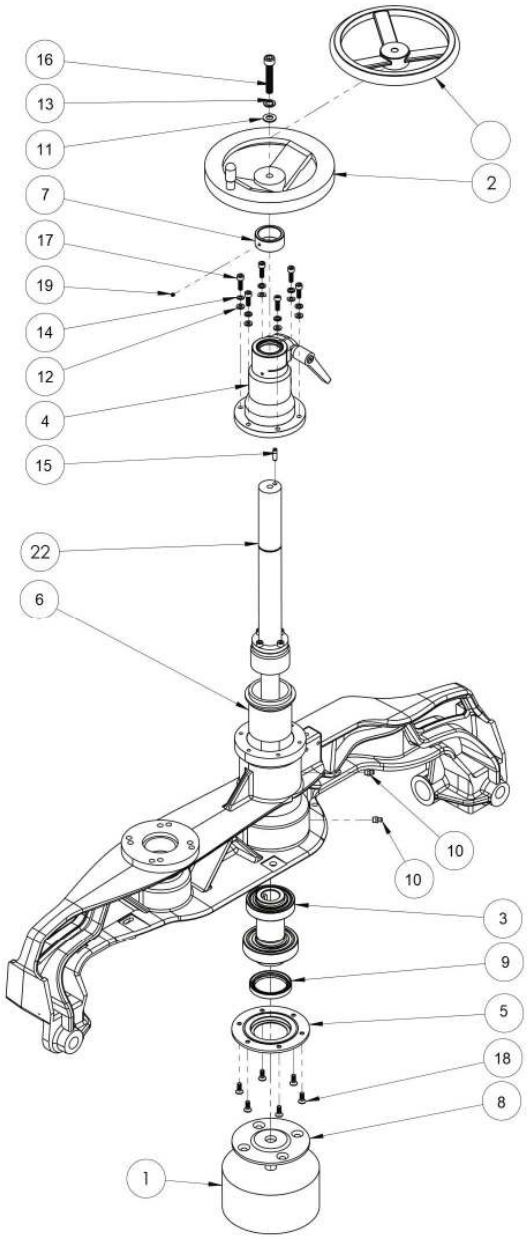
Pos.	Code	Description	Q.ty
1	A0012116	Yanmar Crankshaft	1
2	CU012482	Bearing	1
3	CU012481	Bearing	1
4	S0013007	Ring seeger	1
5	S0013006	Ring seeger	1

TRANSMISSION AREA – COD. GRI.4.A.0000001



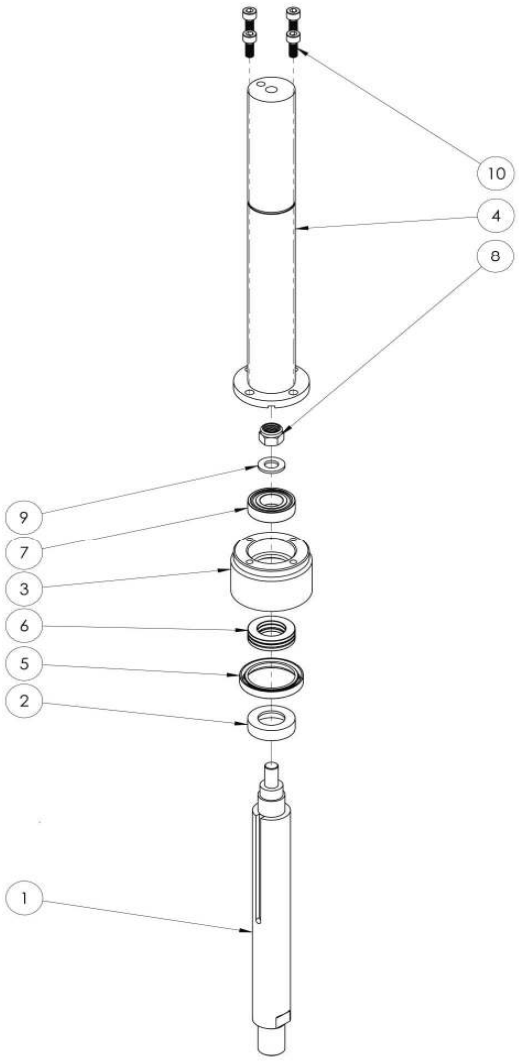
Pos.	Code	Description	Q.ty	Pos.	Code	Description	Q.ty
1	TFF05087	Nut	1	12	V0013003	Screw	1
3	MPR44532	Pulley ring	1	13	V0013069	Screw	11
4	MPR44569	Stone carter	1	14	V0013016	Screw	7
5	MPR44567	Carter belt protection	1	15	V0013007	Screw	1
6	MPR44571	Belt tensioner carter	1	16	V0016063	Screw	1
7	R0013006	Washer	1	17	CI004547	Transmission belt	1
8	R0013002	Washer	7	18	MPR44538	Belt tensioner	1
9	R0012219	Washer	3	19	MPR44550	O-Ring pulley	1
10	R0013018	Washer	1	20	P0004434	Engine pulley	1
11	R0013017	Washer	7	21	P0004435	Stone pulley	1

STONE ADJUSTMENT AREA - COD. MPR46863



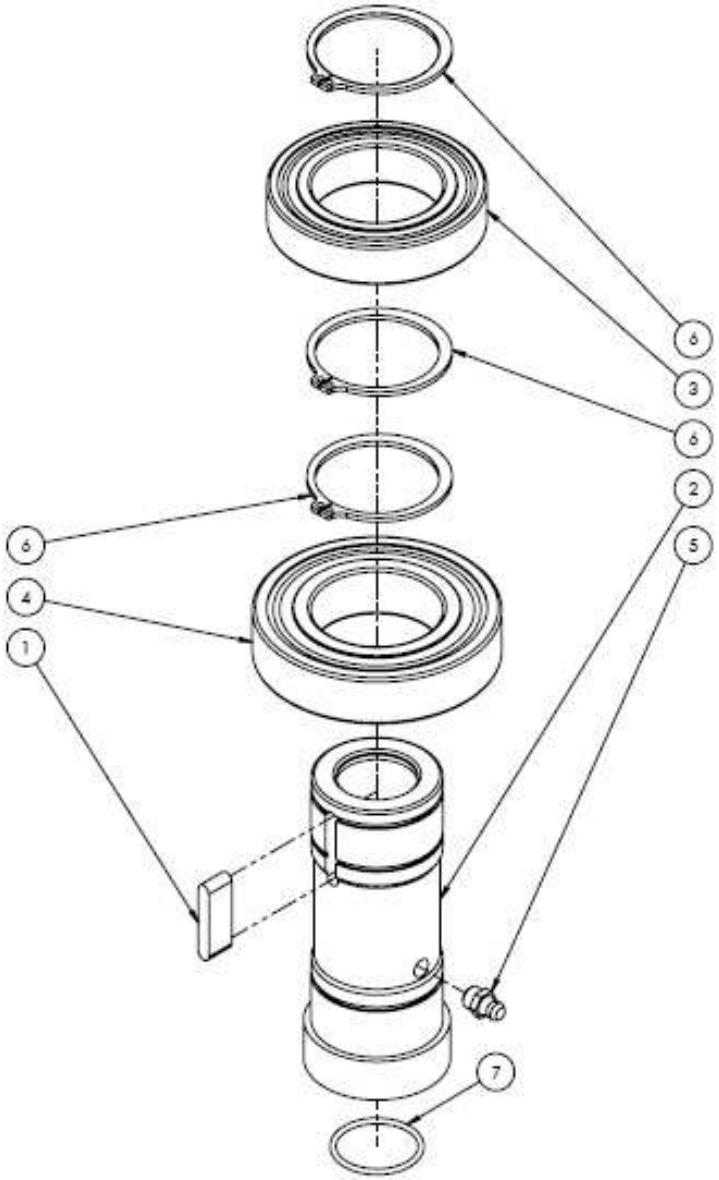
Pos.	Code	Description	Q.ty	Pos.	Code	Description	Q.ty
1	MO000651	Grindstone	1	11	R0013003	Washer	1
	MO001834	Grindstone M20	1	12	R0013006	Washer	6
2	VO002852	Aluminium wheel	1	13	R0013022	Washer	1
3	MPR46861	Stone shaft assembly	1	14	R0013018	Washer	6
4	MPR46862	Quill support assembly	1	15	S0023001	Elastic plug	1
5	B0002109	Oil seal support	1	16	V0013082	Screw	1
6	AL002106	Female adjusting cover	1	17	V0013016	Screw	6
7	B0002121	Spacer	1	18	V0013008	Screw	6
8	B0002113	Plate Support	1	19	GR013000	Wheat	1
	B0002854	Plate Support M20	1	22	AS006847	Stone shaft assembly	1
9	GU002945	Sealing ring	1				
10	I0073000	Lubricator	2				

STONE SHAFT ASSEMBLY – COD. MPR46863



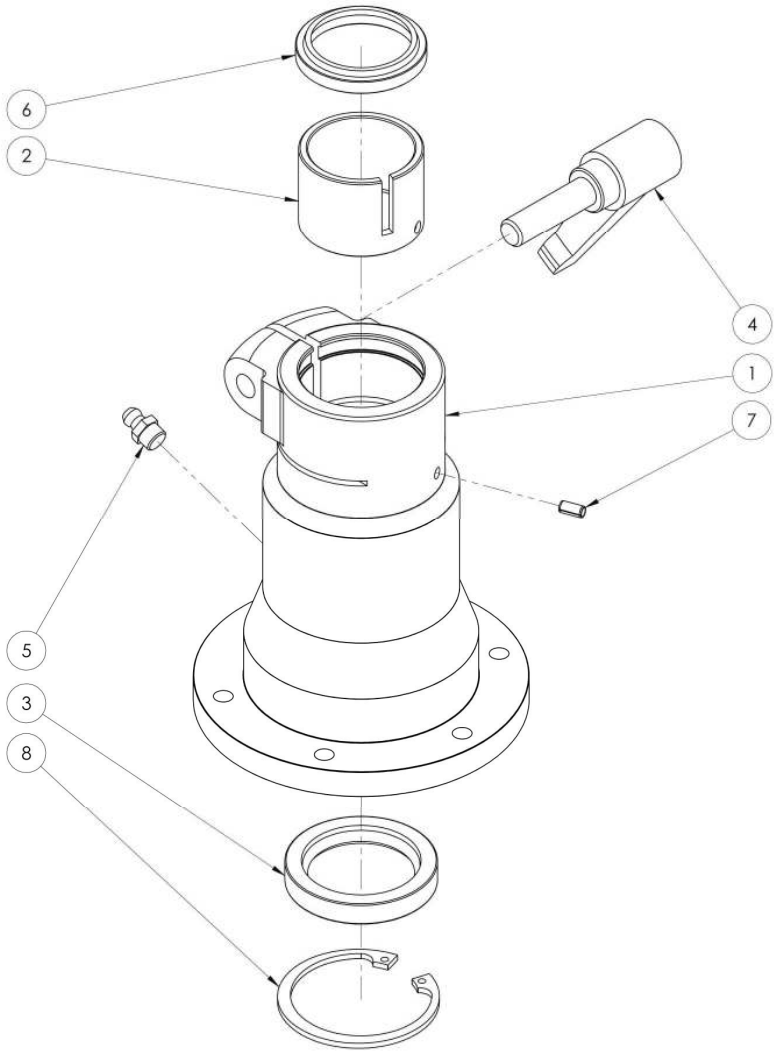
Pos.	Code	Description	Q.ty
1	A0012830	Stone crankshaft	1
2	MPR45360	Bush for grindstone shaft	1
3	AL002112	Male adjusting cover	1
4	MPR44543	Crankshaft registry	1
5	GU002944	Sealing ring	1
6	CU002479	Bearing	1
7	CU012957	Bearing	1
8	D0013006	Nut	1
9	R0013003	Washer	1
10	TFF05109	Screw	4

STONE CRANKSHAFT ASSEMBLY – COD. MPR46861



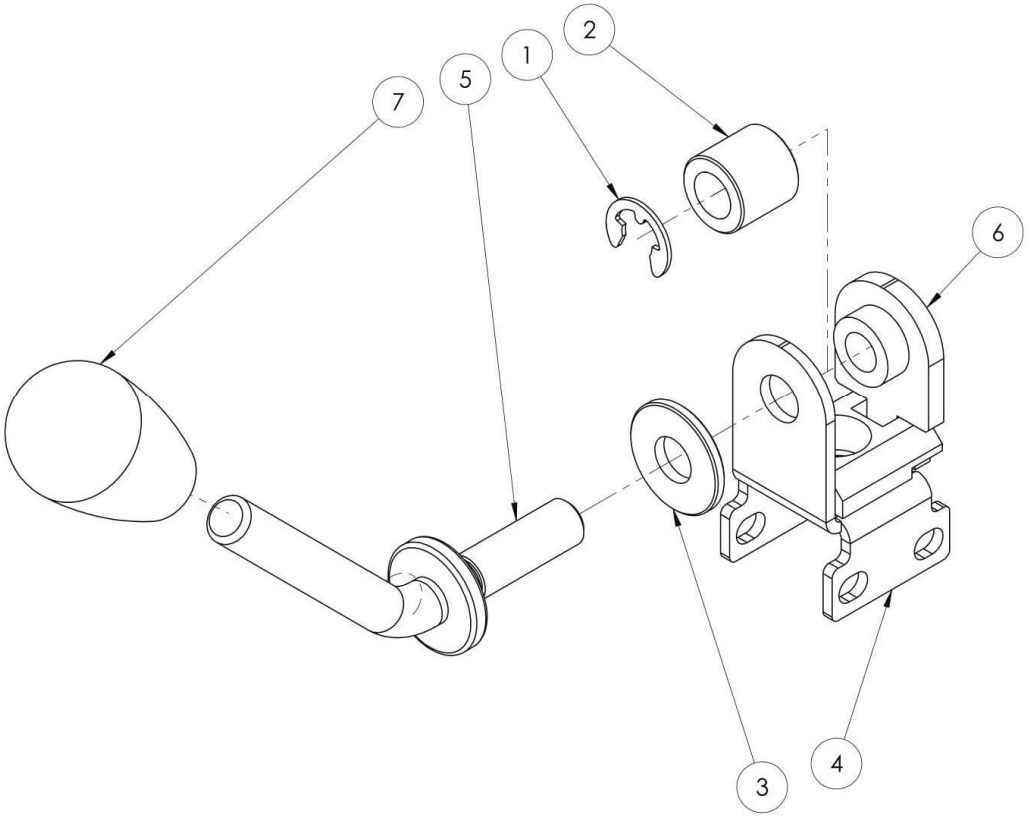
Pos.	Code	Description	Q.ty
1	S0022832	Pin	1
2	A0012111	Grindstone shaft	1
3	CU012956	Bearing	1
4	CU012955	Bearing	1
5	I0073000	Lubricator	1
6	S0013005	Seeger	3
7	MPR45327	O-Ring	1

SUPPORT QUILL ASSEMBLY – COD. MPR46862



Pos.	Code	Description	Q.ty
1	MPR44548	Quill support	1
2	MPR44549	Bushing in teflon	1
3	GU003271	Seal Ring	1
4	M0032847	Lever	1
5	I0073000	Lubricator	1
6	MPR44558	Dust cover	1
7	S0023008	Pin	1
8	S0013013	Seeger	1

SMART LOCKING ASSEMBLY – COD. MPR44591



Pos.	Code	Description	Q.ty
1	S0013017	Seeger	1
2	MPR44711	Spacer bushing	1
3	MPR44737	Spacer sliding	1
4	MPR44709	Clamp together	1
5	MPR44712	Threaded pin assembly	1
6	MPR44710	Fixing plate	1
7	MPR44669	Pomell	1