



PARK PRO 340 IX 2016-2020





Mountfield





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1 General instructions

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This manual refers to the PARK PRO 340 IX. The technical data can be found also in the "INSTRUCTION MANUAL".

This manual does not contemplate repairs to the engine or the transmission. In the event of any problems concerning engines and transmission parts, contact the relative Service Centre.

This manual and relative specifications refer to the machine in its original state. This manual does not cover machines which have undergone modifications designed to alter the machine itself.

1.1 Introduction

1.1.1 Limited liability

Despite the care and attention which has gone into the preparation of this manual, the possibility of errors cannot be excluded. The author is not responsible for any information which may be missing or incorrect. STIGA reserves the right to make changes to the product at regular intervals without prior notice. The information provided in this manual is based on data available at the time of publication. The drawings and photographs herein may not completely match the machine you are working on in every detail.

1.1.2 How to read this manual

This manual is divided into chapters, headings and subheadings. The title of the paragraph "2.1 Rear wheels" is a subheading in chapter 2 "Frame and safety guards" References to titles or paragraphs are indicated with the abbreviation "chap." or "par." accompanied by the relative number. Example: "chap. 2" or "par. 2.1".

To facilitate consultation of the manual, each chapter is dedicated to a specific component. There is a table of contents at the beginning of each chapter. The cover, on the other hand, holds a general index of the chapters.

References to paragraphs or subheadings are indicated by the symbol provided by the paragraph / subheading number, e.g: 1.1.3.

1.1.3 Figures



To identify the various components in the figures, alphabetical "numbering" is used. In each figure numbering begins with (A). An exception is made when a series of figures are needed to describe an operation: in this case each component is given the same letter in every figure it appears in.

1.1.4 Symbols, General warnings

This manual makes use of certain symbols. Their function is to bring the attention of the reader to the most important notes so that he can carry out the operations with due caution:



Warning!

This symbol indicates that failure to carefully follow the instructions may result in injury.



Caution!

This symbol indicates that failure to carefully follow the instructions may result in damage to materials and equipment.

NOTE This text highlights the need to read the information carefully.



This symbol indicates a reference to another section of the manual. Click on the number to go to the section indicated.



Highlights all the operations which require different methods of intervention depending on the version of the machine, any modifications which have been made over time and the accessories installed.

All the indications "front", "back", "right" and "left" are in relation to the position of the seated operator.

The description of elementary operations which any good mechanic should be able to perform have deliberately been left out of this manual, giving preference to more specific aspects with indications of the most

NOTE suitable methods for optimum execution of the works. Please take care to read all the contents in this manual so as to become familiar with the machine: this is essential if you want to work rationally on the machine without making mistakes and wasting time. Remember that all problems connected with use of the machine are amply covered in the User Manual.

Hot parts

Please note that the engine and exhaust systems heat up significantly during use. To avoid the risk of injury, give the engine and exhaust system time to cool down before starting any repair or maintenance work on the machine.

1.1.5 Abbreviations

The following abbreviations are used in this manual:

Chap. = Chapter - Par. = Paragraph - HST = Hydrostatic Transmission - PTO = Power Take-Off.

1.1.6 Safety instructions

A. Level of technician training

All maintenance, disassembly and repair operations must be carried out by expert maintenance mechanics who are familiar with all the safety and accident prevention regulations and have read the procedures described in this manual

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B. Safety principles to be implemented

All the machines have been built in compliance with the strictest European standards on safety. To keep the initial level of safety unaltered over time, it is important for the Service Centre to act accordingly and carry out all necessary checks and inspections whenever possible.

In particular, each time work on the machine is requested it must:

1. check:

- correct operation of the safety microswitches; •
- that none of the safety guards or devices have been removed; •
- that none of the safety/warning decals have become illegible/damaged (these are • considered integral parts of the safety devices).

2. it must also:

- restore correct operation of any safety devices which may have been removed or tampered with;
- reinstall any ineffective, damaged and/or missing safeguards; •
- replace any illegible decals; •
- avoid carrying out any work or modification to the machine or engine which changes • its operating performance or could lead to use of the machine which is improper or in any case different to the use it was designed and homologated to carry out;
- inform the Customer that any failure to observe the aforementioned points will automatically nullify the warranty and exonerate the manufacturer from all liability.

C. Precautions during work

The interventions described herein do not usually entail any particularly hazardous situations except for those usually linked to any kind of mechanical work. Any risks can be avoided by taking the usual amount care and attention required for this kind of work. As well as observance of the usual rules and regulations on the prevention of accidents common to workshops, please remember to:

- remove the keys from the ignition before commencing any work;
- protect hands with suitable work gloves, especially when working on or near the cutting ٠ device:
- make sure that the work in progress does not lead to any accidental fuel leaks or spills; ٠
- never smoke when working on the fuel tank or handling fuel; ٠
- not inhale oil or fuel fumes; ٠
- immediately clean up any traces of spilt fuel;
- test the engine only in a well ventilated environment or in the presence of an adequate ٠ exhaust fumes extractor system;
- not disperse oil, fuel or other hazardous waste into the environment. This kind of waste ٠ must be disposed of in compliance with the relative legislation in force;
- make sure no-one can inadvertently carry out actions which could compromise the safety ٠ of the mechanic working on the machine.

D. Tools required

All the operations described herein can be carried out using the tools usually available in a good vehicle repair workshop.

1.1.7 Lifting

Before starting any work under the machine, check the load capacity of the lifting equipment or the jack.

1.1.8 Spare parts

Always use genuine spare parts for repairs.

1.2 Warranty

1.2.1 Warranty period

The warranty is provided in the way and within the limits in the contract. With regards the engine and transmission unit, the warranty terms provided by the relative manufacturer are valid.

1.2.2 Exceptions

The warranty does not cover damage caused by:

- Failure of the user to become familiar with the documentation accompanying the machine.
- Carelessness.
- Incorrect or prohibited use and installation.
- The use of non-original spares.
- The use of accessories not supplied or approved by STIGA.

Further more, the warranty does not cover:

- Wear components, such as blades, belts, wheels, batteries, cables.
- Normal wear and tear.
- Engine and transmission. These components are covered by the warranty provided by the relative manufacturer, in compliance with the specified terms and conditions.

The purchaser is covered by the national legislation in force in his country. Purchaser's rights envisaged by national laws are not in any way restricted by this warranty.

1.2.3 Interventions carried out after warranty expiry

For each intervention carried out on the machine, the Service Centre must fill in the report indicating the machine's serial number, a brief indication of the problem encountered, the operations performed and any spare parts used.

A copy of said reports must be kept and made available to the Manufacture, together with any replaced parts in the event of complaints from the Customer.

1.2.4 Reporting faults

Please report any faults which may recur with particular frequency to the Manufacturer so that the problem in question can be duly investigated and corrective action implemented during the production stage.

In the same way the Manufacturer will notify the Service Centre of any faults encountered on the machines produced and provide indications on the best way to deal with them.

1.2.5 Ordering spare parts

When ordering spare parts it is essential to cite the code number (for reference use the explosion diagram corresponding to the year of manufacture) indicated on the product's identification label.

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1.3 Identification

Machine



Each machine is supplied with a label (1) affixed to the column, indicating the technical data, the model and the serial number.

The model and serial number must be indicated on the intervention sheet, when requesting application of the warranty and are indispensable in the ordering of spare parts.

Transmission



This machine is equipped with 2 hydrostatic transmissions.

These components are supplied by an external manufacturer and are

built to precise technical specifications which distinguish it from similar products made by the same manufacturer. The serial number indicated on the label (1) makes it possible to correctly identify the product and its characteristics and must always be cited when ordering spare parts or requesting any information from the Manufacturer.

Engine



The engine is built to precise technical specifications which distinguish it from similar products made by the same manufacturer. The serial number indicated on the label (1) makes it possible to correctly identify the product and its characteristics and must always be cited when ordering spare parts or requesting any information from the Manufacturer.

1.4 Unpacking, assembly

All STIGA machines undergo thorough inspection before delivery. Machines are delivered as fully assembled as possible. This means that final assembly after delivery is quick and easy.

Caution!

The machine must stay on the pallet while it is being unpacked and assembled.

1.4.1 Assembly

 \mathbb{A}

For assembly instructions, **T** 7.5.1

1.4.2 Battery



• The battery is a valve-regulated one.

Install/remove the battery in accordance with the instructions provided in chapter 7

7.5.1

Valve-regulated battery

This type of battery requires minimum maintenance. It has no caps or electrolyte level controls.

Warning!

- Never wear metal rings, bracelets, necklaces or other similar jewellery when working on batteries. They could create a short-circuit or fire.
- The battery must be fully charged before being used for the first time. The battery must be fully charged before being put into storage. Serious damage may occur if the battery is put into storage flat.
- If the leads are disconnected/connected in the wrong order, there is a risk of a short-circuit and damage to the battery.
- Inverting the cables on the poles may damage the battery and the alternator.
- The engine must never be used with the battery disconnected. This could damage the alternator and the electrical system.



Charging by the engine

The battery can be charged by the machine's alternator as follows:

- 1. Install the battery in the machine.
- 2. Position the machine outside or set up an exhaust fumes extraction device.
- 3. Start the engine in accordance with the indications in the instructions for use.
- 4. Leave the machine in continuous operation for 45 minutes (not applicable for completely flat batteries).

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5. Stop the motor. The battery will now be fully charged.

Charging with a battery charger

When charging the battery with a battery charger, make sure it is a genuine STIGA battery charger. The battery will be damaged if other battery chargers are used.

1.4.3 Final inspections

Interventions before start-up

Before starting the machine proceed as follows:

- Check/top-up the fuel.
- Check/adjust the engine oil level.
- Check the tyre pressure.
- Carry out safety checks.
- Test drive.

Test drive

The engine must run at minimum revs to reach the correct operating temperature before carrying out the test drive. For more detailed instructions, refer to the instruction manual. Operate the machine for a few minutes. Check all the various functions. In particular check that the safety devices all work properly.

If a cutting device or other equipment is envisaged, these devices must be installed before carrying out the test drive with the machine.

1.5 Maintenance

The instruction manual includes a series of interventions to be carried out by the Customer for the purpose of ensuring minimum basic maintenance and other operations which are not always within his capabilities.

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This is why the Service Centre should undertake to maintain the machine in perfect working order, acting in accordance with the following table:

	First time	Maintenance interval		
Maintenance point	"Service Mon	e hours/ ths"	See Chap. par.	
Safety checks	5	50/12	1.5.1 1.5.2	
Tyre pressure, check, adjust	5	50/12	Tyre, air pressure	
Engine oil, change	5	50/12	Engine oil	
Drive belts, check	5	50/12	Drive belts, check	
Steering adjustment	5	50/12	Steering, adjustment	
Lubrication of the bearings in the articulation	5	50/12	2.2	
Lubrication of the shaft on the front wheels and the angle ball joints.		50/12	2.2	
Engine air filter, clean/ change		100/24	Engine air filter	
Spark plug, change/ replace (when present)		100/24	Spark plug (if present)	
Transmission, check		100/24	Transmission 4.8.1	
Exhaust system, check		100/24	Exhaust system	
Electrical system, check		100/24	Electrical system	
PTO, check		100/24	Power take-off	
Check controls		100/24	Check controls	
Valve play (for petrol engine)		100/24	For the engine, refer to the dedicated manual	
Test driving		100/24	Test drive	

1.5.1 General safety checks

Object	Result
Fuel lines and connections.	No leaks.
Power cables.	All insulation intact. No mechanical damage.
Exhaust system.	No leakage at the joins. All screws tightened.
Test drive.	No abnormal vibrations. No abnormal noise.

1.5.2 Electrical safety check

Status	Action	Result
Driver not seated. Parking brake engaged.	Try to start the engine.	The motor does not start. On the display (if present) the message "SIT DOWN" appears.
Driver not seated. Parking brake disengaged.	Try to start the engine.	The motor does not start. On the display (if present) the message "PRESS BRAKE" appears.
Driver seated. Parking brake engaged.	Try to start the engine.	The engine starts.
Engine on, cutting device disengaged, parking brake engaged.	The driver gets up from the seat.	The engine stays on.

Tyre, air pressure

Check the tyre pressure. Adjust if necessary. The recommended tyre pressure is 0.6 bar for front tyres and 0.4 bar for rear tyres.

Engine oil

See the manual provided by the engine manufacturer.

Drive belts, check

Check the condition of all the belts and tensioners **5.1**

Steering, adjustment

See chapter 3 💌 3.

Engine air filter

Consult the "INSTRUCTION MANUAL" supplied with the machine. Also see the manual provided by the engine manufacturer.

Spark plug (if present)

Remove the spark plug and clean or replace it as required. Also see the manual provided by the engine manufacturer.

Transmission

Check for any abnormal noises.

Exhaust system

Check that there are no cracks, leakage or other types of damage. Check the hook up devices. Also see the manual provided by the engine manufacturer.

Electrical system

Check there are no damaged cables, contacts or other devices. Check that all cables are securely fastened to the frame using the relative cable ties. Check that none of the cables rub against the frame as this could lead to damaged cables and short circuits. Check the tightness of the battery terminals. See chapter 7 \sim 7

Check controls

Check that all the controls function properly and that there is no jamming or excessive play. Adjust if necessary. See chapter 4 10^{-4}

Power take-off

Check that the magnetic clutch engages rotation of the accessory in the preset time and that it does not slip during operation at normal load. Replace the clutch if necessary. Check that the PTO belt engages rotation of the accessory in the preset time and that it does not slip during operation at normal load. Adjust if necessary.

Check that the PTO brake (if present) stops any rotation within a specific time. Adjust if necessary.

The stopping time must never exceed 3 seconds.

1.6 Technical data

For all the Technical Date, see the "INSTRUCTION MANUAL".

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1.6.1 Machine dimensions



	U.M	340 IX
A	mm	2565
В	mm	1185
С	mm	863
D	mm	1223
E	mm	1970
F	mm	923
G	mm	790
Н	mm	1256

1.6.2 General tightening torques

Tightening torques for screws and nuts unless otherwise specified:

Thread	Torque
M5	6 Nm
M6	10 Nm
M8	24 Nm
M10	47 Nm

2 Frame and safety guards

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This chapter provides a brief description of how to disassemble and assemble the machine frame and safety guards.

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2.1 Rear wheels

2.1.1 Hub adjustment and wheel installation (standard position)





NOTE: If the measurements (A) and (B) between the front and back wheels are not identical, the machine will have steering problems.

- 1. Lift the machine using a jack.
- 2. Remove the wheel.
- 3. Remove the hubcap (A) and the stop ring (B).
- 4. Slacken the screws (C).





С		M8	₩ III	T40	20÷25 Nm
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- 5. Slide the hub (D) along the axle and position at a height (Y) of 20 mm.
- 6. Tighten the screws (C).

Installation of wheel when snow chains are used.

To ensure that the chains do not rub against structural parts of the machine it may be necessary to reduce the distance (Y); this distance my be reduced until the hub (D) rests on the stop ring (B).



- 7. Replace the stop ring (B).
- 8. Remove the hubcap (A).
- 9. Tighten the screw (F).
- 10. Replace the rear wheel.
- 11. Tighten the wheel nuts (E).

2.2 Lubrication

For the relative intervention times, see the Maintenance Summary Table in the *"INSTRUCTION MANUAL"* (user manual).

Note!	Lubrication is necessary even if the machine is only used for only a few hours a year.
Note!	Lubrication provides protection not only against wear but also against rust.
Note!	Lubricate the machine before putting it into storage for a prolonged period of time.

Lubricate the various parts as described below:

Object	Action	Pos.
Centre point	 3 grease nipples located on the central articulation on the left-hand side of the machine. Use a grease gun filled with universal grease. Pump until the grease seeps out. 	A
Tensioning arms	Lubricate the support points of the tensioning arms with oil.	В
Wheel bearings	2 grease nipples. Use a grease gun filled with universal grease. Pump until the grease seeps out.	С
Quick-release supports	1 grease nipple for each front wheel. Use a grease gun filled with universal grease. Pump until the grease seeps out.	D
Control cabies	Lubricate the control cable ends with oil.	E









2.3 Safety guards and tank removal



Notel	To open the bonnet follow the procedure described in the "INSTRUCTION
10101	MANUAL".

Pos.	Object	References
Α	Top engine casing	2.3.1
В	Bottom engine casing	2.3.1
С	Rear articulated joint guard	2.3.3
D	Front articulated joint guard	2.3.3
E	Steering guard	2.3.5
F	Dashboard casing	2.3.6
G	Dashboard	2.3.7

2.3.1 Engine casing

Engine upper casing

Removal of the top front casing makes it possible to:

- reach the fuses;
- remove the bottom casings.

Proceed as follows

 \wedge



A () M6 T30 5+6 Nm	
--------------------	--

- 1. Undo the 4 screws (A) on each side.
- 2. Remove the fuel cap (B).

For safety reasons and to stop impurities or anything else getting into the tank, only remove the cap at the time of removing the casing.

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3. Lift and remove the casing.

4. Replace the fuel cap (B).

Engine lower casing

Note! To remove the bottom engine casing you must first remove the top engine casing. To remove the top engine upper casing.

Removal of the bottom engine casing makes it possible to:

- Access cables and piping;
- Access the tank fasteners.

Proceed as follows:



Α		M6		T30	4÷5 Nm
1 U	ndo the 2 s	screws	(A)		
			(, .).		

Page

21



В () Дай M6 Т	30 4÷5 Nm
---------------	-----------

2. Undo the screw (B) on each side.

3. Remove the guard (C).



IMPORTANT - Carefully check that the positive wires (red) are integral, that the insulation is not cracked or worn and that the corrugated protection sheath is installed and correctly mounted to prevent cables from being crushed by the battery housing after installation.

For machines without corrugated protection sheath, this must be installed following the instructions provided. **7.8**.

To reassemble the various parts, repeat the operations in reverse order.

/TIG

2.3.2 Tank

Λ



NOTE: To remove the tank you must first remove the top and bottom engine casings. $1 \ge \frac{2.3.1}{2}$.

- 1. Unscrew the wing nuts (A).
- 2. Remove the tank fasteners (B).
- 3. Position the tank on top of the engine.

Caution!!!

Petrol is highly flammable. The fuel cap must be in place and securely tightened before the tank is removed.

To reassemble the various parts, repeat the operations in reverse order.

2.3.3 Articulated joint guard

Front articulated joint guard







В		M6		10 mm	4÷5 Nm
D	(A) Juin	M6	ţ	T30	4÷5 Nm

(seen from below)

- 2. Unscrew the nuts (B) from below.
- 3. Remove the support (C).
- 4. Undo the 2 screws (D).
- 5. Remove the guard (A)

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Rear articulated joint guard



В	M6	- Alian - Alia	T30	4÷5 Nm
С	M6		10 mm	5÷6 Nm

(seen from below)

NOTE:to remove the rear articulated joint guard you must first remove the front guard.

- 1. Undo the screws (B).
- 2. Unscrew the nut (C).



D	M6	10 mm	5÷6 Nm

- 3. Unscrew the nut (D) from below.
- 4. Remove the two parts of the guard (E).



F		M6	₩ M	Т30	4÷5 Nm
---	--	----	--------	-----	--------

 To replace the rear bottom guard, undo the screws (F) and remove the stiffening ring (G). Install the ring on the new guard.

To reassemble the various parts, repeat the operations in reverse order.

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2.3.4 Tensioner guard



To reassemble the tensioner, repeat the operations in reverse order.

2.3.5 Steering guard



NOTE: Take the front accessories lift lever (C) to the "high" position.

1. Remove the steering column (A) by removing the 2 pins (B).

NOTE: Also see the "INSTRUCTION MANUAL".





F	G

C-D		T25	4÷5 Nm
-----	--	-----	--------

- 2. Undo the 2 screws (D) (one each side).
- 3. Undo the 2 screws (E).
- 4. Remove the front guard (F) by sliding it up.

5. To completely remove the guard (F), unscrew the headlamp connector (G).

To reassemble the various parts, repeat the operations in reverse order.

2.3.6 Dashboard casing

To access the leverages, electronic circuits, the diagnostics connector, the key block and the instrumentation cables, remove the dashboard casing.



External dashboard casing



- 1. Undo the 3 screws (A).
- 2. Tip the seat back.
- 3. Undo the screws (B).
- 4. Remove the external guard (C).

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Internal dashboard casing



Α	O Lind	M6		8 mm	3÷4 Nm
В		M5	ţ.	T25	3÷4 Nm

- 1. Undo the 4 screws (A).
- 2. Undo the screw (B).
- 3. Remove the internal guard (C).

To reassemble the various parts, repeat the operations in reverse order.

2.3.7 Dashboard

The dashboard mask is removed mainly to inspect the electronic board or to replace it. To remove the dashboard mask first remove the dashboard casings $rac{2.3.6}{}$.



To reassemble the various parts, repeat the operations in reverse order.

3 Steering wheel

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Machines with an articulated joint are fitted with both a common mechanical system and a hydraulic power steering system, whereas the mechanical system operates with cables or chains. The hydraulic power steering system is driven by the hydraulic pump. This chapter provides an overview of operation and describes how to repair, replace and adjust worn parts in the steering system.

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3.1 Description

3.1.1 Mechanical system



The gear wheel (A) is connected directly to the steering wheel by means of a steering shaft. A chain (with cables) (B) connects the gear wheel (A) to the steering disc (C) installed on the rear frame.

In this condition the rear frame is forced to steer in relation to the front frame when the driver uses the steering wheel.

3.1.2 Hydraulic power steering system

The power steering system is an additional hydraulic system. The main components are the torque converter or torque booster and the hydraulic pump.

A brief description is provided on the operation of the steering torque converter and the relative valve connectors. For a complete description, see chapter 4 "Hydraulic System". Chapter. 4 - \mathbf{v} 4.4 - describes how the lift cylinder operates with the steering torque converter. It also describes how the pressure is divided between the two circuits and relative adjustments.

Unlike with standard power steering systems (such as those in cars) this system has a limited capacity. This means that in certain circumstances negative characteristics may come to light.

At low engine speed, or in situations where additional steering force is required, steering operation may not be smooth.

The machine should always be in motion when using the steering wheel. Avoid turning the steering wheel when the machine is stationary with the accessory lowered in the operating position.

The machine can also be steered when the engine is switched off. However it may require more effort than for normal machine steering. This may be particularly noticeable when the ambient temperature is low.



Hydraulic connectors

The hydraulic lines have two alternative connectors:

- Pressure plate with O-ring around the piping.
- Adjustable connector.

When assembling, always tighten the nipples to the values indicated in the picture.

<u>Pressure plate</u> When assembling, never forget to insert new O-rings.

Adjustable connector

These connectors do not have gaskets.

The hydraulic power steering system operates mainly in the same way as the analogue mechanical system. The difference is represented by the torque booster (D), installed in the steering column between the wheel and the gear wheel (A).

The flow of fluid from the HST flows through the torque booster and a filter.

When the driver turns the steering wheel, the pressure on the torque booster drops.

The drop in pressure, multiplied by flow, provides a moment (Ma) which is added to the steering wheel moment (Md) and applied to the gear wheel (A) as moment (Ms).

The following components are shown in the figure:

- A Steering chain drive gear wheel.
- D. Torque booster.
- Mh. Steering force (moment) from the hydraulic transmission.
- Md. Manual force (moment) from the steering wheel.
- Ms. The sum of Ma and Md as steering force (moment on gear wheel A).

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3.2.1 Assembly



- 1. Measure the length of the change and mark the middle link (A).
- 2. Put the front wheels straight in relation to the rear wheels.
- 3. Install the chain on the gear wheels. Check that the wheels are straight and that the middle marked link is positioned at the centre of the chain gear wheel, if this is not the case, take to the straight position.
- 5. Put the washers and nuts on the threaded ends of the chain.

3.2.2 Adjustment



- Adjust the nuts underneath (A) until there is no play/minimum play. Turn the steering wheel right and left at the same time to apply the same tension/ slackening on both chains.
- 2. Tighten the nuts (A) by 2.5 turns.

Caution!!!



Never tighten both nuts by more than 5 turns as this could compromise the spring. In this case steering would be hard work and the steering system would be subject to unnecessary wear.

- 3. Test drive the machine with the wheels straight and check that the steering wheel is in the right position.
- 4. If the steering wheel is turned, slacken first one nut and tighten the other by the same value. Repeat the procedure until the steering wheel is in the right position. Tension the nuts on the cables on both sides so that the wheels are straight when the machine is also straight.

3.3 Trouble shooting

One prerequisite for the function of the power assisted steering is the play in the steering. This play must always spring back to the starting position when the wheel is released. Test by slowly turning the wheel in one direction when the engine is switched off. At first there is a slight resistance, which increases when the machine begins to turn. Release the wheel. It should now return to the middle position.

The wheel should spring back approx. 10-20 mm when the wheel is released after turning. However, the machine will not automatically "drive straight forward" after turning in the same way as a car.

If the machine always turns in the same direction as soon as the engine is started, there is probably a fault in the torque converter.

Another conceivable fault can be that the bearing in the steering column tube is jamming, so that the steering wheel cannot automatically return to the neutral position.

Note: If the steering does not function, this does not mean that there is always a fault in the steering booster. Faults can also occur in more simple mechanical parts such as chains and gear wheels and sprockets.

Important: Transmission replacement is not an option to solve steering issue.

The machine has to tested always in motion when the steering is used. Avoid turning the steering wheel when the machine is standing completely still and the accessory is in lowered working position.

Testing the machine with the engine at maximum rpm and assure that the tires have the right pressure.

PROBLEM	CAUSE	REMEDY	Reference
 The steering wheel presents: hard to movement jerky to movement locked strange noises 	The central joint isn't greased.	Lubricate the central joint.	WORKSHOP MANUAL Chapter 2 Paragraph 2.2
	The steering wheel hasn't a minimum axial play.	Remove a washer under the steering wheel.	OWNER MANUAL Chapter 5 Paragraph 5.5
	The chain is dirty, seized and or not lubrificated.	Remove the chain, clean it, check the smoothly movement of the chain links and lubricate.	
	Sprokets damaged or they doesn't work.	Replace the sprockets damaged, check the free movement, and lubricate them.	

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PROBLEM	CAUSE	REMEDY	Reference
 A 1. The steering wheel presents: hard to movement jerky to movement locked strange noises 	The central joint isn't free to movement.	Raise the machine with a lift fork positioned in the centre of the machine, in the way that the rear wheels doesn't touch the ground and check the free rotation of the rear side of the machine.	
	The steering is getting a contact.	Check if the steering column has got a contact with others parts (e.g. with coiled spring pins).	
2. The steering isn't free to turn	The steering isn't stay in place.	Check if the steering column has go a damage (e.g. welds) and replace if necessary. Check if screws are loose and tighten if necessary.	

4 Hydraulic system

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The Park Pro model machines are with integral traction and are fitted with two hydraulic transmissions, a separate hydraulic pump installed in front of the engine, hydraulic power steering and a hydraulic accessory lifting device.

This chapter provides a description of the hydraulic system, trouble shooting for identifying faults and the relative information for carrying out corrective actions and adjustment procedures.

Abbreviations used in this chapter: HST = Hydrostatic Transmission.

4.1 Safety

Danger!

Pressurized hydraulic fluid may be very hazardous if the piping, lines or other distribution components have leaks. To avoid injuries always wear protective gloves and safety glasses when working on the hydraulic system.

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Danger!

Personnel could be exposed to exhaust fumes poisoning. Before starting the engine, position the machine outside or set up an exhaust fumes extraction device.

Caution!!!



A high level of cleanliness is mandatory when carrying out all operations on the hydraulic system. Foreign objects and contaminants would jeopardize system operation and reliability. Always protect and plug the ends of pipes, lines and connectors when replacing components.

4.2 Configuration

The transmissions, steering and front accessory lifting device work using the same fluid but in separate parallel systems.

The following sections illustrate the physical layout of the hydraulic components and provide an operational description of the same.

Hydraulic diagram (Version 2019) 4.3



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4.4 Transmission unit

4.4.1 List of components



- A. Rear transmission with own hydraulic motor (7).
- B. Front transmission with own hydraulic motor (9).
- C. Hydraulic pump. Parts 1,2,3 and 8 are positioned in the hydraulic pump.
- 1. Loading pump, max. 55 bar
- 2. Main pump
- 3. Pressure limiting valve for loading pressure
- 4. Fluid reservoir.
- 5. Fluid filter.
- 6. Auxiliary hydraulic circuit connectors (steering valve and accessories lifting device)
- 7. Hydraulic motor in rear transmission (A).
- 8. By-pass valve in the hydraulic pump (C).
- 9. Hydraulic motor in front transmission (A).
- 11. Return flow lines.
- 12.Delivery flow lines.
- 13.By-pass valve (used only for fluid change operations)

Colour - Pressure

Red	Delivery pressure to the main pump and the auxiliary hydraulic circuits.			
Dark red	Operating pressure to the hydraulic motors.			
Blue	Atmospheric pressure in the fluid reservoir and vessels.			
Light blue	The pressure below atmospheric pressure (pump suction side).			
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4.4.2 Description of operation

Guide

The fluid flows when driving the machine forward and reversing are illustrated in the following diagrams.

Forward driving diagram



Reverse driving diagram



The hydraulic pump (C) which integrates the loading pump (1) and the main pump (2) is located in front of the engine.

The engine activates the hydraulic pump (C) at a constant operating speed. The loading pump (1) feeds the main pump (2) with a maximum pressure of 55 bar. The fluid, sent to the main pump during operation, compensates the fluid returning from the rear and front transmission (A and B) and the main pump (2).

The loading pump (1) takes the fluid from the fluid reservoir (4) through a filter (5). The fluid flow is controlled by the tractionpedal which is mechanically connected to the main pump (2). The pressure of the main pump depends on the power requirements of the wheel axles and is limited by the engine's running power.

The motors are connected in series first of all to the rear hydraulic motor (7) when driving forward. This means that, due to the seepage in the rear motor, the machine in normal operating conditions is activated exclusively by the rear wheels. When the rear wheels start to slip (i.e. turn with a speed 1-4% higher than the front wheels) the front wheels also start to transmit power and the problem of slipping is solved. This fact is not noticed by the operator as the machine switches to four-wheel drive instantly.

Dynamic balancing valve

The hydraulic circuit is equipped with a dynamic balancing valve for the correct balancing of the circuit. When the machine is stationary, the dynamic balancing valve is open and allows the hydraulic steering to rotate smoothly.

While when the machine starts to move forward, the dynamic balancing valve closes automatically, the rear drive axle starts to transmit and then a few moments later, the front drive axle also starts to transmit. The rotation of the hydraulic steering remains fluid.

The time that passes between the engagement of the front axle and the rear axle is not normally perceived by the user.



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The dynamic balancing valve has a standard calibration of 0.25mm, this can be adjusted in the +/- 0.05 range compared to the standard calibration.



With a dynamic balancing valve set to 0.20mm, the valve closing time will be reduced.

With a dynamic balancing valve set to 0.30mm, the valve closing time will be increased.

By-pass valve



The main pump (2) is fitted with a by-pass valve (8) connected to the engagement/release lever (A).

When the by-pass valve is open, the main pump is disconnected from the oil circuit by an open passageway which directs the flow into the body. The drop in pressure in the pump is thus neutralized and the fluid can flow freely in the system.

The by-pass valve is therefore designed to make it possible to move the machine manually without any strong resistance from the main pump.

Loading pump

The loading pump (1) has two jobs:

- To feed the auxiliary hydraulic circuit with 55 bar max.
- To feed the main pump with an initial pressure of 1.5 2.5 bar.



Auxiliary hydraulic circuit

The loading pump (1) takes the fluid from the fluid reservoir (5).

When auxiliary hydraulic circuits are used, the line pressure in outlet (3) is set at $35 \div 45$ bar by the pressure limiting valve (4).

Main pump feed

The fluid delivery line (2) in relation to the main pump and the suction lines (depending on whether the machine is being driven forward or in reverse) flows through the respective valves (6). The pressure in the line (2) is set at 1.5 - 2.5 bar by the pressure limiting valve (7).

4.5 Hydraulic power steering and equipment lift

4.5.1 List of components

This section describes the physical configuration of the hydraulic components and the different maximum pressures within the system.



- Α. The dashed-line box indicates the parts (from 1 to 4) which are incorporated in the hydraulic pump installed in front of the engine.
- Manual valve unit (includes the components from6 to 10. Β.
- 1. Loading pump
- 2. Main pump This pump is part of the driving system and provides pressure/fluid flow.
- 3. Pressure limiting valve.
- 4. Fluid reservoir.
- 5. Steering torque converter.
- 6. Pressure limiting valve.
- 7. Pressure regulating screw.
- 8. Check valve.
- 9. Gate valve with 4 different passage configurations for the relative functions. Illustrated in normal state.
- 10.Manual lever, connected to the gate valve.
- 11. Dual action lift cylinder

Colour - Pressure

Red	Indicates the total maximum pressure from the HST when the torque converter (5) is in operation.
Yellow	Indicates the maximum pressure at the lift cylinder when equipment is being lifted.
Blue	Indicates fluid return with low pressure (> 1 bar).



4.5.2 Operating description

Normal condition

Operating Status:

- Motor running at full speed.
- The steering wheel is not activated.
- The equipment lifting device is not activated.

The loading pump (1) forces the fluid through the steering converter (5) and the open valve (9).

The direction of fluid flow is indicated by the arrows in the figure below. Being as neither of the two components is in operation, the resistance may be ignored and the pressure is very low (> 1bar).

In normal conditions the lift cylinder (11) is blocked in its neutral position as the fluid cannot flow out or in or because the fluid lines are closed by the gate valve (9).



Steering wheel activated

Operating Status:

- Motor running at full speed.
- The steering wheel is activated.
- The equipment lifting device is not activated.

The loading pump (1) forces the fluid through the steering converter (5) and the open valve (9).

The direction of fluid flow is indicated by the arrows in the figure below. From the moment the steering converter (5) is in operation, a drop in upline pressure is generated.

The drop in pressure = the pressure in the red line - the pressure downline from the steering converter (5). The drop in pressure depends on the steering force needed and is limited by the incorporated valve (3).





Lifting

Operating Status:

- Motor running at full speed.
- The steering wheel is/is not activated.
- The equipment lift lever is activated.

The operator has activated the manual lever (10) taking it to the lift position (back position), an operation which alters the configuration of the passages between the connections inside the valve. The configuration of the passages is suitable for the lift procedure. The fluid penetrates the gate valve (9) through the check valve (8) and forces the hydraulic cylinder piston (11) out.

When the cylinder piston (11) is pushed completely out and the manual lever is still activated, the fluid will only flow through the valve (6) which generates an audible acoustic signal.

Once the manual lever is released, the valve (9) returns to its neutral position and the system switches back to normal operating conditions. The hydraulic cylinder piston (11) is therefore blocked in this current position.



Lowering

Operating Status:

- Motor running at full speed.
- The steering wheel is/is not activated.
- The equipment lift lever is activated.

The operator has activated the manual lever (10) taking it to the lowering position (a step forward), an operation which moves the gate valve (9) altering the configuration of the passages between the connections inside the valve. The configuration of the passages is suitable for the lowering procedure (crossed over in the figure below). The fluid is forced through the check valve (8), the gate valve (9) and pushes the piston back into the hydraulic cylinder (11).

In this configuration the equipment is forced to move down, independently of its own weight.

When the piston in the cylinder (11) is again fully retracted and the manual lever is still activated, the fluid will only flow through the valve (6) which generates an audible acoustic signal.

Once the manual lever is released, the valve (9) returns to its normal position and the system switches back to normal operating conditions. The hydraulic cylinder piston (11) is therefore blocked in this current position.



Floating position

Operating Status:

- Motor not running or running at full speed.
- The steering wheel is/is not activated.
- The equipment lifting device is in the top position.

The operator has activated the manual lever (10) taking it to the floating position (blocked in front position), an operation which moves the gate valve (9) altering the configuration of the passages between the connections inside the valve. The configuration of the passages is suitable for the floating status. Both ends of the lifting cylinder

/TIGA

(11) are reciprocally connected to the return line in the gate valve (9). In other words no pressure reaches any end of the circuit. No fluid pressure activates the cylinder. Most of the fluid flows between the top and bottom part of the cylinder. A small amount flows between the fluid reservoir (4) and the cylinder, due to movement of the piston rod. See the arrows in the figure below.

In the floating position, the equipment is always resting on the ground with the same force (the weight of the equipment) and follows the contours of the ground.



4.6 Troubleshooting

Caution!!!

Pressurized hydraulic fluid may be very hazardous if the piping, lines or other distribution components have leaks. To avoid injuries always wear protective gloves and safety glasses when working on the hydraulic system.

Before carrying out troubleshooting the following conditions must be met:

Driving system

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1. The transmission by-pass valves (A) are closed.

- 2. The transmission engage/disengage lever (A) must be engaged (pos. A1).
- 3. The fluid level in the reservoir must be correct.
- 4. There must be no air in the hydraulic fluid.

Problem	Probable cause	Remedy
The machine runs forward but not in reverse.	Front transmission by-pass valve open. High seepage in the front transmission.	Close the by-pass valve. Replace the front transmission.
The machine runs in reverse but not forward.	Rear transmission by-pass valve open. High seepage in the rear transmission.	Close the by-pass valve. Replace the rear transmission.
Reduced speed and irregular traction.	The suction filter (5) is clogged.	Clean the filter.
The front wheels do not provide traction.	One of the transmission splines is broken.	Replace the relative spline.

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Problem	Probable cause	Remedy
The rear wheels do not provide traction.	One of the transmission splines is broken.	Replace the relative spline.
	The engine - pump connection belt is slipping.	Check that the pump fan and pulley rotate.
	Worn belt.	Replace the belt.
	Poorly adjusted clutch cable.	Adjust the clutch cable.
Reduced or no speed.	Excessive seepage in the hydraulic pump.	Replace the hydraulic pump.
	Faulty loading pump	Replace the hydraulic pump.
	The loading pump pressure limiting valve (1.5 -2.5 bar) is faulty.	Check the valve and the relative spring.
	Speed control cable loose or moved.	Repair/adjust the speed control cable.

4.7 Auxiliary hydraulic circuit adjustment/control

Caution!!!

Pressurized hydraulic fluid may be very hazardous if the piping, lines or other distribution components have leaks. To avoid injuries always wear protective gloves and safety glasses when working on the hydraulic system.

Caution!!!

Personnel could be exposed to exhaust fumes poisoning. Before starting the engine, position the machine outside or set up an exhaust fumes extraction device.

This section describes the adjustment/control procedures in the event of incorrect operation of the hydraulic power steering and accessories lifting system.

To apply corrective measures the following conditions must be met:

• Parking brake off.

<u>A</u>

/!\

- Filter in good condition.
- Motor running at full speed.
- · Maximum fluid level in the reservoir.
- The machine's engine has been warmed up for at least 10 minutes to ensure a fluid temperature of at least 50°C.
- The adjustment screw (A) makes it possible to give more pressure to the steering (if unscrewed) or more pressure to the accessories lifting device (if screwed). See the diagram below.
 Adjustment.

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Note! You can access the adjustment screw (A) only after having removed the dashboard casings. **••• 2.3.6**.



Adjustment

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Caution!!!

Do not over-tighten the adjustment screw as this could result in deterioration of the steering capacity.

After making adjustments, always check the steering capacity with the accessories lifting device resting on its travel stops.

Adjust the pressure by slackening the check nut and turning the adjustment screw. Turn right (tightening) to increase the lifting capacity and reduce the steering capacity. Turn left (slackening) to decrease the lifting capacity and increase the steering capacity. Tighten the check nut once adjustments have been completed.



Adjustment procedure

1. The lifting capacity is factory set at approximately 1500 N/150 kg. Measure the lifting power and adjust as required.

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Drive the machine and check steering sensitivity.

- If the steering is smooth, it has been correctly adjusted.
- If steering is difficult, reduce the lifting capacity.
- Hook-up the heaviest equipment which you intend to lift with the machine and adjust the lifting
 power based on its weight. If the steering remains smooth adjustment is correct. If this is not
 the case, perform the following checks:

Steering	Remedy
 Steering is smooth when the screw (A) is completely unscrewed but the lifting capacity is OK when the screw (A) is fully tightened. 	Replace the hydraulic pump.
 Steering remains difficult even when the screw (A) is completely unscrewed and the lifting capacity is OK when the screw (A) is fully tightened. 	Replace the hydraulic pump.

The optimum result is obtained by acting on the adjustment screw (A), dividing the pressure in the auxiliary hydraulic circuit (approx. 35 bar) between the accessories lifting device (completely tightened) and the

NOTE between the accessories lifting device (completely tightened) and the steering (completely unscrewed). If one of the two circuits receives more pressure the other must consequently receive less.

4.8 Transmission fluid

4.8.1 Intervention times table

To check, top up and change the fluid or change the filter, consult the following table.

Action	First time	Then every:	Fluid type	Quantity	Ref. heading
	(in service hours)				
Check - top up to level		50	5W-50 (SAE 75W-90)		4.8.2
Change the fluid	5	200		4.2 litres	4.8.3
Replace the reservoir fluid filter	5	200			4.8.4

4.8.2 Check and top-up



- 1. Position the machine on even ground.
- 2. Open the bonnet.
- 3. Read off the oil level in the reservoir. The level should be on the line (A) and not over it.
- 4. Top up if necessary.

4.8.3 Change

Before proceeding to drain off the fluid, carry out the following operations:

- 1. Run the machine at variable speeds for 10-20 minutes to heat up the transmission fluid.
- 1. Position the machine on even ground.
- 1. Put the parking brake on.
- 1. Open the bonnet.

Drain off the fluid



1. Disengage the transmission - lever (A) out (pos. A2).



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(seen from above)

- 2. Open the valves of the rear and front transmission (B). The valves are located on the upper part of the axles.
- 3. Place a container under the rear transmission and another one under the front transmission.



- 4. Remove the 2 drain plugs (C) from each transmission.
- 5. Let the fluid run out into suitable containers.
- 6. Take the cap off the fluid reservoir.
- 7. Draw out the fluid from the deepest part of the reservoir using a fluid extractor (D).
- 8. Dispose of the oil according to local regulations.

Manual filling

NOTE Before proceeding to fill with new fluid, replace the filter.



|--|

- Check that the gaskets on the 4 drain plugs (C) are intact and replace if necessary.
- 2. Put the plugs (C) back in.
- Fill the fluid reservoir with fresh fluid. For the quantities of fluid required 4.8.1



- 4. Disengage the transmission lever (A) out (pos. A1).
- 5. Prepare a suitably large vessel full of fresh fluid.

Note! The oil is drawn into the system very quickly. The tank must be filled up continuously until it remains full if the circuit is to be filled without any air being drawn into the system (something which must never be allowed to happen).

Caution!!!

If the engine is run indoors, exhaust extraction equipment must be connected to the engine's exhaust pipe.



(seen from below)

- 6. Start the engine and wait for it to idle. Gradually pour fluid into the reservoir and make sure that the level is always on the mark.
- 7. Replace the cap on the fluid reservoir and close the bonnet.
- 8. Stop the engine.
- 9. Close the valves (B) on the axles.

10. Start the engine.

- 11. Move the machine 8 10 metres forward and 8 10 metres in reverse. At the same time, turn the steering wheel full on.
- 12. Lift and lower the accessories hydraulic lifting device 3 4 times.
- 13. Stop the machine and put the parking brake back on.
- 14. Open the bonnet.
- 15. Check the level in the reservoir and top up if necessary.
- 16. Once the operation has been completed, replace the cap on the fluid reservoir and close the bonnet.

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Filling using an external pump

NOTE Before proceeding to fill with new fluid, replace the filter.







- Check that the gaskets on the 4 drain plugs (A) are intact and replace if necessary.
- 2. Put the plugs (A) back in.

- 3. Disengage the transmission lever (A) out (pos. A1).
- 4. Prepare a suitably large vessel full of fresh fluid.



5. Connect the pumping device to the nipple (A) shown in the figure and pump new oil into the system.

Caution!!!

If the engine is run indoors, exhaust extraction equipment must be connected to the engine's exhaust pipe. Workshop Manual PARK PRO 340 IX





- 6. Stop the pumping activities when the fluid level is almost on the line (A).
- 7. Start the engine and wait for it to idle. Gradually pour fluid into the reservoir and make sure that the level is always on the mark.
- 8. Replace the cap on the fluid reservoir and close the bonnet.

(seen from below)

- 9. Stop the engine.
- 10. Close the valves (B) on the axles.

- 11. Start the engine.
- 12. Move the machine 8 10 metres forward and 8 10 metres in reverse. At the same time, turn the steering wheel full on.
- 13. Lift and lower the accessories hydraulic lifting device 3 4 times.
- 14. Stop the machine and put the parking brake back on.
- 15. Open the bonnet.
- 16. Check the level in the reservoir and top up if necessary.
- 17. Once the operation has been completed, replace the cap on the fluid reservoir and close the bonnet.



4.8.4 Replacing the reservoir fluid filter

- 1. Extract the filter unit (A) from the reservoir.
 - Press on the filter sleeve and move it in the direction indicated by the arrow.
 - Extract the filter unit from the reservoir.
- 2. Take hold of the sleeve and the filter spring.
- 3. Extract the filter (B) from the sleeve.
- 4. Check that the rubber gasket (C) on the bottom of the filter is intact. Replace if necessary.
- 5. Insert the new filter and spring in the sleeve. Push the filter until it clicks into its seat in the sleeve.
- Replace the unit in the reservoir. The upper section of the filter must be inserted securely with a click in the groove on the upper part of the reservoir.

4.9 Hydraulic pump replacement

4.9.1 Disassembly

To simplify this operation, use a platform or harness lifter.

- 1. Apply the parking Brake
- 1. Remove the engine **I 2.3.1** and tank casings **I 2.3.2**
- 1. Remove the belts C an D 🖛 5.3.3 📭 5.3.4

NOTE The belts must be removed to eliminate any risk of them getting wet with fluid.

<u>/!</u>\



1. Remove the safety cotter pin (A) and using a screwdriver detach the spherical head (B) to disconnect the traction command cable.





D M10 17 mm 35÷50 Nm

(work from under the machine)

2. Block the pulley (C) of the pump with a safe hold, unscrew the nut (D) and extract the pulley, the two spacers (E) and the fan (F).

Caution!!!

During the removal operation, take care not to damage the pulley and the plastic fan.

- 3. Place a suitable vessel under the pump.
- 4. Mark the position of the pipes on the pump hook up points.
- 5. Disconnect all the piping from the pump with the aid of two wrenches (see figure). Position one wrench on the pump connector and unscrew the relative union using the second wrench.

Caution!!!

Plug the ends of all the pipes to stop any impurities getting in them and to limit fluid loss. Workshop Manual PARK PRO 340 IX





F	Of the	M10	17 mm	-
G	(d)	M10	17 mm	35÷50 Nm

- Remove the screws (F) and the flanged nuts (G).
- 7. Lift the pump (warning! the pump is full of fluid) and extract the control (H) from the mudguard support.

4.9.1 Reassembly



Use a 14 mm and a 19 mm wrench.

- 1. Position and block the pump in a workbench vice. Slacken the pump adapters.
- 2. Unscrew the adapters and insert them one at a time in the corresponding seats on the new pump. Check/replace the O-rings.
- 3. Tighten the adapters to the torque values indicated in the figures.
- 4. When tightening the elbow adapter (A), adjust to 45° down from the horizontal axis of the pump.

5. Reassemble the various parts following the disassembly instructions in reverse order, until all the hydraulic lines have all been installed. Check the condition of the O-rings and replace them if damaged.

Caution!!!

After reinstalling the pump and connecting up all the hydraulic lines, before proceeding take care to clean any parts which may have hydraulic liquid on them.

- 6. Complete reassembly in all of its parts and adjust the cable.
- 7. Once reassembly has been completed, turn on the machine and after a few minutes turn it off (so that the fluid flows into the circuit).
- 8. Filling with fluid **7** 4.8.2.

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5 Belts

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All the mechanical power provided by the engine is transmitted to the various power users by a belt system. The maximum tension of each belt is adjusted by a tensioner with pre-load spring.

This chapter provides a brief description of the belt system and includes brief belt replacement procedures.

5.1 Theory on the use of belts

5.1.1 Why is it so important to use genuine belts supplied by authorized vendors?

The table below shows the specifications for commercially available belts compared to the requisites of genuine belts supplied by an authorized vendor. The latter are designed and made with close collaboration between the belt supplier and the machine manufacturer. The table is to help you understand the importance of using genuine belts.

Example	Commercially available belts	Genuine spare belts	Notes
Fitting on the pulley.	The belt rests its sloping sides against the walls of the pulley. There must be a gap between the belt and the bottom of the groove.	The belt rests its sloping sides against the walls of the pulley. There must be a gap between the belt and the bottom of the groove.	S a m e requirements. Genuine spare belts ensure a perfect fit on the pulley.
Acceleration.	Some belts slot into the pulleys only when the engine is running at operating speed and this generates excessive heat.	The belt follows the engine speed in continuous acceleration until the maximum speed is reached.	Ordinary belts are made from natural rubber which can only withstand temperatures of up to 70°C. Genuine spare belts are made from chloroprene rubber which can withstand temperatures of up to 90°C.
Length	Made with standard length pitch.	Made to a specified length designed to fit the pulley perfectly.	The distance between pulleys is fixed. The tensioner ensures that the genuine belt has the optimum tension.

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Example	Commercially available belts	Genuine spare belts	Notes
Floating pulley on the cutting equipment.	Designed to transmit the power between aligned, parallel and fixed pulleys.	The genuine belt of the PTO is de- signed to function even if the pulleys move up and down and tilt simultane- ously.	The equipment follows the ground which means that the pulley is in constant movement. To withstand extreme operating c o n d i t i o n s , genuine belts are made from fibre reinforced rubber.
Bending in two directions.	Designed to bend around the pulley in one direction only.	Most belts installed on machines have tensioning rollers which act on the outer side of the belt. This means that during opera- tion the belt must bend both inwards and outwards.	All genuine belts, which operate with tensioning rollers acting on the outer side, are fitted with reinforcement. The reinforcement is designed specifically for these specific cases.
Noise.	Made with no special requisite for this specific factor.	Genuine belts are carefully selected to limit increases in machine noise dur- ing operation.	Based on the function of the belt, any of the following types of belt are suitable: • Coated • No friction • Open-sided

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5.2 Arrangement of belts on the machine



- X. Rear side of the machine.
- A. PTO (power take off) belt connection to front accessory.
- B. Belt; connection of articulated joint to front accessory pulley.
- C. Belt; engine articulated joint connection.
- D. Belt; engine hydraulic pump connection.
- 1. Preloaded spring tensioner.
- 2. Transmission pulley on the engine shaft.
- 3. Articulated joint pulley.

5.3 Replacing belts

5.3.1 Belt A

Belt A belongs to the front accessory for which an installation description is provided in the manual accompanying the accessory.

5.3.2 Belt B



- 1. Disconnect the front accessory from the machine, see the "INSTRUCTION MANUAL"
- Disassemble the tensioner arm with the relative pulley
 ².3.4
- 3. Extract the belt (B).

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To reassemble the various parts, repeat the operations in reverse order.

5.3.3 Belt C





- 1. Remove the front accessory from the machine, see the "INSTRUCTION MANUAL".
- 2. Remove the belt (B) **5.3.2**
- 3. Using a spring puller release the tensioner spring (D).
- Apply a fixed wrench to the bolt (E) (on the top of the pulley) which locks the pulley (F) onto the support arm, at the same time unscrew the nut (G) with a socket wrench.
- 5. Remove the pulley (F).



- M 7/16"-20 60 ÷ 70 Nm
- 6. Disconnect the connector (H) from the magnetic clutch.

Caution!!!



The magnetic clutch is very heavy. Exercise caution during its removal.

- 7. Apply a fixed 32-mm wrench to the seat (L) of the clutch and using a socket wrench undo the bolt (M).
- 8. Pull the clutch unit down a few centimetres.
- 9. Remove the belt (C) from the clutch pulley and then completely remove the clutch.

To reassemble the various parts, repeat the operations in reverse order.

5.3.4 Belt D



1. Remove belt (C) **5.3.3**



E	Of the	M10	17 mm	35 ÷ 50 Nm
G		M10	17 mm	35 ÷ 50 Nm

- 2. Apply a fixed wrench to the bolt (E) on the top of the pulley (F), at the same time unscrew nut (G) with a socket wrench.
- 3. Remove the pulley (F).
- 4. Remove belt (D).

To reassemble the various parts, repeat the operations in reverse order.

6 Control cables

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All control functions are grouped on the dashboard and managed by the pedal controls positioned on the machine front side. This is an excellent solution in terms of ergonomics and comfort. Further more it simplifies maintenance operations being as all controls and adjustments can be accessed from a single point.

All mechanical control commands given by the operator and sent to the various devices are via sheath coated wires or, in some cases connector rods.

This chapter gives a brief description of these parts and lists all necessary repair and replacement procedures.

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6.1 Description

All cables are made up of a wire and a sheath. One cable end is connected to the actuator, (pump, carburettor etc.) the other end is connected to the control (pedal lever). In most cases the cable ends are equipped with adjusting terminals with locking nuts and/ or elbow unions.

/TIGA



- A. Accelerator control. **[16.6**]
- B. Choke control. **F** 6.4
- C. HST control. **F** 6.5
- D. Parking brake control. **[17]** 6.6
 - D1. Connection to belt "D" tensioner
 - D2. Connection to the rear axle
- E. Cable composed by:
 - F. Wire.
 - G. Sheath.
 - H. Terminal.
 - I. Terminal with adjustment device.

For a higher transmission of pushing and traction forces, components such as levers, brackets, etc. are used.

6.2 Angle ball joints

The angle ball joints perform two functions:

- Transmit movement from the control to the actuator.
- Adjust cable tension.

Note! On the adjustment point, at least 5 threads should be used.

/TIGA

Change



Disassembly



- A-B
 M5
 A-B
 Nm
 S Nm

 C
 O
 7 mm
 5 Nm
- 1. Tighten nut (A).
- 2. Unscrew the nut (B).
- 3. Unscrew the ball joint (C) from cable (D).
- 4. To reassemble the various parts, repeat the operations in reverse order.
- 5. Once assembly is complete, adjust the cable tension.
- 1. Remove the circlip (A).
- 2. Using a screwdriver or similar tool, remove the ball pin (B) from its seat (C).
- To reassemble the various parts, repeat the operations in reverse order. The ball pin (B) must be inserted into its seat (C) using a polygrip pliers or similar tool.



Caution!



To prevent the ball pin from falling apart during operation, it is important that circlip (C) is inserted in both holes on the angle ball joint seat.

/TIGA

6.3 Accelerator cable

6.3.1 Disassembly

- 1. Remove the upper and lower engine guards.
- 2. Dismount the dashboard guard.





- 1. Cut the cable fixing clamp (A) and take note of its position for future assembling operations.
- 2. Remove the lower guard (B); slacken the four screws (C).





3. Slacken the terminal screw (D) on the engine rear side and release the sheath and the wire.



- E ()))))) M6 ()) T30 6 Nm
- 4. Slacken screws (E) and remove the cable holder (F).



- 5. Withdraw the front bushing (G) from the support. Use a screwdriver.
- 6. Feed the wire forward and release it from accelerator lever (H).
- 7. Withdraw the wire from the machine front side.

6.3.2 Assembly

Note! For cable reassembly, perform the disassembling operations in reverse order, taking care to observe the following points.

- Pour some oil drops on the two cable terminals and move the wire a few times inside its sheath.
- Route the cable through the same previous cable path.
- The front bushing can be pushed into its seat by means of polygrip pliers.
- Mount the new fixing clamps in the exact point of the previous ones.

6.3.3 Adjustment



|--|

- 1. Slightly tighten screw (A) of terminal (B) to stop the sheath end.
- 2. Set the accelerator lever in idling position.
- 3. Start the engine and adjust the position of the end of the sheath on the clamp until engine speed starts to increase.
- 4. Move the terminal (B) forward/backward till reaching the position in which the engine is idling and the wire is fully tensioned.
- 5. Tighten the screw (A) and lock the terminal (B) in place.

Danger!



Personnel could be exposed to exhaust fumes poisoning. Before starting the engine, position the machine outside or set up an exhaust fumes extraction device.

6.4 Choke cable

6.4.1 Disassembly

- 1. Remove the upper and lower engine guards.
- 2. Remove the dashboard external guard.









- 1. Cut the cable fixing clamp (A) and take note of its position for future assembling operations.
- 2. Remove the lower guard (B); slacken the four screws (C).

D	M8	13 mm	3 Nm
G	M5	8 mm	4 Nm

- 3. Slacken the nut (D) placed under the knob (E) and unscrew them.
- 4. Using a socket ended screwdriver (F) unscrew the nut (G).
- 5. Feed the cable (H) downwards and withdraw it through the panel hole.



6. Slacken screws (L) and remove the cable holder (I).





M () M5 ()	8 mm	5 Nm
------------	------	------

ENGINE SIDE

- 7. Slacken the terminal screw (M) on the engine rear side and release the sheath and the cable.
- 8. Withdraw the cable (N) from the machine front side.

6.4.2 Assembly

Note! For cable installation, perform the disassembling procedures in reverse order, taking care to perform these specific operations.

- Pour some oil drops on the two cable terminals and move the wire a few times inside its sheath.
- Route the cable through the same previous cable path.



С		M8	13 mm	4 Nm
D	B	M5	8 mm	3 Nm

- 1. Insert the cable terminal (A) through the panel hole.
- 2. Insert the O-ring (B).
- 3. Tighten the nut (C).
- 4. Tighten nut (C) and knob (E).
- 5. Adjust nut (D) and knob (E) positions.
- 6. Lock the knob (E) by means of nut (D).
- 7. Mount the new fixing clamps in the exact point of the previous ones.

6.4.3 Adjustment



A M5 5 8 mm 5 Nm		Α	D	M5		8 mm	5 Nm
------------------	--	---	---	----	--	------	------

- 1. Slightly tighten screw (A) of terminal (B) to stop the sheath end.
- Move the end of the cable (C) backwards /forwards on the clamp so that when the choke command knob is moved, the lever (D) can reach its open and closed end of stroke position.
- 3. Tighten the screw (A).



6.5 HST control cable

6.5.1 Disassembly

- 1. Dismount the upper and lower front covers of the engine.
- 2. Remove the fuel tank **I** 2.3.2.



6.5.2 Assembly

IMPORTANT NOTE - For machines built after 2015 until November 2019, make sure all the latest updates for HST drive cable supports, illustrated in the figure, have been introduced, to eliminate any faults found in use. Should these updates not have been implemented, THEY MUST be performed using the specific kits and following the relevant assembly instructions.



Note! While reassembling the cable, keep the terminal rod longer on the control pedal side. Refer to the direction arrow marked on the cable.

Note! For cable installation, perform the disassembling procedures in reverse order, taking care to perform these specific operations.

- Pour some oil drops on the two cable terminals and move the wire a few times inside its sheath.
- Feed the cable inside starting from the machine front side.

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C (M6) M6 (10 mm) 5 Nm

- Refit the angle ball joint (A) on the hydraulic pump. <a>6.2
- 2. Mount the fixing bracket (B) of the cable end and tighten the nuts (C).



- Screw the angle ball joint seat (D) on the wire (E) for 6 turns, and connect the joint seat to the ball pin.
- 4. Position the sheath terminal on bracket (F) and tighten nuts (G) by hand.

6.5.3 Adjustment



1. Place a 30 mm shim (A) under the traction pedal.



- 2. Pull bracket (B) forward so that all clearances are eliminated and the pedal rests against the shim.
- 3. Tighten the nuts (C).

6.6 Parking brake cable and belt "C" tensioner control cable

6.6.1 Disassembling the parking brake cable

Note! Pay particular attention to the cable assembling condition. This will ease the assembling operation.



Α	M8	10 mm	4 Nm

- 1. Under the brake pedal, slacken nut (A) and withdraw the cable end from its support.
- 2. Release cable end (B) from the brake pedal arm.



С	M8	10 mm	4 Nm

- 3. From the machine rear side, slacken nut (C) and withdraw the cable end from its support.
- 4. Release the cable end (D) from the spring.
- 5. withdraw the cable from the machine.

6.6.2 Disassembling belt "C" tensioner control cable

Note! Pay particular attention to the cable assembling condition. This will ease the assembling operation.



 Under the brake pedal, slacken adjustment nut (A) from its support and release cable end (B) from the brake pedal arm.






 On the rear chassis, slacken adjustment nut (C) from the support and release cable end (D) from the tensioner bracket.

6.6.3 Assembly

To reassemble the various parts, repeat the operations in reverse order.

Caution!



Make sure the new cable is not unnecessarily bent during the assembly, as its operating life will be reduced.

6.7 Adjusting parking brake cable and belt "C" tensioner control cable

Caution!

Adjustment of the parking brake cable and the belt tensioner control cable (C) must achieve the result that the traction belt (c) (belt between engine and pump) must always be deactivated before the brake goes into operation.

Caution!

A correct adjustment of all parts is highly important. Incorrect adjustment leads to a higher wear.



- 1. Apply the parking brake.
- 2. Check brake spring extension; it must be 43 millimeters. If necessary, adjust by acting on register (A).





- 3. Brake pedal play must be 10-15 mm. Adjust by means of registers (B) and (C) as necessary.
- 4. Tighten all locking nuts on the two cables.

6.8 Test drive.

Note! It is necessary an overall test drive to check for a correct operation.

	Action	Result
		The machine should stop.
•	Slowly release the drive pedal while	 Belt "C" (between motor and pump, - 5.2) must be stationary.
	stroke.	Should test result be negative, repeat belt cable adjustment.
•	Release the drive pedal while pressing more rapidly the brake pedal fully down.	 The machine must stop immediately. Should test result be negative, repeat the parking brake cable adjustment.
•	Park the machine on a slope and engage the parking brake.	 Check that the machine remains station- ary.
•	Stop the engine.	 If the machine still moves, adjust the parking brake cable.

7 Electrical system

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This chapter provides a description of the electrical system and any problems connected to its malfunction, indicating the probable causes and the relative remedies to be adopted.

Note!Faulty electrical cards must always be replaced without attempting to
repair them or replace the individual components.Many of the checks described in this chapter involve intervention on
connectors CN1, CN2 and CN3; to reach them, remove the external

lote! connectors CN1, CN2 and CN3; to reach them, remove the dashboard casing. To remove it **m** 2.3.6

 In this chapter, the indication "operator seated or (present)" means the operator is in the driving seat, whereas "without operator or (absent)" means the driving seat is not occupied.

7.1 Description

The machine has a single electrical wiring system (B) which is completely isolated to avoid wear and damage. The wiring is connected to the electronic card (A) by means of connectors.

/TIGA

The figure below shows the electrical wiring, the main electrical components and the safety circuits which work with microswitches.



- A. Electronic board.
- B. Electric wiring.
- C. Electrical socket for front accessory.
- D. Key switch.
- E. (1) Main ignition; (2) starting relay; (3) fuses.
- F. Headlamp.
- G. Rear sockets for accessory adjustment (1); (2) power supply.
- H. Parking brake microswitch.
- I. Safety switch
- J. Charge regulator.
- K. Electromagnetic clutch.
- L. Earth connected to the motor.
- M. Part not included in this machine model.

7.2 Troubleshooting

Warning

Never wear rings, metal bracelets, necklaces or similar metal objects when working on the electrical system. They could cause short circuits, burns and fires.

This section describes troubleshooting procedures to be followed when there is an electrical fault in one of the machine functions. This section also describes which corrective action needs to be implemented to remove the fault. Should you need to apply the troubleshooting table, it is important the following conditions are met:

- All fuses must be checked and replaced if necessary.
- The battery has been charged.
- All wiring cables are OK.
- All connectors are OK.

Note! In some cases, after a long period of use or in the event of mechanical damage, the cables which pass along the articulation may be damaged.

The actions to be taken are listed in order of most likely fault, consequently if the cause is not identified with the first check continue with the following ones. Continue through the list until the fault has been found.

Troubleshooting table				
Problem	Cause / Action	Remedy		
	The battery is not powering the card.	Check the connecting cables.Check battery conditions.		
1) With the key in the «ON» position the dashboard remains off.	No battery earth or electron- ic card connection.	Check and restore.Check the key of the main power switch.		
	20 A fuse blown.	Replace fuse (20 A).		
	Battery polarity reversal.	Check the connections.		
	The battery is not providing enough current.	 Recharge the flat battery. 		
2) The dashboard	Uncertain earth of battery or missing on start-up relay or motor.	 Check and restore. 		
comes on but when the START button is pressed the starter motor does not turn or	No start-up consent.	 Make sure the consent conditions are met. Check all the microswitches and relative wiring. 7.4. 		
no power (uncertain start-up).	Electronic card malfunction.	 Try replacing the electronic card with one you are sure works. 		
	Defect in the starting relay (you don't hear the click).	 Replace the starting relay. 		
	Starter motor fault (you hear the click).	Replace the starter motor.		



Troubleshooting table				
Problem	Cause / Action	Remedy		
3) The starter motor	No fuel flow.	 Check the wiring of the carburettor solenoid valve opening command. Check the fuel cock and filter. 		
does not start.	Insufficiency in the start-up system.	 Check the spark plug cap is securely in place. Check the spark gap and that the electrodes are clean. 		
4) The starter motor	Mechanical difficulties in the return of the mobile contacts on the starting relay.	 Replace the starting relay. 		
start-up and is not dis- abled when the key is removed or the STOP button pressed.	Irregular operation of the starter motor due to me- chanical or electrical prob- lems which lead to greater absorption causing sticking of the relay contacts.	 Check the starter motor. Repair / replace. 		
5) The starter motor	Faulty operation of the start- ing relay.	 Replace the starting relay. 		
the key is in the «ON» position and can only be disabled by remov-	Faulty operation of the elec- tronic card.	 Replace the electronic card. 		
ing the key.	Faults with the buttons.	Replace the control panel.Replace the electronic card.		
6) Incorrect operation	Insufficient recharge.	 Check that the recharging lead is not disconnected and recharge the battery. Check there is no dispersion caused by cables with damaged insulation and recharge the battery. Check the recharging circuit. 		
(battery and electronic	Overvoltage in recharging.	Check the recharging circuit.		
	Charge fuse blown.	• Replace the fuse (25 A) and check the charging circuit.		
	The electronic card is damp.	Dry the electronic card.		
	Uncertain earth on the elec- tronic card.	Check and restore.		
	Faulty electronic board.	Replace the electronic board.		

Troubleshooting table					
Problem	Cause / Action	Remedy			
	Safety devices tripped or faulty.	 Check operation of the microswitches and relative wiring. 			
	Inadvertent disconnection of some electrical wire.	 Check all the wiring. 			
7) The engine stops during use.	No consent for engine run- ning.	 Make sure that all consent conditions are met, check all the microswitches and relative wiring. 			
	Uncertain or no earth on the charge regulator.	 Check the earth connections and the regulator fixing screws. 			
	Overvoltage caused by regulator malfunction.	Check the recharging circuit.			
	Battery disconnected or faulty during use.	 Check the battery and the wiring. 			
	Short circuit or overload on the power side of the elec- tronic card (starter block, starting relay, headlamps and recharging connector).	 Find and replace the faulty user. 			
8) The 20 A fuse has tripped.	Short circuit or damage to the electronic card protec- tion system (power side).	• Try replacing the electronic card with one you are sure works. If the problem does not recur, permanently replace theelectronic card.			
	Short circuit on the front socket or on the rear socket ets.	Check the sockets.			
	Fuse 20A blown.	 Replace the fuse. 			
	It works in one direction.	Replace the electronic board.			
9) Cutting deck height adjustment does not work.	It does not work in any di- rection.	 Check all contacts. Check the cables. Check the motor by connecting an additional battery to the power cable. Replace the electronic board. 			
10) The clutch does not engage.	Power supply fault.	Check the clutch cables and connections.Replace the electronic board.			
11) The sand spreader is not activated.	Power supply fault.	 Check cables and connections. Replace the sand spreader motor. 			

7.3 Electronic board

The electronic board shown below belongs to a machine model which is of a higher class than the basic model dealt with in this manual, in any case the functions described refer to the basic machine.

/TIGA



For this machine version, the electronic card is connected to the system by means of connectors CN1, CN2 and CN3.

NOTE The connectors are divided into two parts, the electronic card side and the wiring side. E.g.: connector CN1 is divided into (A) for the electronic side and (B) for the wiring side.

The connector CN1 of the wiring is fitted with a lug (C) which locks it onto the female connector on the electronic card.

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7.3.1 **Electrical diagram**



- 12 Clutch
- 13a 25 A fus
- 13b 20 A fuse
- 14 Sand spreader
- 15 Auxiliary accessoires
- 16 Main key switch
- GY Grey
- OR Orange
- RE Red
- VI Violet
- WH White
- YW Yellow

7.4 Electrical safety check

Machine start is consented by the safety system if the following conditions are met.

- Parking brake engaged.
- Operator seated.



- Turn the ignition key to the ON position.
- Press START key.
- If all the aforementioned conditions are met, the engine starts.

In the following table you will find the interventions of the safety devices in the various situations of use.

A) Start-up

Driver	Parking brake	Engine	Cutting means	Result
Absent	Engaged	Off	Deactivated	It does not start.
Seated	Deactivated	Off	Deactivated	It does not start.
Seated	Engaged	Off	Deactivated	It starts

B) During mowing

Driver	Parking brake	Engine	Cutting means	Result
It lifts up.	Engaged	On	Deactivated	It stays on
It lifts up.	Deactivated	On	Deactivated	It switches off
It lifts up.	Deactivated	On	Engaged	It switches off
It lifts up.	Engaged	On	Engaged	It switches off

7.4.1 Operation check

Set-up for the check:

- Disconnect the connectors CN1, CN2 and CN3 of the wiring from the electronic card To identify the connectors 7.3.
- 2. Set the tester to the requested operating mode "ohmmeter" or "voltmeter"
- 3. Make contact with the probes on the contacts of the wiring connector as described below.

Microswitches



Set the tester in "ohmmeter" mode.

- A Electronic board
- **B** Wiring

The figure illustrates the check between the contacts 15 and 17 on the CN1 wiring connector.

	Contacts	Reading the Tester and situation		
	15-17 of	8	390 (+/-5%)	
Microswitch	the CN1	(absent)	ohm (seated)	
Seat	CN3 and	8		
	17 of the	(ab a suf)	0 (seated)	
	CN1	(absent)		
Microswitch	17 - 19 of	~ "	0 (opgogod)	
parking brake	the CN1	~ (free)	u (engageu)	

Key switch



Check terminal board power supply



- Set the tested in "voltmeter" mode (Volt DC0 20).
- Disconnect the connectors CN1, CN2 and CN3 of the electronic board

Contacts		Reading the Tester and situation	
Key switch	17 of the CN1 and connector 2	0 (OFF)	Battery voltage
	of the key switch		

Set the tested in "voltmeter" mode (Volt DC0 - 20).

- Disconnect the connectors CN1, CN2 and CN3 of the electronic board 7.3.
- 2. Rotate the switch key to pos. «ON».
- 3. With the black probe make contact on the 17 terminal of the CN1 connector.

Note! If the instrument fails to record any value, proceed to check the state of the battery.

Carburettor solenoid valve operation check

- 1. Connect the connectors CN1, CN2 and CN3.
- 2. Turn the key to the ON position.
- 3. Press START button.

Result:

- During start-up you should perceive the click of the carburettor solenoid valve coil.
- When turning off the engine the click of the solenoid valve coil should be more marked.

Warning

Check operation of the starting relay.



Disconnect the cap/s from the spark plug/s so that the safety systems which usually prevent any accidental engine start-up are excluded while the checking procedure is performed.

- 1. Apply the parking brake;
- 2. Turn the key to the ON position.
- 3. Disconnect connectors CN1, CN2 and CN3 from the electronic board.
- 4. Wiring side connector. Create a bridge between terminal 8 of the CN1 connector and terminal 2 of the CN2 connector (connector with two red wires **7.3.1**).

Result

- You must perceive the click of the relay coil.
- The starter motor starts.



- If the relay clicks but the starter motor does not start, make a bridge (A) with a large section cable (5 mm²) between the relay power contacts. If at this point the starter motor turns, look for the fault inside the relay or replace it.
- If the starter motor still does not start, check the motor and relative wiring.

Check operation of the electrical sockets

• Set the tester to voltmeter mode (Volt DC 0 - 20).

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	Key switch in position	Operator	Action	Result
Front electrical socket	ON	(Absent)	 Insert the probes in the front socket. 	On the tester display you will see the value referring to battery voltage with the symbol + or - (if necessary reverse the position of the probes to read the correct positive value.
Rear electrical socket	ON	(Present)	 Insert the probes in the rear socket. Press the rear accessory regulation control. 	On the tester display you will see the value referring to the battery voltage with the symbol + or - (if necessary reverse the position of the tips to read the correct positive value.
Rear electrical socket	ON	(Absent)	 Insert the probes in the rear auxiliary socket 	On the tester display you will see the value referring to the battery voltage with the symbol + or - (if necessary reverse the position of the tips to read the correct positive value.

Check operation of the electromagnetic clutch

Warning



This check must be performed when the engine is stationary.

- 1. Disconnect the connectors CN1, CN2 and CN3 on the electronic board **[1]** 7.3.
- Wiring side connectors Connect the probes to connector 7 of the CN1 and to connector
 2 of the CN2 (connector with the two red wires
 7.3.1).
- 3. Turn the key to the "ON" position.
- 4. Press the power take-off button (activates the front accessory).
- When activating the power take-off, you should note the click of the mobile part of the clutch caused by excitation of the electrical winding. If this does not happen, check the wiring and operation of the command button.
- If after these checks the clutch does not engage it must be replaced.

Recharging circuit check.

The charge regulator, located on the engine, is designed to provide the battery with a current flow at a constant voltage of approximately 14 - 15 Volt, intervening each time the generator output voltage exceeds this threshold to take it back down to the correct value. A faulty regulator may insufficiently charge the battery (requiring frequent recharging interventions) or, on the contrary, provide overvoltage which leads to the machine being switched off to safeguard the electronics and the battery.

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Before checking the charging circuit, make sure that:

- The connections on the charging circuit are correct (see the electrical diagram) 7.3.1;
- The earth (on the engine block) offers safe connection, also check the earth connection of the charge regulator:
- The battery is charged and not sulfated.
- The 25A charge fuse is intact.

A) Check the minimum charge threshold

- Set the tester to voltmeter mode (Volt DC 0 20).
- 1. Start the engine and keep it at idle rpm.
- 2. Turn on the headlamps.
- 3. Measure the voltage on the battery terminals.
 - If the value **tends to drop**, even slowly, it means that the regulator is not charging sufficiently and needs replacing.
 - If the voltmeter is **not giving any reading**, it means that the charge fuse has blown.

A) Check the maximum charge threshold

- Set the tester to voltmeter mode (Volt DC 0 20).
- 1. Start the engine and take it up to maximum speed.
- 2. Measure the voltage on the battery terminals: the value **should increase slowly** until it stops at 15-15 Volts.

Note! If the value of 14-15 Volts is exceeded until the engine stops due to intervention of a safety device (at around 16.8 Volts), it means that the regulator is charging too much and needs replacing.

7.5 Hermetic battery care and maintenance

A) General information

In recombination hermetic batteries, the electrolyte of each element is accurately dosed in the production stage and sealed at source in order to guarantee maximum efficiency throughout the battery's life cycle.

Warning

There is no need to add water or acid to this type of battery and it must never be opened nor the cover removed.

B) Recommendations for correct use

To maintain battery efficiency and increase it's duration, certain precautions should be taken:

- Always keep the battery in a good state of charge.
- Always fully charge a flat battery within 1 month, otherwise it may get damaged and no longer be rechargeable (sulfation).
- Always charge the battery before and after a prolonged period of inactivity or storage.



Warning

Charge using a constant voltage battery charger only. The use of any other type of battery charger could damage the battery.

C) Rules for battery charging

The charging operation is particularly important for the duration of the battery and must be carried out in accordance with these prescriptions:

- Do not charge batteries if the casing is broken or cracked;
- Carefully read the user instructions provided with the battery charger and battery;
- Use a suitable battery charger;
- Charge in an environment with an ambient temperature of between +10°C and +30°C.

Warning



When charging, make sure that the battery does not heat up to over 50°C; if this happens stop charging immediately and replace the battery as it is unusable.

With the battery disconnected (and unused for at least 12 hours) and the tester in voltmeter mode, measure the voltage between the poles; the value detected (open circuit voltage) provides an indication of the operations to be carried out as indicated in the table below:

Open circuit battery voltage	Battery status	Operation to be performed
13.1 Volt	Max. threshold	None
12.6 Volt	Min. threshold	None
< 12.4 Volt	Flat	Recharge

NOTE Check the battery voltage after at least 12-24 hours following charging.

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7.5.1 Battery replacement

The battery is located under the engine casing on the right-hand side. To reach it follow the instructions.

Disassembly





- 1. Tilt the seat forward.
- 2. Undo the 3 screws (A).
- 3. Lift and remove the casing (B).





- 4. Unscrew the 2 screws (C) to remove the battery stopper (D)-
- 5. Take the battery out.

Reassembly

To reassemble the various parts, repeat the operations in reverse order.

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Warning

Never wear rings, metal bracelets, necklaces or similar metal objects when working on the electrical system. They could cause short circuits, burns and fires.

Disassembly

Remove the dashboard.
 2.3.7



- Unscrew the screws (A) which fasten the board in place.
- Take the card from the dashboard mask.

Reassembly



NOTE: on the rear of the card, in relation to each command, the following components are installed (A = button) and (B=gasket), take care not to damage them.

- Carefully remove the buttons (A) and the gaskets (B) one at a time and transfer them to the new card.
- Assemble all the parts in reverse order and take special care over the button gaskets.
- Once reassembly has been completed, check all the functions.

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7.7 Diagnostic Tool



For further information see:

http://www.gggpartsandservice.com ==> Service ==> Software ==> STIGA - Diagnostic Tool

7.8 Check and replace the main power cord

IMPORTANT

For work on the electrical system and battery, carefully check that the positive wires (red) are integral, that the insulation is not cracked or worn and that the corrugated protection sheath is installed and correctly mounted to prevent cables from being crushed by the battery housing after installation.

For machines prior to 2020 or, in any case, without corrugated protection sheath, this must be installed following the instructions hereto.

7.8.1 Protection sheath assembly

Needed Material:

- a) Open corrugated sheath Ø 10 mm length 150 mm
- b) Duct tape
- c) Cable tie





1. After having removed the fuel tank and battery housing, wrap the 2 red wires with the open corrugated sheath.



2. Secure the lower end of the corrugated sheath to the main harness with duct tape.





3. Place the main electric harness as closely as possible to the mudguard and pull the exceeding harness backwards as shown in the picture. This will avoid any possible contact with the battery case once mounted.



5. Rebuild the machine in reverse order.

4. Secure the electric harness underneath the battery area by fastening the harness to the main frame bracket with a cable tie.



STIGA S.p.A - Via del Lavoro, 6 - 31033 Castelfranco Veneto (TV) - Italy www.stiga.com