

# ROTAIR S.p.A.

Compressori d'aria

Martelli idraulici

Minitransporter

Operating maintenance  
Parts manual

# RAMPICAR

# R 100

# R 100 Plus

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## --- 1. IDENTIFICATION DATA ---

We are presenting all the indications that are printed on the identification plate (Part C - Fig. 1) applied to the front of the machine.

MODEL:.....**R 100**  
**R 100 Plus**

SERIAL NO. :.....

BASE TRUCK MASS (Kg):.....**570** (with body)

OIL CAPACITY (Lt per min):.....**6 – 6**

WORKING PRESSURE (MPa):.....**200**

YEAR OF CONSTRUCTION:.....



### **IMPORTANT:**

**In the event of the use of non-original spares ROTAIR the guarantee will automatically.**

Always cite the above model and serial number when making requests for assistance or spares orders.

## --- 2. TECHNICAL DATA ---

### **MOTORIZATION:**

- Honda (petrol) 13 HP at 3600 rpm
- Yanmar (diesel) 10 HP at 3600 rpm.

(Consult the motor booklet enclosed with this user and maintenance manual)

### **TRANSMISSION:**

- Integrated hydrostatic type with two motor reduction units with integrated negative brae for belt pulling.
- Variable speed of 0 - 4.2 km/h

### **DRIVE:** (See chapter 7)

Controls:

- A single highly sensitive manipulator for all drive directions (forward, back, right and left).
- Accelerator lever.
- Body engagement lever
- Additional levers according to the accessories used

### **HYDRAULIC SYSTEM:**

Hydraulic oil tank with a capacity of 14.5 lt

Double transmission pump with variable capacity axial pistons

Motorized reduction units with integrated negative brae

Pump capacity – 1000 rpm - 12lt/min. ( 6 + 6 )

Maximum pump capacity 3000 rpm - 36 lt/min. ( 18 + 18 )

Maximum regulation pressure of the transmission system - 200 bar

Gear pump for the auxiliary circuit of 3,1 cm<sup>3</sup>/rev.

Plus Version: Gear pump for the auxiliary circuit of 6 cm<sup>3</sup>/rev.

Hydraulic oil cooling radiator

### **MAXIMUM CAPACITY:**

With level carriage: 850 kg

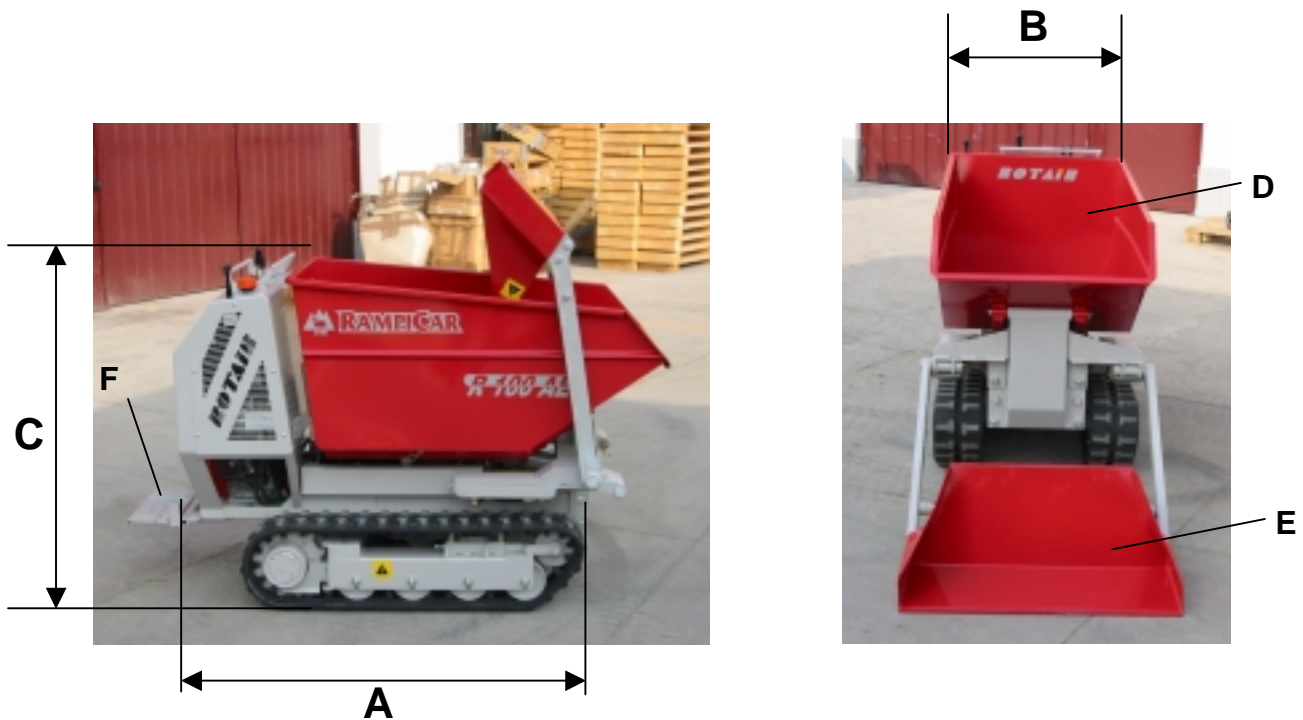
Off-road: 750 kg

### **SLOPE CAPACITY:**

At full load: 35° in the longitudinal machine sense (see drawing 1 page 8)  
20° in the lateral machine sense (see drawing 2 page 8)

## **BASE TRUCK DIMENSIONS:**

Total standard length:	mm 1460	(A)
Total standard width:	mm 800	(B)
Handlebar height:	mm 1210	(C)
Empty weight:	kg 570	with body



## **OPTIONAL ACCESSORIES WHICH CAN BE FITTED TO THE BASE TRUCK**

- Dumper standard truck (Part. D)
- Truck with loading platform and opening sides
- Dumper type body with variable height unloading system
- Self-loading front bucket of 100 kg. capacity (Part. E)
- Funnel type mixer with 180 litre capacity (for Plus version only)
- Operator's seat with foot-rest
- Operator platform (Part. F)
- Snow shovel element
- Manual hydraulic demolisher hammer of 20 g capacity (for Plus version only)
- Hour-counter device



## **IMPORTANT**

The RAMPICAR R 100 mini-transporter is an all-terrain tool carrier vehicle

In accordance with the type loading or working equipment chosen for the RAMPICAR, the envisaged installation, user and safety regulations are to be followed.

We also wish to point out that the operational conditions of the vehicle, such as the stability and operational performance may vary according to the type of accessories installed. Therefore it is important to carefully follow the safety instructions indicated by the constructor.

### **--- 3. MANUAL USE AND CONSULTATION ---**



The owner, user and maintenance technician must carefully read the manual to ensure that the machine is used in accordance with the purpose and principles for which it has been designed.

It is important that the owner ensures that all his employees fully respect and comply with all the instructions of the manual, so as to ensure the best possible use of the machine, in compliance with the safety standards provided.

This manual provides a detailed description of:

- the operating methods of the machine;
- the general rules and useful advice for both ordinary and extraordinary maintenance;
- instructions for identifying and ordering spares.



**N.B. The instructions for the correct use of the motor are provided in the manual prepared by the motor construction company itself.**

The correct and methodical use of the machine according to the advice provided in the present manual, will ensure its long life, and will also help to prevent the risk of any work accidents.

This manual must be carefully kept in its special holder, and prevented from getting damp or heated or in direct sunlight so that it can be consulted at any time both by the personnel responsible for its use and by ordinary and extraordinary maintenance personnel.

It is also important to ensure that all repairs and extraordinary maintenance operations are undertaken by specialized personnel.

In the event of loss or damage to the present manual, please request *ROTAIR S.p.A.* for a replacement copy, citing the machine identification details printed on the special plate fixed to the covering panel of the dashboard. Should the plate be illegible, the details indicated on the purchase invoice should be requested.

Any further information or clarifications regarding the use or any interventions to be undertaken on the machine will be provided on direct request to *ROTAIR S.p.A.* always citing the serial number and identification details of the machine itself.

This machine has been designed and developed for the transportation of various materials along various routes in the conditions as envisaged by the manufacturer. Any

other uses that are not described will be considered as "*non conforming*" and will absolve the constructor from any liability, which will be the complete responsibility of the user.

"*Conforming use*", envisages the observance of the indications provided in the present manual relative to machine use and maintenance.

It is also necessary to respect all the accident prevention regulations as described and recommended, as well as taking into account the general work health and safety regulations as envisaged in the current legislation.

The constructor declines any responsibility in the event of any modifications made to the machine without specific authorization.

The machine is supplied complete with the following documents:

- 1) General use and maintenance booklet;
- 2) Motor use and maintenance booklet;
- 3) Declaration of machine conformity to the R.E.S of EEC directive 89/392;
- 4) Motor guarantee certificate
- 5) Use and maintenance booklet of any eventual optionals

The machine has recommendation and indication symbols on it, so as to allow the operator to correctly undertake operations. The symbols also appear in the present manual and are as follows:



Carefully read the details given in the manual before using the machine



General type of warning: danger risk or risk of machine damage

On the handle, on the left rear, is a fixed plate (part. L. Page 10) bearing the machine identification details (Chap. 1) with relative CE mark.

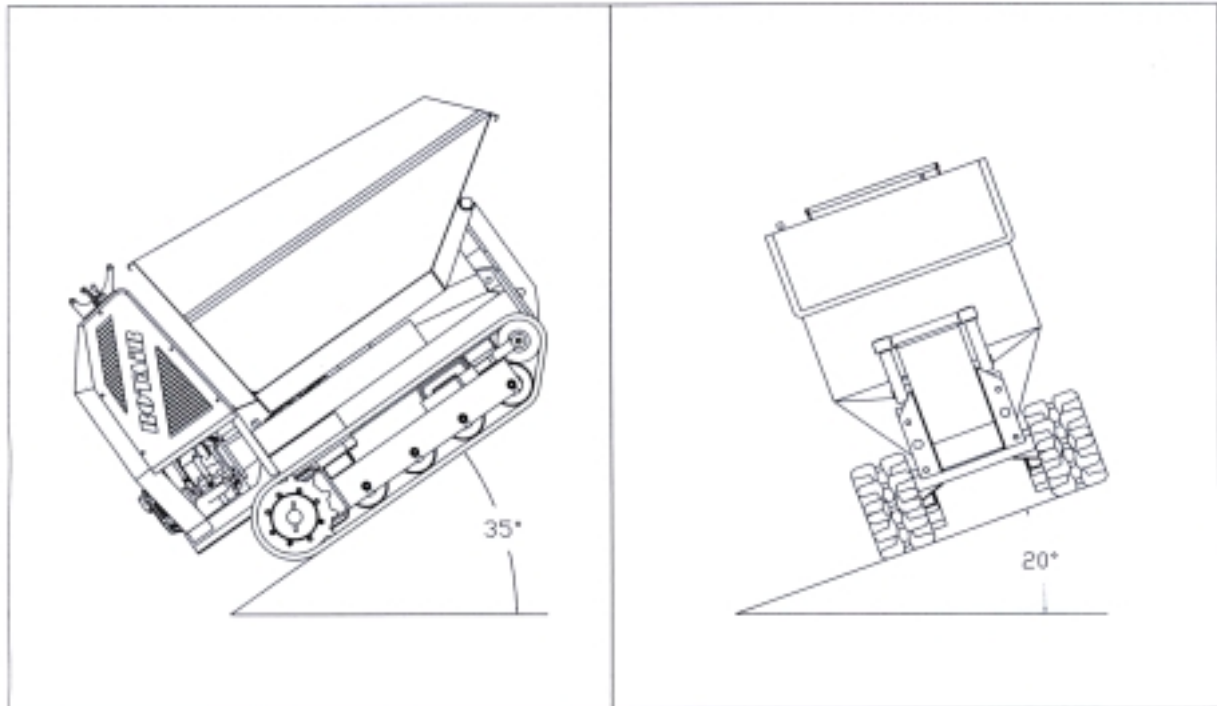
The means of switching on and control of the vehicle direction are indicated on the dashboard.

The machine also features a series of general warning symbols applied onto the components subject to operator use



## --- 4. ENVISAGED MACHINE USE ---

Rampicar R100 is a tracked motorized truck designed for the transportation of various materials over various ground conditions with a variable slope of between  $0^{\circ}$  and  $35^{\circ}$  in longitudinal machine sense (drawing 1) and from  $0^{\circ}$  to  $20^{\circ}$  in a lateral sense (drawing 2) with full load.



Drawing 1

Drawing 2

Rampicar has been created for facilitating small scale transportation operations; in the building sector, in gardens, and orchards where the passage way is of limited size or particularly steep; it can easily transport various types of materials over damp ground or small steps thanks to its sturdy tracks.

RAMPICAR R 100 is also a true tool-carrier thanks to the vast range of load body and specific equipment options (see page.5), which makes it particularly versatile and multi-purpose.

The machine has been designed to be driven by a driver, who by following it step by step undertakes the movement operations by means of a two-hand control.

All the operations are to be undertaken by the driver of the vehicle who is responsible for ensuring that all unauthorised persons are kept away from the working field of the machine when it is in operation

## --- 5. PRECAUTIONS AND COUNTER-INDICATIONS ---



To ensure correct and safe machine use conditions it is important to always carefully follow the instructions contained in the present manual.

The machine when moving constitutes a potentially serious accident risk to any persons that may be in its field of operation.

**The RAMPICAR R100 driver who controls the machine movement is responsible for paying the greatest attention and to ensuring the correct use of the machine and its controls according to the following instructions:**



Rampicar R100 is designed for transporting materials.  
**Transportation of persons or animals is severely forbidden**

Rampicar R100 must be driven by a single person who will use the controls positioned on the handlebar, developed for two-handed use.



**The machine is never to be driven by more than one person, and never block the motor stop lever, positioned on the left handle, in active position. Hands must be kept on the controls during driving.**



Rampicar R100 has been designed for covering ground with a maximum slope of 35° in the drive direction and with full load (Chap.4).  
**Do not use the machine on ground with slope exceeding the above and do not exceed slopes of 20° in the lateral machine sense.**



Do not load the machine with bulky objects or materials which may effect stability over difficult or very sloping ground.



Always pay the greatest attention to the running direction of the vehicle avoiding any bumps or slopes which may cause the machine to overturn. Keep all persons and animals outside the operational field of the machine, otherwise there is a great danger risk



Rampicar R100 has been designed in order to ensure perfect visibility from the driver's seat.  
**Ensure that the height and the position of the load itself does not obstruct visibility**

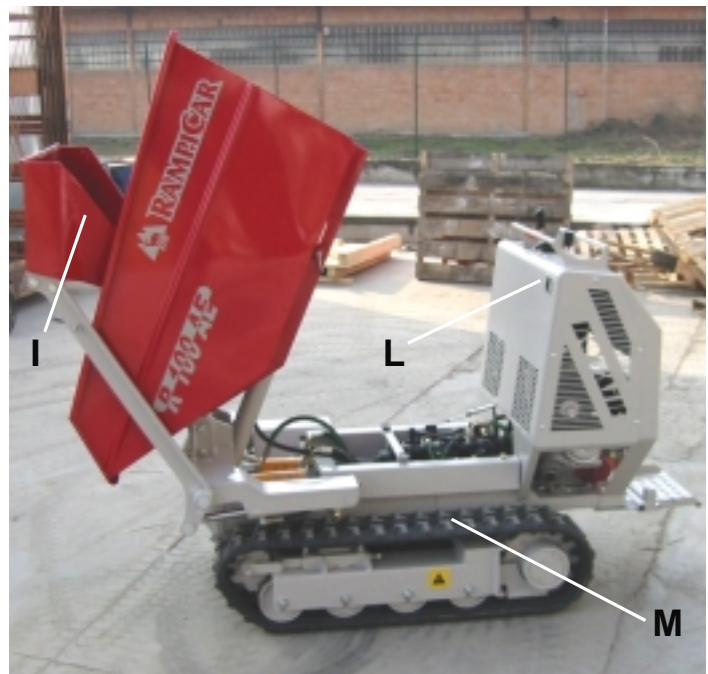
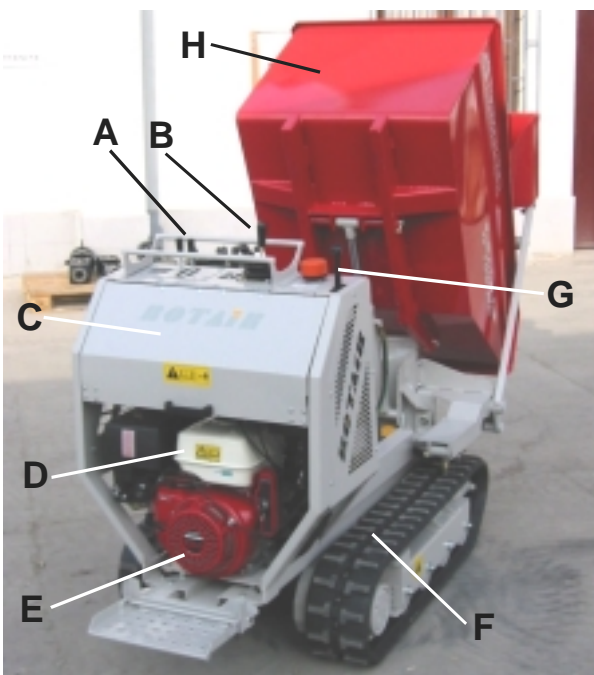
## --- 6. TECHNICAL DESCRIPTION ---

It consists of a motorized- barrow with integrated hydrostatic transmission.

The machine consists of a supporting chassis to which the available accessories can be easily applied (page 5).

The motion comes from two rubber belts operated by means of two motorized reduction elements, which are powered by the double axial piston pump of variable capacity (integrated hydrostatic transmission). The engine is located beneath the flap inside the handlebars.

The two diagrams below indicate the main machine components.



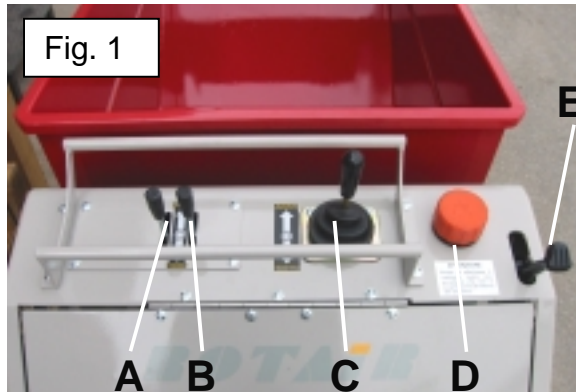
- A) Body operation lever
- B) Control device
- C) Flap
- D) Fuel tank
- E) Thermal motor
- F) Right track

- G) Accelerator lever
- H) Standard dumper body
- I) Self-loading front bucket
- L) **CE** identification plate
- M) Left track

## --- 7. CONTROL INSTRUMENTS AND DEVICES ---

The arrangement of the control instruments is such as to ensure that all the controls are within the reach of the operator using the vehicle.

Figure 1 shows the main control appliances on the dashboard.



The accelerator lever (part. E. Fig.1) is located on the right; by pushing the lever forwards it is possible to accelerate the engine and back to decelerate it.

The control manipulator is at the centre (part. C fig.1) which can be turned by 360°c, to permit machine movement in all directions.

The body control lever is located to the left of the manipulator (part. B fig.1) as well as any other accessories (part. A Fig.1); in the specific version with body, it is possible to tilt the platform by pushing the lever forward and it can be returned to its original position by pulling it back.

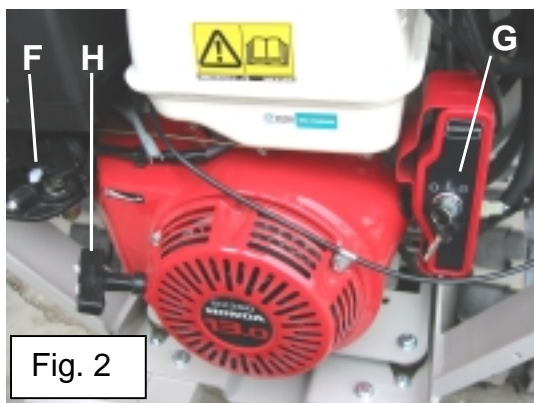


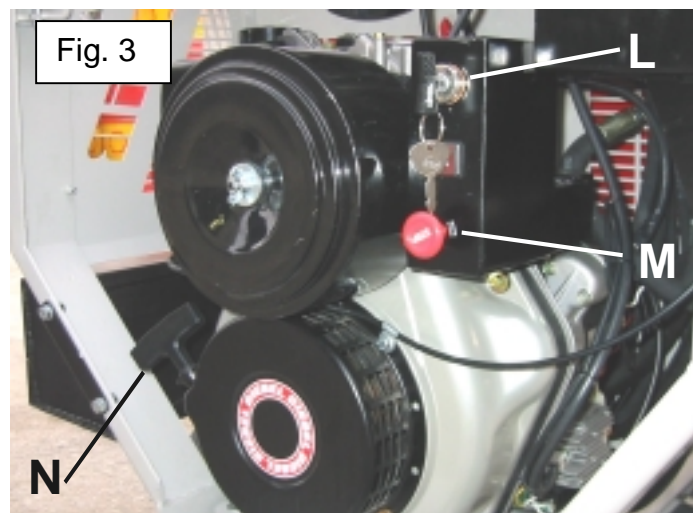
Figure 2 shows the main control devices positioned on the Honda engine.

The starter key is on the right (part. G fig.2), while the air lever is on the left (part. F fig.2) while below is the pull starter string (part. H fig.2)

Figure 3 shows the main control elements to be found on the Yanmar diesel engine.

The starter key is to be found on the top right (part. L fig.3), while the STOP knob is at the bottom (part M. Fig. 3).

While on the bottom left is the pull starter handle (part N. Fig. 3).





## --- 8. RAMPICAR USE ---

### 8.1 BEFORE STARTING

The operations necessary before starting are as follows:

- Check the oil level inside the engine sump (see enclosed engine booklet)
- Check the hydraulic oil level (chapter 9.1)
- Check the fuel level (chapter 9.3)

### 8.2.1 PULL STARTER ENGINE IGNITION

- Position the starter block key to “1”
- Shift the accelerator lever at mid. speed (Part. E Fig. 1)
- Pull the air lever (see enclosed engine booklet).
- Open the fuel cock (see enclosed engine booklet)
- Take the handle of the starter pull cord (see enclosed engine booklet).
- If the engine starts shift the air lever to the initial position

### 8.2.2 ELECTRIC START

- Shift the accelerator lever at mid. speed (Part. E Fig. 1)
- Pull the air lever (see enclosed engine booklet).
- Open the fuel cock (see enclosed engine booklet).
- Turn the starter key
- If the engine starts shift the air lever to initial position

Should the engine fail to start do not force the starter key for over 10 seconds; turn the key to initial position, check the points cited in chapter 8.1 and 8.2.2 and then attempt to re-start it.

Should the engine fail to start after repeated attempts seek technical advice



### **IMPORTANT:**

After starting the engine of either pull or electric type, it is advisable to allow it to run for 5 minutes on empty, before beginning work, especially during the winter season, in order to allow the hydraulic oil to reach a suitable temperature to prevent the risk of damage to the hydraulic system.

## 8.3 STOPPING

- Position the accelerator lever to minimum
- Close the fuel cock (see enclosed engine booklet)
- Position the starter block key to "0"
- With diesel engines pull the STOP knob (part. M fig. 3) and reposition the starter block key to position "0".
- On switching off the engine the brakes of the motorized reduction unit are automatically engaged.

Should the RAMPICAR have worked in very dirty areas it is necessary to clean the "delicate" parts of the system (air filter, cooling radiator, engine and pump unit)

After stopping the machine it should be stored in an area protected against the elements.

## --- 9. MAINTENANCE ---



Machine maintenance principally consists in the replacement of the parts subject to wear during their normal use. The replacement parts are to be ordered from the constructor (as indicated in chap. 10).

The replacement operations are to be undertaken using suitable tools and paying attention to the potential accident risks of these spares.

For the extraordinary repairs of structural machine parts it is advisable to request specialist intervention from the constructor.



### **IMPORTANT :**

Remember that the fluids, batteries and filters must be periodically replaced and disposed off in accordance with current regulations. The materials which make up the machine are chemically dangerous and should be sent to a specialist scrapping company.

### --- 9.1 CHECKING AND REPLACEMENT OF THE HYDRAULIC SYSTEM OIL ---

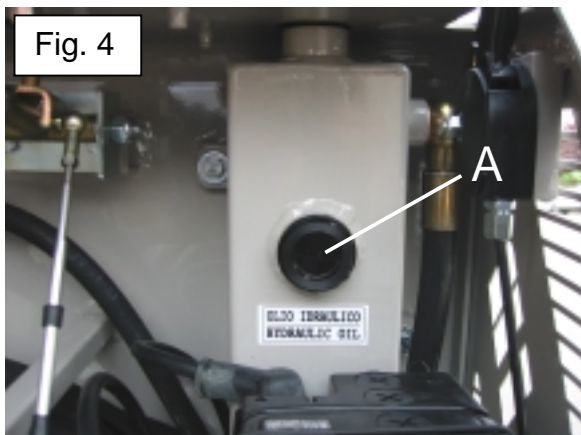
The efficient function of the Rampicar hydraulic system depends on the constant lubrication of its components (pumps, cylinders, motorized reduction units and distributors) using suitable hydraulic oil. The hydraulic oil type used by the RAMPICAR R100 constructor is SHELL DEXRON III type.

It is also possible to use other types of oil, providing that they have the same chemical and physical features as indicated above. Other similar oil types are:

- ROL OIL IDROMATIC DEX
- AUTRAN MBX



The quantity of oil in the tank is indicated in chap. 2- hydraulic system. It is important to ensure that the oil is replaced after the first 100 working hours and then every 400 ÷ 500 hours or once a year. In the event of use under difficult conditions the oil should be replaced every 300 hours.



### **Check on the hydraulic oil level**

- Check that the pistons of the accessories on the base truck, have retracted stem (i.e. in the case of flat loading platforms, lowered front self-loading bucket, etc, to ensure that the tank contains the maximum amount of oil present in the circuit.
- Lift the flap and check that the oil level reaches the indicator mid way (part. A fig.4).

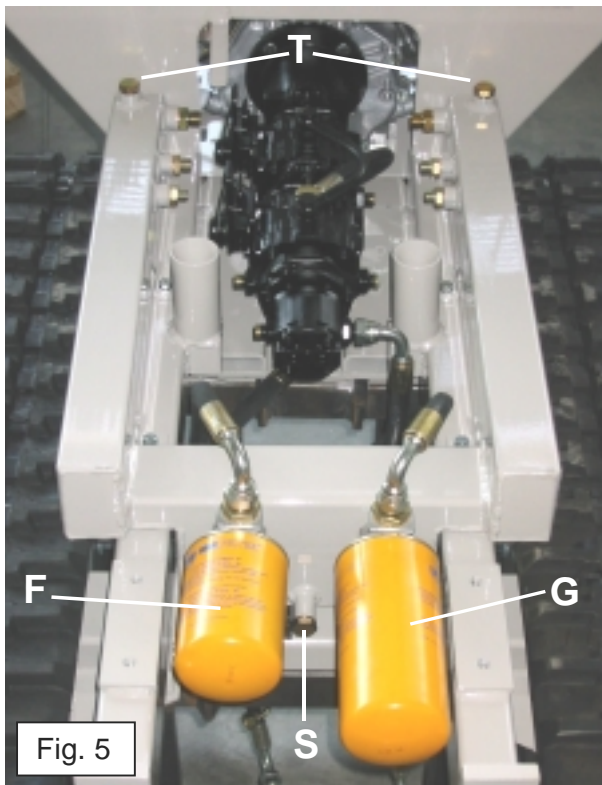


Fig. 5

until the correct level is reached

## Hydraulic oil replacement

- To do this it is necessary to empty the tank: slightly tilt the machine forward and remove the discharge cap (part. S fig.5) under the filter, inserting a container beneath it to ensure that the excess oil does not leak out.
- Now, remove the cap of the filler outlet (part. D fig.2) to allow the oil to flow out more easily.
- Once the tank is totally empty, tighten the exhaust cap making sure that the seal is intact.
- For speed up the filling, removing the stoppers of vent (part. T Fig. 5) of the inferior tank
- Proceed with filling operation using an oil to the above types through the filler mouth on the handlebar (part. D Fig. 2).
- Once the lower tank is full, restore the discharge caps and continue to fill

## --- 9.2 PUMP SUCTION FILTER REPLACEMENT ---



filters.

It is necessary to replace the filters of the exhaust oil of both the main and secondary pumps after the first 100 working hours and then every 400 ÷ 500 ore. Each time that the oil is replaced it is also necessary to replace these

The main pump feeds the motorized reduction elements for Rampicar translation (forward, back, right and left).

The auxiliary pump supplies the distributor for the movement of the accessories (dumper body, self-loading bucket etc.).

The filters to be replaced are located on the front part of the machine:

- the short filter "F" is for the main pump
- the long filter "G" is for the auxiliary pump

There is a chance that oil will leak from the filter support during oil replacement, to avoid the risk, it is advisable to replace the filter only when the tank has been emptied.

The filters need to be loosened using a chain spanner, the new filters are to be tightened **solely by hand**, after greasing the seals.



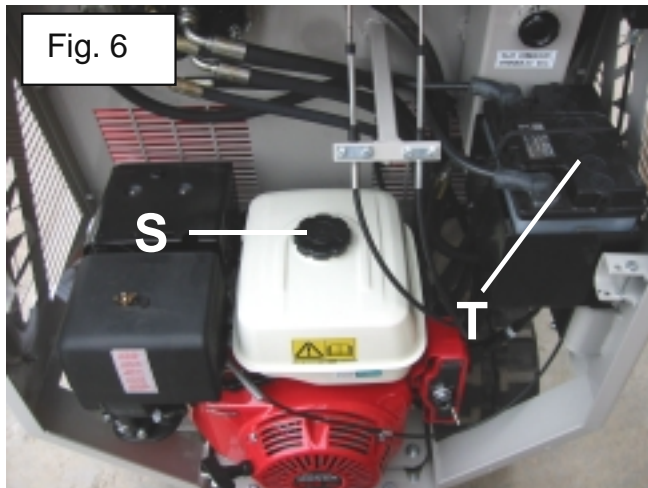
### IMPORTANT:

**Do not invert the two filters otherwise there is a risk of damage to the pumps, as these two filters have totally different features.**



## --- 9.3 FUEL CHECKING AND TOPPING UP ---

The fuel tank is located above the engine. To top up simply lift the flap and remove the cap (Part. S fig.6) positioned above the tank and fill with the fuel



### **IMPORTANT:**

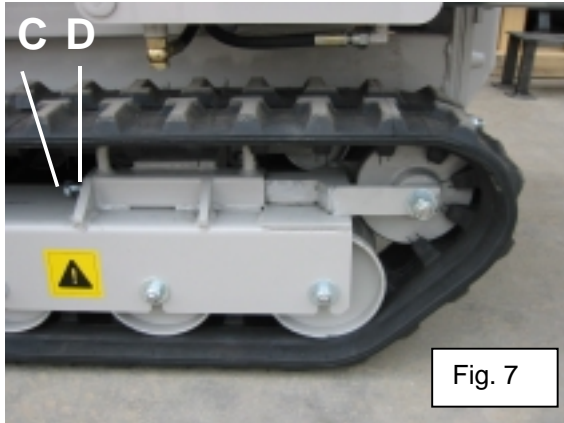
Use only the fuels of similar type to that indicated by the engine manufacturer.

## --- 9.4 BATTERY CHECK ---

Unscrew the caps of the battery (part. T fig.6) elements and check the level of the electrolyte liquid. Top up with distilled water if necessary.

## --- 9.5 TRACK TIGHTENING AND REPLACEMENT ---

It is necessary to make a **monthly** check on the condition of the tracks, both in terms of wear and tightness.

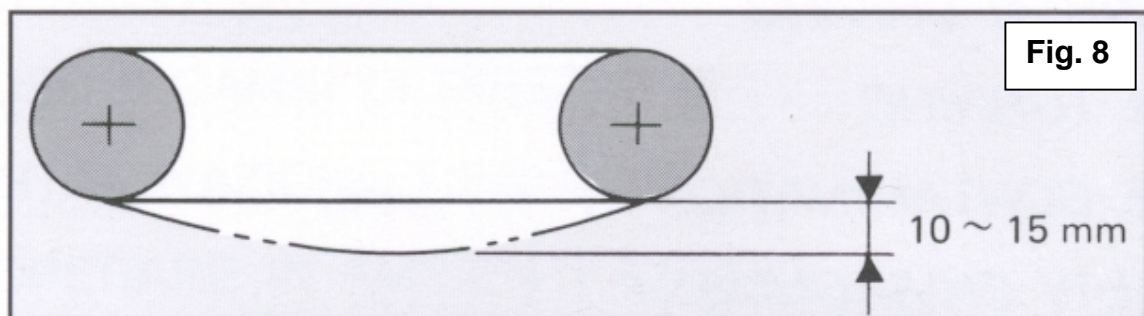


The track-stretcher is positioned on the front part (see fig.7): to make the track more taut simply unscrew nut D and then tighten bolt C. When the track is suitably taut, securely tighten nut D.

Should track replacement be necessary, unscrew nut D and loosen bolt C by as much as possible.

Remember that it is essential to lift the machine to effect track replacement.

The suitably tightened track (**fig. 8**) must have a camber of between 10-15 mm between the two traction end points (length of the track on the ground). This test must be taken with the machine raised from the ground.



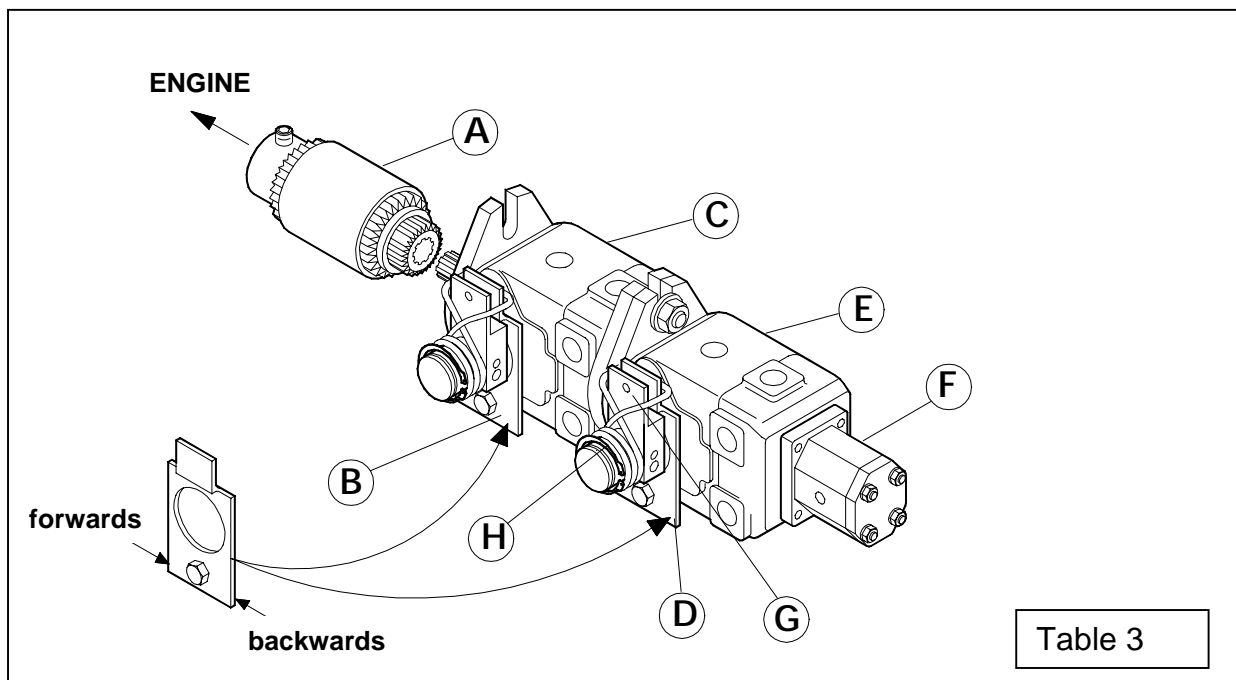
## --- 9.6 REGULATION OF THE ADVANCE SYSTEM ---



### IMPORTANT:

This type of operation must be undertaken with the greatest care and precision and solely by qualified staff.

In the course of the normal use of the RAMPICAR, the two variable capacity pumps are subject to internal adaptation. In some case this adaptation may cause perceptible machine movement even with the machine at a standstill. To prevent this it is necessary to regulate the fixed advance plates on the pumps themselves.



It is necessary to remember that pump C operates the right motor reduction unit and the consequent right track transmission while pump E activates the left track. The settling of the pumps may occur in a different manner, but in both cases results in transmission on a single track. Therefore regulation must be undertaken solely on the transmission pump the track that is actually moving. To simplify the above, if with the control manipulator to idle, RAMPICAR should move by turning to the right, it means that the left track is turning and it is necessary to regulate the second pump E. If it instead advances in a straight manner it means that both pumps need adjusting as both tracks rotate in the same manner.



It is important to carefully read the following before operating the machine. Considering that the two pumps are totally identical we shall refer to pump E of the left track: to regulate the right track the same procedure is necessary but obviously on the advance system of pump C

As shown in drawing no. 3, the operating system of pump “E” To the fixed plate “D” from the mobile plate “G” and from spring “H”. It is easy to see that by moving the control manipulator forwards, plate “G” shifts backwards, vice versa if the manipulator is moved backwards. On releasing the control, due to the effect of spring “H”, the manipulator returns to idle position.

In order to regulate the track advance it is necessary to carefully rotate fixed plate “D” with a few small hammer strokes to the base as indicated by the arrow, without unscrewing the fixture screws of the plate itself. Shifting plate “D” backwards will offset any advance of the left track.



**The pump regulation system is highly sensitive, even the slightest shift of the plate is sufficient to ensure effective pump regulation.**

## --- 10. SPARES TABLE ---

The following pages provide the spares tables complete with exploded view drawings with relative key. Each exploded drawing reference code corresponds to the key reference code in order to facilitate eventual spares ordering. The key indicates the position of the part in the exploded view table, the name of the part, the *ROTAIR* code and the quantity present.

In the event of spares orders simply:

1. Ensure that the part number indicated in page 2 corresponds to the part number stamped on the EC identification plate (Fig.1 - part C) on board the machine
2. Consult the following tables to find the parts required and the relative positions
3. Look for the part position in the keys and note down the name and code.
4. For fast and efficient order processing the following details are to be cited: **model, part number, position, table, description, code and quantity**



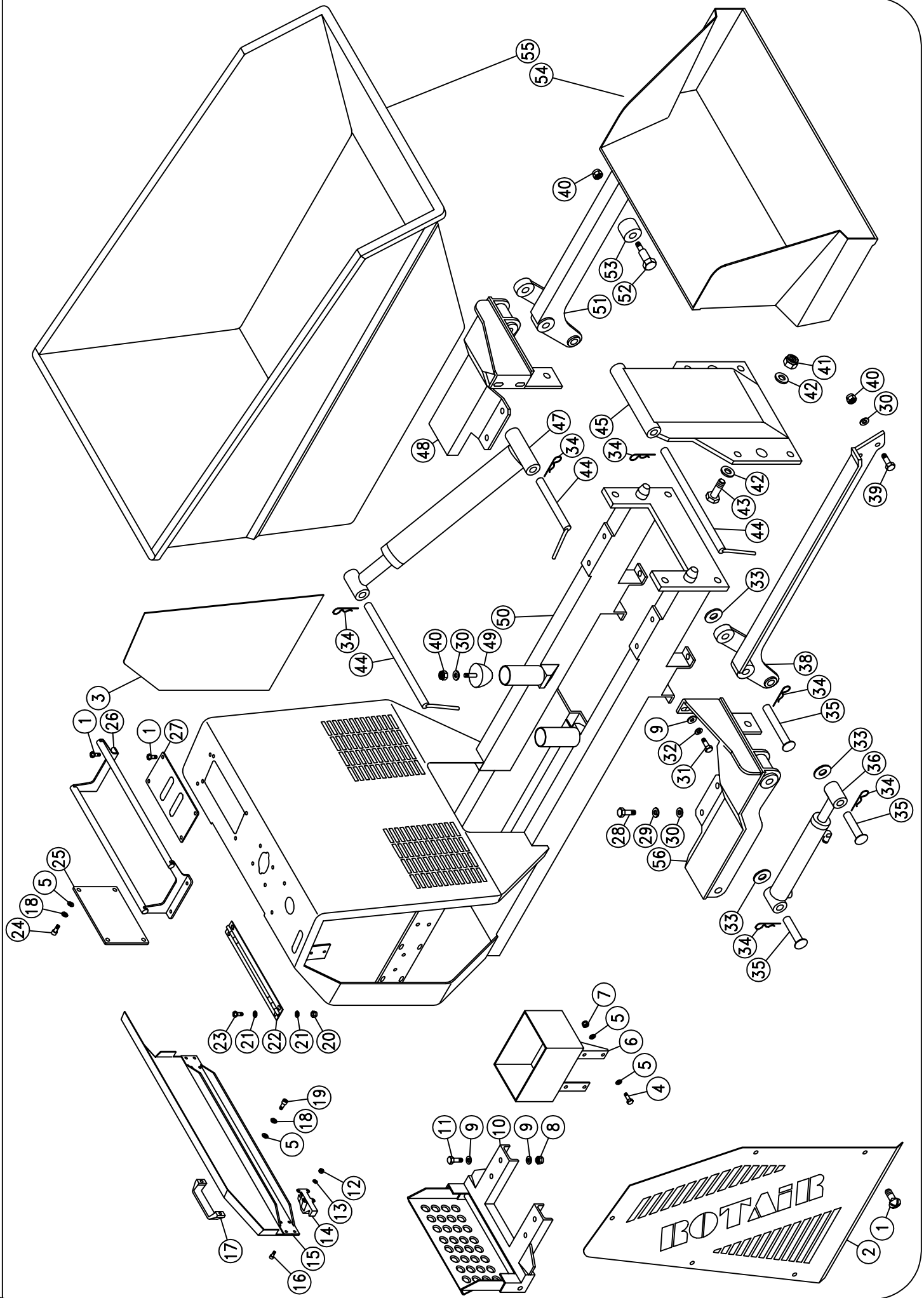
### IMPORTANT !

Unclear or incomplete orders will be processed with a considerable delay!

### ORDER EXAMPLE

To order part 3 in table A look for the relative name and code in the key and compile the order form similar to the one below:

Model	Part number	Pos.	Tab.	Description	Code	Quantity
R 100	XXXX	3	A	LEFT LATERAL CASING	005-9352-S	1



## DETAILS LIST OF R100

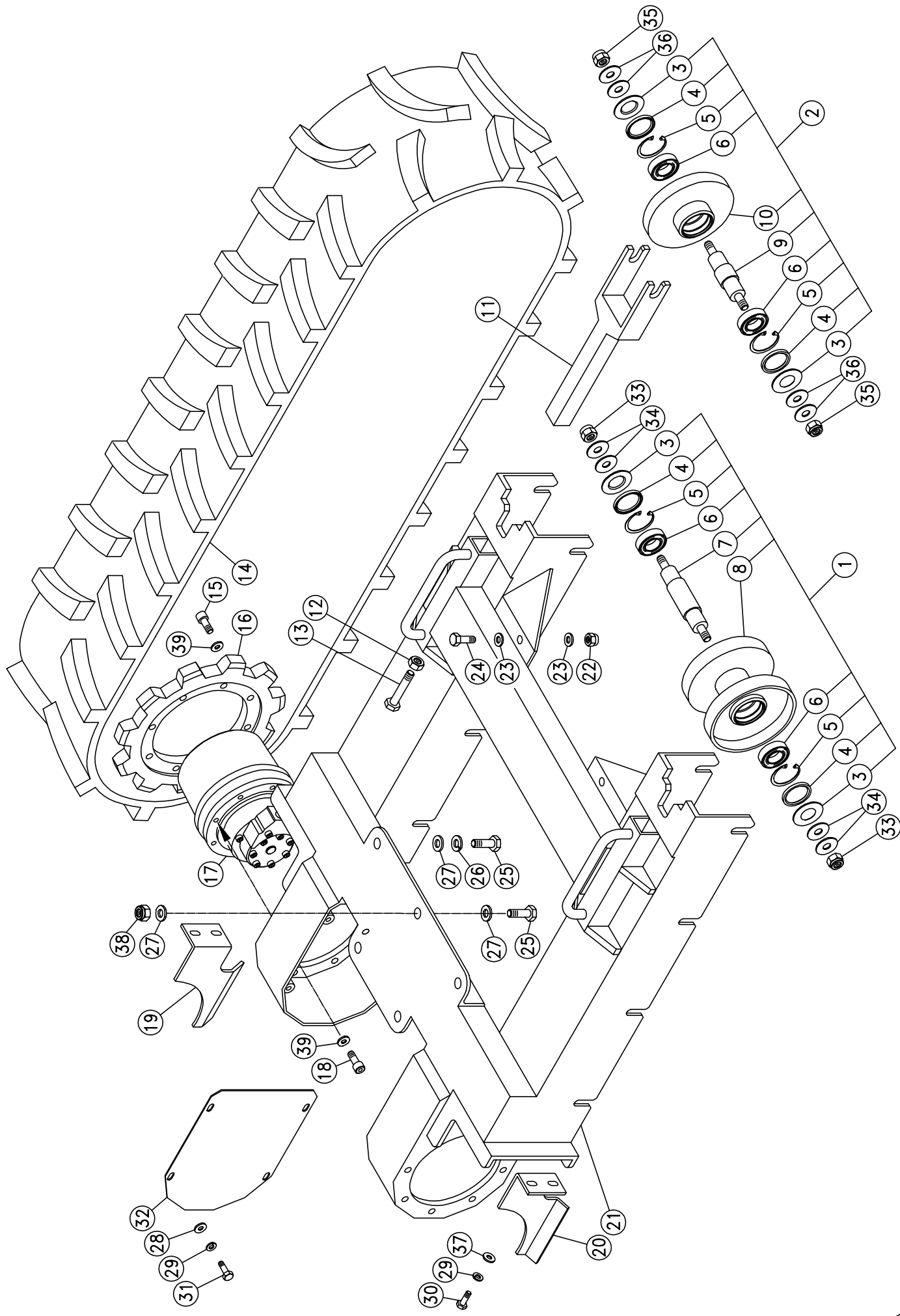
### TAB. A

POSITION	DESCRIPTION	CODE	QUANTITY
1	SCREW M 6x16 POERLIE	243-009-S	18
2	RIGHT LATERAL CASING	005-9353-S	1
3	LEFT LATERAL CASING	005-9352-S	1
4	T.E. SCREW M. 6X25	132-065-S	4
5	FLAT WASHER 6,6X18X2	015-029-S	4
6	BATTERY DRAWER	029-010-S	1
7	SELF-LOCKING NUT M 6	137-030-S	4
8	SELF-LOCKING NUT M 10	137-050-S	4
9	FLAT WASHER 10,2X21X2	015-032-S	4
10	OPERATOR PLATFORM	995-005-S	1
11	T.E. SCREW. M 10X30	132-143-S	4
12	SELF-LOCKING NUT M 4	137-010-S	8
13	FLAT WASHER 4,3X12X1,5	015-028-S	4
14	SNAP LOCK	128-020-S	2
15	CLOSURE FLAP	110-901-S	1
16	TCEI SCREW M 4x16	133-044-S	8
17	HOIST	209-020-S	1
18	KNURLING WASHER SNORR Ø6	015-250-S	2
19	T.E. SCREW M 6X16	132-062-S	2
20	SELF-LOCKING NUT M 6	137-030-S	4
21	FLAT WASHER 6,6X12X1,5	015-027-S	8
22	HINGE FOR BODYWORK	007-011-S	1
23	SCREW M 6x16 POERLIE	243-009-S	7
24	TCEI SCREW M 4X16	133-044-S	4
25	DISTRIBUTOR ATTACHMENT PLATE	208-537-S	1
26	LEVER PROTECTION TUBULAR CASING	005-9350-S	1
27	PLATE ABOVE THE TWO-LEVER DISTRIBUTION	208-5347-S	1
28	T.E. SCREW M 12X25	132-191-S	4
29	KNURLING WASHER SNORR Ø12	015-254-S	4
30	FLAT WASHER 13X24X2,5	015-034-S	6
31	T.E. SCREW M 10X30	132-143-S	4
32	KNURLING WASHER SNORR Ø10	015-252-S	4
33	FLAT WASHER 10,2X21X2	015-032-S	4
34	SPRING SPLIT PIN	104-200-S	9
35	SET OF PINS FOR SELF-LOADING SUPPORT	044-9832-S	1
36	SELF-LOADING CYLINDER-PISTON	002-911-S	2
38	RIGHT ARM SELF-LOADING BUCKET SYSTEM	994-0033-S	1
39	T.E. SCREW M 12X35	132-193-S	2
40	SELF-LOCKING NUT M 12	137-060-S	2
41	SELF-LOCKING NUT M 18	137-090-S	4
42	FLAT WASHER 18X34	015-044-S	4

# ROTAIR S.p.A.

43	T.E. SCREW. M 18X70	132-355-S	4
44	PIN KIT FOR BODY ROTATION SUPPORT	044-9831-S	1
45	BUCKET ROTATION SUPPORT	010-9092-S	1
47	LIFTING CYLINDER-PISTON	002-910-S	1
48	LEFT SUPPORT FOR SELF-LOADER	010-9095-S	1
49	SILENT BLOCK	061-905-S	2
50	UPPER CHASSIS	038-907-S	1
51	LEFT ARM SELF-LOADING BUCKET SYSTEM	994-0032-S	1
52	TEFLON SEAL SUPPORT PIN	018-9261-S	2
53	TEFLON BUSHING	223-8425-S	2
54	SELF-LOADER BUCKET	994-0075-S	1
55	DUMPER BODY	994-035-S	1
56	RIGHT SUPPORT FOR SELF-LOADER	010-9094-S	1





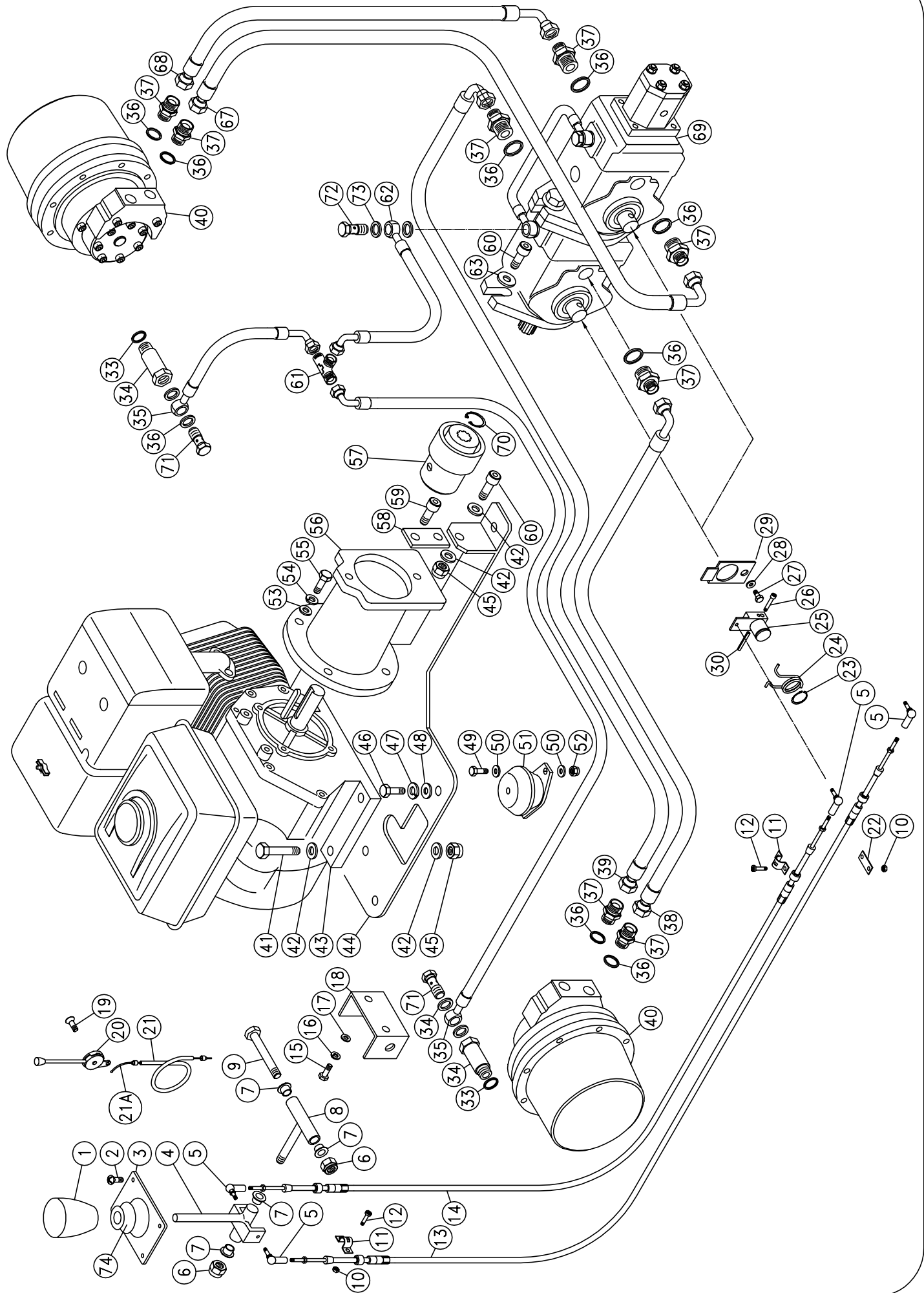
## DETAILS LIST OF R100

### TAB. B

POSITION	DESCRIPTION	CODE	QUANTITY
1	TRACK-GUIDE ROLLER ASSEMBLY	024-9050-S	8
3	SPACER CORTECO Ø 25	009-921-S	2
4	CORTECO Ø 47	151-037-S	2
5	SEEGER FOR INTERIORS DIAM. 47	109-047-S	2
6	BEARING 6005 2RS1 SKF	159-9025-S	2
7	TRACK-GUIDE ROLLER SUPPORT PIN	018-925-S	1
8	TRACK-GUIDE ROLLER	123-918-S	1
2	TRACK GUIDE WHEEL PIN	024-9051-S	2
3	SPACER CORTECO Ø 25	009-921-S	2
4	CORTECO Ø 47	151-037-S	2
5	SEEGER FOR INTERIORS DIAM. 47	109-047-S	2
6	BEARING 6005 2RS1 SKF	159-9025-S	2
9	TRACK GUIDE WHEEL PIN	018-924-S	1
10	TRACK GUIDE WHEEL	123-922-S	1
11	TRACK GUIDE WHEEL FORK	196-903-S	2
12	NUT M 12	135-060-S	2
13	T.E. SCREW M 12x100	132-206-S	2
14	TRACK	156-988-S	2
15	TCEI SCREW M 10x25	133-182-S	14
16	TOOTHED WHEEL	123-909-S	2
17	MOTORIZED REDUCTION UNIT	970-006-S	2
18	TCEI SCREW M 10x20	133-181-S	14
19	LEFT TRACK CLEANER-WASHER	120-9475-S	1
20	RIGHT TRACK CLEANER-WASHER	120-9470-S	1
21	CHASSIS	038-908-S	1
22	SELF-LOCKING NUT M 10	137-050-S	4
23	FLAT WASHER 10x21x2	015-032-S	8
24	T.E. SCREW M 10x30	132-143-S	4
25	T.E. SCREW. M 12x35	132-193-S	5
26	KNURLING WASHER Ø 12	015-254-S	4
27	FLAT WASHER 13x24x2,5	015-034-S	6
28	FLAT WASHER 8x24	015-031-S	8
29	KNURLING WASHER Ø 8	015-251-S	12
30	T.E. SCREW M 8x16	132-100-S	4
31	T.E. SCREW M 8x20	132-101-S	8
32	MOTORIZED REDUCTION UNIT PROTECTIVE CASING	005-913-S	2
33	SELF-LOCKING NUT M 12	137-060-S	16
34	FLAT WASHER 12,5x36x2,5	015-040-S	32
35	SELF-LOCKING NUT M 16	137-080-S	4
36	FLAT WASHER 16x35x3	015-048-S	8

# ROTAIR S.p.A.

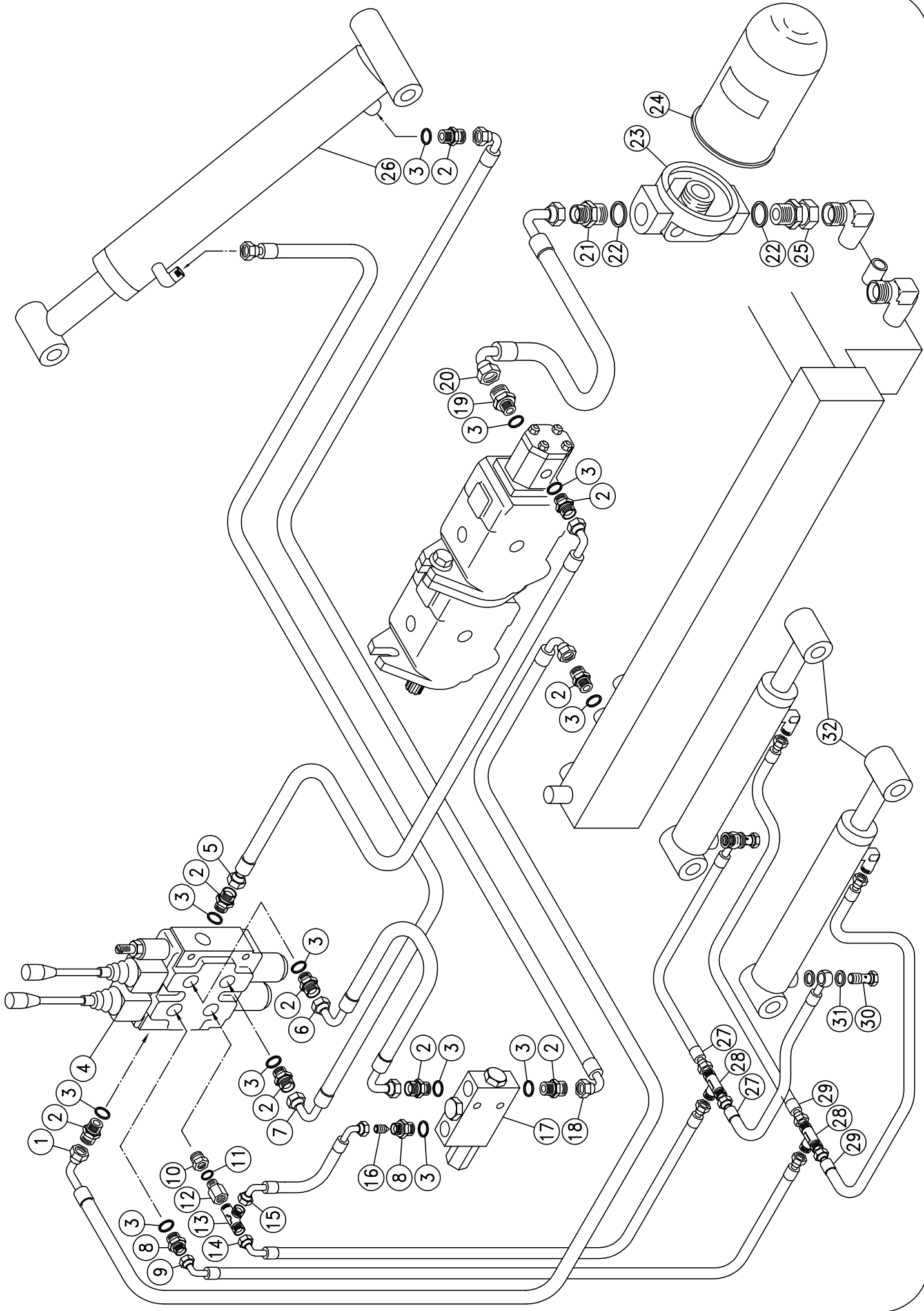
37	FLAT WASHER 8x17	015-030-S	4
38	SELF-LOCKING NUT M 12	137-060-S	1
39	KNURLING WASHER Ø 10	015-252-S	32



**DETAILS LIST OF R100**
**TAB. C**

POSITION	DESCRIPTION	CODE	QUANTITY
1	MANIPULATOR KNOB	185-901-S	1
2	SCREW M 6x16 POERLIE	243-009-S	4
3	MANIPULATOR BELLOW PLATE	208-515-S	1
4	MANIPULATOR CONTROL LEVER	094-920-S	1
5	ARTICULATED HEAD FOR CABLES	961-001-S	4
6	SELF-LOCKING NUT M 10	137-050-S	2
7	CONTROL LEVER BUSHING	223-805-S	4
8	CONTROL LEVER SUPPORT ARTICULATION	236-900-S	1
9	T.E. SCREW M 10X100	132-157-S	1
10	PLATE L14 WITH T.E. SCREW	961-002-S	4
11			
12			
22			
13	PULL-PUSH CABLE HONDA L=1050	960-002-S	1
13	PULL-PUSH CABLE YANMAR L=900	960-003-S	1
14	PULL-PUSH CABLE L=900	960-003-S	1
15	T.E. SCREW M 6x16	132-062-S	2
16	KNURLING WASHER Ø 6	015-250-S	2
17	FLAT WASHER 6,6x12x1,5	015-027-S	2
18	CONTROL LEVER SUPPORT	010-930-S	1
19	TCEI SCREW M 6X16	146-092-S	1
20	ACCELERATOR	963-012-S	1
21	ACCELERATOR CABLE SHEATH	008-9001-S	1
21A	CABLE FOR ACCELERATOR	960-0151-S	1
23	SEEGER DIAM. 30 for exteriors	109-905-S	2
24	ZERO RETURN SPRING	043-900-S	2
25	ZERO RETURN SPRING SUPPORT PLATE	208-501-S	2
26	T.E. SCREW M 6X35	132-067-S	2
27	T.E. SCREW M 8X16	132-100-S	2
28	FLAT WASHER 8,4X17X1,5	015-030-S	2
29	ZERO RETURN SPRING STOP PLATE	208-502-S	2
30	ELASTIC PIN 5 X 35	143-901-S	2
33	COPPER WASHER Ø 10	015-005	2
34	EXTENSION 1/4" – M 10x1	189-900-S	2
35	PIPING R1 1/4" O+F90° L=640 mm	065-0024.564-S	2
36	COPPER WASHER 1/2"	015-012-S	4
37	DOUBLE SCREW 1/2" – 3/8"	187-035-S	4
38	PIPING R1 3/8" FD+F90° L=540 mm	065-019.43-S	1
39	PIPING R1 3/8" FD+F90° L=660 mm	065-019.526-S	1
40	MOTORIZED REDUCTION UNIT	970-006-S	2

41	T.E. SCREW M 10X45		132-146-S	4
42	FLAT WASHER 10x21x2		015-032-S	2
43	MOTOR HONDA GX 390 - 13 CV		165-809-S	1
	MOTOR YANMAR L 100 AE - 10 CV		165-984-S	1
44	MOTOR SUPPORT		039-202-S	1
45	SELF-LOCKING NUT M 10		137-050-S	1
46	T.E. SCREW M 8X20		132-101-S	5
47	ELASTIC SEALS (GROWER) D.8		139-040-S	5
48	FLAT WASHER 8,4X17X1,5		015-030-S	5
49	T.E. SCREW M 6x20		132-063-S	10
50	FLAT WASHER 6,6x12x1,5		015-027-S	20
51	SILENT BLOCK		061-008-S	5
52	SELF-LOCKING NUT M 6		137-030-S	10
53	FLAT WASHER 8,4X17X1,5		015-030-S	4
54	ELASTIC SEALS (GROWER) D.8		139-040-S	4
55	TCEI SCREW 5/16"		133-600-S	4
56	ENGINE	ENGINE BOX + JOINT x MOTOR HONDA	020-902-S	1
57	JOINT			
56	ENGINE	ENGINE BOX + JOINT x MOTOR YANMAR	020-903-S	1
57	JOINT			
58	CHASSIS PUMP ATTACHMENT PLATE (Honda)		208-510-S	1
	CHASSIS PUMP ATTACHMENT PLATE (Yanmar)		208-5105-S	1
59	TCEI SCREW M 10x35		133-184-S	1
60	TCEI SCREW M 10x30		133-183-S	3
61	T-FITTING M+M+M 1/4"		148-510-S	1
62	PIPING R1 1/4" O+F90° L=440 mm		065-0024.544-S	1
63	FLAT WASHER 10x22x4		015-0325-S	2
67	PIPING 3/8" FD+F90° L=660 mm		065-019.526-S	1
68	PIPING R1 3/8" FD+F90° L=490 mm		065-019.34-S	1
69	HYDRAULIC PUMP 6+6+3,1		021-028-S	1
70	SEEGER DIAM. 25 for exteriors (honda motor connection)		109-025-S	1
71	HOLLOW SCREW 1/4"		188-050-S	2
72	DOUBLE HOLLOW SCREW 1/4"		188-051-S	1
73	COPPER WASHER 1/4"		015-007-S	2
74	MANIPULATOR BELLOW		290-001-S	1

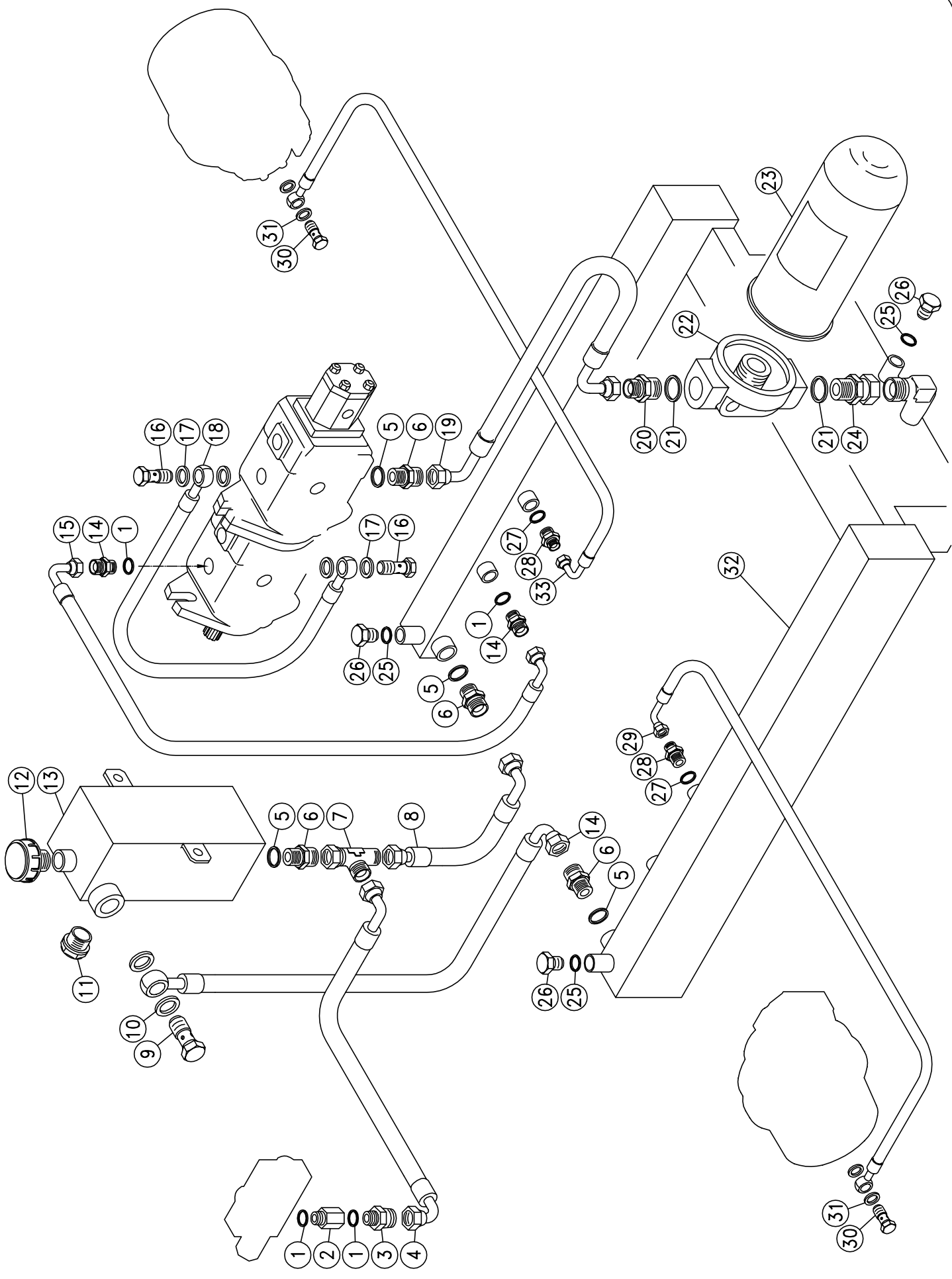


## DETAILS LIST OF R100

### TAB. D

POSITION	DESCRIPTION	CODE	QUANTITY
1	PIPING R1 3/8" F90°+F90° L=1450 mm	065-004.455-S	1
2	DOUBLE SCREW 3/8"	187-025-S	2
3	COPPER WASHER 3/8"	015-010-S	3
4	TWO-LEVER DISTRIBUTOR	962-003-S	1
5	PIPING R1 3/8" F90°+FD L=1400 mm	065-0191-S	1
6	PIPING R1 3/8" F90°+F90° L=630 mm	065-004.211-S	1
7	PIPING R1 3/8" F90°+FD L=1980 mm	065-0199-S	1
8	DOUBLE SCREW 1/4" – 3/8"	187-010-S	1
9	PIPING R1 1/4" FD+90° L=1600 mm	065-000.560-S	1
10	EXTENSION 3/8"F A 3/8"M L=32	189-040-S	1
11	COPPER WASHER 3/8"	015-010-S	1
12	REDUCTION ELEMENT 3/8" M CONICAL 1/4" F	190-020-S	1
13	T-FITTING M+M+M 1/4"	148-510-S	1
14	PIPING R1 1/4" FD+F90° L=1460 mm	065-000.556-S	1
15	PIPING R1 1/4" F90°+F90° L=650 mm	065-000.202-S	1
16	S.T. SCREW M 8X6	218-148-S	1
17	SELF-LOADER VALVE	033-921-S	1
18	PIPING R1 3/8" F90°+F90° L=1420 mm	065-004.452-S	1
20	PIPING R1 1/2" F90°+F90° L=530 mm	065-680-S	1
21	DOUBLE SCREW 1/2" – 3/4"	187-050-S	1
22	COPPER WASHER 3/4"	015-015-S	2
23	PUMP SUCTION OIL FILTER	099-903-S	1
24	OIL FILTER SUPPORT	With 099-903-S	1
25	ADAPTER FITTING M+F ROTATING 3/4"	148-005-S	1
26	CYLINDER-PISTON FOR SELF LOADER	002-910-S	1
27	PIPING R1 1/4" O+FD L=450 mm	065-0010.450-S	2
28	T-FITTING M+M+M 1/4"	148-510-S	2
29	PIPING R1 1/4" FD+FD L=600 mm	065-000.158-S	2
30	HOLLOW SCREW 1/4"	188-050-S	2
31	COPPER WASHER 1/4"	015-007-S	2
32	CYLINDER-PISTON FOR SELF LOADER	002-911-S	2





## DETAILS LIST OF R100

### TAB. E

POSITION	DESCRIPTION	CODE	QUANTITY
1	COPPER WASHER 3/8"	015-010-S	1
2	EXTENSION 3/8" F – 3/8" M	189-040-S	1
3	DOUBLE SCREW 3/8" – 1/2"	187-035-S	1
4	PIPING R1 1/2" F90°+F90° L=300 mm	065-053-S	1
5	COPPER WASHER 1/2"	015-012-S	1
6	DOUBLE SCREW 1/2"	187-045-S	1
7	T-FITTING M+M+F 1/2"	148-518-S	1
8	PIPING R1 1/2" FD+F90° L=840 mm	065-604.998-S	1
9	HOLLOW SCREW 1/2"	188-100-S	1
10	COPPER WASHER 1/2"	015-012-S	2
11	OIL LEVEL INDICATOR	186-025-S	1
12	CAP PLASTIC FOR TANK	106-172-S	1
13	UPPER HYDRAULIC OIL TANK	201-920-S	1
14	PIPING R1 1/2" O+F90° L=870 mm	065-176.027-S	1
15	PIPING R1 3/8" F90°+F90° L=530 mm	065-004.201-S	1
16	HOLLOW SCREW 3/8"	188-080-S	2
17	COPPER WASHER 3/8"	015-010-S	1
18	PIPING R1 3/8" O+O L=360 mm	065-016.5-S	1
19	PIPING R1 1/2" F90°+F90° L=530 mm	065-680.5-S	1
20	DOUBLE SCREW 1/2" – 3/4"	187-050-S	1
21	COPPER WASHER 3/4"	015-015-S	2
22	OIL FILTER SUPPORT	010-901-S	1
23	OIL FILTER	099-912-S	1
24	ADAPTER FITTING M+F ROTATING 3/4"	148-005-S	1
25	COPPER WASHER 1/4"	015-007-S	3
26	HEXAGONAL HEAD IRON CAP	106-115-S	1
27	COPPER WASHER 3/8"	015-010-S	1
28	DOUBLE SCREW 3/8" – 1/4"	187-010-S	2
29	PIPING R1 1/4" O+F90° L=780 mm	065-0024.578-S	1
30	HOLLOW SCREW 1/4"	188-050-S	2
31	COPPER WASHER 1/4"	015-007-S	1
32	LOWER HYDRAULIC OIL TANK	201-921-S	1
33	PIPING R1 1/4" O+F90° L=850 mm	065-0024.585-S	1

## --- 11. REFERENCE NORMS ---

REFERENCE LEGISLATION: Machine directive 93/37/CE and subsequent modifications.

### GENERAL SAFETY NORMS:

UNI EN 292/1: Machinery safety – Fundamental concepts, design features – Terminology, basic methodology.

UNI EN 292/2: Machinery safety – Fundamental concepts - design principles – Specifications and technical principles.

UNI EN 294: Machinery safety – Safe distance to prevent access to danger areas with arms and hands.

UNI EN 349: Machinery safety – Minimum distances to prevent crushing of body parts.

UNI EN 418: Machinery safety – Emergency stop devices – Functional features.

PR EN 953: Machinery safety – Guard elements (fixed and mobile).

CEN/TC 114 CLC/TC 44X/JWG 7: Machinery safety - Two-hand controls.

PR EN 1088: Machinery safety –. Devices of interlock with or without blocking of the guard elements - Generate principles and specific of design

PR EN 954: Machinery safety – Design principles for control systems conditioned by safety factors.

PR EN 982: Machinery safety – Safety requirements for fluid/hydraulic systems and components.

CEN/TC 122/WG 2: Machinery safety – Ergonomic design principles.

- Part 1: Terminology and general principles
- Part 2: Interaction between machine design and work to be undertaken.

CEN/TC 122/WG 6: Machinery safety – Ergonomic principles and data for the design of the control displays and activators.

- Part 1<sup>a</sup>: Human interaction with control displays and activators.
- Part 2<sup>a</sup>: Displays
- Part 3<sup>a</sup>: Control activators

ISO 447: Machine tools – Direction of manoeuvre of the control elements.

CE 2000/14: Environmental acoustic emissions of machines and equipment destined for open-air operation

## --- 12. GUARANTEE CONDITIONS ---

Your Rampicar has a 12 month guarantee from the date of purchase by the user, **with the exception** of the parts subject to wear: hydraulic oil, motor oil, filter cartridges, tracks, etc..

The guarantee will be void in the event of any TAMPERING or MODIFICATIONS that any non- envisaged and non-authorized by the construction company or the result of the improper use of the Rampicar.

The guarantee will become void should the registration document enclosed with the last page of this booklet fail to be compiled and mailed to the *ROTAIR S.p.A.* company.

--- 13. REGISTRATION DOCUMENT ---

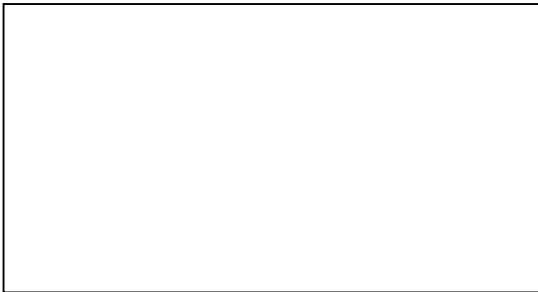
**Coupon to be kept the client**

Machine model: \_\_\_\_\_

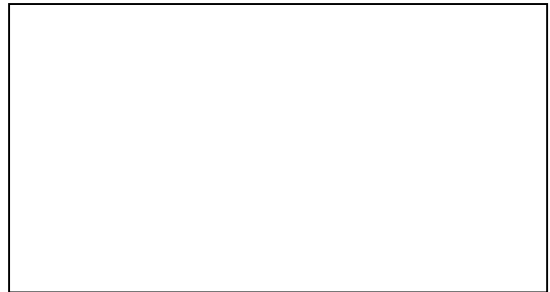
Serial number: \_\_\_\_\_

Delivery date: \_\_\_\_\_

Dealer's stamp and signature



Client's stamp and signature



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**Coupon to be compiled and returned to the constructor**

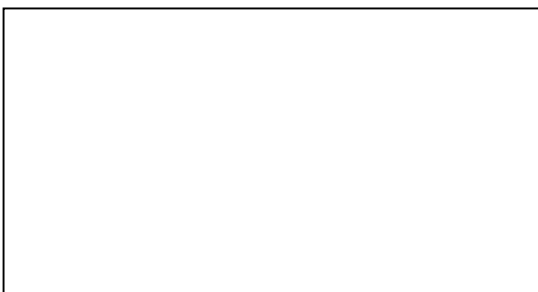
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Serial number: \_\_\_\_\_

Delivery date: \_\_\_\_\_

Client's address: \_\_\_\_\_

Dealer's stamp and signature



Client's stamp and signature

