



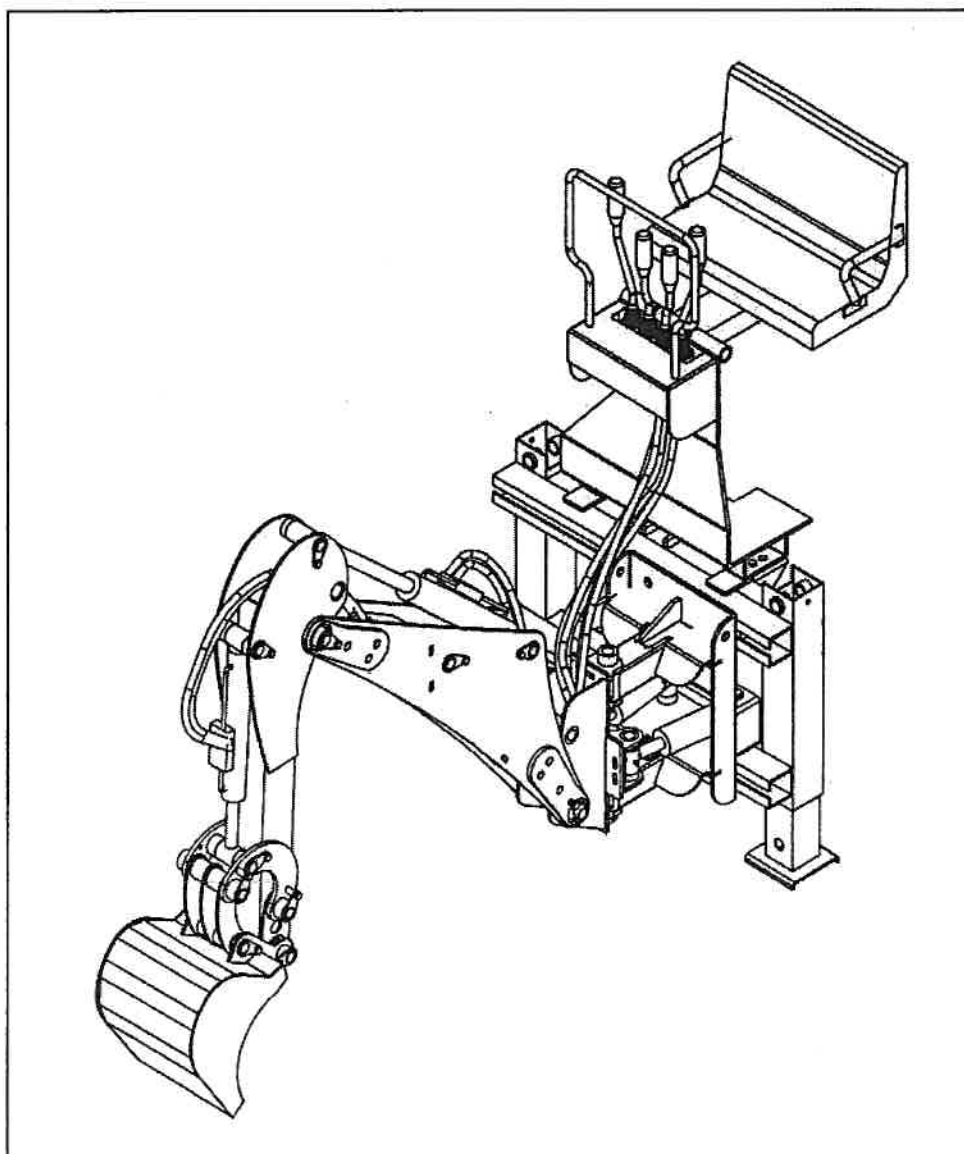
Farm & Garden Equipment

DelMorino SRL

Del Morino srl , v.Caroni di Sotto 19,
I-52033 Caprese Michelangelo AR Italy
Ph: +39-575-791059 Fax: +39-575-791210
E.mail: export@del-morino.it
<http://www.del-morino.it>

USE AND MAINTENANCE MANUAL

BACK HOE TYPE "RES 20" BACK HOE TYPE "RES 30"



PREFACE

This manual is an integral part of the machine.

It must always accompany the machine and be kept within reach of the operator.
The enclosures mentioned are an integral part of this manual.

The purpose of this manual.

This manual gives information for the correct and safe use of the machine.
The owner must read this manual carefully before work with the machine.

Responsibility of the owner

The owner is responsible for accidents or damages caused to people or things due to negligence in following the instructions in this manual.

Assistance in using this manual

Explanations: contact the dealer.

Request for additional copies of the manual: in case of loss or wear and tear, or in case one wants the manual in a different language, the customer should ask the dealer or manufacturer.

Pay attention to the warning signals



<Danger>: indicates a situation that is potentially dangerous which, if not avoided, will cause death or serious damage.



<Warning>: indicates a situation that is potentially dangerous which, if not avoided, will cause death or Serious damage.



<Caution>: indicates a situation that is potentially dangerous which, if not avoided, can cause minor to moderate damage, or it indicates to be careful about an unsafe procedure.

<Important> : indicates instructions that must be followed precisely in order to avoid damage to the product, process or environment.

<Note>: indicates supplementary information.

DESCRIPTION

DESCRIPTION OF THE MACHINE

The back hoes type RES20 and RES30 are machines applicable to the rear lifter of agricultural tractors. The machine is composed with a jointed arm with a bucket mounted at its end. The arm is jointed with a frame where there are the hand drive and the operator seat. The arm can rotate about 170° and can shift respect to the frame. All the arms and bucket movement are hydraulic driven. The shifting movement of the arm respect to the frame is manual with screw locking on RES20 and hydraulic locking on RES30. The machine has an independent hydraulic plant driven by a pump connected with a multiplier to the rear PTO of the tractor.

USE OF THE MACHINE

The back hoe type RES is light, handy and easy to use then is suitable to satisfy the requirement of small and medium factory and hobby workers that need to make digging out or material moving not too heavy.

MACHINE LIMITS

- Maximum tractor hors power: 35 Hp depending from the model.
 - Minimum ratio between Tractor / RES weight – 4:1
-

STANDARD EQUIPMENT

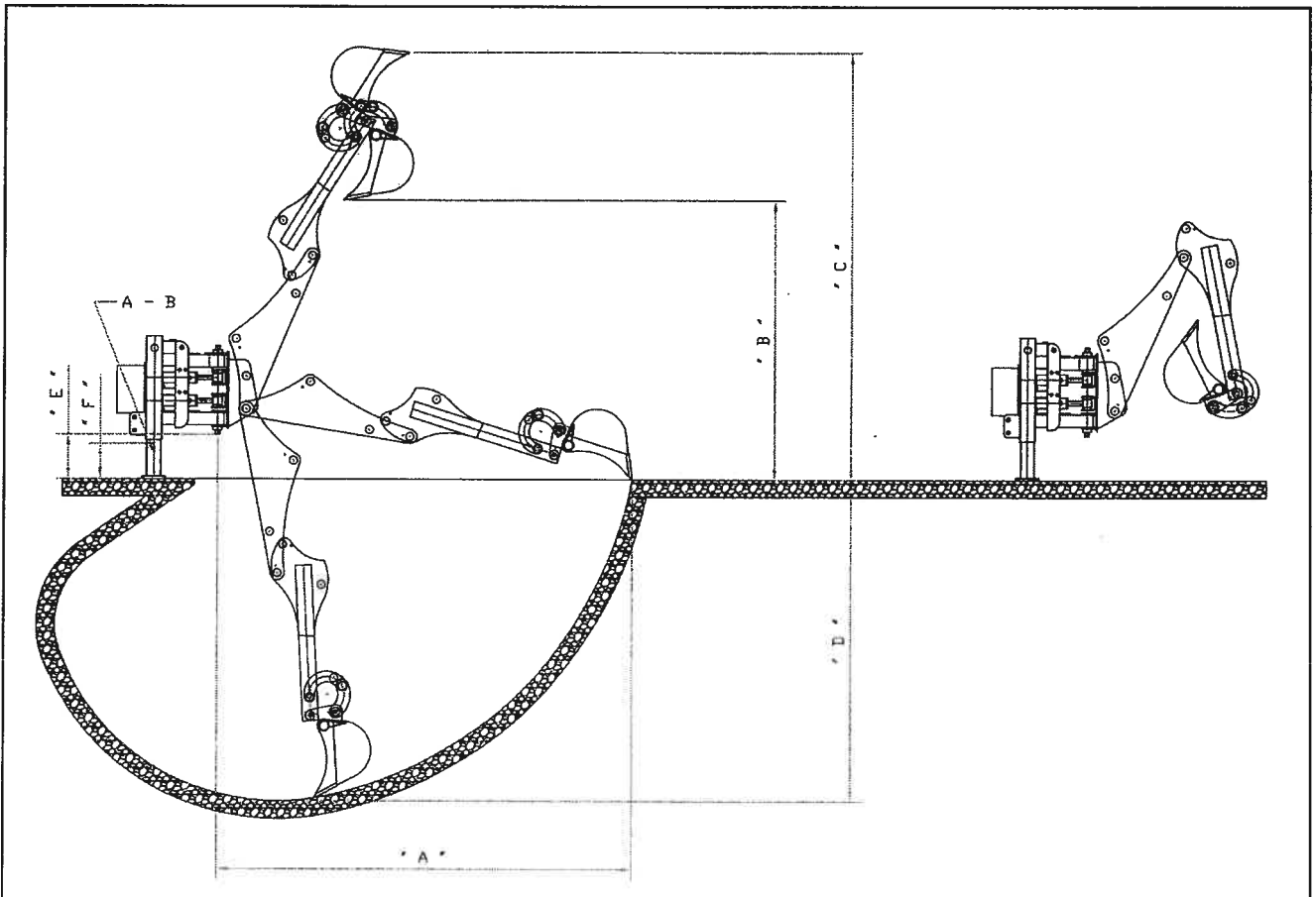
- RES20: 300 mm bucket.
- RES30: 350 mm bucket.
- RES20: shifting lock with screw.
- RES30: shifting lock with hydraulic cylinder.
- Hydraulic pump with multiplier.

VARIANTS & OPTIONS

- Bucket from 250 to 400 mm.
- Tractor lifter locking kit.

TECHNICAL SPECIFICATIONS

		RES 20	RES 30
Arm length "A "	m	2,26	2,54
Maximum working height " B "	m	1,61	1,82
Fork depth " C "	m	2,42	2,73
Maximum fork depth " D "	m	1,57	1,81
Weight	Kg	345	385
Clearance "E"	m	0,27	0,27
Stabilizer height "F"	m	0,20	0,20
Tearing power to the tooth point	Kg	600	1800
Maximum lifting capacity	Kg	100	300
Pump flow	Lt/min	13	13
Working pressure	Kg/cm2	180	180
Rotation	Degree	170	170
Arm side shifting		Manual	Manual
Shifting lock		Mechanical	Hydraulic



SAFETY INFORMATIONS

GENERAL REGULATIONS

Work only to the daylight.

The machine must not be used if in the proximities there are other people, particularly children or animals.

The machine must be operated from experienced personnel that owes to attentively have read this manual.

Before operating the machine check the operation of the safety devices.

Before operating the machine verify that the two feet stabilizers have lowered, that the tractor is stable and with the parking brake inserted.

Don't transit, or stop or work under the arm.

Don't work under or in proximity of electric lines.

Don't use the machine to transport or to lift people or however for non anticipated uses.

Never overcome the limits of performance fixed by the builder.

Before starting the motor of the tractor make sure that all the commands are in neutral position.

Never leave the machine with the engine of the tractor on or the starting key inserted in the panel.

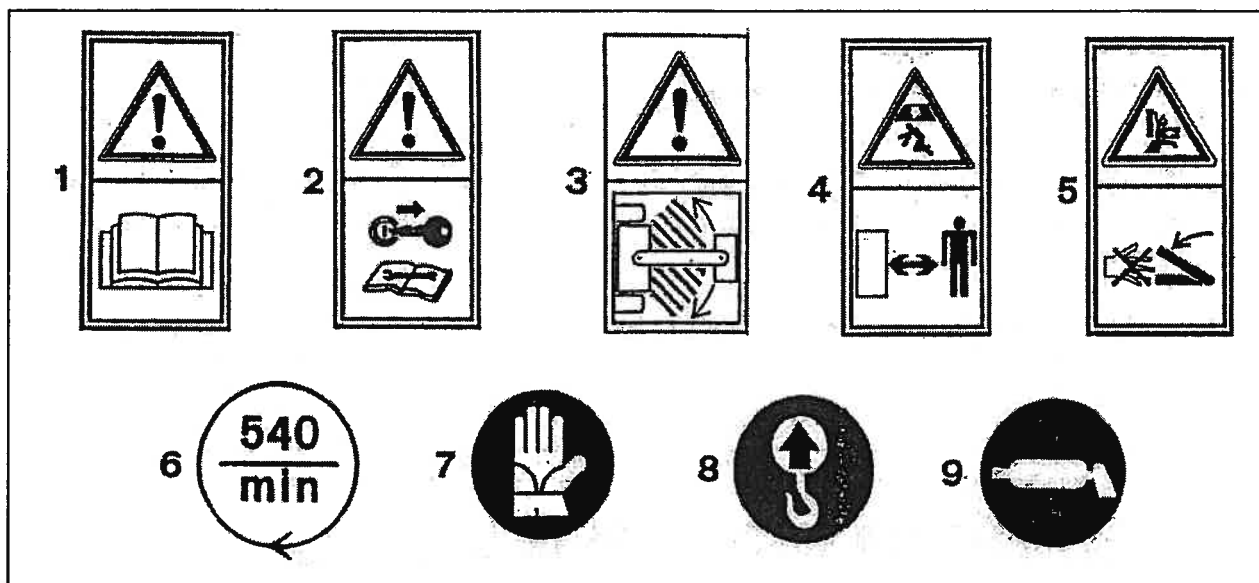
SAFETY RESTRICTIONS

Children and people who are not familiar with these instructions must not be permitted to use the machine.

Local regulations can restrict the use of the machine in accordance to the age.

SAFETY SIGNS ON THE MACHINE

In this section, the safety signs on the machine are reproduced and explained.



1. Read the operator manual.
2. Disconnect the tractor key before maintenance and repair operations.
3. Stay at safety distance from mechanical joint when machine is moving.
4. Danger of objects fall. Stay at safety distance.
5. Ranger of crack. Stay at safety distance with the hands.
6. RPM and turn direction of PTO.
7. Is compulsory to use gloves.
8. Connection point for lifting.
9. Greasing point.

The safety signs on the machine must always be legible.

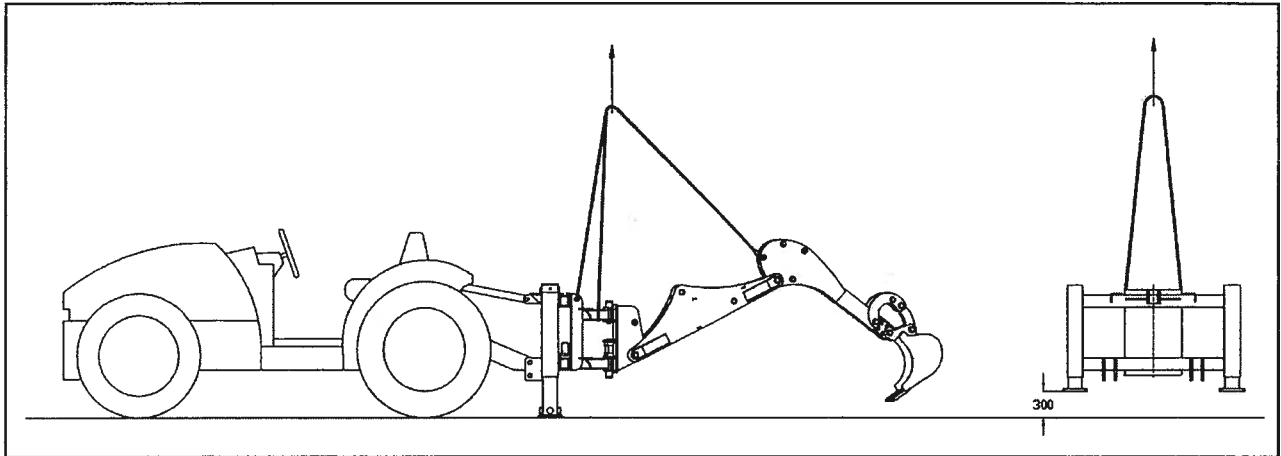
In case of damage, the labels of the signs must be substituted.

In the case of the substitution of machine parts that have safety signs, the signs must be replaced.

Supplying of new safety labels and the application procedure

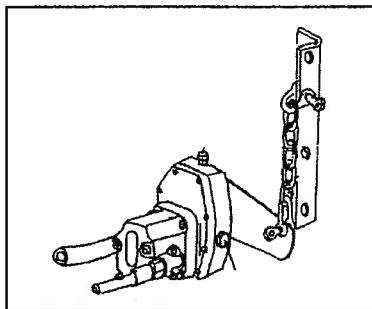
Contact your dealer to receive new safety labels with instructions for application.

ASSEMBLING INSTRUCTION



1. ASSEMBLING TO THE REAR LIFTER OF THE TRACTOR

- a) Hook the machine to a proper lifter in the pre arranged points high lighted with the sticker "Gancio".
- b) Lift and stabilize the machine at the level "H" of 300 mm from the ground then using two wedges fitted under the base of the two stabilizers.
- c) Approach the tractor, rise the lifter to the height of the machine connections then connect the lower arms and the upper tie rod.
- d) Assemble and adjust the racket that will prevent the tractor lifter movement.



2. ASSEMBLING OF THE HYDRAULIC PUMP

- e) Connect the group pump plus multiplier to the tractor PTO.
- f) To prevent the rotation of the pump use the locking device supplied with the machine.
- g) Verify the oil level inside the multiplier following the instruction on page 12 point a).

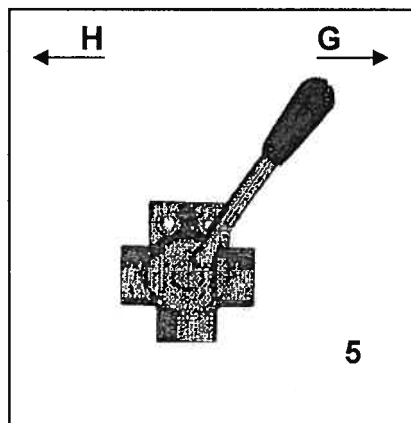
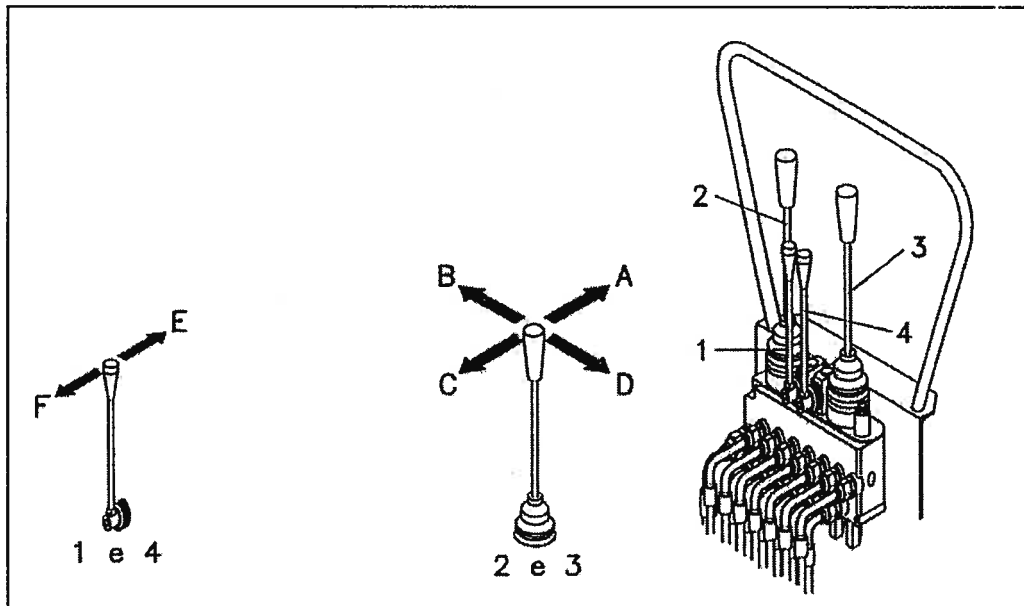
3. OTHER ASSEMBLING METHOD TO THE REAR LIFTER OF THE TRACTOR

- h) To lift and stabilize the machine at the quote "H" of 300 mm, instead of using the two wedges of point b), it is possible to use the the stabilizers of the machine. To make so first connect the pump to the PTO.

INSTRUCTION FOR USE

CONTROL

- a) Lever "1" – Right stabilizer.
F = stabilizer down – E = stabilizer up.
- b) Lever "2" – 1° Arm and Bucket.
A = arm up – C = arm down – B = bucket opening – D = bucket closing.
- c) Lever "3" – 2° Arm and Rotation.
A = arm down – C = arm up – B = right rotation – D = left rotation.
- d) Lever "4" – Left stabilizer.
F = stabilizer down – E = stabilizer up.
- e) Lever "5" – Hydraulic locking (RES30).
G = unlocked – H = locked.



BEFORE BEGINNING DIGGING

- a) Verify the oil level inside the multiplier . (see page 12 point a).
- b) Grease the machine (see page 13).
- c) Move to the working area.
- d) Stop the tractor then operate the parking brake.
- e) Switch on the PTO.
- f) Pull down the two stabilizers pushing the levers "1" e "4".
- g) Remove the safety stopper that prevent the arm rotation.

TO BEGINNING DIGGING

- a) Drive away people, animals and objects at least 15 m.
- b) If it is necessary shift the arm respect to the tractor operating as follow :
 - 1) Unlock the 4 nuts that lock the arm respect to the main frame. If the machine is a RES30 turn the lever that drive the hydraulic lock.
 - 2) Full turn the arm in the direction of the shifting.
 - 3) Open the bucket and fit it in the soil.
 - 4) Make a traction action using both the arms to shift the mobile frame.
 - 5) When in position lock the 4 nuts or turn the lever that drive the hydraulic lock.
- c) Start the digging operation using the levers "2" e "3".

AT THE END OF DIGGING OPERATIN

- a) Shift the mobile frame in the middle of the main frame.
- b) Close on itself the arm, turn it in transport position then lock it with the safety pin.
- c) Full rise the two stabilizers.
- d) Switch off the tractor PTO.

MAINTENANCE INSTRUCTION

On diagram "A" the maintenances are indicated with their terms to effect on the machine.
 Not follow the scheduled terms can compromise the functionality of the machine and in this case the warranty is not applicable.

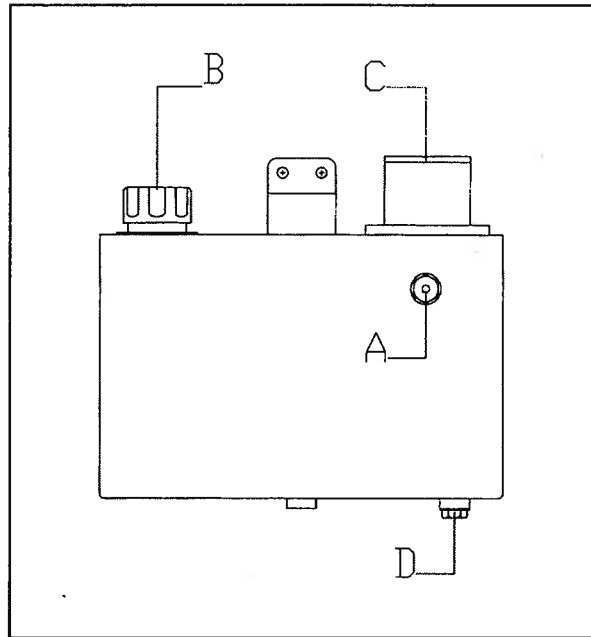
DIAGRAM "A" SCHEDULED MAINTENANCE

	FIRST START	DAILY	EACH 150 HOURS OR EACH MONTH	EACH 1200 HOURS OR EACH YEAR
SAFETY STICKER	Check presence	Check presence	Check presence	Check presence
DRIVE LEVERS	Check automatic return	Check automatic return	Check automatic return	Check automatic return
PIPES	Check locking	Check locking	Check locking	Check locking
OIL IN THE TANK	Chech level	Chech level	Chech level	Sustitute
OIL FILTER				Sustitute
OIL IN THE MULTIPLIER	Chech level	Chech level	Chech level	Sustitute
SPLIT PINS	Check presence	Check presence	Check presence	Check presence
BOLTS *	Check locking	Check locking	Check locking	Check locking
GREASING	Greasing	Greasing	Greasing	Greasing

*** : In the pins with self locking nut, do not lock too much the nut to prevent the joint lock.**

TANK OIL LEVEL- TANK OIL AND FILTER SUBSTITUTION

To refill or change oil use only HYDRAULIC OIL Type NUTO H46, tank capacity: 13 l.
Refill or oil substitution operation must be made at the terms scheduled on diagram "A".



a) To verify the oil level in the tank, operate as follow :

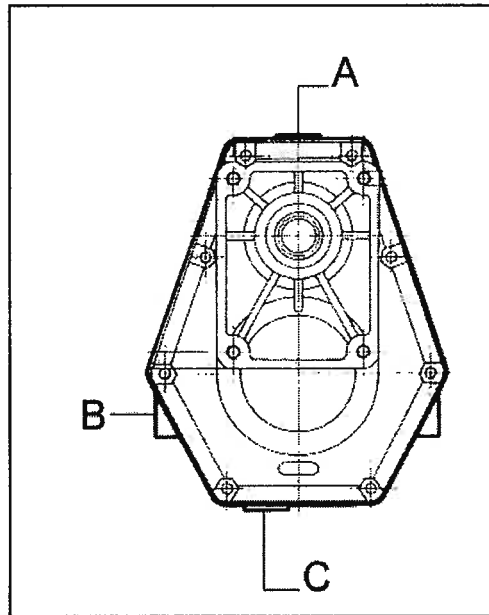
- 1) Put the machine on level then verify the oil level through the spy "A".
- 2) If level is low, remove the plug "B" and refill using proper oil type. Use only new oil.
- 3) When the level is correct put in place the plug "B".

b) To change oil and filter in the tank, operate as follow :

- 1) Remove the plug "B".
- 2) Put a container under the tank then remove the discharge plug "D".
- 3) Remove the cover "C" of the filter case removing the four screws, take out the old filter.
- 4) Put in place a new filter put in place the filter case cover checking the position of the seal then locks the four screws.
- 5) Screw and lock the discharge plug "D".
- 6) Fill oil in the tank through the plug "B".
- 7) When the level is correct put in place the plug "B".

MULTIPLIER OIL LEVEL- MULTIPLIER OIL SUBSTITUTION

To refill or substitute the oil use only OIL SAE 90 EP, multiplier capacity: 0,5 l.
Refill or oil substitution operation must be made at the terms scheduled on diagram "A".



a) To verify oil level in the multiplier operate as follow :

- 1) Put the multiplier in vertical position then verify oil level through the spy "B".
- 2) If the level is low, remove the plug "A" and refill with proper oil type. Use only oil new.
- 3) When the level is correct screw and lock plug "A".

b) To substitute oil in the multiplier operate as follow :

- 1) Remove the plug "A".
- 2) Put a container under the multiplier then remove the discharge plug "C".
- 3) When the multiplier is empty screw and lock the discharge plug "C".
- 4) Fill oil through plug "A".
- 5) When the level is correct put in place the plug "A".

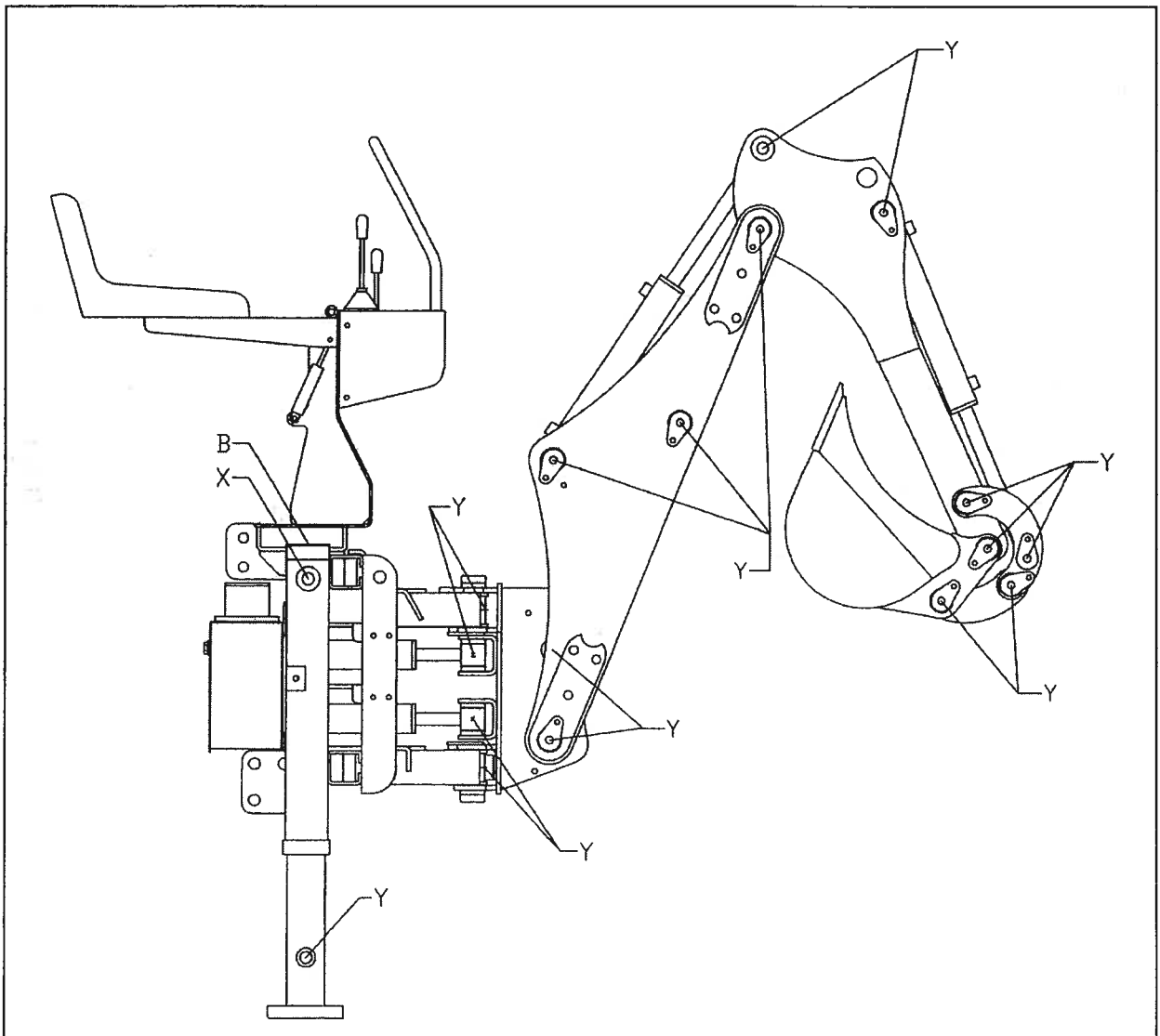
GREASING

All greasing points are equipped with greaser HYDRAULIC TYPE MODEL "A" UNI 7663.

To grease use only MULTIFUNCTIONAL GREASE LITHIUM BASED Type NLGI 2.

With reference to the schema the greasing points are 20: the 2 points "X" one for each stabilizer are accessible removing the two cover "B", the 18 points "Y" are in view or are accessible through appropriate holes.

Greasing operation must be made at the terms scheduled on diagram "A".



PROBLEMS SOLVING

TROUBLES	GROUNDS	SOLUTIONS
The controls don't work	-PTO switch off. -Hydraulic pump broken. -Oil lack.	-Switch on the PTO. -Pump substitution. -Fill oil in the tank.
The rams move with jerks	-Air inside hydraulic plant.	-Check oil level in the tank. -Lock the joint of the pipes. -Drive each ram for few minutes to purge air.
Arms and stabilizers move without drive	-Rams seals worn.	-Joints substitution. -Check valve worn.
Oil over temperature	-Oil filter dust. -Pipes squashed. -Oil level low.	-Oil filter substitution. -Check and replace if necessary. -Fill oil.
Oil leakage	-Joints unlocked. -Rams seals worn.	-Lock the joints. -Seals substitution.
Not enough penetration of the bucket	-Hydraulic pump worn. -Oil level low. -Relief valve not adjusted. -Oil filter dust. -Oil lack. -Rams seals worn.	-Pump substitution. -Fill oil. -Check the set up. -Oil filter substitution. -Find and eliminate. -Seals substitution.
The mobile frame shift without reason	-Locking nuts unlocked. -Hydraulic locking off.	-Lock the nuts. -Turn on the hydraulic locking.

TRANSPORT

Except when working, moving the machine takes place when the machine is standing still and the transmission is disconnected.

<Important>: keep speed low avoiding holes and ground roughness.

<Important>: Before begin the movements always make sure that the safety hooks be in position.

<Note when on the road>, obey existing traffic laws. Exhibit the signal signs on the rear ends. Respect any local laws there may be.

STORAGE

Store the machine in a dry place that isn't dusty.

INFORMATION ON DEMOLITION



At the end of its working life, the machine must be sent to be demolished and that can only be done by an authorized authority, in accordance with the national laws in force for the environment. Therefore it is necessary to get information from the qualified local authorities on the procedure to follow. The machine is mainly composed of: iron materials and paints.

WARRANTY

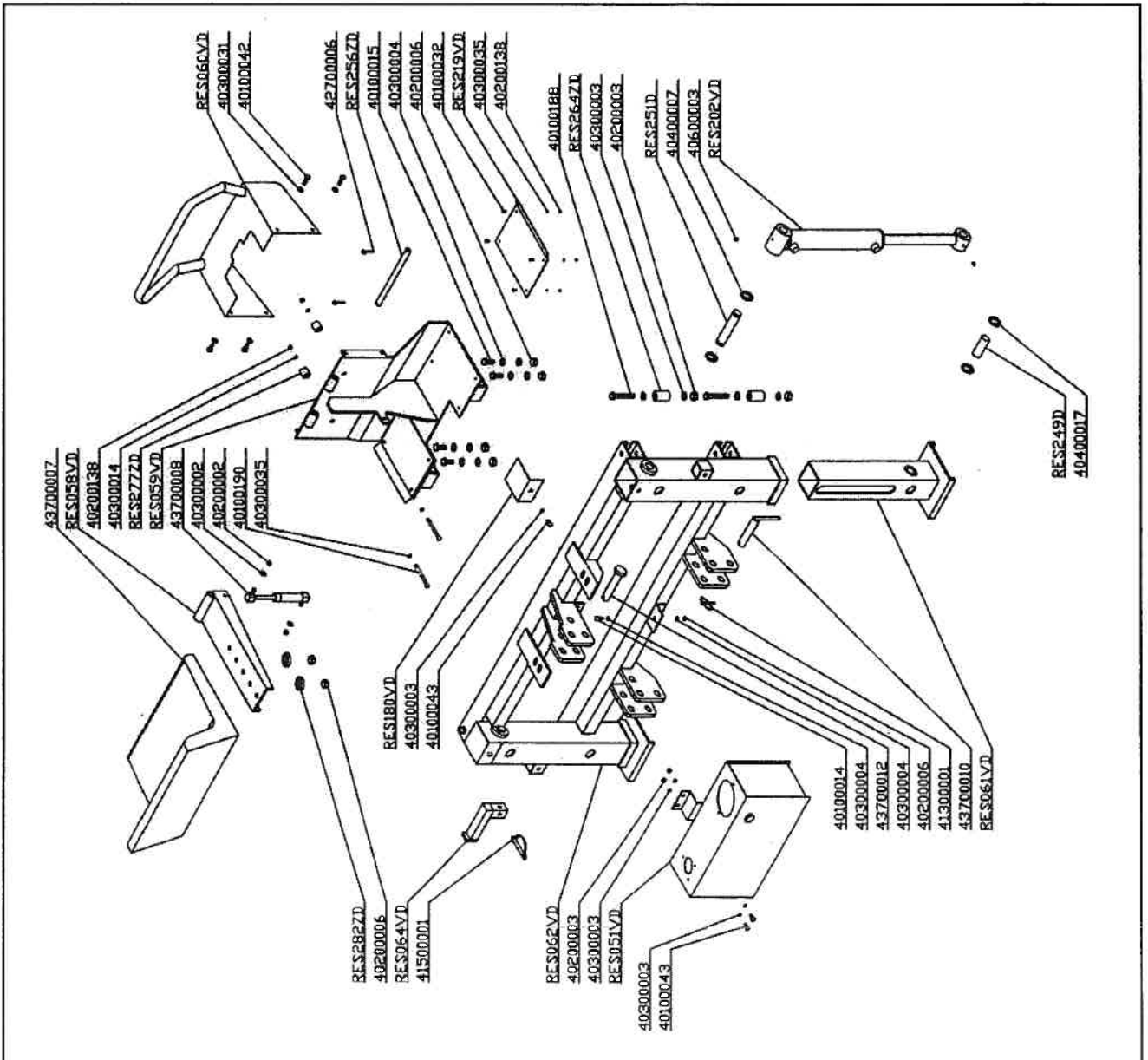
The machine is covered by the manufacturer warranty for a period of 24 months.

The warranty is not applicable when:

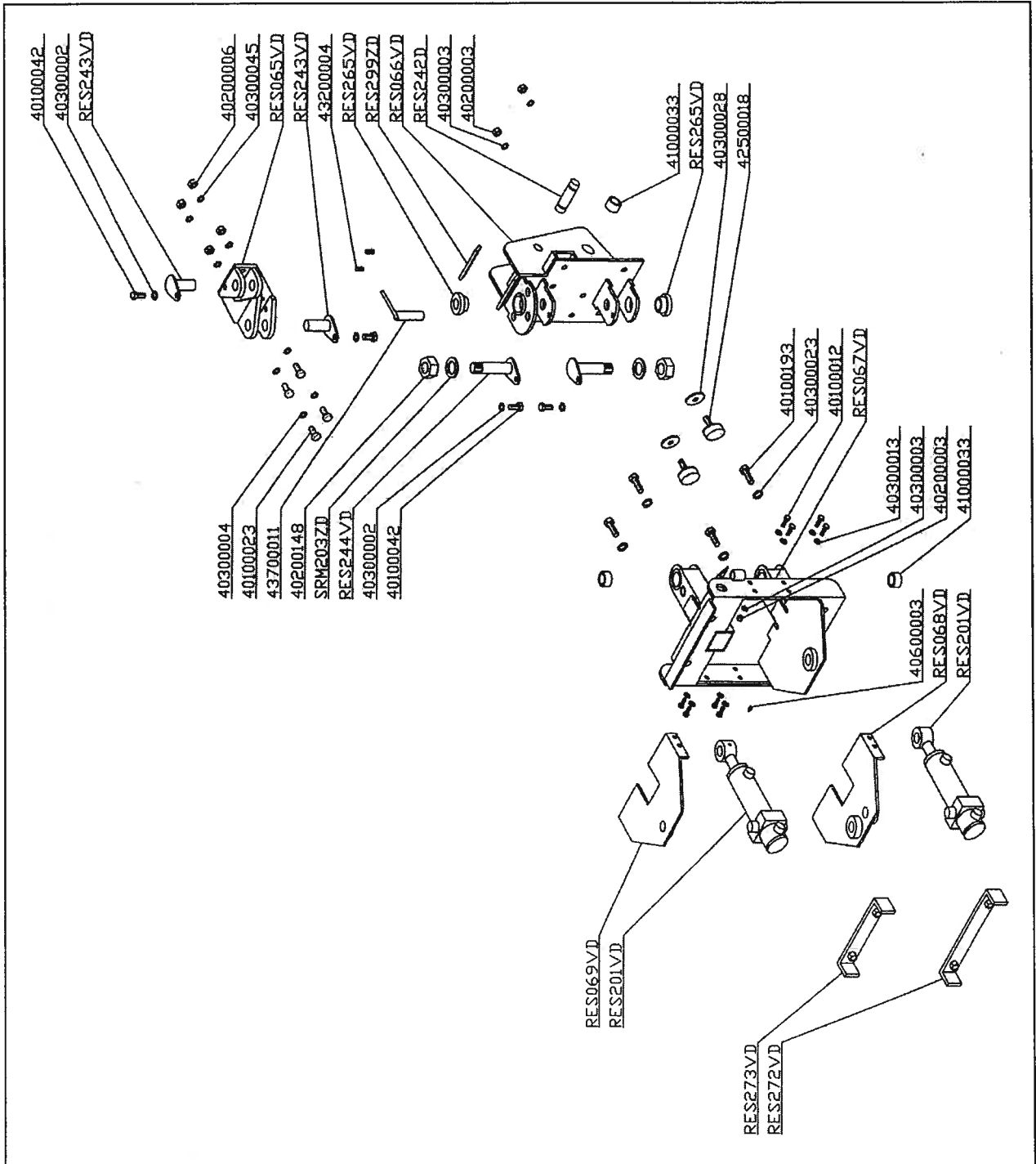
- a) The maintenance work has not been done correctly.
- b) The machine has been used out of its own service.
- c) The machine has been transformed or modified without the manufacturer's written authorization.

SPARE PARTS & OPTIONS

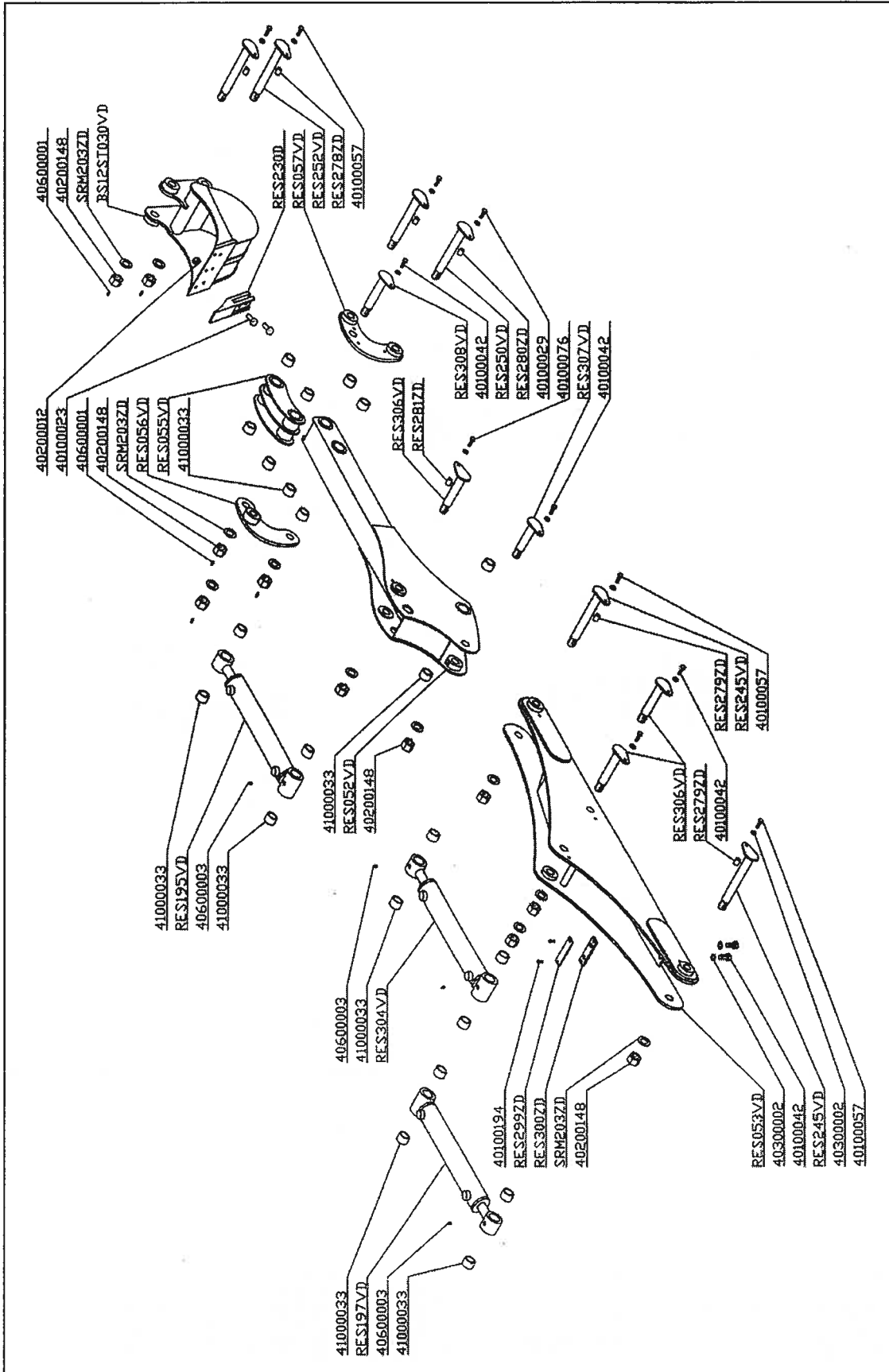
MAIN FRAME RES 20



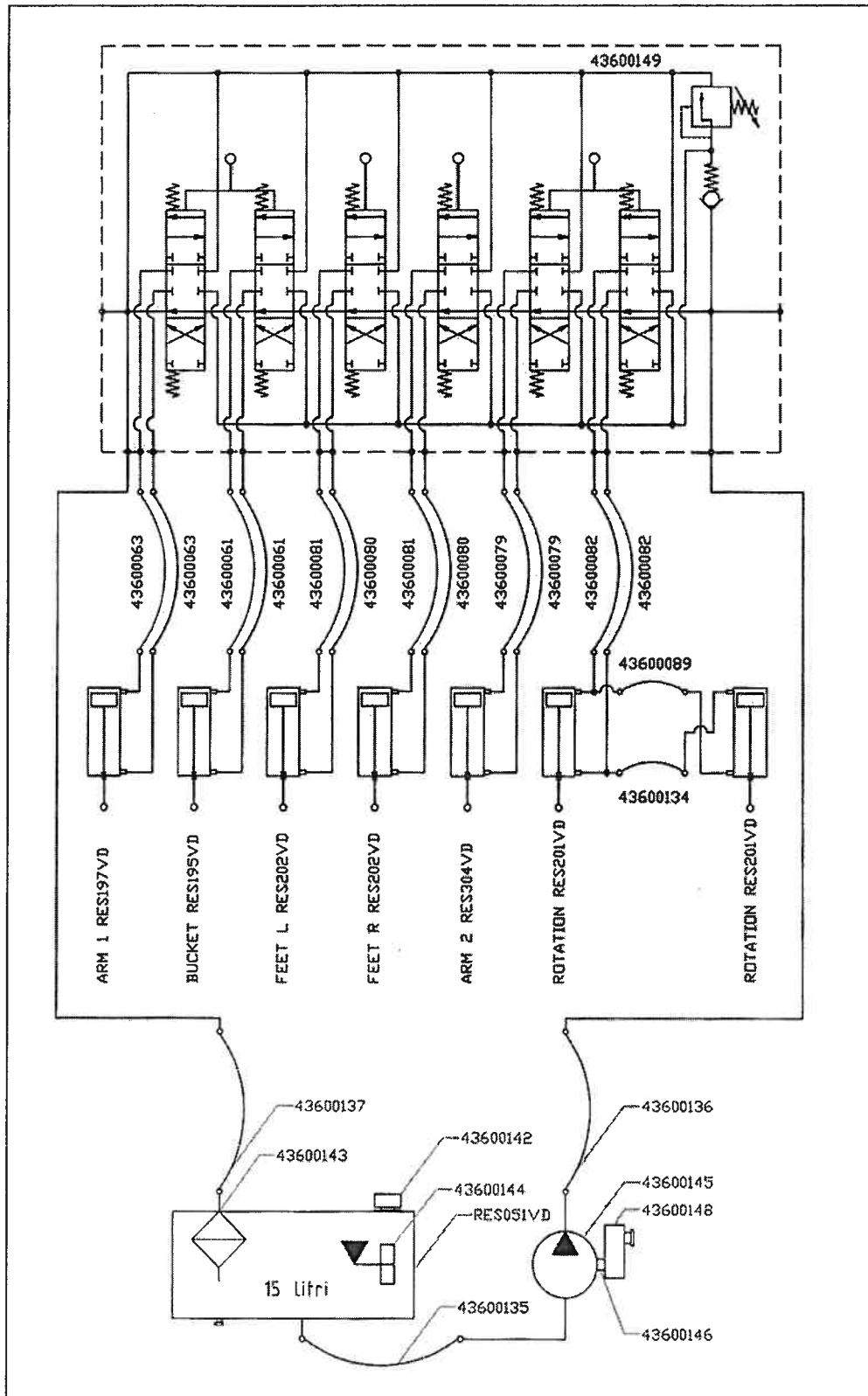
ROTATION GROUP RES 20



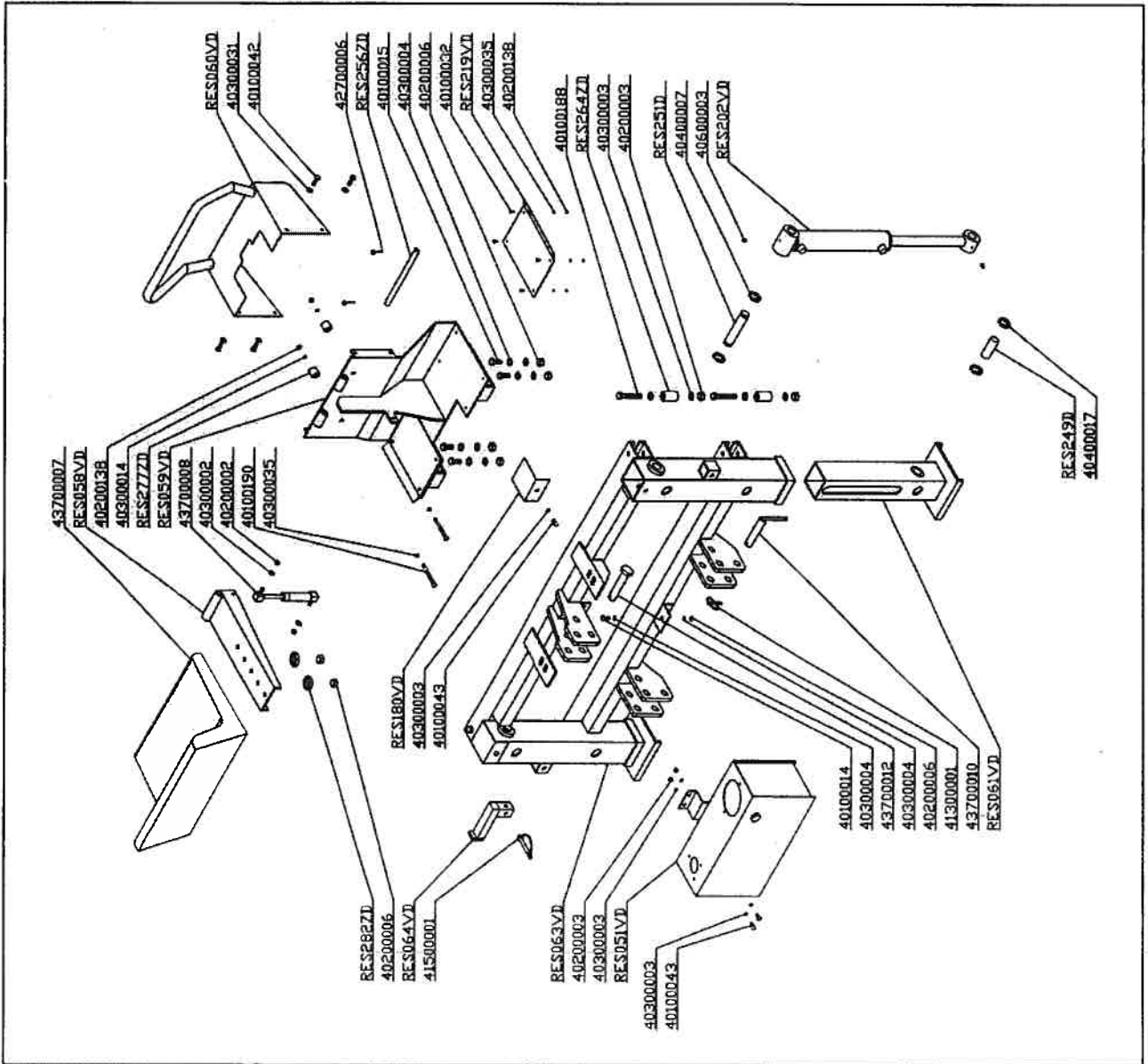
ARMS RES 20



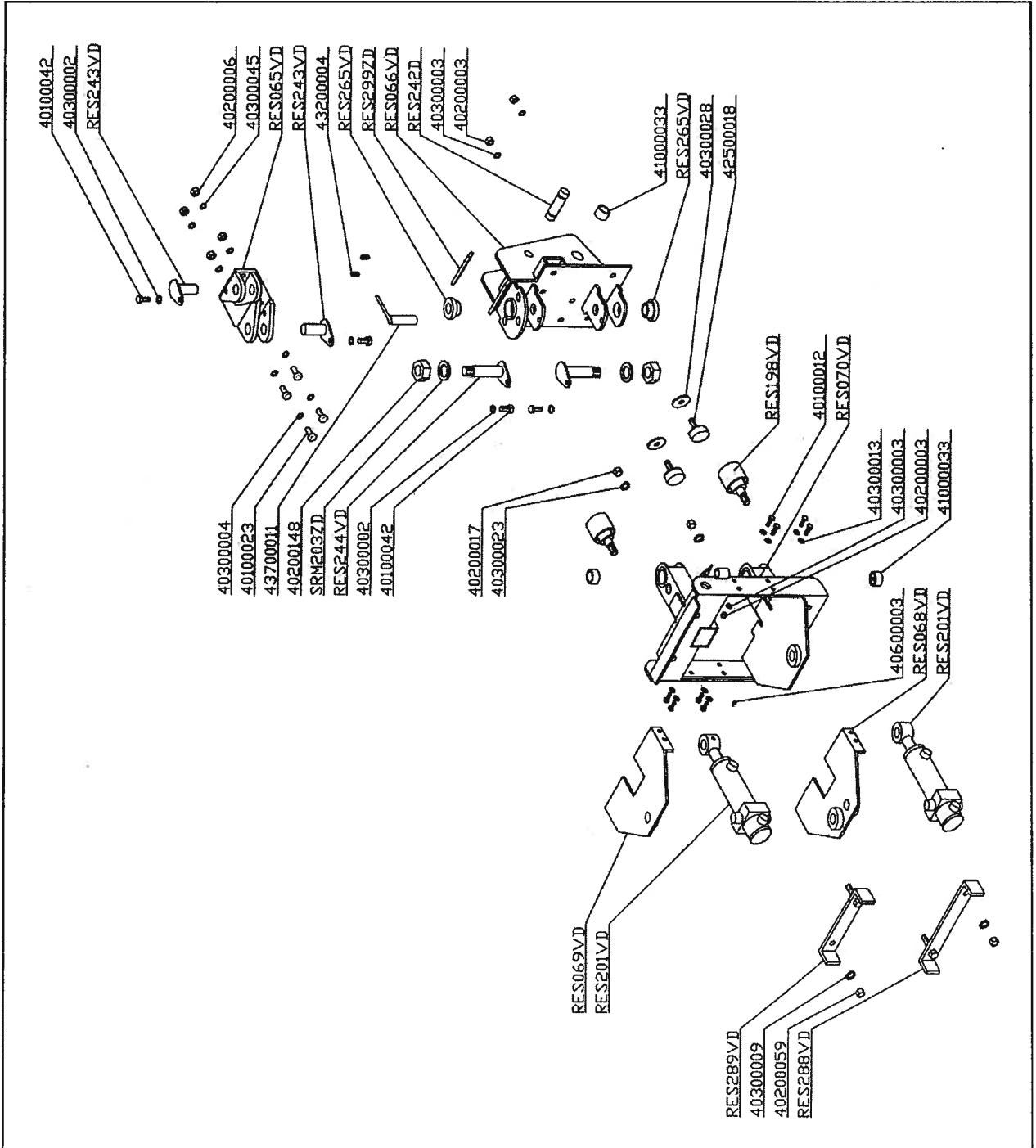
HYDRAULIC PLANT RES 20



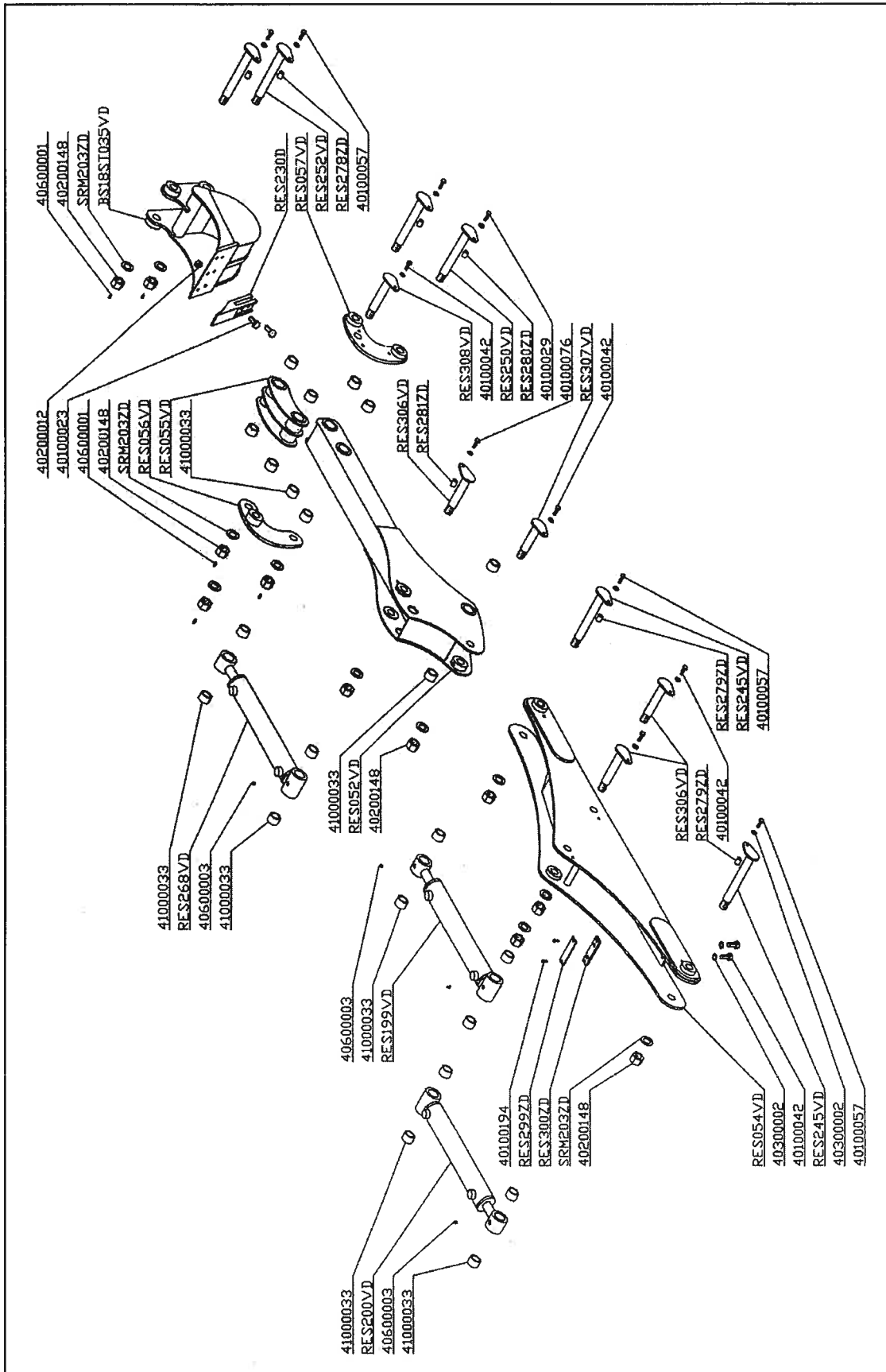
MAIN FRAME RES 30



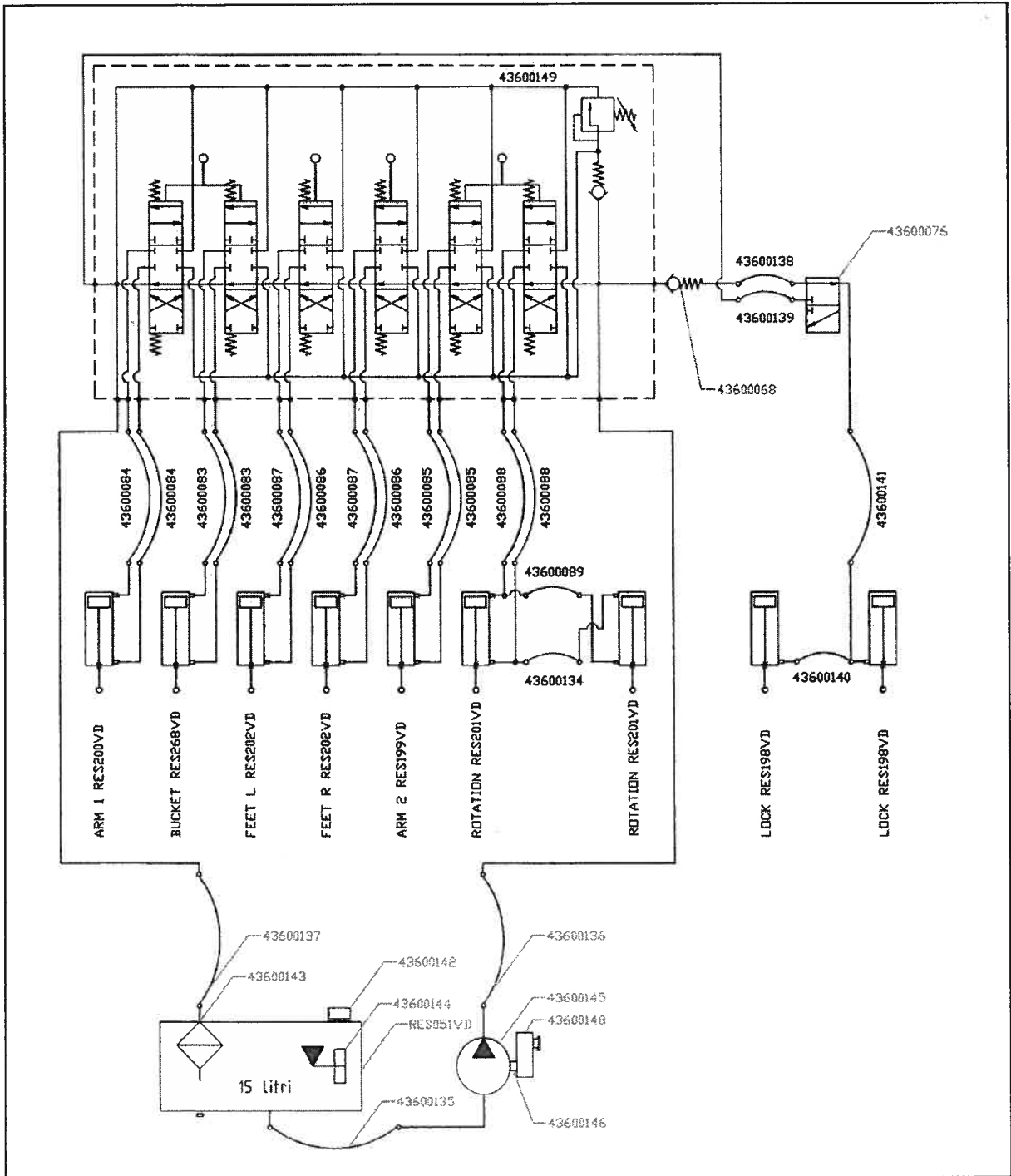
ROTATION GROUP RES 30



ARMS RES 30



HYDRAULIC PLANT RES 30



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ARMS RES 30 24
HYDRAULIC PLANT RES 30 25

CE DECLARATION OF CONFORMITY



**CEE DIRECTIVE 89/392
AND SUCCESSIVE MODIFICATIONS**

The undersigned firm

**"DEL MORINO S.R.L."
- Via Caroni di Sotto n. 19 -
- 52033 CAPRESE MICHELANGELO (AREZZO) ITALIA -**

under its own responsibility **DECLARES** *that the machine*

BACK HOE RES 20 – RES 30

*is conformed to the safety and health protection requisites of the
CEE 89/392 and its successive modifications.*

*In verifying that the machine conforms to the above-mentioned
directives, the following have been consulted:*

**STANDARDIZED REGULATIONS FOR THE EUROPEAN COMMUNITY
EN 292-1 292-2 292-2/A1 982/92 474-1**

Caprese Michelangelo 01.01.2006

**DANIELE DEL MORINO
PRESIDENT**