

**I** Leggere attentamente il Manuale d'uso e Manutenzione prima di procedere a qualsiasi operazione sulla macchina (avviamento, uso, registrazione, manutenzione).



**AVVERTENZA:** Questo segnale sta ad indicare un pericolo e verrà utilizzato ogni qualvolta potrebbe derivare un danno alle persone e/o alla macchina.

**GB**

Become thoroughly familiar with the use and maintenance instructions before proceeding with any operation on the machine (starting, use, adjustment, servicing etc.)



**WARNING:** This signal indicates a hazard and will be used each time either persons and/or the machine could be harmed!

**F**

Lisez attentivement la notice d'utilisation et d'entretien avant d'effectuer une opération quelconque sur la machine (mise en marche, utilisation, réglage, entretien, etc.)



**ATTENTION:** Ce symbole indique une situation de danger; il sera utilisé chaque fois qu'il y a des risques pour les personnes ou pour la machine!

**D**

Lesen Sie diese Betriebs- und Wartungsanleitung durch, bevor Sie irgendeine Arbeit (Starten, Benutzung, Einstellung, Wartung etc.) an der Maschine vornehmen.



**HINWEIS:** Dieses Signal zeigt eine Gefahr an und erscheint daher an allen Stellen, an denen ein Personen- und/oder Sachschaden möglich ist!

**MORRA**

Macchine Agricole

CE

RANGHINATORE ROTATIVO

ROTARY RAKE  
ROTO ANDAINEUR  
KREISELSCHWADER

**RM 280/8**

**RM 320/8**

**RM 320/10**

**RM 360/10 T**

**RM 400/10 T**

**RM 666/H**



Manuale d'uso e manutenzione

Operator and maintenance manual  
Notice d'utilisation et d'entretien  
Betriebs und wartungsanleitung

Edizione 1996 - 1

**MORRA**

MACCHINE AGRICOLE

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## 1.1 Introduction

Thank you for having purchased a MORRA rotary rake. This machine has been designed for the usual agricultural purpose. Any other use is therefore to be considered improper and at the user's risk.

Carefully read and strictly comply with the instruction given in this technical handbook since these will ensure correct use and a long-lasting machine. They will also prevent accidents, keep the Manufacturer's guarantee valid and the machine in an efficient condition.

The MORRA Rotary Rake has been designed as a simple, easily maintained machine. This if there are problems with its working performance, the most likely cause is to be found in worn working parts. Change these as needed but use **only** genuine original parts which are available from your local MORRA dealer.

Always comply with all accident-prevention provisions together with the current highway code regulations. MORRA declines all responsibility for any consequences caused by failure to comply with the above mentioned provisions and regulations.

**Note:** continuous improvement of our products is of prime importance to MORRA technicians. We therefore reserve the right to make all variations to our machines as are considered necessary at any moment, without warning and without being obliged to consequently modify already sold machines.

## 1.2 Warranty

MORRA - Roreto di Cherasco - Cuneo (I) - guarantees all first purchases of a brand new MORRA machine against all manufacturing defects so long as the use and maintenance recommendations given in this instruction manual have been fully complied with. Failure to comply with such recommendations shall void the guarantee itself.

The guarantee covers the goods for a period of one (1) year running from the date of purchase. Guarantee coverage does not extend to damages due to normal wear, accidents caused by negligence or incorrect use of the machine, insufficient or in-existent maintenance, or use other than for which the machine was designed.

The guarantee should equally be considered void if the machine is modified without the written approval of MORRA or when repairs are carried out using non-genuine spare parts, or be means of unauthorized workshops.

The guarantee covers sole replacement or reimbursement of those parts recognized as being defective by our Technical Department.

Besides the above, MORRA shall not be obliged to pay any indemnity or compensation for whatsoever reason this may be requested.

Claims under guarantee shall be forwarded to the Dealer or authorized Workshop which made the sale alone, or straight to our offices in the case of direct sale.

It is advisable to check all goods sold away from our premises on delivery, in order to see they have not been damaged during transport: "any claims should be presented within and not later than six days after delivery".

## 1.3 Machine identification data

The machine is identified by characteristic data:

- Model: RM
- Incremental number
- Year of manufacture

stamped on the plate attached to the machine's chassis. Always specify this information when ordering parts of requesting information.

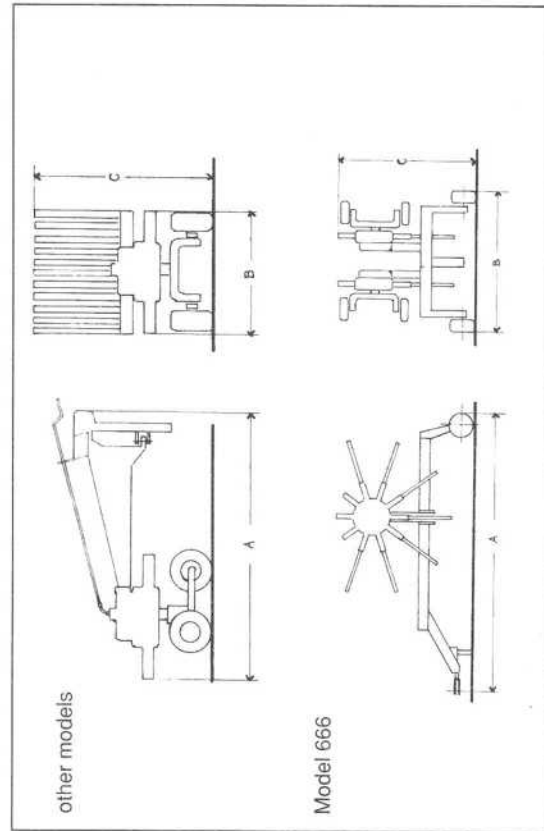
Use only original spare parts available at your local MORRA dealer.

### 2.1 Characteristic data

Model	280/8	320/8	320/10	360/10	400/10	666
Inax work width with containment	2,80	3,20	3,20	3,60	4,00	6,70
Number of turning-heads	1	1	1	1	1	2
Arms per turning-heads	8	8	10	10	10	10
Weight without fittings	270	330	360	540	570	1290
Transport width (B) m	1,00	1,40	1,40	1,60	1,65	2,40
Total height (C) m	1,60	1,60	1,60	1,65	1,80	3,20
Total length (A) m	2,30	2,40	2,50	2,70	2,75	5,00
Tyres	3,50 - 6	x	-	-	-	-
Tandem of serie	15 x 6,00 - 6	-	x	x	x	x
	3,50 - 6	-	-	x	x	-

### 2.2 Tractor requirements

PTO requested power	540	540	540	540	540	540
Hydraulic system	11/15	15/20	15/20	22/30	26/35	44/60
Electric yocket	-	-	-	-	-	x
Minimum weight tractor	1500	1600	1600	1800	2000	-
	Kg	Kg	Kg	Kg	Kg	Kg



### 3.1 General recommendations for the prevention of danger

Most accidents wich occur during work or transport are caused by failure to comply with elementary rules of caution. To prevent accidents, the main rules to comply are:

- The Rotary Rake has been successfully cheked according SAFETY C.E. regulations, but this do not protect you against accidents caused by an incorrect use of the machine.
- Become thoroughly familiar with the Use and Maintenance Instruction before proceeding with any operation on the machine: see Fig. 01

**Warning:** this signal indicates a hazard and will be used each time either persons and/or the machine could be harmed!



The operator should have become fully familiar with correct Use of the machine before working with it alone (Fig. 02)



Check that the protections fixed on the machine are always in the perfect conditions. In case of deformation or breakage repair or replace them immediately because are very important for yours and other's people security.



Before starting work, always check that all installed safety devices, including any guards, are efficient.



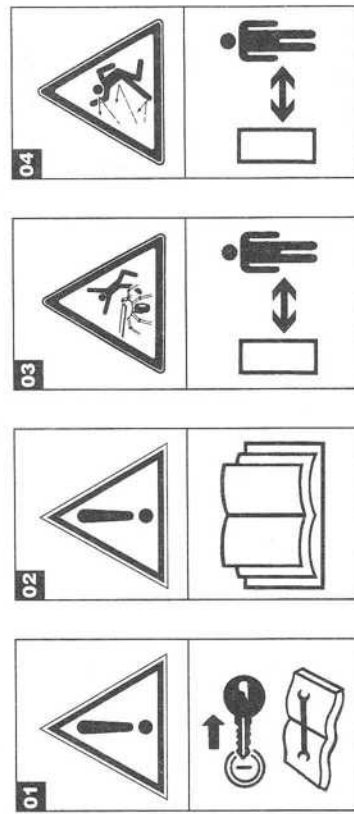
Before to start working with the machine do not allow people to remain within the tedder's working reach nor behind the rear throw area since they could be injured by stones or others foreign bodies throw-out with the grass. Be even more careful if are working close the roads paths or the stony ground. (Fig. 03 - Fig. 04)



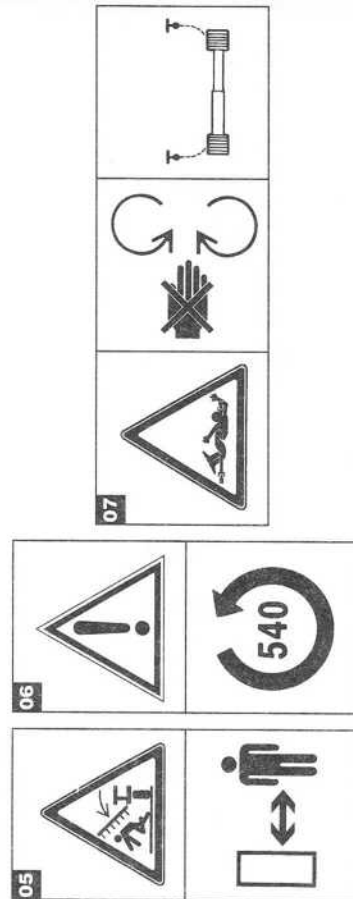
Not to draw near radius of action of the machine.



Before lowering the machine from the transport position to that of work or vice-versa, always check that there are no persons, animals or other obstructions in the range of action in the machine itself. (Fig. 05)



- ⚠ To operate the machine only when it is in work-position.
- ⚠ Keep bystanders (specially children) and animals away from the machine when it is in operation.
- ⚠ Before carrying out any operation on the rotary tedder, always remember to disengage the Pto, turn of the tractor engine and check that the tractor is braked. Remove the keys from the instrumental panel. Wait until all moving components have stopped.
- ⚠ The rotor, by inertia effect, continue to turn for a few second after engine shut-off. It is very dangerous to approach to the rake during this time because the tines can provide entanglements, specially in the rear part of the machine.
- ⚠ Do not allow the Tedder to run, without somebody in charge of it.
- ⚠ Never exceed the prescribed Pto rpm rate: 540 rpm (Fig. 06).
- ⚠ Fix the cardan shaft shield with the relative latch in order to prevent the shaft itself from turning (Fig. 07).
- ⚠ Besides the above provisions, always comply with the general safety regulation in force in your country.

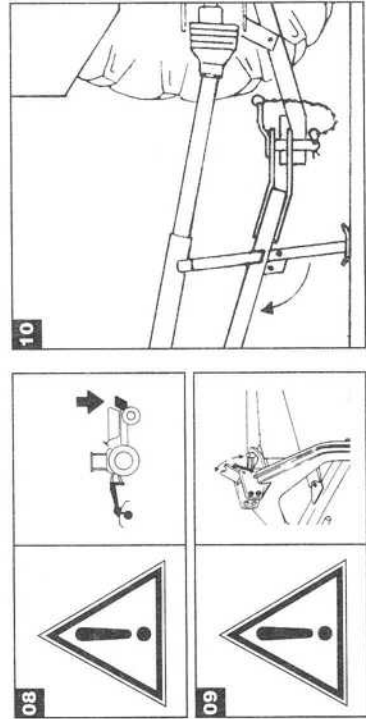


### 3.2 Road circulation

- ⚠ The standards to respect are those foreseen in the Highway Code of the country where the machine will be used.
- ⚠ To ensure that the tractor proceed in a straight line, it is of vital importance that the machine being draw does not excessively lighten the forecarriage of the tractor.  
A ballast can be used if necessary. (Fig. 08)
- ⚠ For model 3 points movable linkage, before any transfer on the road, make sure that the linkage clamping is perfectly fitted. (Fig. 09)
- ⚠ Make sure that signals-equipments are always in perfect conditions . The signals-equipments can be assembled by the utilizer. It is recommended to use always reflecting materiel.
- ⚠ Respect the Rules regarding maximum speed permitted for tractor with equipment.

### 3.3 Stickers

- ⚠ It is essential to pay the greatest attention to the safety stickers affixed to the machine.
- ⚠ The user shall be obliged to keep all safety stickers in a good condition. They must be perfectly legible.  
Contact the Spares Service if the safety stickers need replacing.



## 4.1 Adapting to the tractor

### A. PULLED RAKE (MODEL 666)

 Switch off the engine of the tractor and take off the ignition key.

Couple the linkage to drawbar of the tractor.

Fix the pin and connect the cardan shaft to the PTO of tractor. Fix the protection by its chains.

Push up the holder support turning it to up direction and be sure that lock pin is allocated into its own place. (Fig. 10)

Connect the hydraulic clutch of the machine to the hydraulic distributor of tractor. To open or close the hydraulic circuit you must use the cock located on central beam. (Fig. 11), A = open - B = closed

Connect the 7 poles plug of electric circuit with plug of tractor.

### B. THREE POINTS LINKAGE MACHINE



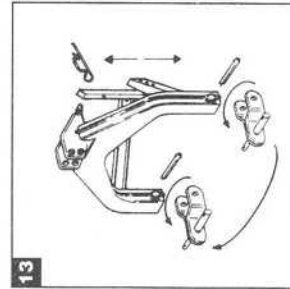
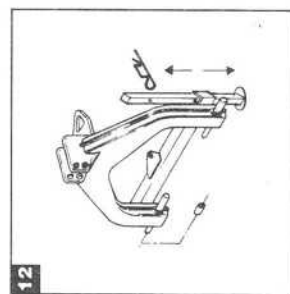
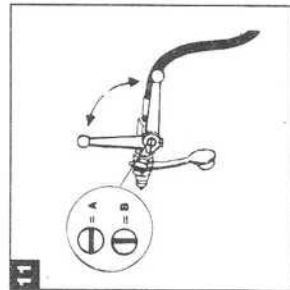
Switch off the engine of the tractor and remove ignition key.

Hook the rake to three points tractor connection. To compensate eventual possible differences of upper arm, there are two fixing holes on the linkage. (Fig. 12)

Push up the holder support.

All three points linkage RAKES are predicted for coupling 1st and 2nd category.

The three points linkage RAKE, with fix linkage, are equipped with two fork-joints with double pin for connection to two lower lifting-arms. It's sufficient to turn 180° and reversing the two pins to have a coupling of 1st or 2nd category. (Fig. 13)



The three points linkage RAKE, **mouvable linkage**, are equipped by two double fix-pins an by one reduction, bushing for connection to two lower lifting-arms. To have 1st category coupling, connect the eyes to the pins of smaller diameter located one inside and other outside of linkage.

To have 2nd category coupling: connect the eyes to out-pins of linkage. Insert before the reduction bushing on the smaller diameter pin. (Fig. 12)

For machines with **mouvable linkage**, make sure that the linkage block is fitted (Fig. 09)

Before any transport operation, make sure that RAKE-arms are located in their holders with block-bar exactly fitted in its own place and locked by its own cotter-pin. The cloth-holder must be completely inside position and locked by the pin an cotte pin. (Fig. 14)

Adjust and block the lower lifting-arms of tractor to avoid lateral swing of the machine during transport.

Push-up the holder support and fix it into up position by proper slit-pin.

Insert the cardan shaft to the PTO of tractor. Make sure that protections are fixed by proper chains.

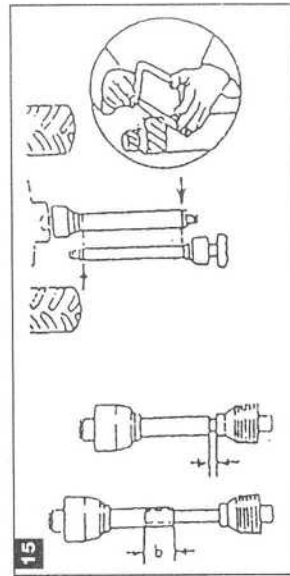
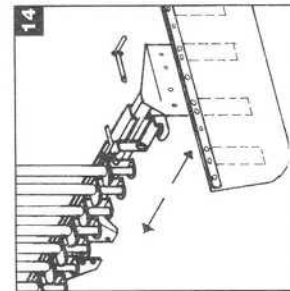
## 4.2 Adapting the universal coupling

Due to the various positions with the shaft of the power take-off can assume on the different tractors, it may be necessary to correct the length of the cardan shaft. This length should be controlled when putting the machine into service for the first time.

Extract the two axle shafts of the cardan and insert them separately into two PTO parts. (Eventual free wheel-machine side).

Check that, when the cardan shaft is in minimum extension position (Raked raised or lower) the tubes must not touch each other on the bottom, but it is necessary to have minimum clearance of 20 mm. If necessary, shorten the shafts and the protections. before reinserting the two axle shafts, carefully clean and grease the sliding parts. (Fig. 15) When the cardan shaft is in maximum extension the tubes must be inserted minimum 150 mm.

Fix the external protection of cardan shaft by its proper chain.



### 4.3 Working position

#### A. PULLED MACHINES (MODEL 666)

⚠ Shut off engine and remove key and lock hand-brake.

Choose the most suitable work-width. That depend on the quality of product, on its quantity an on the windrow-width you desire. To make this operation it is necessary to operate on length-selector (Fig. 16) moving the tie-rod x to central beam.

Be sure that nobody is into action-radius of the machine. Open the hydraulic circuit by the cock (Fig. 11) and lower the arms of the rake by the distributor of the tractor. The arms will be automatically into desired work-position.

Take off the tines from the holder and insert them on their place of rotary heads. Pay attention because you have rights and lefts tines. In sert the pin "A" on the hole "B" (Fig. 17) and fix them by the proper cotter-pin, correctly positionned on the pin.

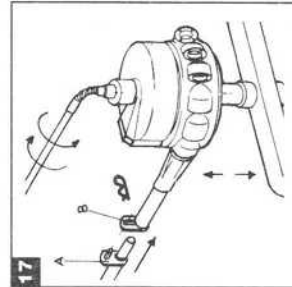
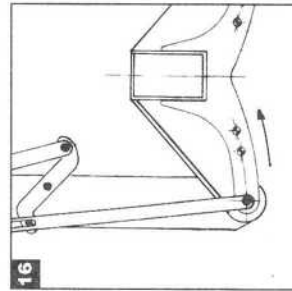
Lower the projections (Fig. 18) and fix them on their blocks.

Put the tractor-distributor into floating position. In this case the turning-head will follow the irregularities of the ground.

#### B. THREE POINTS LINKAGE MACHINES (other models)

⚠ Lower the machine to the ground, shut-off engine, remove the key and lock hand-brake.

Take-off the tines from the holder and insert them on their place of rotary heads. Insert the pin "A" on the hole "B" (Fig. 17) and fix them by proper cotter-pin, correctly positioned on the pin.



For models 3 points movable-linkage, turn to up direction the linkage-block. (Fig. 09)

By lifting equipment of the tractor, place the turning-head in horizontal position to the ground. Regulate the arms-height, so as the tines distance from the soil is no more than 10 mm. For model equipped by breast drill, turn the lever on the right or on the left according the arms must upper or lower (Fig. 17). For other models the height-regulation is made by the adjustable fork (Fig. 19).

Lower the protections and lock them in their proper block-places. (Fig. 18)

Draw-out the holder of containment cloth, and fix it into suitable positions, by its pin.(Fig. 14)

### 4.4 Road circulation



Switch off the tractor-engine, remove the key and lock the parking brake.

Wait untile the tine-holder rotor is completely stopped. Raise the protections pushing them a little ahead (Fig. 18). Disassemble the arms from turning-head and put them on their proper holder.(Fig. 14)

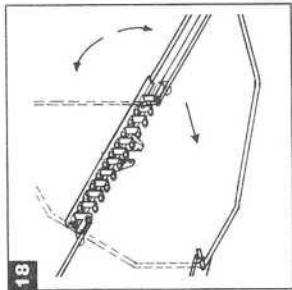
Insert the security bar, lock the arms on the holder and lock it by cotter pin.

Put inside the containment-cloth and lock it by the proper pin.



Models with movable linkage, after raised, lower the linkage-block (Fig. 09) to avoid that the machine, during transport has dangerous disbandments.

Pulled models, after raised the protections, disassemble the three more external arms of two turning heads and put them on holder fixing by cotter-pin. Then by the tractor-distributor raise the arms of turning-head holder and close the cock situated on the main beam of the machine.



## 5.1 Use

The MORRA side-delivery rake is a machine designed for ordinary agricultural use-i.e, to gather common feedstuffs, hay, straw, corn stalks and similar material in windrows.

**All other use shall be considered improper, not recommended and therefore at the user's risk**

Before to start the machine check oil level and be sure that it is greased.

Before to start SWATHING, make sure that nobody is within arm working-area.

Slowly engage power take-off (540 rpm) and gradual reach the r.p.m. on the machine before start to work the forage.

Forward speed of the machine and of turning head must be choisen according to quality and quantity of product and also according to the ground.

During work is important to check frequently the parallelism of turning heads in respect of the ground.

The models 3 points linkage, movable linkage, when raisen automatically come themselves into central position. Make sure nobody is near to the machine during this operation.

## 6.1 General maintenance

Check that the protections on the machine are always unpaired and in perfect conditions. In case of deformations or breakage, immediately repair or replace them because they are very important for yours and other's security.



The machine must be controlled very carefully after the first five hours of work. Check that all screws and bolts are thoroughly tightened (screwing up if necessary). Special care should be given to control the screws fixing

- the arm-mounting
- the tines
- the linkage
- the lock nut on vertical axle tree of turning head

### Tightening couples:

- Tines 85 Nm.
- Arm-mounting 50 Nm.
- Linkage 130 Nm.
- Lock-nut 130 Nm.

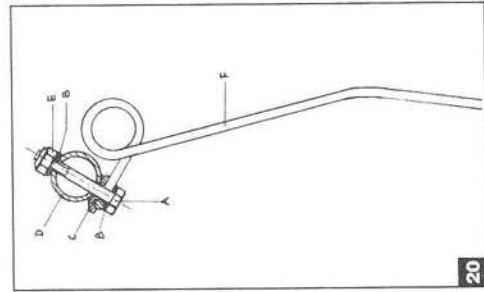
Every 30 hours of work all controls must be repeated and also check the pressure of wheels (=0,9 bar).

In case of cracking or loss of one tine, replace it immediately because the deficiency of one or more tines on one rotor can bleach the rotor, having abnormal vibrations wich can damage the rotor's bearings, the tapered couple or simply get unscrewing of bolts fixing the arm mounting or the lock nut.

To replace the tines:  
unscrew the nut E (Fig. 20), remove the whole and replace the tine F and assemble it on tube D.

Position correctly the boss C and two washers B (the washers B must be renewal every time, because this can give more compact to whole part).

It's necessary to grease the indicated points. (Fig. 21)



## 6.2 Lubrification

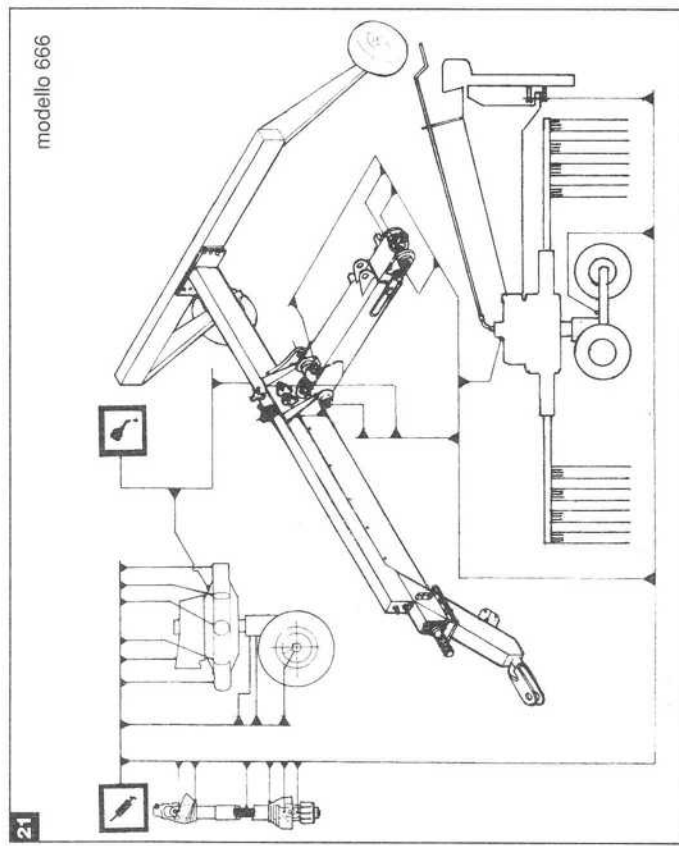
The life of the machine depends very much on the correct respect of LUBRIFICATION RULES, specially regarding the points to lubricate and periodicity.

All points interested are indicated by an arrow (Fig. 21)

For gears and articulations use semifluid grease.

For central gear box use OIL VARIAX EP 80 W 90

<b>Capacity</b>	8 arms rotor	Kg. 3,00
	10 arms rotor	Kg. 3,50



## 6.3 Storage of machine

Disengage the cardan shaft and the protection's chain.

Unclamp the holder support and put it into hold position lowering the machine till to touch the ground. (Fig. 12)

Three points linkage model:

- unclap the lifting arms and the third point.

Pulled model:

- unclamp the draw bar

- lower by tractor distributor the external turning-heads.

Pulled model must store always with the external rotor lowered. Before to lower be sure that nobody is near to the machine.



## 6.4 End season maintenance

For shed at the end off saison it is necessary:

To wash carefully the machine and check that all bolts are correctly screwed. Repair or replace damaged parts.

Grease all points indicateds on Fig. 21 . Check oil-level into central gear box.

Check the pressure of wheels.

On models with hydraulic devices, check the rubber tube of circuit. If there are splits or abrasions, replace them.