



Società Industriale Costruzione Macchine Agricole

Instruction Manual

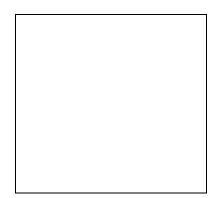
ATTENTION

Read carefully this manual before using the equipment

SA . ZL-L . SB . CS . SF . ST . SD . HLV-HLF . SHV-SHF-SHE . SM-F . SM . SP . RG



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Industrial Manufacture Company of Agricultural Machines

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SICMA joint-stock company reserves the right to make any necessary changes without giving prior notice in order to optimize the quality and safety of its products and without committing itself to update this manual every time a change takes place.

This booklet provides an accurate description of the operating instructions and maintenance activities to be carried out on the tiller you bought. We congratulate you on your choice and remind you that reading and following scrupulously all prescriptions here contained will assure the regular working of your machine and especially a high degree of safety.

The manufacturer therefore declines all responsibility as for the onset of problems caused by a lack of compliance with the instructions and/or negligence of the operator.

This manual is divided into chapters and paragraphs and its pages are progressively numbered in order to present information in a clear and concise way. Information, thus, can be found through the keywords used as chapters' title and especially consulting the index (page 4).

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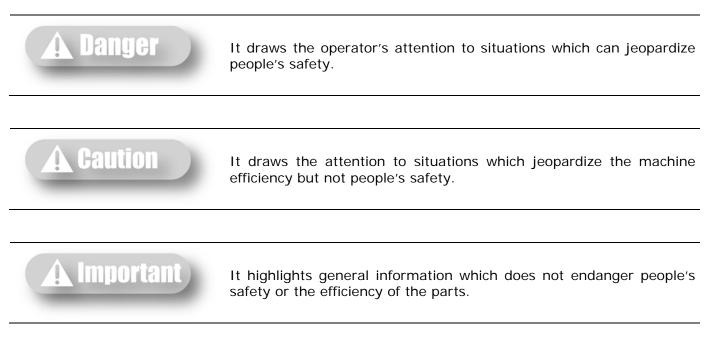
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GENERAL INFORMATION

SYMBOLS

This booklet contains three "safety graphic symbols" to highlight as many danger levels or important information:



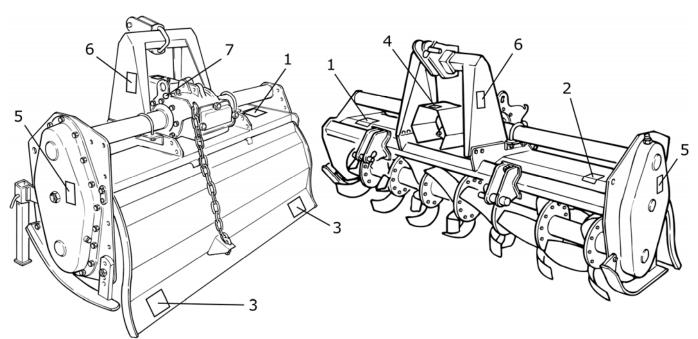
BOLTS AND NUTS TIGHTENING TABLE

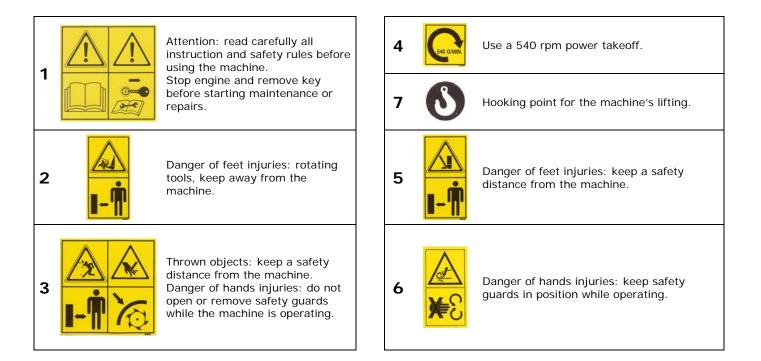
In order to tighten correctly all bolts and nuts of your tiller, we advice you to use a special dynamometrical spanner and to refer to the following table:

Screws/threaded bolts Bolt class										
thread	8	.8	1(0.9						
thread	Nm	Lb-ft	Nm	Lb-ft						
M6	11	8.5	17	12						
M8	28	20	40	30						
M10	55	40	80	60						
M12	95	70	140	105						
M14	150	110	225	165						
M16	240	175	305	225						
M18	330	250	475	350						

SAFETY LABELS

The safety labels and the information on the machine, listed in the following table, must be necessarily carried out; failure to carry out these warnings can cause death or severe injuries. Make sure that the labels are always present and legible, should this not be the case contact your nearest SICMA dealer to replace the missing or illegible ones.





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Technical data

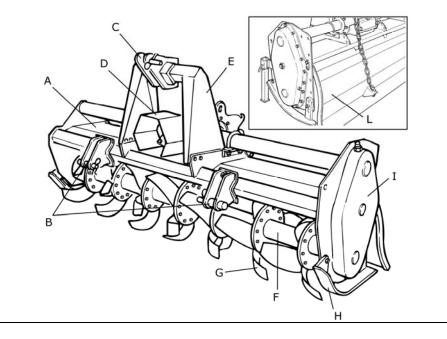
Model		Working	Horse- power	weight		king pth	Speed gear	Drive	eline		des lo)	Blade	type
		width (cm)	(CV)	(Kg)	cm	inc	Speed gear	chain	gear	4	6	curved	"L" shaped
	85	85	10-10	106	15	6	·	x		x		x	
SA	105	105	10-10	118	15	6		х		х		х	
	125	125	10-10	130	15	6	·	х		х		х	
	90	90	20-35	126	18	7	·	х		х		x	х
	100	100	20-35	130	18	7	· · · · · ·	х		х		х	x
	110	110	20-35	136	18	7	·	х		х		х	х
ZL-L	120	120	20-35	152	18	7	·	х		х		х	х
	130	130	20-35	158	18	7		х		х		х	х
	140	140	20-35	166	18	7	· · · · · ·	х		х		х	x
	150	150	20-35	190	18	7	· · · · · ·	х		х		х	x
	110	110	20-35	165	18	7	· · · · · ·	х		х		х	x
	120	120	20-35	170	18	7	·	х		х		х	х
SB	130	130	20-35	175	18	7		х		х		х	х
	140	140	20-35	180	18	7	· · · · · ·	х	х	х		х	x
	105	105	30-50	220	18	7	· · · · · ·	х	х	х	х	х	х
	125	125	30-50	230	18	7		х	х	х	х	х	х
	135	135	30-50	238	18	7	·	х	х	х	х	х	х
cs	145	145	30-50	246	18	7	·	х	х	х	х	х	х
	165	165	30-50	266	18	7		х	х	х	х	х	х
	185	185	30-50	290	18	7	· · · · · ·	х	х	х	х	х	x
	125	125	20-50	200	18	7	·		х	х	х	х	х
	145	145	20-50	284	18	7			х	х	х	х	х
SF	165	165	20-50	294	18	7	· · · · · ·		х	х	х	х	x
	185	185	20-50	350	18	7	· · · · · ·		х	х	х	х	x
	120	120	30-60	312	20	8	х		х	х	х	х	х
	130	130	30-60	340	20	8	х		х	х	х	х	х
~~	145	145	30-60	358	20	8	х		х	х	х	х	х
ST	155	155	30-60	380	20	8	х		х	x	х	х	х
	180	180	30-60	394	20	8	х		х	х	х	х	х
	205	205	30-60	400	20	8	x		х	х	х	х	х
	130	130	30-60	290	22	8			х	х	х	х	х
	140	140	30-60	300	22	8	· · ·		х	х	х	х	х
SD	155	155	30-60	320	22	8			х	х	х	х	х
	180	180	30-60	360	22	8			х	х	х	х	х
	125	125	15-40	295	18	7		х			х	х	х
HLV HLF	145	145	15-40	315	18	7		x			х	х	х
	165	165	15-40	335	19	7		х			x	х	х

Model		Working	Horse- power	Weigth		rking pth	Speed gear-	driv	eline		des lo)	Blade	type
		width (cm)	power (CV)	(Kg)	cm	m inc	Speed gear	chain	gear	4	6	curved	"L" shaped
	135	135	35-60	420	22	. 8	<u>.</u>		x		x	x	x
SHV	150	150	35-60	445	22	8			x	x	x	x	x
SHF SHE	160	160	35-60	458	22	8			х	x	х	x	×
	185	185	35-60	500	22	8			x	x	х	x	х
	210	210	35-60	534	22	8			х	х	х	х	х
	140	140	40-70	458	20	8	х		x	х	х	х	x
	155	155	40-70	466	20	8	x		x	х	x	x	x
SM-F	180	180	40-70	496	20	8	х		х	х	х	x	х
	205	205	40-70	530	20	8	х		x	х	х	x	x
	230	230	40-70	570	20	8	х		х	х	х	х	x
	130	130	40-70	354	20	8	х		х	х	х	x	x
	140	140	40-70	394	20	8	х		х	х	х	х	х
	155	155	40-70	406	20	8	х		х	х	х	x	x
SM	170	170	40-70	415	20	8	х		x	х	x	x	x
	180	180	40-70	440	20	8	x		x	x	x	x	x
•	205	205	40-70	445	20	8	х		х	х	х	x	x
	230	230	40-70	450	20	. 8	x		x	х	x	x	x
	160	160	60-90	480	25	10	×	x			x	x	x
	180	180	60-90	568	25	10	x	x			x	x	x
SP	205	205	60-90	575	25	10	X				 x	x	X
chain	205	230	60-90	600	25	10	· · ·	x	·	•	•		
							x	x			x	x	X
	255	255	60-90	625	25	10	X	x	•		x	х	x
	160	160	60-90	510	25	10	x		x		x	X	x
SP	180	180	60-90	555	25	10	х		х		х	x	х
gear	205	205	60-90	605	25	10	Х		х		<u>х</u>	x	x
	230	230	60-90	630	25	10	x		x		x	x	x
	255	255	60-90	655	25	10	х		х		x	х	х
	230	230	90-160	880			х		х		•		•
RG	255	255	90-160	970			х		x				
hoes	280	280	90-160	1000		-	х		х				
	305	305	90-160	1032		<u>.</u>	х		x				
RG teeth	230	230	90-160	930		<u>.</u>	x		x	- <u>i</u>	-		
	255	255	90-160	1020			х		х				
	280	280	90-160	1110			х		х	-	-		
	305	305	90-160	1150		•	х		x		•		
	230	230	90-160	900		•	x		x		-		
RG	255	255	90-160	990			x		x	<u>.</u>	•		
blades	280	280	90-160	1080		·	x		x	•			·
-	305	305	90-160	1180		-	x		×				



MAIN PARTS TERMINOLOGY

- A) Frame
- B) Lower three-point hitches
- C) Upper three-point hitch
- D) Cardan guard
- E) Third point mast
- F) Rotor
- G) Hoes
- H) Side skids
- I) Transmission case
- L) Cover



IDENTIFICATION PLATES

1 Important

Identification plates are placed on every tiller and are structured as follows:



When asking for information or technical service, always specify the machine type and width.

ALLOWED USE

SICMA tillers, as described in this instruction and maintenance booklet, have been specifically designed to till the land.

Any other use jeopardizes the operator's safety and the machine integrity.

IMPROPER USE

When using SICMA tillers it is particularly forbidden:

- The attachment to vehicles of unsuitable power or weight.
- To assemble the machine without securing the rebound tie rods of the three-point hitch of the tractor's elevator.
- To work in excessively stony grounds
- To lift the machine when the power takeoff is engaged.
- To approach the machine when wearing inappropriate work clothing.
- To get on the machine while it is being used or transported

SAFETY

SAFETY IN THE WORKPLACE

Most of the accidents which take place while the operator is using the machine or the equipment or during their maintenance or repair are caused by a lack of compliance with the basic safety precautions.

It is necessary, therefore, to become more and more conscious of the potential risks of one's action by constantly paying attention to its effects.

If potentially dangerous situations are known, accidents can be prevented!

OPERATOR'S REQUIREMENTS

All operators using the equipment must be competent and meet necessarily the following features:

Physical: good eyesight, coordination and capability of carrying out all functions required for the machine's use.

Mental: capability of understanding and applying the established rules and safety precautions. Users must pay attention and be sensible for their own and other people's safety

Training: users must have read and studied this manual, its eventual enclosed graphs and schemes and its identification and danger plates. They must be skilled and trained on any use or maintenance activities.

WORK CLOTHING

When working and especially when executing repair or maintenance activities, it is necessary to wear the following clothing and safety accessories:

- Overalls or other comfortable clothing, not too loose to prevent the possibility that parts of them might be caught in the moving parts.
- Protective gloves for hands.
- Protective glasses or faceplate to protect eyes and face.
- Protective helmet for the head.
- Safety shoes

Important

Wear only personal safety accessories in good condition and complying with the rules in force.

GENERAL SAFETY RULES Always consider the features of the area where work is taking place:

- When the equipment is running, it is forbidden to stand within the field of action of the tilling cutter or of the other accessories of which it is provided with.

Prepare the work:

Before and when working do not drink alcohol, take drugs or any other substances which may alter your capability of working with machine tools.

- Be sure to have sufficient fuel, to prevent a forced stopping of the machine, maybe during a critical movement.
- Do not use the equipment under unsafe conditions. For instance, it is forbidden to execute makeshift repair activities just to start working; it is forbidden to work at night with an insufficiently illuminated working area.

When working or during the maintenance activities it is necessary to remember:

- The labels and stickers providing instructions and pointing out the dangers, must not be removed, hidden or made illegible.
- Do not remove, except in case of maintenance, the safety devices, protective covers or sumps. When it is necessary to remove them, stop engine, handle with care and reassemble them properly before restarting the engine and using the equipment.
- It is forbidden to lubricate, clean and adjust the moving parts while they are running.
- During maintenance or adjustment activities on the equipment it is forbidden to use hands for executing operations for which there are specific tools.
- Do not use tools in bad condition or inappropriately, for instance pliers rather than monkey spanners, etc.
- Before executing interventions on hydraulic lines under pressure, disconnect their components and make sure that the line is no longer under pressure and that it does not contain any hot fluid.
- Check out all pipe fittings and make sure that they are well connected before raising steam to the hydraulic lines.
- When maintenance or repairs are completed check out that no tools, wiping rags or other materials are left inside spaces or guides with moving parts.
- While using the equipment it is forbidden to make more than one person give directions and make signals. The eventual directions and signals relating to the load handling must be given by a person only.
- Do not unexpectedly call an operator while he is working if not necessary; it is forbidden as well to frighten who is working and throw objects, even if just for fun.
- Watch out those present, especially the children!
- Make always sure that no people stand within the equipment's ray of action.
- Do not make people get on the machine.
- When the equipment is not needed, stop the vehicle's engine, park it on a flat ground with first speed and parking brake on, with the machine rested on the ground and power takeoff disengaged.
- Do not make any cleanings, lubrications, repairs or adjustments with running engine and lifted machine.
- Never use the machine in steep slopes which may jeopardize the equipment's stability.

SICMA declines all responsibility for a lack of compliance with these instructions.

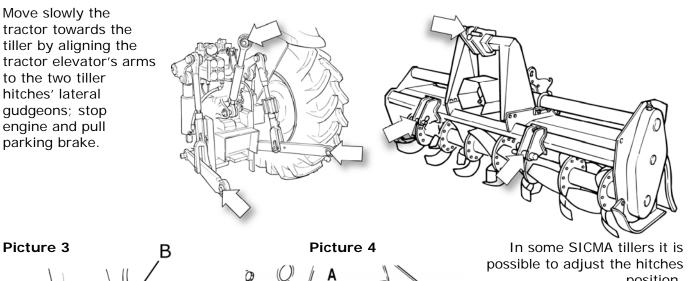
SETUP

ATTACHMENT TO THE TRACTOR

It is necessary to read up this instruction manual and the manuals of the tractor and cardan shaft manufacturer.

All SICMA tillers have been manufactured to be attached to any tractor provided with hydraulic elevator and universal three-point hitch.

Before attaching the equipment to the tractor, set both on a flat and smooth ground and make sure that nobody is standing between them.



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position. On ZLL, CS, ST, SM, SP tillers, adjustment can be made by loosening bolt B (picture 3) and modifying the position of plates A. Tighten strongly all bolts after regulation (ref. bolts and nuts tightening table).

On **SA** and **SB** tillers the hitches regulation can be made by moving spacing bushings **A** (picture 4)

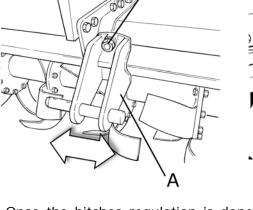
Once the hitches regulation is done, connect the lower arms by removing the release pins of the gudgeons placed on plates \mathbf{A} , inserting the elevator bars into the arms centre and fastening them with the relevant release pins, which had been removed in precedence.

Connect, afterwards, the tractor tie rod to the third upper point by removing the pin located between the plates, inserting the tie rod itself and locking it with the pin.

Adjust the third point so that the upper part of the frame is parallel to the ground.

Lock all connection parts with the special sway chains or tie rods.

It is always good to make sure that the central group axis (sump/bevel gear pair) is parallel to the ground thus reducing the stresses on the power takeoff and extending the working life of the equipment.





After executing the above-mentioned activities it is always good to check that all bolts and nuts of your tiller are tightened strongly (ref. bolts and nuts tightening table).

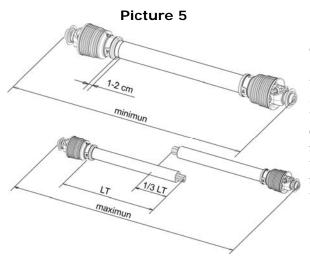
ATTACHMENT TO THE CARDAN SHAFT

Before assembling the cardan shaft, it is very important to check out that its number of revolutions and direction of rotation match those of the tractor. Moreover, read carefully the instruction manuals of the cardan shaft and the tractor manufacturers.

Before starting work, check the presence of the safety guards on the power takeoffs of the machine, the cardan shaft and the tractor. Check in particular that the safety guards cover the cardan shaft throughout its extension.



When at their maximum extension, the safety guards' plastic hoses shall overlap of at least 1/3 of their length (LT). When in their maximum closing position, the minimum clearance allowed shall be of 1-2 cm (picture 5).

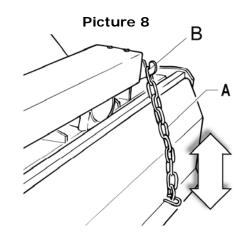


Check out that the cardan shaft minimum and maximum length are the ones required by the machinetractor coupling.

Should problems arise, contact a skilled repair shop or the cardan retailer. After installation, secure safety guards both to the tractor and the machine using the special chains and make sure that they pivot freely. If the cardan shaft is equipped with other safety devices, such as a pair limiter or freewheels, be sure to install them on the machine side. As for the cardan use and maintenance refer to the relevant booklet.

COVER ADJUSTMENT

The rear cover can be adjusted in height to better compact the round and make it flat. The adjustment can be made by releasing chain A (picture 8) from upper hook B and inserting it back to the needed height.





These operations shall be made only on working ground and only after having stopped the engine, disengaged the power takeoff and pulled the parking brake. If necessary, lift the machine from the ground but, in order to avoid risks for people, place it on supports thus preventing any injuries that might be caused by its sudden fall.

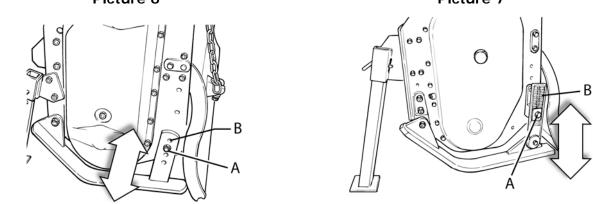
WORKING DEPTH ADJUSTMENT

The machine's working depth is determined by the position of side skids.

Lifting the skids the work depth increases, lowering them it decreases; it is important to lift or lower skids equally on both sides.

To adjust the working depth on SA, SB, SF, SD, SM-F, SM-F, SHV-SHF-SHE, CS, ST and SM tillers, screw out and remove screw A (picture 6) and adjust the height of the skid through holes B. At the end of these operations tighten screws strongly (ref. bolts and nuts tightening table)

To adjust the working depth on **SP** and **RG** tillers, loosen screw nut A (picture 7) and make regulation rod **B** slide up to needed height. At the end of these operations tighten screws strongly. **Picture 6 Picture 7**





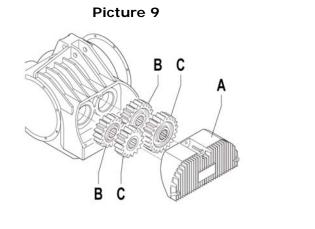
These operations shall be made only on working ground and only after having stopped the engine, disengaged the power takeoff and pulled the parking brake. If necessary, lift the machine from the ground but, in order to avoid risks for people, place it on supports thus preventing any injuries that might be caused by its sudden fall.

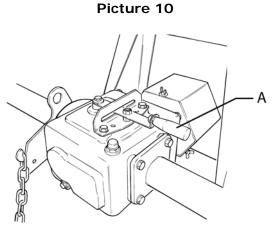
SPEED GEAR

ST speed gear, SM speed gear, SM-F, SP and **RG** tillers are provided with speed gear and it is possible to modify the rotor speed independently from the speed of the tractor power takeoff. Higher speeds improve the soil working speed but produce a faster wear of rotating parts.

- To change speed on **ST speed gear**, **SP** and **RG** tillers leave cover **A** (picture 9) from gearbox and invert gear wheels **B** and **C** inside it; it is possible to obtain two more speeds by replacing the assembled gears with those put into the cover.
- To change speed on **SM speed gear** and **SM-F** tillers just move lever **A** (picture 10) following the indications shown on the gearbox (1, 2, 3).

As for the gear's speed, refer to the stickers put on the machine.







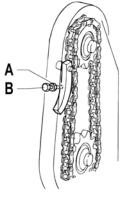
Do not act on gears before having stopped the engine, disengaged the power takeoff, pulled the parking brake and placed the machine on the ground.

CHAIN TENSION

SA, SB, SF chain, ZLL, CS chain, SP chain and HLV-HLF tillers are equipped with chain drive.

As for **SA**, **SB**, **ZLL** and **CS chain** models, the chain tension adjustment takes place during assembly; for eventual further regulations during the machines' use please contact SICMA authorized repair shops.

As for **SP chain** tiller, the chain tension adjustment is made through a tightener (picture 11). Eventual excessive clearances can be regulated by loosening lock nut **A** and screwing screw **B** to its fullest without forcing (up to the chain maximum tension), then loosening screw **B** of about two turns (thus avoiding excessive chain tension). Keeping screw **B** standstill, tighten lock nut **A** strongly (ref. bolts and nuts tightening table).



Picture 11

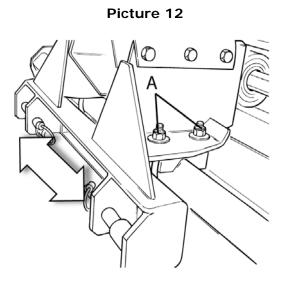


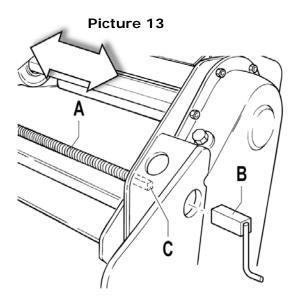
Adjustment of the chain shall be made with standstill machine after having stopped the engine and disengaged the power takeoff.

SIDE SHIFT ADJUSTMENT

SA, SB, SF, SD, HLV-HLF, SHV-SHF-SHE and SM-F tillers are provided with side shift.

As for **SA** and **SB** models, when a side shift is required loosen nuts **A** (picture 12) to make the main frame slide as needed; tighten nuts strongly after regulation (ref. bolts and nuts tightening table). **SF** and **SD** models are not equipped with hydraulic side shift, therefore shift can be made through the special screw **A** (picture 13); for adjustment, insert crank **B** in trailing tang **C** and swing it up to needed shift.





HL and SH side shift

HLV-HLF and **SHV-SHF-SHE** tillers are equipped with automatic hydraulic side shift, useful in case of workings which require a shift of the machine's body with respect to the tractor axis. Models **HLF**, **SHF** (orchard version) and **SHE** (intermediate version), are equipped with a hitch which is shifted from the tractor axis.

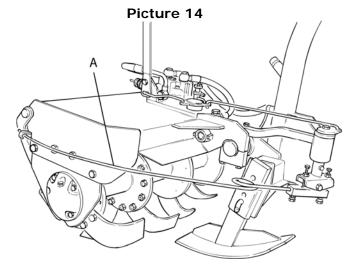
INTER-LINES TILLAGE

To set in action the automatic hydraulic side shift during inter-lines tillage:

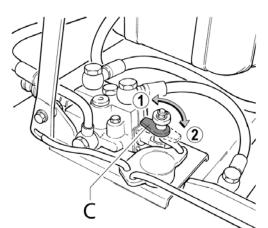
- Release feeler A (picture 14)
- Extract the locking gudgeon **B** (picture 15)
- Move lever **C** (picture 16) in position **2**

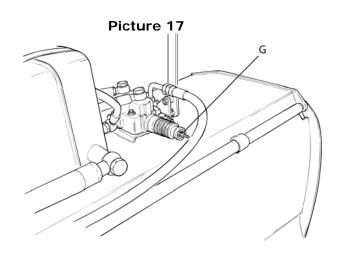
NORMAL TILLAGE

With machine in standard position, insert the locking gudgeon **B** (picture 15) and move lever **C** in position **1** (picture 16); hook feeler **A** (picture 14)



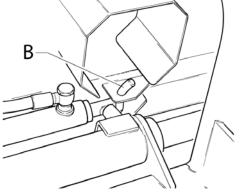
Picture 16







Picture 15



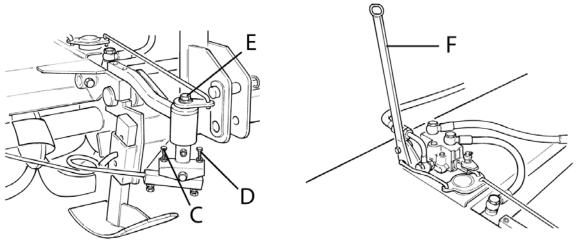
The machine automatic shift is made through pressure on the feeler. The feeler's resistance and its sensibility can be adjusted through spring **G** (picture 17) placed behind the deviating device. It is also possible to adjust the feeler height through screws **C** and **D** (picture 18) and its amplitude (ray of action) through screw **E** (picture 18).

Moreover, **HLV-HLF** and **SHV-SHF-SHE** tillers are equipped with a lever (**F** - picture 19) for the manual setting of hydraulic side shift.



Picture 19

Picture 18



STARTING UP

Now that all setting up operations are completed, your machine is ready to be used; after reaching the work place we advice to engage power takeoff only after having lifted the machine of a few centimetres with the tractor elevator. After this, it is possible to start engine, engage power takeoff, drop the machine down to work position and start using it.

ROAD TRANSPORT

While transporting the machine it is very important to follow the road traffic code of the country where you circulate.

SET ASIDE

If the tiller will not be used for a long period of time, we advice to:

- 1 Wash the machine accurately and dry it.
- 2 Check out all equipment and replace eventual damaged or worn parts.
- 3 Tighten strongly all bolts and nuts (ref. bolts and nuts tightening table).

Make an accurate greasing and finally protect the whole machine with a tarpaulin and put it in a dry place.

MAINTENANCE

Maintenance is a fundamental operation to extend life and performances of any agricultural vehicle; taking care of the machine grants you not only a good work execution, but also a longer life of the whole equipment and a greater safety on the workplace.

The operating times indicated on this manual have just an informative character and are referred to normal conditions of use; they can thus undergo variations according to the type of service, to the more or less dusty environment, to seasonal factors, etc

Before injecting AGIP GREASE MU EP2 lubricating grease into the nipples, clean them accurately to prevent mud, dust or other foreign matters from mixing up with grease, thus diminishing the lubrication effect



- When making oil feed or change it is better to use the same oil type, in order to avoid mixing oils with different features.
- When executing maintenance activities, keep the machine rested on the round in horizontal position, stop engine and disengage power takeoff.
- After the first working hours check that all bolts and nuts are tightened strongly, especially the hoes' ones; remember also to check often all the machine safety guards.

FIRST CHECK

After the first 50 hours of work change oil in the gear case and check all bolts and nuts tightening.

EVERY 8 HOURS OF WORK

- Grease with AGIP GREASE MU EP2 the rotor support through the lubricating nipples A (picture 20) of CS, SA, SD, SF and HLV-HLF tillers.
- Grease the cardan shaft spider of every model of tillers.

EVERY 50 HOURS OF WORK

- Check oil level of sump/bevel gear pair (A picture 21).
- Check oil level of the lateral drive (A picture 22),
- Check oil level of the rotor support on ST, SM, SP, RG, SHV-SHF-SHE and SM-F tillers (A picture 23).

If necessary feed with AGIP ENI BLASIA 150 80W90 oil.

- On **HLV-HLF** and **SHV-SHF-SHE** tillers, check oil of their hydraulic system (cap **B** – picture 24) and of their mast (cap **C** – picture 24)

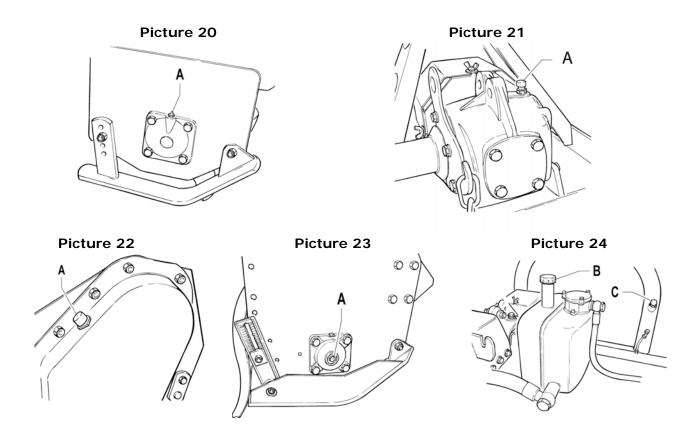
If necessary feed with AGIP OSO 68 hydraulic oil.

- Check that all bolts and nuts are strongly tightened, especially the hoes' ones.

EVERY 500 HOURS OF WORK

- It is necessary to change oil of the group sump/bevel gear pair, of the lateral drive and of the rotor support (ST, SM, SP, RG, HLV-HLF, SHV-SHF-SHE, SM-F); use only AGIP ENI BLASIA 150 80W90 oil.

For this kind of maintenance please contact the nearest SICMA authorized repair shop.



A Caution

Get rid of exhaust oil in compliance with the relevant rules of the country where you operate. It is thus forbidden to pour it on the ground.



Before executing maintenance activities on the machine, stop engine, disengage power takeoff, pull parking brake and place the equipment on the ground.

BLADES REPLACEMENT

To assure a perfect functioning of the machine, check often that its hoes are in good condition and perfectly fixed by the locking bolts; in case they are broken or bent replace them with new spare parts, remembering to keep always the original position.

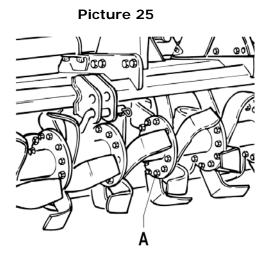
CS, **ST**, **SM**, **SP**, **RG**, **SF**, **SD**, **HLV-HLF**, **SHV-SHF-SHE** and **SM-F** tillers are equipped with 6 hoes per flange; on **CS**, **ST** and **SM** models it is possible to reduce their number to 4 when particular soil conditions require this modification.



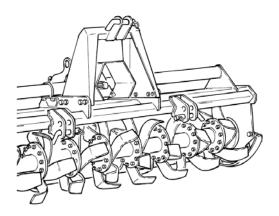
Before starting the hoes replacement activities, stop engine, pull parking brake and disengage power takeoff; lift then the tiller with the tractor elevator and place it on supports to avoid an accidental fall.

Pay attention to hoes bolts **A** (picture 25): these ones must be assembled with their screwhead on the hoes side and their washer and nut on the flange side; bolts, thus, will not unscrew while the machine is being used.

If you have to replace a sequence of more than one hoe, do it one by one in order to keep as better as you can the original helical-run position (picture 26).



Picture 26



SPARE PARTS ORDERING

To order spare parts, please consult the catalogue.

Request of spare parts must be made to the retailer or to the nearest service centre and must always be completed with the following information:

- Type and width of the equipment.
- Code number of the needed spare part. Lack of this number, you can replace it with the number of the table where the part is represented and the correspondent reference.
- Denomination of the needed part and desired quantity.
- Chosen transportation. When this item is not specified, the retailer or service centre, even devoting many cares to this service, do not answer for eventual shipping delays due to acts of God. Transport charges must always be paid by the addressee.







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