



Order-No. 9900.00.39GB01

Operating Instruction

Marabu, - Avant 180 C

Marabu Variant, - Vari-Avant 180 CS

Marabu Variant, - Vari-Avant 180 C

Marabu, - Avant 180 CS





No. 133 - 9 - 96 GB

Semi- mounted reversible ploughs 'MARABU'

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EC Declaration of Conformity

according to Directive 89/392/EEC

We

RABEWERK GmbH+Co.

Am Rabewerk, D-49152 Bad Essen

declare under our sole responsibility, that the product

Reversible Plough MARABU A(G) and MARABU AVANT A(G)

to which this declaration relates corresponds to the relevant basic safety and health requirements of the Directive 89/392/EEC.

"The Supply of Machinery (Safety) Regulations 1992 as amended" have been respected.

For the relevant implementation of the safety and health requirements mentioned in the Directive, the standard EN 292 has been respected.

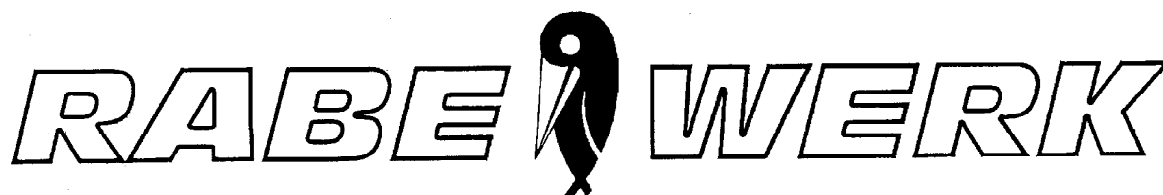
Bad Essen,

11.5.95

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Operating Instruction

No. 133 - 9 - 96 GB

SEMI - MOUNTED REVERSIBLE PLOUGHS 'MARABU'

SERIES C

Before use

Ensure operators have read and are familiar with the instructions contained in this manual and the seed drill is not operated by untrained persons.
This reversible plough is a semi- mounted implement fixed to the 3- point hydraulic linkage of the tractor and is designed for normal agricultural work. Use the plough only for the purpose for which it was designed and tested and in accordance with the instructions contained in this handbook.

Caution: Warranty will be invalid if the machine is improperly used or non-genuine parts or any other parts or components are fitted which are not released by RABE WERK.

Only authorized and skilled RABE WERK dealer technicians, national distributors or our own factory service engineers are allowed to undertake repairs under warranty.

RABE WERK accept no liability for consequential damages or losses of any kind.

Safety precautions

Warning. Make certain that all guards, covers, warning labels and safety devices are correctly fitted and operative.
Ensure the plough is always standing on firm, level ground with the parking stands in lowered position and the work area is clear of bystanders.



Preparing for work

Warning. Select 'Position Control' on the tractor hydraulic before mounting or disconnecting machine.
Take care that sufficient front end weights are fitted on tractor to compensate the rear mounted implement.



Hydraulic connections and adjustments

The plough is equipped with

- * 2 hoses (double acting) for turnover
- * 1 hose (single acting) for the control of the transport wheels
- * 2 hoses (optional) for the control of the hydr. front furrow width adjustment
- * 1 hose (optional) necessary for operating the hydr. disconnecting device on the pick- up arm for the furrow press.

MARABU ploughs with hydraulic variable working width adjustment (VARIANT) require another set of double acting spoolvalves on the tractor.

Transport position (Fig. 3, 4, 6 & 7)

The tractor lower link arms should be in raised position, fixed for transport, not to swing sideways.

The parking stands (6 Fig. C/ C1) have to be raised and the transport safety bars (4 Fig. E) must be engaged in the forward pointing transport position.

The articulating centre section of the plough must be locked also to avoid that the rear section can swing uncontrolled during transport. Only in lifted position with the plough turned to the right hand bodies the transport safety pin (3 & 4 Fig. F) can be engaged. The special transport locking lever (7 Fig. K) on the plough headstock must be shifted into the engaged position.

Now the plough can be turned halfway in a butterfly position until it locks automatically. Before moving off lower the plough at the rear until the plough will rest on the safety bars (4 Fig E).

Hydro- Pneumatic Suspension (optional) Fig. 4

This option is recommended when the plough is carried on long distances between farms at fast speed especially on bad roads.

When fitted the plough should **not rest completely on the safety bars** (4 Fig. E).

A clearance of apprx. 5 cm (2 ") should be allowed to soften the bumps.

As an extra safety measurement close the shut- off valve (4 Fig. B) also.

Lower the front section of the plough so far that sufficient ground clearance is provided.

Working position and testing turnover (Fig. 3, 4, 5, 6 & 7)

Open shut- off valve (4 Fig. B), lift transport safety bars in rearward pointing direction (3 Fig. E) out of work, raise the support stands (6 Fig. C & C1) and lift the front and rear end of the plough.

Disengage the transport locking lever (7 Fig. K). In case lever cannot be released start turning the plough for a second. Release locking pin (3 & 4 Fig F) on central section and operate the double acting spool valve to start turnover until the turnover arm will rest completely against the vertical adjustment screws (7 Fig. G).

When not in use (Fig. 4 & 6)

When the plough is not in use it can be left in transport position for short periods but to relieve the tyres for longer periods let the plough rest in working position on the r.h. bodies.

In transport position: Let the plough rest on the transport locking bars (4 Fig. E) , close shut- off valve (4 Fig. B) and rest the plough on the parking stands (6 Fig. C & C1).

On right hand bodies: Close shut- off valve (4 Fig. B) and rest plough on parking stands (6 Fig. C & C1).

Turning on headlands (Fig. 9)

Warning. Do not reverse the plough when driving narrow bends and the tractor rear wheels are in danger of colliding with the plough headstock. Take care of sufficient distance between the mudguards or tyres of the tractor and the first plough body. This applies specifically when backing-up with the tractor.



Approaching the headland lift the plough first in front and then the rear. Drive a pear shape of loop and turn the plough in the second half of the loop (9 Fig X). It will not be necessary to stop during turning. When entering the furrow again lower the front first and then the rear part.

Check chains or stabilizer brackets on tractor linkage

It is recommended to keep the link arms free when the plough is in work. Only when ploughing hill sides it might be necessary to work with fixed stabilizers.

Operation

Warning. Never allow people to stand or sit on the plough during work. The area of operation must be also clear of bystanders.



Working depth (Fig. 3)

For hillside ploughing select 'Mixed Control' on the hydraulic system: For level fields the plough can be operated in 'Position Control'.

To limit the depth of the rear section there are two adjuster screws provided (3 Fig. H).

Note: Make sure that the screws are adjusted on both sides at even length. The plough must rest during work completely on both depth adjuster screws.

Rear land wheel (Fig. 1)

The rear wheel must not carry a lot of load! It should be adjusted so, that it is just be driven by contacting the ground.

There is an excentric collar provided (1 Fig. G1) to be able to adjust both left and right hand sides at an even depth.

Plough inclination (Fig. 7 & 10)

Each side of the plough can be individually adjusted to cope with uneven and hillside conditions.

By means of altering the inclination the plough legs must stay always in 90° angle to the ground surface (Fig. 10) and the plough beam level.

There are two screws for each side (7 Fig. G) provided.

Precise adjustment is very important on large multifurrow ploughs!

Complains about too wide front furrow is in most cases the result of wrong adjustment

- * of the plough inclination
- or
- * draught alignment of the plough

Front furrow width adjustment (Fig. 7)

The front furrow must have the same width as the other furrows which are in a fixed position. The width may need to be altered depending from the wheel setting or the tyre size.

To alter use the adjustment screw (7 Fig. G) or the hydraulic ram (option) if fitted. The fitment of an hydr. ram can be of advantage when ploughing on hillsides or in changing soil conditions.

- | | |
|---|----------------------|
| * Shorten adj. screw or decrease hydr. ram | Front furrow wider |
| * Lengthen adj. screw or increase hydr. ram | Front furrow smaller |

VARIANT- models

Align front furrow when the plough is in a mid- width position of appr. 43 cm (17").

Tractor wheel setting (Fig. 4)

In case the range of the front furrow width adjustment to smaller cut (as described before) is not sufficient fix the draught link on the beam center section (4 Fig. L1) in the rear pin hole (4 Fig. 2). This second pin hole setting is to adopt the plough to wider wheel settings.

Matching working width between front and rear section of plough (Fig. 5)

Both sections must be aligned so that the landsides are in parallel lines to each other. Use the turnbuckle (5 Fig. O) to match (not applicable to VARIANT models). The working with can be matched by using the adjuster screw (5 Fig. P). The MARABU ploughs are set in the factory so that the first furrow of the rear section is appr. 3,0 cm narrower when the plough is out of work.

Retrospective fitment of wedges to in- or decrease working width (not on Variant): To reposition front strut (5 Fig. O2) and adjustment of correct length of rear turnbuckle (5 Fig. O) follow the instructions as follows.

	Furrow width		
	Standard	Position of Wedges	
		Narrow position	Wide position
Strut (5 Fig. O2)	Fix in position 2 & 4	Fix in position 2 & 3	Fix in position 1 & 4
Length of turnbuckle (5 Fig. O1)	Length between position 2 & 4	Length between position 1 & 4	Length between position 2 & 3

Working width adjustment on VARIANT models (Fig. 8)

The hydraulical adjustment is controlled for the front section by two rams and for the rear plough by one ram. By increasing the working width the front rams (8 Fig. R) are extending automatically and the rear ram will decrease (8 Fig. S). By decreasing the working width the action is vice versa.

When the rear ram is fully decreased for smallest width the length of both front rams at that moment in fully extended position must be even with the length of the rear ram.

If that is not the case adjust as follows:

Front ram adjustment (Fig. 8)

Shut- off valve 1 - closed

Rams (8 Fig. R) fully decreased

Shut- off valve 2 - open

Rear ram adjustment (Fig. 8)

Shut- off valve 1 - open

Ram (8 Fig. S) fully extended

Shut- off valve 2 - closed

Note: The shut- off valves 1 & 2 are staying always closed either in work or in transport position.

Travelling direction of transport wheels (Fig. 5 & 8)

The correct direction is straight in line with the travelling direction. The guidance and the degree of landside pressure can be influenced by the running direction of the wheels. Multi- furrow ploughs tend to have low landside pressure in light soil conditions. By changing the running direction of the wheels towards the unploughed ground the guidance can be improved by adjusting the bolt connection (5 & 8 Fig. D).

To increase landside pressure adjust bolt (5 & 8 Fig. D) to turn spindelnut (5 & 8 Fig. D1) into the direction of the unploughed side. Tighten again with approx. 700 Nm tension.

Central articulating section (Fig. 8)

The big feature of the design of the central pivoting section is that the rear section is under permanent spring tension to allow the plough to follow the ground contours without losing penetration. When the plough is raised out of work the tension can be increased. The nut (8 Fig. T) can be tensioned until the bolt (8 Fig. T1) can be removed. Increase tension further until the bolt can be relocated in hole (8 Fig. T2). Thereafter the tensioning nut (8 Fig. T) must be turned out again until the old setting position and secured with washer.

Hydraulic damper

To ease the turnover sequence the rear section of the plough is equipped with an hydr. damper system. When losing pressure hydraulic oil can be refilled by opening the valve at the bottom of the hydraulic device and poured at socket.

To do so let the plough rest on the l. h. bodies but put some object under the last furrow to allow the rear section to lift.

Skim coulters (Fig.11)

Positive ratched locks on skim (11 Fig. M & M1) and beam locating position eliminates movement even in heavy stoney condition.

The distance of the skimmers to the plough bodies can be changed by reversing the holder and / or by turning the cranked stalk.

In all cases they should be set only deep enough to ensure that all trash is buried.

Different sizes of wheels (Fig. 12)

The different sizes of wheels optionable available are fixed as pictured:

Tyres 400 / 60 - 15. 5 - as illustrated (12 Fig. 1)

Tyres 400 / 55- 22. 5 - as illustrated (12 Fig. 2)

Disc coulters (Fig. 13)

The depth is adjusted by locating the notched segments (13 Fig. N 1) allowing a minimum clearance between disc bearing and ground of approx. 5 cm (2 inch) to avoid excessive wear to the bearings. They should also be set so that there is clearance (2 - 4 cm) between their cut and the landside shin.

The lateral movement should be restricted by adjusting the collar (13 Fig. N) allowing unrestricted movement of approx. 5 ° in each direction.

Caution. Take care that the collars (13 Fig. N) are always kept tight, especially when plough is in horizontal transport position running on the Combi Wheel.

Trashboards (Fig 14)

The trashboards (optional) are supported from the rear by adjustable bolts (Fig. 14 V) which should always be resting against the plough leg.

Pick-up arm for furrow presses (Fig. 15 & 16)

Fix the connection rod so, that the pick-up arm is in an rectangular position to the working direction.

For transport move the arm rearwards to the beam and lock securely (pict. for VARIANT models 15 Fig. H)

On the arm of the Hydraulic Disconnecting Device the set of holding pins (16 Fig. H3) can be fitted on both ends of the hook, to pull the furrow press around obstacles with the plough lifted out of work.

To operate the disconnecting device move hydr. control lever in the direction as when reversing the plough.

AVANT Automatic Reset System (Fig. 17 & 20)

The reset system is already correctly adjusted in the factory. The reset force can either be in- or decreased by turning the adjuster bolt (Fig. 17 Fig. T).

Standard AVANT reset system (2100 kp reset force):

Turn bolt (17 Fig. T) clockwise - less reset force

Turn bolt (17 Fig. T) anti-clockwise - more reset force

It is important that between the knee- lever body (17 Fig. R) and (17 Fig. S) a small gap of approx. 1 mm is left.

Extra h.d. AVANT reset system (2400 kp reset force):

Turn adj. bolt (17 Fig. T1) to shift knee- lever body away from boxed beam section for required min. clearance of 1 mm. Then turn adj. bolt (17 Fig. T) tight and counterlock nut. Now the bolt (17 Fig. T1) can be released again and counterlocked.

Under very heavy but stone-free conditions the reset system can be blocked by fitting a special locking device (17 Fig. J) which is optionally available.

Warning. The reset system works under strong spring tension. The built-in compression spring is pre- tensioned by the factory. Dismantling of the reset system must be carried out only by trained RABE personnel using special tools which can be ordered from the manufacturer.



Shearbolt overload protection (14 & 19 Fig.)

All plough models are standard with shearbolts (14 & 19 Fig. U1). Also the „Avant“ automatic reset models. The shearbolt is provided in the mounting of the plough legs. The shearbolt must be fitted always from the side of the leg. Check spare parts list whether a washer is required.

Note: Tighten shearbolts carefully again and check periodically.
Use genuine shearbolts only (refer to spare parts list)

Maintenance

Warning. Never allow work to be carried out on plough in raised position unless the plough is supported. Work on hydraulic system of plough only if the plough is lowered and the system is not under pressure.



All hardware should be checked for tightness, particularly during the first hours of operation.

Torque settings for bolts:

Mouldboards:	80 Nm (60 lbs ft)
Wheel nuts:	260 Nm
Wheel axle fixing:	400 Nm (Fig.12)

Trip Fork and Pilot Peg on Reversing System (Fig. 18)

The trip fork (18 Fig. Z) and the pilot peg (18 Fig. Z) should be checked from time to time for correct function. The trip fork must engage every time in its final position by means of a spring tensioned ball. During the turnover sequence when the plough is turned halfway, the pilot peg must be caught exactly by the trip fork. To align the pilot peg (18 Fig. Z) to the correct position it is adjustable in height.

Grease Nipples (Fig. 19)

All moving parts with grease nipples must be greased regularly (daily) such as on wheel carrier (19 Fig. W & W1) turnover ram, turnover shaft, vertical adjustment screws, front furrow adjusters, sliding rail, centre pins and turnbuckles. Also disc coulters and rear landwheel.

Replacement of Bushes (Fig 7 & 19)

There are bushes fitted which need replacement when worn.
For example: adj. base plate (7 Fig. X1), universals on headstock, beam- and wheel carrier pivot or VARIANT- consoles (19 Fig. X2).

Avant Automatic Reset System

In stoney conditions the bearings must be greased daily.

Tapered Roller Bearings

The depth wheel, disc coulter and turnover shaft bearing on the headstock is equipped with tapered roller bearings which have to be readjusted after long usage (e.g. once a season).

Bolt-on Points (on shares)

To achieve maximum service life the bolt-on points are designed with three fixing position holes.

First turn the point around and after both sides are worn adjust forward.

Tyre Pressure

Rubber depthwheel and transport wheels - 2.5 bar

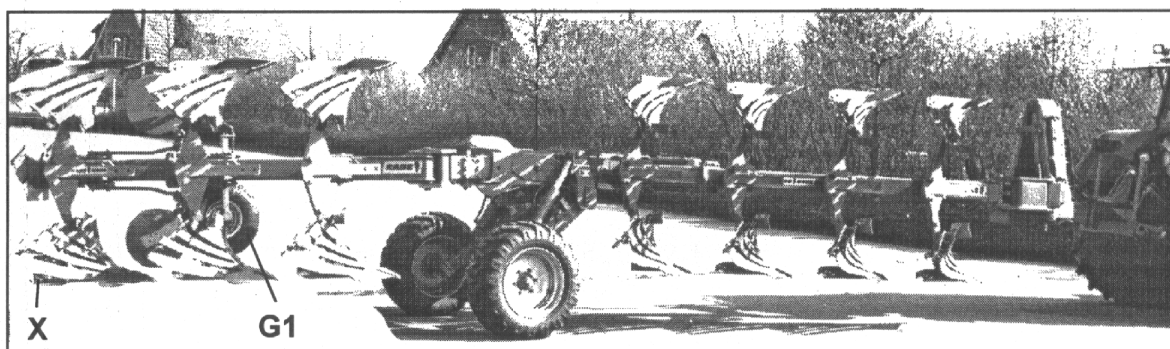


Fig.1

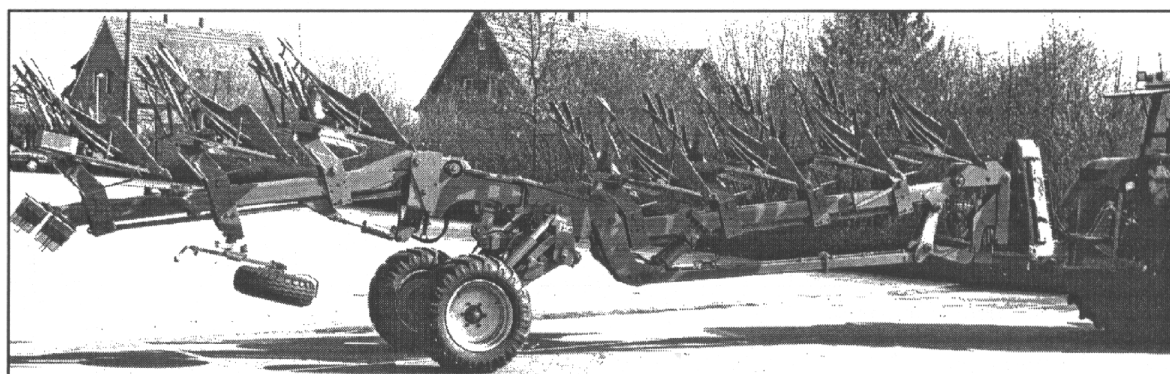


Fig.2

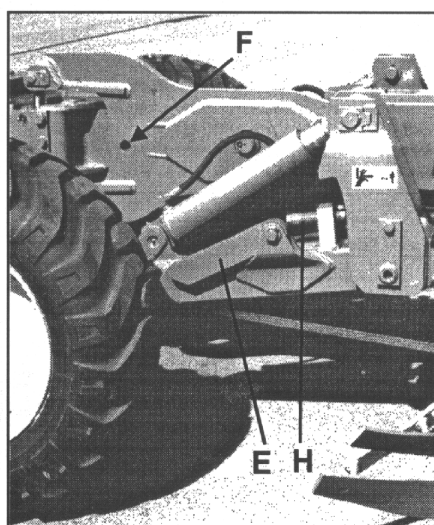


Fig.3

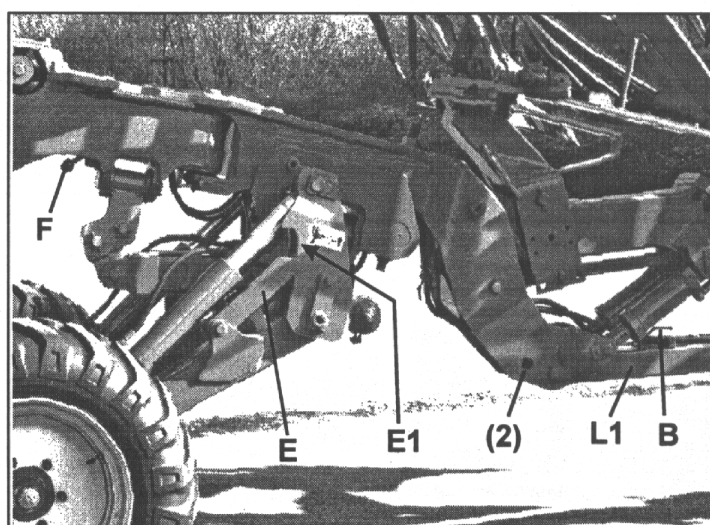


Fig.4

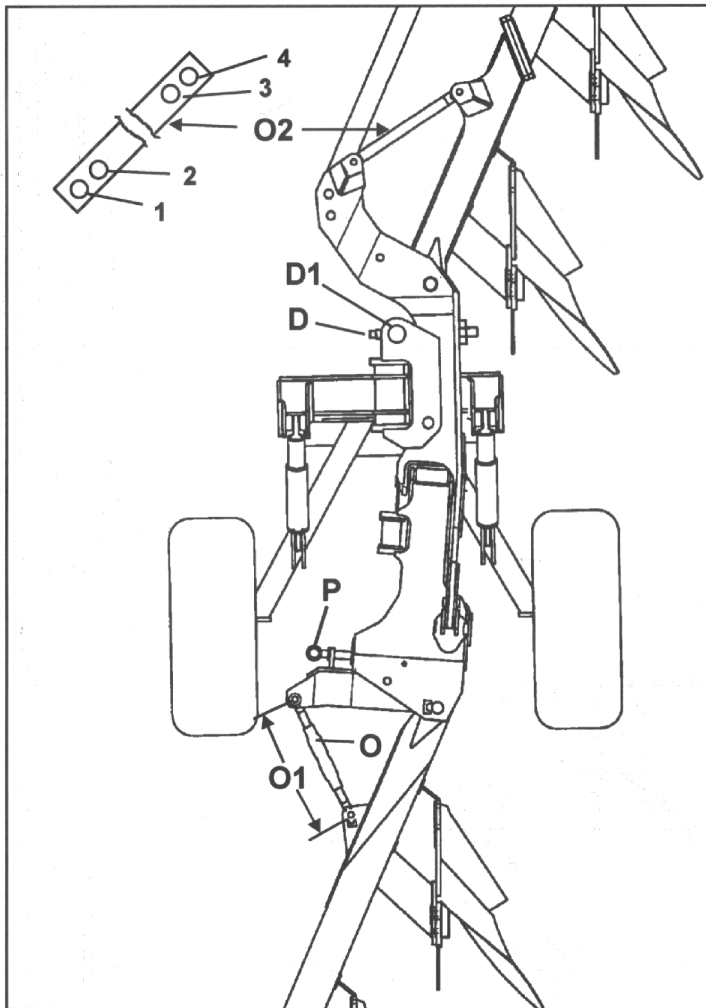


Fig.5

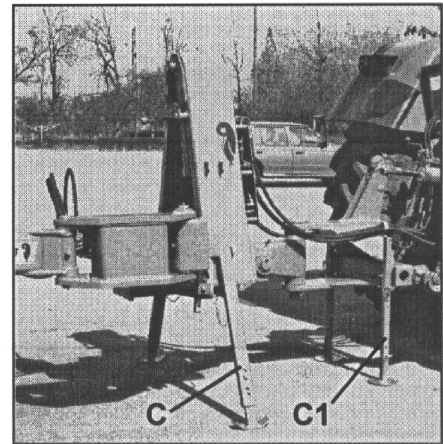


Fig.6

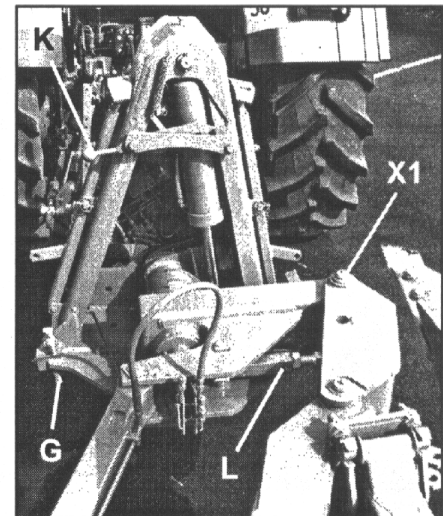


Fig.7

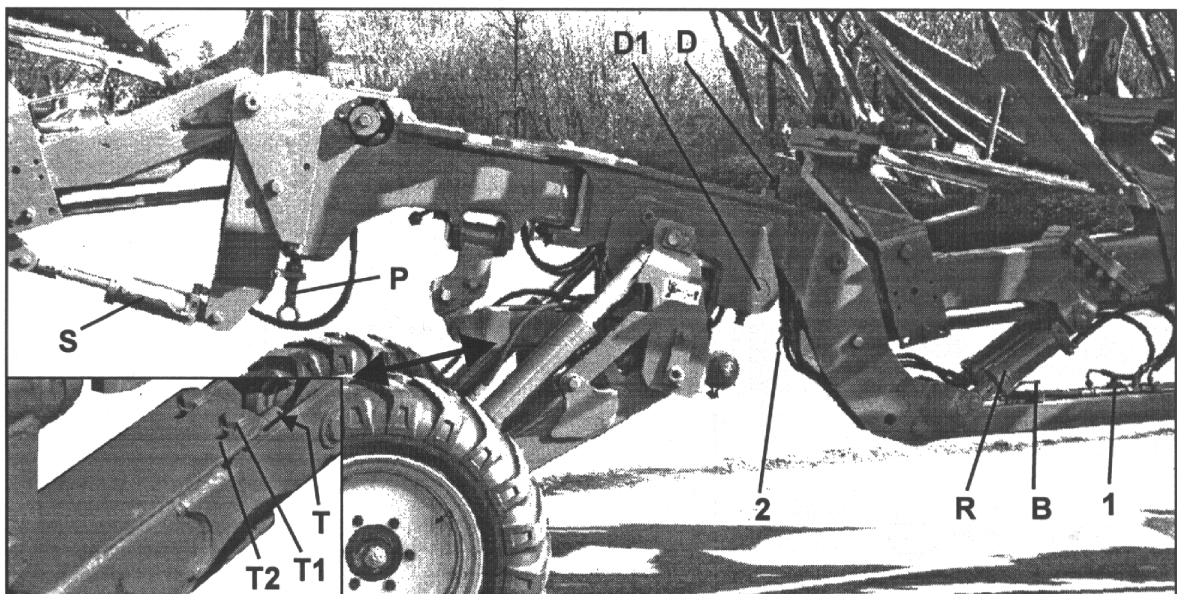


Fig.8

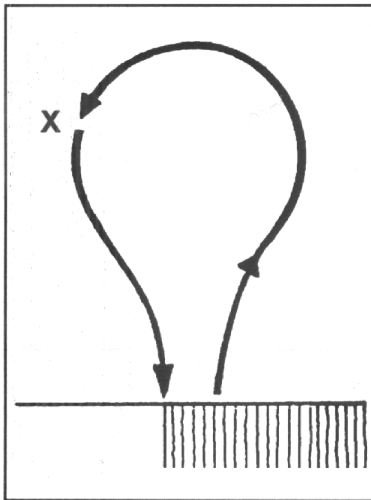


Fig. 9

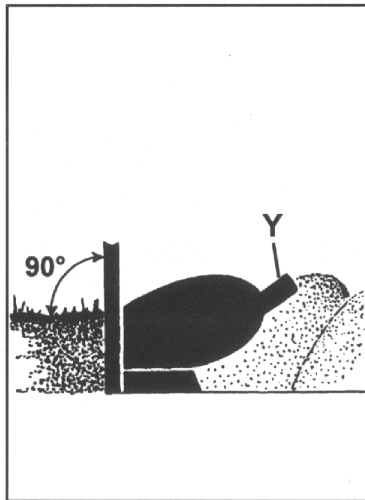


Fig. 10

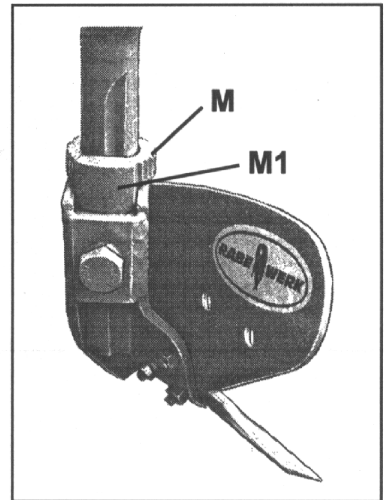


Fig. 11

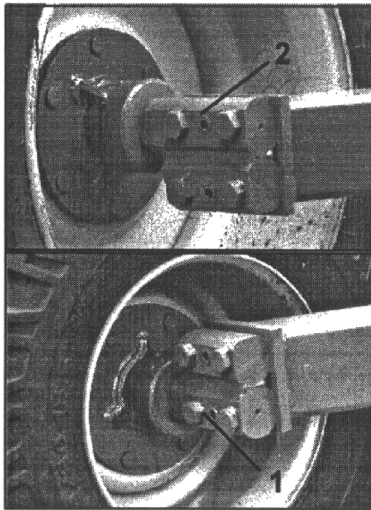


Fig. 12

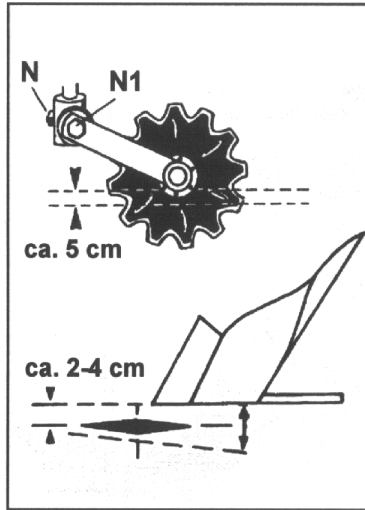


Fig. 13

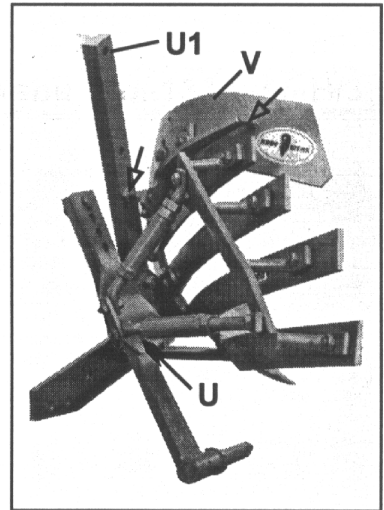


Fig. 14

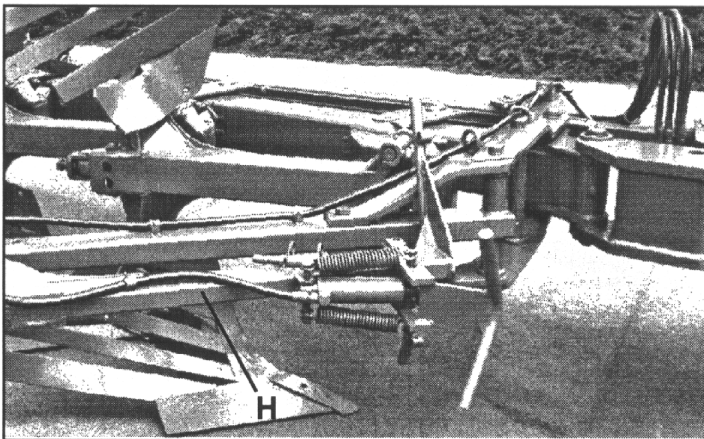


Fig. 15

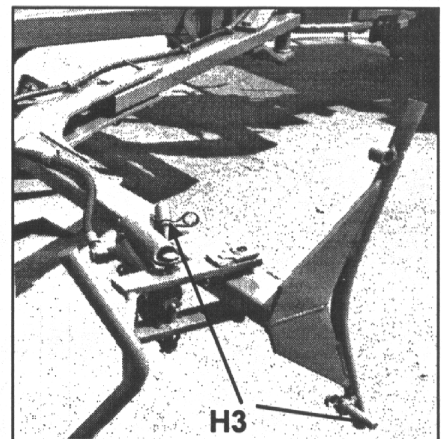


Fig. 16

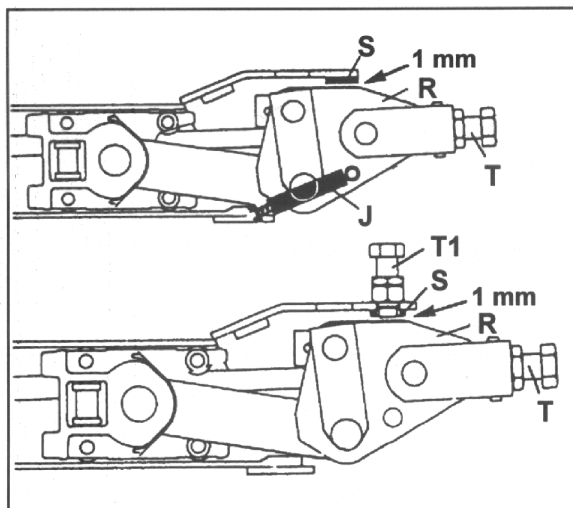


Fig.17

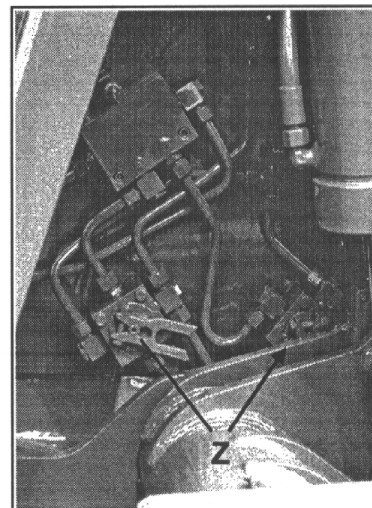


Fig.18

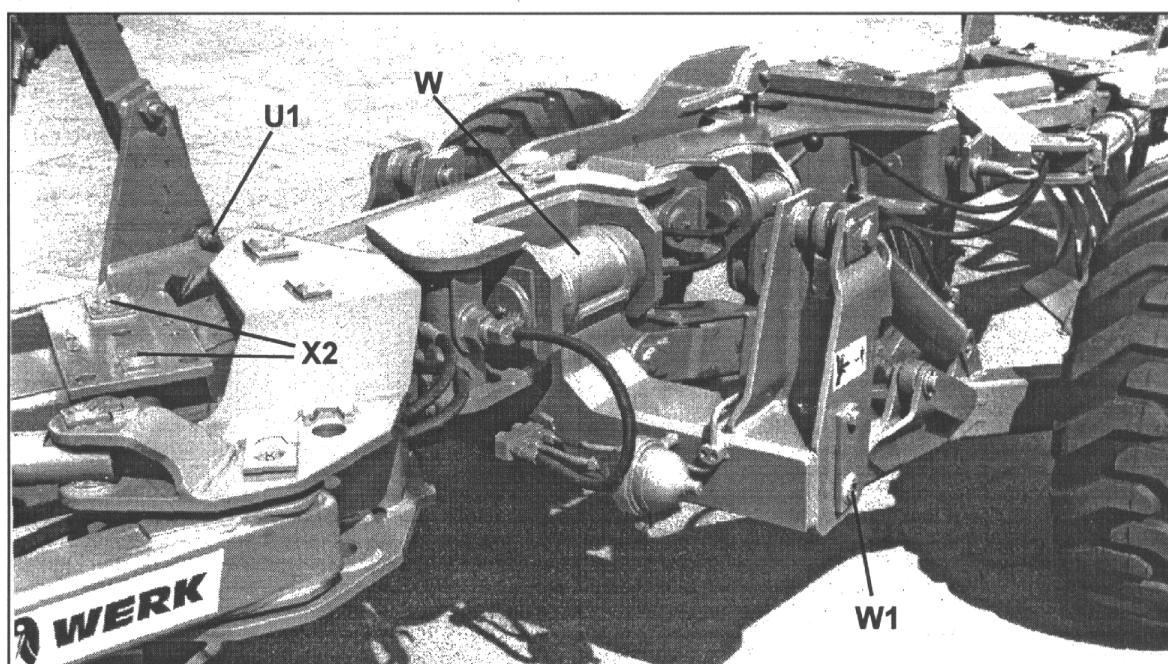


Fig.19