

Pneumatic Fertilizer Spreader

AMAZONE

JET 1203/1503 H

Instruction Manual



To ensure that you will get the best possible results from your "AMAZONE" we would ask you to read and observe these instructions carefully. You will of course appreciate that we will not be able to accept claims under guarantee if any damage is caused due to incorrect operation.

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Please enter the serial number of your pneumatic broadcaster here. You will find the number stamped on the right front side of the main frame.

Please always quote the serial number when ordering spareparts or making enquiries.

Machine serial no.

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1 Specification of the machine

1.1 Manufacturer

AMAZONEN-WERKE, H. Dreyer GmbH & Co. KG,
P. O. Box 51, D-4507 Hasbergen-Gaste, West Germany

1.2 Type of pneumatic spreaders

order-No.

AMAZONE JET 1203 H	296 001
AMAZONE JET 1503 H	217 001

1.3 Boom sizes

10 m working width	18 410
12 m working width	18 510
15 m working width	18 610
16 m working width	18 710
18 m working width	18 810

1.4 Technical data

Length	1.34 m
Filling height	0.90 – 1.05 m

at working width	10 m	12 m	15 m	16 m	18 m
number of jets	16	16	30	32	32
jet spacing	0.625 m	0.75 m	0.50 m	0.50 m	0.56 m
hydr.boom folding	option	option	stand.	stand.	stand.
Transport. width	2.50 m	2.50 m	2.90 m	2.90 m	2.90 m
Total height	2.36 m	2.82 m	2.98 m	2.98 m	3.16 m
Weight of booms	126 kg	140 kg	233 kg	238 kg	272 kg
Spreadrate at 8 k.p.h. in kg/ha	30–750	30–750	30–930	30–930	30–930

Type of pneumatic spreader	JET 1203 H	JET 1503 H
Net weight of base machine	370 kg	399 kg
Hopper capacity	1200 l	1500 l
Metering system	forced speed metering system (stud wheels)	
Checking of spread rate	Possibility for calibrating	
Adjustable spread fan	for normal spread and top dressing	
Stepless spread rate setting	by oil motor and electrical remote control	

We reserve the right for any technical changes without notice.

1.5 Application range

The pneumatic spreaders **AMAZONE JET 1203** and **JET 1503** are suitable for spreading granular fertilizers, microgranules, seeds and material of similar consistency.

1.6 Description of the machine's function

The material for spreading is metered from the hopper into the injector sluices by forced feed toothed wheel rollers, which are driven hydraulic motor.

The p.t.o.-driven blower fan provides a stream of air which transports the spreading material from the injector sluices through the pipes to the distribution jets at the booms.

Deflector plates spread the material fan-like to the ground whereby the spreading fans overlap one another 2 – 4 fold to ensure an optimum lateral distribution.

2 Hints upon receiving the machine

2.1 Receiving

On receipt check the spreader for damage and missing parts. Claims must be made to the carrier immediately if compensation is to be obtained. Please ensure also that all parts listed in the consignment note have been received.

3 Putting into operation

3.1 General notes

The AMAZONE pneumatic spreaders type JET 1203 H and 1503 H may only be used for the purpose they are designed for. Otherwise no claims for warranty are accepted for damage to the machine.

This means that the implement should be used only for the purpose it is designed for and its use is bound to adhering to the manufacturer's operating instructions, setting charts and maintenance instructions including the exclusive use of original spare parts.

The AMAZONE pneumatic spreader JET 1203 H and 1503 H may only be used, serviced and repaired by persons, who have received proper instructions and warnings about possible dangers.

All applicable accident preventing advices as well as the further generally accepted safety technical, working medical and traffic rules and laws must be observed (see here-to also the particular instructions by the Health- and Safety Office).

3.2 Attaching to the tractor

The machine is attached to the category II three point linkage system of the tractor in the usual manner.

Under normal conditions the three point mounting pins of the machine should be mounted in the upper position, for top dressing in the lower position.

In the operating position the machine should be set parallel with the ground by adjustment of the top link.

In working position the distance between the lower part of the machine and the ground or the top of the crop should be about 700 mm. As this mounting height cannot be achieved for top dressing, the deflector plates at the jets should be mounted facing upwards (compare para. 4.7).

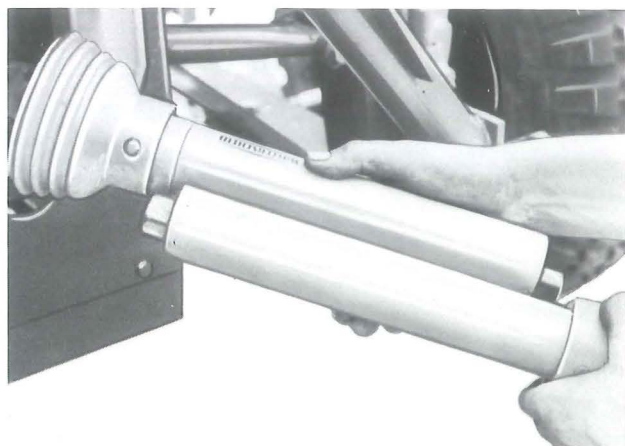


Fig.1

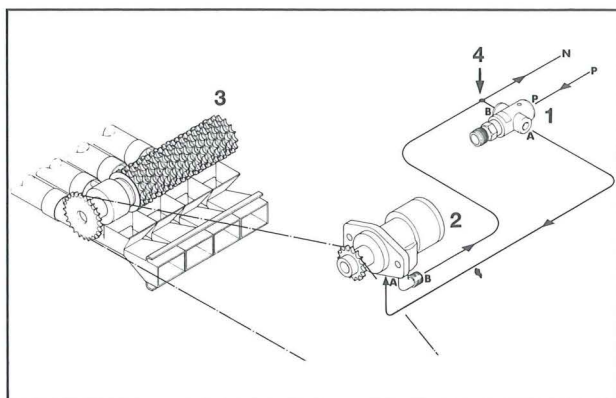


Fig.2

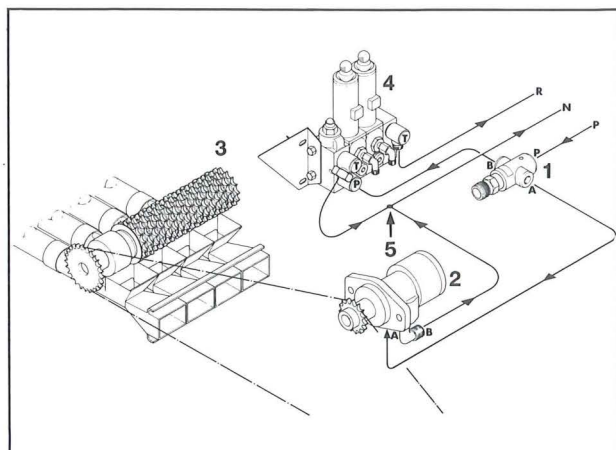


Fig.3

3.3 Universal joint shaft (very important)

When attaching the machine for the first time to the three-point linkage of the tractor do not attach the p.t.o.-shaft to the tractor. Instead pull the front half of the p.t.o.-shaft out first, attach it to the splined p.t.o.-shaft of the tractor, lift the machine into working position and check the overlap of the p.t.o.-shaft by holding both free ends side by side and simultaneously lower the hydraulic to the floor. A minimum overlap of 60 mm ($2\frac{1}{2}$ "") should be maintained in all lifting positions of the machine. On the other hand the inner and outer tube must under no circumstances touch the universal joint on the end of the tubes (Fig. 1). If the p.t.o.-shaft-halves are too long they have to be shortened by the same amount on either side including the protective tubes). Apply grease to the inner shaft!

3.4 Hydraulic circuit (principle of function)

As illustrated in Fig. 2 (standard) and Fig. 3 (JET with optional control chest) the JET is supplied with oil from the tractor via the pipeline P. The maximum oil requirement is about 30 l/min. With the aid of the three-way-regulating valve (Fig. 2.1 and 3.1) and the setting motor this flow of oil is variably divided. Accordingly the speed of the oil motor (Fig. 2.2 and 3.2) and thus of the metering rollers (Fig. 2.3 and 3.3) is changed. The amount of the oil which is not needed for the oil motor is guided into the return-flow hose N (Fig. 2.4). If however, the machine is additionally equipped with a control chest (Fig. 3.4) this amount of oil is available for hydraulic "side-functions" at the control chest. If no oil is needed at the control chest for the hydraulic control, it shall be returned to the tractor through the return flow hose N together with the oil returned from the oil motor. The hose R brings the oil coming from the control chest and that from the hydraulic rams directly back into the tractor tank. In the hose R the oil must be able to return without pressure. By the use of the solenoid control chest many tractor-spool control valves are saved and the simultaneous operation of oil motor and hydraulic functions remains always possible without altering the speed of the oil motor (and of the metering units).

3.5 Connecting the hydraulics to the tractor

Note:

The hydraulic circuit is protected by return-valves against wrong connections or by one-way acting hydraulic plug (tin coloured) at the hydraulic pipeline.

John Deere Tractors are equipped with a special hydraulic system (constant pressure system), which is not immediately available for driving oil motors.

Please adhere to the recommendation of the tractor manufacturer and ask your AMAZONE dealer or importer for further information.

3.5.1 JET 1203/1503 H without solenoid control chest

Take the end of the hydraulic hoses from the implement side carriers and connect the pressure feeding hose P and the return flow hose N to a double acting control valve at the tractor.

If no double acting control valve is available, P must be connected with a single acting control valve and N should be connected as a pressure free return flow directly with the oil tank of the tractor.

The other hydraulic connections are needed for the hydraulic side functions, i. e. metering roller actuation (standard) and are connected to the remaining free single acting or to one side of a double acting control valve.

3.5.2 JET 1203/1503 H with solenoid control chest (special option)

Remove the three hydraulic hoses with the descriptions P, N and R from the machine side provided fixing place and connect as follows:

Hydraulic hose P (pressure feeding) and N (return flow) to the double acting control valve of the tractor. The hose R (pressure less return flow) should be connected directly to the oil tank of the tractor. If such a possibility is not provided at the tractor it can either be installed by the tractor service department or it can perhaps also be connected with a single acting control valve which during operation is set on "lowering".

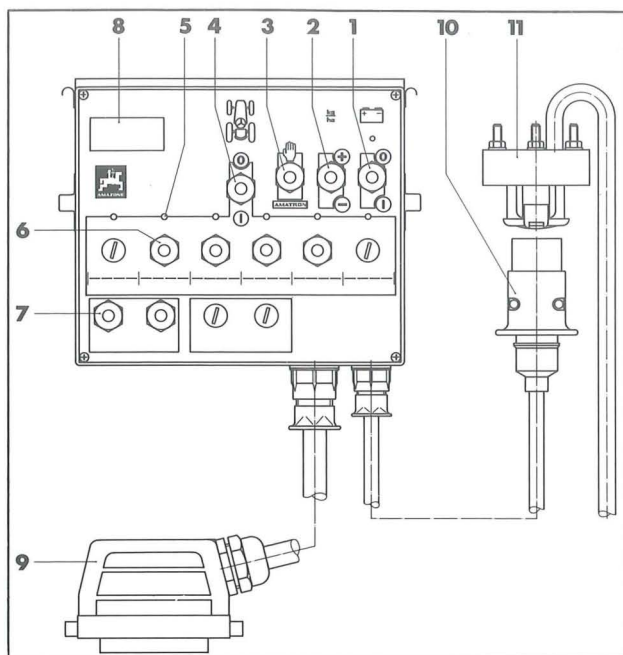


Fig.4

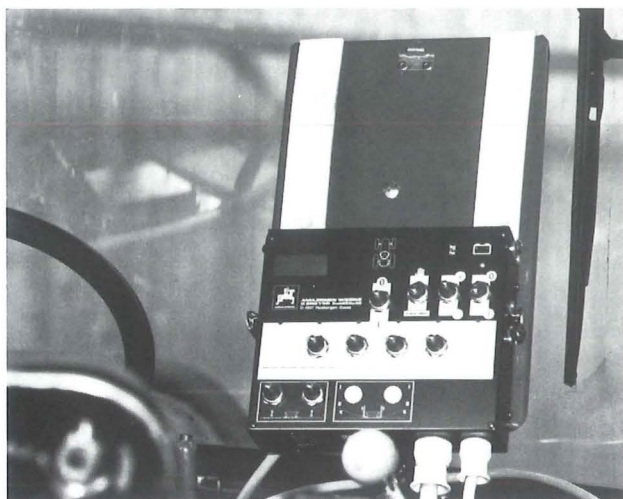


Fig.5

3.6 Connecting of control box SKJ 1 (JET) (Fig. 4)

The electrical remote control box is separately packed and is connected to the machine with an implement plug to the machine with an implement plug (Fig. 4/9). For the electrical supply the enclosed connecting cable should be directly fitted to the tractor's battery (12 volt), blue to earth, negative and brown to plug. Put in plug (Fig. 4/10) into the socket (Fig. 4/11).

Attention:

The negative pole must always be connected to earth (frame or chassis). This is especially important with older American, Canadian or British tractor types.

Mount the control box with the aid of the enclosed brackets if possible to the right above the armature panel within reach of the tractor operator (Fig. 5). A mounting bracket should be made to suit the particular possibilities of the existing tractor.

Description of the function of the individual switches (Fig. 4)

1 – Battery main switch

By switching this switch into position 1 the complete control box is ready to start. The red pilot light below the battery symbol is turned on. When connecting the plugs 9, 10, 11 or the AMATRON (extra option) with the SKJ, the battery main switch should always be in off position (0).

2 – Sensor for spread rate adjustment

With this sensor (2) you actuate the setting motor which controls the three-way regulating valve and in consequence the speed of the metering rollers.

3 – By switch (3) you can decide whether the setting motor is being controlled manually (i. e. with aid of switch 2) or automatically (AMATRON). Without AMATRON switch (3) should be set to the manual operation (hand-symbol).

4 – Main boom switch for switching on or off the metering units across the entire boom width.

5 – Pilot light (green)

For every boom section one pilot light lights up if fertilizer is metered through that section.

6 – Switch for shutting on/off of the individual metering units (boom sections).

These switches are only connected to implements which have been bought with boom section control (special option). For implements which are equipped with AMATRON it is essential to follow para. 4.3.4.

7 – Switch for lifting/lowering of the boom halves

8 – Digital LCD-display LCD-display for checking of the oilmotor/metering roller speed.

N. B.: The switches 4 and 6 should be held in minimum for a period of 2 seconds in the on- or off-position, to ensure switching function.

3.7 Linking up SKJ 1 with AMATRON (special option)

For operation with AMATRON it is necessary to additionally fit the drive transducers for computing the forward speed. The fitting should follow para. 2.2 of the AMATRON fitting- and operating-instructions.

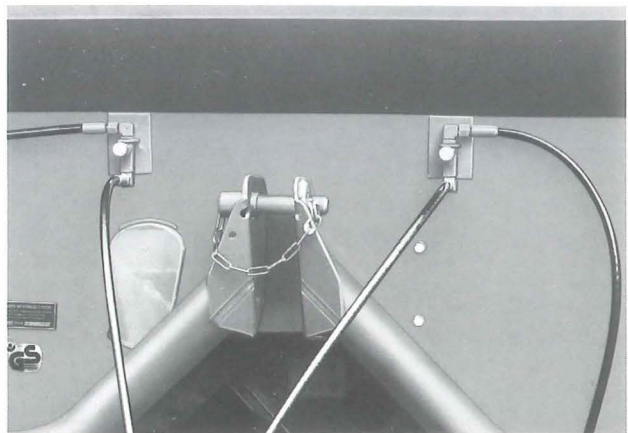


Fig.6

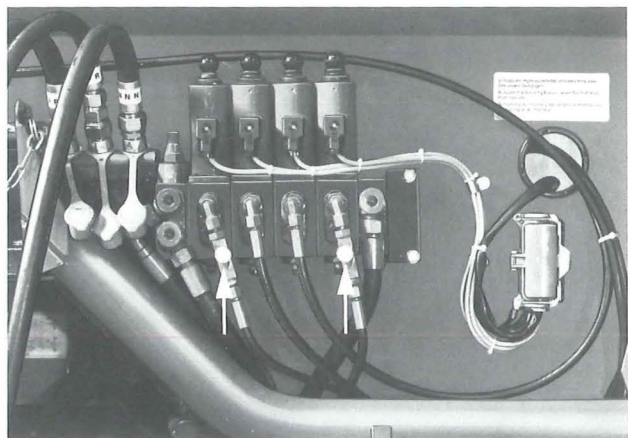


Fig.7

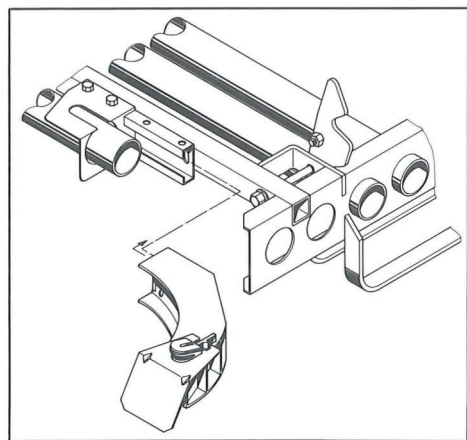


Fig.8

3.8 Fitting of the boom halves

The fitting of the boom halves should be done according to the separately supplied fitting instruction. For the first operation of the hydraulically actuated booms the throttle valves (Fig. 6 and 7) should be set in such a way that the boom halves slowly fold up or down. Before it is possible to turn the setting screw at the throttle valve it is necessary to loosen the threaded pin with Allen Key head (safety provision).

3.9 Completing and fitting of the injector sluice

First fit the loosely supplied bends in the shown manner (Fig. 8). Then insert the injector frame from below into the main chassis (Fig. 9.1). For this the injector sluice frame should rest on the studs in front of the air channel. Then raise the rear, pull the grip (Fig. 9/2) and hang in. Check the proper seating of the injector frame because a possible loss of air would have negative effect on the spread pattern.

3.10 Installing of the metering units

Hang the metering unit with its tube onto the provided hooks on the machine above the injector sluices. Then swing the metering unit towards the machine centre until it is held by the catches. The metering units can only be locked in position if the dog clutches at the drive side are disengaged. If the metering units are equipped with a boom section control the left and right hand metering units should not be mixed up. To ascertain a correct fitting make sure that the square dog clutch of the metering unit shaft always is facing to the clutch/drive side.



Fig.9

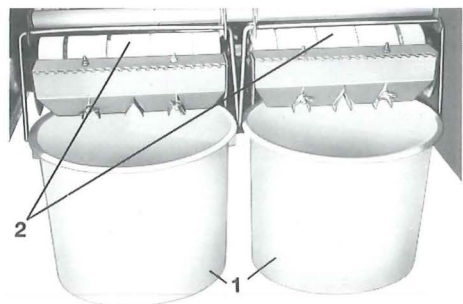


Fig.10

4 Practical operation in the field

4.1 Filling of the spreader

The spreader may only be filled if it is mounted to the tractor as otherwise it may tip over. The permissible payload is 1600 kg. The favourable filling height of 1.05 m at the rear allows filling by a tipping trailer, bulk container or front-end loader. Please consider the maximum allowable lifting capacity or the front axle weight decrease of the tractor!

4.2 Setting of the spread rate

The spread rate depends on the revolving speed of the metering roller and the chosen tractor forward speed. The metering rollers are driven by the oil-motor; the ratio oil-motor/metering unit is equivalent to 1 : 1.6. to 1 : 1.6. With the aid of the three-way oil flow control valve which is actuated by a setting motor the amount of oil being fed and thus the revolving speed of the oil-motor/metering roller is steplessly controlled. The setting motor is controlled by switch 2 (Fig. 4) of the SKJ.

4.3 Calibrating the required spread rate

Before the first use of the spreader we highly recommend that you practise the following working steps first without fertilizer to get acquainted with the individual operation levers.

4.3.1 Calibration procedure for standard specification machines (without solenoid control chest)

- Fill hopper with fertilizer.
- Remove left hand injector sluice (compare Fig. 9).
- Hang the supplied calibration bucket beneath the metering unit as shown in Fig. 10.
- Switch on battery main switch (Fig. 4/1).

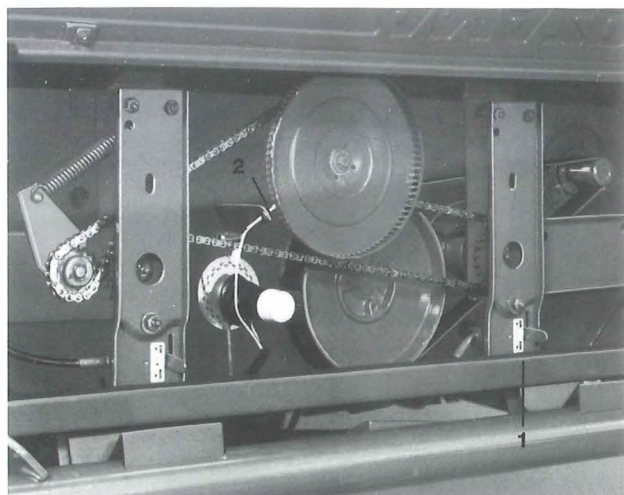


Fig. 11

- Disengage the metering roller dog clutches by actuating the single acting control valve.
- Set right hand metering roller dog clutch by hand to “Aus”/“Out” (Fig. 11/1). The left hand metering roller stays disengaged.
- Switch on the oil supply and accelerate the tractor engine to 540 p.t.o. R.P.M. However, do not switch on the p.t.o. shaft!
- Set oil motor speed to 50 with the aid of switch 2 (Fig. 4).
- Switch on briefly the left hand metering unit so that it is charged with fertilizer. For this turn off the oil supply, then engage the metering unit dog clutch by the control valve on the tractor and then briefly switch on and again off the oil supply by the tractor spool valve.
- Empty bucket and hang in once again.
- Now the machine is driven at the chosen forward speed of the tractor and the left hand metering unit is engaged over a calibration area of 1/40 ha.
- For further details about this, please refer to para. 4.3.3.

4.3.2 Calibration procedure for implements with solenoid control chest

- Fill hopper with fertilizer.
- Remove left hand side injector sluice (compare Fig. 9).
- Hang the supplied calibration bucket as shown in Fig. 10.
- Switch on battery main switch 1 (Fig. 4) and the oil-motor. Simultaneously switch off the metering unit at switch 4 (Fig. 4).
- Briefly switch on and again off the left hand metering unit by switch 6 (Fig. 4), so that the metering unit is charged with fertilizer. For safety sake the right hand metering unit may be switched to “Aus”/“Out” by hand (Fig. 11/1).
- Empty bucket and replace under the metering unit again.
- Accelerate engine R.P.M. to 540 p.t.o.-R.P.M.; however, do not engage p.t.o.-shaft!
- Set speed of oil motor with the aid of switch 2 (Fig. 4) to 50.
- The machine prepared in this way is then run across the test area of 1/40 ha at the desired tractor forward speed and engage the left hand metering unit. Please see also para. 4.3.3.

4.3.3 Driving the calibration distance and calculating of the desired spread rate

Depending on its working width and the desired tractor forward speed the machine must be driven along the following calibration distances:

- at 18 m working width over a calibration distance of 27.7 m
- at 16 m working width over a calibration distance of 31.25 m
- at 15 m working width over a calibration distance of 33.3 m
- at 12 m working width over a calibration distance of 41.6 m
- at 10 m working width over a calibration distance of 50.0 m

The calibration distance multiplied with half of the working width is equivalent to an area of 1/40 ha. The spreading material collected in the calibration bucket is afterwards weighed and multiplied by the factor 40 to determine the spread rate in kg/ha.

Example:

chosen tractor forward speed	8 k.p.h. (km/h)
working width – for example	18 m
speed of oil motor	50
desired spread rate	350 kg/ha
desired spread rate for 1/40 ha:	$\frac{350}{40} = 8.75$ kg

actually collected quantity: 15 kg

Thus the machine is spreading 6.25 kg too much.

Now calculate the correct speed of the oil motor:

$$\frac{50 \times 8.75}{15} = 29$$

The correct oil motor speed for the desired spread rate of 350 kg/ha would be 29 at a tractor forward speed of 8 k.p.h. (km/h).

After the calibration test has been completed the injector sluice has to be replaced and the right hand metering roller dog clutch be set to "ein"/"in".

4.3.4 Calibration procedure for machines equipped with AMATRON (if AMATRON II is supplied please follow the accompanying operating and fitting instructions for AMATRON II)

First proceed according to para. 4.3.2, 1 – 6.

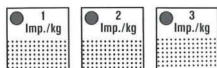
If the machine is equipped with AMATRON it is not necessary to drive along a calibration distance. The calibrating is conducted according to the operation and fitting instructions of the AMATRON, para. 3.1 and the following with the exception of 3.1.3.1. When calibrating fertilizer with AMATRON any metering roller speed can be chosen at random.

Please proceed differently as mentioned in para. 3.3.3.1 of the AMATRON instructions for JET 1203/1503 H:

If the value (impulse/kg) is unknown

- Fill the machine with fertilizer.
- Place calibration buckets under the left hand metering unit.
- Switch briefly on and again off several times left hand metering unit with both switches 6 (Fig. 4) (the metering units must be charged with fertilizer). Empty bucket.

- Press one of the keys



- Press key



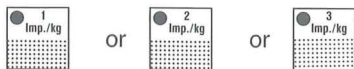
- Switch on fertilizer spreader by **both switches 6** (Fig. 4).
- After the calibration bucket is filled, switch off fertilizer spreader by **both switches 6** (Fig. 4).
- Weigh fertilizer.
- Feed in the quantity (e. g. 12 kg) via the numerical key board.

- Press key



When pressing the key the computer has converted the recorded values into impulses/kg.

The specific figure (Impulses/kg) for the fertilizer just calibrated will be stored by memory key



(The indicator lamp of the selected key will light up.)

During this operation the lamp of the chosen memory key must light up.

It will now also be possible to store figures (Impulses/kg) of two other kinds of fertilizer.

If the fertilizer has to be changed between the three types memorized, press the corresponding key to select the figure (Impulses/kg) of the other fertilizer.

4.4 Changing the spread rate during operation

With the aid of the standard supplied electric remote control (SKJ) it is possible, to adjust the spread rate to the varying nutrition demand of the crop within one field. To do this, use switch 2 (Fig. 4) by which it is possible to spread defined higher or reduced spread rates. If you wish to increase or decrease your spread rate by 10 % at a constant forward speed you just increase or decrease the figure in the LCD-display at the SKJ.

Example:

Set oil motor speed: 50, actual spread rate 600 kg/ha. For a 10 % change of the spread rate with an oil motor speed of 55 or 45 should be set. This would result in a spread rate of either 660 kg/ha or 540 kg/ha.

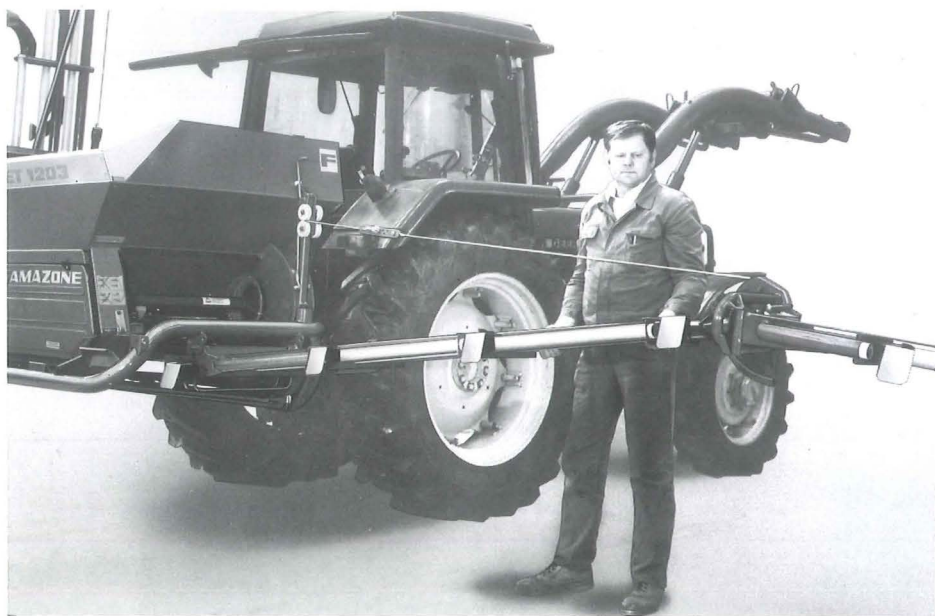


Fig. 12

4.5 Matching spread rate to tractor gear change

Should the terrain make it necessary to change the tractor gear within one field, the speed of the oil motor must be changed in the same proportion as the forward speed has been changed.

Example:

The previous forward speed was 9 k.p.h. (km/h) at an oil motor speed of 50 and a spread rate of 600 kg/ha. The new changed forward speed now is 6 k.p.h. (km/h). This change is equivalent to - 33 %. Thus the oil motor speed should be changed by 33 % to the speed of 33 so that the spread rate of 600 kg/ha remains unchanged.

4.6 Folding of booms

Disconnect road safety boom pins and then fold down boom either by hand or hydraulically. To do this with the hydraulic boom folding unit use either control valve at the tractor or in conjunction with the solenoid control chest the switch 7 (Fig. 4). **Please ensure that the boom halves are completely lowered down.** During the spreading operation the booms equipped with hydraulic boom lifting can easily be angled with a solenoid control valve to avoid ground contact. If the outer boom ends hit firm obstacles they can give way to the rear and upwards and after the obstacle has been passed, return into the original position.

Attention:

It is prohibited to stay in the swivelling area of the hydraulic booms! Keep others off too!

For booms which are folded up or down by hand it is recommended to lift the boom in the place as shown in Fig. 12. In this position, the boom can be lifted or lowered safely with a relative small power.

When transporting the booms in the lifted position, they always must be secured with the mechanical safety device!



Fig. 13



Fig. 14

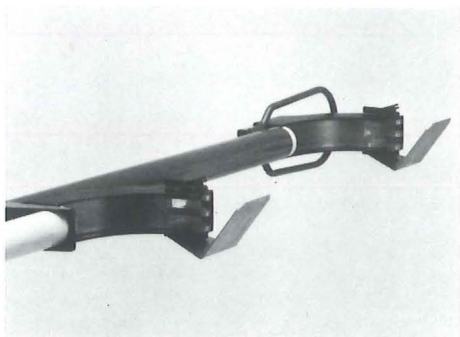


Fig. 15

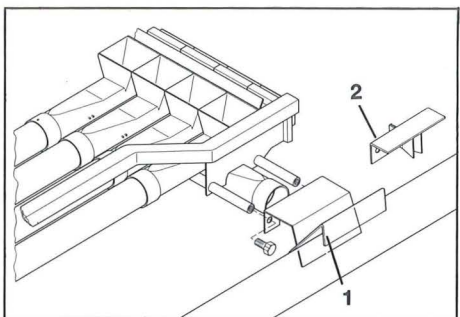


Fig. 16

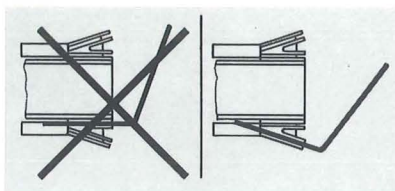
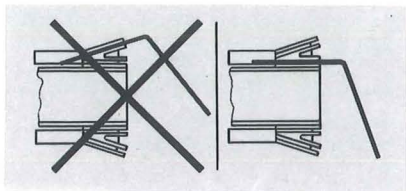


Fig. 17

4.7 Normal spreading and top dressing

Normal spreading:

The machine is mounted parallel to the ground, the spacing between the boom and the ground is 700 mm.

All deflectors on the boom and those integrated into the main chassis are pointing downwards; this way the spread fan is hardly affected by wind (Fig. 13, 14/1, 14/2).

Top dressing:

The machine is mounted parallel to the ground and lifted slightly above the top of the ears.

All deflector plates on the boom are pointing upwards (Fig. 15).

The deflectors in the outer chassis area (Fig. 14/1) left and right hand are removed. Beneath the machine (Fig. 14/2) the deflectors are removed at the 15 m-, 16 m- and 18 m-booms (compare also Fig 16/1). If the machine is equipped with a 10 m- or 12 m-boom the deflectors below the chassis (Fig. 14/2) are exchanged for the deflectors shown in Fig. 16/2.

Turning the deflectors on the booms is done without tools. To do this the plastic trip on the deflector plate mounting is bent sideways and the deflector plate is pulled off. The turned deflector plate must then be slid into the correct slot (Fig. 17) until the plastic trip catches.

4.8 Spreading on the field

Engage p.t.o. shaft and the oil drive at a low engine speed and accelerate up to 540 R.P.M. Now set the oil motor's speed which was previously calculated during the calibration test and begin the operation at the chosen forward speed. The metering of the material to be spread is activated by the control valve on the tractor or by the main switch 4 (Fig. 4) (remember to press the switch for at least 2 seconds). At the field end the metering is switched off by the same main switch or control valve, then the tractor slows and turns. For the new bout, increase tractor engine speed to obtain the necessary 540 R.P.M. at the p.t.o.-shaft, switch on metering drive and continue to operate at the constant predetermined forward speed.

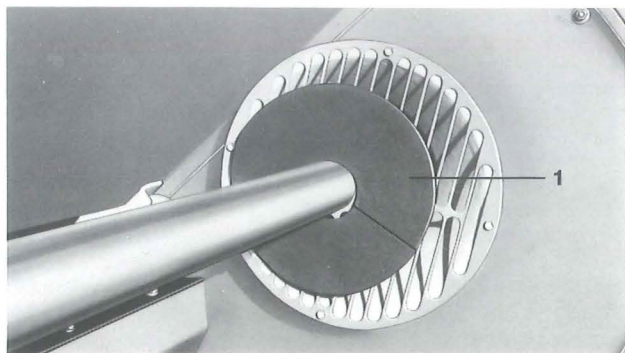


Fig. 18

Keep the oil motor drive switched on at the headland. However, if it is, due to the particular hydraulic outfit of the tractor, impossible to operate the hydraulic ram for the metering roller clutch and the oil motor drive simultaneously, the metering roller clutch should first be switched on and then the oil motor drive. Then at the headlands the metering is switched on or off by the oil motor drive. During operation it may occur that the figures in the digital display vary, however deviations of ± 2 have no significance. When the oil warms up its viscosity will change and this leads to deviations of the desired R.P.M. In this case the R.P.M. should be re-set with the aid of switch 2 (Fig. 4).

Always try to maintain the forward speed chosen for the calibration test as well as the blower and p.t.o. R.P.M. (540 R.P.M.).

Also on machines which are used with AMATRON, the speed of the fan in dependence of the working width should not be allowed to drop off too much as otherwise a precise lateral distribution of the fertilizer can no longer be ensured. Should the electronic or the remote control become defective it is possible to control the speed of the oil-motor by hand. On machines which are equipped with a solenoid control valve the hydraulic functions can be actuated by hand (please refer to para. 7).

4.9 Hints for special care!

The pneumatic spreaders JET 03 are suited for the spreading of granular fertilizers, grass seeds or similar products. When spreading grass seeds the standard supplied metering units should be exchanged for the special grass seed metering rollers (option).

When spreading fertilizers of a low bulk density such as Urea and prilled Calcium Nitrate the supplied restriction disc $\varnothing 210$ mm (Fig. 18/1) should be used during the spreading operation.

With some spreading materials such as Kieserite, Excello-granular and Magnesium Sulphate an increased wear on the delivery tubes and the end outlets should be taken into account.

5 Special optional equipment

5.1 Hydraulic half side control of metering unit

for controlling the right and left hand metering units individually from the tractor on condition that there are two one-way acting hydraulic sockets on the tractor or a two-way control chest at the machine's side available.

5.2 Two-way valve

If at the tractor side only a single acting hydraulic valve is available an individual control of the metering unit clutches from the tractor is possible by using the two-way valve.

5.3 Hydraulic boom lifting

The machines with 15 m-, 16 m- and 18 m-booms are supplied as standard with hydraulic boom lift. For machines with 10 m- and 12 m-booms it is available as special option.

The boom halves can be conveniently raised and lowered by an extra single acting control valve. The raising and lowering speed may be set according to the oil's viscosity by an adjustable throttle valve. With the aid of two separate single acting control valves or two solenoid control chests the boom can easily be folded up or down.

5.4 Hydraulic double control

On tractors with two single acting spool valves the hydraulic double control consisting of a link-up of each 2 hoses on either side is available for use with machines incorporating 1/2 side boom spread "on/off" and hydraulic boom folding, so that the lefthand and right-hand **functions may be operated independently** by each spool valve. This may also be achieved by connecting a 2-way-valve to one spool valve. Remember when starting to spread that first the booms must be lowered and in the following the dog clutches of the metering units be engaged by hydraulic rams before the hydraulic motor is switched on. When turning at the headland, the booms should only be operated after the on/off engagement is completed. Tilting the booms **during operation**, for example, to prevent ground contact by the boom ends, **is not possible** with the hydraulic double control.

5.5 Hydraulic sectional boom spread control (Fig. 19)

These special options offer the possibility to reduce or to increase the working width from the tractor's seat on wedge-shaped fields. By four hydraulically operated clutches the working width can be reduced from the outside to the tractor centre width in steps depending on the total boom width as follows:

JET 1203/1503 H – 18 m: working widths of 4.5; 9; 13.5
and 18 m are possible.

JET 1203/1503 H – 16 m: working widths of 4; 8; 12 and
16 m are possible.

JET 1203/1503 H – 15 m: working widths of 4; 7.5; 8; 11.5
and 15 m are possible.

JET 1203/1503 H – 12 m: working widths of 3; 6; 9 and 12 m
are possible.

JET 1203/1503 H – 10 m: working widths of 2.5; 5; 7.5 and
10 m are possible.

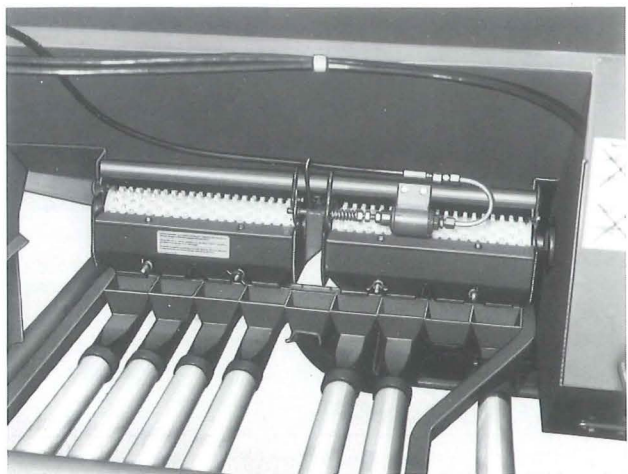










Fig. 19

5.6 Preconditions for fitting hydraulically actuated special options without using the solenoid control chest (standard)

It is imperative for the hydraulic-motor, to provide a double acting control valve or if this is not available a single acting control valve with a free flow return. The additional hydraulic valves necessary for the options may be taken from the following table.









Special note:

On tractors with only one hydraulic circuit the simultaneous drive of hydraulic motor and hydraulic secondary functions is not possible

		1203 H 10/12 m	1503 H 10/12 m	1203 H 15/16/18 m	1503 H 15/16/18 m
switching metering units together by tractor hydraulics half side boom sections: manual	boom folding: manual	1	1		
	boom folding: manual 4-part boom sections: manual	1	1		
	boom folding: hydraulic	3 x 1 2 x 1 + two-way valve			
	boom folding: hydraulic 4-part boom sections: manual	3 x 1 2 x 1 + two-way valve			
half side boom sections: hydraulic	boom folding: manual	2 x 1 1 x 1 + two-way valve			
	boom folding: hydraulic	4 x 1 2 x 1 as double function 2 x 1 + 2 two-way valves			
4-part boom sections: hydraulic	boom folding: manual	4 x 1 2 x 1 + 2 two-way valves solenoid control chest recommended			
	boom folding: hydraulic	solenoid control chest recommended			

5.7 Preconditions for fitting hydraulically actuated special options when using the solenoid control chest

When using the solenoid control chest irrespective of the number of solenoid valves a double actuated control valve and a free flow return should be provided. The number of solenoid control valves necessary for the desired hydraulic execution may be taken from the following table:

		1203 H 10/12 m	1503 H 10/12 m	1203 H 15/16/18 m	1503 H 15/16/18 m
switching metering units together by tractor hydraulics half side boom sections: manual	boom folding: manual	no solenoid valve needed simultaneous drive impossible			
	boom folding: manual 4-part boom sections: manual				
	boom folding: hydraulic	3	3	3	3
	boom folding: hydraulic 4-part boom sections: manual	3	3	3	3
half side boom sections: hydraulic	boom folding: manual	2	2		
	boom folding: hydraulic	4	4	4	4
4-part boom sections: hydraulic	boom folding: manual	4	4		
	boom folding: hydraulic	6	6	6	6

5.8 Metering unit for grass seeds or for micro granulars

There are individual metering units available for grass seeds or for micro granules and pellets to replace the standard metering unit. The procedure for exchanging the metering units is mentioned in the para's 3.10 and 6.1.

5.9 Universal joint shaft with free clutch

This is recommended for tractors which are equipped with hydraulically engaged p.t.o.-shaft. If you are not certain which system is used at your tractor, please ask your tractor dealer.

5.10 Foam marker

The foam marker is needed if an accurate spread is wanted on fields which were sown without tramlines. The foam marker with compressor is connected to the electric circuit of the tractor whereas the implement without compressor is used on tractors which are provided with a compressor.

More details may be taken from the instructions supplied with this option.

5.11 Position lights, tail lights, light carriers

These items can be fitted to the machine without difficulty and they are required when travelling on public roads.

5.12 Row spreading attachment (for 10 m- and 12 m-booms with manual lifting only)

Being especially designed for fertilizing crops which are planted in wider rows ("row crops"), such as potatoes, maize, vegetables etc. The row spreading attachment consists of a total of 16 big diameter flexible tube attachments two of which are directly mounted to the chassis and every boom half receives seven. The fertilizer is placed in a wider band on the ground by the side of the rows of plants so that nutrition concentrate cannot occur in the root area.

Corresponding fitting and operation instructions are provided with the row spreading attachment kit.

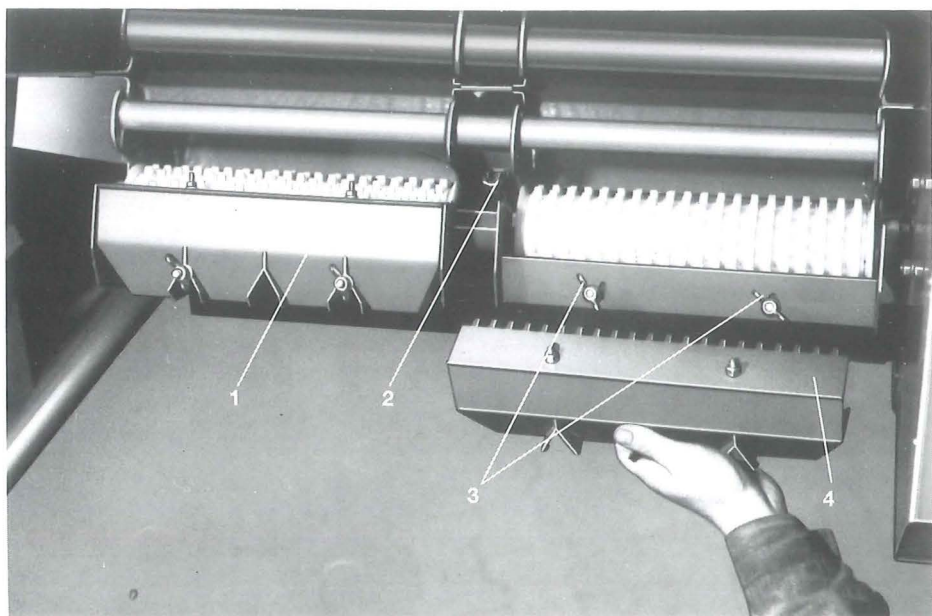


Fig. 22

6 Care, maintenance, emptying and parking of the machine

6.1 General hints

After the first 30 hours of operation all bolts and nuts should be checked for tightness.

Cleaning the spreader should be done with water **whilst the machine is running** in a rear tilt position. Take out the injector sluices (ref. para. 3.9) and remove the metering units (Fig. 22/1) on both sides after having disengaged the dog clutches hydraulically. By pulling the trip (Fig. 22/2) the metering unit swings down and can be taken out easily. By loosening of the wing nut (Fig. 22/4) the bottom flap's upper part (Fig. 22/3) can be taken out easily for cleaning.

After removal and cleaning of the metering units and injector sluices they should be placed in such a way inside the machine that the water can drain off. They are reinserted again just prior to the next operation. The electric control box (SKJ) and also the AMATRON should be stored well protected in a dry place separately from the machine. Also cover the implement electric socket tightly with the lid to prevent corrosion to the contacts.

6.2 Greasing plan

All bearings should be greased from time to time:

Universal joint shaft:	2 grease nipples
Blower wheel shaft:	2 grease nipples
Right dog clutch:	1 grease nipple
Left dog clutch:	1 grease nipple

Apply grease from time to time to the universal joint shaft tubes.

For maintenance of the roller chain during a longer operational pause it is recommended to wash it in Kerosine and to dip it into clean oil or heated grease. Never lubricate the chain while operating the machine.

Also apply grease to the chrome-plated piston rods of the hydraulic rams after cleaning of the machine.

6.3 Attention! Hints for assembling the blower wheel shaft

In case the repair of the blower wheel shaft becomes necessary, the assembly should follow the following points.

The bearing is firmly connected to the blower wheel shaft by the clamping sleeve nut. The necessary firm seating of this connection can only be achieved if the nut is tightened with a torque M of the following momentum:

Blower shaft diam. 35 mm: $M = 50 \text{ Nm}$

Main drive shaft diam. 30 mm: $M = 35 \text{ Nm}$

7 Function trouble/Trouble shooting

7.1 Electric control box

Trouble	Cause	Remedy
Remote control does not function.	Fuse in the main power supply from the battery is defect.	Exchange fuse.
	Fuse is intact, then check cable from the battery and socket (Fig. 4) for damage.	Sight-check the cable and exchange if necessary.
	Check voltage at the socket (see wiring plan).	Check socket contacts.
7.1.2 Digital display shows varying figures	Drive transducer (Fig. 11/2) does not have the correct distance towards the impulse disc.	Correct spacing to the prescribed distance between drive transducer/ impulse disc of $1 \text{ mm} \pm 0.5 \text{ mm}$.

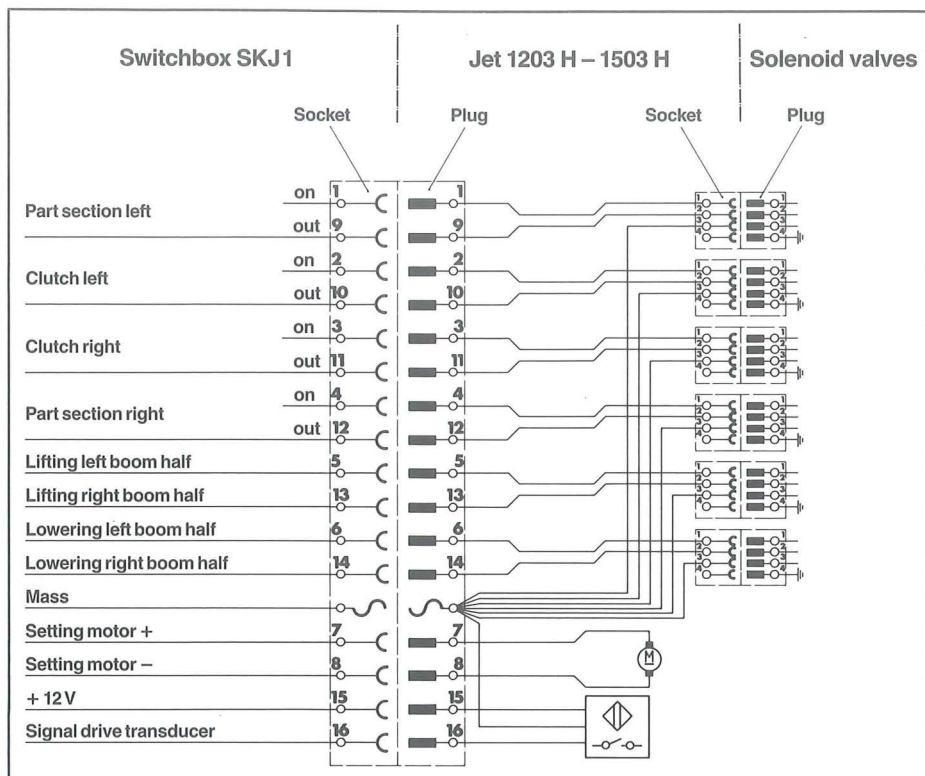


Fig. 23

Trouble	Cause	Remedy
7.1.3 Setting motor for spread rate adjustment does not react.	Switch 3 (Fig. 4) was not switched to "Hand"-symbol.	Switch to "Hand" symbol.
	Cable defect. Check whether any voltage is arriving at the setting motor when actuating switch No. 3.	If voltage is noticeable, probably the setting motor is defect. Exchange.
		Field operation can still be continued to its end by setting the spread rate manually. d rate (See para. 7.3)
7.1.4 Setting motor turns contrary to the switch position \pm .	Wires have been misconnected.	Connect wires vice versa (Fig. 23).
7.1.5* Some hydraulic functions, i.e. boom lifting cannot be actuated.	Solenoid switch does not receive voltage.	Check corresponding poles at implement side plug (Fig. 23) for voltage, check cable by sight.
	Solenoid switch defect, oiled up (if voltage gets to the solenoid switch).	Exchange solenoid switch; spreading operation can still be ended, switch valves by hand.
	Defect to switch of SKJ (no voltage gets to the implement plug).	SKJ defect; Check. Exchange by service.

Trouble	Cause	Remedy
7.1.6* Hydr. functions switch the other way round, for example boom actuation left instead of right.	Misconnecting of hydraulic hoses. Poles to the socket (Fig. 23) were wrongly wired.	Unscrew and connect correctly. Wire correctly according to the (wiring plan Fig. 23).

* Is only applicable for machines with solenoid control chest (option).

7.2 Hydraulics

Trouble	Cause	Remedy
7.2.1 Oil motor does not run.	Hose connections P, N mixed up. Loss of oil on the hoses and joints. Three-way oil stream control valve is set to "shut". Defect in three-way oil stream control valve.	Connection P oil feed N return flow Tighten joints' screw nuts, exchange hose. Drive open the valve by \pm switch. (See para. 4.2.) See special service.

Trouble	Cause	Remedy
7.2.2 Oil motor functions; hydraul. secondary functions cannot be controlled (simultaneously).	On machines without solenoid control chest no simultaneous operation is possible.	Switch off oil drive operate hydraulical secondary functions, switch on oil drive again.
	* Tractor oil pump delivery insufficient for the chosen oil rate of abt. 30 l/min.	Chose a slower oil motor speed and a corresp. slower tractor fwd. speed. For tractors with reduced pump oil delivery in some cases the use of a special oil motor may be of help.
	* Solenoid valves of the control chest do not function (sight-check).	(See table of function troubles. Electrical control box.)
7.2.3 Hydraulical boom lift control does not lift/lower.	Please refer to para. 7.2.2.	
	Throttle valve (Fig. 7) set on "shut" or is blocked up.	Turn open valve, lift and lower boom several times, thereafter readjust or remove valve and clean.
7.2.4 Excessive oil heating (up to 95°C).	High resistance in the back flow system (N) of the tractor.	Check whether a free oil return flow is existing at the tractor oil tank. Max. allowable resistance at the coupling plug (N) approx. 20 bar.

* Refers only to machines which are equipped with the solenoid control chest (extra option).

7.3 Continuing field operation after break down of electrical functions

Should the electrical/electronic device break down, the machine can still be operated manually.

Examples:

The solenoid valve for the metering shaft dog clutch does not function any more.

In this case the metering is then switched on and off on the field via the oil motor drive.

Solenoid valve for the boom folding does not operate.

For lifting or lowering of the booms, the valve at the control chest can be actuated by hand by pulling or pressing of the black ball head.

Setting motor does not produce any function.

The spread rate adjustment can be done via the three-way hydraulic diverter valve by hand. For this loosen the clamp behind the graduated disc and pull the motor to the rear away from the three-way hydraulic diverter valve. Set the speed of the hydraulic motor at the black handle adjusting screw of the three-way hydraulic diverter valve.

Danger of accident:

Switch off hydraulic motor before conducting any settings at the oil motor.

Trouble	Cause	Remedy
7.2.2 Oil motor functions; hydraulic. secondary functions cannot be controlled (simultaneously).	On machines without solenoid control chest no simultaneous operation is possible.	Switch off oil drive operate hydraulical secondary functions, switch on oil drive again.
	* Tractor oil pump delivery insufficient for the chosen oil rate of abt. 30 l/min.	Chose a slower oil motor speed and a corresp. slower tractor fwd. speed. For tractors with reduced pump oil delivery in some cases the use of a special oil motor may be of help.
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