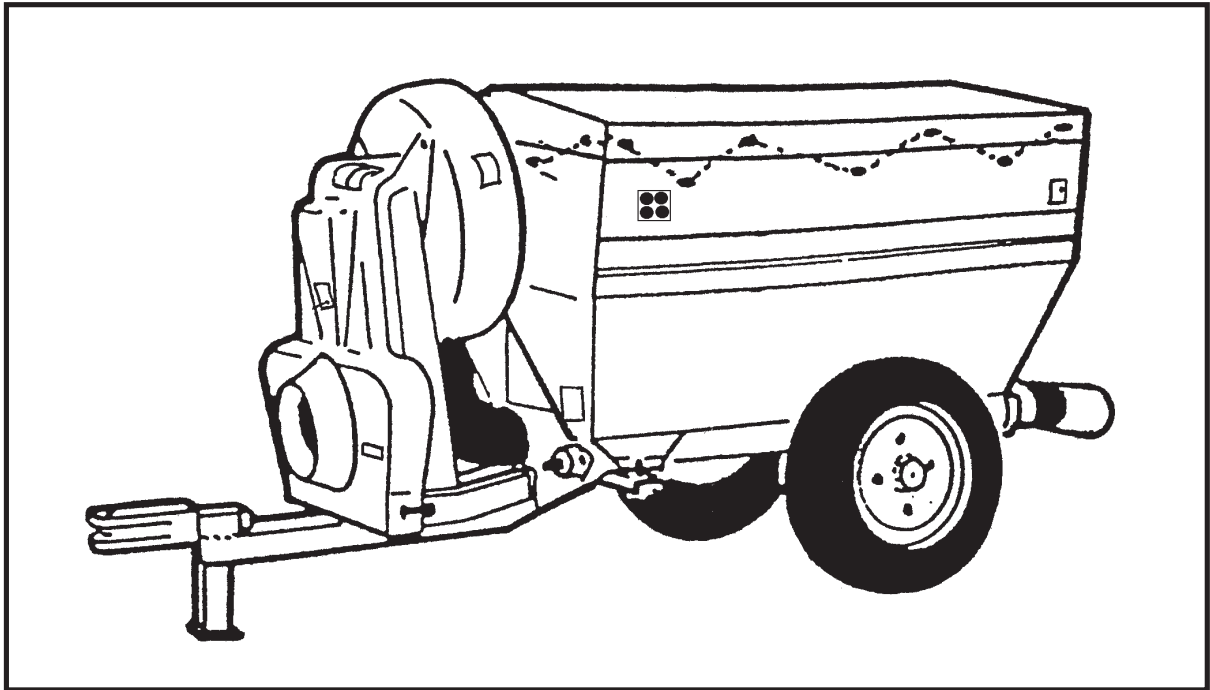


APOLO 600

375.418 B *English*

To be kept for future consultation

03/98



TECHNICAL DATA

CHASSIS : Steel profile and plate.

HOPPER : Sheet plate, 600 litres capacity, large opening closed by a tilt.

MECHANISM : Speed multiplier with POLY-V drive belt.

FEEDING : 2 disengageable archimedians screw driven by a hydraulic motor.

Speed adjustment by flow regulation.

This system ensures perfect evenness of powder distribution.

The powder runs directly on to the distribution blade.

No risk of the turbine, ventilation cage or caisson becoming clogged...

FAN : Aluminium.

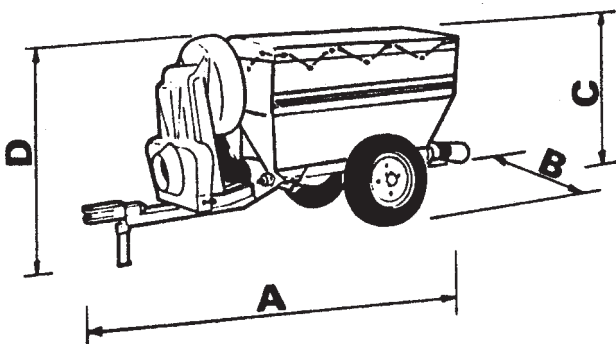
Speed of rotation : 4.650 rpm.

DISTRIBUTION : Through two swivelling blades with adjustable treatment device for the first row.

MIXER : Anti-vault device using 2 vibrating partitions (BERTHOUD patent).

SPACE REQUIREMENTS AND WEIGHT

Length (A)	2,00 m
Width (B)	0,92 m
Hopper height (C)	1,08 m
Overall height	1,13 m
Weight empty	267 kg
Gross vehicle weight	720 kg



WARNING

Successful treatment depends on correct **operation** of your duster.

Correct **operation** depends on precise calibration of the equipment, and this requires careful **checking**.

When this **checking** has been undertaken, the duster must be **commissioned** correctly, this also being necessary for correct spraying and operation.

Finally, to be certain that your duster can give you the performance you expect, for a long time, make sure that you undertake the **maintenance** operations required.

CHECKING, STARTING-UP, OPERATION, MAINTENANCE

are therefore essential operations, and you have every reason to carefully read the details in this booklet.

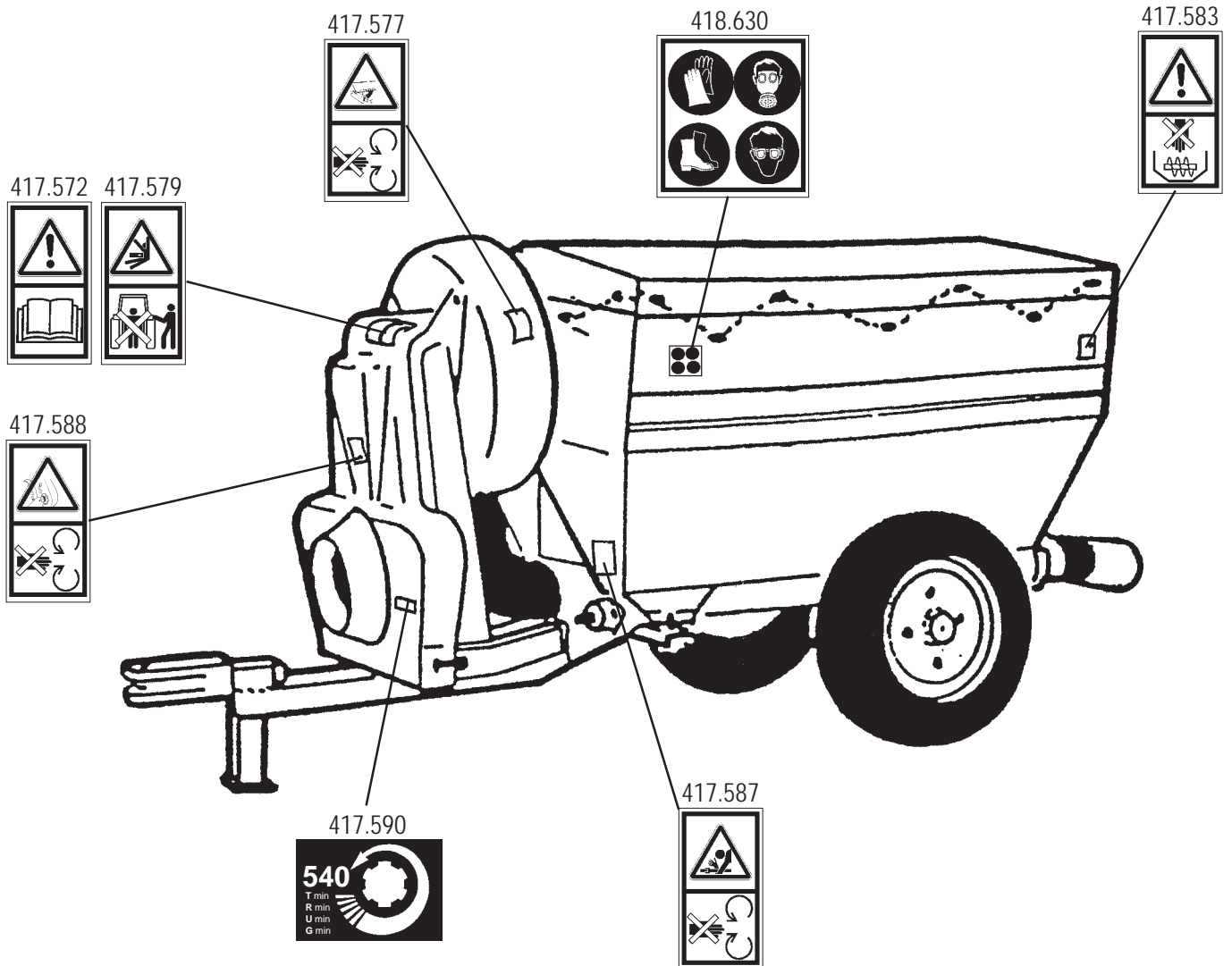
"This duster has been manufactured using materials which withstand most plant protection chemicals currently available on the market. Nevertheless, BERTHOUD cannot assume responsibility for any damage resulting from an incompatibility of the crop protection chemicals or product mixtures with the plastic materials: (polyethylene, polyvinyl chloride, polypropylene, Vitton, nitrile polyamide)."

PRECAUTIONS WHEN WELDING

When electric arc welding operations are undertaken on your sprayer it is **OBLIGATORY** to disconnect all electrical boxes ; if this is not done the electronic components may be destroyed, and the guarantee is null and void.

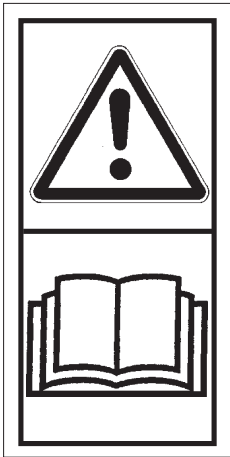
Each time a connecting box is repaired, it should be given a coat of KF 1280 insulating varnish.

- APOLO 600 - POSITIONS OF THE SAFETY STICKERS



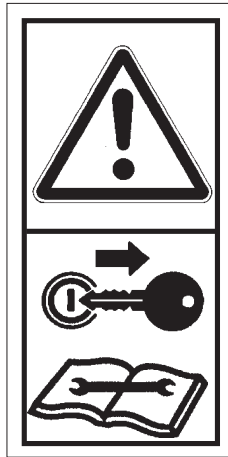
*It is very important to keep the safety stickers in location and in good condition as they draw your attention to possible dangers and refer to the operator's manual.
See the following pages and check their location on the sprayer.*

MEANING OF THE SAFETY STICKERS



GENERIC WARNING SYMBOL

READ THE OPERATING MANUAL BEFORE ANY OPERATION



SWITCH OFF THE ENGINE AND REMOVE THE IGNITION KEY BEFORE UNDER-TAKING WITH ANY INSPECTION, MAINTENANCE OR REPAIR OPERATION



RISK OF ASPHYXIA DO NOT ENTER IN THE TANK

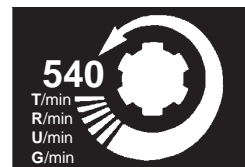


RISK OF ELECTRIC SHOCK AND ELECTROCUTION

HAND PROTECTION OBLIGATORY



AIR PASSAGE PROTECTION OBLIGATORY



ROTATING SPEED OF 540 REVOLUTIONS PER MINUTE RECOMMENDED

FOOT PROTECTION OBLIGATORY



EYE PROTECTION OBLIGATORY



HAND PROTECTION OBLIGATORY



NOW WASH YOUR HANDS



FILL WITH CLEAR WATER

MEANING OF THE SAFETY STICKERS



GENERIC WARNING SYMBOL

KEEP HANDS AWAY FROM THE SCREW WHILE THE TRACTOR POWER TAKE-OFF SHAFT IS CONNECTED AND THE ENGINE IS RUNNING



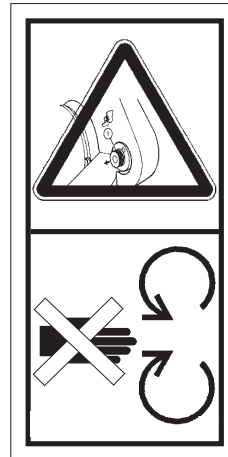
RISK OF PROJECTION

STAY AT A SAFE DISTANCE FROM THE SPRAYER



RISK OF INJURY

KEEP HANDS AWAY FROM VENTILATION FAN WHILE THE TRACTOR POWER TAKE-OFF SHAFT IS ENGAGED AND THE ENGINE IS RUNNING



RISK OF SNATCHING

DO NOT OPEN OR REMOVE THE PROTECTIVE COVERS WHILE THE TRACTOR POWER TAKE-OFF SHAFT IS ENGAGED AND THE ENGINE IS RUNNING



RISK OF SNATCHING

DO NOT OPEN OR REMOVE THE PROTECTIVE GUARDS WHILE THE TRACTOR POWER TAKE-OFF SHAFT IS ENGAGED AND THE ENGINE IS RUNNING



RISK OF CRUSHING

KEEP A SAFE DISTANCE FROM THE SPRAYER

ACCEPTABLE USE OF THE DUSTER

Do not use your duster out of its function : spraying crop protection chemicals, spraying of plant protective products.

In the event of any damage related to the use of the duster outside the framework of the applications specified by the manufacturer, the latter shall not be liable.

Any extrapolation of the sprayer's original intended use shall be at the user's risk.

Acceptable use of the duster also implies :

- compliance with the operating, servicing and maintenance instructions laid down by the manufacturer,
- the exclusive use of original spare parts, equipment and accessories or those recommended by the manufacturer.

The duster must only be used, serviced and repaired by trained people, familiar with its characteristics and methods of use. These people must also be aware of the dangers they may be exposed to.

The user must comply strictly with existing regulations as regards :

- accident prevention,
- safety at work (Labour Code),
- travelling on the public highway (Road legislation).

He must strictly observe the warnings affixed on the duster.

Any change to the duster done by the user himself or any other person, without the manufacturer's prior written agreement, shall mean that the latter is not liable for any damages which may result.

GENERAL SAFETY INSTRUCTIONS

- This sprayer should be used by a fully trained operator in spray techniques,
- Do not allow anyone to enter the sprayer's working radius,
- The only workpost is the tractor's cab when the sprayer is in operation,
- In addition to the instructions contained in this manual, comply with the legislation relating to safety and accident prevention regulations,
- The stickers on the sprayer indicate safety measures to be complied with to prevent accidents,
- The user must train himself in the operation of this sprayer before doing any work,
- Read the sprayer's "counter-indications" section,
- Protect yourself from spray drift during spraying,
- No passengers should be carried on the sprayer,
- Take care when hitching or unhitching the sprayer,
- Before hitching the sprayer, make sure that there is sufficient ballast on the tractor's front axle,
- All the remote controls must be placed so that they cannot cause a dangerous situation,
- Before doing anything on the sprayer, disconnect the power take-off, switch off the engine, remove the ignition key and wait until the sprayer has stopped completely,
- Make sure that all the safety covers are in place,
- Carry out the adjustments and a water spray test before preparing the spray mixture,
- Dispose of chemical cans in accordance with the instructions given by the manufacturer.

HITCHING

- Beware of crush risks in the 3-point lifting area,
- Comply with the maximum weight allowed on the tractor hitch for trailed machines,
- Disconnect the power take-off, switch off the engine and remove the tractor's ignition key while the sprayer's drive shafts are being connected,
- Use only EC-approved drive shafts. Fit them and service them in accordance with their manufacturer's instructions. Replace their protectors as soon as they are damaged,
- Rest the drive shafts on their supports as soon as they are disconnected.

HYDRAULIC CIRCUIT

- Check that the hydraulic hoses are in good condition and replace them if they are damaged.

MAINTENANCE

- For all maintenance work, the PTO has to be disconnected, the tractor engine must be switched off, the ignition key removed,
- Only carry out operations on the boom when it is at its lowest position.
- Only use recommended spare parts by BERTHOUD.

DESCRIPTIVE PLATE

The duster's identification plate is located on the front left-hand side of the chassis.

The reference in the "Type" box is composed of letters and numbers.

Example : 8 AP OL 600 = Apolo 600

06 = Tank capacity 600 litres
AP OL = Apolo (basic model)
8 = duster (product family)

Constructeur: **BERTHOUD** agricole
Z.I. de Bois Baron
1, rue de l'industrie
69220 BELLEVILLE S/S - FRANCE

Type: N° de série:

Poids à vide : P.V. kg

Poids total autorisé en charge : P.T.A.C. kg

CE 199

473.800 D

The "Serial No." box is composed of 8 figures
Example : 95 1042 04 = serial number

Manufacturing year

The "Kerb weight" and "Gross vehicle weight" boxes use the data in the table on page 1.

STARTING-UP THE DUSTER

CHECKS OF FOWARD SPEEDS

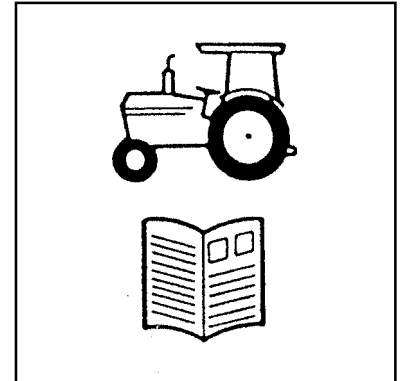
FORWARD SPEED RESEARCH IN RELATION WITH :

- An engaged gear.
- A P.T.O. RPM rated at 540 RPM.

FIRST CASE = Your tractor is equipped with standard wheels.
You have got its instructions booklet.

In that booklet, the foward speed is given for an engine RPM corresponding to 540 RPM at the PTO. Then choose the closer gear from the speed you want to work with in that range.

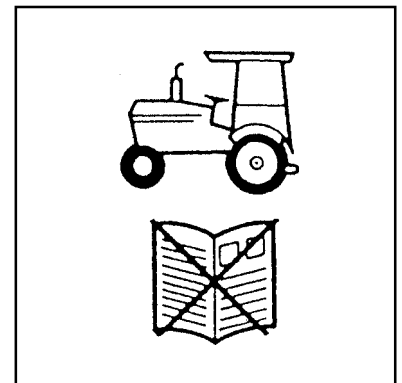
ENGINE RATE : 2000 RPM
PTO RPM : 540 RPM
GEAR ENGAGED : 5 th
WORKING SPEED : 5 km/h or 3 mph



SECOND CASE = Your wheels are not standard.
You don't have the instructions booklet of your tractor.

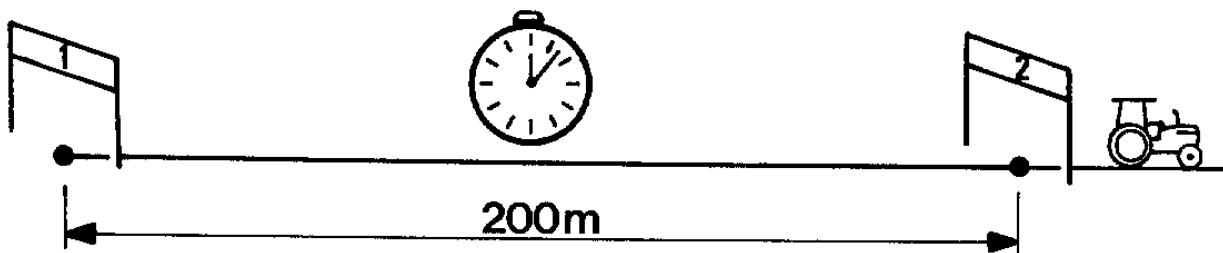
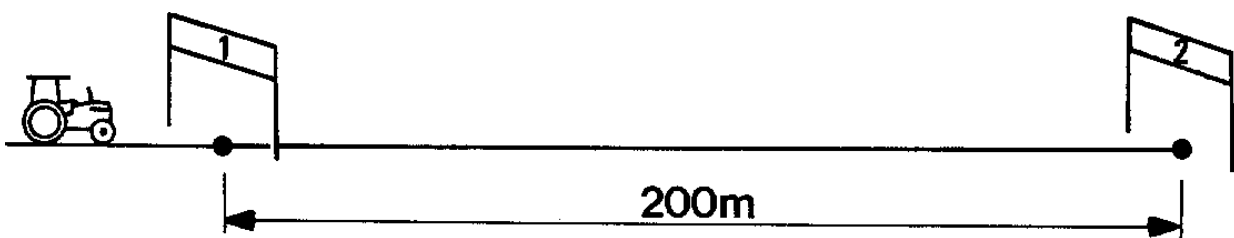
YOU MUST PROCEED TO A TEST RUN IN THE FIELD

- 1 - Measure a 200 metres run, preferably on the land you will treat.
- 2 - Engage gear to be run at example : 5th gear) after having set engine for at the 540 RPM at the PTO.
- 3 - Time out the run over the 200 metres.



EXAMPLE : 2 minutes and 24 seconds
or 144 seconds

$$\text{Speed on km/h : } \frac{200 \times 3600}{144} = 5000 \text{ metres/h or } 5 \text{ km/h}$$



Km/h	2	2,5	3	3,5	4	4,5	5	5,5	6
Seconds	360	288	240	206	180	160	144	131	120

ON RECEIPT OF THE EQUIPMENT

- Make sure there is no foreign body in the duster hopper.
- Axle in "narrow-width" position.
To obtain the large-width position, reverse the wheels.

HITCHING THE MACHINE TO THE TRACTOR

- Hitch the equipment to tractor using the ringended bar of tractor. (figure 1).

This harnessing system, alone, permits :

- Height adjustment (1).
- Swivelling of harnessing point in both axes.
- Correct function of harnessing shaft.
- If necessary, cut the CV joint transmission shaft.
To do this, consult and comply with the manufacturer's instructions and make sure the two-half-shafts are of equal length.

IMPORTANT (figure 2)

Minimum interlocking distance is 25 to 30 cms when the tractor and the equipment are in line. Maximum interlocking distance : the tubes must not be in contact. Make sure there is play of at least 10 cms in the minimum turning position.

- Check pressure of tyres (2,2 bar).
- Grease CV joint transmission shaft and bearings.

- Check tension of belts (figure 3)

(before each treatment)

Proceed as follows :

Drawing (A) : Orientate pulley (1) and unscrew the four nuts (2).

Drawing (B) : Swivel the pulley (1) through 45°. Unscrew nut (3), then act on screw (4).

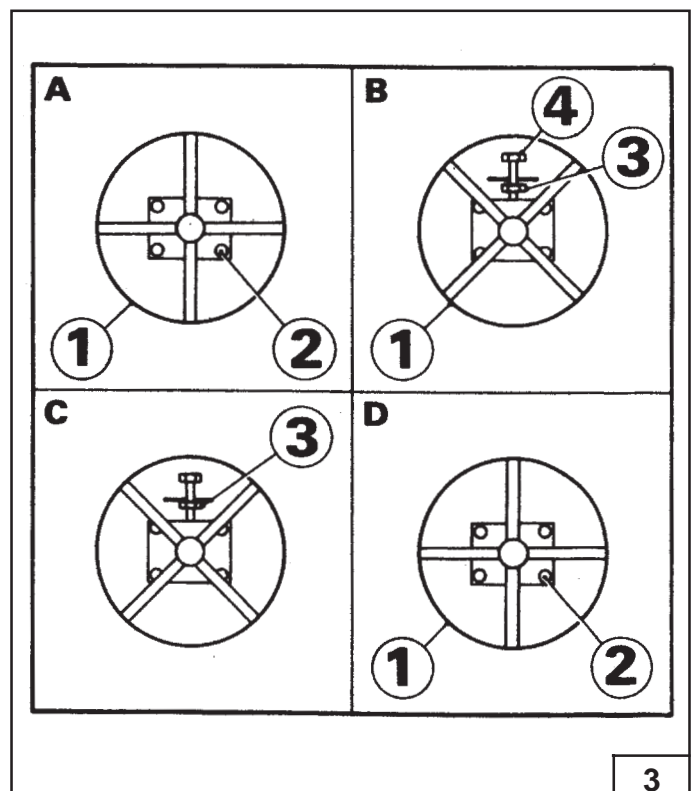
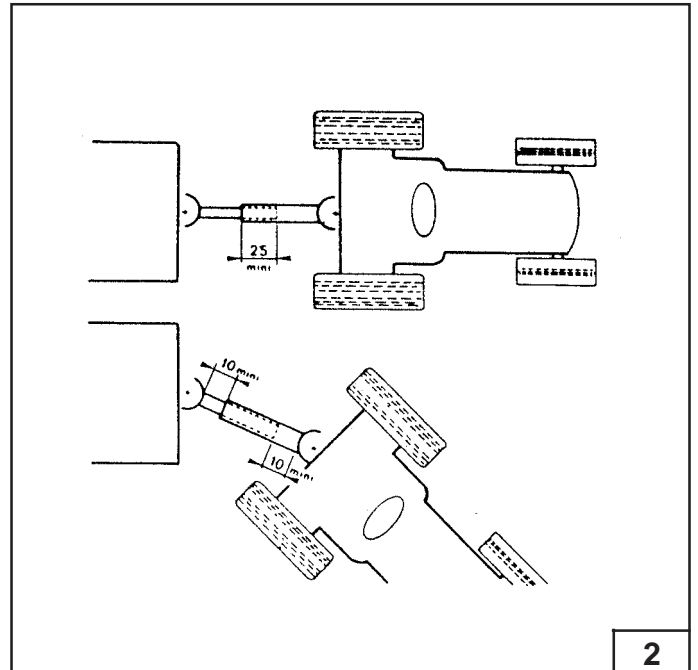
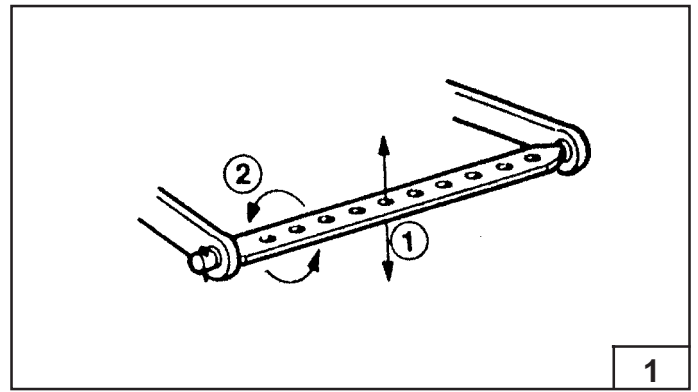
Drawing (C) : Once the drive belt is correctly tensioned, drive the nut (3) home.

Drawing (D) : Swivel the pulley (1) through 45° again, then drive the nuts (2) home in the opposite direction.

IMPORTANT : If the fan belt "squeaks" there is either too little tension or the clutch has been released too suddenly.

CAUTION !

THIS PHENOMENON IS DAMAGING.



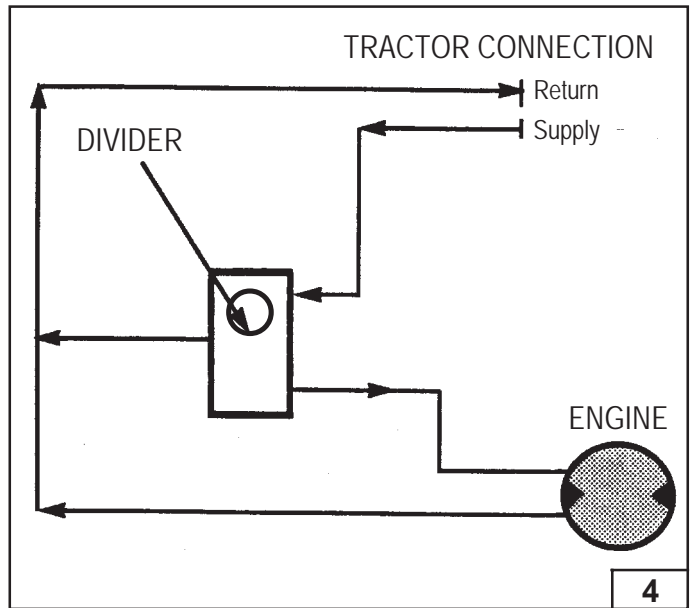
HYDRAULIC CONNECTION

- SERIAL SETTING

(All tractors, except JOHN DEERE)

Connection following figure (4) :

- Supply pipe to hydraulic connection of tractor (pressure supply).
- Return pipe to be connected to tractor tank (return).



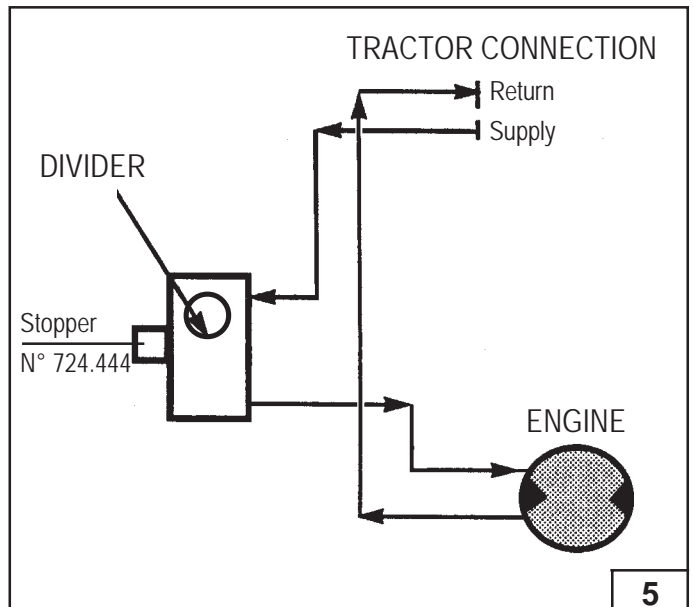
- SPECIAL SETTING FOR JOHN DEERE

(Obligatory for correct operation of the duster).

MODIFICATION KIT : Ref. 224.443

Connection following drawing (5) :

- Disconnect the engine return pipe from flow divider opening.
- Connect this pipe to the tractor tank return (return).
- Supply pipe to hydraulic connection of tractor (pressure supply).
- Plug flow divider opening using the stopper delivered with the equipment 724.444.

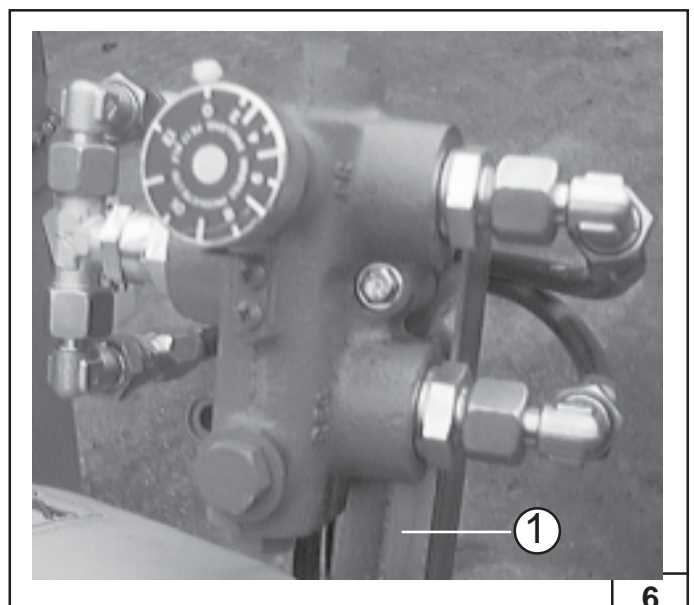


IMPORTANT :

In the case of a hydraulic circuit as shown by figure 5 (JOHN DEERE) and for utilisation of the duster on another tractor make, comply with figure 4 to avoid any serious damage to the hydraulic pump of tractor.

- FIX THE FLOW DIVIDER SUPPORT (1) TO THE TRACTOR WING (figure 6)

As speed variation is controlled by means of a hydraulic flow divider, it is important that the oil circulating in the system is clean. Contaminated oil could lead to maladjustment or improper operation.



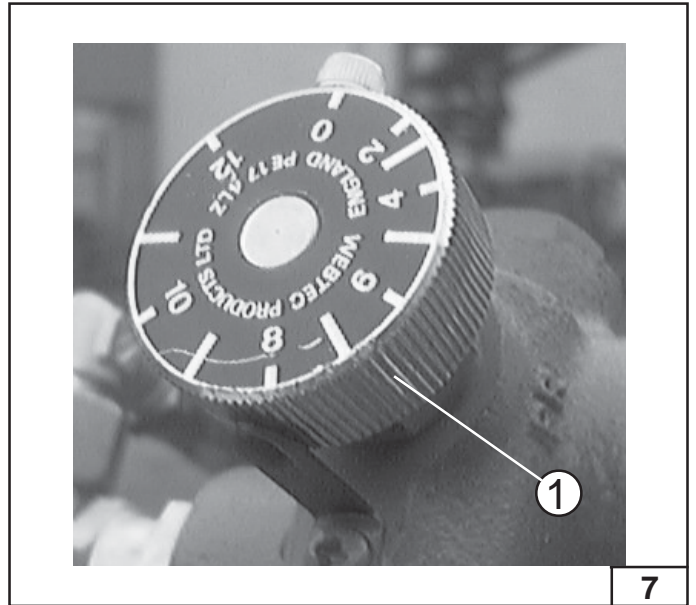
OPERATION

FILLING HOPPER :

Make sure that no foreign body (bag fragments or others) are mixed with the powder.

ADJUSTING FLOW DIVIDER :

Act on the knurled knob (1) (figure 7) of the divider as indicated on the flow table (page 17).

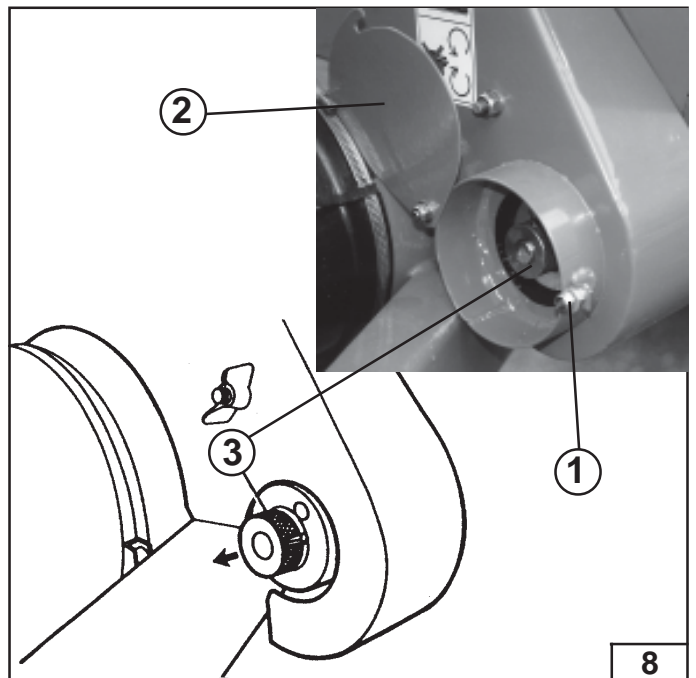


START OF DUSTING OPERATION :

Engage the power take-off (540 rpm).
Switch on the hydraulic circuit using the distributor of your tractor.
All that needs to be done, at the end of each row, in order to initiate or stop dusting, is to switch off and then switch on your distributor.

DUSTING ON ONE SIDE ONLY :

Disengage the archemedians screw on the side opposite that you wish to dust. Loosen the nut (1), lift the protective cover (2), then pull the knurled knob (3) (figure 8) toward the front of the duster.

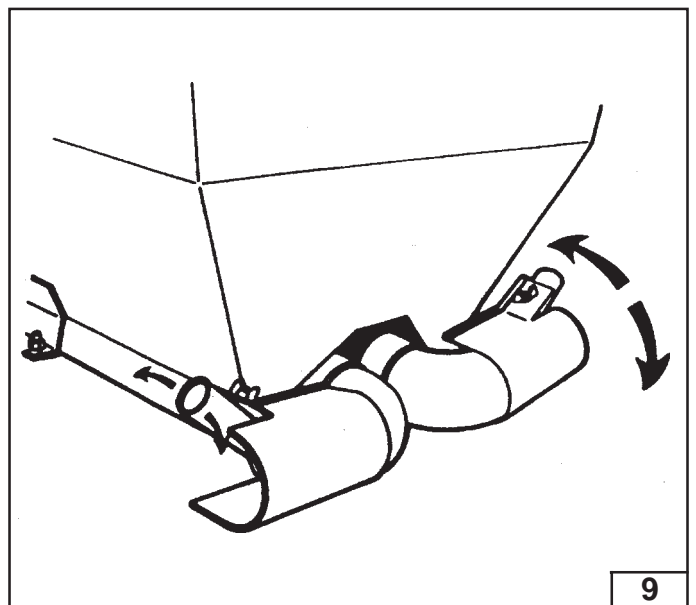


ADJUSTING THE BLADES :

Before dusting, adjust the output blades and their tubes (figure 9).

AT THE END OF THE TREATMENT, EMPTY THE HOPPER BY USING THE TWO ARCHEMEDIANS SCREW.

CLEAN THE HOPPER.



MAINTENANCE

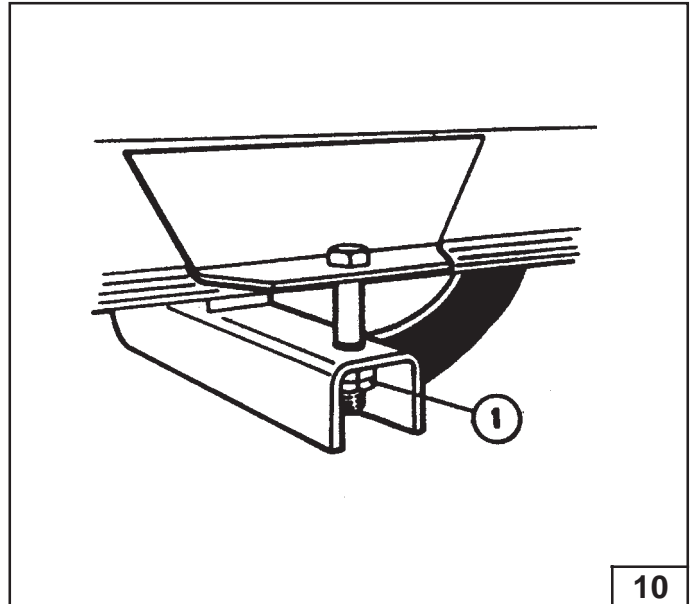
DURING THE FIRST WORKING HOURS

RETENSION THE FAN DRIVING POLY-V BELT :

(procedure described on page 13).

CHECK TIGHTENING OF THE HOPPER :

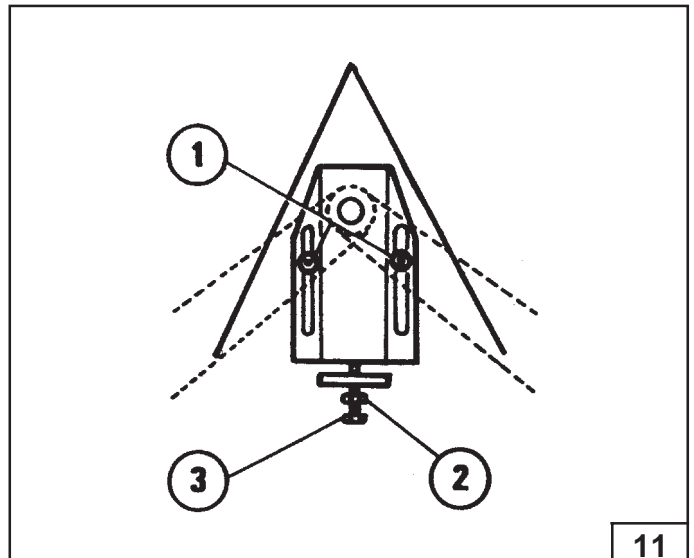
Tighten the nuts (1), but do not overtighten.



CHECK TENSION OF ARCHEMEDIANS SCREW DRIVING CHAINS : (figure 11)

- . Remove front cover,
- . Release the engines support (1),
- . Unscrew the lock nut (2),
- . Move the engines support up by turning the screw (3),
- . Tension the chains, but do not overtension,
- . Drive the lock nut (2) home,
- . Relock the engines support (1),
- . Fix the front cover.

Do not overtension the chain, the soft strand should slightly hang loose.



LUBRICATION

LUBRICATING THE BEARINGS

Every 100 hours or once a season (5 lubricating nipples (G), figure 12), using bearing grease.

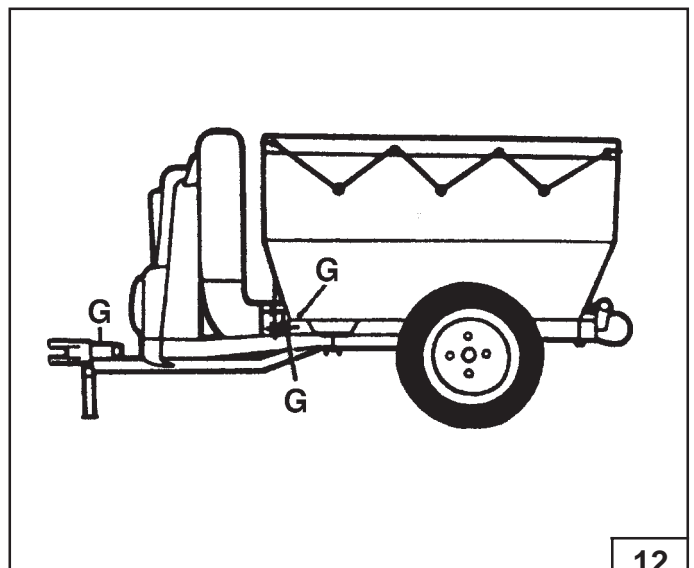
LUBRICATION WITH A BRUSH

After each treatment :

The transmission tube.

Every 20 hours :

The chains and worm claw.



FLOW TABLE (in lb/acre)

Divider position adjustment	Flow rate in lb/min	WIDTH TREATED, IN YARDS															
		11 yd				13 yd				15 yd				17 yd			
		TRACTOR SPEED IN mph															
		2.5	3	3.5	4	2.5	3	3.5	4	2.5	3	3.5	4	2.5	3	3.5	4
3	2.31	14	12	10	9	12	10	8	7	10	8	7	6	9	7	6	5
4	5.17	31	26	22	19	26	22	19	16	23	19	16	14	20	17	14	13
5	8.36	50	42	36	31	42	35	30	27	37	31	26	23	32	27	23	20
6	11.55	69	58	50	43	59	49	42	37	51	42	36	32	45	37	32	28
7	14.56		73	62	55	74	62	53	46	64	53	46	40	57	47	40	35
8	17.27			74	65		73	63	55	76	63	54	47	67	56	48	42
9	20.46				77			74	65		75	64	56		66	57	50
10	23.76								75			75	65			66	58
11	27.28												75			76	66
12	31.46																76

Chain sprocket ratio = 4

NOTE :

- The figures given in the table for flow rate/acre correspond to a "Fluido" sulphur.
- These figures may change depending on the quality, density et humidity of sulphur used.
- The maximum divider position (12) permit to drain the hopper.

FORMULA :

$$\frac{\text{Flow rate/min} \times 165}{\text{Width treated (yd)} \times \text{Advance speed (mph)}} = \text{Flow rate (lb/acre)}$$

COUNTER-INDICATIONS

- Never unhitch the machine with the boom open.
- Never travel outside fields with the boom open.
- Do not use the spray boom for anything other than spraying.
- Do not fit sprayer wheels to machines other than agricultural machines limited to 30 km/h.
- Never drain the machine into a river or any water point whatsoever.
- Never spray in strong wind.
- Do not unhitch the full machine in the field without checking the load-bearing capacity of the ground on which the leg is resting.
- Do not remove the guards from the rotating items.
- Carefully control spraying alongside roads and houses.
- Control spray drift by adjusting the equipment.
- Only use the fan to convey the droplets.
- Do not use the fan to spread solid particles.
- Do not rotate the fan at a speed higher than that recommended by the manufacturer.
- Do not modify the fan blade angle.
- Do not carry passengers on the sprayer.
- Do not transport food products in the tanks.



***Our safety rules and recommendations
are not exhaustive.***

**NOTES ON TREATMENTS
CARRIED OUT DURING SEASON**

Date	Parcel	Treatment	Product	Dose	Volume l/hect	Measure	Speed km/h	

*Because of our policy of constant product improvement,
we reserve the right to modify product specifications or design without prior notice.*

BERTHOUD agricole

Z.I. de Bois Baron - 1, rue de l'industrie - 69220 BELLEVILLE S/S - FRANCE

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