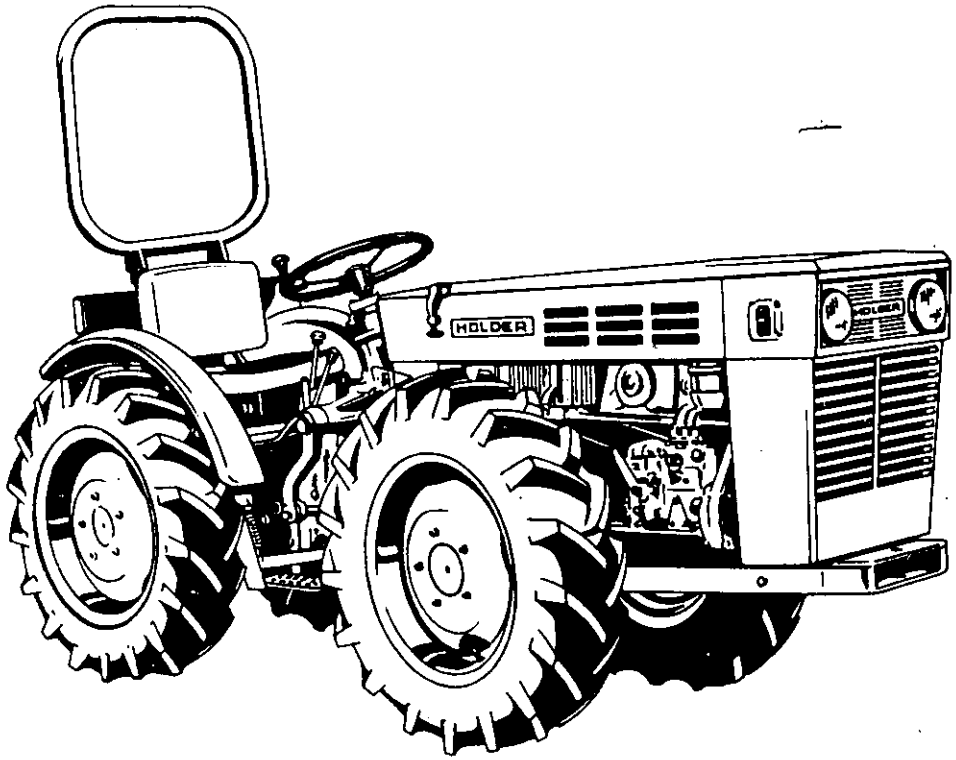
Hydrolenkung (28 RS, nom) Kud. / Wuxster
Bis A30, 2 51657, bis A45 3 57799

HOLDER

A 30
A 45



Betriebsanleitung
mit Anbaugeräten

Operating Instructions
including implements

Notice d'emploi
comprenant les accessoires

Instrucciones de servicio
incl. los accesorios

1975

Gebrüder Holder Maschinenfabrik
7418 Metzingen Western Germany
Telefon (07123) 2036* Telex: 07245319

A) Important instructions for our customers

1. Service

Please have all prescribed services and maintenance jobs in your tractor (according to the operation manual) carried out regularly through your Holder dealer, and, where necessary, have this confirmed by his stamp and signature, in this service manual. This is necessary to maintain your warranty rights.

1st service (charged).: After approx. 20 operation hours according to service chart in operation manual.

2nd service (charged): After approx. 150 operation hours according to the service chart contained in the operation manual.

3rd service (charged): After approx. 300 operation hours according to the service chart contained in the operation manual.

Further yearly services (charged): according to the service chart contained in the operation manual.

2. Warranty

Manufacturers' warranty is granted for faultless material and workmanship, according to the relevant standard of technic, for the factory-new tractor or implement.

Warranty is granted for a period of 12 months, starting with the date of delivery through the dealer, resp. the date of the first official registration of the tractor. However, warranty will expire at any rate, 24 months after the tractor, resp. implement, left the factory.

For factory-new replacement engines, or engines and components not made by the tractor-manufacturers, warranty is granted for max. 6 months only. Rubber and leather parts, gaskets, spark plugs, glower lamps, rubber-tyres and other parts subject to wear and tear, are exempted from warranty.

A warranty claim can only be taken into consideration if it has been filed with the manufacturers, through their dealers, on Holder's regular forms, immediately upon detection of the failure.

Adjustment is made according to the manufacturers' decision, either by repair, or by replacement of the faulty parts. The dealer who sold the factory-new tractor, or implement, is responsible for the carrying out of repair jobs under warranty.

If a warranty claim has been acknowledged by the manufacturers, they will bear the costs for the least expensive way of shipment, as well as the costs for reassembly of the replacement parts, in accordance with their fixed repair times. Replacement is made for parts which have proved to be faulty in material or workmanship, and such parts which are bound to be damaged as a result thereof. Replaced parts become the property of the manufacturers, and must be returned to them, freight paid to destination. Because of the

high costs involved from overseas countries, parts must only be returned if expressively asked for by the manufacturers. All other parts must be returned to the local agent who will keep them for inspection through the manufacturers till he will be allowed to scrap them.
Manufacturers' instructions regarding the settlement of warranty claims, as issued in their relevant Circular Letters, must be strictly observed.
Natural wear, and damage or failure resulting from improper handling or maintenance, as well as storage, transport, or corrosion damages, will not fall under manufacturers' warranty.

Warranty automatically expires if:

a tractor under warranty has been repaired by the owner, seals have been broken or removed, the tractor has been modified by installation of parts and components of other manufacture than the original ones,
the owner has been proved not to follow the instructions of the Holder operation manual, and/or has omitted to have regularly carried out the inspections prescribed in the Holder Service Chart,
the customer sells the tractor after its official registration,
the owner does not fulfill his obligations, particularly of payment, towards the manufacturers, or the Holder dealer.

Refund for mileage and other side expenses, for out-of-service periods, or for other direct or indirect damage, is not granted under warranty.
Claims for a change of the purchase agreement, or for a reduction of the purchase price, are excluded.
Second-hand tractors do not fall under warranty.
Place of jurisdiction 7417 Urach or 7410 Reutlingen, W.Germany.

Metzingen, 1st October 1974
supplemented on 2nd April 1975.

B) Re.: Conditions for the Handling of Warranty Claims

1. Orange-coloured Warranty File Card
(for tractors, two-wheel tractors, power units, power mowers etc.)
The orange-coloured warranty file card must be returned to the Service Dept. of Gebrüder Holder, entirely completed in type-writing, and duly signed, within 4 weeks upon sale of the machine.

2. **Pink Warranty File Card in duplicate**
(for Holder replacement engines)
If a Holder made replacement engine is installed, the upper sheet of the pink warranty file card for replacement engines must be returned to the Holder Service Dept. within 4 weeks. Repaired engines do not fall under warranty. (Otherwise see under para. 1).

3. The orange and pink warranty cards are filed under the corresponding country, type of machine, and in sequence of serial numbers. All warranty claims are entered in this file to be used for the purpose of statistics.

4. **Warranty Claims**
For submitting warranty claims please use the forms procured by Messrs. Holder and proceed as follows:

Blue sheet:	for dealer's files
Pink sheet:	for agent's files
White-yellow-green sheets:	Return to Messrs. Gebrüder Holder, Metzingen. The green sheet is, if applicable, submitted to the manufacturers of components of other origin installed in Holder tractors and machinery, whilst the yellow sheet is filed at Holder's for the purpose of statistics.

a) Please number the claim forms in sequence during the current year, e.g. 3/74 Tr (third warranty claim submitted in 1974 for tractors). It is important to indicate Tr = Tractors, resp. Pl = Plant Protecion Equipment because the warranty claims are handled by different departments.

b) Complete the claims thoroughly in typewriting, and submit them in triplicate (white-yellow-green sheets) to the After-Sales-Service Department for tractors, resp. plant protection equipment, of Messrs. Gebrüder Holder, 7418 Metzingen, within four weeks of the breakdown.
Incomplete claim forms may have to be rejected. The reverse page of the forms is for manufacturers' use only – do not fill in.

c) From all **European countries** parts pertaining to warranty claims must be sent to Gebrüder Holder, 7418 Metzingen, freight paid to destination, within four weeks after breakdown.
A strong label, giving the following details, must be affixed to each returned part:

Sender: agent's resp. dealer's full address

Claim No. ..... Date: .....

Customer's name and address: .....

From all **overseas countries** parts must only be returned if specifically requested.

d) When returning engines, these must never be dismantled, but must be shipped entirely assembled (version replacement engine), and in scrupulously clean condition, mounted on our engine transport pallet, safe for shipment. Inlet and outlet parts, all open pipes, and other apertures, must be closed.

e) Warranty claims for components and parts of other origin, e.g. Bosch, ZF, F&S, JLO, HATZ, can be submitted direct to local or nearby agencies of these companies. In such cases please let us have the first, white sheet of the claim form marked „for information only". Where no branch or agency of the manufacturer in question exists, the claimed parts should be sent to Holder, following the procedure explained above. Parts, or components, which have been repaired, dismantled, or tampered with before their return, are not accepted by the manufacturers, and any claim for these will be rejected from the beginning.

f) We should like to point out to the fact that, according to our warranty conditions, no compensations can be made for mileage, or other side expenses, such as „out-of-service-periods", or costs involved for the removal and attachment of previously installed implements.

g) Any consent made verbally (over the phone) is non-obligatory for us because decisions regarding warranty or „fair dealing" are principally given in writing by our after-sales service departments for tractors or plant protection equipment.

h) Exceptionally urgent cases can be reported after office hours (from 19.00 hours – 7 p.m.) to Mr. Feind, Phone No. 07381/2513.

Office hours: Monday to Friday: 7.00 h to 12.00 h (7 to 12 a.m.)
and 13.15 h to 16.15 h (1.15 p.m. to 4.15 p.m.)

i) When reporting breakdowns over the telephone, please make sure to have the following details ...

Model: Machine serial No.: Engine serial No.:

Implement No.: Date of sale: Operation hours:

Nature of breakdown:

Description, illustration number and part number of involved parts.

5. If, during or after the warranty period, the dealer or tractor owner asks for a factory mechanic to be sent, the mechanic's travelling expenses are to be borne by the firm or person issuing the demand.
Estimates of costs are submitted upon special request and after inspection, resp. dismantling of the object in question only.
Estimates and offers not specifically indicated to be obligatory, must be regarded as non-obligatory.
The costs involved in an estimate, particularly those for delegating a mechanic, are to be borne by the customer, even if the order will not be executed at all, or executed in a different manner.

6. **Replacement Engines**
Are supplied in the following version:
Engine complete — but without radiator and without V-belts, without dynamo, without starter
with flywheel
without clutch plate and without pressure plate.
Including fuel injection pump, injection nozzle and pipes, with oil pump and all pipes (assembled).
Without hydraulic pump, with thermostat and flange, without induction elbow and without manifold.

Metzingen, 1st October 1974
supplemented on 2nd April 1975.

Engine and Tractor

A) General Information

The experience achieved by the Holder Company in the course of more than 80 years of designing and manufacturing agricultural tractors, combined with the latest knowledge in engineering and production, have gone into your new Holder tractor, which will impress you with its economy, driving comfort, and high performance in all cultivations.
To keep your tractor ready for service at any time, please read this manual carefully, for it contains all instructions necessary for thorough care and maintenance of the tractor.

The operation manual belongs into the hands of the tractor driver.

For all inquiries please indicate:

a) Type of tractor . . . . . e.g. A 45
b) Engine serial No. . . . . e.g. V3 22 212
c) Tractor serial No. . . . . e.g. 3 51 337
d) Date of sale: . . . . . e.g. 10/2/1975 and, if necessary, date of reclamation
e) Tractormeter reading: . . . . . e.g. 500 operation hours

The tractor serial No. is embossed on the type plate affixed to the dash panel (26 Ill. 4), or on the connection housing (25 Ill. 4). The engine No. is to be found on the cylinder crankcase (47 Ill. 9) – exhaust side.

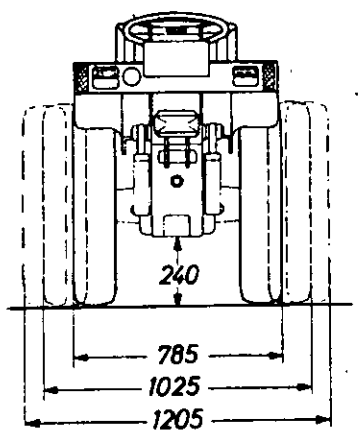
Technical data, illustrations and measurements, as stated in this manual, are not obligatory for us, and no claims can be derived from these. We reserve the right to make improvements in the tractors without changing this operation manual.

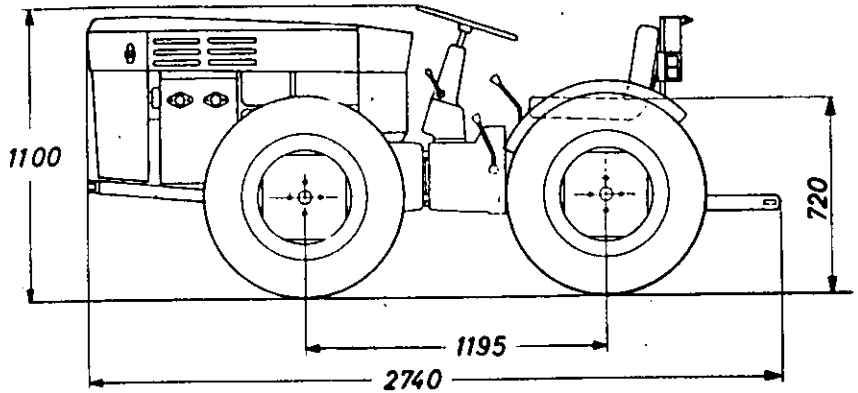
B) Technical Data

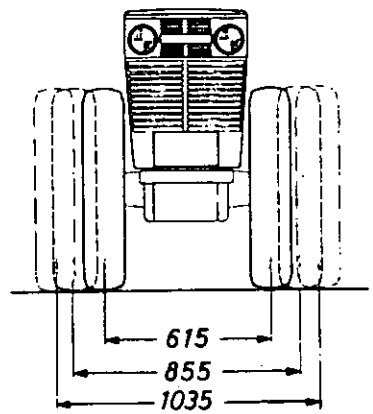
1. Engine	**A 30**	**A 45**
Manufacturers:	Gebrüder Holder, Maschinenfabrik, 7418 Metzingen/Württ.	
Type:	VD 2	VD 3
Design:	in-line, vertical engine	in-line, vertical engine
Mode of operation:	four-stroke Diesel	four-stroke Diesel
Combustion:	Direct fuel injection	Direct fuel injection
Number of cylinders:	2	3
Cylinder bore:	95 mm	95 mm
Stroke:	95 mm	95 mm
Cylinder capacity:	1346 cc	2020 cc
Compression ratio:	16,8	16,8
Air gap: warm and cold	0,25 mm	0,25 mm
Fuel consumption:	264 g/kWh (194 g/PSh)	251 g/kWh (185 g/PSh)
Cooling:	Water circulation cooling with thermostatically controlled pump	
Air filter:	Oilbath air filter with cyclone preselector	
Lubrication system:	Force-feed lubrication with gear pump	
Oil pressure at n=2000 min^{-1} (rpm)	4 $^{+1}_{-0,5}$ bar (atm.)	4 $^{+1}_{-0,5}$ bar (atm.)
Oil filter:	Change-cartridge in main stream (M & H No. W 9.20)	
Speed:	2450 min^{-1} (rpm)	2450 min^{-1} (rpm)
Idling speed:	800 min^{-1} (rpm)	800 min^{-1} (rpm)
Max. torque at n=2000 min^{-1} (rpm)	83,4 Nm (8,5 mkp)	132,5 Nm (13,5 mkp)
Capacity according to DIN 70020:	21 kW (28 PS)	31 kW (42 PS)
Capacity according to SAE:	32 HP	48 HP
Transmission:	Gear drive 6 forward, 3 reverse	Gear drive 6 forward, 3 reverse
Clutch:	Single-plate dry clutch K 180 (make F & S) with blue springs	Single-plate dry clutch KS 200 (make F & S) with yellow springs
Fuel system		
Fuel injection pump with regulator:	Bosch 0 400 462 049	Bosch 0 400 463 117
Fuel injection nozzle:	Bosch DLLA 150S 513	Bosch DLLA 150 S 513
Injection pressure:	175 bar (atm.)	175 bar (atm.)
Fuel filter:	Micronic filter cartridge – built into the tank –	
***Commencement of delivery of fuel injection pump:**	12,6 mm b. T.D.C. (before top dead centre) Unscrew cover of injection pump. Turn regulator sleeve with gear ring forward by approx. 2/3. (Take care that markings of camshaft drive gear will correctly mesh).	

*Detailed instructions for timing in VD2/VD3 Workshop Manual.

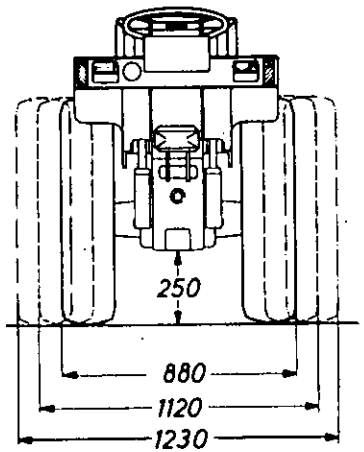
A 30 – Dimensions in mm

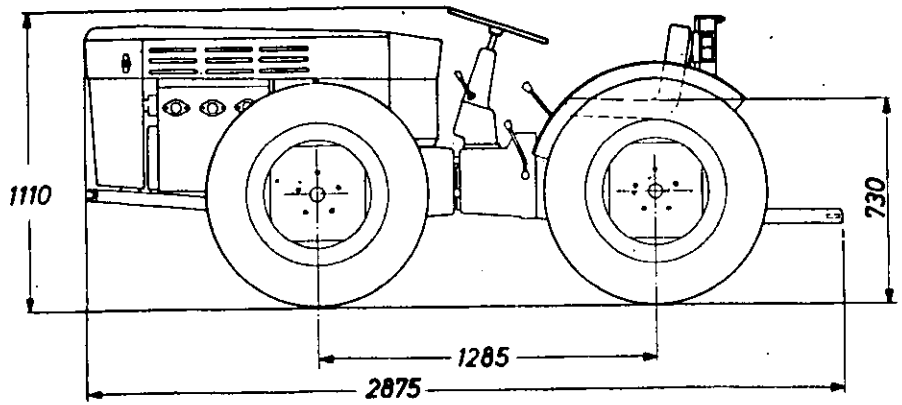


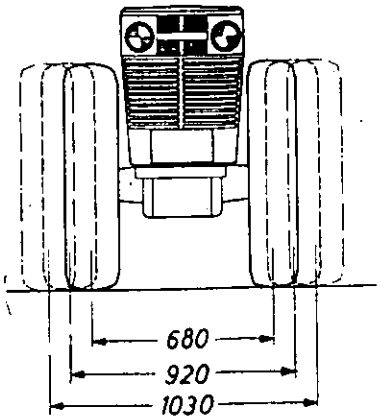




A 45 – Dimensions in mm







Dimensions and measurements of tractors	**A 30**	**A 45**
Wheel base:	1195 mm	1285 mm
Track widths:	615/855 mm	680/920 mm
Overall width:	785/1025 mm	880/1120 mm
Overall length incl. 3-point linkage:	2810 mm	2890 mm
Overall height without safety frame:	1100 mm	1100 mm
Overall height incl. safety frame:	1735 mm	1745 mm
Diameter of minimum inner turning circle	2000 mm	2220 mm

Oil filling quantities:	**A 30**	**A 45**
Engine:	4,0 Ltr. (HD-B oil for diesel engines)	6,0 Ltr. (HD-B oil for diesel engines)
Oilbath air filter:	0,5 Ltr. (HD-B oil for diesel engines)	0,5 Ltr. (HD-B oil for diesel engines)
Hydraulic system: in front gearbox	11,0 Ltr. + 1,0 Ltr. in hydraulic system (+ 2,0 Ltr. in hydromatic steering and hydraulic system) (HD-B-oil)	7,0 Ltr. + 1,0 Ltr. in hydraulic system (+ 2,0 Ltr. in hydromatic steering and hydraulic system) (HD-B-oil)
in rear gearbox	9,25 Ltr. (SAE 80 gear oil)	6,75 Ltr. (SAE 80 gear oil)
Reduction gears:	–	0,2 Ltr. (SAE 80 gear oil)
Steering box (mechanical):	1,2 Ltr. (SAE 80 gear oil)	1,2 Ltr. (SAE 80 gear oil)
Fuel tank:	23 Ltr. (fuel oil, diesel)	23 Ltr. (fuel oil, diesel)
Cooling system (total quantity):	7,0 Ltr. (water plus antifreeze mixture)	9,2 Ltr. (water plus antifreeze mixture)
Anti-freeze mixture:	„Glysantin" – effective up to –20° C filled in from the manufacturers all the year round	
	2,3 Ltr.	3,1 Ltr.

Weights:		
Empty weight, total:	960 kg	1115 kg
front:	570 kg	770 kg
rear:	320 kg	345 kg
Permissible total weight:	1300 kg	2100 kg
Permissible load on front axle:	650 kg	1050 kg
Permissible load on rear axle:	650 kg	1050 kg
Permissible prop load on trailer hitch:	200 kg	510 kg

2. Transmission

a) Gearbox: 6 forward speeds and 3 reverse speeds. Four-wheel drive via two differentials with spiral bevel gears, front diff-lock operated by spring-loaded foot pedal.

b) Speeds at max. engine revs (2450 min^{-1} (rpm)

		A 30 with rubber-tyres 7.00-16 AS	A 45 with rubber-tyres 7.50-18 AS
Forward:	1st speed	1,33 km/h	1,33 km/h
	2nd speed	2,13 km/h	2,13 km/h
	3rd speed	4,05 km/h	4,05 km/h
	4th speed	6,34 km/h	6,34 km/h
	5th speed	10,20 km/h	10,20 km/h
	6th speed	19,30 km/h	19,30 km/h
Reverse:	1st speed	1,33 km/h	1,33 km/h
	2nd speed	2,13 km/h	2,13 km/h
	3rd speed	4,05 km/h	4,05 km/h

c) Tractormeter: (2 III. 3) Registering ground speed, engine and P.T.O. rpm. and hours. The tractormeter registers one hour based at an engine speed of 1650 rpm.

d) Diff-lock: Foot-pedal operated front-axle diff-lock.

e) P.T.O.: (gear P.T.O.) Standardised P.T.O. with 540 min^{-1} (rpm) at 2100 min^{-1} (rpm) of the engine, or 630 min^{-1} (rpm) at 2450 engine min^{-1} (rpm) works independent of the transmission.

f) Steering: Pivotal ZF-type steering with blacklash eliminator, Hydromatic steering as an option.

g) Brakes: Two independent braking systems, footbrake and handbrake acting on all four wheels. The handbrake consists of a ratched lever.

h) Trailer hitch: Adjustable for height and revolving, with a pistol-type handle grip for one-man operation.

i) Hydraulics:

Holder two-cylinder hydraulics with Bosch gear pump. Max. lifting capacity – as measured on lower linkage arm of the field bar: 14000 N (1400 kg)

Capacity of hydraulic pump:		
without hydromatic steering	4 cc per one rev (9,2 l/min at max. engine speed 2450 min^{-1} (rpm)	
with hydromatic steering	11 cc per one rev (26 l/min at max. engine speed 2450 min^{-1} (rpm)	
Working pressure:	175 bar (atm.)	
Hydraulic oil supply tank:	situated in front gearbox	engine oil HD-B SAE 20
	for temperatures below -10^{o} C	HD-B-SAE 10
Control valve:	Bosch HY/SEA 5/175/1	
Oil filter:	Situated in return flow pipe	

k) Implement linkage:

Holder three-point linkage (giving vertical lift) with safety lock in transport position. The use of implements for standard three-point linkage requires the advice of your local Holder dealer.

l) Electrical system (12 Volt system)

		A 30	A 45
Starter:		Bosch 0001 362 012 Type JF	Bosch 0001 362 012 Type JF
Dynamo:		Bosch EH (R) 14 V 11 A 19	Bosch EH (R) 14 V 11 A 19
Dynamo voltage:		12 V	12 V
Dynamo capacity:		90 W	90 W
Mode of regulation:		Voltage regulation	Voltage regulation
Battery capacity:		55 Ah	88 Ah
Headlights:		2	2
Front traffic lights:		2	2
Tail lamp:	Three-chamber lamp	2	2
Braking light:	Three-chamber lamp		
Rear traffic light:	Three-chamber lamp		
Licence plate light:		1	1

Pilot light system:	yes	yes
Rear reflectors:	2	2
Horn:	yes	yes
Socket for trailer lighting:	yes	yes
Socket for windscreen wiper of tractor cab:	yes	yes
Combined control instrument:	yes	yes

C) Operation levers and control instruments

Ignition lock

The ignition lock allows the selection of three different positions with the ignition key:

0 = engine clear for starting, engine can be started

1 = parking light on

2 = dimmed headlight on

No.	Ill.	Description of part:	No.	Ill.	Description of part:
1	3	Combined control instrument	10	1	Cut-out- rod
2	3	Tractormeter	11	1	Hydraulic lever
3	2	Ignition lock with ignition key	12	1	P.T.O. selector lever
4	2	Warning light impulse transmitter	13	1	Gear selector lever
5	2	Glow starter indicator	14	1	Selector lever (preselection)
6	2	Glow starter switch	15	1	Foot-pedal for diff-lock operation
17	1	Traffic light switch	16	1	Clutch pedal
8	1	Horn button	24	4	Foot brake pedal
9	1	Throttle lever	23	4	Hand brake

Driver seat

Can be adjusted to the operator's weight. A righthand turn of screw (59 Ill. 13) causes a harder, and a lefthand turn, a softer springing.

D) Preparations for taking the tractor into service

Do not operate engine under full load for a prolonged period of time during the first 20 service hours.

Before taking your tractor into service, examine it. thoroughly for traffic and operation safety. Make the following check-up:

a) Fuel supply in tank (27 Ill. 5)
b) Oil level in engine (32 Ill. 7)

never allow tank of oil sump to run entirely empty

For temperatures below -10^{o} C — HD-B-oil SAE 10 W
from -10^{o} C to $+20^{o}$ C — HD-B-oil SAE 20
above $+20^{o}$ C — HD-B-oil SAE 30

Use only HD-B oils for diesel engines. HD-B oils are high-grade branded oils for diesel engines corresponding to the specification MIL-L-2104 B. Please ask your Holder distributors or dealers for advice. List of recommended oils see page 57.
In order to avoid damages caused by the use of inferior lubrication oils, we recommend to use only branded oils of the large oil companies, and to stick to the initially chosen brand.

c) To check cooling water level, remove radiator cap (38 Ill. 6).

d) All four tyres must have the same pressure of 1,5 bar (atm.)

e) Check lighting system.

f) Check trailer hitch.

Make a short trial run in order to control:
a) Clutch and steering.
b) Foot and hand brakes.

Repair any irregularities at once!
When driving on public roads please pay strict attention to your local traffic regulations.

E) Taking tractor into service

1. Preparation

Shift gear selector lever into neutral (13 Ill. 1).

Starting at normal temperatures

a) Move throttle lever (9 Ill. 1) to approx. half revs.
b) Insert key (3 Ill. 2) in ignition lock till charging lamp (21 Ill. 3) lights up red, and oil pressure indicator (22 Ill. 3) lights up yellow.
c) Pull out glow starter button (6 Ill. 2) as far as stop. The starter is now in operation. As soon as engine has sprung to life, release the button. **Never operate the starter** with running engine. If engine fails to fire after 10 seconds, release button and repeat the starting procedure. After the engine has sprung to life, glow starter indicator (21 Ill. 3) and oil pressure indicator (22 Ill. 3) must go out.
d) Select desired engine speed with the hand throttle lever (9 Ill. 1).

Starting at low temperatures

a) Move throttle lever (9 Ill. 1) to approx. half revs.
b) Insert key (3 Ill. 2) in ignition lock till charging lamp (21 Ill. 3) lights up red, and oil pressure indicator (22 Ill. 3) lights up yellow.
c) Pull glow starter button (6 Ill. 2) out to first position and hold for approx. 1 minute (preglow), i.e. till glow starter indicator (5 Ill. 2) lights up bright red, then pull out button as far as stop. (The starter now turns over the engine). After the engine has come to life, glow starter indicator (21 Ill. 3) and oil pressure indicator (22 Ill. 3) must go out.
d) Select desired engine speed with the throttle lever (9 Ill. 1).

2. Driving

Before using the gear lever, the throttle lever (9 Ill. 1) should be shifted to neutral. Then depress clutch pedal (16 Ill. 1) (declutch). Preselect desired gear by means of the preselector lever (14 Ill. 1). Shift gear lever (13 Ill. 1). See gear selection diagram Ill. 16). Release hand brake (23 Ill. 4).
If the gear proves difficult to engage, depress clutch pedal (16 Ill. 1) a second time (never use force), release clutch pedal slowly. Control speed within desired gear range with the throttle lever (9 Ill. 1). (Whilst driving, take your foot off the clutch pedal.

With the hydraulically assisted steering system, uncalculably high pressures might develop

a) if the permissible steering angle is not maintained
b) when passing over obstacles with high speed, or pushing away heavy objects with the drive wheels.

In such events, the steering system is bound to be overstressed and can be damaged.

Never let tractor run in unventilated space!

Carbon oxydes are scentless and invisible.

Driving on steep slopes

We draw your particular attention to the fact that driving on extremely steep slopes, whether in line with, or diagonally across the slope, is at your own risk!

Security can be increased by using Holder hub spacers, or Holder wheel ballast weights. Please ask your Holder dealer for advice.

Take particular care whilst using the tractor – set on narrow track, and with heavy implements attached – in uneven territory, specially when turning the machine downhill on slopes.

Should it happen that the machine has turned over under an extreme working condition, pay attention to the following:

An open inlet valve allows the oil of the air filter to enter the cylinder, blocking up the engine. This oil must be drained through the opening of the nozzle holder.

Stationary operation

For a lengthy stationary operation of the tractor, i.e. when using the P.T.O., for instance to drive a water pump, take care that the machine stands on level ground. We recommend to increase the oil level of the rear gearbox by approx. 2 ltrs.

3. Braking

The foot brake (24 Ill. 4) is used when the tractor is moving. Test the brakes for proper function before each use of the tractor. The brakes have the advantage of acting at any time uniformly on all four wheels. A slight outward turn of the hand ratchet lever (23 Ill. 4) releases the handbrake. When parking the tractor on a slope, use suitable chocks, turn the engine off, and shift the gear lever to a low gear.

When using the tractor with an attached trailer, pay attention to your local traffic and safety regulations.

Trailer lighting: Please pay attention to local traffic and safety requirements. Where rear reflectors, traffic, and brake lights, are required by law, a 7-pole plug DIN 72576, can be supplied.

Pay attention to your local traffic and safety regulations. Driving with attached trailers, specially drive axle trailers, or other trailed vehicles, is at your own risk.

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4. Diff-lock

The diff-lock rigidly locks the two front wheels, preventing either, of them from slipping. To operate the diff-lock, depress the diff-lock operation foot pedal (15 Ill. 1).

Attention! With the differential locked, i.e. with a rigidly locked pair of front wheels, the tractor must be steered straight ahead only.

5. Adjustment of the track width

To alter the track width, change over both pairs of wheels from right to left. Make sure that the arrow on the tyre always points forward. Fenders can be adjusted to altered track width. The tyre size must be the same for all four wheels. Ranges of adjustment see on page 41. Tyre pressure 1,5 bar (atm.). Check wheel nuts for tightness regularly, specially after having changed over the wheels. The steering angle must always remain as adjusted by the manufacturers.

Do not use larger tyre sizes for the following reasons:

a) The permissible speed must never be exceeded.
b) Sufficient distance between the tyres must remain at maximum steering angle.
c) Larger tyres will overstress the transmission.

Track widths (measured from wheel centre to wheel centre)

To avoid overstress of the bearing points, the max. track widths allowed from the works must never be exceeded.

A 30 max. track width = 1035 mm — wheel spacers type 092/1 (90 mm)
A 45 max. track width = 1030 mm — wheel spacers type 572 (55 mm)

6. Wheel ballast weights

A 30 — 30 kg for each wheel, front or rear
A 45 — 50 kg for each wheel, front or rear.

The weights must always be used in pairs. If ballast weights are used, water in the tyres, or other ballasts, are not allowed.

Filling the tyres with water

Water filling valve

The A 45 tractor has a water filling valve for standard equipment (not the A 30).

Filling in water (Ill. 17)

Jack up the tractor and turn the wheel till the air valve is on top. Remove the valve insert and screw the water filling valve into the hose valve. Connect the water hose, and let water flow in till it comes out on the little ventilation valve — L —. Then remove water filling valve, refit valve insert, and pump up the tyre to the prescribed pressure.

Draining the water from the tyres (Ill. 18)

Jack up the tractor, remove valve insert, and drain the water. To drain completely, fit combined valve, and pump up air. The air pressure will cause the last drop of water to come out of the ventilation tube. Then remove refit valve insert, and pump up tyre to required pressure.

Water filling in winter
When frost is expected, add an anti-freeze mixture to the water used for filling the tyres.

7. Hydraulic power lift
The hydraulic lift arms (63 Ill. 13) are actuated by means of hydraulic lever (11 Ill. 4) via the control valve. A forward push of the lever (‚Senken') will cause lowering, and a rearward pull (‚Heben'), will cause lifting, of the implements. In intermediate position, the implement is locked in instant height. At the bottom of the travel, the level is held, and the control valve in its working (floating) position. The hydraulic pump continuously working, the hydraulic lever must only be used for lifting or lowering the implements.

Caution: When driving the tractor on roads with implements attached, or when parking it unattended (even during working breaks), the implement should be secured with chain (62 Ill. 13). If the tractor is idle, or unattended, for any long period of time, implements should be principally lowered, to avoid accidents, and to save wear on the hydraulic cylinders. When using implements, always pay attention to the corresponding local traffic regulations!
The distributor (78 Ill. 5) has a throttle valve plate for standard equipment.

8. Stopping tractor
Let engine run idle, declutch, shift gear lever (13 Ill. 1) to neutral position „0". Put on hand brake.

9. Shutting engine off
Shift throttle lever (9 Ill. 1) forward to neutral. Pull cut-out lever (10 Ill. 1) till engine shuts off. Remove ignition key.

F) Service and Maintenance
(See also Service Chart on pages 58/59).

Always bear in mind:
Thorough service will pay! Oil changed in time and punctual lubrication are cheaper than repairs which become necessary due to negligance!

1. Engine

a) **Oil change** – for the first time after 20 operation hours, thereafter every 150 operation hours. Remove oil drain screw (A_1 Ill. 9 and 79 Ill. 9) with tractor standing on level ground. Drain oil (to do so engine should still be warm so that the old oil drains well). Clean oil drain screw and magneto plug. Replace change filter (44 Ill. 9), thereby the gasket must be flush.

Attention! With every engine oil change, fit a new change filter cartridge. Part No. of change filter cartridge 000 022 96 51 (M & H No. W 9.20).

Refit oil drain screw (A_1 Ill. 9) in oil sump, and oil drain screw (79 Ill. 9) in housing and tighten well. Only after this has been done, fill in fresh oil through the oil filler plug (35 Ill. 6) **(observe utmost cleanliness).** The ventilation filter of the oil filler plug (35 Ill. 6) must also be cleaned with every oil change. After the oil change, make a short trial run. Thereby, observe oil pressure indicator (22 Ill. 3). Check gasket of change filter cartridge. After this, check oil level with shut-off engine. Max. diprod mark (32 Ill. 7) can be exceeded by approx. 5 mm.

Oil filling quantities: (incl. change filter)
A 30 = 4,0 Ltr.
A 45 = 6,0 Ltr.

Use only scrupulously clean HD-B oil for diesel engines

below	–10° C	HD-B SAE 10
up to	+20° C	HD-B SAE 20
above	+20° C	HD-B SAE 30

Clean the ventilation filter of the fuel injection pump (33 Ill. 5) after every 150 hours of operation in diesel oil.

b) **Oilbath air filter:** Clean according to dust development, if necessary daily. Remove oil basin (57 Ill. 10) and wire gauze insert (56 Ill. 10), and clean in diesel fuel. Let wire gauze drip dry, and top-up to mark with fresh engine oil.
Clean cyclone. Pay attention to outlet port, (situated downwards.) Check, if necessary clean, inlet pipe of air filter.

c) **Cooling system:** Check cooling water level daily, possibly when engine is cold. Be careful if engine is still warm. Lift radiator cap (38 Ill. 6) carefully as far as stop, and let excess pressure escape. Only then remove radiator cap entirely. The cooling agent thermometer has a three-colour scale. **White:** sub-temperature of engine. **Green:** normal working temperature. **Red:** engine temperature too high – shut-off at once! Excessive cooling water temperature can have the following causes: dirty radiator, insufficient cooling water, defective water pump, thermostat not responding, V-belt slack or torn.

If frost is expected, add anti-freeze mixture, or have cooling water concentration checked.
Cleaning radiator: Remove insects and dust deposits by blowing through radiator fins from the engine side with compressed air.
Draining cooling water: Open drain screw (Aw III. 9) at the radiator bottom.
Open drain screw (45 III. 9) at the engine.

d) **V-belt:** The V-belt (49 III. 9) has the right tension, if you can press it down with your finger between the 2 V-belt pulleys of ventilator and dynamo (52 III. 9) by approx. 1 cm. To retighten the V-belt, slacken both screws (50 III. 9) on the adjustment shackle, as well as the two screws (51 III. 9) on the dynamo retainer. Then press dynamo outwards, till the V-belt has the right tension. Thereafter, retighten screws.

We recommend:

e) **Regulator of fuel injection pump** (43 III. 7) — after every 300 hours of operation, drain excessive oil on control plug (40 III. 7). Have fuel injection pump, injection nozzles, and regulator, checked by a Bosch service station after every 1500 service hours. Have oil in regulator renewed.

f) **After every 600 operation hours,** remove injection nozzles, clean and check with Bosch test device. Test pressure 175 atm. (bar.)

g) **Valve clearance** (Have valve clearance checked and adjusted by an expert only!)
After the first 20 operation hours, check valve clearance with a feeler gauge (warm and cold 0,25) thereafter — under normal working conditions — check valve clearance after every 300 service hours.

Adjustment of valve clearance:
The sequence of cylinders, as mentioned below, is as seen from the radiator side.
Direction of rotation of engine ‚clockwise' as viewed from the V-belt pulley of the crankshaft.

a) VD 2 (A 30)

Adjustment of cylinder I valves: right after the inlet valve of cylinder II has shut.
Adjustment of cylinder II valves: at the point of opening of cylinder I outlet valve.

b) VD 3 (A 45)

Adjustment of cylinder I valves: at the point of opening of cylinder III outlet valve.
Adjustment of cylinder II valves: at the point of opening of cylinder I outlet valve.
Adjustment of cylinder III valves: at the point of opening of cylinder II outlet valve.

The clearance between rocker arm and valve – on both, inlet and outlet valve – should „only just" allow the feeler gauge to be inserted. If the clearance proves to be either too narrow, or too wide, slacken counternut (70 Ill. 14) and readjust setscrew in a way, which will allow, with counternut retightened, the feeler gauge to be removed without resistance.

h) Mechanical steering

Check oil level after every 300 operation hours. Change oil after 1500 hours.
Check steering play and if necessary readjust. Have this job principally carried out by an accredited service Station.

i) ZF spindle-type hydromatic steering (standard in A 45, option in A 30).

The hydromatic steering assistance considerably reduces the force required for steering. Steering assistance responds only if the engine is running. Should the steering aid cease to function, the tractor can still be steered, but with increased force. (Oil change see under the heading „Front transmission".)
Check steering play and if necessary readjust. Have this job principally carried out by an accredited Service Station.

k) Ventilation („bleeding") of fuel system

The fuel system must be ventilated („bled") if:

a) fuel tank is empty
b) fuel pipes have been disconnected, or removed, i.e. if air has entered the pipes, or the intake chamber of the fuel injection pump (e.g. if fuel tank has been run dry).

Slacken the ventilation screw (42 Ill. 7) of the fuel injection pump. The fuel must come out without bubbles. Then tighten ventilation screw.

l) Replacing fuel filter

The fuel filter cannot be cleaned.

The fuel filter, built into the fuel tank (27 Ill. 5) must be replaced, depending on the degree of dirt, approx. after every 300 hours of operation.
As soon as the fuel filter has been removed, the valve in the fuel tank automatically prevents the fuel from entering the tank. After the fuel filter has been refitted, the fuel flow into the tank is resumed.

Fuel

It is absolutely essential, to use only high-grade fuel. Fuels corresponding with the German specification standards DIN 51601, or the British specification standards BS 2859: 1957 class A – high speed, will fulfill all requirements of a good fuel. The proportion of sulphur should not exceed 0,5 %.

Attention! To avoid trouble during the cold season, we recommend that you provide for winter fuels well in time. Your filling station will advise you.

m) **Battery maintenance** (37 Ill. 5)
Regular control and renewal of the acid level is of particular importance.
The liquid level must be 15 mm above upper edge. Use only distilled water for refilling. Check every 4 weeks, during the warm season every two weeks.
At this opportunity we recommend to also check tight fitting of battery and terminals. This is particularly important to obtain sufficient current for starting.
Avoid oxidation by thoroughly cleaning the terminals and by greasing them, particularly at the lower side, with acid-free battery grease.
An entirely charged battery is particularly important for starting in cold weather because then more energy is required than in warm seasons. If the tractor is used for short periods only, the charge via generator is insufficient and the battery must be charged with a charging unit now and then.

2. Transmission

a) Grease the lubrication nipples (S_K) of the universal cross after every 1500 operation hours. Grease all other lubrication nipples (S) after every 300 operation hours. Under unfavourable working conditions, and in tropical areas, lubrication should be effected in shorter intervals. To lubricate the universal crosses, the tractor must be in maximum steering angle to one side, and the position of the universal shaft must be so that the grease nipples are visible. Grease guns with spacer pieces, that permit to reach the nipples, are commercially available.

b) **Front gearbox** – (hydraulic oil supply tank).
Change oil for the first time after 150 hours, thereafter every 1500 operation hours. The front gearbox contains normally HD-B SAE 20 engine oil, in case of temperatures below 10° C, HD-B SAE 10 oil.
A 30 = 11,0 Ltr. + 1,0 Ltr. in hydraulic system (+ 2,0 Ltr. in hydromatic steering and hydraulic system).
A 45 = 7,0 Ltr. + 1,0 Ltr. in hydraulic system (+ 2,0 Ltr. in hydromatic steering and hydraulic system).
Drain screw (A_2 Ill. 11), sight glass (E_2 Ill. 4).

Tractors with hydromatic steering
Draining oil:

1. Press hydraulic lever (63 Ill. 13) of hydraulic power lift down as far as stop. Lever (11 Ill. 4) must be in position „S".
2. Open drain plug of steering, and turn steering wheel left and right to steering lock.
3. Drain oil on front transmission through drain screw (A_2 Ill. 11).

Refilling oil and ventilation:

1. Fill in oil on filler sight glass (E_2 Ill. 4). A 30 = 11,0 Ltr. – A 45 = 7,0 Ltr. HD-B SAE 10 or HD-B SAE 20 oil.
2. Start engine and let it run in idling speed. Turn steering wheel several times from right to left steering lock. Ventilation is effected through the ventilation filter in the front gearbox.
3. Refill with 2,0 Ltr. HD-B oil.
4. Lift and lower hydraulics several times under load.
5. Shut engine off. Lower hydraulics. Check oil level on filler sight glass (E_2 Ill. 4). The system has been correctly ventilated, if the oil level is visible at the mark of the filler sight glass. If necessary, top-up to mark.

c) Rear gearbox

Change oil for the first time after 300, thereafter every 1500 operation hours. The rear gearbox contains SAE 80 gear oil, A 30 = 9,25 Ltr., A 45 = 6,75 Ltr. If the tractor stands on level ground, the oil must at least be visible at the centre of the sight glass (K Ill. 4). Drain screw (A_3 Ill. 13). Filler screw (E_3 Ill. 1). If the tractor is used stationary for some period of time, e.g. for driving a water pump, we recommend to increase the oil level by approx. 2 litres, and to stand the machine on level ground.

d) Reduction gears: A 45

Check oil level on control plug (K Ill. 5 and Ill. 13). If necessary, top-up with SAE 80 gear oil.

3. Brakes, Clutch, Lighting system

Brakes, clutch and lighting system must be in full order at any time.

a) Brakes – Clutch

Check function before each use. Apply every week a few drops of oil to the clutch operating shaft, brake pedal bearings, etc.

b) Lighting

Have lighting system checked after every 150 operation hours by an expert. (See wiring diagramme Ill. 4a).

c) Resetting clutch

In the course of time, lost motion will be reduced owing to wear of the clutch plate linings, resp. increased through wear of the graphite seal. Lost motion of the clutch pedal must be regularly controlled and reset. At its press-fit, hold threaded part (71 Ill. 1) tight with a pair of pliers, and adjust lost motion to approx. 15–20 mm by turning the collar nut (72 Ill. 1). Lost motion of the clutch pedal is the way the pedal takes before a resistance can be felt.

Attention! Unnecessary sliding of the clutch will cause premature wear. Therefore, do not use the clutch pedal as a foot rest.

4. Washing the tractor

When washing the tractor down with water, disconnect battery terminals, or still better, remove battery entirely. Protect air filter opening, and fuel injection pump, from a direct contact with water.

G) Position of rear licence plate on four-wheel drive tractor

Traffic regulations in Germany prescribe for agricultural and forestry machines with a speed not exceeding 30 km/h a licence plate of the size 240 x 130 mm. In order to be correctly lighted by the licence plate lamp, the plate must be fitted to the tractor as shown on illustration No. 15.

H) Transporting persons

Traffic regulations in Germany prohibit the transporting of persons unless a suitable seat in provided. Please pay attention to your corresponding local regulations.

I) Holder three-point linkage for vertical lift — type 4001-3

The Holder implements of the AM 2 or AG 3 can be used in connection with A 30 and A 45 tractors, on the above linkage.

K) Holder Implement linkage for Cat. I standard three-point implements — Type 4001-7

Standard three-point implements, which have been tested and approved of by Messrs. Gebrüder Holder, can be used in connection with the three-point linkage type 4001-7. Your local agents or dealers will advise you to this respect.

L) How to value a tractor

A motorcar is generally valued according to driven kilometers and age. A tractor is best valued according to operation hours and age, with the following guiding principles:

1 operation hour	=	75 driven km
10 operation hours	=	750 driven km
250 operation hours	=	18750 driven km
500 operation hours	=	75000 driven km
1000 operation hours	=	75000 driven km
2000 operation hours	=	150000 driven km
2500 operation hours	=	187500 driven km.

M) List of recommended oils

The oils to be used with Holder diesel engines must be in conformity with the American Military Specification **MIL-L-2104 B.** The following oils correspond to the above mentioned specification and are recommended by us:

1. ARAL

ARAL diesel engine oil SAE 10 W	= SAE 10 W
ARAL diesel engine oil SAE 20 W/20	= SAE 20
ARAL diesel engine oil SAE 30	= SAE 30

2. BP

BP Vanellus-T-SAE 10	= SAE 10 W
BP Vanellus-T-SAE 20	= SAE 20
BP Vanellus-T-SAE 30	= SAE 30

3. ESSO

Essolube HDX SAE 10 W	= SAE 10 W
Essolube HDX SAE 20	= SAE 20
Essolube HDX SAE 30	= SAE 30

4. FINA

FINA Delta Motoroil SAE 10	= SAE 10 W
FINA Delta Motoroil SAE 20	= SAE 20
FINA Delta Motoroil SAE 30	= SAE 30

5. GASOLIN

GASOLIN HD SAE 10 W	= SAE 10 W
GASOLIN HD SAE 20-W-20	= SAE 20
GASOLIN HD SAE 30	= SAE 30

6. MOBIL-OIL

MOBIL Delvac Oil 1210	= SAE 10 W
MOBIL Delvac Oil 1220	= SAE 20
MOBIL Delvac Oil 1230	= SAE 30

7. SHELL

SHELL Rotella Oil S SAE 10 W	= SAE 10 W
SHELL Rotella Oil SAE 20 W/20	= SAE 20
SHELL Rotella Oil S SAE 30	= SAE 30

8. VALVOLINE

VALVOLINE Super HPO SAE 10	= SAE 10 W
VALVOLINE Super HPO SAE 20	= SAE 20
VALVOLINE Super HPO SAE 30	= SAE 30

9. VEEDOL

VEEDOL Engine oil (Heavy duty plus) HD 901 Special	= SAE 10 W
VEEDOL Engine oil (Heavy duty plus) HD 902 Special	= SAE 20
VEEDOL Engine oil (Heavy duty plus) HD 903 Special	= SAE 30

Our foreign agents are requested to check the oils they have so far recommended, and which are being used by Holder tractor owners, in the light of these instructions. This means, that the relevant mineral oil companies should be asked whether their recommended oils are in conformity with the American Military Specification **MIL-L-2104 B.**

N) Service chart

We recommend to have the following services carried out by an accredited Holder Workshop. (Customer liable for costs).

A	B	C	D
To be carried out by agent immediately upon receipt, and before taking tractor into service.	**When handing tractor over to client.** If possible, carry out all jobs, and give all explanations, in the presence of the tractor owner, or his authorised person, and the tractor driver.	**After every 8 to 10 operation hours (daily)**	**1st service** **After the first 20 operation hours**
1. Grease all lubrication nipples. 2. Check oil level in engine and gearbox. a) Engine: Optimum oil level upper diprod mark. HD-B oils. b) Rear gearbox: oil level centre of sight glass. SAE 80 gear oil. c) Front gearbox: Check oil level on filler sight glass! HD-B SAE 20 engine oil, for temperatures below -10^{o} C HD-B SAE 10. d) Reduction gears A 45: Check oil level on control plug. SAE 80 gear oil. e) Mechanical steering: Check oil level, SAE 80 gear oil. 3. Retighten wheel nuts. 4. Check oil level in air filter. If necessary top-up with engine oil. 5. Check cooling water level. If frost is expected, check cooling water concentration! 6. Check tyre pressure. 7. Trial run engine, check function of tractor and hydraulic system.	1. Check tractor for completeness. Check tools. 2. Instructions according to operation manual. 3. Before taking tractor into service, in the presence of client: a) Check oil level of engine, explain oil change. (Point out change filter.) Observe scrupulous cleanliness when filling in oil. b) Explain cooling system. In danger of frost, check cooling water concentration! c) Check V-belt tension. d) Rear and front transmission, show sight glass, resp. filler screw, and explain oil change. e) Reduction gears A 45, point out overflow control screw, and lubrication points. f) Show lubrication nipples, oil control screws, and lubrication points. g) Explain air filter and ventilation of fuel pipe. h) Check oil level of air filter, and explain cleaning. i) Mechanical steering; check oil level and show control plug. k) Point out to battery maintenance. l) Show steering stop bolts, and explain their function. 4. Check tyre pressure. 5. Check function of engine, gearbox, diff-lock, give practical demonstration of hydraulics. Point out to correct way of parking tractor – discharging hydraulics, lowering of implements (danger of accidents). 6. Check electrical system. Explain fuse box and battery maintenance. 7. Give practical field demonstration of purchased implements. 8. Explain maintenance of implements in accordance with operation manual. 9. Issue warranty file card, and return to Messrs. Gebrüder Holder. 10. Pay attention to your local traffic and safety regulations.	1. Check oil level of engine. (When driving on steep slopes, the oil level should reach the upper mark). 2. Depending on dust development, clean air filter and top-up with fresh engine oil. 3. a) Check cooling water level. b) If necessary, depending on operation conditions, check and clean, radiator fins. c) Check whether air intake rubber part of air filter is blocked.	**1. Change micro-mesh oil filter.** **2. Change oil in engine. Use only clean, branded HD-B oils for diesel engines. For temperatures below 10^{o}C HD-B SAE 10, from -10^{o} C up to $+20^{o}$ C HD-B SAE 20, above + 20^{o} C HD-B SAE 30.** **3. Check valve play (warm and cold 0,25)** **4. Retighten cylinder head screws once more with torque wrench set to break at 90 Nm (9 mkp).**

Attention: The engine is filled with running-in oil which must, under any circumstances, be changed after 20 hours of operation.

2nd Service	3rd Service	4th Service	5th Service
E	F	G	H
After every 150 operation hours. If possible, carry out all jobs, and give all explanations, in the presence of the owner, or his authorized person, and the tractor driver.	**After every 300 operations hours.** Latest 6 mon months after having handed tractor over to client. If possible, all jobs should be carried out, and all explanations given, in the presence of the tractor owner, or his authorized person, and the tractor driver.	**After every 600 hours, resp. annually.**	**After every 2500 operation hours (once a year).**
1. Engine a) Change micro-mesh oil filter. b) Change engine oil. c) Clean ventilation filter (sealing cover). d) If necesssry, clean oil filter, and top-up with fresh oil. e) Check V-belt tension. f) If necessary, blow through radiator fins with compressed air, from inside out. If frost is expected, check cooling water concentration! g) Clean ventilation filter of fuel injection pump. 2. Change gear oil for the first time, thereafter every 1500 operations hours. **Front gearbox:** A 30 = 11,0 Ltr. + 1,0 Ltr. in hydraulic system (+ 2,0 Ltr. in hydromatic steering and hydraulic system). A 45 = 7,0 Ltr. (+ 2,0 Ltr. in hydromatic steering and hydraulic system). HD-B SAE 20 engine oil, for temperatures below -10^{o} C HD-B SAE 10. 3. Grease all lubrication nipples. 4. Check complete electrical system, incl. battery. 5. Check clutch play, if necessary readjust. 6. Check brakes, if necessary readjust. 7. Retighten all screws, particularly check wheel nuts. 8. Check tyre pressure. 9. Trial run tractor and, if necessary, give another practical field demonstration of the implements.	1. Engine a) Check valve tolerance (0,25). (If necessary, replace cork seal of cylinder cap). b) Check oil level of fuel injection pump. 2. Replace fuel filter in tank (do not clean). 3. Change oil in gearbox for the first time, thereafter every 1500 operation hours. **Rear gearbox:** A 30 = 9,25 Ltr. A 45 = 6,75 Ltr. SAE 80 gear oil. 4. A 45: Check oil level of reduction gears (if necessary, top-up to filler screw — SAE 80 gear oil). 5. Steering a) Change oil in mechanical steering for the first time after 1500 operation hours. SAE 80 gear oil. b) Check steering play and stop bolts. 6. Fill in 3rd cheque.	Remove injection nozzles, clean and check with Bosch test device. Test pressure 175 bar (atm.).	1. Engine a) Check compression pressure (24 $\pm$ 2 bar). 2. Check engine clutch. 3. Have injection pump with regulator checked by a Bosch Service Station. Have oil in regulator housing renewed. 4. Change gear oil. a) Front gearbox: A 30 = 11,0 Ltr. + 1,0 Ltr. in hydraulic system (+ 2,0 Ltr. in hydraulic steering, and hydraulic system). A 45 = 7,0 Ltr. + 2,0 Ltr. in hydromatic steering and hydraulic system. HD-B SAE 20 engine oil, for temperatures below -10^{o} C HD-B SAE 10. b) Rear gearbox: A 30 = 9,25 Ltr. A 45 = 6,75 Ltr. SAE 80 gear oil. c) Reduction gears A 45: Check oil level. If necessary top-up with SAE 80 gear oil. 5. Steering: a) Oil change, SAE 80 gear oil Mechanical steering b) Check steering play c) Check according to manufacturers (ZF) instructions. 6. Check pivot axle bearing, and if necessary, replace. 7. Retighten all screws. 8. Remove fuel tank and rinse. Fit new filter.

Lubricating grease: The lubricating grease must neither contain resin, nor acid, or other detrimental compounds. „Stauffer" grease must not be used for lubrication. We recommend lithium-saponified multipurpose lubricating grease with a penetration quota of 260 to 290.

O) List of possible engine troubles

Troubles	Possible cause	Remedy
Engine does not spring to life.	Empty fuel tank	Refill fuel tank and ventilate fuel pipes
	Air in fuel injection system	Renew fuel filter
	Fuel filter clogged — in winter owing to separation of paraffin	Use winter fuel
	Leaking fuel pipes	Check all pipe connections for tightness, and retighten screw unions.
Engine proves difficult to start.	Battery capacity insufficient	Have battery checked.
	Battery terminals loose and oxidizing	Clean battery terminals, and apply vaseline-fr battery grease
	Starter turns too slowly.	
	In winter: engine oil too viscous	Use engine oil according to ambient temperat
	Fuel feed insufficient: fuel system blocked owing to paraffin separations.	Renew fuel filter. Check pipe connections for leaks, and tighten screw unions. In cold weatl use winter fuel.
	Coarse leakage of pistons and cylinder heads.	Have checked by a skilled mechanic.
Engine operates irregularly, and performs badly.	Insufficient fuel feed	Replace fuel filter, check pipe connections fo leaks, and tighten screw unions.
	Air filter system dirty.	Clean air filter system
	Relief valve of fuel injection pump not working correctly	Have checked by a skilled mechanic
	Required valve tolerance not in order	Have valve tolerance reset, have valve springs renewed
	Nozzle needles jammed	Have checked by an expert mechanic
Exhaust smokes excessively	Oil level in engine too high	Reduce oil level to upper diprod mark
	Oil level in oilbath air filter too high	Reduce oil level to mark
	Bad combustion owing to coked, or broken combustion rings, or incorrect valve tolerance	Have combustion rings and pistons checked by a skilled mechanic. Reset valve tolerance
	Incorrect injection timing	Have checked by an expert mechanic
	Air filter system dirty	Clean air filter system

Troubles	Possible cause	Remedy
Engine overheats	V-belt loose or torn	Check V-belt tension, renew V-belt
	Radiator fins blocked	Blow through radiator fins from inside out, with compressed air
	Thermostat defective	Replace thermostat
	Air filter dirty	Clean air filter
	Injection nozzles defective	Have checked by an expert mechanic
	Delivery of fuel injection pump not precisely adjusted	Have re-adjusted by an expert mechanic
Engine without oil pressure	Leaks in lubrication system	Check screw unions of oil pipes and of lubrication oil filter for leaks, and retighten
Oil pressure warning indicator lights up	Crankshaft bearings too much tolerance	Consult an accredited workshop
	Oil pressure warning indicator defective, or faulty electrical conductor	
Charging lamp lights up during operation	V-belt loose or torn	Check V-belt tension, renew V-belt
	Battery not charged by dynamo because same, or regulator switch, defective	Have checked by a skilled mechanic.
Charging lamp does not light up before starting	Bad cable connections	Tighten battery terminals
	Glower lamp defective	Check cable connections
	Battery discharged	Have battery checked.

Ill. No.	Description
1	Combined control instrument
2	Tractormeter
3	Ignition with ignition key
4	Warning light impulse transmittor
5	Glow starter
6	Glow starter switch
7	Socket
8	Horn button
9	Throttle lever
10	Cut-out rods
11	Hydraulic operation lever
12	P.T.O. operation lever
13	Gear selector lever
14	Selector lever (preselection)
15	Diff-lock foot pedal
16	Clutch pedal
17	Blinker light switch
18	Temperature indicator
19	Blinker pilot light / trailer
20	Blinker pilot light / tractor
21	Charging lamp
22	Oil pressure indicator
23	Hand brake
24	Foot brake pedal
25	Machine serial number
26	Type plate
27	Fuel tank
28	Tool box
30	Horn
31	Battery
32	Oil diprod
33	Ventilation filter (Fuel injection pump)
34	Set nut for brake adjustment
35	Oil filler plug
36	Cyclone preselector
37	Air intake rubber part
38	Radiator cap
39	Air filter
40	Overflow control screw
41	Tractormeter drive shaft
42	Ventilation screw — fuel injection pump
43	Fuel injection pump
44	Change-filter
45	Radiator drain screw (engine)
46	Oil pressure warning indicator switch
47	Engine serial number
48	Starter
49	V-belt
50	Screws for adjustment shackle (dynamo)
51	Screws for retaining shackle (dynamo)
52	Dynamo
53	Exhaust
54	Water pump
55	Thermostat
56	Oil reservoir of air filter
58	Set screw for brake adjustment
59	Adjustment screw for seat springing
60	Trailer socket
61	Trailer hitch with pistol-type grip
62	Guard chain
63	Hydraulic lifting lever
64	P.T.O. shaft
65	Adjustment spindle
66	Check chains
67	Three-chamber tail light
68	Licence plate light
69	Glow plug
70	Counter nut
71	Thread piece (clutch cable)
72	Collar nut
E_2	Filler sight glass (front gearbox)
E_3	Filler screw (rear gearbox)
A_1	Drain screw (engine)
A_2	Drain screw (front gearbox)
A_3	Drain screw (rear gearbox)
Aw	Drain screw (radiator)
K	Control plug (reduction gears) resp. sight glass (rear gearbox)
S	Lubrication nipples
a)	Fuse — blinker light
b)	Fuse — stop light switch
c)	Fuse — left parking light
d)	Fuse — right parking light
e)	Fuse — dimmed light left and right
f)	Fuse — warning light impulse transmittor
73	Temperature indicator
74	Blinker light
77	Connection rail
78	Distributor
79	Oil drain screw

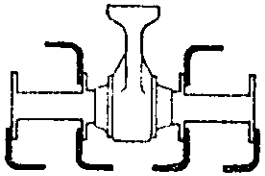
Implements for soil cultivation

P) Holder Rotary Hoes Model 4083.7-11

Thanks to the unit construction system, working width can be increased or reduced by interchanging the hoeing tines. For working underneath branches etc., the hoe shaft can be offset to the right. Changing from central to offset position is very quick and easy as the shaft assemblies are held in position by means of one sturdy long bolt. The hood, with two adjustable sideparts, can be adjusted for the relevant working width.

The diagramme below shows which parts are required for working widths of 80–100 and 125 cm, in-line, as well as 125 cm laterally offset.

Type 4083-7 80 cm (31")

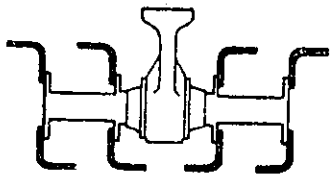


4-blade hoeing set
1 Inner hoeing tine ass., left
(4083 240 04 16) with
4 right and 2 left hoe blades
1 Inner hoeing tine ass., right
(4083 240 05 16) with
2 right and 4 left hoe blades

6-blade hoeing set
1 Inner hoeing tine ass., left
(4083 240 06 16) with
6 right and 3 left hoe blades
1 Inner hoeing tine ass., right
(4083 240 07 16) with
3 right and 6 left hoe blades

1 Long bolt 22 dia.
834 mm long
(4083 250 00 37)
1 Castle nut M 22 x 2
1 Tension plate
1 Split pin 5 x 40

Type 4083-8 100 cm (39")

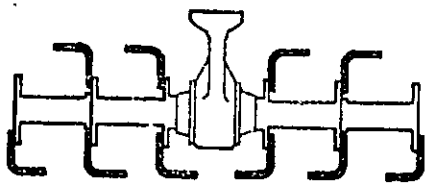


4-blade hoeing set
1 Inner hoeing tine ass., left
(4083 240 08 16) with
4 right and 4 left hoe blades
1 Inner hoeing tine ass., right
(4083 240 09 16) with
4 right and 4 left hoe blades

6-blade hoeing set
1 Inner hoeing tine ass., left
(4083 240 10 16) with
6 right and 6 left hoe blades
1 Inner hoeing tine ass., right
(4083 240 11 16) with
6 right and 6 left hoe blades

1 Long bolt 22 dia.
834 mm long
(4083 250 00 37)
1 Castle nut M 22 x 2
1 Tension plate
1 Split pin 5 x 40

Type 4083-9 125 cm (48")

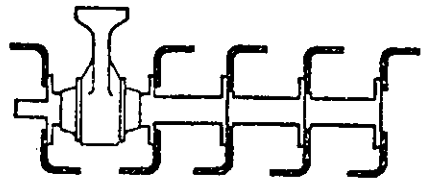


4-blade hoeing set
1 Inner hoeing tine ass., left
(4083 240 08 16) with
4 right and 4 left hoe blades
1 Inner hoeing tine ass., right
(4083 240 09 16) with
4 right and 4 left hoe blades
1 End hoeing tine ass., left
(4083 240 02 43)
with 2 right hoe blades
1 End hoeing tine ass., right
(4083 240 03 43)
with 2 left hoe blades

6-blade hoeing set
1 Inner hoeing tine ass., left
(4083 240 10 16) with
6 right and 6 left hoe blades
1 Inner hoeing tine ass., right
(4083 240 11 16) with
6 right and 6 left hoe blades
1 End hoeing tine ass., left
(4083 240 04 43)
with 3 right hoe blades
1 End hoeing tine ass., right
(4083 240 05 43)
with 3 left hoe blades

1 Long bolt 22 dia.
1310 mm long
(4083 250 01 37)
1 Castle nut M 22 x 2
1 Tension plate
1 Split pin 5 x 40

Type 4083-11 laterally offset



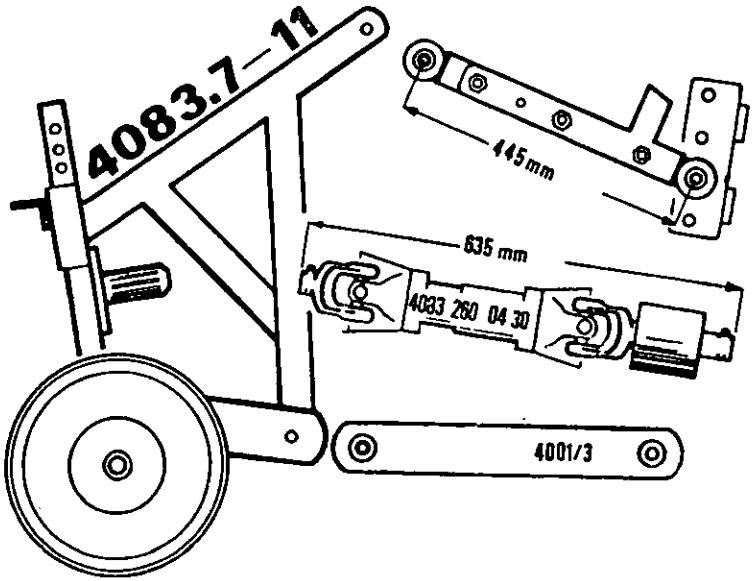
4-blade hoeing set
1 Inner hoeing tine ass., left short,
(4083 240 02 16) with
2 right and 2 left hoe blades
1 Inner hoeing tine ass., right
(4083 240 09 16) with
4 right and 4 left hoe blades
2 Outer hoeing tine ass., right
(4083 240 03 17) with
2 each right and 2 hoe blades

6-blade hoeing set
1 Inner hoeing tine ass., left short,
(4083 240 03 16) with
3 right and 3 left hoe blades
1 Inner hoeing tine ass., right
(4083 240 11 16) with
6 right and 6 left hoe blades
2 Outer hoeing tine ass., right
(4083 240 05 17) with
3 each right and 3 left hoe
blades

1 Long bolt 22 dia.
1172 mm long
(4083 250 02 37)
1 Castle nut M 22 x 2
1 Tension plate
1 Split pin 5 x 40

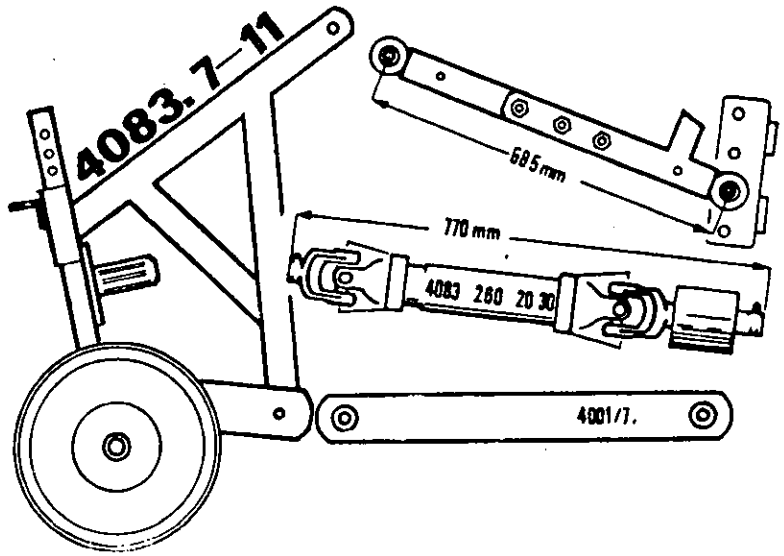
Attachment of Rotary Cultivator type 4083.7-11 on A 30 / A 45 in connection with special-type three-point linkage 4001-3 (for vertical lift). The upper linkage arm must have a length of 445 mm, and the universal shaft must be 635 mm long.

Universal shaft part No. 4083 260 04 30



Attachment of Rotary Cultivator type 4083.7-11 on A 30 / A 45 in connection with Cat. I three-point linkage 4001-7. The upper linkage arm must have a length of 585 mm, and the universal shaft must be 770 mm long.

Universal shaft part No. 4083 260 20 30



Installation of rotary hoe on tractor:

Fit top link arm in third hole (counted from top) of mounting bracket. This position of top link arm is the same for all combinations. See Ill. 21.

Lower hydraulics. Fit both lower link arms and secure with locking pins. Take care that both lower link arms have the same height! Where necessary adjust connecting link.

Connect upper link arm to linkage frame of rotary hoe, using the hydraulic lift to raise hoe may assist.

Note: When fitting telescopic universal shaft with safety clutch, care should be taken to see that the safety clutch is fitted to the tractor P.T.O. shaft!

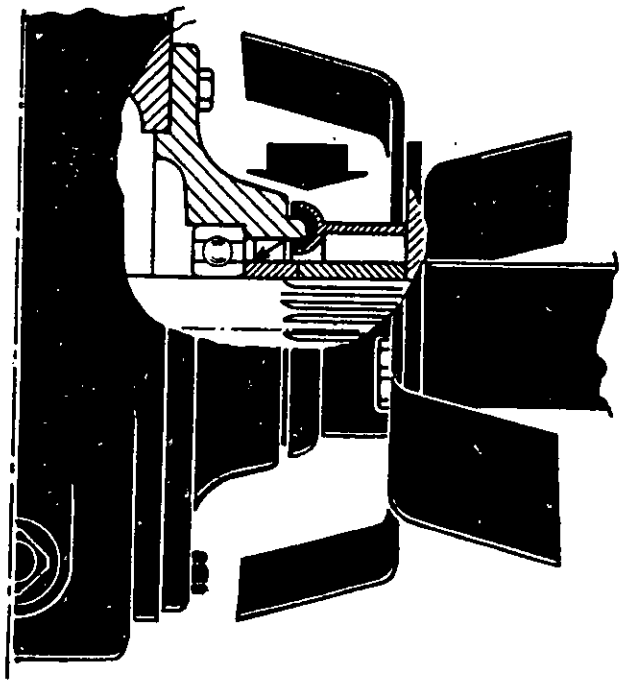
Place guard chain across strut of suspension frame, and secure, but not tightly, or it will break!
Before fitting the standard telescopic universal shaft, check position of journals.

Attention! Journals must lie in the same parallel position, as shown on Ill. 22, and transfer picture cn end guard of universal shaft.
Any other position, e.g. as shown in lower part of Ill. 22, is bound to result in a broken universal shaft!

Adjust check chains on lower link arms to give the hoe a lateral play of approx. 5 cm.

Taking rotary hoe into operation:

Depth is adjusted by means of the two depth control wheels. Recesses in both wheel adjusting beams guarantee an even height adjustment.
Adjust depth according to work required and soil conditions, i.e. safety clutch should only respond when meeting heavy obstacles, such as large stones, tree stubs, roots etc.



The rotary hoe is lowered and lifted through the hydraulics from driver seat. Do not engage P.T.O. drive before hoe is completely lowered. Disengage P.T.O. drive before lifting hoe.

Driving speed depends on desired tilth of the soil. We recommend:
1st speed for fine tilth
2nd speed for coarse tilth and high performance in large areas.

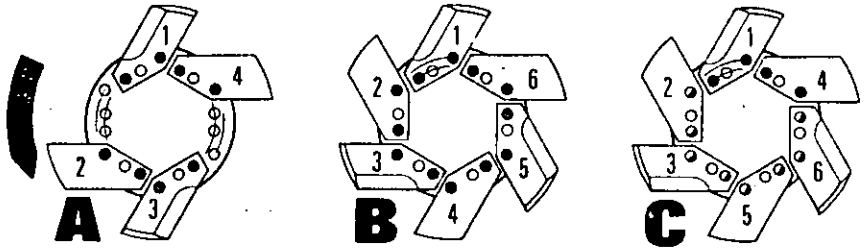
The hoe shaft assemblies are held together with a long bolt. Each assembly consists of 4 or 6 hoe blades and carrier plates and shaft which connects to the next shaft assembly.

Keep the carrier plate free from dirt so that the driving plate lies flush against it. The flange of every inner hoeing tine has a safety ring to protect the seals of the gearbox. Clean this safety ring every 100 to 150 operation hours, and fill it with grease. In sandy soils, check the ring earlier. After the first 20 operation hours, check all screw unions for tightness, and, if necessary, readjust. Repeat this prcedure regularly from time to time.

Change-over from 4-blade to 6-blade hoeing tine

For coarse tilth, we recommend 4-blade hoeing tines, whilst, to obtain a fine tilth, the use of 6-blade hoeing tines is more advantageous. The special design of the flange (round-shaped), allows without difficulties, the change-over from a 4-blade to a 6-blade hoeing tine ass. Assembly of the hoeing tines is shown on III. A – B – C.

III. A = 4-blade hoeing tine ass., III B = 6-blade hoeing tine ass., III. C = changed over from 4 to 6 blades.



III. A and C show that blades one and four remain in the same position on the flange, whilst blades 2 and 3 have been displaced by one section.

Blades 5 + 6 have been added.

Note: The rear bore of the first blade must be fitted in a way to match a bore on the larger hole circle. If this is observed, the further arrangement will show itself almost automatically.

Service and maintenance:

A regular service pays as it saves time and unnecessary costs. Observe our operation, maintenance, and service instructions, and your implement will be ready for use at any time, and give a longer service life.

The telescopic universal shaft is subject to high stress and must be carefully serviced.

Observe the following points carefully! (III. 23)

1. Grease locking pins every time before taking hoe into operation.
2. Grease journals after 8–10 operation hours (daily). If the rotary hoe is not constantly used, it must be lubricated once a week. Operate grease gun until grease comes out at journal seals. Use ball bearing grease.

3. Grease ball bearings of end guards after 8–10 operating hours (daily).
4. If implement is under high stress, and exposed to dirt, clean and grease end guards after 8–10 operating hours (daily).
5. Lubricate profile of square shaft inside end guard after 8–10 operating hours (daily).
6. The safety clutch is adjusted to a torque of 800 Nm (80 kpm). Readjustment of the clutch to this torque should be left to an accredited workshop. For lubrication use SAE 80 gear oil. Check oil level after every 200–250 operation hours. If necessary top-up, with the telescopic universal shaft in a vertical position. Secure screw cap with a wire.

Hoeing tines:
The cutting edges of the hoeing tines must always point in driving direction. Replace damaged or worn hoe blades. Take care that driving plates and carrier plates of adjacent hoeing tools fit exactly into each other. If the carrier plate is dirty, the hoe shaft assemblies cannot be held properly together with the long bolt. Insert the bolt through hoe shaft from the right – as viewed from driving direction – this prevents slackening of the bolt nut. Tighten bolt nut well with special spanner supplied with hoe, and check from time to time for tightness. Secure nut with split pin.

Lubrication of transmission:
The gearbox of the rotary hoe contains approx. 2 Ltr. of SAE 80 gear oil. The oil level is checked with the dipstick. In horizontal position of hoe, oil should be between top and bottom dipstick mark.

Change oil for the first time after 10 operating hours, then after every 450–500 operating hours.

The **depth control wheels** of the rotary hoe run in a plastic bush. In spite of this, they will run smoother when a grease gun is regularly applied to the nipples on the hubs.

Q) Holder Two-bottom plough type 4007-1

Attention: Ploughing only permissible with tractor set on narrow track, A 30 = 855 mm, A 45 = 920 mm track width.

a) **Installation on tractor** (see Ill. 24) for steep vertical lift (approx. 70°)
The Holder two-bottom plough is attached to the Holder three-point linkage type 4001-3 of the tractor. Fit top link bracket (100) to the two bottom holes with U-bolt (101) so that the arm points diagonally

downwards. Secure U-bolt (101) with locking pin (102). Fit hitch mounting bracket (103) to the two top bores. The hitch mounting bracket (103) limits the lift of the plough. Attach lower linkage arms (104) to the hitch pins on either side of the plough and secure with the locking pins (105). Attach top link (106) to plough and secure with locking pin (107).
The same instructions apply for use of the Holder reversible plough type 4503-1 in connection with the implement linkage type 4001-1.

b) Vertical lift (90°)

In case of 90° lift of the plough, the hitch mounting bracket (103) must be removed.
Attention – Caution! – in maximum raised position, the plough can swing toward the driver's back.

c) Ploughing

The best ploughing job is achieved with a plough body that has been „polished by use". From the factory, the plough has a protective coating of paint which should be removed from the cutting edges, particularly when ploughing in wet ground. Once the plough has been „polished by use", we recommend protecting it from corrosion with a rust preventive, oil or grease.
When ploughing heavily overgrown soil, or when ploughing manure into the soil, either the disc coulter type 415-1, or the manure under-furrow distributor, type 314, can be attached. When using the under-furrow manure distributor, the knife coulter remains on the plough. This ensures an accurate furrow edge.
The ploughing depth can be controlled with the top link (106).

The vertical position or „tilt" of the plough bodies is controlled with the adjustable connecting arm (108). After the first furrow has been made, the right hand front and rear tractor wheels run inside the furrow. Therefore, the lateral axis of the machine is tilted according to ploughing depth. The position of the plough must be consequently corrected so that the plough bodies are level.

As mentioned, ploughing depth is adjusted with the top link arm (106). After the first or second furrows have been made, the desired ploughing depth can be maintained by the control wheel which should be adjusted so that under normal ploughing conditions it causes only slight pressure on the ground.

When ploughing, the hydraulic lift must be in floating position, i.e. the hydraulic lever must be in position „S" (Ill. 4). We recommend using plough weight type 044-4 on the rear plough body (see Ill. 25) in order to achieve a quicker and better „bite" into the soil at the beginning of a furrow, in dry and hard, or in heavy and overgrown soil.

The „cutting position" of the plough is better when using a plough weight, as this helps to maintain the parallel position of the plough frame to the surface of the soil.
When the plough is in the ground, do not turn the tractor more than allowed by the play in the three-point linkage. Otherwise, the linkage arms will bend out of shape, or fracture.

Prevention of accidents:
When interrupting work for any length of time, lower the implement (plough – implement carrier frame etc.) to the ground. For transport, secure the locking chain to bolt (111). When fitting the chain, take care that the implement has only little play.

R) Posthole Digger – Make „Klein", Pfeddersheim

Description and application:
Thanks to the availability of different auger sizes, the unit can be used for a number of digging jobs. Recommended for posthole digging in forestry, vineyards and orchards. The digger arm swings out to the side to allow corrections to the line of holes. The digger arm can be locked for one-man operation. The telescopic universal shaft has a safety clutch.

Installation on tractor (see Ill. 26)
Three-point linkage (lower linkarm, draw rods) must be dismantled.
1. Fit frame of digger (130) with U-bolt (131) in two bottom bores of vertical mounting bracket and secure U-bolt with locking pin.
2. Tighten screw (132). Slacken two screws (133) as far as stop and secure with lock nut.
3. Press locking plate (134) backwards and slide telescopic universal shaft on tractor P.T.O. shaft till it locks on the pin. Fix guard ring with chain (135).
4. Fit lifting chains (136) to hydraulic arms with pins (137).
5. Attach auger and secure with screw (140).
6. Adjust lifting chains by means of pin (137).

Attention:
The tip of the auger should not be lifted more than 20 cm. Leave lifting chains as long as possible, otherwise there is risk of damage to the telescopic universal shafts.

Technical data:

Auger sizes: 110 – 160 – 240 – 350 – 400 mm
Speed of auger: 180 rpm

Length/width/height (without auger): 175/45/75 cm
Oil filling of gearbox: 0,3 Ltr. SAE 80 gear oil.

Adjustment: (See Ill. 27 and 28)

1. Adjust set screw (141). The digger must have a rearward inclination of 5^{o}–10^{o}. Vertical digging will require resetting according to soil condition.
2. Adjust limit stop arm (142) according to desired depth.
3. For one man operation lock the digger arm (143) by means of pin (138). If the operator has an assistant, the lateral direction of digging can be corrected with arm (144).
4. On sloping ground, tilt can be corrected by means of screws (150).

Operation:

Engage P.T.O. and adjust engine revs according to soil conditions. Lower hydraulics. The auger penetrates the soil, is supported by the limit stop arm (142), and works itself clear in the process of digging.

Attention:

Do not raise unit before limit stop arm (142) rests on ground, and auger has worked itself clear.

Prevention of accidents:

Keep clear of working radius of digger.
When interrupting work lower digger to the ground. When cleaning auger shut-off engine and P.T.O. For transport lace auger in guard sleeve (145).

Service and maintenance (See Ill. 28)

Daily, or after 8–10 operation hours:
Grease telescopic universal shaft (grease nipple S).

After 200–250 operation hours:
Check oil level on oil control plug (K), and if necessary top-up.

For the first time after 450–500 operation hours, then every 2500 operation hours:
Change oil in gearbox: 0,3 Ltr. SAE 80 gear oil.

Basic implement carrier frame with hydraulic adjustment of width, and hydraulically operated inter-row cultivator.

Assembling control block

a) Assemble control block (201 Ill. 29) with bracket on safety frame. Remove angle screw union (202 Ill. 30), and connect pressure pipe (203 Ill. 29) of tractor hydraulics with pressure hose (204 Ill. 29) of the Clemens control block. Also connect the return flow hose (205 Ill. 29) of the Clemens control block with the feed pipe (206 Ill. 29) leading to the tractor control valve.
When assembling the hydraulic parts, take utmost care that no foreign matter will enter the system.

Attachment of implement carrier frame to Holder special-type three-point linkage for steep vertical lift, type 4001-3.

Fit limit stop (226 Ill. 33) of vertical lift, together with the top link bracket – pointing diagonally downwards – (211 Ill. 31) in the two lower bores of the attachment plate (228 Ill. 33).
In order to guarantee a secure lift – even of dirty implements – under any condition of operation, the lower linkage arm (215 Ill. 32) has been provided with a second bore for the righthand, resp. lefthand connecting links. Where that bore is not available, it can be locally drilled (Ill. 39).

For shallow cultivation jobs (in summer), fit the link pins (216 Ill. 32) pointing inwards in the lower bore.

For jobs, which require an increased working depth, fit the link pins (216 Ill. 32) pointing inwards in the centre bore. Connect lower link arms with link pins (216 Ill. 32) and secure with locking pin.

The joint bar (213 Ill. 31) for the upper linkage arm must, in the notched segment, be inclined towards the tractor by two notches out of vertical position. With the joint bar in that position, also connect upper linkage arm (212 Ill. 31) to it.

Attachment of implement carrier frame to Standard Cat. I Three-point Linkage Type 4001-7

For attachment of the implement carrier frame to the Cat. I standard three-point linkage 4001-7, the joint bar size 1 (213 Ill. 31), originally fitted to the frame, must be replaced by joint bar size 2. And the link pins (216 Ill. 32) must be fitted pointing outwards.

The top link bracket (250 Ill. 37) of the attachment plate (228 Ill. 37) must be fitted in the two lower bores. Connect upper linkage arm (249) with top link bracket as shown on Ill. 37.

Clean instant coupling I—IV and fit it to the control block (201 Ill. 33).
Pay attention to colour marks.

I = for inter-row cultivator (ZG) red (pressure)
II = for inter-row cultivator (ZG) green (return flow)
III = for width adjustment device (BV) blue
IV = for width adjustment device (BV)

Ventilation („bleeding") must be carried out with running engine.

1. Move control lever ZG (207 Ill. 29) to operation position, simultaneously operating the feeler of the inter-row cultivator (232 Ill. 34) several times.
2. Also operate the control lever BV (208 Ill. 29) several times, i.e. till the entire system is filled with hydraulic oil.

Thereafter, check hydraulic oil level and, if necessary, top-up to mark (E_2 Ill. 4) with hydraulic oil HD-B-SAE 20.

The basic implement carrier frame takes up the different working tools as illustrated and described in our implement list of four-wheel drive tractors.

Instructions for adjustment

Care must be taken to always position basic frame with working tools parallel to the surface of the ground.

By means of their fixtures (235 Ill. 34), each tool can be individually adjusted. The working depth is infinitely variable by means of the clamp (219 Ill. 30) of the depth adjustment wheels. The cutting angle of the unit can be controlled with the upper linkage arm (212 Ill. 31).

Control device for reciprocating motion securing uniform depth guidance in the soil, independent of the tractor's movements.
Lever (229 Ill. 33) in medium position **(working without control of reciprocating motion).** Slacken stop lever (220 Ill. 32) and pull it rearwards. The implement frame must swing around axis (221 Ill. 32). **(Working with control of reciprocating motion).**

Lever (229 Ill. 33) further permits on click-stop device (230 Ill. 33) an additional adjustment of the lateral slope inclination. For this purpose, the depth adjustment wheels must be fitted on the head piece (217 Ill. 33).

The depth adjustment wheels can either be fitted on the rigid section (217 Ill. 32), or on the adjustable section (218 Ill. 32) of the frame. Also, the depth adjustment wheels can be turned through 180° on their haft (wheel inside or outside).

Changing the complete assembly of the depth adjustment wheel over from left to right, or vice versa (in driving direction), will result in a forward motion of the wheel.

From the factory, the depth adjustment wheel is mounted with a trailing effect (Ill. 32).

When using the plough beams No. 865-082 19 and 865-092 19 (for summer jobs), adjustment must be made according to points a) and b) „Feeler adjustment on the inter-row cultivator".

Feeler adjustment on the inter-row cultivator

a) Working on level ground

The distance between plough share (234 Ill. 34) and feeler (232 Ill. 34) should, according to experience, be 15 cm, whereby the tension frame (247 Ill. 36) is in centre position on the rail (248 Ill. 36). In this position, the feeler (232 Ill. 34) is entirely retraced. The safety distance can be varied by means of the screw (241 Ill. 55). The elasticity of the spring (245 Ill. 35) must always be greater than that of spring (243 Ill.35).

b) Working on sloping territory

Depending on the degree of the slope, the tension frame (248 Ill. 36) must be more or less displaced forwards from its centre position on the rail (248 Ill. 36). To do so, slacken screw (246 Ill. 36). Slacken the screw (233 Ill. 34) for pulling the feeler (232 Ill. 34) into a linear position in order to prevent the share from swinging out prematurely. By means of screw (242 Ill. 35) adjust the height of the feeler (ideal position 50 mm above ground level). The shearing pin (236 Ill. 34) is an overload safety device.

Fitting of a rope in loop (231 Ill. 34) permits the feeler to be controlled from the driver seat which is advantageous when reversing, or when driving along borders.

Operation

Operation of inter-row cultivator ZG

Move control lever (207 Ill. 29) to operation position (click-stop).

Operation of width adjustment device (BV)
Move control lever (208 Ill. 29) to desired direction. The lever will automatically return to „0" (neutral) position.

Using the tractor without hydraulically controlled inter-row cultivator
Protect the coupling sleeves of the control block from dirt by fitting the supplied sealing plugs. Before moving the control lever (207 Ill. 29) to operation position, it must be brought into „0" (neutral) position (free flow).

Maintenance
Occasionally renew grease in angular joint (224 Ill. 35). Depending on prevailing operation conditions, lubricate, resp. oil, grease nipples (S) and all moving bearings.

To secure implement in transport position, fit the safety chain to bolt (227 Ill. 33) in a way that leaves the implement only a slight play.

Pivot-axle reinforcement type 5046 (for A 45 only)

General: The pivot-axle reinforcement must be principally installed if front-mounted implements are attached to the tractor. Up to machine serial No. 3 50 131, fitting of the pulley ass. (251 Ill. 36) requires two additional thread bores (M 12) to be drilled in the connection housing as shown on Ill. 40.

Assembly
a) Remove cover plate. Assemble pulley ass. (251 Ill. 36) from below on the connection housing of the tractor. Place spacer plate (252 Ill. 36), shims 14,5 x Ø 29 x 5 between pulley ass. (251 Ill. 36) and connection housing (253 Ill. 36) and tighten with hexagon screws M 14 x 45 (254 Ill. 36). and M 12 x 35 (255 Ill. 36). **(Attention!** place shims in countersinking of connection housing)!

b) Screw support plate ass. (256 Ill. 36) to intermediate housing (257 Ill. 36). Screw roll-off pressure plate (259 Ill. 36) onto support plate. Place shims (260 Ill. 36) as required, till pulley bears on roll-off pressure plate without tolerance. Under hard operating conditions, occasionally examine pivot-axle reinforcement and, if necessary, adjust tolerance between pulley and roll-off pressure plate.

Knickpunktverstärkung Type 5046 (nur für A 45)

Allgemeines: Grundsätzlich muß beim Anbau von Frontgeräten die Knickpunktverstärkung angebaut werden.
Bis Masch.-Nr. A45 3 50 131 sind zum Anbau der Zsb. Rolle (251 Abb. 3) am Anschlußgehäuse zwei zusätzliche Gewindebohrungen M 12 nach Abb. 1 anzubringen.
Ab Maschine A 45 ca. 3 51 746 ist das Zwischengehäuse geändert. Beim Anbau der Zsb. Stützplatte aus der bisherigen Fertigung muß diese nach Abb. abgeändert werden. D. h. in die linke senkrechte Lasche in einem Abstand von 43,5 mm eine Bohrung Ø 13 bohren. Lasche auf 130 mm kürzen. (Abb. 2).
Die Befestigung der Stützplatte am Zwischengehäuse wird dadurch an der abgeänderten Lasche mit 1 Sechskantschraube M12x30 vorgenommen.

Anbau

a) Abdeckblech abschrauben. Zsb. Rolle (251 Abb. 3) von unten an das Anschlußgehäuse des Schleppers montieren. Zwischenplatte (252 Abb. 3), Distanzscheiben 14,5 x Ø29 x 5 zwischen Zsb. Rolle (251 Abb. 3) und Anschlußgehäuse (253 Abb.3) einfügen und mit Sechskantschrauben M14x45 (254 Abb. 3) und M12x35 (255 Abb. 3) anschrauben. (**Achtung!** Distanzscheiben in der Ansenkung am Anschlußgehäuse einlegen).

b) Zsb. Stützplatte (256 Abb. 3) am Zwischengehäuse (257 Abb. 3) mit Sechskantschrauben M12x30 (258 Abb.3) anschrauben. Abrolldruckplatte (259 Abb. 3) an Zsb. Stützplatte anschrauben. Beilegbleche (260 Abb. 3) nach Bedarf beilegen, bis Rolle spielfrei an der Abrolldruckplatte anliegt. Bei schwerem Einatz von Zeit zu Zeit Knickpunktverstärkung auf vorhandenes Spiel zwischen Rolle und Abrolldruckplatte überprüfen und evtl. nachstellen.

Abb. 4 zeigt die Knickpunktverstärkung angebaut am A45 mit ~~hydraulischer~~ hydrostatischer Lenkung.

Pivot-axle reinforcement type 5046 (for A 45 only)

General: The pivot-axle reinforcement must be principally installed if front-mounted implements are attached to the tractor. Up to machine serial A45 No. 3 50 131, fitting of the pulley ass. (251 Ill. 3) requires two additional thread bores (M 12) to be drilled in the connection housing as shown on Ill. 1.
Starting with A 45 serial No. 3 51 746, the intermediate housing has been modified. When assembling the former support plate, this must be changed as illustrated, i.e. a bore of 13 mm dia. must be drilled at a distance of 43,5 mm into the left vertical shackle. Shorten the shackle to a length of 130 mm (Ill. 2.) Consequently, the support plate is fitted to the intermediate housing on the modified shackle by means of an hexagon screw M 13 x 30.

Assembly

a) Remove cover plate. Assemble pulley ass. (251 Ill. 3) from below on the connection housing of the tractor. Place spacer plate (252 Ill. 3), shims 14,5 x Ø29 x 5 between pulley ass. (251 Ill. 3) and connection housing (253 Ill. 3) and tighten with hexagon screws M 14 x 45 (254 Ill. 3) and M 13 x 35 (255 Ill. 3).
(**Attention!** place shims in countersinking of connection housing)!

b) Screw support plate ass. (256 Ill. 3) to intermediate housing (257 Ill. 3). Screw roll-off pressure plate (259 Ill. 3) onto support plate. Place shims (260 Ill. 3) as required, till pulley bears on roll-off pressure plate without tolerance. Under hard operating conditions, occasionally examine pivot-axle reinforcement and, if necessary, adjust tolerance between pulley and roll-off pressure plate. Ill. 4 shows the pivot axle reinforcement as assembled on the A 45 with hydrostatio steering.

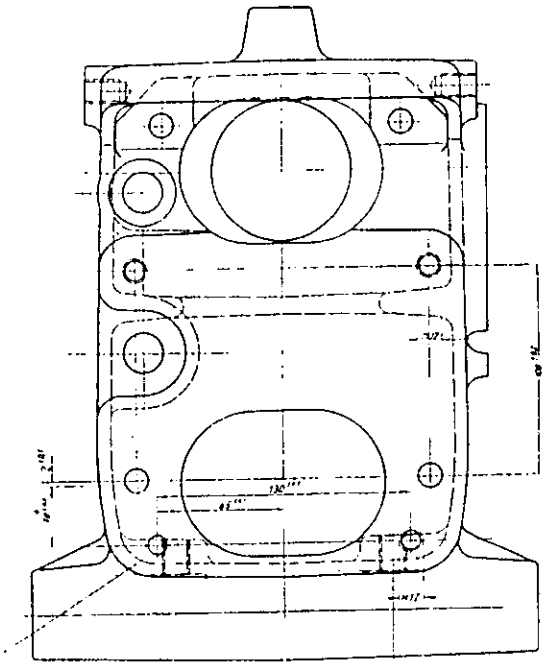


Abb. 1

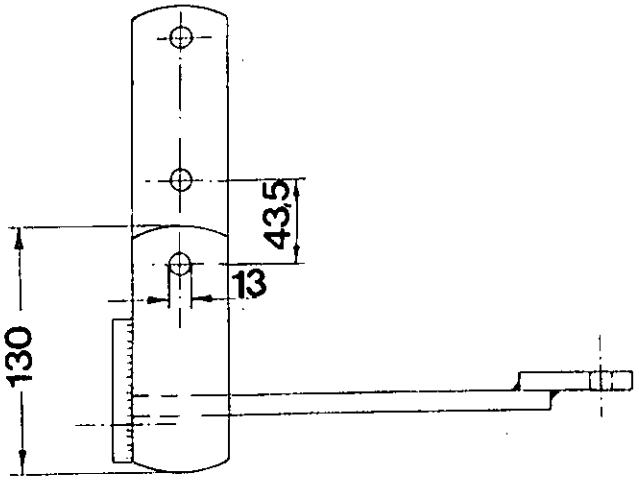


Abb. 2

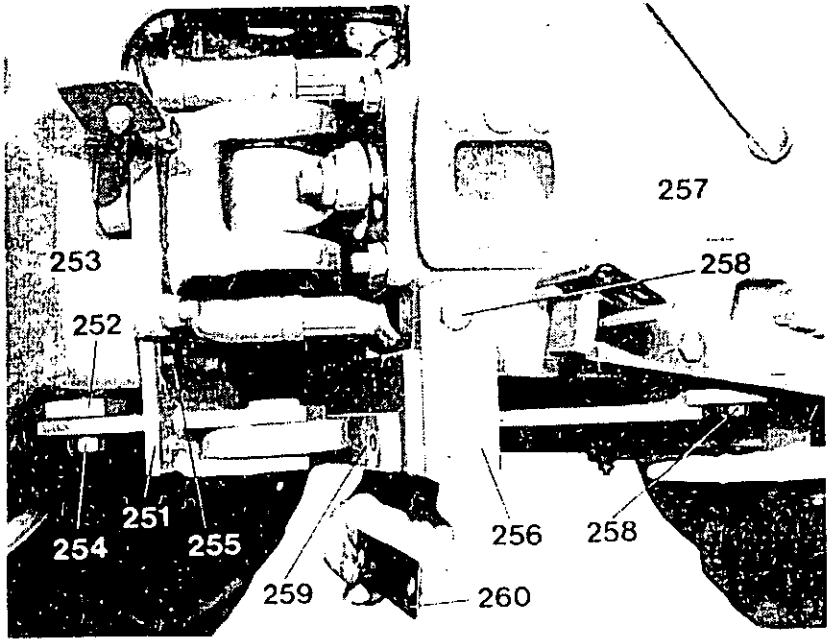


Abb. 3 Ab A45 ca. 3 51 746

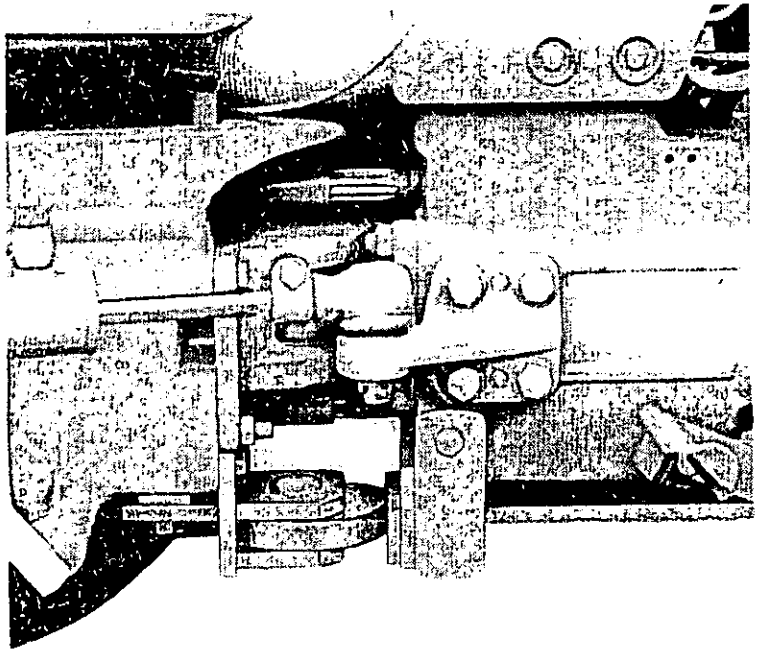


Abb. 4

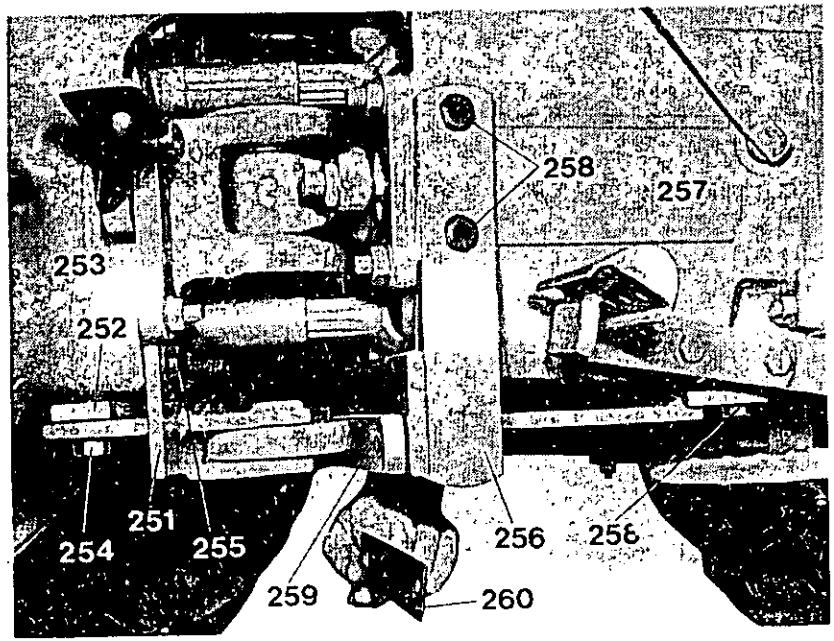


Abb. 5 Bis A45 ca. 3 51 745

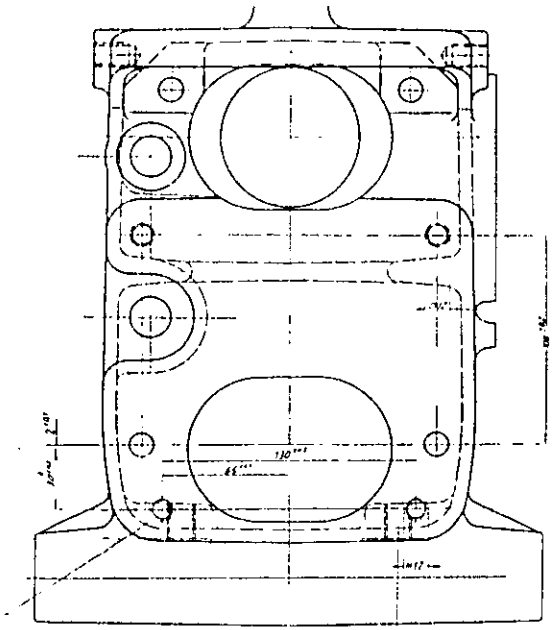
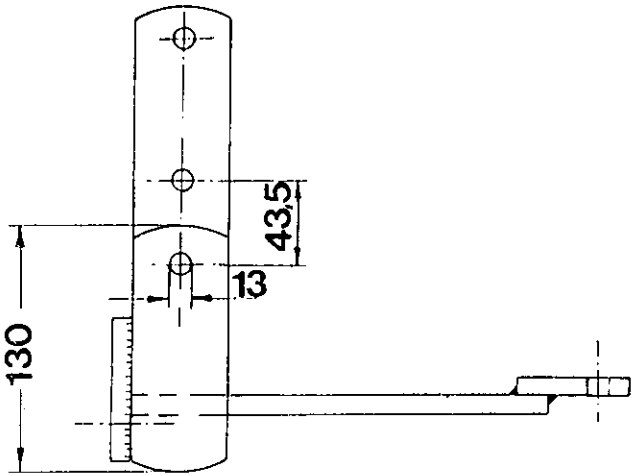


Abb. 1



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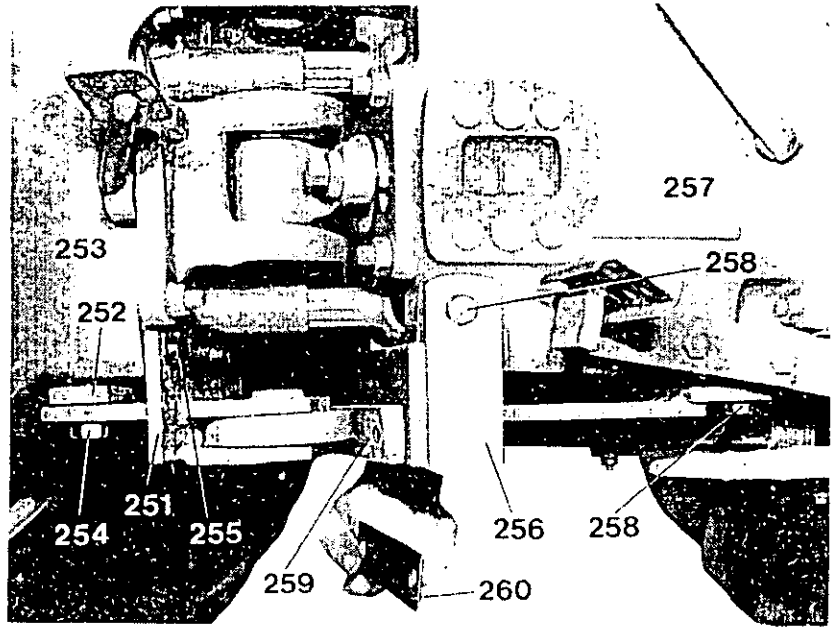


Abb. 3 Ab A45 ca. 3 51 746

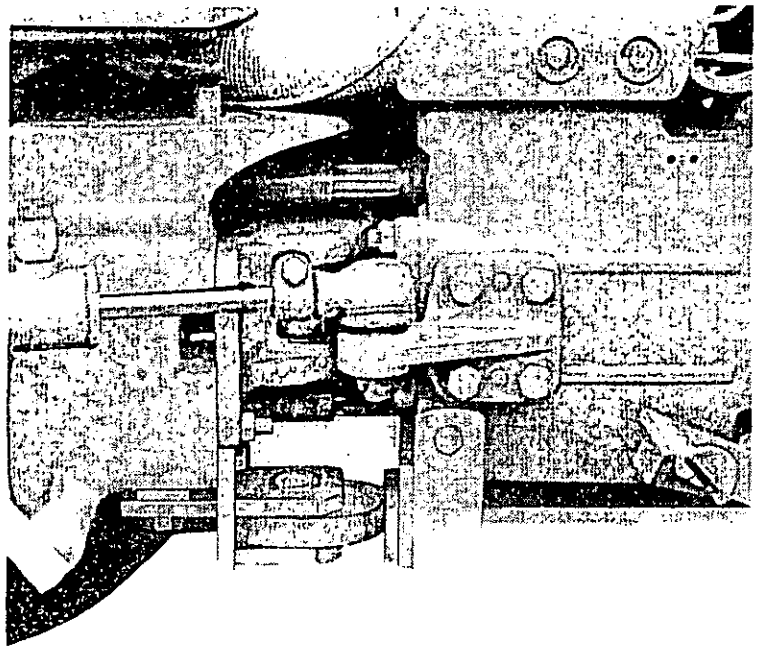


Abb. 4

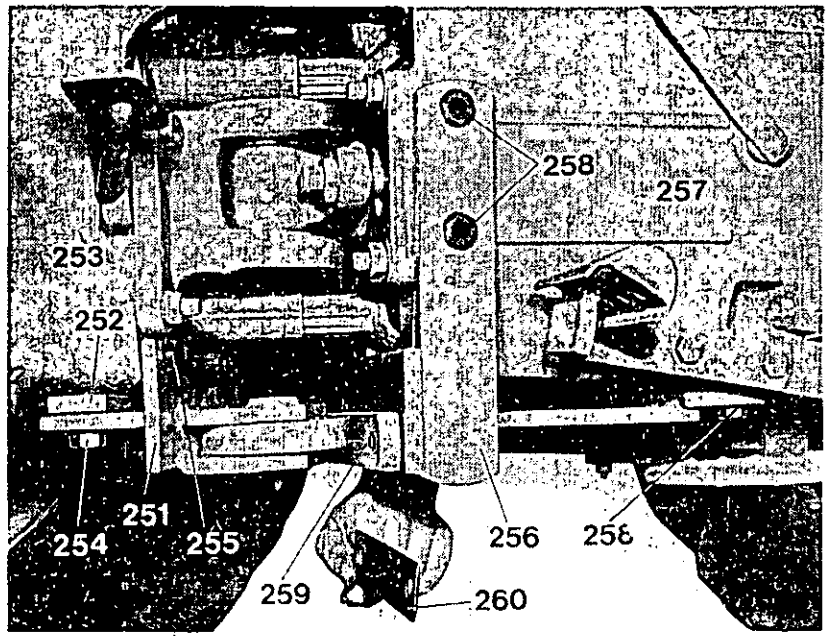


Abb. 5 Bis A45 ca. 3 51 745

Renforcement d'articulation centrale type 5046 (seulement pour A 45)

Généralités: En principe, lorsque l'on monte des outils portés avant, il faut également monter le renforcement de l'articulation centrale. Jusqu'à No. machine 350131 deux trous additionels M 12 sont nécessaires dans le carter de raccordement pour monter le galet (251 fig. 3).
A partir du tracteur A 45 No. 351746 ou environ, le carter intermédiaire est modifié. Lorsque l'on monte l'ensemble plaque d'appui de l'ancienne fabrication, il faut le modifier selon figure, c'est-à-dire qu'il faut pratiquer dans la bride verticale gauche, à une distance de 43,5 mm, un trou de 13 mm de diamètre et raccourcir la bride à 130 mm (fig. 2). La fixation de la plaque d'appui sur le carter intermédiaire s'effectue à l'emplacement de la bride modifiée au moyen d'une vis six pans M 12 x 30.

Montage

a) Dévisser le couvercle tôle. Monter la galet (251 fig. 3) en partant du bas sur le carter de raccordement du tracteur. Introduire la plaque intermédiaire (252 fig. 3), les rondelles entretoises 14,5 x Ø29 x 5 entre le galet (251 fig. 3) et le carter de raccordement (253 fig. 3) et les fixer au moyen de vis 6 pans M 14 x 45 (254 fig. 3) et M 12 x 35 (fig. 3).
(Attention! Placer les rondelles entretoise dans le chanfrein du carter de raccordement.)

b) Visser la plaque d'appui (256 fig. 3) sur le carter intermédiaire (257 fig. 3) au moyen de vis 6 pans M12x30 (258 fig. 3). Visser la plaque de compression (259 fig. 3) sur la plaque d'appui. Placer des rondelles entretoise (260 fig. 3) selon les besoins, jusqu'à ce que le galet s'appui sans jeu sur la plaque de compression. En cas de durs travaux, vérifier de temps à autre le renforcement d'articulation centrale pour déterminer le jeu existant entre la galet et la plaque de compression et effectuer éventuellement un réglage. Fig. 4 montre le renforcement d'articulation centrale monté sur le A 45 avec direction hydrostatique.

Reforzamiento del punto de inflexión o pandeo, tipo 5046 (solamente para A 45)

Generalidades: Este reforzamiento del punto de inflexión se montará en principio siempre que se suspendan aperos frontales. Hasta la máquina A 45 no. 3 50 131, para el montaje del conjunto „rodillo" (251 fig. 3) en la carcasa de unión se harán complemente dos perforaciones roscadas M 12 según la fig. 1.
A partir de la máquina A 45, aprox. 3 51 746 se ha modificado la carcasa de unión. Al proceder al montaje del conjunto „placa de apoyo" de la fabricación antecedente, éste tiene que ser modificado según la figura. Es decir, en el cubrejuntas vertical izquierdo se perforará un orificio a una distancia de 43'5 mm. Diámetro del orificio Ø13 mm. Se acortará el cubrejuntas a 130 mm (fig. 2). La fijación de la placa de apoyo a la carcasa de unión se llevará a cabo de este modo en el cubrejuntas modificado, con un tornillo de cabeza exagonal M 12 x 30.

Montaje:

a) Desatorníllese la chapa de cubrición. Móntese el conjunto „rodillo" (251, fig. 3) de abajo a arriba en la carcasa de uniŏn del tractor. Intercálese la placa intermedia (252, fig. 3), las arandelas distanciadoras de 14'5 x Ø29 x 5, entre el conjunto „rodillo" (251, fig. 3) y la carcasa de unión (253, fig. 3), fijando con tornillos de cabeza exagonal M 14 x 45 (254, fig. 3) y M 12 x 35 (255, fig. 3). **(Atención:** colóquense las arandelas distanciadoras en el rebaje de la carcasa de unión).

b) El conjunto „placa de apoyo" se atornillará (256, fig. 3) en la carcasa intermedia (257, fig. 3) con tornillos de cabeza exagonal M 12 x 30 (258, fig. 3). Atornílllese la placa de deslizamiento a presión (259, fig. 3) al conjunto „placa de apoyo". La chapita que se adjunta (260, fig. 3) se colocará, según sea necesario, hasta que el rodillo apoye sin juego sobre la placa de deslizamiento a presión. En el caso de realizar trabajos pesados, de vez en cuando se comprobará el reforzamiento del punto de inflexión, en cuanto al juego existente entre el rodillo y la placa de deslizamiento a presión, reajustando si se estimase necesario. Véase en fig. 4 el reforzamiento del punto de inflexión o pandeo montada sobre el A 45 con servo-dirección hidrostático.

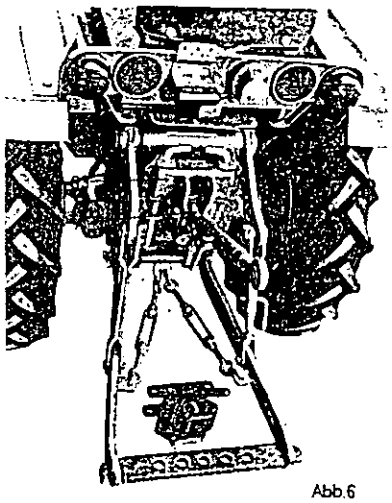


Abb.6

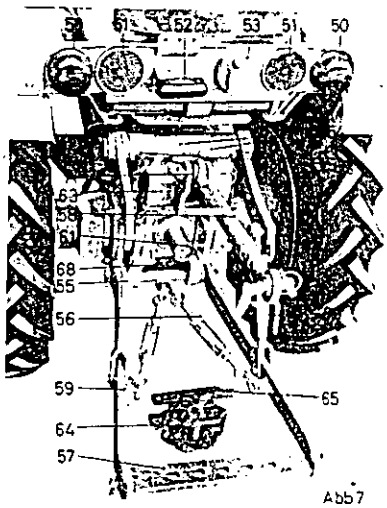


Abb7

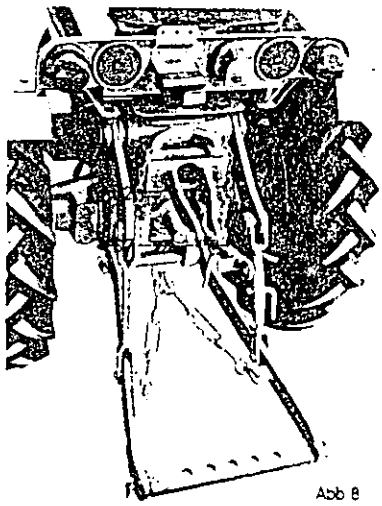


Abb 8

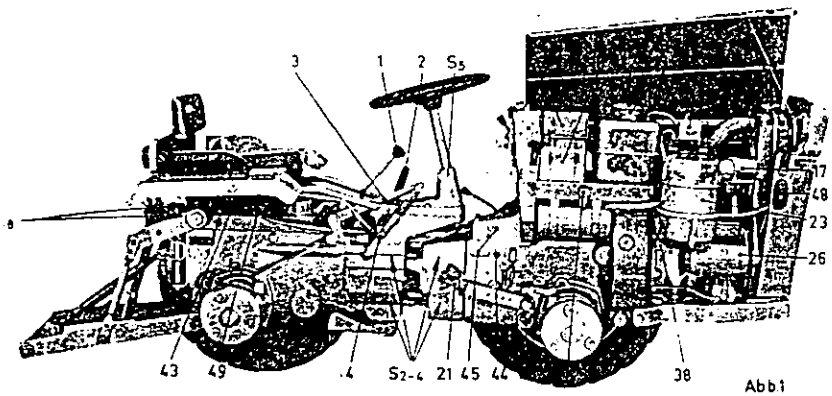
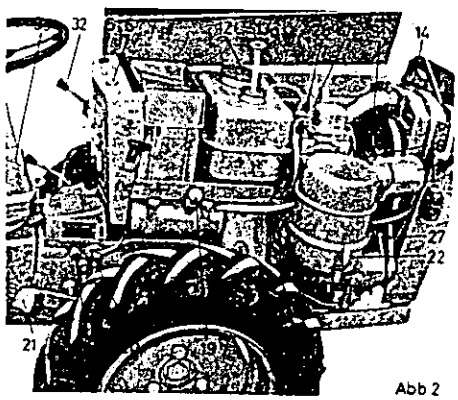


Abb 1



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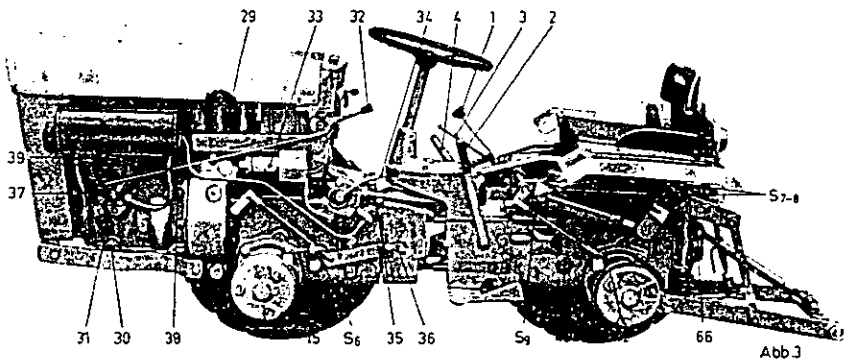

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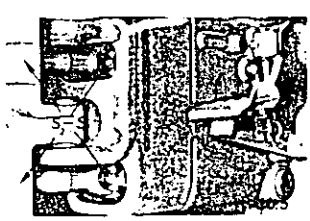

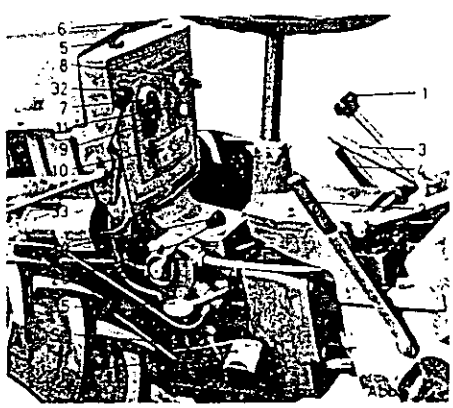

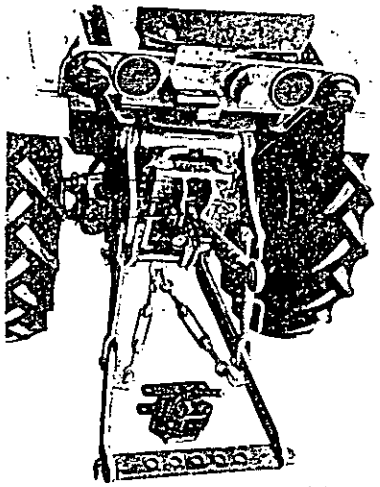

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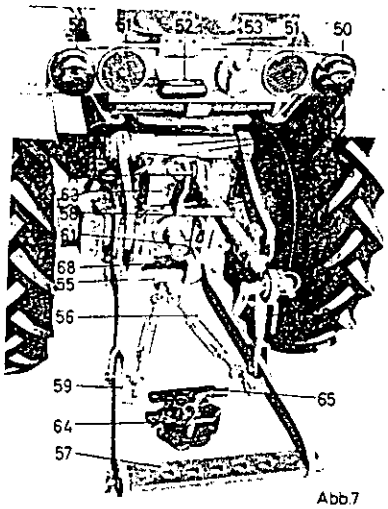

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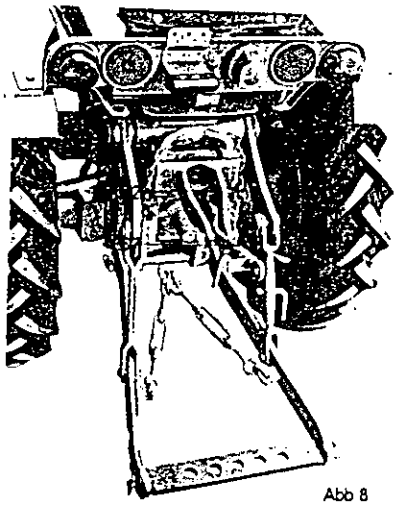


Abb 8

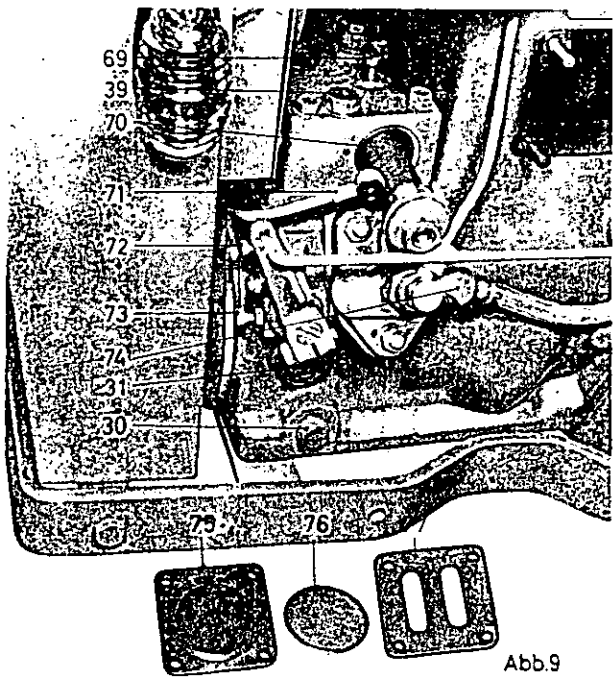
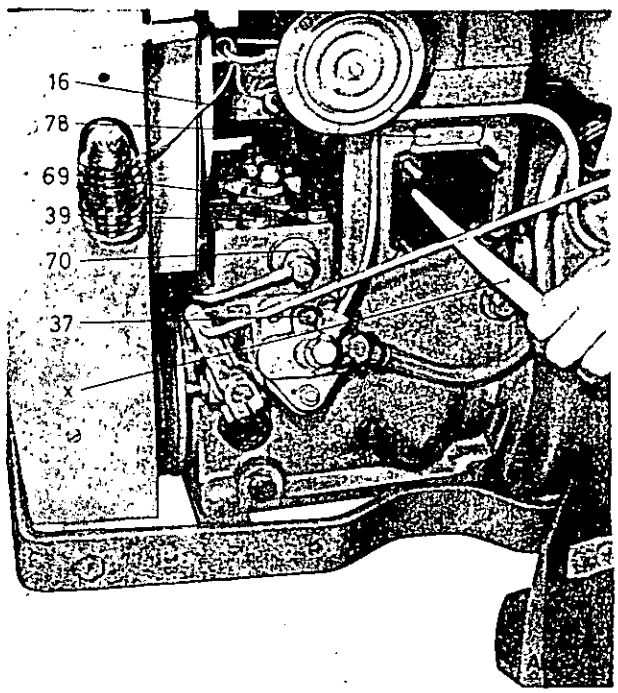
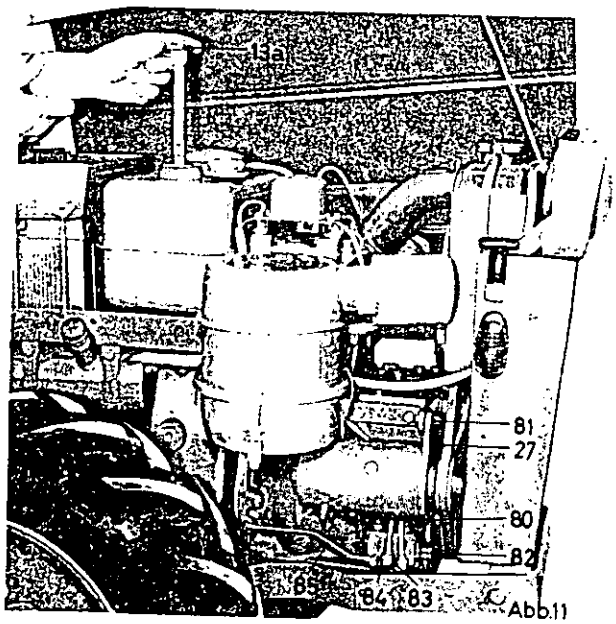


Abb.9

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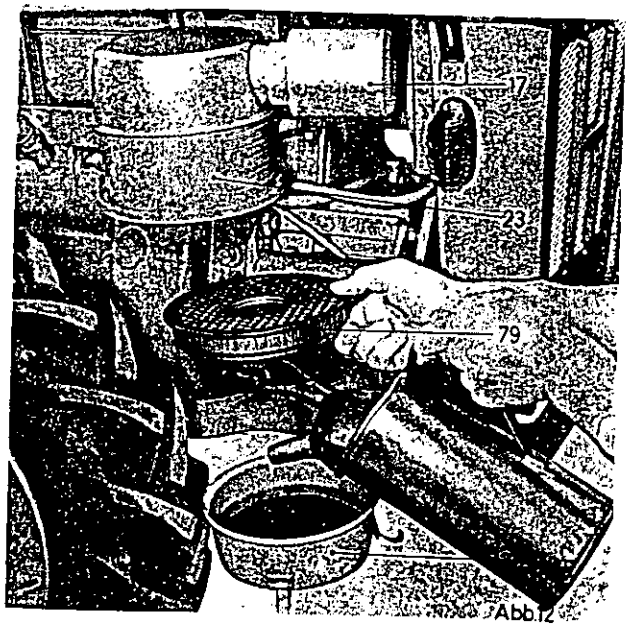
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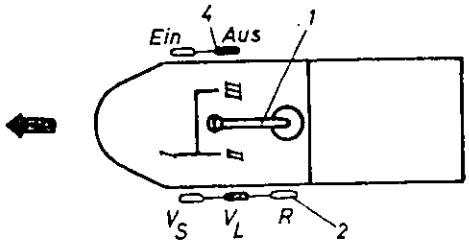
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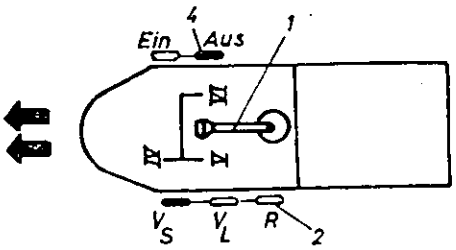
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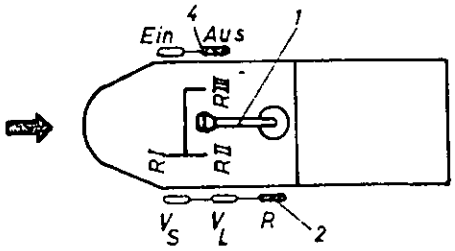
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4. Endmontage (Abb. 32)
Steht die Rahmenkrone waagrecht zur Schlepperachse, kann der gesamte Sicherheitsrahmen verbohrt (13 mm Ø) und anschließend verschraubt werden (Anzugsmoment 7 kpm). Dabei ist zu beachten, daß die Schraubenköpfe (A) jeweils im Innenraum liegen. Mit Ausnahme der beiden Schrauben (B) an der Rahmenmitte, die so einzuführen sind, daß sich die aufzuschraubenden Muttern oben innen befinden. Nach Festziehen der Muttern mit 7 kpm über beide Muttern die Plastikkappen drücken. Stützrohre mit Kotflügel verbohren und verschrauben, Unterlagscheiben auf Blechteil.

Achtung! Die selbstsichernden Muttern dürfen aus Sicherheitsgründen nur einmal verwendet werden.

1. Selector lever
2. Selector lever (preselection)
3. Hand brake lever
4. P.T.O. selector lever
5. Warning light
6. Horn button
7. Blinker switch
8. Ignition lock with light switch
9 Charging control lamps
10. Fuse box
11. Starter knob
12. Fuel (diesel oil) tank cover
13. Cover of lubricating oil container (engine)

13a. Diprod

14. Radiator cover
15. Oil drain plug/front gearbox
16. Hydraulic pump
17. Cyclone preselector
18. Battery
19. Ventilation filter of hydraulic oil supply tank
20. Brake light switch
21. Brake pedal
22. Oil tank of air filter
23. Air-filter
24. Regulator and cut-out
25. Second hydraulic connection for additional implements
26. Dynamo
27. V-belt for dynamo
28. Spark plug holder
29. Fuel filter
30. Oil drain screw of gearbox for auxiliary pumps (engine)
31. Oil sight glass of gearbox for auxiliary pumps (engine)
32. Throttle lever
33. Starter
34. Hydraulic operation lever
35. Foot lever for front diff-lock
36. Clutch pedal
37. Starter knob (blue)
38. Cooling water drain plug RH and LH (engine)
39. Oil filler screw (gearbox for auxiliary pumps (engine)
40. Oil level sight glass, rear gearbox
41. Oil level sight glass, front gearbox
42. Hydraulic cylinder
43. Oil filler screw, rear gearbox
44. Oil filler screw – front gearbox
45. Tractor serial number
46. Tool box
47. Injection nozzle
48. Traffic indicators
49. Seat buffers
50. Rear light
51. Rear reflector
52. Licence plate light
53. 7-pole socket
54. Pin for link carriers and trailer hitch
55. Left drawrod
56. Lock
57. Field bar
58. Upper linkage arm, long
59. Lower linkage arm
60. Right drawrod (adjustable)
61. Standard splined P.T.O. shaft
62. Link carrier ass., long for vertical lift
63. Link carrier ass. short for 3-point linkage
64. Trailer hitch
65. Pin for trailer hitch
66. Hydraulic lift arms
67. Upper linkage arm, short

68. Oil drain screw, rear transmission
69. Ventilation screw of oil filter
70. Oil filter
71. Oil suction pipe, filter-oil pump
72. Set screw for idling speed
73. Set screw for max. revs.
74. Fuel ventilation screw
75. Oil drip plate (cover)
76. Oil collector strainer
77. Graphite seal
78. Engine serial number (embossed)
79. Filter cartridge (wire gauze)
80. Hex. nut for V-belt tension
81. Dynamo fixing screws
82. Suction pipe of oil return pump
83. Oil return pipe to oil tank
84. Oil suction pipe for oil delivery pump
85. Oil pressure pipe

S1 Lubrication nipple of fan blade

S2–4 Lubrication nipples of universal shafts

S5 Lubrication nipple of steering column

S6 Lubrication nipple of clutch pedal

S7–8 Lubrication nipple of hydraulic shaft

S9 Lubrication nipple of hydraulic cylinder