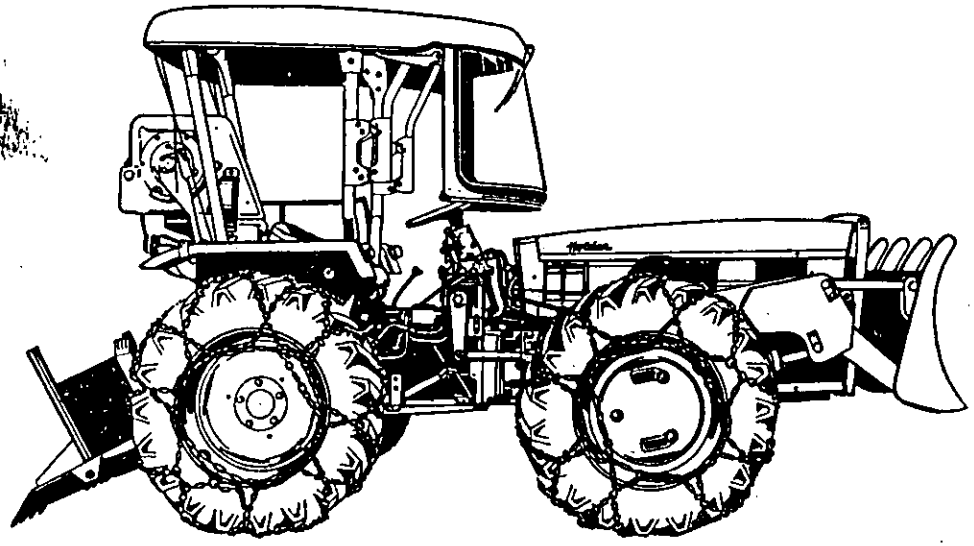
Holder
1888

AG 35
AG 35 F



Betriebsanleitung

Operating Instructions

Notice d'emploi

Instrucciones de servicio

1971

Gebrüder Holder Maschinenfabrik
7418 Metzingen Western Germany

Engine and Tractor

A) Description

More than 80 years of experience and the latest knowledge in design and construction are incorporated in your new HOLDER AG 35 or AG 35 F tractor. The economy, comfort and efficiency of these machines make them suitable for application in any kind of cultivation.
Your tractor will always be ready for work if you study this manual carefully and if you follow its instructions for proper maintenance and correct handling. The Operation Instruction Manual belongs in the hands of the tractor driver, not in an office file.

With all inquiries please state the following:

a) Type of machine: . . . . . e. g. AG 35, resp. AG 35 F
b) Engine serial number: . . . . . e. g. D 3 10100
c) Tractor serial number: . . . . . e. g. 35 10100
d) Date of sale: . . . . . e. g. 16. 6. 1970
e) Tractormeter reading: . . . . . e. g. 150 operating hours

The tractor serial number is embossed on the type plate fitted to the intermediate housing (see Ill. 16). The engine serial No. is to be found on the cylinder crank housing on the lefthand side of the engine (see Ill. 18).

B) Technical data

AG 35 - AG 35 F

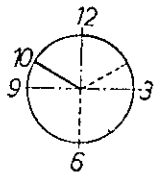
1. Engine:

a) Manufacturers:	Gebrüder Holder Maschinenfabrik, D-7418 Metzingen-Württ.
b) Type:	HD 3
c) Design:	In-line vertical engine
d) Mode of operation:	Two-stroke
e) Combustion:	Direct fuel injection
f) Lubrication:	Fresh-oil lubrication
g) Cooling:	Water-cooling with thermostatically controlled pump
h) Cooling water filling: (total quantity incl. anti-freeze mixture) (Anti-freeze mixture "Glysantine" up to – 20° C as from 1. 4. 1969 contained from the works all the year round)	8,7 ltr.
i) Number of cylinders:	3
j) Cylinder bore:	84 mm
k) Stroke:	90 mm
l) Cylinder capacity:	1500 cc
m) Engine capacity:	30 HP after DIN 70020 (German specification standards), 34 SAE HP (after SAE J 816 a)
n) Engine revs.:	2300 rpm
o) Fuel consumption:	195 gr/HPh
p) Oil supply in oil tank:	2,6 ltr. HD oil for diesel engines
r) Oil supply in gearbox for auxiliary pumps:	0,22 ltr. SAE 80 gear oil
s) Commencement of delivery of fuel injection pump:	38° from top dead centre

Hints for the mechanic: (see Dismantling/Reassembly Instructions)

(Direction of rotation as viewed from flywheel end anti-clockwise)

Fuel injection pump:	Position of notch on front side of drive shaft
Insertion of injection pump:	**10 o'clock**
Coarse adjustment:	7–8 mm before t. d. c.
Adjustment of commencement of fuel injection:	overflow method



Fine adjustment:	
t) Fuel injection pump:	11,8 mm before t. d. c.
u) Injection pressure:	Bosch No. 0400 463 076
v) Thermostat responds at:	175 kg/cm²
w) Air filter:	83° C
x) Temperature control:	oilbath air filter with cyclone preselector
	Temperature pilot lamp 110° ± 3° C

2. Tractor:

a) **Clutch:** Fichtel & Sachs single-plate dry clutch type K 200

b) **Gearbox:** 8 forward and 4 reverse gears (0,5–20,0 km/h). Drive from engine is taken by splined propeller shaft and universal shafts through two differentials. Pedal-operated front wheel diff-lock (10 Ill. 1), hand lever operated rear diff-lock (64 Ill. 11).

c) Speeds at max. revs (2300 rpm)

	AG 35 (with tyres 8.00-24 AS)		**AG 35 F** (with tyres 10.5-20 AS)	
forward:	1st gear	appr. 1,2 km/h	1st gear	appr. 1,1 km/h
	2nd gear	appr. 2,1 km/h	2nd gear	appr. 2,0 km/h
	3rd gear	appr. 3,4 km/h	3rd gear	appr. 3,3 km/h
	4th gear	appr. 5,4 km/h	4th gear	appr. 5,2 km/h
	5th gear	appr. 4,5 km/h	5th gear	appr. 4,4 km/h
	6th gear	appr. 7,7 km/h	6th gear	appr. 7,4 km/h
	7th gear	appr. 12,4 km/h	7th gear	appr. 9,9 km/h
	8th gear	appr. 20,0 km/h	8th gear	appr. 19,0 km/h
reverse:	1st gear	appr. 1,6 km/h	1st gear	appr. 1,5 km/h
	2nd gear	appr. 2,8 km/h	2nd gear	appr. 2,7 km/h
	3rd gear	appr. 4,6 km/h	3rd gear	appr. 4,4 km/h
	4th gear	appr. 7,5 km/h	4th gear	appr. 7,2 km/h

d) **Tractormeter** (58 Ill. 10): Registers ground speed, engine and P.T.O. rpm and hours.

e) **Diff-lock:** Foot-pedal operated front wheel diff-lock (10 Ill. 1).
Hand lever operated rear wheel diff-lock (64 Ill. 11).

f) **P.T.O.:** Standard splined shaft with 540 rpm at 2100 rpm, or 590 rpm at 2300 rpm engine revs., independent of transmission.

g) **Steering:** Pivotal hydraulic ZF steering acting on all four wheels (spindle-type hydromatic steering).

h) **Brakes:** Foot pedal operates rear wheel brakes. Hand ratchet lever operates front wheel brakes for parking. Both brakes act independently on all four wheels through the transmission.

i) **Trailer hitch:** Adjustable for height and revolving, with guard forged in one piece.

j) **Hydraulics:** Holder two-cylinder hydraulics with Bosch gear pump (16 l/min.). Lifts with disengaged transmission. Max. lifting capacity at bottom of lower link arms: 1400 kg (3080 lbs.). The control valve provides for a second pressure connection. (See Ill. 22.)

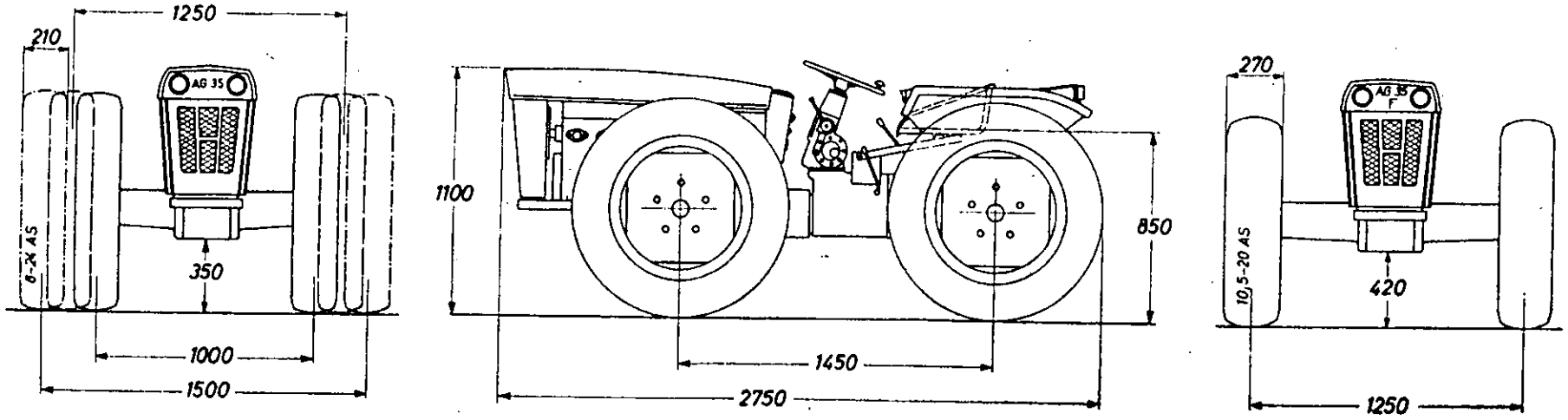
k) **Implement lift:** Cat. I standard three-point linkage after DIN 9674 with field bar.

l) **Electrical equipment:** 12 V system
Bosch dynamo (Bosch No. LJ/GEH 90/12/1800 FR 15)
Bosch starter (Bosch No. 0 001 307 022)
Battery (56 Ah)
Regulator (Bosch No. 0 190 215 028)
Glower plugs (Bosch No. 0 250 200 010)
2 headlights with distant and dimming light
2 front traffic indicators fitted to rear fender
2 rear traffic indicators
2 rear reflectors (1 rear reflector with licence plate light)
2 brake lights with brake light switch
Warning light system
1 horn
1 fuse box
1 7-pole plug (for 2 trailer lights and one traffic light)
1 temperature pilot lamp (109 Ill. 10).

m) **Rubber-tyres:** Standard tyres front and rear 8-24 AS, Forestry version, front and rear 10.5×20 AS

n) **Oil filling quantities:**

Engine (oil tank):	2,6 ltrs. (5½ Pints) HD-B-oil for diesel engines
Engine (oil sump):	0,5 ltrs. (17 Ounces) HD-B-oil for diesel engines
Oilbath air filter:	0,4 ltrs. (13½ Ounces) HD-B-oil for diesel engines
Hydraulic system:	5,3 ltrs. (5½ Quarts) HD-B-oil for diesel engines
Gearbox for auxiliary pumps (engine):	0,22 ltrs. (7½ Ounces) SAE 80 gear oil
Gearbox front:	1,5 ltrs. (3 Pints) SAE 80 gear oil
Gearbox, rear:	9,0 ltrs. (9½ Quarts) SAE 80 gear oil
Axle housing:	0,3 ltrs. (10 Ounces) SAE 80 gear oil
Fuel tank:	20,0 ltrs. (5 Gallons) diesel oil
Cooling system (total quantity 8,7 ltrs.):	8,7 ltrs. (9 Quarts)
Anti-freeze mixture:	2,9 ltrs. (6 Pints) Glysantine



o) **Measurements:**

p) **Weights:**

	AG 35 (with tyres 8-24 AS)	**AG 35 F** (with tyres 10.5-20 AS)
Weight without implements	1270 kg	1460 kg
Front axle pressure	760 kg	860 kg
Rear axle pressure	510 kg	600 kg
Permissible load on rear axle	1200 kg	1200 kg
Permissible load on front axle	1200 kg	1200 kg
Permissible load on trailer hitch	550 kg	550 kg

The above mentioned permissible axle loads are for driving on public roads and squares. The permissible axle loads when transporting logs with the AG 35 F are the following: permissible rear axle pressure: 1500 kg, permissible front axle pressure: 1500 kg.

C) Preparations for taking tractor into service

1. Engine:

a) Checking oil level.
Open oil tank (E 1 Ill. 1) and, with engine shut-off, top-up to upper dipstick mark with **HD-B-oil for diesel engines.**

For temperatures below 0° C	HD-B-Oil SAE 10 W
For temperatures from O° to +30° C	HD-B-Oil SAE 20
For temperatures above +30° C	HD-B-Oil SAE 30

Use only HD-B oils for diesel engines. HD-B oils are highly alloyed engine oils for diesel engines corresponding to the specification MIL-2104 B. Your local agents will let you have the necessary recommendations. List of recommended oils see page 58.
In order to avoid engine trouble which might be caused through the use of inferior lubrication oils, we recommend to use only high-branded oils, and not to change the brand that has been originally chosen. Consumed oil must be regularly renewed. The oil level should possibly be kept at upper dipstick mark, and must never be below the bottom dipstick mark (MIN).

b) **Oilbath air filter (Ill. 6)**
Remove oil basin (23 Ill. 6) and top-up to mark with the same brand of oil as used in the engine.

c) **Cooling water:**
Check cooling water if possible when engine is cold. Be very careful if the cooling water must be checked straight after shutting engine off because in this case steam escapes with excess pressure. Lift radiator cap (1 Ill. 1) in such a case slowly and let excess pressure escape before removing it completely.
Attention! An anti-freeze mixture (safe up to −20° C) is filled in from the works all the year round. Check cooling water concentration before handing tractor over to customer, and before the winter season starts. If necessary increase the concentration depending on the frost to be expected.
When draining the anti-freeze mixture in summer, make sure to add an anti-corrosive to the cooling water.

d) The V-belt (19 Ill. 3) has the right tension if you can press it with your finger approx. 1 cm between the fan and dynamo pulleys (17 Ill. 3). For retightening the V-belt slacken both screws (32 Ill. 3) of the slotted bracket (33 Ill. 3) of the dynamo. Press dynamo outwards till the V-belt has the right tension, then tighten screws.

e) **Filling fuel tank:**

Use scrupulously clean fuel. Dirty fuel will cause premature wear of injection pump and nozzles. The fuel should be filtered through a clean cloth. Ventilate fuel system (see para. 4 on page 51).

f) **Checking tyre pressure:**

Check tyre pressure at least once a week. Front and rear pressure 1,5 atm.

g) **Exhaust:**

Exhaust, resp. outlet socket, can be assembled in the position which is most suitable and convenient for the prevailing conditions of operation. Ask your agents or dealers for their advice.

h) **Stop bolts :**

Check stop bolts (78 Ill. 17). A broken stop bolt causes the two tractor halves to swing too much resulting in damage to the universal shafts.

D) Lubrication

1. Engine:

a) HD-B oil for diesel engines, depending on temperatures:

below 0° C	HD-B Oil SAE 10 W
from 0° to +30° C	HD-B Oil SAE 20
above +30° C	HD-B Oil SAE 30

b) **Gearbox for auxiliary pumps** (engine):
0,22 ltr. SAE 80 gear oil. Filler screw (E_2 Ill. 2), oil level sight glass K_2 Ill. 3).

c) **Oil circulation** (Ill. 21):
The engine oil is led from the oil tank (100) through the oil pipe (102) to the oil pump. The oil pump transports the oil through the pressure pipes (D 1–D 4) to the crankshaft bearings. The new oil pump (104) has four pressure connections which allows each crankshaft bearing to be lubricated by a separate oil connection. The return oil is sucked out of the oil sump by the oil pump through the coarse filter (42) via pipe (106), transporting it through the return flow pipe (107) to the micro-mesh filter (108) and from there back to the oil tank. The oil supply tank, situated above the engine (dead-loss system), has a capacity of 2,6 ltr.

2. Gearbox:

a) **Front gearbox:** SAE 80 gear oil 1,5 ltr. (overflow control screw K_4 Ill. 18).

b) **Rear gearbox:** SAE 80 gear oil 9,0 ltr. (sight glass K_3 Ill. 12 and 16).

c) **Hydraulic oil supply tank:** HD-B engine oil SAE 20 5,3 ltr. (for hydraulic system and hydromatic steering 20 Ill. 2). (Total quantity, including pipes)

d) **Epicyclic gears:** SAE 80 gear oil 0,3 ltr. (Filler and control plug K_5 Ill. 16 and 18).

e) Grease **all lubrication points** (S) according to the Service Chart. Before greasing remove the protective coating of paint from the lubrication nipples. The lubrication points of cross and bearings of the upper and lower universal shafts have constant lubrication, and only the square socket, i. e. the centre lubrication nipples (S_4 and S_5) must be greased.

E) Taking tractor into service

1. Preparations:

a) Move selector lever (63 Ill. 12) into neutral.
b) Move throttle lever (69 Ill. 12) to approx. 3/4 revs.
c) Insert key (52 Ill. 10) into ignition (51 Ill. 10) till red charging lamp (56 Ill. 10) lights up.
d) Pull out preglow starter knob (53 Ill. 10) to first position (preglow). Hold for one minute, i. e. till glow starter (54 Ill. 10) lights up bright red. Then pull out glow starter indicator as far as stop. Then starter will turn over the engine. Release knob as soon as engine fires. The starter knob should not be used for more than 10 seconds. Before repeating the starting procedure wait for 60 seconds for battery to recover. The red charging lamp (56 Ill. 10) must go out as soon as engine comes to life.
e) Adjust throttle lever (69 Ill. 12), or foot pedal (72 Ill. 12) to desired engine revs.
f) The spring-loaded seat is adjusted to the weight of the operator with lever (65 Ill. 11):

Soft springing = Move lever several times from bottom to top
Hard springing = Move lever several times from top to bottom
} Fix ratchet lever (Y Ill. 11) correspondingly.

2. Driving:

Before using gear selector lever move throttle lever and foot pedal (69 Ill. 12) resp. (72 Ill. 12) into neutral. Depress clutch pedal (68 Ill. 11). Release hand brake (70 Ill. 12). Preselect desired gear range (reverse, forward – slow, forward – fast). Engage gear selector lever (63 Ill. 11). (Gear selection diagramme see Ill. 13 – 14 – 15.)

If the gear proves difficult to engage, depress clutch pedal (68 Ill. 11) once more (do not use force). Release clutch pedal slowly, control desired speed within the gear ranges by means of throttle lever (69 Ill. 12), or foot pedal (72 Ill. 12).
When using heavy implements with the tractor set on narrow track, utmost care must be taken in sloping territory, particularly when turning the machine whilst driving downhill.

Driving on steep slopes:

Your particular attention is drawn to the fact that driving on **extremely steep slopes,** whether in line with the slope, or across the slope, is at your own risk!
Security can be increased by using wheel hubs, or wheel weights! – Ask your local distributors or dealers for their advice.

Never run tractor in unventilated space!
Carbon oxyde is scentless and invisible!

Stationary operation:

If the tractor is used stationary only, i. e. with P.T.O., e. g. for driving a water pump, care must be taken that the machine stands on level ground.

3. Braking:

The foot brake (73 Ill. 12) is used when the tractor is moving. The brakes have the advantage of acting at any time uniformly on all four wheels. The hand brake is released by giving a slight outward turn to the knob of the hand brake lever (70 Ill. 12). When parking the tractor on raising ground, use suitable chocks, shut engine off, and engage one of the low gears.
When driving the tractor with an attached trailer, pay attention to the traffic regulations which are in force in your country.
Trailer lighting: German traffic regulations require that the distance between outer edge of headlamp beam and outer edge of trailer must not be more than 400 mm. Further the trailer must be equipped with rear reflectors, rear traffic and brake lights.
The necessary 7-pole plug is available commercially, under DIN 72576.

Always pay attention to your local safety and traffic regulations which are in force in your country. The use of any trailed vehicle behind your tractor, particularly drive axle, or other trailers, is at your own risk!

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4. Diff-lock:

The diff-lock rigidly locks the two front wheels, resp. the two rear wheels to prevent either of them from slipping. To apply front diff-lock depress diff-lock foot pedal (10 Ill. 11) – to apply rear diff-lock, use hand lever (64 Ill. 11). With

differential locked, i. e. with rigidly connected front wheel and rear wheel pairs, the tractor must be steered straight ahead only. (As from approx. machine serial No. 10500 the diff-lock is a standard equipment of the AG 35 tractor.)

5. Adjustment of track width — Tyres:

To readjust the track width, interchange the two right and the two left wheels. The arrow on the tyres should always point in forward driving direction. The fenders can be adjusted to the relevant track width. All four tyres must be of the same size and have the same tyre pressure.
In order to avoid an undue stress on the bearings, no other than the track widths permitted by the manufacturers, with hub spacers up to max. 1500 mm, must be used. Ranges of track widths see on page 40.
Tyre pressure 1,5 atm. Check wheel nuts from time to time, particularly after changing over the wheels.
If ballast weights are used, it is not permissible to fill the tyres with water, or to use any other ballast.
The steering angle of the lateral stop bolts (84 Ill. 14) must always be the same as adjusted by the manufacturers since the distance between the tyres at max. steering angle must be sufficiently large.

6. Hydraulic Lift:

The hydraulically operated lift arms are actuated through lever (74 Ill. 12). When pressing the lever downwards, the implements are lowered, when pulling the lever up, the implements are lifted. Intermediate adjustment keeps the implements in instant position. At the end of the downward motion, the lever is felt to catch (floating position). Since the hydraulic pump runs all the time, the hydraulic lever must be used only for lifting and lowering the implements.

7. Three-way distributor valve (90 Ill. 24) with hydraulic coupling.

Lever position A ≙ flow 1 (blanked off) open
Lever position B ≙ flow 1 (blanked off) 2 and 3 shut
Lever position C ≙ flow 2 and 3 open

8. Stopping tractor:

Let engine run idle, throttle engine revs., disengage clutch, move selector lever (63 Ill. 12) in position "0", put on hand brakes.

9. Shutting engine off:

Move throttle lever (69 Ill. 12) forward in "idle position". Pull cut-out lever (71 Ill. 12) till engine stops. Remove ignition key.

F) Service and maintenance (see also Service Chart on pages 54/55)

1. Engine:

a) **Oil change** – after 500 operation hours.
Open oil pipe on hollow screw (103 Ill. 21) and drain oil tank. Refill oil tank with 2,6 ltr. HD-B-oil and tighten oil pipe with hollow screw (103) only after the oil comes out without bubbles. (Attention: copper gaskets must be used on both ends of the oil pipes.) The oil level should possibly be kept at upper dipstick mark, and must never be below the bottom dipstick mark. Use only HD-B oils for diesel engines, see page 58.

b) **Unscrew oil drain screw** (42) from oil sump, drain oil. Thereby clean filter of oil drain screw (A_1 Ill. 42), possibly with diesel oil and blow out from inside out, then refit and tighten screw. In order not to let the element of the suction pump run dry, fill in 0,5 ltr. HD-B oil through the ventilation hose by means of a funnel (Ill. 21).
The lubrication oil filter cartridge (micro-mesh filter 108 Ill. 1) must be replaced after 200–250 operation hours. The micro-mesh filter cartridge cannot be cleaned! The ventilation filter of the fuel injection pump (22 Ill. 2) must be cleaned with diesel oil after every 200–250 operation hours.

c) **Hints for the mechanic:**
In case of empty oil tank: refill with HD-B oil for diesel engines. Then open hollow screw (103 Ill. 21) till oil comes out without bubbles. Tighten hollow screw. After repairs: Fill oil pressure pipes with HD-B oil.
Attention: When removing and cleaning the oil sump take care to clean the magneto disc contained therein and to replace it in the oil sump. Refill oil sump with 0,5 ltr. of oil (Ill. 21).

Attention:

d) After every 100 operation hours remove sealing plug of exhaust manifold (16 Ill. 8) and check outlet ports of cylinder. If necessary clean.
After every 200–250 operation hours clean outlet ports of cylinder and exhaust system. Dismantle exhaust and clean (see Ill. 7 page 142). Unscrew exhaust manifold (welded part) part from cylinder and clean. Remove oil carbon deposits from cylinder outlet ports using a piece of wood (see Ill. 9). Thereby move the corresponding piston in front of the outlet port which is to be cleaned so that no oil carbon will enter the piston race.

e) **Oilbath air filter:**
Clean depending on dust development, **if necessary daily.** Remove oil basin (23 Ill. 6) and filter gauze (43 Ill. 6) and clean with diesel oil. Let filter gauze drip well and refill oil basin with fresh engine oil up to mark.

f) **Gearbox for auxiliary pumps (engine):**
Change oil after every 450–500 operation hours. Open oil drain screw (A_2 Ill. 3) and drain oil. Slacken filler screw (E_2 Ill. 2) and fill in 0,22 ltr. of SAE 80 gear oil. Oil level see sight glass (K_2 Ill. 3).

g) **Cooling system:**
Check cooling water level daily, possibly if the engine is cold. When checking cooling water straight after the engine has been shut off, open radiator cap (1 Ill. 1) very slowly as far as stop to let steam escape. Then remove radiator cap completely. If the temperature pilot lamp (109 Ill. 10) lights up shut engine off at once. Overheating of the cooling water can have the following reasons: Radiator dirty, insufficient cooling water, defective cooling water pump, thermostat does not respond, V-belt slack or torn, outlet ports coked. If frost is expected, add anti-freeze mixture, or have cooling concentration checked.
Cleaning radiator: Blow from engine side through radiator grille with compressed air in order to remove dust deposits and insects.

h) **Draining radiator cooling water:**
Open drain screw (AW_3 Ill. 3) on bottom of radiator.
Open drain screws (AW_2 Ill. 2) and (AW_1 Ill. 3) on engine.

i) **Regulator – Fuel Injection Pump** (26/28 Ill. 2):
Drain superfluous oil of regulator on control screw (K_1 Ill. 2) after 200–250 operation hours. Have injection pump, injection nozzles, and regulator, checked by a Bosch Service Station. Have oil in the regulator renewed.

2. Hydraulic System:

Change hydraulic oil for the first time after 450–500 operation hours, thereafter every 2500 hours. Clean ventilation filter of the hydraulic system (7 Ill. 23) and the filter cartridge (85 Ill. 23) after every 450–500 operation hours with diesel oil.

Oil flow:
The Bosch oil pump delivers 16 ltr./min. The oil flow is controlled by the built-in control valve. Up to 1200 rpm (corresponds to approx. 8 ltr.) the hydraulic steering is fed, only then the oil is led over a control valve (distributor valve) to the hydraulic lift.

Draining oil:

1. Press hydraulic lever (83 Ill. 20) completely down.
2. Open drain plug of steering and turn steering wheel to right and left steering lock.
3. Drain oil through suction socket of hydraulic oil tank.

Refilling oil and ventilation (total quantity 5,3 ltr. of SAE 20 engine oil).

1. Measure off 5,3 ltr. of oil, open cap of hydraulic oil supply tank (6 Ill. 1). Fill tank (approx. 3 ltr.) and put on tank cap.
2. Start engine and let it run in idling revs. Turn steering wheel several times from right to left steering lock. **In this procedure the oil supply tank must not be sucked empty by the pump.** Ventilation through the ventilation filter of the hydraulic tank.
3. Top-up with hydraulic oil.
4. Lift and lower hydraulic power lift several times under load.
5. Shut engine off and fill in the rest of the oil. If the measured off oil quantity will not be taken up entirely, repeat procedure 2 to 4.
6. Check oil level once more after the tractor has been in operation for some hours. If the system has been correctly ventilated, the oil level should be – with engine shut-off – approx. 1,5 cm below the upper edge of the tank or, with lifted hydraulic cylinders, at maximum mark of dipstick (7 Ill. 23).

3. Steering – ZF Hydromatic Steering:

In order to obtain utmost steering accuracy and safety even under the worst soil conditions, the AG 35 tractors have been equipped with a ZF spindle-type hydromatic steering.
The steering is only then hydraulically assisted if the oil pump for the steering works, i. e. if the engine runs. Driving need not be interrupted if the hydraulic steering assistance fails.
The hydraulic oil supply tank contains oil a) for the hydraulic steering assistance, and b) for the hydraulic implement lift.

4. Ventilation of the Fuel System:

The fuel system must be ventilated
a) before starting engine for the first time if the fuel tank is empty,
b) when fuel filter is replaced, or when injection pipes are opened or removed, i. e. if air has entered the pipes, or the intake part of the injection pump (e. g. if the tractor has run out of fuel).

Slacken air vent screw (21 Ill. 2) of fuel injection pump. Retighten screw if fuel comes out without bubbles.

5. Replacing fuel filter (12 Ill. 1)

The fuel filter cannot be cleaned!

The fuel filter (12 Ill. 1) built into the fuel tank, must be replaced after approx. every 450–500 hours, depending on dust development.

6. Battery maintenance:

Check battery (11 Ill. 1) every 4 weeks, in tropical countries after two weeks. The acid level must be 10–12 mm above upper edge (mark). For refilling use only distilled water. Lightly grease battery terminals with acid-free Vaseline. The battery must be filled with pure battery acid, with a consistency of $-1{,}28 = 32°$ Bé at $+20°$ C acid temperature (in tropical countries $1{,}23 = 27°$ Bé). To charge battery remove the sealing plug.

7. Transmission:

a) Grease all nipples (S_1–S_8 and S_{13}–S_{18}) after every 200–250 operation hours (monthly). If molybdenum lubricants are available, use these, particularly for greasing the lubrication nipples of the upper and lower universal shafts. The lubrication points (S_9–S_{12}) of cross and bearings on the upper and lower universal shafts are permanently lubricated from the works. Only the centre nipple (S_4 and S_5) must be greased by the tractor owner. If a repair is

carried out, i. e. if the universal shafts have worn loose, resp. after approx. 2500 hours, cross and bearings of the universal shafts should be greased. This requires a grease gun with an articulated nozzle.

b) **Front gearbox:**

Change oil for the first time after 450–500 operation hours. Thereafter every 2500 hours. The front transmission is filled with 1,5 ltr. SAE 80 gear oil. Drain screw (A_4 Ill. 18), control screw K_4 Ill. 18), oil filler screw (E_4 Ill. 18).

c) **Rear gearbox:**

Change oil for the first time after 450–500 operation hours, thereafter every 2500 hours. The rear gearbox contains 9,0 ltr. SAE 80 gear oil.
With the tractor standing on level ground, the oil level should be at the centre of the sight glass (K_3 Ill. 16). Drain screw (A_3 Ill. 20), filler screw (E_3 Ill. 16).
If the tractor is used stationary only for some time, e. g. to drive a water pump, it should be on level ground and the oil level of the rear gearbox should be increased by approx. 2 litres.

Axle housings:

After every 500 hours of operation check the oil level on control plugs (K_5 Ill. 16 and 18) and if necessary refill with SAE 80 gear oil.

8. Brakes and Lighting System:

Have brakes, clutch and lighting system checked at least once a year by a special service station, particularly if the tractor is driven on public roads. All moving parts, e. g. brake bearings, etc. should be given a few drops of oil every week.
If the tractor is taken out of service for some lenghty period of time, clean and grease it well. For proper servicing of the battery ask the advice of a specialist.

9. Washing Tractor:

Before washing tractor down with water, disconnect battery terminals, or, still better, remove the battery. Protect fuel injection pump, dynamo, starter, regulator and intake opening of the oil bath air filter from a direct contact with water.

G) Service Chart

1st service

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 give all instructions in the presence of the future owner, or his authorized person and the tractor operator.**	**After every 8–10 operation hours (daily)**	**After every 100 operation hours.**
1. Grease all lubrication nipples. 2. Check oil level of engine and gearbox. a) Engine: Max. oil level at upper dipstick mark. Use only clean, high-branded HD-B-oil for diesel engines. For temperatures below 0°C HD-B-SAE 10, from 0-+30°C HD-B-SAE 20, over +30°C HD-B-SAE 30. From the works HD-B-SAE 20 oil is filled in at any time. b) Check oil filling in gearbox for auxiliary pumps (engine) on sight glass. SAE 80 gear oil. c) Rear gearbox: oil level at centre of sight glass. SAE 80 gear oil. d) Front gearbox: check oil level on control plug. SAE 80 gear oil. e) Axle housings: Check oil level on control plug. SAE 80 gear oil. 3. Retighten all screws, bolts and nuts, specially wheel nuts. 4. Check oil level of air filter, if necessary top-up with engine oil. 5. Check cooling water level. If frost is expected check concentration! 6. Check hydraulic oil (HD-B-SAE 20). 7. Check tyre pressure (1.5 atm.) 8. Trial run engine and check function of tractor and hydraulic system. 9. Instruction: What are HD-B engine oils? Ask local agents for recommendation list. Recommendation list. See page 58.	1. Check tractor for completeness. Check tools. 2. Give instructions in accordance with operation manual. 3. Before taking tractor into service – in the presence of client: a) Check oil level in engine. Explain lubrication system and oil change. Filter: explain cleaning and replacement of filter cartridge. b) Explain cooling system. If frost is expected check cooling water concentration. c) Check V-belt tension. d) Rear gearbox: explain sight glass and oil change. e) Front gearbox: explain overflow control screw and oil change. f) Axle housings: Point out overflow control screw. g) Point out lubrication nipples, oil control screws, and lubrication points. h) Explain cleaning of air vent filter of hydraulic oil supply tank. i) Explain fuel filter and ventilation of fuel system. k) Check oil level of air filter and explain cleaning l) Battery maintenance. m) Explain cleaning of outlet ports and of exhaust. n) Point out stop bolt and explain its function. 4. Check tyre pressure (1.5 atm.) 5. Check function of engine, transmission, diff-lock and demonstrate hydraulic lift. Point out to correct parking of tractor, discharging of hydraulic lift, and lowering of implements (Danger of accidents). 6. Check electrical system. Explain fuse box and servicing of battery. 7. Give practical field demonstration of purchased implements. 8. Explain servicing of implements in accordance with operation manual. 9. Make out service check book and fill in first service check. 10. Complete guarantee file card and return to Holder. 11. Take care to observe your local traffic regulations.	1. Check oil level of engine. Top-up to max. mark daily. For oil quality see column A-2a. 2. Clean air filter depending on dust development and refill with fresh engine oil. 3. a) Check cooling water level. If frost is expected, check cooling water concentration. b) If necessary, depending on operating conditions, check radiator grille and clean.	1. Check oil level of gearbox for auxiliary pumps (engine) on sight glass and, if necessary, top-up with SAE 80 gear oil. 2. Check oil level of rear gearbox on sight glass. 3. Front gearbox: check oil level on lateral control plug and if necessary top-up with SAE 80 gear oil. 4. Check stop bolt. Replace broken stop bolts. 5. Remove sealing plug of exhaust manifold and clean outlet ports if necessary.

2nd Service	3rd Service	4th Service
E	F	G
After every 200-250 operation hours (monthly). If possible, all jobs are to be carried out and explained in the presence of the owner, or his authorized person, and the tractor driver.	**After every 450 – 500 operation hours.** Latest 6 months after taking tractor into service. If possible, all jobs to be made and all explanations given in the presence of tractor owner, or his authorized person, and the tractor driver.	**After every 2500 hours (yearly).** We recommend to have the following maintenance work carried out through an accredited Holder Service Station:
1. Engine a) Clean oil filter of oil sump and replace micro-mesh filter cartridge. b) Check oil level in regulator housing (injection pump) and drain superfluous oil on control screw. c) If necessary clean oilbath air filter and top-up with fresh oil. d) Check V-belt tension. e) If necessary blow through radiator fins from inside out. If frost is expected check cooling water concentration. f) Clean air vent filter of injection pump. g) Decarbonize outlet ports of cylinder block, exhaust manifold, and exhaust! 2. Grease all lubrication nipples. 3. Check complete electrical system including battery. Temperature pilot lamp (test tempe rature 110° +3°C). 4. Check clutch play, if necessary readjust. 5. Check brakes, if necessary readjust, 6. Retighten all screws. 7. Check tyre pressure (1.5 atm.) 8. Trial run tractor and if necessary give again practical demonstration of implements. 9. Complete 2nd service check.	**1. Engine** a) Change oil in engine, for oil quality see column A 2 a. b) Renew oil in gearbox for auxiliary pumps (engine). Oil quantity 0,22 ltr. SAE 80 gear oil. c) Check both hollow screws of oil suction pipe (engine) for tightness. d) Check nozzle holder for tightness 2. Replace fuel filter of tank (do not clean)! 3. Hydraulic oil a) Check oil level of hydraulic tank (approx. 2 cm below container edge with hydraulic lift lowered). b) Change hydraulic oil for the first time, thereafter every 2500 operation hours. SAE 80 gear oil. Front gearbox 1,5 ltr., rear gearbox 9,0 ltr. 5. Check oil level of axle housings (if necessary top-up to filler screw) – SAE 80 gear oil. 6. Steering a) Check steering play and if necessary readjust. b) Check steering angle and stop bolt. 7. Complete 3rd cheque.	1. Engine a) Check compression pressure. If the required pressure is not obtained, proceed as described in Workshop Manual! b) Engine oil change. For oil quality see column A 2a. Replace micro-mesh filter cartridge. Clean oil filter of oil sump, thereby remove sump and clean, also magneto disc. c) Check delivery of lubrication oil pump (see workshop manual). 2. Check engine clutch. 3. Have fuel injection pump with regulator checked by a Bosch Service Station. Have oil renewed. 4. Change oil in gearbox. a) Front gearbox: 1,5 ltr. SAE 80 gear oil. b) Rear gearbox: 9,0 ltr. SAE 80 gear oil. c) Axle housing. Check oil level, if necessary top-up with SAE 80 gear oil. 5. Change oil in hydraulic supply tank. 5,3 ltr. HD-B-SAE 20 engine oil for hydraulic steering and hydraulic lift. Wash filter cartridge of hydraulic oil supply tank. 6. Retighten all screws. 7. Remove fuel tank and rinse it. Fit new filter. 8. Complete 4th cheque.

SAE 80 gear oil:
Front gearbox, rear gearbox, gearbox for auxiliary pumps, axle housings, mechanic steering.

HD-B-SAE 20 engine oil:
Hydraulic system

HD-B-SAE 10, HD-B-SAE 20, HD-B-SAE 30 engine oil, depending on temperatures, see column (A-2a); **oil tank, air filter**

In case of abnormal loss of oil, try to find cause!

Replacement engine:
Ventilate („bleed") oil suction pipe before taking replacement engine into service.

FRANÇAIS

ESPAÑOL

H) Implement lift for standard cat. I three-point implements

The implement lift will take up Cat. I three-point implements. Horizontal adjustment with crank (81 Ill. 20). It is advisable to discharge the hydraulic during adjustment. The lateral range of the implement is adjusted with the chains (82 Ill. 20).

I) 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	=	**18 750** driven km
500 operation hours	=	**37 500** driven km
1000 operation hours	=	75 000 driven km
2000 operation hours	=	150 000 driven km
2500 operation hours	=	**187 500** driven km.

K) AG 35 F - Forestry Version

1. When attaching the rope winch without front-mounted rolling and stacking blade ballast weights of 50 kg per wheel must be used on the front wheels. (Filling the tyres with water, or using other ballast, is not permissible.)

2. For forestry work, particularly in winter, all four wheels should be fitted with chains (e. g. Rud-type chains 96 Ill. 27),

3. When extracting logs remove rear reflectors (95 Ill. 25). For this purpose take plug (93 Ill. 25) out of socket, slacken wing nut (94 Ill. 25) and remove rear reflectors with their mounting brackets.

4. **Front-mounted Rolling and Stacking Blade:** operation lever (91 Ill. 24) for front-mounted rolling and stacking blade (97 Ill. 27), or for front-mounted bucket, or clearing blade.
   Lever position H ≙ lift
   Lever position S ≙ lower
   Operation lever (92 Ill. 24) for front-mounted bucket
   Lever position H ≙ fill
   Lever position S ≙ dip

5. After removing the butt plate, the rope winch can remain on the tractor when fitting three-point implements (e. g. rotary hoe – see Ill. 28).

L) 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 S 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.**

M) Description of Illustrations

Fig. No.

Illustration 1

1 Radiator cap
2 Cyclone preselector
3 Air filter
4 Air induction elbow
5 Injection nozzles
6 Cover for hydraulic oil supply tank
7 Air vent filter with oil diprod for hydraulic tank
8 Cover for fuel tank
9 Tool box
10 Diff-lock foot pedal (front)
11 Battery
12 Fuel filter
13 Glower plugs
14 Exhaust manifold
15 Starter
16 Sealing screws, resp. control screw for exhaust manifold
17 Dynamo
18 Exhaust
19 V-belt for water pump
30 Thermostat
35 Temperature switch
101 Oil diprod
108 Micro-mesh oil filter
E1 Filling opening of oil tank
A Drain screw (steering)
AW1 Cooling water drain plug (engine)

Illustration 2

20 Hydraulic oil supply tank
21 Air vent screw (fuel tank)
22 Air vent filter for fuel injection pump
23 Oil tank for air filter
24 Air filter clasp
25 Hydraulic pump
26 Fuel injection pump
27 Oil pump
28 Regulator
29 Hollow screw
102 Oil suction pipe
103 Hollow screw
105 Oil sump
106 Return flow pipe
107 Oil return pipe
E2 Oil filler plug for bearing housing (engine)

Fig. No.

K1 Oil control plug (Fuel injection pump)
AW2 Cooling water drain plug (engine)

Illustration 3

15 Starter
16 Sealing screw resp. control screw for exhaust manifold
17 Dynamo
19 V-belt of water pump
31 Water pump
32 Screws for adjustment shackle of dynamo
33 Screws for retaining bracket of dynamo
34 Horn
A1 Oil drain screw with filter
A2 Oil drain plug of bearing housing (engine)
AW1 Cooling water drain plug (engine)
K2 Oil level sight glass for bearing housing (engine)
AW3 Cooling water drain plug, (radiator)

Illustration 4

36 Suction pipe for return oil
42 Oil filter for engine return oil
A2 Oil drain plug (bearing housing engine)
K2 Oil level sight glass for bearing housing (engine)
KW1 Cooling water drain plug (engine)

Illustration 6

3 Air filter
23 Oil tank of air filter
43 Air filter inset

Illustration 7

14 Exhaust manifold
44 Exhaust intake
45 Exhaust outlet with muffler
48 Hexagon nut

Illustration 8

16 Sealing plugs, resp. control plugs for exhaust manifold

Fig. No.

Illustration 9

X Cleaning stick (wood)

Illustration 10

50 Horn button
51 Ignition with light switch
52 Ignition key
53 Starter switch
54 Glow starter indicator
55 Blinker switch
56 Charging control light (red)
57 Blinker pilot lamp (tractor – yellow)
58 Tractormeter
59 Blinker pilot lamp (trailer – yellow)
60 Warning light impulse transmitter
109 Temperature pilot lamp (red)
a Fuse – warning light impulse transmitter
b Fuse – dimming light
c Fuse – parking light
d Fuses – rear reflectors
e Fuse – brake light
f Fuse – traffic light

Illustration 11

10 Foot pedal for front diff-lock
61 Steering angle set screw
62 Selector lever (preselection) – R.–V–S)
63 Selector lever
64 Hand lever for rear diff-lock
65 Adjustment lever for seat springing
66 Set screw for foot brake adjustment
67 Set screw for clutch play
68 Clutch pedal
S6-S8 Lubrication nipples for bearing surfaces resp. deep-groove ball bearing
S 13 Lubrication nipple for deep-groove ball bearing
Y Ratchet lever
A Oil drain plug steering

Fig. No.

Illustration 12

62 Selector lever preselection R-V-S
63 Gear selector lever
69 Hand throttle lever
70 Hand brake
71 Cut-out lever
72 Gas pedal
73 Brake pedal
74 Hydraulic operation lever
75 Brake light switsch
76 P.T.O. selector lever
77 Set nut for foot brake adjustment
S1-S2 Lubrication nipple for thrust rod
S3 Lubrication nipple for deep-groove ball bearing
E3 Filler plug, rear transmission
K3 Oil level sight glass rear transmission

Illustration 16

E2 Oil filler plug for bearing housing (engine)
E3 Oil filler plug, rear gearbox
K1 Oil control plug (fuel injection pump)
K3 Oil level sight glass rear gearbox
K5 Filler-control and drain plug for axle housings
A4 Oil drain plug for front gearbox
AW2 Cooling water drain plug (engine)
S1-S2 Lubrication nipple for thrust rod
S3 Lubrication nipple for ball bearing

Illustration 17

78 Stop bolt
84 Set pin for steering angle
S1-S2 Lubrication nipple for thrust rod
S3 Lubrication nipple for ball bearing
S4-S5 Lubrication nipple for universal shaft

Illustration 18

79 Bore for lubrication nipples S4 and S5
108 Micro-mesh oil filter
E1 Filling opening (oil tank)
E4 Filler plug for gearbox
K2 Oil level sight glass for bearing housing (engine)
K4 Oil control plug front gearbox
K5 Filler control and drain plug plug for axle housings
A1 Oil drain screw with filter
A2 Oil drain plug bearing housing (engine)
A4 Oil drain plug front gearbox
AW1 Cooling water drain plug (engine)
AW3 Cooling water drain plug (radiator)
S6-S8 Lubrication nipple for bearing surfaces, resp. ball bearings
S13 Lubrication nipple for clutch pedal

Illustration 19

79 Bore for lubrication nipples S4 and S5
84 Steering angle set pin
S4-S5 Lubrication nipple for universal shaft
S6-S7 Lubrication nipple for bearing surfaces
S8 Lubrication nipple for deep-groove ball bearing
S9-S12 Lubrication nipple for universal shafts (cross and bearings)

Illustration 20

64 Hand lever for rear diff-lock
80 P.T.O. shaft
81 Crank for adjustable drawbar

Fig. No.

82 Coupling nut for three-point linkage
83 Hydraulic lever
K5 Filler control and drain plug for axle housings
A3 Oil drain plug, rear transmission
S14 Lubrication nipple for
S15 hydraulic shaft
S16 Lubrication nipple for adjustable drawbar
S17 Lubrication nipple for
S18 support shaft

Illustration 21

42 Oil filter for engine return oil
100 Oil tank
101 Diprod
102 Oil suction pipe
103 Hollow screw
104 Oil pump
105 Oil sump
106 Return suction pipe
107 Oil return pipe
108 Micro-mesh oil filter
D1-D4 Oil pressure pipes

Illustration 23

6 Hydraulic tank cover
7 Air vent filter with oil diprod for hydraulic tank
20 Hydraulic oil supply tank
85 Filter cartridge

Illustration 24

90 Three-way distributor valve
91-92 Operation lever for front-mounted rolling and stacking blade, resp. front lifter bucket

Illustration 25

93 Plug
94 Wing nut
95 Mounting bracket for rear reflectors

Illustration 27

96 Rud snow chains
97 Front-mounted rolling and stacking blade.

N) Safety frame (Make Fritzmeier) (For track widths of 1.25 m only)

For attachment of the safety frame use only the recommended parts. Please pay strict attention to the following instructions. Safety and traffic regulations will not permit any deviation in the attachment of the frame.

1. **Assembly of the Frame Top (Ill. 29)**
   Rub talcum powder, or another sliding compound, into the rubber tube serving as neck protection (A). Then slide the same onto the tube at the left half of the frame, and fit both halves (B) together. Fix front clamp connections using assembly screws (D), whereby screw heads must point inside. To serve as a protection, put a profiled rubber (E) between the front lefthand clamping connections (C).

2. **Attachment of Support Tubes on Tractor (Ill. 30)**
   Remove rear wheels of tractor. Remove fenders, fix base plates (A) with fenders on axle housing (use external bores). The tapered edges of the base plates must point inside, and the spacing of holes (B = 110 mm) outside. For fixing screws use hexagon screws M 14×40 DIN 933-8.8. Put support tubes into base plates. The fixing shackles must be flush with the fenders. Secure support tubes in base plates with screws by inserting oval-head screws in the bores from inside. Tighten hexagon nuts with torque wrench set to break at 7 kpm.

3. **Fitting Top of Frame on Support Tubes (Ill. 31)**
   The available bores (A) must be placed so that they point downwards on the outside, and upwards on the inside (see arrow). Aligning top of frame (Ill. 31).
   The loosely assembled top of the frame must be aligned in a way that the length (X) of 905 mm and the width (Y) of 1090 mm are maintained. (Measurements taken from centre to centre of tube.)
   The top of the frame overlaps the tractor in front by 220 mm (see measurement B).
   (Measurement from the centre of the tube of the front clamp connection to the centre of the top frame tube.)

4. **Final Assembly (Ill. 32)**
   If the top of the frame is in horizontal line with the tractor axle, the whole safety frame can be bored up to 13 mm dia. and then the screws can be fitted and tightened with the torque wrench set to break at 7 kpm. Take care that all screw heads (A) point inside. With the exception of the two screws (B) at the centre of the frame. Fit these in a way that the lock nuts are on top of the inside of the tube. After having tightened these nuts with the torque wrench set to break at 7 kpm, fit plastic caps over both of them. Bore up support tubes and fenders in centre line and bolt. Use washers on sheet plate.
   Attention! For safety's sake use self-locking nuts only once.

O) Forestry winches

I) Make Schlang and Reichart – Mechanically operated

A) Attachment of Rope Winch and Butt Plate on Tractor

1. Unscrew P.T.O. guard and trailer hitch with socket from tractor, clean P.T.O. shaft and bearing surface from paint, clean tap holes with screw tap.
2. Slide winch, together with the winch support, onto the greased P.T.O. shaft and on centering seat, and tighten with the centre screw and with 5 screws on each side. For this purpose remove the lateral chain guard.
   Secure all screws with locking rings and tighten firmly!
3. Screw punched support of trailer hitch and top link arm, as well as P.T.O. guard, onto the winch support. Fit clutch operation lever of the winch with screws in a place from where it can be reached from the driver's seat – grease toothed segment.
4. Change lifter rod with threaded spindle over to the lefthand side. Thereby it is recommended to replace the split pin on top by a clamping sleeve. Fit the spacers which are supplied with the winch, between lifter rod and lower link arms using split pins, or dowel pins and bolts. Before, fit the butt plate in the lugs of the lower linkage arm and place it between spacer and lower link arm.
   We recommend to use ballast weights in the front wheels.

B) Operation Instructions for Rope Winch Type 142

1. Lower three-point hydraulics and, simultaneously, the butt plate (Ill. 26).
2. Disengage the clutch of the winch.
3. Run out the cable and fit load (avoid loops and sharp angles).

4. **When pulling**
   in normal operation: engage P.T.O. (76 Ill. 12 resp. 26) and close the clutch of the winch,
   with heavy loads: engage the clutch of the winch first, then start, using the more sensitive P.T.O. clutch.
   Shut the clutch of the winch only to such an extend which is necessary to obtain sufficient traction to move the load – this will enable the clutch to slip smoothly over obstacles.
   Never let clutch slip for any length of time!
5. a) **Clutch of the winch released** (open slowly to avoid slackening of the coiled rope) – The rope can now be pulled out.

b) **Clutch of the winch engaged** (P.T.O. disengaged) – The return stop safety mechanism does now not allow the rope to be pulled out.

6. With this winch, the rope can be pulled within the range of an angle of 180°. Normally, the tractor should be in line with the direction of pull.

After removing the butt plate, the rope winch can remain on the tractor when using trailers on the trailer hitch, and when fitting three-point implements.

Before taking the winch into operation for the first time, and before pulling heavy loads, we recommend to pay out almost the full length of rope – leaving only 3 coils on the drum – then fasten the rope onto a fixed point, and rewind it by slowly backing the tractor with hand brake slightly closed, to the fixing point of the rope. By proceeding thus, a tight package of rope is obtained and, in unwinding, the rope will not cut into the layers.

The wire ropes supplied with the winch have undergone severe resistance tests through the manufacturers and have been rechecked by us so that any warranty claims for the ropes must be principally rejected.

C) Service and Maintenance

When unwinding the rope trailing is avoided through a small skid brake which can be adjusted with a lateral set screw.

Oil the roller chains of the rope transmission twice a week.

Oil the grease fitting of the trapezoidal thread nut once a month.

Lubricate monthly:

the lubrication nipple of the castor, and the toothed segment of the clutch lever.

Change oil in gearbox, resp. the return stop safety mechanism, for the first time after 50 operation hours, thereafter every 200 hours. (Use 2,5 resp. 0,3 ltr. Mobil GX 140 oil.) You are expressively requested to use only SAE 140 oils with the winch.

To protect the steel wire rope from corrosion and to cover it with a non-skidding film of dry lubricant, spray it with, or dip it in, a fast-dry solid-matter sliding compound as, e.g. molybdenum 165 X. Thus, no sand or dirt will adhere to the rope. For this treatment the rope must be absolutely clean and free from grease.

D) General Instructions

When fitting a new rope, the rope must be **unrolled** from the pulley – loops caused through lateral pull will result in damage.

One end of the rope is fitted in the rope drum with a socket-head screw. The other end is fitted on the drawhook with a wedge lock. The automatic return stop safety device avoids the unwinding of the rope if a load is hooked to it, and if the clutch of the winch is engaged.

Drive is taken from the P.T.O. over a vertically arranged chain drive and a second chain, arranged diagonally to the worm shaft.
Retighten the vertical chain by placing the screw flange of the double sprocket higher. To do so, slacken the 4 screws of the flange behind the driver seat and displace them upwards in their long slots.
Retighten the second, diagonal chain, by slackening the winch on its support in order to put the spare setting shims between winch and winch support. After that, retighten winch.

II) Make Schlang and Reichart Type 410 – Hydraulically operated

A) Attachment of Rope Winch and Butt Plate on Tractor

1. Unscrew P.T.O. guard and trailer hitch with socket from tractor, clean P.T.O. shaft and bearing surface from paint, clean tap holes with screw tap.
2. Slide winch, together with the winch support, onto the greased P.T.O. shaft and on centering seat, and tighten with the centre screw and with 5 screws on each side. For this purpose remove the lateral chain guard.
   Secure all screws with locking rings and tighten them firmly!
3. Screw punched support of trailer hitch and top link arm, as well as P.T.O. guard, onto the winch support.
4. Change lifter rod with threaded spindle over to the lefthand side. Thereby it is recommended to replace the split pin on top by a clamping sleeve. Fit the spacers which are supplied with the winch, between lifter rod and lower link arms using split pins, or dowel pins and bolts. Before, fit the butt plate in the lugs of the lower linkage arm and place it between spacer and lower link arm.
   We recommend to use ballast weights in the front wheels.

After removing the butt plate, the rope winch can remain on the tractor when using trailers on the trailer hitch, and when fitting three-point implements.

B) Operation Instructions for Rope Winch Type 410

The wire ropes supplied with the winch have undergone severe resistance tests through the manufacturers and have been rechecked by us so that any warranty claims for the ropes must be principally rejected.
Before taking the winch into operation for the first time, and before pulling heavy loads, we recommend to pay out almost the full length of rope – leaving only 3 coils on the drum –, then fasten the rope onto a fixed point, and rewind it by slowly backing the tractor with hand brake slightly closed, to the fixing point of the rope. By proceeding thus, a tight package of rope is obtained and, in unwinding, the rope will not cut into the layers.
1. Lower three-point hydraulics and, simultaneously, the butt plate (Ill. 26).

2. Release winch brake by means of the hydraulic operation lever.
3. Run out the cable and fit load (avoid loops and sharp angles).

4. **When pulling**
   in normal operation: engage P.T.O. (76 Ill. 12 resp. 26) and close the clutch of the winch.
   with heavy loads: engage the clutch of the winch first, then start, using the more sensitive P.T.O. clutch.

When rewinding the rope, one or more control valves (LB 408 PaD) are actuated against the pull of the return spring. When released, the return spring moves the control lever to "O" position – and the winch is automatically braked.
When releasing the brake, the control lever is operated in opposite direction and is automatically fixed by catching in a groove (if the rope is pulled tight, open brake slowly, otherwise the rope will get loose on the drum).
Slow starting, using the clutch, and releasing the brake slowly, is enabled by delayed changing of the gears. However, this will cause clutch and brake linings to slip and results in increased wear!

C) Service and Maintenance

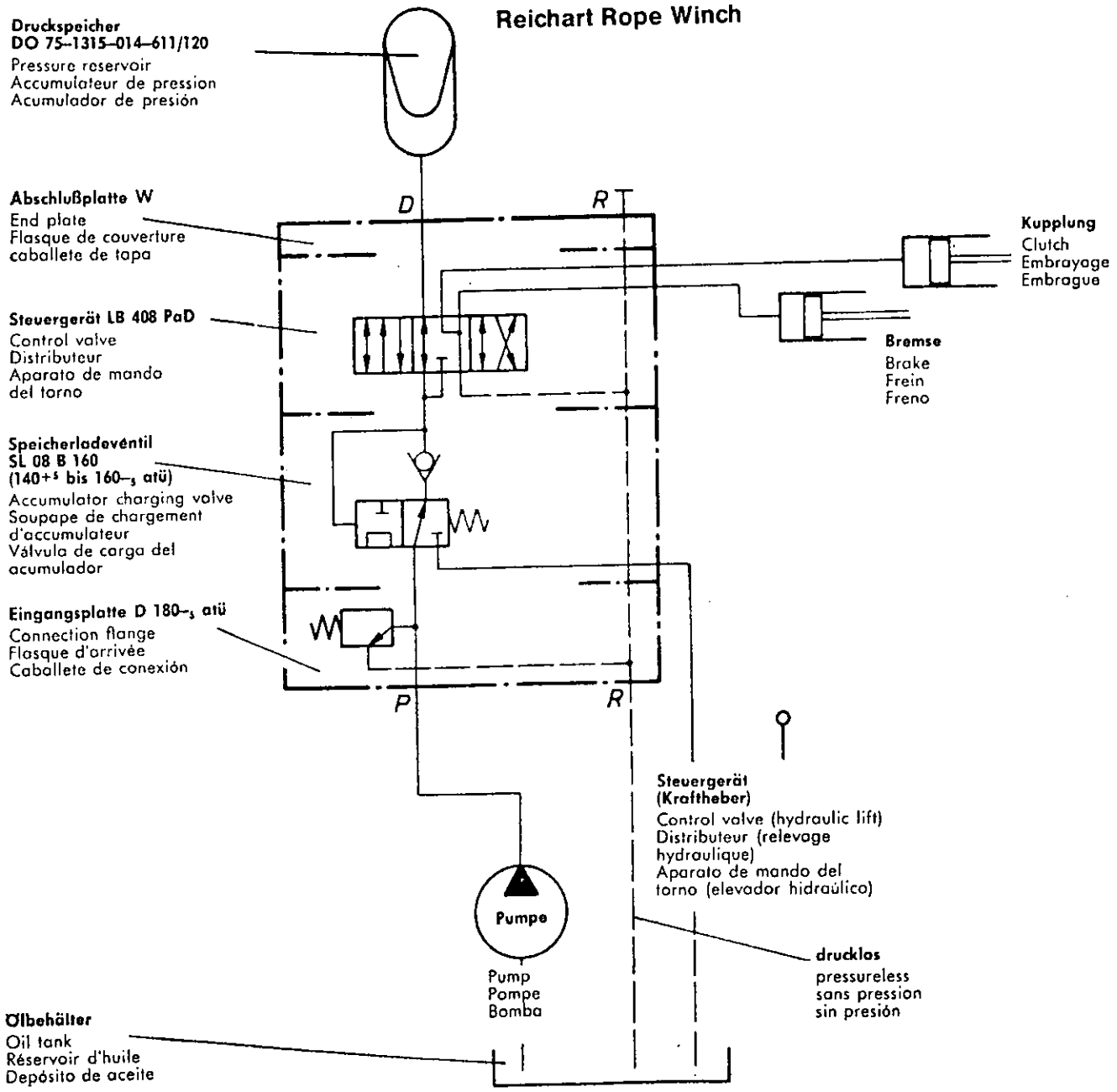
When unwinding the rope trailing is avoided through a small skid brake which can be adjusted with a lateral set screw.
Oil the roller chains of the rope transmission twice a week.
Lubricate the lubrication nipple of the castor monthly.
Change oil in gearbox for the first time after 50 operation hours, thereafter every 200 hours (2.5 ltrs. GX 140).
Use only SAE 140 oils with the winch!
When fitting a new rope, the rope must be **unrolled** from the pulley – loops caused through lateral pull will result in damage.
To protect the steel wire rope from corrosion and to cover it with a non-skidding film of dry lubricant, spray it with, or dip it in, a fast-dry solid-matter sliding compound, as, e. g. molybdenum 165 X. Thus, no sand or dirt will adhere to the rope. For this treatment the rope must be absolutely clean and free from grease.
One end of the rope is fitted in the rope drum with a socket-head screw. The other end is fitted on the drawhook with a wedge lock. The automatic return stop safety device avoids the unwinding of the rope if a load is hooked to it, and the clutch of the winch is engaged. Instead of the wedge lock a running noose with slide hook can be used.
Drive is taken from the P.T.O. over a vertically arranged chain drive and a second chain, arranged diagonally to the worm shaft.
Retighten the vertical chain by placing the screw flange of the double sprocket higher. To do so, slacken the 4 screws of the flange behind the driver seat and displace them upwards in their long slots.

To retighten the 2nd diagonal chain, slacken the 4 inner screws of the adjustment flange and displace the bearing pin with double sprocket in the long slots till the chain is tight. Retighten screws.

D) Description of Hydraulic Operation Diagramme for Schlang and Reichart Rope Winch Type 410
(Illustration see page 67)

The hydraulic pump of the tractor pumps pressure oil into the front side of the control block and from there, via the accumulator charging valve, through the control valve (or valves) of the winch to the pressure reservoir. If the latter is charged with $160._{5}$ bar (atmosphere) the accumulator charging valve changes over to idling. The idling oil flows out of the accumulator charging valve and is separately led to another "consumer", e.g. the hydraulic lift, and the tank. In case of pressureless return flow, the idling oil can be returned to the tank (see R in illustration). No heavy dynamic return pressure must exist in the return flow pipe (R).
As soon as the tractor engine has been started, the pressure reservoir must be charged by the pump – after the pressure has been obtained, the accumulator charging valve switches over to pressureless circulation. – If the accumulated pressure falls, owing to oil leak or the actuation of implements (as far as 140^{+5} bar) it is automatically recharged up to $160._{5}$ bar. This happens if the control valve of the winch does not respond in intervals of a few minutes. Should this time of changing fall below one minute, we recommend to replace the control block.
A humming sound of a duration of 10 seconds is the sign of the pressure chamber being charged. If this sound goes on for more than 10 seconds, this is a sign of the accumulator charging valve having become stuck in intermediate position (e. g. as a result of dirty oil). In this case one of the control valves of the winch should be operated in order to force the accumulator charging valve to respond again to avoid unnecessary heating of the oil. A distortion of the valve block may also result in incorrect responding of the valve. Therefore, the torque of the 4 long tie rods must not be more than $^{1}/_{2}$ mkp.
Oil pressure adjustments, as prescribed by the operation diagramme (excess pressure $180._{5}$ bar and cut-off pressure $160._{5}$ bar) are important for correct function of the unit and must be maintained.

Illustration of Hydraulic Operation Diagramme of Schlang & Reichart Rope Winch



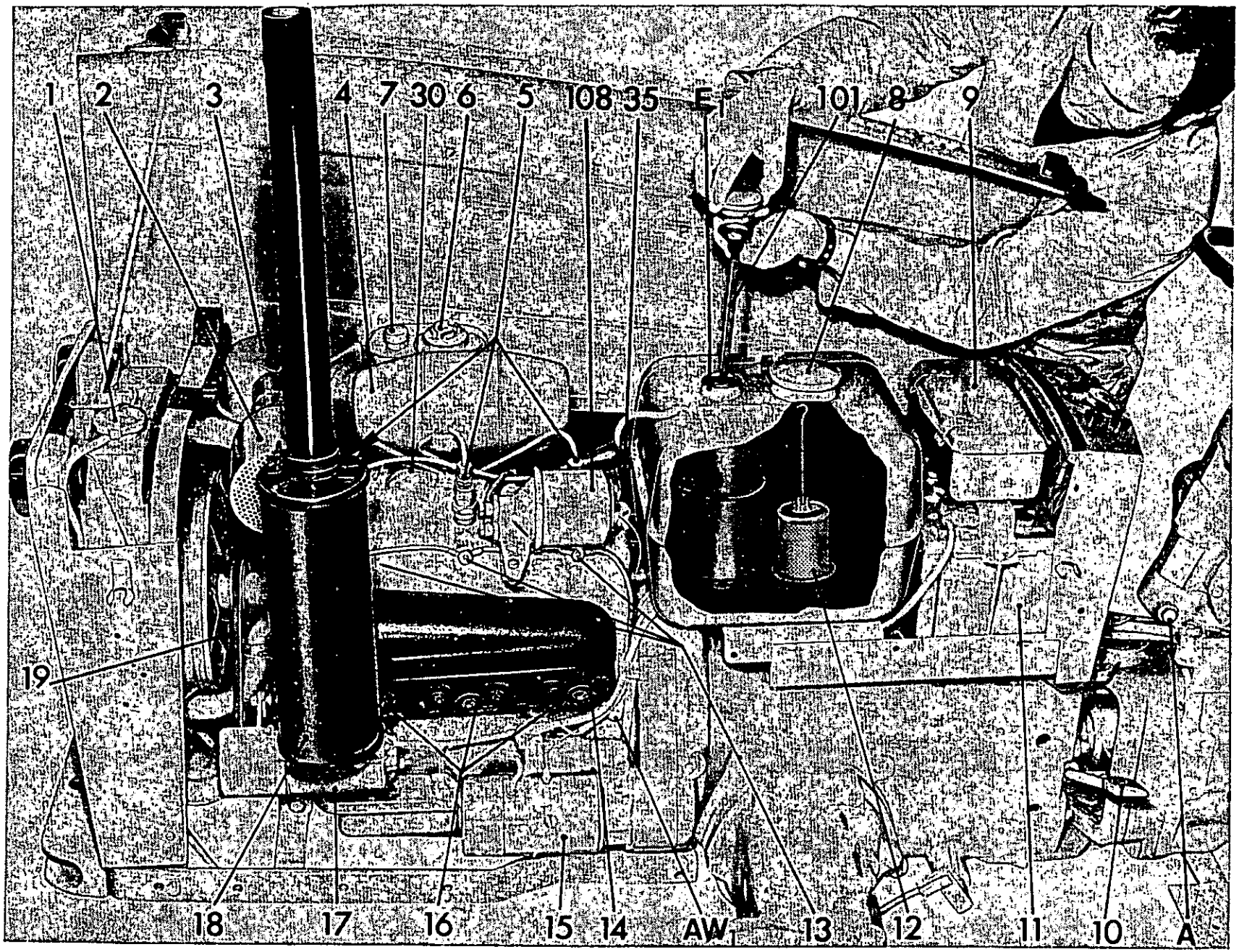


Abb. 1

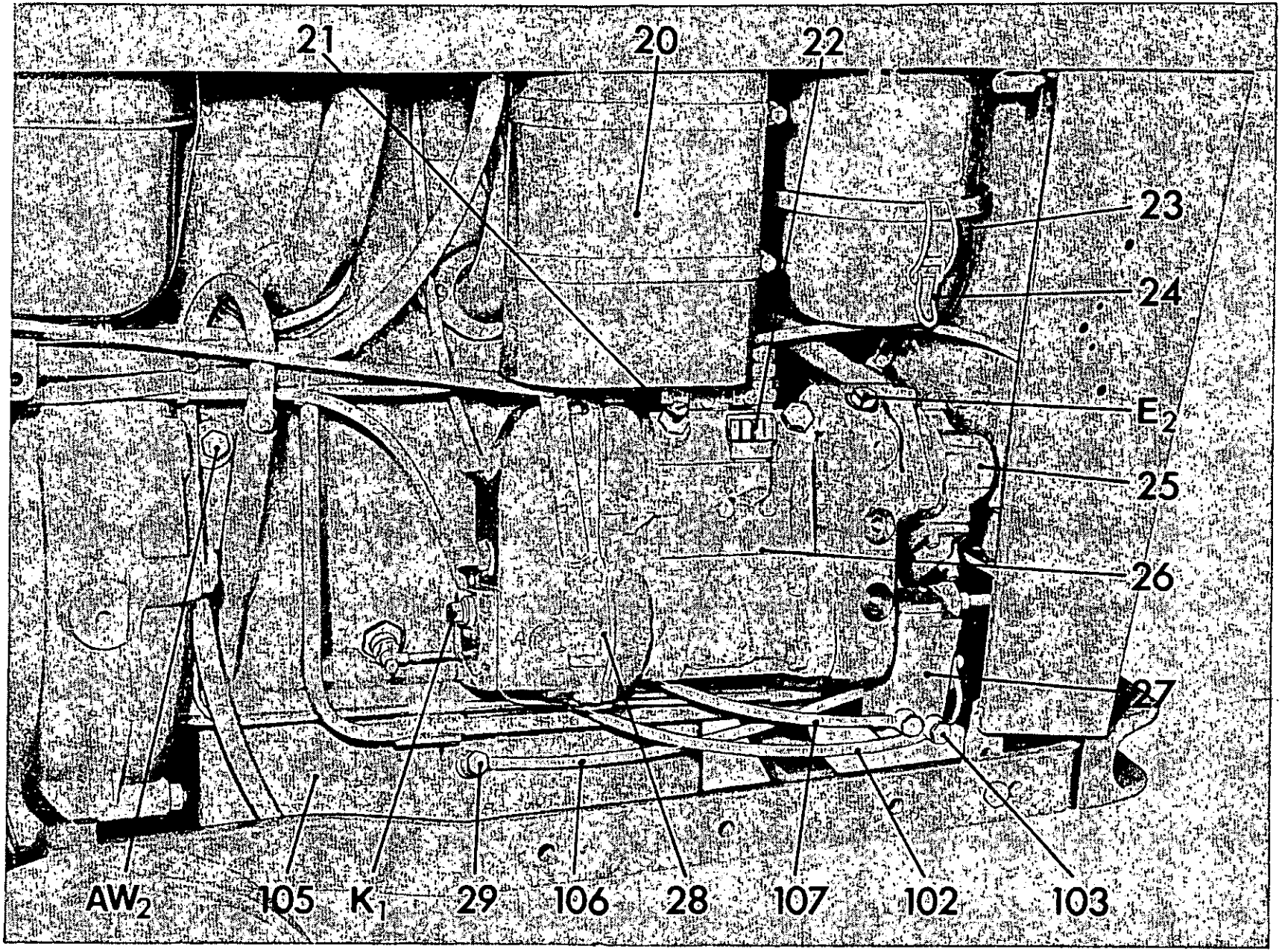


Abb. 2

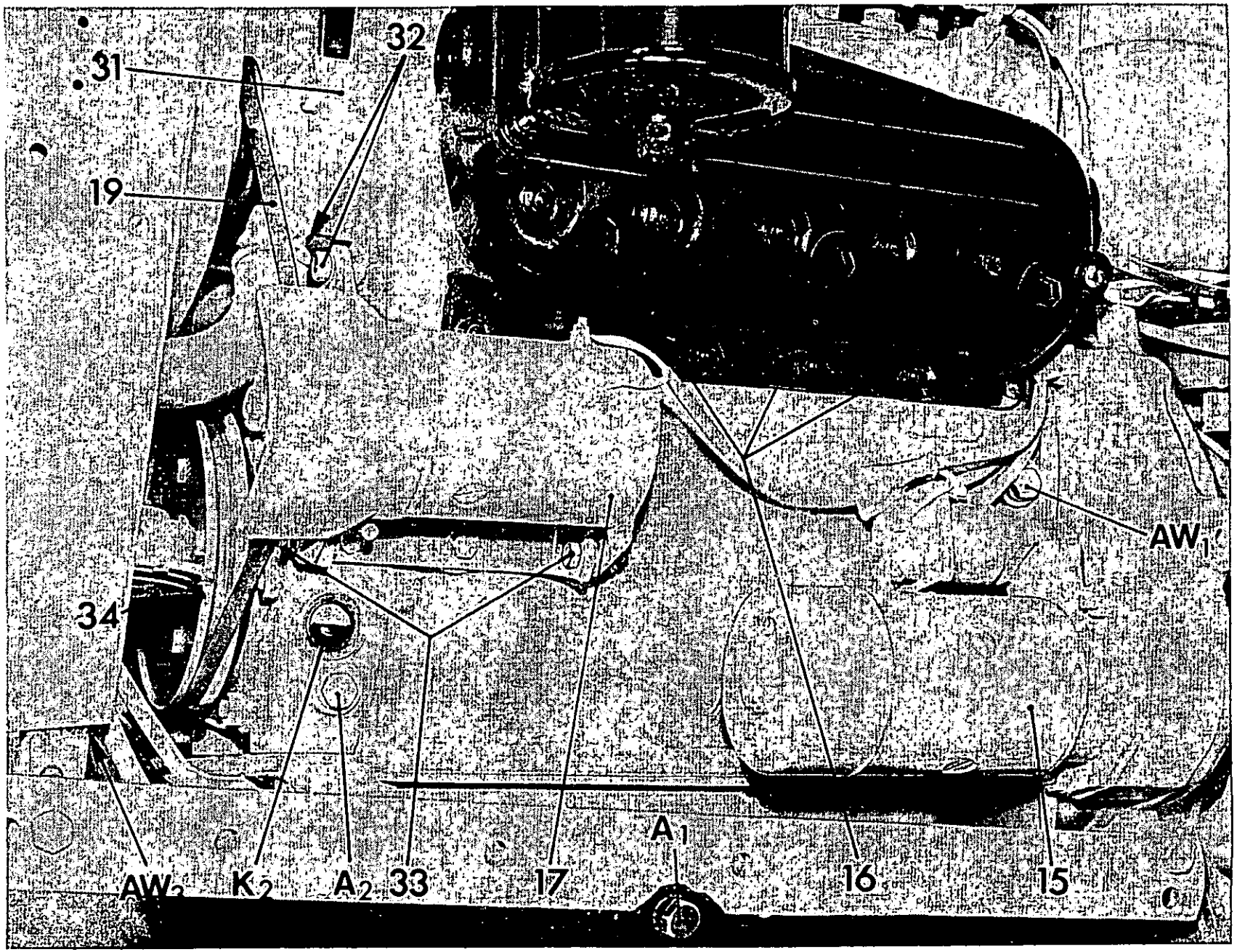
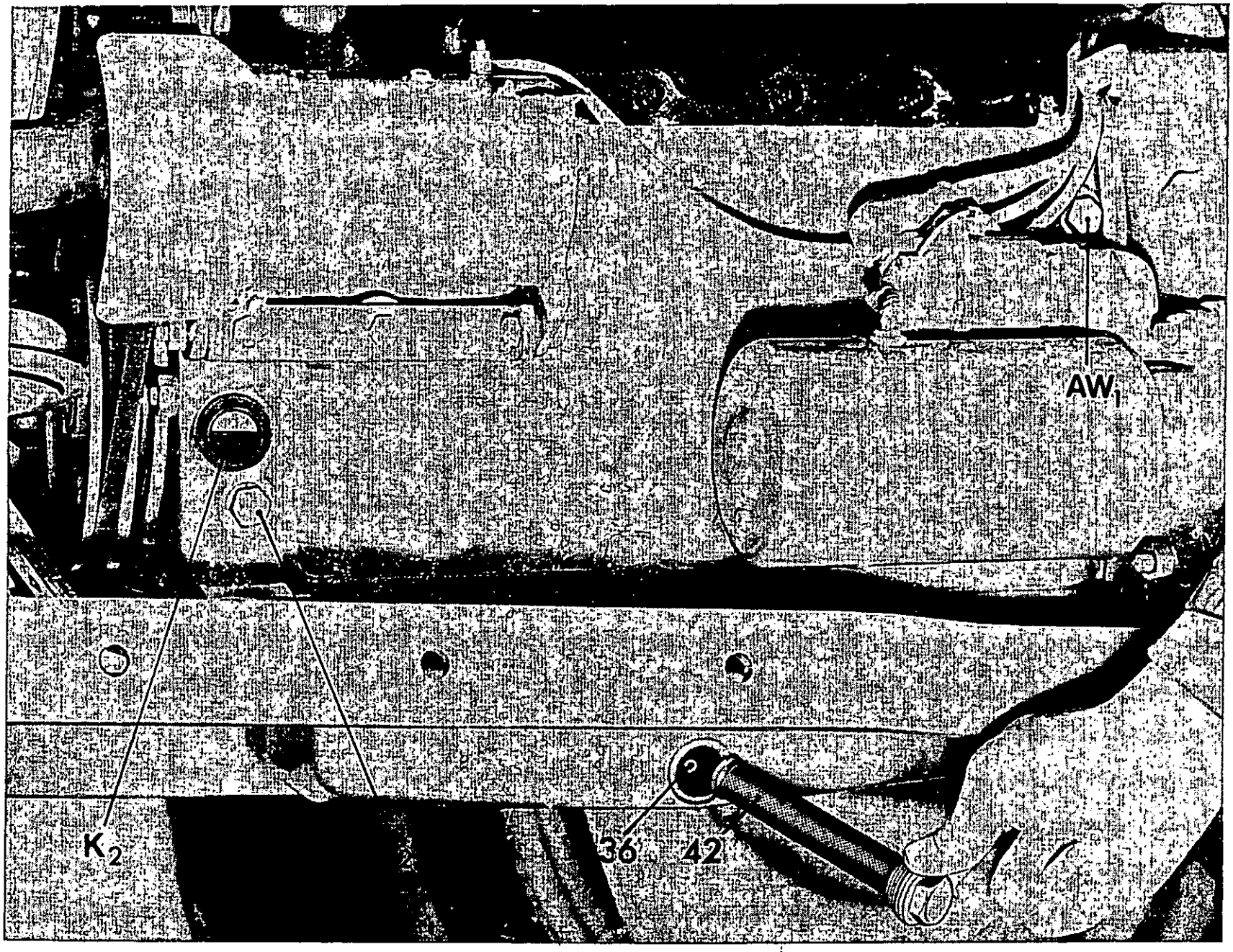


Abb. 3



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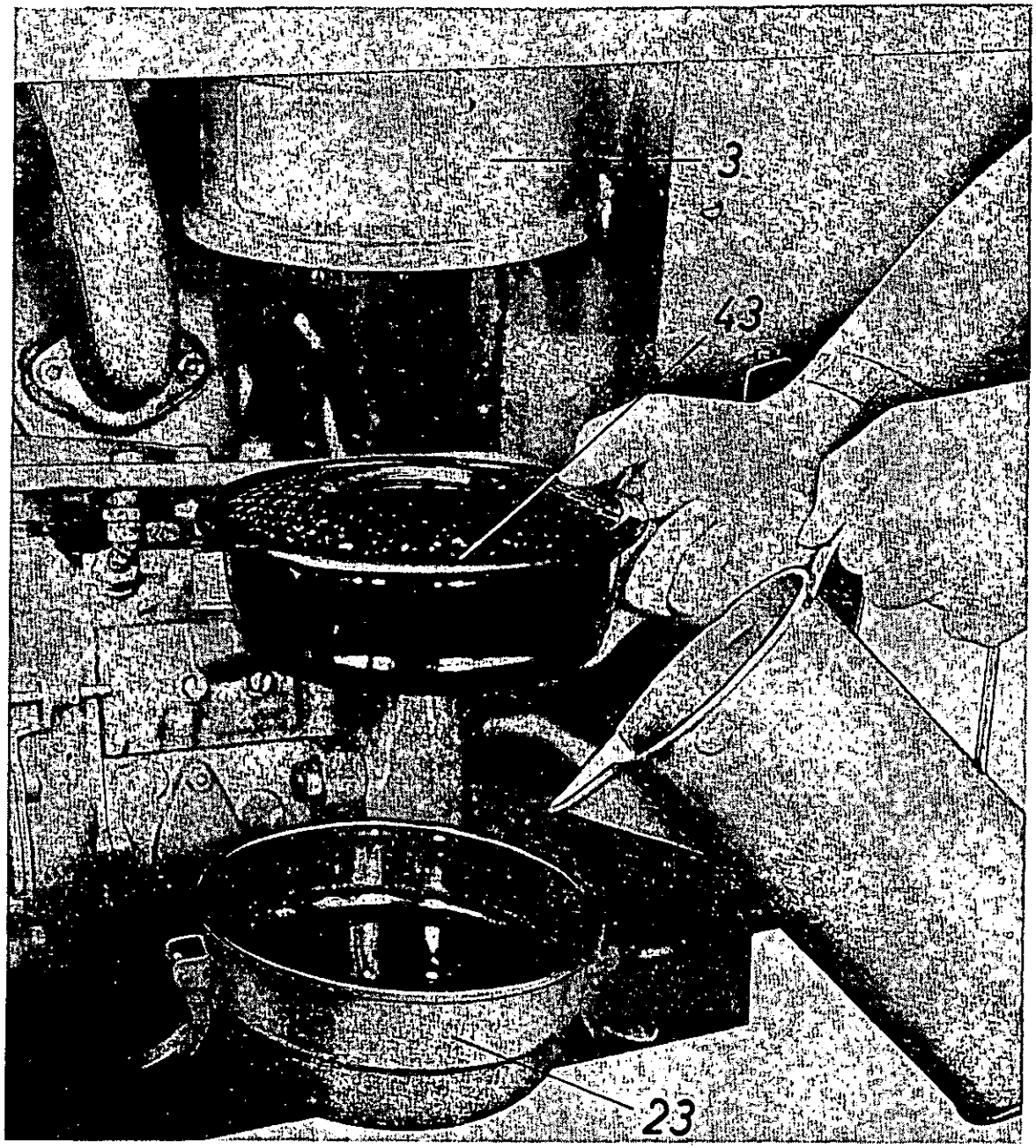


Abb. 6

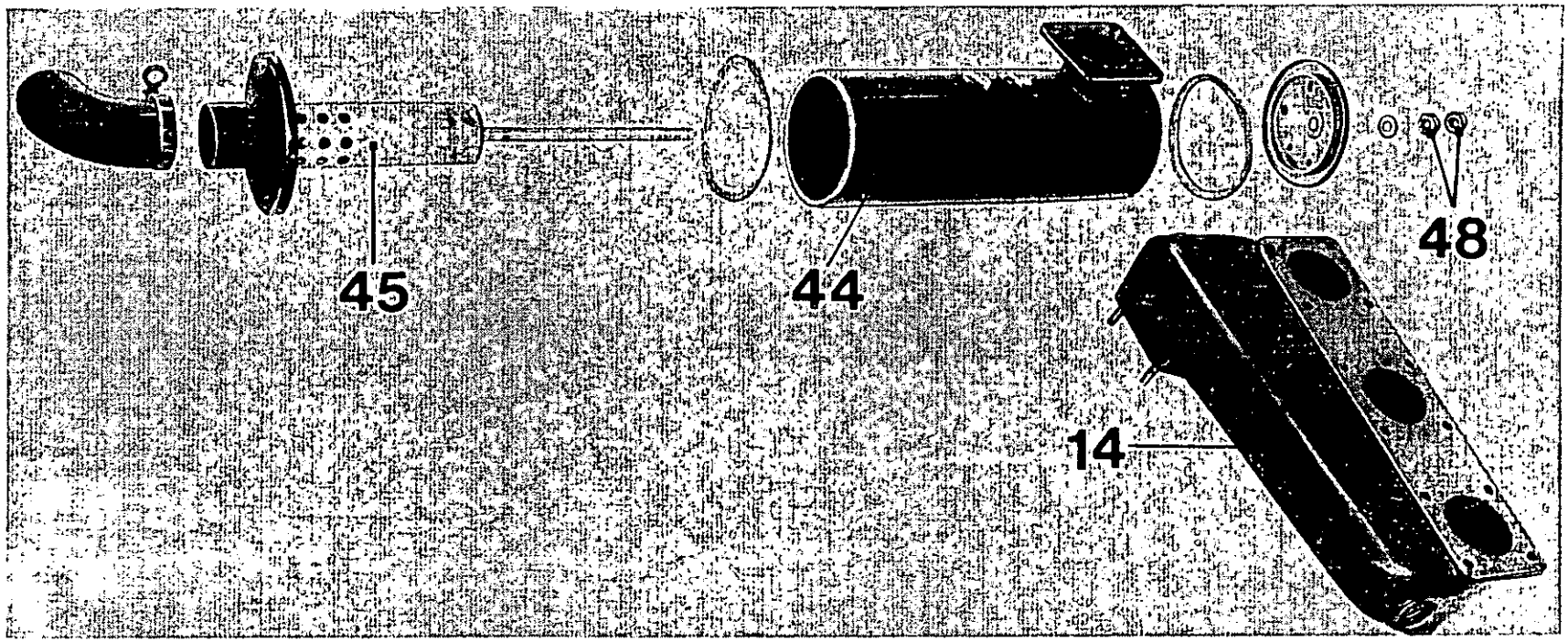
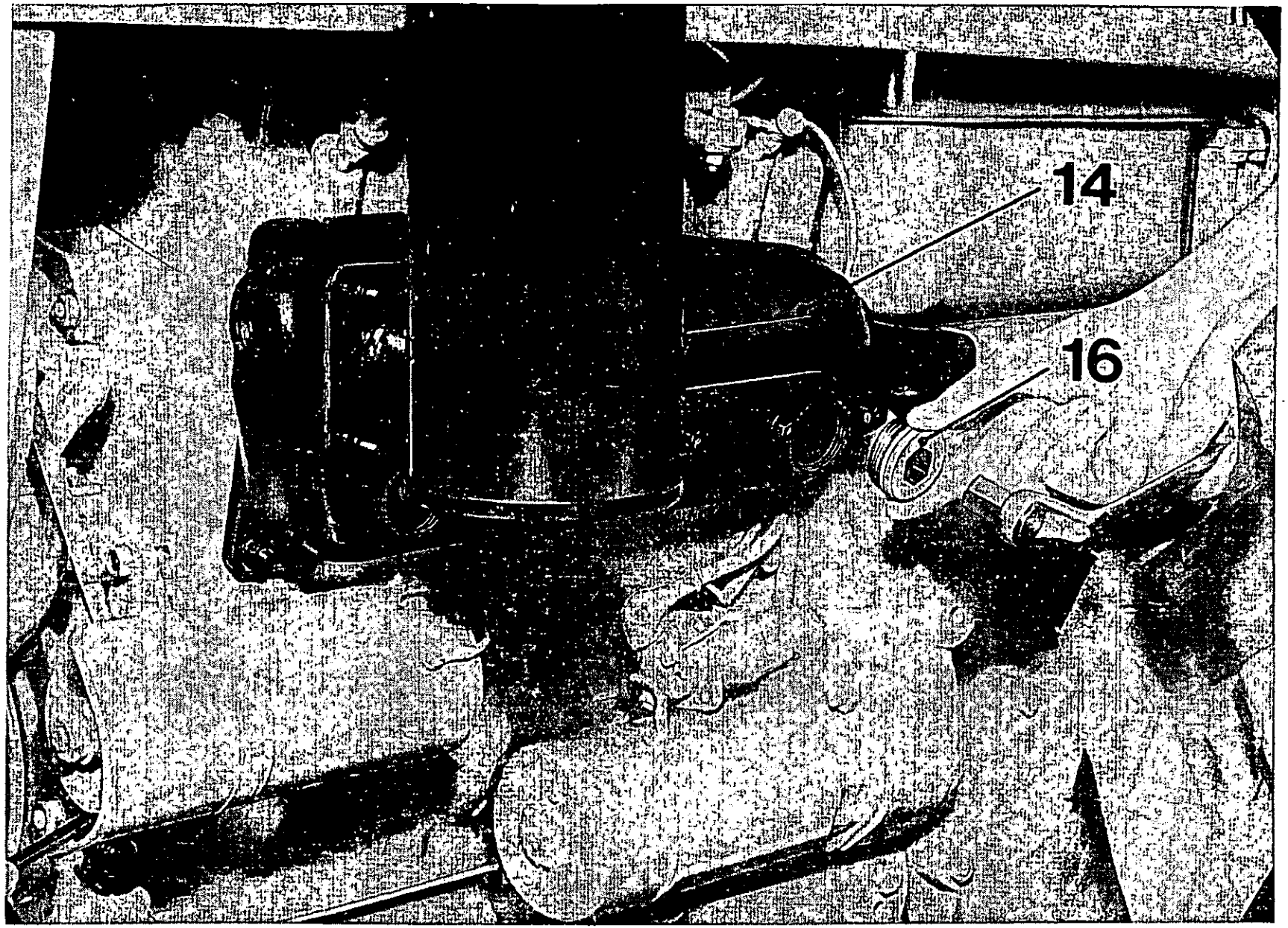


Abb. 7



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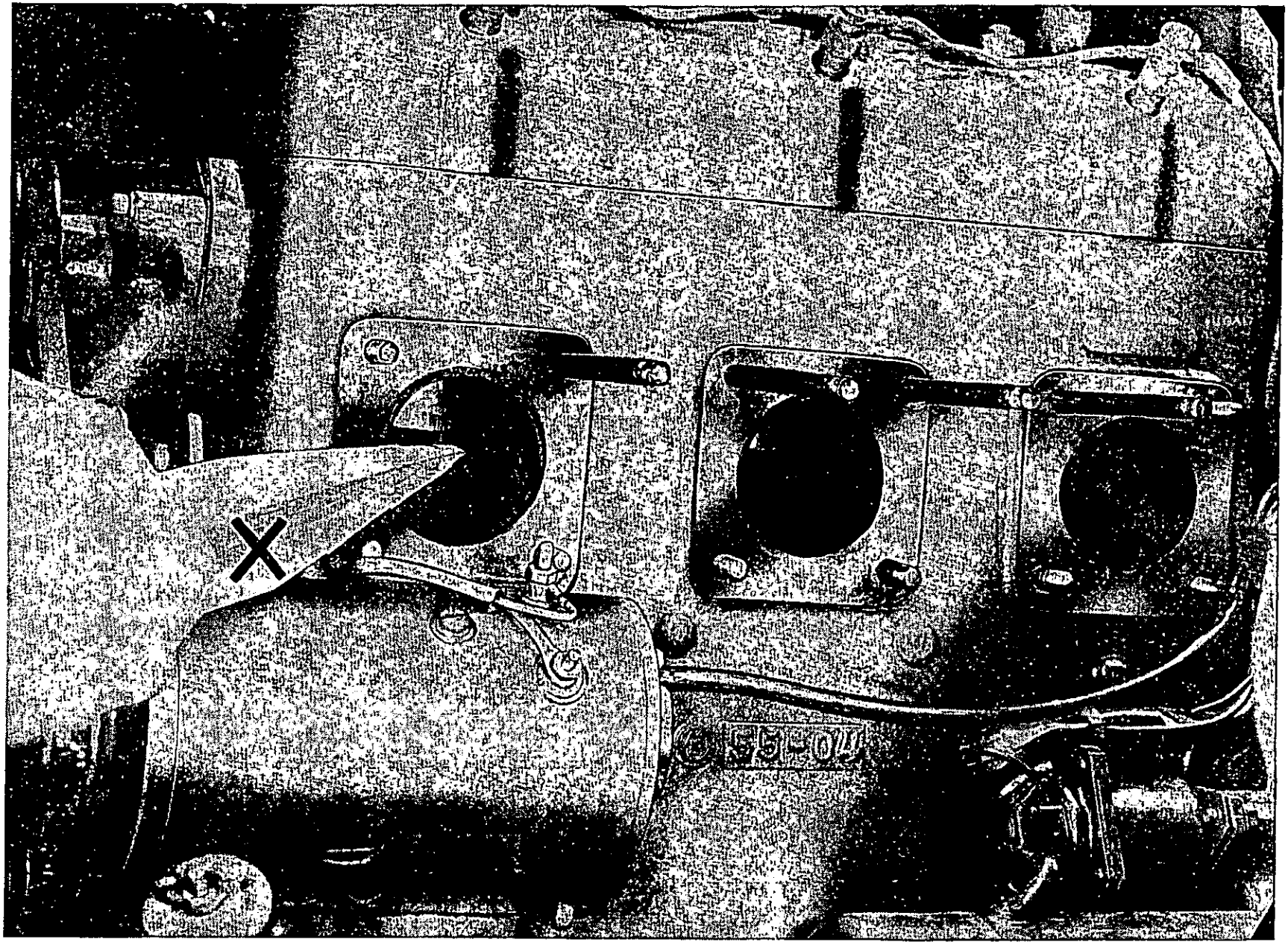

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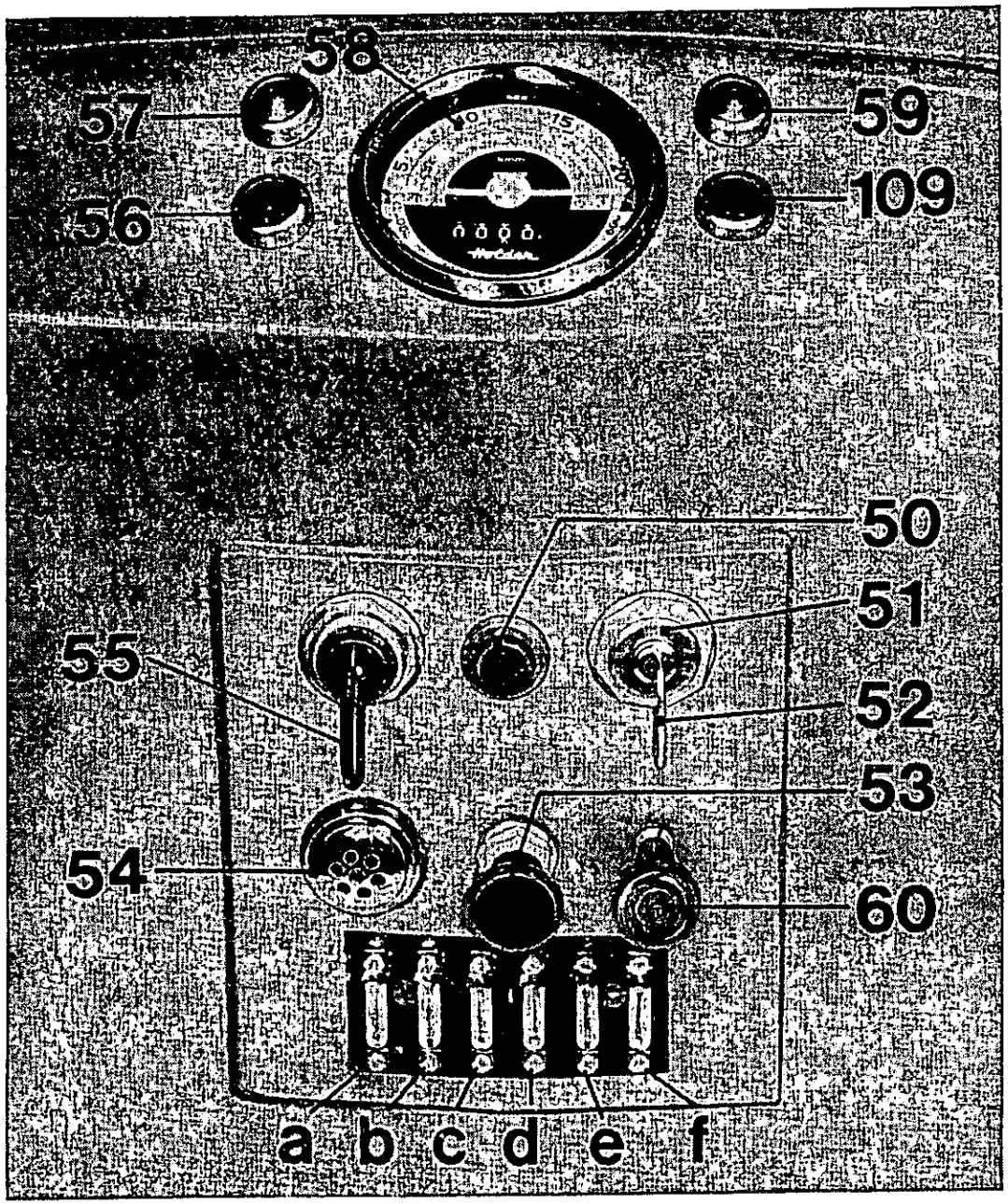

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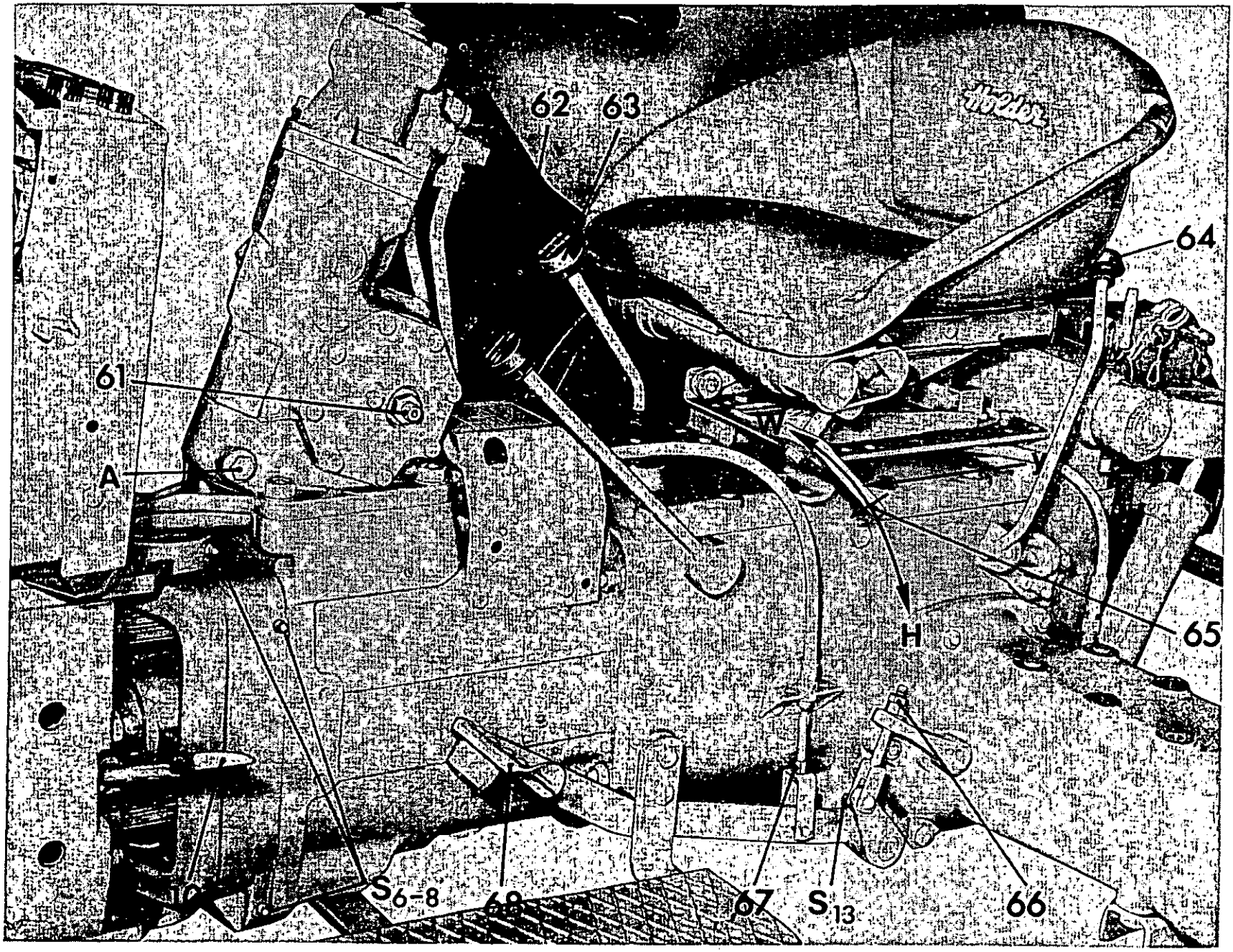


Abb. 11

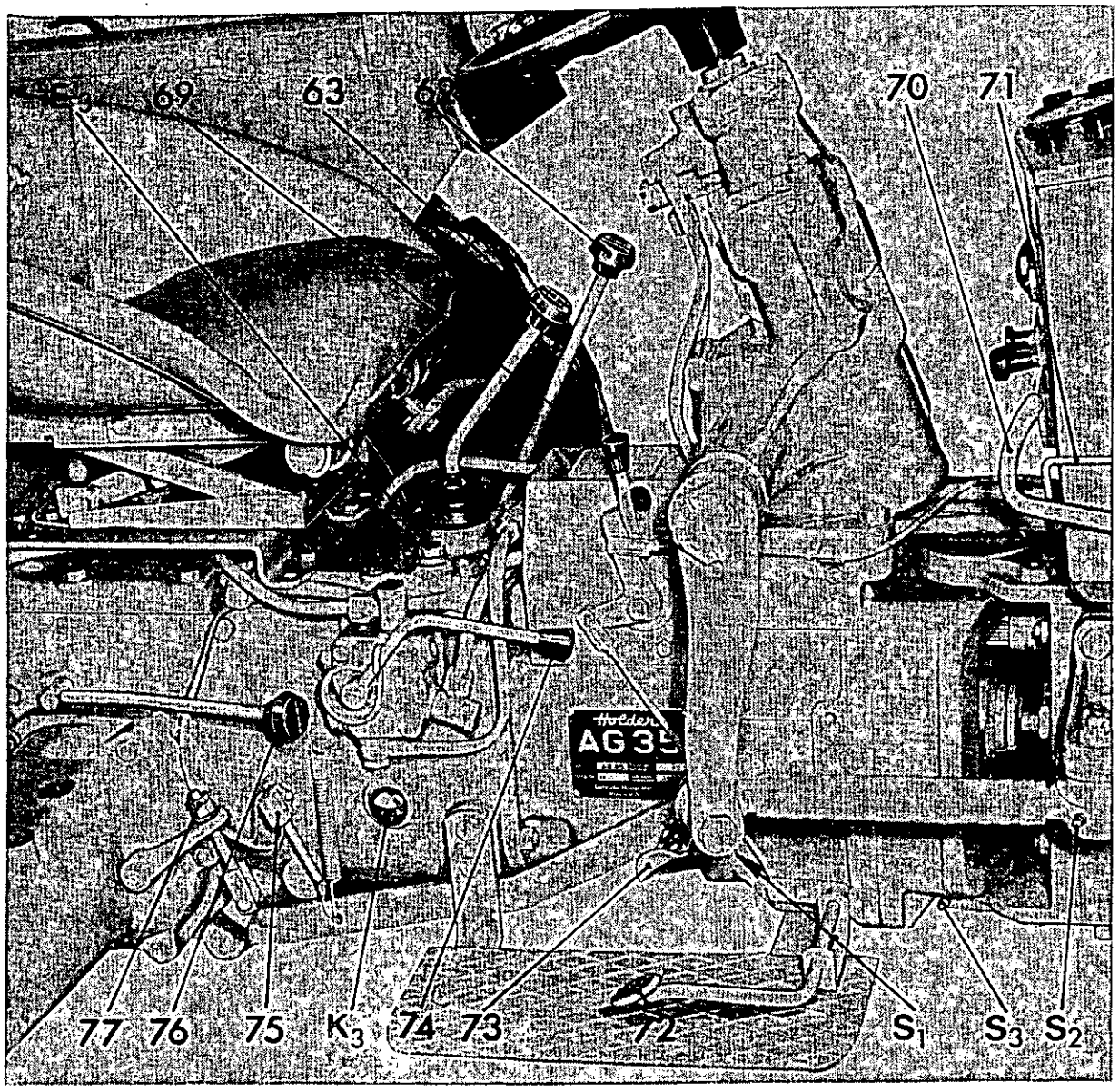


Abb. 12

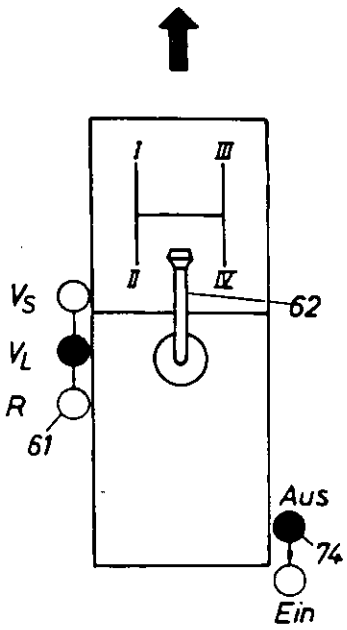


Abb. 13

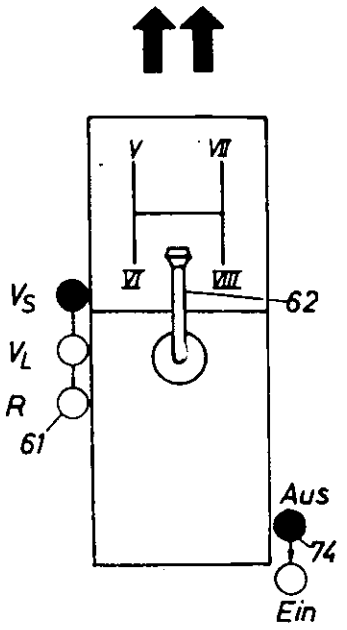
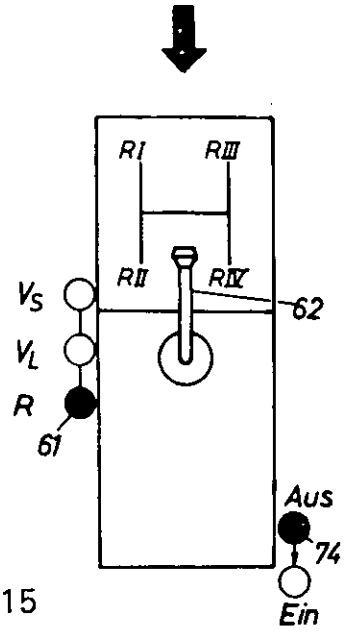


Abb. 14



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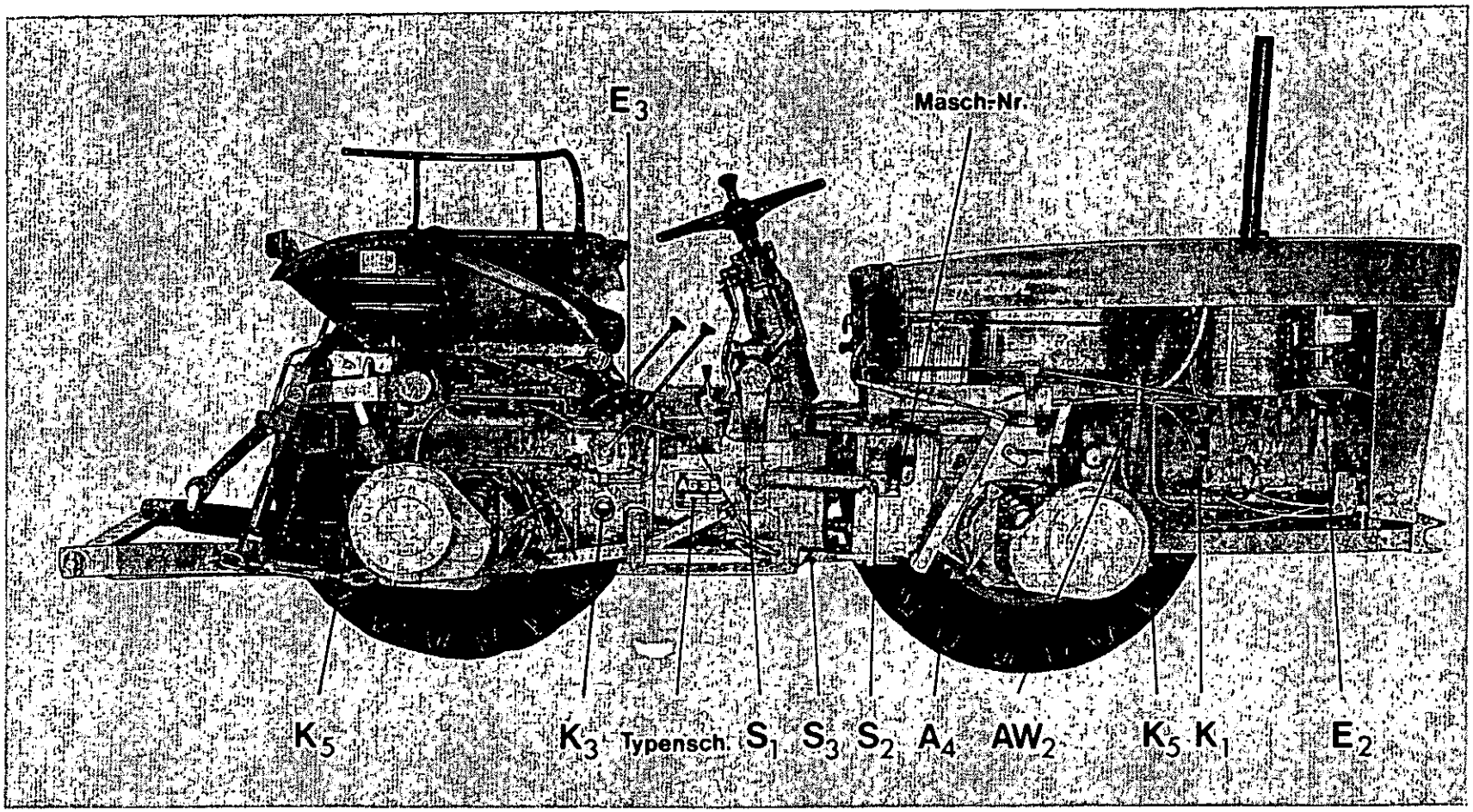
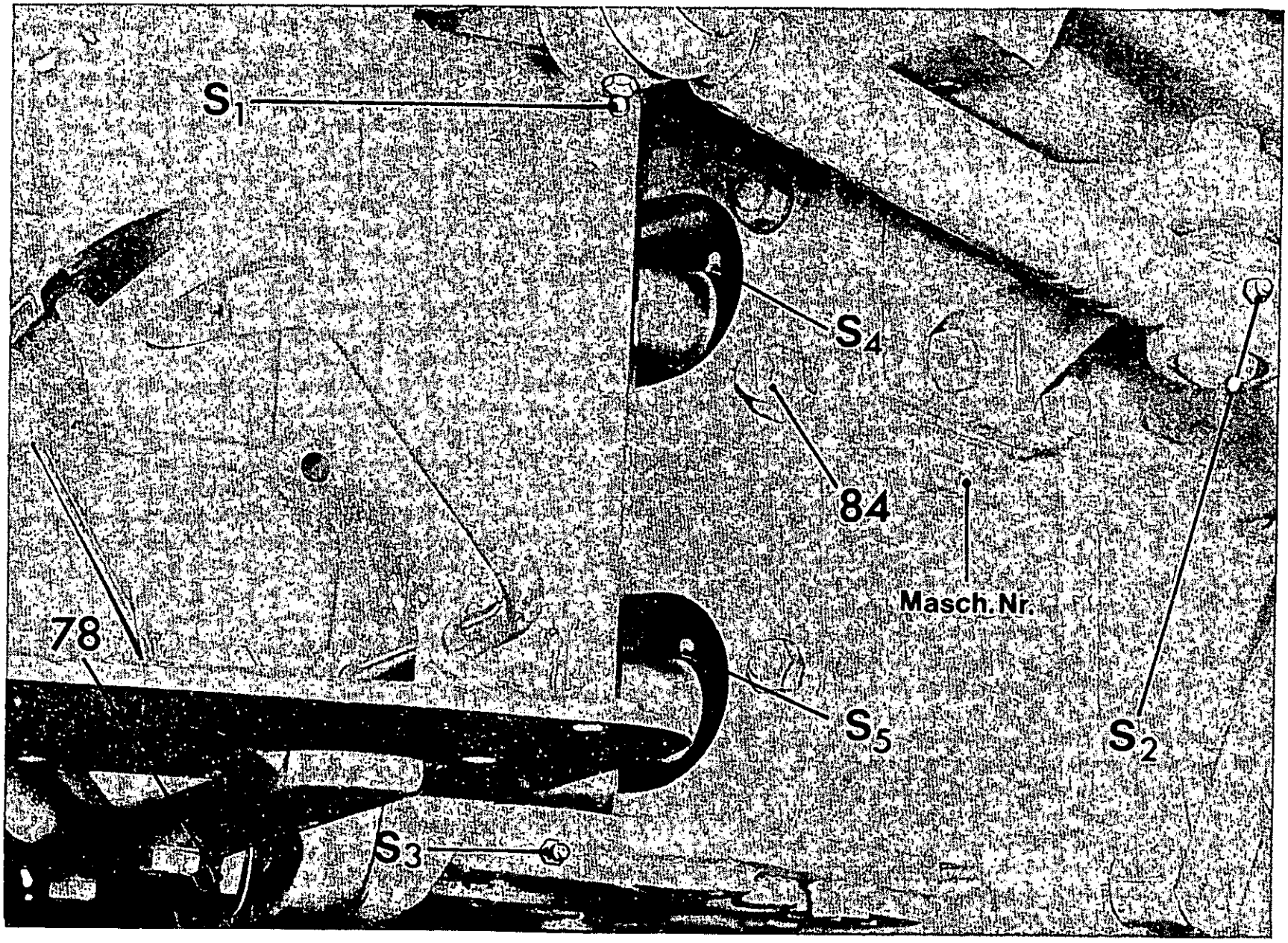


Masch.-Nr. = Tractor serial No.
N° du tracteur – N° de la máquina
Typensch. = Type plate – Plaque d'identité –
Placa de características

Abb. 16



Masch.-Nr. = Tractor serial number –
N° du tracteur – N° de la máquina

Abb. 17

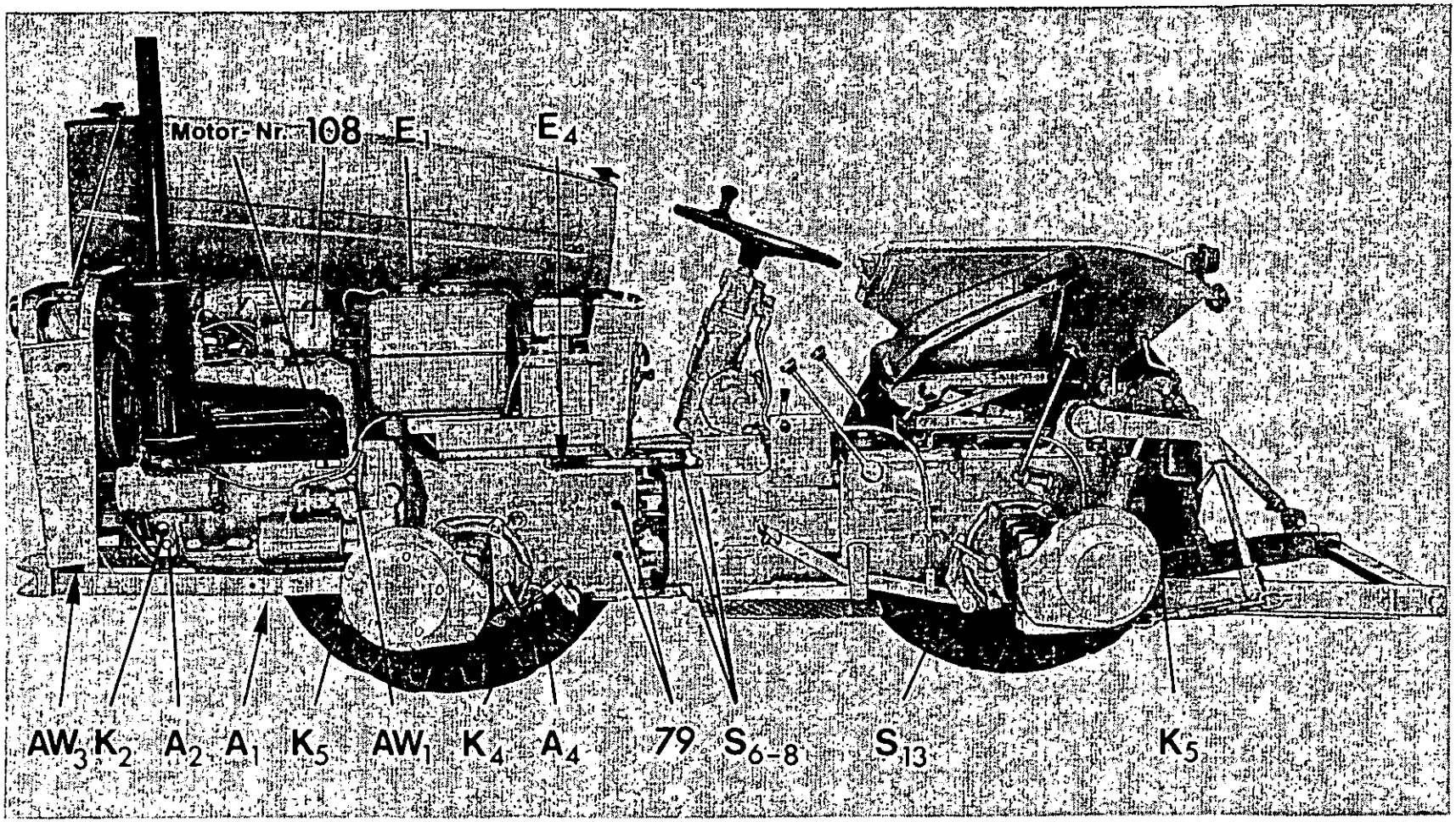


Abb. 18

Motor-Nr. = Engine number
N° du moteur – N° del motor

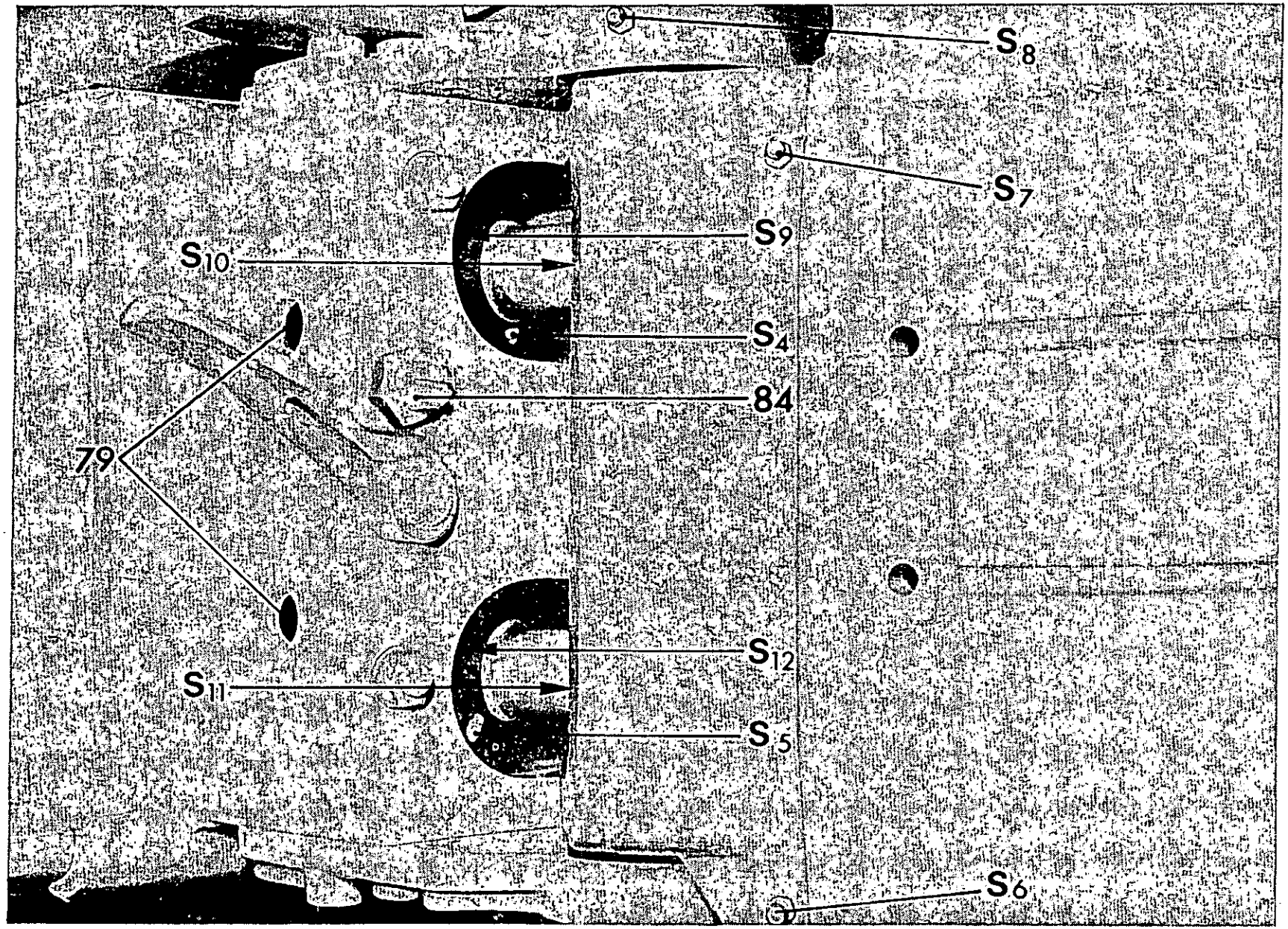


Abb. 19

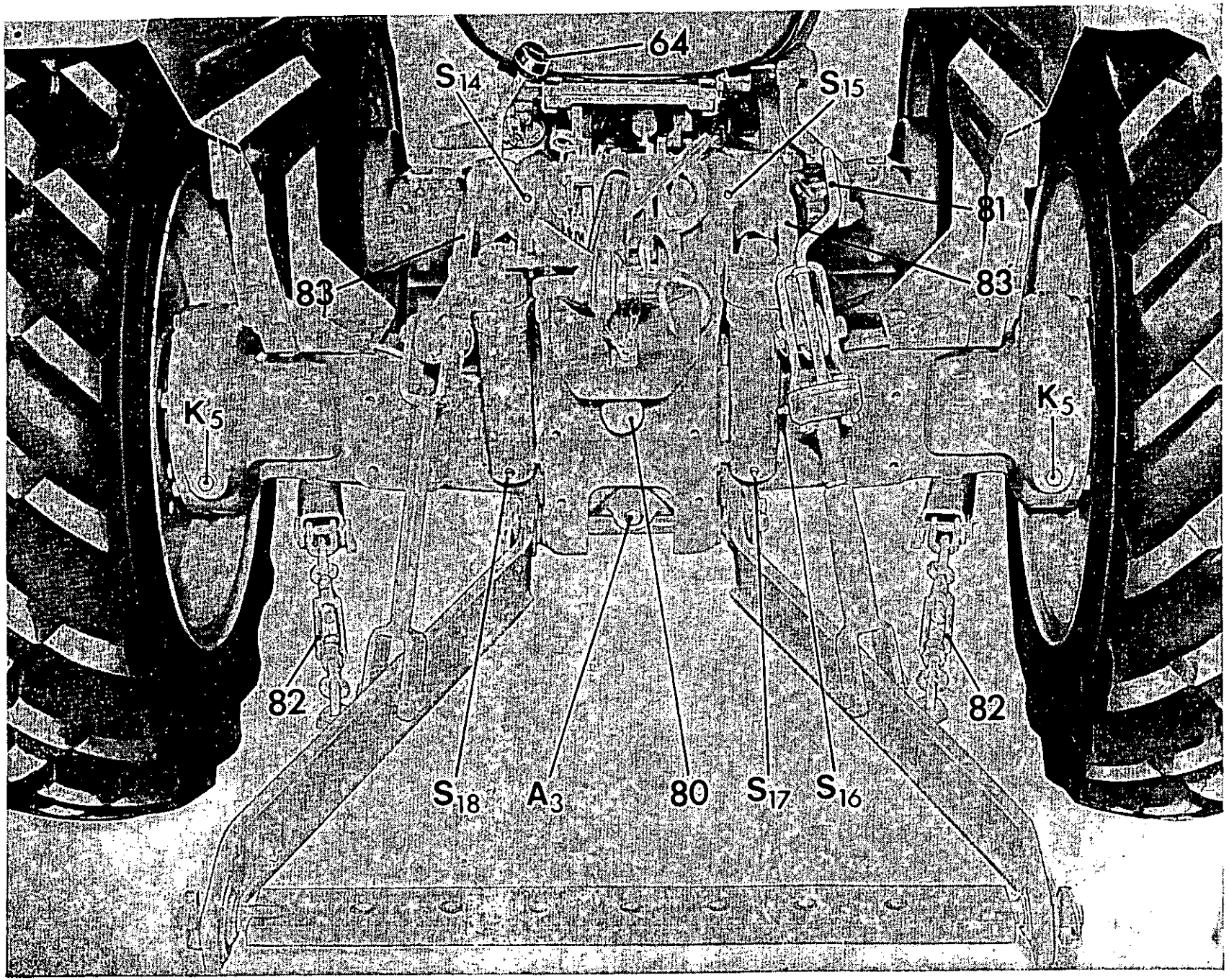


Abb. 20

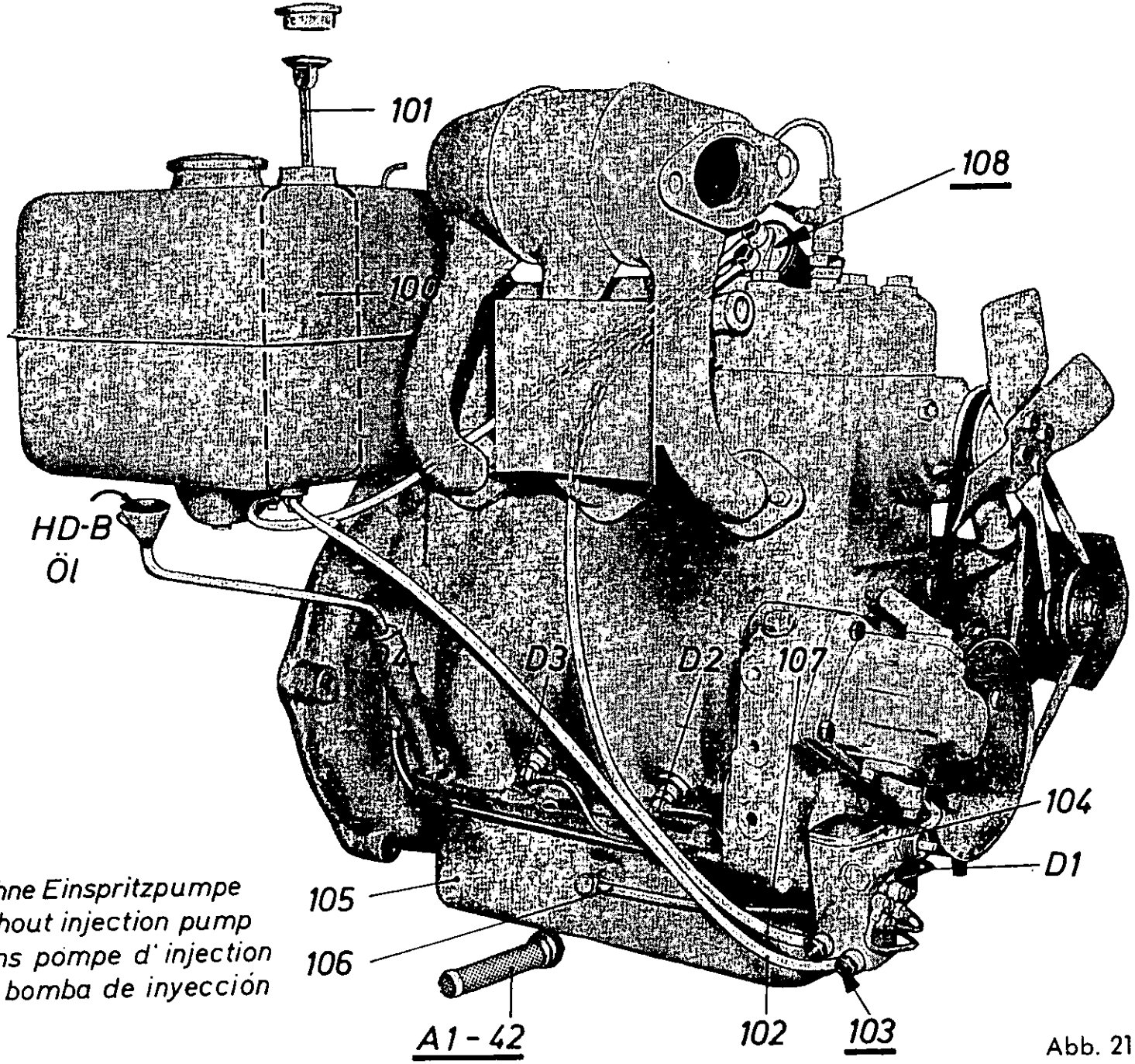


Abb. ohne Einspritzpumpe
Jll. without injection pump
Jll. sans pompe d' injection
Jl. sin bomba de inyección

Abb. 21

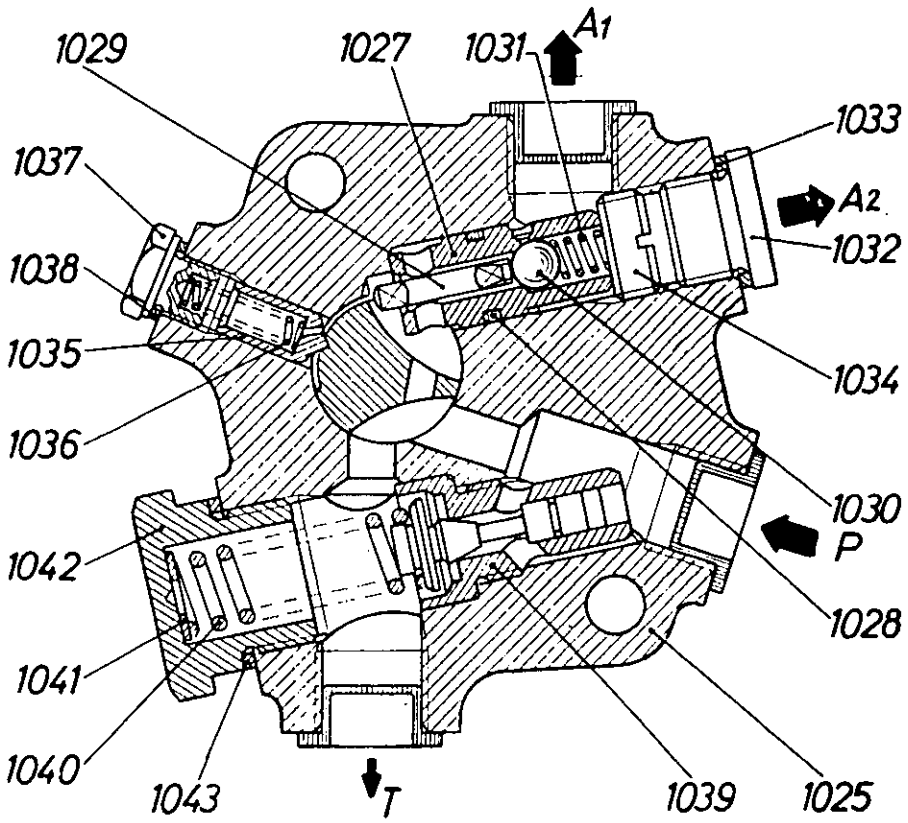

1029
1027
1031
A1
1033
1037
A2
1032
1038
1035
1034
1036
1030
P
1042
1028
1041
1040
1043
T
1039
1025

Abb. 22


85
20

Abb. 23

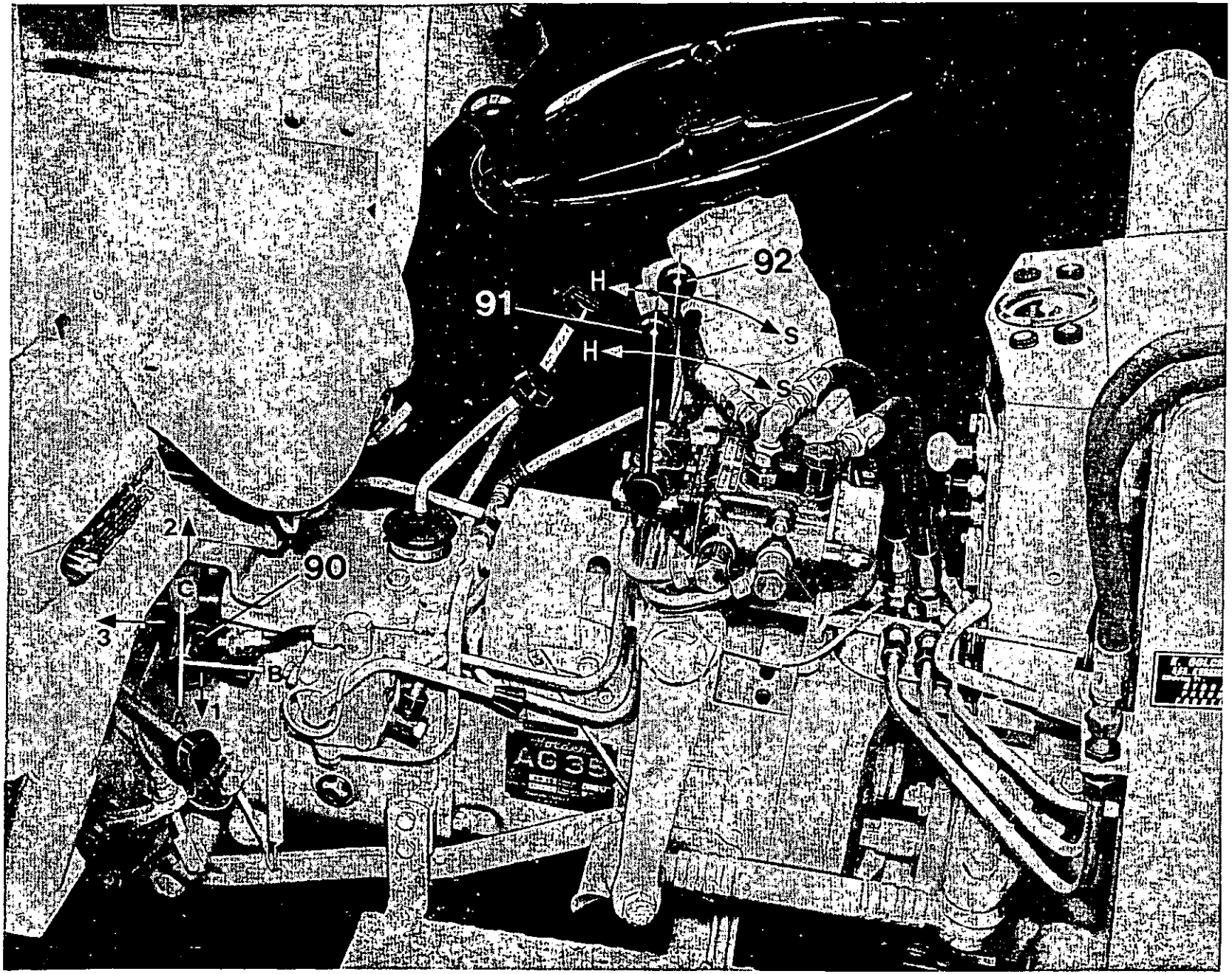


Abb 24

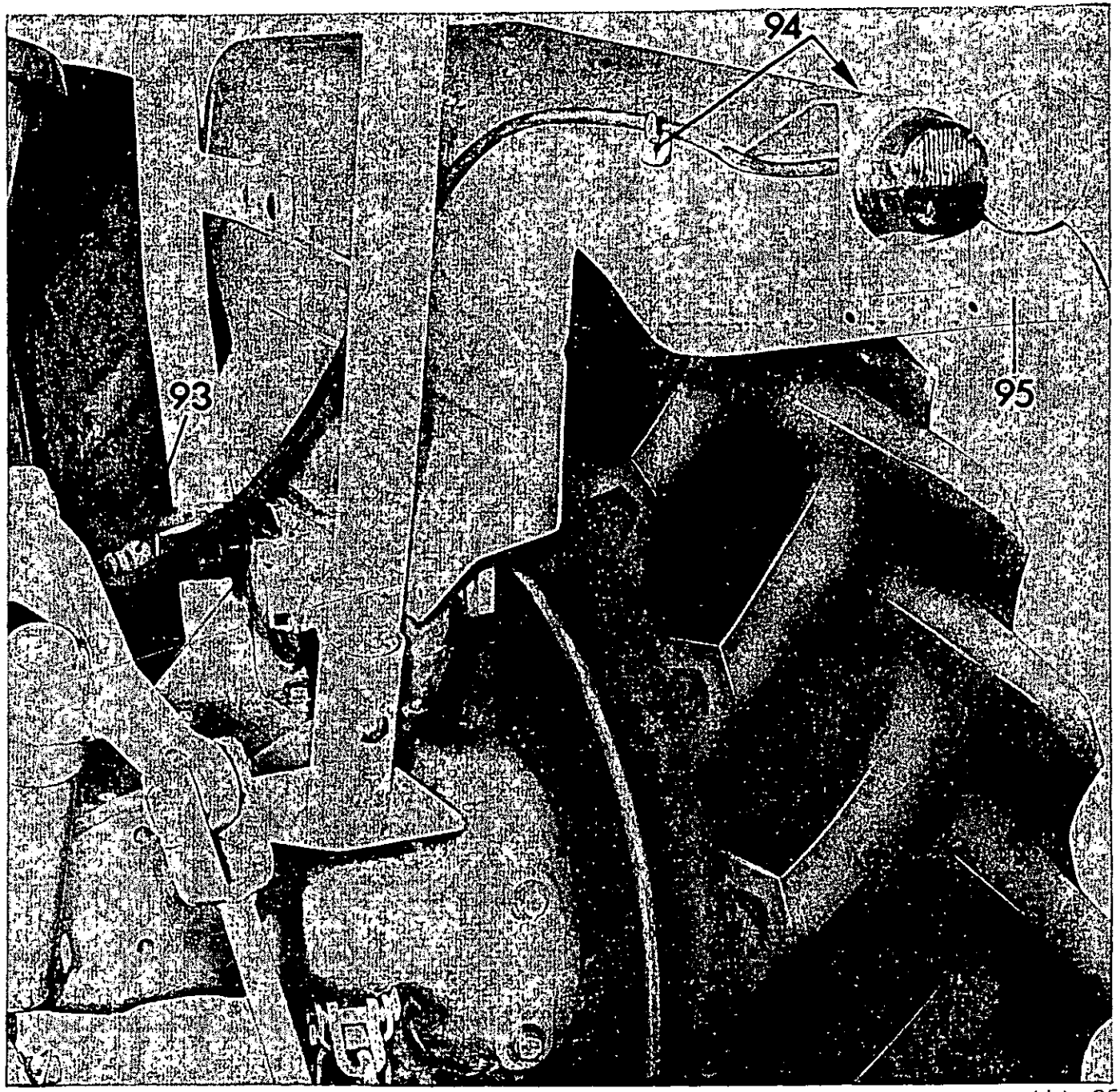


Abb. 25

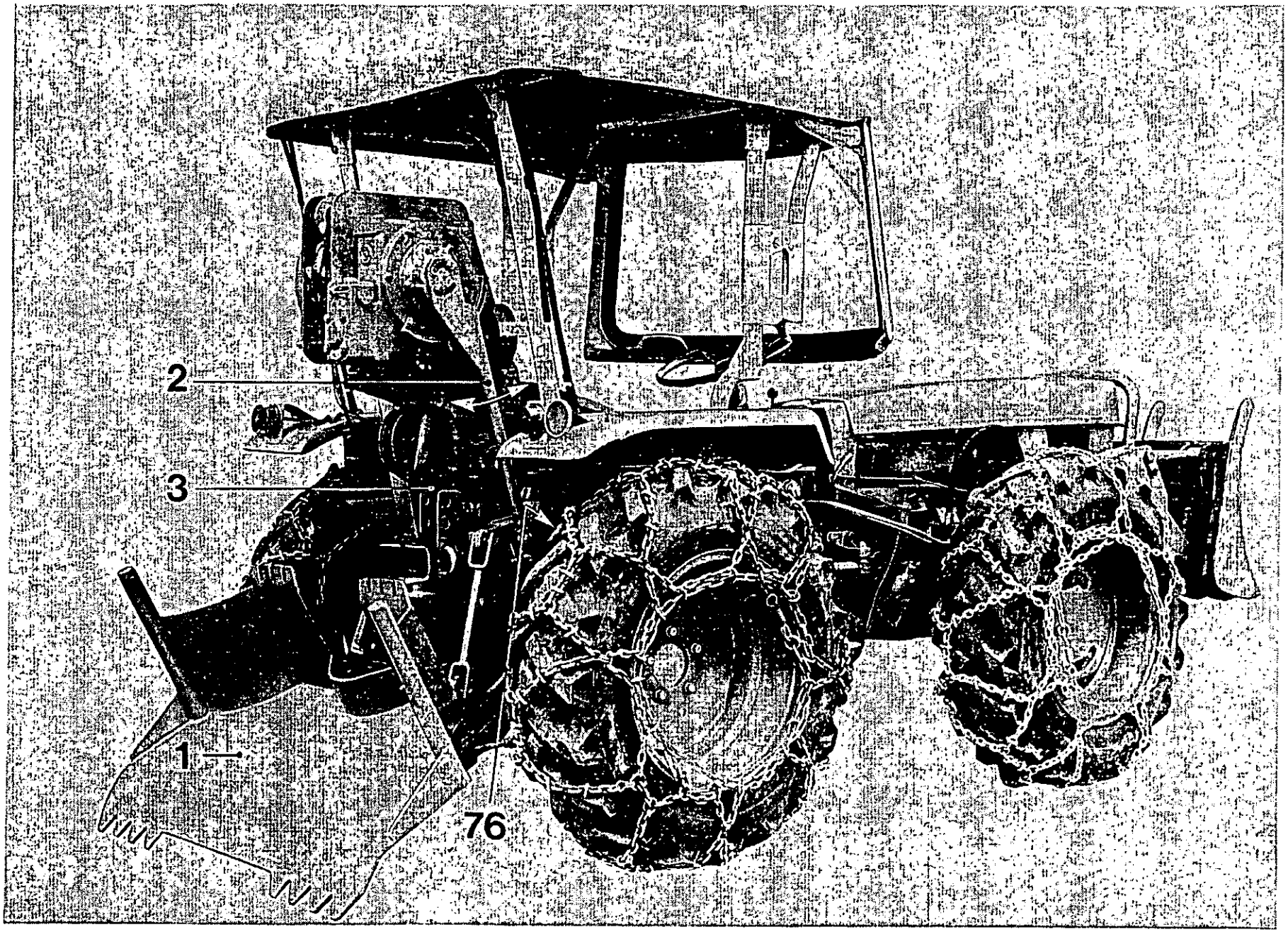


Abb. 26

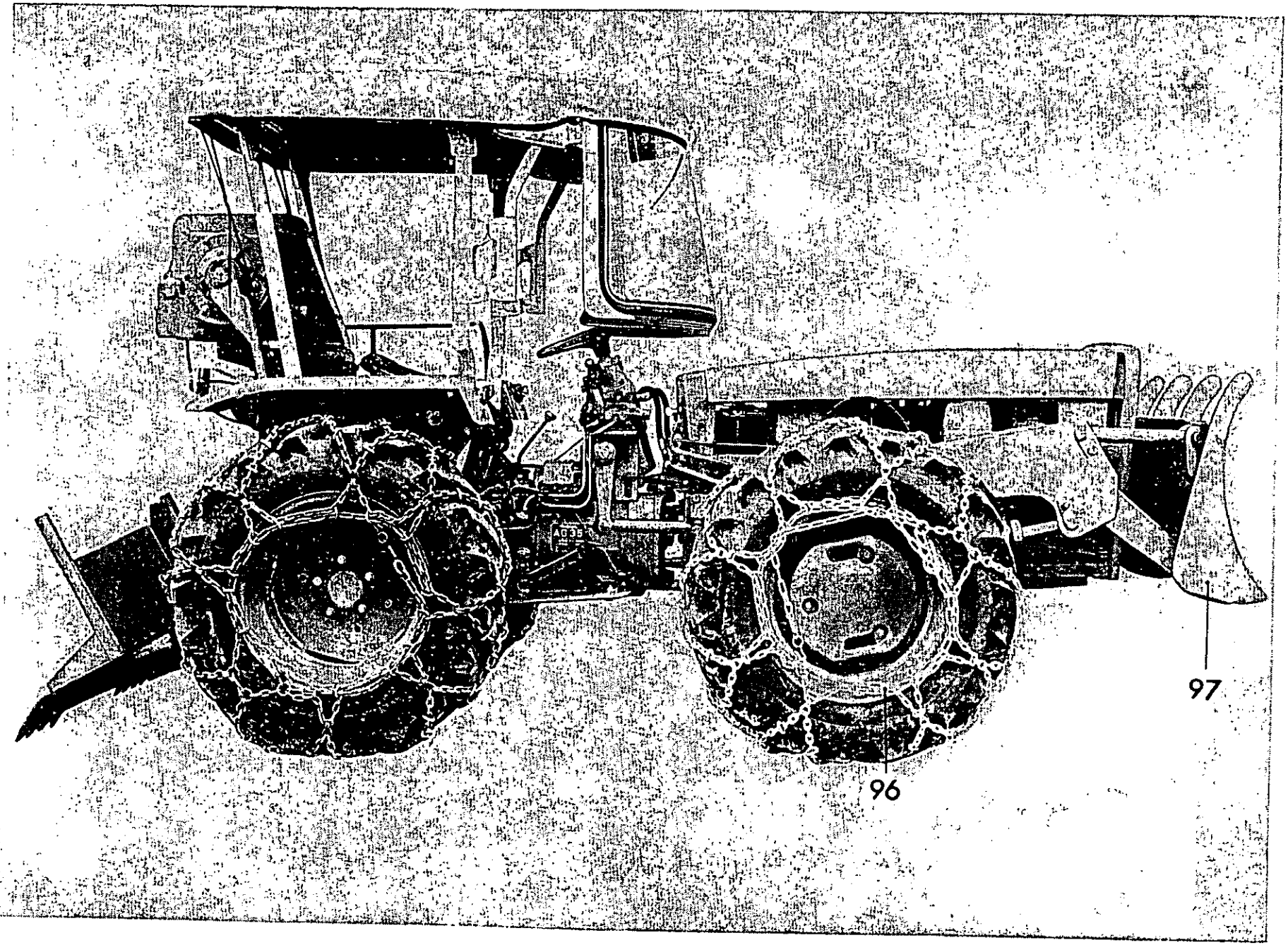


Abb. 27

Abb. 28

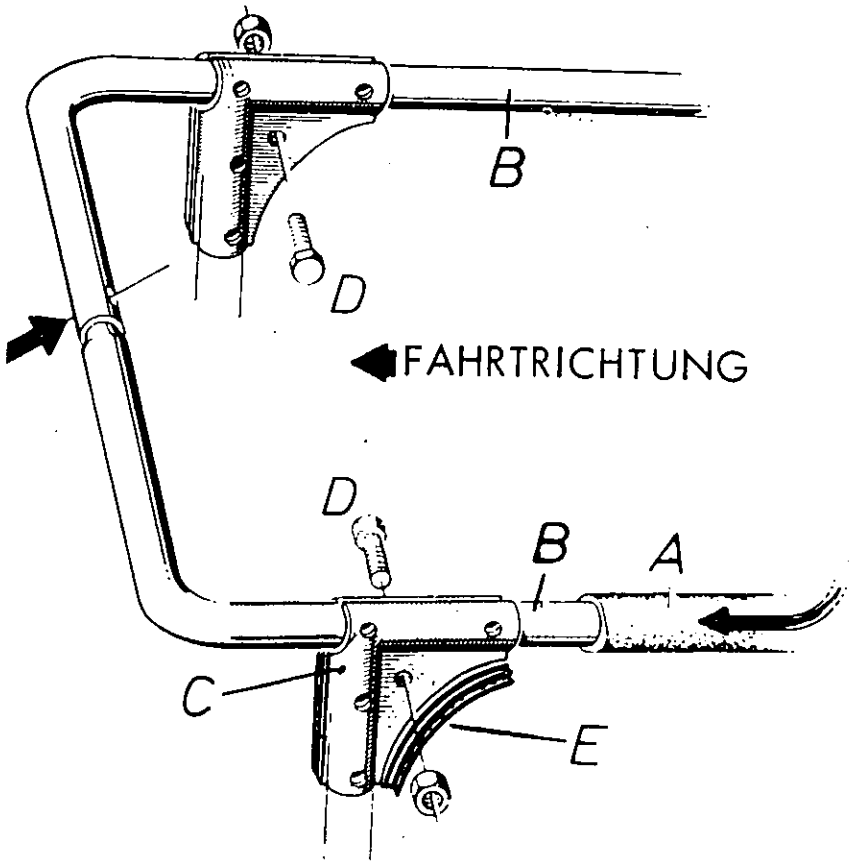


Abb.29

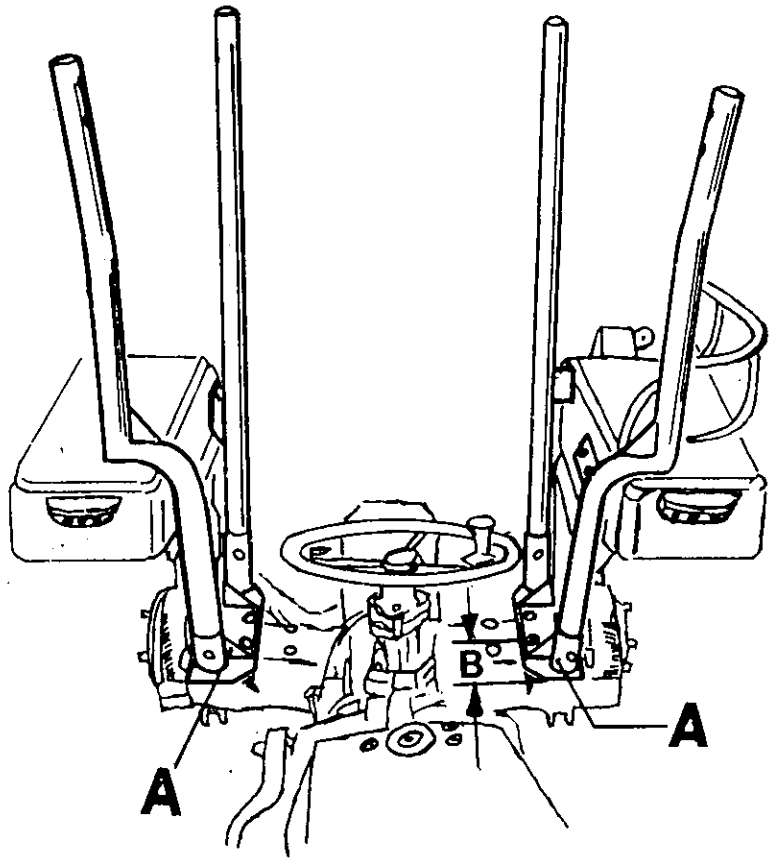


Abb. 30

Fahrtrichtung = Driving direction –
Direction de la marche – Dirección de la marcha

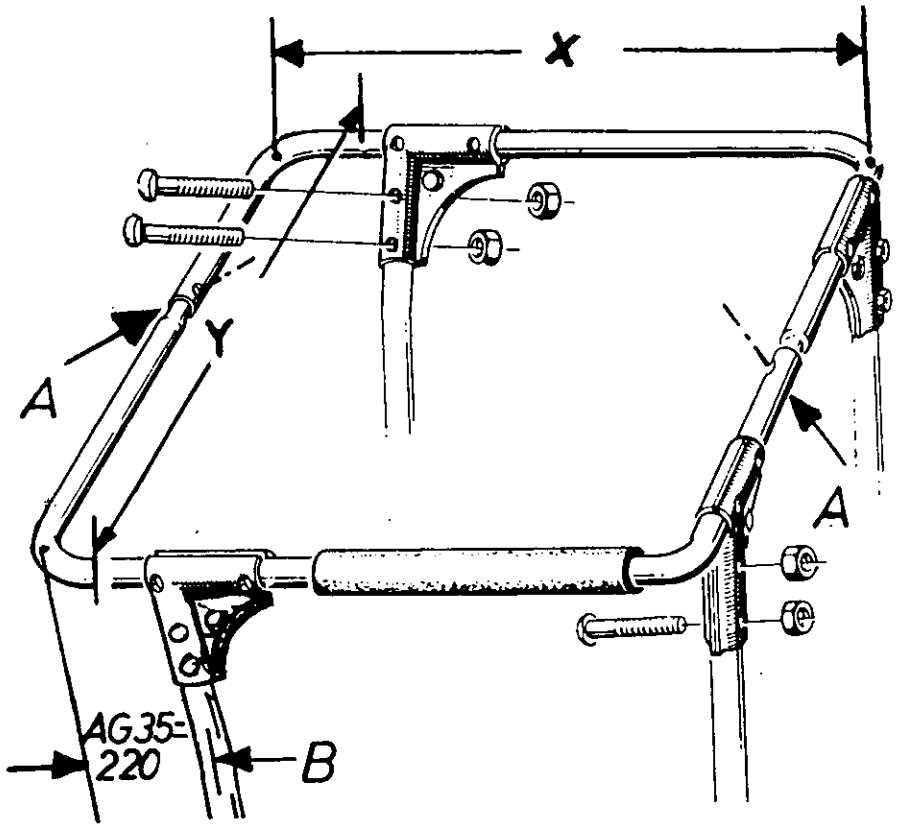


Abb. 31

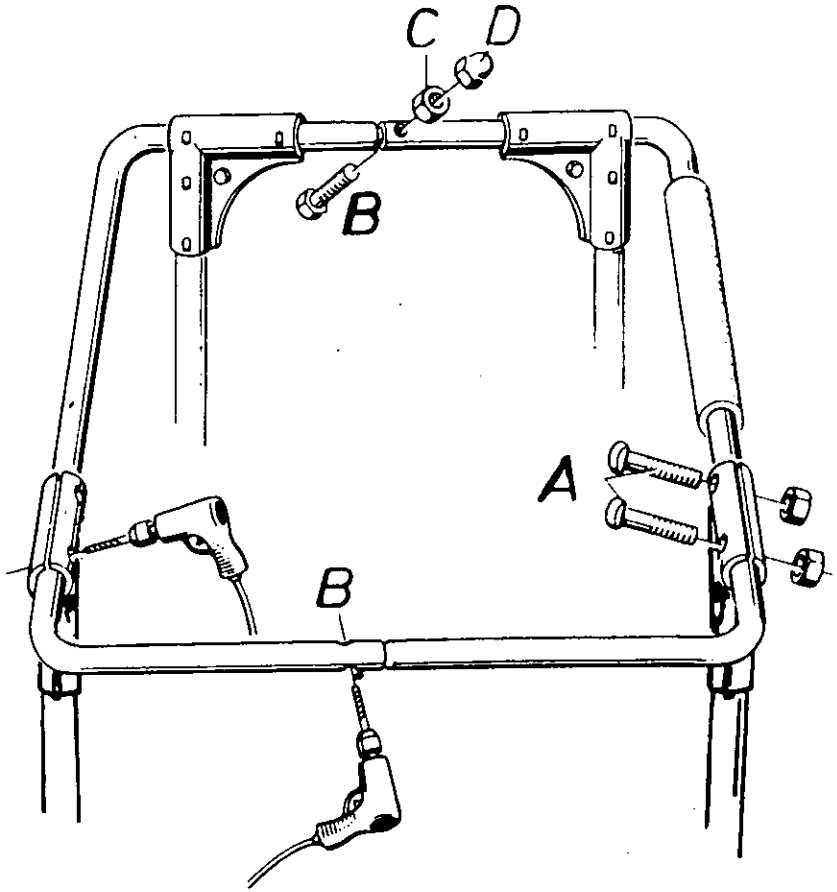


Abb. 32