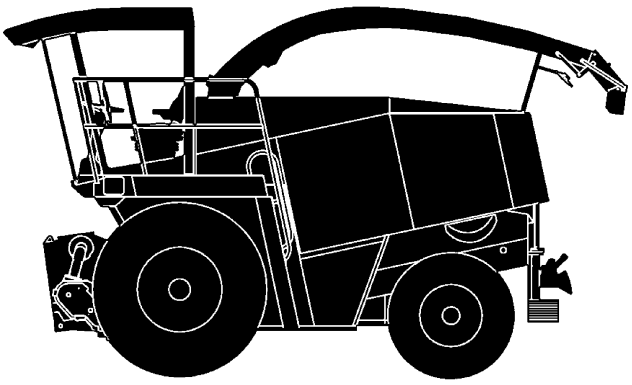
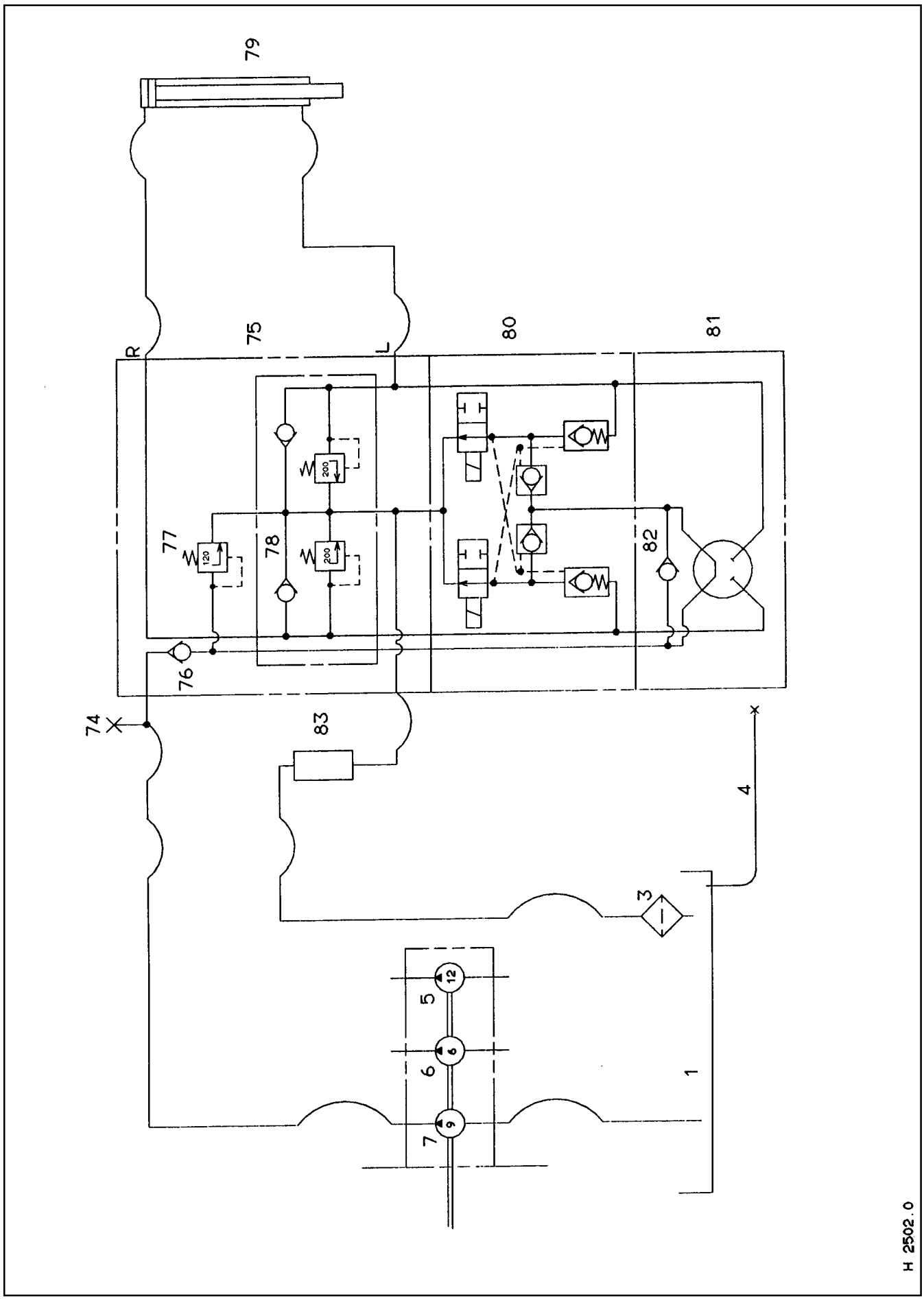
Hydraulics
Electrics

CLAAS

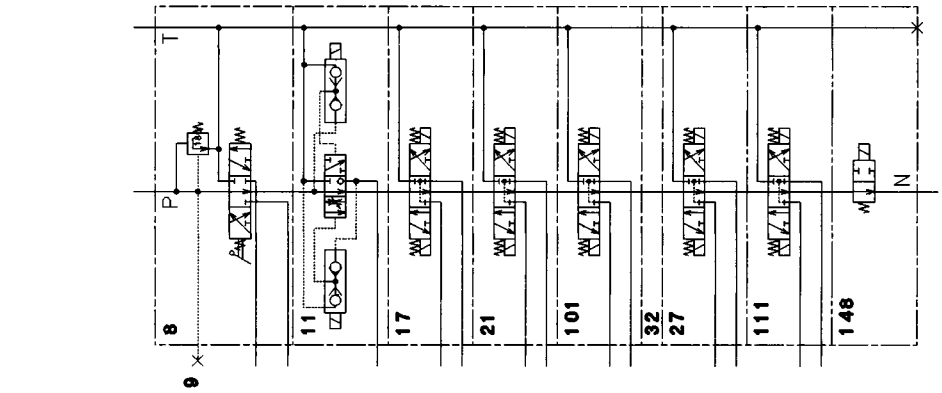


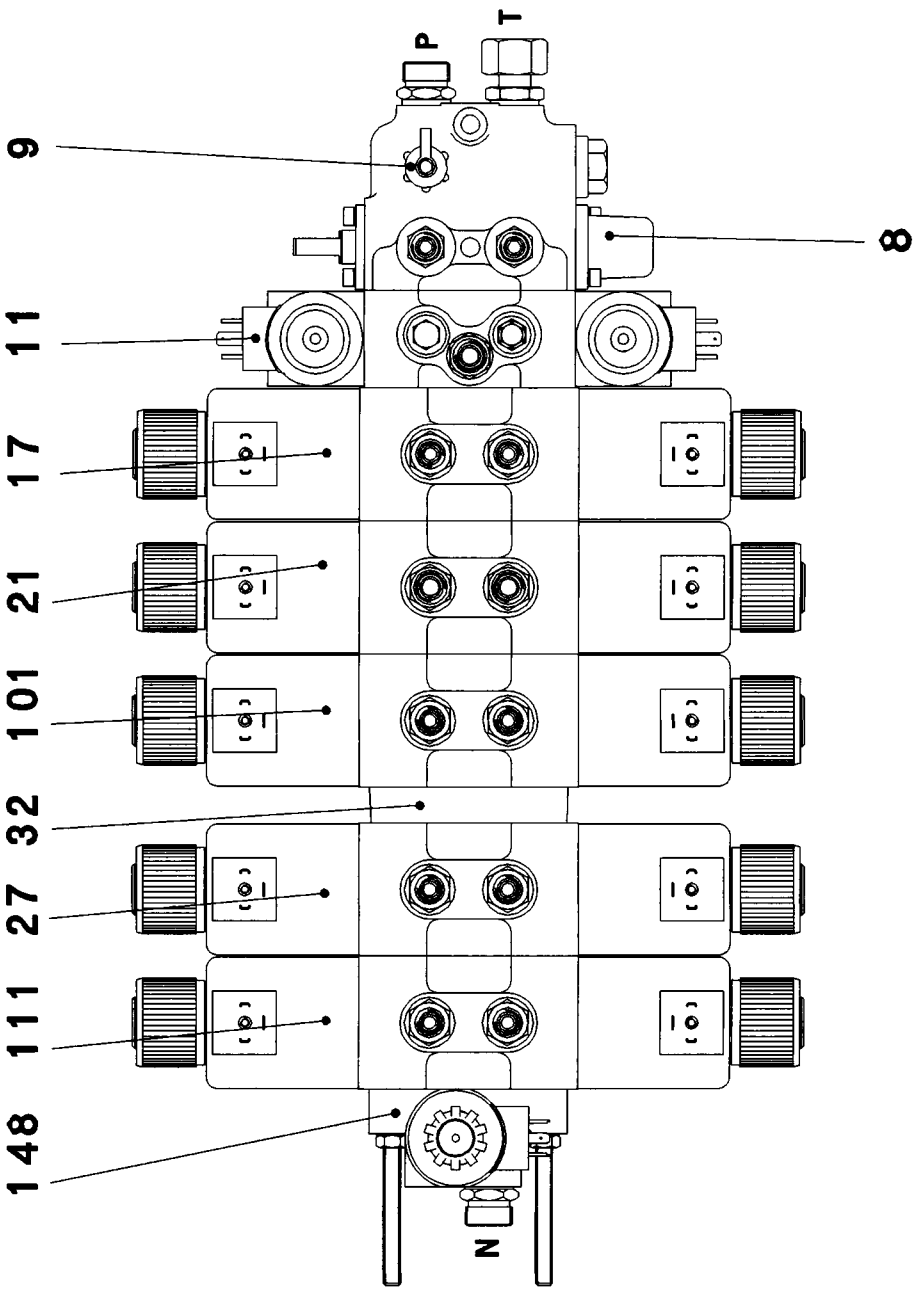
CLAAS JAGUAR 880
CLAAS JAGUAR 860
CLAAS JAGUAR 840
CLAAS JAGUAR 820

Circuit diagram for steering system, up to Machine No. ...



Hydraulic oil overheats.	– oil pressure switch switches on and off in short intervals. Disconnect the electrical connection of the oil pressure switch 144, and then check the oil overheating problem. Possible causes for this problem are: – pressure accumulator is defective. – ball valves allow leakage. – inlet valve allows leakage. – pressure relief bolt allows leakage. – oil pressure switch is defective.
Steering resistance is abnormally high on one side only (Autopilot is switched off).	– check one-way valves and the piston K in the lock-up valve unit 146.
Machine turns right or left on its own.	– check grooved seals in the steering cylinders. – check one-way valves and the piston K in the lock-up valve unit 146.





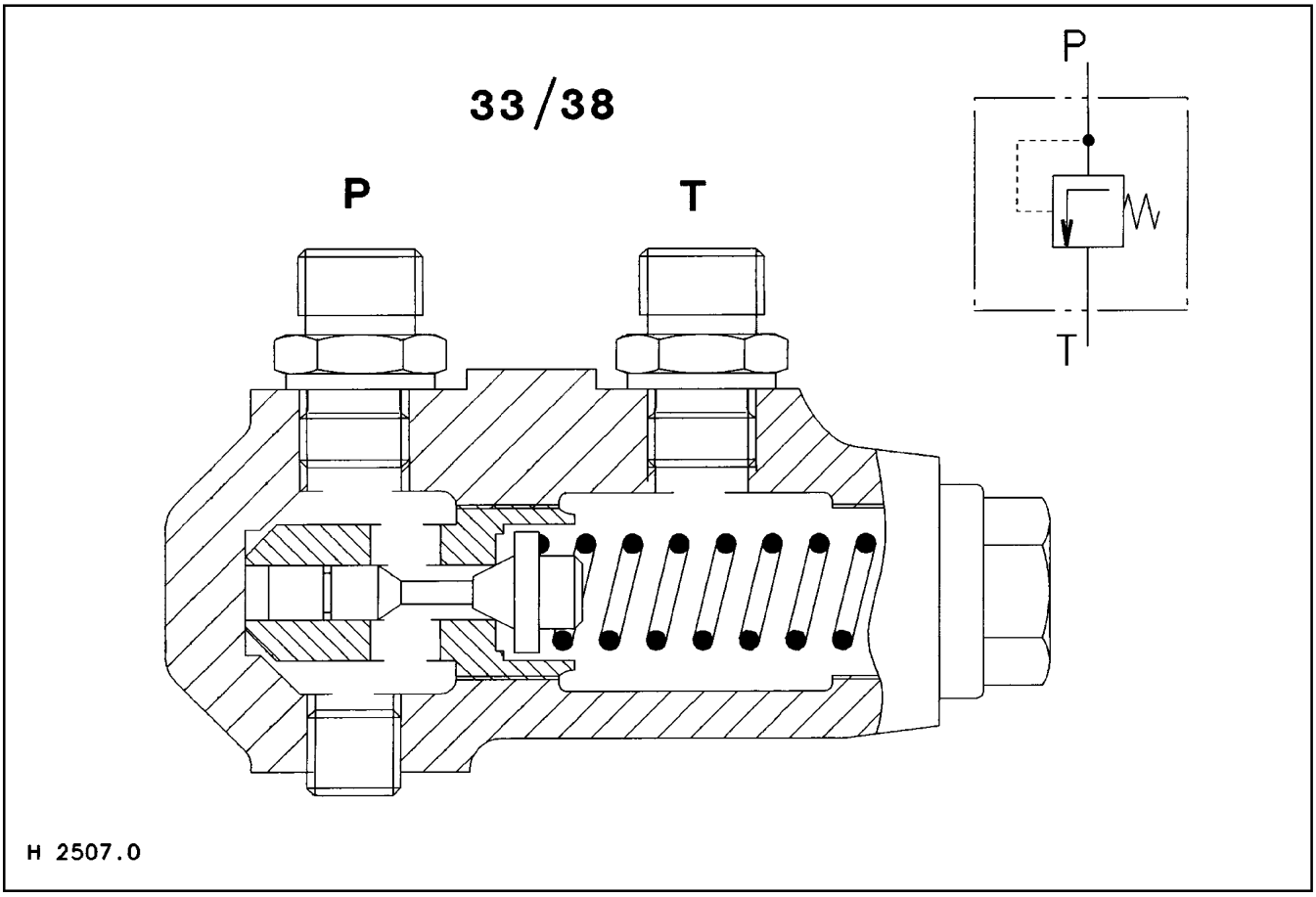
H 2513.0

Position “lower”	The solenoid valve of the pilot valve “lower” is being energized. The solenoid pin seats the ball. The needle moves and unseats the other ball. Oil pressure from A operates a plunger (proportional surface area) and opens the return valve. Oil can now flow from A through the open return valve to R. When the solenoid is deenergized, the spring seats the ball and the needle unseats the opposite ball. The fluid pressure in front of the plunger decreases. This closes the outlet valve. Drop speed can be adjusted with the adjustable restrictor.

PROBLEM

Front attachment drops	– Check delivery valve in solenoid valve. – Check condition of seating of return valve cone and of return valve O-ring. – Check ball seating in the pilot valve “lower”.
Front attachment cannot be raised by means of solenoid valve	– Check that the master switch RAISE/LOWER is switched on. – Check if the solenoid is switched (see wiring diagram). – Check if the spool 7 in the solenoid valve sticks. – Check needle and ball seating in pilot valve “raise”. – Check iron core in solenoid.
Front attachment keeps raising a little bit or raises to full height after the push button switch “raise” has been operated.	– 0.6 mm dia. restrictor in solenoid valve clogged. – Sticking spool in solenoid valve.
Front attachment cannot be lowered with solenoid valve.	– Check that the master switch RAISE/LOWER is switched on. – Check if solenoid is switched. – Inspect the needle in the pilot valve “lower”. – Check that the drop rate restrictor is open. – Check iron core in solenoid. – Check return valve 6.

Pressure relief valve



Key

33 – Pressure relief valve $100^{\pm 5}$ bar
38 – Pressure relief valve $175^{\pm 15}$ bar
P – Connector pump
T – Connector reservoir

Specifications

Spring-loaded seated valve with damping, direct controlled.

Valve setting = $100^{\pm 5}$ bar and/or $175^{\pm 15}$ bar, adjustable by shims 10 x 16 x 0.5 mm.

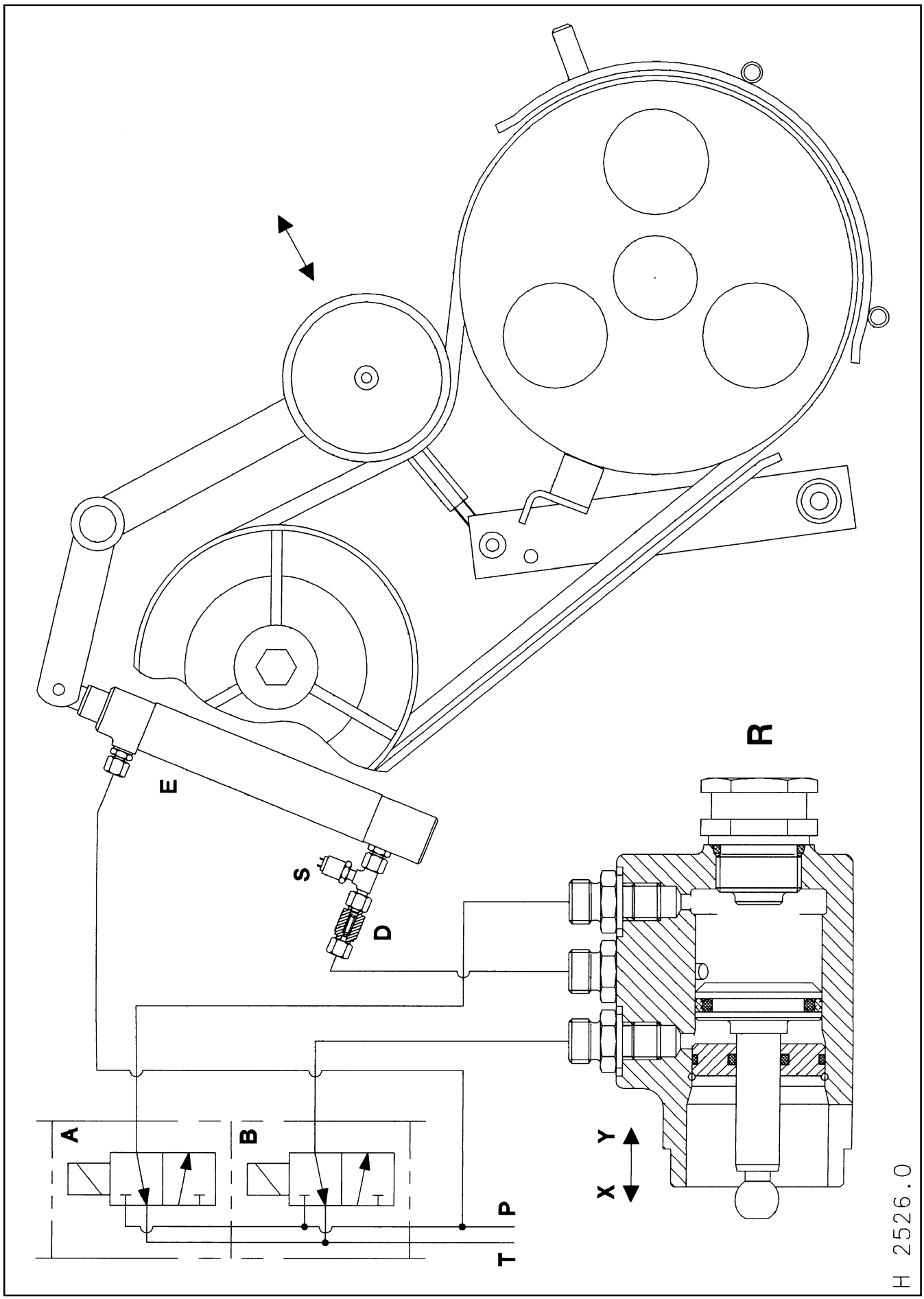
Valve seating secured with self-locking fluid.

When dismantling the valve use special wrench for slotted nuts part no. 181 934.2 and heat the housing.

Torque setting = 30 Nm (22 ft lb).

PROBLEM

Little or no pressure build-up at test point	– Spring setting incorrect. – Spring broken.
Pressure raised above rated setting	– Valve seat loose.


R
E
S
D
A
B
P
T
Y
X
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5

Hydraulics

Front attachments

Key

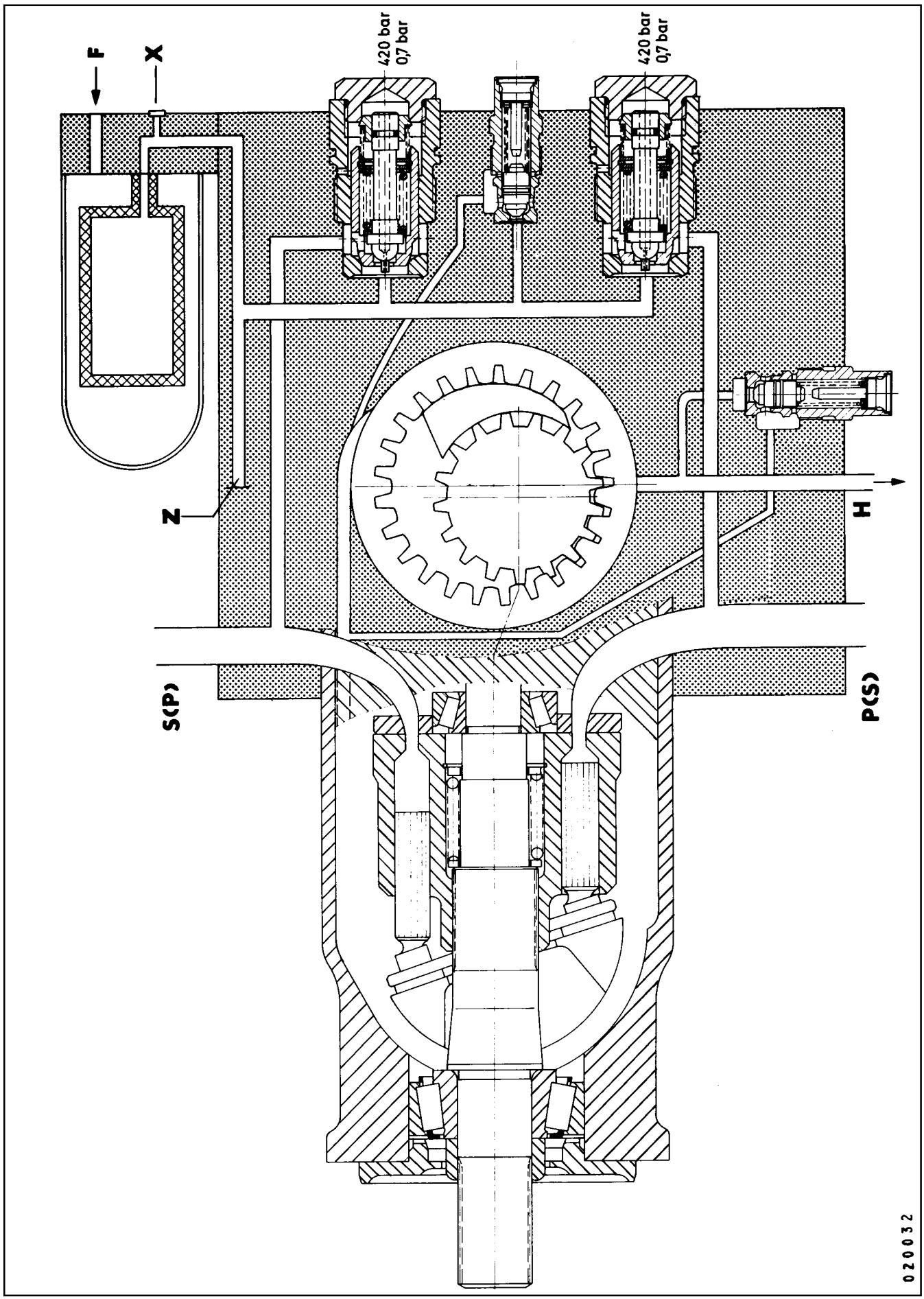
25 – Coupling, machine side
26 – Coupling, front end attachment side
27 – Solenoid-operated 4/3 directional control valve, fore and aft reel adjustment
28 – Coupling, machine side
29 – Coupling, front end attachment side
32 – Valve block port plate
101 – Solenoid-operated 4/3 directional control valve, reel raise / lower
102 – 1.2 mm diameter restrictor
103 – Lock-up valve
104 – Hydraulic cylinder, fore and aft reel adjustment
105 – Hydraulic cylinder, reel raise / lower
106 – Hydraulic cylinder, reel raise / lower
108 – Pilot operated one-way valve
109 – 1.2 mm diameter restrictor
111 – Solenoid-operated 4/3 directional control valve, hitch
112 – Lock-up valve

Key

5 – Solenoid-operated 6/2 directional control valve with lock-up valves
6 – Solenoid-operated 6/2 directional control valve
7 – Lock-up valve, fore and aft reel adjustment
8 – Lock-up valve, folding cutterbar
9 – Hydraulic cylinder, locking cutterbar in working position
10 – Hydraulic cylinder, folding cutterbar
11 – 0.8 mm diameter restrictor
12 – 0.8 mm diameter restrictor
13 – Pilot operated one-way valve
14 – Hydraulic cylinder, locking cutterbar in drive position
15 – Hydraulic cylinder, L/H fore and aft reel adjustment
16 – Hydraulic cylinder, R/H fore and aft reel adjustment
17 – Hydraulic cylinder, reel raise / lower, double-acting
18 – Hydraulic cylinder, reel raise / lower, single-acting
25 – Couplings, machine side
26 – Couplings, front end attachment side
27 – Solenoid-operated 4/3 directional control valve, fore and aft reel adjustment and folding cutterbar
28 – Couplings, machine side
29 – Couplings, front end attachment side
101 – Solenoid-operated 4/3 directional control valve, reel raise / lower
108 – Pilot operated one-way valve
109 – 1.2 mm diameter restrictor

P – Connector pump
T – Connector reservoir
H1 – Connector hydraulic cylinder, R/H fore and aft reel adjustment
H2 – Connector hydraulic cylinder, L/H fore and aft reel adjustment
V1 – Connector hydraulic cylinder, locking cutterbar in drive position (connecting rod end)
V2 – Connector hydraulic cylinder, locking cutterbar in working position (connecting rod end)
S1 – Connector hydraulic cylinder, folding cutterbar and pilot operated one-way valve
S2 – Connector hydraulic cylinder, folding cutterbar

LINDE Pump BPV (schematic)

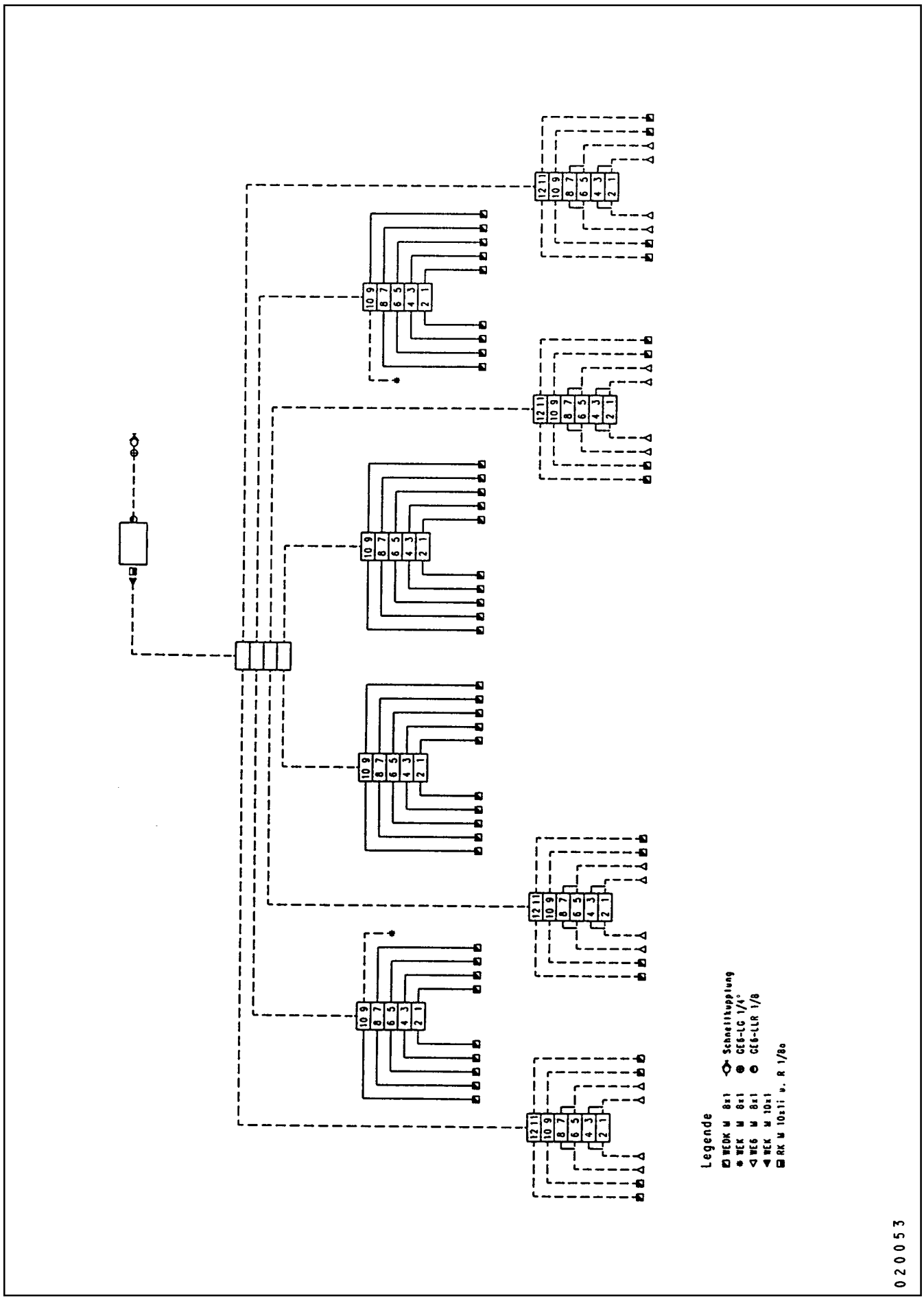


Contents

1) Technical Data

Pump Quicklub	from Serial No. ... Type 203 CS (identifiable = timer is located at bottom of housing) up to Serial No. ... Type 103 CS (identifiable = timer is located at top in reservoir unit)
Operating temperature range	–25° C to 70° C
Number of pump elements	2
Reservoir capacity	2 or 8 litres
Refilling	via hydraulic lubrication fitting, cartridge or return flow quick release connection.
Lubricant	greases up to NLGI grade 2
Motor	DC gear motor (interference-suppressed), 12 V, power consumption max. 6.5 A
Pump element	pump element 1 = machine pump element 2 = front attachment plunger diameter 6 mm lubricant output approx. 2.8 cm^3/min. admissible operating pressure max. 350 bar (safety valve on pump)
Metering device	LINCOLN, type SSV lubricant output per outlet and stroke = 0.2 cm^3
Lubrication time	8 minutes. Indicated by a green indicator light on the panel.
Pause time	15 minutes
Switching on the lubricating pump	The lubricating pump can be manually activated when the ignition and the main drive are switched on.

LINCOLN Lubrication Chart 8-Row Maize Header (72 Lubrication Points)



Key

4 – Ignition switch
5 – Vehicle information unit
15 – Safety start switch in hydrostatic drive lever
37 – Switch, Diesel engine speed
39 – Switch, main drive
48 – Relay, safety start
50 – Relay, safety start
51 – Relay, handbrake lever
52 – Relay – engine slow idling speed
59 – Relay (15)
69 – Relay, engine cut-off solenoid, 12 V, 40/2.8 A, 100% CDF
166 – Engine oil pressure switch
169 – Battery I, 12 Volts
170 – Battery II, 12 Volts
171 – Lift magnet, engine cut-off system
172 – Alternator (90 A), engine
173 – Starter, Diesel engine
175 – Water level sender
183 – Battery series/parallel relay (with 2 x 80 A fuses)
193 – Module – engine cut-off system
194 – Diode plate
220 – Battery master switch, safety disconnect

FUNCTION

Start diesel engine

Important: Observe the following switch positions:

- Main drive must be switched off. (Switch 39).
- The ground speed control lever must be in O position. (Switch 15).
- Turn on the ignition = plus via fuse (a9), diode plate (194) terminals 18 – 17 to the relays 59, 52, 48, terminals 86.
  Relay (59) switches.
  Relay (52) switches when switch (37) is set to slow idle speed position = position shown.
  Relay (48) in deactivated position.
- Fuse (a17) switches plus to module (193) terminals 16 – 17.
  Module (193) switches plus via terminals 3 – 6 to relay (69) terminal 86 and via closed switch (15) to relay (51), terminal 86 and to relay (48), terminal 30.
  Relay (50) terminal 86 receives plus from relay (48) terminals 30 – 87a and thus switches over.
- From starter switch (4) terminal 50a plus is switched via relay (50) to battery series/ parallel relay (183).
  The diesel engine starts.
- If the ground speed control lever is not in neutral (with switch 15 open), then no power is supplied to relay (48) terminal 30 and thus also to relay (50) terminal 86.
  The diesel engine does not start.
- If switch (39) is unlocked and switch (37) is set to slow idle speed position, then relay (48) switches from 30 to 87.
  The diesel engine does not start.
- If switch (39) is unlocked and switch (37) is set to the full speed position, relay (52) remains in the deactivated position.
  This is insignificant for the starting process of the diesel engine.

Important! On machines without engine cut-off system, oil pressure switch (166) is an NC contact.
Module (193) is replaced with an adaptor (module housing without LED's).
The cable (gn) from the oil pressure switch is inserted into the plug-in connection Y-viol terminal 7.

Key

1 – Hazard warning flasher switch
3 – Turn flasher switch
5 – Vehicle information unit
55 – Turn flasher relay
124 – Turn flasher, L/H
129 – Turn flasher, R/H
130 – Connector, trailer
149 – Horn
153 – Turn flasher, left front
154 – Turn flasher, right front
159 – Connector, direct-cut attachment marker lights
186 – Turn flasher, L/H, front attachment
187 – Turn flasher, R/H, front attachment

Key

6 – Switch, windscreen wiper/washer
7 – Wiper motor
8 – Operations display screen
59 – Relay 15 (20/30 A)
64 – Relay (20/30), compressor-type air conditioner
77 – Connector radio
79 – Cab interior light
84 – Thermostat, compressor-type air conditioner
85 – Motor, cab blower
86 – Switch, cab blower speed
103 – Safety switch, compressor-type air conditioner
150 – Pump, windscreen wiper/washer
165 – Electro-magnetic clutch (3.4 W coil) compressor-type air conditioner
194 – Diode plate
229 – Connector CB radio
230 – Digital clock

FUNCTION

Positive current is supplied from the battery to relay (64) terminal 87. Earth is supplied through the closed safety switches (103) to relay (64) terminal 85. When the ignition is switched on, positive current is supplied via fuse b9 to fan switch (86).

When the fan switch is switched on, positive current is supplied through the switched thermostat (84) to relay (64) terminal 86 and to the fault lamp in the operations display screen (8).

Relay (64) switches from 87 to 30. The electro-magnetic clutch (165) of the compressor is energised.

As soon as the safety switch opens, relay (64) is deenergized. Earth is switched through the coil of electro-magnetic clutch (165), via relay (64) (from 30 to 87a) to the fault lamp in the operations display screen, which then lights up and shows a fault (plus from thermostat switch (84)).

The diode on the diode plate functions as an interference suppressor (induction current of the electro-magnetic clutch).

Inspection chart (reference values)

Refrigerant R 134a
Machine in shade
Cab door and windows closed
Maximum compressor speed
Fan at “high” = position 3
Do not switch off the refrigerant compressor at the control switch during the measurement

Outside temperature	Low side pressure (intake pressure at compressor)	High side pressure at compressor	Air discharge temperature at rearmost louvre	Temperature at compressor suction valve
°C	bar	bar	°C	°C
20	0,8	9,0	–	–
25	0,85	11,0	2,0	30,0
30	0,9	13,0	3,0	34,0
35	0,95	15,0	4,0	38,0
40	1,0	17,0	5,5	43,0
45	1,5	19,0	7,0	49,0

Fault diagnosis for pressure variations (HP = High pressure, LP = Low pressure)

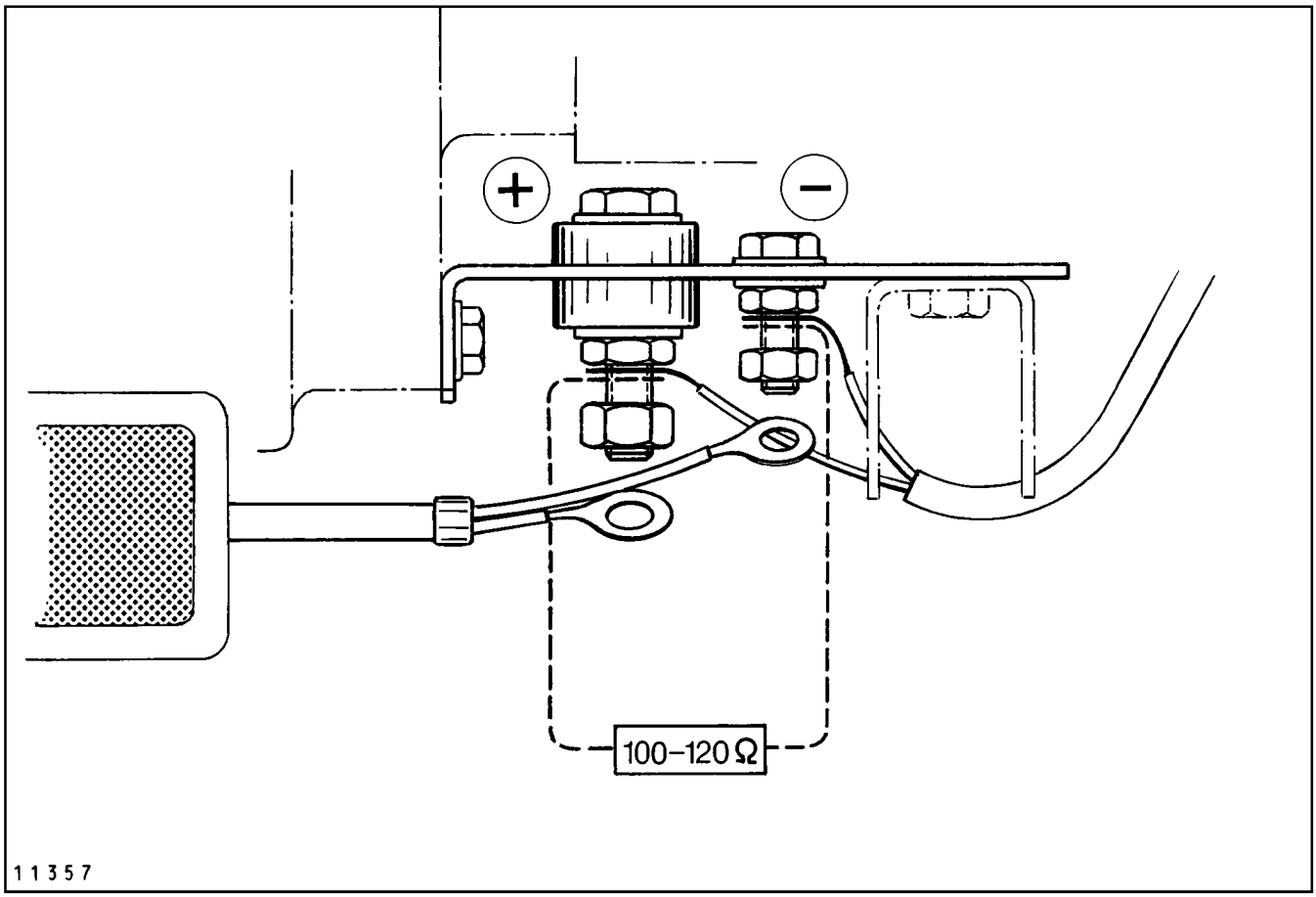
Condensing pressure (HP) \ Suction pressure (LP)	Too high	Too low
Too low	– Compressor valve plate seal or valve plate defective. – Excessive clearance or piston ring defective.	– Moisture or foreign substances in system, thus expansion valve blocked. – Insufficient refrigerant in system.
Normal	– Expansion valve defective or incorrectly set. – Expansion valve sensor loose or poorly insulated.	– Evaporator iced up or dirty, filter plugged.
Too high	– Excessive amount or refrigerant in system. – Condenser dirty or fan defective.	– Compressor generates too much capacity, wrong electro-magnetic clutch or belt pulley fitted.

Metal detector trips and stops the mechanism without ferrous material.

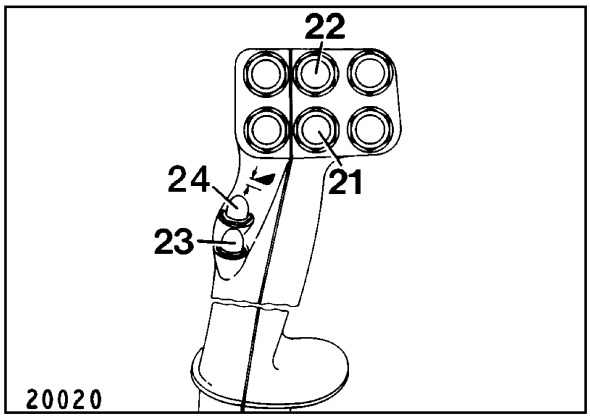
- Check whether pre-compressing roller was welded with a normal welding rod or whether a magnetic foreign body is jammed in (check with magnet).
- Check contacts in 7-pin connector; they should not be loose.
- Carry out test by using a resistor (see drawing 11357).

  If metal detector no longer trips the stop mechanism, then check the magnetic box, its mountings (metal chips) and the cable to the box.
- Have CB radio checked (aerial).
- Fit the radio with an interference suppressor.

Caution: If the stop mechanism is tripped when the deflector or the front attachment is actuated, check the appropriate diode in the plug.

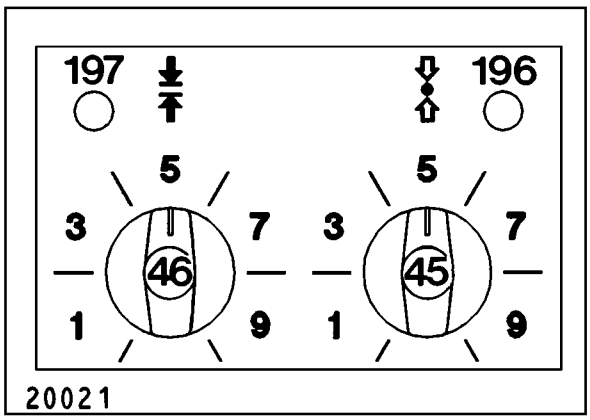


Activating the Contour system



– Press switch (23) “Contour”. LED (196) lights up.
– Set the cutting height with setpoint potentiometer (45) “Contour”.

Storing a second cutting height



– Activate Contour with switch (23). LED (196) comes on.
– Set the desired cutting height with setpoint potentiometer (45).
– Then hold switch (23) “Contour” depressed until the LED flashes. The value is now stored.

Example:

Turn setpoint potentiometer (45) to position “9” and activate Contour with switch (23). Store the cutting height as described above. Now turn the setpoint potentiometer to position “3” and wait until the cutting height is reached.

Then:

Press switch (23) “Contour”
=> The front attachment moves to cutting height “9”.

Press switch (23)“Contour” again
=> The front attachment moves to position “4”, etc.

Operation:

Automatic sharpening and shearbar adjustment:

Important: Electronic module (204) has another part number if the machine comes without automatic shear bar adjustment.

When the cutterbar is lowered to rest on the ground, the clearance between the cutting cylinder and shearbar changes (bearing play of cutting cylinder).

A) Sharpening knives:

- Engine at slow idling speed.
- Switch on main switch.
- Select number of grinding cycles on potentiometer (201), e.g. 10 cycles.
- Push main switch (200) to the 1st step. Wait until only the green indicator light B is lit or, if the previous program was interrupted, until only red indicator light C is lit.
- Unlock main switch (200) and push into the 2nd step. The sharpening cover is now opened hydraulically and the grinding process is performed for the preset number of cycles. The orange indicator light (G) is lit and green indicator light (B) flashes during the grinding process. When grinding is finished, the orange indicator light (G) goes out. The sharpening cover closes automatically and green indicator light (B) comes on continuously.

  The number of grinding cycles can also be altered at the potentiometer during grinding.
- Continue with the shearbar adjustment or turn off main switch (200).

B) Adjusting the shearbar:
(after sharpening the knives at least once)

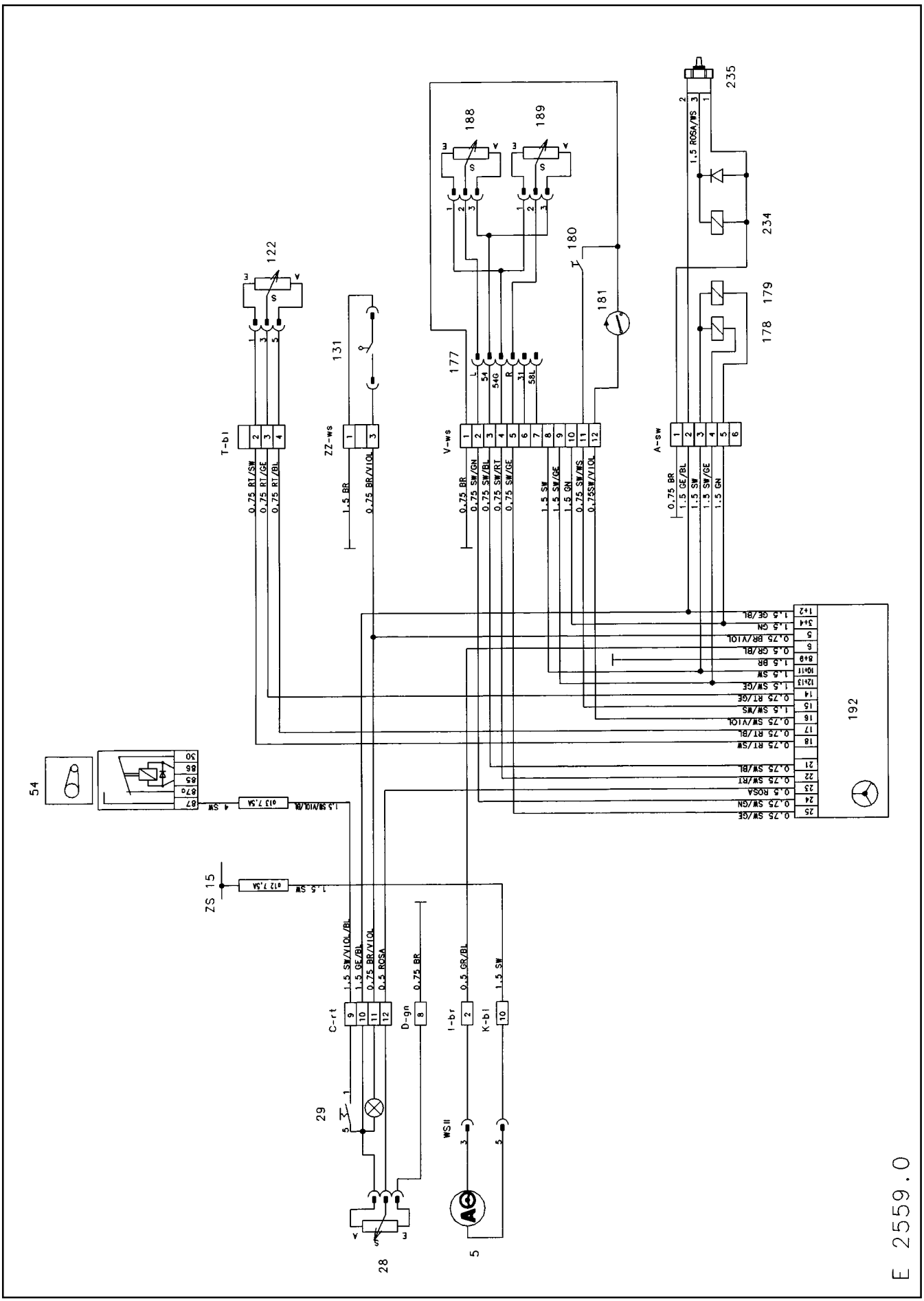
- Lower the front attachment to the ground.
- Preselect the distance between shearbar and cutting cylinder at potentiometer (205).
- Turn switch (200) to the 2nd step again. The green indicator light (B) flashes and the shearbar is moved forward parallel to the cutting cylinder by the amount previously ground off the knives until it contacts the cutting cylinder and then backed off again by the amount set on potentiometer (205).

  When the adjustment has been completed, the green indicator light (B) comes on continuously.

  If the cutting cylinder strikes too hard against the shearbar, the shearbar can be moved back to the 2nd step by pressing and holding switch (200) again.
- Turn off switch (200).

TROUBLESHOOTING

Fieldwork indicator lamps do not light up when the ignition is switched on.	– Check fuse (a11) – Check wires on connectors as per wiring diagram.
Engine rpm not shown or reading shown too high.	– Check actual engine rpm using tachometer. – Check distance between magnetic pick-up and magnet ($6^{\pm 2}$ mm). – Check mounting screw of magnet – it must be brass – Check cable and wire connections as per wiring diagram – Check magnetic pick-up with an ohmmeter (1000 – 1200 Ohm)
The area harvested, the rate of work and the total area harvested are not displayed or are incorrectly displayed.	– Working width not properly programmed – Check setting of chain-operated pull switch – Check reed switch and magnet on intermediate shaft (see drawing) – Check mounting screw of magnet – it must be brass – Check cable and wire connections as per wiring diagram
Distance travelled and ground speed not displayed or incorrectly displayed.	– Check reed switch and magnet on intermediate shaft (see drawing) – Check cable and wire connections as per wiring diagram
Digital reading deviations when operating at high speeds (e.g. $18^{\pm 1}$ km/h).	– This display is O.K. The accuracy of the read-out is set for lower ground speeds.
Working hours and total working hours not displayed or incorrectly displayed.	**Note:** The hours are only displayed when the main drive is engaged. – Check the setting of the magnetic pick-up of the feed roller housing gearbox ($2^{\pm 1}$ mm) up to Serial No. ... – Check the setting of the magnetic pick-up of the main drive ($2^{\pm 1}$ mm) from Serial No. ... – Check magnetic pick-up with an ohmmeter (1000 – 1200 Ohm). – Check cable and wire connections as per wiring diagram
LED's of cracker rpm, cutting cylinder rpm and engine load drop do not light up.	**Note:** The LED's only light up when the drives are engaged and the front attachment is lowered. – Speeds of individual units are not entered correctly or are incorrectly entered (see Instruction Manual) – The belt-slip (1 – 3%) and engine load drop (5%) are not programmed or are incorrectly programmed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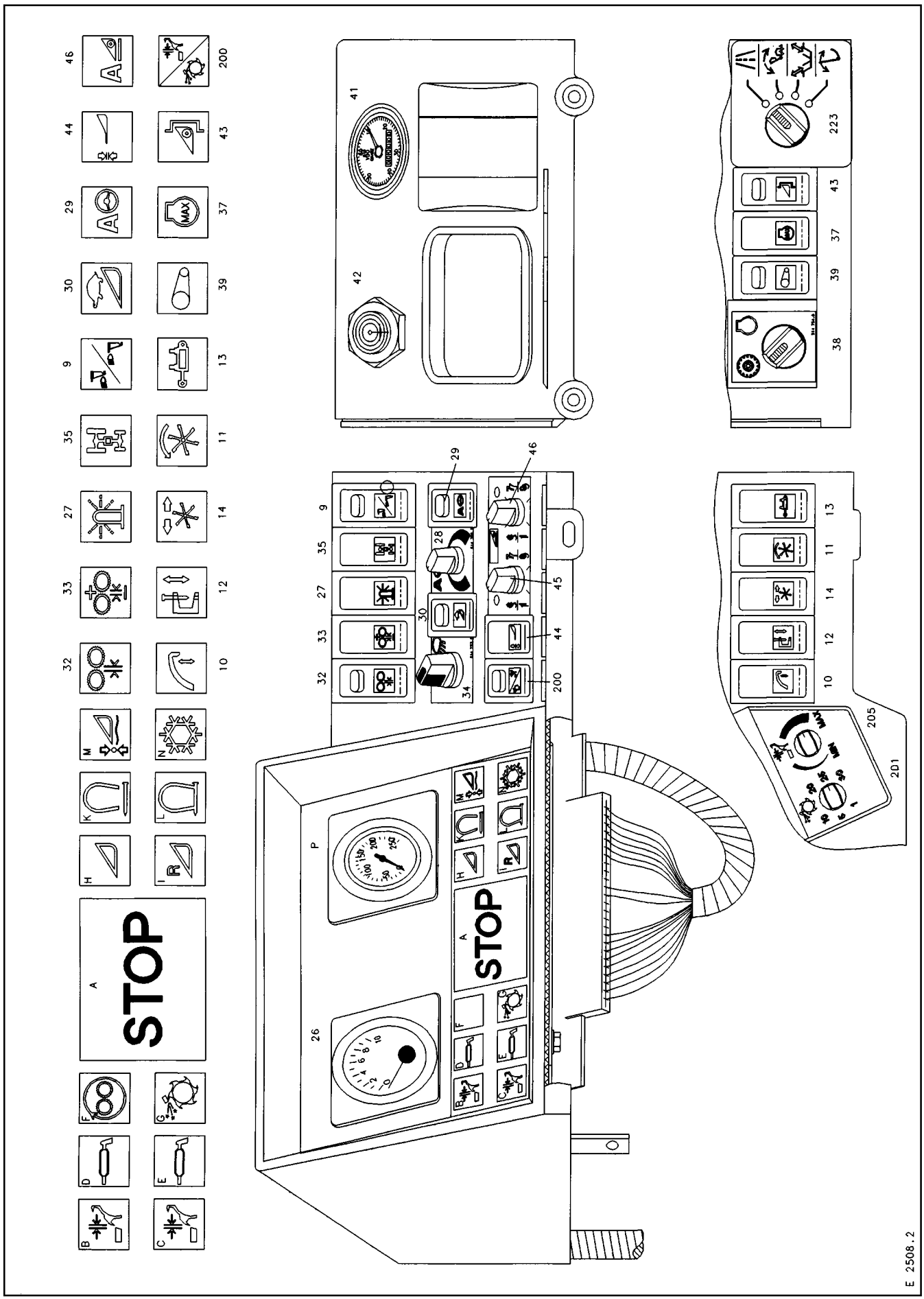
Testing the system

Basic machine with front attachment. System on basic machine is working correctly.	– Plug 7-pin connector into socket. – Switch on the Autopilot. – Actuate the R/H sensor. The rear wheels must turn to the left (R/H curve position). – Actuate the L/H sensor. The rear wheels must turn to the right (L/H curve position). **NOTE:** Check the sensor with a tester. The sensors must work correctly.

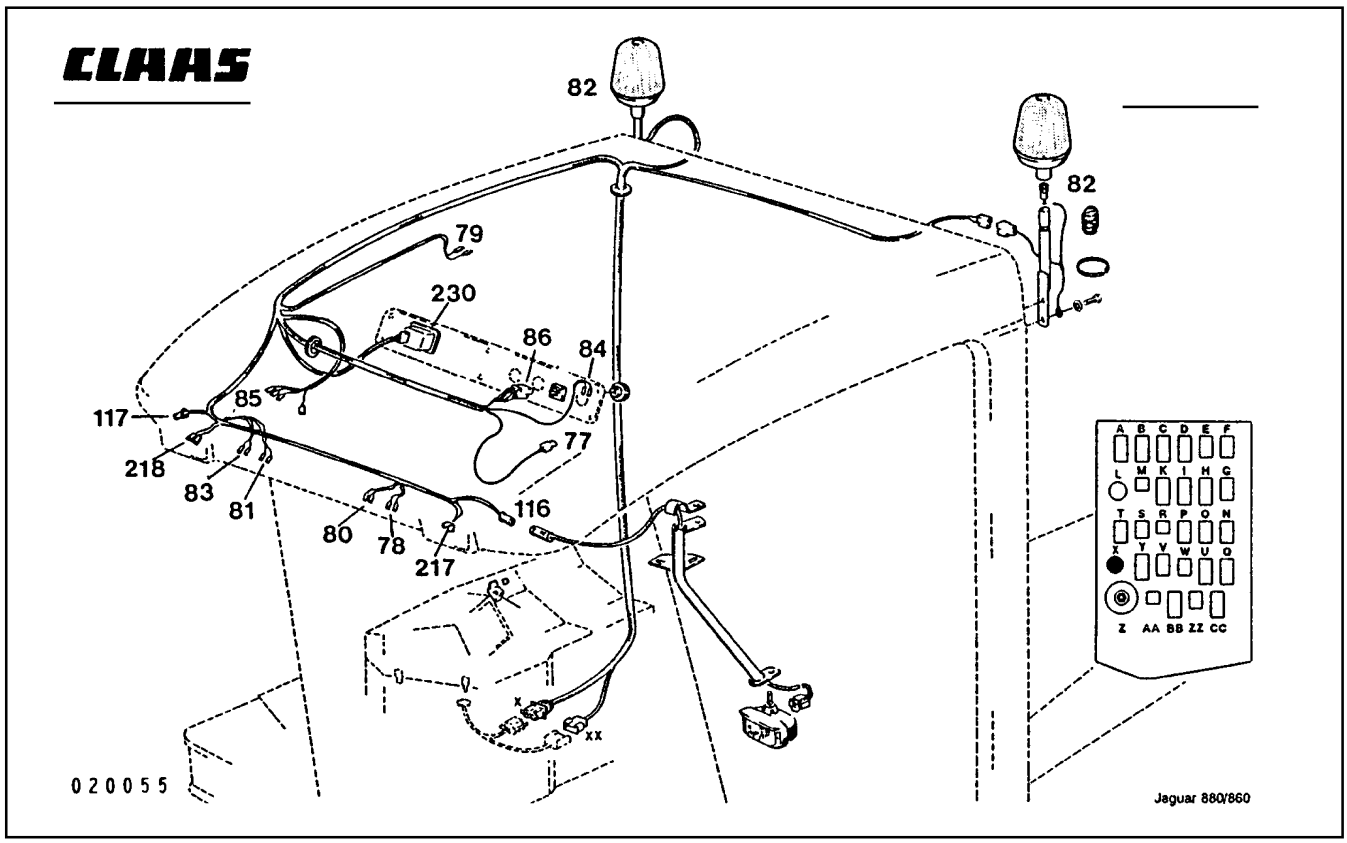
PROBLEMS (Basic Machine with Front Attachment)

No response of rear wheels when the L/H sensor is actuated. Normal response when the R/H sensor is actuated.	– Check connector on sensor. – No continuity from terminal 2 of the L/H sensor plug to terminal 24 of module.
No response of rear wheels when the R/H sensor is actuated. Normal response when the L/H sensor is actuated.	– Check connector on sensor. – No continuity from terminal 2 of the R/H sensor plug to terminal 25 of module.
Autopilot is switched on. Rear wheels move to the L/H lock, without the sensor being actuated (R/H curve position).	– Short circuit of terminals 3 and 2 in the sensor plugs or in the 7-pin plug. – Terminal 3 not connected or no continuity.
Autopilot switched on. Rear wheels move to the R/H lock, without the sensor being actuated (L/H curve position).	– Short circuit of terminals 2 and 1 in the sensor plugs or in the 7-pin plug. – Terminal 1 not connected or no continuity.
When sensors are actuated, the rear wheels turn in the wrong direction.	– Check rear wheel position indicator with the tester. **NOTE!** Right hand curve position = minus reading Left hand curve position = plus reading If not: replace the rear wheel position indicator. – Interchange the plugs on the solenoid valve. – Use continuity tester and check cables to sensors and to rear wheel position indicator. (The 3-pin plug sensor plugs, the 7-pin plug or the rear wheel position indicator may have the wrong polarity).

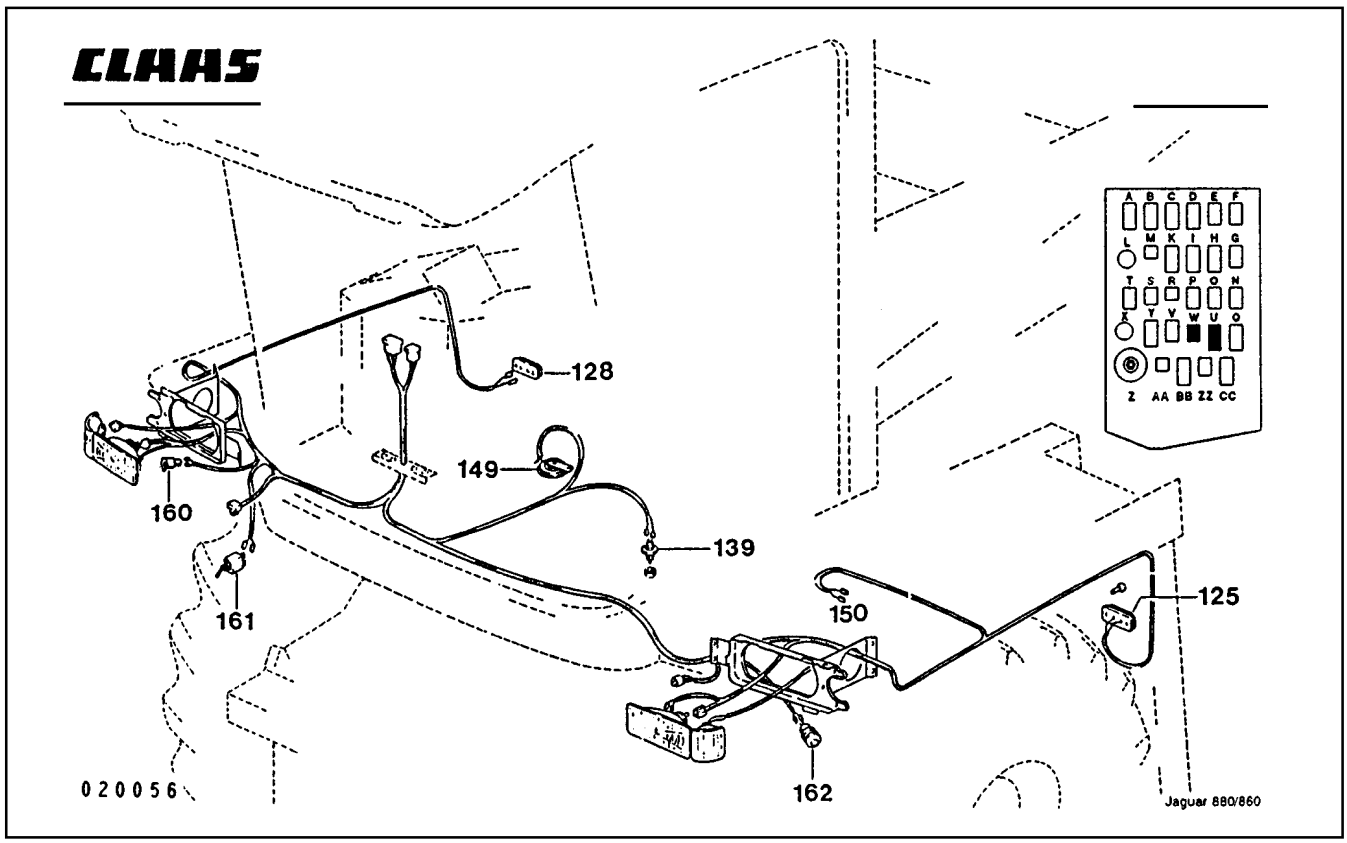
Switch console with operations display screen



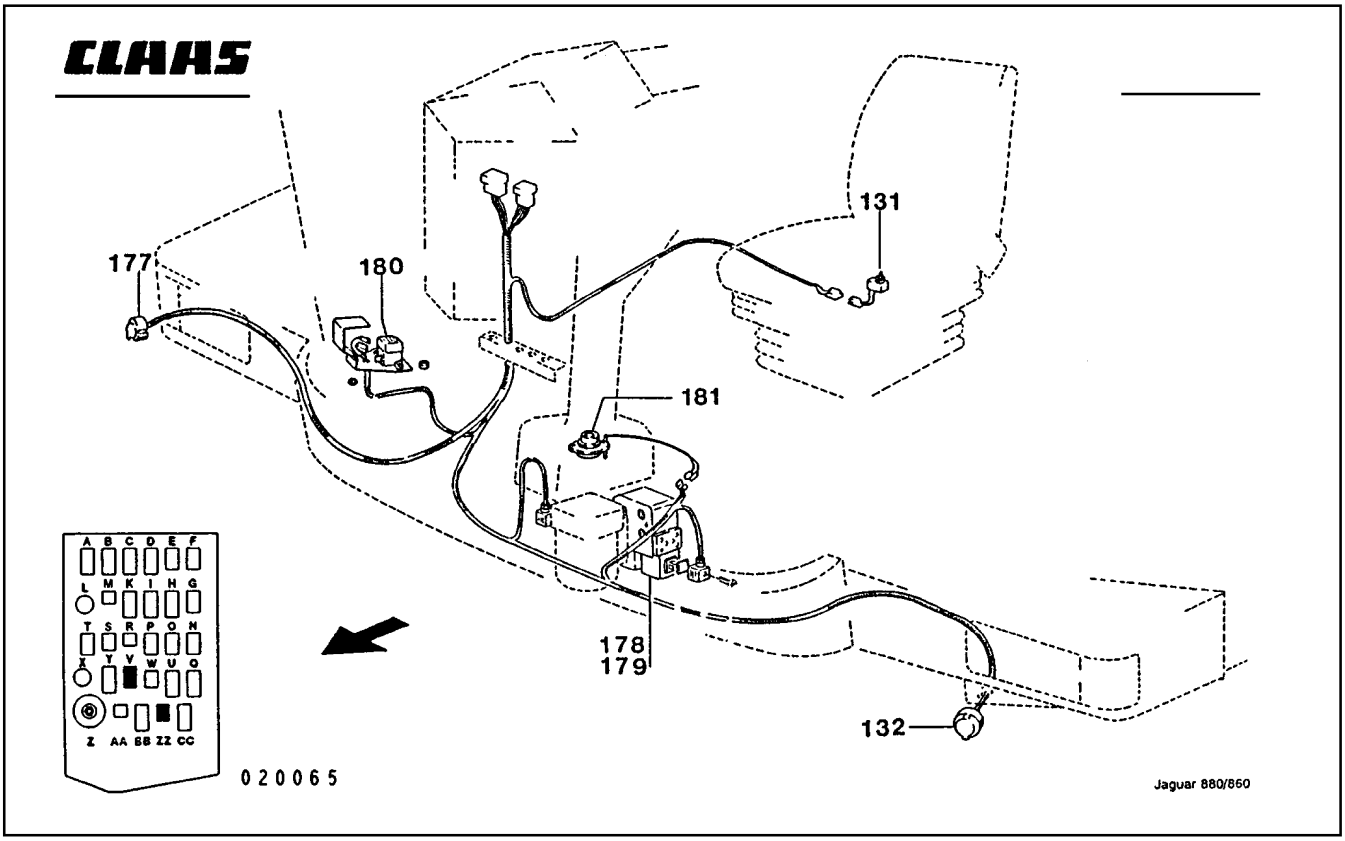
Wiring, operator's cab



Wiring, operator's platform, front



Wiring, Autopilot, operator's platform



Wiring, Autopilot, sensor arms