

Printed Circuit Board 236-13857-1

***with Fixed Time of Availability and Adjustable Operating Time
“H”***















Trailers and Semi-Trailers



Subject to change without notice

10121327

Survey

Pump	Voltage [V]	Control unit	Setting ranges	Part no.	Applications
203	12/24	integrated F ^{*,**}	P : 6 hours, fixed A : 2 to 30 minutes	236-13856-1	
		integrated V00-V03 ^{*,**}	P 1 : 3.75 to 56.25 minutes P 2 : 1 hour to 15 hours A 1 : 7.5 seconds to 112.5 seconds A 2 : 2 to 30 minutes	236-13862-1	    
		integrated M00-M23 ^{***}	P : 4 to 60 minutes P : 1 to 15 hours Ü : 5 or 30 minutes	236-13870-1	 
		without control unit or with external control unit*			 
203	12/24	integrated F ^{*,**} ADR V00-V03 ^{*,**} ADR		236-13859-1 236-13862-1	
203	12/24	integrated H [*]	B : 6 hours, fixed A : 2 to 30 minutes	236-13857-1	 
203	12/24	integrated H ADR [*]	B : 6 hours, fixed A : 2 to 30 minutes	236-13857-1	
203	24 VDC	external PSG 01	P : 0.5, 1, 2...to 12 hrs A : 2, 4, 8, 16, 32 min	236-13834-1 664-36875-1	
203	24 VDC, 115 VAC, 230 VAC	external PSG 02		236-13860-2	

P : 1 min to 160 hrs
A : 1 min to 160 min
Ü : 1 min to 160 min

A - Operating time ranges B - Time of availability P - Pause time range Ü - Monitoring time

- * 1A1 - Version - Pump without connection for the illuminated pushbutton
- **2A1 - Version - Pump with connection for the illuminated pushbutton
- ***2A4 - Version - Pump with microprocessor control

Note: The applications of the progressive systems are various. There is therefore a control unit available for each individual application.

Subject to change without notice

Table of Contents

	Page		Page
Survey	2	Time setting	7
Printed circuit board H	4	Operational test/To trigger an additional lubrication....	9
Mode of operation	4	Repair	8
Time of availability - Operating time	6	Troubleshooting	10
Time sequence diagram	6	Technical data	10
Time of availability	6	Connection diagram	11
Operating time	7		
Time storage	7		

Further information can be found in the following manuals:

Technical Description Pump Model 203
Technical Description Progressive Metering Devices for Grease and Oil, model SSV
Technical Description for "Electronic Control Units" of the pump model 203
Printed Circuit Board 236-13856-1 - Model F
Printed Circuit Board 236-13862-1 - Model V00-V03
Printed Circuit Board 236-13870-1 - Models M 00 - M 15
Printed Circuit Board 236-13870-1 - Models M 16 - M 23
Timer 236-13860-1 Model PSG02
Installation Instructions
Parts Catalog

Printed Circuit Board H*

Patented

- The electronic control unit with printed circuit board is patented. It controls the time of availability and operating time of centralized lubrication systems used on trailers and semi-trailers.

Advantages

- Precise recording of the real vehicle travel time by means of a shock sensor (Fig. 5) which detects all travelling motions.
- Exact control of the lubrication cycles as a function of the running time.

Mode of Operation

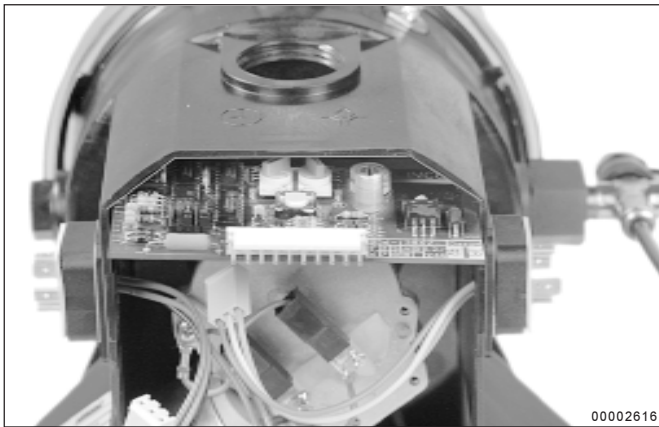


Fig. 1: Printed circuit board installed in the pump housing

The printed circuit board

- is integrated in the pump housing.

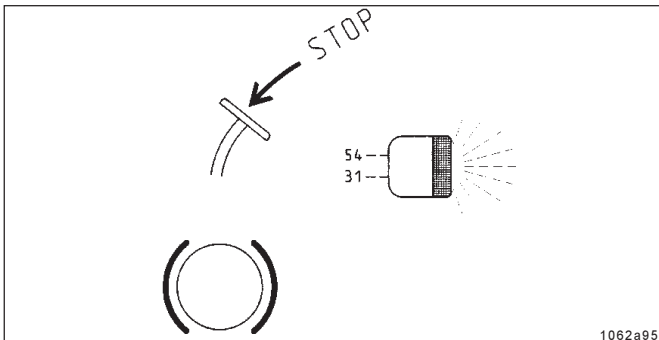


Fig. 2: Stop light voltage

- operates via the **stop light voltage** (terminals 54 and 31) in the case of pumps installed on the trailer.
- is actuated by the travelling motions of the trailer or semi-trailer, which activates the pause time and the time of availability.

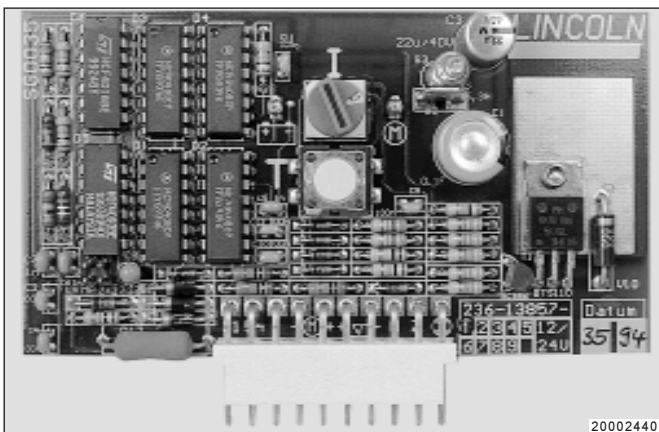


Fig. 3: Printed circuit board 236-13857-1

- Compared to tractors, the trailers/semi-trailers do not have a permanent voltage supply.
- The pump can therefore only operate for the duration of the individual braking operations. Refer to Fig. 6.

*H 1 is the designation of the respective version of the printed circuit board. It is part of the pump type designation code mentioned on the nameplate of each pump.

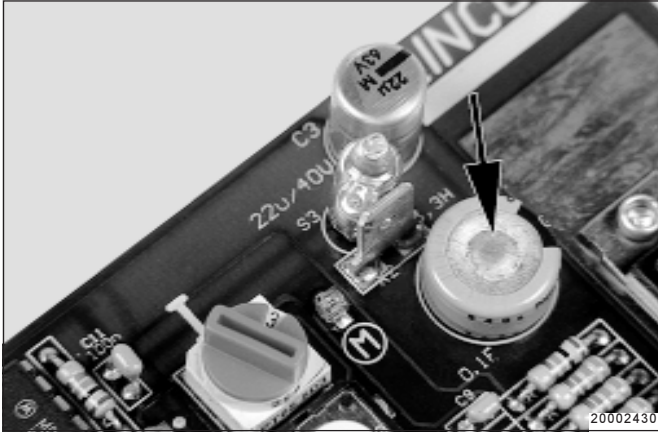


Fig. 4: Capacitor

- If no braking takes place, the printed circuit board gets the electric power from a capacitor (Fig. 4)
- When the brake is actuated for the first time:
 - the capacitor is charged;
 - the time of availability is activated;
 - the operating time starts.

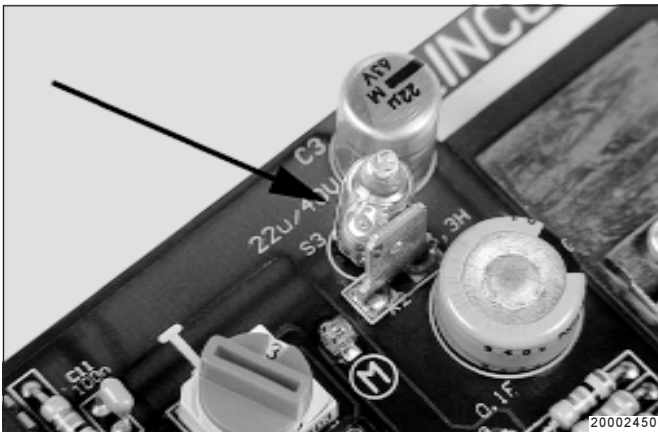


Fig. 5: Shock sensor

- Compared to the tractors, the trailers/semi-trailers do not have terminal 15 (driving switch) which is used for recording the vehicle running time. This function is taken over by the shock sensor (Fig. 5) which is integrated in the control unit.
- The electronic unit converts the incoming impulses into running times which correspond to the switching on and off of the driving switch.

Time of Availability - Operating Time

Time Sequence Diagram

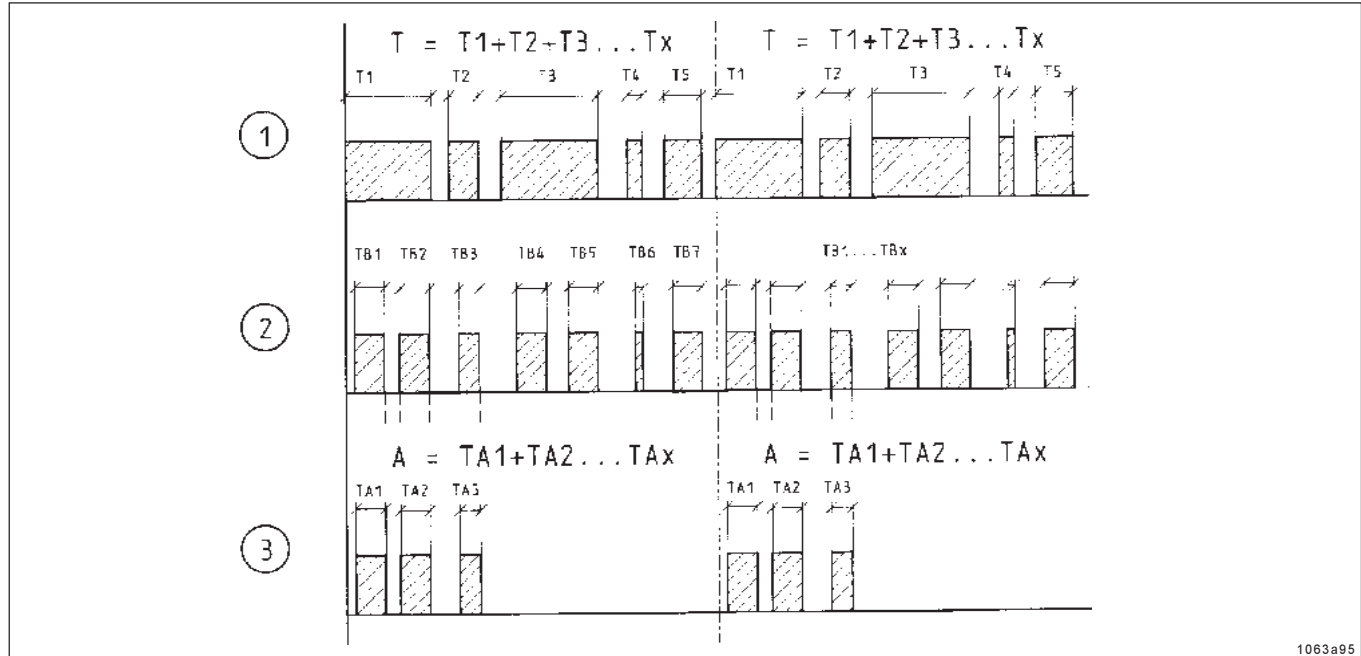


Fig. 6: Time sequence diagram

- 1 - Time of availability (2 cycles shown)
- 2 - Braking time sequence
- 3 - Operating time sequence
- T - Time of availability, fixed setting: 6 hours

- T1...TX - Individual travelling times
- TB1...TBX - Individual braking times
- A - Preset operating time (variable)
- TA1...TAX - Individual operating times

Time of Availability

- The time during which the printed circuit board records the travelling motions is defined as the time of availability.
- The time of availability starts with an operating time.
- The printed circuit board is designed in such a way that, within a real travelling time of 6 hours, the operating time runs once.
- The setting of 6 hours (time of availability) is fixed and cannot be changed.
- As soon as the shock sensor transmits travelling motions to the electronic unit, the time of availability T (Fig. 6) starts.
- Each time the vehicle stops, the electronic unit records the times which have elapsed so far (T1...TX).
- When the vehicle moves again, the time of availability continues to run from the point where it had been interrupted.
- The individual travelling times are stored until the 6 hours of real travelling time are reached.
- Once the time of availability has elapsed, a new cycle begins.

Operating Time

- The operating time TA1 (Fig. 6) starts with the first braking actuation TB1 and runs for the duration of the braking.
- The electronic unit records the duration of each braking operation (operating time) which is added to the preceding one until the preset operating time A is reached.
- After each further braking (example: TB 4) there is no more operating time until the time of availability starts again.
- The operating time
 - depends on the lubricant requirement;
 - is adjustable.
- The longer the operating time, the greater the lubricant requirement and vice-versa.
- During the operating time the pump dispenses lubricant to the lubrication points via progressive metering devices.

Time Storage

- When the vehicle is immobilized, the capacitor maintains the stored time of availability as well as the stored operating times for about 4 - 5 days.
- If the vehicle is immobilized for a longer time, the stored times are cancelled (the capacitor loses its charge).
- When the vehicle is started up again, the cycle begins with an operating time of the pump the first time the brake is actuated.

Time setting



Fig. 7: The cover to the printed circuit board has been removed

- * To set the operating time, remove the cover on the pump housing.

Important: After having set the operating time, screw the cover on the pump housing again.

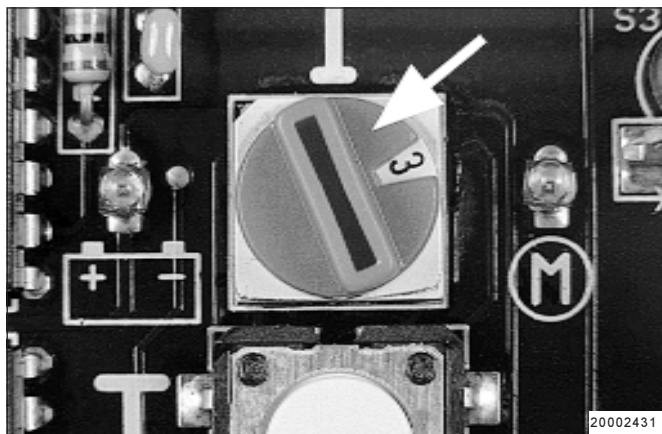


Fig. 8: Rotary switch - Operating time

To set the operating time

The operating time can be set to 15 different settings by means of the red rotary switch.

Switch position	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Minutes	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30

Note: The 0 setting has no function

Factory setting

Operating time :6 minutes

Time of availability :6 hours, fixed setting

Operational Test / To Trigger an Additional Lubrication Cycle

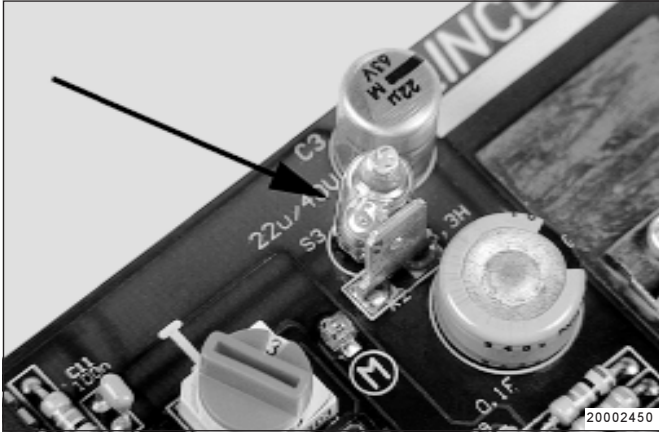


Fig. 9: Shock sensor

- To check the pump operation it is possible to perform an operational test.
- * Connect the trailer to the tractor.
- * Switch on the driving switch.
- * Keep the brake actuated:
- * Slightly push the pump causing the shock sensor (mercury switch, Fig. 9) to move.

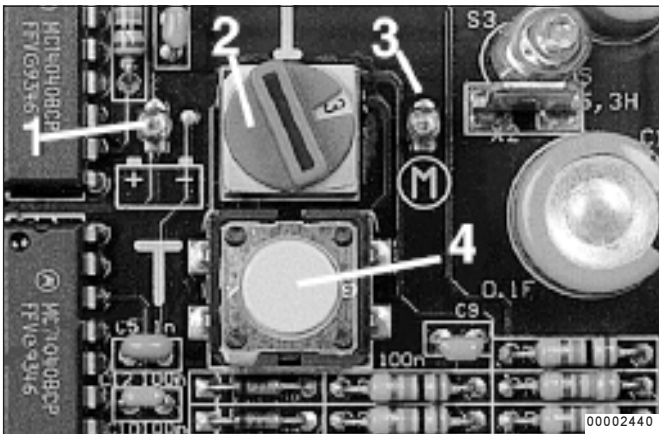


Fig. 10: LED of the printed circuit board

- To check whether voltage is applied to the printed circuit board, observe whether the left-hand LED 1, Fig. 10, is lit.
- * Press pushbutton 4 on the printed circuit board (> 2 seconds) until the right-hand LED 3 lights up.
- A shorter pause time elapses, followed by a normal lubrication cycle.
- Additional lubrication cycles can be triggered at any time.

- | | |
|-----------------------------------|---|
| 1 - LED, left-hand | 3 - LED, right-hand |
| 2 - Rotary switch, operating time | 4 - Pushbutton for additional lubrication |

Repair

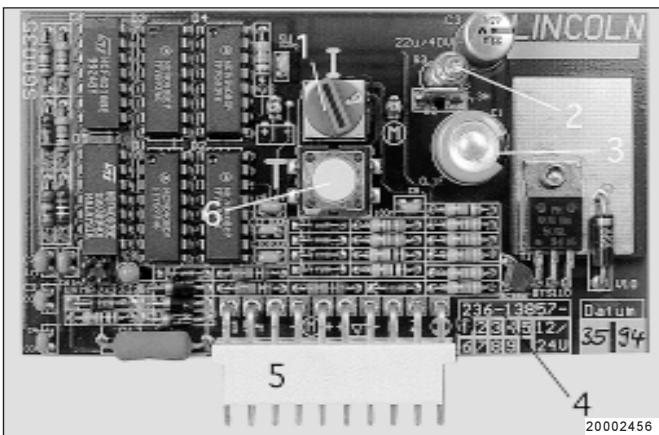


Fig. 11: Printed circuit board 236-13857-1

- | | |
|-------------------|--------------------|
| 1 - Rotary switch | 4 - Part number |
| 2 - Shock sensor | 5 - Terminal strip |
| 3 - Capacitor | 6 - Pushbutton |

Attention: The shock sensors installed on the printed circuit boards contain mercury. In the case of a repair take care that the sensor is not damaged as there would be the risk of harmful vapours. Defective printed circuit boards should be suitably packed and returned to the factory.

Subject to change without notice

Troubleshooting

Note: The pump operation can be checked from the outside by observing whether the stirring paddle is rotating (e.g. by triggering an additional lubrication) or whether the LED on the printed circuit board are lit.

• Fault: the pump motor does not run	
• Cause:	• Remedy:
<ul style="list-style-type: none"> • Voltage supply interrupted • Voltage supply to the printed circuit interrupted • Voltage supply interrupted between the printed circuit board and the motor • Printed circuit board defective 	<ul style="list-style-type: none"> • Check the voltage supply to the pump. If necessary, eliminate the fault. • Check the line leading from the pump plug to the printed circuit board. • If the voltage is applied, the left-hand LED is lit. • If the voltage is applied, the right-hand LED is lit. • Replace the printed circuit board

Technical Data

Rated voltage 12/24V DC
 Operating voltage
 12V/ 24V 9V to 30V
 Residual ripple in relation
 with the operating voltage $\pm 5\%$ acc. to DIN 41755
 Motor output Transistor 7A/short-circuit proof
 Reverse voltage protection:
 The operating voltage inputs are protected against
 polarity reversal
 Temperature range: -25°C to 70°C
 Class of protection
 Printed circuit board integrated in housing IP 6 K 9 K

All the printed circuit boards comply with the EMC guidelines for road vehicles acc. to DIN 40839 T1, 3 and 4.

Time setting
 Operating time 2,4,6,... to 30 minutes
 Time of availability 6 hours
 Factory setting
 Operating time 6 minutes

In order to protect the printed circuit board against condensation, it has been covered with a protective varnish.

Connection Diagram

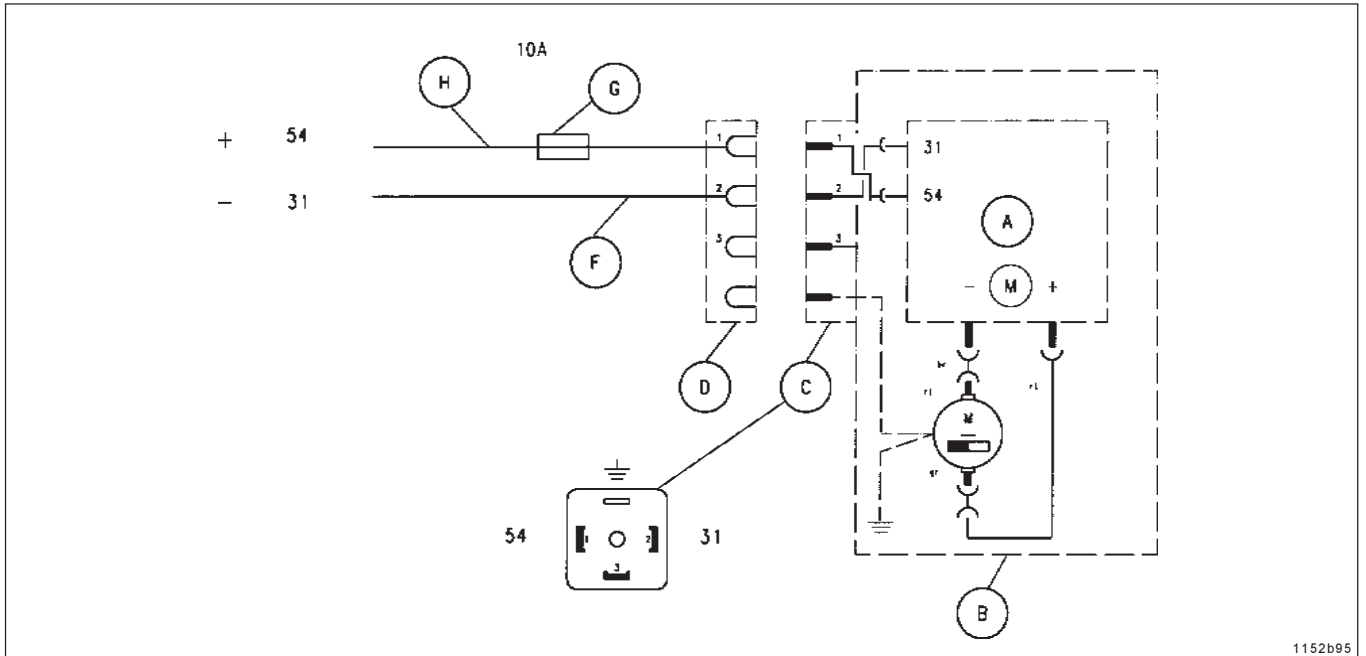


Fig. 12: Connection diagram QUICKLUB 203 for trailers/semi-trailers
 Connection via Hirschmann plug-in connectors DIN 43650-A

1152b95

- | | |
|--|------------------|
| A - Printed circuit board | F - Cable, brown |
| B - Pump housing | G - Fuse 10 A |
| C - Cable connector 1 | H - Cable, red |
| D - Line socket 1 (black)
with connecting cable, 3-wire | |

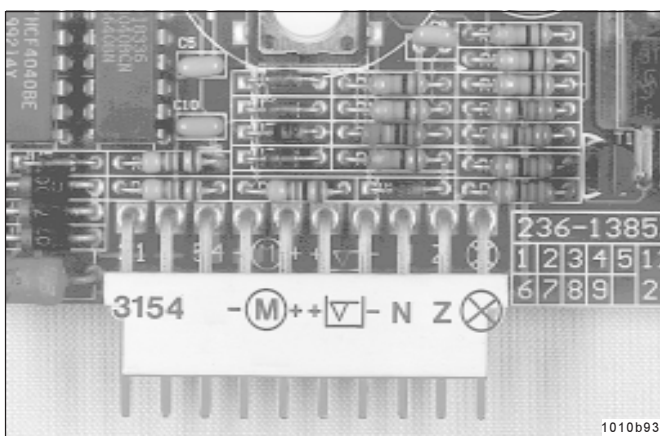


Fig. 13: Terminals of the printed circuit board

Subject to change without notice