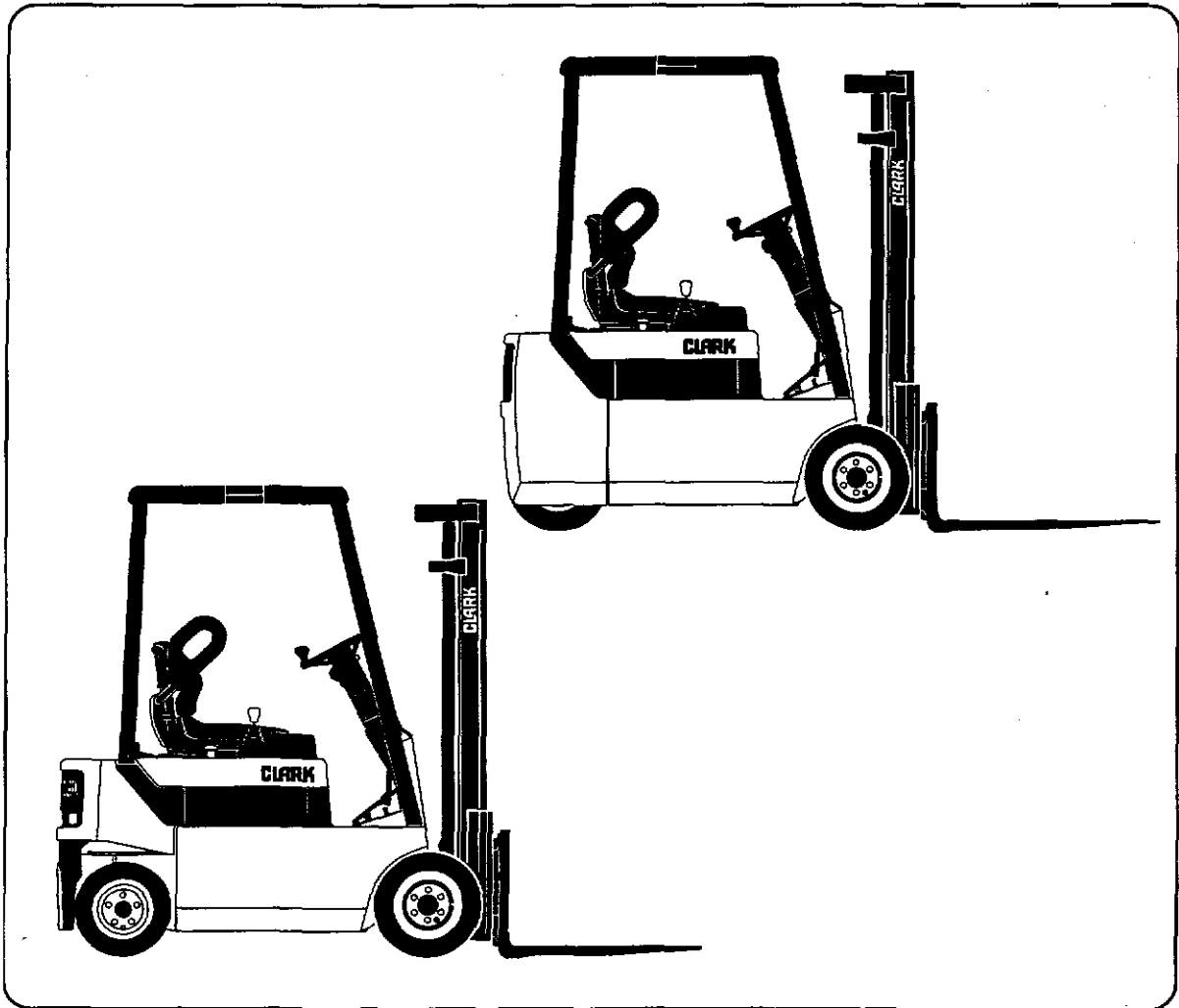


# **CLARK** Material Handling

**CTM/CEM 10-20**  
Lot No. 7096 / 7101  
with HPB1 - Control



**Training Manual Electr. System  
incl. Trouble Shooting with LC-Display**

SM 5167 GEF GB 02/97

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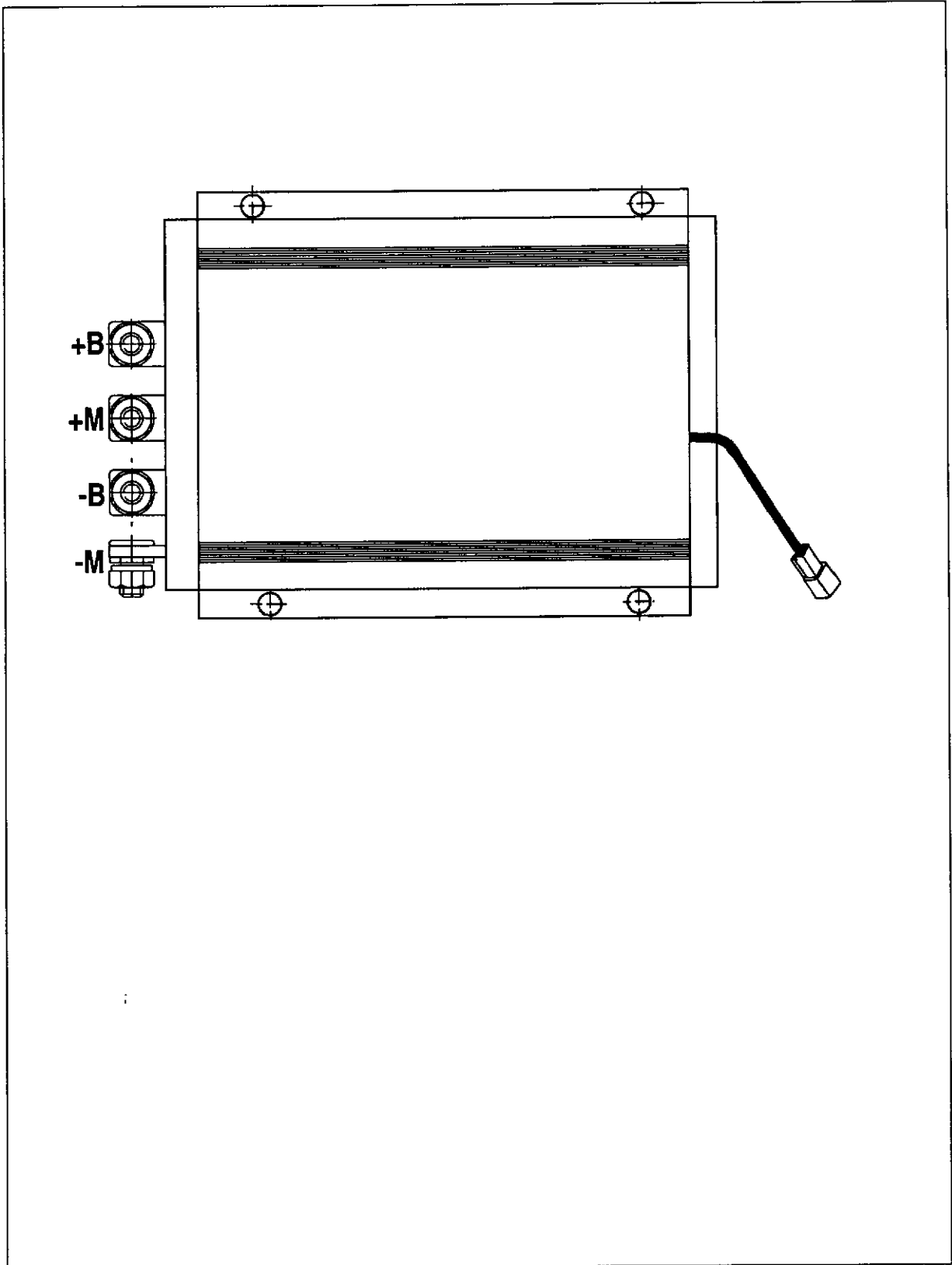
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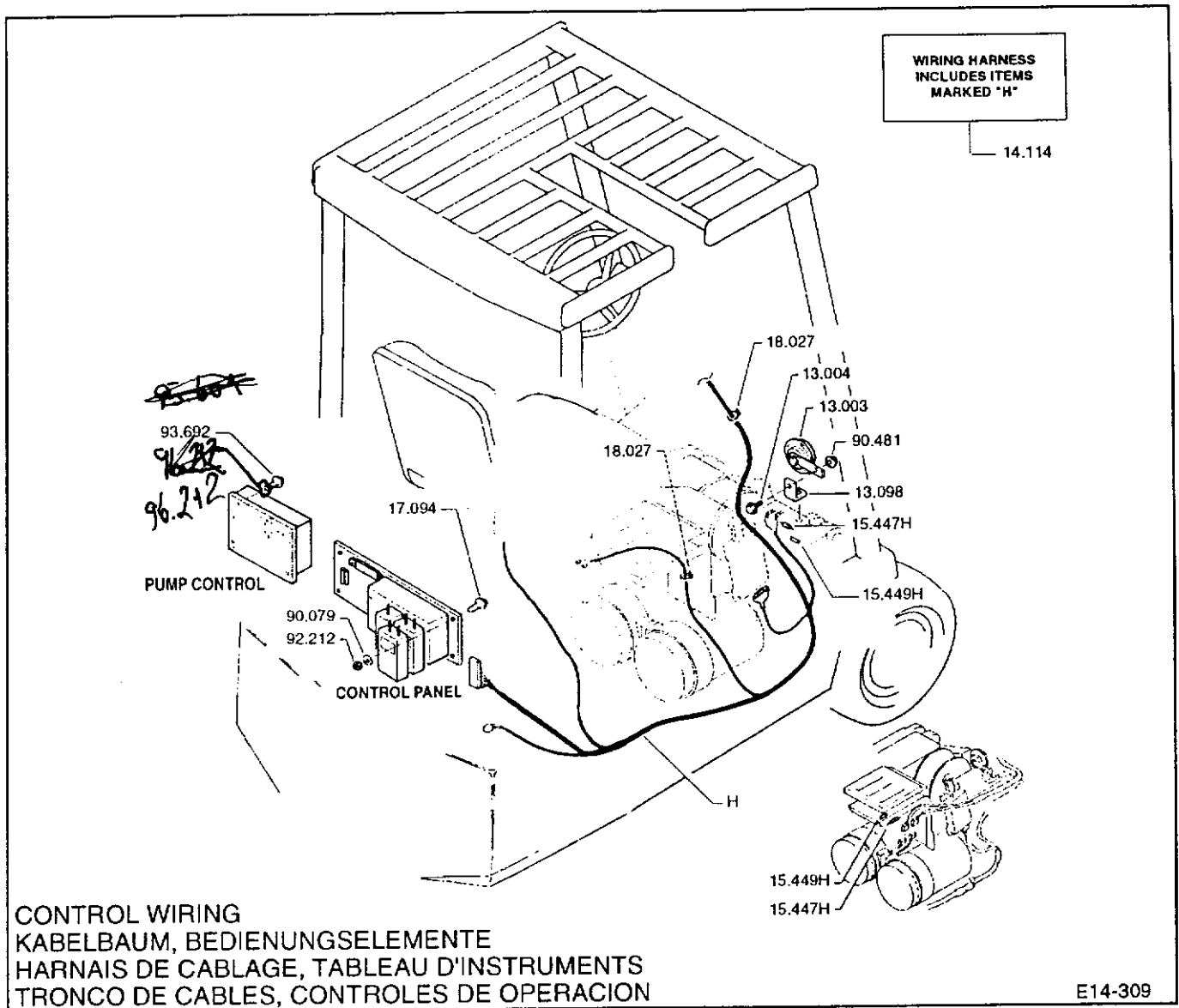


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## Cable Connections - Pump Control HP

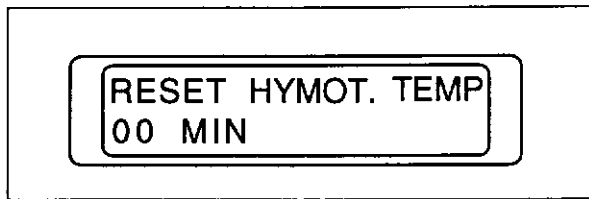




E14-309

13.003	HORN SIGNALHORN AVERTISSEUR BOCINA	17.094	FASTENER, CONTACTOR PANEL MOUNTING BEF.-MITTEL, SCHUETZTAFEL PIECE FIX., PANNEAU CONTACTEUR ELEM.FIJAC., PANEL CONTACTOR
13.004	FASTENER, HORN BEF.-MITTEL, SIGNALHORNRELAIS PIECES DE FIXATION DE L'AVERTISSEUR ELEMENTO DE FIJACION, BOCINA	18.027	CLIP, HARNESS SCHELLE, KABELBAUM ATTACHE DU HARNAIS ABRAZADERA, TRONCO DE CABLES
13.098	BRACKET, HORN MOUNTING HALTER, SIGNALHORN SUPPORT D'AVERTISSEUR SOPORTE, MONTAJE DE BOCINA	90.079	LOCKW. CONTACTOR PANEL FASTENER FEDERRING BEF SCHUETZENTAFEL ROND.GROWER, FIX.PANNEAU CONTACTEUR ARAND.SEG., FIJACION TABLERO CONTACTORES
14.114	HARNESS, MACHINE WIRING KABELBAUM, MASCHINENVERDRAHTUNG HARNAIS, CABLAGE DE LA MACHINE TRONCO DE CABLES, CABLEADO DE LA MAQUINA	90.481	NUT, HORN MOUNTING BRACKET FAST MUTTER, MONTAGEHALTERBEFESTIGUNG ECROU, FIX.SUPPORT DE MONTAGE TUERCA, FIJ. SOPORTE DE MONTAJE BOCINA
15.447	DIODE, HARNESS DIODE, KABELBAUM DIODE, HARNAIS CABLAGE DIODO, TRONCO DE CABLES	92.212	NUT, CONTACTOR PANEL MOUNT, FASTENER BEFESTIGUNGSMUTTER, SCHUETZENTAFEL ECROU DE FIX.PANNEAU DU CONTACTEUR TUERCA, FIJACION TABLERO DE CONTACTORES
15.449	BOOT, HARNESS DIODE SCHUTZKAPPE, DIODE KABELBAUM CAPOT PROTECTEUR, DIODE HARNAIS CABLAGE TAPA PROTECTORA, DIODO MAZO DE CABLES	93.962	FASTENER, PUMP CONTROL PANEL ASSEMBLY BEFESTIGUNG, PUMPEN-STEUERTAFEL PIECE DE FIX., PANNEAU DE COMMANDE DE POMPE ELEM.FIJ., TABLERO DE CONTROL DE BOMBA



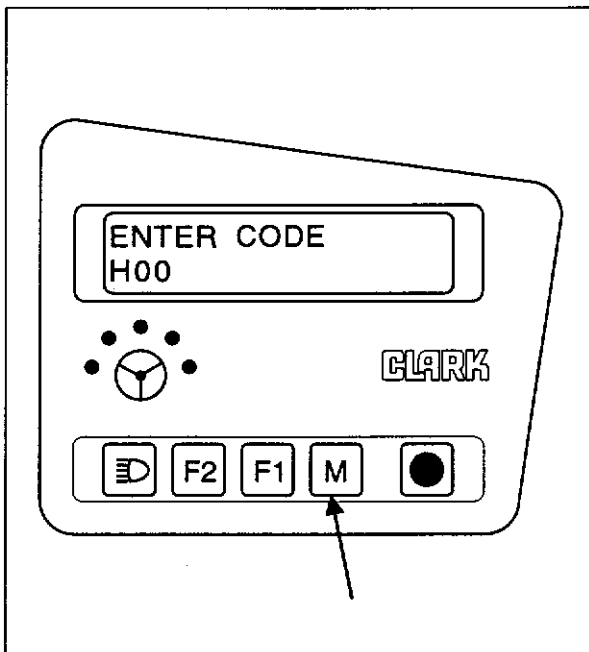


Here is indicated how much time the pump motor was overheated longer than 5 minutes.

## 2. Diagnosis, Pulse control

During this diagnosis the forklift is not operational.

To switch to this mode the "MODE" key must be pressed while switching on the keyswitch.



H00 appears on the display.

With keys F1 and F2 the code can be set.

Move to the next position by pressing the MODE key.

Pressing F1 and F2 accesses the various lists.

For explanations of the individual list positions see the parameter sheets.

The content of a displayed position is shown when the MODE key is pressed.

With the two function keys the values released for editing can be modified.

For rapid alteration, the increment is greater than 1.

When the MODE key is pressed twice in immediate succession the display counts down from 9 to 0.

This countdown can be interrupted by pressing the MODE key again. When 0 is reached the altered value is written to the memory.

When the MODE key is pressed once the control returns to display of the list position after 1 second.

If the MODE key is pressed during display of the fault memory, the fault memory is cleared on completion of the countdown.

## Checking of demand values at the accordingly connections (pins)

Connector Traction Control			
Description	Pin	Active	Inactive
Output UB- (not used)	TA 01	< 0,5V	
Output power steer request	TA 02	> 8V	< 0,5V
Input supply opto coupler	TB 01	12V +/- 1V	< 10V
Input mode signal	TB 02	(V inactiv)-2V	12V +/- 1V
Output data request pump	TB 03	> 8V	< 0,5V
Output UB-	TB 05	< 0,5V	
Output supply opto coupler	TB 06	12V +/- 1V	
Checkpoint supply 5V	TB 07	> 4,5V < 5,5V	
Input diagnostic to dash board	TB 08	< 0,5V	> 0,5V
Input key UB+	TE 01	U Battery	
Output key UB+, supply contactor coils	TE 02	U Battery	
Output driver clock	TE 03	< 0,5V	> 4V
Output driver contactor REV right	TE 04	< 0,5V	U Battery
Output driver contactor FWD right	TE 05	< 0,5V	U Battery
Output driver contactor REV left	TE 06	< 0,5V	U Battery
Output driver contactor FWD left	TE 07	< 0,5V	U Battery
Output contactor regen	TE 08	U Battery	open
Output driver contactor regen	TE 09	< 0,5V	U Batt / open
Input seat switch	TF 01	> U Bat - 2V	< 0,5V
Output UB- accelerator (not used)	TG 01	< 0,5V	
Accelerator value, MS1 closing max. range	TG 02	0,2 V - 1 V > 3,8V + 0,4V	
Output 12V to accelerator, max. 25 mA	TG 03	12V +/-1V	
Output UB+, supply micro switches	TG 05	U Battery	
Input food brake switch	TG 06	>U Batt -2V	< 0,5V
Input REV switch	TG 07	>U Batt -2V	< 0,5V
Input FWD switch	TG 08	>U Batt -2V	< 0,5V
Output data driver	TH 02	< 0,5V	> 4V
Output UB- steering pot.	TL 01	< 0,5V	
Right max.	TL 02	4,0V+0,1V	
Right reversal		3,7V+0,2V	
Right cut off		3,1V+0,2V	
Steering straight		2,5V +/-0,1V	
Left cut off		1,9V-0,2V	
Left reversal		1,3V-0,2V	
Left max.		1,0V-0,1V	
Output 8,5V 40mA steering pot.	TL 04	8V - 9V	
Input release data communication	TL 05	< 3V	> 10V
Input speed reduction in case of pump failure	TL 09	> 10V	< 3V

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