



**NOTICE: Always refer to the appropriate Vehicle Service Manual when troubleshooting electrical problems. See all GENERAL INSTRUCTIONS WARNINGS AND PRECAUTIONS**



### DECODING DIAGNOSTIC LED ALARM CODES FOR H2 PUMP CONTROLLERS

The diagnostic LED found on the Controller may be used to give a general indication of what the problem may be with the hydraulic system. Below is a table that shows which possible alarms may have occurred in relation to the number of flashes you count on the LED. Use the Hand Set to determine which alarms are causing the problem.

NUMBER OF LED FLASHES	POSSIBLE ALARM MESSAGES ON HANDSET	TYPE OF ALARM	NOTES
1	EEPROM DATA KO EEPROM PAR. KO EEPROM CONF. KO EEPROM OFF-LINE CHOPPER NO CONF WATCH-DOG	LOGIC TEST FAIL	
2	INCORRECT START	START TEST FAIL	
3	NO FULL CONDUCTION VMN** LOW	VMN TEST FAIL	Check C2 Contactor tips
4	VACC NO OK	ACCEL POT HIGH	Truck does not operate
5	I HIGH AT STAND I=0 EVER	CURRENT READING TEST FAIL	Truck does not operate
6	DRIVER SHORTED COIL SHORTED	CONTACT DRIVER CIRCUIT MALFUNCTION	
7	TH. PROTECTION	TEMPERATURE HIGH	Truck operates slower or not at all. Temp over 80 deg C.
32	BATTERY	LOW BATTERY CONDITION	

Refer to Truck Manual for a more detailed description of the alarm messages that appear on the Hand Set.

NOTE: \*\* VMN means Voltage Motor Negative - voltage on Mosfets.

## DECODING HAND SET ALARMS FOR PUMP MOTOR CONTROLLER

### 1) STAND BY VMN LOW

The test is carried out with the pump motor off. If the VMN voltage is lower than 1/3 of the battery voltage, this alarm is signalled. Possible causes:

- a) Check the motor wiring to make sure it is correct, check C2 contactor tips.
- b) Controller is broken. Replace it.

### 2) NO FULL COND.

The test is carried out at maximum pump motor speed.

If, in this condition, the VMN is found to be greater than  $1/3 + V_B$ , the diagnostic circuit is faulty. Therefore, the pump motor operations is stopped. If the problem persists, replace the logic card.

### 3) TH.PROTECTION

It indicates that the Controller temperature has exceeded 80°C.

The maximum current is gradually reduced to a value of zero at a temperature of 85°C.

- a) If the alarm occurs immediately when the truck is turned on and the Controller is cold, it is very likely that the heat detection circuit on the power or on the Controller is broken. In this case replace the Controller.
- b) If the alarm occurs frequently just a short time after the truck has been switched on, it is probably due to little cooling. Check that the securing nuts are bolted tightly and that the Controller is correctly installed.

### 4) BATTERY

The battery charge is low.

The alarm is signalled only if the BATTERY CHECK option has been selected (usually BATTERY CHECK is OFF). All functions, except hydrostatic steering pump motor (which is not used), are inhibited.

### 5 ) INCORRECT START

A running request is present on key startup.

Possible causes:

- a) Operator turns on key switch with pump controller switch (left thumb switch) actuated. Release switch and try again.
- b) Request switch stuck.

### 6) I HIGH AT STAND

Test carried out with pump motor(s) not running. Checks that current is 0.

If this is not verified, this alarm is displayed. This alarm shuts down the pump motor(s). Possible causes:

- a) Current sensor broken and logic failure.

First replace the logic card, and if the problem persists, replace the Controller.

### 7) I=0 EVER

Test carried out with pump motor(s) running.

Checks that the current during running is greater than a minimum value. If it is not, this alarm is displayed and the pump motor(s) are shut down. Possible causes:

- a) The current sensor is faulty. Replace the Controller.
- b) Power cables interrupted or loose connections.
- c) One or more brushes do not touch the collector. Remove brushes, clean brush holders and brushes and reassemble, check for correct contact.

### 8) EEPROM PAR.KO

Fault in the memory area containing the setting parameter data.

The alarm stops the truck.

If the fault persists after turning the key off and back on again, replace the Controller logic card.

If the alarm disappears, previously stored parameters have been cleared and replaced with default values. You must reset the parameters.

### 9) EEPROM CONF.KO

Fault in the memory area containing the Controller special configuration data. If the fault persists after turning the

key off and back on again, replace the logic card.

If the fault disappears, the Controller configuration has been replaced with default values (regeneration version, etc...), so it will be necessary to reprogram it. Use the Hand Set and follow the instructions for Initializing a new Controller.

#### **10) EEPROM DATA KO**

The data relating to the hour meter memory area are incorrect. The alarm does not stop the truck. If the alarm disappears when the truck is turned off and back on again, the hour meter data have been set to zero.

#### **11) EEPROM OFF LINE**

Fault in the nonvolatile memory containing the hour meter data, stored alarms and programming parameters.

If the fault persists after turning off and back on again, replace the logic card.

#### **12) CHOP. NO CONF.**

This alarm is similar to No.9, but in this case, though the data are incorrect, they do not correspond to a hardware configuration recognized by the Controller.

If the fault persists after turning the key off and back on again, replace the logic card.

If the fault disappears chopper configuration has been replaced with default values (regeneration version, etc...), so it will be necessary to reprogram it. Use the Hand Set and follow the instructions for Initializing a new Controller

#### **13) WATCHDOG**

This test is performed both at all times when the power is turned on to the Controller.

It is a self-diagnostic function inside the logic card. It may be reset by turning off the key.

If the alarm persists, replace the logic card.

#### **14) COIL SHORTED**

On the contactor negative drivers there is a short circuit to the battery positive pole. Possible causes:

- a) The contactor coils are shorted or they absorb more than 6 amps.
- b) Short circuit with +BATT of the wiring coming out of the contactor connectors. The alarm indicates that there has been an overload but not a failure of one of the Controller components. After removing the external cause restart the truck.

#### **15) DRIVER SHORTED**

This test is performed with the truck stopped. It consists in checking that the driving voltage of the drivers controlling the contactors have the expected voltage.

Possible causes:

- a) Fault in the logic card .
- b) The drivers are broken, because of an overvoltage in the contactor negative wiring of the contactor negative poles. Replace Controller.