



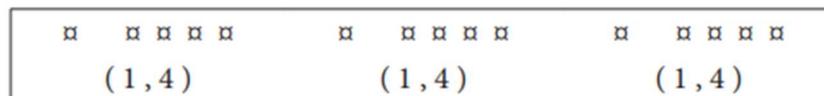
**HOW TO**

**Fault-find on Curtis 1212**

## LED DIAGNOSTICS

During normal operation, with no faults present, the status LED is steadily on. If the controller detects a fault, the status LED flashes a 2-digit fault identification code continuously until the fault is corrected.

For example, code “1,4”—undervoltage—appears as:



The fault codes are listed in Table 2. Refer to the troubleshooting chart (Table 3) for suggestions about possible causes of the various faults.

Note: The status LED can only indicate one fault at a time. If multiple faults are detected, the highest priority fault code flashes until it is cleared.

Table 2 Status LED Fault Codes

LED CODES		FAULT
LED off		no power or defective controller
solid on		controller powered up; no faults
1,1	□ □	THERMAL FAULT
1,2	□ □□	THROTTLE FAULT
1,3	□ □□□	SPEED POT FAULT
1,4	□ □□□□	UNDERVOLTAGE FAULT
1,5	□ □□□□□	OVERVOLTAGE FAULT
2,1	□□ □	MAIN OFF FAULT
2,2	□□ □□	EMR SEQUENCING FAULT / MOTOR STALLED
2,3	□□ □□□	MAIN FAULT*
2,4	□□ □□□□	MAIN ON FAULT
2,5	□□ □□□□□	PUMP SRO FAULT
3,1	□□□ □	WIRING FAULT*
3,2	□□□ □□	BRAKE ON FAULT
3,3	□□□ □□□	PRECHARGE FAULT*
3,4	□□□ □□□□	BRAKE OFF FAULT
3,5	□□□ □□□□□	HPD FAULT
4,1	□□□□ □	CURRENT SENSE FAULT*
4,2	□□□□ □□	HARDWARE FAILSAFE*
4,3	□□□□ □□□	EE CHECKSUM FAULT †
4,4	□□□□ □□□□	MOTOR OPEN
4,5	□□□□ □□□□□	BATTERY DISCONNECT FAULT*

Table 3 TROUBLESHOOTING CHART

LED CODE	PROGRAMMER LCD DISPLAY	EXPLANATION	POSSIBLE CAUSE
1,1	THERMAL FAULT	over-/under-temperature cutback	1. Temperature >80°C or < -10°C. 2. Excessive load on vehicle. 3. Operation in extreme environments. 4. Electromagnetic brake not releasing.
1,2	THROTTLE FAULT	PotLow and/or PotWiper out of range	1. Throttle input wire open or shorted. 2. Throttle pot defective. 3. Wrong throttle type selected.
1,3	SPEED POT FAULT	speed limit pot wiper out of range	1. Speed limit pot wire(s) broken or shorted. 2. Broken speed limit pot.
1,4	UNDERVOLTAGE FAULT	battery voltage too low	1. Battery voltage <17 volts. 2. Bad connection at battery or controller.
1,5	OVERVOLTAGE FAULT	battery voltage too high	1. Battery voltage >31 volts. 2. Vehicle operating with charger attached. 3. Intermittent battery connection.
2,1	MAIN OFF FAULT	main contactor driver Off fault	1. Main contactor driver failed open.
2,2	EMR SEQUENCING FAULT [1212P]	improper sequencing	1. Emerg. Rev. switch pressed before KSI on.
	MOTOR STALLED [1212]	motor stall fault	1. Motor is stalled.
2,3	MAIN FAULT	main contactor fault	1. Main contactor welded or stuck open. 2. Main contactor driver fault.
2,4	MAIN ON FAULT	main contactor driver On fault	1. Main contactor driver failed closed.
2,5	PUMP SRO FAULT [1212P]	improper sequencing	1. Pump switches pressed before KSI on.
3,1	WIRING FAULT	HPD fault present >10 sec.	1. Misadjusted throttle. 2. Broken throttle pot or throttle mechanism.
3,2	BRAKE ON FAULT	brake On fault	1. Electromagnetic brake driver shorted. 2. Electromagnetic brake coil open.
3,3	PRECHARGE FAULT	precharge fault	1. Brake driver shorted. 2. Precharge circuit damaged. 3. MOSFET failure.
3,4	BRAKE OFF FAULT	brake Off fault	1. Electromagnetic brake driver open. 2. Electromagnetic brake coil shorted.
3,5	HPD FAULT	HPD (High Pedal Disable)	1. Improper sequence of throttle and KSI, push, or inhibit inputs. 2. Misadjusted throttle pot.
4,1	CURRENT SENSE FAULT	current sense out of range	1. Short in motor or in motor wiring. 2. Controller failure.*
4,2	HARDWARE FAILSAFE	motor voltage out of range	1. Motor voltage does not correspond to throttle request. 2. Short in motor or in motor wiring. 3. Controller failure.*
4,3	EEPROM CHECKSUM FAULT	EEPROM fault	1. EEPROM failure or fault.
4,4	MOTOR OPEN [1212]	motor open fault	1. Motor wiring is open.
4,5	BATTERY DISCONNECT FAULT	battery disconnected	1. Battery not connected. 2. Poor connection to battery terminals.