

# Fault Charts

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## Fault Charts

### Overview

Faults can occur during start-up, motoring and charging.

- *Start-up faults* - occur after the key is turned on. The PCU runs a check to ensure that the system is ready for operation. If it is not ready, it sends a fault signal.
- *Motoring faults* - occur after the initial start-up
- *Charging faults* - occur during charging

The charts on the following pages list possible causes and suggested solutions to the faults.

**Start Up Faults**

**No Indicator Lights** If no indicator lights are displayed when the key is turned on, this could be due to the causes listed below.

Possible Cause	Action
Loose or disconnected cables feeding the PCU	Disconnect and reconnect all cables to the PCU
Auxiliary 12 volt power system fault	Check the voltage of the 12 volt battery and load test if necessary.  If the voltage is low, refer to the DC/DC Converter Diagnostic Procedure.
Short or open in the 12 volt circuit	Check the voltage on the circuit.
Blown 12 volt DC line fuse	Check the voltage on the circuit and replace fuse if necessary.
Burned out indicator lights.	Test bulbs. (Refer to the Indicator Diagnostic Procedure) and replace bulb if necessary.
PCU fault	Run the DOLCOM diagnostics.  Refer to the PCU Removal and Replacement Procedure.



**Start Up Faults (continued)**

**Fault Indicator Remains On**

If the fault indicator remains on, it could be due to the causes listed in the chart below.

Possible Cause	Action
Battery pack external ON/OFF switch is off.	Turn switch to the on position.
Loose or disconnected cables feeding the PCU.	Disconnect and reconnect all cables to the PCU.
Accelerator pedal not in fully off position.	Refer to the Accelerator Potentiometer Diagnostic Procedure.  Re-attempt normal operating procedure.
State of charge on main battery pack low.	Check the main battery pack voltage between Pins A and B in J2 connector.  Charge main battery pack if necessary.
No pre-charged voltage	Refer to Battery Pack Diagnostic Procedure.
Low auxiliary battery or auxiliary power system fault	Check the voltage of the 12 volt battery and load test if necessary.  If the voltage is low, refer to the DC/DC Converter/Auxiliary Battery Diagnostic Procedure.
Isolation fault (voltage leaking from main battery pack to the chassis)	Refer to Battery Pack Diagnostic Procedure (Voltage Leaking from Battery Pack)
PCU failure	Run the DOLCOM diagnostics Refer to PCU Removal and Replacement Procedure.

## Start Up Faults (continued)

### Ready and Fault Indicator Blinking

If both the ready and fault indicator remain lit after start up, check the causes below.

Possible Cause	Possible Correction
Main power relay may not be engaging	Refer to Battery Pack Diagnostic Procedure (Voltage Leaking to Chassis portion)
PCU fault	Run the DOLCOM diagnostics Replace PCU if needed



## Motoring Faults

### Vehicle Will Not Move

If the vehicle will not move when the accelerator is depressed, refer to the chart below for possible causes and solutions.

Possible Cause	Action
PRNDL switch out of adjustment (ready light lit)	Refer to PRNDL Adjustment Procedure
Main power relay may not be engaging	Refer to Battery Pack Diagnostic Procedure (Main Power Relay portion)
Accelerator potentiometer fault (fault light lit when you press the accelerator)	Refer to Accelerator Potentiometer Diagnostic Procedure
PCU fault	Replace PCU if needed

## Motoring Faults (continued)

### Miles Per Charge Has Decreased

If the miles per charge has decreased, it could be due to a mechanical or an electrical problem.

Following is a list of the mechanical problems that could cause decreased miles per charge. For repair procedures, refer to the vehicle's shop manual.

- Incorrect tire pressures
- Emergency brake out of adjustment
- Service brake dragging
- Wheel alignment
- Incorrect lubrication of transmission components
- Wheel bearings too tight
- Worn transmission bearings
- Worn "U" joints
- Rear axle differential

The chart below includes a list of the electrical problems that could cause decreased miles per charge. To repair these problems, refer to the appropriate procedure.

Possible Cause	Action
Charging system malfunction.	Refer to Charging System Diagnostic Procedure
Battery pack failure or loss of capacity	Refer to Battery Pack Diagnostic Procedure
Individual battery failure	Refer to Battery Removal and Replacement Procedure
Motor fault	Refer to Motor Diagnostic Procedure
Malfunctioning state of charge gauge (this is not actually a cause, but it could cause the driver to assume the miles per charge is decreasing)	Ensure the vehicle has been fully charged inductively or conductively – this should reset the state of charge gauge



**Motoring Faults (continued)**

**Vehicle Powers  
Down Unexpectedly**

If the vehicles powers down unexpectedly while driving, check the possible causes and solutions listed below.

Possible Cause	Action
Loose connector (Fault light on)	Disconnect and reconnect all PCU cables
PRNDL switch out of adjustment (Ready light on)	Refer to PRNDL Adjustment Procedure
Thermal shutdown (Fault light on which goes to ready after cool down)	Refer to Cooling System Diagnostic Procedure
Low auxiliary battery (Fault light on or no lights)	Check auxiliary battery voltage and DC/DC converter  If the voltage is low, refer to the DC/DC Converter Diagnostic Procedure
Blown 12 volt fuse (No lights)	Check fuse and replace if necessary
Battery pack failure (Fault light on or Fault and Ready Light Blinking)	Refer to Battery Pack Diagnostic Procedure
Motor fault (Fault light or no light)	Refer to the Motor Diagnostic Procedure
Motor encoder fault (Ready light on)	Refer to the Motor Encoder Diagnostic Procedure
PCU fault (Fault light or fault and ready lights)	Run DOLCOM diagnostics. Replace PCU if necessary.

**Motoring Faults (continued)**

**Temperature Problems**

If the temperature gauge indicates that the vehicle is running below or above the normal range, check the possible causes and solutions below.

Possible Cause	Action
Low coolant	Refill coolant reservoir with proper coolant mixture (Refer to Coolant Replacement Procedure)
Water pump fault	Refer to coolant pump portion of the Cooling System Diagnostic Procedure
Fan fault	Refer to the Cooling System Diagnostic Procedure
Air in the system	Refer to coolant pump portion of the Cooling System Diagnostic Procedure
PCU fault	Replace PCU if necessary. Refer to PCU Removal and Replacement Procedure



**Motoring Faults (continued)**

**Unusual Noise  
 During Motoring**

If the driver notices unusual noises while driving, check the possible causes and solutions below.

**Note:** Because of the lack of engine noise, it is possible to hear mechanical noise from the brakes, transmission and tires that normally would not be heard in a gasoline powered vehicle.

Possible Cause	Action
Motor noise – loose motor mounting bolts	Tighten motor mounting bolts. See motor replacement procedure for specifics
Motor noise – motor fault	Refer to motor Removal and Replacement procedure
PCU noise – loose PCU mounting bolts	Tighten PCU mounting bolts. See PCU replacement procedure for specifics
PCU Noise – PCU fault	Refer to PCU removal and replacement procedure
Vacuum pump noise	Check mounting bolts
Power steering pump noise	Check power steering fluid level and add if necessary

**Motoring Faults (continued)**

**Vehicle Movements are not Normal** If the vehicle does not drive smoothly, check the possible causes and solutions below.

Possible Cause	Action
Cables to PCU are loose or disconnected (No indicator lights lit)	Disconnect and reconnect all cables to PCU
Motor encoder fault	Refer to Motor Encoder Diagnostic Procedure
Battery pack not fully charged	Charge main battery pack
Integral charger is not fully charging main battery pack	Use DOLCOM to check charge complete voltage
Battery pack fault	Refer to Decreased Miles per Charge Diagnostic Procedure
High impedance in the power circuit causing voltage drop	Check all battery and cable connections in the battery pack
PCU fault	Run the DOLCOM diagnostics Replace PCU if necessary



**Motoring Faults (continued)**

**Vehicle Slips Into Charge Mode While Motoring**

If the vehicle slips into charge mode while motoring refer to PCU Removal and Replacement Procedure.

**Vehicle Indicators Will not Turn Off When Key is in Off Position**

If the vehicle indicators will not turn off when the key is in the off position, check the causes and solutions listed below.

Note: To shut off the vehicle in this condition, you must turn off the main battery pack switch.

Possible Cause	Action
Main power or pre-charge relay wiring shorted	Replace the wiring and relay if necessary
PCU fault or integral charger within PCU is not fully charging the batteries	Replace PCU. Refer to the PCU Removal and Replacement Procedure

**Ready Indicator Blinks**

If the ready indicator blinks during driving, check the possible causes and solutions listed below.

Possible Cause	Action
DC/DC converter not enabled	Refer to the DC/DC Converter Diagnostic Procedure.  Replace the PCU if necessary (Refer to the PCU Removal and Replacement Procedure)

## Charging Faults

### Charge Indicator Never Lights

If the charge indicator light never lights during charging, check the possible causes and solutions below.

Possible Cause	Action
AC voltage not present	<p>Check AC power to the charge cord. (Check building AC breaker, GFI and continuity of charge cord.)</p> <p>Check AC power to the J6 charger input at Pins A and B. (You should read line voltage. Pin C is the ground)</p>
Dead 12 volt auxiliary battery	<p>Check the voltage and load test if necessary</p> <p>If voltage is low, refer to the DC/DC Converter Diagnostic Procedure</p>
Cables to PCU are loose or disconnected	Disconnect and reconnect all cables to PCU
Indicator is burned out.	<p>Check bulb (Refer to Indicator Diagnostic Procedure)</p> <p>Run DOLCOM Diagnostics to see if the vehicle is charging properly</p>
Ground Fault Indicator (GFI) switch has been tripped	Disconnect from AC power and reset GFI switch.
PCU fault.	Replace PCU. (Refer to the PCU Removal and Replacement Procedure)



**Changing Faults (continued)**

**Fault and Ready  
 Light Blinking**

If the fault and ready light blink during charging check the possible causes and solutions below.

Possible Cause	Action
Vehicle was plugged in too long – this happens if the vehicle remains connected to AC power supply for more than 15 hours after “charge complete” indicator stops blinking	Unplug the vehicle. (This is not an actual fault, - it is the vehicle’s built-in overcharge protection.)

**Immediately Shows  
 “Charge Complete”**

If the vehicle immediately shows “charge complete” when you begin charging, check the following causes and solutions.

Possible Cause	Action
Vehicle is fully charged	Run the DOLCOM diagnostics to determine state of charge. Voltage should be 373 volts DC
PCU failure	Run the DOLCOM diagnostics.

**Charging Faults (continued)**

**Fault Light Remains Lit Longer than Five Seconds**

If the fault indicator does not turn off after five seconds, check possible causes and solutions below.

*Note: If the vehicle is conductively charged for over 16 hours, the charge and fault light will blink. Unplug the AC power source to eliminate the problem.*

Possible Cause	Action
Start key is in the ON position	Turn start key to the OFF position
Battery pack switch is in the OFF position	Turn the main battery pack switch to the ON position
Ground Fault Indicator (GFI) switch has been tripped	<b>Disconnect from AC power</b> and reset GFI switch and check for isolation faults
Cables to PCU are loose or disconnected	Disconnect and reconnect all cables to PCU
Indicator is burned out	Refer to Indicator Diagnostic Procedure
Pre-charge fuse blown	Refer to Battery Pack Diagnostic Procedure
Open circuit or blown fuse in main battery pack	Check main fuses in the battery pack and replace if necessary.  Check battery cable and connections
Isolation fault	Refer to Battery Pack Diagnostic Procedure (Voltage leaking from main battery to chassis portion of the procedure)
PCU fault	Run the DOLCOM diagnostics  Replace PCU. (Refer to PCU Removal and Replacement Procedure.)



## Charging Faults (continued)

### Charge Indicator Does Not Blink or Fault Light is On and the Charge Light Blinks

If the charge indicator does not blink or the fault light is on and the charge light is blinking, check the possible causes and solutions below.

*Note: If the vehicle is conductively charged for over 16 hours, the charge and fault light will blink. Unplug the AC power source to eliminate the problem.*

Possible Cause	Action
Start key is in the ON position	Turn start key to the OFF position
Battery pack switch is in the OFF position	Turn the main battery pack switch to the ON position
Ground Fault Indicator (GFI) switch has been tripped	<b>Disconnect from AC power</b> and reset GFI switch and check for isolation faults
Cables to PCU are loose or disconnected	Disconnect and reconnect all cables to PCU
Indicator is burned out	Refer to Indicator Diagnostic Procedure
Pre-charge fuse blown	Refer to Battery Pack Diagnostic Procedure
Open circuit or blown fuse in main battery pack	Check main fuses in the battery pack and replace if necessary.  Check battery cable and connections
Isolation fault	Refer to Battery Pack Diagnostic Procedure (Voltage leaking from main battery to chassis portion of the procedure)
PCU fault	Run the DOLCOM diagnostics  Replace PCU. (Refer to PCU Removal and Replacement Procedure.)

**Charging Faults (continued)**

**Battery Pack  
 Not Fully Charging**

If charged with 220 volts AC or above, the vehicle may stay in trickle charge mode for a long period of time (10-20 hours). To charge in "normal mode", charge with 110 volts AC.

**12 Volt Auxiliary  
 Battery Loses Its  
 Charge**

If the 12 volt auxiliary battery loses its charge, check the possible causes and solutions below.

Possible Cause	Action
Current drain	Check hood light, dome light, key left on, brake light switch stuck or other accessories powered by the 12 volt auxiliary battery
Cable connection between auxiliary battery and PCU is loose or bad.	Tighten connection at PCU and auxiliary battery or replace cable if necessary.
12 volt auxiliary battery fault	Load test and charge/replace battery if necessary.
DC/DC converter is faulty (ready light will flash)	Refer to the DC/DC Converter Diagnostic Procedure  Replace PCU if necessary.