

Improvements to Comfort Monitor Mode and Diagnostics

A. SUMMARY:

The Comfort Pro APU's DCP and APU software have been updated to allow for the following improvements:

1. Comfort Monitor Mode:
 - a. Cabin temperature set point range is now configurable (vs fixed at one value)
 - b. Fan speed is now configurable to allow both low and high speed
 - c. Minimum engine on time now 10 min (vs 15); Minimum engine off time now 3 min (vs 10)
2. Diagnostics: Fault codes now stored, including date and runtime stamps
3. Heater Disable: A heater disable feature added

B. APPLICABILITY:

This applies to APU's with serial numbers ETD22220943 and higher. Both the DCP and the APU software must be updated at the same time.

C. UPDATING SOFTWARE:

Re-Program the APU:

1. Use APU software: TD-APU-02.02.01.hex
2. Unplug both connectors from the APU controller
3. Remove the blue rubber plug
4. Connect the programmer to the connector behind the blue plug and press red button to start programming. NOTE - TAB ON PROGRAMMING CABLE MUST FACE DOWN. The light should be green while programming & then flash 5 times at the end. If you get a red light, unplug the cable from the programmer and re-try (it is common to have to try a few times).
5. Un-plug the programming cable, re-insert the blue plug and plug back in the two connectors

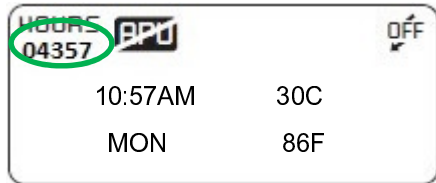


Tabbed part of connector faces down.
UNPLUG TWO CONNECTORS FROM CONTROLLER FIRST

6. Mark the top of the APU controller with the software filename loaded (TD-APU-02.02.01) with a marker or paint pen.

Record APU Hours and Battery Set Voltage on the DCP :

- Record APU hours and the "Calibrate Set Voltage" value



- Record the configuration of all other items. For example, is "Temp Start" and "Max Runtime" etc enabled and what settings do they have. These settings will need to be re-entered after programming the DCP.

Re-Program the DCP :

- Use DCP Software ID: [TD-DCP-02.02.01.hex](#)
- Remove the 4 x Phillips screws from the cover of the DCP
- Connect PIC programmer cable to connector on DCP board & re-program by pressing the red button. The light should be green while programming & then flash 5 times at the end. If you get a red light, unplug the cable from the programmer & re-try (it is common to have to try a few times).

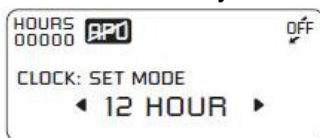


Connect programming cable here. DO NOT unplug the other connectors/cables attached to the DCP.

- Un-plug the programming cable from the DCP and re-install the DCP using the 4 x Phillips screws
- Re-setup the DCP clock, date and APU hours (as recorded before re-programming)

D. Set Clock/Date/APU Hours:

- Press right arrow to choose "12 HRS" & then Menu key to accept



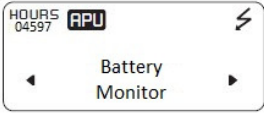



- Confirm time by pressing Menu



- Confirm date by pressing Menu





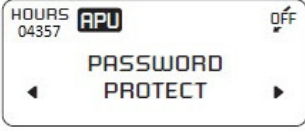


E. Configure Battery Monitor:

<p>1. Go to "BATTERY MONITOR" menu item</p> 	<p>2. Turn "ON" Battery Monitor</p> 	<p>3. Go to "CALIBRATE VOLTAGE" menu item</p> 
<p>4. Set the voltage that was recorded before DCP re-programming (step C7)</p> 		

F. Configure All Other Required Items:

Enable other monitors and set them up as they were before re-programming the DCP.

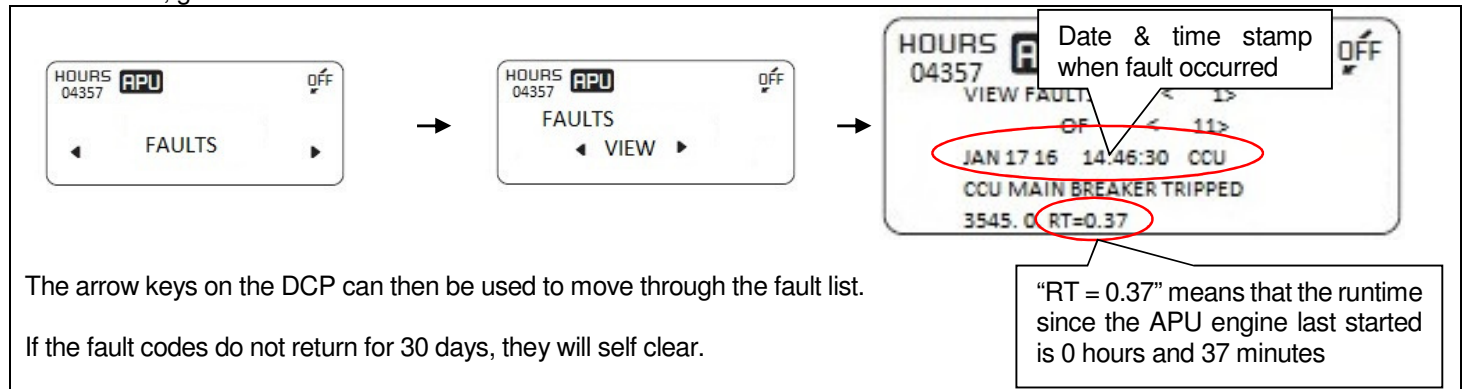
G. Set a Password & Password Protect Appropriate Items:

<p>1. On main menu, choose "SET/CHANGE PASSWORD"</p> 	<p>2. Use the arrow keys to increment each # & menu button to accept. Suggest that the last 3 digits of APU serial # be used as password</p> 	<p>3. On main menu, choose "PASSWORD PROTECT"</p> 
<p>4. Enter password</p> 	<p>5. Choose "YES" for all desired items using the arrow key; use the "menu" button to toggle through the items.</p> 	

H. Diagnostic Improvements:

Fault codes will now be time stamped, including runtime info and stored. There are up to 23 fault codes depending on the APU model.

To view faults, go to the main menu and:

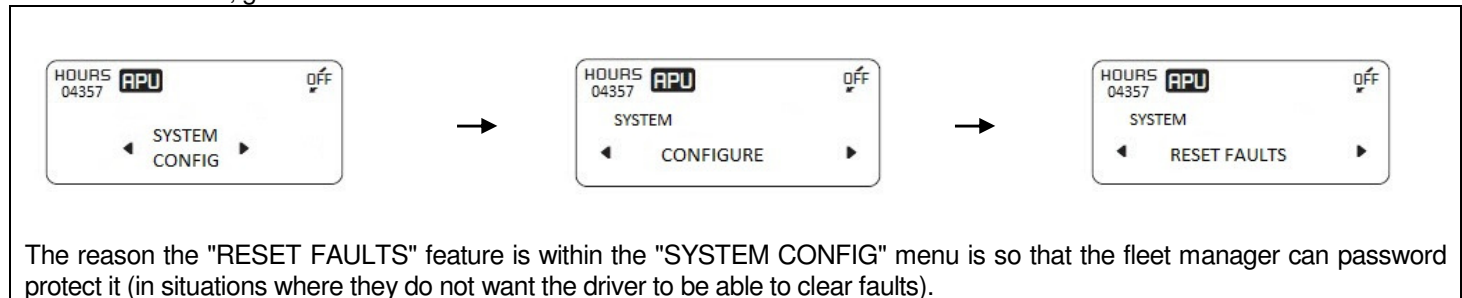


The arrow keys on the DCP can then be used to move through the fault list.

If the fault codes do not return for 30 days, they will self clear.

"RT = 0.37" means that the runtime since the APU engine last started is 0 hours and 37 minutes

To clear fault codes, go to the main menu and:



The reason the "RESET FAULTS" feature is within the "SYSTEM CONFIG" menu is so that the fleet manager can password protect it (in situations where they do not want the driver to be able to clear faults).

The list of fault or warning messages are:

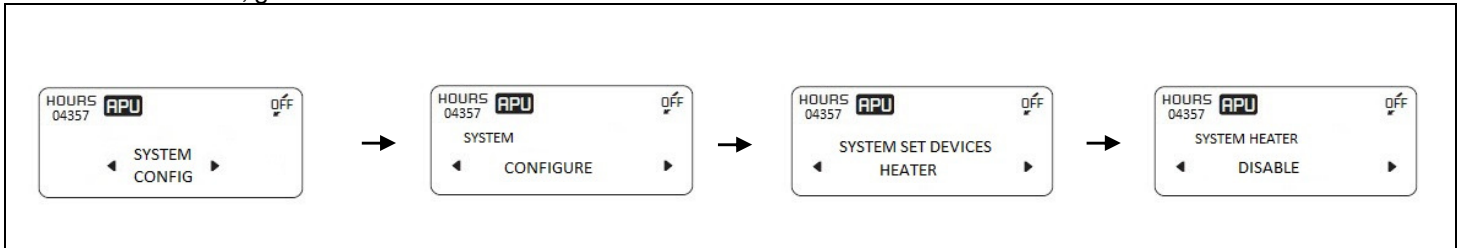
ID	FAULT OR WARNING CODE NAME	CODE #	CATEGORY	COMMENTS
1	CHECK APU	-	Fault message	
2	CRANK LIMIT	-	Fault message	
3	LOW VOLTAGE	-	Fault message	
4	APU LOW OIL PRESSURE	100	Fault code	
5	APU ENGINE OVERHEAT	110	Fault code	
6	APU ALT FEEDBACK FAULT	3353	Fault code	
7	CCU MAIN BRKR TRIPPED	3545	Fault code	
8	CCU HVAC BR1 TRIPPED	3546	Fault code	
9	CCU OUTLET BR2 TRIPPED	5869	Fault code	
10	DPF SERVICE REQUIRED		Fault code	
11	DPF FILTER NEEDS CLEANING		Fault code	
12	EXHST TEMP SENSOR FAILURE		Fault code	
13	EXHST TEMP HIGH		Fault code	
14	DPF LOST		Fault code	
15	MUST CLEAN FLTR		Fault code	
16	PRESS SENSOR OR SNUBBER FAILURE		Fault code	
17	DPF HEATER FAIL		Fault code	
18	DPF FLTR PLUGGED		Fault code	
19	GEN VOLTAGE LOW		Fault code	
20	GEN FREQ FAULT		Fault code	
21	ACKNOWLEDGE ERROR		Fault code	
22	EXCESSIVE TIME BETWEEN REGENS		Fault code	
23	PRESS AND TEMP SENSOR FAILURE		Fault code	

DPF Only

J. Heater Disable Feature:

A heater disable feature has been added for fleets that desire to disable the electric heat. Note that the only case where this disabling is over-road is in "TEMP START" mode where the system will command on the heater in order to load up the APU (in order to then heat up the truck engine via APU generated heat more easily).

To disable the heater, go to the main menu and:



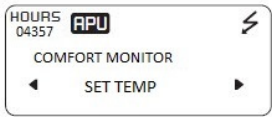
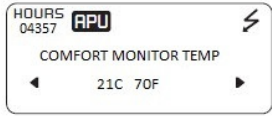
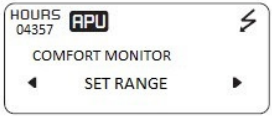
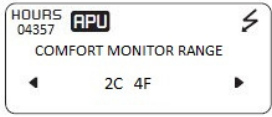
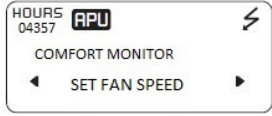
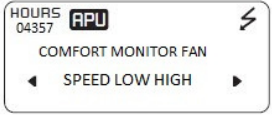







Note that if the heater is disabled and the operator attempts to turn on the heater, they will see the following message appear on the DCP: "HEATER DISABLED BY FLEET MANAGER"


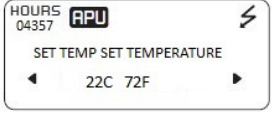

Appendix A: Configure Comfort Monitor and Password Protect:

For those that want to take advantage of the Comfort Monitor strategy (cycles the APU engine off for 3 minutes minimum when set temperature is met to save fuel), the following instructions are provided:

NOTE; STEPS 4, 6, 8 & 10 BELOW ARE SUGGESTED SETTINGS. OTHER SETTINGS ARE POSSIBLE.

<p>1. Go to "COMFORT MONITOR"</p> 	<p>2. Turn "ON" Comfort Monitor</p> 	<p>3. Go to "SET TEMP" sub menu</p> 
<p>4. Set cabin temperature to "21C 70F" as shown below</p> 	<p>5. Go to "SET RANGE" sub menu</p> 	<p>6. Using arrows, choose "2C 4F" as shown below (4 °F)</p> 
<p>7. Go to "SET FAN SPEED" sub menu</p> 	<p>8. Choose "SPEED LOW-HIGH" or "SPEED HIGH" (only high speed).</p> 	<p>9. Go to "SET DURATION" sub menu</p> 
<p>10. Set "COMFORT MONITOR HOURS" to "10.0 HRS".</p> 	<p>11. In main menu, find the new "PASSWORD PROTECT" menu</p> 	<p>12. Enter password</p> 
<p>13. Go to the "COMFORT MONITOR" option & choose yes</p> 		

Comfort Monitor is now configured & the following steps are what the operator will be allowed to use once the APU is turned on:

<p>14. Operator will now have a new "SET TEMP" main menu item</p> 	<p>15. Operator will use this to adjust the temperature above or below the set point as per the range that was set in step 6</p> 	<p>16. Operator uses the "FAN" button to control fan speed (if "SPEED LOW-HIGH" was chosen in step 8, otherwise, always high speed).</p> 
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