Diagnostic Cards
-
Federal Pioneer Reactive

Version 0 **Rev.0**

December 17, 2009

Cette version est une version préliminaire et temporaire pour **diffusion très limitée**.
Cette version fait référence au logiciel DIAC dont le développement est arrêté par Hydro-Québec.

Le logiciel OpenZen - Zensol (issu de nos logiciels existants CbaWin, GenWin, CbvWin, etc., copyright 1992 à 2009) remplacera DIAC totalement à court terme.

Il sera donc nécessaire de réviser et de corriger cette version, en supprimant notamment toutes les références à DIAC et en les remplaçant par les références équivalentes à OpenZen.

Merci de me contacter directement pour tout commentaire (bon ou mauvais), toute nouvelle idée, ainsi que toute suggestion d'amélioration de ce document ou du logiciel OpenZen et ces documents associés, dans le but ultime de l'obtention d'un logiciel et d'une documentation claire et pratique pour vous et tous nos utilisateurs. Tous vos retours d'information seront très appréciées.
Vous remerciant par avance pour votre collaboration,

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This version is a draft and temporary version for **limited distribution ONLY**.
This version refers to DIAC software whose development by Hydro-Québec is stopped.

The OpenZen – Zensol software (based on our existing softwares CbaWin, GenWin, CbvWin, etc., copyright 1992-2009) will completely replace DIAC in the short term.

This version needs to be reviewed and corrected by Tap-Changer specialists. Among other things, all references to DIAC software will be replaced by their equivalents in the OpenZen Software.

Text in red requires special attention and will be corrected.
If you want the original version of this text, please download the French document.

Please do not hesitate to contact me directly for any comment (good or bad), any new idea, or any suggestion regarding the improvement of this document or the improvement of the OpenZen software and any of its related documents, in order to ultimately obtain clear and useful documentations for you and all of our users. All of your feedbacks will be appreciated.

Thank you for your cooperation.

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The following pages consist of diagnostic cards for tap changers (OLTP) of the Federal Pioneer Reactive family. They summarize the main operational problems specific to this family of tap changers.

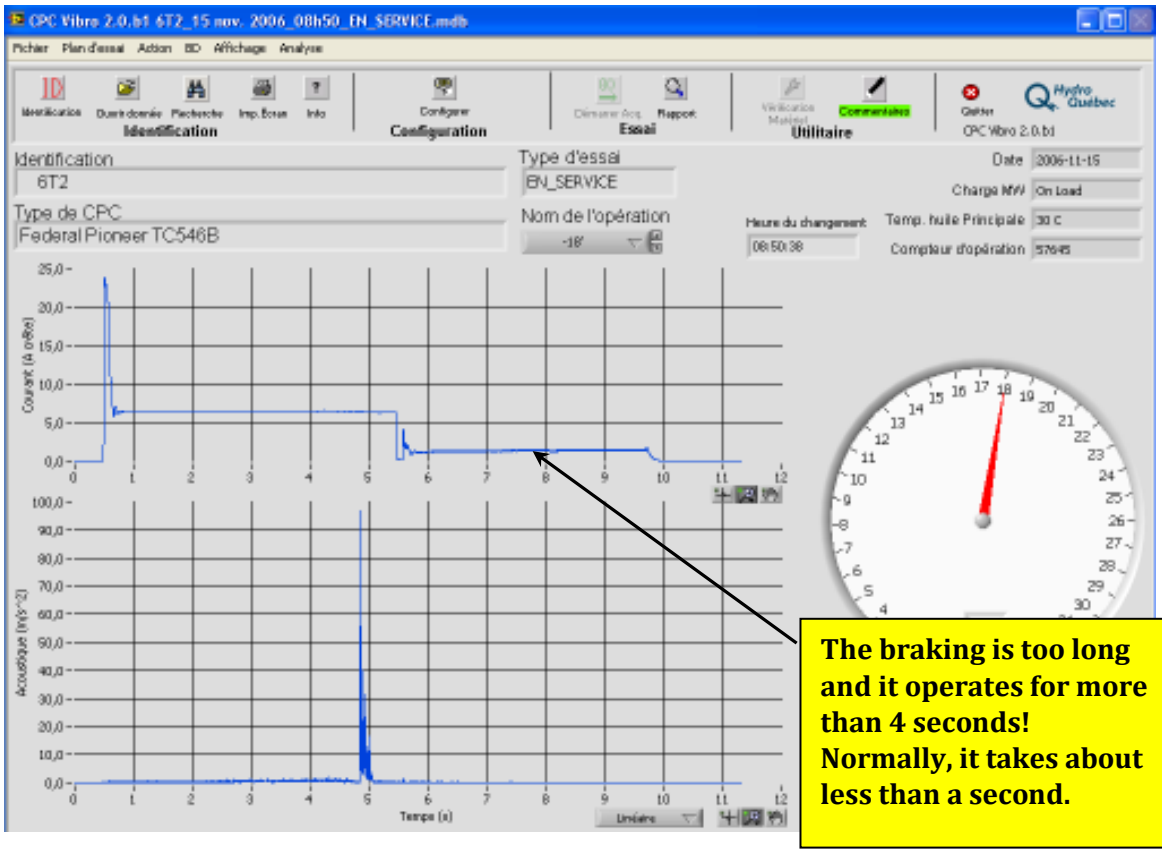
Each table defines an anomaly that can be detected using vibro-acoustic methods developed thru DIAC software. The cards are prepared for visual analysis of the traces to provide a more thorough diagnostic. They are complementary tools to the report available in DIAC. Each card shows the anomaly as seen on the measured trace, the malfunction of the OLTP associated with this trace, and the necessary adjustment for its repair. A graphical representation of the anomaly as it appears on the trace acquired is also shown.

Table of Contents

Anomalies as seen on the acoustic traces classified by the number of the card:

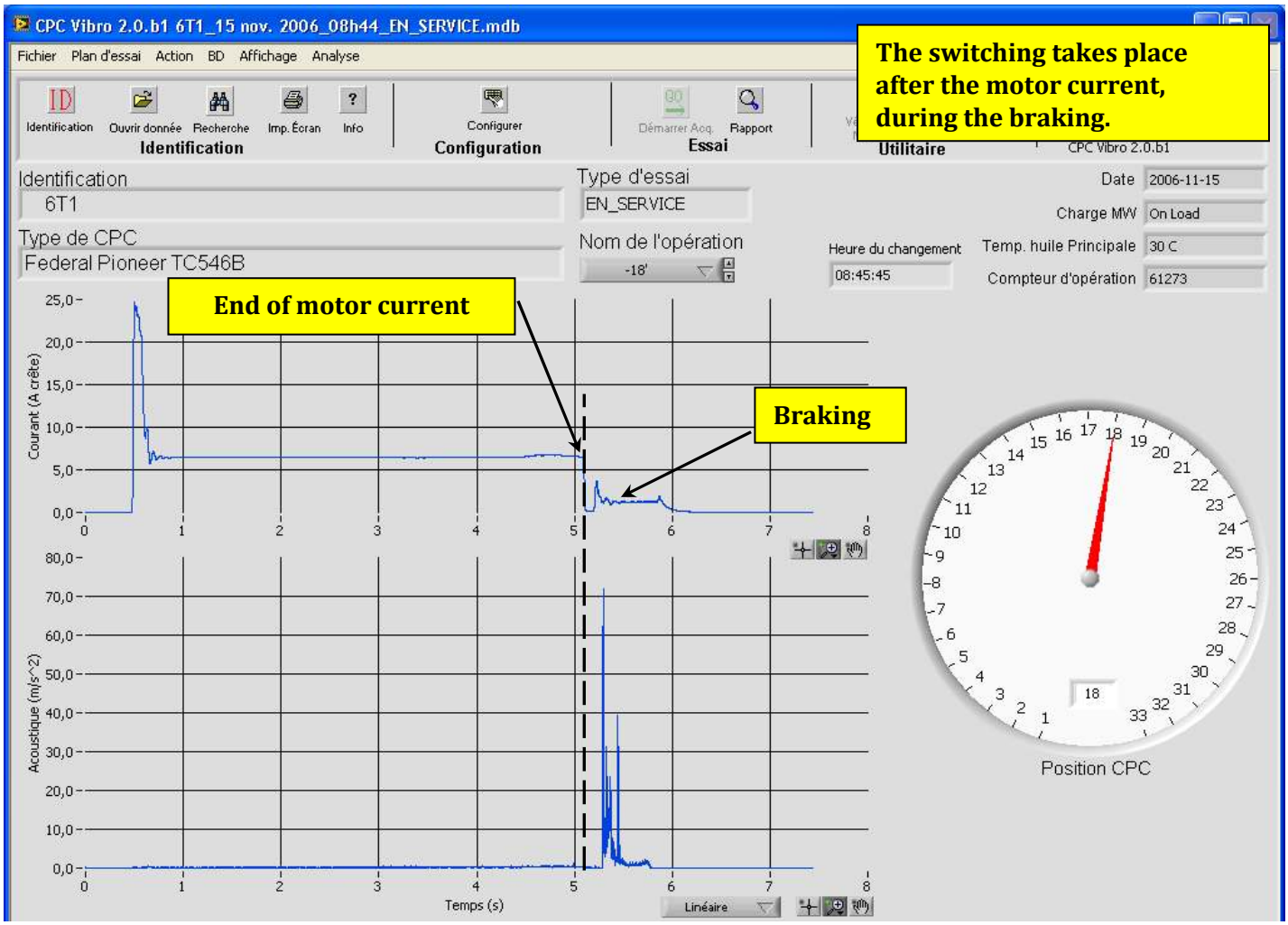
Card #1: The trace of the current contains an extended braking

Anomalies seen on the trace	Problem	Adjustment needed
The trace of the current contains an extended braking.	Dynamic brake is applied for an abnormally long time.	Adjust and repair the braking system.



Card #2: The switching occurs too early/late.

Anomalies seen on the trace	Problem	Adjustment needed
The switching occurs too early/late. It happens after the end of the motor current during the braking or much too early in the operation.	Desynchronization of the switching with the braking.	Synchronize the switching.



Card #3: Significant fluctuations on the trace of the motor current.

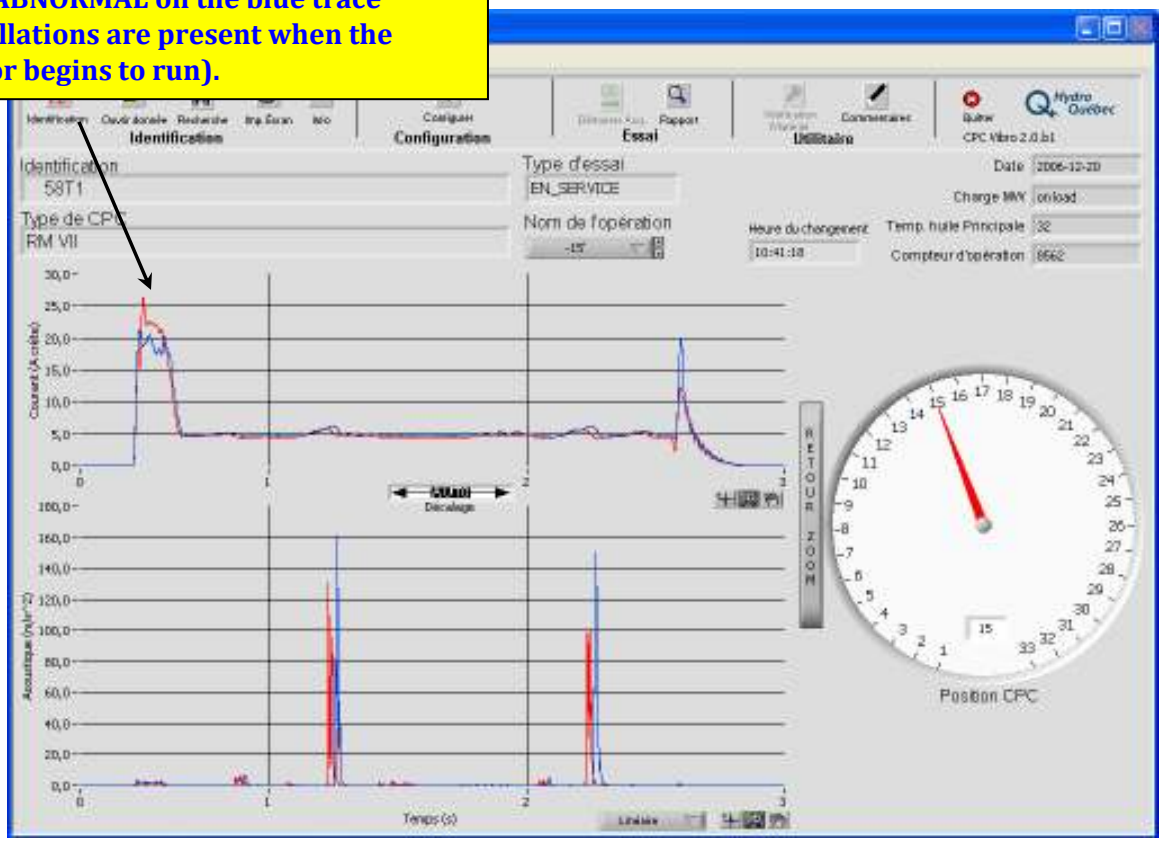
Anomalies seen on the trace	Problem	Adjustment needed
Fluctuations such as oscillations appear on the trace of the motor current during the operation of the switch, selector or inverter.	A lubrication problem of the drive mechanism.	Lubricate the drive mechanism. **(CRITERIA???)**

The red trace, lubricated mechanism, shows a further stress of the motor during the switching operation. The blue trace shows the same stress with oscillations pointing to a lack of lubrication.

Card #4: The trace of the inrush contains oscillations.

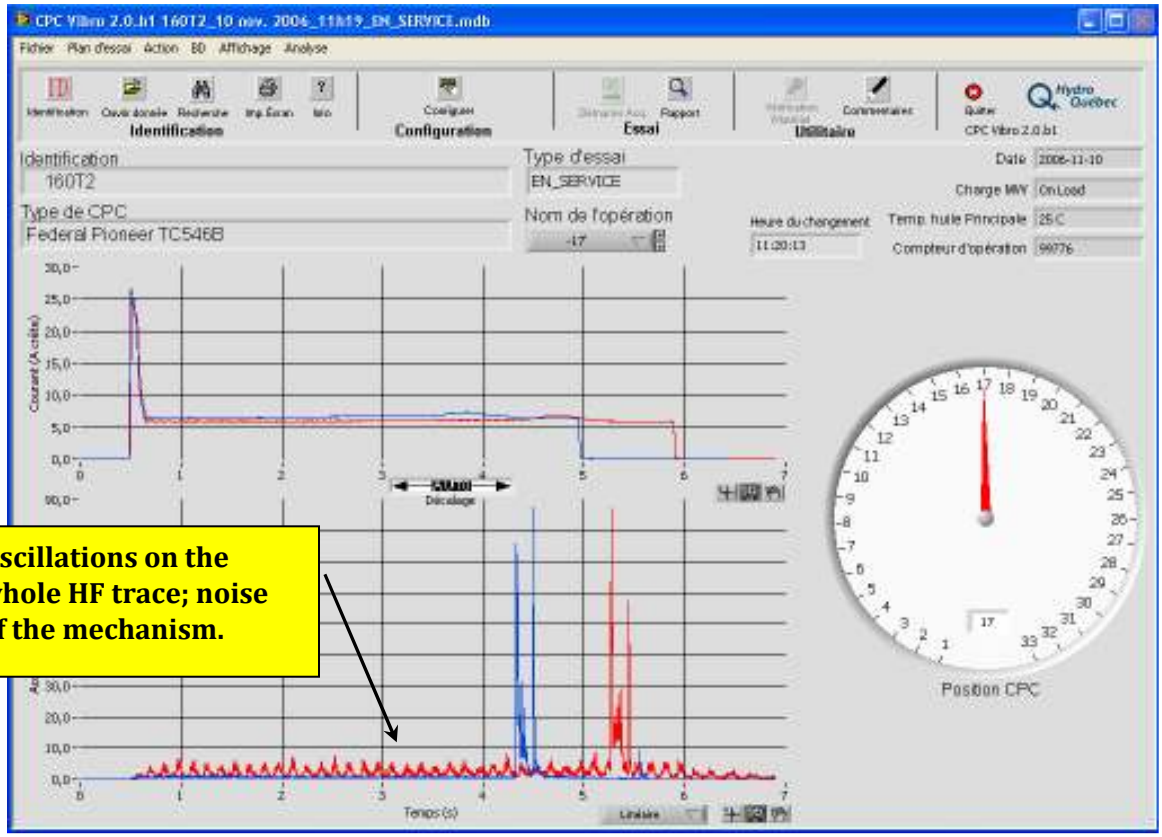
Anomalies seen on the trace	Problem	Adjustment needed
The inrush trace is present on abnormal oscillations, while the normal inrush trace is generally smooth and stable.	These oscillations can be caused by a problem with the contactor that starts the motor or with the motor itself.	Readjust the contactor or replace the motor if it is defective. **(CRITERIA???)**

The inrush is NORMAL on the red trace and ABNORMAL on the blue trace (oscillations are present when the motor begins to run).



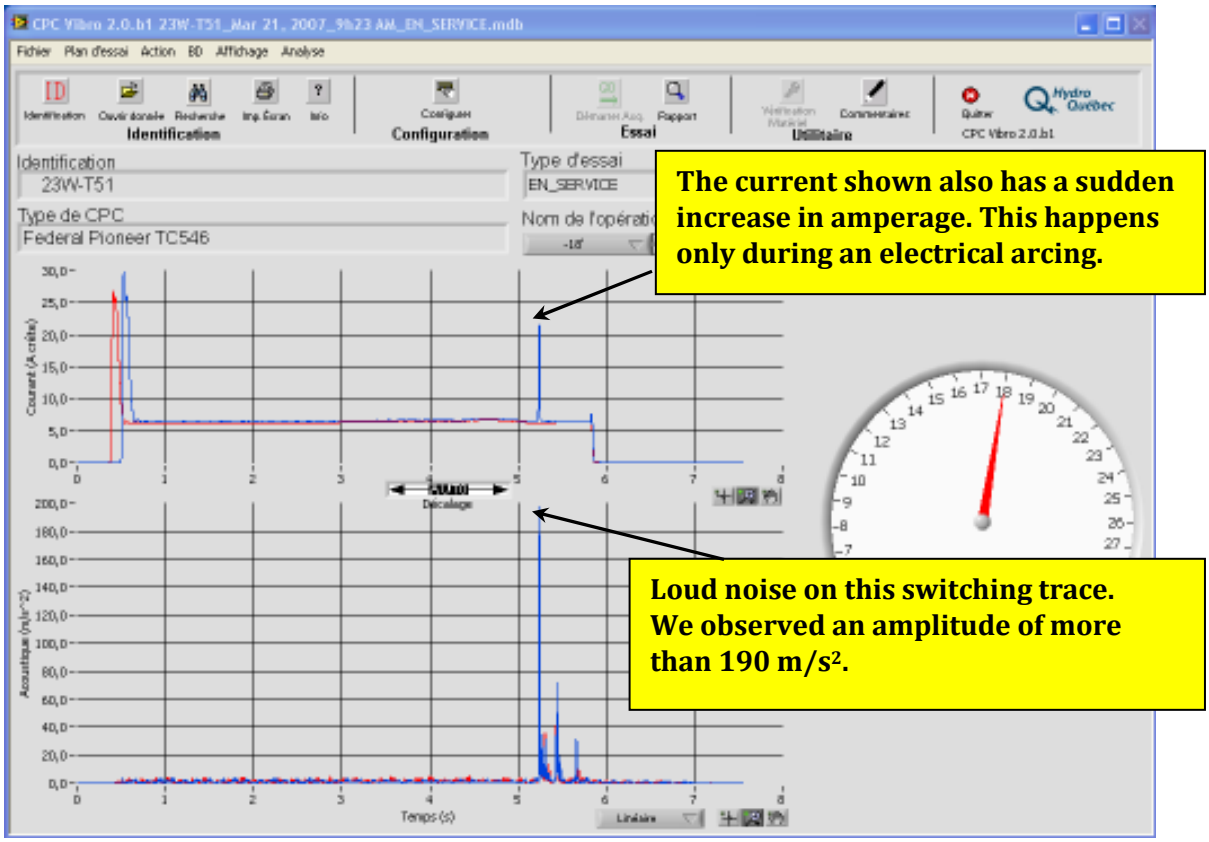
Card #5: Noise of the mechanism during its operation;
oscillations present throughout the HF trace.

Anomalies seen on the trace	Problem	Adjustment needed
Noise of the mechanism during its operation; the oscillations are present throughout all the trace of HF.	A lack of lubrication of the drive mechanism or an advanced wear of the drive mechanism is present.	Correct the situation by lubricating or replacing worn parts or observe the OLTP periodically to monitor the problem at hand.



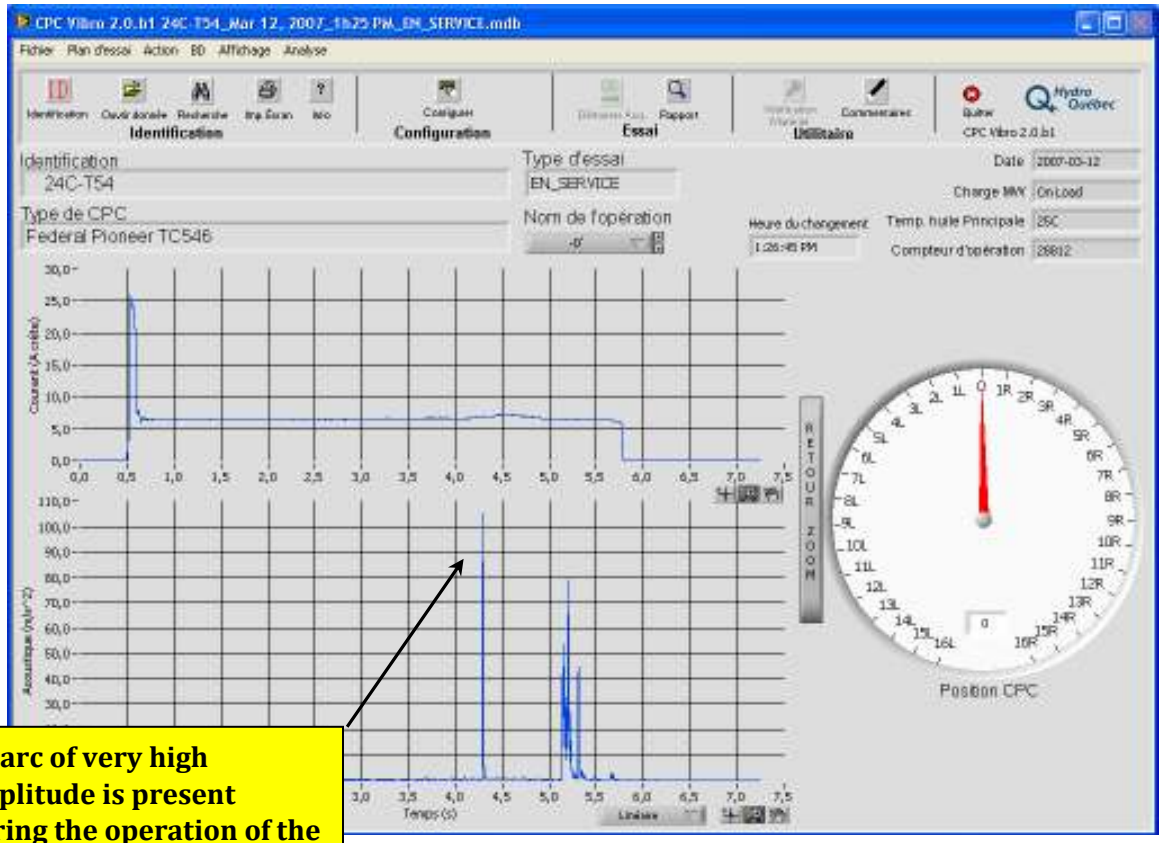
Card #6: Noise of very high amplitude during the switching operation.

Anomalies seen on the trace	Problem	Adjustment needed
The switching shows a noise with very high amplitude compared to normal switching, and compared with other noises on the same switching.	This may be due to a problem of the transition of the spring, a problem with the switch mechanism or another cause.	Identify the cause of the problem and repair, by readjustment of the mechanism, changing the much worn parts or the springs.



Card #7: Noise of very high amplitude during the operation of the inverter.

Anomalies seen on the trace	Problem	Adjustment needed
A noise of very high amplitude during the operation of the inverter.	This defines an arc of very high amplitude present during the operation of the inverter. This may be due to too much carbon in the oil, or to a problem with the limiting voltage device, or other sources.	Identify the cause of the problem and repair, change or filter the oil, etc.



An arc of very high amplitude is present during the operation of the inverter.