



**ALL-TEST Pro  
Case Study 2004-002**



**ALL-TEST PRO™ OL**

**Motor Current Signature Analysis on Gearbox Motor**

Introduction

Noise and vibration was investigated on a 7.5 horsepower, 1750 RPM, 575 Vac motor and gearbox using the ALL-TEST PRO™ OL (ATPOL) motor current signature analyzer. One set of data requiring less than one minute of data provided the information necessary. The number of rotor bars, stator slots, bearing information and gears was not available. The lack of information did not hinder the ATPOL in immediately identifying the faults.

Discussion

Although lightly loaded, the ATPOL automatically identified casting voids (Figure 1), an electrical fault in the stator (Figure 2), gear problems and identified the number of rotor bars (48) and stator slots (36).

Figure 1: Casting Void Signature

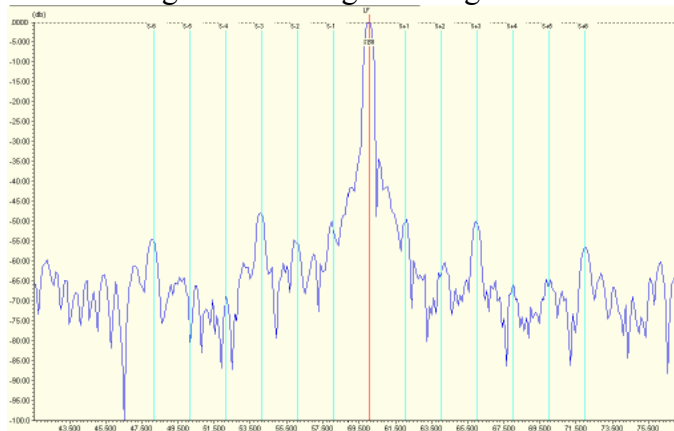


Figure 3 shows the automatic analysis display shown in the ATPOL software.

Figure 2: High Frequency Signature



Figure 3: Auto-Analysis Form and Report Page

Calculations				
Time	Freq.	Bearings	Phasors	Results
Power factor				PF is below 0.85
Current				OK
Voltage				Dev. too much from name plate
Load				OK [Ld:34.2%]
Vlt-GND ref. NDT neutral				OK
Connection				OK
Rotor				RB health is questionable [C:7]
Stator				Elec. Mech.
Air gap				OK
Harmonic distortion				OK
Misalignment				OK
Bearing				OK
Bottom line				Abnormal indications

**ALL TEST PRO OL 3.1 Analysis Results**  
**PERFORMANCE SUMMARY**  
**Rotor**  **OK**  
 The rotor is operating normally, no action is required.  
 The rotor health is questionable, immediate corrective action is required.  
 The rotor health is questionable, immediate corrective action is required.

**Power Factor**  **OK**  
 Power factor is within normal limits.  
 Power factor is below 0.85, immediate corrective action is required.

**Current**  **OK**  
 Current variation is beyond normal limits, immediate corrective action is required.

**Voltage**  **OK**  
 Voltage variation is beyond normal limits, immediate corrective action is required.

**Load**  **OK**  
 Load on the motor is acceptable, no action is required.  
 Load on the motor is unacceptable, immediate corrective action is required.

**Phase Connection**  **OK**  
 Phase connection is correct.  
 Phase connection is incorrect, immediate corrective action is required.

**Air Gap**  **OK**  
 Air gap is within normal limits.  
 Air gap is unacceptable, immediate corrective action is required.

**Harmonic Distortion**  **OK**  
 Harmonic distortion is within normal limits.  
 Harmonic distortion is unacceptable, immediate corrective action is required.

**Misalignment**  **OK**  
 Misalignment is within normal limits.  
 Misalignment is unacceptable, immediate corrective action is required.

**Bearing**  **OK**  
 Bearing health is within normal limits.  
 Bearing health is questionable, immediate corrective action is required.

**Bottom Line**  **OK**  
 There are no indications of abnormal conditions.  
 There are indications of abnormal conditions, immediate corrective action is required.

ALL-TEST PRO™ MD Kit

The ALL-TEST PRO™ MD kit consists of:

- ALL-TEST PRO™ OL motor current signature analyzer
- ALL-TEST PRO™ 31 and ALL-TEST IV PRO™ 2000 motor circuit analyzers
- EMCAT motor management software
- ATPOL and Power System Manager software modules for EMCAT