

Machinery Faults Diagnosed By ExpertALERT™

CLOSE COUPLED MACHINES

Imbalance
Motor Imbalance
Pump Imbalance
Fan Imbalance
Foundation Flexibility
Motor Cooling Fan Problem
Internal Misalignment
Compressor Imbalance
Ball Bearing Wear
Generator Imbalance
Looseness
Journal Bearing Oil Whirl
Line Phase Voltage Imbalance
Motor Stator Lamination Looseness
Motor Air Gap Problem
Pump Impeller Wear
Fan Air Flow Problem
Pump Internal Wear
Pump Cavitation or Air Ingestion
Fan Dirt Buildup or Blading Clearance Problem
Thrust Bearing Problem or Fan Wheel Wobble
Thrust Bearing Problem or Cocked Pump Impeller
Foundation Weakness or Resonance
Ball Bearing Noise
Oil Pump Drive Gear Mesh Problem or Wear
Oil Pump Shafting Problem
Oil Pump Internal Wear or Flow Problem
Turbine Blading or Rotor Clearance Problem
Radial Bearing Wear
Idle Shaft Looseness
Free End Ball Bearing Wear
Drive End Ball Bearing Wear
Drive End Looseness
Free End looseness
Compressor Internal Wear
Journal Bearing Clearance Problem (Trapped Fluid)
Motor Free End Bearing Noise
Motor Drive End Bearing Noise
Drive End Journal Wear
Free End Journal Wear
Thrust Bearing Wear
Turbine Imbalance

TURBINES

Turbine Imbalance
Turbine Wheel Runout and Imbalance
Turbine Imbalance or Rotor Problem
Turbine Journal Bearing Wear
Turbine and/or Driven Component Imbalance
Indication of Possible Warped Turbine Shaft
Turbine Journal Bearing Looseness
Turbine Ball Bearing Wear
Turbine Ball Bearing Looseness
Turbine Driven End Journal Wear
Turbine Free End Bearing Looseness
Turbine Driven End Bearing Looseness
Turbine Free End Journal Bearing Oil Whirl
Turbine Oil Pump Drive Gear Mesh Problem or Wear
Turbine Driven End Journal Bearing Oil Whirl
Turbine Rotor Clearance Problem or Nozzle Erosion
Attached Lube Oil Pump Drive Gear Mesh Problem or Wear
Oil Pump Drive Pinion Problem
Oil Pump Driven Gear Problem
Oil Pump Internal Wear
Oil Pump Flow Problem
Oil Pump Shafting Problem
Structural Resonance
Turbine Blading Damage or Rotor Clearance Problem
Turbine Thrust Bearing Problem
Free End Journal Bearing Wear
Coupling End Journal Bearing Wear
Turbine Thrust Bearing Wear
Turbine Journal Bearing Oil Whirl
Unspecified Turbine Problem

MOTORS

Motor and/or Driven Component Imbalance
Motor Imbalance
Motor Mounting Flexibility
Foundation Flexibility
Motor Cooling Fan Blade Damage
Motor Bearing Wear
Motor Thrust Bearing Wear
Motor Bearing Looseness
Motor Thrust Bearing Looseness
Motor Bearing Misalignment

Motor Lamination Looseness
Motor Free End Bearing Wear
Motor Drive End Bearing Wear
Motor Free End Bearing Looseness
Line Phase Voltage Imbalance
Motor Air Gap Problem
Motor Journal Bearing Wear
Motor Bearing Noise
Motor Free End Bearing Noise
Motor Drive End Bearing Noise
Motor Free End Journal Wear
Motor Drive End Journal Wear
Foundation Vibration
Motor Foundation Resonance or Mounting Looseness
Motor Shaft Attached Oil Pump Internal Wear
Motor Bearing Fit Problem
Indication of Bent Motor Shaft

GEAR BOXES

Main Gear Mesh Problem or Wear
First Gear Mesh Problem or Wear
Second Gear Mesh Problem or Wear
Gearbox Oil Pump Gear Mesh Problem or Wear
Gearbox Oil Pump Internal Wear
Gearbox Noise
Accessory Drive Gear Mesh Problem or Wear
Accessory Drive Shafting Problem
High Speed Pinion Problem
Oil Pump Drive Pinion Problem
Oil Pump Driven Gear Problem
High Speed Driven Gear Problem
Low Speed Driven Gear Problem
Gearbox Input Shaft Ball Bearing Looseness or Pinion Problem
Gearbox Input Shaft Pinion Problem or Journal Bearing Wear
Intermediate Shaft Ball Bearing Wear
Intermediate Shaft Ball Bearing Looseness
Intermediate Shaft Journal Bearing Wear
Intermediate Shaft Thrust Bearing Wear
Gearbox Output Shaft Ball Bearing Wear
Gearbox Output Shaft Journal Bearing Wear

Gearbox Output Shaft Bearing Looseness
or Gear Damage
Unspecified Gearbox Problem
Gearbox Oil Pump Shaft Problem
Low Speed Pinion Problem
Idle Shaft Problem
Gearbox Ball Bearing Wear

ADDITIONAL DIAGNOSES FOR >2 SPEED CHANGES

Gear Mesh #1 Problem
Gear Mesh #2 Problem
Gear Mesh #3 Problem
Gear Mesh #4 Problem
Gear Mesh #5 Problem
Gear Mesh #6 Problem
Intermediate Shaft #1 Looseness
Intermediate Shaft #2 Looseness
Intermediate Shaft #3 Looseness
Intermediate Shaft #4 Looseness
Intermediate Shaft #5 Looseness

Note: Gear mesh problem faults

Indicate that a gear mesh, wear, pinion, driven gear - sidebands and/or harmonics are present. When any of the above faults are detected the report will specify applicable amplitude deviation, data source, and frequency for analyst review.

BELTS AND CHAINS

Drive Belt Irregularity
Drive Chain Irregularity
Drive Sheave Axial Runout or Wobble
Drive Sprocket Runout
Drive Sprocket Tooth Wear
Driven Sheave Axial Runout or Wobble
Driven Sprocket Runout
Indication of Possible Belt Slippage or Different Speed Ratio
Driven Sheave Radial Runout
Drive Sheave Radial Runout

CENTRIFUGAL PUMPS (INCLUDING AXIAL FLOW PROPELLER PUMPS)

Pump Imbalance
Pump Mounting Flexibility
Pump Propeller Imbalance
Pump Ball Bearing Wear
Pump Thrust Ball Bearing Wear
Pump Internal Looseness
Pump Bearing or Rotor Misalignment
Pump Cavitation or Air Ingestion

Indication of Pump Bearing Housing Looseness
Pump Journal Bearing Wear
Pump Impeller Wear
Pump Thrust Bearing Problem
Pump Impeller Wear or Rotor Clearance Problem
Pump Propeller Erosion or Clearance Problem
Pump Journal Bearing Problem
Indication of Pump Impeller Looseness
Indication of Possible Pump Mounting Looseness
Pump Free End Bearing Wear
Pump Drive End Bearing Wear
Pump Free End Bearing Looseness
Pump Drive End Bearing Looseness

ROTARY THREAD/GEAR PUMPS

Pump Ball Bearing Wear
Pump Journal Wear
Indication of Possible Pump Rotor Wear
Pump Rotor Looseness
Pump Timing Gear Wear
Pump Free End Bearing Wear
Pump Free End Journal Wear
Pump Drive End Bearing Wear
Pump Drive End Journal Wear
Pump Idle Shaft Problem
Pump Internal Wear and Thrust Bearing Problem
Unspecified Pump End Problem

SLIDING VANE PUMPS

Pump Imbalance
Pump Bearing Wear
Pump Internal Looseness
Pump Vane Wear
Pump Air Ingestion or Flow Problem
Unspecified Pump End Problem
Pump Journal Bearing Wear
Pump Free End Bearing Wear
Pump Drive End Bearing Wear

RECIPROCATING PUMPS

Pump Bearing Wear
Pump Internal Looseness
Pump Rotating Assembly Wear
Internal Valve Plate Wear or Flow Restriction
Replenishing Oil Pump Internal Wear
Unspecified Pump Internal Problem
Attached Oil Pump Drive Gear Mesh Problem or Wear

FANS

Fan Imbalance
Fan Bearing Wear
Fan Bearing Looseness
Fan Bearing or Fan Wheel Misalignment
Fan Air Flow Disturbance
Fan Dirt Buildup or Blading Clearance Problem
Fan Journal Bearing Wear
Fan Journal Bearing Looseness
Fan Air Flow Separation
Fan Free End Bearing Wear
Fan Drive End Bearing Wear
Fan Free End Bearing Looseness
Fan Drive End Bearing Looseness
Fan Blading Problem
Fan Journal Bearing Oil Whirl

CENTRIFUGAL COMPRESSORS

Compressor Impeller Wear or Clearance Problem
Compressor Journal Bearing Wear
Compressor First Stage Bearing Wear
Compressor Second Stage Bearing Wear
Compressor Third Stage Bearing Wear
Compressor Fourth Stage Bearing Wear
Compressor Journal Bearing Looseness
Compressor Imbalance
Compressor Flow Disturbance
Compressor Guide Vane Problem
Compressor First Stage Imbalance or Bearing Problem
Compressor Second Stage Imbalance or Bearing Problem
Compressor Third Stage Imbalance or Bearing Problem
Compressor Fourth Stage Imbalance or Bearing Problem
Main Compressor Shaft Journal Bearing Oil Whirl
Compressor First Stage Journal Bearing Oil Whirl
Compressor Second Stage Journal Bearing Oil Whirl
Compressor Third Stage Journal Bearing Oil Whirl
Compressor Fourth Stage Journal Bearing Oil Whirl
Compressor Shaft Ball Bearing Wear
Compressor First Stage Impeller Problem
Compressor Second Stage Impeller Problem

Compressor Third Stage Impeller Problem

Compressor Fourth Stage Impeller Problem

Compressor Drive Gear Mesh Problem or Wear

PISTON COMPRESSORS

Compressor Oil Pump Problem
Compressor Imbalance
Compressor Piston Problem or Internal Wear
Compressor Bearing Looseness
Compressor Crankshaft Ball Bearing Wear
Compressor Crankshaft Journal Bearing Wear
Compressor Oil Pump Gear Mesh Problem
Compressor Oil Pump Shaft Looseness
Compressor Fan Blading Problem
Unspecified Compressor End Problem

GENERATORS

Generator Imbalance
Generator Journal Bearing Wear
Generator Ball Bearing Wear
Generator Free End Journal Wear
Generator Drive End Journal Wear
Generator Free End Bearing Looseness
Generator Drive End Bearing Looseness
Generator Free End Bearing Misalignment
Exciter Imbalance
Generator Ball Bearing Looseness
Bent or Warped Generator Shaft
Generator Journal Bearing Looseness
Generator Commutator or Stator Problem
Generator Thrust Bearing Wear
Exciter Bearing Wear or Clearance Problem

PURIFIERS

Modulation of Motor and Bowl Rotational Rate Vibration
Purifier Low Speed Shaft Misalignment
Purifier Low Speed Bearing Looseness
Clutch Imbalance
Clutch Misalignment
Clutch Problem
Purifier Bowl Imbalance
Purifier Spindle Bearing Looseness
Purifier Spindle Bearing Wear
Purifier Low Speed Bearing Wear
Purifier Bowl Drive Gear Mesh Problem
Purifier Bowl Drive Pinion Problem
Purifier Bowl Driven Gear Problem

Purifier Oil Pump Gear Mesh Problem or Wear
Purifier Oil Pump Drive Pinion Problem
Purifier Oil Pump Driven Gear Problem
Purifier Oil Pump Shaft Bearing Wear
Purifier Oil Pump Internal Wear or Flow Problem
Indication of Clutch Slippage or Non-standard Gear Ratio

COUPLINGS AND ALIGNMENT

Parallel Misalignment
Motor to Gearbox Parallel Misalignment
Gearbox to Compressor Parallel Misalignment
Coupling Wear
Turbine to Gearbox Parallel Misalignment
Gearbox to Generator Parallel Misalignment
Gearbox to Pump Parallel Misalignment
Angular Misalignment
Motor to Gearbox Angular Misalignment
Gearbox to Pump Angular Misalignment
Gearbox to Compressor Angular Misalignment
Turbine to Gearbox Angular Misalignment
Gearbox to Generator Angular Misalignment
High Speed Shaft Coupling Wear
Motor to Gearbox Coupling Wear
Low Speed Shaft Coupling Wear
Indication of Possible Engine Shaft Misalignment
Gearbox to Spindle Parallel Misalignment
Gearbox to Spindle Angular Misalignment

TWO STAGE STEAM TURBINE REDUCTION GEARS

Low Speed Gear Mesh Problem or Wear, HP Side
HP High Speed Gear Mesh Problem or Wear
LP High Speed Gear Mesh Problem or Wear
HP Side Low Speed Gear Input Pinion Problem
LP Side Low Speed Gear Input Pinion Problem
HP High Speed Pinion Problem
LP High Speed Pinion Problem

HP High Speed Driven Gear Problem
LP High Speed Driven Gear Problem
Indication of Possible LP High Speed Bearing Wear
Indication of Possible HP High Speed Bearing Wear
Unspecified Gearbox Shafting Problem
Low Speed Gear Mesh Problem or Wear, LP Side
Intermediate Shafting Problem

DIESEL ENGINE REDUCTION GEARS

Reduction Gear Mesh Problem or Wear
Auxiliary Gear Mesh Problem or Wear
Hydraulic Oil Pump Shafting Looseness
Accessory Drive Shafting Looseness
PTO Generator Shafting Looseness
Gearbox Input Shaft Pinion Problem or Journal Wear
Gearbox Input Shaft Ball Bearing Looseness or Pinion Problem
Reversing Gear Mesh Problem or Wear
Diesel Engine Excitation
Unspecified Gear Problem
Hydraulic Oil Pump Wear or Flow Problem
Gearbox Input Shaft Misalignment and Pinion Problem
PTO Driven Gear Problem
Tachometer Driven Gear Problem
Hydraulic Oil Pump Driven Gear Problem
Gearbox Output Shaft Journal Wear
Low Speed Thrust Bearing Wear
Low Speed Shaft Bearing Looseness
Low Speed Shaft Ball Bearing Wear
Ball Bearing Wear
Gearbox Noise
Accessory Drive Pinion Problem
Main Low Speed Gear Problem
Main High Speed Pinion Problem
PTO Drive Pinion Problem
Clutch Wear

SCREW COMPRESSORS

Compressor Drive Shaft Bearing Looseness
Compressor Idler Assembly Looseness
Compressor Rotor and/or Idler Wear Interference

Indication of Compressor Foundation
Looseness
Compressor Internal Problem
Compressor Ball Bearing Wear

Timing Gear Wear of Mesh Problem
High Pressure Compressor Looseness
High Pressure Compressor Idler
Assembler Problem

High Pressure Compressor Rotor Wear
High Pressure Compressor Internal
Problem

High Pressure Compressor Timing Gear
Wear
Low Pressure Compressor Looseness
Low Pressure Compressor Idler
Assembly Problem
Low Pressure Compressor Rotor Wear
Low Pressure Compressor Internal
Problem
Low Pressure Compressor Timing Gear
Wear

Camshaft Problem
Indication of Possible Drive End Bearing
Wear
Attached Oil Pump Internal Wear or Flow
Problem

Spindle Drive End Bearing Wear
Spindle Driven End Bearing Wear
Spindle Drive End Looseness
Spindle Driven End Looseness

DIESEL ENGINES

Diesel Noise
Indication of Misfire
Diesel Engine Crankshaft Imbalance
Accessory Drive Gear Problem
Timing Gear Problem
Oil Pump Drive Gear Problem
Water Pump Drive Gear Problem
Camshaft Drive Gear Problem
Diesel Cooling Fan Blade Damage
Indication of Possible Diesel Free End
Bearing Wear
Indication of Possible Diesel Thrust
Bearing Wear
Unspecified Diesel Engine Problem
Indication of Engine Overload or Injector
Timing Problem

LOBED BLOWER

Blower Rotor Imbalance
Timing Gear Wear
Blower Lobe Wear
Blower Internal Looseness
Blower Journal Bearing Wear
Idler Shaft Looseness
Blower Shaft Ball Bearing Wear
Blower Free End Journal Wear
Blower Drive End Journal Wear
Blower Free End Ball Bearing Wear
Blower Drive End Ball Bearing Wear
Unspecified Blower Problem

SPINDLES

Spindle Imbalance
Spindle Bearing Wear
Spindle Bearing Looseness
Spindle Bearing or Shaft Misalignment
Spindle Bearing Misalignment or Shaft
Runout
Bearing Misalignment or Shaft Runout

TURBOCHARGERS

Excessive Overall Vibration
Turbocharger Rotor Imbalance
Unspecified Turbocharger Vibration
Turbine Blading or Rotor Clearance
Problem
Turbocharger Compressor Vane Problem
Indication of Possible Turbine Journal
Wear
Indication of Possible Compressor
Journal Wear
Unspecified Turbocharger Problem

VACUUM PUMPS

Pump Rotor Imbalance
Timing Gear Wear
Pump Lobe Wear
Pump Internal Looseness
Pump Journal Wear
Idler Shaft Looseness
Pump Shaft Ball Bearing Looseness
Unspecified Pump Problem

Subject to change without notice.

Machinery faults are continuously added to ExpertAlert and are included in updates to all users in warranty or with an extended warranty. Fault names listed may have several rules or rule combinations to arrive at each specific fault. The number of rules in ExpertAlert is greater than those faults listed.

Call DLI Engineering for the latest listing. Phone: 206-842-7656 / 1-800-654-2844; Email: support@dlengineering.com

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