EDDY CURRENT DYNAMOMETER CARE & PREVENTIVE MAINTENANCE TIPS*

Dyne Systems, Inc.

Service life of a dynamometer and the quality of test results depend on routine maintenance received during its lifetime. Inadequate maintenance increases the probability of sudden and catastrophic failures. Routine maintenance is the best assurance of a trouble free, long life operation.

Many factors affect service life. This list cannot cover all contingencies but may assist experienced maintenance personnel in maintaining the dynamometer in foreseen conditions.

* Refer any questions to your EC dynamometer manufacturer or DSI Service Department at 800-657-0726.

CHECK LIST:

A check list provides proof of work completed and serves as a necessary reference. Each installation requires a unique basic check list that incorporates all equipment involved. The maintenance supervisor should prepare the check list that includes all maintenance check points pertaining to the equipment. Listed here are suggested items to be included on such a list:

1. Complete nameplate information for each unit
2. List of drawings, such as Outline Dimensions, Assembly, and Connections
3. Speed Ranges, including minimum and maximum speeds at rated power
4. Load Ranges, including minimum and maximum power ratings
5. Electrical Service including voltage and current
6. Coil Ratings including voltage, current, and cold resistance
7. Water Service including normal drain temperature, GPM required, and pressure
8. Lubrication Service, including type of grease, type of oil, viscosity
9. Air Service including type and pressure
10. Safety Settings including low water pressure, high water temperature, low oil pressure
11. Alignment Data, including angular and parallel maximum limits
12. Vibration including normal readings
13. Service Record including date or maintenance cycle when above test points should be checked
14. Repair Record including date and description of problems versus items repaired or replaced

LOADING:

Overloading will cause overheating, shorten installation life, promote mineral deposits on heat transfer surfaces, and generate thermal stresses in the unit. Observe load limits of dynamometer. Maintenance personnel must know operating limits and report overloading promptly. Record load data on check list.

INSPECTION:

During routine maintenance, visually check for loose bolts, missing shaft guards, coolant or lubricant leaks, and excessive dirt on cooling surfaces. Question the operator to determine if abnormal conditions exist or a change in operation has been noted. Compare operation of unit with its performance profile. Investigate any changes noted on check list. Carefully check air filters, strainers, and auxiliary support devices.

CLEANING:

If filters or screens are plugged or dirty, remove and clean them. When they cannot be properly cleaned, replace them. Clean equipment of excessive dirt, oil, and other contamination that may work into the unit and cause a problem.

LUBRICATION:

Absorption dynamometers include two types of bearings. Trunnion bearings can be grease lubricated anti-friction bearings or hydrostatic lift bearings. Rotor bearings can be lubricated with constant oil leveler or a circulating pump system. Determine from your drawings which types of bearings are used in your unit and use recommended lubricants and appropriate procedures. Do **NOT** mix brands or types of lubricant unless manufacturer guarantees compatibility. Excessive lubricant will cause bearings to overheat.

Follow manufacturer recommendations regarding: the refilling of constant level oilers, cleaning and draining circulating oil system annually, checking filters and screens periodically, and replacement when they cannot be cleaned. Check safety devices annually, such as pressure switches, to ensure proper connections and operation.

GUIDELINE FOR DYNAMOMETER MAINTENANCE SCHEDULE

DAILY:

1. Check oil level.

MONTHLY:

1. Check water hoses for cracks.
2. Check for coolant leaks.
3. Check for oil leaks.

EVERY 3 MONTHS:

1. Rotate Trunnion Bearings using the manufacturer recommended process. This should be performed based on the severity of the testing. If dynamometer is utilized daily in extensive testing, the trunnion bearings should be rotated monthly.

EVERY 6 MONTHS:

1. Check pressure gauge is functioning properly using the manufacturer recommended process.

ANNUALLY:

1. Check run-out of shaft. It should not exceed manufacturer recommended measurement.
2. Check solenoid is functioning properly.
3. For circulating oil systems, clean and change oil following the manufacturer recommend process.
4. Check vibration using a manufacturer recommended Accelerometer and manufacturer recommended RPM measurement guidelines.

TROUBLE SHOOTING

The possibility of a component failure or other problem always exists. This section of the manual is intended to provide assistance in finding the fault. Check the obvious first then follow the Trouble Shooting Guide.

PROBLEM	POSSIBLE FAULT
Dynamometer will not Load	1. Controller malfunction; no coil excitation 2. Loose or incorrect wiring 3. Defective field coil 4. Water pressure, oil pressure or temperature switch open
Noise	1. Vibration from imbalance or misalignment 2. Bearing failure 3. Improper mounting 4. Shaft coupling loose
Hot Unit	1. Overloaded 2. Lack of coolant 3. Defective modulating valve 4. Plugged cooling passages
Hot Bearings	1. Bearing damage 2. Thrust 3. Lack of, or wrong lubricant 4. Alignment 5. Bent shaft
Dynamometer Stops Operation	1. Controller malfunction 2. Overload (causing collapsed rings and locked rotor) 3. Safety interlock operating 4. Cooling or lubricant failure
Erratic Operation	1. Controller malfunction 2. Trunnion bearing binding 3. Weighing system malfunction 4. Surging coolant 5. Defective bearing 6. Speed feedback malfunction 7. Torque feedback malfunction 8. Electrical noise 9. Loose electrical connection

Table 6-4

Parts and Service

Good maintenance alone is not always enough to keep equipment running. To provide additional services to our clients, DSI maintains an aftermarket sales and service department at our Jackson, Wisconsin location. The services offered include technical assistance, field service engineers, factory repair service and renewal parts stock.

SPARE PARTS:

Each installation is different depending on the output volume of the machine. Complete parts lists and other renewal parts information is available on request. Prices can be obtained from the Service Department at DSI by phone, fax, or e-mail.

ORDERING INSTRUCTIONS:

To ensure correct parts are furnished, include complete nameplate data from your specific unit, purchase order number, description of the part and quantity required. The nameplate lists the Model number and Serial Number. These numbers are necessary to identify the unit and the parts required.

Parts will be shipped from stock or will be manufactured on receipt of order depending on usage of the part. The standard renewal parts warranty as published in Company's Terms and Conditions of Sale for Renewal Parts will apply.

FIELD SERVICE:

We employ trained field service engineers at the factory. Assistance can be provided by telephone or by a field trip if circumstances require.

REPAIR SERVICE:

Any item returned will be repaired on a time and material basis if deemed repairable, unless a quotation is requested before authorizing the repair.

SHIPPING REQUIREMENTS:

Please contact your Sales representative prior to sending product in for repair. All dynamometers need to be shipped on an air ride truck. The load cell **MUST** be disconnected and the carcass secured. All coolant **MUST** be drained.

ON-SITE REPAIRS:

Accessory devices and small removable components can be repaired on site. Magnetic pick-ups, weighing system linkage, coolant devices, hoses and tubing generally are replaced rather than repaired. The technique involved is not difficult, since qualified personnel can make repairs without special instructions.

* Excerpted from the Midwest & Dynamatic Eddy Current Dynamometer User's Manual, copyright 2008 Dyne Systems, Inc.