

Y-8 BATTERY POWERED OPERATING INSTRUCTIONS

Description

The Y-8 Battery Yoke is an articulated leg magnetic yoke providing a portable means of creating magnetic fields for the detection of surface cracks and some subsurface flaws.

The unit consists of a “C” shaped core of laminated, transformer iron upon which the magnetizing coil is wound. These components are housed in a nonmagnetic shell that carries the lead in cable and operating switch. Each leg off the “C” core has two (2) moveable joints permitting contouring to fit various part geometries. The yoke is equipped with a twelve (12) foot line cable with the end plug adaptable to the 6-volt battery.

Electrical Connections

The Y-8 Battery Yoke is constructed for use with a 6 volt, 12 amp-hour batteries. The yoke will draw approximately 1.5 amps when in contact with a steel plate and 1.7 amps in the air. The battery is shipped from the factory with at least a 75% of full charge.

CAUTION: Use recommended battery. Use of substitute battery may result in unsatisfactory operation or damage to the unit. Warrantees will be voided in these cases.

Duty Cycle

CAUTION: Prolonged use in excess of the recommended duty cycle may cause the unit to overheat.

The rated duty cycle for the Y-8 is 33%. Cycles in excess of 30 seconds ON, 60 seconds OFF not recommended.

Principle of Operation

With the yoke connected to a suitable battery source, depressing the switch creates an intense magnetic field between the legs of the unit. When applied to ferromagnetic materials, cracks or discontinuities occurring across the magnetic field create leakage fields that will indicate the presence of such discontinuities when magnetic particles are dusted/bathed on the surface.

Depending on the degree of contact with the test surface, magnetic yokes have a characteristic leakage field around each leg that becomes visible in the presence of magnetic particles and this tends to obscure indications in the immediate vicinity. This area will increase in size as rough surfaces, which result in poor contact with the legs of the yoke, are tested. For this reason, best indications obtained midway between the legs where the magnetic field forms a regular pattern.

The effective magnetic field of the yoke can best be described as a multiplicity of invisible lines of force extending across the gap between the legs. When the yoke is applied to a steel plate, the magnetic circuit is closed and the magnetic field enters the plate and makes its passage through the legs and across the surface and subsurface of the plate. A discontinuity across the field cuts the magnetic circuit; the sides of the discontinuity become opposite poles of a magnet, and a leakage field will occur in the air above the discontinuities. Magnetic particles are attracted to this leakage field and form an indication.

Operation

The operation of the yoke is simple. The legs are positioned and placed against a part or area to be tested. Make as good a contact as possible at right angles to the direction of the suspected discontinu-

ities and depress the switch. As an example: If testing for longitudinal surface cracks in a weld, the legs should straddle the weld. If the directions of the discontinuities are not known, two inspections should be done with the yoke turned approximately 90 degrees for the second inspection.

Using the powder spray bulb (P/N 501232), dust the area between the legs lightly with a Magnaflux powder of magnetic particles while the yoke is energized. Inspect area closely for cracks and other defects. This process is repeated until the entire area of the part is inspected.

The method described should be adhered to if maximum sensitivity is to be obtained. Experience with different types of parts and/or surfaces will indicate the extent of the area in which good indications can be obtained.

Because of its portability, dry powder (as just described) is generally recommended for use with yokes. The wet method, though, is better for locating fine cracks. Hand spray guns, and aerosol products, are available for the wet method of particle application for yoke inspection.

For extreme sensitivity, Magnaflux fluorescent magnetic particles (Magnaglo) are available in aerosol form also. After bath and current application, a black light from a portable ultraviolet lamp (ZB-100 or ZB-100F) is used to fluoresce the Magnaglo particles, producing brilliant yellow-green indications that are easily detected.

Interpretation:

After an indication has been formed, it must be correctly interpreted or identified. Size, shape, appearance, location, and direction of the indication as well as knowledge of the part history, all assist the experienced inspector in correct interpretation.

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Evaluation:

The most important part of an inspection is the decision as to whether a part with a known discontinuity is acceptable, can be repaired, or must be rejected. This depends on how the discontinuity affects the serviceability of the part. Many parts with indications are acceptable.

Recharging:

Recharging the battery is recommended every 8-10 hours of use or if the battery is stored for an extended period of time. The battery may last 16 hours but extreme discharge will reduce battery life. The following procedure applies to a Magnaflux supplied charger only.

110 Volt

First hook the charger cord to the charger taking care to hook the "+" spade to the "+" screw. Next plug the battery and the charger together. Plug the charger into a 110 Volt outlet. Recharge time depends on amount of discharge. In general multiply the number of hours the battery was in use by 1.25 for the number of recharge hours. If the battery charger is connected properly the charge light should come on. Once the battery is fully charged the "float" light will come on. The float state of the charger will insure the battery remains fully charged but will not allow the battery to be over charged.

230 Volt

Plug the charger cord into the battery. Then plug the charger into the 230-volt source outlet. Recharge time depends on the amount of discharge. In general, multiply the number of hours the battery was in use by 1.3 for the number of recharge hours. Do not over charge the battery; this will reduce the life of the unit.