



**Figure 10-35.** *Magnetic particle inspection accessories.*

magnetizing force that is continually reversing in direction and, at the same time, gradually decreasing in strength. As the decreasing magnetizing force is applied first in one direction and then the other, the magnetization of the part also decreases.

### ***Standard Demagnetizing Practice***

The basic procedure for developing a reversing and gradually decreasing magnetizing force in a part involves the use of a solenoid coil energized by AC. As the part is moved away from the alternating field of the solenoid, the magnetism in the part gradually decreases.

A demagnetizer whose size approximates that of the work is used. For maximum effectiveness, small parts are held as close to the inner wall of the coil as possible. Parts that do not readily lose their magnetism are passed slowly in and out of the demagnetizer several times and, at the same time, tumbled or rotated in various directions. Allowing a part to remain in the demagnetizer with the current on accomplishes very little practical demagnetization.

The effective operation in the demagnetizing procedure is that of slowly moving the part out of the coil and away from the magnetizing field strength. As the part is withdrawn, it is kept directly opposite the opening until it is 1 or 2 feet from the demagnetizer. The demagnetizing current is not cut off until the part is 1 or 2 feet from the opening as the part may be remagnetized if current is removed too soon. Another procedure used with portable units is to pass AC through the part being demagnetized, while gradually reducing the current to zero.

### ***Radiographic***

Because of their unique ability to penetrate material and disclose discontinuities, X and gamma radiations have been applied to the radiographic (x-ray) inspection of metal fabrications and nonmetallic products.

The penetrating radiation is projected through the part to be inspected and produces an invisible or latent image in the film. When processed, the film becomes a radiograph or shadow picture of the object. This inspection medium and portable unit provides a fast and reliable means for checking the integrity of airframe structures and engines. [Figure 10-36]

### ***Radiographic Inspection***

Radiographic inspection techniques are used to locate defects or flaws in airframe structures or engines with little or no disassembly. This is in marked contrast to other types of nondestructive testing that usually require removal, disassembly, and stripping of paint from the suspected part before it can be inspected. Due to the radiation risks associated with x-ray, extensive training is required to become a qualified radiographer. Only qualified radiographers are allowed to operate the x-ray units.

Three major steps in the x-ray process discussed in subsequent paragraphs are: exposure to radiation, including preparation; processing of film; and interpretation of the radiograph.

### ***Preparation and Exposure***

The factors of radiographic exposure are so interdependent that it is necessary to consider all factors for any particular