June 1968

Brief 68-10209

AEC-NASA TECH BRIEF

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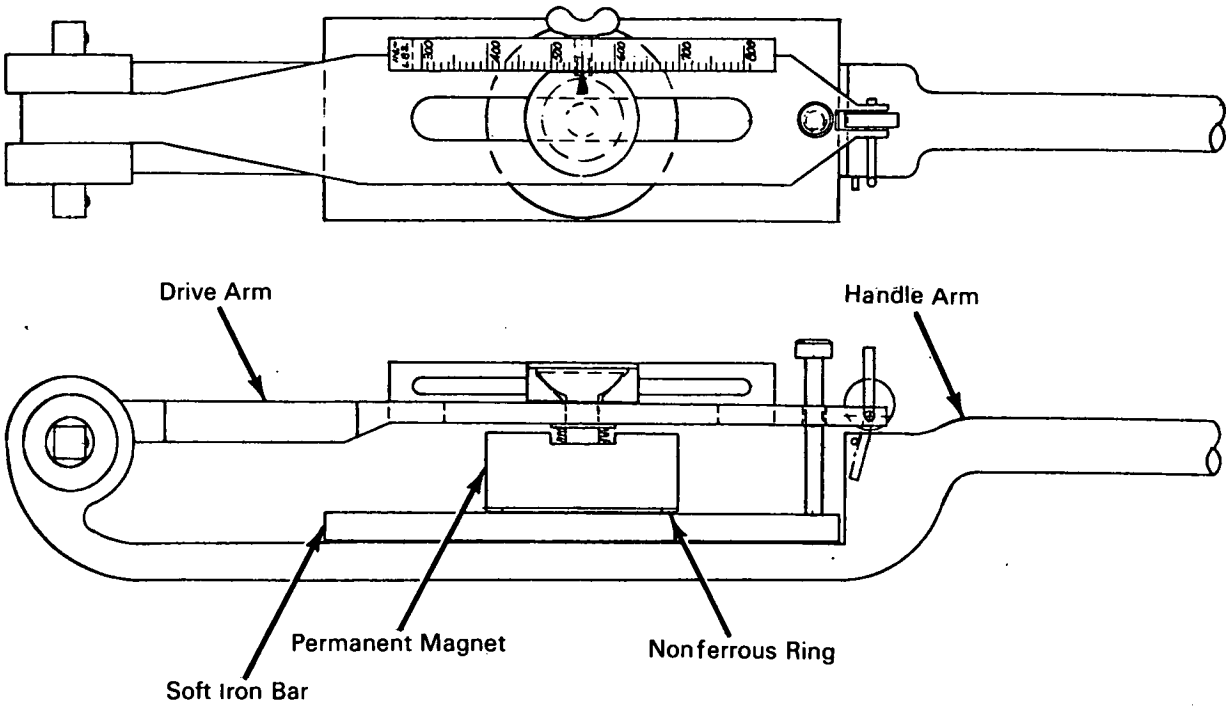
Magnetically Controlled Torque Wrench Prevents Overtorquing



Note: Permanent Magnet Type Only; Electromagnetic Type Not Shown

The problem:

To design a torque wrench that incorporates the repeatability of magnetic attraction, produces the required torque values accurately, and prevents overtorquing.

The solution:

The force between a magnet and a soft iron bar on the arms of a torque wrench constitutes a predetermined maximum torque that cannot be exceeded. So long as the magnetic flux remains constant, the torque remains the same.

How it's done:

The iron bar is attached to the drive arm of the wrench and the magnet to the handle arm. As soon as the torquing force exceeds the magnetic force, the contact faces separate and the hold is released. If an electromagnet is used, the torque force can be controlled by the power supply. Since torque output is equal to the product of lever arm length and magnetic force, it is directly proportional to the input current to the electromagnet; therefore, a current scale, calibrated in units of torque, could be used for accurate

(continued overleaf)

control. The permanent magnet does not offer the control capabilities of the electromagnet, although the holding force can be changed by varying the position of the iron bar so that the contact area changes. The advantages of using a permanent magnet are portability and simplicity in manufacture and use.

Note:

Inquiries concerning this innovation may be directed to:

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Reference: B68-10209

Patent status:

No patent action is contemplated by AEC or NASA.

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(SAN-10002)