

**Inspection Specification for
25 cm Active Length Tangential Probes**

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I. Introduction: The note specifies quality assurance inspection procedure for the 25 cm active length, 1 inch diameter tangential probes being constructed for use in Lab 2.

In this note "longitudinal" refers to grooves cut along the long axis of the probe, and "azimuthal" refers to grooves cut around the outer circumference of the probe. The notation for angular positions of longitudinal grooves is dd.mm.ss, where dd = degrees, mm = minutes, and ss = seconds of arc.

Each probe has slots provided for 5 windings. Detailed views of all windings are shown on drawing ~~0102-ME-2963941~~ (two sheets.) The nominal dimensions of the various grooves are as follows: ²⁶³⁹⁴¹

1) **Tangential Winding:** This winding has longitudinal grooves .036" wide at $\pm 11.32.13$ relative to 00.00.00. The longitudinal grooves are 9.566" in length, and are joined by azimuthal grooves of the same width.

2) **Belly Band Winding:** This winding has longitudinal grooves .028" wide at $\pm 90.00.00$ relative to 00.00.00. The longitudinal grooves are 9.574" long, and are joined by azimuthal grooves of the same width.

3) **Dipole 1 Winding:** This winding has longitudinal grooves .010" wide at $+45.00.00$ and $+225.00.00$ relative to 00.00.00. The longitudinal grooves are 9.832" long, and are joined by azimuthal grooves of the same width.

4) **Dipole 2 Winding:** This winding has longitudinal grooves .010" wide at $+135.00.00$ and $+315.00.00$ relative to 00.00.00. The longitudinal grooves are 9.718" long, and are joined by azimuthal grooves of the same width.

5) **Auxilliary Winding:** This winding has longitudinal grooves .036" wide at $+174.15.39$ and $+185.44.21$ relative to 00.00.00. ($\pm 5.44.21$ relative to 180.00.00.) The longitudinal grooves are 9.390" long, and are joined by azimuthal grooves of the same width.

In inspecting these probes, we are concerned with several features of the grooves for each winding. These parameters include:

- 1) **Angular Positions** of all longitudinal grooves.
- 2) **Widths and Depths** of all longitudinal and azimuthal grooves.
- 3) **Parallelness** of all longitudinal grooves relative to probe axis.
- 4) **Lengths** of longitudinal grooves.

II. Setup: In this section, I refer to photographs used to specify the setup for a Morgan Coil inspection. This photograph and the accompanying inspection instructions were given to W. Pritchard by C.Hess.

- Set up as in photograph, on table with vibro-shock feet.
- Use 4-jaw independent chuck on rotary table with small pieces of aluminum stock between ends and chuck jaws. The probe must be set up so that it is parallel to the table surface.
- Use direct light source with microscope.
- Use home made thin disc probes on Micro-Hite for checking groove depths and parallelness (see Section III, part C.)

III. Measurements:

A. Angular Positions of Axial Grooves:

1. Measure the longitudinal groove angles at the 1 1/2", 5 1/2", and 9 1/2" positions shown in Figure 1. Perform and record at least two sets of measurements at each position, so that measurement precision may be estimated.

2. Rotate the probe until the 11.32.13 longitudinal groove is approximately 30 degrees above the horizontal, facing toward the table edge. Use the Micro-Hite to measure the vertical position of the lower edge of the groove relative to the table at the 1 1/2", 3 1/2", 5 1/2", 7 1/2", and 9 1/2" positions shown in Figure 1. At each position, use a dial indicator to check that the probe is not deflecting vertically when the Micro-Hite makes contact with the groove edge.

B. Longitudinal Groove Depths and Widths: Measure longitudinal groove depths at the 1 1/2", 3 1/2", 5 1/2", 7 1/2", and 9 1/2" positions shown in Figure 1.

C. Lengths of Longitudinal Grooves: Use the Micro-Hite to measure the length of each longitudinal groove between the intersection points of the groove and its associated azimuthal grooves. If there is any question about which azimuthal grooves to use, contact Steve Delchamps x2416 or Charlie Hess x3375.

Indexing Head Chuck

"Dead Center"

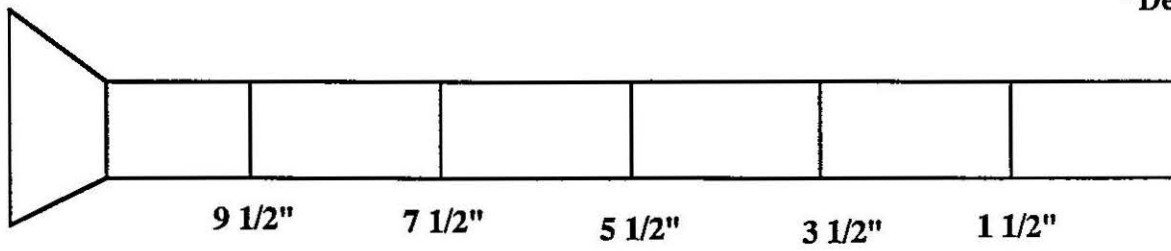


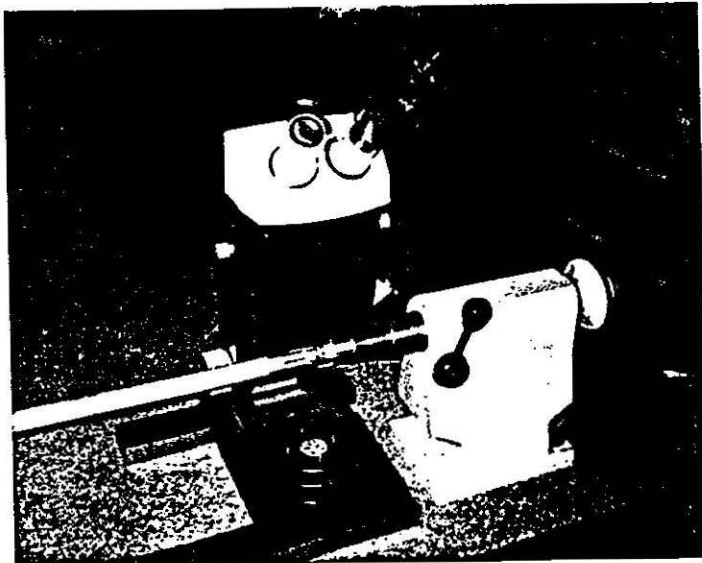
Figure 1. Measurement Positions for 25 cm Tangential Probe

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MORGAN COIL ROTATING PROBE SETUP.

MICROSCOPE



"DEAD CENTER"

MICROSCOPE ON PARALLEL BARS, WITH DIRECT LIGHT SOURCE IN EYEPIECE.