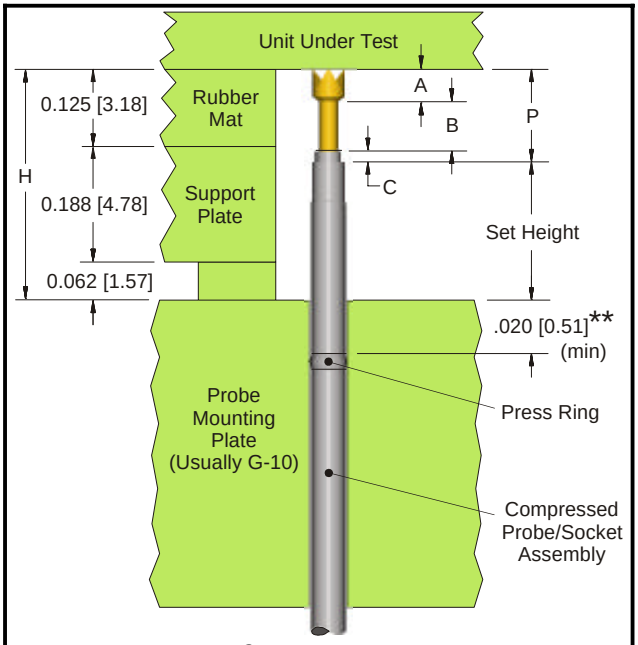
QA Technology Company, Inc.

A p p l i c a t i o n s N o t e

How to Calculate Socket Set Heights

Socket set height is a critical factor in the performance and life of a test probe. When set too low, the probe is under-stroked, reducing the contact force and the probe's ability to penetrate surface contaminants. When set too high, the probe is over-stroked, resulting in decreased spring life or possible tip damage due to bottoming. To calculate proper set height, follow these steps:

1) Make a cross-sectional sketch of the fixture in the actuated position. The sketch at right is typical of many vacuum fixtures.
2) Dimension the thickness of the items that stack up on the top surface of the probe mounting plate. Add these dimensions to get a final distance (H) from the top of the plate to the contact surface of the UUT. Subtract the average lead length from this dimension if contacting leaded components.
3) Calculate the distance (P) from the probe tip to the top of the socket in which it is mounted. Remember to calculate this dimension with the probe compressed to its recommended working travel. See the table below for key probe dimensions.
4) Subtract P from H. The result is the proper set height



Cross-Section of a Typical Vacuum Fixture in the Actuated Position

Example for 100-25 Series:

H = Spacer + Support Plate + Rubber Mat
= .062(1.58) + .188(4.78) + .125(3.18) = .375(9.53)

P = .163(4.14) (from table)

Set Height = H - P
= .375(9.53) - .163(4.14) = **.212(5.39)**

Related Notes:

To mix-mount probes, calculate the proper set height for each series used in the fixture.

Thicker mounting plates allow the greatest set height range, but hole straightness may suffer.

For dual level testing, .400 inch stroke probes are mounted in the same sockets, at the same set height, as standard .250 inch stroke probes. As a result, they can be interchanged freely from one socket to another as test needs dictate.

*100-05, 050-05 and 025-16 Series sockets are all mounted flush (set height is zero).

**To account for irregularities at the hole ends, a margin of at least .020(0.51) is recommended between the press ring and the closest plate surface.

Key Probe Dimensions For Calculating Set Height

Series	Probe Tip Height A	Exposed Shank B	Probe Tube Extension C	Recomm. Extension P
025-16*	.010 (0.25)	.053 (1.35)	.020 (0.51)	**.083 (2.11)**
039-16	.015 (0.38)	.053 (1.35)	.024 (0.61)	**.092 (2.34)**
050-05*	.040 (1.02)	.000	.000	**.040 (1.02)**
050-16	.020 (0.51)	.053 (1.35)	.000	**.073 (1.85)**
050-25	.022 (0.56)	.083 (2.11)	.038 (0.96)	**.143 (3.63)**
075-25	.050 (1.27)	.083 (2.11)	.030 (0.76)	**.163 (4.14)**
075-40	.050 (1.27)	.083 (2.11)	.030 (0.76)	**.163 (4.14)**
075-40-D***	.050 (1.27)	.233 (5.92)	.030 (0.76)	**.313 (7.95)**
100-05*	See Catalog	.000	.005 (0.13)	**See Catalog**
100-16	.080 (2.03)	.053 (1.35)	.010 (0.25)	**.143 (3.63)**
100-25	.060 (1.52)	.083 (2.11)	.020 (0.51)	**.163 (4.14)**
100-40	.060 (1.52)	.083 (2.11)	.020 (0.51)	**.163 (4.14)**
100-40-D***	.060 (1.52)	.233 (5.92)	.020 (0.51)	**.313 (7.95)**
125-25	.080 (2.03)	.083 (2.11)	.005 (0.13)	**.168 (4.27)**

All dimensions are in inches (mm)

*** See "Decreased Stroke Probe (–D Option)" apps note (D10059) for more information.