

# **Welcome to: Lincoln College of Technology**

**RICK CALVERLEY**



## ***PROBING TO COMPLETE ON MACHINE VERIFICATION***



***“this is how we have always done it..”***



*“this is how we have always done it..”*

- 1. We machine a feature or complete part**



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- 1. We machine a feature or complete part**
- 2. We check what we can on the machine**



***“this is how we have always done it..”***

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- 3. We take the part out and check it some more**





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- 4. We take it to the CMM for inspection**



***“this is how we have always done it..”***

- 1. We machine a feature or complete part**
- 2. We check what we can on the machine**
- 3. We take the part out and check it some more**
- 4. We take it to the CMM for inspection**
- 5. QA gives report and adjustments made at machine**

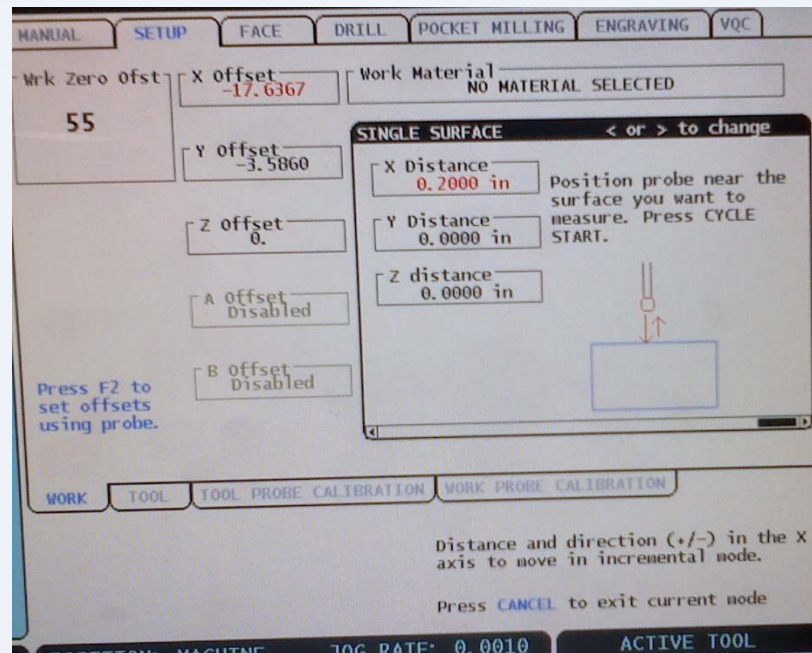


**“but where is the manufacturing industry headed?”**

<http://www.youtube.com/watch?v=kCB4fEiyGRo>

***PROBING TO COMPLETE ON MACHINE VERIFICATION***

# Haas makes this simple in set up



**PROBING TO COMPLETE ON MACHINE VERIFICATION**

*But, we can build this inside our machine code....very simply*



**PROBING TO COMPLETE ON MACHINE VERIFICATION**

*First, call the probe, position in WCS, and turn on the probe*

T10 M6  
G0 G90 G54 X-1. Y-1.  
G43 H10 Z2.  
**G65 P9832**

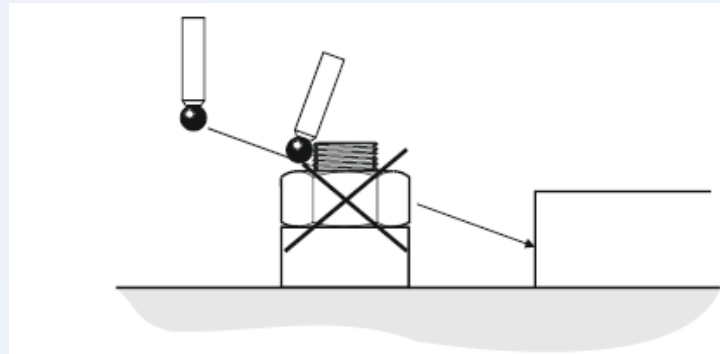
PROBE IS TOOL #10  
POSITION IN WCS X-1. Y-1.  
TURN ON TLO AND POSITION A SAFE DISTANCE IN Z  
**THIS IS CODE TO ORIENT AND INITIATE PROBE POWER**

***PROBING TO COMPLETE ON MACHINE VERIFICATION***

***Next, use “Protected Position Move”***

T10 M6  
G0 G90 G54 X-1. Y-1.  
G43 H10 Z2.  
G65 P9832  
**G65 P9810 Z.5**

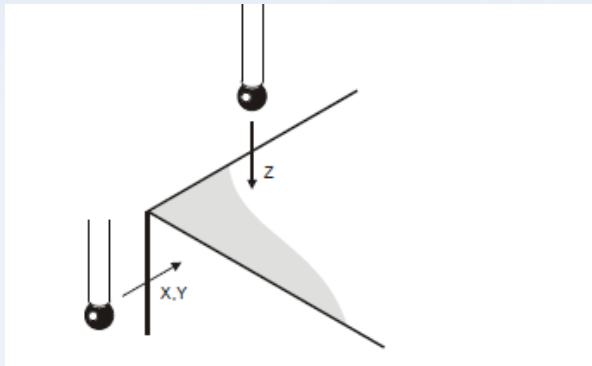
PROBE IS TOOL #10  
POSITION IN WCS X-1. Y-1.  
TURN ON TLO AND POSITION A SAFE DISTANCE IN Z  
THIS IS CODE TO ORIENT AND INITIATE PROBE POWER  
**P9810 IS PROTECTED MOVES –AVOIDS PROBE DAMAGE**



***PROBING TO COMPLETE ON MACHINE VERIFICATION***



## SINGLE AXIS MEASUREMENTS AND VARIABLES



T10 M6

G0 G90 G54 X-1. Y-1.

G43 H10 Z2.

G65 P9832

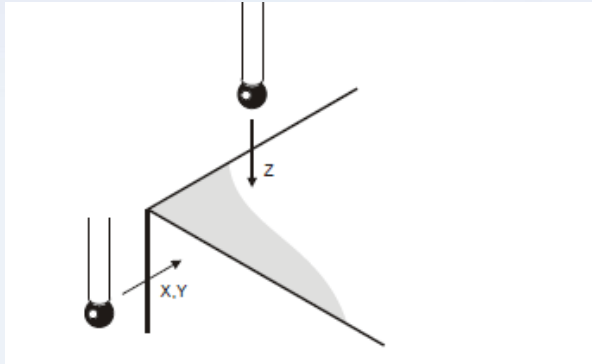
G65 P9810 Z.5

**G65P9811Z0. (H.005)(S1-S6)(T10)(W1.)**

**PROBING TO COMPLETE ON MACHINE VERIFICATION**



## **SINGLE AXIS MEASUREMENTS AND VARIABLES**



```
T10 M6  
G0 G90 G54 X-1. Y-1.  
G43 H10 Z2.  
G65 P9832  
G65 P9810 Z.5  
G65P9811Z0. (H.005)(S1-S6)(T10)(W1.)
```

### **VARIABLES**

**H=TOLERANCE OF FEATURE, IF FEATURE OT MESSAGE IS OUTPUT**

**S=WCS UPDATE, S1 = G54, S2 = G55, ETC**

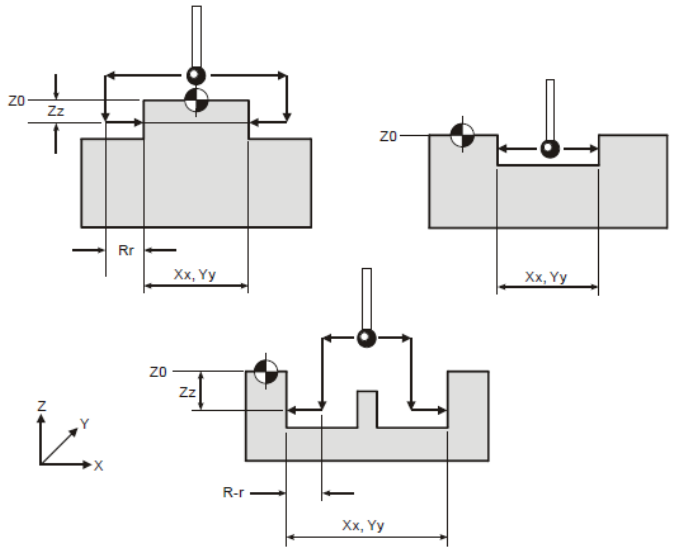
**T=TOOL OFFSET UPDATE**

**W= PRINT OR OUTPUT INSPECTION DATA**

***PROBING TO COMPLETE ON MACHINE VERIFICATION***

## WEB POCKET MEASUREMENTS AND VARIABLES

Web / pocket measurement – macro O9812



T10 M6

G0 G90 G54 X0. Y-1.

G43 H10 Z2.

G65 P9832

G65 P9810 Z.5

G65P9812X0. (H.005)(S1-S6)(T10)(W1.)

### VARIABLES

H=TOLERANCE OF FEATURE, IF FEATURE OT MESSAGE IS OUTPUT

S=WCS UPDATE, S1 = G54, S2 = G55, ETC

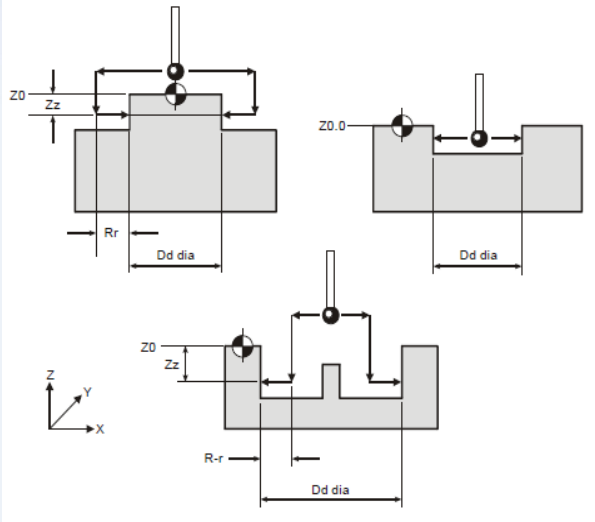
T=TOOL OFFSET UPDATE

W= PRINT OR OUTPUT INSPECTION DATA

**PROBING TO COMPLETE ON MACHINE VERIFICATION**

## BORE/BOSS MEASUREMENTS AND VARIABLES

Bore / boss measurement – macro O9814



T10 M6  
G0 G90 G54 X0. Y-1.  
G43 H10 Z2.  
G65 P9832  
G65 P9810 Z-.5  
**G65P9814D0.875(H.005)(S1-S6)(T10)(W1.)**

### VARIABLES

H=TOLERANCE OF FEATURE, IF FEATURE OR MESSAGE IS OUTPUT

S=WCS UPDATE, S1 = G54, S2 = G55, ETC

T=TOOL OFFSET UPDATE

W= PRINT OR OUTPUT INSPECTION DATA

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**RICK CALVERLEY**