VR SERIES H-5AX DOUBLE YOKE INSPECTION REPORT

1

INSPECTOR	
DATE	
SERIAL #	

VR-8 ☐ **VR-9** ☐ **VR-11** ☐ **VR-14** ☐

Y-Axis Pitch

F _____

M _____

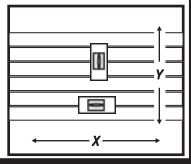
B _____

1. FLATNESS OF TABLE TRAVEL MOVEMENTS

Read Level at Front, Middle, and Back for both X & Y Axis Directions.

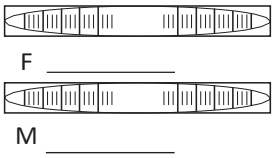
Electronic Level: Record the values.

Bubble Level: Draw in the bubble position.



Electronic Levels:
For Federal Level (NTE 0.0005 / 10") (NTE 12.7µm / 250mm)
For DigiPass Level (NTE0.0015 / 10") (NTE 38µm / 250mm)

Y-Axis Roll



F _____

M _____

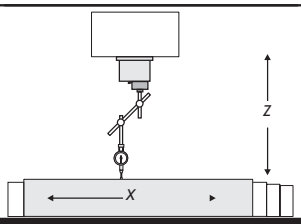
B _____

2. FLATNESS OF TABLE

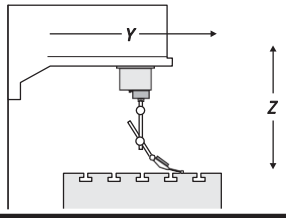
MOUNT INDICATOR TO SPINDLE HEAD AND MOVE X & Y-AXIS OVER FULL RANGE.

____	____	____	____	____	____	____	____	____	____
____	____	____	____	____	____	____	____	____	____
____	____	____	____	____	____	____	____	____	____
____	____	____	____	____	____	____	____	____	____

MOVE X-AXIS OVER FULL RANGE



MOVE Y-AXIS OVER FULL RANGE



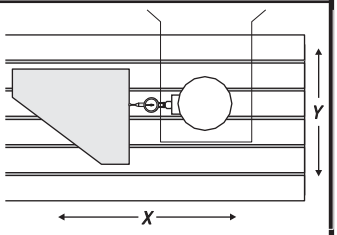
FULL TRAVEL: _____
VR-8/9: (NTE 0.002 MAX)(NTE 50.8µm)
VR-11/14: (NTE 0.003 MAX, 0.0012 /10")
(NTE 76.2µm, 30.48µm / 250mm)

3. INSPECT SQUARENESS OF X-AXIS TO Y-AXIS

ALIGN PRECISION SQUARE WITH X-AXIS INDICATE ALONG Y-AXIS.

MEASURED VALUE: _____
(NTE 0.0005 / 10")
(NTE 12.7µm / 250mm)

X-AXIS INDICATE ALONG Y-AXIS



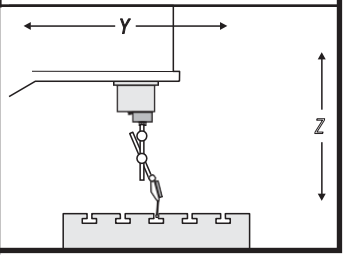
4. T-SLOT STRAIGHTNESS

PLACE INDICATOR IN CENTER T-SLOT OF MILL TABLE. INDICATE OVER FULL TRAVEL OF X-AXIS.

MEASURED VALUE:_____
(NTE 0.0005 / 10")
(NTE 12.7µm / 250mm)

FULL TRAVEL:_____
READING 0.0015 MAX.
(NTE 38.1 µm)

INDICATE FULL TRAVEL OF X-AXIS



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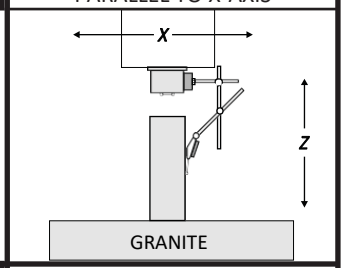
5.A SQUARENESS OF Z-AXIS MOTION TO X-AXIS

PLACE A CYLINDER SQUARE CENTERED ON TABLE. ADJUST CYLINDER TOP TO WITHIN 0.0000 FOR X-Y MOTION (NO MEASURABLE CHANGE IN X/Y MOTION). INDICATE THE SIDE OF THE CYLINDER SQUARE IN X DIRECTION. FIND THE HIGH POINT AND MOVE Z.

MEASURED VALUE: _____ Z-AXIS TILT RELATIVE TO X-AXIS
(NTE 0.0005 / 10")
(NTE 12.7µm / 250mm)

PARALLEL TO X-AXIS



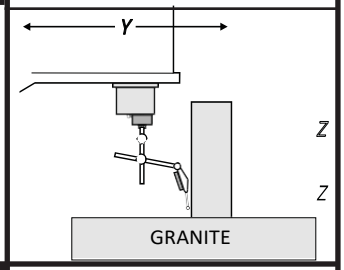
5.B SQUARENESS OF Z-AXIS MOTION TO Y-AXIS

INDICATE THE SIDE OF THE CYLINDER SQUARE IN Y DIRECTION.

FIND THE HIGH POINT AND MOVE Z.MOVE Z.

MEASURED VALUE: _____ Z-AXIS TILT RELATIVE TO Y-AXIS
(NTE 0.0005 / 10")
(NTE 12.7µm / 250mm)

PARALLEL TO Y-AXIS

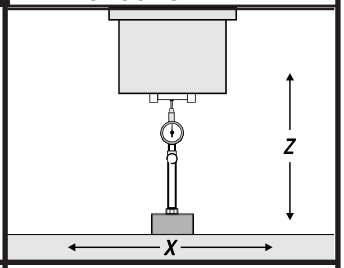


6.A SPINDLE RUNOUT AT TAPER

MEASURED VALUE: _____

(RUNOUT OF TAPER 0.0002" [5.08µm] TIR)

RUNOUT OF TAPER

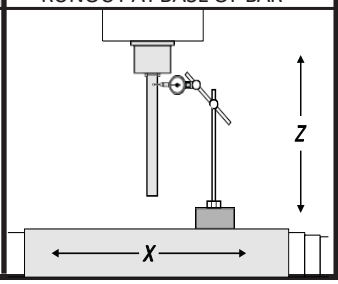


6.B SPINDLE RUNOUT ON TEST TOOL BAR

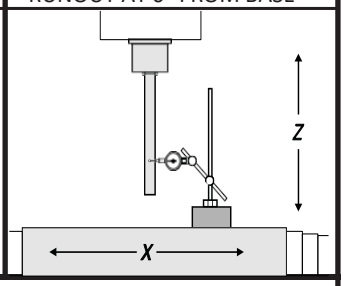
(1) **MEASURED VALUE:** _____
(RUNOUT AT BASE OF BAR 0.0005 [12.7µm] TIR)

(2) **MEASURED VALUE:** _____
(RUNOUT AT 6" FROM BASE 0.001 [25.4µm] TIR)

RUNOUT AT BASE OF BAR



RUNOUT AT 6" FROM BASE



THE FOLLOWING STEPS OF THE INSPECTION REPORT ONLY APPLIES TO THE DOUBLE YOKE 5-AXIS HEAD OF THE VF SERIES.

7. C-AXIS PARALLEL TO Z AXIS

SETUP THE GRANITE SQUARE ON THE TABLE WITH THE TOP SURFACE PARALLEL TO THE XY PLANE WITHIN 0.0001"/10". USE MACHINIST JACKS OR SHIM UNDER THE GRANITE.

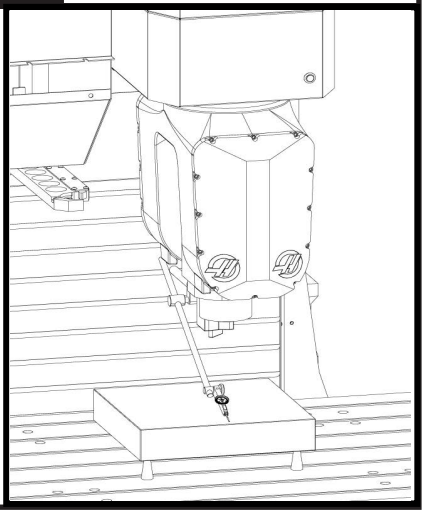
(1) POSITION INDICATOR BASE ON THE SPINDLE TO SWEEP THE GRANITE SURFACE WITH A 10" DIAMETER.

(2) ROTATE C-AXIS +/-180
Note: You will not be able to fully rotate 360 degrees in one direction as the head has +245 to -245 travel limits.

(3) RECORD THE READING

MEASURED VALUE: _____
(NTE 0.0008" / 10" dia.)

C-AXIS PARALLEL TO Z AXIS



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8. B-AXIS SWEEP

B-AXIS POSITIONS AT 45° INCREMENTS

(1) HOME THE B AND C-AXIS AND SWING B = -90 DEGREES. PLACE AN INDICATOR ON THE FRONT FACE OF THE TEST BAR AT THE END OF THE BAR ON THE HIGH SPOT. ZERO THE INDICATOR AT THIS LOCATION. SWING B = +90 DEGREES. JOG THE TABLE IN THE Z AND X DIRECTION TO MOVE THE INDICATOR TO THE FRONT FACE OF THE TEST BAR AT THE END OF THE BAR ON THE HIGH SPOT. ADJUST THE C-AXIS SO THAT THE ERROR ON THE INDICATOR IS THE SAME BETWEEN B = -90 AND B = +90 DEGREES. THIS SHOULD NOT EXCEED 0.0005".

(2) WHILE AT B = +90 DEGREES, MEASURE 4" AWAY FROM SPINDLE NOSE. MARK THE POINT ON THE TEST BAR WITH A FELT TIP MARKER AND PLACE YOUR INDICATOR ON THE HIGHEST POINT ON THE TEST BAR AND SET IT TO ZERO AT THE MARKED POINT (LOCATION 1 RUN 1 WILL ALWAYS BE SET TO ZERO).

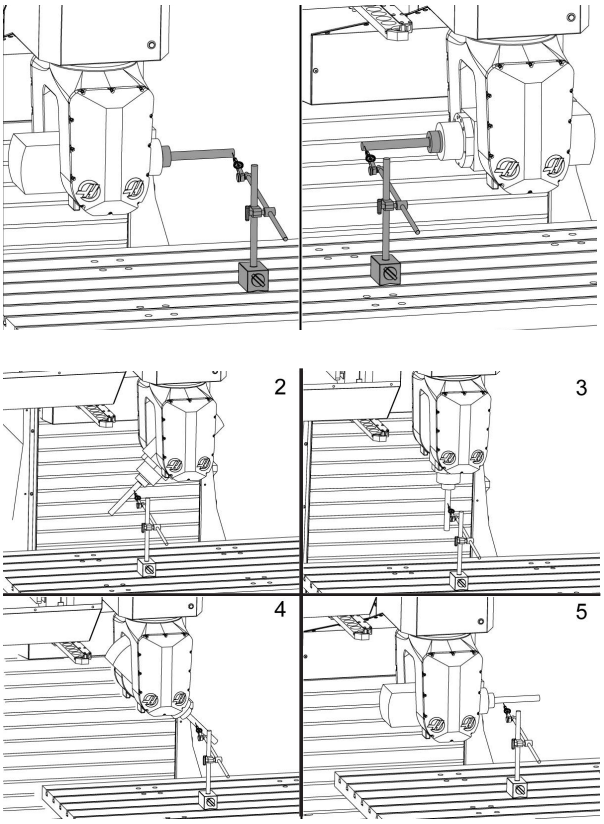
(3) ROTATE 45° TO POSITION [2]. WITHOUT MOVING THE INDICATOR JOG THE X AND Z AXIS TO THE MARKED POINT ON THE TEST BAR IN POSITION [2] MAKE SURE THERE IS NO MOVEMENT IN THE Y- AXIS.

(4) REPEAT FOR POSITIONS [3], [4], & [5].
NOTE: ALL POSITIONS ARE IN 45° INCREMENTS

(5) FROM POSITION [5] ROTATE THE C-AXIS POSITIVE 180° AND MEASURE THE ERROR (LOCATION 1 RUN 2). REPEAT STEPS 1-4. USE THE TABLE BELOW TO FIND THE B-AXIS SWEEP ERROR.

(6) FOR EACH RUN THE VALUE AT LOCATION 5 IS NTE 0.0005" FROM THE LOCATION 1 VALUE.

(7) THE TOTAL VALUE IS NOT TO EXCEED THE DIFFERENCE DIVIDED BY 2 AT EACH LOCATION.

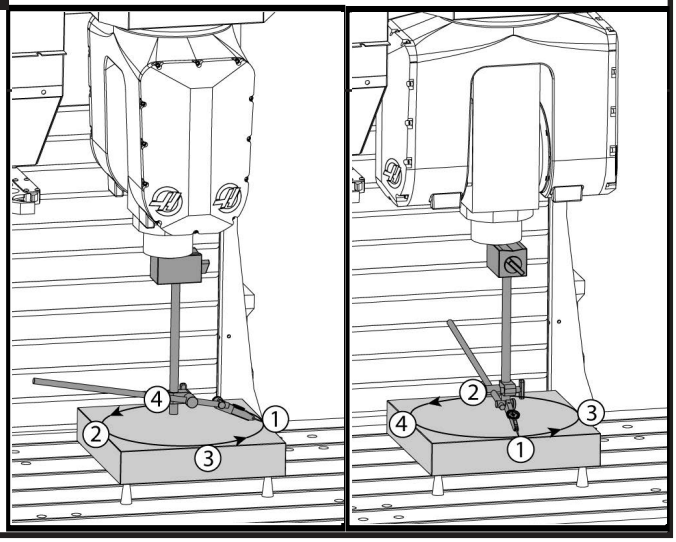


	Location 1	Location 2	Location 3	Location 4	Location 5
Run 1 (C=0)	0.0000				
Run 2 (C= +180)					
Difference	0.0000	0.0000	0.0000	0.0000	0.0000
TOTAL (NTE 0.0040")	0.0000	0.0000	0.0000	0.0000	0.0000

9. Spindle Centerline Parallel to C-Axis

C-AXIS AT 0 DEGREES

C-AXIS AT 90 DEGREES



(1) HOME THE B AND C-AXIS, MOUNT THE INDICATOR ON THE SPINDLE AND SET THE INDICATOR TO SWEEP A 10" CIRCLE. SET THE INDICATOR TO ZERO AT POSITION [1] AND SWEEP BETWEEN THE FOLLOWING POSITIONS.

C = 0:

MEASURED DIFFERENCE BETWEEN 1 AND 2: _____
(NTE 0.0005")

MEASURED DIFFERENCE BETWEEN 3 AND 4: _____
(NTE 0.002")

C = 90:

MEASURED DIFFERENCE BETWEEN 1 AND 2: _____

MEASURED DIFFERENCE BETWEEN 3 AND 4: _____

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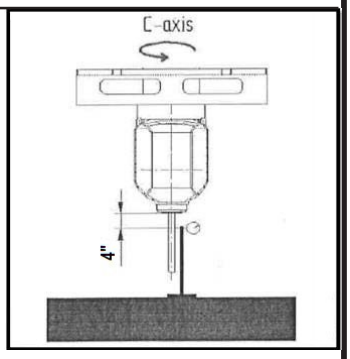
10. C-AXIS RUNOUT

C-AXIS RUNOUT



(1) POSITION INDICATOR NEEDLE ON HIGH SPOT OF ALIGNMENT BAR.

(2) ROTATE C-AXIS +180/-180 DEGREES AND MEASURE RUNOUT.

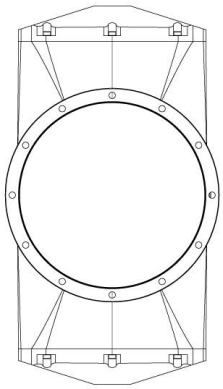
(3) RECORD THE ERROR AT THE FOLLOWING POSITIONS: C = +90, C = +180/-180, C = -90.
NOTE: HOLD THE TEST BAR WHEN JOGGING THE C-AXIS.

C = 180

ERROR BETWEEN C = 0 AND C = 180:
(NTE 0.0015") _____

ERROR BETWEEN C = +90 AND C = -90:
(NTE 0.003") _____

C = -90

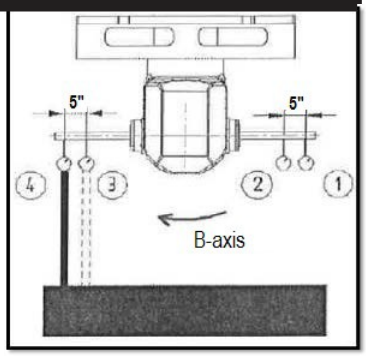


C = +90

0.0000

C = 0

11. SPINDLE CENTERLINE AND B-AXIS INTERSECTION



1. ROTATE THE B-AXIS TO +90° with C = 0°.

2. SWEEP THE BOTTOM OF THE TEST BAR AND ADJUST THE B-AXIS TO OBTAIN ZERO AT POSITIONS 1 AND 2.

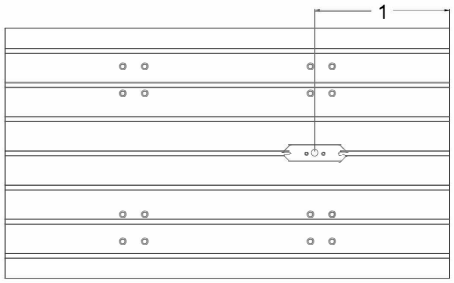
3. ZERO THE Y AND Z-AXIS ON THE OPERATORS PAGE.

4. ROTATE THE B-AXIS 180°.

5. SWEEP THE BOTTOM OF THE TEST BAR FROM POSITIONS 3 AND 4 AND ADJUST THE B-AXIS TO OBTAIN THE SAME VALUE BETWEEN POSITIONS 3 AND 4, WITH THE Y AND Z-AXIS AT ZERO.

ERROR BETWEEN POSITIONS 3 AND 4 DIVIDED BY TWO: _____
(NTE 0.002)

12. MACHINE ROTARY ZERO POINT SETTINGS



USE THE VPS MACRO PROGRAM AND PROBE SYSTEM TO SET THE VALUES FOR THE MRZP AND SAFE ZONE SETTINGS SHOWN IN THE TABLES BELOW.
(MACHINE ROTARY ZERO POINT X,Y,Z AXES AND 5 AXIS ROTARY CENTER POINT DISTANCE)
PLACE THE MRZP ARTIFACT IN THE CENTER T-SLOT AND 17.25 INCHES AWAY FROM THE RIGHT EDGE OF THE TABLE.

RECORD THE SETTING VALUES BELOW:

MRZP SETTING	VALUE
300 - MRZP X OFFSET MASTER	
301 - MRZP Y OFFSET MASTER	
302 - MRZP Z OFFSET MASTER	
303 - MRZP X OFFSET SLAVE	
305 - MRZP Z OFFSET SLAVE	