SUPPLEMENT
TO I-CVA-620
Operating and Maintenance Instructions
For Sunnen CV-616 Automatic Vertical Honing Machines

GENERAL
This supplement is issued to update pages 2, 3, 15, 16, and 17 of your Operating and Maintenance Instructions. CROSS OUT step 6. on the bottom of page 15.
Tape or glue the attached pages (2, 3, 16 & 17) over the corresponding pages in your instructions.
NOTE: The following changes should be written in where indicated.

On PAGE 5 change step 9. to read:
Indicates thickness of Shims required to set Guides and Stones to cylinder diameter. Also used to adjust Alignment Guides.

On PAGE 9 change step 4.a. to read:
Place Setting Gage in one of the cylinders to be honed and snug, making sure to center. Make sure proper side of Turret Block faces the opening for honing head being used.

On PAGE 9 change step 4.c. to read:
If graduated slide reads "15", or less, no additional shims should be added.
If slide reads over "15", remove Assembly from Setting Gage and add one 1/4" shim.

On PAGE 19 change step E. to read:
If the last cylinder was undersize, hold the Feed Handwheel still and slide the Feed Dial to the right the number of marks you calculated. In our example it would be 3.
If you were oversize, hold the Feed Handwheel still and slide the Feed Dial to the left the number of marks you calculated. In our example it would be 3.

On PAGE 19 change step F. to read:
NOTE: Stone must be fully radiused to cylinder diameter to assure consistent load meter readings and results.

On PAGE 20 change step F.3.c. to read:

\[ \text{c. The surface finish left by the prior operation is too rough for the stones being used; therefore, an intermediate stone must be used between the rough and the fine finish honing operation.} \]

On PAGE 20 change step G.1. to read:
1. If load is too high (consistently over 90 points on the bar graph), make the stones feed slower by setting the selector cover to a lower number, or use a softer stone.

On PAGE 39 change the last line of step H. to read:
models have only one Switch with double contacts.

On PAGE 46 change step S.4. to read:
4. Tighten Lock Nuts.

On PAGE 46 change the sixth line of the note in step T. to read:
and turn off. First, the Feed Handwheel

On PAGE 48 change step V.2. to read:
2. Turn off power at main disconnect.

On PAGE 51 change step 2. to read:
2. Open left hand side guard door so that overload protective device can be seen.

On PAGE 51 change the last two lines of step 3. to read:
3. observed through the left hand side guard door opening.
I. IDENTIFICATION OF CONTROLS AND COMPONENTS OF THE SUNNEN AUTOMATIC CYLINDER RESIZING MACHINE

1. "Oil" SHUT OFF VALVE
   Regulates flow of honing oil.

2. DRIVE TUBE (Upper Half)
   Transmits the rotation and stroking motion from the Drive Arm to the Hone Head.

3. DRIVE TUBE GUARD

4. DRIVE ARM ASSEMBLY
   Produces the stroking and rotational motion.

5. GRADUATED FEED DIAL ASSEMBLY
   Indicates amount of stone feed, and controls when the honing cycle will stop.

6. INDEX PLATE ASSEMBLY
   Calibrates each graduation on Feed Dial according to tooling being used.

7. HAND WHEEL ASSEMBLY
   Feeds out or retracts stones in Hone Head.

8. "Motor On" INDICATOR LIGHT (Red)
   Indicates that all motors are on.

9. SETUP CHART* (Not Shown)

10. CLUTCH CONTROL LEVER ASSEMBLY
    Push back to start motors; pull forward to engage drive.

11. LIFT LEVER ASSEMBLY
    Lowers the Hone Head into the bore (cylinder) to be honed.

12. OPERATOR CONTROL PANEL
    Houses controls for checking and producing straight bore (cylinder).

13. HONING LOAD METER
    Indicates stone cutting action and cylinder straightness.

14. HONING TIME
    Switch is used to set honing time in seconds, as displayed in the indicator window.

15. BOTTOM OF STROKE
    Indicates when Hone Head is at the bottom of the stroke.

16. POWER ON
    Turns ON electrical power to Machine's Operator Controls; places machine in standby mode.

17. POWER OFF
    Turns OFF electrical power to Machine's Operator Controls; and turns off power to motors, but does not shut off power to the machine.

18. DWELL CYCLES
    Switch is used to set the number of strokes the machine will dwell at the bottom of stroke, as displayed in the indicator window.

19. MODE
    Timed: Machine will hone until the number of seconds on the Honing Time display reaches zero. Zero Shutoff: Machine will hone until zero is reached on the Graduated Feed Dial (5).

20. E-STOP
    Turns OFF power, Stopping the Machine. MUST be released before Power ON Button can be depressed.

21. MAIN ELECTRICAL CONTROL ENCLOSURE
    Contains electrical controls and main switch.

22. DWELL CONTROL BUTTON
    Provides a single dwell cycle when button is depressed; provides continuous dwell for blind holes when outer ring is rotated.

23. "Traverse" HAND WHEEL ASSEMBLY
    Moves the Carriage and Drive Arm sideways, from bore to bore (cylinder to cylinder).

24. POSITIONING LATCH (Hidden)
    Used to hold Cradle in correct angular position.

25. LEVELING SCREW
    Used to level machine.

26. "Oil" NOZZLE
    Directs flow of honing oil.

27. RISER BLOCKS* (Not Shown)
    Adapt different sizes and styles of workpieces (style engine blocks) to the Cradle.

28. CLAMPS NUTS*
    Used to hold workpiece (engine block) to Cradle.

29. CRADLE ASSEMBLY
    Provides the mounting for the workpiece (engine block).

30. CRADLE COUNTERWEIGHT KIT**
    Balances offset cradle when honing small parts.

31. ELEVATING CRANK
    Vertically positions the workpiece (engine block) on the Cradle.

32. AIR VENTS

33. COVERS

34. COVER CLAMPS

35. FILTER CANISTERS

36. STANDPIPES

37. DRAIN COCKS

38. FILTER ELEMENT STORAGE AREA
    * Supplied with CK-1200 Clamp Kit (ordered separately).
    ** Should be removed when honing V-type engine blocks.
Power up the Machine:

6. Raise Disconnect Switch on Main Control Panel.

7. Set Mode Switch to Zero Shutoff or Timed. Timed: Machine will hone until the number of seconds on the Honing Time display reaches zero and head is at top of stroke. Zero Shutoff: Machine will hone until zero is reached on the graduated feed dial and head is at top of stroke.

8. Rotate E-Stop Button to release.


11. Raise the front panel splash doors.

12. Push Clutch Control Lever toward the back of the drive arm to start the motors. See Figure 37.

WARNING: Do not pull Clutch Control Lever unless hone head is in the bore.

13. Direct oil spout so that cylinder receives good flow of oil.

14. Pull Clutch Control Lever forward slowly, but steadily until it hits the stop. This action engages the main drive belts.

NOTE: Machine will shut off automatically when the feed dial and feed handwheel move to "0" in the zero shutoff mode or when the honing time display reads "0" in the timed mode.

B. REMOVING TAPER FROM OPEN CYLINDER

1. Start honing the tapered cylinder and adjust the feed dial as directed in Section IV.C.

2. Set Dwell Cycle to required number of dwells. Approximately one dwell is required for each .001" (0.025mm) of taper as determined in setup (Section III.E.). See Figure 38.

NOTE: Make sure outer ring of Dwell Control set at SINGLE. See Figure 39.

3. Observe the Honing Load Meter to check cylinder straightness after the dwell cycle stops. See Figure 40.

a. The meter's display is calibrated at the factory to display zero load when the machine is stroking with no honing load, and 100% when the machine is running at its two horsepower limit.
b. If the display "swings" more than 10 points (i.e. the difference between the position of the "bar" and the "dot" is more than 10 points), and the yellow light flashes when the bar moves to the left (in the direction of the decreasing load), wait several strokes to see if the distance between the bar and the dot decreases. If load continues to vary by more than 10 points, rotate the Elevating Crank one turn counterclockwise to lower the engine block. When the load display settles back to less than a 10 point swing, raise the block back to its original position. If engine block required lowering, decrease the number of dwells for the next cylinder. See Figures 39 & 41.

c. If the load display "swings" more than 10 points (i.e. the difference between the

C. HONING TO SIZE

FIRST CYLINDER ONLY

1. Gage the cylinder. Determine the amount of stock removal required for the desired standard over size. See Section III.E. If you are rough honing, plan to leave .003" (0.08mm) for finish honing. As an example we will assume .007" (0.18mm) of stock needs to be removed.

2. Place the hone head in the cylinder and expand the stones by turning the Feed Handwheel to the left. Shake the drive tube and make sure the stones are expanded against the cylinder walls. See Figure 44.

3. Adjust the Feed Dial for the amount of stock to be removed. In our example you would move the Feed Dial – the Feed Handwheel does not move – until it shows 7 (18 for metric machines).

If there were no stone wear, the machine would hone the cylinder to size without any additional adjustment. However, there is stone wear and you must compensate for it on each cylinder, if you are going to “hit size”.