Sequence VH O&H Meeting
May 21ST, 2024 at 3PM EST via MS Teams

Attendees: Mike Deegan, Al Lopez, Tony Catanese, Ben Maddock, Bob Campbell, Rich Grundza

Overview:

1. Organized Build Workshop Actions
2. Fuel
3. Hardware
4. Operation

Notes:

1. **Build Workshop Actions**

Intertek – Confirmed values but need to investigate OHT vs Sunnen part, Al to follow-up

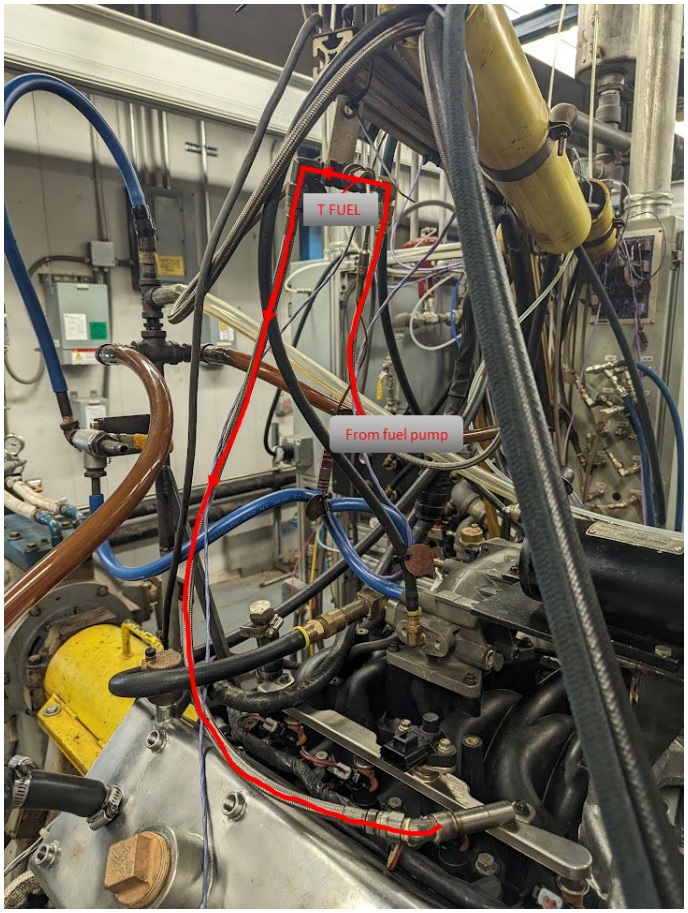
- 7.8.5.1: Ring grinder bit part number SA-81 CYL S/C
- 7.8.4.1, Step 5: Defines brushes
    - IAR: C30-PHT-731 brush part number
    - or
    - SwRI & Afton: OHT3G-096-1

Afton – Partially complete, needs final refinement

- 7.8.4.1 The group to standardize on identical surface analyzer
    - Suggested Mitutoyo SJ-410 (IIIH)
    - Define stylus and probe diameter
    - Define analyzer settings and filters
    - Two measurements middle and top
- Investigate load calibration options with Sunnen machines
    - Sunnen: Zero only, ignore span
    - Historical option: Zero and Span with external load device

SwRI:

- Fuel temperature control
    - Labs to investigate on what's typical and where to land
        - Afton: 30 to 45 C
        - Intertek: 29 to 42 C
        - SwRI: 20 to 42 C
    - Identify Fuel Rail temp location
        - Intertek & SwRI: ~2ft from fuel rail
        - Afton: ~6ft from fuel rail



    - Add to op data study to help guide
        - Rich to add to Op Data Study template
- Verify fuel injector prep requirement - TBC
    - Hot pink (latest superseded #) are regarded as lower quality

Valvoline: - TBC

- Blowby tree cleaning was questioned but no fully explored
    - Hose replacement frequency?
- RAC system VFD option was proposed
- Bore gauge tip diameter definition
    - Poll the labs to identify commonality that may already exist

Lubrizol: - TBC

- Coordinated reference
    - Labs are receptive but timing and logistics could be challenging
    - Pat Lang suggested that a number of engines are built at one lab and then shipped to the others for testing.

2. Fuel

- Afton received samples from Haltermann before and after AO was replenished to the fuel batch. Afton also testing a sample from the recent shipment of the latest fuel batch and will track AO depletion over time

Description	AO Content (ppm)
Before from Haltermann	0.3
Truck	0.7
After from Haltermann	9

  -
  - Analytical team working on titrating samples to verify accuracy

- Afton will also work to formalize a procedure for all analytical labs to use so that they're empowered to perform the same analysis
-
- Lubrizol sent Haltermann Solutions a sample of their bad fuel with high washed gums to help understand what occurred

3. Hardware

- FCS Order through TEI
  - A concern was raised about where these overstock pistons come from?
    - A set of pistons back in early VH days was rejected due to excessive staining
    - Ford will supply a sample from each size to TEI and/or Intertek to evaluate condition
- TEI Dyno harness unavailable
  - 10-week delay with no clear path from supplier
- Camshafts
  - Original manufactured by Romeo Engines who are no longer in business
    - Deegan is looking for the forgings to supply alternate supplier such as IMTS

4. Operation

- Honing Data from PM was shared by the TMC and briefly reviewed as a group with no significant follow-up actions defined
  - Labs agreed to standardized on measurement technique first, ensure all labs are taking required surface parameters to calculate crevice volume, then leverage next fuel approval matrix data to redefine Ra into modern parameters

- OSCR Workshop
  - TMC agreed to supply a summary to this group

- Operational Data Study: N-10-1 approval matrix vs PM
  - Proposed timing: Labs to provide data in the correct format for analysis by 6/21/2024

Honing Machine Calibration

As Found:

%	Watts	Volts	Psi
10	714	1.357	190
20	835	1.418	245
30	959	1.480	300
40	1082	1.540	355
50	1203	1.602	410
60	1325	1.662	465

After making adjustments to machine to make numbers better correlate to previous years, we bench tested the pressure gauge and found it read ~20psi high. Thus "As Left" values show our compensation to pressure. It is recommended to purchase a 500psi pressure gauge for next time and pre-calibrate it for validity.

As Left:

%	Watts	Volts	Psi
10	695	1.348	165
20	821	1.410	225
30	945	1.472	300
40	1064	1.532	335
50	1195	1.598	390
60	1318	1.660	445

EXAMPLE ONLY
4/13/2012

Motions and Action Items
As Recorded at the Meeting by Bill Buscher

1. Action Item – Ford to investigate alternate suppliers for piston rings. If aftermarket rings from an alternate supplier are available for one or more of the Sequence VG piston/bore sizes, then Ford will acquire some of these piston rings for comparison to the current Sequence VG piston rings.

2. Action Item – Labs to use fuel tanks for the fuel approval matrix tests that have been drained of all Haltermann SVGM2 fuel from a previous fuel batch or that have been thoroughly cleaned if the previous fuel was something other than SVGM2 fuel.

3. Motion – Labs will use their pilot batch test stand for Row 1 fuel approval matrix tests. Labs will conduct Row 1 of the fuel approval matrix design only as fuel approval tests, charging Haltermann for these tests.

   Ron Romano / Rich Grundza / Passed 12-0-1

4. Motion – If no statistical significant differences are found between fuel batches, then labs will conduct Row 2 of fuel approval matrix design. Labs will use their pilot batch test stand for Row 2 fuel approval matrix tests. Prior to starting the Row 2 tests, the labs have the option to declare the Row 2 tests as calibration tests, as well as fuel approval tests. If the lab decides to conduct their Row 2 test as a calibration test, then Haltermann will charge the lab for the fuel used in the Row 2 test and the lab will not charge Haltermann for their test.

   Ron Romano / Bill Buscher / Passed 11-0-2

5. Motion – The labs can also choose to run calibration tests on additional test stands concurrent with the Row 2 tests, and data from these tests will be included in the calculation of correction factors, unless statistically significant differences can be found in the test results.

   Bill Buscher / Dwight Bowden / Failed 2-3-8

Honing machine load testing rig procedure

(1) Lock out power to honing machine.
(2) Remove shaft and honing head.
(3) Turn power back on.
(4) Check honing fluid flow it should be 7 LPM make adjustments as needed.
(5) Lockout honing machine power.
(6) Remove one of the engine block rest plates from the block mounting table.
(7) Position the honing head to the right side of the machine.
(8) Remove the drive belt that drives the stroke, It is the lower belt.
(9) Remove the torque meter from the box and set it on the block rest table with the driveshaft pointing outward.
(10) Secure the torque meter to the table using the 2 plates and bolts supplied.
(11) Connect the shafts
(12) Put a diverter pipe over the honing fluid discharge pipe to divert the splatter.
(13) Put the supplied hydraulic fluid into the torque meter reservoir.
(14) Unlock the power.
(15) Have Instrument Tech hook up a volt meter across the output resistor of the watt transducer located in the control box on the side of the honing machine.
(16) Turn on the honing machine power as normal and then with the knob on the load meter adjust the load to different set points on the % load meter to 10, 20, 30, 40, 50, 60, and record the watts amp draw and then the pressure from the load meter.
(17) Confirm that the readings match old data to ensure the machine is running properly.
(18) Lock out the power
(19) Remove the shaft.
(20) Remove the honing fluid diverter pipe.
(21) Attach hoist.
(22) Remove locking plates and bolts.
(23) Lift out the load meter and tie the driveshaft back into its shipping position.
(24) Drain out the hydraulic fluid back into the containers.
(25) Put the load meter in the box.
(26) Put the fluid containers and the box with the hold down plates and bolts into the box.
(27) Secure the meter in the box as it was and put on the lid and ship it out.
(28) Put the engine rest plate back onto the table.
(29) Reattach the shaft and honing head.
(30) Reinstall the drive belt.
(31) Clean up any mess.
(32) Unlock the power.

http://www.sunnen.com

CALIBRATION INSTRUCTIONS for SUNNEN® CV-616 VERTICAL HONING MACHINE

GENERAL

The CV-616 must be calibrated to the line voltages encountered in your shop. This will give you the ability to adjust the display so that 100% on the display matches the FLA (Full Load Amps) of the spindle motor.

The only adjustment necessary is to the potentiometer labeled “ZERO”. The potentiometer labeled “GAIN”, should not be touched. Once the machine has been calibrated to a particular locations line voltage, it will not require any future adjustments.

CALIBRATION PROCEDURE

Once the machine has been prepared for service, for safety reasons, place a tool in the spindle and place a scrap work piece on tool during calibration.

Then calibrate as follows:

1. Open the operator station enclosure and locate the “ZERO” potentiometer on the CV-1627 circuit board (it is near the top of the enclosure). If orange torque seal has been placed on the potentiometer, it must be carefully scraped off so that the potentiometer can be turned freely.

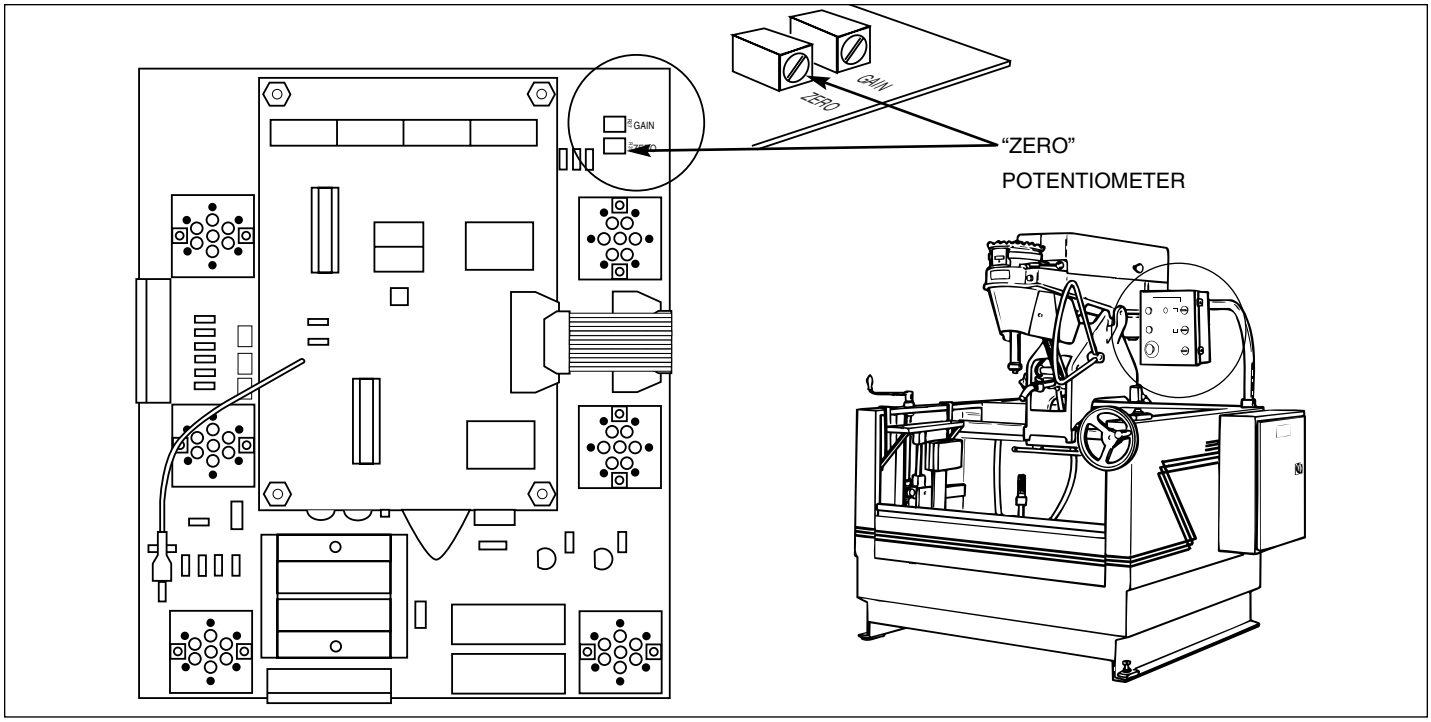
2. Set the feed rate at one and make any stroke adjustments necessary for the scrap work piece.

3. Turn the power to the machine on, retract the stones fully, and start the motor. Engage the spindle/stroker motor.

NOTE: It is imperative that there is no load between the stones and the work piece.

4. With a small screwdriver, adjust the “ZERO” potentiometer until you get a 10 to 15% reading on the load display.

5. Turn the machine off. At this time, check the tooling in the work piece. If a load exists between the stones and the work piece, steps 3 and 4 must be repeated.



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