Appendix C. UT-GOM2-2 Site H Pressure Coring Deployment Data

This appendix contains plots of rig, wireline, and data storage tag (DST, pressure and temperature) data as a function of time for each pressure coring tool deployment.

Contents

Introduction: Explanation of Figures

Eight figures are provided for each pressure coring deployment. Figures A, B, C, and D display the entire deployment, from wireline core barrel deployment through wireline core barrel recovery to the rig floor (see examples in Figure 1, Figure 2, Figure 3, and Figure 4. Figures A1, B1, C1, and D1 provide higher resolution on the period from initiation of rotary coring through unlatching of the core barrel (see gray boxes Figure 1, Figure 2, Figure 3, and Figure 4). For each deployment, Figures A, B, C, and D are stacked vertically on the left and Figures A1, B1, C1, and D1 on the right. Vertical dashed lines extend through all the figures highlighting the timestamp of specific events (Figure 1, dashed vertical lines).

Figures A and A1 plot hole depth, bit depth, wireline tool depth, high-viscosity sweep depth, and wireline tension as a function of time. They illustrate the start and end of coring, arrival of the sweep at the bit, difficulties with unlatching, wireline delays at the seafloor, and wireline speed (Figure 1). Figures B and B1 highlight changes in temperature and pressure as a function of time, recorded by three sensors: two inside the PCTB (labeled in the figures as core and autoclave) and the other above the PCTB assembly in the wireline sinker bar (labeled in the figures as pipe). They illustrate if and when the PCTB seals, if the sealed pressure is boosted, when the core barrel is placed in the cold shuck, and if the acquired core stays within the hydrate stability boundary (Figure 2). The figures can also be used to see a buildup of pressure in the pipe, if flow through the bit becomes partially blocked. Figures C and C1 highlight coring conditions (Figure 3). Figures D and D1 expand on Figures A and A1 and cover approximately a 100 ft range around coring depth (Figure 1, light blue box). They illustrate latching and unlatching of the core barrel from the bottom hole assembly (BHA) (Figure 4).

All data were collected in 1-second increments unless noted in the figure captions. A description of the steps in a pressure coring tool deployment using these same figures can be found in Methods: Pressure Coring Tool with Ball Valve (Flemings et al., 2025)

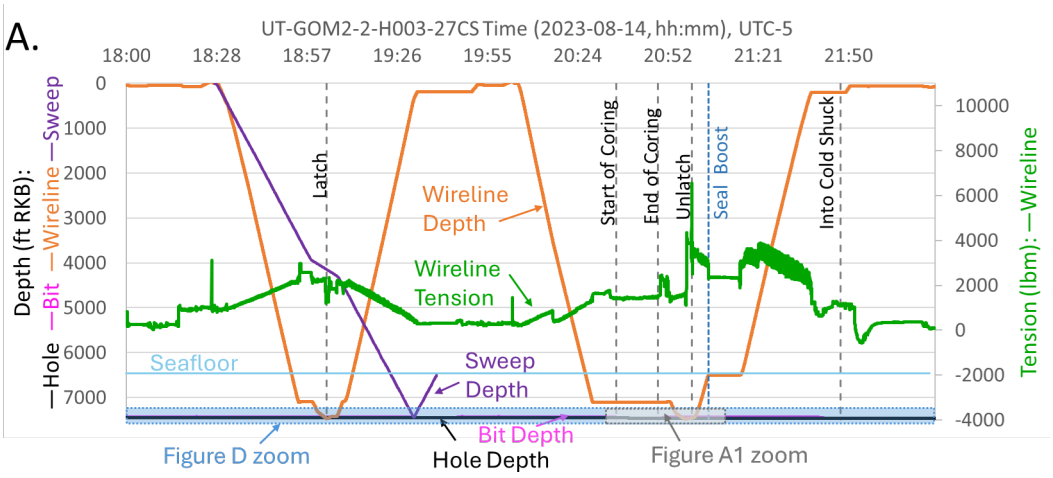

Figure 1. Example Figure A. Hole depth (solid black line), bit depth (solid magenta line), wireline tool depth (solid orange line), and wireline tension (solid green line) as a function of time. The wireline tool depth is not calibrated to the rig floor, thus 0 ft RKB wireline tool depth is not the same as 0 ft RKB of the hole or bit. As a result, the wireline may appear deeper than the hole or too shallow in the

hole. The calculated high-viscosity sweep depth (solid purple line) as a function of time is also presented if a sweep was used. The method for determining sweep depth is presented in Methods: Pressure Coring Results (Flemings et al., 2025). The light gray box shows the zoomed in area for Figure A1. The light blue box shows the zoomed in area for Figure D (see Example Figure D). Vertical dashed lines show the time of specific events in the coring deployment as labeled.

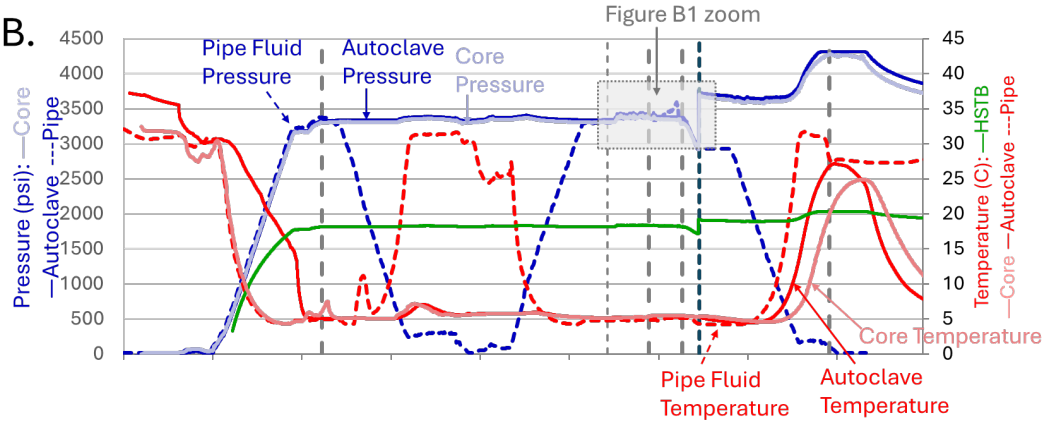

Figure 2. Example Figure B. Pressure of the drilling fluids in the pipe at the wireline sinker bar (dashed blue line, in 10-15 second intervals), autoclave pressure (solid blue line), core pressure (solid light blue line), temperature of the drilling fluids in the pipe at the wireline sinker bar (dashed red line), autoclave temperature (solid red line), and core temperature (sold pink line) as a function of time. The locations of the data storage tags (DSTs) are presented in Methods (Flemings et al., 2025). Figures B also plots the calculated hydrate stability temperature boundary (HSTB, solid green line) as a function of time. The HSTB is calculated from the autoclave pressure assuming seawater salinity (3.5% NaCl). Any hydrate present in the core will be stable if the core temperature stays below this boundary and may remain stable even if it crosses the boundary for several minutes. The method for determining the hydrate stability boundary is presented in Methods (Flemings et al., 2025). The light gray box shows the zoomed in area for Figure B1. Vertical dashed lines show the time of specific events in the coring deployment as labeled in Figure A.

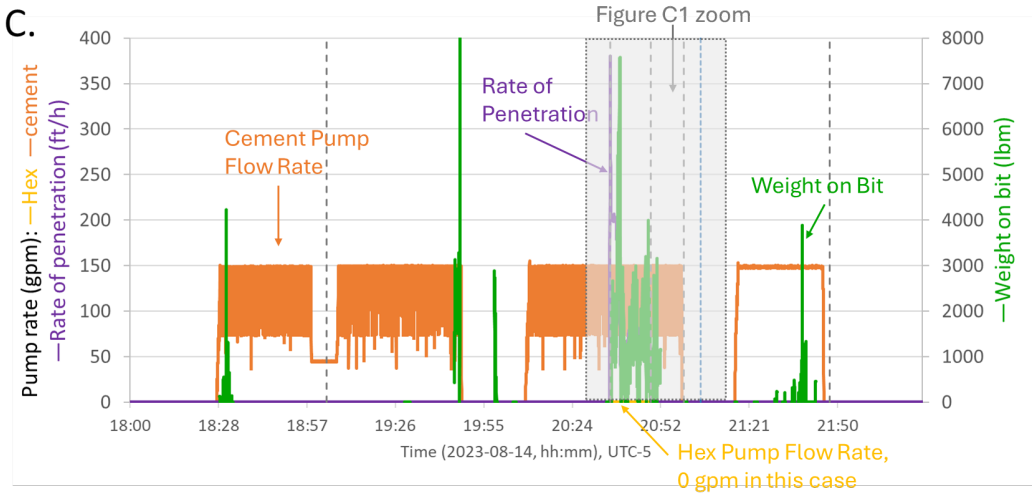

Figure 3. Example Figure C. Hex pump rates (combined flow rate from all hex pumps as a solid yellow line), cement pump rates (combined flow rate from all cement pumps as a solid orange line), rate of penetration (solid purple line), and weight on bit (WOB, solid green line) as a function of time. WOB is calculated from hook load (see Methods: Weight on Bit (Flemings et al., 2025) for a discussion WOB). The light gray box shows the zoomed in area for Figure C1. Vertical dashed lines show the time of specific events in the coring deployment as labeled in Figure A.

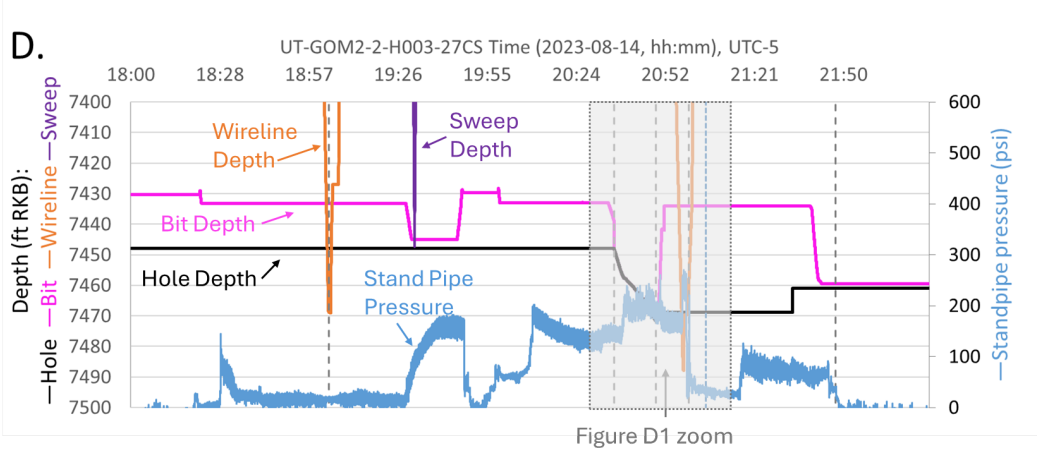

Figure 4. Example Figure D. Hole depth (solid black line), bit depth (solid magenta line), wireline tool depth (solid orange line), and wireline tension (solid green line) as a function of time. The wireline tool depth is not calibrated to the rig floor, thus 0 ft RKB wireline tool depth is not the same as 0 ft RKB of the hole or bit. As a result, the wireline may appear deeper than the hole or too shallow in the hole. The calculated high-viscosity sweep depth (solid purple line) and standpipe pressure (solid light blue line) as a function of time are also shown. The method for determining sweep depth is presented in Methods: Pressure Coring Results (Flemings et al., 2025). The light gray box shows the zoomed in area for Figure D1. Vertical dashed lines show the time of specific events in the coring deployment as labeled.

UT-GOM2-2-H003-Full function test

One full-function test of the PCTB in the cutting shoe configuration (PCTB-CS) was conducted prior to spudding H003. This test was conducted while suspending the BHA in the water column at 2047 ft RKB. The PCTB-CS boost pressure was set to 3500 psi. The core barrel was lowered in the drill string and latched into the BHA. The core barrel was then unlatched to actuate the tool and brought back to the rig floor. The measured recovery pressure in the autoclave was 2672 psi, 1,744 psi over the interpreted hydrostatic pressure of 928 psi. Thus, the PCTB-CS both sealed and captured a pressure boost. Rig, wireline, and DST data were not recorded during this test, so no figures are available.

Core UT-GOM2-2-H003-04CS

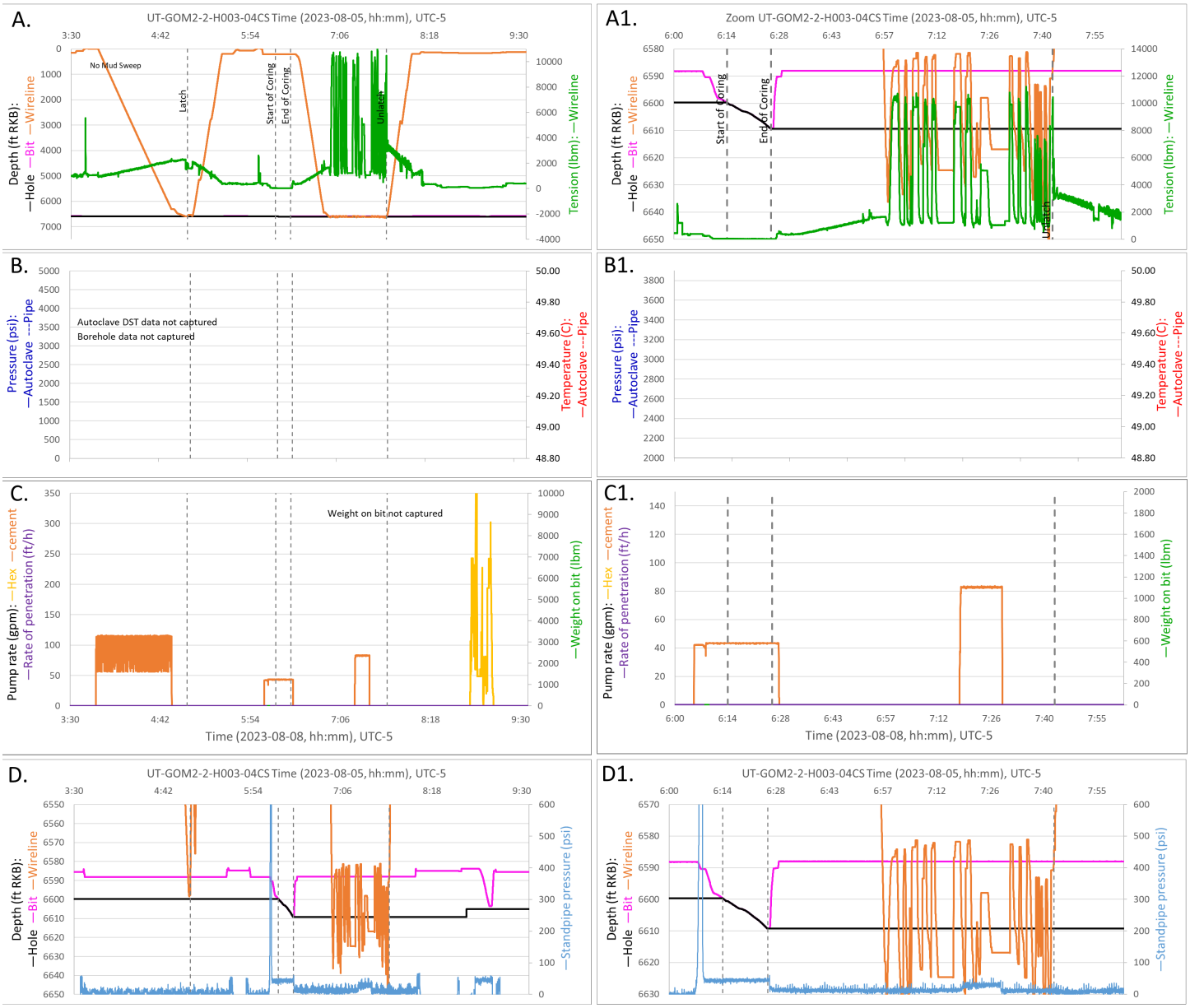

Figure 5. UT-GOM2-2-H003-04CS pressure coring data. Core depth was 6595–6605 ft RKB (27.1–30.2 mbsf). Coring was conducted with seawater. Core was recovered at a pressure of 0 psi with the ball valve open and the ball packed with mud; A and D) No high-viscosity sweep was deployed; A and A1) Wireline tension shows that many attempts were required to unlatch the tool; B. and B1) Pipe, autoclave, and core data storage tag data were not captured for this core; C and C1) Weight on bit was not captured for this core.

Core UT-GOM2-2-H003-05CS

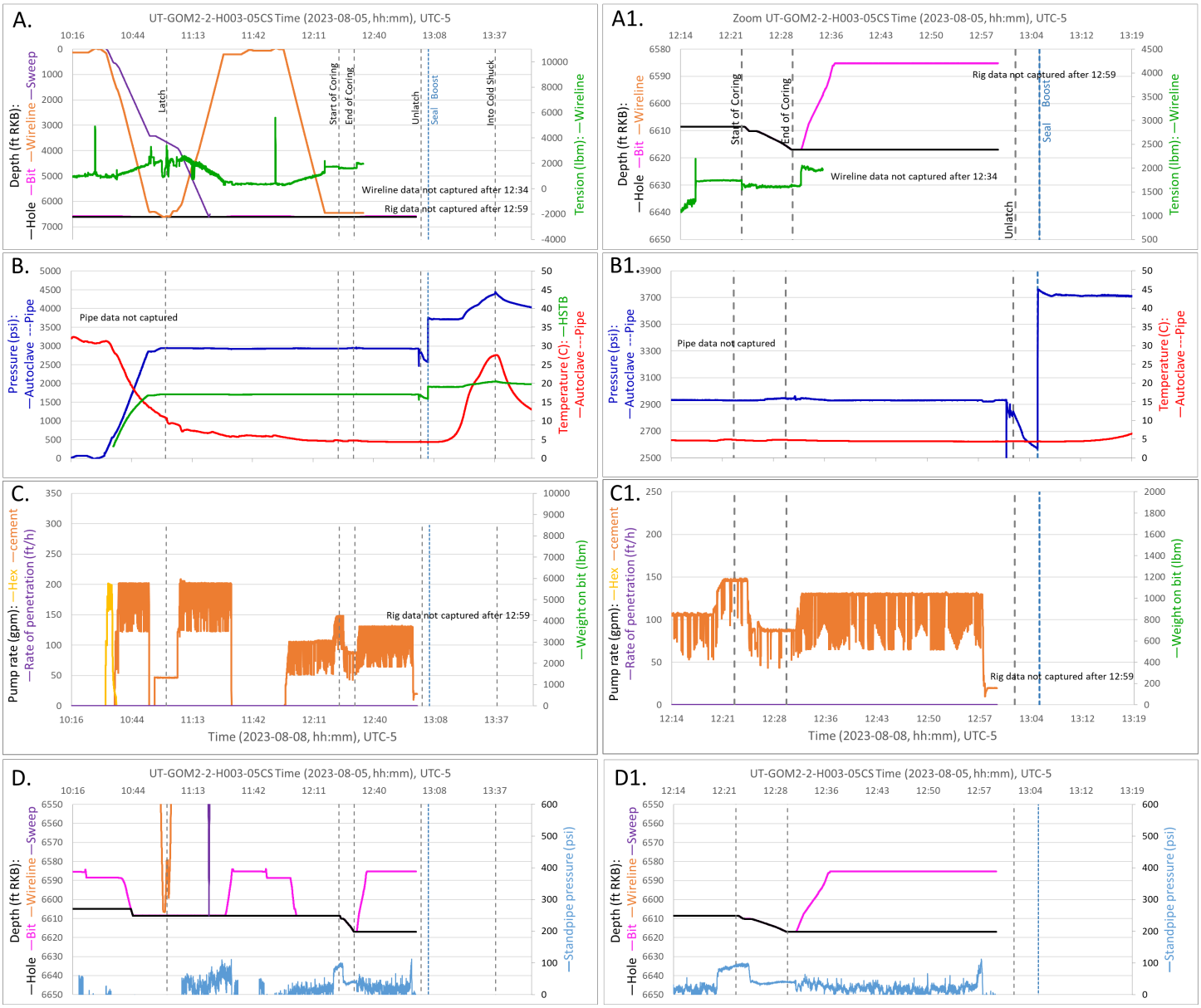

Figure 6. UT-GOM2-2-H003-05CS pressure coring data. Core depth was 6605-6612 ft RKB (30.2-32.3 mbsf). Coring was conducted with seawater. Core was recovered at a pressure of 3475 psi; A and A1) High-viscosity sweep arrived before the pumps are shut off. Rig data were not available after 12:59 and wireline data were not available after 12:34. Because the wireline data were not available at the time of tool sealing, the seal depth was estimated from the seal pressure; B and B1) Pressure history shows late sealing below in-situ pressure followed by a pressure boost; B and B1) No pipe or core data storage tag data were available for this core; C and C1) Weight on bit and instantaneous rate of penetration were not properly captured during this time. Rig data were not available after 12:59; D and D1) Rig data were not available after 12:59.

Core UT-GOM2-2-H003-08CS

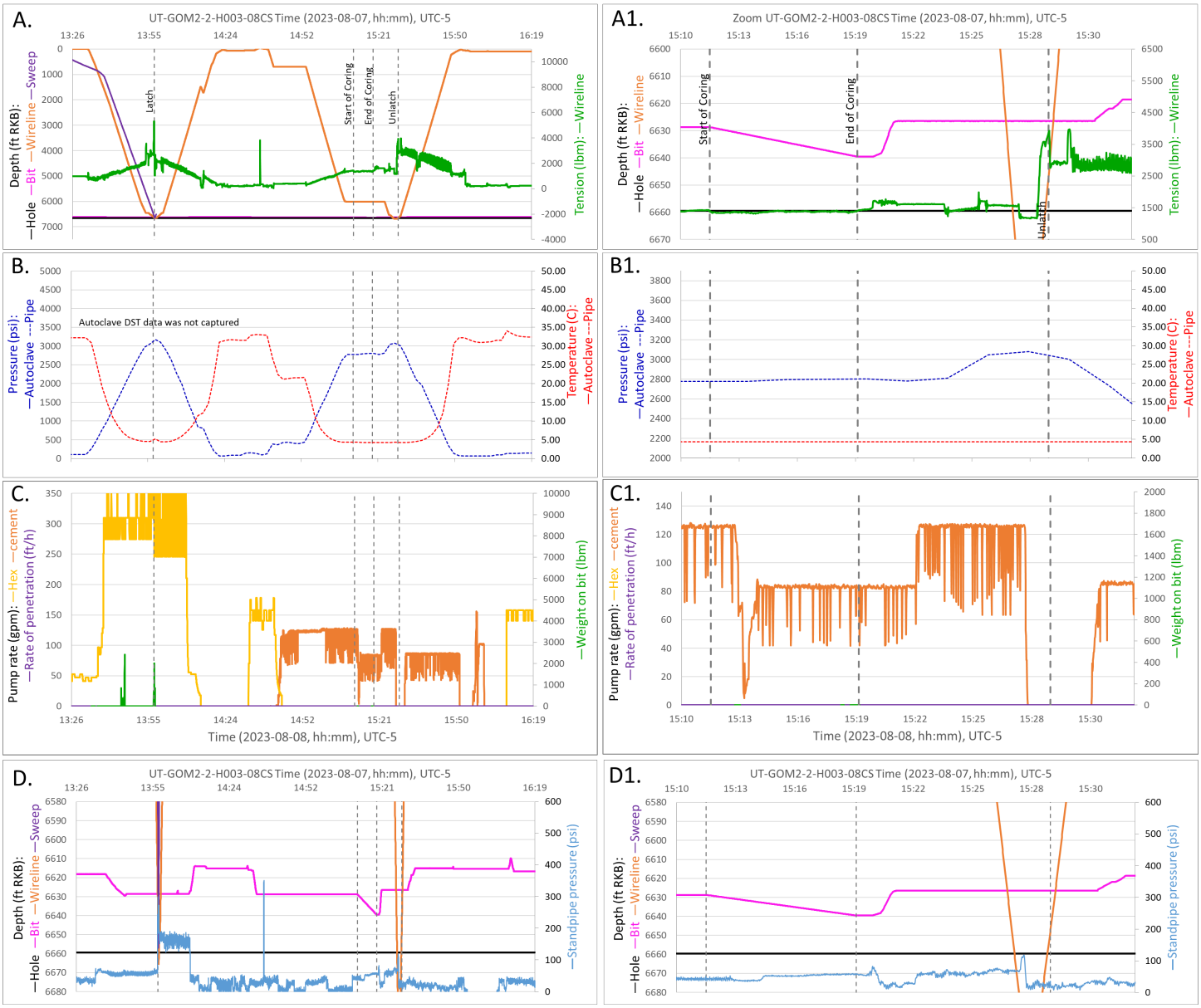

Figure 7. UT-GOM2-2-H003-08CS pressure coring data. Core depth was 6659 – 6669 ft RKB (46.6 – 49.7 mbsf). Coring was conducted with seawater. Core was recovered at a pressure of 2075 psi; A and A1) High-viscosity sweep arrives at the BHA while latching the core barrel; B and B1) Autoclave and core data storage tag data were not captured. Time of sealing and capture of a pressure boost could not be assessed; C and C1) Weight on bit and instantaneous rate of penetration were not properly captured during this time.

Core UT-GOM2-2-H003-13CS

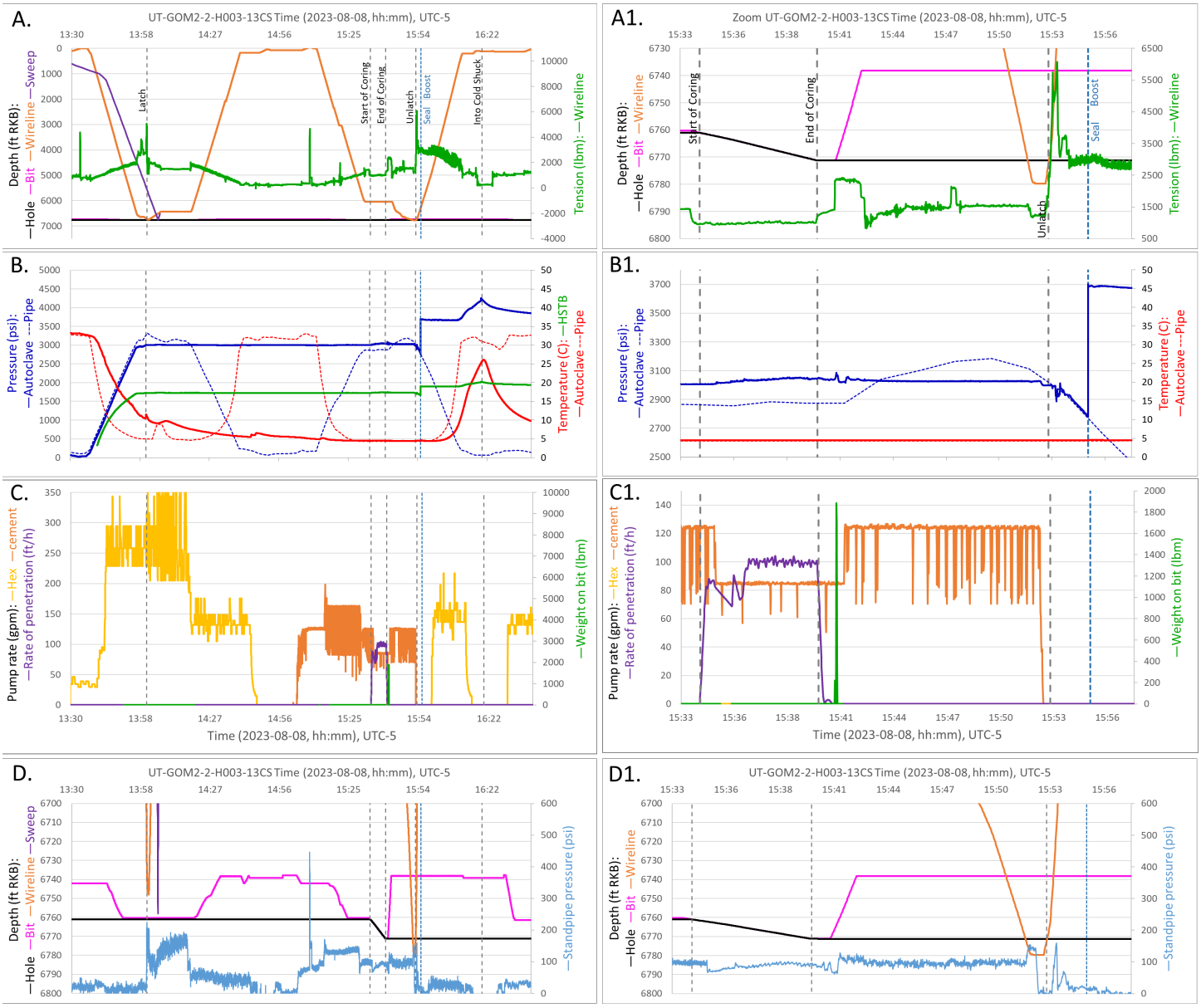

Figure 8. UT-GOM2-2-H003-13CS pressure coring data. Core depth was 6761-6771 ft RKB (77.1-80.7 mbsf). Coring was conducted with seawater. Core was recovered at a pressure of 3531 psi; A and A1) High-viscosity sweep arrives before the pumps are shut off; B and B1) Core data storage tag data were not captured. Pressure history shows late sealing below in-situ pressure followed by a pressure boost; C and C1) Weight on bit data is questionable and not fully captured.

Core UT-GOM2-2-H003-15CS

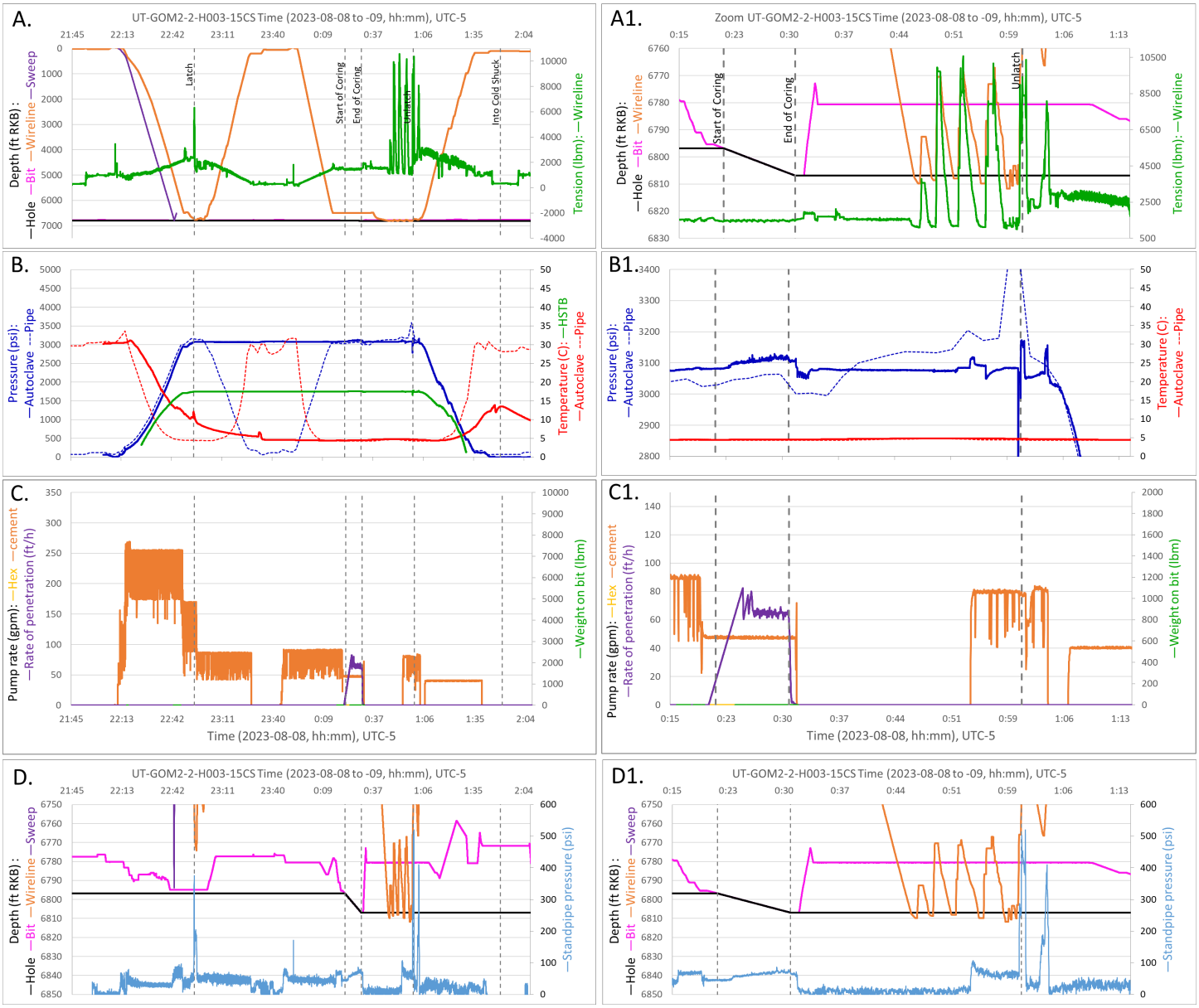

Figure 9. UT-GOM2-2-H003-15CS pressure coring data. Core depth was 6771-6781 ft RKB (88.4-91.4 mbsf). Coring was conducted with seawater. Core was recovered at a pressure of 0 psi with the ball valve open and the ball packed with mud; A and A1) High-viscosity sweep arrives before the core barrel is latched. Wireline tension shows that several attempts were required to unlatch the core barrel; B and B1) Core data storage tag data were not captured; C and C1) Weight on bit was not properly captured for this core.

Core UT-GOM2-2-H003-19CS

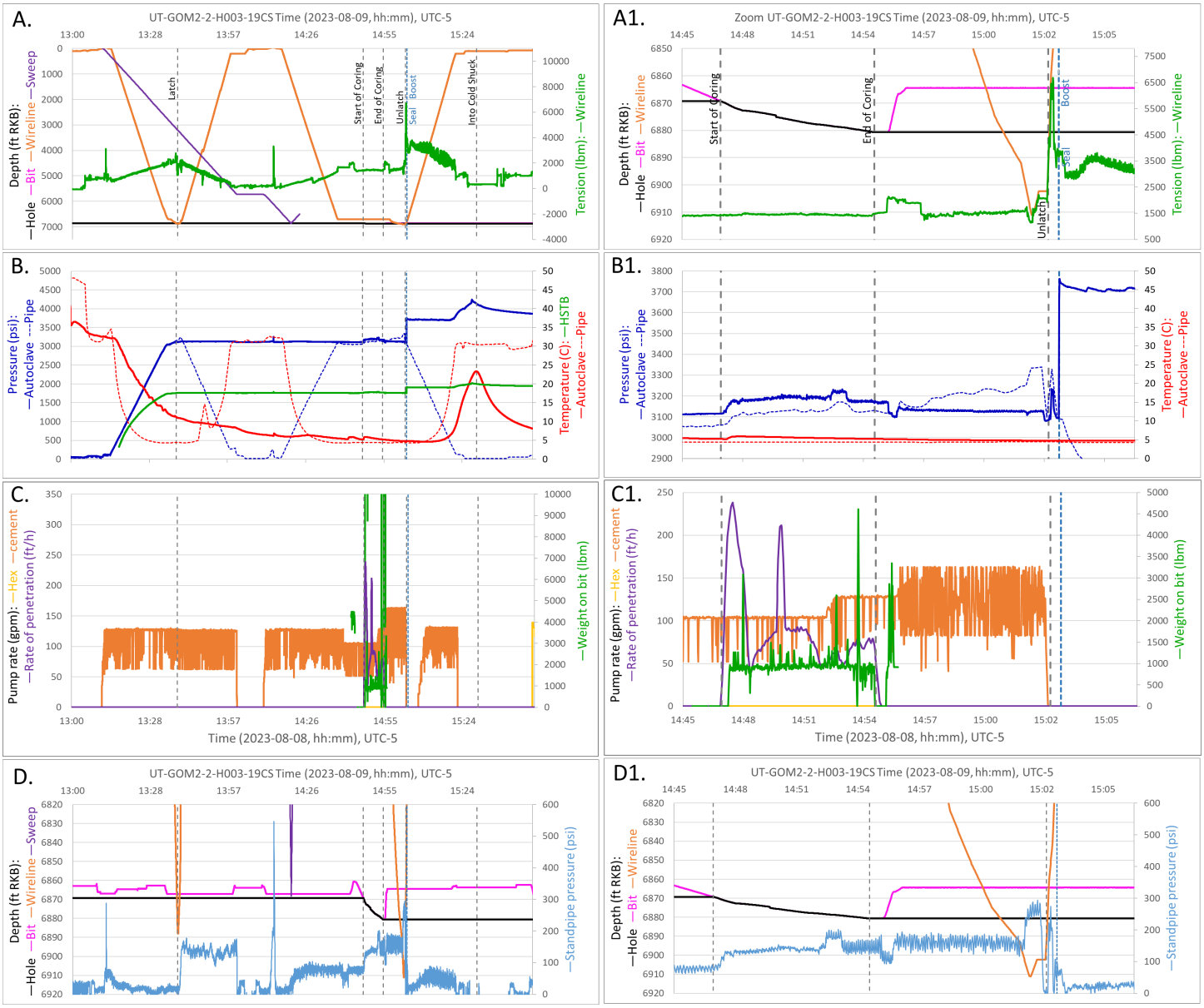

Figure 10. UT-GOM2-2-H003-19CS pressure coring data. Core depth was 6870 – 6880 ft RKB (110.9-113.9 mbsf). Coring was conducted with seawater. Core was recovered at a pressure of 3042 psi; A and A1) High-viscosity sweep arrives after the pumps are turned back on; B and B1) Core data storage tag data were not captured. The pressure coring tool sealed late but close to in-situ pressure because the pipe pressure was elevated.

Core UT-GOM2-2-H003-24CS

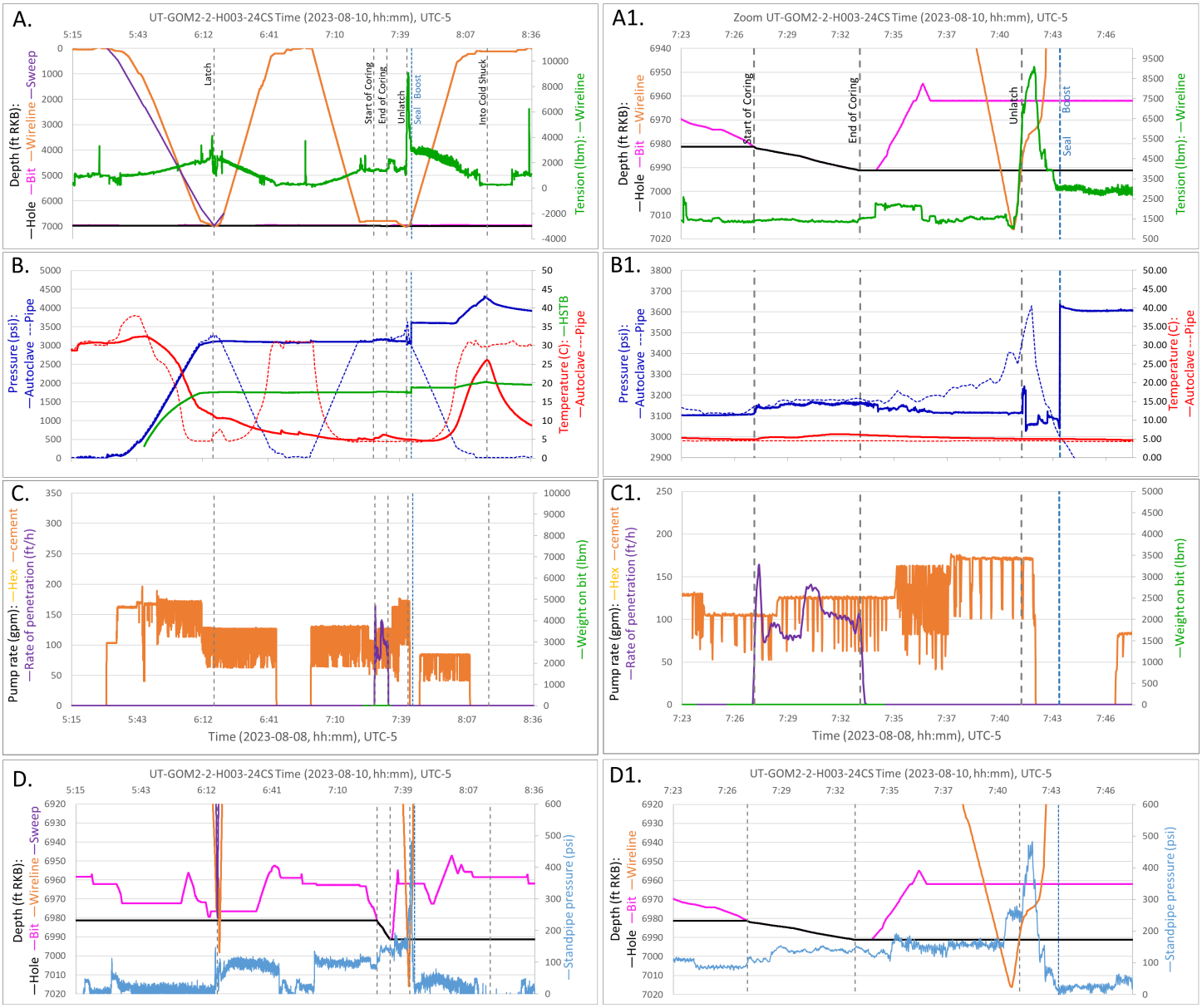

Figure 11. UT-GOM2-2-H003-24CS pressure coring data. Core depth was 6980 – 6990 ft RKB (144.5 – 147.5 mbsf). Coring was conducted with seawater. Core was recovered at a pressure of 3091 psi; A and A1) High-viscosity sweep arrives as the core barrel is being latched; B and B1) Core data storage tag data were not captured. Pressure history shows that the pressure coring tool sealed late but at close to in-situ pressure because the pipe pressure was elevated; C and C1) Weight on bit was not properly captured.

Core UT-GOM2-2-H003-27CS

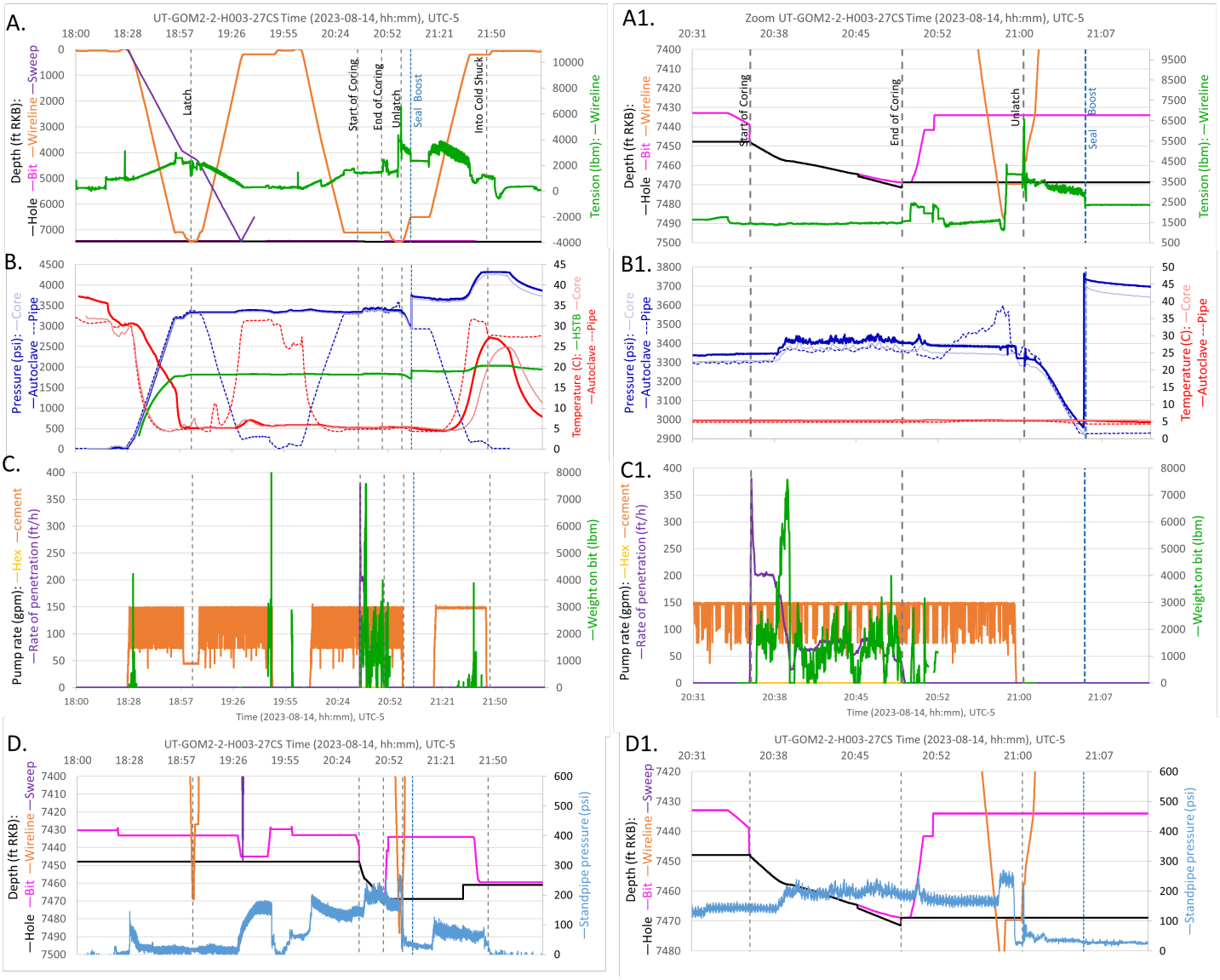

Figure 12. UT-GOM2-2-H003-27CS pressure coring data. Core depth was 7448 – 7458 ft RKB (287.1 – 290.8 mbsf). Coring was conducted with seawater. Core was recovered at a pressure of 3531 psi; A and A1) High-viscosity sweep arrives before the pumps are shut off; B and B1) Pressure history shows that the pressure coring tool sealed below in-situ pressure and was followed by a pressure boost. Core temperature rises above the hydrate stability boundary during recovery of the core barrel to the rig floor. The core may have gone out of the hydrate stability boundary for a few minutes assuming the sensor was in thermal contact with the core. No evidence of hydrate dissociation is present. When dissociation occurs the core temperature rides along the hydrate stability temperature boundary.

Core UT-GOM2-2 -H003-28CS

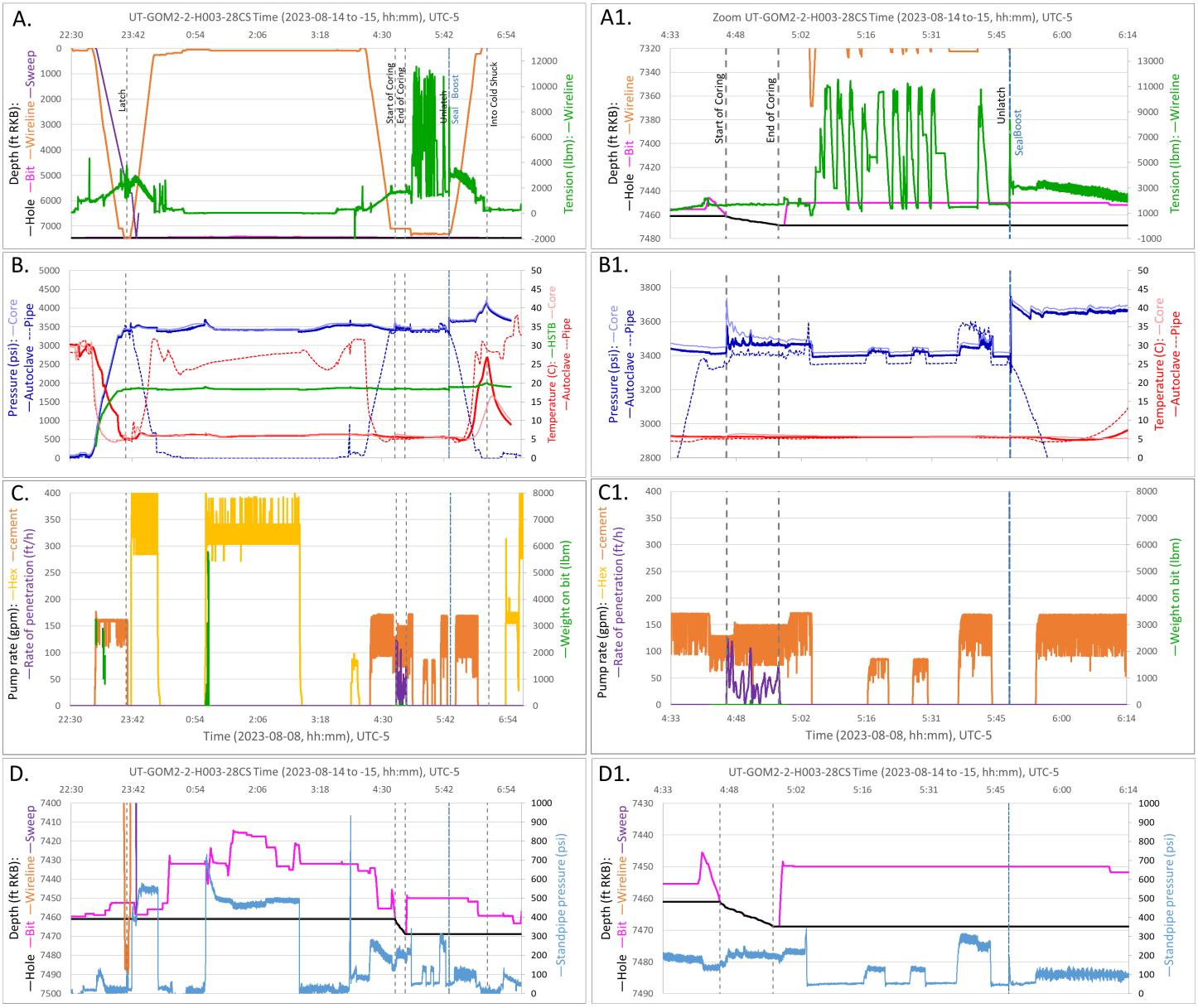

Figure 13. UT-GOM2-2-H003-28CS pressure coring data. Core depth was 7460-7470 ft RKB (290.8-293.8 mbsf). Coring was conducted with seawater. Core was recovered at a pressure of 3478 psi; A and A1) High-viscosity sweep arrives before the pumps are shut off. Wireline tension shows that many attempts were required to unlatch the core barrel; B and B1) Pressure history shows that the pressure coring tool seals and the pressure is boosted as the core barrel unlatches. It is unclear when the pressure coring tool was actuated. Actuation was assumed to have occurred during one of the attempts to unlatch, thus sealing is assumed to be late. Core temperature does not rise as high as the autoclave or pipe temperature during recovery of the core barrel to the rig floor. The core stays within the hydrate stability boundary; C and C1) Weight on bit was not properly captured.

Core UT-GOM2-2-H003-29CS

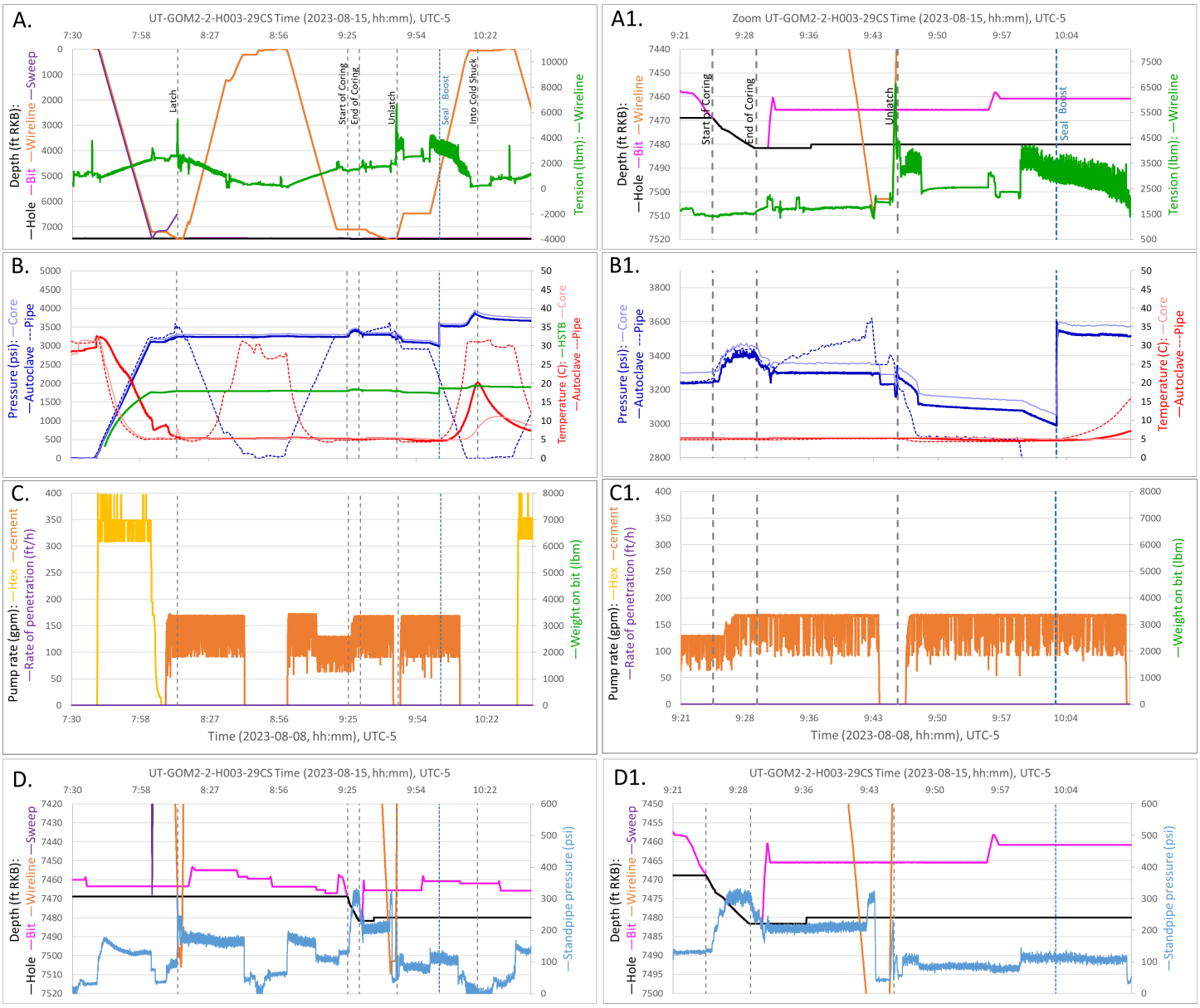

Figure 14. UT-GOM2-2-H003-29CS pressure coring data. Core depth was 7470 – 7480 ft RKB (293.8 – 296.9 mbsf). Coring was conducted with seawater. Core was recovered at a pressure of 3480 psi; A and A1) High-viscosity sweep arrives before the core barrel is latched. B and B1) Pressure history shows that the pressure coring tool partially seals after unlatching until the tool fully seals when the pressure is boosted. Core temperature does not rise as high as the autoclave or pipe temperature during recovery of the core barrel to the rig floor. The core stays within the hydrate stability boundary; C and C1) Weight on bit and instantaneous rate of penetration were not properly captured.

Core UT-GOM2-2-H002-01FB

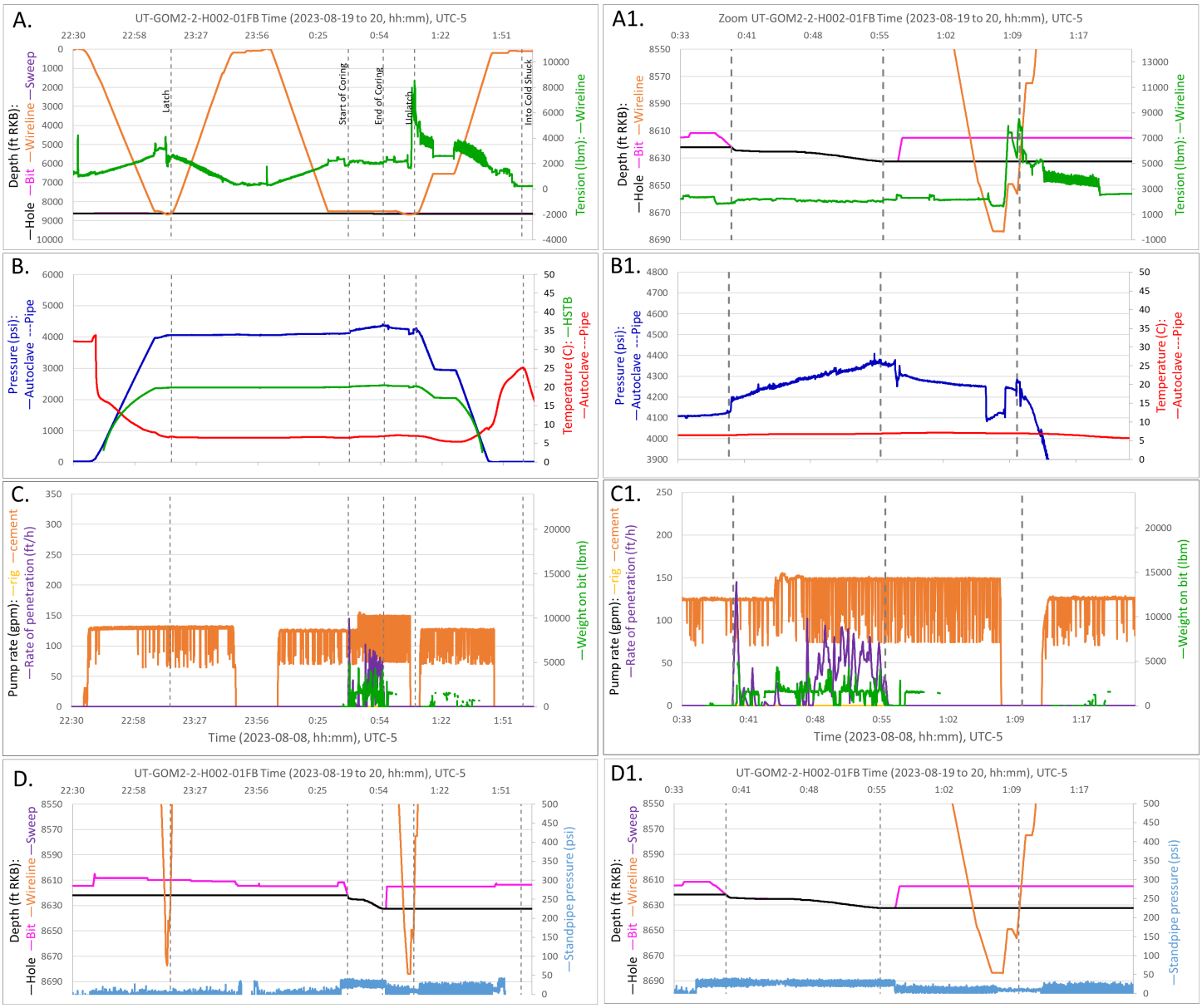

Figure 15. UT-GOM2-2-H002-01FB pressure coring data. Core depth was 8621-8631 ft RKB (644.6-647.7 mbsf). Coring was conducted with 10.3 ppg water-based mud. Core was recovered at a pressure of 0 psi with the ball valve closed and the upper seal open; A and D) No high-viscosity sweep was deployed; B and B1) Pipe and core data storage tag data were not available.

Core UT-GOM2-2-H002-02FB

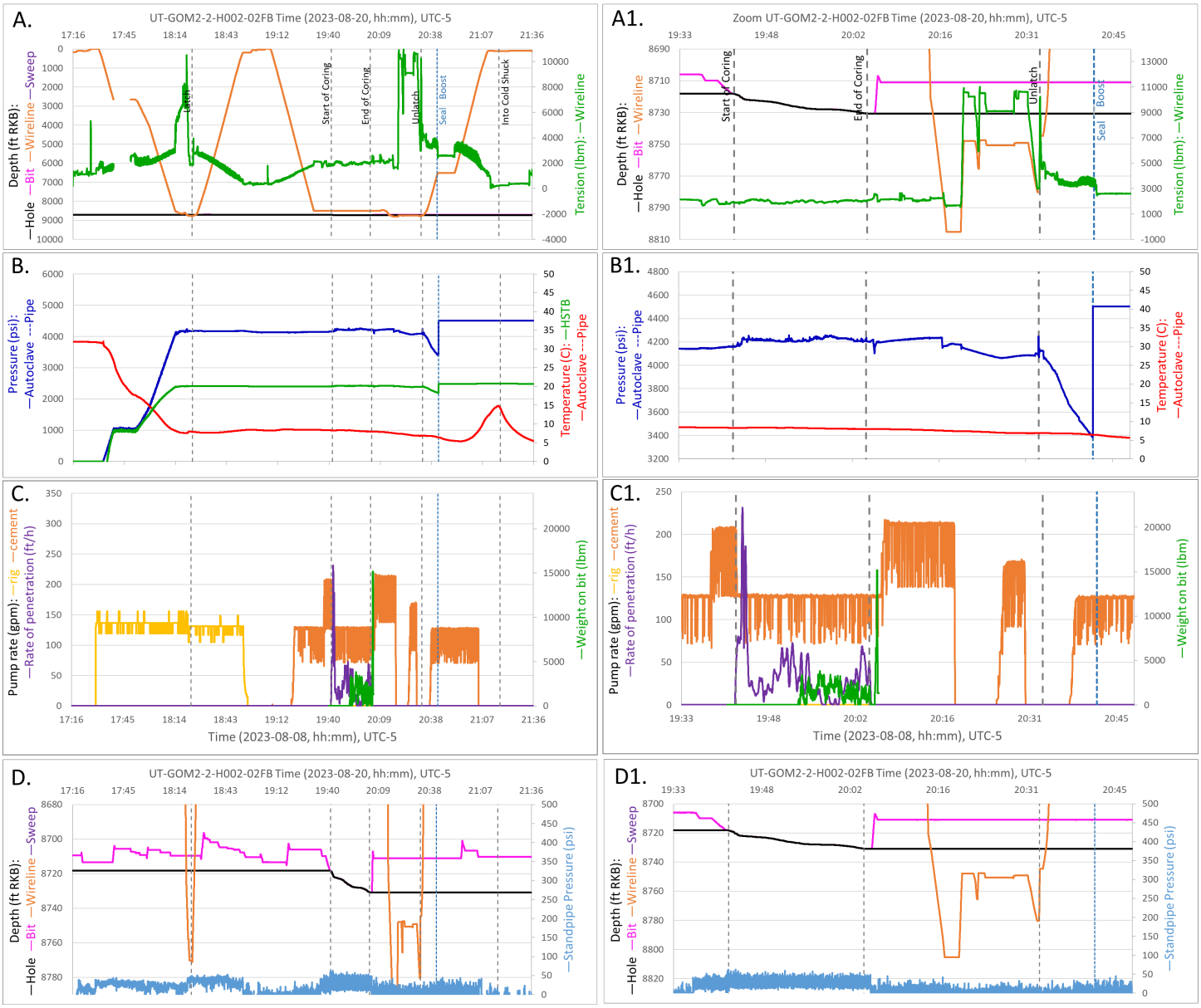

Figure 16. UT-GOM2-2-H002-02FB pressure coring data. Core depth was 8718-8728 ft RKB (674.2-677.2 mbsf). Coring was conducted with 10.3 ppg water-based mud. Core was recovered at a pressure of 4543 psi; A and D) No high-viscosity sweep was deployed; B and B1) Pipe and core data storage tag data were not available. Autoclave pressure hits the DST upper limit when the pressure is boosted.

Core UT-GOM2-2-H002-03FB

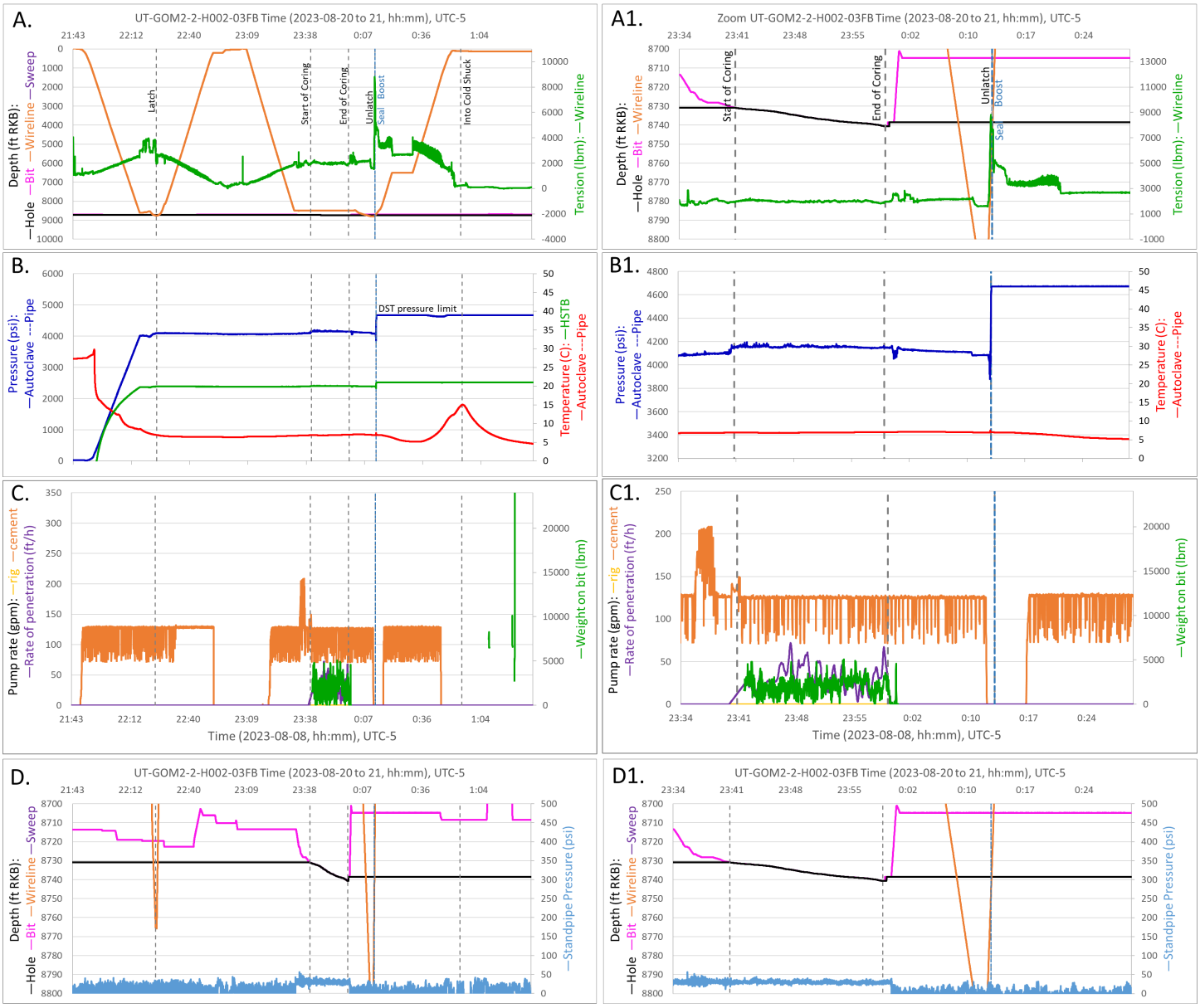

Figure 17. UT-GOM2-2-H002-03FB pressure coring data. Core depth was 8728-8738 ft RKB (677.2-680.3 mbsf). Coring was conducted with 10.3 ppg water-based mud. Core was recovered at a pressure of 4530 psi; A and D) No high-viscosity sweep was deployed; B and B1) Pipe and core data storage tag data were not available. Autoclave pressure hits the DST upper limit when the pressure is boosted.

Core UT-GOM2-2-H002-04FB

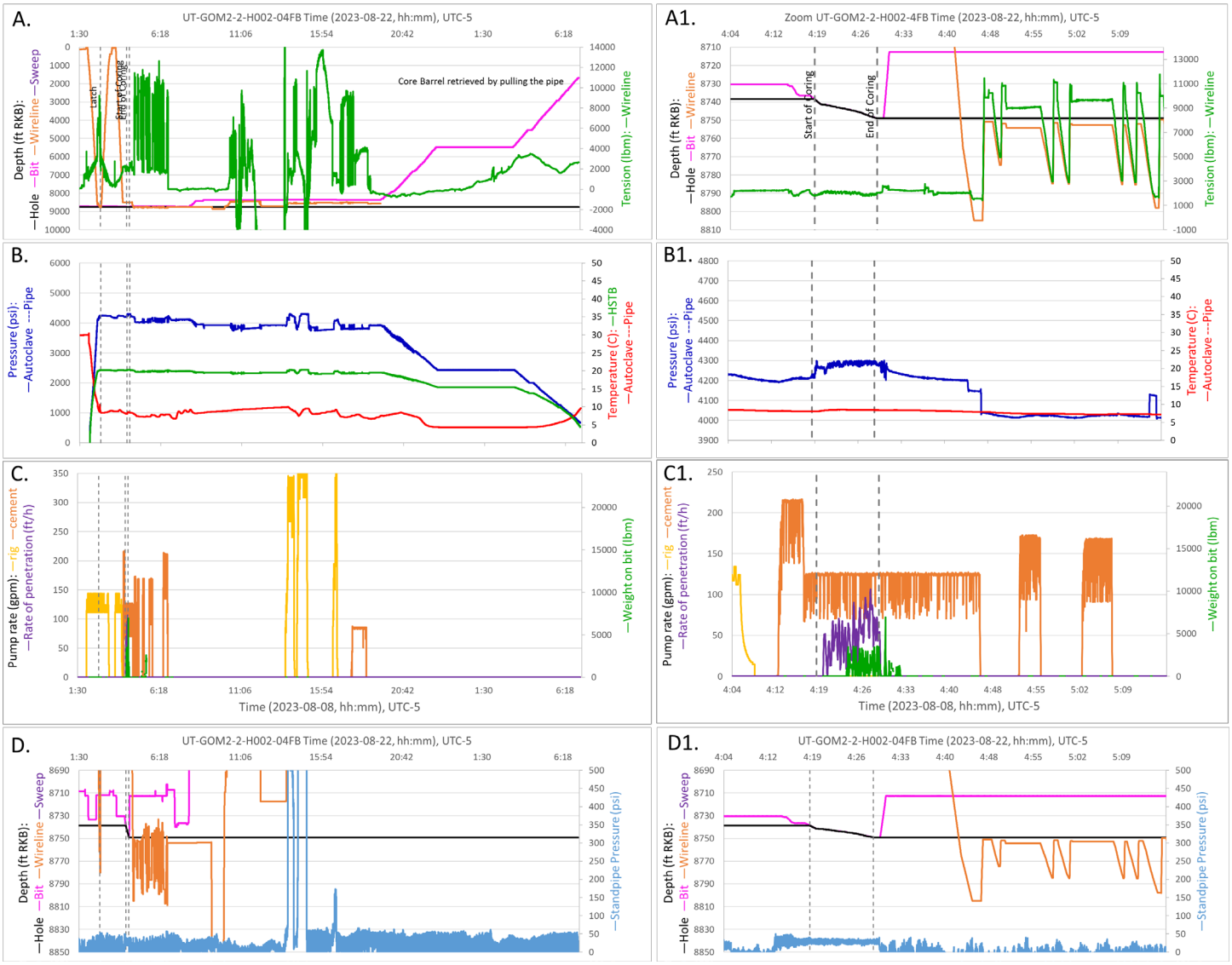

Figure 18. UT-GOM2-2-H002-04FB pressure coring data. Core depth was 8738-8748 ft RKB (680.3-683.3 mbsf). Coring was conducted with 10.3 ppg water-based mud. Core was recovered at a pressure of 0 psi with the ball valve open. A piece of wireline was stuck in the latch and the pressure coring tool could not be actuated or unlatched; A and D) No high-viscosity sweep was deployed; A and A1) Wireline tension shows the many attempts to unlatch the core barrel. Unlatching was unsuccessful. Bit depth decreases as the core barrel was pulled up in the BHA by pulling up the pipe; B and B1) Pipe and core data storage tag data were not available. Pressure drops as the pressure coring tool is brought to the rig floor.

Core UT-GOM2-2-H002-05CS

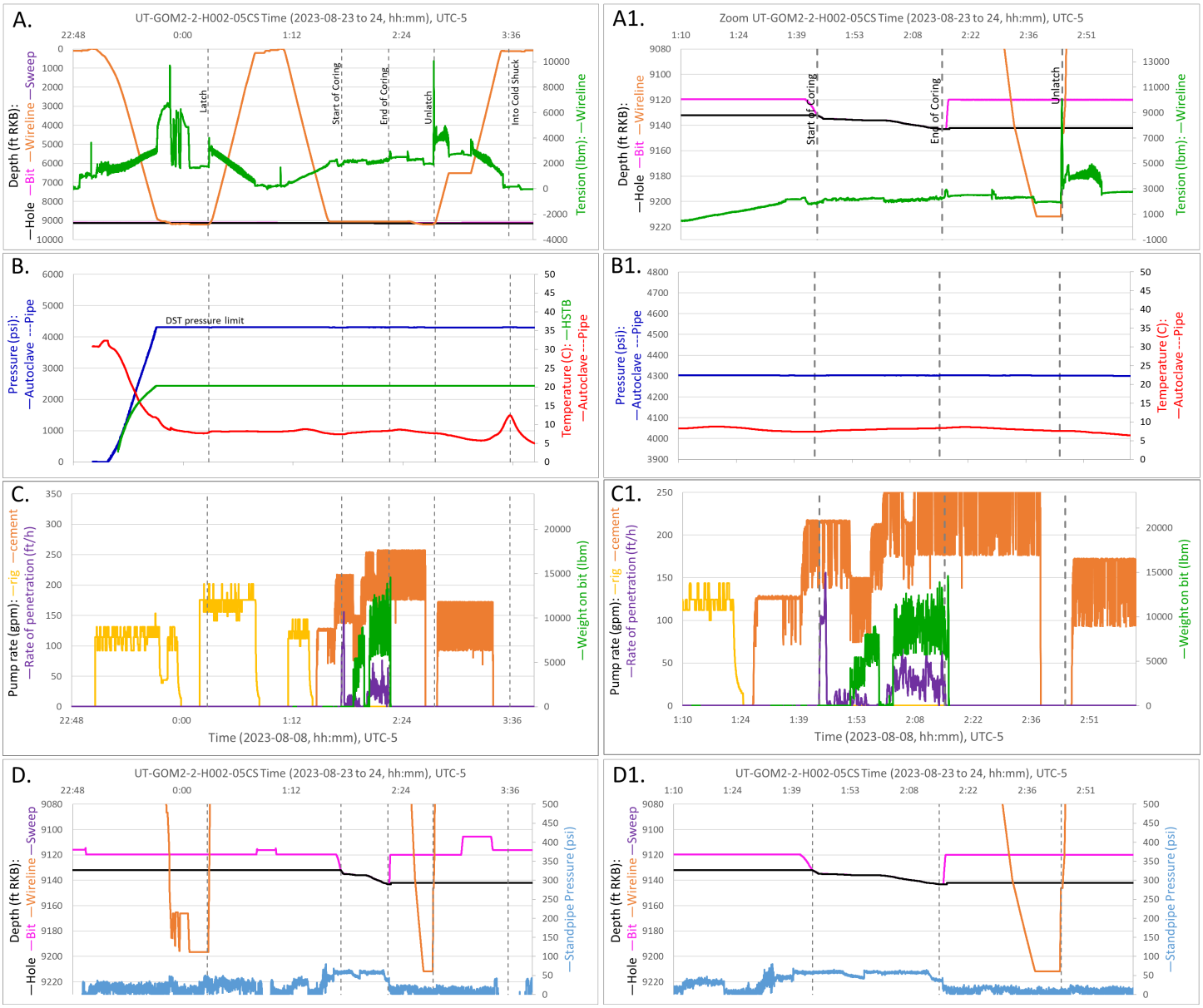

Figure 19. UT-GOM2-2-H002-05CS pressure coring data. Core depth was 9132-9142 ft RKB (800.4-803.4 mbsf). Coring was conducted with 10.5 ppg water-based mud. Core was recovered at a pressure of 4566 psi; A and D) No high-viscosity sweep was deployed; B and B1) Pipe and core data storage tag (DST) data were not available. Autoclave pressure is above the DST limit. Seal and boost times could not be assessed.

Core UT-GOM2-2-H002-06CS

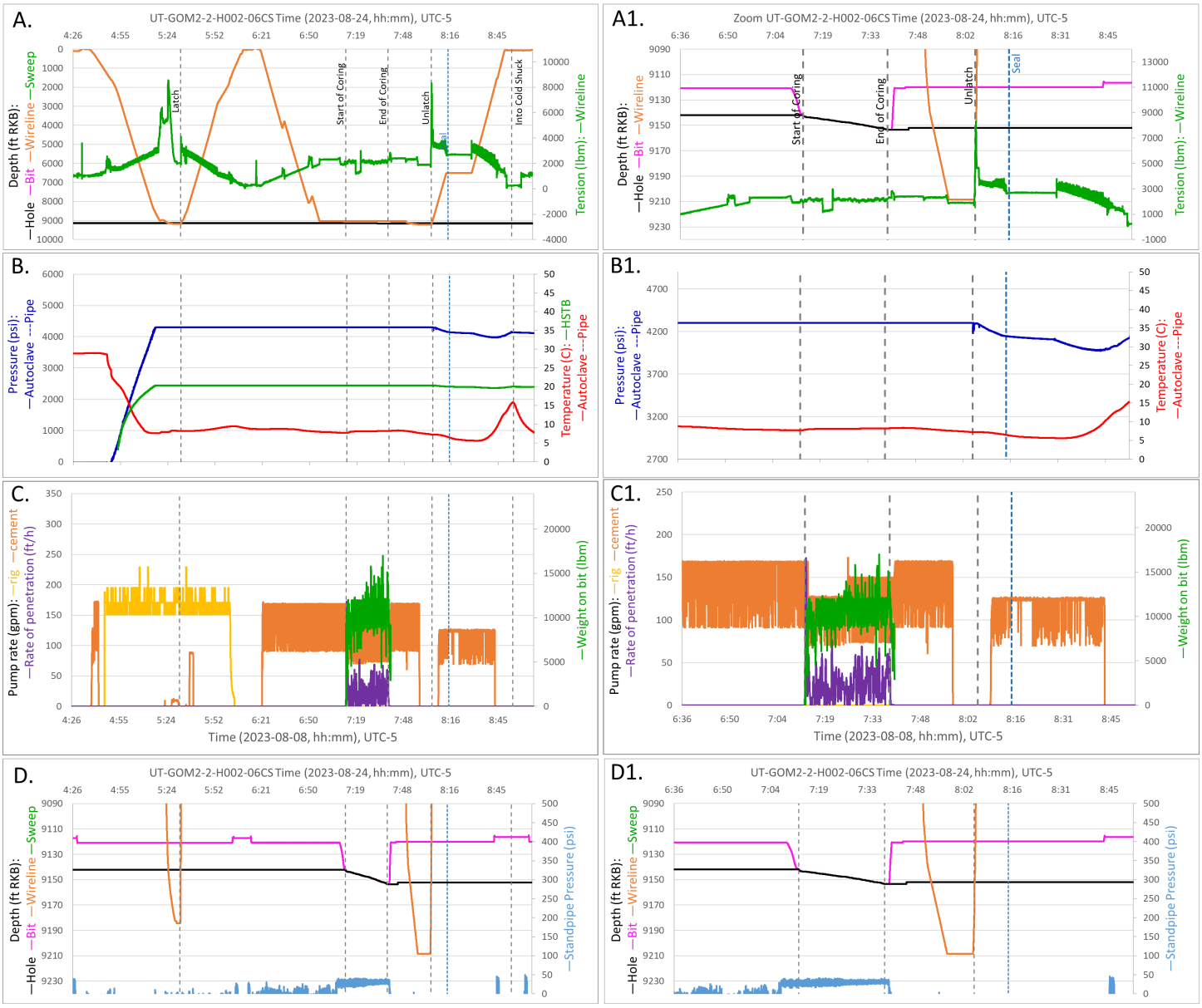

Figure 20. UT-GOM2-2-H002-06CS pressure coring data. Core depth was 9142-9152 ft RKB (803.4-806.5mbsf). Coring was conducted with 10.5 ppg water-based mud. Core was recovered at a pressure of 3784 psi; A and D) No high-viscosity sweep was deployed; B and B1) Pipe and core data storage tag (DST) data were not available. Autoclave pressure goes over the DST limit until the core barrel is unlatched. The pressure coring tool seals late and there is no evidence of a pressure boost.

Core UT-GOM2-2-H002-07CS

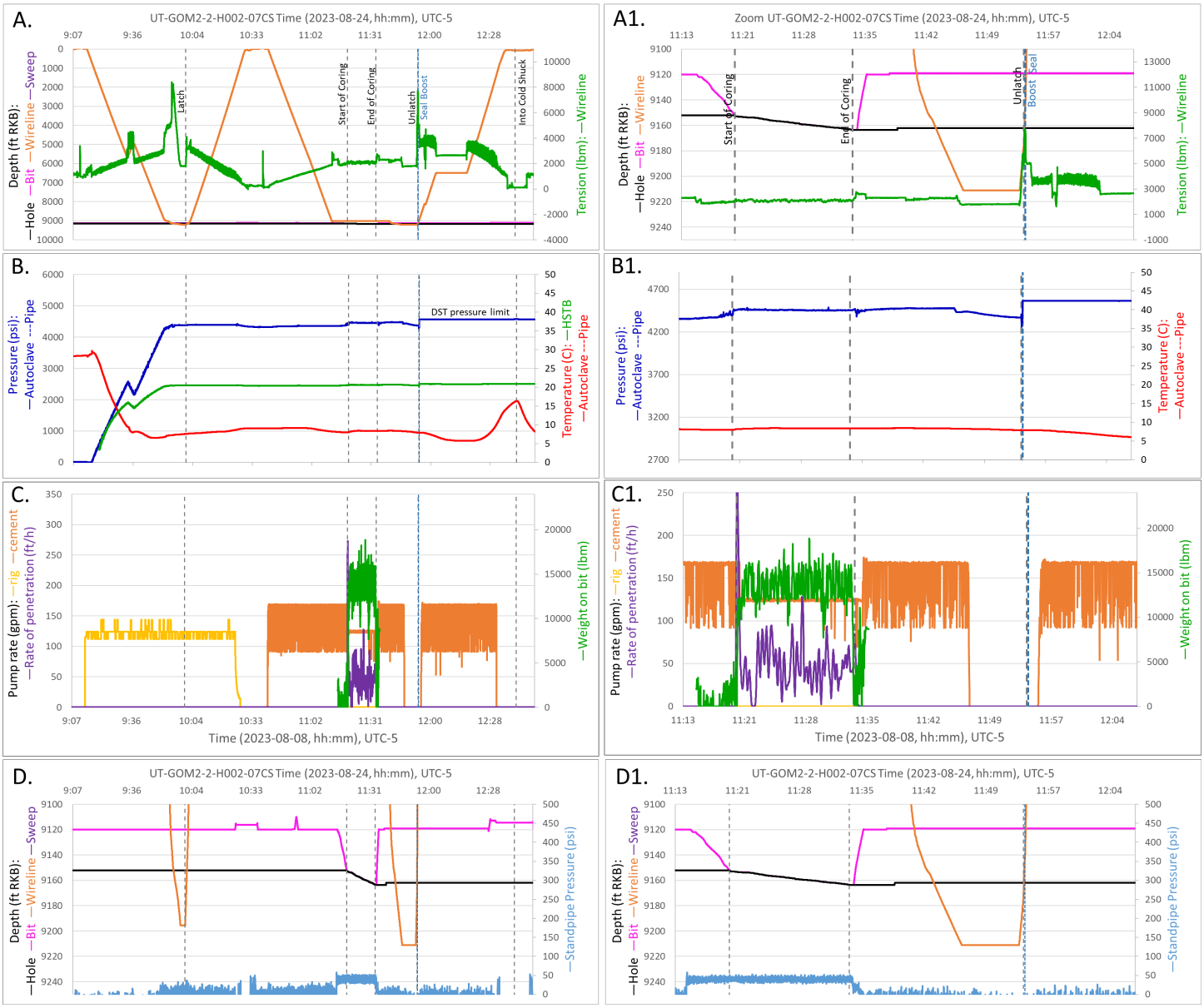

Figure 21. UT-GOM2-2-H002-07CS pressure coring data. Core depth was 9152-9162 ft RKB (806.5-809.1 mbsf). Coring was conducted with 10.5 ppg water-based mud. Core was recovered at a pressure of 4503 psi; A and D) No high-viscosity sweep was deployed; B and B1) Pipe and core data storage tag (DST) data were not available. Autoclave pressure hits the DST upper limit when the pressure is boosted.

Core UT-GOM2-2-H002-08CS

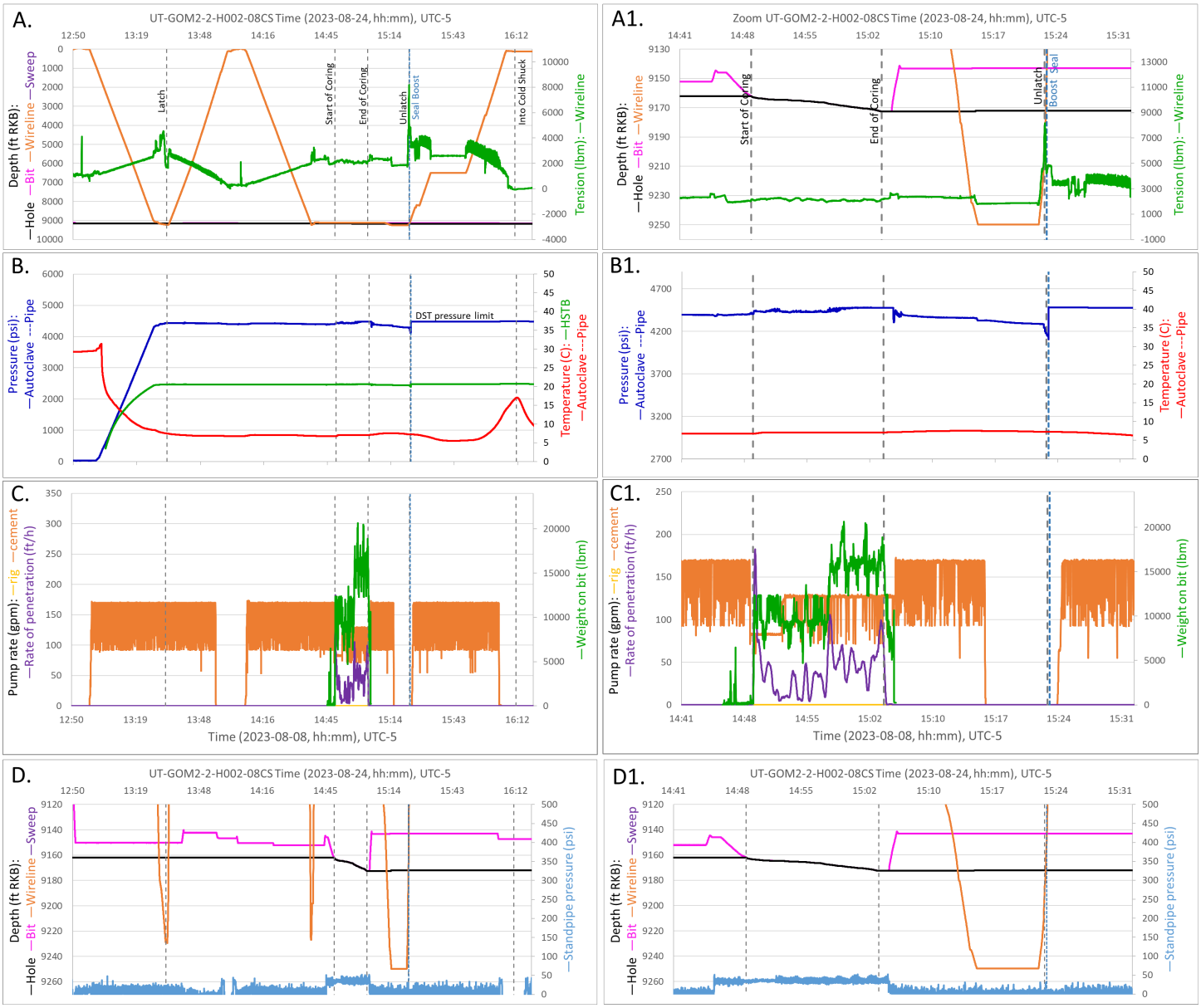

Figure 22. UT-GOM2-2-H002-08CS pressure coring data. Core depth was 9162-9172 ft RKB (809.5-812.6 mbsf). Coring was conducted with 10.5 ppg water-based mud. Core was recovered at a pressure of 4631 psi; A and D) No high-viscosity sweep was deployed; B and B1) Pipe and core data storage tag (DST) data were not available. Autoclave pressure hits the DST upper limit when the pressure is boosted.

Core UT-GOM2-2-H002-09CS

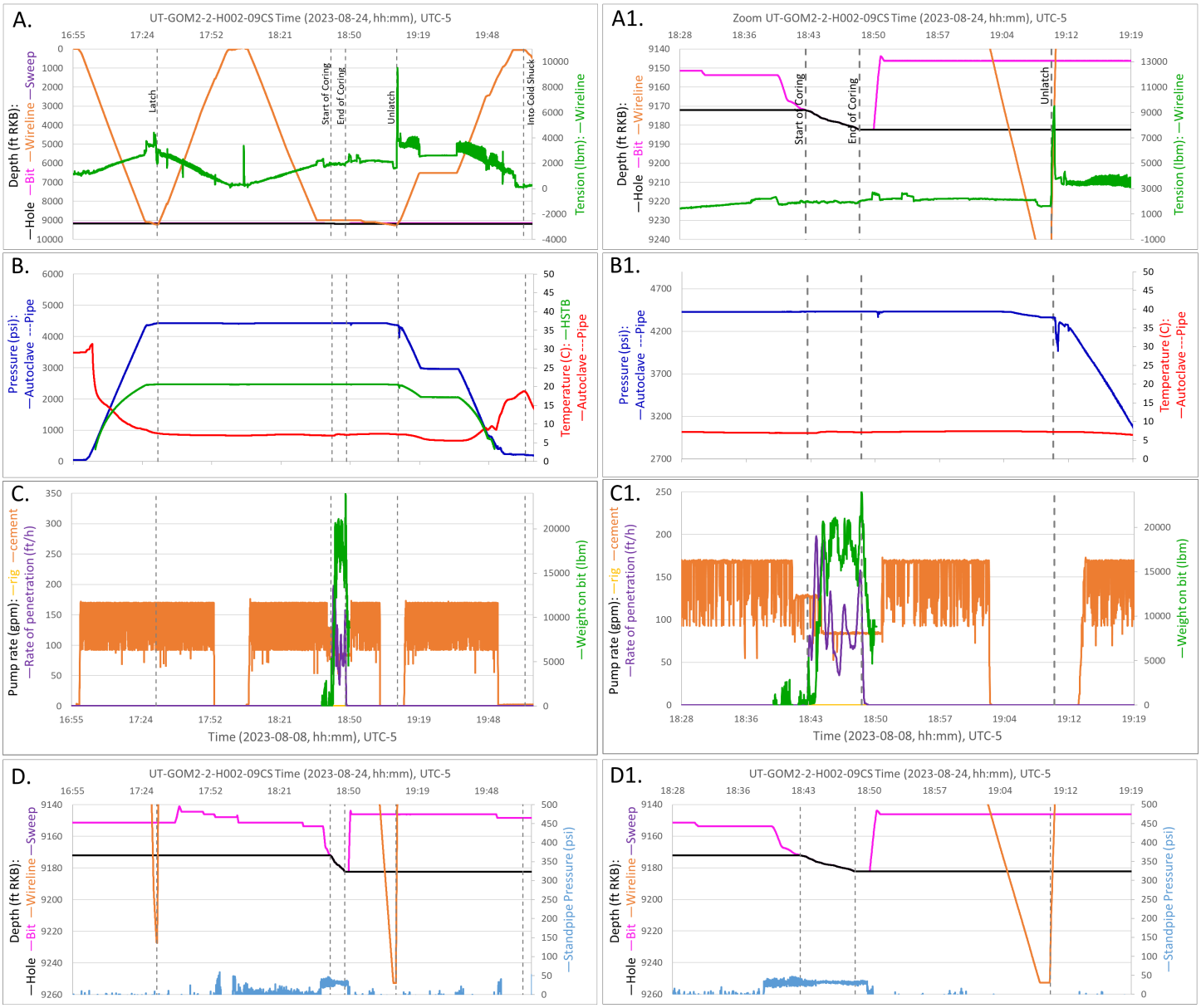

Figure 23. UT-GOM2-2-H002-09CS pressure coring data. Core depth was 9172-9182 ft RKB (812.6-815.6 mbsf). Coring was conducted with 10.5 ppg water-based mud. Core was recovered at a pressure of 0 psi with the ball valve closed and the upper seal open; A and D) No high-viscosity sweep was deployed; B and B1) Pipe and core data storage tag data were not available. Autoclave pressure drops as the core barrel is brought to the rig floor.

Core UT-GOM2-2-H002-10CS

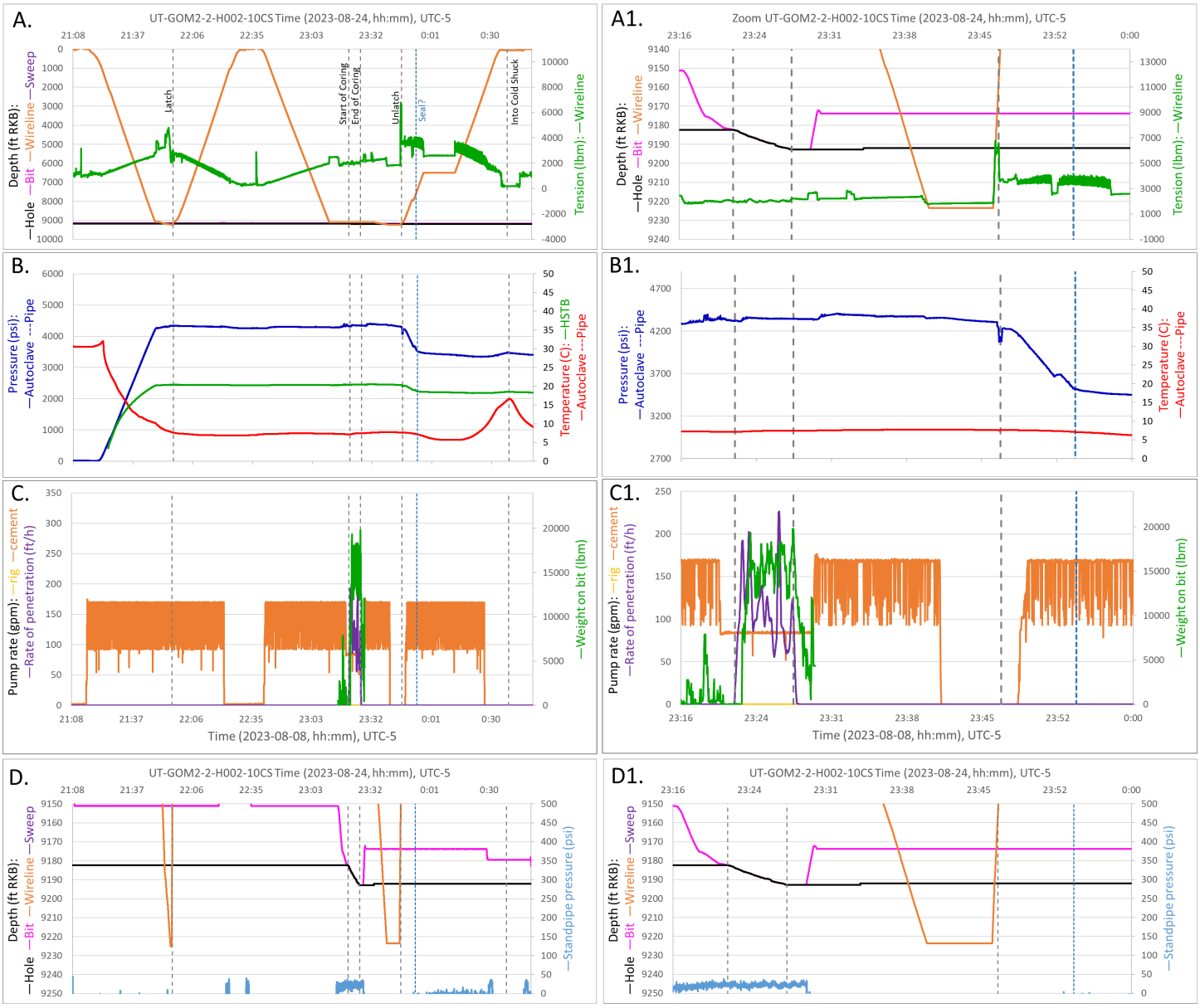

Figure 24. UT-GOM2-2-H002-10CS pressure coring data. Core depth was 9182-9192 ft RKB (815.6-818.7 mbsf). Coring was conducted with 10.5 ppg water-based mud. Core was recovered at a pressure of 2777 psi; A and D) No high-viscosity sweep was deployed; B and B1) Pipe and core data storage tag data were not available. Autoclave pressure history shows a weak seal and no pressure boost.

Core UT-GOM2-2-H002-11CS

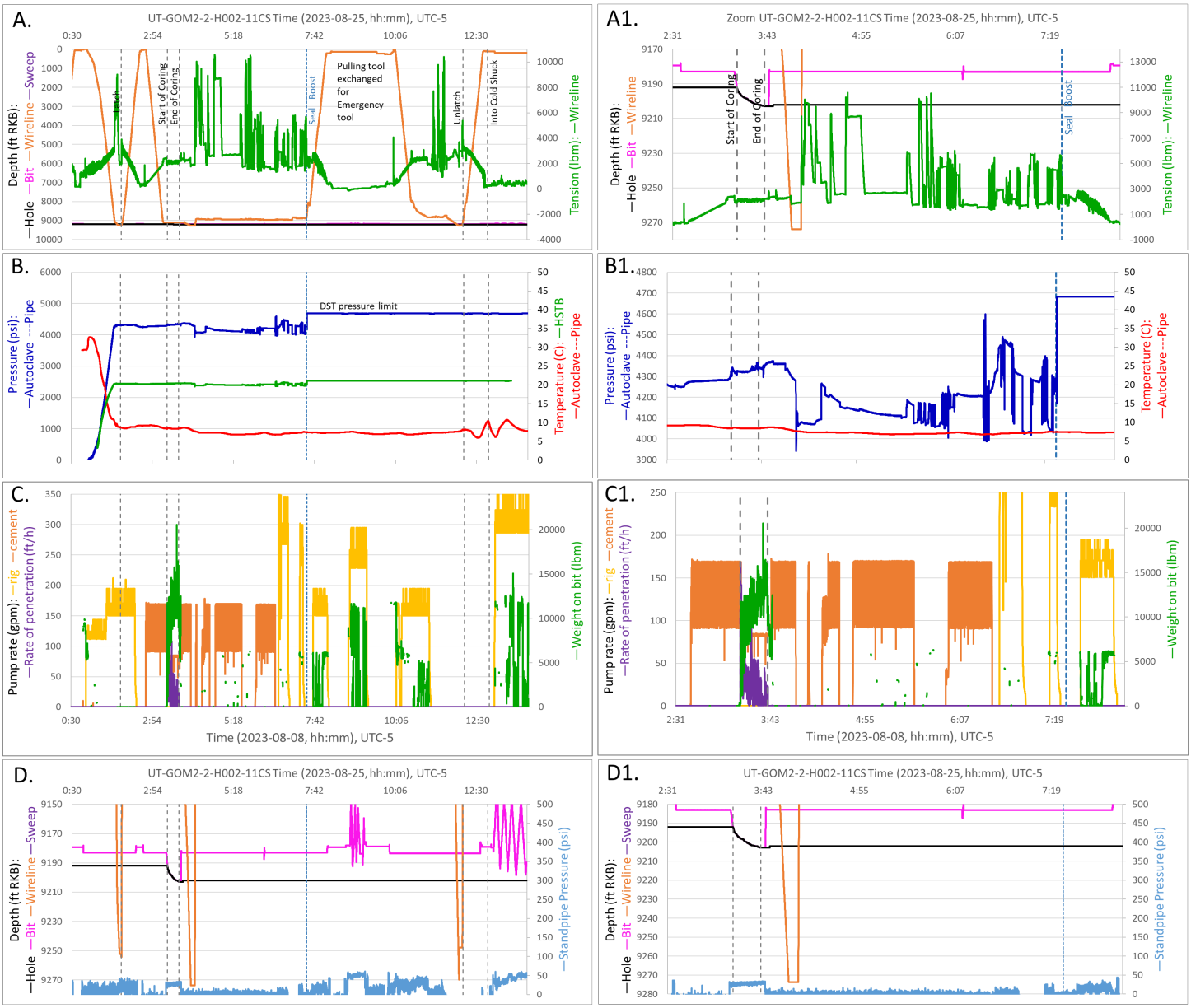

Figure 25. UT-GOM2-2-H002-11CS pressure coring data. Core depth was 9192-9202 ft RKB (818.7-821.7 mbsf). Coring was conducted with 10.5 ppg water-based mud. Core was recovered at a pressure of 4708 psi; A and D) No high-viscosity sweep was deployed; A and A1) Wireline data shows difficulty removing the core barrel from BHA. Recovered core barrel with an emergency retrieval tool.; B and B1) Pipe and core data storage tag (DST) data were not available. Autoclave pressure hits the DST upper limit when the pressure is boosted.

Core UT-GOM2-2-H002-12CS

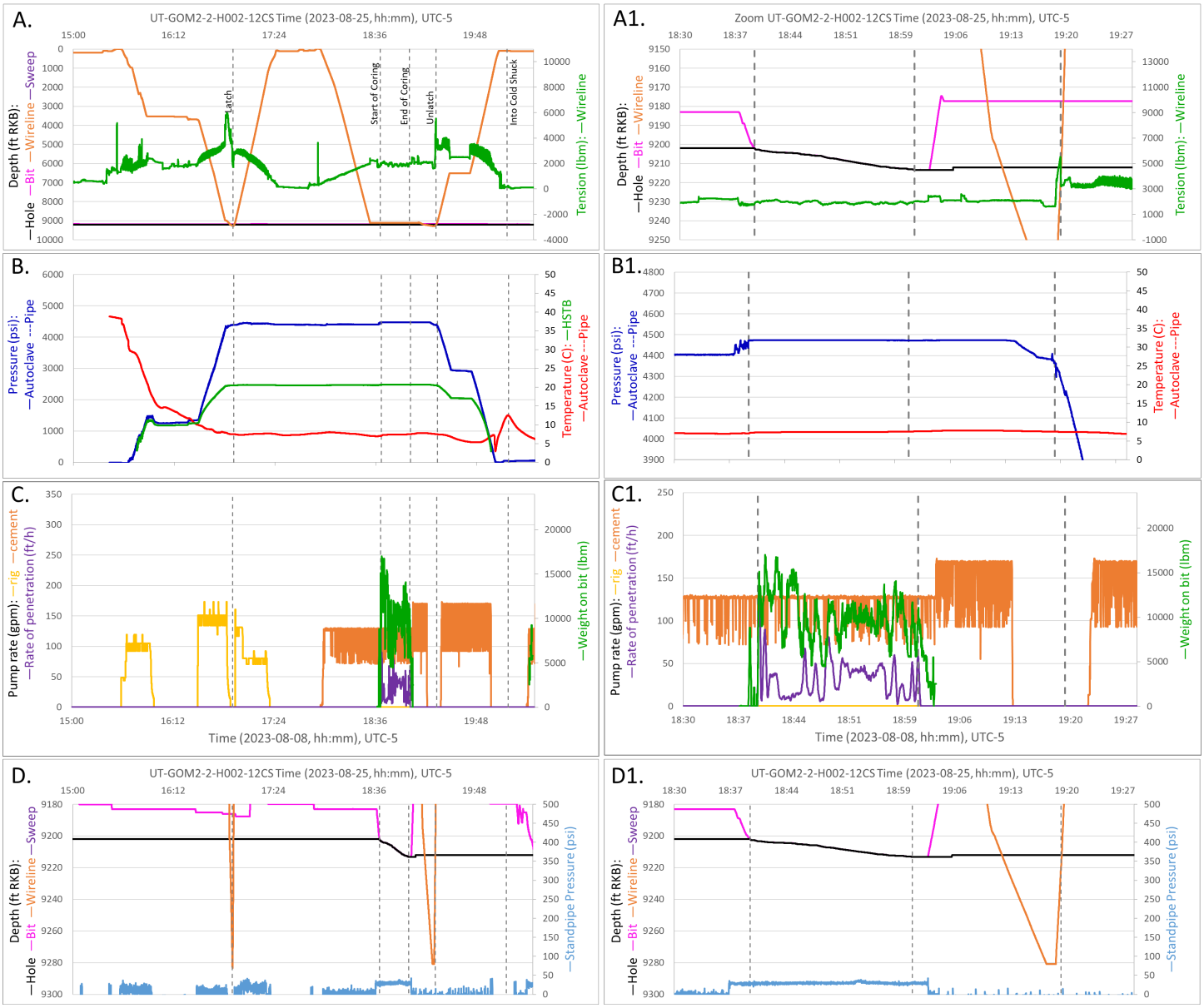

Figure 26. UT-GOM2-2-H002-12CS pressure coring data. Core depth was 9202-9212 ft RKB (821.7-824.8 mbsf). Coring was conducted with 10.5 ppg water-based mud. Core was recovered at a pressure of 0 psi with the ball valve closed and the upper seal open; A and D) No high-viscosity sweep was deployed; B and B1) Pipe and core data storage tag (DST) data were not available. Autoclave pressure may have surpassed the DST limit during coring. Autoclave pressure drops as the core barrel is brought to the rig floor.

Core UT-GOM2-2-H002-13CS

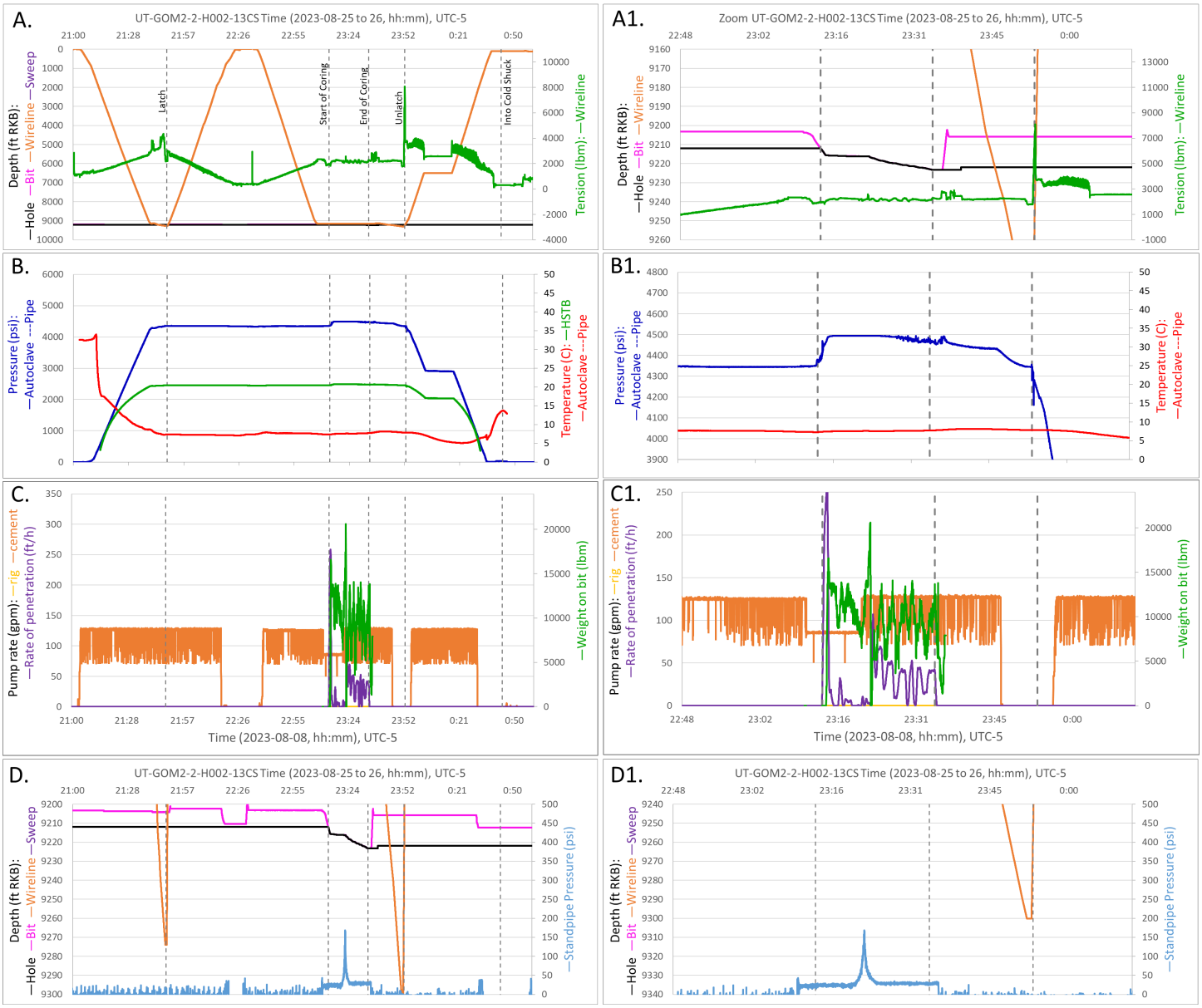

Figure 27. UT-GOM2-2-H002-13CS pressure coring data. Core depth was 9212-9222 ft RKB (824.8-827.8 mbsf). Coring was conducted with 10.5 ppg water-based mud. Core was recovered at a pressure of 0 psi with the ball valve closed. There was no noted information on the state of the upper seal; A and D) No high-viscosity sweep was deployed; B and B1) Pipe and core data storage tag data were not available. Autoclave pressure drops as the core barrel is brought to the rig floor.

Core UT-GOM2-2-H002-14CS

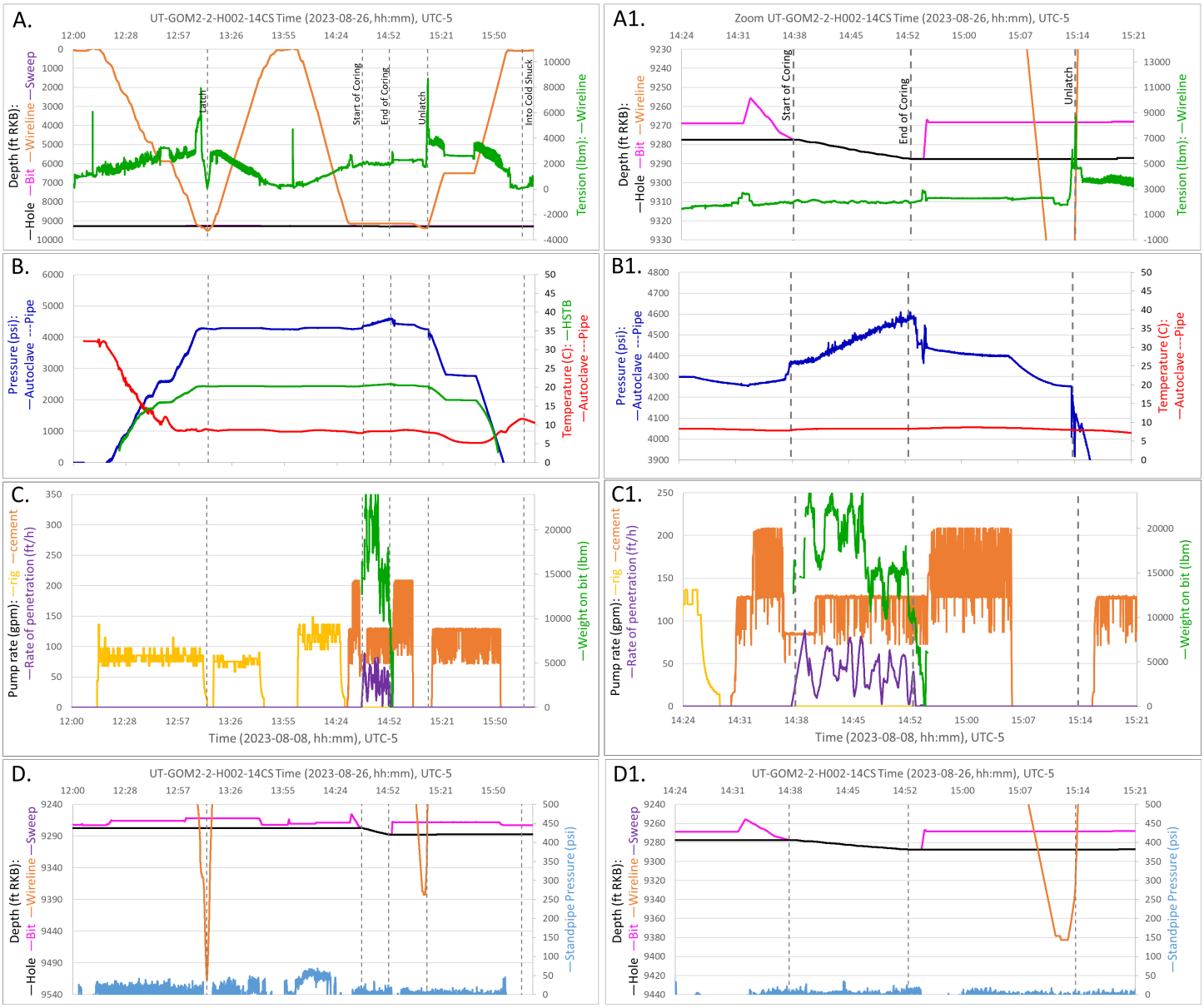

Figure 28. UT-GOM2-2-H002-14CS pressure coring data. Core depth was 9277-9287 ft RKB (844.6-847.6 mbsf). Coring was conducted with 10.5 ppg water-based mud. Core was recovered at a pressure of 0 psi with the ball valve partially open; A and D) No high-viscosity sweep was deployed; B and B1) Pipe and core data storage tag data were not available. Autoclave pressure drops as the core barrel is brought to the rig floor.

Core UT-GOM2-2-H002-15CS

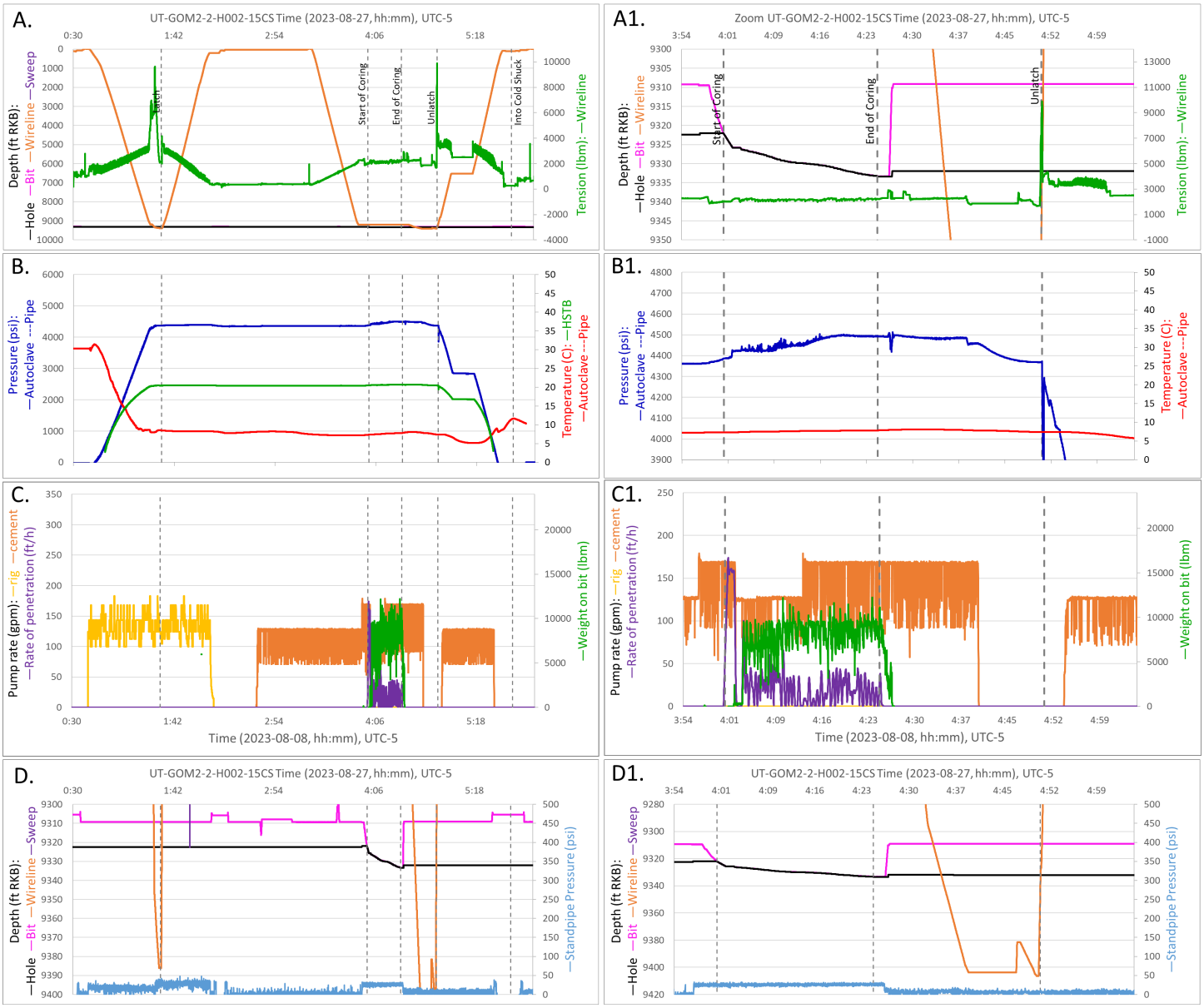

Figure 29. UT-GOM2-2-H002-15CS pressure coring data. Core depth was 9322-9332 ft RKB (858.3-861.3 mbsf). Coring was conducted with 10.5 ppg water-based mud. Core was recovered at a pressure of 0 psi with the ball valve open; A and D) No high-viscosity sweep was deployed; B and B1) Pipe and core data storage tag data were not available. Autoclave pressure drops as the core barrel is brought to the rig floor.

References

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