

# Cooling System Air Bleed Procedure

## Technical Bulletin # FRA-2021-EN003-00

Approval



### RECOMMENDED

This Technical Bulletin provides information concerning the proper procedure to bleed air out of the engine cooling system to prevent overheating.

Thorough bleeding of the cooling system is critical for normal operation of the HPD FRA engine. Please read the entire bleeding procedure in detail before attempting to bleed a car.

#### Required Tools:

- Lisle 24680 or equivalent spill free funnel modified to accept -3AN bleed lines
- Clear -3 AN Bleed Lines (qty 4)
- -3AN Plug (qty 3)
- -3AN Cap (qty 3)
- Cooling system pressure tester
- Small hand pump

#### Procedure:

1. Starting with an empty cooling system, raise rear of car so that engine is at minimum 5° angle as measured on the top of the engine. On a level surface this is equivalent to raising the rear wheels until the axle centerline is 19" off the ground.



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2. Disconnect the tube from the header tank to overflow tank. Cap off the connection on the header tank neck.
3. Install the modified funnel with extension on header tank.
4. Disconnect the bleed lines for RHS radiator, LHS radiator, and cylinder head from the header tank and re-connect to the modified funnel. Cap off two of the header tank connections to prevent leaks during filling, on the 3rd header connection attach additional bleed line from header tank to the modified funnel to prevent trapping air pockets in the header tank itself.

Note: At this point all bleed lines should be connected to the funnel on a positive incline and without any dips or flat sections that will hinder gravity bleeding.

5. Begin filling the header tank with distilled water (and corrosion inhibitor at 5% mixture) and continue until the system is full. The system should hold approximately 4 gallons. Continue to add distilled water until the funnel is half-full.
6. Slowly crack open the bleed caps on oil cooler and LHS radiator out pipe locations until air is released and solid water comes out. Tighten caps. Add coolant to the funnel if the level drops significantly.



Left hand side radiator outlet bleed



Oil cooler bleed

7. Burp system several times by squeezing and slowly releasing the oil cooler outlet hose until air bubbles are no longer visible in bleed lines.

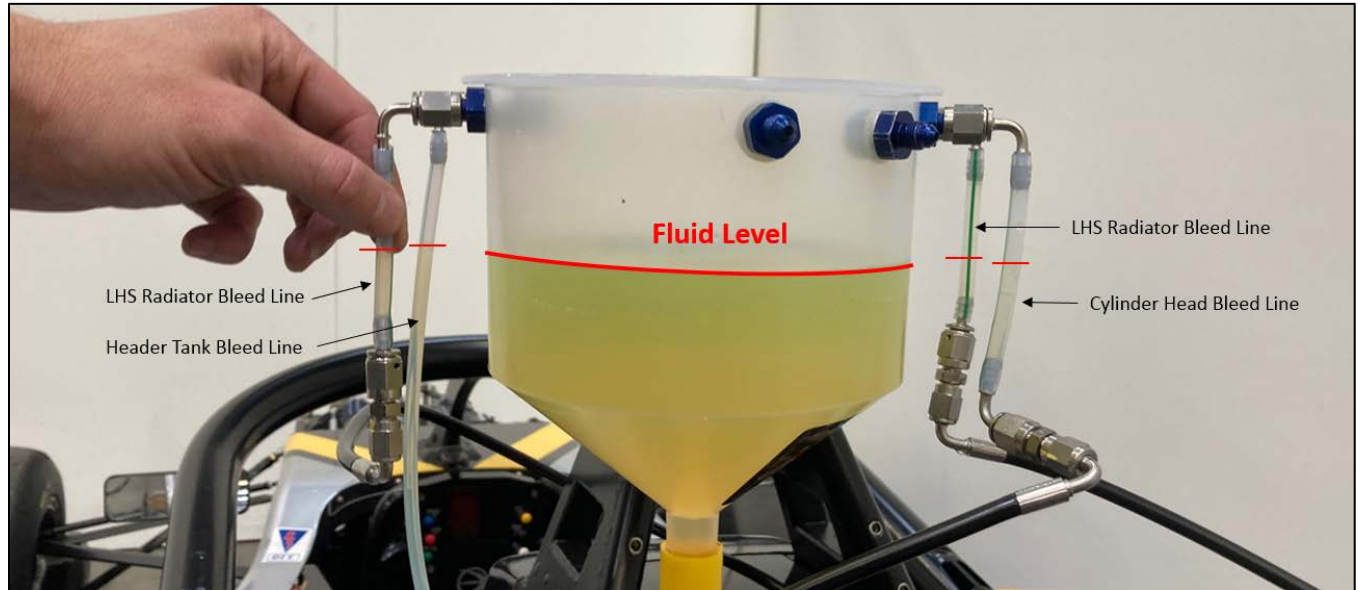
Note: Lines may be disconnected from the funnel one at a time and held vertical to assist in removing trapped air and then reconnected to funnel.

8. Return the car to level and confirm that the coolant level in all bleed lines is near equal to coolant level in funnel. This indicates system is nearly completely bled. Any small remaining air pockets will be addressed during constant bleed idling.

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9. Remove excess fluid from funnel by disconnecting header tank bleed line from funnel and drain it into a bucket.
10. Disconnect each of the three remaining bleed lines from funnel and install -3AN plugs one at a time to prevent spilling.
11. Remove the funnel and reconnect all three bleed lines to the header tank.
12. Set the header tank level to 2" below top of the sight tube. Use a small hand pump to remove excess fluid.
13. Reconnect the overflow hose.
14. Start the engine (after oil pressure priming) with the header tank cap off. The coolant level will likely drop initially as additional air is bled out. Add coolant until the level remains stable at 2" below sight tube. Keep engine running for approximately 15 min to allow constant bleed lines to purge air. Combination of idle RPM and some revs works best for this.
15. Shut down the engine, disconnect the three bleed lines from header tank, and seal off connections on both header tank and bleed lines using -3AN caps and plugs. Pressurize header tank to 0.5 bar using cooling system pressure tester. Remove plug from RHS radiator bleed line to burp additional air. Repeat for LHS radiator and cylinder head bleed lines.
16. Allow the engine to cool and then fill the coolant to the bottom of the header tank cap neck. Install a 1.4-1.7 bar (21-25 psi) radiator cap.

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17. Start the engine and allow coolant temperature to reach 90°C. Shut off engine and confirm the coolant level in the overflow tank is at max height. At this point sight tube on both header tank and overflow tank should be full. Top off at the overflow tank if needed. If the level is already at max height, check the catch tank for excess coolant and drain.

#### Maintenance Requirements:

- Coolant should be topped off in the header tank between each running session, ideally when at the lowest temperature. This should be done in a safe manner as to prevent injury.
- The engine oil and coolant catch tank should be checked every session and emptied regularly to reduce the risk of oil/coolant mixture ingestion into the engine or gearbox.
- Coolant temperature data should be monitored closely to address any potential issues before they occur. Excessive fluctuation in temperature may be a sign of an air pocket in the system.



Header tank full @90°C coolant temp



Overflow tank full @90°C coolant temp

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If you have any questions regarding the content of this bulletin, please contact Andrew Salzano at [ASalzano@na.honda.com](mailto:ASalzano@na.honda.com) or GRMS Admin at [GRMSAdmin@hra.com](mailto:GRMSAdmin@hra.com).

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