June 1, 2025

Brian Rayner
Office of Aviation Safety
National Transportation Safety Board
490 L'Enfant Plaza East, SW
Washington, DC 20594

Re: Party Submission of Hop-A-Jet Worldwide Jet Charter
Accident Involving Aircraft N823KD, Dual Engine Rotating Stall
NTSB Investigation No. ERA24FA110

Dear Mr. Rayner:

This letter provides Hop-A-Jet Worldwide Jet Charter's Party Submission to the National Transportation Safety Board (NTSB) pursuant to 49 C.F.R. § 845.13. We appreciate the opportunity to participate in this investigation and to contribute our analysis based on the data and findings reviewed in coordination with the investigative team.

This submission is limited to the factual record. It does not seek to assign blame or offer speculative conclusions. Instead, it highlights technical findings that are central to understanding the circumstances of the event and provides clarifying context where elements of the revised draft report may misrepresent operational realities.

I. INTRODUCTION

On February 9, 2024, aircraft N823KD, operated by Hop-A-Jet Worldwide Jet Charter and powered by GE CF34-series engines, experienced a dual engine rotating stall shortly before arriving at Naples Airport. The flight crew executed emergency procedures and successfully landed the aircraft on Interstate 75 and then impacted into the highway sound suppressing wall. All passengers and the flight attendant survived. Tragically, both flight crew members lost their lives.

Following the release of the revised draft NTSB Factual Report, we noted several changes in language and framing that may unintentionally misrepresent technical conditions or imply operator deficiencies not supported by the factual record. This submission is based on Hop-A-Jet's technical review of the second draft of the Factual Report conducted on May 7, 2025. As Hop-A-Jet will not have access to the final version of the Factual Report until it is released to the public alongside the NTSB's Final Report, this submission reflects our best effort to address changes and issues identified during the technical review process.

II. SUMMARY OF KEY FINDINGS

1. After completing the technical review of the NTSB Factual Report, Hop-A-Jet identified an email dated May 11, 2023, from GE CF34-3 HPT/CDN/Systems Fleet Engineering that would have been valuable during the course of the investigation. The correspondence, titled Final Answer Case #01791643, contains GE Fleet Engineering's official troubleshooting guidance in response to earlier diagnostic efforts conducted by South Florida Jet Center on the right-hand engine, ESN E950106, which was exhibiting hung starts only when heat soaked, reference attachment. As noted in Section 6.2 of the NTSB Factual Report, GE personnel were present during this troubleshooting effort, when the decision was made to replace the main fuel control (MFC) unit. Notably, Maintenance Practice 68 (MP68) is not referenced in the response from GE Fleet Support, nor was it recommended or requested by the GE Technical Representative at any point prior to the replacement of the MFC. This omission further supports our position that MP68 was not part of the authorized or expected troubleshooting protocol at the time.
2. The dual hung starts that occurred January 15th, 2024 prior to the accident took place within approximately 30 seconds of each other, suggesting a near-simultaneous failure of potentially systemic origin.
3. Hop-A-Jet takes exception to the inclusion of Maintenance Practice 68 (MP68), "Functional Check of the Variable Geometry Vane (VGV) System," in Draft 2 of the Factual Report as a procedure that was not performed during troubleshooting prior to the accident. While it is factually accurate that MP68 was not accomplished, several additional facts must be acknowledged to provide proper context:
   a) MP68 was neither recommended nor authorized by GE during any relevant troubleshooting period. According to the Service Manual (SM 72-00-00), under Fault Isolation Procedure 07 "Hung or Slow Start," MP68 appears near the end of the troubleshooting sequence. That portion of the troubleshooting guide was never reached because engine performance normalized following replacement of the fuel filters.
   b) MP68 requires specialized tooling that, at the time, was available only to GE. It is not a task that operators such as Hop-A-Jet could independently perform without the involvement of GE technicians.
   c) GE did not request or recommend that its own technicians perform MP68 during the January 15th troubleshooting event, nor in response to previous hung starts experienced by the accident aircraft. GE was directly involved in supporting troubleshooting efforts on these occasions, yet MP68 was never identified as a necessary step.
4. Hop-A-Jet respectfully disagrees with the inclusion of Section 6.3, "Previous GE CF34-3B Hung-Start History," in the Factual Report. The aircraft referenced in this section had an operational profile involving overwater flights and missions such as search and rescue, air ambulance, firefighting, and law enforcement. These conditions differ significantly from N823KD's prior operation under CFR Part 91 and later as a CFR Part 135 on-demand charter operator. Additionally, the report does not mention that the Special Operations aircraft in question had no history of engine compressor washes prior to experiencing its own dual hung starts. This omission is material to understanding the context and relevance of the comparison.
5. In the Factual Report, Section 7.0, *"CF34-3B Engine Compressor Wash Procedures and Accident Airplane History,"* references are made to GE Service Bulletins 71-0000 R00 and R01. Specifically, the guidance concerning operation in "harsh environments" is irrelevant and not applicable to the accident aircraft as the aircraft did not operate in any of the geographic regions that GE defines as meeting that classification. The inclusion of this reference in the NTSB's analysis introduces confusion and may mislead readers into applying inapplicable maintenance standards to this aircraft. Given the aircraft's operating profile and locations, this portion of the Service Bulletins cited should not have been considered relevant to its maintenance history or factored into the Board's evaluation.

6. In the Factual Report, Section 7.0, *"CF34-3B Engine Compressor Wash Procedures and Accident Airplane History,"* reference is made to GE Service Bulletin 71-0000 Revision 1, which outlines Special Requirements for Sea/Salt Operations or for engines exhibiting corrosion on external areas. This reference is not applicable to the accident aircraft. As acknowledged in Paragraph 6.3 of the same report, the section of the Service Bulletin cited was developed specifically in response to the operational profile of a Special Operations aircraft. The accident aircraft did not operate under such conditions and did not exhibit the environmental exposure or corrosion risks addressed by the bulletin. Throughout the investigation, GE personnel consistently confirmed that this portion of the Service Bulletin was not intended for broad application and was not relevant to the aircraft involved in this accident. Its inclusion in the report creates a misleading association between the accident aircraft and maintenance protocols developed for a distinctly different operational context. Although Hop-A-Jet maintained a routine engine wash program, neither GE nor Bombardier mandated water washes for this aircraft at the time of the accident. Moreover, confusion regarding the applicability of water wash interval guidance was acknowledged by GE engineers, NTSB staff, and Hop-A-Jet personnel alike, stemming from a lack of clear and consistent structuring of the SB.
7. The Factual Report omits information presented by Hop-A-Jet to the investigative team that we believe is directly relevant to the cause of the accident. Specifically, damage to the Inlet Guide Vane (IGV) bushings and corrosion observed post-accident within the bore holes of the compressor casing are consistent with known vulnerabilities in this engine series. Airworthiness Directive AD 2022-08-06 and GE Service Bulletin 72-0244 Revision 00 both identify binding between the compressor case and inlet guide vane bushings in CF34-8E model engines, a condition that results in increased Variable Geometry (VG) actuation loads. These technical findings align closely with the anomalies observed in the accident aircraft. Despite the similarity in design and operational symptoms, neither the AD nor the Service Bulletin was expanded to address other CF34-series models, including the CF34-3B engines installed on the accident aircraft. The absence of this broader applicability may have contributed to the failure to identify and mitigate a known risk within this engine family.
8. A post-accident review of archived borescope imagery revealed visible corrosion around the Variable Geometry Vane (VGV) bore holes in the 4th and 5th stages. This corrosion was not identified or reported during pre-accident borescope inspections conducted by GE or GE-authorized vendors. In Section 8.0 of the Factual Report, *"Accident Engines Compressor Borescope Procedures History,"* the NTSB states that "Neither SB 71-000 nor SM 72-00-00 Table 604 mentions corrosion of the compressor case as an inspection requirement nor provides serviceable limits or recommendations when corrosion is found." The report does include a NOTE from the Service Manual that reads:

   NOTE: The condition of the compressor case can be determined if you do an inspection at four locations: stage 1, stage 6, stage 9, and stage 12. If any unusual conditions are found, more inspections can be done through the other compressor borescope ports.

   Throughout the investigation, GE asserted that its borescope inspection procedures were not intended to detect corrosion. Hop-A-Jet respectfully disagrees with this position. If GE's assertion is accurate, it would indicate that at the time of the accident, no corrosion detection program was in place for these engines. Additionally, GE's "on condition" inspection program, which permits continued engine operation for another 3,200 hours following the initial 3,200-hour borescope inspection, would allow the engines to remain in service without ever being inspected for corrosion. This raises serious concerns, as corrosion detection is a fundamental component of any aircraft and powerplant inspection, as required under FAA Advisory Circular AC 43.13-1B. This is further supported by GE's own Service Manual (SM 72-00-00), Engine Inspection, Paragraph 5, "Borescope Inspection Procedures," which includes the following in Table 602:

A. The definition of inspection terms that are used in this manual is contained in Table 602. The first column lists the terms that usually describe the deviation from normal conditions of the engine parts. The second column defines the terms. The third column lists the causes of the defined terms(conditions). Refer to Figure 614.

Term	Definition	Causes
Corrosion	Formation of many small pits which cumulatively create a wide cavity (usually shallow) in the surface of the part	Oxidation of particles

The inclusion of corrosion in this inspection terminology table confirms that GE recognizes corrosion as a defined condition subject to detection during inspections. Therefore, corrosion should be considered an expected inspection item when evaluating internal engine surfaces during a borescope procedure.

Hop-A-Jet believes that the procedures outlined in the Service Manual were not adequately followed during the prior borescope inspections, which failed to identify the corrosion that was later plainly visible in archived imagery. Furthermore, while Figure 614 of the Service Manual establishes limits for other defect types, no specific limits are provided for corrosion. In such cases, it is standard practice that GE Engineering should be contacted for guidance upon the identification of corrosion. The absence of corrosion limits does not negate the obligation to identify the condition; rather, it heightens the necessity for proper reporting and engineering involvement.

III. Recommendations to the NTSB

1. If not already implemented prior to the issuance of the Final Report, Hop-A-Jet recommends that GE Service Bulletin 72-0347, *"One-Time Compressor Inner Diameter Inspection for Corrosion and Variable Geometry System Functional Check,"* be elevated to the status of an Airworthiness Directive. Given the safety implications of undetected corrosion and impaired VGV system functionality, mandating this inspection would provide greater assurance of compliance across the fleet and help prevent recurrence of similar events.
2. Throughout the course of the investigation, Hop-A-Jet has repeatedly requested that the investigative team, including representatives from the NTSB, FAA, Bombardier, and GE, initiate action to revise the Challenger 600 Series Aircraft Flight Manual (AFM), Quick Reference Handbook (QRH), and Operating Manual (OM). To date, we have not received any confirmation that such revisions will be pursued. Hop-A-Jet respectfully renews its request that these flight manuals be updated. This recommendation is based on the following safety-critical considerations:
   a) The affected flight manuals currently do not contain language that distinguishes between a no light-off, a hung start, and a slow start. This lack of differentiation can lead to confusion for flight crews during abnormal start scenarios. GE Service Information SEI-780 and Service Manual 72-00-00, Fault Isolation 07, clearly define these distinct engine start anomalies and provide corresponding troubleshooting guidance. Reference is made to the attached documents titled *"Failure to Start"* for the AFM, QRH, and OM, which demonstrate the absence of this critical information.
      i) The affected AFM, QRH, and/or OM must include definitions consistent with those provided by GE to ensure clarity for flight crews. Specifically, we recommend incorporating language aligned with the following GE definitions:

(1) GE defines a Hung Start; A hung start is frequently called an N2 stagnation. It is seen when the engine lights off normally but cannot accelerate to reach the idle speed limits specified in the appropriate AFM for Engine Operating Limits. If N2 indication stays constant for 5 seconds, the start procedure must be stopped, and troubleshooting must be done. This condition can be seen if a compressor stall occurs during the start procedure or if there is not enough starter air pressure to accelerate the compressor. Because of the engine light-off, ITT increases, and the engine must be shut-down if the ITT is more than 1400°F (760°C).

(2) GE defines a Slow Start as; When you try to start the engine, it takes more time than is specified in the appropriate AFM for Engine Operating Limits, to reach idle speed. A slow start can occur on the first start of the day because of combustion energy loss from heating the casings, the combustion liner, and the turbine. If the next start is normal, troubleshooting procedures are not necessary because the engine is satisfactory.

ii) The affected AFM, QRH and OM must include a warning, prohibiting an attempt of restart without maintenance troubleshooting for a hung start.

iii) QRH Volume 2 05-37 Interrupted Starts, allows for subsequent engine starts, reference attachment. Currently this gives flight crews the ok to attempt a restart when they have a true hung start.

(1) This section must also include a warning, prohibiting an attempt of a restart without maintenance troubleshooting for a hung start.

(2) Interrupted Start Scenario.

(a) The flight crew is operating a critical multi-leg trip for the aircraft owner. During the first engine start of the day, the No. 1 engine experiences a hung start. Although N2 stagnation occurs, the captain interprets the event as an interrupted start and, under pressure to keep the schedule for the owner, proceeds without further maintenance consultation. After observing the starter cooling time limitation, the captain attempts a second start, which is successful. The remainder of the day's flight segments are completed with no further anomalies. Believing the initial failure to be an isolated incident, the captain does not report the event to the repair station. Unbeknownst to the crew, the variable geometry vanes are binding, and a latent maintenance issue persists that could ultimately result in a rotating stall.

(3) To our knowledge, flight training schools do not teach the flight crews to differentiate between hung starts (N2 stagnation) and slow starts.

iv) Hop-A-Jet has issued an internal Safety Comm to all Challenger crew members, reference attached, to ensure that our flight crews are aware of the differences between a hung and slow start. They are also directed to contact maintenance for any hung start.

b) In conclusion, The AFM, QRH and OM conflict with 72-00-00-100-07 for GE SEI-780 SM 72-00-00 Hung Start or Slow Start Fault Isolation 07 in that hung starts must be troubleshot upon occurrence.

IV. DISCUSSION

Hop-A-Jet acknowledges and embraces the vital role of operators in maintaining aviation safety through strict adherence to approved troubleshooting and maintenance procedures. However, the ability to fulfill this responsibility depends on the availability of timely and actionable guidance from OEMs, access to specialized tooling, and transparency regarding known risks.

At the time of the event, MP68 was not a supported or executable option offered to Hop-A-Jet. The suggestion that it should have been performed retroactively overlooks practical limitations

and the manufacturer's role in providing clear procedural direction. Similarly, the corrosion found after the accident was visible in earlier imagery but went unreported to Hop-A-Jet.

The revised Factual Report's selective emphasis on certain OEM documents, which Hop-A-Jet believes are not relevant to the accident aircraft, along with its reframing of key language, may undermine the clarity of the root cause and may dilute important lessons for the broader aviation community.

V. CONCLUSION

Hop-A-Jet respectfully requests the Board take into consideration Hop-A-Jet's position, opinions and recommendations stated within this submission when crafting the Final Report.

We thank the NTSB and the investigative team for its diligent work on this investigation and for the opportunity to partner with and to contribute to its findings.

Sincerely,

Tim Rounds

[redacted]
Vice President & Director of Maintenance

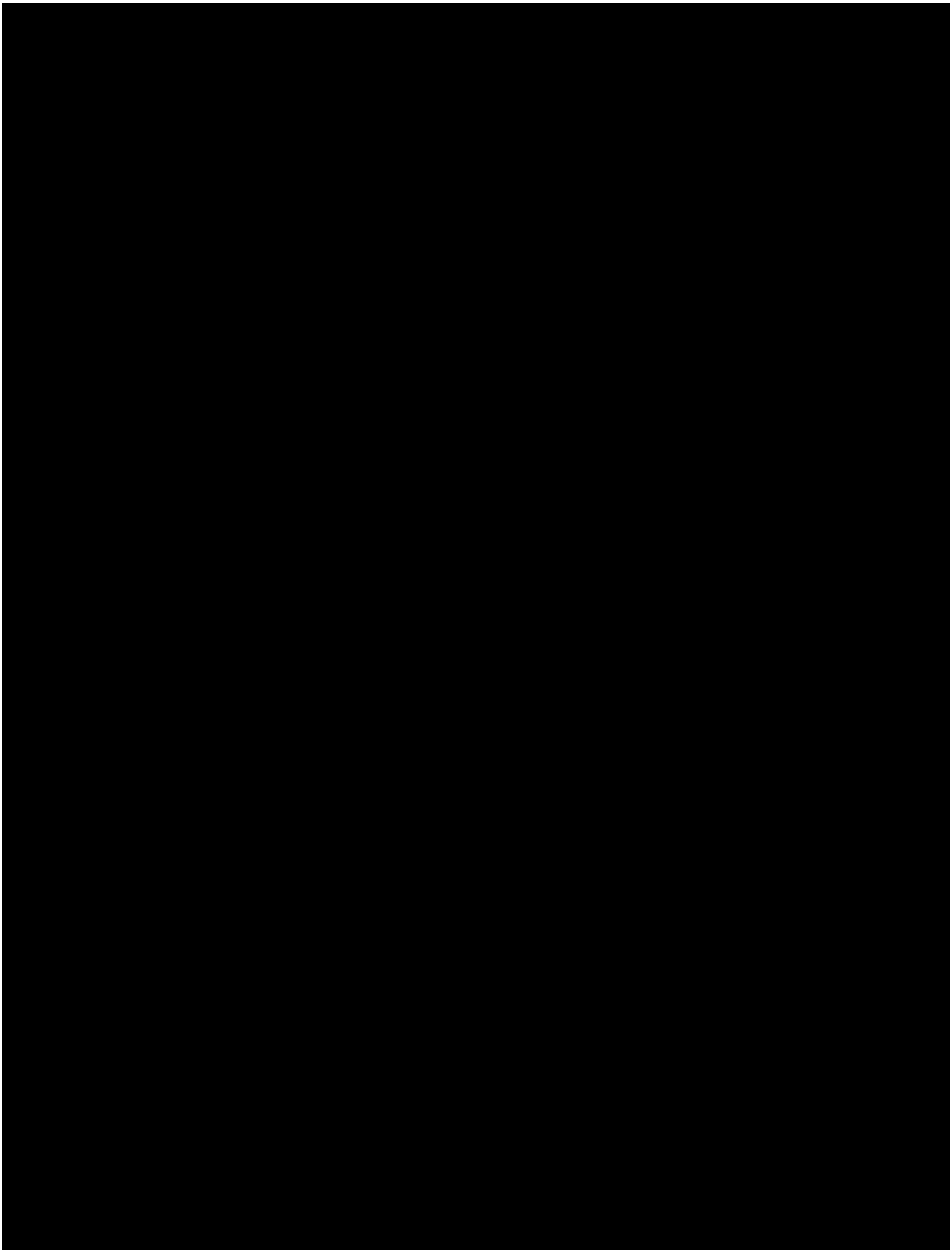
Hop-A-Jet Worldwide Jet Charter, Inc.

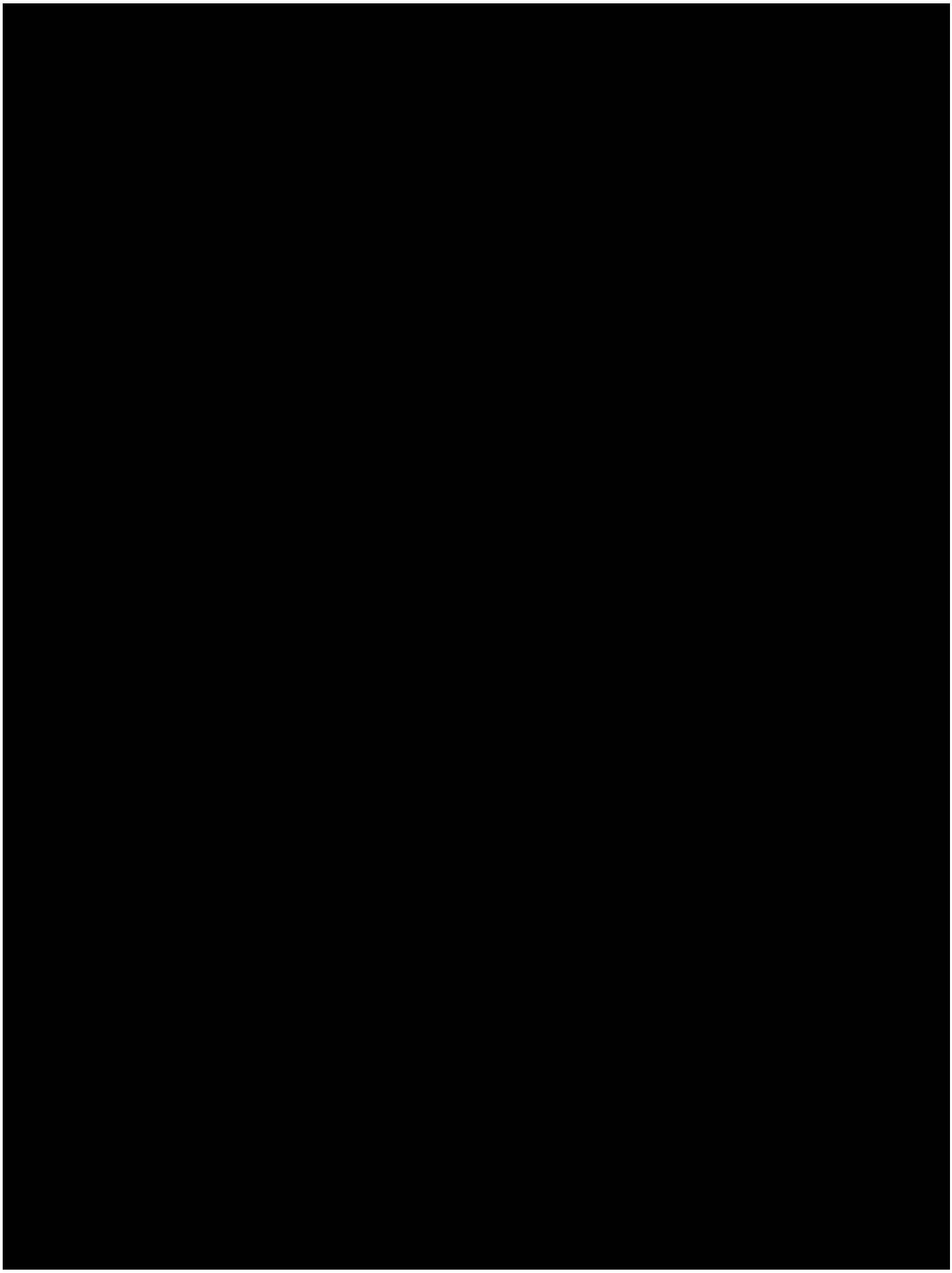
From: [redacted]
To: [redacted]
Cc: [redacted]

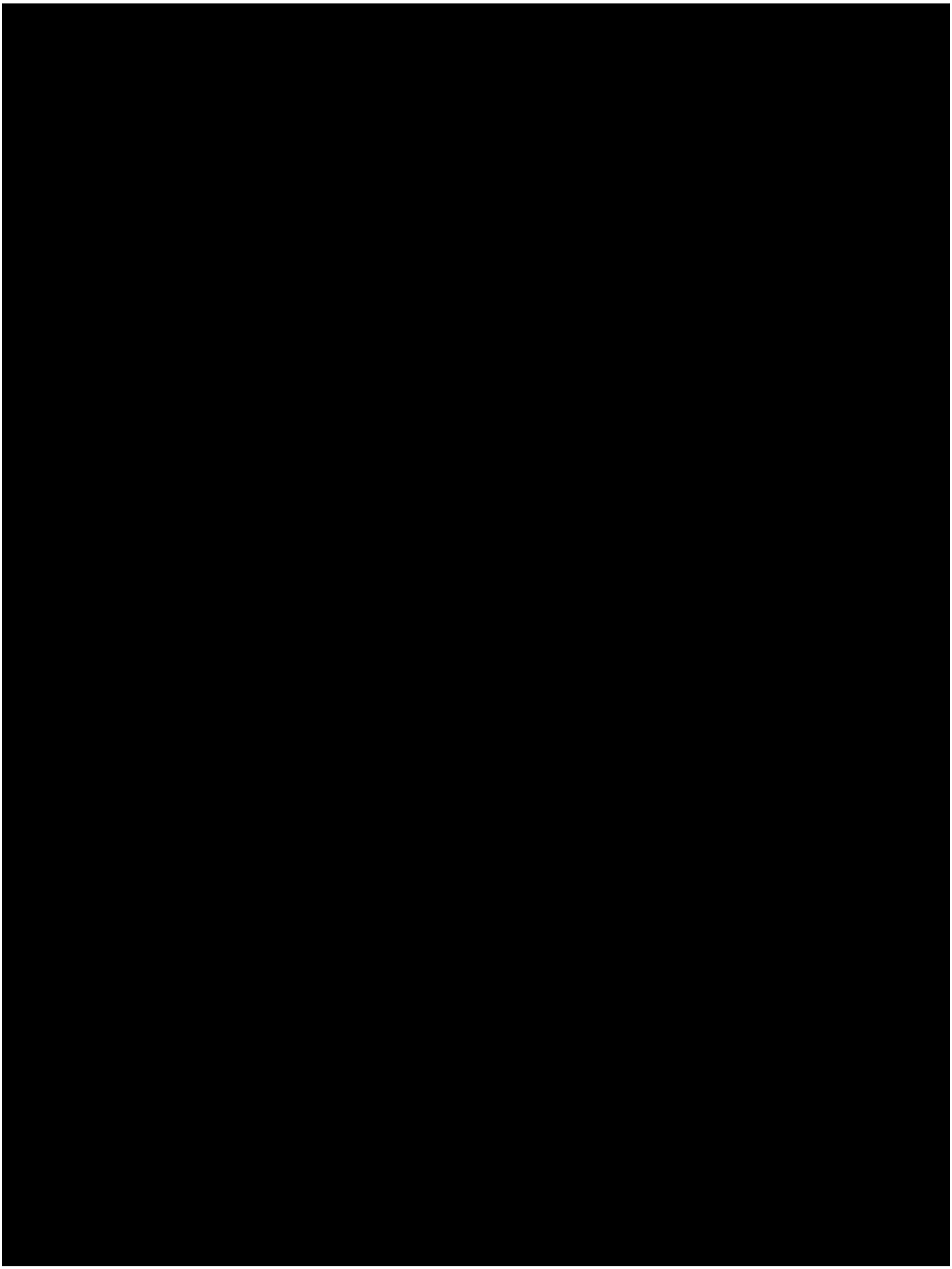
Subject: Final Answer: Case #01791643 - IMM AOG: CL5584 RH Engine Hung Start
Date: Thursday, May 11, 2023 1:42:48 AM

GE Designated: CONFIDENTIAL - authorized distribution only

[redacted]







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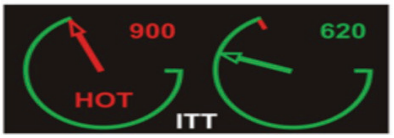
Hot Start



Condition: HOT icon on ITT gauge and/or readout indicates 900°C or hotter.

Objective: Discontinue engine start.

Affected engine:

(1) Thrust lever .....SHUT OFF

(2) IGNITION .....PRESS OUT

If one engine is operating:

(3) Inoperative engine BOOST PUMP .....PRESS OUT

(4) Dry Motor.....ACCOMPLISH until ITT is reduced below 120°C, or starter limit.

– COMPLETE –

Interrupted Start

Objective: Discontinue engine start.

If a start is interrupted:

(1) Thrust lever .....SHUT OFF

(2) IGNITION .....PRESS OUT

If one engine is operating:

(3) Inoperative engine BOOST PUMP .....PRESS OUT

(4) Dry Motor..... WITHIN STARTER LIMITS

DRY MOTORING CYCLE		
START	MAXIMUM TIME ON	FOLLOWED BY
1	90 – seconds	5 minutes off
2 and subsequent	30 – seconds	5 minutes off

– COMPLETE –

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