

Engine Systems Inc

175 Freight Road

Rocky Mount

NC 27804

**FROM**

**TO**

Name: Susan Woolard

Phone: Fax: 7134351000 301-816-5151

E-mail: Susan.Woolard@kirbycorp.com NRC Operations Center

Sent: 1/30/26 at: 3:01:17 PM

11 page(s) (including cover)

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Subject: Report No. 10CFR21-0140, Rev. 0

Comments:

See attached report.

**ENGINE SYSTEMS, INC.**

175 Freight Road  
Rocky Mount, NC 27804

Telephone: 252/977-2720  
Fax: 252/446-1134

**TELEFAX**

**Date:** January 30, 2026  
**Company:** NRC Operations Center  
**Fax Number:** 301/816-5151  
**Verification No.:** 301/816-5100  
**Reference:** Report No. 10CFR21-0140, Rev. 0  
**From:** Dan Roberts

Dear Sir / Madam:

Following this cover is a copy of our report 10CFR21-0140, Rev. 0, for a 10CFR21 reportable notification for EMD Cylinder Head, P/N 40121485, with a casting date from May 2023 to August 2025.

A copy of the report will be mailed to the NRC Document Control Desk and to our affected nuclear customers.

Should you have questions, please let us know.

Sincerely,

ENGINE SYSTEMS, INC.

Dan Roberts  
Quality Manager

/sjw

**ENGINE SYSTEMS, INC.**

175 Freight Road, Rocky Mount, NC 27804

Telephone: 252/977-2720  
Fax: 252/446-1134**Report No. 10CFR21-0140**  
**Rev. 0: 01/30/26****10CFR21 REPORTING OF DEFECTS  
AND NON-COMPLIANCE****COMPONENT:** EMD Cylinder Head with a casting date from May 2023 to August 2025  
Part Number 40121485**SYSTEM:** Emergency Diesel Generator**CONCLUSION:** Reportable in Accordance With 10CFR21

Prepared By:

  
John Lin  
Engineering Manager

Date: 1/30/26

Reviewed By:

  
Dan Roberts  
Quality Manager

Date: 1-30-26

REV	DATE	PAGE	DESCRIPTION
0	01/30/26		Original Issue.

**Pursuant to 10 CFR 21.21(d)(4), ESI is presenting the required information as follows:**

**(i) Name and address of the individual or individuals informing the Commission.**

Dan Roberts Quality Manager Engine Systems Inc. 175 Freight Rd. Rocky Mount, NC 27804	John Kriesel Engineering Manager Engine Systems Inc. 175 Freight Rd. Rocky Mount, NC 27804
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**(ii) Identification of the basic component supplied within the United States which fails to comply or contains a defect.**

EMD cylinder head, P/N 40121485, with a casting date from May 2023 to August 2025.

**(iii) Identification of the firm supplying the basic component which fails to comply or contains a defect.**

Engine Systems Inc. (ESI)

**(iv) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.**

Commercial, high duty cycle applications have experienced cracks between the core plugs and injector well on EMD cylinder heads cast from May 2023 to August 2025. The effect is a minor jacket water leak at the top of cylinder head.

If the leakage goes undetected, there is the long term possibility of lube oil dilution that could prevent the engine from fulfilling its safety-related function.

**(v) The date on which the information of such defect or failure to comply was obtained.**

December 10, 2025

**(vi) In the case of a basic component which contains a defect or fails to comply, the number and location of these components in use at, supplied for, being supplied for, or may be supplied for, manufactured, or being manufactured for one or more facilities or activities subject to the regulations in this part.**

See Appendix A for a list of affected users. Note the cylinder head is typically supplied within a power pack assembly. The power pack assembly part number ordered by the customer is shown in the table.

**(vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.**

For affected customers:

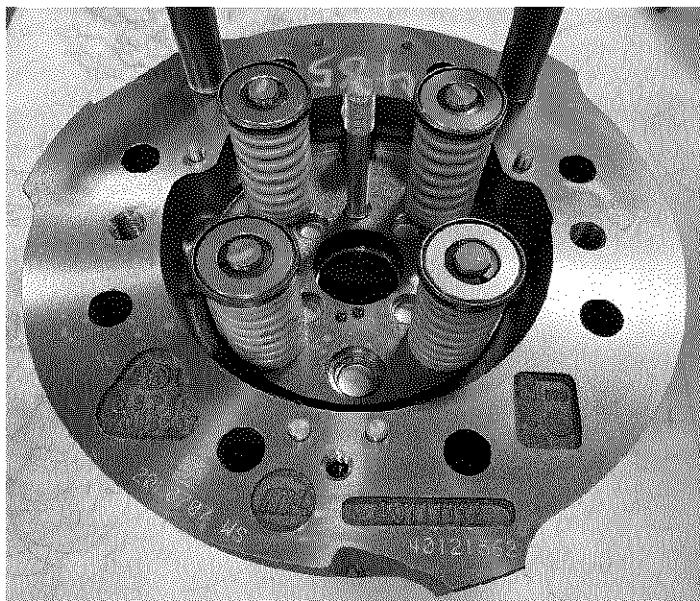
ESI recommends no near term action. Data obtained from commercial applications indicates these top deck head cracks developed in only the heaviest loaded engines and at an average of 3000 hours. Considering a typical EMD nuclear engine operating time of 50 hours per year, a cylinder head is expected to last 60 years in an emergency standby application before a crack may develop. For the few commercial applications impacted by this issue (<0.5%), cracks were detected during top deck inspections, but the leakage did not negatively affect engine operation. Crack propagation has not been a concern and the issue is localized to the top deck area adjacent to the core plugs. Effect of the crack was nuisance leakage. If left undetected, one symptom of the leak is oil dilution. It is recommended to perform periodic top deck visual inspections of the head and continue performing lube oil analysis.

For ESI:

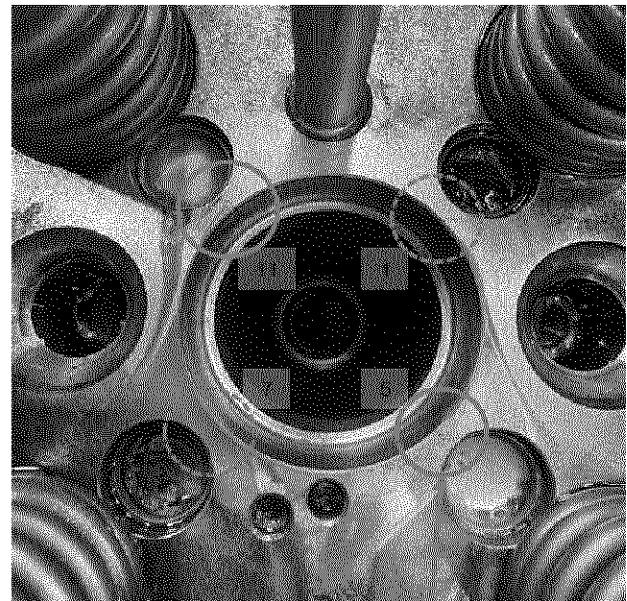
Corrective actions have been implemented by the casting manufacturer effective August 2025. For future shipments, ESI will ensure all cylinder heads have a cast date after August 2025.

**(viii) Any advice related to the potential defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.**

Photos 1 and 2 below show a typical cylinder head top view and location of cracks when they have occurred. Cracks have been detected on 51 out of 10,534 heads (<0.5%) supplied for commercial applications. No major engine damage has occurred and there have been no cracks reported in emergency applications. Engine hours required to potentially develop cracks exceed the expected service time of nuclear standby units.



**Photo 1: Typical Cylinder Head  
(top view)**



**Photo 2: Location of Crack Formation**

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Customers  
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Customer	Customer PO	ESI Sales Order	Serial Number	Cyl Head Casting Date Code	Part Number Ordered	ESI C-of-C Date
CONSTELLATION - DRESDEN	01448871	3025358	23J0297	2023-0704	40124898 (Blade Power Pack)	5/29/2024
			23J0319	2023-0717		
			23J0386	2023-0717		
			23J0405	2023-0630		
			23J0416	2023-0511		
			23J0424	2023-0605		
			23J0429	2023-0717		
			23J0532	2023-0607		
			23J0540	2023-0612		
			23J6071	2023-0711		
CONSTELLATION - DRESDEN	01448876	3025380	23J0324	2023-0717	40124897 (Fork Power Pack)	5/30/2024
			23J0330	2023-0629		
			23J0423	2023-0630		
			23J0432	2023-0717		
			23J0436	2023-0717		
			23J0322	2023-0717	40124897 (Fork Power Pack)	6/27/2024
			23J0323	2023-0717		
			23J0328	2023-0717		
			23J0331	2023-0705		
			23J6065	2023-0717		
CONSTELLATION - DRESDEN	01478888	3026099	24E0320	2024-0321	40124897 (Fork Power Pack)	10/23/2025
			24E0324	2024-0321		
CONSTELLATION - FITZPATRICK	01372298	3023905	23G0476	2023-0608	40124898 (Blade Power Pack)	9/6/2023
			23G0481	2023-0608		
			23G0485	2023-0607		
			23G0489	2023-0607		
			23G0492	2023-0608		
			23G0502	2023-0608		
			23G0504	2023-0608		
			23G0509	2023-0602		
CONSTELLATION - FITZPATRICK	01449105	8004093	23J0544	2023-0612	40124898 (Blade Power Pack)	7/22/2024
CONSTELLATION - FITZPATRICK	0000703-13854	3023906	23G0149	2023-0524	40124897 (Fork Power Pack)	9/6/2023
			23G0191	2023-0515		
			23G0195	2023-0515		
			23G0212	2023-0512		
			23G0247	2023-0512		
			23G0471	2023-0613		
			23G0479	2023-0608		
			23G0482	2023-0608		

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CONSTELLATION - NINE MILE POINT	01448184	3025346	23H1240	2023-0612	40124897 (Fork Power Pack)	6/26/2024
			23H1320	2023-0705		
CONSTELLATION - QUAD CITIES	01466186	3025808	23J0538	2023-0608	40124897 (Fork Power Pack)	7/21/2025
			23J0602	2023-0711		
			23J0623	2023-0329		
			23J6073	2023-0717		
			24E0313	2024-0321		
			24E0311	2024-0314		
			24E0323	2024-0321		
			24D1377	2024-0314		
			24E0275	2024-0322		
			24E0315	2024-0321		
DUKE - BRUNSWICK	03186370	4011179	23J0246	2023-0718	40124898 (Blade Power Pack)	7/21/2025
			23J0256	2023-0705		
			23J0273	2023-0704		
			23J0275	2023-0704		
			23J0278	2023-0704		
			23J0607	2023-0711		
			23J0612	2023-0718		
			23J0614	2023-0718		
			23J0619	2023-0511		
			23J0628	2023-0425		
ENERGY HARBOR CORP - DAVIS BESSE	45680875	3023968	24E0304	2024-0321	40121469 (Cylinder Head Assy)	11/6/2024
			23J0984	2023-0718	40124897 (Fork Power Pack)	3/28/2024
			23J1016	2023-0811		
			23J1042	2023-0810		
			23J1044	2023-0810		
			23J1045	2023-0810		
			23J1052	2023-0718		
			23J1053	2023-0718		
			23J1058	2023-0718		
			23J1059	2023-0710		
			23J1086	2023-0811		
			23J6095	2023-0710	40124898 (Blade Power Pack)	3/28/2024
			23J0987	2023-0810		
			23J1001	2023-0810		
			23J1020	2023-0810		
			23J1043	2023-0810		
			23J1047	2023-0810		
			23J1048	2023-0810		
			23J1080	2023-0811		
			23J1085	2023-0811		
			23J1089	2023-0811		
			23J1090	2023-0811		
			23J1091	2023-0811		

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ENERGY HARBOR CORP - PERRY NUCLEAR POWER	45688545	3024827	23J0410	2023-0530	40124897 (Fork Power Pack)	3/5/2024
ENTERGY OPERATIONS INC - GRAND GULF NUCLEAR	10683340	3022678	23H0538 23H0547 23H0567 23H0570 23H0575 23H1268 23H1324 23J0992 23J1014 23J1018 23J1046 23J1050 23H0479 23H0483 23H0498 23H0563 23H0572 23H0579 23H1218 23H1265 23H1305 23H1312 23H1325 23H6026	2023-0706 2023-0620 2023-0620 2023-0620 2023-0705 2023-0616 2023-0704 2023-0810 2023-0811 2023-0810 2023-0810 2023-0810 2023-0629 2023-0623 2023-0613 2023-0626 2023-0620 2023-0705 2023-0615 2023-0615 2023-0717 2023-0717 2023-0704 2023-0626	40124897 (Fork Power Pack)	1/29/2024
ENTERGY OPERATIONS INC - GRAND GULF NUCLEAR	62323413	3026888	23J0537 23J0547 23J0613 23J0617	2023-0607 2023-0612 2023-0718 2023-0718	40124897 (Fork Power Pack)	6/6/2025
FLORIDA POWER & LIGHT - TURKEY POINT	02458184	3024528	23H1308	2023-0717	40111744-ESI (Fork Power Pack)	6/24/2024
TAIWAN POWER COMPANY	0081320029 / 008132002901 / 420001461	3025425	24E0284 24E0274 24E0267 23J0624 24E0293 24E0246 24E0276 24E0273	2024-0321 2024-0321 2024-0322 2023-0425 2024-0321 2024-0321 2024-0321 2024-0321	40124897 (Fork Power Pack)	10/6/2025
					40124898 (Blade Power Pack)	10/6/2025

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TENNESSEE VALLEY AUTHORITY - SEQUOYAH	7332773	3023002	23G0188	2023-0515	40124897 (Fork Power Pack)	9/14/2023
			23H0453	2023-0629		
			23H0475	2023-0629		
			23H0495	2023-0612		
			23H0497	2023-0613		
			23H0701	2023-0619		
			23H0718	2023-0515		
			23H0730	2023-0602		
			23H0767	2023-0615		
			23H0773	2023-0615		
			23H0779	2023-0616		
			23H0784	2023-0602		
			23H0474	2023-0629		
			23H0502	2023-0612		
			23H0507	2023-0612		
			23H0726	2023-0602		
			23H0729	2023-0530	40124897 (Fork Power Pack)	9/29/2023
			23H0735	2023-0605		
			23H0738	2023-0602		
			23H0761	2023-0602		
			23H0778	2023-0616		
			23H1279	2023-0602		
			23H1282	2023-0602		
			23H1286	2023-0711		
			23H0489	2023-0623		
			23H0501	2023-0612		
			23H0504	2023-0612	40124897 (Fork Power Pack)	10/4/2023
			23H0512	2023-0628		
			23H0514	2023-0629		
			23H0515	2023-0629		
			23H1259	2023-0619		
			23H1270	2023-0602		
			23H1275	2023-0602		
			23H1296	2023-0710		
			23H1306	2023-0717		
			23J0413	2023-0530		
			23G0161	2023-0511	40124898 (Blade Power Pack)	9/14/2023
			23H0503	2023-0612		
			23H0505	2023-0612		
			23H0509	2023-0613		
			23H0516	2023-0629		
			23H0525	2023-0623		
			23H0752	2023-0602		
			23H0756	2023-0602		
			23H0764	2023-0602		
			23H0765	2023-0602		
			23H0772	2023-0615		
			23H0774	2023-0615		

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TENNESSEE VALLEY AUTHORITY - SEQUOYAH	7332773	3023002	23H0520	2023-0629	40124898 (Blade Power Pack)	9/29/2023
			23H0749	2023-0602		
			23H0757	2023-0602		
			23H0768	2023-0749		
			23H0769	2023-0615		
			23H0777	2023-0615		
			23H0781	2023-0616		
			23H0782	2023-0615		
			23H0783	2023-0607		
			23H0786	2023-0607		
			23H0787	2023-0607		
			23H0789	2023-0607		
TENNESSEE VALLEY AUTHORITY - WATTS BAR	7570605	3025178	23H0492	2023-0629	40124898 (Blade Power Pack)	10/4/2023
			23H0510	2023-0613		
			23H0518	2023-0623		
			23H0522	2023-0630		
			23H0523	2023-0629		
			23H0527	2023-0704		
			23H0529	2023-0705		
			23H0553	2023-0612		
			23H0555	2023-0613		
			23H0557	2023-0619		
			23H1285	2023-0711		
			23H1293	2023-0710		
			23J1055	2023-0717	40124897 (Fork Power Pack)	2/28/2024