

**ENGINE SYSTEMS, INC.**175 Freight Road  
Rocky Mount, NC 27804Telephone: 252/977-2720  
Fax: 252/446-1134**TELEFAX**

**Date:** January 4, 2024  
**Company:** NRC Operations Center  
**Fax Number:** 301/816-5151  
**Verification No.:** 301/816-5100  
**Reference:** Report No. 10CFR21-0137, Rev. 0  
**From:** Dan Roberts  
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Dear Sir / Madam:

Following this cover is a copy of our report 10CFR21-0137, Rev. 0, for a 10CFR21 reportable notification for an EMD cylinder liner with bore deficiency, P/N 9318833 (component of power assembly P/N 40124897), S/N 20M0938.

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

Should you have questions, please let us know.

Sincerely,

ENGINE SYSTEMS, INC.

Dan Roberts  
Quality Manager

/sjw



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**Report No. 10CFR21-0137**

**Rev. 0: 01/04/24**

## 10CFR21 REPORTING OF DEFECTS AND NON-COMPLIANCE

**COMPONENT:** EMD Cylinder Liner with Bore Deficiency  
P/N 9318833 (component of power assembly P/N 40124897)  
S/N 20M0938

**SYSTEM:** Emergency Diesel Generator

**CONCLUSION:** Reportable in Accordance With 10CFR21

Prepared By:                     *Joe Liu*                      
Engineering Manager

Date:           1/4/24          

Reviewed By:                     *Dan Robert*                      
Quality Manager

Date:           1/4/24

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Record of Revisions  
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REV	DATE	PAGE	DESCRIPTION
0	01/04/24		Original Issue.

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**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.

<i>Dan Roberts</i>	<i>John Kriesel</i>
<i>Quality Manager</i>	<i>Engineering Manager</i>
<i>Engine Systems Inc.</i>	<i>Engine Systems Inc.</i>
<i>175 Freight Rd.</i>	<i>175 Freight Rd.</i>
<i>Rocky Mount, NC 27804</i>	<i>Rocky Mount, NC 27804</i>

- (ii) Identification of the basic component supplied within the United States which fails to comply or contains a defect.

*EMD Cylinder Liner, P/N 9318833, S/N 20M0938*  
*Component of Fork Power Pack Assembly, P/N 40124897, S/N 23H1306*

- (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.

*An edge or lip in the bore of an EMD cylinder liner prevented successful installation of the corresponding power assembly on an emergency diesel generator set. The lip is located axially at the bottom of the inlet ports and is present around the circumference of the bore. See photos of the power assembly, liner, and air inlet ports on page 3. The EMD model 645E4 is a 2-stroke engine with air inlet ports in the wall of the cylinder liner. As the piston travels below the inlet ports, air box pressure scavenges and replenishes air to the power assembly.*

*Installation of the power assembly requires lowering the piston through the liner in order to secure the connecting rod to the crankshaft. During this process the piston could not be lowered below the inlet ports due to the piston rings catching on the lip. The power assembly was not installed and therefore there was no safety hazard; however, if the defect had gone undetected there was the potential to damage engine components and possibly reduce load carrying capacity of the engine.*

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

*November 27, 2024*

- (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.

*The extent of condition is this single cylinder liner, P/N 9318833, S/N 20M0938 used in the power assembly shown below.*

<b>Customer</b>	<b>Customer PO</b>	<b>ESI Sales Order</b>	<b>Part Number Ordered</b>	<b>Serial Number</b>	<b>ESI C-of-C Date</b>
<i>Tennessee Valley Authority – Sequoyah Nuclear Plant</i>	<i>7332773</i>	<i>3023002</i>	<i>40124897 (Fork Power Pack)</i>	<i>23H1306</i>	<i>10/4/2023</i>

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- (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 TVA-Sequoyah:

*No action required; the power assembly has been returned to ESI.*

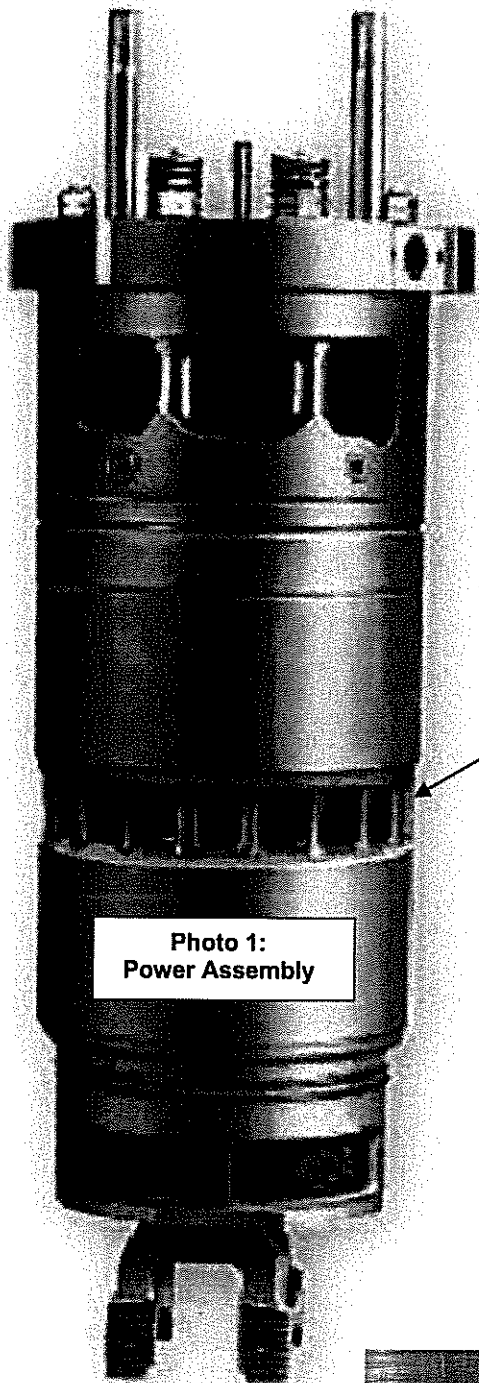
For ESI:

*To prevent reoccurrence, ESI has revised the dedication package to include verification that bore machining is continuous along the entire length and no edges or lips are present. The revision was implemented on December 6, 2023.*

- (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.

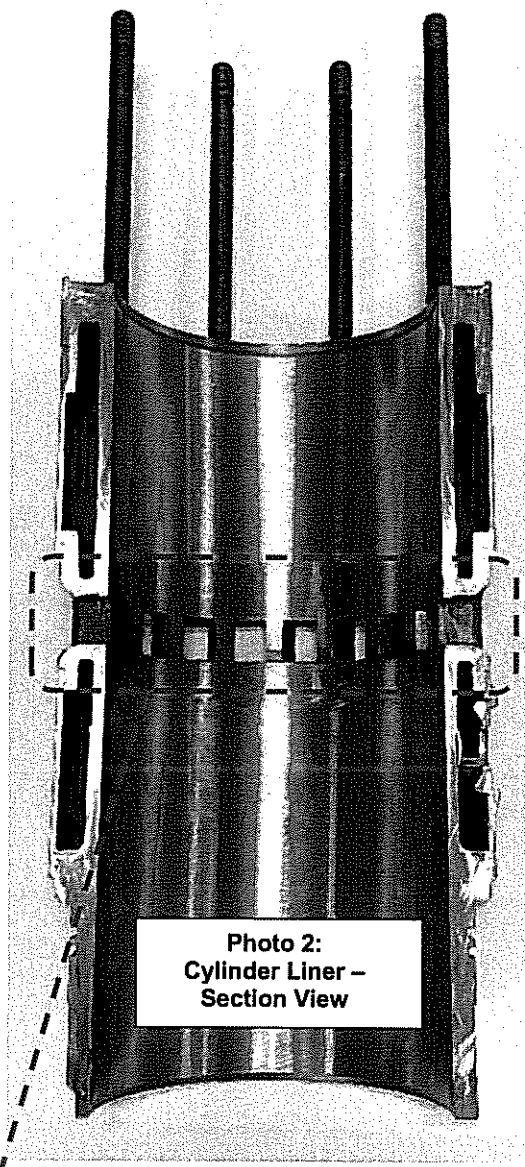
*See photos on page 3 showing location of the lip in the bore.*

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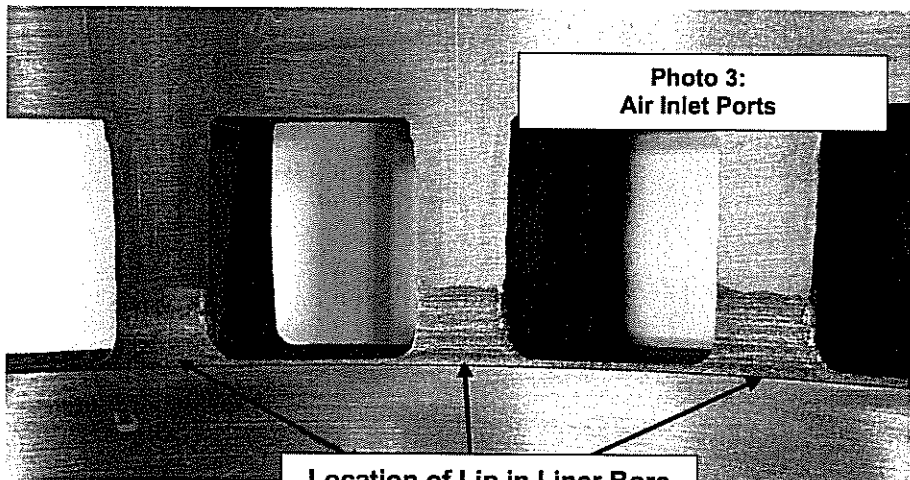


**Photo 1:  
Power Assembly**

Air Inlet  
Ports



**Photo 2:  
Cylinder Liner -  
Section View**



**Photo 3:  
Air Inlet Ports**

Location of Lip in Liner Bore  
at Bottom of Inlet Ports