



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: September 26, 2002

In reply refer to: M-02-22

Mr. Tim Solso
Chairman and Chief Executive Officer
Cummins, Inc.
500 Jackson Street
Columbus, Indiana 47201

The National Transportation Safety Board (Safety Board) is an independent Federal agency charged by Congress with investigating transportation accidents, determining their probable cause, and making recommendations to prevent similar accidents from occurring. We are providing the following information to urge you to take action on the safety recommendation in this letter. The Safety Board is vitally interested in this recommendation because it is designed to prevent accidents and save lives.

The recommendation addresses the adequacy of the instructions for the installation of engine accessories. The recommendation is derived from the Safety Board's investigation of the fire on board the high-speed domestic vessel *Seastreak New York* near Sandy Hook Point, New Jersey, on September 28, 2001, and is consistent with the evidence we found and the analysis we performed.¹ As a result of this investigation, the Safety Board has issued safety recommendations to Cummins Engine Company, Inc., and Circle Navigation Company of New York. The Safety Board would appreciate a response from you within 90 days addressing actions you have taken or intend to take to implement our recommendation.

The National Transportation Safety Board determined that the probable cause of the fire on board the *Seastreak New York* was the improper installation of the Centinel System's lube oil hose, which allowed the hose to come in contact with the hot exhaust manifold. Contributing to the cause of the fire was the absence of detailed guidance from the manufacturer of the Centinel System on the proper installation of the system. Also contributing to the cause of the fire was the lack of inspection and maintenance procedures by Circle Navigation Company that might have discovered the improper installation.

¹ For further information, read: National Transportation Safety Board, *Fire On Board the Small Passenger Vessel Seastreak New York, Sandy Hook Point, New Jersey, September 28, 2001*, Marine Accident Report NTSB/MAR-02/04 (Washington, DC: NTSB, 2002).

The fire damage to engine No. 3 precluded Safety Board investigators from identifying all possible failure mechanisms. Investigators, therefore, examined engine No. 1, which according to Circle Navigation, had been configured similarly to engine No. 3. They found that the lube oil hose was routed from the oil filter assembly at the rear starboard side of the engine over the top of the engine and underneath the cooling water hoses leading to the cooling jacket. The lube oil hose then led to the control valve on the front port side of the engine. The hose was not secured to any point in this area. Investigators found that this routing and the failure to secure the hose above the engine had allowed the lube oil hose on engine No. 1 to slip down past the forward edge of the cooling shield during installation or operation. The hose was found resting on or very near the hot exhaust manifold of engine No. 1.

The Safety Board is convinced that the lube oil hose was routed similarly on engine No. 3. When investigators examined engine No. 3 after the fire, they found no evidence that the hose had been secured. They found that one end of the broken lube oil hose was resting on top of the engine's exhaust manifold cooling shield and the other end of the hose was underneath the cooling shield, resting near the forward edge of the exhaust manifold.

In the absence of any securing of the lube oil hose in the space underneath the cooling water hoses, the vibrations of engine No. 3 could have provided the mechanism for the migration of the hose from its original position to the hazardous location below the exhaust manifold cooling shield and on or near the forward edge of the exhaust manifold, where the oil hose was subject to heat stress that eventually caused it to fail.

The Cummins Engine Company's documentation for the Centinel System does not contain any guidance for routing the lube oil hose from the oil filter assembly around heat sources to the control valve. Installation instructions in the hose manufacturer's catalog states, "When hose lines pass near an exhaust manifold or other heat source, they should be insulated by a heat resistant boot, fire sleeve, or a metal baffle." Based on its findings, the Safety Board concluded that the lack of guidance for the proper installation of the lube oil hose resulted in the lube oil hose on engine No. 3 being improperly routed and not secured, allowing it to migrate to the forward edge of the exhaust manifold, where it was subject to unintentional heat stress that eventually caused the hose to fail.

The National Transportation Safety Board, therefore, makes the following safety recommendation to Cummins Engine Company, Inc.:

Revise your manufacturing and installation literature for the Centinel System to specify how to safely route and secure the lube oil hose between the oil filter assembly and the control valves on the engines. (M-02-22)

In your response to the recommendation in this letter, please refer to M-02-22. If you need additional information, you may call (202) 314-6177.

Acting Chairman CARMODY and Members HAMMERSCHMIDT, GOGLIA,
and BLACK concurred in this recommendation.

Original Signed

By: Carol J. Carmody
Acting Chairman