



U.S. Department
of Transportation
Research and
Special Programs
Administration

Memorandum

Date: JUN - 8 1998

Reply to Attn. of:

Subject: ACTION: Clarification of Requirements For Internal Combustion Engines

From: *Edward T. Mazzullo*
Edward T. Mazzullo, Director
Office of Hazardous Materials Standards

To: Charles Lovinski, Manager
HAZMAT and Dangerous Goods Program

This is in response to your memo requesting clarification of whether aircraft engines, such as jet engines, turbine engines, and turbo props being shipped by aircraft are subject to the Hazardous Materials Regulations (HMR). Your questions are paraphrased and answered as follows:

Question 1. Are aircraft engines which are being transported by air that have been drained and purged of all fuel subject to the HMR?

Aircraft engines, whether piston-powered, rotary-powered, or turbine-powered, derive their power by heat and pressure produced by the compression and combustion of a fuel-air mixture. Therefore, aircraft engines are properly classified as "Engines, internal combustion, 9, UN 3166", and regulated by the provisions of the HMR. An aircraft engine that does not contain a hazardous material such as flammable liquid, however, is not regulated under the provisions of the HMR. Any method that renders the engine sufficiently cleaned of residue and purged of vapors to remove any potential hazard is acceptable.

Question 2. Are aircraft engines which are being transported by air, that have not been purged of residual fuel, subject to the HMR? If so, how must the engine be described and prepared for shipment?

A jet engine which contains a hazardous material, such as a flammable liquid, is subject to the requirements of the HMR. Section 173.220 (b) provides for the transportation by aircraft of an internal combustion engine utilizing flammable liquid fuel with up to 500 ml (17 oz) of fuel in engine components provided the lines are securely closed to prevent leakage. Section 173.220 (g) excepts shipments made under the provisions of this section from part 172, subparts D, E, and F, (marking, labeling, and placarding, respectively) and § 172.604 (emergency response telephone number) for transportation by aircraft. All other requirements of the HMR would apply.

I trust this satisfies your inquiry. If this office can be of further assistance, please contact us.



U.S. Department
of Transportation
Federal Aviation
Administration

NELSON
§ 173.220

Memorandum

Username
ACS_FAA

Subject: **ACTION:** Engines, internal combustion

Date: MAY 12 1998

From: Dangerous Goods and Cargo Security Program,
ACO-800

Reply to
Attn. of: B. Romo
202-267-3207

To: Edward T. Mazzullo, Director,
Office of Hazardous Materials Standards/RSPA

ACO-800 is requesting a letter of clarification on the applicability of the Hazardous Materials Regulations (HMR) to aircraft engines. Our agents are encountering numerous situations involving improperly declared or undeclared aircraft engines, such as jet engines, turbine engines, and turbo-props. Many air carriers are offering and transporting these engines as non-regulated, whether or not the engines have been drained and purged. These carriers claim the shipping description "Engines, internal combustion, 9, UN 3166" does not apply to aircraft engines.

Attached is a memo from our Chicago field office, which describes two ways in which an aircraft engine can be drained and purged of all fuel. We are requesting your opinion as to whether aircraft engines which have been drained and purged in the described manner would be subject to the HMR. In addition, do you consider an aircraft engine which has not been purged (i.e., residual fuel remains in the fuel lines, manifolds and fuel controls) to be subject to the HMR and, if so, how would this engine be described and prepared for shipment?

I appreciate your attention to this matter. If you have any questions or need additional assistance, please contact Beth Romo of my staff.



Charles N. Lovinski

Attachment

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Subject: **ACTION:** Letter of Interpretation,
UN3166 Engines, Internal Combustion

Date: May 1, 1998

From: Manager, Chicago Civil Aviation
Security Field Office

Reply to: James Berk
Attn. of: (847) 928-8050
FAX (847) 928-8090

To: Regulations Development Office of
Hazardous Materials Standards
THRU: Beth Romo, Dangerous
Goods Staff, ACO-800

The Chicago CASFO has encountered several problems involving the improper classification and transportation of aircraft engines (i.e. jet engines, turbine-engines, turbo-prop).

In general, industry believes aircraft engines are NOT considered Engines, Internal Combustion. Most airlines are accepting and shipping these items as non-regulated. This is being accomplished without consideration of whether or not the engine has been drained and PURGED.

Some common responses received from the carriers are: "we have been shipping aircraft engines the same way for 20 years", or "the manufacturer (GE, Pratt & Whitney) has told us this is NOT UN3166", or "173.220 applies to vehicles not jet engines".

The Chicago CASFO has been advised that aircraft engines are properly classified as UN3166 , Engine, Internal Combustion, Class 9.

An aircraft engine can be purged or preserved in two ways. A Hot Preservation is accomplished at the end of an engine test. Testing facilities will shut off the fuel supply and introduce lightweight (1010) oil. The engine continues to run burning this oil instead of the fuel. Fuel has now been replaced with oil and the flammable liquid has been *completely* removed. After the engine is shut down, it can be drained of excess oil and preservation should be documented in engine records.

Engines removed to be sent back to the repair facility could be cold purged/preserved if equipment is available. A hand operated pump filled with the same 1010 oil or preservative will be attached to a specific location on the fuel control or fuel pump (directed by manufacturer technical instructions). A fuel line or valve will be opened down stream of the manual pump location. Oil will be pumped through the fuel system until all the fuel has been pushed out and replaced with oil. The excess oil can then be drained and lines resealed. Documentation should once again be noted in the engine records.

If an aircraft engine has been drained and PURGED of all fuel (and properly documented on the engine records), is the shipper required to label, mark, ship the material as a hazardous material?

If an aircraft engine has not been PURGED (residual fuel remaining in lines, manifolds and fuel controls...), is the shipper required to ship the equipment as a hazardous material?

Based on the ongoing misunderstanding within the aviation industry, please provide a written letter of clarification relative to the proper classification of aircraft engines for air transportation.

Joyce B. Scott

File:

WP: C:\My Documents\Request Letter of Interpretation.doc
ORD CASFO,JBerk,JEB,(847) 928-8010,4/29/98