TO: ALL HOLDERS OF FIRE RESISTANT HYDRAULIC FLUID OVERHAUL MANUAL, 29-00-01

REVISION NO. 6, DATED MAR 1/97

HIGHLIGHTS

DESCRIPTION OF CHANGE	TOPICS AFFECTED												
	D & O	D / Assy	Cleaning	Insp / Chk	Repair	Assy	F / C	Test	T / Shooting	S / Tools	Storage	IPL	L / Overhaul
Updated the BMS 3-11 fluid requirements to be the same as those specified in the latest change to the BMS 3-11 specification (Rev K)	X												

FIRE RESISTANT HYDRAULIC FLUID

29-00-01

BOEING P/N NO ASSIGNED PART NUMBER

AIRLINE P/N

THE FOLLOWING DIRECTIVES APPLY TO THIS SUBJECT:

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVES	DATE DIRECTIVE INCORPORATED INTO TEXT
		PRR 17590	Feb 15/68

LIST OF EFFECTIVE PAGES

* Indicates pages revised, added or deleted in latest revision
F Indicates foldout pages - print one side only

	PAGE	DATE		PAGE	DATE		PAGE	DATE
	29-00-01							
	T-1	Jun 15/69						
	T-2	BLANK						
*	LEP-1	Mar 1/97						
	LEP-2	BLANK						
	T/C-1	Oct 1/69						
	T/C-2	BLANK						
	1	Nov 10/86						
*	2	Mar 1/97						
	3	Feb 10/73						
	4	Feb 10/73						

TABLE OF CONTENTS

FIRE RESISTANT HYDRAULIC FLUID

1. INTRODUCTION

A. The material described in this subject is for use in hydraulic systems requiring a fire resistant fluid.

B. The information in this subject is general in nature and should be used for information only.

C. For detailed requirements, data, and testing criteria relative to this fluid, reference and compliance with the provisions of Boeing Material Specification, BMS 3-11, is required.

D. Whenever hydraulic system components are disassembled, cleaned, overhauled or installed, final flushing with BMS 3-11 hydraulic fluid only is recommended to avoid fluid contamination within the operational system by incompatible materials such as cleaning solvents.

2. PROPERTIES

NOTE: The properties of BMS 3-11, hydraulic fluid, listed below are those for new fluid except as noted.

A. There is one type of hydraulic fluid currently approved. It consists of a base fluid (phosphate enter) with additives. The fluid is purple in color. The type is divided into two classes as follows:

(1) Type 1, Obsolete

(2) Type 2, Obsolete

(3) Type 3, Obsolete

(4) Type 4, -65 to 275°F Fire Resistant Fluid

(a) Class 1 -- Low Density Fluid

(b) Class 2 -- High Density Fluid

B. The fluid conforms to the following requirements when tested in accordance with the provisions of BMS 3-11.

(1) Viscosity (centistokes)

(a) Maximum at -65°F

1) Class 1 -- 2000 maximum

2) Class 2 -- 4200 maximum

(b) Range at 100°F — 9.00 to 12.50

(c) Range at 210°F — 3.00 to 4.00

(2) Pour Point — -80°F maximum

(3) Specific Gravity at 77°F (25°C)

(a) Class 1 — 0.970 to 1.020

(b) Class 2 — 1.021 to 1.066

(4) Acidity

(a) New fluid — 0.2 (maximum) mg KOH to neutralize 1 gm fluid

(b) Used fluid — 1.5 mg KOH to neutralize 1 gm fluid

NOTE: Based on experience, no damage occurs to hydraulic components with acid numbers to this limit.

(5) Moisture content, % by weight

(a) Deleted

(b) Type 4 — 0.30 maximum

(6) Flash Point — 320°F minimum

(7) Fire Point — 350° minimum

(8) Auto-Ignition Temperature — 750°F minimum (IAW ASTM D2155)

(9) Toxicity — No acute health hazard or cumulative toxic effects from skin contact or breathing vapors.

(10) Deleted

(11) Particle Count (maximum)

Particle Size Range (micrometer)	Particles /100 ml Hydraulic fluid (maximum)
	Type 4
5-15	32,000
15-25	5,700
25-50	1,012
50-100	180
greater than 100	32

(12) Foaming

Sequence	Foam Volume at end of 5 minute blowing period (ml)	Collapse Time (seconds)
75°F	250 maximum	100 maximum
200°F	150 maximum	50 maximum
75°F (after 200°F)	450 maximum	250 maximum

3. CHARACTERISTICS

A. Mixing of fluids conforming to requirements of BMS 3-11 is permissible.

B. Mixing of fluids conforming to provisions of BMS 3-11 with other oils or fluids is prohibited, as damage to system components may result.

C. When used below a temperature of 240°F, BMS 3-11 is compatible with metal used in airplanes except when contaminated by foreign materials or water.

D. Products and finishes of vinyl, nitrocellulose, asphalt, synthetic resins, oil base paints, and some electrical potting compounds can be affected chemically and softened by the fluid. Items contaminated with the fluid should be quickly cleaned, using alkaline cleaner, and wiped dry. Components susceptible to damage should be protected by covering or painting with a material resistant to the fluid, such as nylon or epoxy.

E. Properly processed thermosetting resins, natural fiber (cotton, linen, burlap, wool, silk) textiles and nylon synthetic fabrics or materials, and some paints are not affected by the fluid. Refer to 20-41-01 for hydraulic fluid resistant finishes, identified by SRF.

F. Only materials compatible with BMS 3-11 Fluids, such as ethylene propylene, butyl rubber, and teflon are used for system seals, gaskets, packings, and hose linings.

G. Ordinarily used thread lubricants and antiseize compounds are not compatible for use in areas contacting the fluid.

4. HANDLING AND USE

A. Although the acute affect of BMS 3-11, hydraulic fluid, is not permanent or toxic, the adverse affects listed below may be experienced by personnel who do not take proper precautions against exposure to BMS 3-11.

(1) Skin irritation in the form of dry or cracked skin from prolonged and repeated contact.

(2) Painful but temporary irritation to the eyes.

(3) Burning sensation to sensitive parts of the body other than the eyes.

(4) Irritation of the upper respiratory tract from inhaling mist or spray.

WARNING: BMS 3-11 HEATED TO TEMPERATURES ABOVE 450°F CAN BE DECOMPOSED INTO TOXIC FUMES AND GASES. AVOID INHALATION OF FUMES AND VAPORS FROM OVERHEATED BMS 3-11. WEAR SAFETY APPROVED EYE AND RESPIRATORY PROTECTION WHEN WORKING IN FUMES AND VAPORS OF OVERHEATED BMS 3-11.

B. Personnel handling BMS 3-11 should protect themselves against direct exposure by exercising the following precautions:

(1) Wear goggles, safety glasses, or face mask to protect face and eyes from exposure.

(2) Wear a respirator in an environment of mist or spray.

(3) Wear gloves to protect hands.

(4) Use hand creams and lotions to protect skin.

C. If contact is made with BMS 3-11, treat the exposed area as follows:

(1) Remove all contaminated clothing.

(2) Thoroughly wash exposed area with a generous amount of clean water.

(3) Flush eyes immediately with clean water and obtain medical observation until all irritation is gone.

5. STORAGE AND RECLAMATION

A. Water and contamination are the major problems involved in storage. The fluid can be reclaimed but is generally confined to removal of dirt.

B. For further detailed information, consult the applicable vendor of the product.

6. APPROVED PRODUCTS

Refer to 20-60-03.