FLUID, HYDRAULIC BRAKE, DOT 3 **∇ WSS-M6C65-A1**

FLUID, HYDRAULIC BRAKE, ISO 4925 CLASS 6, DOT 4 **∇ WSS-M6C65-A2**

FLUID, HYDRAULIC BRAKE, DOT 5.1 **∇ WSS-M6C65-A3**

1. SCOPE

The material defined by these specifications is a non-petroleum hydraulic brake fluid containing glycol ethers, borate esters, and additives.

2. APPLICATION

This material is primarily intended for use as a hydraulic fluid in passenger and light commercial vehicle brake systems. The quality or grade of brake fluid is determined by the vehicle program.

3. REQUIREMENTS

3.1 APPROVED SOURCES

This specification requires the use of approved sources. Only the sources identified on the Ford Approved Source List (ASL) can be used when this specification is listed on the drawing, CAD file, or other documents. The list of approved sources is located within Ford at www.mats.ford.com or available externally through a Ford Materials Engineer.

3.2 QUALIFICATION

∇ 3.2.1 Fluid defined by WSS-M6C65-A1 must conform to all the requirements of a DOT 3 fluid per government regulation FMVSS 116, *Motor Vehicle Brake Fluids*. Refer to the supplier's control plan for specific requirements that may be designated as control items.

∇ 3.2.2 Fluid defined by WSS-M6C65-A2 must conform to all the requirements of a DOT 4 and Class 6 fluid per government regulation FMVSS 116 and ISO 4925, Road Vehicles – Specification of non-petroleum-base brake fluids for hydraulic systems. Refer to the supplier's control plan for specific requirements that may be designated as control items.

∇ 3.2.3 Fluid defined by WSS-M6C65-A3 must conform to all the requirements of a DOT 5.1 fluid per government regulation FMVSS 116, *Motor Vehicle Brake Fluids*. Refer to the supplier's control plan for specific requirements that may be designated as control items. DOT 5.1 is a non-silicone, non-petroleum, based fluid which meets DOT 5 requirements.

∇ 3.2.4 The fluid qualification test results and certificate of conformity must be provided for all fluids to maintain homologation requirements. Qualification must be renewed such that a current qualification exists at all times.

3.2.5 Product Development and Materials Engineering reserves the right to subject fluids submitted against this specification to any additional investigation they may consider necessary and use the data derived for approval.

Date	Action	Revisions	Rev. 5
2018 02 09	Revised	See Summary of Revisions	S. Gould, EU
2012 11 19	Revised	See Summary of Revisions	A. Wedepohl, NA
2007 01 11	Activated		A. Wedepohl, NA

Controlled document at www.MATS.ford.com
Copyright © 2018, Ford Global Technologies, Inc.

Copyright Ford Motor Company
Provided by IHS Markit under license with FORD
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: FORD WSS-M6C65-A3 2018
AVA Documents Document Sharing Hub

3.3 DOCUMENTATION

Supplier must furnish to the affected Materials Engineering activity a completed copy of the attached Supplement A. Manufacturing control limits and test reports demonstrating full compliance with all requirements of this specification must be provided. All tests must be certified by a qualified and authorized representative of the test facility.

3.4 E.R.B.P.
(Equilibrium Reflux Boiling Point, SAE J1704, 5.1; FMVSS 116, S6.1)

3.4.1	DOT 3	260 ºC min
3.4.2	DOT 4 / Class 6	260 ºC min
3.4.3	DOT 5.1	262 ºC min

3.5 W.E.R.B.P.
(Wet Equilibrium Reflux Boiling Point)

3.5.1 Humidification Method
(SAE J1704, 5.2; FMVSS 116, S6.2)

3.5.1.1	DOT 3	145 ºC min
3.5.1.2	DOT 4 / Class 6	170 ºC min
3.5.1.3	DOT 5.1	180 ºC min

3.5.2 Direct Addition Method
(Completely mix 3% by weight demineralized water directly into the fluid. May be used in place of the humidification method for control plan testing.)

3.5.2.1	DOT 3 with 3% by weight water content	145 ºC min
3.5.2.2	DOT 4 / Class 6 with 3% by weight water content	180 ºC min
3.5.2.3	DOT 5.1 with 3% by weight water content	180 ºC min

3.6 FLUID COLOR — Light yellow to amber
(Visual)

3.7 KINEMATIC Viscosity at -40 °C
(SAE J1704, 5.3; FMVSS 116, S6.3; ASTM D7042)

3.7.1	DOT 3	1050 mm^2/sec max
3.7.2	DOT 4 / Class 6	750 mm^2/sec max
3.7.3	DOT 5.1	900 mm^2/sec max

3.8 MINERAL OIL CONTAMINATION, % v/v — 0.05% max
(FLTM AM 153-01, Ford VOPQUG-205 Exhibit B,
or other suitable methods)

Copyright © 2018, Ford Global Technologies, Inc.

Documents
Document Sharing Hub

Copyright Ford Motor Company
Provided by IHS Markit under license with FORD
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: FORD WSS-M6C65-A3 2018

3.9 WATER CONTENT 0.20% max
(Karl Fischer Method. ASTM E203, DIN 5177, ISO 760)

3.10 CORROSION

3.10.1 Metal Strip Corrosion
(SAE J1704, 5.6 Dry and Wet Corrosion)

This test is to be performed with and without water added to the fluid.

The corrosion test shall be carried out according to the SAE procedure with the addition of a zinc alloy and aluminum alloy test strip. The zinc alloy test strip shall be UNS Z35531 (SAE J468 925), and the aluminum alloy shall be JIS H 5302 ADC10. The test strips shall be placed in the following order: tinned iron, steel, aluminum, aluminum alloy, cast iron, brass, copper, zinc alloy.

Test Strip Material	Maximum Weight Change, mg/cm^2
Steel, Tinned Iron, Cast Iron	0.2
Aluminum, Aluminum Alloy	0.1
Brass, Copper, Zinc Alloy	0.4

The test strips outside the contact area shall not be pitted or roughened to an extent visible to the naked eye. Staining or discoloration is permitted.

3.10.2 Thermal Stability Corrosion Test

After 5 days at 100 °C in a one-liter sealed can, fluid shall meet the requirements of corrosion test 3.10.1.

3.11 WATER TOLERANCE AT 60 °C
(SAE J1704, 5.8.2; FMVSS 116, S6.9.3(b))

The brake fluid shall show no stratification; sedimentation shall not exceed 0.05% by volume after centrifugation.

3.12 EFFECT ON EPDM RUBBER
(SAE J1704. 5.11)

3.12.1 At 70°C

3.12.1.1	Hardness decrease	0 to 10 IRHD
3.12.1.2	Volume increase	0 to 10 %
3.12.1.3	Blisters	None
3.12.1.4	Sloughing	None

3.12.2 At 120°C

3.12.2.1	Hardness decrease	0 to 15 IRHD
3.12.2.2	Volume increase	0 to 10 %
3.12.2.3	Blisters	None
3.12.2.4	Sloughing	None

Copyright © 2018, Ford Global Technologies, Inc.

Documents Document Sharing Hub
Copyright Ford Motor Company
Provided by IHS Markit under license with FORD
No reproduction or networking permitted without license from IHS
Licensee=/, User=,
Not for Resale,
Full document details: FORD WSS-M6C65-A3 2018