



## FLUID, AUTOMATIC TRANSMISSION, MANUAL GEARBOX

WSS-M2C244-A

### 1. SCOPE

The material defined by this specification is a first fill fluid for manual transmissions composed of mineral base oils and performance additives.

### 2. APPLICATION

This specification was originally released as a hydraulic control fluid and general lubricant in manual transmissions.

### 3. REQUIREMENTS

#### 3.1 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements for Production Materials (WSS-M99P1111-A).

#### 3.2 APPEARANCE

Bright and clear

#### 3.3 DENSITY (15°C) (ASTM D 1298)

Report

#### 3.4 VISCOSITY

3.4.1 At 100 °C, min  
(ASTM D445)

14.0 mm<sup>2</sup>/s

3.4.2 At 40 °C, min  
(ASTM D445)

75 mm<sup>2</sup>/s

3.4.3 At -30 °C, max  
(ASTM D 2983)

18,000 mPa.s

3.4.4 At -40 °C, max  
(ASTM D 2983)

150,000 mPa.s

3.4.5 Shear Stability, Viscosity Loss, %, max  
250 cycles, (ASTM D 6278)

2.0

3.4.6 Viscosity Index, min  
(ASTM D 2270)

170

#### 3.5 POUR POINT, max (ASTM D 97)

-40 °C

| Date       | Action    | Revisions | Ver 1 |
|------------|-----------|-----------|-------|
|            |           |           |       |
|            |           |           |       |
| 2008 07 15 | Activated |           |       |



Documents

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|             |                                                                                                                                                                                                                                                                                                          |                                                    |                                                      |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------|
| <b>3.6</b>  | <b>FLASH POINT, min</b><br>(ASTM D 92)                                                                                                                                                                                                                                                                   |                                                    | 190 °C                                               |
| <b>3.7</b>  | <b>COPPER CORROSION</b><br>(ASTM D 130)                                                                                                                                                                                                                                                                  |                                                    |                                                      |
|             | 3 h at 121 +/- 2 °C, max                                                                                                                                                                                                                                                                                 |                                                    | 1                                                    |
| <b>3.8</b>  | <b>ANTI FOAMING PROPERTIES</b><br>(ASTM D 892)                                                                                                                                                                                                                                                           | Foam Tendency<br>at end of 5 min<br>blowing period | Foam Stability<br>at end of 1 min<br>settling period |
|             | Sequence 1, max                                                                                                                                                                                                                                                                                          | 20 mL                                              | 0 mL                                                 |
|             | Sequence 2, max                                                                                                                                                                                                                                                                                          | 40 mL                                              | 0 mL                                                 |
|             | Sequence 3, max                                                                                                                                                                                                                                                                                          | 20 mL                                              | 0 mL                                                 |
|             | Sequence 4, max                                                                                                                                                                                                                                                                                          | Report                                             | Report                                               |
|             | (Sequence 4 to consist of 150 +/- 3 °C, 200 mL/minute air)                                                                                                                                                                                                                                               |                                                    |                                                      |
| <b>3.9</b>  | <b>MOISTURE, max</b><br>(ASTM D 95)                                                                                                                                                                                                                                                                      |                                                    | 0.1%                                                 |
| <b>3.10</b> | <b>ODOR</b>                                                                                                                                                                                                                                                                                              |                                                    |                                                      |
|             | Materials shall produce no objectionable odour during any test performed herein.                                                                                                                                                                                                                         |                                                    |                                                      |
| <b>3.11</b> | <b>FUNCTIONAL APPROVAL</b>                                                                                                                                                                                                                                                                               |                                                    |                                                      |
|             | Materials being evaluated for initial approval must be submitted to a functional trial. Functional trial results shall be evaluated by Manual Transmission Engineering prior to material approval and release. Manual transmission engineering may submit the material for further testing, if required. |                                                    |                                                      |
| <b>3.12</b> | <b>MISCIBILITY TEST</b>                                                                                                                                                                                                                                                                                  |                                                    |                                                      |
|             | The fluid shall be compatible with WSD-M2C200-C material when equal volumes of each are heated to 150 +/- 5 °C for one hour and then cooled to -40 +/- 5 °C for one hour. There shall be no visual sign of deposits or separation.                                                                       |                                                    |                                                      |