



GREASE, LITHIUM BASE, SYNTHETIC OIL, LOW TEMPERATURE

ESA-M1C232-A

1. SCOPE

The material defined by this specification is a low temperature lubricant containing lithium hydroxy stearate thickener with synthetic oils, necessary rust and oxidation inhibitors, and solid lubricants. The lubricant operating temperatures range from -50 to 150 °C.

2. APPLICATION

This specification was released originally for grease used to lubricate the steering column actuator assembly.

3. REQUIREMENTS

3.0 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

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

3.4	COLOR	Yellow
3.5	ODOR	Not unpleasant
3.6	TEXTURE	Smooth
3.7	SURFACE EXAMINATION	Slight bleed
3.8	BASE	Synthetic oil
3.8.1	Lithium Soap	8 - 13%
3.8.2	Solid Lubricant	12 - 14%

3.9 SYNTHETIC OIL REQUIREMENTS

3.9.1	Fluid	Balance
3.9.2	Viscosity at 40 +/- 2 °C (ASTM D 445)	23.0 - 29.0 mm ² /s
3.9.3	Viscosity at 100 +/- 2 °C	3.0 - 7.0 mm ² /s
3.9.4	Viscosity Index, min	120
3.9.5	Pour Point, max (ASTM D 97)	-50 °C

Date	Action	Revisions
2004 04 22	Revised	Para 3.0 inserted; para 3.1, 3.2, 3.3, 3.20 & 4 deleted
1990 09 20	NC00E10091185000	Released K. Gribble L. Mastrofrancesco



ENGINEERING MATERIAL SPECIFICATION

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3.9.6	Flash Point, min (ASTM D 92)	200 °C
3.9.7	Fire Point, min (ASTM D 92)	230 °C
3.10	DROPPING POINT, Min (ASTM D 566)	185 °C
3.11	PENETRATION, mm/10 (ASTM D 217)	
3.11.1	Worked 60 Strokes	285 - 315
3.12	OXIDATION STABILITY, Pressure Drop, max (ASTM D 942, 500 h)	49.0 kPa
3.13	OIL SEPARATION, max (Federal Standard 791 modified)	5%
3.14	WATER WASHOUT, max (ASTM D 1264, 40 +/- 2 °C)	3%
3.15	CORROSION (ASTM D 130)	1
3.16	LOW TEMPERATURE TORQUE (ASTM D 1478)	
3.16.1	Starting, max	.049 N/m
3.16.2	Running, max	.029 N/m
3.17	FOUR BALL	
3.17.1	Weld Load, min (ASTM D 2596)	3432 N/m
3.17.2	Wear, max (ASTM D 2266)	0.7 mm
3.18	EVAPORATION 22 h at 80 +/- 2 °C, max (ASTM D 972)	1%
3.19	STORAGE STABILITY	

The worked penetration of the material after being stored for a six month period at a temperature of 38 +/- 2 °C in an oil tight container shall not have changed from the original worked penetration of the material by more than 30 points.