

APPENDIX D

GRIACE SPECIFICATIONS TABLE 1

Type	Rocker Arm Grease TL 147-730	Protective Grease (40L) TL 147-770	Axle Grease TL 147-740	Refrigeration Grease TL 147-750	Avia. Instr. Grease TL 147-750	Aviation Grease Blue TL 147-735
Specification Number	(1)	(1)	(1)	(1)	(1)	(1)
Appearance	80	50	160	90	165	90
Drop Point (Min.) °C	brown to black	dark brown to black	brown to dark green	brown	red/brown (distillate)	blue (dyed)
Color (2)	--	neutral	--	--	--	--
Acid Value (3)	--	neutral	--	--	--	--
Alkali Value (3)	--	0.5	--	--	--	--
Ash Content wt % (min)	2	--	2	4	1	3
Oil Separation wt %	4	--	1	1.5	1	1.5
Water Resistance	--	waterproof	--	waterproof	waterproof	waterproof
Homogeneity	homogeneous	homogeneous	homogeneous	homogeneous	homogeneous	homogeneous
Consistency	--	--	--	--	Penetrometer 280 ± 20	Penetrometer 250 ± 20
Water content(min) wt%	0.5	--	1	3	1	1
Storage Stability yrs	1	2	1	2	0.5	1
Cold behavior range (2)	0°C to -30°C (4)	(5)	0°C to -35°C (6)	(7)	0°C to -65°C (8)	0°C to -60°C (9)

NOTE:

- (1) Appearance should be structureless, smooth with short fibers.
- (2) Test instructions may be obtained from the Air Ministry.
- (3) No limit specified but reading should be recorded.
- (4) (5) (6) (7) (8) (9) Calibration curves may be obtained from the G.A.F. Laboratory, Trevenance, E 31. The curves are attached in the order shown.

APPENDIX D

GREASE SPECIFICATIONS

General Comments on Greases Listed in Preceding Table

1. The Air Ministry must be informed on the types and quality of the raw materials, mixing proportions, operating conditions used in the manufacture of the grease. The manufacturer is obliged to inform the Air Ministry of any change in the composition of the grease.
2. Contents of containers delivered to the Air Force and/or the Aircraft Industries must be made known.
3. The material should be packed in clean containers which conform to specific form, size and material of construction.
4. The manufacture of the grease must be done by firms authorized by the Air Ministry. If new or additional facilities are required the Air Ministry must be notified in advance.
5. The grease must conform to the listed specifications.
6. Only tests approved by the Air Ministry are to be used in testing the grease for quality and acceptance.

APPENDIX D

GREASE SPECIFICATIONS TABLE 2

Type	Protective Grease 40 (Tp)	Protective Grease 40
Spec. No.	TL 6023	TL 6017
Appearance	Transparent and must not become liquid when stirred.	Transparent and must not become liquid when stirred
Drop Point (Min) °C	75	50
Color	Colorless	colorless
Acid Value	Mineral Acid--0	Mineral Acid--0
mg KOH/gm	Organic Acid--0.5	Organic Acid--0.2
Alkali Value	--	--
Ash Content	1.0	0.5
wt % (air)		
Oil Separation	None permitted	None permitted
Water Resistance	Completely water resistant at 20°C with no oil separation.	Completely water resistant at 20°C.
Homogeneity	No change in homogeneity after 3 hrs heating at 150°C	No change in homogeneity after 3 hrs heating at 150°C
Consistency	Must be spreadable at 0°C as well as at 20°C.	Must be spreadable at 0°C as well as at 20°C
Water content	---	---
wt % (min)	---	---
Storage Stability	Rust proof for a minimum of 3 days at 40°C and 100% relative humidity	Rust proof for a minimum of 3 days at 40°C and 100% relative humidity.
Corrosion Stability		

COMMENTS:

A sample of 500 grams is required from each 100 kg batch. One sample has to pass the minimum requirement for each test listed above otherwise the whole batch is rejected. Additional comments regarding test techniques follow.

1. Drop point test done according to DIN DVM 3654.
2. Heat Resistance--A sample of grease is spread on a sheet metal container with raised edges and then heated for 3 hours at 50°C. The sample must be spreadable and show no marked changes.
3. Water Resistance--A layer of grease 10 cm long, 1 cm wide and about 1 mm thick is spread on a prepared glass strip 16 cm x 1.5 cm. The prepared glass strip is placed in a flask with 100 cc. distilled water so that the grease layer projects 5 mm above the water surface. If the layer has not changed after 48 hours the sample passes provided

that the water is clear. If the water is clouded or a slight change occurs on the greased surface the test should be continued for one week.

4. Ash Content--Done according to DIN DNW 3657
5. Free Acid--Done according to DIN DNW 3658
6. Corrosion Stability--Emery cloth polished steel rods, 50 mm x 10 mm are dried for 3 hours in a desiccator and then coated with grease by dipping for three minutes in molten grease at 130°C. The coated rods are hung so that surplus grease runs off and the sample reaches room temperature. The rods are next put in an air sealed chamber over warm water at about 50°C, so that a constant air temperature of 40°C is maintained. The sample passes when there is no trace of corrosion after 3 days.

APPENDIX D
GREASE SPECIFICATIONS TABLE 3

Type	Weapon Grease	Instrument Grease	Water Pump Grease	Lubricating Grease
Spec. No. Appearance	TL 6006 Without lumps	TL 6009 Transparent	TL 6035 Without lumps	TL 6014 Transparent and free of oil pockets
Drop Point °C (min)	145	160	95	130
Color	Transparent	Colorless	Salve color	Colorless
Acid Value mg KOH/gm	0	0.10	Mineral Acid-0 Organic Acid-0.2	---
Alkali Value	0	---	Slightly alkaline	---
Ash Content wt % (min)	---	0.5	4	---
Oil Separation wt %	---	0.5	5	---
Water Resistance	---	waterproof	---	---
Homogeneity	No change after 3 hrs @ 50°C	homogeneous	No change after 5 hrs @ 50°C	No change after 5 hrs @ 50°C
Consistency	Between solid and tallow consistency at 20°C	2.0 Kg @ 0°C (1)	---	0.3 Kg @ 50°C (1)
Water Content wt % (min)	---	0	4	---
Storage Stability	---	---	---	---
Unseparatable wt %	70°	---	---	---

- CODE: (1) The consistency value is the smallest weight in Kg, which causes the extension of a 10 mm length strip in a period of 60 seconds. The details of the test follow.
- a. Each sample must be kneaded in special apparatus for 200 strokes.
 - b. Fill the test cylinder with grease sample, taking necessary precautions to exclude air bubbles.
 - c. Place test cylinder in thermostat. A minimum of 45 minutes is required at 50°C and a minimum of 2 hours at -10°C.
 - d. Place the necessary weights on plunger to extrude grease.

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