

RECOMMENDED LUBRICANTS AND FLUIDS MT 4000AC, MT 4400, AND MT 4400AC

GENERAL

The items listed here are a compilation of the recommended lubricants and fluids used in specified operating conditions for the listed equipment. Brand names listed are for reference only and do not necessarily constitute an endorsement of the particular product. For detailed recommendations for specific applications, contact your suppliers or your TEREX|UNIT RIG Representative.

NOTE: *These recommendations are subject to change without notice.*

LUBRICANTS

1. Engine

NOTE: *These listed items are typical and for reference only. Actual fluid recommendations will vary with a number of factors including engine, duty cycle, fuel content and consumption, lubricant/fluid used, etc. See the appropriate engine manufacturer's instructions and directions for detailed information and specifications, or contact your engine or TEREX|UNIT RIG Representative.*

a. Engine crankcase oil

(1) Capacity:

- (a) DDC 4000 (2700 hp (2 015 kW))
66 gallons (250 liters)
- (b) Cummins QSK 60 (2700 hp (2 015 kW))
72 gallons (273 liters)

(2) Recommend service intervals:

- (a) Sample: Typically 250 hours. See engine manufacturer's recommendations.
- (b) Change: See engine manufacturer's recommendations.

(3) Recommended fluid:

- (a) 15W-40 Category 2 Engine Oil (for extended change intervals) that meets current DDC and Cummins criteria.

NOTES:

1. *This is the typical oil requirement. Manufacturer, site, and operating environmental considerations may cause alternative oils to be required.*

2. *For operation in arctic environments, a synthetic CE/SF engine oil with adequate low temperature properties such as a 5W-30 is recommended.*

3. *At other times during the year, other oils may be recommended to maintain proper operation and engine lubrication.*

4. *A non-synthetic, petroleum based 15W-40 is recommended for break in periods and when operating in the non-arctic temperatures.*

b. Engine coolant

(1) Capacity:

- (a) DDC 4000 Engine (2700 hp (2 015 kW))/Wabtec radiator: 160 gallons (605 liters)
- (b) Cummins QSK 60 Engine (2700 hp (2 015 kW))/Wabtec radiator: 150 gallons (568 liters)

(2) Recommended service interval:

- (a) Sample: See engine manufacturer's recommendations.
- (b) Change: See engine manufacturer's recommendations.

(3) Recommended fluid:

(a) Ethylene glycol based antifreeze that does not require a precharge of supplemental coolant additives to be added before use in heavy duty diesel engines. It is to meet TCM RP-329 (ASTM D6210) with cavitation corrosion additive type "A".

NOTES:

1. *A mixture of 50% ethylene glycol and 50% water is recommended in normal climates. It may be used year round.*

2. *A mixture of 67% ethylene glycol and 33% water is recommended in arctic climates. It may be used year round. It is the maximum recommended mixture.*

(b) When mixed 50/50 with water, it is to have the following corrosion inhibitor chemistry:

Boron	125 - 500 ppm
Nitrites	800 - 2400 ppm
Nitrates	200 - 750 ppm
Silicon	50 - 250 ppm
Phosphates	0 ppm
Acidity (pH)	8.0 - 11



The water used with this antifreeze must meet the following requirements:

Chlorides	40 ppm (maximum)
Sulfates	100 ppm (maximum)
Total dissolved solids	340 ppm
Total hardness (Magnesium and Calcium)	170 ppm (maximum)

2. Front wheel bearing

a. Grease lubricant

(1) Capacity: 5.3 gallons (20 liters) or 40 lb (18 kg) each

(2) Recommended service intervals:

- (a) Sample: As required
- (b) Change/repack: 5,000 hours

(3) Recommended lubricant specifications: Synthetic grease, SHC 460 or equivalent

b. Oil lubricant

(1) Capacity: 3.3 gallons (13 liters) each

(2) Recommended service intervals

(a) Sample: 500 hours
(b) Change: 2,500 hours (or when indicated by sampling)

(3) Recommended lubricant specifications: Synthetic lubricant (ambient temperatures listed).

- (a) -67°F to 59°F (-55°C to 15°C):
SHC 150 or equivalent
- (b) -35°F to 77°F (-37°C to 25°C):
SHC 220 or equivalent
- (c) -29°F to 95°F (-34°C to 35°C):
SHC 320 or equivalent
- (d) -20°F to 104°F (-29°C to 40°C)
SHC 460 or equivalent
- (e) -9°F to 122°F (-23°C to 50°C)
SHC 680 or equivalent

3. Hydraulic system

a. Hydraulic fluid

(1) Capacity:

(a) Complete System Fill:
252 gallons (953 liters)

NOTE: *This quantity represents an initial system fill. The actual volume required when draining and refilling the system will be somewhat less, depending upon the amount drained from various components.*

(2) Recommended service intervals:

- (a) Sample: 500 hours
- (b) Change:
 - [1] Filters: 500 hours
 - [2] Oil: 5,000 hours

(3) Recommended fluid:

(a) Petroleum based anti-wear hydraulic oil

NOTE: *Must be approved for use with Mannesmann Rexroth axial pump units.*

(b) The recommended viscosity varies with fluid's operating temperature range, which may not directly correspond with the ambient temperature. See Figure 1 – Selecting Hydraulic Fluid Viscosity for the proper recommendation.

(c) Standard viscosities include:

- [1] VG 22 Arctic conditions
- [2] VG 32 Winter conditions
- [3] VG 46 Summer conditions
- [4] VG 68 Tropical conditions
- [5] VG 100 Excessively high temperatures

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NOTES:

1. *In severe arctic environments, the use of TEREXUNIT RIG Arctic Hydraulic Oil is recommended. It consists of:*

70% Mobil 1 Synthetic ATF

30% Mobil Aero HFA Low Temperature Oil

2. *During the warmer months of the year, it is recommended that the normal hydraulic oil be used in the system.*

4. Automatic lubrication system

a. Grease pump reservoir—Lincoln rotary pump

(1) Capacity: 10 fluid ounces (296 ml)

(2) Recommended service intervals:



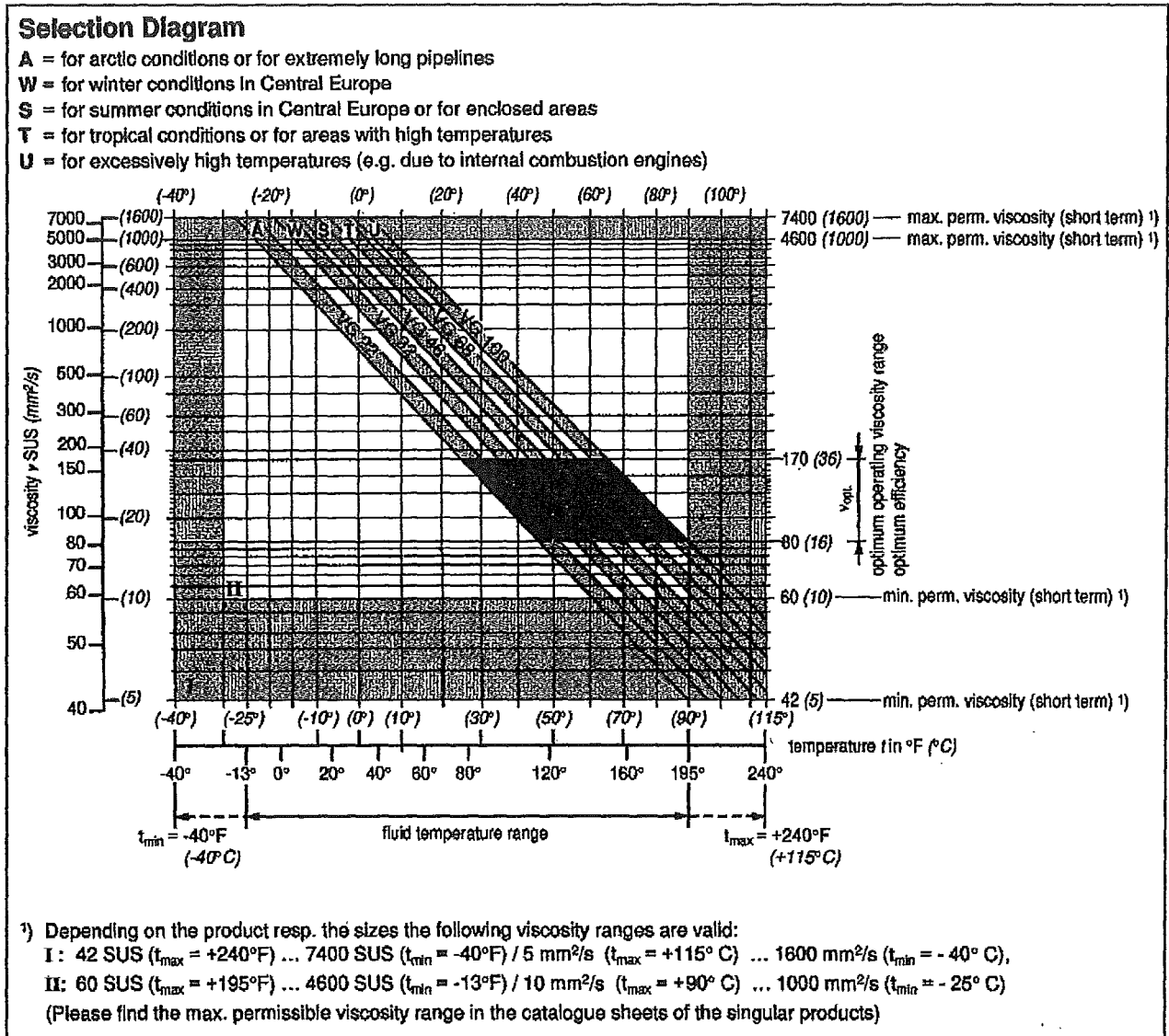


FIGURE 1 – SELECTING HYDRAULIC FLUID VISCOSITY (REXROTH)

- (a) Check level: 100 hours
- (b) Change: 500 hours
- (3) Recommended fluid:
 - (a) Non-arctic environments:
10W-30 engine motor oil
 - (b) Arctic conditions:
Mobil Aero HFA Low Temperature Hydraulic Oil
- b. Lubricating chassis grease
 - (1) Capacity: Varies with configuration.
 - (2) Recommended change interval: Not applicable.
 - (3) Grease Specifications
 - (a) General: Premium Quality EP Grease that meets the following specifications:

NOTE: May be used all year.

Property	Test	Requirement
Base Oil Viscosity @ 40°C (104°F)	ASTM D 445	320 cSt (minimum)
Base Oil Viscosity @ 100°C (212°F)	ASTM D 445	20 cSt (minimum)
Worked Penetration, 60 Stokes @ 25°C (77°F)	ASTM D 217	370 mm (maximum)
Dropping Point	ASTM D 2265	450°F (232°C) (minimum)
Water washout at 175°F (80°C)	ASTM D 1264	8% of weight (maximum)
4-Ball Wear Scar Diameter	ASTM D 2266	0.5 mm (maximum)
4-Ball EP Weld Point	ASTM D 2596	400 kg (885 lb) (minimum)
Timken OK Load	ASTM D 2509	45 lb (20.5 kg) (minimum)
Molybdenum Disulfide Content		5 – 6% by weight
Molybdenum Particle Size		5 microns (maximum)
Graphite Content		None

Minimum Ambient Temperature (Sustained for 48 hours)	Applicable NLGI Grade
-30°F to 0°F (-34°C to -18°C)	0
0°F to 30°F (-18°C to 0°C)	1
Over 30°F (0°C)	2

NOTES:

1. For applications in which the ambient temperature is expected to be sustained at less than -30°F (-34°C) for greater than 48 hours and possibly to as low as -73°F (-58°C), use TEREX|UNIT RIG Arctic Grease:

- 80% Mobiltemp SHC 32
- 20% Mobil 1 Synthetic ATF

2. During the warmer months of the year, it is recommended that the normal chassis grease be used in the system.

5. Suspensions – Front and rear (Operating Fluid)

a. Capacity:

- (1) Front: 9.7 gallons (36.7 liters)
- (2) Rear: 8.9 gallons (33.7 liters)

b. Recommended change interval: Not normally required. Change when the assembly is drained for service.

c. Recommended fluid specifications

(1) Non-arctic ambient temperatures
Good quality 10W hydraulic oil or automatic transmission fluid (Conoco Power Trans III (or equivalent))

(2) Arctic ambient temperatures
Synthetic hydraulic oil or automatic transmission fluid (Conoco Syncon Synthetic R & O (or equivalent))

NOTES:

1. The arctic fluid should have the properties:
ISO 46 viscosity grade
-70°F (-55°C) pour point
PAO synthetic – May be used with common seals
2. May be used all year.

6. Wheelmotor– GE 787 or GEB 25

a. Gearcase oil

(1) Capacity: 10.5 gallons (39.8 liters)

NOTE: The use of synthetic lubricants is recommended for all applications. See the appropriate General Electric information for detailed fluid requirements at each of the listed operating temperature ranges and related service information.

(2) Recommended service intervals:

- (a) Sample: 500 hours
- (b) Change: (maximum)
 - [1] GEB 25: 3,000 hours
 - [2] GE 787: 3,000 hours

NOTES:

1. This represents the maximum number of hours between oil changes. More frequent oil change intervals may be required, depending upon individual mine and wheelmotor conditions. An oil monitoring or sampling program should begin with a base line at the oil change and proceed throughout the operating interval, with any



"early" changes dictated by information derived from this system. For more detailed information, see the detailed information in the appropriate General Electric publication.

2. On new or newly overhauled wheelmotors, it is recommend that the oil be changed after the first 500 hours of operation then at the 3,000 hour intervals or when indicated by sampling.

3. Since synthetic oils may be filtered for reuse rather than discarded, they may be monitored to determine whether or not filtering is required, through a particle analysis process. GE recommends an ISO Cleanliness Code of 18/13 be used for motorized wheels. Oil that is qualified to be reused must be filtered to 10 microns absolute. For more detailed information, see the detailed information in the appropriate General Electric publication.

4. When the oil is changed or filtered, the magnetic plugs should be removed, inspected, and cleaned.

(3) Recommended fluid specification: Synthetic lubricant (ambient temperatures listed)

- (a) -67°F to 59°F (-55°C to 15°C):
SHC 150 or equivalent
- (b) -35°F to 77°F (-37°C to 25°C):
SHC 220 or equivalent
- (c) -29°F to 95°F (-34°C to 35°C):
SHC 320 or equivalent
- (d) -20°F to 104°F (-29°C to 40°C):
SHC 460 or equivalent
- (e) -9°F to 122°F (-23°C to 50°C):
SHC 680 or equivalent

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