LUBRICATION ORDER

LO 10-4320-344-12

28 FEBRUARY 1994

(This Lubrication Order, together with TM 10-4320-303-13, TM 10-4320-344-10 and TM 10-4320-344-24 supersedes TM 5-1320-303-10 dated 14 April 1986 and TM 5-4320-303-24, dated 13 June 1986)

PUMPING ASSEMBLY, WATER, 600 GPM, MODEL 609-A (4320-01-184-7494)
PUMPING ASSEMBLY, WATER, 600 GPM, MODEL 609-C (4320-01-261-6470)
PUMPING ASSEMBLY, WATER, 600 GPM, MODEL US636HCCD-1 (4320-01-201-6937)

References: TM 10-4320-344-10 and TM 10-4320-344-24.

REPORTING OF ERRORS

You can improve this publication by calling attention to errors and by recommending improvements and by stating your reasons for the recommendations. Your letter or DA Form 2028, Recommended Changes to Publications and Blank Forms, should be mailed directly to Commander, U.S. Army Aviation and Troop Command, ATTN: AMSAT-I-MTS, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished directly to you.

NOTES

This LO is for operator/crew (C) or unit (O) maintenance. Lube intervals (on-condition or hard time) are based on normal operation. Lube more during constant use, and less during inactive periods. Use correct grade of lubricant for seasonal temperature expected.

On the pictures a dash line (--) means lube points on both sides.

Maintenance levels are indicated on the pictures as (C) for operator/crew or (O) for unit level.

Lube intervals are indicated on the pictures as OC for on condition as recommended by AOAP laboratory analysis, Q for quarterly, S for semiannually, or a number followed by H for hours of operation.

Lubricate immediately after fording, or as soon after as unit movement permits.

Clean parts with dry cleaning solvent (SD), type II, or equivalent. Dry before lubricating.

Engine oil must be sampled quarterly as prescribed by DA Pam 738-750.

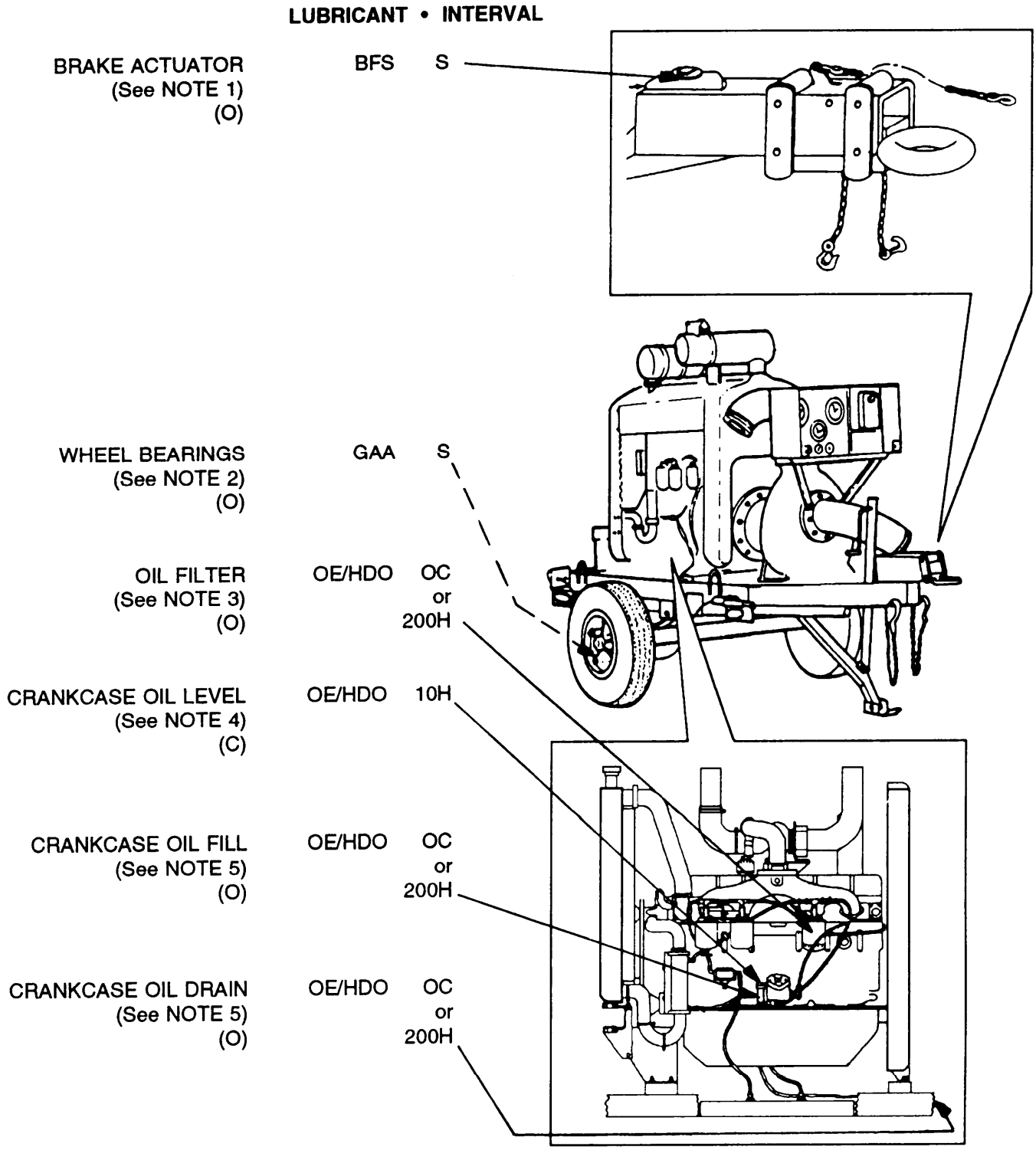
Oil filters shall be serviced/cleaned/changed as applicable, when:
a. They are known to be contaminated, or clogged;
b. Service is recommended by AOAP laboratory analysis, or
c. At prescribed hardtime intervals.

Before you start your lube service.

ALWAYS	NEVER
a. Clean grease fittings before lubrication.	a. Use wrong type/grade grease.
b. Use the lubrication order as your guide.	b. Use too much lubricant.

LO 10-4320-344-12

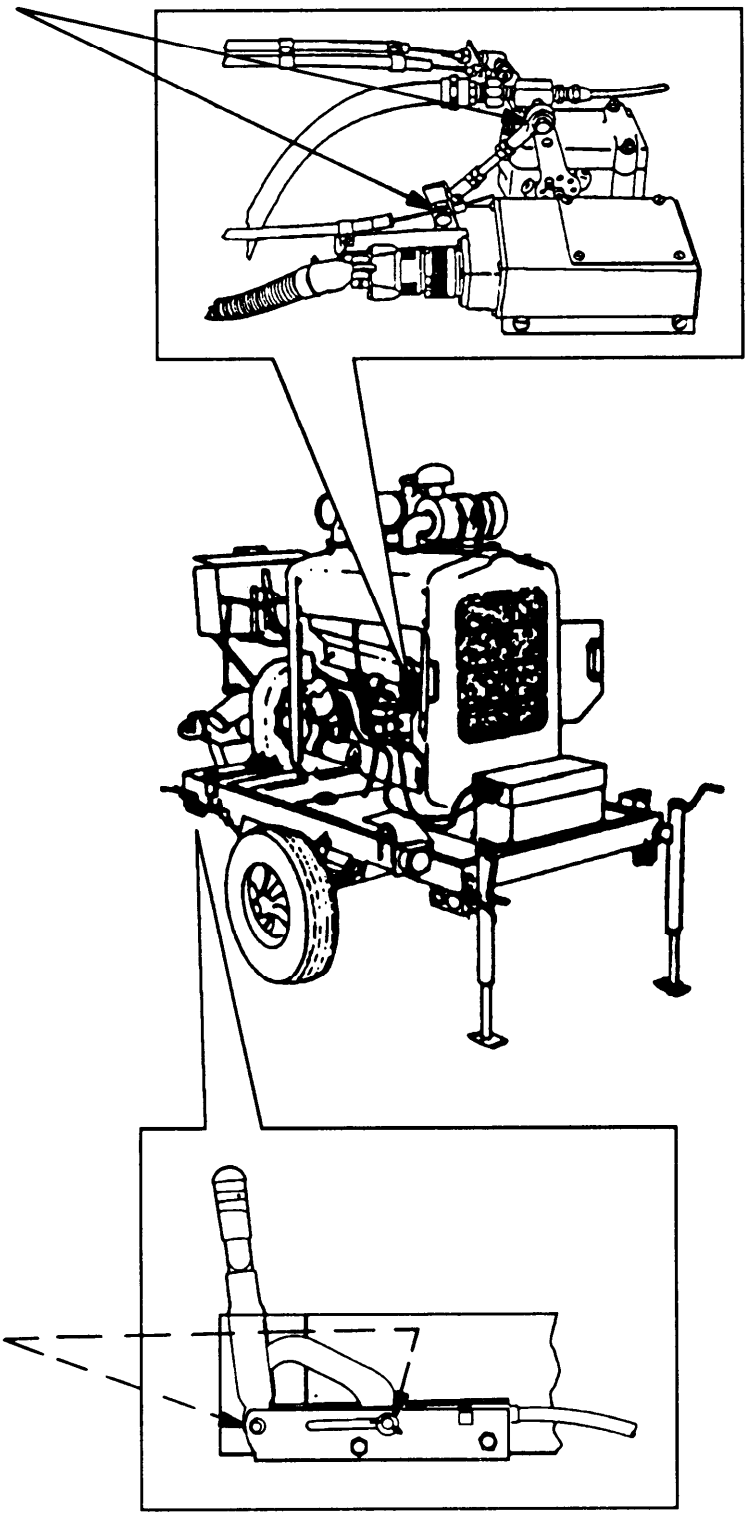
Notes for pumping assembly model 609-A begin on card 4.



Pumping Assembly Model 609-A

LUBRICANT • INTERVAL

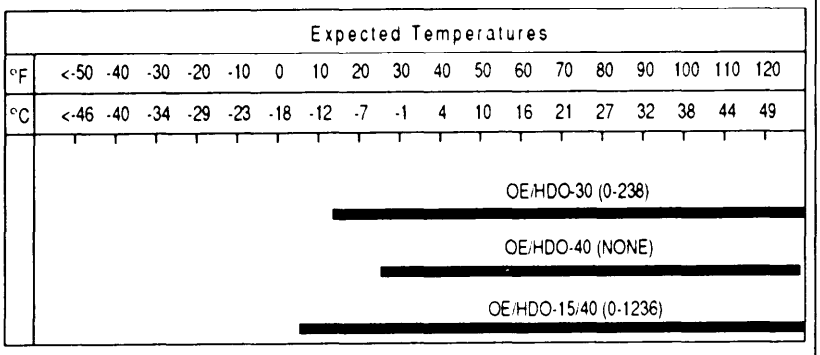
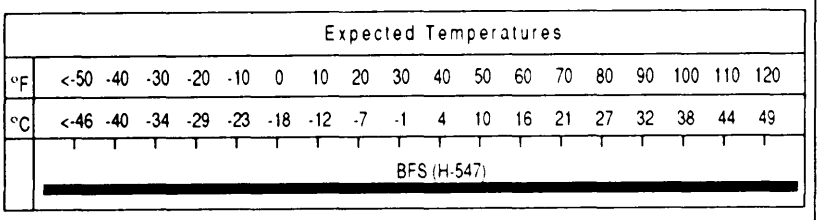
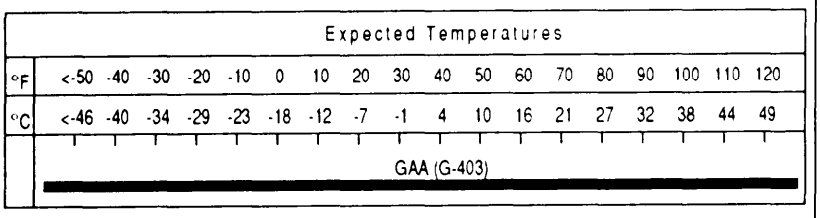
GOVERNOR LINKAGE (OIL CAN POINT) (See NOTE 6) (O) — OE/HDO Q



HANDBRAKE LEVERS (See NOTE 7) (O) — GAA S

Pumping Assembly Model 609-A (Continued)

TABLE 1. Lubricant Table for Pumping Assembly Model 609-A.*

Lubricants	Components	Capacity	Ambient Temperature Range Usage	Interval
OE/HDO (MIL-L-2104) Lubricating Oil, Internal Combustion Engine, Combat/Tactical **OEA** (MIL-L-46167) Lubricating Oil, Internal Combustion Engine, Arctic	Engine Crankcase Oil Can Point	6 Qts (5.7 L) As Required		OC or 200 hrs Q
BFS (MIL-B-46176) Brake Fluid, Silicone, Automotive, All Weather, Operational and Preservative	Brake Actuator	As Required		S
GAA (MIL-G-10924) Grease, Automotive and Artillery	Wheel Bearings Handbrake Levers	As Required		S

The pumping assembly model 609-A is not intended to operate at temperatures below 32°F (O°C).

TABLE 2. Man-hour Requirements for Lubrication of Pumping Assembly Model 609-A.

LOCATION	MAN-HOUR
Engine crankcase	1.0
Oil Can Point	0.2
Brake Actuator	0.1
Wheel Bearings	1.5
Handbrake Levers	0.2

NOTES for Pumping Assembly Model 609-A:

1. BRAKE ACTUATOR. Check brake fluid level. To check level, remove cover from brake master cylinder. Add fluid as required to bring level 1/4 inch from top of opening. Install brake master cylinder cover.

NOTES for Pumping Assembly Model 609-A (continued):

2. WHEEL BEARINGS. Refer to TM 10-4320-344-24 for wheel bearing removal, cleaning, lubrication, and installation instructions.
3. OIL FILTER. Replace oil filter with every crankcase oil change. Remove filter element, clean seat, and install new filter element.
4. CRANKCASE OIL LEVEL. Check oil level when engine is stopped. Remove dipstick and check oil level. Add oil as required to bring level to FULL mark on dipstick. Insert dipstick fully into oil filler neck.

WARNING

Be careful when draining oil. Hot oil can scald.

5. CRANKCASE OIL DRAIN AND FILL. Drain after operation when hot. To drain, remove plug at bottom of crankcase sump. After all oil is drained, clean and install plug. Replace oil filter (NOTE 3.). Remove dipstick from oil filler neck and fill crankcase with 6 quarts (5.7 L) of OE/HDO. Insert dipstick fully into oil filler neck. Operate engine for 5 minutes and check oil filter for leakage. Check crankcase oil level (NOTE 4).
6. GOVERNOR LINKAGE. Clean and apply a light coat of OE/HDO.
7. HANDBRAKE LEVERS. Clean and apply a light coating of GAA.

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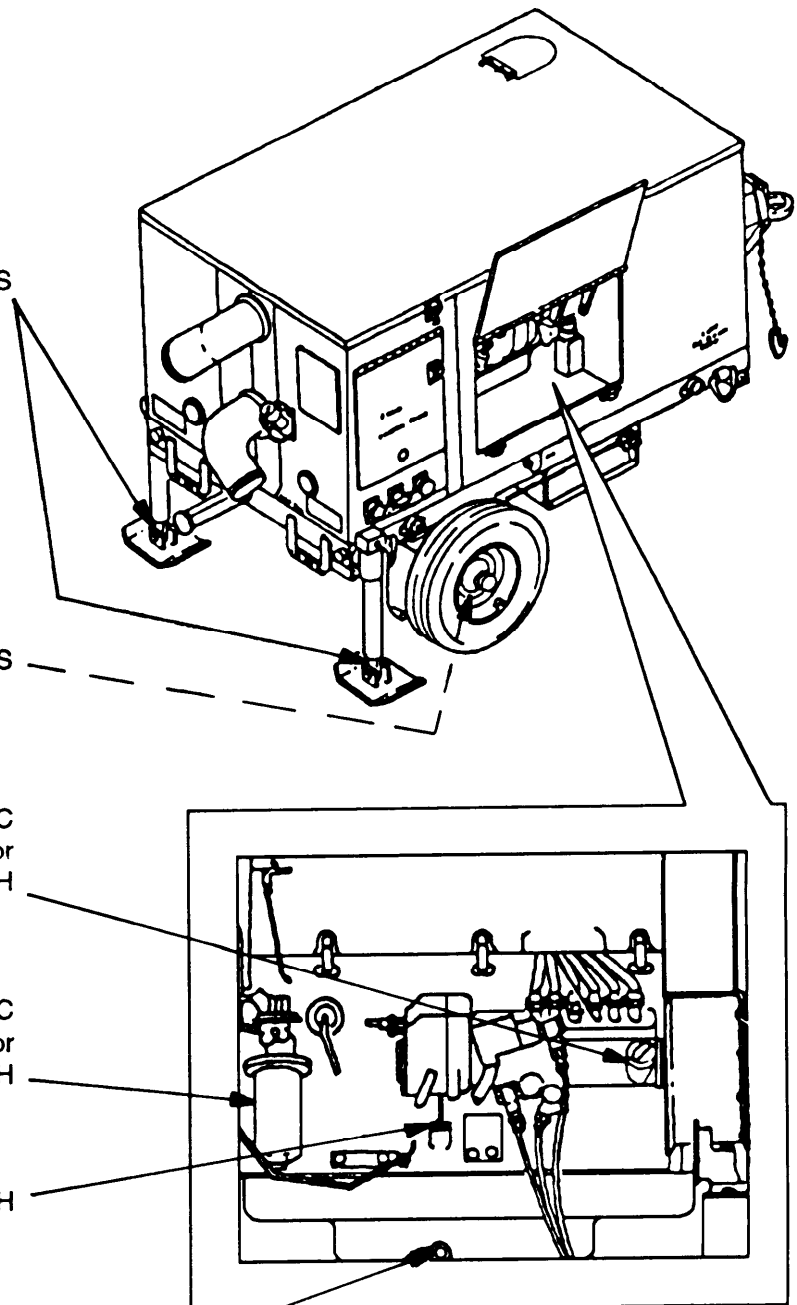
Notes for pumping assembly model 609-C begin on card 9.

LUBRICANT • INTERVAL



JACKSTAND POSTS (OIL CAN POINT) (See NOTE 1) (O) — OE/HDO S

WHEEL BEARINGS (See NOTE 2) (O) — GAA S

CRANKCASE OIL FILL (See NOTE 3) (O) — OE/HDO OC or 200H

OIL FILTER (See NOTE 4) (O) — OE/HDO OC or 200H

CRANKCASE OIL LEVEL (See NOTE 5) (C) — OE/HDO 10H

CRANKCASE OIL DRAIN (See NOTE 3) (O) — OE/HDO OC or 200H

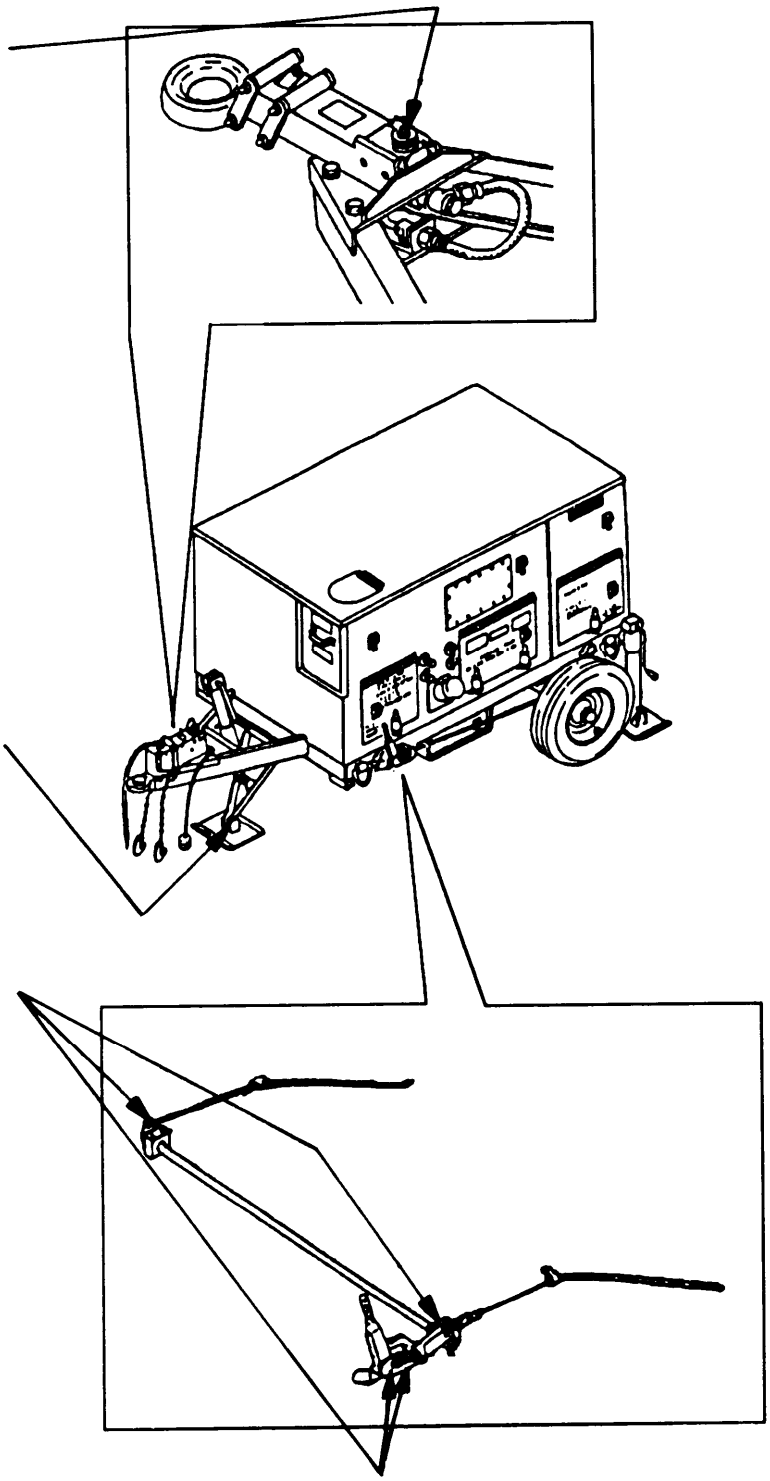
Pumping Assembly Model 609-C

LUBRICANT • INTERVAL

BRAKE ACTUATOR (See NOTE 6) (O) — BFS S

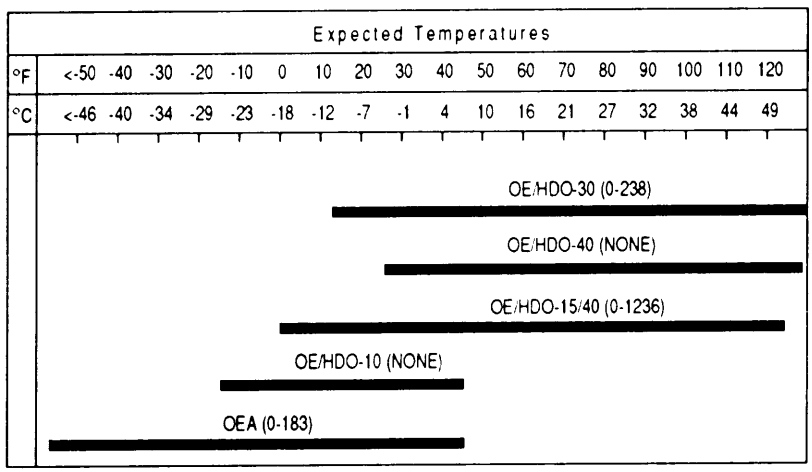
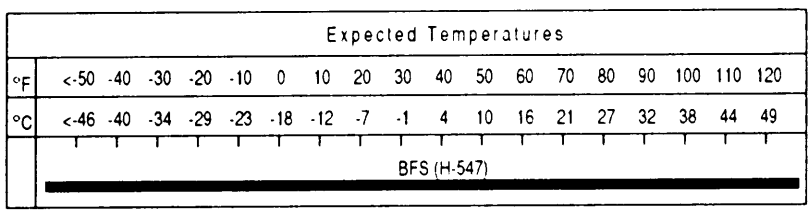
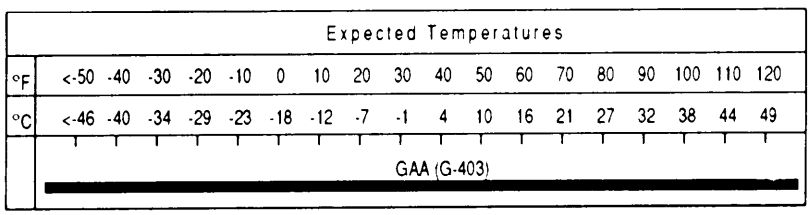
TRIPOD PIVOT (OIL CAN POINT) (See NOTE 1) (O) — OE/HDO S

HANDBRAKE LEVER AND CABLES (See NOTE 7) (O) — GAA S



Pumping Assembly Model 609-C (Continued)

TABLE 3. Lubricant Table for Pumping Assembly Model 609-C.*

Lubricants	Components	Capacity	Ambient Temperature Range Usage	Interval
OE/HDO (MIL-L-2104) Lubricating Oil, Internal Combustion Engine, Combat/Tactical **OEA** (MIL-L-46167) Lubricating Oil, Internal Combustion Engine, Arctic	Engine Crankcase Oil Can Point	12.5 Qts (11.8 L) As Required		OC or 200 hrs Q
BFS (MIL-B-46176) Brake Fluid, Silicone, Automotive, All Weather, Operational and Preservative	Brake Actuator	As Required		S
GAA (MIL-G-10924) Grease, Automotive and Artillery	Wheel Bearings Handbrake Levers	As Required		S

*** The pumping assembly model 609-C is not intended to operate at temperatures below 32°F (O°C).**

TABLE 4. Man-hour Requirements for Lubrication of Pumping Assembly Model 609-C.

LOCATION	MAN-HOUR
Engine Crankcase	1.0
Oil Can Points	0.1
Brake Actuator	0.1
Wheel Bearings	1.5
Handbrake Levers and Cables	0.1

NOTES for Pumping Assembly Model 609-C:

1. OIL CAN POINTS. Clean and oil lightly with OE/HDO.

2. WHEEL BEARINGS. Refer to TM 10-4320-344-24 for wheel bearing removal, cleaning, lubrication, and installation instructions.

WARNING

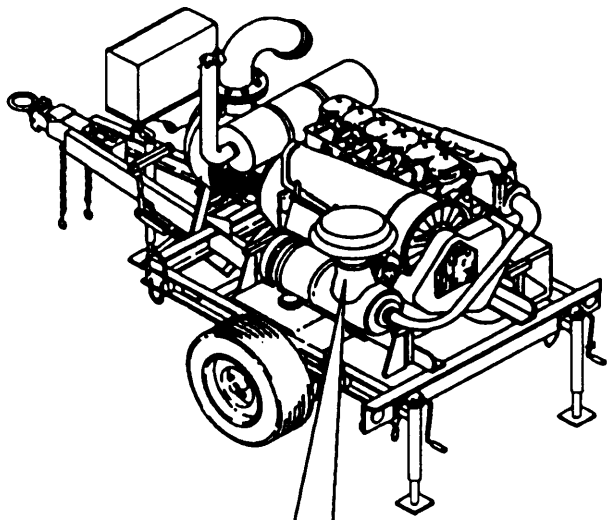
Be careful when draining oil. Hot oil can scald.

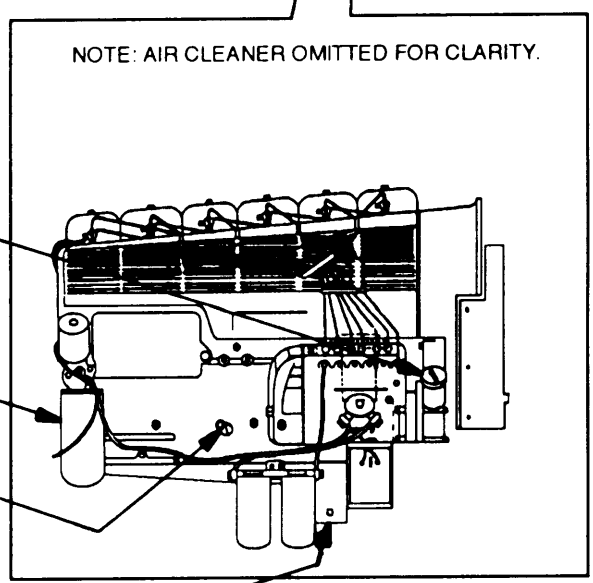
3. CRANKCASE OIL DRAIN AND FILL. Drain after operation when hot. To drain, remove plug at bottom of crankcase sump. After all oil is drained, clean and install plug. Replace oil filter (NOTE 4.). Remove filler cap from oil filler neck and fill crankcase with 12.5 quarts (11 .82 L) of proper grade OE/HDO. Install filler cap. Operate engine for 5 minutes and check oil filter for leakage. Check crankcase oil level (NOTE 5).
4. OIL FILTER. Replace oil filter with every crankcase oil change. Remove fitter element, clean seat, and install new filter element.
5. CRANKCASE OIL LEVEL. Check oil level when engine is stopped. Remove dipstick and check oil level. Add oil as required to bring level to FULL mark on dipstick. Insert dipstick fully into dipstick opening.
6. BRAKE ACTUATOR. Check brake fluid level. To check level, remove cover from brake master cylinder. Add fluid as required to bring level to bottom of threads. Install brake master cylinder cover.
7. HANDBRAKE LEVER AND CABLES. Clean and apply a light coating of GAA.

LO 10-4320-344-12

Notes for pumping assembly model US636HCCD-1 begin on card 15.

LUBRICANT • INTERVAL

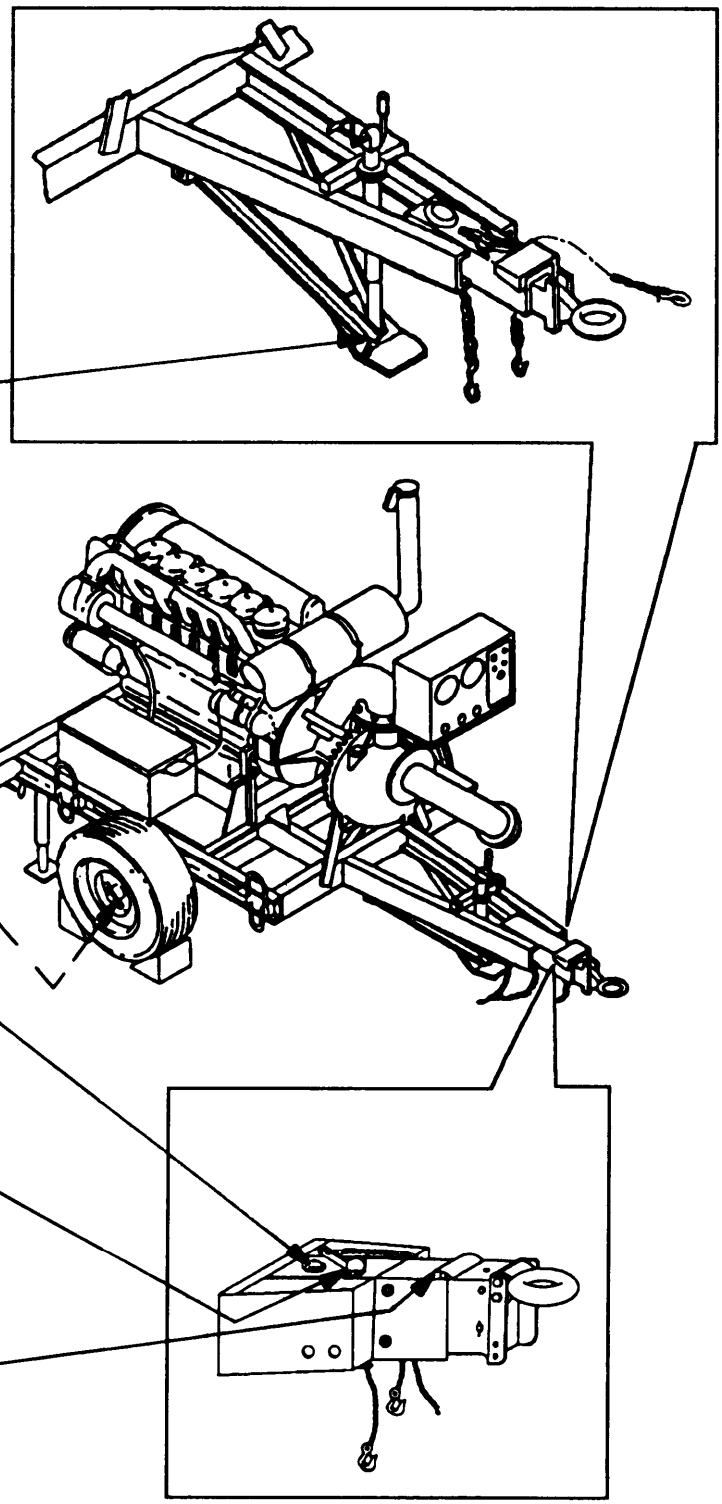




CRANKCASE OIL FILL (See NOTE 1) (O)	OE/HDO	OC or 200H
OIL FILTER (See NOTE 2) (O)	OE/HDO	OC or 200H
CRANKCASE OIL LEVEL (See NOTE 3) (C)	OE/HDO	10H
CRANKCASE OIL DRAIN (See NOTE 1) (O)	OE/HDO	OC or 200H

Pumping Assembly Model US636HCCD-1

LUBRICANT • INTERVAL



TRIPOD PIVOT (OIL CAN POINT) (See NOTE 4) (O) — OE/HDO S

WHEEL BEARINGS (See NOTE 5) (O) — GAA S

BRAKE ACTUATOR MASTER CYLINDER (See NOTE 6) (O) — BFS S

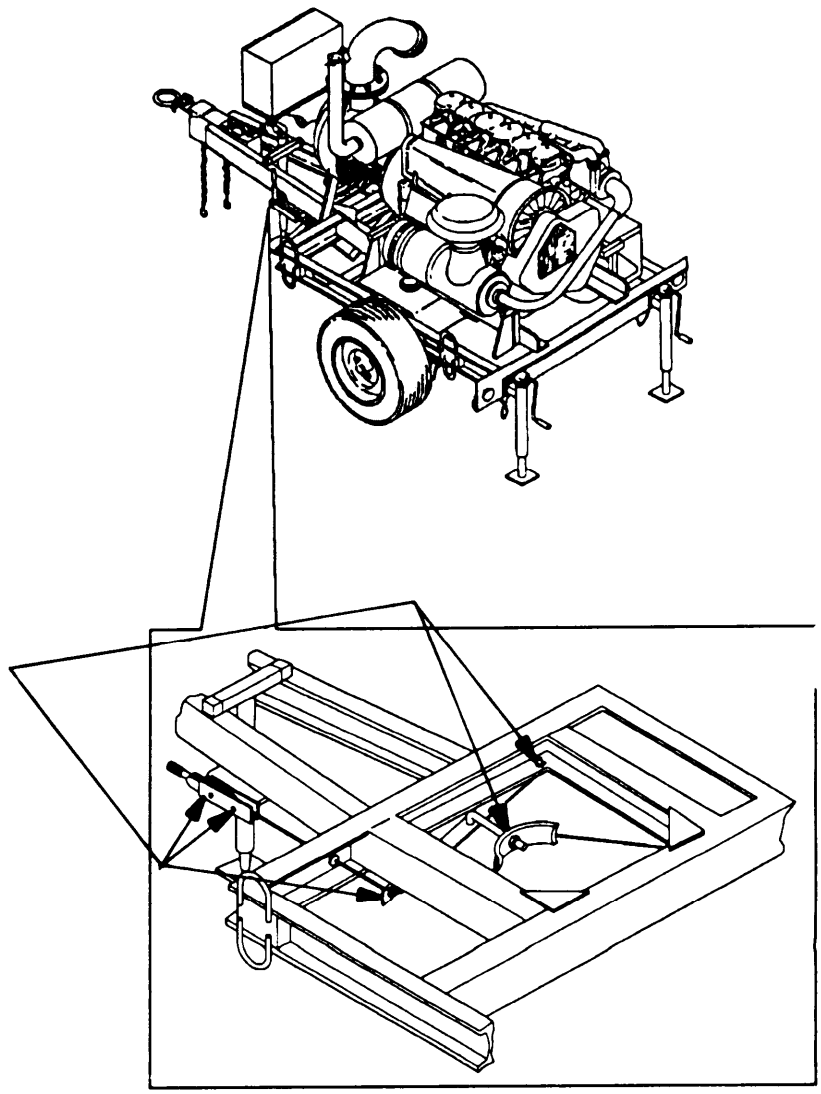
BRAKE ACTUATOR (OIL CAN POINT) (See NOTE 4) (O) — OE/HDO S

BRAKE ACTUATOR ROLLER (See NOTE 7) (O) — GAA S

Pumping Assembly Model US636HCCD-1 (Continued)

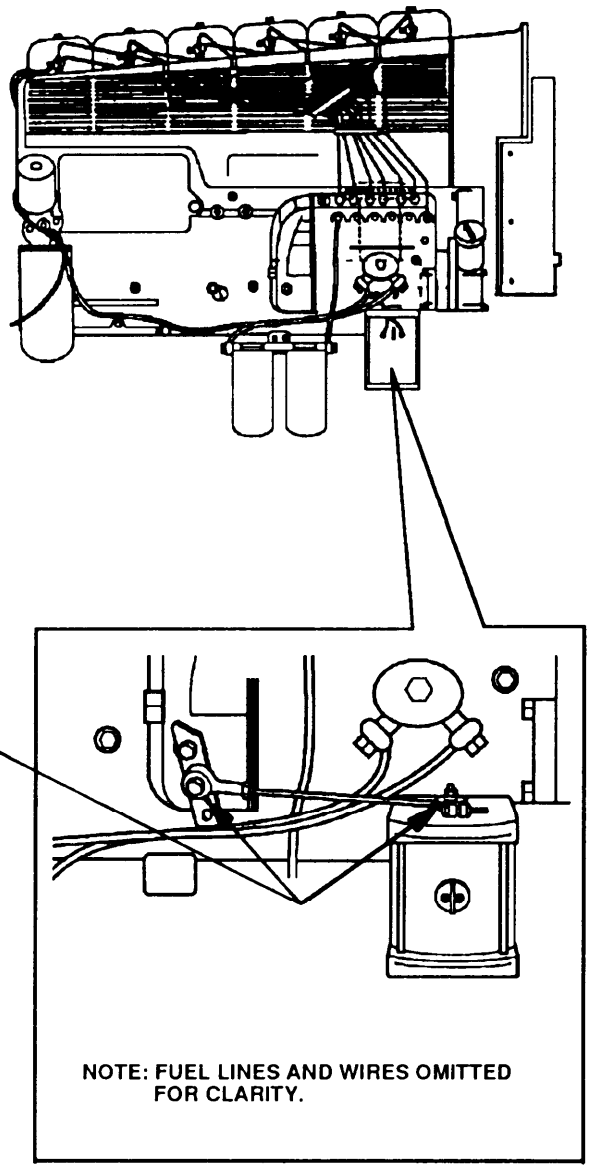
LO 10-4320-344-12

LUBRICANT • INTERVAL



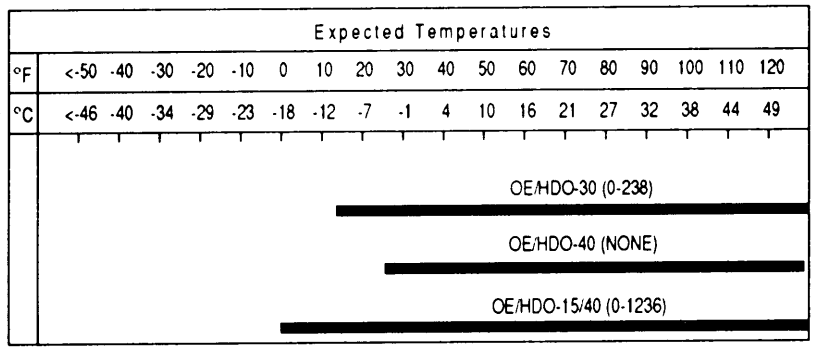
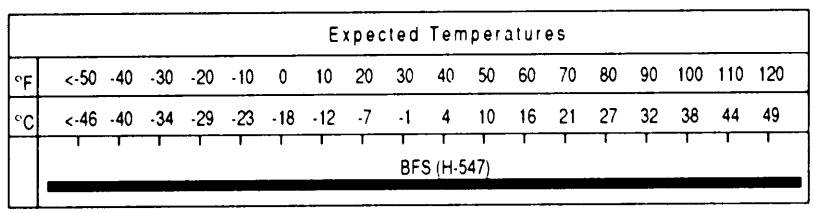
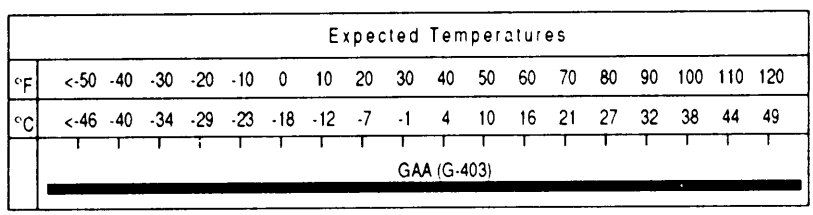
HANDBRAKE LEVER AND CABLES (See NOTE 8) GAA S

LUBRICANT • INTERVAL



CONTROL LINKAGE (See NOTE 8) (O) GAA S

TABLE 4. Lubricant Table for Pumping Assembly US636HCCD-1 .

Lubricants	Components	Capacity	Ambient Temperature Range Usage	Interval
OE/HDO (MIL-L-2104) Lubricating Oil, Internal Combustion Engine, Combat/Tactical **OEA** (MIL-L-46167) Lubricating Oil, Internal Combustion Engine, Arctic	Engine Crankcase Oil Can Points	16 Qts (15.2 L) As Required		OC or 200 hrs Q
BFS (MIL-B-46176) Brake Fluid, Silicone, Automotive, All Weather, Operational and Preservative	Brake Actuator	As Required		S
GAA (MIL-G-10924) Grease, Automotive and Artillery	Wheel Bearings Handbrake Lever and Cables Brake Actuator Roller Control Linkage	As Required As Required		S

*** The pumping assembly model US636HCCD-1 is not intended to operate at temperature below 32°F (0°C).**

TABLE 6. Man-hour Requirements for Lubrication of Pumping Assembly Model US636HCCD-1.

LOCATION	MAN-HOUR
Engine Crankcase	1.0
Oil Can Points	0.1
Brake Actuator	0.1
Wheel Bearings	1.5
Handbrake Lever and Cables	0.1
Brake Actuator Roller	0.1
Control Linkage	0.1

NOTES for Pumping Assembly Model US636HCCD-1:

WARNING

Be careful when draining oil. Hot oil can scald.

1. CRANKCASE OIL DRAIN AND FILL. Drain after operation when hot. To drain, remove plug at bottom of crankcase sump. After all oil is drained, clean and install plug. Replace oil filter (NOTE 3.). Remove filler cap from oil filler neck and fill crankcase with 16 quarts (15.136 L) of OE/HDO. Install filler cap. Operate engine for 5 minutes and check oil filter for leakage. Check crankcase oil level (NOTE 4).
2. OIL FILTER. Replace oil filter with every crankcase oil change. Remove filter element, clean seat, and install new filter element.
3. CRANKCASE OIL LEVEL. Check oil level when engine is stopped. Remove dipstick and check oil level. Add oil as required to bring level to FULL mark on dipstick. Insert dipstick fully.
4. OIL CAN POINTS. Clean and oil lightly with OE/HDO.
5. WHEEL BEARINGS. Refer to TM 10-4320-344-24 for wheel bearing removal, cleaning, lubrication, and installation instructions.
6. BRAKE ACTUATOR MASTER CYLINDER. Check brake fluid level. To check level, remove cover from brake master cylinder, Add fluid as required to bring level 1/4 inch from top of opening. Install brake master cylinder cover.
7. BRAKE ACTUATOR ROLLER. Clean grease and dirt from fitting. Using a hand-pump grease gun, pump handle until grease appears around outside edges of roller. Wipe off excess grease.
8. HANDBRAKE LEVER AND CABLES AND CONTROL LINKAGE. Clean and apply a light coating of GAA.

LO 10-4320-344-12

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:

MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army
06499

DISTRIBUTION:

To be distributed in accordance with DA Form 12-25-E, block no. 5925, requirements for LO 10-4320-344-12.

*U.S. GOVERNMENT PRINTING OFFICE: 1994-300-721 (00008)

Copy of this lubrication order will remain with the equipment at all times; instructions contained herein are mandatory.

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN...JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL.

SOMETHING WRONG WITH PUBLICATION

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE

BE EXACT PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.

IN THIS SPACE, TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT.

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER	SIGN HERE

TEAR ALONG PERFORATED LINE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

PIN: 072522-000