LUBRICATION ORDER

LO 5-2350-262-12

8 November 1993

SUPERSEDES L05-2350-262-12, 26 JUNE 1992

ARMORED COMBAT EARTHMOVER (ACE), M9
(2350-00-808-7100)

Reference: TM 5-2350-262-10, TM 5-2350-262-20-1, -2, TB 43-0210, and Supply Catalog C9100-IL

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MB, Warren, Ml 48397-5000. A reply will be furnished to you.

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

This lubrication order is divided into six sections, based on lubrication intervals (daily, monthly, quarterly, semiannually, annually, and on-condition).

An overall view showing lubrication points precedes each set of detailed notes.

A dotted leader line (- - - -) means there are lubrication points on both sides of the vehicle.

Intervals are based on normal operation.

- Lubricate more often during constant operation.
- Relubricate all items found contaminated after fording, swimming, or high-pressure washing.
- On-condition intervals for oil changes shall be determined by the Army Oil Analysis Program (AOAP) laboratory and shall be applied unless otherwise notified. See card 3 for oil sampling procedures.
- Oil filters shall be changed at prescribed hardtime intervals or sooner when:

  a. They are known to be contaminated, or clogged;
  b. Service is recommended by AOAP laboratory analysis.

- For equipment under manufacturer's warranty, hardtime oil service intervals shall be followed. Intervals shall be shortened if lubricants are known to be contaminated or if operation is under adverse conditions (such as longer-than-usual operating hours, extended idling periods, extreme dust).

- **WARNING:** Drycleaning solvent (SD-2) is toxic and flammable. Wear protective goggles and gloves, and use only in well-ventilated area. Avoid contact with skin, eyes, and clothes, and do not breathe vapors. Do not use near open flame or excessive heat. If you become dizzy while using drycleaning solvent, get fresh air immediately, and get medical aid. If contact with skin or clothing is made, flush with water. If contact with eyes is made, wash your eyes with water, and get medical aid immediately.
- For operation of vehicle in prolonged cold temperatures below -10~F (-23~C): remove lubricants prescribed in the key for temperatures above -10~F (-23~C), clean parts with drycleaning solvent (SD-2), and relubricate with lubricants specified in the key for temperatures 0~F to -65~F (-18~C to -54~C).
- Operation in dusty or sandy areas requires more frequent cleaning and servicing of filters to prevent dust from entering engine, transmission, steer unit, and hydraulic system.

MAN-HOUR TIMES

The man-hour time specified is the time you need to do all the services prescribed for **a** particular interval. These times are based on normal vehicle operation.

LEVEL OF MAINTENANCE: C – - Operator
O – – Unit Maintenance

LUBRICATION POINTS

Type of lubricants used at each point are identified by arrows:

PL GAA

OBSERVE THE FOLLOWING:

- **NEVER** use the wrong type grease.
- **NEVER** use too much lubrication.
- **ALWAYS** clean grease fittings with drycleaning solvent (SD), type II or equivalent, and dry before lubricating.
- **ALWAYS** use the lubrication order.

—KEY—

LUBRICANTS		CAPACITIES	EXPECTED TEMPERATURES			INTERVALS
			Above +15°F (Above -9°C)	+40° to -15°F (44° to -26°C)	+40° to -65°F (+4° to -54°C)	
OE/HDO (MIL-L-2104)	LUBRICATING OIL, Internal Combustion Engine Tactical Service		OE/HDO-30	OE/HDO-10	OEA	D-Daily M-Monthly or 33 hours of operation, whichever occurs first. Q-Quarterly (3 months) or 100 hours of operation, whichever occurs first. S-Semiannually (6 months) or 200 hours of operation, whichever occurs first. A-Annually (12 months) or 400 hours of operation, whichever occurs first. OC-On-condition.
OEA (MIL-L-46167)	LUBRICATING OIL, Internal Combustion Engine Artic					
	Engine Crankcase, add 4 additional quarts (3.785 L) for filters	Refill 22 qts (20.812 L) Dry 30 qts (28.380 L)				
	Winch	3.5 qts (3.312 L)	OE/HDO-10	OE/HDO-10	OEA	
	Transmission, Steer Unit, Transfer Case, Oil Cooler and Lines	Refill 50 qts (47.300 L) Dry 78 qts (73.815 L)				
	Hydraulic Tank	Refill 108 qts (102.206 L) Dry 128 qts (121.133 L)				
	Hydraulic Tank Return Line Filter	4 qts (3.785 L)				
GO (MIL-L-2105)	LUBRICATING OIL, Gear, Multi-purpose		GO-85/140	GO-80/90	GO-75	
	Final Drives (2)	8 qts each (7.571 L)	GO-80/90			
GAA (MIL-G-10924)	GREASE, Automotive and Artillery	ALL TEMPERATURES				
	Roadwheel Hub Bearing		GAA	GAA	GAA	
CMD (MIL-G-21164)	Molybdenum Disulfide	ALL TEMPERATURES				
	Hatch Hinge Assembly		GMD	GMD	GMD	
PL (Medium (MIL-L-3150) (special VV-L-800)	LUBRICATING OIL, General Purpose Oil Can Points		PL-M Medium	PL-S Special	PL-S Special	
SD-2 (P-D-680)	SOLVENT, Drycleaning	ALL TEMPERATURES				
		EXPECTED TEMPERATURES				
(MIL-G-18458)	GREASE, Wire Rope and Exposed Gear	ALL TEMPERATURES				
	WINCH CABLE and Drum		Grease, Wire Rope and Exposed Gear	Grease, Wire Rope and Exposed Gear	Grease, Wire Rope and Exposed Gear	

FUEL REQUIREMENT'S – TEMPERATURE LIMITS (VV-F-800)

Grade DF-2 Fuel For use above +10°F (-12°C)*
Grade DF-1** For use below +10°F (-12°C) to above -20°F (-29°C)
Grade DF-A For use below -20°F (-29°C)
Grade JP8 For use above -60°F (-51°C)

* Usage temperature may vary dependent on the cloud point of the actual DF-2 fuel being supplied in the geographical area

** DF-1 is not normally procured in CONUS or OCONUS Refineries will blend DF-2 with kerosene to meet temperature requirements of DF-1.

TOTAL MAN-HOURS		TOTAL MAN-HOURS	
INTERVAL	MAN-HOURS	INTERVAL	MAN-HOURS
D	0.3	S	2.8
M	1.0	A	4.6
Q	3.7	OC	1.0

GENERAL NOTE 1 If OEA lubricant is required to meet the temperature ranges specified in key, OEA is to be used in all places where OE/HDO-10 is specified.

GENERAL NOTE 2 The use of OE/HDO 15W-40 in lieu of OE/HDO-30 is authorized. The OE/HDO 15W-40 can be used at all temperatures above 5°F (-15°C) for all components except the transmission, transfer case, steer unit and final drives.

OIL ANALYSIS PROGRAM SAMPLING PROCEDURES

Note

Oil samples must be submitted to an assigned Army Oil Analysis Program (AOAP) laboratory every 25 engine hours or 30 days, whichever comes first, in accordance with TB 43-0210.

Three oil sampling valves (1) are located on the oil sampling manifold (2). The valves are identified by the plate (3) above the valves (1), and are used to sample oil from the following:

HYDRAULIC OIL SAMPLE — — Samples oil from the entire vehicle hydraulic system.

ENGINE OIL SAMPLE —— Samples vehicle engine oil.

POWERTRAIN OIL SAMPLE —— Samples lubricating oil from the transmission and steer unit.

When a lubrication note specifies that an oil sample must be taken, use the following procedures:

A Open engine intake grilles (TM 5-2350-262-10).

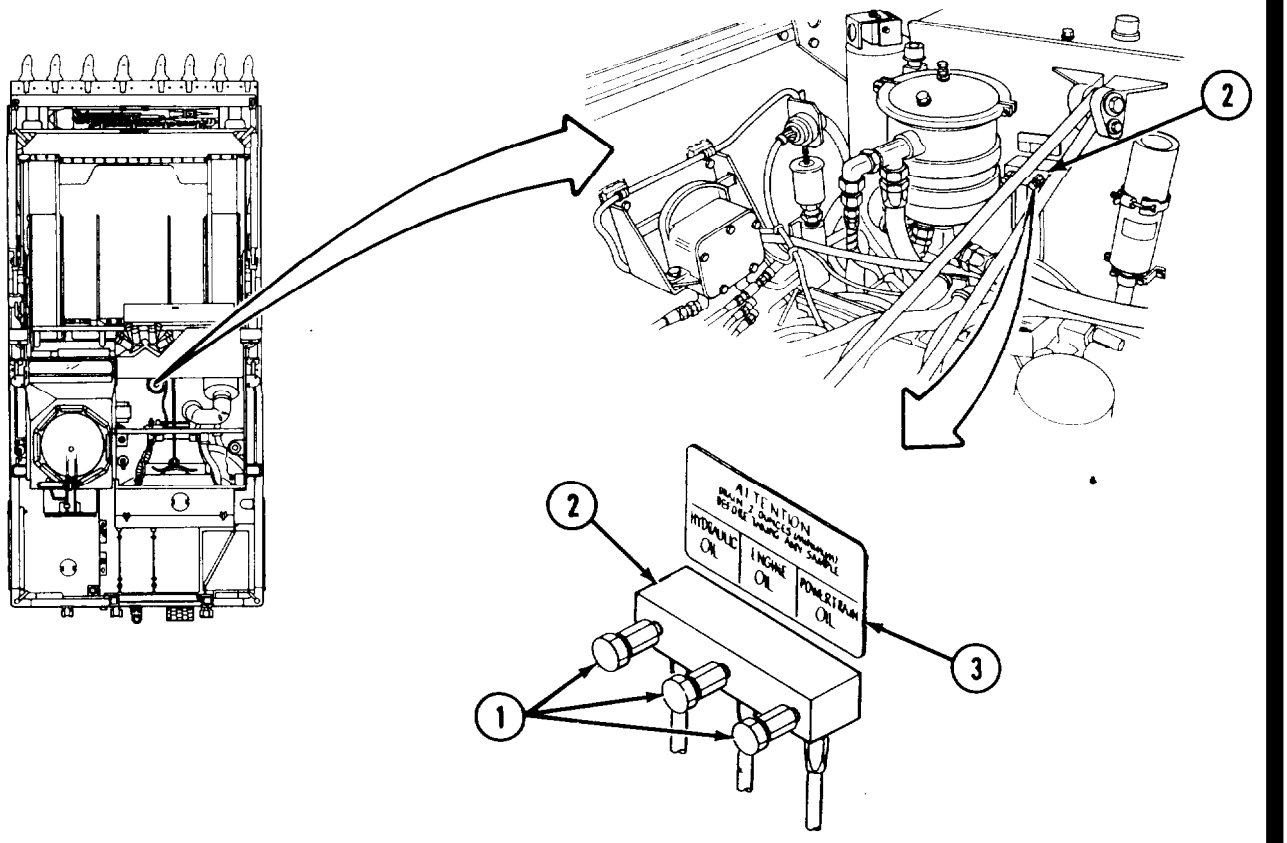
B Ensure that oil to be sampled is at its normal operating temperature (TM 5-2350-262-10).

C Open valve (1) of system or component to be sampled, and drain at least 2 oz (59 ml) of oil into a container. Close valve (1), and discard this oil.

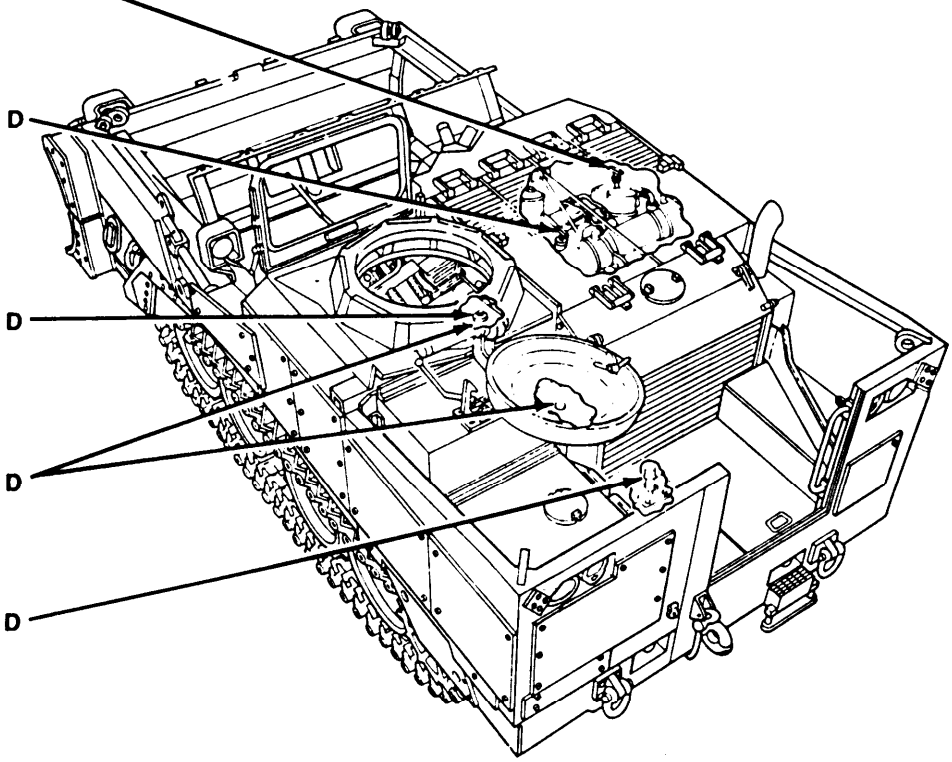
D Place sample bottle (TB 43-0210) under valve of system or component to be sampled, open valve (1), and fill sample bottle to approximately 1/2 in. (1.3 cm) below neck of bottle. Close valve (1).

E Send oil sample to AOAP laboratory.

F If no other tasks will be performed in the engine compartment, close engine intake grilles (TM 5-2350-262-10).



DAILY NOTES

This page shows what to check or lubricate each day the vehicle is operated or driven.

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