LUBRICATION ORDER
29 September 1995

LO 9-2350-285-12

(Supersedes LO 9-2350-285-05 April 1990)

CARRIER, CARGO: TRACKED, 1-1/2 TON, M973A1
(2350-01-281-6451)
CARRIER, CARGO: TRACKED, 2 TON, M1067
(2350-01-281-6450)
CARRIER, COMMAND POST: TRACKED, 1-1/2 TON, M1065
(2350-01-281-8324)
CARRIER, AMBULANCE: TRACKED 1-1/2 TON, M1066
(2350-01-283-6215)

Reference: TM 9-2350-285-10 or TM 9-2350-285-20

Intervals (on-condition or hard time) and the related man-hour times are based on normal operation. The man-hour time specified is the time you need to do all the services prescribed for a particular interval. On-condition (OC) oil sample intervals shall be applied unless changed by the Army Oil Analysis Program (AOAP) laboratory. Change the hard time interval if your lubricants are contaminated or if you are operating the equipment under adverse operating conditions, including longer-than-usual operating hours. The hard time interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken. Hard time intervals will be applied in the event AOAP laboratory support is not available.

WARNING

Dry cleaning solvent P-D-680 is toxic and flammable. Always wear protective goggles and gloves, and use only in a well-ventilated area. Avoid contact with skin, eyes, and clothes and DO NOT breathe vapors. DO NOT use near open flame or excessive heat. The solvent's flash point is 140° F (60° C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes with water and get medical aid.

Clean fittings before lubricating. Clean parts with dry cleaning solvent P-D-680, Type II or equivalent. Dry before lubricating.

Broken arrow shafts (- - -) indicate lubrication points on both sides of the equipment.

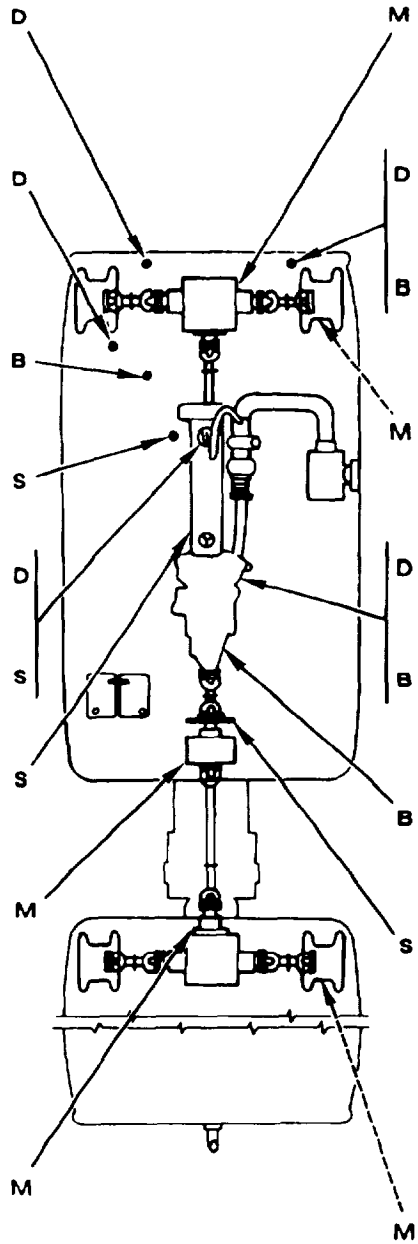
The lowest level of maintenance authorized to lubricate a point is indicated by one of the following: (C) for Crew/Operator, or (0) for Unit Maintenance.

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) direct to: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-IM-MMAA, Warren, MI 48397-5000. A reply will be furnished to you.

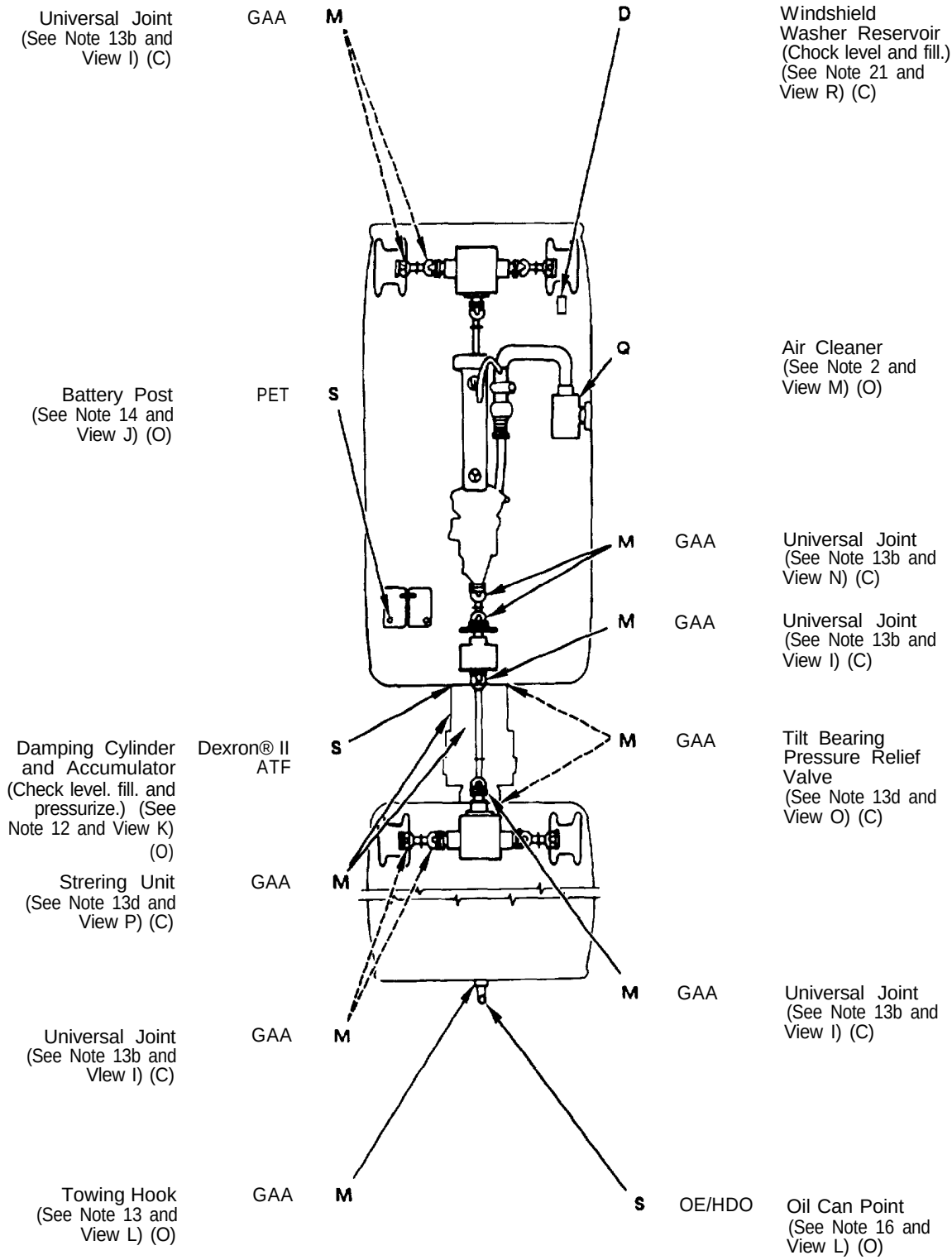
You may also provide DA Form 2028 information to TACOM via e-mail or datafax. Our fax number is DSN 786-6323. Our e-mail address is: amsta-mmaa@cc.tacom.army.mil.

LUBRICANT • INTERVAL		INTERVAL • LUBRICANT	
Stowing Hydraulic Fluid Tank (Check level and fill.) (See Note 9 and View A) (C)	Dexron® II ATF or OEA	GO	Differential (Chock level and fill.) (See Note 7 and View F) (C)
Brake Master Cylinder Reservoir (Check level and fill.) (See Note 10 and View B) (C)	BFS	D	Coolant Antifreeze (Check level and fill.) (See Note 22)
		B	Coolant Antifreeze (Change.) (See Note 22)
Stowing System Hydraulic Oil Filter (See Note 19 and view Q) (O)		M	GAA Drive Sprocket Bearing (See Note 13a and View G) (C)
In-line Fuel Filter (See Note 20 and view C) (O)		S	
Crankcase (Check level and fill.) (See Note 4 and View D) (C)	OE/HDO or OEA	D	Dexron® II ATF or OEA Transmission (Chock level and fill.) (See Note 8 and View D) (C)
Crankcase Oil OC AOAP Analysis (See Note 5) (O)	OE/HDO or OEA	S	Dexron® II ATF or OEA Transmission (Drain and fill.) (See Note 8) (O)
Engine Oil Filter OC AOAP Analysis (See Note 3 and view C) (O)		B	Transmission Oil Filter (See Note 8) (O)
Transfer (Check level and fill.) (See Note 6 and View E) (C)	GO	M	
		S	GAA Brake Caliper (See Note 11) (O)
Differential (Check level and fill.) (See Note 7 and View F) (C)	GO	M	
		M	GAA Drive Sprocket Bearing (See Note 13a and View G) (C)



TOTAL MAN-HOURS*		TOTAL MAN-HOURS*	
INTERVAL	MAN-HOUR	INTERVAL	MAN-HOUR
D	0.3	S	2.8
M	2.2	B	0.8

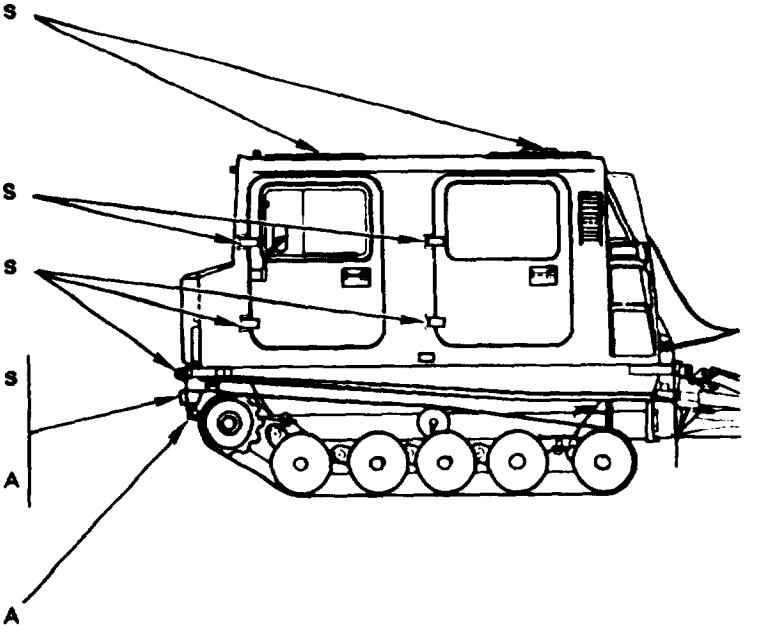
***The time specified is the time required to perform all services at the particular Interval (on-condition or hard time).**



TOTAL MAN-HOURS*		TOTAL MAN-HOURS*	
INTERVAL	MAN-HOUR	INTERVAL	MAN-HOUR
D	0.3	Q	3.2
M	2.2	S	2.8

***The time specified is the time required to perform all servicer at the particular interval (on-condition or hard time).**

	LUBRICANT • INTERVAL	
Roof Hatch and Side Window Locks (See Note 15) (O)	GAA	S
Oil Can Points (See Note 16) (O)	OE/HDO	S
Oil Can Points (See Note 16) (O)	OE/HDO	S
Winch (Check level and fill.) (See Note 17 and View H) (O)	OEA	S
Winch (Drain and fill.) (See Note 17 and View H) (O)	OEA	A
Winch Cable (See Note 18) (O)	CW-II	A



TOTAL MAN-HOURS'		TOTAL MAN-HOURS*	
INTERVAL	MAN-HOUR	INTERVAL	MAN-HOUR
S	2.8	A	2.4

***The time specified is the time required to perform all service at the particular interval (on-condition or hard time).**

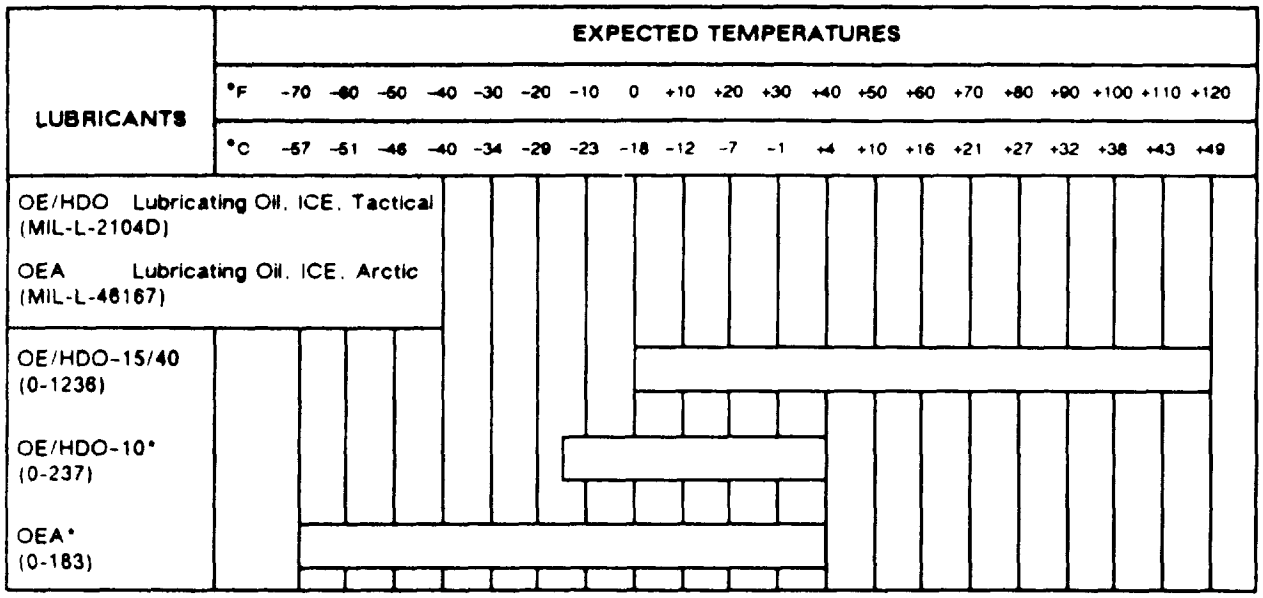
— KEY —

LUBRICANTS	CAPACITIES	EXPECTED TEMPERATURES
OE/HDO Lubricating Oil, ICE, Tactical (ML-L-2104D) OEA Lubricating Oil, ICE, Arctic (ML-L-46167)		See Table I
Engine Crankcase (Add one additional quart for filter.)	9.5 qt. (9.0 l)	
Winch	0.7 qt. (0.7 l)	
Oil Can Points	As Required	
Dexron® II Automatic Transmission Fluid (NSN 9150-00-698-2382) OEA Lubricating Oil, ICE, Arctic (ML-L-46167)		Dexron® II may be used when expected temperatures are above –40°F (–40°C). For temperatures below –40°F (–40°C), use OEA meeting specification MIL-L-46167.
Transmission	8.2 qt. (7.8 l)	
Steering System	7.2 qt. (6.8 l)	
Damping Cylinder and Accumulator	0.5 qt. (0.5 l)	
GO Lubricating Oil, Gear. Multipurpose (MIL-L-2105)		See Table II
Differential (Each)	3.0 qt. (2.8 l)	
Transfer Case	2.2 qt. (2.1 l)	
GAA Grease, Automotive and Artillery (ML-G-10924) (G-403)		GAA ALL TEMPERATURES
All Grease Points	As Required	
BFS Brake Fluid, Silicone, Automotive, AH Weather Operational and Preservative (MIL-B-46176) (H-547)		BFS ALL TEMPERATURES
Hydraulic Brakes	0.5 qt. (0.5 l)	
CW-II Lubricating Oil: Chain, Wire-Rope, and Exposed Gear (VV-L-751)		See Table III
Winch Cable	As Required	
PET Petrolatum Technical (VV-P-236) (S-743)		PET ALL TEMPERATURES
Battery Post	As Required	
Ethanol. Denatured or Windshield Washer Fluid (O-E-760)		ALL TEMPERATURES
WIndshieid Washer	As Required	
Antifreeze, Ethylene Glycol Inhibited. Heavy-duty (MIL-A-46153)	As Required	See Table IV
Antifreeze, Arctic Type (MIL-A-11755)		

FOR ARCTIC OPERATION, REFER TO FM 9-207

INTERVALS
OC : On-Condition, as directed by AOAP laboratory
D: Daily
M: Monthly or 500 miles (804 km)
S: Semiannaul, 6 months, or 3,000 miles (4,827 km)
A: Annual. 12 months. or 6.000 miles (9,654 km)
B : BIennial, 24 months, or 12,000 miles (19,308 km)

Table I. Lubricant Chart for Engine.



*If OEA lubrication it required to meet the low expected temperature range. OEA lubrication is to be used in lieu of OE/HDO-10 lubrication for all expected temperatures where OE/HDO-10 is specified.

Table II. Lubricant Chart for Differentials.

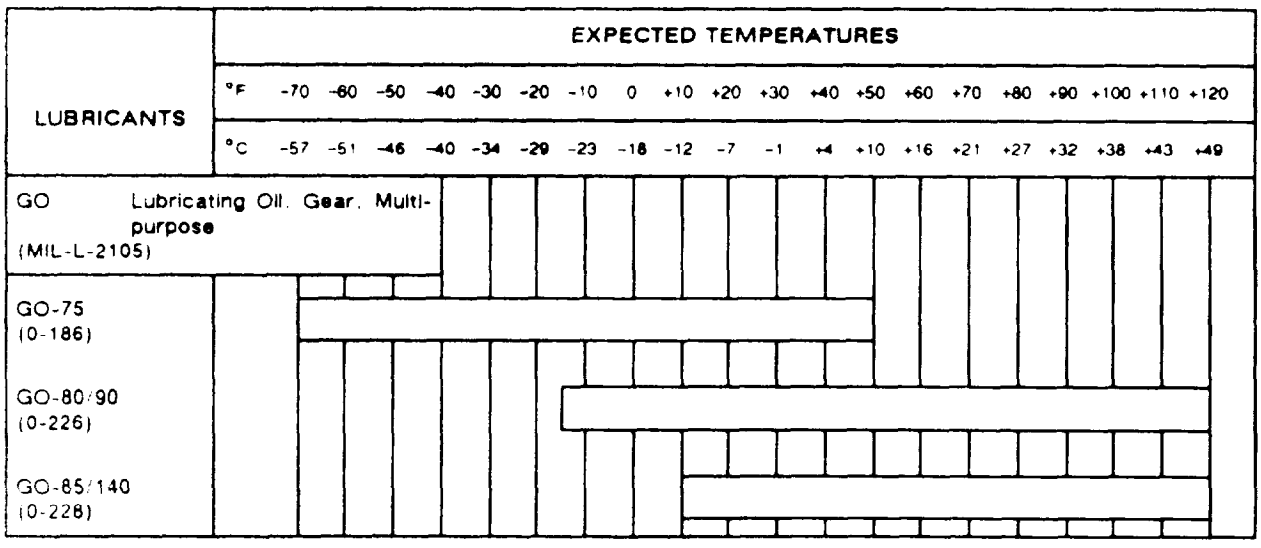


Table III. Lubricant Chart for Exposed Gear, Chain, and Wire Rope.

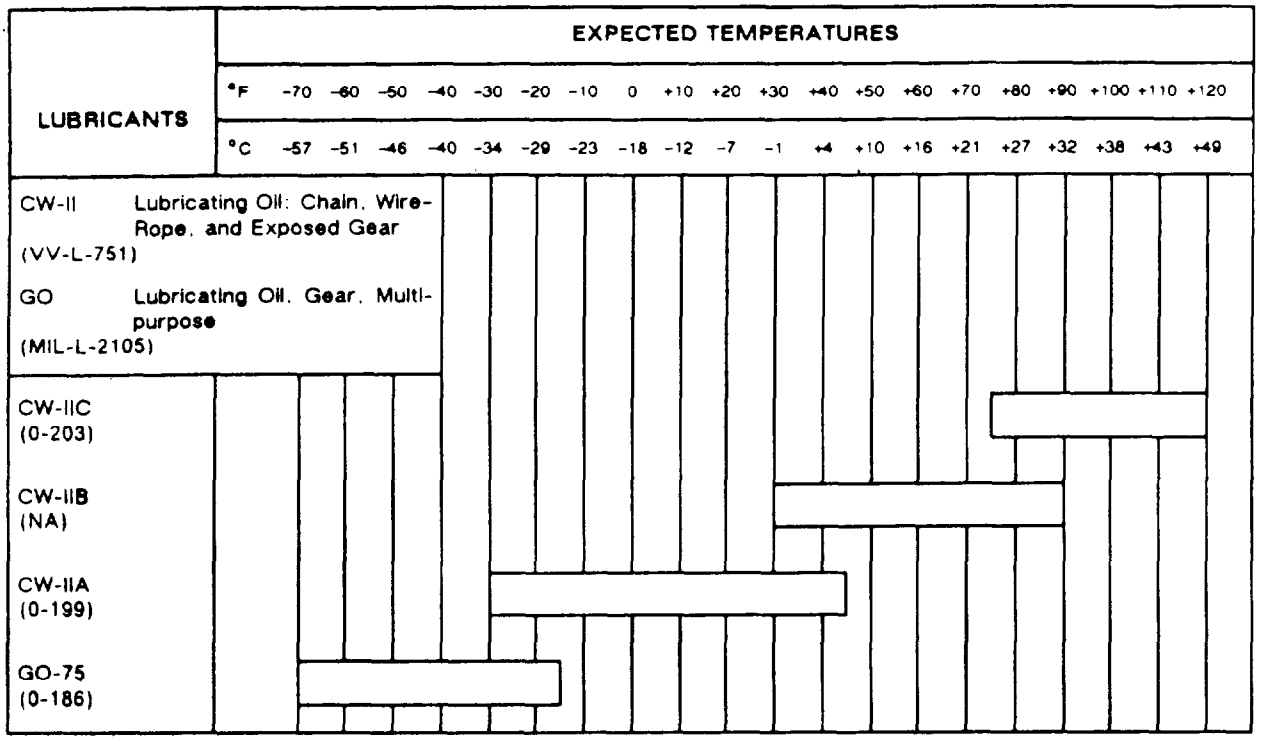
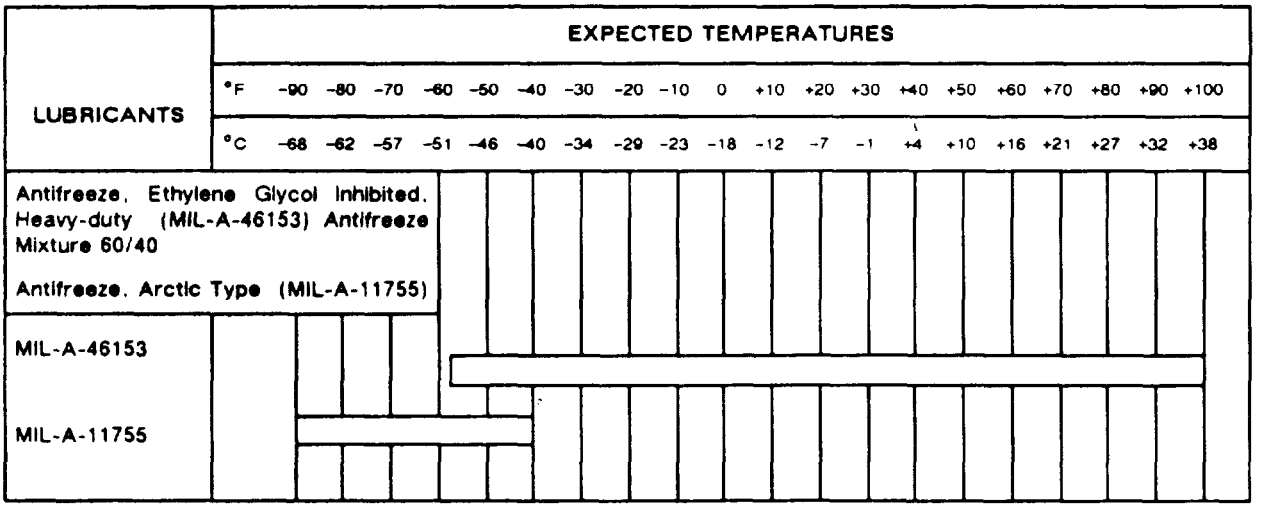
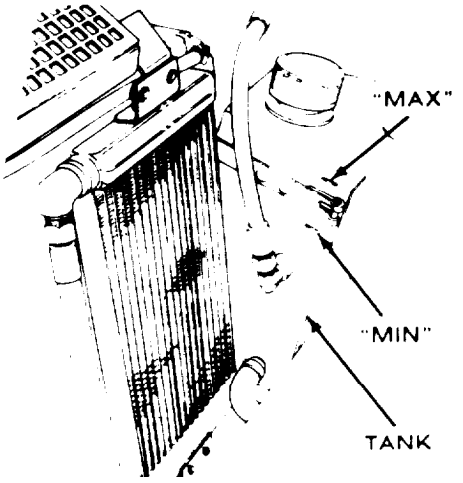


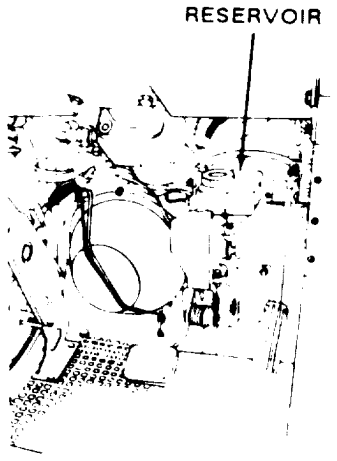
Table IV. Lubricant Chart for Antifreeze.



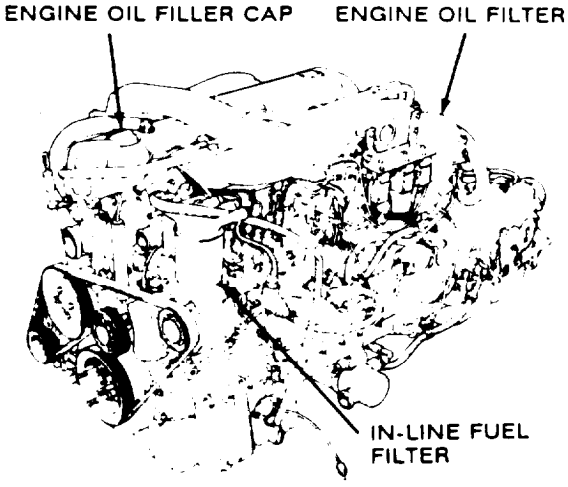
A Steering Hydraulic Fluid Tank



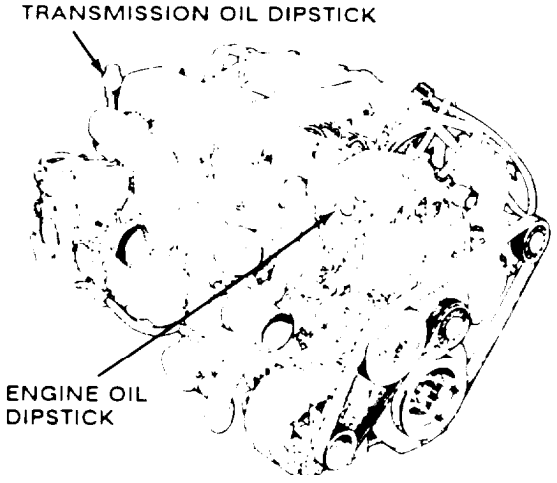
B Brake Master Cylinder Reservoir



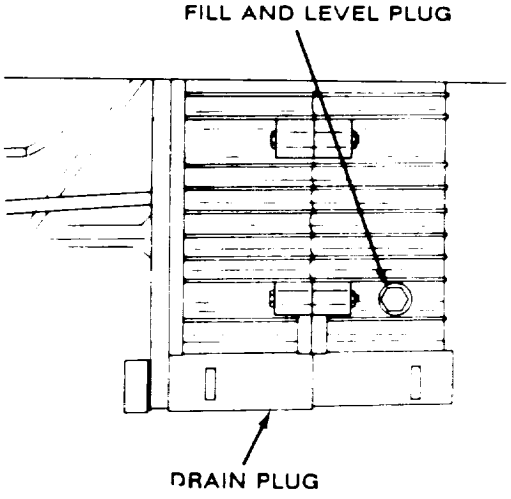
C Crankcase Oil, Engine Oil Filter, and In-line Fuel Filter



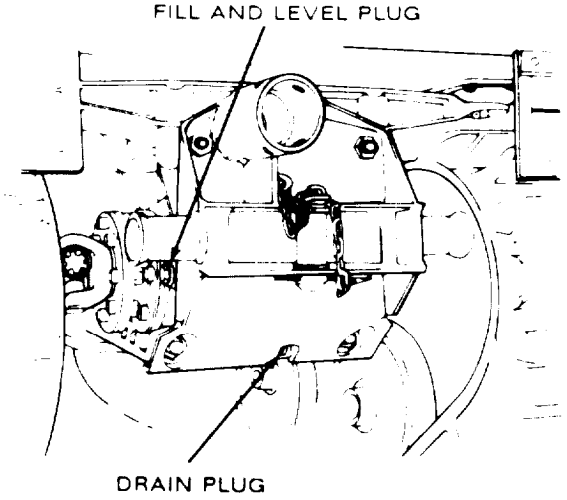
D Engine and Transmission Oil Dipsticks



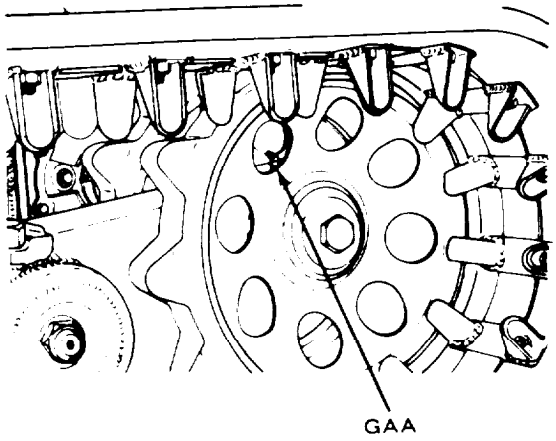
E Transfer



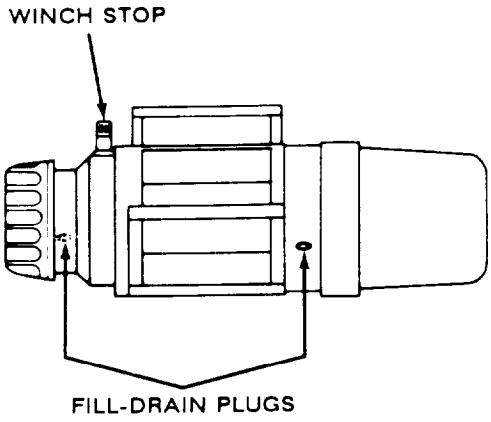
F Differential



(G) Drive Sprocket Bearing

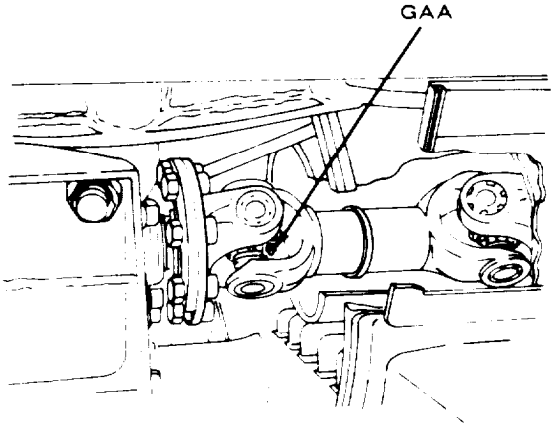


(H) Winch

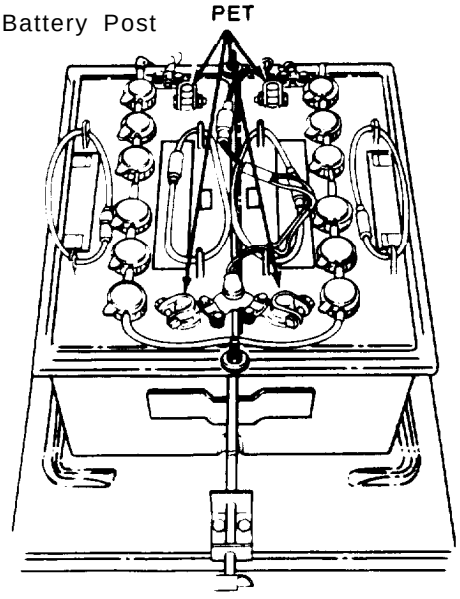


*One fill-drain plug on rear on winch

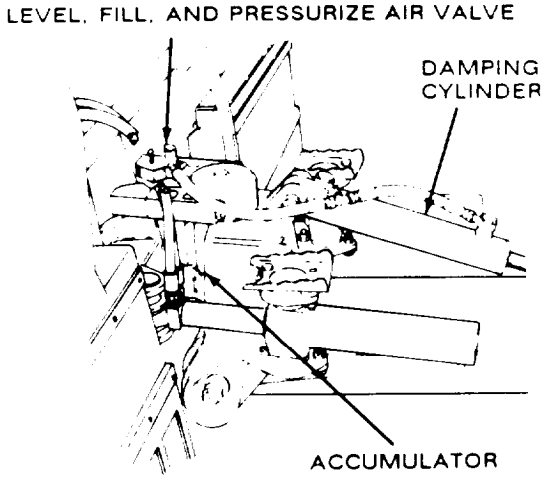
(I) Universal Joint (Track Drive Sprockets and Drive Shaft Front-to-Rear Carrier Through Steering Unit)



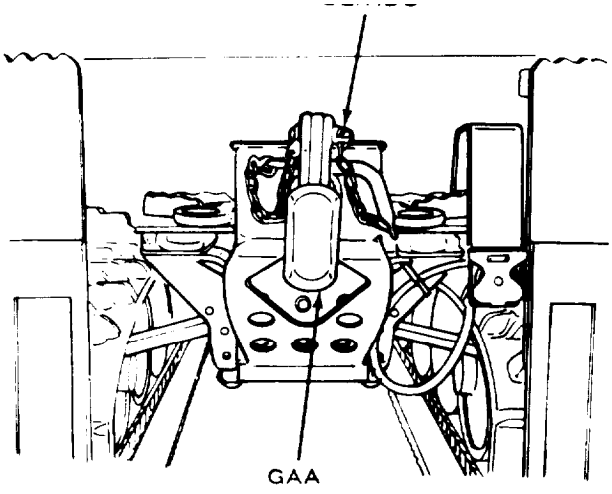
(J) Battery Post



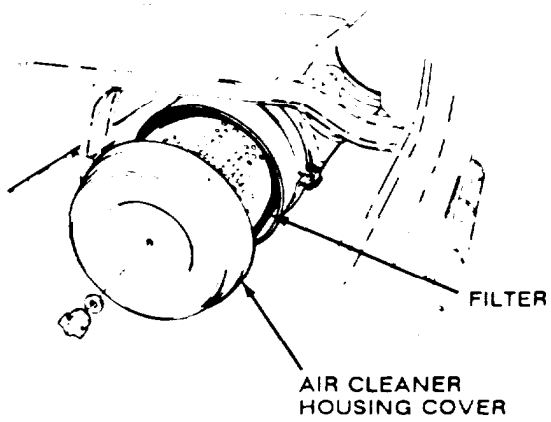
(K) Damping Cylinder and Accumulator



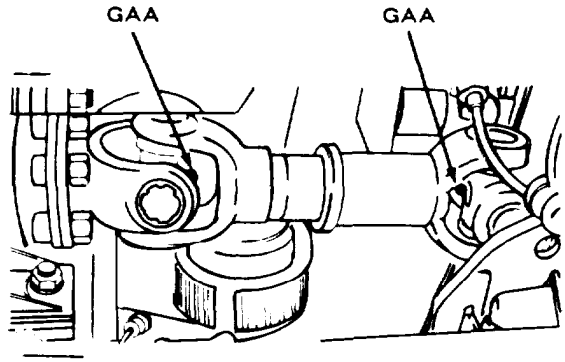
(L) Towing Hook



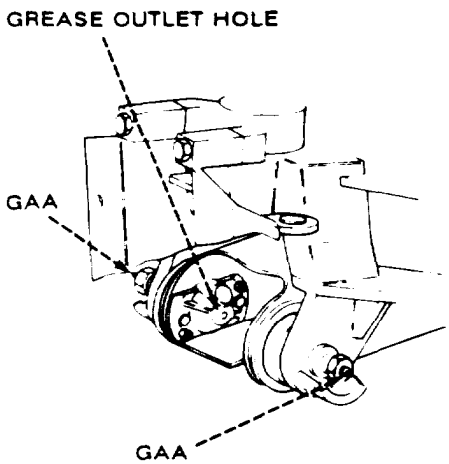
(M) Air Cleaner



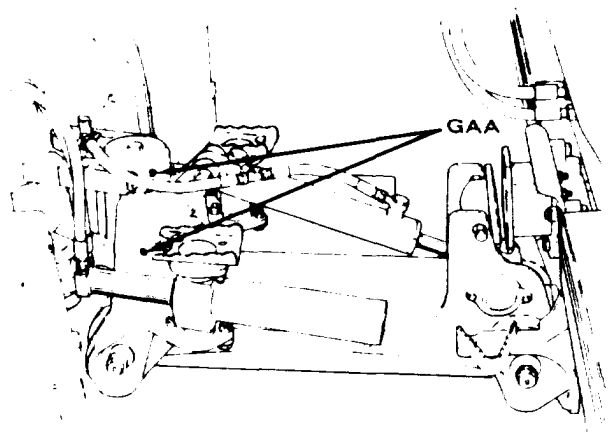
(N) Universal Joint (Drive Shaft, Transmission Brake Unit, Transfer Care)



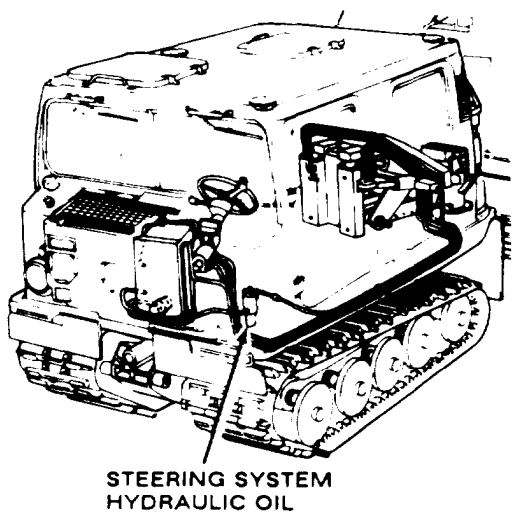
(O) Tilt Bearing Pressure Relief Valve



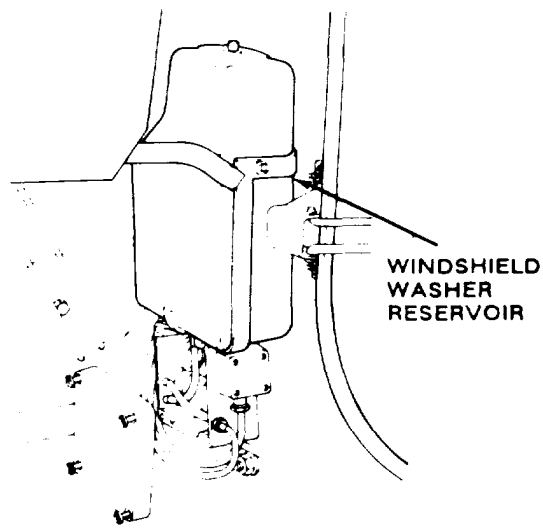
(P) Steering Unit



(Q) Steering System Hydraulic Oil Filter



(R) Windshield Washer Reservoir



NOTES:

1. FOR OPERATION OF EQUIPMENT IN PROTRACTED COLD TEMPERATURES BELOW -15°F (-26°C). Remove lubricants prescribed in the KEY for temperatures above -15°F (-26°C). Relubricate with lubricants specified in the KEY for temperatures 0°F to -65°F (-18% to -50°C).

2. AIR CLEANER. Check quarterly, 3 months, or 1,500 miles (2,413 km). More often under sandy/ dusty conditions. To check, remove air cleaner housing cover (see View M). Check air filter for condition. Clean or replace filter. Install cover.

3. ENGINE OIL FILTER. After installing new filter element, fill crankcase, operate engine five minutes, and check housing for leaks. Shut down engine, check crankcase oil level, and bring to "FULL" mark. Oil filter replacement interval shall aline with on-condition AOAP Analysis or hard time oil change requirements (see Notes 4 and 5).

4. CRANKCASE. Check crankcase oil level with engine off. If engine has been running, wait two minutes before checking level. Remove and clean engine oil dipstick (see View D). Put in gage, wait 10 seconds and pull out. Check level. Correct level is between marks.

5. CRANKCASE OIL. A sample of the oil shall be sent to an AOAP laboratory for analysis of an interval of 1,000 miles (1,608 km) or 60 days. Refer to DA PAM 738-750 for sampling requirements. Hard time interval during warranty period is 777 miles (1,250 km).

When AOAP laboratory support is not available, drain and refill crankcase oil at 777 miles (1,250 km) or 6 months.

NOTE

Change engine oil and filter in a new or reconditioned engine after break-in period [semiannually, 6 months, or 63-311 miles (100-500km)].

To change oil and filter, see TM 9-2350-285-20.

6. TRANSFER. Check oil level monthly or 500 miles (804 km). To check, remove fill plug (see View E). Oil must appear level with bottom of fill plug opening. Fill with GO through fill plug opening until oil begins to overflow. Clean and install plug. Change the oil one month or 500 miles (804 km) after new unit replacement.

7. DIFFERENTIAL. Check oil monthly or 500 miles (804 km). To check, remove fill plug (see View F). Oil must appear level with bottom of fill plug opening. Fill with GO through fill plug opening until oil begins to overflow. Clean and install plug. Change the oil one month or 500 miles (804 km) after new unit replacement.

CAUTION

Use of the Check Cold Oil Level procedure should be avoided unless it has been at least six hours since engine was last started and there is doubt as to whether transmission has adequate oil to safely operate vehicle. Damage to transmission may occur.

NOTE

Accurate transmission oil level checks can only be done using the Check Hot Oil Level procedure. The Check Cold Oil Level procedure is used only to provide an indication of adequate transmission oil necessary to safely operate vehicle until next scheduled hot level check can be performed.

8. TRANSMISSION. Check fluid level daily with engine at idle and selector lever in Neutral (N) position. Hot is 158°F to 194°F (70°C to 90°C). Remove and clean transmission dipstick (see View D). Put in and pull out dipstick. Check level. Correct level is between marks. Checking transmission fluid level cold will provide an incorrect fluid level reading.

Change transmission fluid and filter biennially, 24 months, or 12,000 miles (19, 308 km). The power pack must be removed to change the transmission fluid and filter.

9. STEERING HYDRAULIC FLUID TANK. Check oil level daily. To check, look at tank (see View A) Fluid must appear between the "MAX" and "MIN' marks. To fill, remove cap and fill with fluid as necessary. Replace tank cap.

10. BRAKE MASTER CYLINDER RESERVOIR Check fluid level daily. To check, look into reservoir (see View B). Fluid must appear 3/8 in. (10 mm below the filler opening. To fill, remove the cap and fill with BFS.

11. BRAKE CALIPER. Lubricate semiannually, 6 months, or 3,000 miles (4,827 km). To lubricate apply a light film of GAA only to brake caliper sliding surfaces.

12. DAMPING CYLINDER AND ACCUMULATOR Check fluid level semiannually, 6 months, or 3,000 miles (4,827 km). To check, loosen air valve and reduce air pressure. Remove air valve (see View K) Fluid level must be 2-3/4 in. (70mm) above bottom Install air valve and pressurize to 87±14.5 psi (600: 100 kPa). Check for leaks.

NOTES: (Con't):

13. GREASE POINTS.

a. Hold grease gun on fitting. Pump grease until grease comes out through seals.

b. Hold grease gun on fitting. Pump grease until grease comes out through all 4 bearing cups. Rotate drive shaft if necessary.

c. Hold grease gun on fitting. Pump grease until grease comes out of spline coupling.

d. Hold grease gun on fitting. Pump grease until grease comes out of outlet hole.

14. BATTERY POST. Lubricate semiannually, 6 months, or 3,000 miles (4,827 km). Apply a light film of PET to battery post.

15. ROOF HATCH AND SIDE WINDOW LOCKS. Lubricate semiannually, 6 months, or 3,000 miles (4,827 km). To lubricate, apply a light film of GAA to roof hatch and side window locks.

16. OIL CAN POINTS. Lubricate semiannually, 6 months, or 3,000 miles (4,827 km). Lubricate all pivot points, windshield wiper shafts, seat adjustment rails, accelerator pedal and linkage, door hinges, mirror arms, tow hook, and winch stop with OE/HDO.

17. WINCH. Check oil level semiannually, 6 months, or 3,060 miles (4,827 km). Place winch into winch mount. Remove fill-drain plugs (see View H). Oil must appear level with bottom of fill-drain plug opening. Fill with fluid, as prescribed by the KEY, through fill-drain plug openings until oil begins to overflow. Clean and install plugs.

Drain oil annually, 12 months, or 6,000 miles (9,664 km). To drain, place winch on a firm surface. Remove fill-drain plugs (see View H). Drain winch. Turn winch to where oil can drain from fill-drain holes. Place winch into winch mount. Refill with fluid as outlined above.

18. WINCH CABLE. Clean cable annually, 12 months, or 6,000 miles (9,654 km). Apply CW-II to cable.

19. STEERING SYSTEM HYDRAULIC OIL FILTER. Lubricate biennially, 24 months, or 12,000 miles (19,308 km). Remove oil filter. Replace with new oil filter. Fill steering hydraulic fluid tank (see Note 9, View A).

20. IN-LINE FUEL FILTER. Change semiannually, 6 months, or 3,000 miles (4,827 km). Unscrew in-line fuel filter and replace with a new in-line fuel filter.

21. WINDSHIELD WASHER RESERVOIR. Check fluid in reservoir. Reservoir should be approximately 3/4 full. Add 50/50 mixture of water and ethylene glycol.

22. ANTIFREEZE.

WARNING

Do not remove reservoir cap when system is hot or personnel may be injured.

Check coolant level before operation by checking sight glass with engine at idle. Level should be between "MIN" and "MAX". If coolant is low, add a 60/40 mixture of coolant and water to reservoir until level is reached.

Every 24 months or 12,000 miles (19,308 km), drain, flush and refill system with new coolant (see TM 9-2350-285-20).

A copy of this Lubrication Order will remain with the equipment at all times. Instructions contained herein are mandatory.

By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

Official:
Yvonne M. Harrison
YVONNE M. HARRISON
Administrative Assistant to the Secretary of the Army
01047

DISTRIUBTION:
To be distributed in accordance with DA Form 12-37-E, block 1278, requirements for LO 9-2350-285-12.