ROUGH TERRAIN CONTAINER HANDLER (RTCH): RT 240; 53,000 LB CAPACITY; 4 X 4 (NSN 3930-01-473-3998)

References: TM 10-3930-675-10, TM 10-3930-675-20, TM 10-3930-675-34, FSC C9100-IL, SF Form 368

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028 (*Recommended Changes to Equipment Technical Publications*), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is http://aeps.ria.army.mil. If you need a password, scroll down and click on "ACCESS REQUEST FORM". The DA Form 2028 is located in the ONLINE FORMS PROCESSING section of the AEPS. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, fax or e-mail your letter, DA Form 2028 direct to: AMSTA-LC-CI/TECH PUBS, TACOM-RI, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The e-mail address is: TACOM-TECH-PUBS@ria.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-

NOTE

- These instructions are mandatory.
- Do NOT sample engine and transmission oil until 50 hours <u>after</u> 100-hour initial break-in services.

AOAP Sampling. Engine and transmission system oil must be sampled every 50 hours of operation or 90 days, whichever occurs first, for Active Army Units. Reserve and National Guard activities will use 50 hours or 180 days, whichever occurs first, as prescribed interval. Hydraulic system oil must be sampled annually. Sampling will be performed as prescribed by DA Pam 730-750.

Maintenance Levels. This Lubrication Order (LO) is for Operator/Crew and Organizational Maintenance. The lowest level of maintenance authorized to lubricate a point is indicated on the Lubrication Chart by either Operator/Crew (C) or Organizational Maintenance (O). Operator/Crew may lubricate points authorized for Organizational Maintenance when directed to do so by Organizational Maintenance.

Intervals. Lubrication intervals (on-condition or hard-time) and the related man-hour times are based on nor-

mal operation. 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 lubricants are contaminated or if operating the equipment under adverse operating conditions, including longer-than-usual operation hours. The 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.

Warranty Period. Hard-time intervals shall be applied during the warranty period. 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 or extreme heat or dust.

Distribution Statement. Approved for public release; distribution is unlimited.

Locators. Lubrication points indicated with dashed leader lines are lubricated on both sides of the vehicle. Reference to the appropriate localized view is given after many lubrication entries. Localized views begin on Card 10.





WARNING





Dry cleaning solvent P-D-680 type III is toxic and flammable. 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 200°F (94°C). If you become dizzy while using dry cleaning solvent, get fresh air immediately and get medical help. If solvent contacts eyes, wash your eyes and get medical aid immediately.

Specific Lubrication Instructions.

- 1. Keep all lubricants in a closed container and store in a clean, dry place away from extreme heat. Keep container covers clean and do not allow dust, dirt or other foreign material to mix with lubricants. Keep lubrication equipment clean and ready for use.
- Clean area around lubrication points with dry cleaning solvent or equivalent before lubricating equipment. Keep all external parts of equipment not requiring lubrication free of lubricants. After lubrication, wipe off excess lubricant to prevent accumulation of foreign matter.
- Maintain record of lubrication performed and report any problems noted during lubrication. Refer to DA Pam 738-750 for maintenance forms and procedures to record and report any findings.
- 4. Refer to FM 9-207 for lubrication instructions in cold weather.

NOTE

DO NOT lubricate boom and tophandler wear plates.

Initial Break-in. Perform the following after the first <u>100</u> hours of operation:

- Change transmission fluid.
- Change transmission filters.
- Remove, clean, and reinstall transmission internal coarse filter.
- Check oil level in front/rear axle differential housings.
- Check oil level in front/rear axle hub ends.
- Clean and lubricate boom support locking pins.
- Drain and refill tophandler spreader and slewing motors.

Man-Hour Times. The man-hour time specified is the time needed to perform all services prescribed for a particular interval. The man-hour times for the RTCH are as follows:

Interval	Man-Hour
Daily	0.5
Weekly	0.5
200 Hours	1.0
300 Hours	2.0
1000 Hours	4.0

KEY

		EXPEC	TED TEMPERATU	RES*	
LUBRICANT/ COMPONENT	REFILL CAPACITY	+6°F TO +122°F (-14°C TO +50°C)	-4°F TO +50°F (-20°C TO +10°C)	-67°F TO +32°F (-55°C TO 0°C)	INTERVALS
OE/HDO (MIL-PRF-2104) Lubricating Oil, Tactical					D - Daily W - Weekly HR - Hours OC - On Con- dition
OEA (MIL-L-46167) Lubricating Oil, ICE, Arctic					
Engine Crankcase w/ Filters	38.6 Qt (36.5 L)		See Chart A		
Transmission	36 Qt (34 L)		See Chart B		
Hydraulic System	180 Gal. (680 L)		See Chart C		
GO (MIL-L-2105) Lubricating Oil, Gear, Multipurpose					
Front Axle Differential Housing	15.9 Gal. (60 L)		See Chart D		
Front Axle Hub End	2.64 Gal. (10 L)		See Chart D		
Rear Axle Differential Housing	11.1 Gal. (42 L)		See Chart D		
Rear Axle Hub End	2.77 Gal. (10.5 L)		See Chart D		
GAA (MIL-G-10924) Grease, Automotive and Artillery			All Temperatures		
ANTIFREEZE (MILA46153) Permanent, Ethylene Glycol, Inhibited, Heavy-Duty					
ANTIFREEZE (MILA11755) Permanent, Arctic Grace					
Engine Radiator	23.7 Gal. (90 L)		See Chart E		
* For Arctic Operation, ref	er to FM 9-207.				1

CHART A—ENGINE.

							EX	KPE(CTEI	D TE	MPI	ERA	ΓUR	ES						
	°F	-70	-60	-50	-40	-30	-20	-10	0	+10	+20	+30	+40	+50	+60	+70	+80	+90	+100	+120
Lubricant	°C	-57	-51	-46	-40	-34	-29	-23	-18	-12	-7	-1	+4	+10	+16	+21	+27	+32	+38	+49
OE/HDO (MIL-PRF-2104)	Lubri																			
OEA (MIL-L-46167)	Lubri	cating	Oil, IC																	
OE/HDO- 15/40																				_
OE/HDO-10*													_							
OEA *																				

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

CHART B—TRANSMISSION.

							E	XPE	CTE	D TE	MPI	ERAT	ΓUR	ES						
	°F	-70	-60	-50	-40	-30	-20	-10	0	+10	+20	+30	+40	+50	+60	+70	+80	+90	+100	+120
Lubricant	°C	-57	-51	-46	-40	-34	-29	-23	-18	-12	-7	-1	+4	+10	+16	+21	+27	+32	+38	+49
OE/HDO (MIL-PRF-2104)	Lubrio	cating	Oil, Ta	actical																
OEA (MIL-L-46167)	Lubrio	cating	Oil, IC	E, Ard	ctic															
OE/HDO-10																				⊢
OEA		_																		

CHART C—HYDRAULIC, STEERING, AND BRAKE SYSTEM.

							EXPECTED TEMPERATURES													
	°F	-70	-60	-50	-40	-30	-20	-10	0	+10	+20	+30	+40	+50	+60	+70	+80	+90	+100	+120
Lubricant	°C	-57	-51	-46	-40	-34	-29	-23	-18	-12	-7	-1	+4	+10	+16	+21	+27	+32	+38	+49
OE/HDO (MIL-PRF-2104)	Lubrio																			
OEA (MIL-L-46167)	Lubrio	cating	Oil, IC	E, Ard	ctic															
OE/HDO-10																				—
OEA		_																		

LUBRICATION ORDER

LO 10-3930-675-12

CHART D—FRONT/REAR AXLE DIFFERENTIALS.

							EX	KPE(CTEI) TE	MPF	ERA	ΓUR	ES						
	°F	-70	-60	-50	-40	-30	-20	-10	0	+10	+20	+30	+40	+50	+60	+70	+80	+90	+100	+120
Lubricant	°C	-57	-51	-46	-40	-34	-29	-23	-18	-12	-7	-1	+4	+10	+16	+21	+27	+32	+38	+49
GO (MIL-L-2105)	Lubri Tactio	-	Oil, G	ear,																
GO 85W/140																				_

CHART E—ANTIFREEZE.

		EXPECTED TEMPERATURES																		
	°F	-90	-80	-70	-60	-50	-40	-30	-20	-10	0	+10	+20	+30	+40	+50	+60	+70	+80	+90
Lubricant	°C	-68	-62	-57	-51	-46	-40	-34	-29	-23	-18	-12	-7	-1	+4	+10	+16	+21	+27	+32
MIL-A-46153	Antifre Inhibit				ycol,															
MIL-A-11755	Antifre	eeze,	Arctic	Grade	;															
MIL-A-46153																				_
MIL-A-11755	_																			

350-003

RTCH - RT 240

LUBRICANT • INTERVAL

Daily

Engine Coolant Expansion Tank
Check Level/Fill (C) (Note 4)

Primary Fuel Filter Drain Moisture (C) Change Filter (O) (Note 6 and View E)

Engine Oil Check Level/Fill (C) (Note 2 and View B)

Transmission Oil Check Level/Fill Note 7 and View C)

Transmission Oil Filters (O) (Note 8)

Pilot Pressure Filter (O) (Note 9)

Hydraulic System Pressure Filters (O) (Note 9)

Rear Brake **Cooling Filter** (O) (Note 9)

Hydraulic Oil Breather Filters (O) (Note 9)

Hydraulic Oil **Return Filters** (O) (Note 9)

Hydraulic Oil Reservoir Fill (C) (Note 1 and View A) Antifreeze (Ethylene glycol)

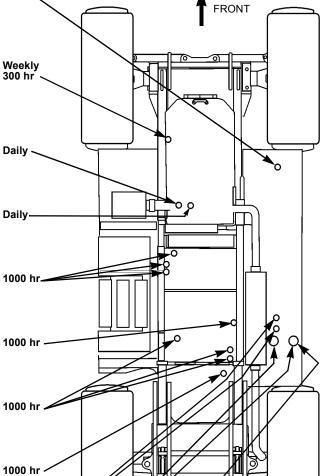


OE/HDO 15/40

OE/HDO 10

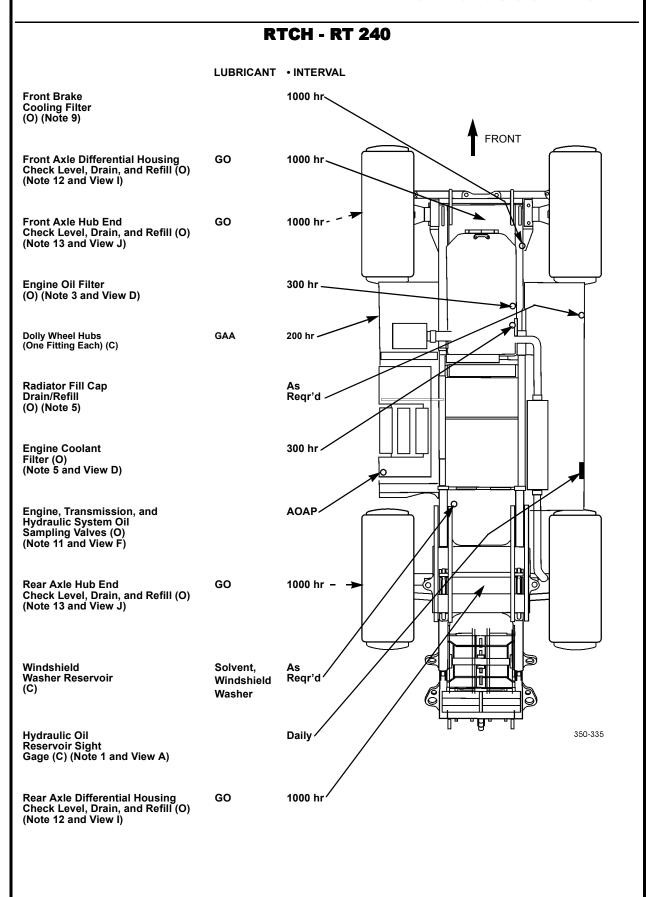
1000 hr

1000 hr



OE/HDO

10



RTCH - RT 240 LUBRICANT • INTERVAL Tophandler Hydraulic Slewing Weekly OE/HDO 1000 hr Motors 10/GO Check Level (C) Fill or Change (O) (Note 15 and View G) Tophandler **GAA** 200 hr **Pivot Pins** FRONT One Fitting Each (C) OE/HDO Weekly **Tophandler Hydraulic Spreader** 1000 hr Motor Check Level (C) Fill or Change (O) (Note 16 and View H) GAA Front Axle Steering 200 hr Cylinder Two Fittings (C) Front Propeller Shaft GAA 200 hr and Universal Joints Three Fittings (C) Cab Door Hinge Pin Two Fittings (C) GAA 1000 hr **Boom Support** GAA 200 hr Locking Pins (C) (Note 17) GAA **Boom Support** 200 hr One Fitting Each (C) Lifting Boom Pivot Pins (C) (One Fitting Each) GAA 200 hr Bogie Wheel Cylinder Four Fittings (C) GAA 200 hr Bogie Wheel Frame One Fitting (C) GAA 200 hr **Bogie Wheel Axle** GAA 200 hr-One Fitting Each Side (C) 350-004 **Pintle Hook** GAA 200 hr-Two Fittings (C) Dashed lines indicate lubrication points on BOTH sides of vehi-NOTE DO NOT lubricate boom and tophandler wear plates.

RTCH - RT 240 LUBRICANT • INTERVAL Tophandler Pinion and Ring Gear Two Fittings Each Side (O) (Note 14) GAA 200 hr FRONT **Chain Wheel** GAA 200 hr One Fitting Each Side (C) **GAA** 200 hr Front Axle Steering Knuckle Pin Two Upper Fittings, One Lower Fitting (C) Front Axle U-Joint GAA 200 hr Two Fittings (C) **Rear Propeller Shaft** GAA 200 hr and Universal Joints Three Fittings (C) 200 hr **Rear Axle Pivot GAA** Bearing Two Fittings (C) 200 hr Rear Axle Knuckle Pin **GAA** Two Upper Fittings One Lower Fitting (C) Rear Axle U-joint Two Fittings (C) GAA 200 hr ~ **Rear Axle Steering** GAA 200 hr -Cylinder Two Fittings (C) Boom Folding Cylinders Two Fittings Each Side (C) GAA 200 hr _ 350-986

Dashed lines indicate lubrication points on BOTH sides of vehicle.

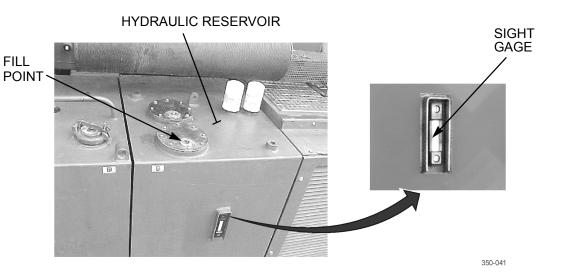
NOTE

DO NOT lubricate boom and tophandler wear plates.

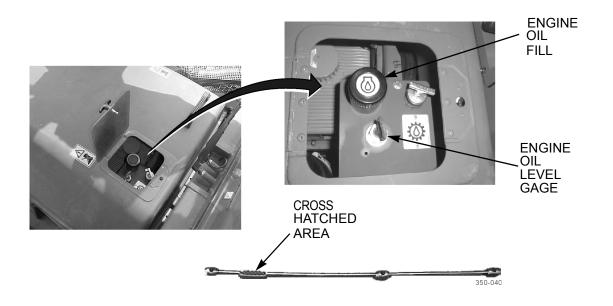
LO 10-3930-675-12

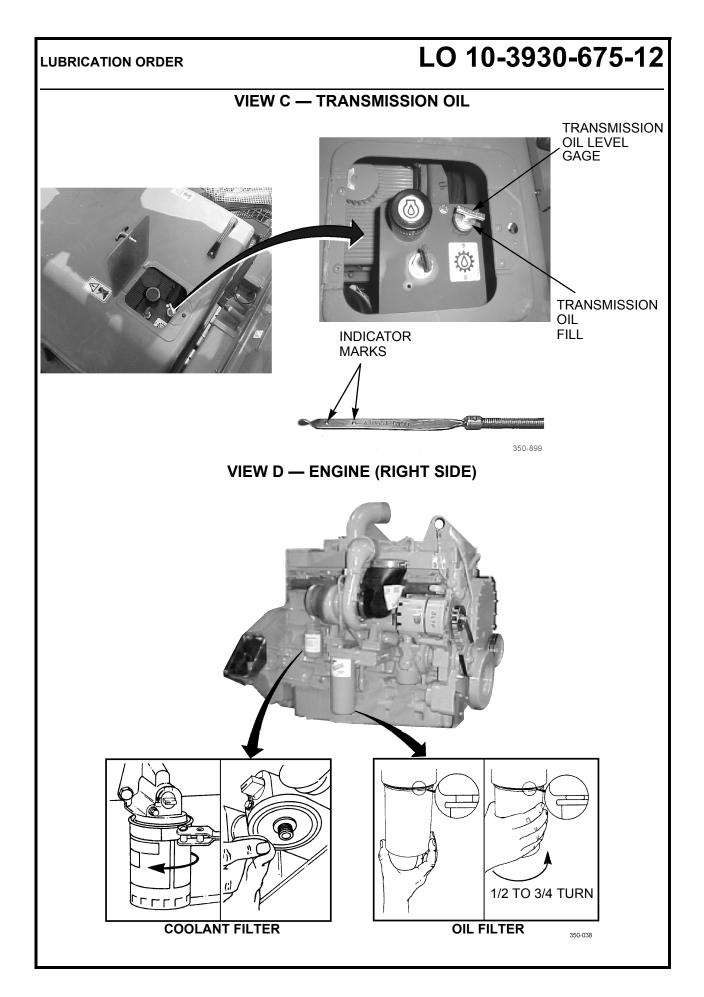
LUBRICATION ORDER

VIEW A — HYDRAULIC RESERVOIR

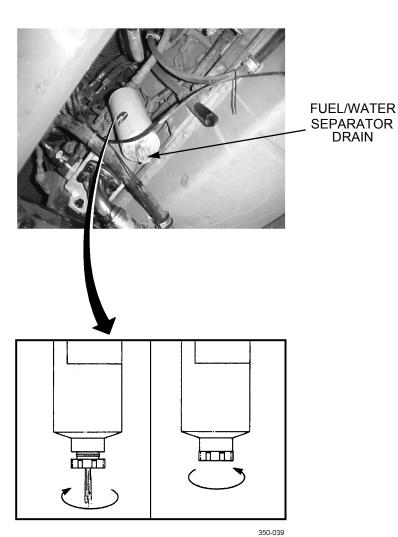


VIEW B — ENGINE OIL





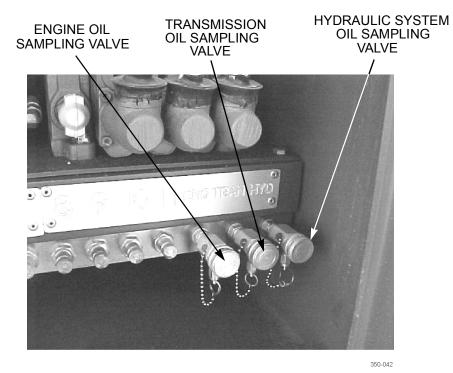
VIEW E — ENGINE (LEFT SIDE)



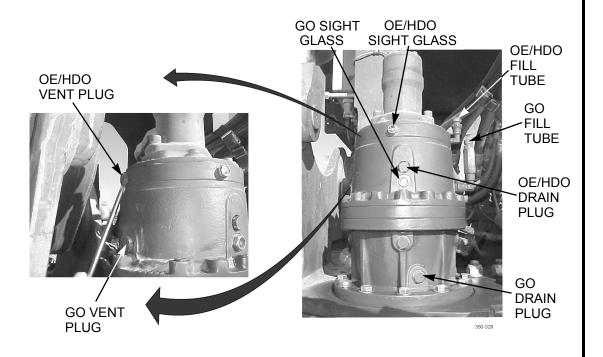
LUBRICATION ORDER

LO 10-3930-675-12

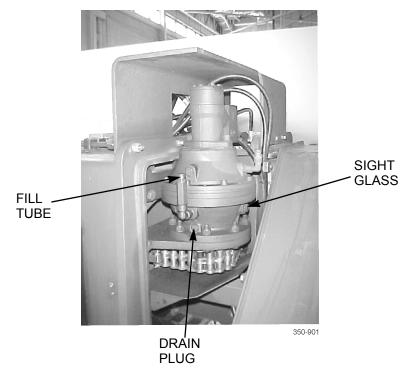
VIEW F — AOAP SAMPLING VALVES



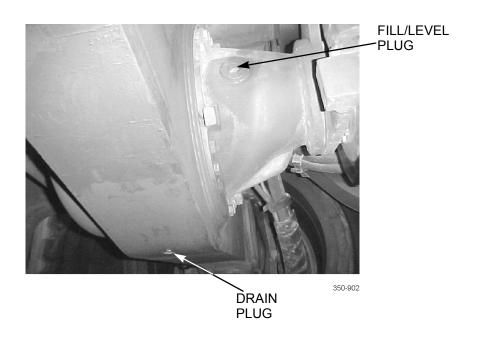
VIEW G —TOPHANDLER HYDRAULIC SLEWING MOTORS



VIEW H — TOPHANDLER HYDRAULIC SPREADER MOTOR

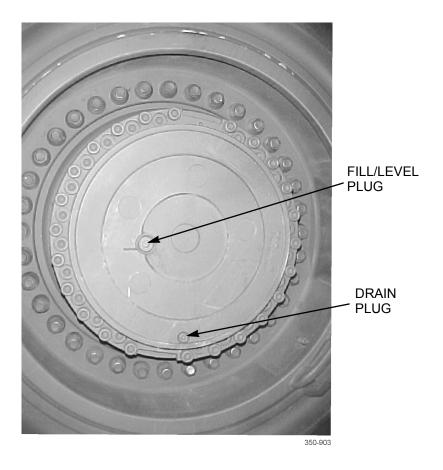


VIEW I — FRONT/REAR AXLE DIFFERENTIAL HOUSING



LO 10-3930-675-12

VIEW J — FRONT/REAR AXLE HUB END



NOTES:

1. HYDRAULIC SYSTEM OIL.



WARNING

- At operating temperature, hydraulic oil is hot. Allow hydraulic oil to cool before servicing hydraulic system. Failure to do so could result in injury.
- Hydraulic fluid is very slippery. Immediately wipe up any spills. Failure to follow this warning may result in injury to personnel.

NOTE

Boom must be fully lowered and retracted, and truck on level ground before checking hydraulic oil level in reservoir. Engine should be stopped at least five minutes.

Check hydraulic oil in oil level sight gage.

- a. If hydraulic oil is visible in sight gage, level is okay.
- b. If level is low, add hydraulic oil as follows: Use 24 mm hydraulic reservoir tool (TM 10-3930-675-10, *Basic Issue Items*) to remove plug at fill opening. Add oil thru fill opening until level is visible in sight gage. Reinstall plug.
- c. Replace hydraulic system oil as directed by AOAP oil sampling.

2. ENGINE OIL LEVEL CHECK.

- a. If engine has been running, shut down engine and wait 10 minutes for oil to drain down into engine oil pan before checking.
- b. Remove oil level gage (dipstick), clean, and reinstall.
- c. Remove and check oil level at least two times. Oil level should be within cross hatched area at end of dipstick.
- d. If level is low, add engine oil as follows: Remove cap from engine oil fill tube. Add oil thru tube until level on dipstick is within cross hatched area at end of dipstick. Reinstall cap on engine oil fill tube.
- 3. **ENGINE OIL AND FILTER.** Replace engine oil and oil filter after the first 100 hours of operation, thereafter every 300 hours of operation. Drain oil when engine is warm. Dispose of used oil properly.
- 4. ENGINE COOLANT LEVEL CHECK.



WARNING

DO NOT service cooling system unless engine has been allowed to cool down. DO NOT remove radiator cap. This is a pressurized cooling system and escaping steam or hot coolant will cause serious burns.

NOTE

Always shut down engine before checking, adding or draining coolant.

Check engine coolant level in radiator expansion tank. Level should be above the MIN mark. Add coolant to expansion tank if level is below the MIN mark.

NOTES - CONTINUED:

5. ENGINE COOLANT AND FILTER.



WARNING

DO NOT service cooling system unless engine has been allowed to cool down. This is a pressurized system and escaping steam or hot coolant may cause serious burns.

NOTE

Always shut down engine before checking, adding or draining coolant.

- a. Drain and refill coolant as required. Dispose of drained engine coolant properly.
- b. Replace coolant filters after the first 100 hours of operation, thereafter every 300 hours of operation.

6. PRIMARY FUEL FILTER.

- a. Drain fuel/water separator weekly. Dispose of drained fluid properly.
- b. Replace fuel filter after the first 100 hours of operation, thereafter every 300 hours of operation.

7. TRANSMISSION OIL LEVEL CHECK.

In order to properly check the transmission oil level, the following steps MUST be followed.

- a. Park the RTCH on level ground.
- b. Set parking brake.
- c. Place the transmission selector in neutral "N" position.
- d. Start engine and idle until operating temperature is reached (TM 10-3930-675-10).
- e. Remove oil level gage (dipstick), clean, and reinstall.
- f. Remove and check oil level at least two times. Correct oil level should be within two indicator marks at end of dipstick.
- g. If level is low, add transmission oil as follows: Add oil thru transmission oil fill opening until level on dipstick is within two indicator marks at end of dipstick.

NOTE

- With transmission at operating temperature, the oil level must not exceed the upper indicator mark. If the oil level is above this mark, notify Organizational Maintenance.
- With transmission at operating temperature, if oil level is below the lower indicator mark, oil level MUST be increased to be between indicator marks.

8. TRANSMISSION OIL AND FILTERS.

- a. After the first 100 hours of operation, replace transmission oil and external oil filters. Remove, clean, and reinstall the transmission internal coarse filter.
- b. Every 1000 hours of operation, replace transmission oil and oil filters. Remove, clean, and reinstall the transmission internal coarse filter.

NOTES - CONTINUED:

9. HYDRAULIC AND BRAKE SYSTEM OIL FILTERS.



- DO NOT disconnect or remove any hydraulic system line or fitting unless hydraulic system pressure has been relieved. Tighten all connections before applying pressure. Escaping hydraulic fluid under pressure can penetrate the skin, causing serious injury.
- Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids. If an
 accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically
 removed within a few hours or gangrene may result.
- At operating temperature, hydraulic oil is hot. Allow hydraulic oil to cool before servicing hydraulic system. Failure to do so could result in injury.
- Hydraulic fluid is very slippery. Immediately wipe up any spills. Failure to follow this warning may result in injury to personnel.

CAUTION

Following any hydraulic system maintenance action that results in hydraulic system being opened, replacement of hydraulic reservoir return filters is required after 100 hours of operation.

Replace the hydraulic system and brake system filters after the first 100 hours of operation, thereafter at 1000 hour intervals. More frequent replacement is needed only as a result of oil sampling by the AOAP.

- 10. **OIL CAN POINTS.** Lubricate storage compartment hinges, locks, and fuel cap and right-side step assembly pivot points as required with hand oiler (OE/HDO).
- 11. ARMY OIL ANALYSIS PROGRAM (AOAP).

NOTE

- Engine and transmission system oil must be sampled every 50 hours of operation or 90 days, whichever occurs first, for Active Army Units. Reserve and National Guard activities will use 50 hours or 180 days, whichever occurs first, as prescribed interval. Hydraulic system oil must be sampled annually. Sampling will be performed as prescribed by DA Pam 738-750.
- Do NOT sample engine and transmission oil until 50 hours after 100-hour initial break-in services.
- Steps to sample engine, transmission, and hydraulic system oil are the same.
- a. Open remote hydraulic control compartment door (refer to View F).
- b. Take sample of oil as follows:
 - (1) Start engine and bring to operating temperature (TM 10-3930-675-10).
 - (2) Remove cap from discharge port of sampling valve. Clean sampling valve with a clean rag.
 - (3) Turn knob of sampling valve 1/4 turn clockwise and collect oil sample in a clean container.
 - (4) Install cap on sampling valve discharge port.
 - (5) Shut down engine (TM 10-3930-675-10).
 - (6) Close remote hydraulic control compartment door.
 - (7) Submit sample to AOAP laboratory.

NOTES - CONTINUED:

12. FRONT/REAR AXLE DIFFERENTIAL HOUSING.

a. After initial 100 hours of operation, remove fill/level plug and check level of oil at plug opening. Wait a few minutes. If oil level falls, add oil until level remains constant.

NOTE

The first time engine oil is changed <u>after</u> the initial 100 hour break-in change, front/rear axle differential housing oil must also be changed. Thereafter, change every 1000 hours.

b. Every 1000 hours, drain oil and refill. Place truck on level ground and drain oil while it is still warm from operation. Refill through fill/level plug opening.

13. FRONT/REAR AXLE HUB END.

a. After initial 100 hours of operation, check level of oil in front/rear axle hub ends. Vehicle should be positioned with drain plug at bottom 6 o'clock position. Oil level should be even with bottom of fill/level plug opening.

NOTE

The first time engine oil is changed <u>after</u> the initial 100 hour break-in change, front/rear axle hub end oil must also be changed. Thereafter, change every 1000 hours.

- b. Every 1000 hours, drain oil and refill. Place truck on level ground and drain oil while it is still warm from operation. Vehicle should be positioned with drain plug at bottom 6 o'clock position. Refill through fill/level plug opening until level is even with bottom of fill/level plug opening.
- 14. **TOPHANDLER ROTATOR.** Every 200 hours, remove ring and pinion gear protective cover, inspect ring and pinion gear lubrication. Clean and apply grease (GAA) as required.
- 15. TOPHANDLER HYDRAULIC SLEWING MOTORS.

NOTE

- Upper sight glass is for motor brake.
- Bottom sight glass is for motor planetary gear.
- a. Weekly, check level at upper and lower sight glasses. Level should be visible in sight glass.

NOTE

- Procedure to fill either OE/HDO or GO is the same.
- Add OE/HDO 10 at upper fill tube.
- Add GO at bottom fill tube.
- b. As required, add OE/HDO 10 or GO as follows:
 - (1) Remove cover from appropriate fill tube.
 - (2) Remove appropriate vent plug.
 - (3) Add oil thru fill tube until level is visible in sight glass.
 - (4) Install vent plug. Install cover on fill tube.
- c. Every 1000 hours, drain fluid and refill. Replace drain plug copper washers each time drain plug is removed.

16. TOPHANDLER HYDRAULIC SPREADER MOTOR.

- a. Weekly, check level of oil at sight glass. Level should be visible in sight glass.
- b. As required, add OE/HDO 10 oil as follows:
 - (1) Remove cover from fill tube.
 - (2) Remove vent plug, located on opposite side from fill tube.

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LUBRICATION ORDER

NOTES - CONTINUED:

- (3) Add oil thru fill tube until level is visible in sight glass.
- (4) Install vent plug. Install cover on fill tube.
- c. Every 1000 hours, drain fluid and refill. Replace drain plug copper washers each time drain plug is removed.
- 17. **BOOM SUPPORT LOCKING PINS.** Every 200 hours, retract locking pins (TM 10-3930-675-10). Cover pins with a thin coat of GAA, then extend pins and lock pins into extended position.

By Order of the Secretary of the Army:

ERIC K. SHINSEKI General, United States Army Chief of Staff

Official:

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0108508

DISTRIBUTION: To be distributed in accordance with the initial distribution requirements for IDN: 256671 LO 10-3930-675-12.

PIN:078950-000