LUBRICATION ORDER

LO 10-3930-243-12

22 February 84 **(Supersedes LO 10-3930-243-12-1, -2, and -3, 24 JANUARY 1975)**

TRUCK, LIFT, FORK, DIESEL ENGINE: PNEUMATIC TIRED WHEELS; ROUGH TERRAIN; 10,000 LB CAPACITY, 24 INCH LOAD CENTER (PETTIBONE-MULLIKEN MODEL RTL10, ARMY MODEL MHE-199) (NSN 3930-00-903-0899) AND (MODEL RTL10-1, ARMY MODEL MHE-215) (3930-00-465-5869)

Reference: TM 10-3930-243-12 and FEDERAL SUPPLY CATALOG C9100-IL.

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 sup port is not available.

WARNING

Dry cleaning fluid is flammable. Do not use near a flame or excessive heat. Use only with adequate ventilation. Avoid prolonged breathing of vapors and minimize skin contact.

Clean parts or fittings with dry cleaning solvent (SD), Type II or equivalent. Dry before lubricating. Dotted arrow shafts indicate lubrication on both sides of equipment. A dotted circle indicates a drain below. Relubricate all items found contaminated after fording or washing.

The lowest level of maintenance authorized to lubricate a point is indicated by one of the following symbols as appropriate: Operator/Crew (C); and Organizational Maintenance (O).

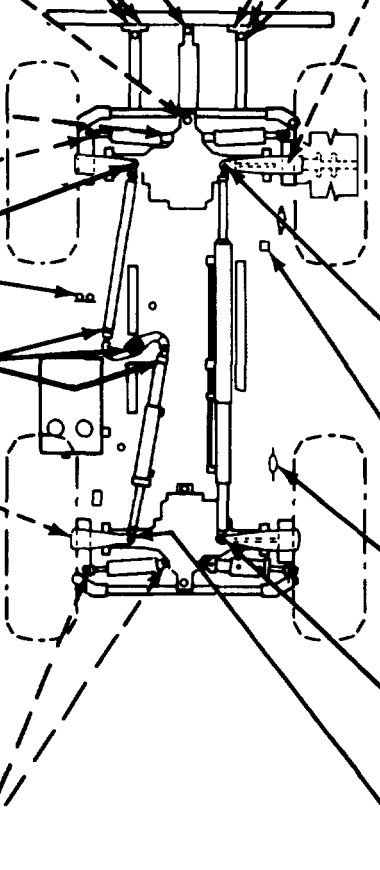
Reporting errors and recommending improvements. You can help improve this manual. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) direct to: Commander, US Army Tank-Automotive Command, ATTN: DRSTA-MB, Warren, Ml 48090. A reply will be furnished to you.

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

● TOTAL MAN-HOURS		● TOTAL MAN-HOURS	
INTERVAL	MAN-HOURS	INTERVAL	MAN-HOURS
10	0.2	500	3.0
50	3.0	1000	3.5 (MODEL RTL10-1)
100	2.0	1000	4.2 (MODEL RTL10)
250	2.0		

TA 220446

LUBRICANT • INTERVAL **INTERVAL • LUBRICANT**



Tilt Cylinder (0) **GAA 50**

Lift Thrust Rollers (0) (Lower) **GAA 50**

Front Axle Trunnion (0) (Front and rear) **GAA 50**

Front Steering Cylinder (0) **GAA 50**

Front Draglink (0) **GAA 50**

Brake Shaft (0) **GAA 50**

Steering Pivot Points (0) (3 fittings) **GAA 50**

Steering Ball Joints (0) (2 shots each top and bottom) **GAA 100**
CAUTION – Do not over lubricate. Over lubrication will eventually fill the CV joint cavity and force grease into brake area.

Rear Steering Cylinder (0) **GAA 50**

50 GAA Lift Thrust Rollers (0) (Upper)

50 GAA Fork Carriage Pivot (0)

100 GAA Steering Ball Joints (0) (2 shots each top and bottom)
CAUTION – Do not over lubricate. Over lubrication will eventually fill the CV joint cavity and force grease into brake area.

50 GAA Crab Cylinder (0) (Model RTL10 only)

50 GAA Transmission Control Linkage (0)

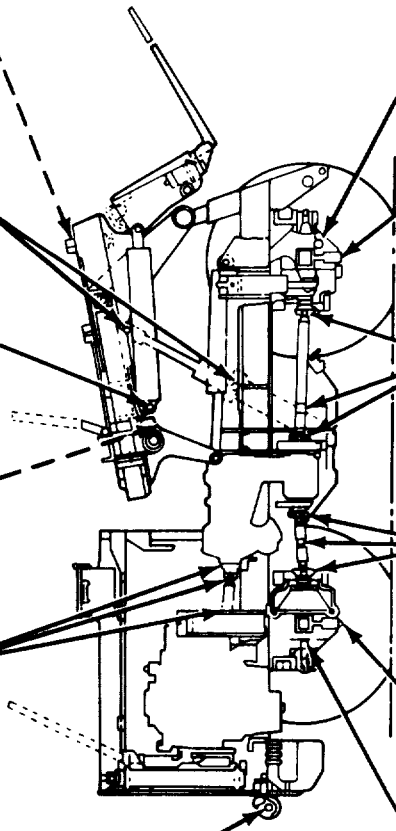
50 GAA Oscillation Cylinder (0) (Upper and Lower) (Model RTL10 only)

50 GAA Crab Cylinder (0) (Model RTL10 only)

50 GAA Rear Draglink (0)

TA 220447

LUBRICANT•INTERVAL **INTERVAL•LUBRICANT**



Lift Cylinder Pivots (0) **GAA 50**

Extension Slides (0) (Clean and coat) (See Key) **CW 250**

Tilt Cylinder Pivot (0) **GAA 50**

Boom Pivot Points (0) **GAA 50**

Engine To Transmission Propeller Shaft Spline and Universals (0) (Sparingly) **GAA 50**

Towing Pintle (0) (2 fittings) **GAA 50**

50 GO Front Differential Fill and Level Plug (0) (Check level) (See Key)

C/MR Front Differential Drain Plug (0) (Drain and refill) (See Note 11)

50 GAA Front Propeller Shaft Spline and Universals (0) (Sparingly)

50 GAA Rear Propeller Shaft Spline and Universal (0) (Sparingly)

C/MR Rear Differential Drain Plug (0) (Drain and refill) (See Note 11)

50 GO Rear Differential Fill and Level Plug (C) (Check level) (See Key)

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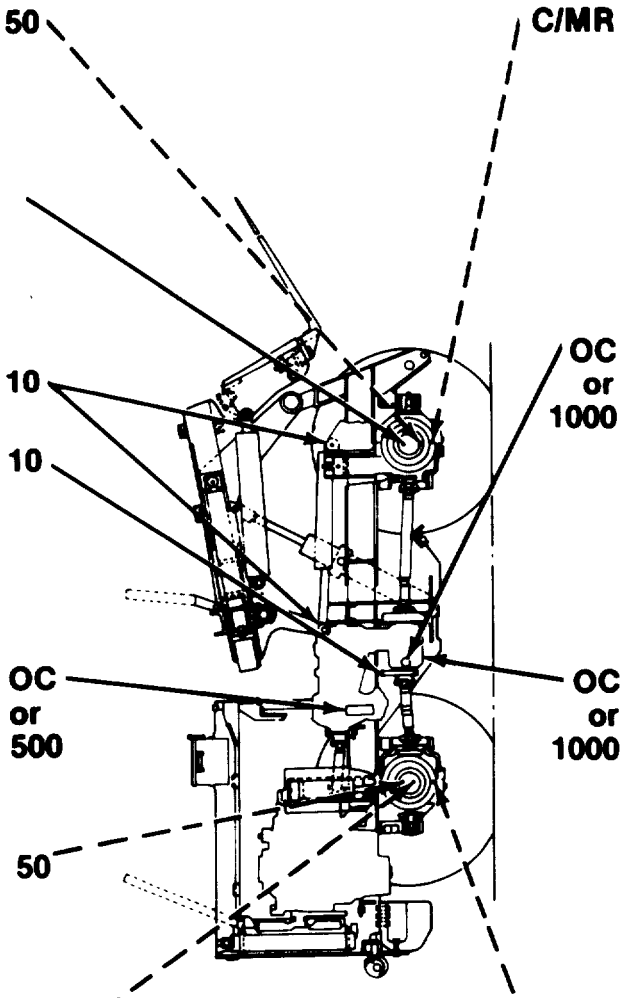
LUBRICANT•INTERVAL **INTERVAL•LUBRICANT**



Front Planetary Hub Level Plug (C) (Check level) (See Note 13) — 50

Front Planetary Hub Fill Plug (O) (See Key) (See Note 12) — GO

Slave Cylinder (O) — GAA 10

Transmission and Converter Fill and Level Gage (C) (Check level) (See Key) (See Note 9) — OE/HDO 10

Transmission and Converter Oil Filter (O) (See Notes 1 and 10) — OC or 500

Rear Planetary Hub Level Plug (O) (Check level) (See Note 12) — 50

Rear Planetary Hub Fill Plug (O) (See Key) (See Note 12) — GO 50

C/MR — Front Planetary Hub Drain Plug (O) (Drain and refill) (See Note 12)

OC or 1000 — Transmission and Torque Converter Oil Strainer (O) (Clean strainer) (See Notes 1 and 9)

OC or 1000 — Transmission and Torque Converter Drain (O) (Drain and refill) (See Notes 1 and 9)

C/MR — Rear Planetary Hub Drain Plug (O) (Drain and refill) (See Note 12)

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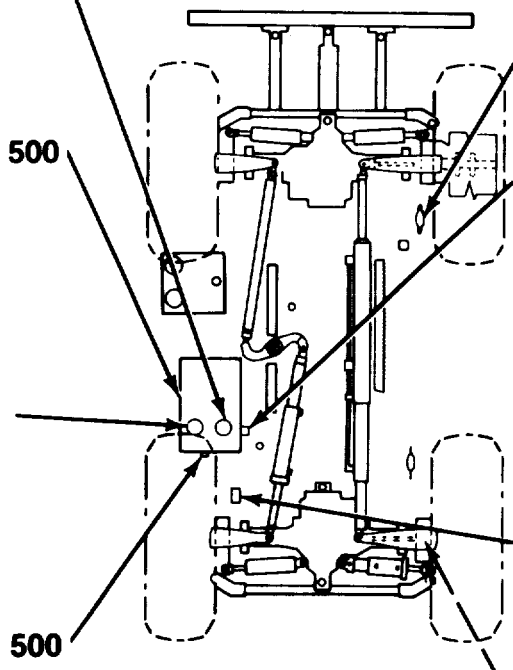
LUBRICANT • INTERVAL **INTERVAL • LUBRICANT**



Hydraulic Reservoir Level Gage (C) (Check level) — **50**

Magnetic Strainer Plug (0) (Remove and clean magnets) — **500**

Hydraulic Reservoir Fill Cap (0) (See Key) — **OE/ HDO**

Hydraulic Reservoir Drain Plug (0) (Drain and refill) — **500**

50 GAA Oscillation Cylinder (0) (Upper and lower)

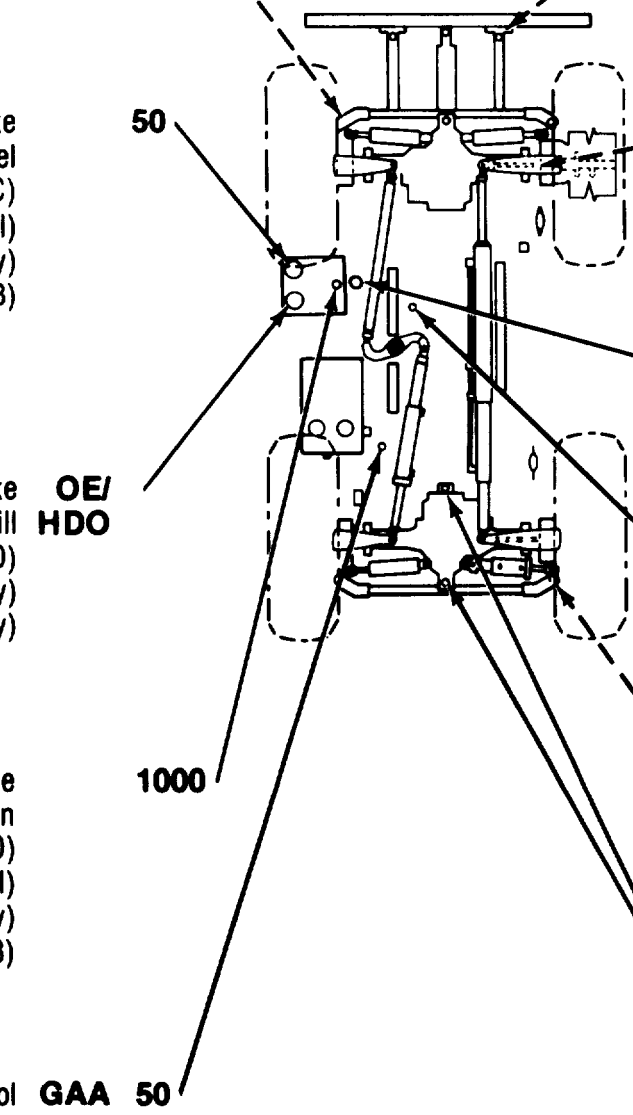
500 Hydraulic Reservoir Filter (0) (Remove element, clean filter shell, install new element. After replacement, operate for 5 minutes, check for leaks, check level and bring to full mark.)

250 OE/ HDO Fan Disconnect Cylinder Linkage (0) (Mdl RTL10 only)

1000 GAA Constant Velocity Joint (0) (Repack with 12 lbs each end)

TA 220450

LUBRICANT • INTERVAL **INTERVAL • LUBRICANT**



Front Tie Rod Ends (0) (2 fittings) — GAA 50

Hydraulic Brake Reservoir Level Gage (C) (Check level) (Model RTL10 only) (See Note 13) — 50

Hydraulic Brake Reservoir Fill Cap (0) (See Key) (Model RTL10 only) — OE/HDO

Hydraulic Brake Reservoir Drain Plug (0) (Drain and refill) (Model RTL10 only) (See Note 13) — 1000

Governor Control Linkage (0) — GAA 50

250 CW — Fork Shift Chains (0) (Clean and coat) (See Key)

1000 GAA — Constant Velocity Joint (0) (Repack with 12 lbs each end)

50 OE/HDO — Hand Brake Linkage (0)

50 GAA — Fork Control Rod (0)

50 GAA — Rear Tie Rod Ends (0) (2 fittings)

50 GAA — Rear Axle Trunnion (0) (Front and rear)

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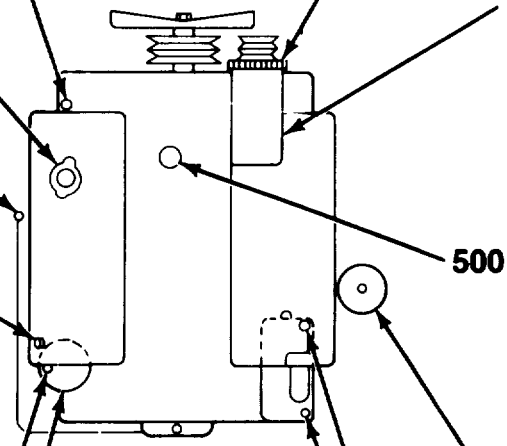
LUBRICANT • INTERVAL **INTERVAL • LUBRICANT**



Crankkcase Drain Plug (O) (Drain and refill) (See Notes 1 and 7) — **OC or 100**

Crankcase Oil Fill Cap (O) (See Key) — **OE/ HDO**

Output Shaft (O) — **GAA 100**

Crankcase Oil Level Gage (C) (Check level) CAUTION: When OEA oil is used the level will be checked more often. (See Note 6) — **10**

Oil Filter Drain (O) (Drain filter) (See Notes 1 and 8) — **OC or 100**

Oil Filter (O) (Service) (See Notes 1 and 8) — **OC or 100**

100 OE/ HDO Fan Belt Tightener Linkage (O) (Sparingly)

Generator (Sealed bearings no lubrication required)

500 Crankcase Breather (O) (Remove and clean)

Air Cleaner (C) (Dry type) (Change filter when indicator shows red)

500 OE/ HDO Starting Motor (O) (Remove plugs to lubricate) (Sparingly)

TA 220452

* KEY –

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES				INTERVALS
		Above +15°F (Above -9°C)	+40°to -15°F (+4°to -26°C)	+40°to -65°F (+4°to -54°C)	For Arctic operation refer to FM 9-207	
OE/HDO - Lubricating Oil, Internal Combustion Engine, Tactical Service		**OE/HDO** 30	**OE/HDO** 10			C/MR - Condition Monitor
OEA - Lubricating Oil, Internal Combustion, Arctic				**OEA** (See Note 2)		OC - On Condition (AOAP)
- Oil Can Points (See Note 3)						
- Engine Crankcase w/filter	5 gals. (19 L)					Intervals given are in hours of normal operation.
- Oil Can Points (See Note 4)						
- Hydraulic Brake Reservoir RTL10 only	30 qts. (28 L)					
- Torque Converter Transmission	6 gals. (23 L)					
- Hydraulic Reservoir	38 gals. (144 L)					
- Oil Can Points (See Note 5)		**OE/HDO** 30				
GO - Lubricating Oil, Gear, Multipurpose		**GO** 85W/90	**GO** 80W/90	**GO** 75W		
- Wheel Planetary, Front and Rear	4 qts. ea. (3.8 L)					
- Differential, Front and Rear	10 qts. ea (9.5 L)					

*See Note 13 for lubricant specification number.

TA 220453

* KEY –

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES				INTERVALS
		Above +15°F (Above -9°C)	+40°to -15°F (+4°to -26°C)	+40°to -65°F (+4°to -54°C)		
CW - Lubricating Oil: Chain, Wire, Rope, Exposed Gear		CW-II-B	CW-II A	CW-II A		
GAA - Grease, Automotive and Artillery		ALL TEMPERATURES				

*See Note 13 for lubricant specification number.

NOTES:

1. ARMY OIL ANALYSIS PROGRAM (AOAP). For Active Army units, obtain samples from engine and automatic transmission every 50 hours of operation or 60 days (whichever comes first). Reserve and National Guard activities will use 50 hours or 120 days as the prescribed sample intervals. Reserve and National Guard equipment in frequent use during active training period will adhere to the schedule for Active Army units. As a minimum, one sample from each unit's two week active training period will be submitted for each item of equipment. Send these samples to the nearest AOAP laboratory. Refer to TB 43-0210 for sampling instructions. When or if AOAP laboratory support is unavailable, hard time intervals will apply.

NOTE

Do not hold oil samples. Submit oil samples as soon as they have been taken.

Seasonal oil changes will be made due to expected temperatures. (See Key.)

2. FOR OPERATION OF EQUIPMENT IN PROTRACTED COLD TEMPERATURES BELOW -15°F (-26°C). Remove lubricants prescribed in Key for temperatures above -15°F (-26°C). Relubricate with lubricants specified in Key for temperatures below -15°F (-26°C). If OEA lubricant is required to meet the temperature ranges prescribed in the Key, OEA lubricant is to be used in place of OE/HDO-10 lubricant for all temperature ranges where OE/HDO-10 is specified in the Key.

3. OIL CAN POINTS. Each 50 hours lubricate throttle and governor linkage, pins and clevises, door hinges and all exposed adjusting threads with OE/HDO.

4. OIL CAN POINTS. Each 50 hours lubricate accelerator bellcrank, brake and hydraulic valve linkages with OE/HDO 10.

5. OIL CAN POINTS. Each 50 hours lubricate yoke pins, ball and socket joints, pivot pins, door fasteners and control linkages with OE/HDO 30.

6. ENGINE OIL LEVEL HOT OR COLD CHECK. Cold engine, oil level should be at high mark on dipstick. Hot engine, oil level must be between high and low marks on dipstick (allow to set 5 minutes before checking).

7. ENGINE. Oil is to be changed each time an engine oil change is directed by AOAP laboratory. When AOAP laboratory

NOTES - CONTINUED:

support is not available, change oil each 100 hours. Drain when oil is warm.

8. ENGINE OIL FILTER. Filter is to be replaced each time an engine oil change is directed by AOAP laboratory. Remove filter element, clean housing and install new filter element. After installing new filter element, fill crankcase, operate engine 5 minutes, check housing for leaks, check crankcase oil level and bring to full mark. When AOAP laboratory support is not available, install new filter element each 100 hours.

9. TRANSMISSION AND TRANSMISSION OIL FILTER. Check level each 10 hours with engine running at 1000 RPM, oil at operating temperature, and transmission in neutral. Maintain oil level to "FULL" mark. Oil and oil filter are to be changed each time a transmission oil change is directed by AOAP laboratory. Remove transmission magnetic strainers, clean and replace using new gaskets. Remove filter elements, clean filter housing, install new filter elements and seals. After replacement, fill transmission to low mark. With engine running, oil at operating temperature, and transmission In neutral (to fill lines and converter) add oil to bring to “FULL” mark. Operate for 5 minutes and check for leaks. When AOAP support is not available, change transmission oil each 1000 hours, and transmission oil filter each 500 hours.

10. FRONT AND REAR DIFFERENTIAL. Check level each 50 hours. Remove plug and add oil until it flows from level plug opening. Change lubricant only when required by maintenance repair action, contamination by water or other foreign material. After refill, operate for 5 minutes, check for leaks and bring to full mark.

11. FRONT AND REAR PLANETARY HUBS. Each 50 hours, rotate wheels until drain plug is at 6 o’clock position, remove level plug and check level. Change gear lubricant only when required by maintenance repair action, contamination by water or other foreign material. In order to drain oil, rotate wheels until drain plug is at 6 o’clock position and remove both drain and fill plugs. Install drain plug and fill with GO until oil is at level plug. install fill and level plugs and operate for 5 minutes, check for leaks and bring oil to full mark.

12. HYDRAULIC BRAKE RESERVOIR (Model RTL10 only). Each 50 hours check level and bring to full mark. Each 1000 hours drain reservoir, clean fill cap and screen. Fill reservoir with OE/HDO, operate equipment for 5 minutes, check for leaks, check level and bring to full mark.

13. LUBRICANTS. The following is a list of lubricants with military symbols and applicable specification numbers.

OE/HDO	MIL-L-2104
GO	MIL-L-2105
GAA	MIL-G-10924
OEA	MIL-L-46167
CW	VV-L-751
(SD), Type II	P-D-680

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:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

OFFICIAL:

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

DISTRIBUTION:

To be distributed in accordance with DA Form 12-25A, Operator and Organizational maintenance requirements for Fork Lift Trucks.

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