

LUBRICATION ORDER

15 DECEMBER 83

(Supersedes LO 5-2420-206-12-1 and -2, 29 JULY 1968)

**TRACTOR, WHEELED, INDUSTRIAL: DIESEL DRIVEN,  
MEDIUM DRAWBAR PULL W/DOZER, W/SCARIFIER,  
W/DRAWBAR TRAILER PINTLE AND HYDRAULIC  
SCRAPER CONTROLS (CLARK MODEL 290M)  
NSN 2420-00-088-9384**

Reference: TM 5-2420-206-12 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 support is not available.

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).

**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.**

**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, MI 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               | 1.0       | 250              | 2.0       |
| 50               | 1.5       | 500              | 0.6       |
| 100              | 0.5       | 1000             | 1.5       |

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**LUBRICANT • INTERVAL**

**INTERVAL • LUBRICANT**

Push Beams ( C )  
(6 Fittings)  
(See Note 10)

**GAA 10**

Tachometer  
Drive ( O )

**GAA 100**

Steering Gear  
Fill and Level  
Plug ( C )  
(Check level)

**GAA 50**

Steering  
Drag Link ( C )

**GAA 100**

Propeller Shaft  
Transmission to  
Bearing Box ( O )  
(3 fittings)

**GAA 500**

Propeller Shaft  
Bearing Box  
to Rear  
Differential ( C )  
(3 Fittings)

**GAA 500**

Universal  
Coupler ( C )  
(Bottom)

**GAA 10**

Pintle Hook ( C )  
(3 fittings)

**GAA 100**

**1000 GAA** Engine  
Support ( C )

**10 GAA** Lift  
Cylinder ( C )  
(4 fittings)

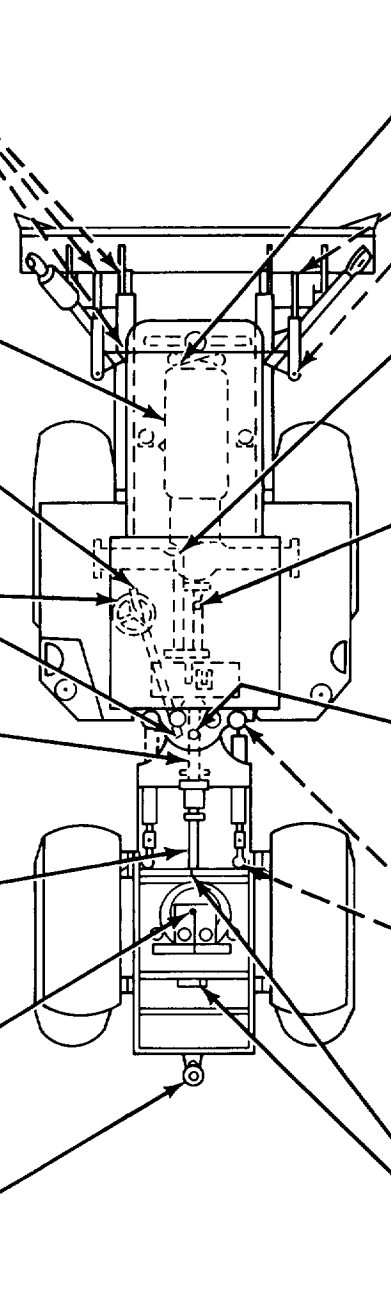
**500 GAA** Propeller  
Shaft Con-  
verter to  
Transmission ( C )  
(3 fittings)

**500 GAA** Propeller  
Shaft Trans-  
mission to  
Front Differ-  
ential ( C )  
(3 fittings)

**10 GAA** Pivot Hinge  
Pins Top and  
Bottom ( C )  
(See Note 10)

**10 GAA** Steering  
Cylinders ( C )  
(4 fittings)

**10 GAA** Cradle Pins ( C )



**LUBRICANT • INTERVAL**

**INTERVAL • LUBRICANT**

Tilt Cylinder ( C ) **GAA 50**

**GO 50**

Front Differential Fill and Level Plug ( C ) (Check level) (See key)

Front Differential Drain Plug ( O ) (Drain and refill) (See Note 11)

**C/MR**

**GO 50**

Front Planetary Hub Fill, Level and Drain ( C ) (Check level) (See key) (See Note 12)

**GO 50**

Rear Differential Fill and Level Plug ( C ) (Check level) (See key)

**C/MR**

Rear Differential Drain Plug ( O ) (Drain and refill) (See Note 11)

**10 GAA**

Pitch Strut ( C ) (4 fittings)

Generator (Sealed bearings, no lubrication required)

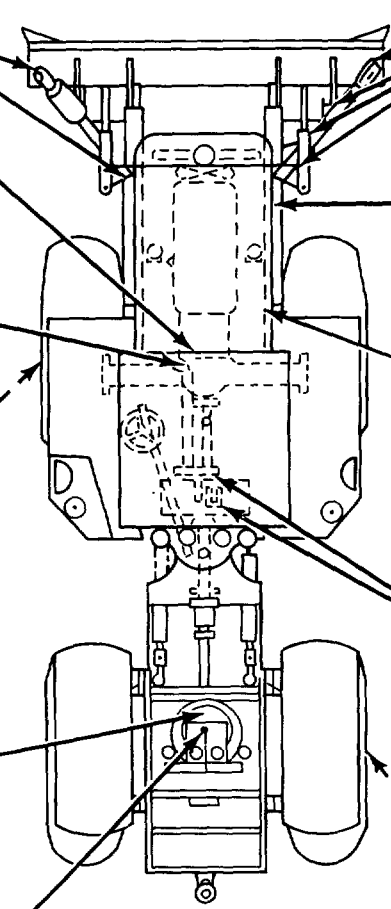
Starter (Sealed bearings, no lubrication required)

**100 GAA**

Gear Shift Control Linkage ( O ) (5 fittings)

**50 GO**

Rear Planetary Hub Fill, Level and Drain ( C ) (Check level) (See key) (See Note 12)



**LUBRICANT • INTERVAL**

**INTERVAL • LUBRICANT**

Aneroid Control Fill and Level Cap (O) (Drain and refill) (See key) **OE/ HDO 250**

Engine Crankcase, Oil Fill Cap (C) (See key) **OE/ HDO**

Engine Crankcase, Oil Level Gage (C) (Check level)

**CAUTION:** When OEA oil is used the level will be checked more often (See Note 4)

Engine Oil Drain Plug (O) (Drain and Refill) (See Notes 1 and 5) **OC or 50**

Transmission and Torque Converter Drain Plug (O) (Drain and refill) (See Notes 1 and 7) **OC or 500**

Transmission and Torque Converter Fill and Level Cap (C) (Check level) (See Note 7) (See key) **OE/ HDO 10**

Bearing Box Fill and Level Plug (C) (Check level) (See key) **OE/ HDO 50**

**50 OE/ HDO** Front Hydraulic Brake, Fill and Level Cap (C) (Check level) (See key)

**OC or 50** Engine and Turbocharger Oil Filters (O) (See Note 6)

**250 OE/ HDO** Hydraulic System Filter (C) (See Note 9)

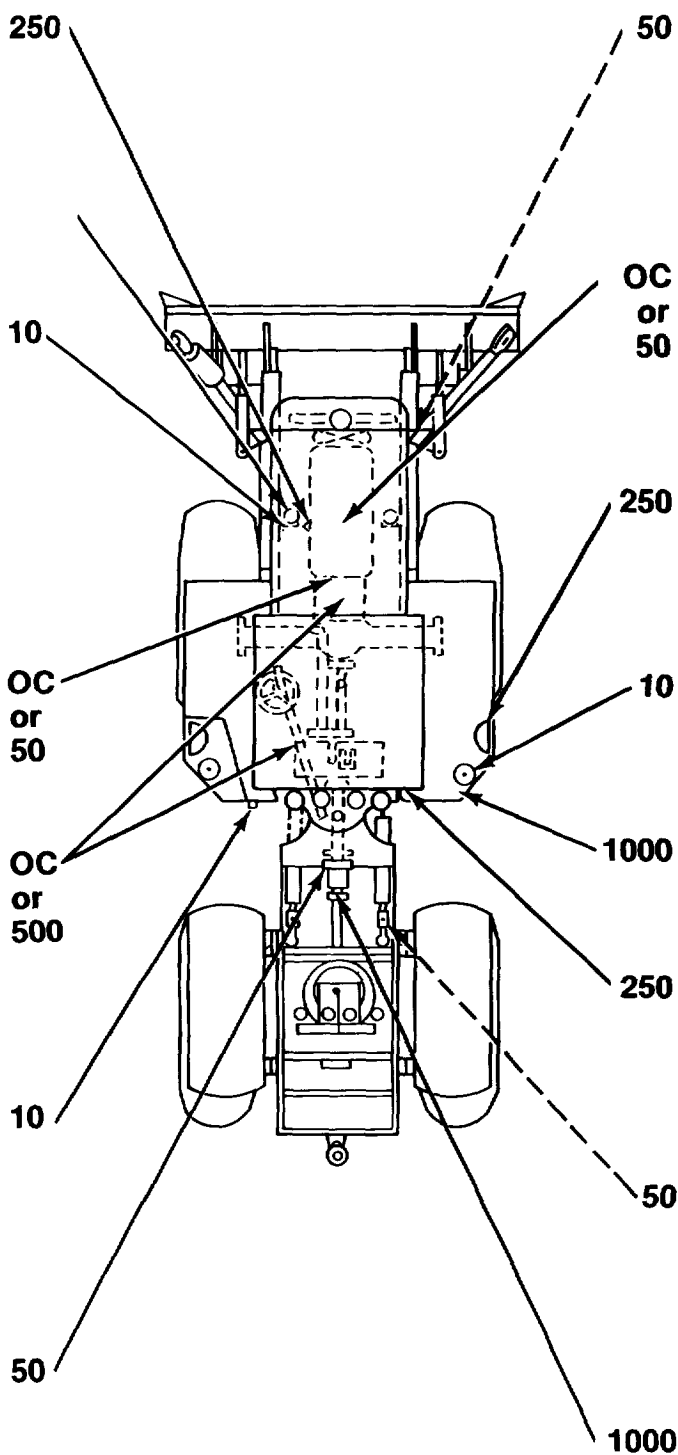
**10 OE/ HDO** Hydraulic Tank Fill and Level Cap (C) (Check level) (See key)

**1000** Hydraulic Tank Drain Plug (O) (Drain and refill)

**250** Transmission and Torque Converter Oil Filters (O) (See Notes 1 and 8)

**50 OE/ HDO** Rear Hydraulic Brake, Fill and Level Cap (C) (Check level) (See key)

**1000** Bearing Box Drain Plug (O) (Drain and refill)



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**\*-KEY-**

| LUBRICANTS   | CAPACITY  | EXPECTED TEMPERATURES      |                                    |                                 | INTERVALS   |
|--|---|----------------------------|------------------------------------|---------------------------------|---|
|  |   | Above +15°F<br>(Above -9°) | + 40°F to -15° F<br>(+ 4° to -26°) | +40°F to -65°F<br>(+4° to -54°) |   |
| <b>OE/ HDO</b> - Lubricating Oil, Internal Combustion Engine, Tactical Service<br><br><b>OEA</b> - Lubricating Oil, Internal Combustion, Arctic<br><br>Engine Crankcase<br>- Aneroid Control<br>- Front Brake Reservoir<br>- Rear Brake Reservoir<br>- Bearing Box<br><br>- Oil Can Points (See Note 3)<br>- Transmission and Torque Converter<br>- Hydraulic Tank | 36 qts. (34L)<br><br>2 oz.<br><br>2 qts. (1.9L)<br>2 qts. (1.9L)<br>5 qts. (4.8L)<br><br>72 qts. (69L)<br>500 qts. (473L) | <b>OE/HDO 30</b>           | <b>OE/HDO 10</b>                   | <b>OEA</b><br>(See Note 2)      | C/MR - Condition Monitor<br><br>OC-On Condition (AOAP)<br><br>Intervals given are in hours of normal operation. |
| <b>GO</b> - Lubricating Oil, Gear, Multipurpose<br><br>- Front Differential<br>- Rear Differential<br>- Front Planetary<br>- Rear Planetary  | 34 1/2 qts. (32.64L)<br>34 1/2 qts. ea (32.64L)<br>13 qts. ea (12.30L)<br>13 qts. ea (12.30L)                             | <b>GO 80W/90</b>           | <b>GO 75W</b>                      |                                 |   |
| <b>GAA</b> - Grease, Automotive and Artillery  |   | ALL TEMPERATURES           |                                    |                                 |   |

For Arctic operation refer to FM 9-207

\* 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 units' 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 control linkage, pins and clevises, and all exposed adjusting threads with OE/HDO.

4. ENGINE CRANKCASE 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).

5. ENGINE. Oil is to be changed each time an engine oil change is directed by AOAP laboratory. When AOAP laboratory support is not available, change oil each 50 hours. Drain when lubricant is warm.

6. ENGINE AND TURBO CHARGER OIL FILTERS. Filters are to be replaced each time an engine oil change is directed by AOAP laboratory. After installing new filter elements, 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 elements each 50 hours.

7. TRANSMISSION AND TORQUE CONVERTER. Check level each 10 hours with engine running at idle speed, oil at operating temperature and transmission in neutral. Maintain oil level to "FULL" mark. Oil is to be changed each time a transmission oil change is directed by AOAP laboratory. Remove transmission magnetic strainers, clean and replace using new gaskets. Fill transmission to low mark. Run engine at idle speed to fill converter and lines. Add oil to bring level to low mark. With engine running at idle speed, oil at operating temperature and transmission in neutral, add oil to bring oil level to "FULL" mark. Operate for 5 minutes and check for leaks. When AOAP laboratory support is not available, change transmission oil each 500 hours.

8. TRANSMISSION AND TORQUE CONVERTER OIL FILTERS. Filter elements are to be replaced each time a transmission oil change is directed by AOAP laboratory. 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, add oil to bring

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## NOTES - CONTINUED:

oil level to "FULL" mark. Operate for 5 minutes, check filter housing for leaks. When AOAP laboratory support is not available, install new filter elements each 250 hours.

9. HYDRAULIC SYSTEM FILTER. Each 250 hours, remove element, clean filter housing and install new element. After replacement, operate hydraulic system for 5 minutes, check for leaks, check level and bring to "FULL" mark.

10. PUSH BEAMS AND PIVOT HINGE PIN. Intervals should be more frequent under adverse conditions.

11. FRONT DIFFERENTIAL/REAR DIFFERENTIAL. Check level each 50 hours. Change gear lubricant only when required by maintenance repair action, contamination by water, or other foreign material. After refill, operate for five minutes, check for leaks and bring oil level to level of level plug opening.

12. FRONT PLANTERY HUB/REAR PLANETARY HUB. Check level each 50 hours. Change gear lubricant only when required by maintenance repair action, contamination by water or other foreign material. To drain, position wheels so that fill and drain plug is at 6 o'clock position and remove plug. To fill, move wheels so that arrow on drive cover is pointing down and fill to level of plug hole. After refill, operate for 5 minutes, check for leaks and bring oil level to level of plug hole.

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   |
| OEA           | MIL-L-46167  |
| GAA           | MIL-G-10924C |
| (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 12-25B, Operator and Organizational maintenance requirements for Tractors.

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