8 November 1993

**TRUCK, FORKLIFT: ADVERSE TERRAIN,
10,000 LB CAPACITY, M544E
(NSN 3930-01-301-8250)**

References: TM 10-3930-659-10 and TM 10-3930-659-20

REPORTING OF 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, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2, located in the back of this manual, directly to: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MB, Warren, MI 48397-5000. A reply will be furnished to you.

This LO is for Crew/Operator (C) or Unit (O) Maintenance. Lubrication intervals (on-condition or hard time) are based on normal operation. Lube more during constant use and less during inactive periods. Use correct grade of lubricant for seasonal temperature expected.

AOAP sampling intervals for the engine and transmission are 50 hours of operation or 90 days, whichever comes first. Hydraulic system sampling is annually as prescribed by DA Pam 738-750. If AOAP laboratory support is not available, HARD TIME INTERVALS APPLY

Engine, transmission, and hydraulic system oil filters shall be changed when:

a. They are known to be contaminated, or clogged;
b. Service is recommend by AOAP laboratory analysis; or
c. At prescribed hard time interval.

On pictures, a dashed line (- - -) means lube points on both sides.

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 100°F-138°F (38 C-59°C). If you become dizzy while using cleaning solvent, immediately get fresh air and medical help. If solvent contacts eyes, immediately wash your eyes and get medical aid.**
- **Always install the frame locking bar before working In the frame hinge pivot area (see TM 10-3930-659-10). Failure to follow this warning could cause injury or death to personnel.**

Clean all fittings and area around lubrication points with dry cleaning solvent or equivalent before lubricating equipment. After lubrication, wipe off excess oil or grease to prevent accumulation of foreign matter.

Before you start your lube service:

ALWAYS

a. Clean grease fittings before lubricating.
b. Use the Lubrication Order as your guide.

NEVER

a. Use wrong type/grade grease.
b. Use too much lubricant.

Approved for public release; distribution is unlimited.

LUBRICANT • INTERVAL

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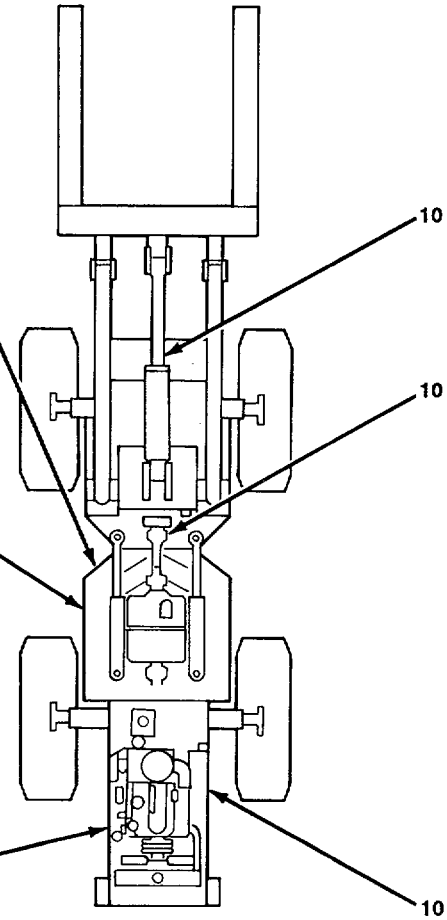

Transmission Oil Level Gage (Check Level) (See Note 7 and View A) (C) — OE/HDO 10

Hydraulic Oil Level Sight Gage (Check Level) (See Note 11) (C) — OE/HDO 10

Engine Oil Level Gage (Check Level) (See Note 4 and View B) (C) — OE/HDO 10

10 GAA — **Front Drive Line Support Bearing** (See Note 14c and View D) (O)

10 GAA — **Frame Hinge Pivots** (Two Fittings) (See Note 14b and View E) (O)

10 — **Coolant Recovery Tank Level** (Check Level) (See Note 10 and View R) (C)

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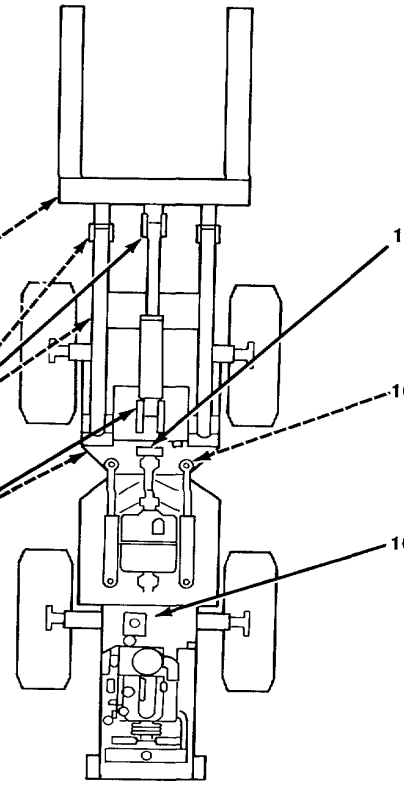

Fork Carriage (Seven Fittings) (See Note 14e) (O) — GAA 100

Boom Cylinders Pivot Points (Five Fittings) (See Note 14d and View F) (O) — GAA 100

Boom Cylinders Pivot Points (Three Fittings) (See Note 14d and View F) (O) — GAA 100

100 GAA — **Front Differential Telescoping Shaft** (See Note 14h and View D) (O)

100 GAA — **Steering Cylinder Pivots** (Four Fittings) (See Note 14f and View A) (O)

100 GAA — **Oscillating Rear Axle** (Two Fittings) (See Note 14g and View A) (O)

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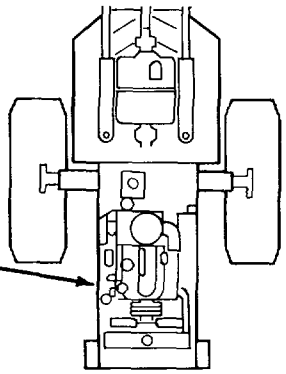
Engine Crankcase (Drain and Refill) (See Note 5 and Views B and C) (O) — OE/HDO — OC/250



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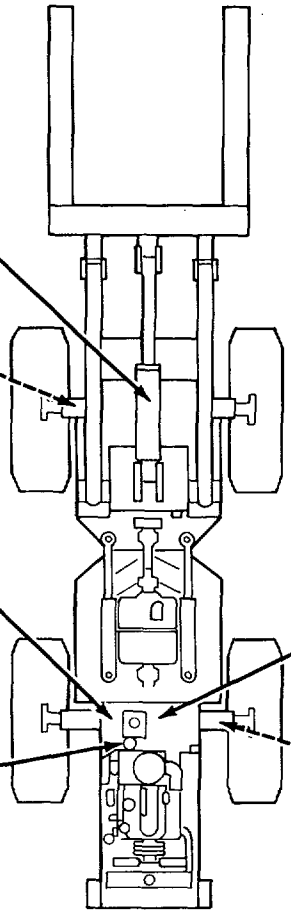
Front Differential Oil Level (Check Level) (See Note 13 and View G) (O) — OE/HDO — 500

Axle Bearings (Four Fittings) (See Note 14i and View K) (O) — GAA — 500

Hydraulic System Return Filter (See Note 12 and View L) (O) — 500

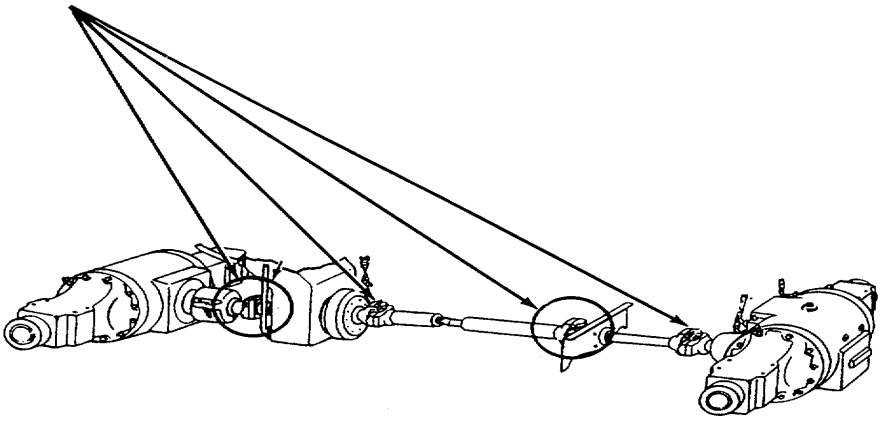
Breather Filter (Replace) (See View L) (O) — 500



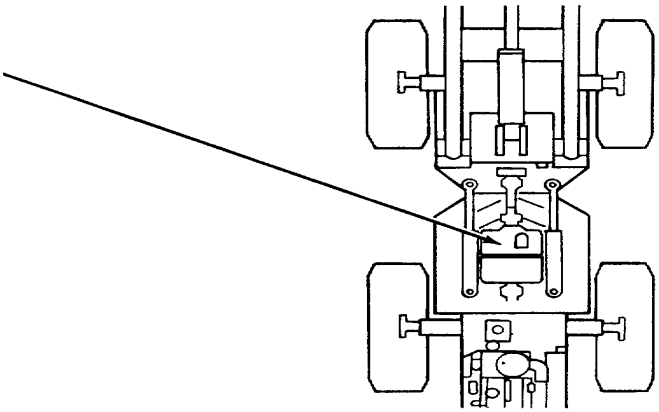
500 — OE/HDO — **Rear Differential Oil Level** (Check Level) (See Note 13 and View I) (O)

500 — OE/HDO — **Axle Bearings** (Four Fittings) (See Note 14i and View K) (O)

	LUBRICANT	INTERVAL
Transmission-to-Differential Drive Lines (Seven Fittings) (See Note 14j) (O)	GAA	500



	LUBRICANT	INTERVAL
Transmission (Drain and Refill) (See Note 8 and Views A and M) (O)	OE/HDO	OC/ 1000



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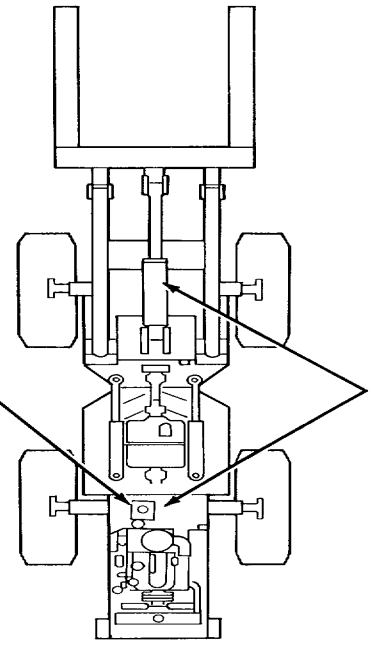


Hydraulic System Oil (Drain and Refill) (See Note 11 and Views P and Q) (O) — OE/HDO — OC/ 3000

3000 — OE/HDO — **Front and Rear Differentials** (Drain and Refill) (See Note 13 and Views G, H, I, and J) (O)

Table I. Lubricant Table for Engine

TEMPERATURE RANGE	LUBRICANT MIL. SYMBOL (NATO CODE) SPECIFICATION	CAPACITY	INTERVAL	MAN-HOUR
+68°F to +122°F (+20°C to +50°C)	OE/HDO-40 (N/A) MIL-L-2104	20 qt (19 l)	250 hr	1.0
+32°F to +104°F (0°C to +40°C)	OE/HDO-30 (0-238) MIL-L-2104	20 qt (19 l)	250 hr	1.0
+6°F to +104°F (−15°C to +40°C)	OE/HDO-15W/40 (0-1236) MIL-L-2104	20 qt (19 l)	250 hr	1.0
−4°F to +50°F (−20°C to +10°C)	OE/HDO-10 (0-237) MIL-L-2104	20 qt (19 l)	250 hr	1.0
−67°F to +32°F (−55°C to 0°C)	OEA (D-183) MIL-L-46167	20 qt (19 l)	250 hr	1.0

Table II. Lubricant Table for Transmission.

TEMPERATURE RANGE	LUBRICANT MIL. SYMBOL (NATO CODE) SPECIFICATION	CAPACITY	INTERVAL	MAN-HOUR
+24°F to +122°F (−5°C to +50°C)	OE/HDO-30 (0-238) MIL-L-2104	10 qt (9 l)	1000 hr	0.5
−4°F to +122°F (−20°C to +50°C)	OE/HDO-15W/40 (0-1236) MIL-L-2104	10 qt (9 l)	1000 hr	0.5
−10°F to +122°F (−25°C to +50°C)	OE/HDO-10 (0-237) MIL-L-2104	10 qt (9 l)	1000 hr	0.5
−67°F to +14°F (−55°C to −10°C)	OEA (D-183) MIL-L-46167	10 qt (9 l)	1000 hr	0.5

Table III. Lubricant Table for Hydraulic System

TEMPERATURE RANGE	LUBRICANT MIL. SYMBOL (NATO CODE) SPECIFICATION	CAPACITY	INTERVAL	MAN-HOUR
+24°F to +122°F (−5°C to +50°C)	OE/HDO-30 (0-238) MIL-L-2104	20 gal (19 l)	3000 hr	1.0
−4°F to +122°F (−20°C to +50°C)	OE/HDO-15W/40 (0-1236) MIL-L-2104	20 gal (19 l)	3000 hr	1.0
−10°F to +122°F (−25°C to +50°C)	OE/HDO-10 (0-237) MIL-L-2104	20 gal (19 l)	3000 hr	1.0
−67°F to +14°F (−55°C to −10°C)	OEA (D-183) MIL-L-46167	20 gal (19 l)	3000 hr	1.0

Table IV. Lubricant Table for Differentials.

TEMPERATURE RANGE	LUBRICANT MIL. SYMBOL (NATO CODE) SPECIFICATION	CAPACITY	INTERVAL	MAN-HOUR
+24°F to +122°F (−5°C to +50°C)	OE/HDO-30 (0-238) MIL-L-2104	17 qt (16 l)	3000 hr	0.5
−4°F to +122°F (−20°C to +50°C)	OE/HDO-15W/40 (0-1236) MIL-L-2104	17 qt (16 l)	3000 hr	0.5
−12°F to +94°F (−25°C to +35°C)	OE/HDO-10 (0-237) MIL-L-2104	17 qt (16 l)	3000 hr	0.5
−67°F to +14°F (−55°C to −10°C)	OEA (D-183) MIL-L-46167	17 qt (16 l)	3000 hr	0.5

Table V. Lubricant Table for Frame Hinge Pivots and Front Drive Line Support Bearing

TEMPERATURE RANGE	LUBRICANT MIL. SYMBOL (NATO CODE) SPECIFICATION	CAPACITY	INTERVAL	MAN-HOUR
All Temperatures	GAA (G-403) MIL-G-10924	As Req	10 hr	0.5

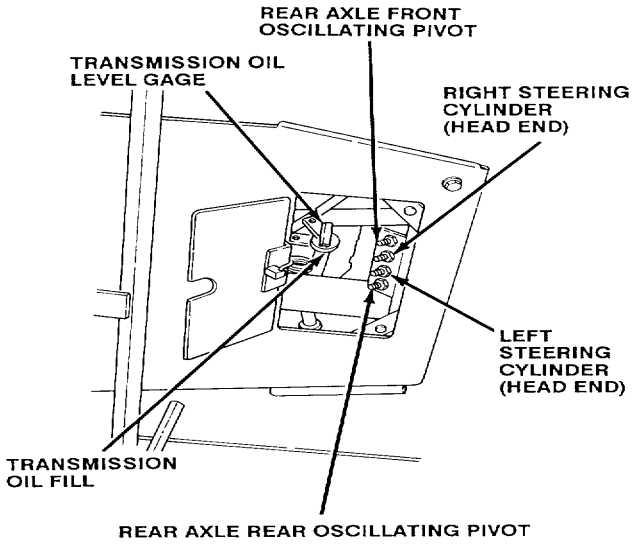
Table VI. Lubricant Table for Boom Cylinder Pivots, Fork Carriage, Steering Cylinder Pivots, Oscillating Rear Axle, Front Differential Telescoping Shaft, and Axle Bearings.

TEMPERATURE RANGE	LUBRICANT MIL. SYMBOL (NATO CODE) SPECIFICATION	CAPACITY	INTERVAL	MAN-HOUR
All Temperatures	GAA (G-403) MIL-G-10924	As Req	100 hr 500 hr Axle Bearing	0.5

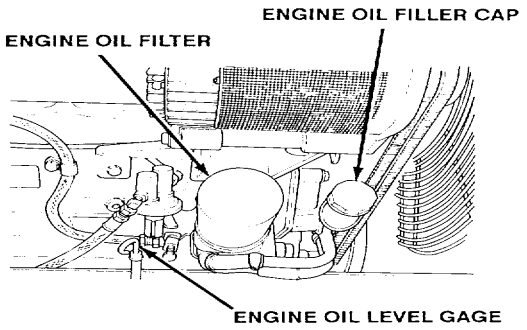
Table VII. Lubricant Table for Cooling System.

TEMPERATURE RANGE	LUBRICANT MIL. SYMBOL (NATO CODE) SPECIFICATION	CAPACITY	INTERVAL	MAN-HOUR
−50°F to +122°F (−46°C to +50°C)	Antifreeze, Ethylene Glycol Inhibited (N/A) MIL-A-46153	25 qt (24 l)	As Req	1.0
−80°F to −40°F (−60°C to −40°C)	Antifreeze, Ethylene Glycol Inhibited (N/A) MIL-A-11755	25 qt (24 l)	As Req	1.0

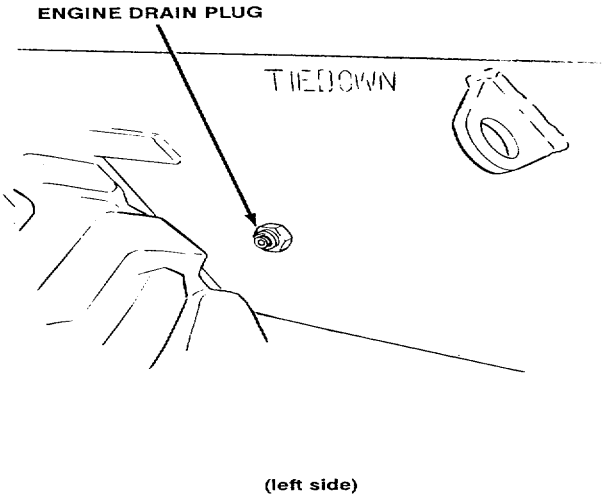
(A) Transmission Oil Level Gage



(B) Engine Oil – Fill and Check

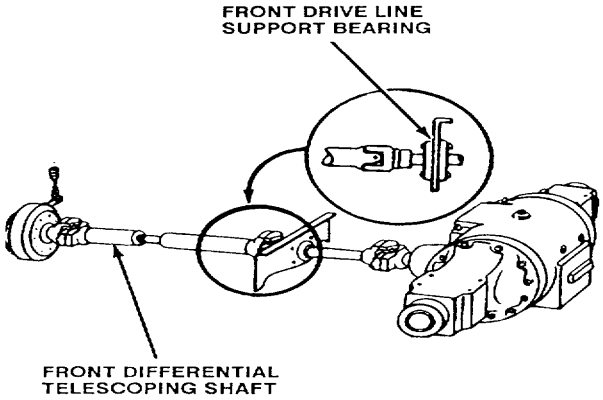


(C) Engine Oil – Drain

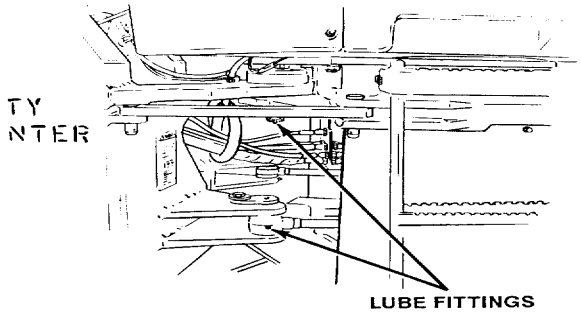


(left side)

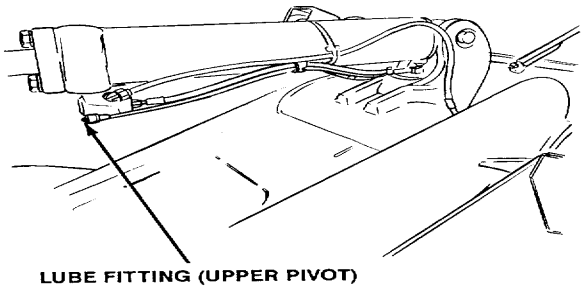
(D) Front Drive Line



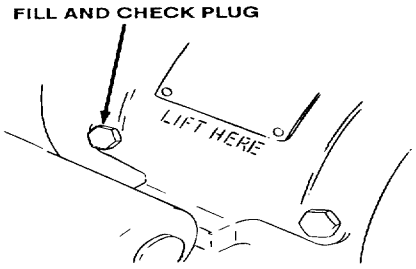
E Frame Hinge Pivots



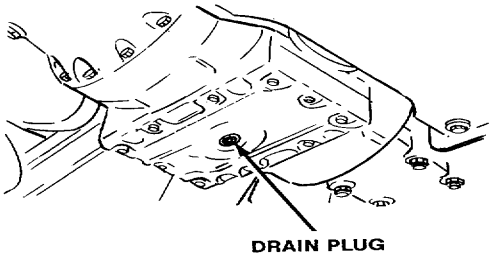
F Boom Cylinder Pivot Points



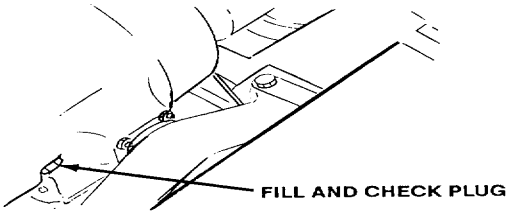
G Front Differential — Fill and Check



H Front Differential — Drain

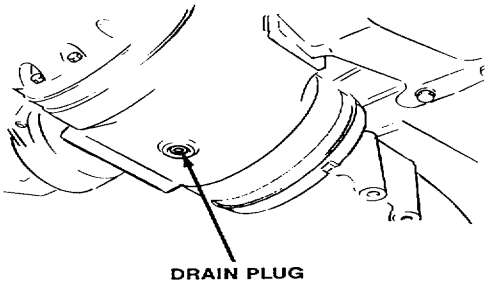


I Rear Differential — Fill and Check

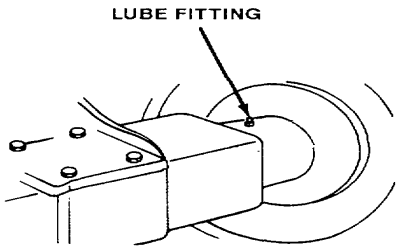


(seen from below)

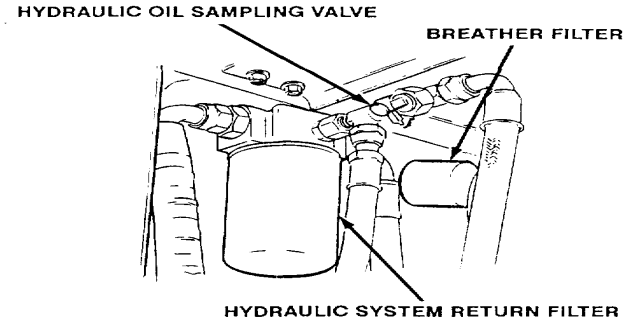
J Rear Differential — Drain



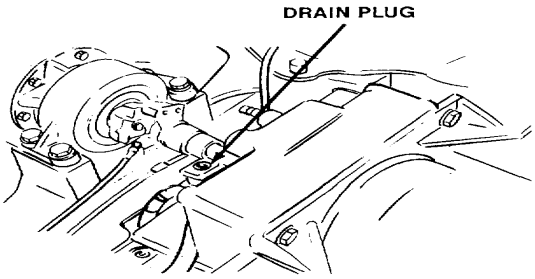
K Axle Bearings



L Hydraulic Filters

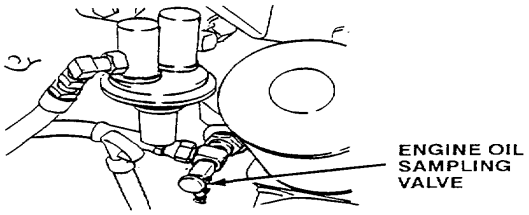


M Transmission

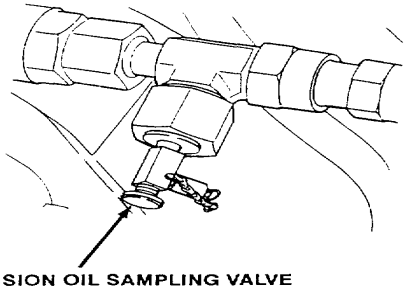


(seen from below)

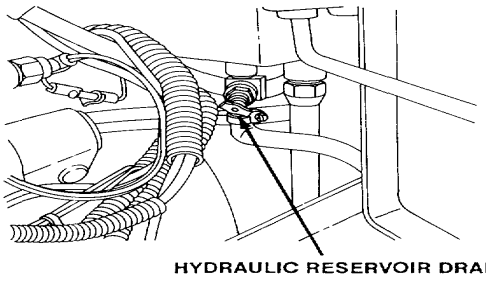
N Engine Oil Sampling Valve



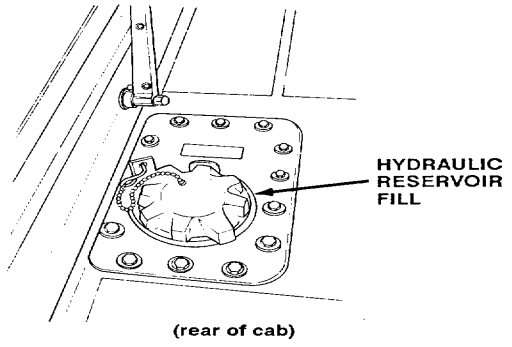
O Transmission Oil Sampling Valve



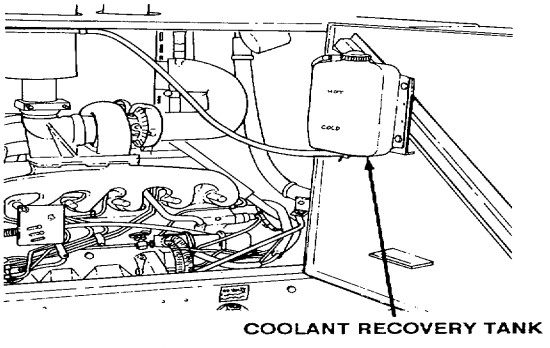
P Hydraulic Reservoir – Drain



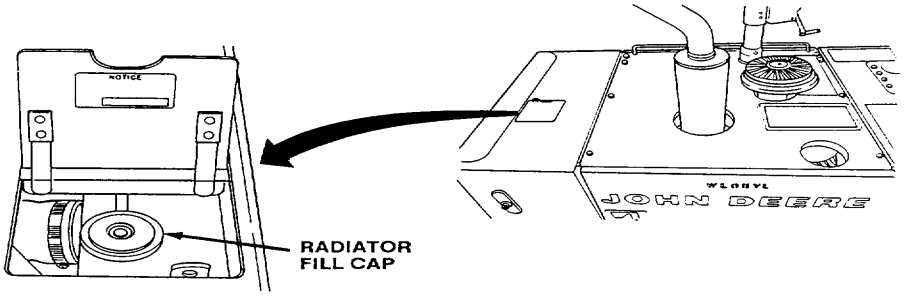
Q Hydraulic Reservoir — Fill



R Coolant Recovery Tank



S Radiator Fill Cap



NOTES:

1. **ARMY OIL ANALYSIS PROGRAM (AOAP)**. For Active Army units, obtain samples from engine, transmission, and hydraulic system every 50 hours of operation or 90 days (whichever comes first). Re- serve or National Guard activities will use 50 hours or 180 days as the prescribed intervals. Reserve and National Guard equipment in frequent use during active duty 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. Sampling valves have been provided for engine, transmission, and hydraulic system (see Views L, N, and 0).

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 applicable table).

2. **FOR OPERATION OF EQUIPMENT IN PRO-TRACTED COLD TEMPERATURES BELOW -15 °F (-260C).** Remove lubricants prescribed in applicable table for temperatures above -15°F (-260C). Lubricate with lubricants specified in applicable table for temperatures below -15°F (-260C). If OEA lubricant is required to meet the temperature ranges prescribed in the table, OEA lubricant is to be used in place of OE/HDO-10 lubricant for all temperature ranges where OE/HDO is specified.

NOTES (Con't)

3. **OIL CAN POINTS**. Each 100 hours, lubricate all door and window hinges with OE/HDO-10.

4. **ENGINE OIL LEVEL CHECK**. If engine has been running, wait 10 minutes for oil to drain into oil pan before checking. Oil level should be between ADD and FULL marks on engine oil level gage (see View B).

5. **ENGINE.** Oil is to be changed each time an engine oil change is directed by AOAP laboratory. When AOAP laboratory is not available, change oil each 250 hours. Drain when oil is warm (see Views B and C). If a new or rebuilt engine is installed, change engine oil after first 80-100 hours of operation.

6. **ENGINE OIL FILTER**. Filter is to be replaced each time an engine oil change is directed by AOAP laboratory. When AOAP laboratory support is not available, install new filter element each 250 hours (see View B). See TM 10-3930-659-20 for filter change instructions. If a new or rebuilt engine is installed, install new filter element after first 80-100 hours of operation.

7. TRANSMISSION OIL LEVEL HOT OR COLD CHECK.

   a. Cold Check. Start engine. Oil level should be at COLD mark on transmission oil level gage.

   b. Hot Check. Oil level should be between COLD and HOT marks on transmission oil level gage (see View A and TM 10-3930-659-10).

8. **TRANSMISSION OIL CHANGE**. Oil is to be changed each time a transmission oil change is directed by AOAP laboratory (see Views A and M). When AOAP laboratory support is not available, change transmission oil each 1000 hours. See TM 10-3930-659-20 for oil change instructions.

9. **TRANSMISSION OIL FILTER**. Filter is to be replaced each time a transmission oil change is directed by AOAP laboratory. When AOAP laboratory support is not available, install new filter element each 1000 hours. See TM 10-3930-659-20 for filter change instructions.

WARNING

DO NOT remove radiator fill cap unless engine is cold. This Is a pressurized cooling system and escaping steam, hot water, or coolant will cause serious burns.

10. **ENGINE COOLANT**. Coolant level in recovery tank must be between HOT and COLD lines on side of recovery tank (see View R). If no coolant is visible in recovery tank, remove radiator fill cap and add coolant to radiator and recovery tank (see View S and TM 10-3930-659-10).

11. **HYDRAULIC SYSTEM OIL**. Check hydraulic oil level in hydraulic oil level sight gage. When oil is cold, oil level must be to middle of sight gage window. If oil level is low, remove hydraulic reservoir filler cap (see View Q) and add hydraulic oil until oil comes up to middle of sight gage window. Hydraulic oil is to be changed each time a hydraulic oil change is directed by AOAP laboratory (see View P). When AOAP support is not available, change hydraulic oil each 3000 hours.

12. **HYDRAULIC SYSTEM RETURN FILTER**. Filter is to be replaced each time a hydraulic oil return filter change is directed by AOAP laboratory and when a hydraulic oil change is directed (see View L). When AOAP laboratory support is not available, install new filter element each 500 hours. See TM 10-3930- 659-20 for filter change instructions.

NOTE

Differential housings have three sumps. Slowly fill center sump and allow oil to drain Into all sumps.

13. **FRONT AND REAR DIFFERENTIAL OIL**. Remove plug (see Views G and I). Oil must be to bottom of opening in differential housing. Check differential oil level at 500 hours and add oil as necessary to bring up to bottom of opening in differential housing. Drain and fill differential housing at 3000 hours (see Views G, H, I, and J and TM 10-3930-659-20).

14. **CHASSIS**.

WARNING

Install frame locking bar (see TM 10-3930- 659-10) prior to start of any chassis lubrication to prevent injury to personnel.

a. **Purging of Lubricant**. When using a grease gun, apply lubricant to fitting until clean lubricant squeezes out of part being lubricated.

NOTES (Con't)

b. **Frame Hinge Pivots**. Lubricate two separate grease points every 10 hours with three shots of GAA (see View E).

c. **Front Drive Line Support Bearing**. Lubricate every 100 hours until GAA escapes around seal (see View D).

d. **Boom Cylinder Pivot Points**. Lower forks to ground. Lubricate eight separate grease points every 100 hours until GAA escapes around seals (see View F).

e. **Fork Carriage**. Lower forks to ground. Lubricate seven separate grease points every 100 hours until GAA escapes around seals (see Card 3 of 15).

f. **Steering Cylinder Pivots**. Lubricate four separate grease points every 100 hours with three shots of GAA (see View A).

g. **Oscillating Rear Axle**. Lubricate two separate grease points every 100 hours with five shots of GAA (see View A).

h. **Front Differential Telescoping Shaft**. Lubricate shaft every 100 hours with five shots of GAA (see View D).

i. **Axle Bearings**. Lubricate four separate grease points every 500 hours with 20 shots of GAA or until GAA escapes around seal (see View K).

j. **Transmission-to-Differential Drive Lines**. Lubricate seven separate grease points every 500 hours until GAA escapes around seals (see Card 5 of 15).

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:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:

MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army
05645

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PREVIOUS EDITIONS ▸ ARE OBSOLETE.

P.S.—IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.