

# LUBRICATION ORDER

8 JULY 1994

# LO 9-2350-247-12

(Supersedes LO 9-2350-247-12, March 1982)

**CARRIER, CARGO TRACKED, 6-TON: M548A1-2350-01-096-9356**  
**CARRIER, CARGO, TRACKED, 6-TON: M548A3-2350-01-369-6081**  
**CARRIER, ELECTRONIC WARFARE SYSTEMS, TRACKED, 6-TON:**  
**M1015A1-2350-01-136-8745**

Reference: TM 9-2350-247-10, TM 9-2350-247-20, IL 91OOSL, TB 43-0106, TM 9-2300-422-23 & P, FM 9-207

## REPORTING OF ERRORS

You can improve this publication by calling attention to errors, recommending improvements and by stating your reasons for the recommendations. Your letter or DA Form 2028, Recommended Changes to Publications and Blank Forms, should be mailed directly to Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MB, Warren, MI 48397-5000. A reply will be furnished directly to you.

Lubrication intervals, other than the AOAP On-Condition (OC) symbol, will be indicated by one of the following symbols: Before operation (B), Daily (D), After (AF), Weekly (W), Monthly (M), 1,500 miles (2400 km), Semi-annually (S), or Annually (AN). Additionally, the "either-or" clause may be utilized to reflect hard time intervals where AOAP is not required or not available (i.e., "1,500 miles or semi-annually", "6000 miles or annually", etc).

On-condition (OC) AOAP Laboratory determined oil change intervals shall be applied instead of hard time intervals such as hourly, calendar, or mileage, unless otherwise notified. The services will be required when directed by an Army Oil Analysis Program (AOAP) Laboratory which has analyzed the oil for serviceability.

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

Oil filled components such as engine, transmission, final drives, and fan gear box on the M548A1/M1015A1

and M548A3 carriers use approved OE/HDO type oil (see Temperature Key Charts for required oils). For specific data, see applicable pages in this Lubrication Order.

On drawings, arrows indicate lubrication points on equipment.

## WARNING

**Dry cleaning solvent PD-680 is toxic and flammable. Death or injury may result. Always use in an open area with good air flow, away from sparks, heat, or flames. Wear protective goggles and gloves. Do not breathe vapors. Avoid contact with skin, eyes, and clothes. If you get dizzy while using solvent, breathe fresh air and get medical help. If solvent gets on hands, wash them. If solvent gets in eyes, flush eyes with fresh water and get medical help immediately. Keep fire extinguisher nearby.**

## NOTE

**Park carrier on level ground to check oil levels. Clean fittings with dry cleaning solvent (PD-680, Type III, or equivalent). Dry before lubricating. Check/lubricate all oil and grease fitting points after washing or fording.**

Approved for public release: distribution is unlimited.

## ARMY OIL ANALYSIS PROGRAM (AOAP)

AOAP is an effective maintenance diagnostic tool and not a maintenance substitute. TB 43-0106 and TM 9-2300-422-23&P must not be interpreted to mean that AOAP minimizes in any way the need to employ good maintenance practices and strong maintenance discipline.

### SAMPLING REQUIREMENTS

Samples may be taken without warming a component to operating temperature if the equipment has been operated within the last 30 days. If the equipment has not been operated within the last 30 days these requisites apply to both routine and special sampling. Several hours of operation are needed to completely mix old and new oils.

### SAMPLING PROCEDURES

1. Perform AFTER operation checks and services.

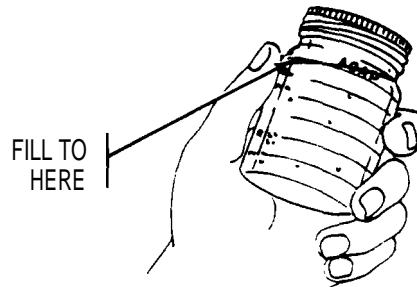
#### NOTE

**DO NOT ADD OIL immediately prior to taking oil samples. When AFTER operation checks and services indicate the need to replenish oil levels, WAIT until after taking samples. New oil added immediately prior to taking samples will adversely effect oil analysis results.**

2. Obtain two sample bottles (NSN 8125-01-082-9697) and two DA Form 2026 from the unit AOAP monitor.
3. Start engine (TM 9-2350-247-10). If required (see Sampling Requirements), drive carrier to bring engine and transmission up to normal operating temperatures.
4. Stop carrier and set the brakes (TM 9-2350-247-10).
5. Place range selector in the N (Neutral) position and keep engine running. On M548A3, lock the steering wheel (TM 9-2350-247-10).
6. Raise crew seat and center floor plate (TM 9-2350-247-10).

7. With engine operating, remove dust caps from the engine and transmission oil sampling valves.

8. Open sample valve on engine oil filter and drain a small amount of oil into a container to clear valve of grit and contamination. (Properly dispose of container and oil upon completion of sample taking.) Fill sampling bottle to the neck shoulder and seal it. Attach DA Form 2026 to sampling bottle.



9. Close oil sample valve and install dust cap.
10. Take oil sample from transmission in the same manner (steps 7 thru 9).
11. Stop engine (TM 9-2350-247-10).
12. Lower crew seat and center floor plate (TM 9-2350-247-10).
13. Deliver sample bottles to the unit AOAP monitor.

#### NOTE

**For location of nearest AOAP Laboratory and complete information about AOAP, refer to TB 43-0106. "Oil filters shall be serviced/cleaned/changed as applicable, when:**

- a. They are known to be contaminated, or clogged;
- b. Service is recommended by AOAP Laboratory analysis, or
- c. At prescribed hard time intervals."

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(Supersedes LO 9-2350-247-12, March 1982)

## LUBRICANT • INTERVAL

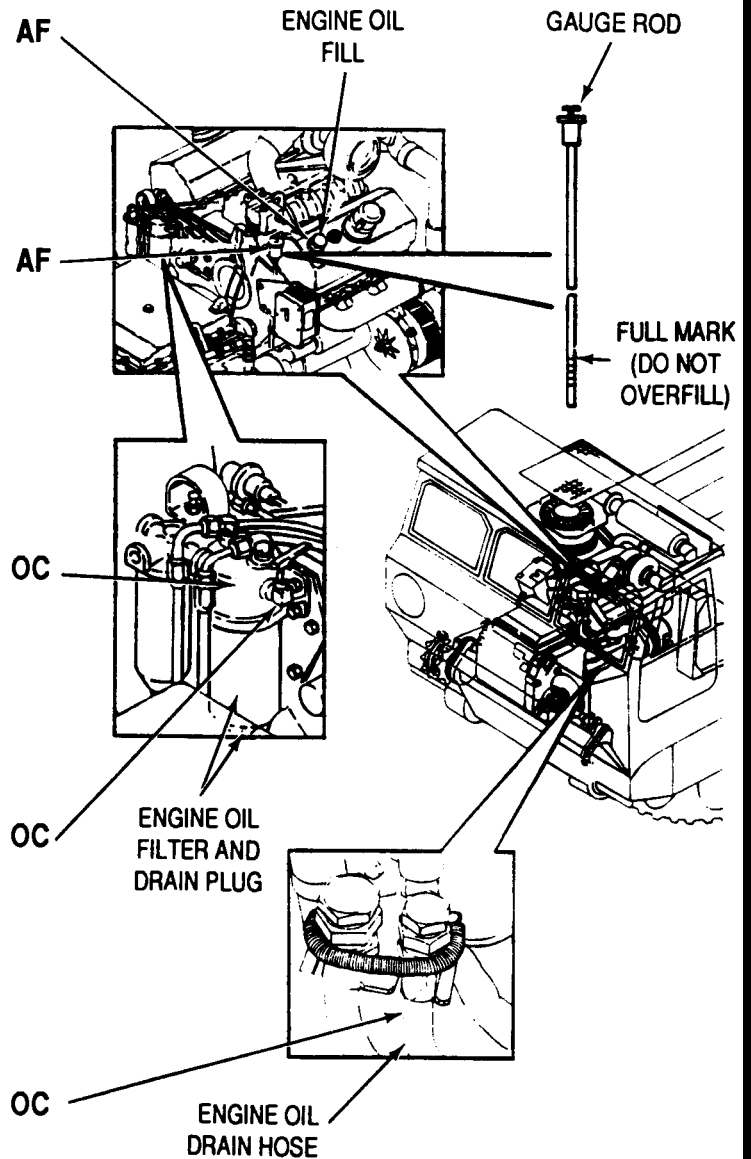
Engine Oil Fill OE/HDO  
(M548A3)  
(see notes 1 and 2) (C)

Engine Oil  
Level Check OE/HDO  
(M548A3)  
(see note 3) (C)

Engine Oil Filter  
and Drain Plug —  
(M548A3)  
(see notes 6 and 7) (O)

Engine AOAP  
Sample Valve —  
(M548A3)  
(see note 4)(C)

Engine Oil Drain —  
(M548A3)  
(see notes 5, 7 and 8) (O)



TOTAL MAN-HOURS	
INTERVAL	MAN-HR
AF	0.3
AF	0.1
OC	0.5
OC	0.2
OC	0.5

# KEY

LUBRICANTS/COMPONENTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*		INTERVALS
			+5°F to +120°F	+40°F to -60°F	
OE/HDO (MIL-L-2104D) OR OEA (MIL-L-46167)	LUBRICATING OIL, INTERNAL COMBUSTION ENGINE	18 qt.	OE/HDO-15/40	OEA	AF - After
(MIL-L-21260)	Engine PRESERVAION OIL		PE 30-1		OC - On Condition

\*1 For Arctic Operation Refer to FM 9-207

## NOTES

1. ENGINE OIL FILL. OE/HDO 15/40 MUST NOT be mixed with single grade lubricants.

2. A complete oil and filter change is required when converting to a different grade of oil in accordance with Temperature Key Chart.

### CAUTION

**Engine can be damaged if engine is filled above FULL mark. Do not fill engine above FULL mark.**

3. ENGINE OIL LEVEL. After operation, check for oil level between F and L marks on gauge rod. Add oil as necessary. Oil level should not be above F (full) mark.

4. FREQUENCY OF AOAP SAMPLE. Every 30 days, obtain a sample of engine oil. Samples should be taken as near the prescribed interval as possible. If sampling at the prescribed interval is not possible, a 10 percent variance is permissible.

5. HARD TIME INTERVAL. If AOAP Laboratory support is not available, then every 1,500 miles, or annually, drain oil and change filter. Hard time interval may be shortened if you are operating the equipment under adverse conditions.

6. ENGINE OIL FILTER. See TM 9-2350-247-20 for engine oil filter removal/installation instructions.

7. ENGINE OIL DRAIN. See TM 9-2350-247-20 for instructions.

### NOTE

**Drain oil only when hot after engine operation. Allow oil to drain thoroughly.**

8. PRESERVATION OIL. If engine has preservation engine oil leave this oil in engine until first scheduled oil change. Maintain operating oil level by adding required quantity of same grade oil.

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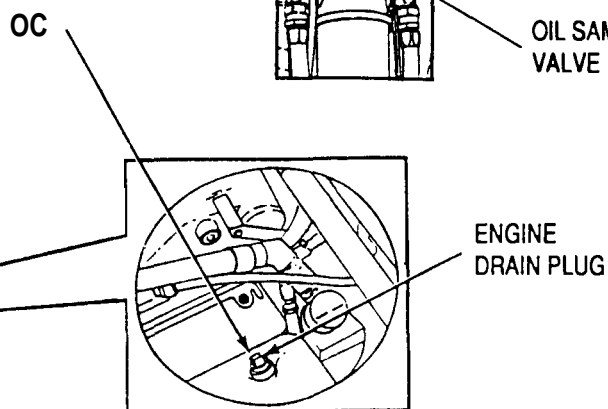
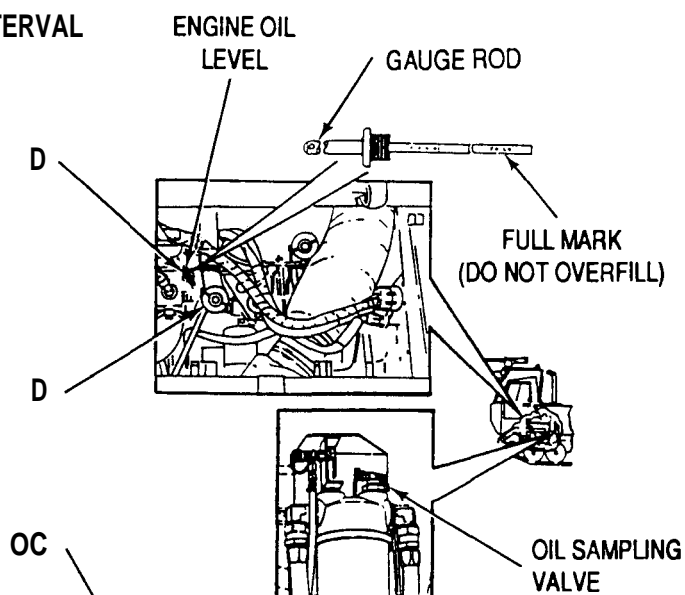
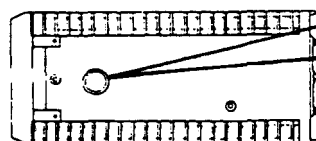
(Supersedes LO 9-2350-247-12, March 1982)

## LUBRICANT • INTERVAL

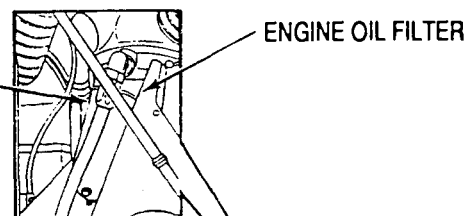
Engine Oil Level OE/HDO  
(M548A1/M1015A1)  
(Check Level)  
(see note 1) (C)

Engine Oil Fill OE/HDO  
(M548A1/M1015A1)  
(see note 1) (C)

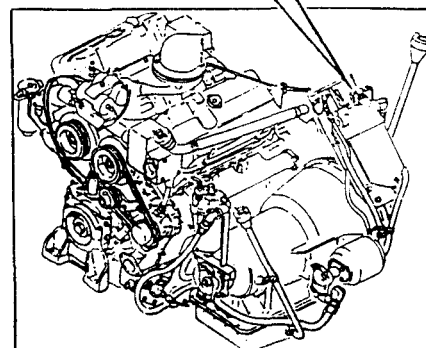
Engine Oil Drain -  
(M548A1/M1015A1)  
(see notes 2, 4 and 5)(O)



Engine Oil Filter - OC  
(M548A1/M1015A1)  
(see note 3) (O)



TOTAL MAN-HOURS	
INTERVAL	MAN-HR
D	0.1
D	0.3
OC	0.5
OC	0.5



# KEY

LUBRICANTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*			INTERVALS
			Above 32°F	+40°F to -10°F	0°F to -65°F	
OE/HDO (MIL-L-2104C) OR OEA (MIL-L-46167D)	LUBRICATING OIL INTERNAL Combustion ENGINE  Engine		HDO-30	HDO-10		D - Daily S - 150 Hours, 1,500 Miles or Semiannually OC - On Condition

For Arctic Operation Refer to FM 9-207

## NOTES

1. ENGINE. Daily, after the mission, check oil for level between F and L marks on gauge rod. Add oil (OE/HDO) as required to bring level between F and L marks on gauge rod.

### CAUTION DO NOT overfill.

2. Every 25 hours of operation or 30 days (whichever comes first), obtain a sample of engine oil. Send this sample to the nearest AOAP Laboratory. To obtain oil samples from AOAP valves:

- (1) Unlatch and raise grille behind cab on left side of carrier.
- (2) Take oil sample of engine oil, using procedures given in TB 43-0106.

### WARNING

Do not access AOAP valves from the power plant rear access panel opening as serious injury could result from air brake compressor belts.

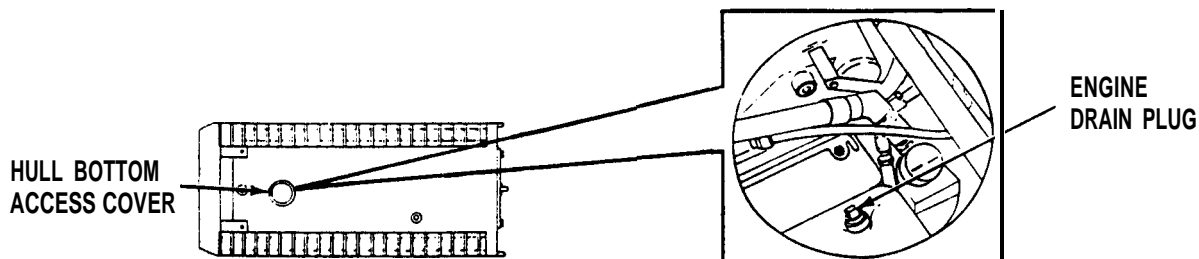
## NOTE

When using On Condition for engine oil, the engine oil filter should be changed at hard time intervals.

3. ENGINE OIL FILTER. On Condition during AOAP oil change, filter is to be replaced each time an engine oil change is indicated by AOAP Laboratory. When AOAP Laboratory is not available, change engine oil filter during engine oil hard time intervals every 150 hours, 1,500 miles, or semi-annually. See TM 9-2350-247-20 for engine oil filter removal and installation instructions.

4. When or if AOAP Laboratory support is unavailable, drain and refill crankcase and replace engine oil filter every 150 hours, 1,500 miles, or semi-annually. Drain only when hot after operation.

5. If engine has been filled with (PE) oil (preservative engine oil) leave this oil in engine until first scheduled oil change. Maintain operating oil level by adding applicable grade of oil (OE/HDO).



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## LUBRICANT • INTERVAL

**Transmission Oil** - **OC**  
**Drain Hose**  
 (M548A3)  
 (see notes 5 and 8) (O)

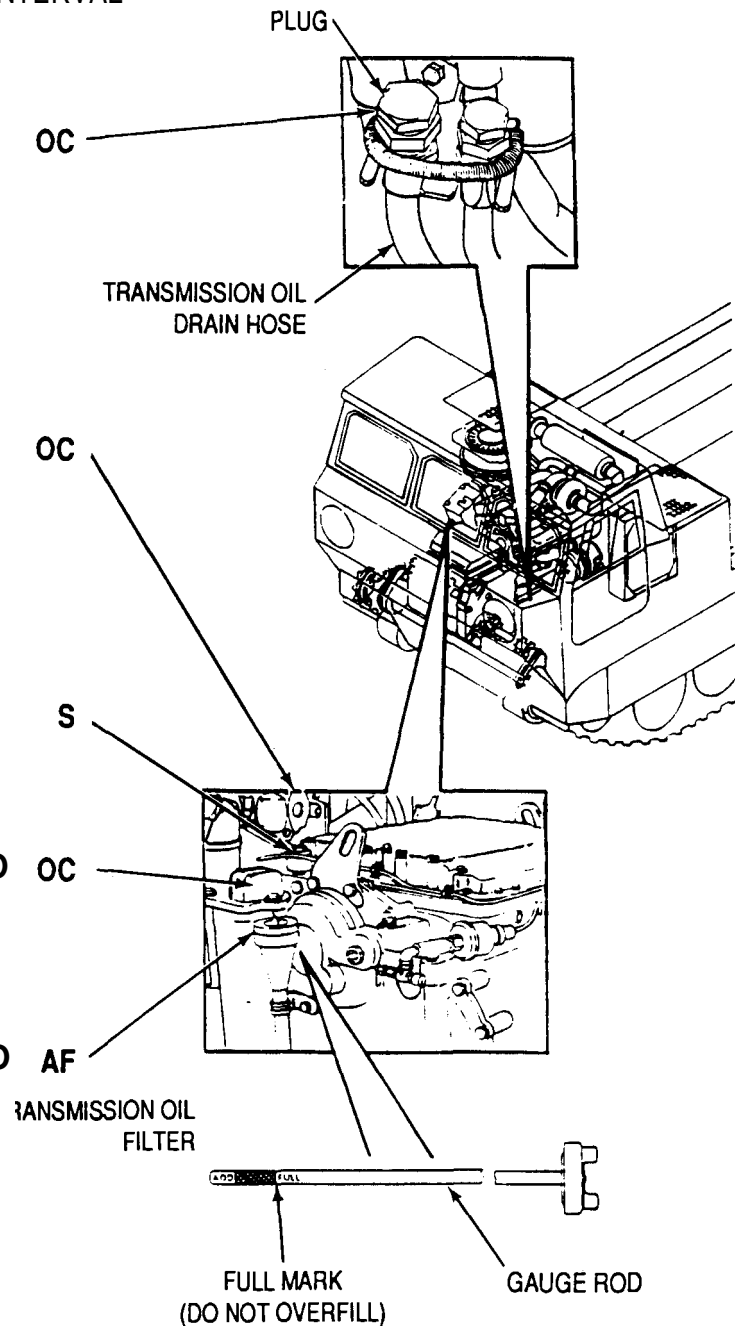
**Transmission** - **OC**  
**AOAP Valve**  
 (M546A3)  
 (see note 4) (C)

**Transmission Breather** - **S**  
 (M546A3)  
 (see note 10) (O)

**Transmission Oil Filter OE/HDO** - **OC**  
 (M548A3)  
 (see notes 6 and 7) (O)

**Transmission Fill OE/HDO** - **AF**  
**and Level Check**  
 (M548A3)  
 (see notes 1, 2 and 3) (C)

TOTAL MAN-HOURS	
INTERVAL	MAN-HR
OC	0.8
OC	0.2
OC	0.2
OC	0.4
AF	0.5



# KEY

LUBRICANTS/COMPONENTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*		INTERVALS
			+5°F to +120°F	+40°F to -60°F	
OE/HDO (MIL-L-2104D) OR OEA (MIL-L-46167)  (MIL-L-21260)	LUBRICATING OIL INTERNAL COMBUSTION ENGINE  Transmission PRESERVATION OIL	40 qt. or 10 gal.  (See Note 11)	OE/HDO-15/40  PE 30-1	OEA	AF - After S - Semi-annual AN - Annually or Every 1,500 Miles  OC - On Condition

\* For Arctic Operation Refer to FM 9-207

## NOTES

1. TRANSMISSION OIL FILL. OE/HDO 15/40 MUST NOT be mixed with single grade lubricants.

2. A complete oil and filter change is required when converting to a different grade of oil in accordance with Temperature Key Chart.

### CAUTION

**Transmission can be damaged when filled above FULL mark.**

3. TRANSMISSION OIL LEVEL. After operation, check transmission oil level. Oil level should be at FULL mark on gauge rod. When oil is warm, oil level should be at or just above ADD mark on gauge rod.

4. FREQUENCY OF AOAP SAMPLE. Every 30 days, obtain a sample of transmission oil. Samples should be taken as near the prescribed interval as possible. If sampling at the prescribed interval is not possible, a 10 percent variance is permissible.

5. HARD TIME INTERVAL. If AOAP Laboratory is not available, every 1,500 miles or annually, drain oil, change filter. Hard time interval may be shortened if you are operating the equipment under adverse conditions.

6. TRANSMISSION OIL FILTER. Replace filter element and packings each time a transmission oil change is required. When AOAP Laboratory support is not available, change transmission oil filter annually, or every 1,500 miles, or when transmission differential pressure light comes on (filter clogged).

7. OIL FILTER REMOVAL AND INSTALLATION INSTRUCTIONS (TM 9-2350-247-20).



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### 8. TRANSMISSION OIL DRAIN (M548A3).

#### NOTE

**Drain transmission oil when hot after operation. Allow oil to drain thoroughly for one hour if time permits.**

- a. Remove lower hull access cover (TM 9-2350-247-20).
- b. Remove transmission oil drain hose from bracket (see card no. 7).
- c. Place end of hose in suitable container and remove plug from hose.
- d. If you detect anything out of the ordinary, notify direct support maintenance.
- e. Clean and install drain plug in oil drain hose. Secure hose in bracket.
- f. Fill transmission with approximately 36 quarts (refill capacity) or 48 quarts (initial fill) of oil to bring level between F and L marks on gauge rod.

### 9. TRANSMISSION OIL FLUSH PROCEDURE (M548A3). Use the following procedure when changing oil grade or when oil is contaminated.

#### NOTE

**Transmission oil must be flushed when changing oil grades.**

- a. Operate carrier until coolant reaches normal operating temperature.

#### NOTE

**Do not change transmission oil filter at this time.**

- b. Drain transmission oil.

- c. Fill transmission with new grade oil.

- d. Operate transmission in 1-4 range with engine idling for 5-6 minutes.

- e. Drain oil and change transmission oil filter.

- f. Fill transmission with new grade oil.

- g. Check oil level.

#### WARNING

**Dry cleaning solvent PD-680 is toxic and flammable. Death or injury may result. Always use in an open area with good air flow, away from sparks, heat, or flames. Wear protective goggles and gloves. Do not breathe vapors. Avoid contact with skin, eyes, and clothes. If you get dizzy while using solvent, breathe fresh air and get medical help. If solvent gets on hands, wash them. If solvent gets in eyes, flush eyes with fresh water and get medical help immediately. Keep fire extinguisher nearby.**

### 10. TRANSMISSION BREATHER (M548A3). Semi-annually or every 1,500 miles, remove and clean transmission breather with dry cleaning solvent (PD-680, Type III). Dry breather and install on transmission (TM 9-2350-247-20).

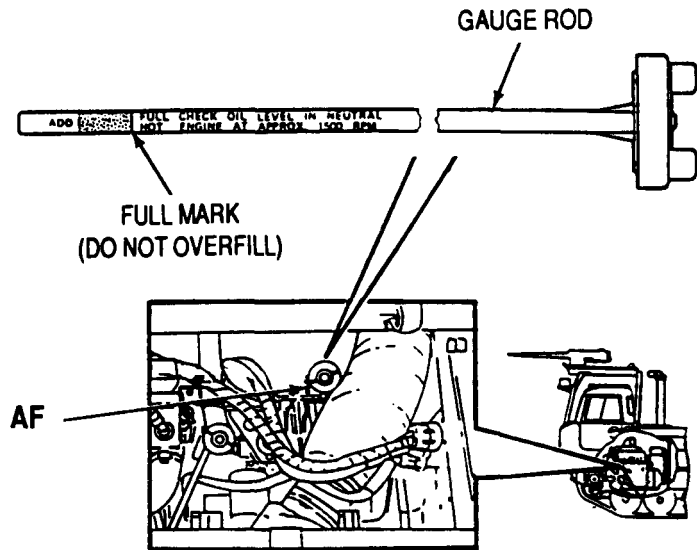
**11. PRESERVATION OIL.** If transmission has been filled with preservation oil (MIL-L-21260) by the manufacturer or at time of overhaul, leave this oil in transmission until first scheduled oil change. Maintain operating oil level by adding same grade of PE oil. When first scheduled oil change is made, refill transmission with applicable grade oil (OE/HDO or OEA). See note 3 (card no. 8) and note 8 above.

**12. REFILL CAPACITY (M548A3).** After a fluid change, the transmission refill capacity is approximately 9 gallons or 36 quarts. In the event of a major disassembly or rework of the transmission, the initial fill is approximately 14.25 gallons or 57 quarts.

## LUBRICANT • INTERVAL

Transmission Fill  
and Level  
(M548A1/M1015A1)  
(Check Level)  
(see note 1) (C)

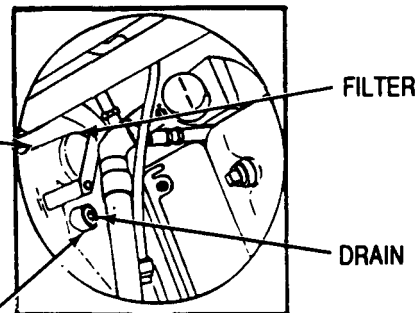
OE/HDO



Transmission Oil Filter  
(M548A1/M1015A1)  
(see note 2) (O)

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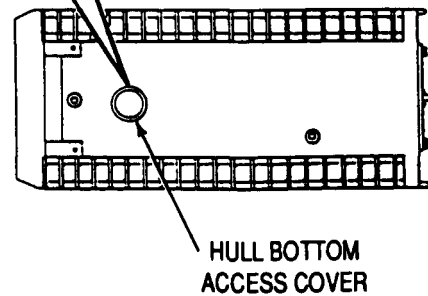
S



Transmission Drain  
(M548A1/M1015A1)  
(see note 1) (O)

—

OC



TOTAL MAN-HOURS	
INTERVAL	MAN-HR
AF	0.2
S	0.5
OC	0.5

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(Supersedes LO 9-2350-247-12, March 1982)

### KEY

LUBRICANTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*			INTERVALS
			Above 32°F	+40°F to -10°F	0°F to -65°F	
OE/HDO (MIL-L-2104C) OR OEA (MIL-L-46167)	LUBRICATING OIL, INTERNAL COMBUSTION ENGINE  Transmission	16 qt.	OE/ HDO-10	OE/ HDO-10	OEA	AF - After S - 150 Hours, 1,500 Miles or Semi-annually OC - On Condition

\*For Arctic Operation Refer to FM 9207

### NOTES

1. TRANSMISSION (M548A1/M1015A1). After operation, check transmission oil level for between ADD and FULL marks on gauge rod. With engine disconnect engaged, start and run engine at 800 rpm for 3 to 5 minutes with shift lever in 2-3 and brakes locked to allow transmission oil to reach all normal operating temperature. Move shift lever through all RANGES to assure complete oil circulation. Return shift lever to N and check transmission oil level with engine operating at 1,500 rpm. Add oil (OE/HDO) as required. Every 25 hours of operation or 30 days (whichever comes first), obtain a sample of oil and send this sample to the nearest AOAP Laboratory. To obtain oil samples from AOAP valves:

- (1) Unlatch and raise grille behind cab on left side of carrier.
- (2) Take oil sample of transmission oil, using procedures given in TB 43-0106.

### CAUTION

**Do not access AOAP valves from the power plant rear access panel opening as serious injury could result from air brake compressor belts.**

When AOAP Laboratory support is not available, drain transmission oil every 150 hours, 1,500 miles, or semi-annually. Drain only when hot after operation. To drain, remove hull bottom access cover (TM 9-2350-247-20) and transmission drain plug. Catch oil in suitable container. Allow oil to drain thoroughly - 1 hour if time permits. Examine oil for evidence of overheating, foreign matter, and metallic particles. If metal chips or filings are found on plug or in oil, notify your supervisor. Clean and install drain plug, and INSTALL ACCESS COVER SECURELY. Service filter (see note 2). Add oil (OE/HDO) as required to bring oil level between FULL and ADD

marks on gauge rod (refill capacity 16 quarts). After filling transmission, check for oil leaks with engine running. Recheck oil level.

### WARNING

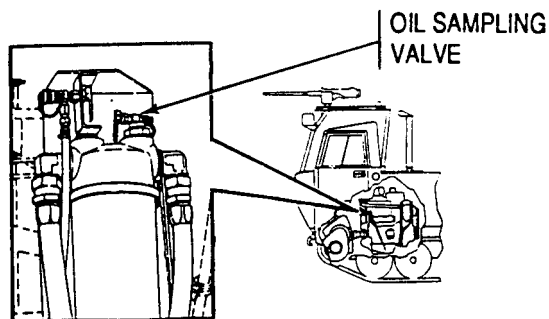
**Dry cleaning solvent PD-880 is toxic and flammable. Death or injury may result. Always use in an open area with good air low, away from sparks, heat, or flames. Wear protective goggles and gloves. Do not breathe vapors. Avoid contact with skin, eyes, and clothes. If you get dizzy while using solvent, breathe fresh air and get medical help. If solvent gets on hands, wash them. If solvent gets in eyes, flush eyes with fresh water and get medical help immediately. Keep fire extinguisher nearby.**

### NOTE

If transmission has been filled with (PE) oil (preservative engine oil) by the manufacturer or at time of overhaul, leave this oil in transmission until first scheduled oil change. Maintain operating oil level by adding applicable grade of oil (OE/HDO). When first scheduled oil change is made, refill transmission with applicable grade oil (OE/HDO). OE/HDO is equivalent to PE-10-1.

**When using On Condition for the transmission oil, the transmission oil filter should be changed at hard time intervals**

2. TRANSMISSION OIL FILTER (M548A1/M1015A1). On condition during AOAP oil change, filter is to be replaced each time a transmission oil change is indicated by AOAP Laboratory. When AOAP Laboratory support is not available, change transmission oil filter every 150 hours, 1,500 miles, or semi-annually (TM 9-2350-247-20). Remove element, clean cavity with dry cleaning solvent (PD-680, type III), and install new element. After filling transmission, check for oil leaks at filter with engine running.



## LUBRICANT • INTERVAL

Transfer Gearcase  
Fill and Level  
(M548A1/M1015A1)  
(Check Level)  
(see note 1) (C)

OE/HDO AF  
GAUGE ROD

ADD FULL CHECK WITH ENGINE STOPPED

GAUGE ROD

ADD FULL 1 PINT BETWEEN MARKS

Differential Fill and Level  
(M548A1/M1015A1)  
(Check Level)  
(See note 2) (C)

OE/HDO

AF

Differential Drain  
(M548A1/M1015A1)  
(see note 2) (O)

—

OC

DRAIN PLUG

HULL BOTTOM  
ACCESS  
COVERS

Transfer Gearcase Drain  
(M548A1/M1015A1)  
(see note 1) (O)

—

S

DRAIN PLUG

TOTAL MAN-HOURS	
INTERVAL	MAN-HR
AF	0.3
AF	0.4
OC	0.5
S	0.5

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## KEY

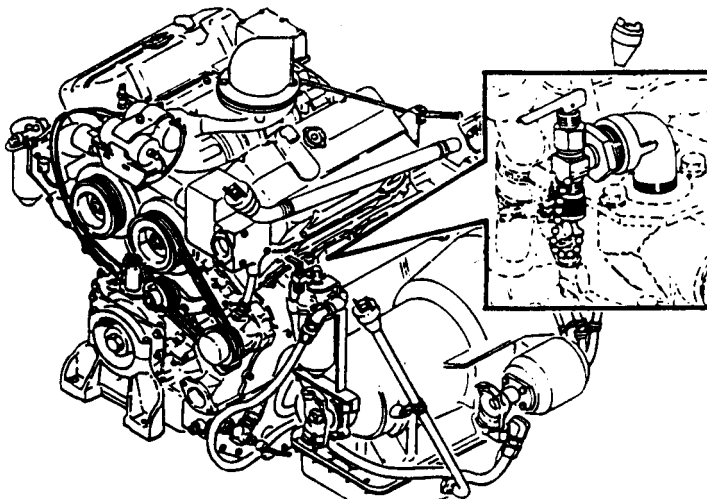
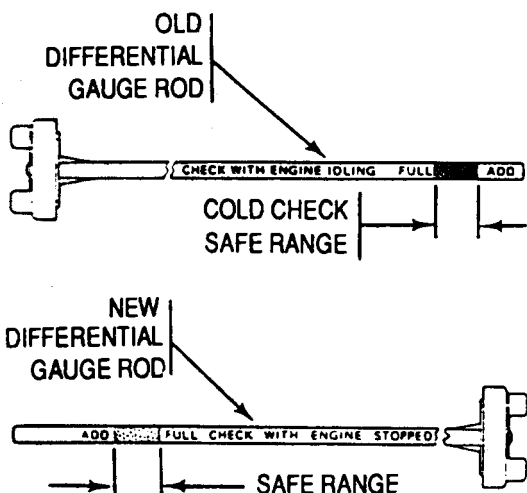
LUBRICANTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*			INTERVALS
			Above 32°F	+40°F to -10°F	0°F to -65°F	
OE/HDO (MIL-L-2104C) OR OEA (MIL-L-46167)	LUBRICATING OIL, INTERNAL COMBUSTION ENGINE  Transfer Gearcase Differential	2.5 qt. 18 qt.	OE/ HDO-30	OE/ HDO-10	OEA	AF - After  S - 150 Hours, 1,500 Miles or Semi-annually  OC - On Condition

\*For Arctic Operation Refer to FM 9-207

## NOTES

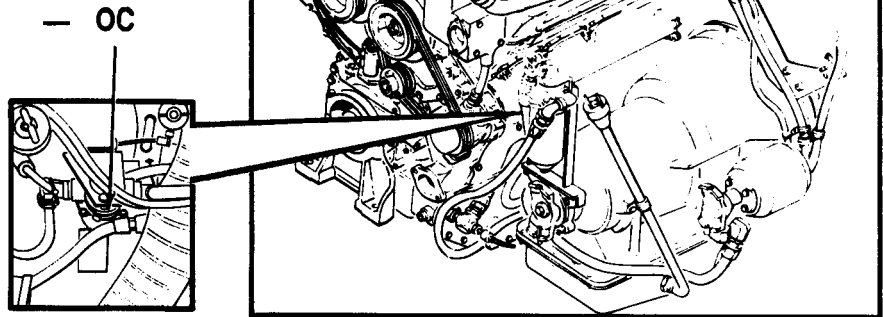
1. TRANSFER GEARCASE (M548A1/M1015A1). After operation, check transfer gearcase oil level for between ADD and FULL marks on gauge rod. Add oil (OE/HDO) as necessary. Every 150 hours, 1,500 miles, or semi-annually, drain gearcase oil. Drain only when hot after operation. To drain, remove hull access cover (TM 9-2350-247-20) and gearcase drain plug. Inspect oil being drained for metallic particles. If metal chips are found in oil, notify direct support maintenance. Drain at least 15 minutes, clean and install gearcase drain plug. Fill transfer gearcase with approximately 2 1/2 quarts of oil (OE/HDO). Make sure gearcase filler cap is closed and breather hole in gauge rod tube is open. Start engine: operate for 1 minute. Stop engine, and check oil level. Level should be between FULL and ADD marks on gauge rod. INSTALL BOTTOM ACCESS COVER SECURELY.

2. DIFFERENTIAL (M548A1/M1015A1). After operation, check differential oil level to make sure there is sufficient oil for warm-up operation. On carriers with old style dipstick, add oil to differential if oil is below the letter "F" in the word "FULL." Never add oil if level is above the letter "F". On M548A1 carriers, add oil only if level is below safe range. Add oil (OE/HDO) as required. Every 25 hours of operation or 30 days (whichever comes first), obtain a sample of oil. Send the sample to the nearest AOAP Laboratory. See TB 43-0106 for sampling instructions. When AOAP Laboratory support is not available, drain differential every 150 hours, 1,500 miles, or semi-annually. Drain only when hot after operation. To drain, remove front hull plug (TM 9-2350-247-20) and differential plug. Inspect differential drain plug for metallic particles. If metal chips are found, notify direct support maintenance. Clean and install drain plugs. Service oil filter. Remove gauge rod from housing, add oil (OE/HDO) (refill with 18 quarts), and check level.

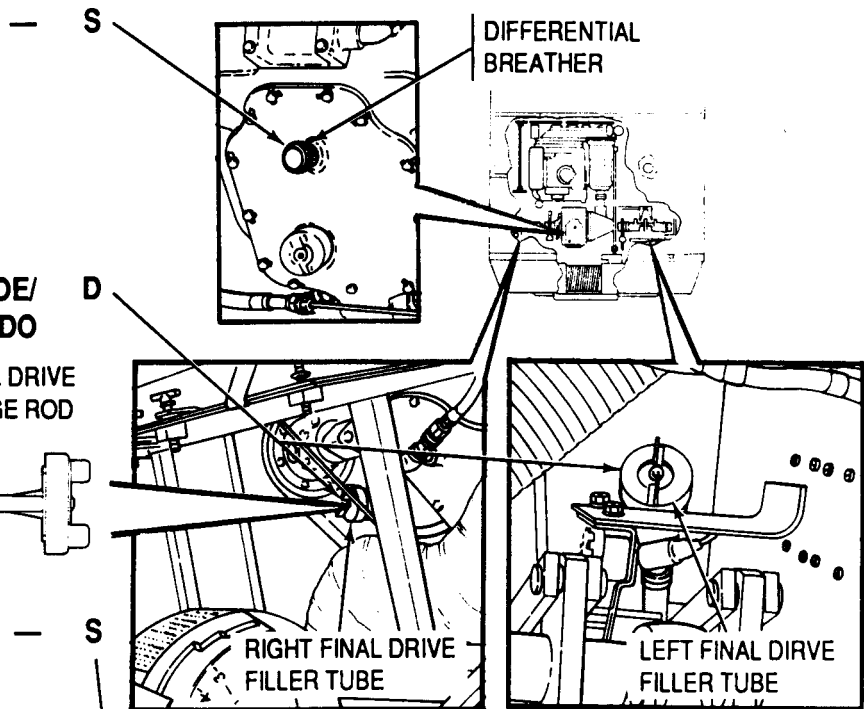


# LUBRICANT • INTERVAL

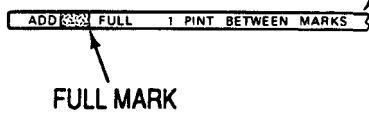
Differential Oil Filter  
(M548A1/M1015A1)  
(see note 1) (C)



Differential Breather  
(M548A1/M1015A1)  
(Remove, clean, dry, and  
install breather)  
(see TM 9-2350-247-20) (O)

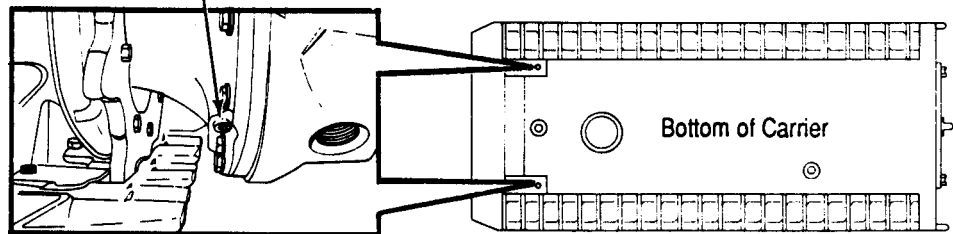


Final Drive Fill  
and Level  
(Check Level)  
(see note 2) (C)



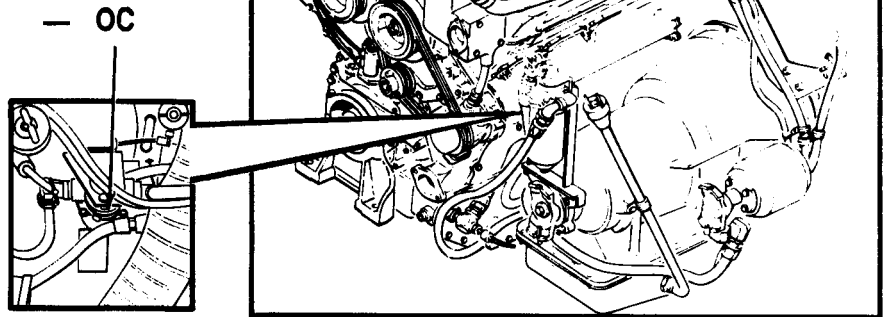
Final Drive Drain  
(see note 2) (O)

TOTAL MAN-HOURS	
INTERVAL	MAN-HR
OC	0.3
S	0.3
D	0.2
S	0.5

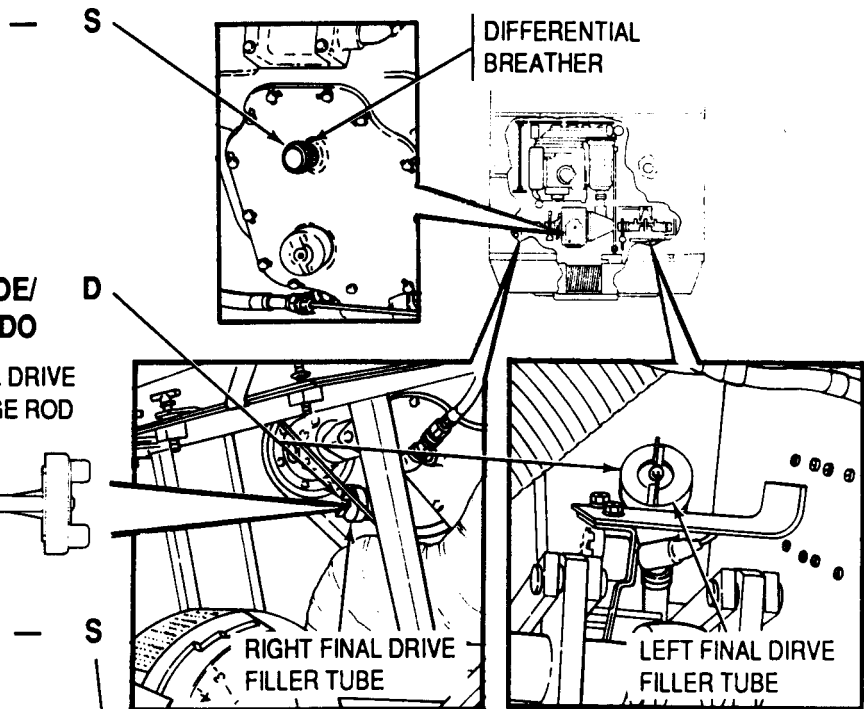


# LUBRICANT • INTERVAL

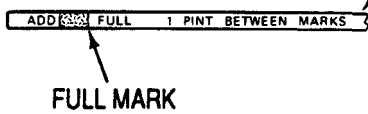
Differential Oil Filter  
(M548A1/M1015A1)  
(see note 1) (C)



Differential Breather  
(M548A1/M1015A1)  
(Remove, clean, dry, and  
install breather)  
(see TM 9-2350-247-20) (O)

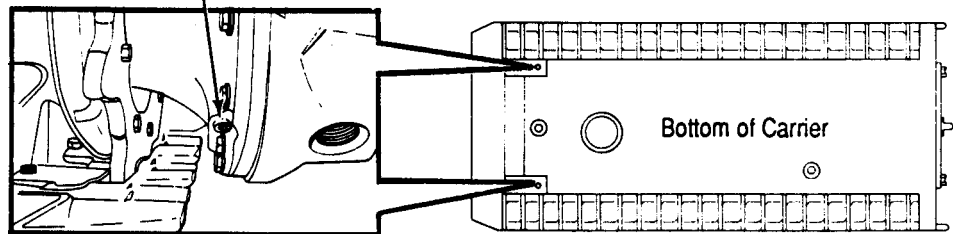


Final Drive Fill  
and Level  
(Check Level)  
(see note 2) (C)



Final Drive Drain  
(see note 2) (O)

TOTAL MAN-HOURS	
INTERVAL	MAN-HR
OC	0.3
S	0.3
D	0.2
S	0.5

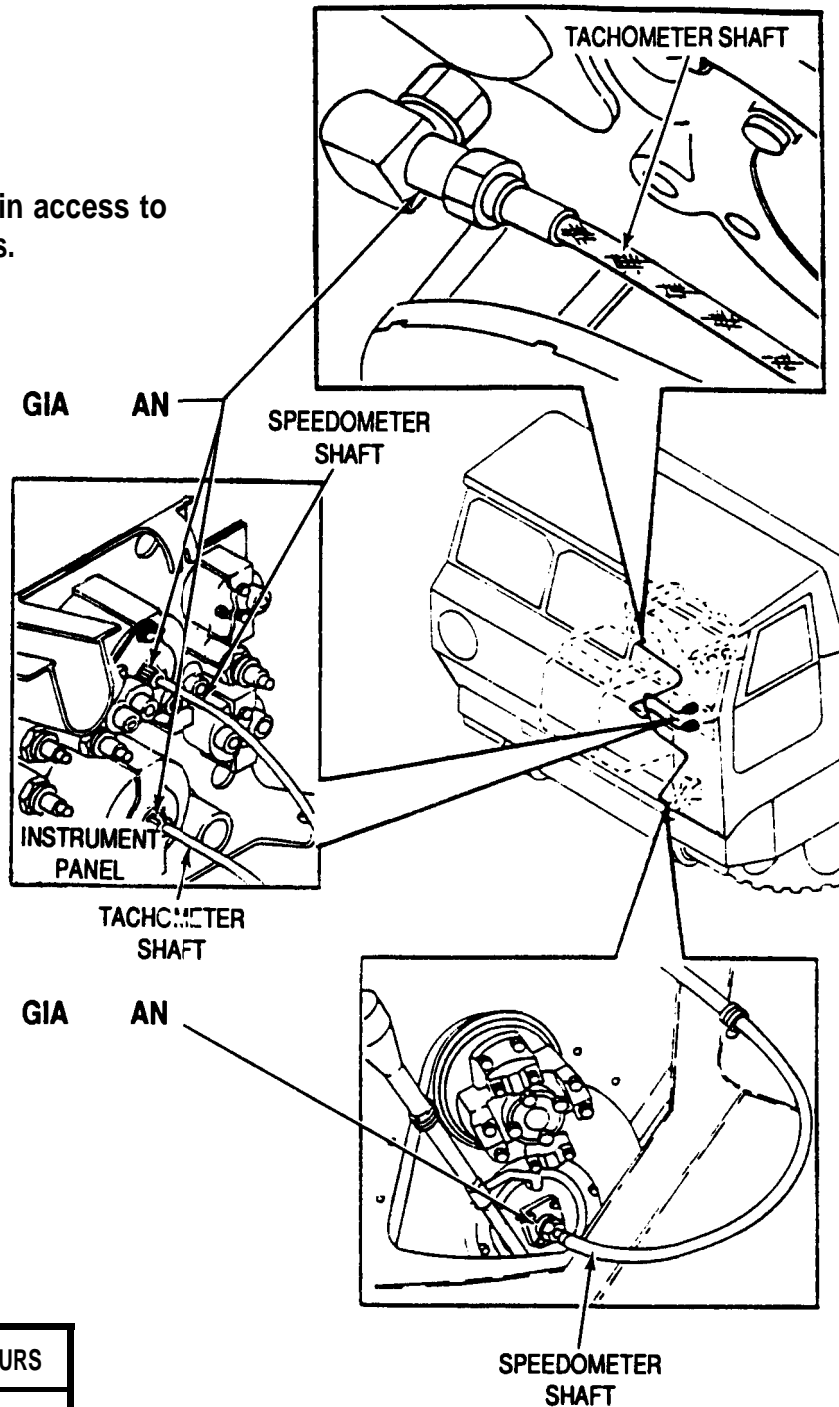


## LUBRICANT • INTERVAL

### NOTE

Remove center floor plate to gain access to tachometer and speedometer shafts.

Tachometer and  
Speedometer Shafts  
(see note 1) (O)



TOTAL MAN-HOURS	
INTERVAL	MAN-HR
AN	0.4



# LUBRICATION ORDER

## 8 JULY 1994

# LO 9-2350-247-12

(Supersedes LO 9-2350-247-12, March 1982)

### KEY

LUBRICANTS/COMPONENTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*		INTERVALS
			+5°F to +12°F	+40°F to -60°F	
GIA (MIL-G-23827)	GREASE, INSTRUMENT, AIRCRAFT	As Required	All Temperatures		AN - Annually or Every 1,500 Miles  S - 150 Hours, 1,500 Miles or Semi-annually
GAA (MIL-G-10924)	GREASE, AUTOMOTIVE AND ARTILLERY				
OE/HDO (MIL-L-2104D) OR OEA (MIL-L-46167)	LUBRICATING OIL, INTERNAL COMBUSTION ENGINE				

\*For Arctic Operation Refer to FM 9-207

### NOTES

1. TACHOMETER AND SPEEDOMETER SHAFTS. Annually, disconnect shafts at both ends (TM 9-2350-247-20), remove slotted washers from drive ends of cores, and remove cores from instrument panel end of shafts. Clean and lubricate cores with grease (GIA) and insert cores in shafts. Install slotted washers and connect both ends of shafts. If tachometer adapter has a grease fitting, lubricate with lubricant GIA sparingly.

2. OIL CAN POINTS. Every 1,500 miles, semi-annually, or as required, lubricate fan tensioner, door, tailgate hinges and latches; control linkage pins and shafts, and seat control. Use oil (OE/HDO or OEA).

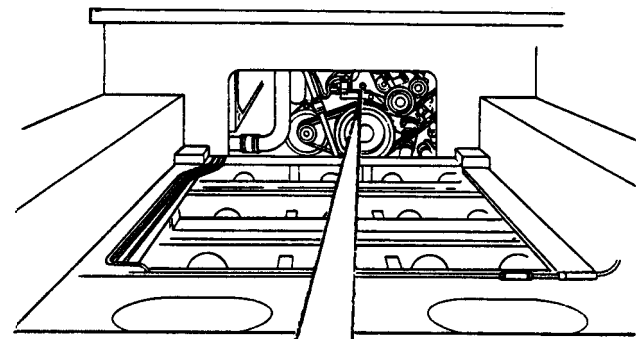
3. LUBRICATED AT TIME OF ASSEMBLY. Coat ends of suspension torsion bar, idler wheel support arm spindle and bearings, steering control linkage bearing surfaces and pins, and towing pintle shaft. Use grease (GAA or GIA) as specified during assembly procedure.

## LUBRICANT • INTERVAL

Pulley Support Arm  
(M548A3)  
(see note 1) (O)

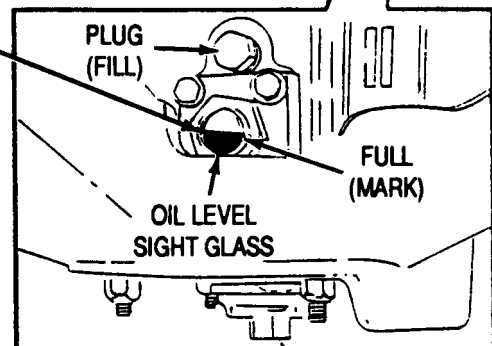
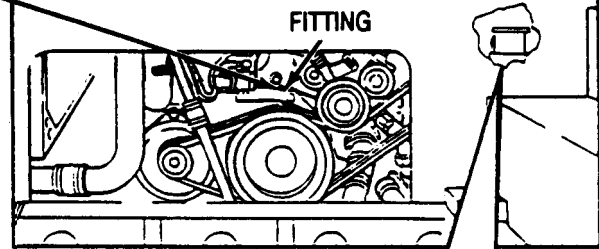
GAA

S



Fan Gear Box OE/HDO  
Drain and Level Check  
(M548A3)  
(see notes 2 and 3) (O)

M



### NOTE

Add mark is even with bottom of sight glass. Full mark is even with center of glass.

TOTAL MAN-HOURS	
INTERVAL	MAN-HR
S	0.4
M	0.3

CAP AND LOCKING WIRE  
(DRAIN PORT)

# LUBRICATION ORDER

## 8 JULY 1994

# LO 9-2350-247-12

(Supersedes LO 9-2350-247-12, March 1982)

### KEY

LUBRICANTS/COMPONENTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*		INTERVALS
			+5°F to +120°F	+40°F to -60°F	
OE/HDO (MIL-L-2104D)	LUBRICATING OIL, INTERNAL COMBUSTION ENGINE	0.75 Pt.	OE/HDO-15/40	OEA	M - Monthly
GAA (MIL-G-10924)	GREASE, AUTOMOTIVE AND ARTILLERY	As Required	All Temperatures		S - 150 Hours, 1,500 Miles or Semi-annually

\*If For Arctic Operation Refer to FM 9-207

### NOTES

1. PULLEY SUPPORT ARM. Every 1,500 miles or semi-annually, lubricate with grease (GM). Use grease gun with flexible adapter on fitting.

2. FAN GEAR BOX. Monthly, check fan gear box oil level. Oil should be between ADD and FULL marks. Maintain oil level with OE/HDO or OEA as required by Temperature Key Chart.

### NOTE

**Drain oil only when hot after operation.**

3. FAN GEAR BOX OIL DRAIN. Drain gear box oil every 1,500 miles or semi-annually.

LUBRICANT • INTERVAL

NOTE

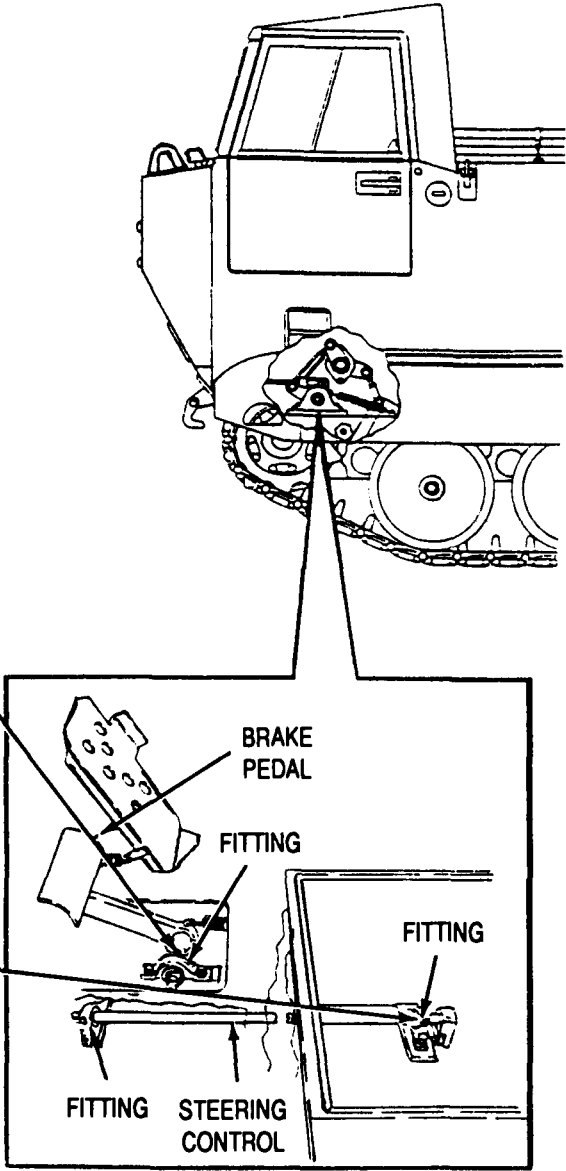
Remove plate over brake pedal linkage to gain access to bearings and linkage. Remove front battery to gain access to bearing.

Foot Brake Pedal Linkage  
(M548A3)  
(1 Fitting)  
(see note 2) (O)

GAA S

Steering Control Bearings GM S  
(M548A3)  
(2 Fittings)  
(see note 1) (O)

TOTAL MAN-HOURS	
INTERVAL	MAN-HR
S	0.3
S	0.8



# LUBRICATION ORDER

8 JULY 1994

# LO 9-2350-247-12

(Supersedes LO 9-2350-247-12, March 1982)

## KEY

LUBRICANTS/COMPONENTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*		INTERVALS
			+5°F to +120°F	+40°F to -60°F	
GAA (MIL-G-10924)	GREASE, AUTOMOTIVE AND ARTILLERY  Steering Control Bearing Foot Brake Pedal Linkage	As Required	All Temperatures		S - 150 Hours, 1,500 Miles or Semi-annually

\*For Arctic Operation Refer to FM 9-207

## NOTES

### WARNING

Dry cleaning solvent PD-680 is toxic and flammable. Death or injury may result. Always use in an open area with good air flow, away from sparks, heat, or flames. Wear protective goggles and gloves. Do not breathe vapors. Avoid contact with skin, eyes, and clothes. If you get dizzy while using solvent, breathe fresh air and get medical help. If solvent gets on hands, wash them. If solvent gets in eyes, flush eyes with freshwater and get medical help immediately. Keep fire extinguisher nearby.

### NOTE

Clean grease fittings with dry cleaning solvent PD-680, Type III, or equivalent) prior to lubrication. Check/lubricate grease fitting points after washing or fording.

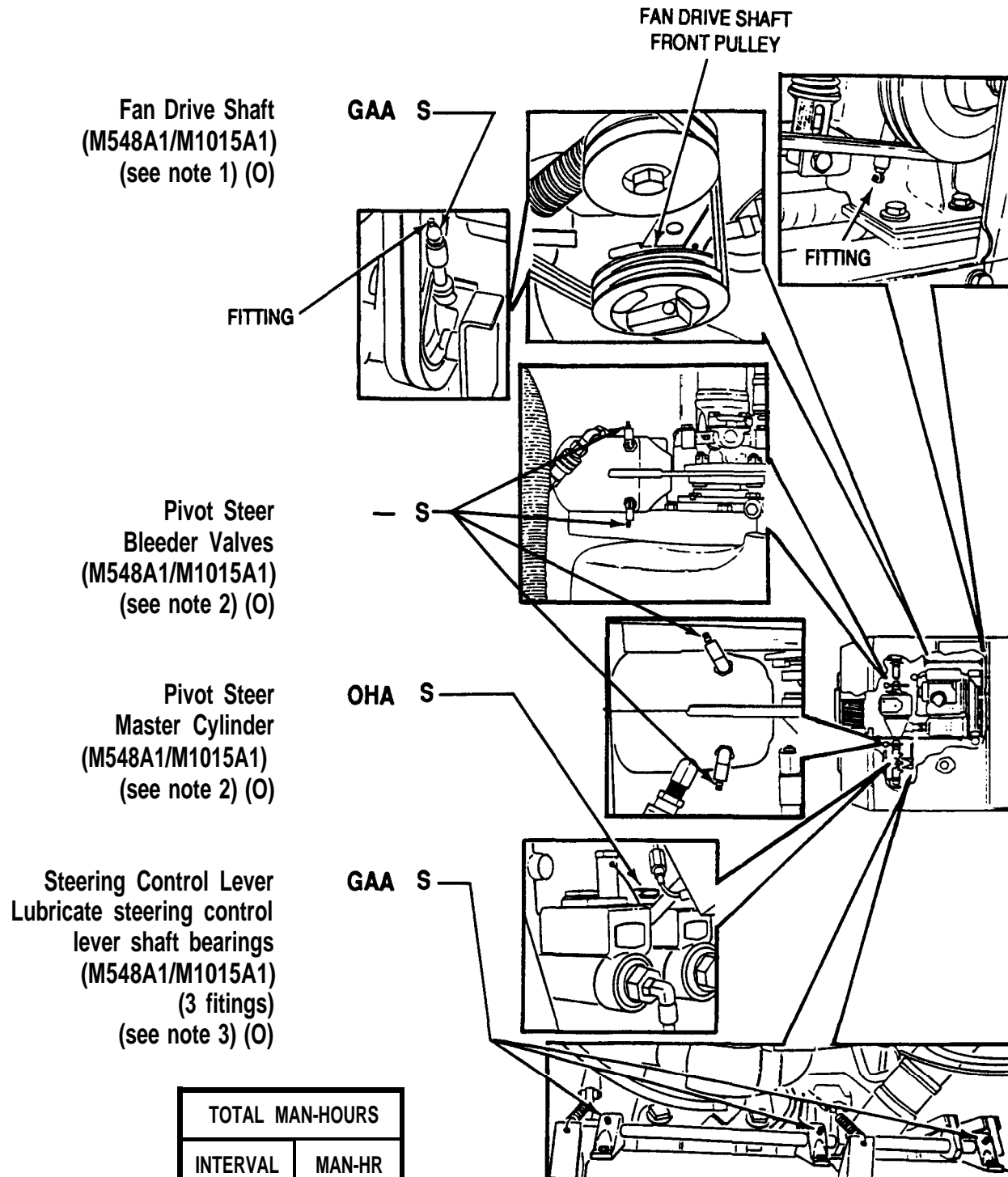
1. STEERING CONTROL BEARINGS (M548A3). Every 1,500 miles or semi-annually, lubricate bearings with grease (GAA) through fitting at each end of steering control. Use grease gun with flexible adapter. Remove forward battery under driver's seat (TM 9-2350-247-20).

### NOTE

When grease fittings will not accept GAA, notify unit maintenance.

2. FOOT BRAKE PEDAL LINKAGE (M548A3). Every 1,500 miles or semi-annually, lubricate linkage with grease (GAA) through fitting. Use grease gun with flexible adapter.

# LUBRICANT • INTERVAL



# LUBRICATION ORDER

## 8 JULY 1994

# LO 9-2350-247-12

(Supersedes LO 9-2350-247-12, March 1982)

### KEY

LUBRICANTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*			INTERVALS
			Above +32°F	+40°F to -10°F	0°F to -65°F	
OHA (MIL-H-5606)	HYDRALIC FLUID, PETROLEUM BASE  Pivot Steer System	1 pt.	All Temperatures			S - 150 Hours, 1,500 Miles or Semi-annually
GAA (MIL-G-10924)	GREASE, AUTOMOTIVE AND ARTILLERY  Fan Drive Shaft Steering Control Lever	As Required				

\*For Arctic Operation Refer to FM 9-207

### NOTES

1. FAN DRIVE SHAFT. Every 150 hours, 1,500 miles, or semi-annually, lubricate fan drive shaft bearings with grease, GAA, through fittings at each end of shaft. Use grease gun with flexible adapter. Fittings are located behind front and rear fan drive shaft pulleys.

3. STEER CONTROL LEVER. Every 150 hours, 1,500 miles, or semi-annually, lubricate steering control lever shaft bearings with grease, GAA.

### CAUTION

**Use only OHA petroleum base hydraulic fluid. DO NOT use brake fluid. DO NOT overfill.**

**Do not attempt to grease pivot steer bleeder valves.**

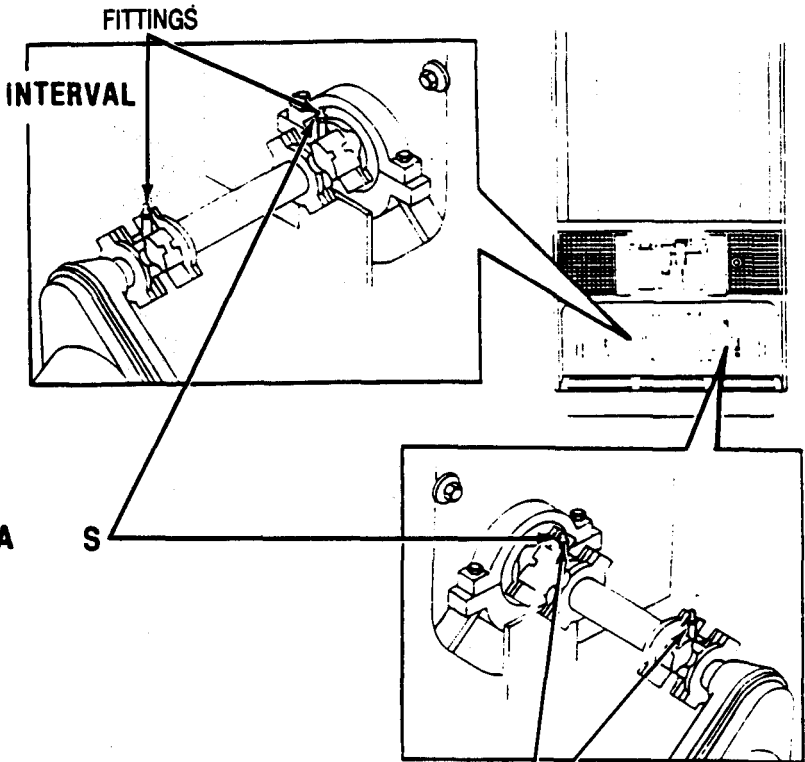
2. PIVOT STEER SYSTEM. Every 150 hours, 1,500 miles, or semi-annually, remove plugs and check fluid level in both master cylinders (TM 9-2350-247-20). Add fluid (OHA) as required to bring fluid within 1/2 to 3/4 inch from top of cylinder.

LUBRICANT • INTERVAL

Universal Joints  
(M548A3)  
(4 Fittings)  
(see notes 1,3 and 4)(0)

GAA

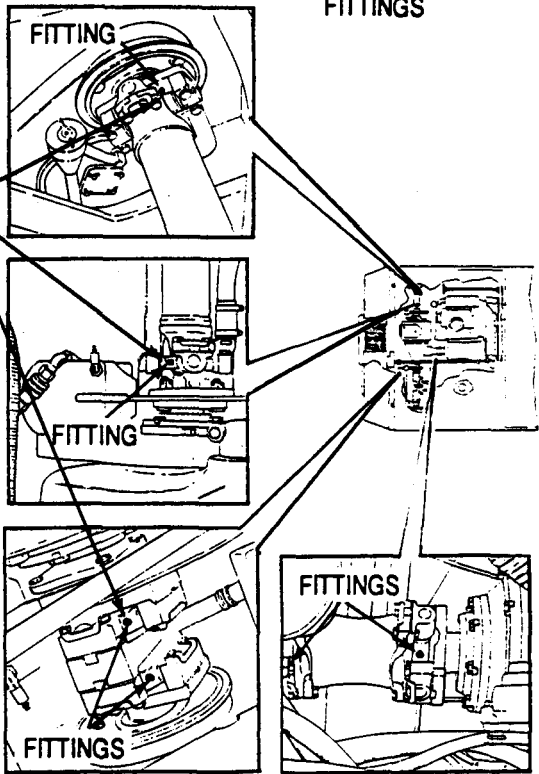
S



Universal Joints  
(M548A1/M1015A1)  
(see notes 2, 3 and 4) (0)

GAA

S



TOTAL MAN-HOURS	
INTERVAL	MAN-HR
S	0.4
S	0.7



# LUBRICATION ORDER

8 JULY 1994

# LO 9-2350-247-12

(Supersedes LO 9-2350-247-12, March 1982)

## KEY

LUBRICANT/COMPONENTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*		INTERVALS
			+5°F to +120°F	+40°F to -60°F	
GAA (MIL-G-10924)	GREASE, AUTOMOTIVE AND ARTILLERY  Tow Pintle and Universal Joint	As Required	All Temperatures		S - 150 Hours, 1,500 Miles or Semi-annually

\*For Arctic Operation Refer to FM 9-207

## NOTES

1. UNIVERSAL JOINTS (M548A3). Every 1,500 miles or semi-annually, lubricate four universal joints through four fittings with grease (GAA). Universal joints are on ends of propeller shafts.

2. UNIVERSAL JOINTS (M548A1/M1015A1). Every 1,500 miles or semi-annually, lubricate all universal joints and propeller shaft bearings with grease (GAA) (12 places). Each universal joint spider has two fittings, but only one of each pair of fittings requires lubrication.

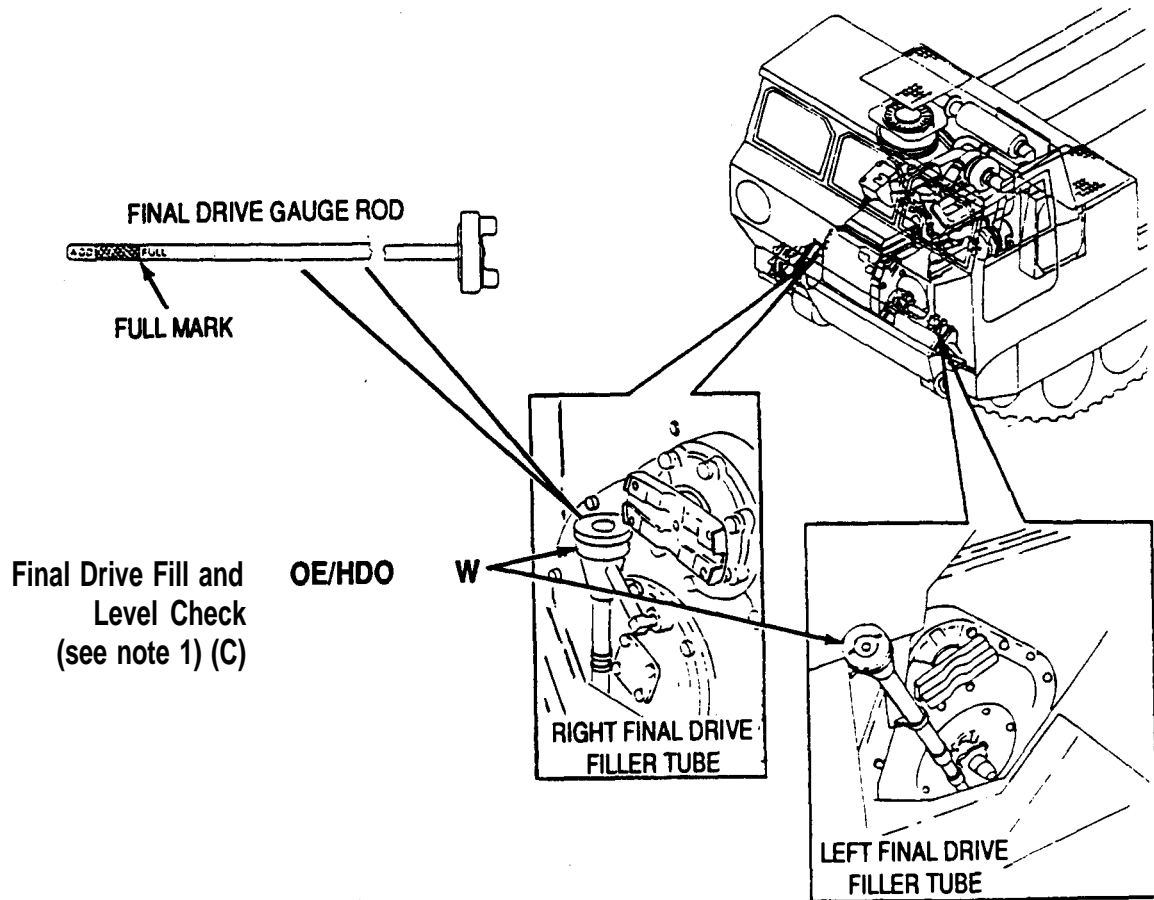
3. When grease fittings will not accept GAA, notify unit maintenance.

## WARNING

Dry cleaning solvent PD-680 is toxic and flammable. Death or injury may result. Always use in an open area with good air flow, away from sparks, heat, or flames. Wear protective goggles and gloves. Do not breathe vapors. Avoid contact with skin, eyes, and clothes. If you get dizzy while using solvent, breathe fresh air and get medical help. If solvent gets on hands, wash them. If solvent gets in eyes, flush eyes with fresh water and get medical help immediately. Keep fire extinguisher nearby.

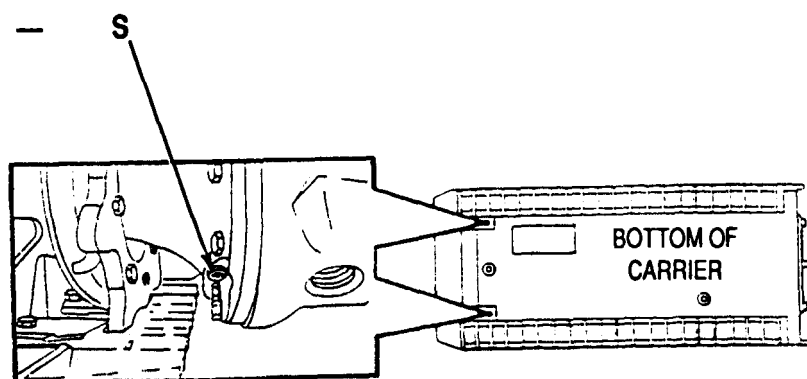
4. Clean grease fittings with dry cleaning solvent (PD-680, Type III, or equivalent) prior to lubrication. Check/lubricate grease fitting points after washing or fording.

# LUBRICANT • INTERVAL



Final Drive Drain —  
(see note 2) (O)

TOTAL MAN-HOURS	
INTERVAL	MAN-HR
W	0.2
S	0.5



# LUBRICATION ORDER

## 8 JULY 1994

# LO 9-2350-247-12

(Supersedes LO 9-2350-247-12, March 1982)

### KEY

LUBRICANTS/COMPONENTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*		INTERVALS
			+5°F to +120°F	+40°F to -60°F	
OE/HDO (MIL-L-2104D) OR OEA (MIL-L-46167D)	LUBRICATING OIL, INTERNAL COMBUSTION ENGINE  Final Drives	3.5 qt. or 7 pt.	OE/HDO-15/40	OEA	W - Weekly  S - Semi-annually or Every 1,500 Miles

\*For Arctic Operation Refer to FM 9-207

### NOTES

1. FINAL DRIVES. Weekly, check oil in both final drives for level between ADD and FULL marks on gauge rod. Add applicable OE/HDO or OEA in accordance with Temperature Key Chart, as required.

#### NOTE

**Drain only when hot after operation.**

**Do not substitute hydraulic fluid for OE/HDO or OEA. Red dye may have been added to some final drives to aid in detection of leaks.**

2. FINAL DRIVE OIL DRAIN. Drain final drives every 1,500 miles, or semi-annually.

- Place a suitable container under final drive housing.
- Remove drain plug from final drive housing and drain oil into container.

c. Inspect drain plugs and oil for metallic particles. If metal chips are found, notify direct support maintenance.

d. Clean and install drain plug.

e. Fill each final drive with OE/HDO or OEA, as applicable, adding the proper amount to bring level between the ADD and FULL marks on gauge rod.

# LUBRICANT • INTERVAL

## Idler Wheel Support **GAA**

Arm Bearings  
(2 places)  
(see note 1) (O)

S

FITTING

IDLER WHEEL  
SUPPORT ARM

## Road Wheel Support **GAA**

Arm Bearings  
(10 places)  
(see note 3) (O)

S

PLUG/RELIEF  
VALVE

ROAD WHEEL  
SUPPORT ARM

PLUG/FITTING

## Road Wheel and Idler **GAA**

Wheel Bearings  
(12 places)  
(see note 2) (O)

S

FITTING

ROAD WHEEL  
AND IDLER WHEEL

GREASE FILLED  
HUB

RELIEF  
VALVE

TOTAL MAN-HOURS	
INTERVAL	MAN-HR
S	1.4

# LUBRICATION ORDER

8 JULY 1994

# LO 9-2350-247-12

(Supersedes LO 9-2350-247-12, March 1982)

## KEY

LUBRICANTS/COMPONENTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*		INTERVALS
			+5°F to +120°F	+40°F to -60°F	
GAA (MIL-G-10924)	<b>GREASE, AUTOMOTIVE AND ARTILLERY</b>  Road and Idler Wheel Bearings Road and Idler Support Arm Bearings	As Required	All Temperatures		S - 150 Hours, 1,500 Miles or Semi-annually

\*1 For Arctic Operation Refer to FM 9-207

## NOTES

### WARNING

Dry cleaning solvent PD-680 is toxic and flammable. Death or injury may result. Always use in open area with good airflow, away from sparks, heat, or flames. Wear protective goggles and gloves. Do not breathe vapors. Avoid contact with skin, eyes, and clothes. If you get dizzy while using solvent, breathe fresh air and get medical help. If solvent gets on hands, wash them. If solvent gets in eyes, flush eyes with fresh water and get medical help immediately. Keep fire extinguisher nearby.

### NOTE

Clean grease fittings with dry cleaning solvent PD-680, Type III, or equivalent) prior to lubrication. Check/lubricate grease fitting points after washing or fording.

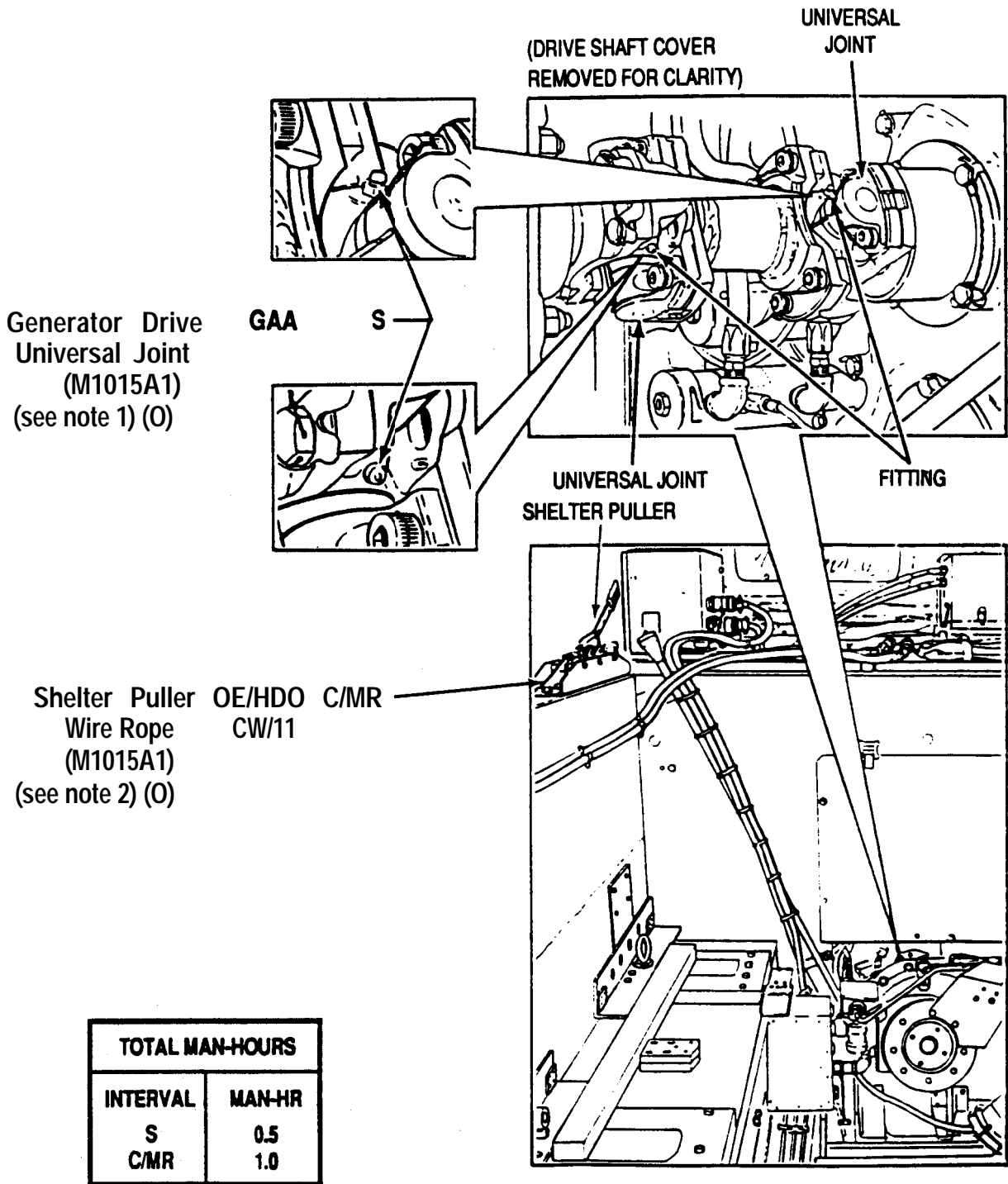
When grease fittings will not accept GAA, notify unit maintenance.

1. IDLER WHEEL SUPPORT ARM BEARINGS. Every 1,500 miles or semi-annually, lubricate idler wheel support arm bearings through fittings as follows: use grease gun with grease (GAA) on fitting at rear of support arm until grease appears at relief valve.

2. ROAD WHEEL AND IDLER WHEEL BEARINGS. Every 1,500 miles or semi-annually, lubricate each road wheel and idler wheel bearings as follows: use grease (GAA) and grease gun with flexible adapter. Lubricate hub through fitting until grease appears at relief valve.

3. ROAD WHEEL SUPPORT ARM BEARINGS. Every 1,500 miles or semi-annually, lubricate all road wheel support arm bearings. Use grease (GAA) and grease gun with flexible adapter on fitting until grease appears at relief valve. If support arm has plugs but no fittings, remove one plug and install fitting. Remove remaining plug and install relief valve. Perform lubrication. Remove fitting and relief valve. Clean and install two plugs.

LUBRICANT • INTERVAL



# LUBRICATION ORDER

8 JULY 1994

# LO 9-2350-247-12

(Supersedes LO 9-2350-247-12, March 1982)

## KEY

LUBRICANTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*			INTERVALS
			Above 32°F	+40°F to -10°F	0°F to -65°F	
OE/HDO (MIL-L-2104C) OR OEA (MIL-L-46167)	LUBRICATING OIL, INTERNAL COMBUSTION ENGINE Shelter, Puller Wire, Rope	As Required	OE/ HDO-10	OE/ HDO-10	OEA	S - Every 75 Hours on Engine Hour Meter, semi- annually  C/MR - Upon Contamination/ During Maintenance Repair
CW-11 (VV-L-751)	LUBRICATING OIL CHAIN-WIRE ROPE, EXPOSED GEAR Shelter, Puller Wire, Rope	As Required	CW-11B	CW-11A	GOS	
GAA (MIL-G-10924)	GREASE, AUTOMOTIVE AND ARTILLERY Generator Drive Universal Joint	As Required	All Temperatures			

\*For Arctic Operation Refer to FM 9-207

## NOTES

### WARNING

Disengage the engine disconnect (TM 9-2350-247-10) before greasing generator drive universal joints.

1. GENERATOR DRIVE UNIVERSAL JOINT (2 places). Every 75 hours on engine hour meter (on carrier instrument panel tachometer) or semi-annually, remove drive shaft cover (TM 9-2350-247-20) and lubricate. Each universal joint has two fittings, but only one requires lubrication. Reinstall drive shaft cover (TM 9-2350-247-20).

### WARNING

Use gloves when handling wire rope. Bare hands can be cut by broken strands.

### NOTE

If M1015A1 carrier has a shelter installed, it may be necessary (depending on the type of shelter) to slide shelter back on skid guides (see M1015A1 portion of TM 9-2350-247-10) for access to some lubrication points.

2. SHELTER PULLER WIRE ROPE. Service only when contaminated after use or during maintenance repair. Pay out wire rope from ratchet drum. Clean wire rope with oil (OE/HDO), wipe off excess oil, and coat with oil (CW-11). Ratchet in wire rope.

# LUBRICANT • INTERVAL

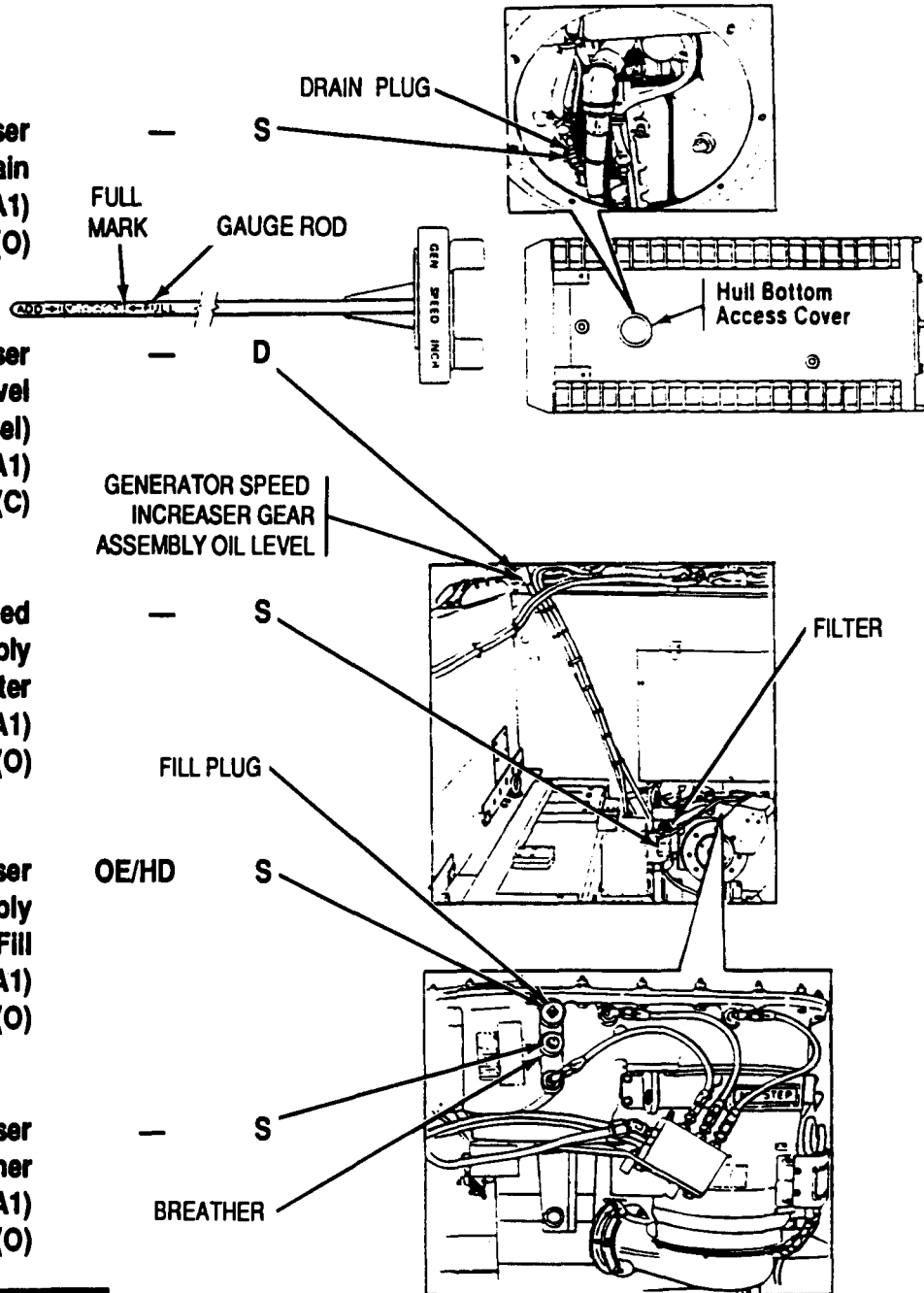
**Generator Speed Increaser  
Gear Assembly Oil Drain  
(M1015A1)  
(see note 1) (O)**

**Generator Speed Increaser  
Gear Assembly Oil Level  
(Check Level)  
(M1015A1)  
(see note 1) (C)**

**Generator Speed  
Increaser Gear Assembly  
Oil Filter  
(M1015A1)  
(see note 2) (O)**

**Generator Speed Increaser  
Gear Assembly  
Oil Fill  
(M1015A1)  
(see note 1) (O)**

**Generator Speed Increaser  
Gear Assembly Breather  
(M1015A1)  
(see note 3) (O)**



TOTAL MAN-HOURS	
INTERVAL	MAN-HR
S	2.0
D	0.2
S	0.3
S	0.4
S	0.2



# LUBRICATION ORDER

8 JULY 1994

# LO 9-2350-247-12

(Supersedes LO 9-2350-247-12, March 1962)

## KEY

LUBRICANTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*			INTERVALS
			Above 32°F	+40°F to -10°F	0°F to -65°F	
OE/HDO (MIL-L-2104C) OR OEA (MIL-L-46167)	LUBRICATING OIL, INTERNAL COMBUSTION ENGINE  Generator Speed Increaser Gear Assembly	4 qt.	OE/ HDO-30	OE/ HDO-10	OEA	D - Daily  S - Every 200 hours on generator ETI meter (see TM 9-2350-247-10) or semi-annually

\*For Arctic Operation Refer to FM 9-207

## NOTES

1. GENERATOR SPEED INCREASER GEAR ASSEMBLY. Daily check generator speed increaser gear assembly oil level for between ADD and FULL marks on gauge rod. Add oil (OE/HDO) through dipstick tube as necessary. Every 200 hours on generator ETI meter (TM-2350-247-10) or semi-annually drain generator speed increaser gear assembly oil. To drain, remove hull bottom access cover (TM 9-2350-247-20) and speed increaser drain plug. Inspect oil being drained for metallic particles. If metal chips are found in oil, notify your supervisor. Clean and install drain plug. Service oil filter and breather (see Notes 2 and 3). To fill, remove plug with preformed packing and add oil (OE-HDO) (refill capacity about 4 quarts) to bring level between ADD and FULL marks on gauge rod. Discard packing. Clean fill plug, apply coat of antiseize compound to plug threads, position new preformed packing on lu and install plug. Run carrier en ine and check for leaks at filter and at drain plug. INSTALL BOTTOM ACCESS COVER SECURELY.

### WARNING

Dry cleaning solvent PD-680 is toxic and flammable. Death or injury may result. Always use in an open area with good air flow, away from sparks, heat, or flames. Wear protective goggles and gloves. Do not breathe vapors. Avoid contact with skin, eyes, and clothes. If you get dizzy while using solvent, breathe fresh air and get medical help. If solvent gets on hands, wash them. If solvent gets in eyes, flush eyes with fresh water and get medical help immediately. Keep fire extinguisher nearby.

2. GENERATOR SPEED INCREASER GEAR ASSEMBLY FILTER. Every 200 hours on generator ETI meter (TM 9-2350-247-10) or semi-annually during oil change, replace filter element. Remove locking wire, cover, filter element, and two preformed packings (see M1015A1 portion of TM 9-2350-247-20). Discard locking wire, element, and packings. Clean inside of cover with dry cleaning solvent (PD-680, type III) and install two new packings and new element. Install filter cover and new locking wire. After filling generator speed increaser gear assembly (see Note 1), check for oil leaks with engine operating.

3. GENERATOR SPEED INCREASER GEAR ASSEMBLY BREATHER. Every 200 hours on generator ETI meter (TM 9-2350-247-10) or semi-annually, during oil change, clean breather. Remove breather, clean with dry cleaning solvent (PD-680, type III), apply coat of sealing compound\* to breather threads, and install breather.

### NOTE

If M1015A1 carrier has a shelter on it, it may be necessary (depending on the type of shelter) to slide shelter back on skid guides for access to some lubrication points (see M1015A1 portion of TM 9-2350-247-10).

\* Use sealing compound - 8030-00-543-4384 antiseize compound - 8030-00-286-5453, or Permallex - 5330-00-252-3391.

# LUBRICANT INTERVAL (M548A1/M1015A1)

Winch End Frame Level  
(see note 2) GO

Winch End Frame Drain  
(see note 2)

Winch Wire Rope OE/HDO  
(see note 4) CW/II

Winch End Frame Fill GO

Winch Gear Box Fill GO

Winch Gear Box Level GO

Winch Gear Box Drain  
(see note 3)

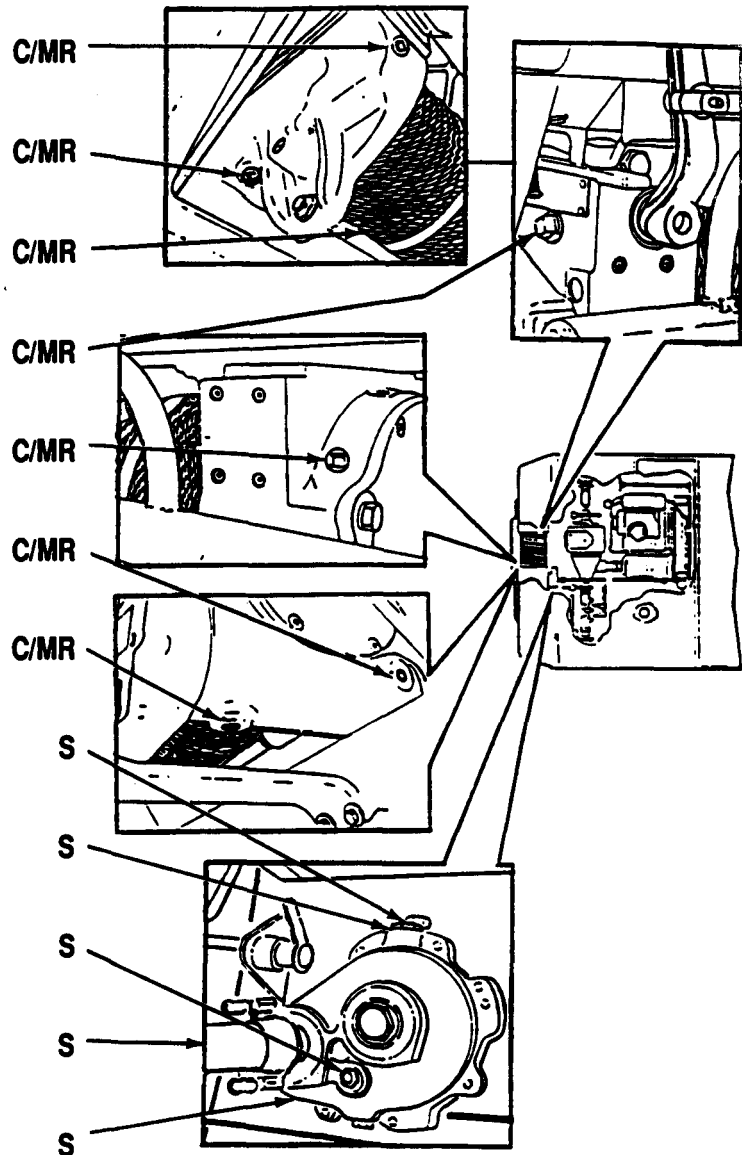
Winch Transfer Gearcase  
Breather  
(see note 1)

Winch Transfer Gearcase  
Fill (see note 1) OE/HDO

Winch Transfer Gearcase  
Level (see note 1) OE/HDO

Winch Drive Shaft  
(Lubricate) (3 places) GAA

Winch Transfer Gearcase  
Drain (see note 1)



TOTAL MAN-HOURS	
INTERVAL	MAN-HR
C/MR	1.9
S	0.2
S	0.4
S	0.2
S	0.2
S	0.5

# LUBRICATION ORDER

8 JULY 1994

# LO 9-2350-247-12

(Supersedes LO 9-2350-247-12, March 1982)

## KEY

LUBRICANTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*			INTERVALS
			Above 32°F	+40°F to -10°F	0°F to -65°F	
OE/HDO (MIL-L-2104C) OR OEA (MIL-L-46167)	LUBRICATING OIL INTERNAL COMBUSTION ENGINE Winch Transfer Gearcase	1/4 pt.	OE/ HDO-10	OE/ HDO-10	OEA	S - 150 Hours, 1,500 Miles or Semi-annually  C/MR - Upon Contamination/ During Maintenance Repair
CW-11 (VV-L-751)	LUBRICATING OIL CHAIN-WIRE ROPE, EXPOSED GEAR	As Required	CW-11B	CW-11A	GOS	
GO (MIL-L-2105)	LUBRICATING OIL GEAR, MULTIPURPOSE Winch End Frame Winch Gear Box	0.75 pt. 2.75 pt.	GO- 80/90	GO- 80/90	GO-75	
GAA (MIL-G-10924)	GREASE, AUTOMOTIVE AND ARTILLERY Winch Drive Shaft	As Required	All Temperatures			

\*For Arctic Operation Refer to FM 9-207

## NOTES

### WARNING

**Dry cleaning solvent PD-680 is toxic and flammable. Death or injury may result. Always use in an open area with good air flow, away from sparks, heat, or flames. Wear protective goggles and gloves. Do not breathe vapors. Avoid contact with skin, eyes, and clothes. If you get dizzy while using solvent, breathe fresh air and get medical help. If solvent gets on hands, wash them. If solvent gets in eyes, flush eyes with fresh water and get medical help immediately. Keep fire extinguisher nearby.**

1. WINCH TRANSFER GEARCASE (M548A1/M1015A1). Every 1,500 miles or semi-annually, drain and refill winch transfer gearcase. To drain, remove drain plug in bottom of gearcase housing. Inspect plug and oil for metallic particles. If found, notify your supervisor. Clean plug, apply a coat of sealing compound\* to plug

threads, and install plug. To fill, remove fill and level plugs and add oil (OE/HDO) until oil level reaches bottom of level plug hole (refill capacity 1/4 pint). Clean plugs, apply a coat of sealing compound\* to plug threads, and install plugs. During oil change, unscrew gearcase breather and clean with dry cleaning solvent (PD-680, type III). Apply a light coat of sealing compound\* to breather threads and install breather.

2. WINCH END FRAME (M548A1/M1015A1). Service only when contaminated or during maintenance repair. Drain and refill winch end frame. To drain, remove plug in bottom of end frame. Inspect plug and oil for metallic particles. If found, notify your supervisor. Clean plug, apply a coat of sealing compound\* to plug threads, and install plug. To fill, remove fill and level plugs, and add gear lubricant (GO) until lubricant reaches bottom of level plug hole (refill capacity 3/4 pint). Clean plugs, apply a coat of sealing compound\* to plug threads, and install threads.

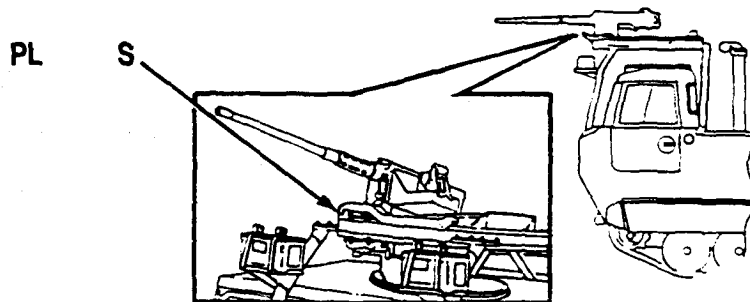
\* Use sealing compound - 8030-00-543-4384 antiseize compound - 8030-00-286-5453, or Permatex - 5330-00-252-3391.

3. WINCH GEAR BOX (M548A1/M1015A1). Service only when contaminated or during maintenance repair. Drain and refill winch gear box. To drain, remove plug in bottom of gear box. Inspect plug and oil for metallic particles. If found, notify your supervisor. Clean plug, apply a coat of sealing compound\* to plug threads, and install plug. To fill, remove fill and level plugs and add gear lubricant (GO) until lubricant reaches bottom of level plug hole (refill capacity 2 3/4 pints). Clean plugs, apply a coat of sealing compound\* to plug threads, and install plugs. On M1015A1 carriers, it will be necessary to remove ground rod stowage box (TM 9-2350-247-20) before draining winch gear box.

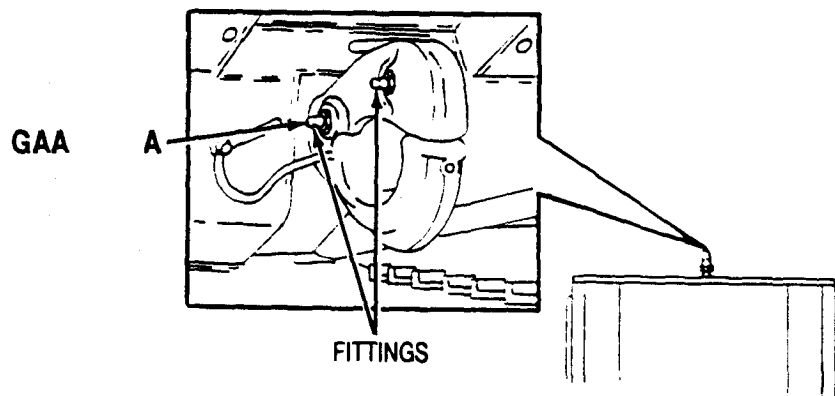
4. WINCH WIRE ROPE (M548A1/M1015A1). Service only when contaminated after use or during maintenance repair. Pay out winch wire rope from drum. Clean wire rope with oil (OE/HDO), wipe off excess oil, and coat with oil (CW-11). Reel in wire rope.

### LUBRICANT • INTERVAL

**Machine Gun Mount**  
(Clean with dry cleaning solvent; oil all moving parts)(see note 1) (O)



**Towing Pintle**  
(2 Fittings)  
(see note 1) (O)



\* Use sealing compound - 8030-00-543-4384 antiseize compound - 8030-00-286-5453, or Permatex - 5330-00-252-3391.

# LUBRICATION ORDER

8 JULY 1994

# LO 9-2350-247-12

(Supersedes LO 9-2350-247-12, March 1982)

## KEY

LUBRICANTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*			INTERVALS
			Above 32°F	+40°F to -10°F	0°F to -65°F	
PL-M (MIL-L-3150)	LUBRICATING OIL, GENERAL PURPOSE Medium	As Required				AN - Annually or Every 1,500 Miles  S - 150 Hours, 1,500 Miles or Semi-annually
PL-S (VV-L-800)	LUBRICATING OIL, GENERAL PURPOSE Special Machine Gun Mount	As Required	PL-M	PL-S	PL-S	
*CLP (MIL-L-63460)	CLEANER, LUBRICANT AND PRESERVATIVE	As Required	CLP	CLP	CLP	
GAA (MIL-G-10924)	GREASE AUTOMOTIVE AND ARTILLERY Towing Pintle	As Required	All Temperatures			

\*For Arctic Operation Refer to FM 9-207

## NOTES

1. \*CLP is an alternate for PL-M and PL-S.

### WARNING

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### NOTE

Clean grease fittings with dry cleaning solvent (PD-680, Type III, or equivalent) prior to lubrication. Check/lubricate grease fitting points after washing or fording.

### NOTE

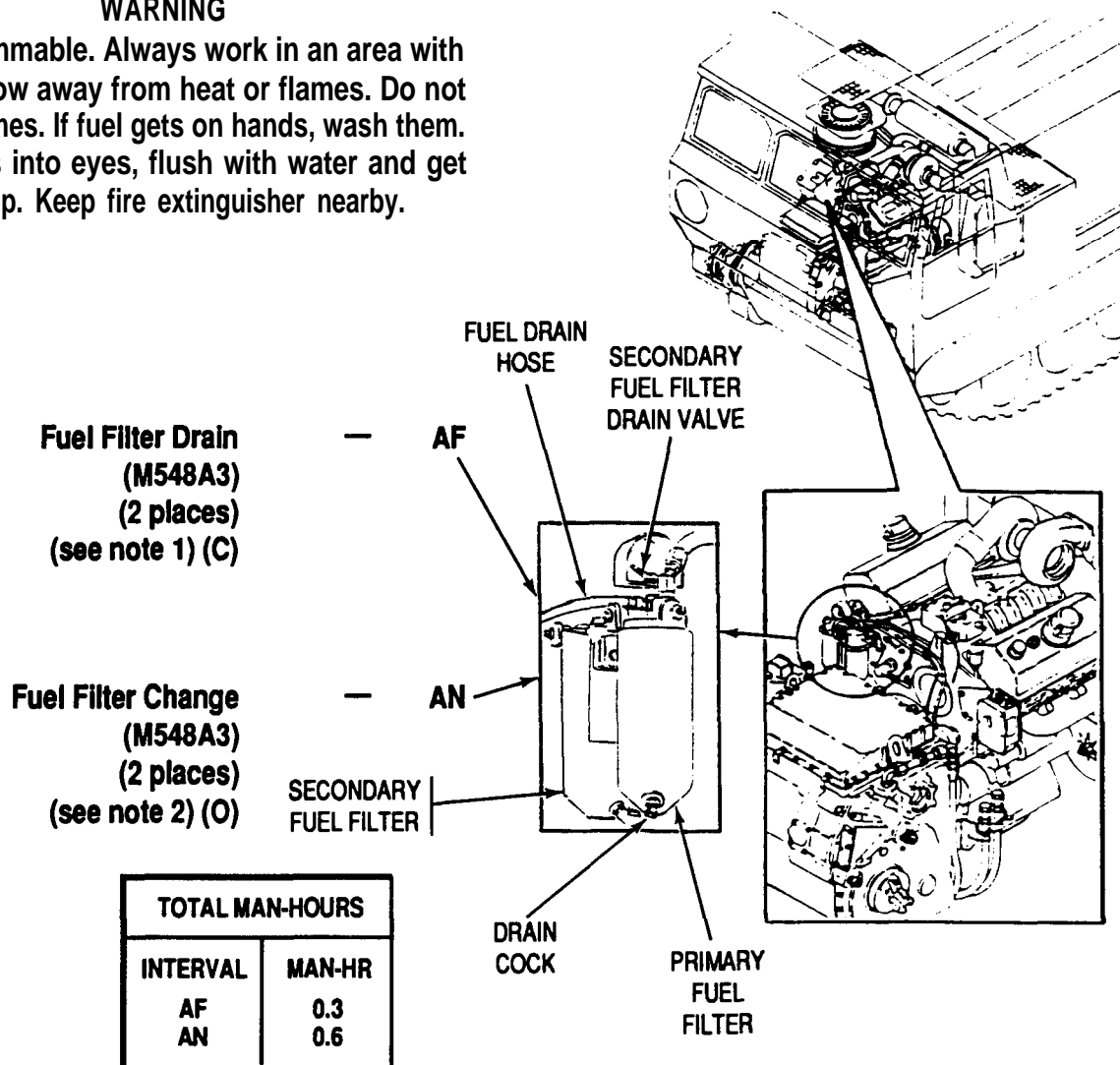
Late model towing pintles do not have grease fittings and do not require lubrication.

2. TOWING PINTLE. Every 1,500 miles or annually, lubricate pintle through two fittings with grease (GAA). Towing pintle is at rear of carrier.

## LUBRICANT • INTERVAL

### WARNING

Fuel is flammable. Always work in an area with good air flow away from heat or flames. Do not breathe fumes. If fuel gets on hands, wash them. If fuel gets into eyes, flush with water and get medical help. Keep fire extinguisher nearby.



### NOTES

1. FUEL FILTER DRAIN. After operation, drain water and sediment from primary and secondary fuel filter.

2. FUEL FILTER CHANGE. Every 1,500 miles or annually replace primary and secondary fuel filter elements.

# LUBRICATION ORDER

8 JULY 1994

# LO 9-2350-247-12

(Supersedes LO 9-2350-247-12, March 1982)

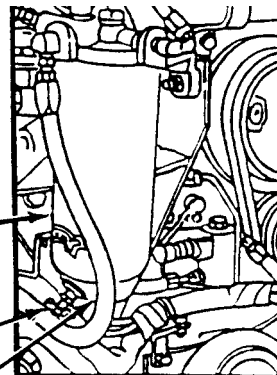
## LUBRICANT • INTERVAL

### WARNING

Fuel is flammable. Always work in area with good air flow away from heat or flames. Do not breathe fumes. If fuel gets on hands, wash them. If fuel gets into eyes, flush with water and get medical help. Keep fire extinguisher nearby.

SECONDARY  
FUEL FILTER  
(M548A1/M1015A1)

DRAIN  
COCK

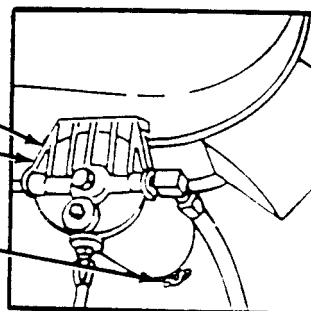


Fuel Filter  
(M548A1/M1015A1)  
(2 places)  
(see note 1, 2) (C)

— AF, AN

PRIMARY  
FUEL FILTER  
(M548A1/M1015A1)

PRIMARY  
FUEL FILTER  
DRAIN COCK  
(M548A1/M1015A1)

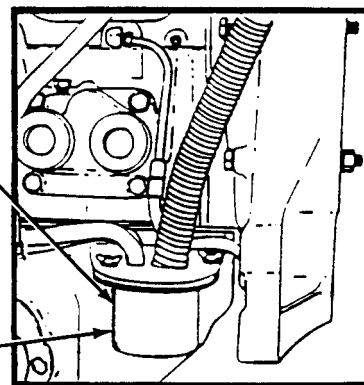


Air Box Drain  
(M548A1/M1015A1)  
(see note 3) (C)

— W

TOTAL MAN-HOURS	
INTERVAL	MAN-HR
AF	0.3
AN	0.6
W	0.6

Air Box Drain



# KEY

FUEL CHART/COMPONENTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURES*			INTERVALS
			Above 32°F	+40°F to -10°F	0°F to -65°F	
Diesel Fuel VV-F-800 Fuel Filter		2 qt.	DF-2	DF-1	DF-A	AF - After AN - Every 1,500 Miles or annually

\*If For Arctic Operation Refer to FM 9-207

## NOTES

1. FUEL FILTERS. Daily, after operation, open drain cocks and drain water, debris, etc. from each filter until clear fuel is flowing into container. Dispose of waste through Unit SOP.

2. On M1015A1 carriers, lift up and secure center seat support panel to access primary fuel filter drain cock.

## WARNING

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3. AIR BOX DRAIN/CRANCKCASE BREATHER COLLECTION CAN (M548A1/M1015A1). Weekly, remove wing nuts. Lower can slowly to remove. Empty can, dispose of contents per Unit SOP, and reinstall (TM 9-2350-247-10). Every 25 hours, 250 miles, or monthly, empty can and remove element. Clean element and inside of can with dry cleaning solvent (PD-680, type III) and reinstall.

4. OIL CAN POINTS. Every 1,500 miles, semi-annually, or as required, lubricate tailgate hinges, cargo door hinges, and driver's throttle control linkage pins and shafts, and seat control.

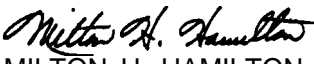
5. LUBRICATED AT TIME OF ASSEMBLY. Coat ends of suspension torsion bar, idler wheel support arm spindle and bearings, steering control linkage bearing surfaces and pins, and towing pintle shaft with GAA or GIA as specified during assembly. Late model towing pintles do not have grease fittings and do not require lubrication. Pack new support arm and idler hub before assembly.

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  
07303

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## THE METRIC SYSTEM AND EQUIVALENTS

### LENGTH MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches  
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches  
 1 Kilometer = 1000 Meters = 0.621 Miles

### WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces  
 1 Kilogram = 1000 Grams = 2.2 lb.  
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

### LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces  
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

### SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches  
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet  
 1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

### CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches  
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

### TEMPERATURE

$5/9(^{\circ}\text{F} - 32) = ^{\circ}\text{C}$   
 212° Fahrenheit is equivalent to 100° Celsius  
 90° Fahrenheit is equivalent to 32.2° Celsius  
 32° Fahrenheit is equivalent to 0° Celsius  
 $9/5^{\circ}\text{C} + 32 = ^{\circ}\text{F}$

### APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Quarts	Liters	0.473
Gallons	Liters	0.946
Ounces	Liters	3.785
Pounds	Grams	28.349
Short Tons	Kilograms	0.454
Pound-Feet	Metric Tons	0.907
Pounds per Square Inch	Newton-Meters	1.356
Miles per Gallon	Kilopascals	6.895
Miles per Hour	Kilometers per Liter	0.425
	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Grams	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621

