

**LUBRICATION ORDER****LO 9-2320-289-12**1 May 1992 (Supersedes LO 9-2320-289-12,  
dated 16 June 1986)

**TRUCK, CARGO, TACTICAL, 1-1/4 TON, 4X4, M1008**  
(2320-01-123-6827)

**TRUCK, CARGO, TACTICAL, 1-1/4 TON, 4X4, M1008A1**  
(2320-01-123-2671)

**TRUCK, UTILITY, TACTICAL, 3/4 TON, 4X4, M1009**  
(2320-01-123-2665)

**TRUCK, AMBULANCE, TACTICAL, 1-1/4 TON, 4X4, M1010**  
(2310-01-123-2666)

**TRUCK, SHELTER CARRIER, TACTICAL, 1-1/4 TON, 4X4, M1028**  
(2320-01-127-5077)

**TRUCK, SHELTER CARRIER W/PTO, TACTICAL, 1-1/4 TON, 4X4, M1028A1**  
(2320-01-158-0820)

**TRUCK, SHELTER CARRIER W/PTO, TACTICAL, 1-1/4 TON, 4X4, M1028A2**  
(2320-01-295-0822)

**TRUCK, SHELTER CARRIER, TACTICAL, 1-1/4 TON, 4X4, M1028A3**  
(2320-01-325-1937)

**TRUCK, CHASSIS, TACTICAL, 1-1/4 TON, 4X4, M1031**  
(2320-01-133-5368)

**Reference: TM 9-2320-289-10 and TM 9-2320-289-20**

Intervals (on-condition or hard time) and the related man-hour times are based on normal operation. Reduce the hard time interval if your lubricants are contaminated or if you are operating the vehicle under adverse 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. While the vehicle is under warranty, hard time engine oil change intervals may not be extended. The man-hour time specified is the time you need to do all the services prescribed for a certain interval. Park

truck on most level ground possible to check oil levels. Clean fittings with dry, lint free cloth before lubricating. Relubricate after fording operations. Use only approved lubricants.

The level of maintenance for lubricating requirements is indicated at note reference by (C) for Crew/ Operator and (O) for Organizational Maintenance. Broken arrow shafts (- - -) indicate lubrication points on both sides of vehicle.

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

(Army) You can help improve this Lubrication Order. 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, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MB, Warren, MI 48397-5000. (Marine Corps) Submit NAVMC 10772 to the Commanding General, Marine Corps Logistic Base (Code 850), Albany, GA 31704. A reply will be furnished to you.

**Approved for public release; distribution is unlimited.**

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LO 9-2320-289-12

CARD 1 OF 9

## — KEY —

LUBRICANTS	CAPACITIES	EXPECTED TEMPERATURES			INTERVALS
		Above +32°F (Above 0°C)	+40°F to -10°F (+4°C to -23°C)	0°F to -10°F (-18°C to -23°C)	
Dexron® II Hydraulic Fluid NSN 9150-00-698-2382  Transmission: Service Filter  Transfer Case	 4.0 qt (3.8 l)  5.0 qt (4.7 l)	ALL TEMPERATURES			FOR ARCTIC OPERATION, REFER TO FM 9-207  D: Daily  W: Weekly  M: Monthly or 1000 Miles  S: 6 Months or 6000 Miles  A: 12 Months or 12,000 Miles  B: 24 Months or 24,000 Miles
GO (MIL-L-2105) Hydraulic Fluid, Gear, Multipurpose  Differential: Front  Rear	  4.5 pt (2.1 l)  5.4 pt (2.6 l)	GO 80/90		GO 75	
Differential Additive (NSN 9150-01-198-3829)  M1028, M1028A1, M1028A2, M1028A3, and M1031 Front Differential	  4 oz (113.4 g)	ALL TEMPERATURES			
BFS (MIL-B-46176) Brake Fluid, Silicone, Automotive, All Weather Operational and Preservative  Brake System and Master Cylinder	  As Req'd	ALL TEMPERATURES			
Dexron® II Power Steering Fluid (NSN 9150-00-698-2382)  Power Steering System and Pump Reservoir	  As Req'd	ALL TEMPERATURES			
GAA (MIL-G-10924) Grease, Automotive and Artillery  Steering Linkage  Constant Velocity Joint  Front Propeller Shaft Slip Joint  Front Wheel Bearings  Parking Brake Cable Guide  Brake Pedal Spring  Tow Pintle	  As Req'd  As Req'd  As Req'd  As Req'd  As Req'd  As Req'd	ALL TEMPERATURES			

FOR ARCTIC OPERATION, REFER TO FM 9-207

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## — KEY —

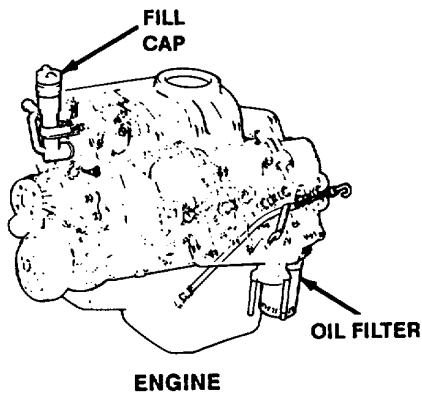
LUBRICANTS	CAPACITIES	EXPECTED TEMPERATURES			
		+125°F to +60°F (+52°C to +16°C)	+100°F to +5°F (+38°C to -15°C)	+40°F to -25°F (+4°C to -32°C)	+10°F to -50°F (-12°C to -46°C)
OE/HDO (MIL-L-2104D) Lubricating Oil, ICE, Tactical  OEA (MIL-L-46167) Lubricating Oil, ICE, Arctic  Oil Can Points Crankcase (w/filter)	7 qt (6.6 l)	OE/HDO 30	OE/HDO 15W 40	OE/HDO 10	MIL-L-46167
Antifreeze, Ethylene Glycol Inhibited, Heavy-duty (MIL-A-46153) Cooling System	25 qt (23.7 l)	ALL TEMPERATURES			
Cleaning Compound (O-C-1901) Windshield Washer	2 qt (1.9 l)	To -20°F			

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## LUBRICANT • INTERVAL

**Crankcase Oil Filter**  
Can (Drain and Fill)  
(See Note 2) (O)

OE/HDO S



**Oil Filter**  
(Replace at Oil  
Change)  
(See Note 2) (O)

**Coolant Recovery  
Tank (Check/Maintain  
Coolant)** (See Note 3)  
(C)

COOLANT

D

**COOLANT  
RECOVERY  
TANK**

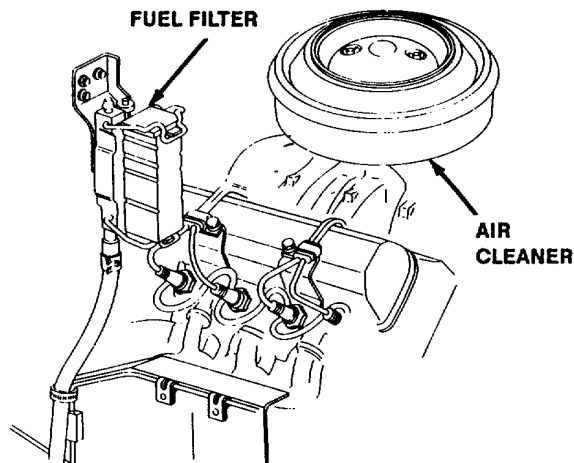
**Windshield Cleaner  
Jar (Check/Maintain  
Fluid)** (See Note 4)  
(C)

FLUID M

**WINDSHIELD  
CLEANER  
JAR**

**FUEL FILTER**

**Fuel Filter**  
(Replace Fuel Filter)  
(See Note 5)



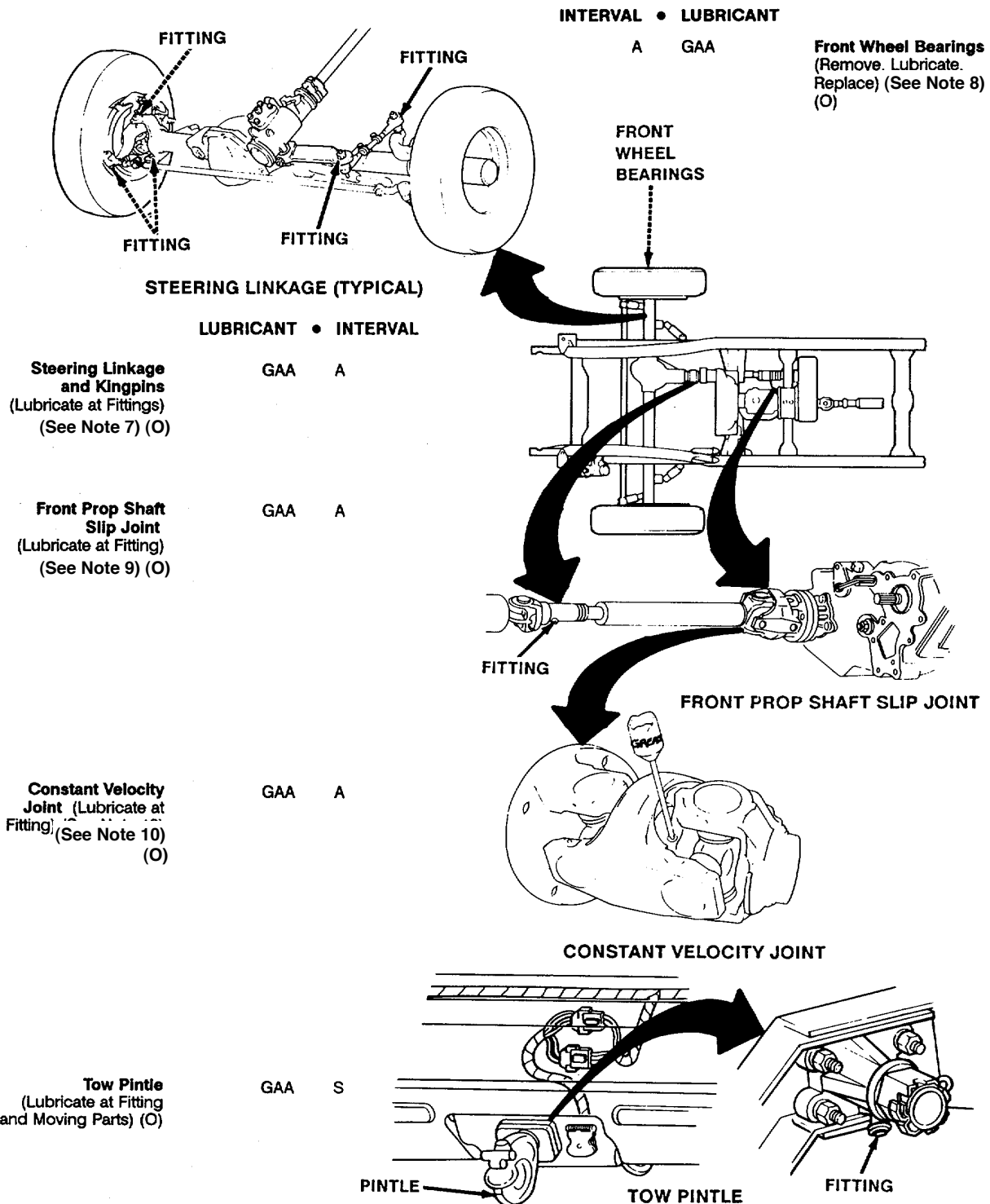
**AIR  
CLEANER**

**Air Cleaner**  
(Replace Filter  
Element) (See Note 6)  
(O)

## FUEL FILTER AND AIR CLEANER

## TOTAL MAN-HOURS\*

INTERVAL	MAN-HOURS
D	0.1
S	0.5
M	0.1
A	0.4



## TOTAL MAN-HOURS\*

INTERVAL	MAN-HOURS
S	0.3
A	1.2

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

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**LUBRICANT • INTERVAL**

**Front Differential**  
(Check/Maintain Oil)  
(See Note 12) (O)

GO A

FILLER  
PLUG

**FRONT DIFFERENTIAL**

**Front Differential**  
(Drain/Refill)  
(See Note 12) (O)

GO B

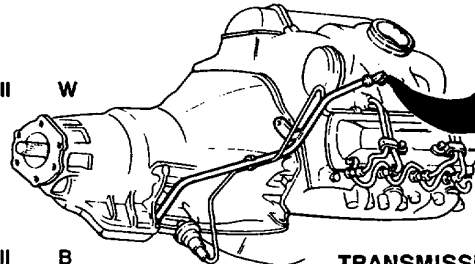
COOL



WARM

**Transmission**  
(Check/Maintain  
Fluid Level)  
(See Note 13) (O)

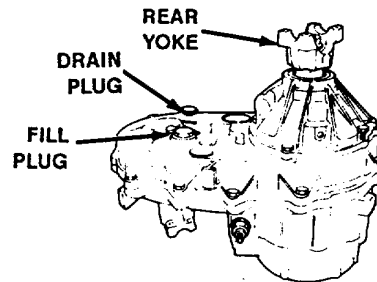
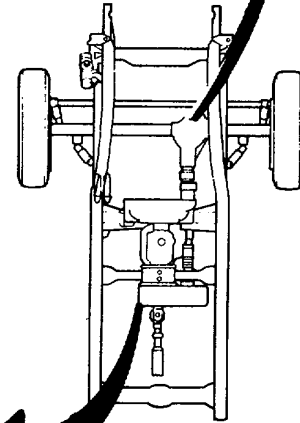
DEXRON® II W



**TRANSMISSION**

**Transmission**  
Fluid and Filter  
(Change) (O)

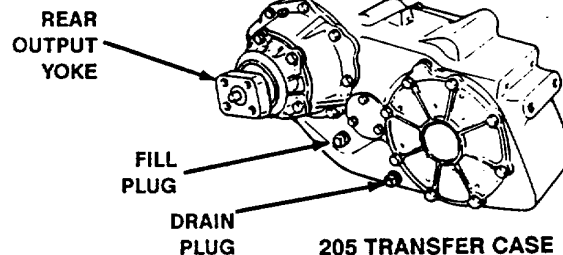
DEXRON® II B



**208 TRANSFER CASE**

**Transfer Case**  
(205 and 208)  
(Check/Maintain  
Fluid Level)  
(See Note 14) (O)

DEXRON® II A



**205 TRANSFER CASE**

**TOTAL MAN-HOURS\***

INTERVAL		MAN-HOURS	CARD 6 OF 9
W		0.1	
A		0.5	
B		0.5	

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

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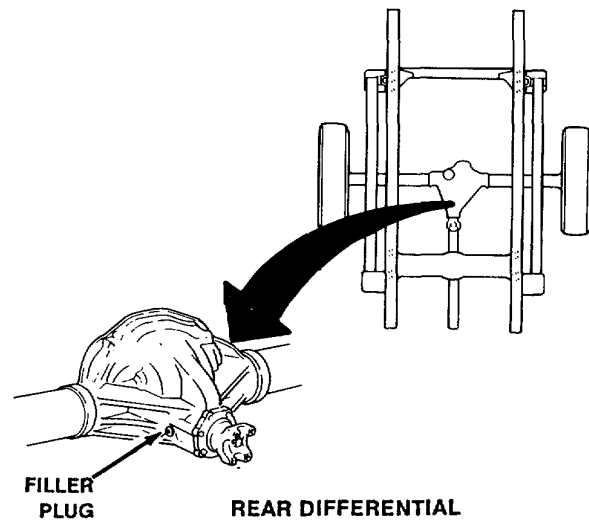
**LUBRICANT • INTERVAL**

**Rear Differential**  
(Check/Inspect) (C)  
(See Note 12) (O)

GO A

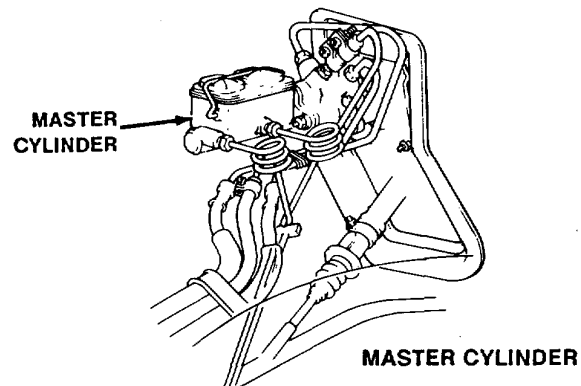
**Rear Differential**  
(Check/Inspect) (C)  
(See Note 12) (O)

GO B



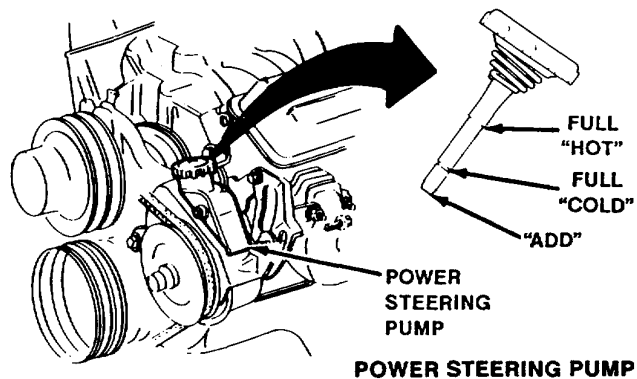
**Master Cylinder**  
(Check/Maintain) (C)  
(See Note 15) (C)

BFS M



**Power Steering Pump and Reservoir**  
(See Note 16) (C)  
Fluid Level  
(See Note 16) (C)

DEXRON® II W

**TOTAL MAN-HOURS\*****INTERVAL****MAN-HOURS**

W

0.1

M

0.1

A

0.5

B

0.5

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time required to perform all services at the particular interval (on-condition or hard tire)

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CARD 7 OF 9

**NOTES:**

**1. OIL CAN POINTS.** Semiannually, or as required, lubricate door hinge pins, hood hinges, hood latch assembly, tailgate hinge and linkage, fuel door hinge, trailer coupling cover, transmission and transfer case linkage, rear pintle hook, and accelerator linkage with OE/HDO. DO NOT lubricate accelerator cable.

**2. ENGINE OIL AND FILTER.****CAUTION**

**After checking or changing oil, ensure that the dipstick is pushed all the way in or oil may be pulled up the dipstick and leak out.**

Change engine oil and filter every six months or 6000 miles. When directed by the oil analysis laboratory, the oil and filter may be changed more frequently. However, while the vehicle is under warranty, hard time intervals may not be extended. When operating under unusual conditions, change the oil and filter at 3 month intervals or 3000 miles. Refer to TM 9-2320289-20 for oil and filter change instructions.

**3. ENGINE COOLANT.****WARNING**

**DO NOT remove radiator cap when system is hot or personnel may be injured.**

Check coolant level before operation by looking at coolant recovery tank. Level should be at or slightly above the FULL "COLD" arrow. If coolant is below the arrow, add a 50/50 mixture of ethylene glycol and water to the recovery tank until the level is at the FULL "COLD" arrow. At temperatures below -10°F (-230C), change the coolant mixture to 65% ethylene glycol and 35% water. Every 2 years or 24,000 miles, drain, flush, and refill system with new coolant (refer to TM 9-2320-289-20).

**4. WINDSHIELD CLEANER.** Check monthly and fill washer jar with cleaning compound. In winter, maintain bottle at no more than X full. If vehicle is going to operate for a long period of time in temperatures below -20°F (-290C), drain washer system and do not use.

**5. FUEL FILTER.** Replace fuel filter at annual intervals or when STF/ICE indicates there is a pressure drop of 6 inches Hg or more. Refer to TM 9-2320-289-20 for filter removal and replacement instructions.

**6. AIR CLEANER.** Change air filter element annually or at 12,000 miles. If vehicle is operating under unusual conditions, change filter more frequently. Refer to TM 9-2320-289-10 for filter removal and replacement instructions.

**7. STEERING LINKAGE.** Lubricate every 12 months or 12,000 miles. Lubricate tie-rod ends, connecting rod, and kingpins at fittings (M1009 ball joints do not require lubrication). When driving in dust, mud, or off-road, lubricate every 2 months or 3000 miles. Lubricate with GAA.

**8. FRONT WHEEL BEARINGS.** Annually, remove, clean, dry, repack, and install front wheel bearings. Lubricate wheel bearings with GAA.

**9. FRONT PROPELLER SHAFT SLIP JOINT.** Every 12 months or 12,000 miles, lubricate front propeller shaft at fitting with GAA.

**10. CONSTANT VELOCITY JOINT.** Every 12 months or 12,000 miles, lubricate constant velocity (CV) joint with GAA. Clean fitting before lubrication. Use a needle point greaser to inject grease into the fitting. If the fitting cannot be seen from beneath the vehicle, the fitting may be lubricated from above the CV joint by attaching the needle point greaser to the end of a flex hose.

**11. PARKING BRAKE CABLE GUIDES AND BRAKE PEDAL SPRING.** Semiannually, lubricate the hook shaped parking cable guide (located on the inside of the frame, driver's side, forward of the parking brake equalizer). Semiannually, lubricate the service brake pedal spring located at the upper end of the foot pedal assembly. Lubricate with GAA.

**12. DIFFERENTIALS.** Every 12 months or 12,000 miles, operate vehicle 2 to 3 miles to ensure that differential has reached normal operating temperature, fill to level of filler plug hole with lubricant. Lubricate with GO lubricating oil. Every 24 months or 24,000 miles, drain and refill with clean GO lubricating oil. For drain and refill of M1028, M1028A1, M1028A2, M1028A3, and M1031 front axles, 4 ounces of additive (NSN 9150-01-198-3829) must be added to lubricant. Refer to TM 9-2320-289-20 for drain and refill procedures.

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## NOTES (Con't):

## 13. TRANSMISSION.

**CAUTION**

DO NOT overfill; transmission could be damaged. If fluid level is low, fill with DEXRON® II. It takes only 1 pint to raise the level from "ADD" to "FULL" with a hot transmission.

Weekly, crew/operator should check transmission fluid with engine running, shift lever in "Park," parking brake engaged, and vehicle level. Dipstick should read between "ADD" and "FULL" mark. If not, notify your supervisor.

Biennially, Unit Maintenance should remove oil pan, drain fluid, replace filter, install oil pan, and refill with new fluid if vehicle is used under normal conditions. Change fluid and filter annually if vehicle is primarily used for off-road or heavy-duty operations.

**14. TRANSFER CASE (205 AND 208).** Check fluid level in transfer case every 24 months or 24,000 miles (under normal use) and 12 months or 12,000 miles (under heavy use). Fluid should be approximately 4 inch (6.4 mm) below the edge of the filter plug hole. If low, fill with Dexron® II fluid. Biennially or 24,000 miles, change fluid by removing drain plug and allowing fluid to drain, then refill with new fluid.

## 15. MASTER CYLINDER.

**CAUTION**

Care should be taken to prevent contamination of brake fluid when removing cap.

Use a clean cloth to remove dirt from cover. Monthly, check fluid in each reservoir and maintain 1/4 inch

below lowest edge of each filler opening. Fill with BFS Brake Fluid, Silicone.

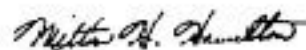
**16. POWER STEERING RESERVOIR.** Weekly, check fluid level in the reservoir of the power steering pump. If fluid is warmed up, it should read between "HOT" and "COLD" on dipstick. If it is cold, it should read between "COLD" and "ADD" on dipstick. If low, add fluid.

A copy of this Lubrication Order will remain with the equipment at all times. Instructions contained herein are mandatory and supersede all conflicting lubrication Instructions dated prior to the date of this Lubrication Order.

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  
03494

Distribution:

To be distributed IAW DA Form 12-38-E, Block No. 0589, requirements for LO 9-2320-289-12.

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## RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN...JOT DOWN THE  
DOPE ABOUT IT ON THIS FORM.  
CAREFULLY TEAR IT OUT, FOLD IT  
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## SOMETHING WRONG WITH PUBLICATION

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GRAPHFIGURE  
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DA FORM 2028-2  
1 JUL 79PREVIOUS EDITIONS  
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P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR  
RECOMMENDATION MAKE A CARBON COPY OF THIS  
AND GIVE IT TO YOUR HEADQUARTERS.

## 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

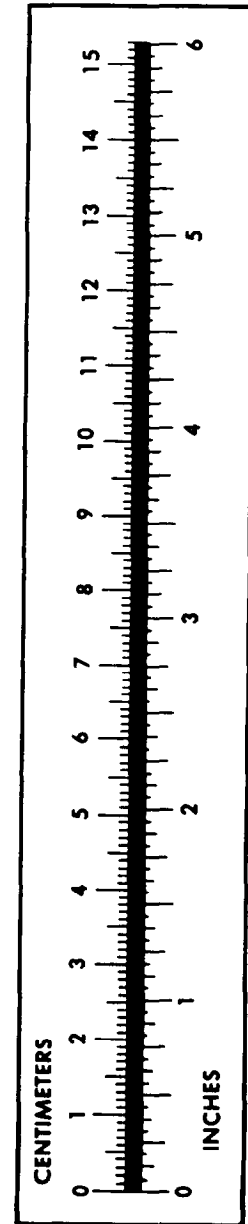
### TEMPERATURE

$5/9(^{\circ}\text{F} - 32) = ^{\circ}\text{C}$   
 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
its .....	Liters .....	0.473
arts .....	Liters .....	0.946
allons .....	Liters .....	3.785
Ounces .....	Grams .....	28.349
Pounds .....	Kilograms .....	0.454
Short Tons .....	Metric Tons .....	0.907
Pound-Feet .....	Newton-Meters .....	1.356
Pounds per Square Inch .....	Kilopascals .....	6.895
Miles per Gallon .....	Kilometers per Liter .....	0.425
Miles per Hour .....	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
ers .....	Gallons .....	0.264
ms .....	Ounces .....	0.035
ograms .....	Pounds .....	2.205
Metric Tons .....	Short Tons .....	1.102
Newton-Meters .....	Pounds-Feet .....	0.738
Kilopascals .....	Pounds per Square Inch .....	0.145
ometers per Liter .....	Miles per Gallon .....	2.354
ometers per Hour .....	Miles per Hour .....	0.621



**PIN: 053610-000**