LUBRICATION ORDER **LO 5-3810-306-12**
25 February 1993

*This Lubrication Order shall be used in place of the lubrication instructions contained in the GROVE Manufacturing Company Commercial Maintenance Manual No. 7-187-000004-2 dated 1 Feb 89 that was originally overpacked with the crane.

CONTAINER CRANE, ROUGH TERRAIN, WHEEL MOUNTED
HYDRAULIC, DIESEL POWERED, DOD MODEL
NSN 3810-01-205-2716

REFERENCE: TM 5-3810-306-20

On-condition (OC) intervals for oil changes shall be determined by the Army Oil Analysis Program (AOAP) laboratory and shall be applied unless otherwise notified.

In the event that the AOAP can not be performed hard time intervals shall apply.

Hard time intervals and the related man-hour times are based on normal operation. The man-hour specified is the time you need to do all the services prescribed for a particular interval. Change the interval if your lubricants are contaminated or if you are operating the equipment under adverse operating conditions, including longer than usual operating hours. The interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken.

Clean fittings before lubricating. Clean parts with dry cleaning solvent (SD), Type II or equivalent. Dry before lubricating.
Dotted arrow points indicate lubrication on both sides of the equipment.

All oil levels to be checked with the crane parked on a level surface in transport position, and while oil is cold, unless otherwise specified.

The lowest level of maintenance authorized to lubricate a point is Organizational Maintenance (0).

Reporting errors and recommending improvements. You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank forms) direct to: (U.S. ARMY TANK-AUTOMOTIVE COMMAND, Warren, MI, 48397-5000). A reply will be furnished to you.

LUBRICATION ORDER
25 February 1993

LO 5-3810-306-12

NOTES

1. For operation of equipment in protracted cold temperatures below -10°F (-23°C). Remove lubricants prescribed in the key for temperatures above -10°F (-23°C). Clean parts with dry cleaning solvent. Re-lubricate with lubricants specified in the key for temperatures 0°F to -65°F.

2. Check transmission and torque converter with engine running and oil warm. Fill converter/ transmission through the fill pipe until fluid is at the top of the fill pipe. Run the engine two minutes at 500 to 600 rpm to prime the torque converter and hydraulic lines. Recheck the level of oil in the transmission with the engine running at idle (500 to 600 rpm). Add oil as necessary to bring the level above the ADD mark on the dipstick. After the oil temperature reaches 180 to 200°F (82.2 to 93.3°C), add oil to bring the level to the FULL mark on the dipstick.

3. When greasing the lift cylinders and boom pivot shafts, better distribution of grease within the shafts is obtained if the weight of the boom is removed from the shafts.

4. With grease gun, pump grease until some extrusion is visible at the division of the bearing races, then rotate 90 degrees and repeat. Continue until the whole bearing is greased.

CAUTION When checking the gear box oil level. Place the dipstick into the sleeve until the cap is flush with the end of the sleeve. Do not screw the cap onto the sleeve to check the level.

5. Turntable swing gear box and brake. Drain and refill first time after 250 hours. Fill to mark on gear box dipstick. Fill to fill plug on brake.

6. Axle drive units and planetary ends. Make first change after 100 hours of operation.

7. Fill to bottom of level hole in housing with oil level mark horizontal.

8. Drain at oil pan, fill at oil filler cap.

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

Distribution: 03483

To be distributed in accordance with DA Form 12-25-E, Block 5978, requirements for LO 5-3810-306-12.

CONTAINER CRANE, ROUGH TERRAIN, WHEEL MOUNTED HYDRAULIC, DIESEL POWER, DOD MODEL NSN 3810-01-205-2716

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES				INTERVALS
		Above +32°F (0°C)	+40°F (+4°C) to -10°F (-23°C)	0°F (-17°C) to -65°F (-53°C)		
MPG-Multipurpose Grease (MIL-G-10924)		ALL TEMPERATURES			FOR ARTIC OPERATION REFR TO FM9-207	Intervals given are *in hours* of normal operation
Turntable Gear and Pinion Teeth	Brush on all teeth					
Steer Cylinder Pivot Pins	Until grease extrudes					
Main and Auxiliary Boom Nose Sheaves	Until grease extrudes					
Hook Block Sheaves	Until grease extrudes					
Outrigger Beam Wear Surfaces	Brush on each beam where pads contact					
Driver Shaft Universal Joints and Splines	Until grease extrudes					
Turntable Swing Bearing	Until grease extrudes entire circumference					
Oscillation Lockout Cylinder Pins	Until grease extrudes					
Fifth Wheel Pivot Pins	Until grease extrudes					
Axle Knuckle Bearings and Bushings	Until grease extrudes					
Tie Rod Ends (Both Axles)	Until grease extrudes					
Boom Pivot Shafts	Until grease extrudes					
Lift Cylinder Pivot Shafts	Until grease extrudes					

LUBRICANTS (CONTD)

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES			INTERVALS
		Above +32°F (0°C)	+40°F (+4°C) to -10°F (-23°C)	0°F (-17°C) to -65°F (-53°C)	
MPG-Multipurpose Grease (MIL-G-10924)					
Swivel	One pump standard grease gun				
Pintle Hook Shank	Brush as required				
Hook Block Pivot and Swivel Bearings	Until grease extrudes				
Overhall Ball Hook Swivel	Until grease extrudes		ALL		
Swing Box Pinion Gear Bearing	Until grease extrudes		TEMPERATURES		
Pintle Hook Coupler	Until grease extrudes				
Foot Brake Pedal	Brush as required				
Cardan Universal Joints	Until grease extrudes				
MPL- Multipurpose gear oil (MIL-L-2105)					
Turntable Swing Gear Box	15 Qts (14.2L)		ALL		
Main and Auxiliary Hoists Final Drive	10 Qts (9.5L)		TEMPERATURES		
Axle Drive Units	30 Pts (14.2L)				
Planetary Ends	58 Pts (26.5L)				
OE/HDO Engine Oil (MIL-L-2104)			OE/HDO 15W40	OEA	
OEA Engine Oil (MIL-L-46167)					
Engine Crankcase	23.7 Qts(22.42L)				
SPC Anti-Seize Lube (MIL-A-907C)			ALL		
Boom Wear Pads	Brush on area contacting pads		TEMPERATURES		

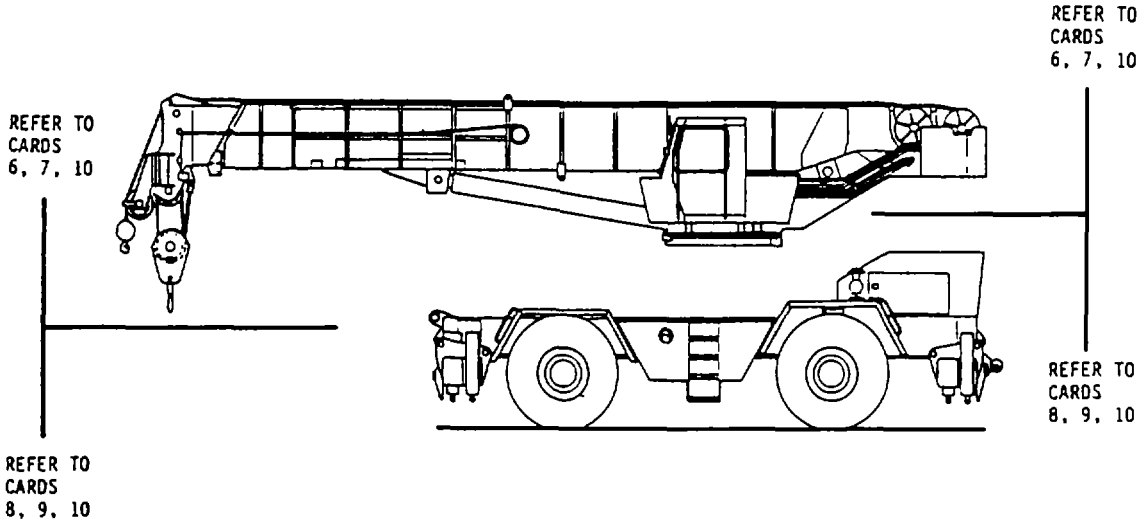
FOR ARTIC OPERATION REFR TO FM9-207

Intervals given are in hours of normal operation

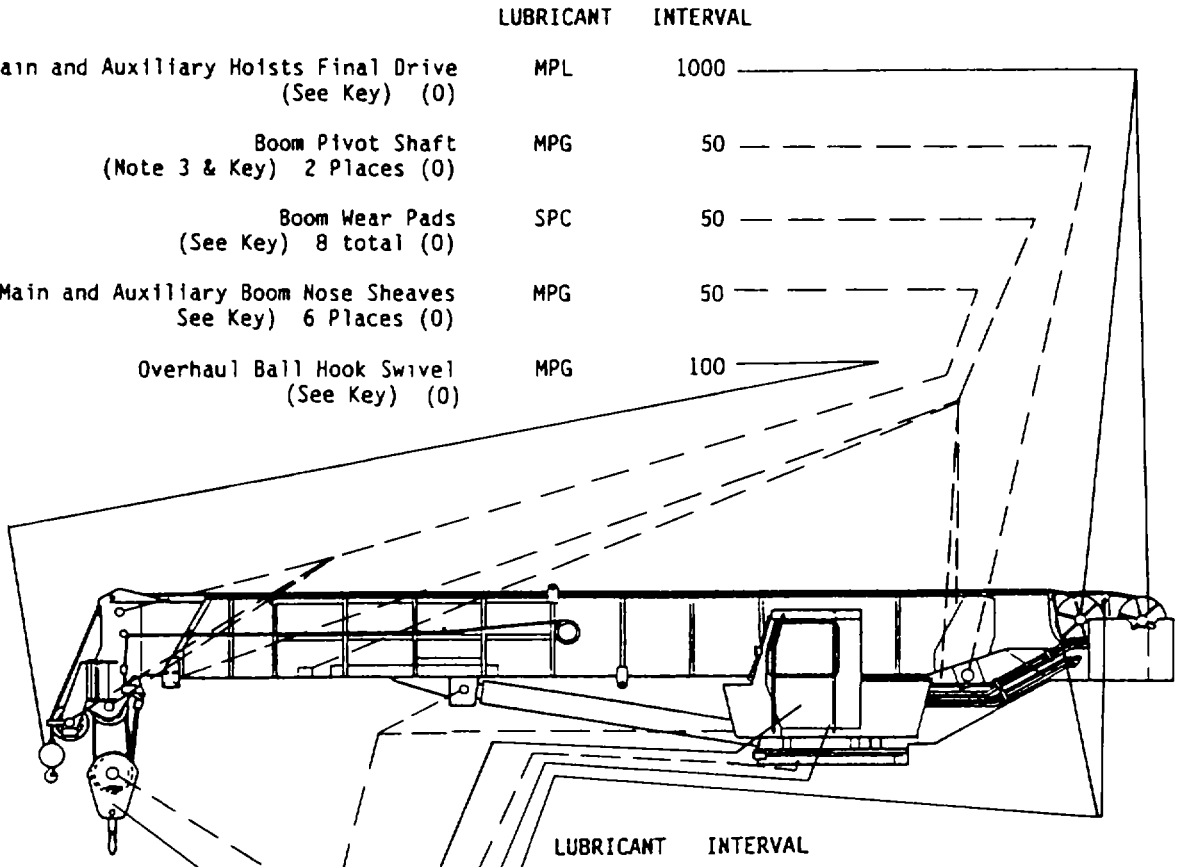
CONTAINER CRANE, ROUGH TERRAIN, WHEEL MOUNTED HYDRAULIC, DIESEL POWERED, DOD MODEL NSN 3810-01-205-2716

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES			INTERVALS
		Above +32°F (0°C)	+40°F (+4°C) to -10°F (-23°C)	0°F (-17°C) to -65°F (-53°C)	
OE/HDO Engine Oil (MIL-L-2104) OEA Engine Oil (MIL-L-46167) Transmission and Torque Converter	8.6 Gals (32.6L)	OE/HDO 10W		OEA	Intervals given are in hours of normal operation
OE/HDO-10 Engine Oil (MIL-L-2104) Swing Brake Hydraulic Reservoir	1/2 Pint 165 Gals	ALL TEMPERATURES			

FOR ARTIC OPERATION REFR TO FM9-207



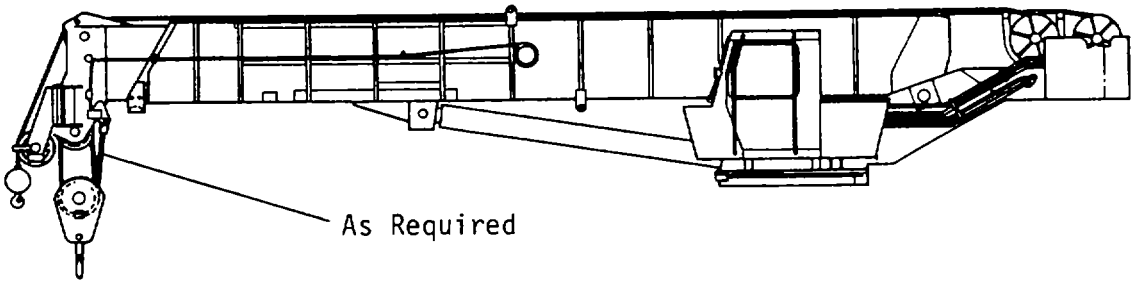
TOTAL MAN - HR		TOTAL MAN - HR	
INTERVAL	MAN-HR	INTERVAL	MAN-HR
50	1.5	500	.1
100	0.2	1000	1.0
250	0.3		
300	0.1		



	LUBRICANT	INTERVAL
Main and Auxiliary Hoists Final Drive (See Key) (O)	MPL	1000
Boom Pivot Shaft (Note 3 & Key) 2 Places (O)	MPG	50
Boom Wear Pads (See Key) 8 total (O)	SPC	50
Main and Auxiliary Boom Nose Sheaves See Key) 6 Places (O)	MPG	50
Overhaul Ball Hook Swivel (See Key) (O)	MPG	100

LUBRICANT	INTERVAL	
MPG	50	Hoist Idler Rollers (See Key) 2 Places (O)
MPG	50	Swivel (See Key) (O)
MPG	50	Turntable Gear and Pinion Teeth (See Key) 2 Places (O)
MPG	50	Turntable Swing Bearing (Note 4 & Key) 2 Places (O)
MPG	100	Swing Box Pinion Gear Bearing (See Key) (O) (Detail D)
MPL	50	Turntable Swing Gear Box (Note 5 & Key) (O) (Detail D)
OE	50	Turntable Swing Brake (Note 5 & Key) (O) (Detail D)
MPG	50	Lift Cylinder Pivot Shafts (Note 3 & Key) 6 Places (O)
MPG	50	Hook Block Sheaves (See Key) 2 Places (O)
MPG	50	Hook Block Pivot and Swivel Bearings (See Key) (O)

CONTAINER CRANE, ROUGH TERRAIN, WHEEL MOUNTED
HYDRAULIC, DIESEL POWERED, DOD MODEL
NSN 3810-01-205-2716

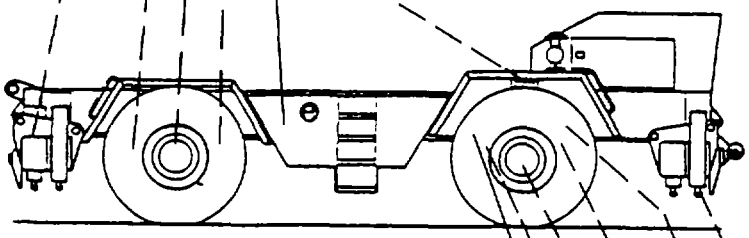


WIRE ROPE LUBRICATION.

The surface of some ropes may become covered with dirt, rock dust, or other material during their operation. This covering can prevent field applied lubricants from properly penetrating into the rope. Therefore, these ropes should be cleaned before being lubricated.

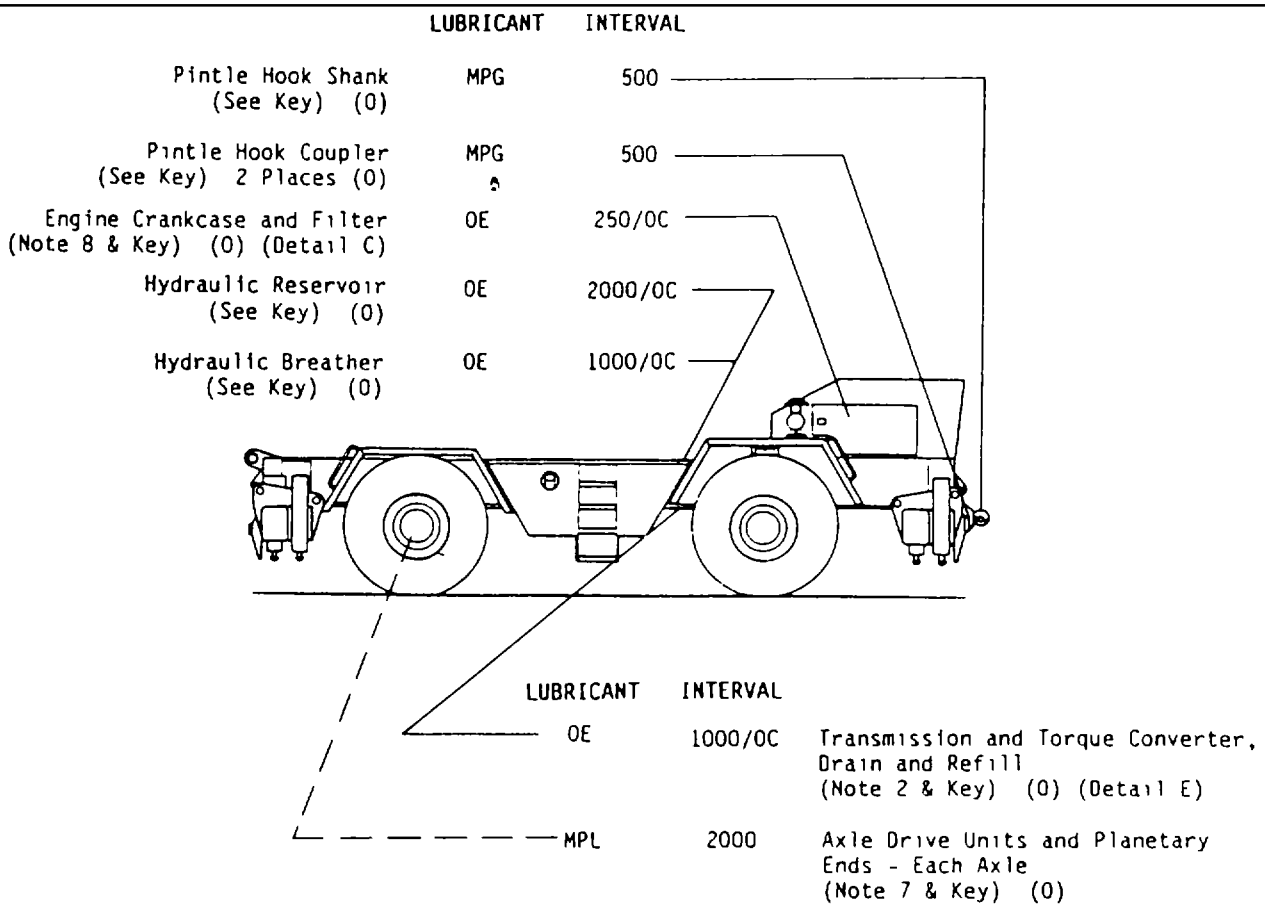
The lubricant applied should be light bodied enough to penetrate to the core of the rope. Lubricant may be applied effectively by various methods. It may be dripped on, sprayed on, or put on by brushing, but in any case it should be applied at a place where the rope is being bent, such as at a sheave. It should be applied at the top of the bend, because at the point where the strands are spread by bending they are more easily penetrated. The service life of rope will be directly proportional to the effectiveness of the methods used and amount of lubricant reaching the working parts of the rope.

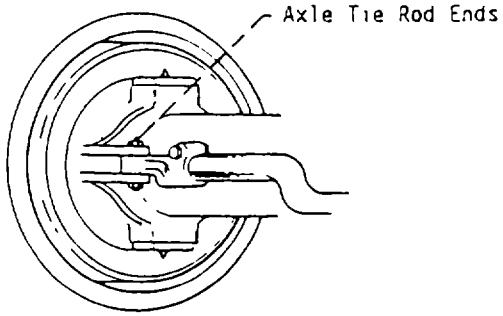
A proper lubricant must reduce friction, protect against corrosion, adhere to every wire and be pliable and not crack or separate when cold and yet not drip when warm.



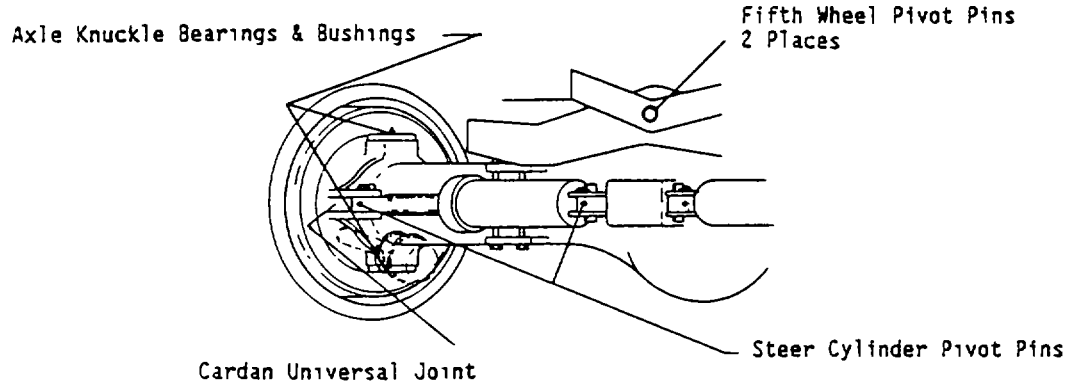
	LUBRICANT	INTERVAL	
	MPG	50	Outrigger Beam Wear Surfaces (See Key) 2 Places (O)
	MPG	50	Steer Cylinder Pivot Pins (See Key) 2 Places per cylinder (O) (Detail B)
	MPG	50	Axle Knuckle Bearings & Bushings (See Key) 4 Places (O) (Detail B)
	MPG	50	Axle Tie Rod Ends - Each Axle (See Key) 2 Places (O) (Detail A)
	MPG	50	Drive Shaft Universal Joints & Splines (See Key) 10 Places (O)
	MPG	50	Oscillation Lockout Cylinder Pins (See Key) 2 Places per cylinder (O)
Fifth Wheel Pivot Pins (See Key) 2 Places (O) (Detail B)	MPG	50	
Axle Tie Rod Ends - Each Axle (See Key) 2 Places (O) (Detail A)	MPG	50	
Axle Knuckle Bearings & Bushings (See Key) 4 Places (O) (Detail B)	MPG	50	
Steer Cylinder Pivot Pins (See Key) 2 Places per cylinder (O) (Detail B)	MPG	50	
Cardan Universal Joint (See Key) 4 Places (O) (Detail B)	MPG	50	
Outrigger Beam Wear Surfaces (See Key) 2 Places (O)	MPG	50	

CONTAINER CRANE, ROUGH TERRAIN, WHEEL MOUNTED HYDRAULIC, DIESEL POWERED, DOD MODEL NSN 3810-01-205-2716

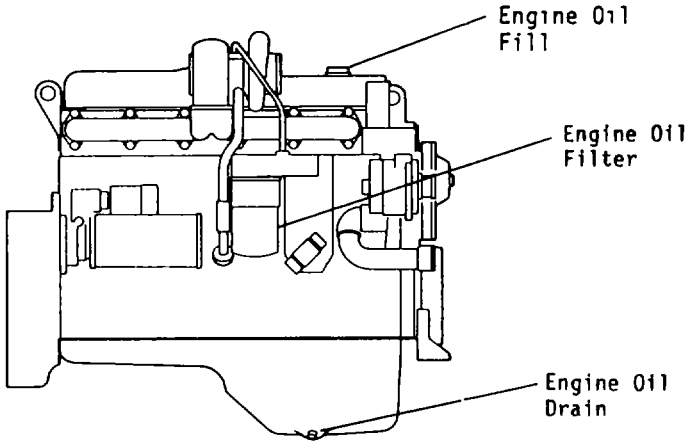




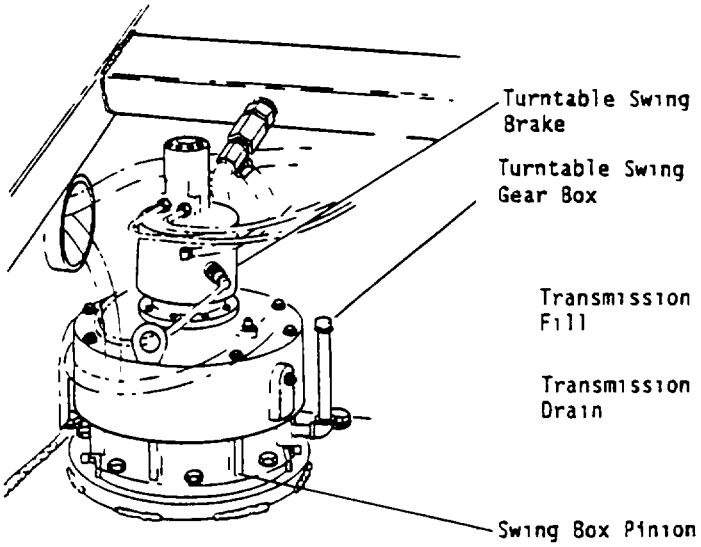
DETAIL A



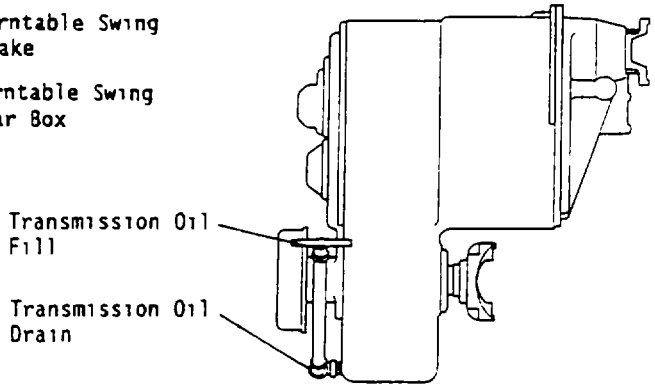
DETAIL B



DETAIL C



DETAIL D



DETAIL E

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO	TABLE NO.

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER	SIGN HERE:

DA FORM 1 JUL 79 2028-2

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.

THE METRIC SYSTEM AND EQUIVALENTS

'NEAR MEASURE

. 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

'VEIGHTS

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

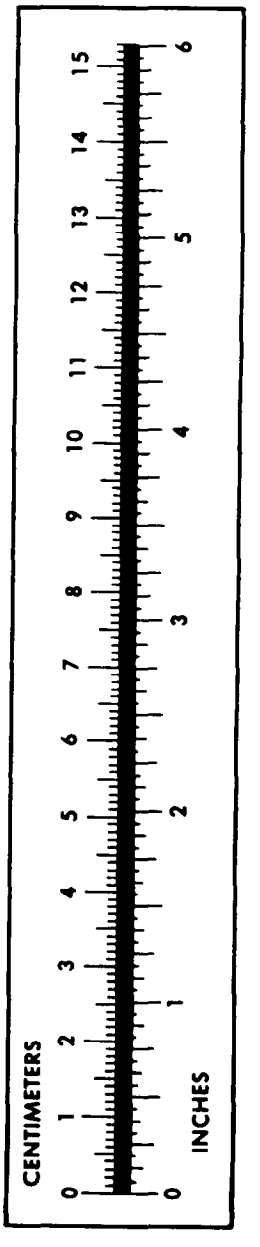
TEMPERATURE

5/9(°F - 32) = °C
212° Fahrenheit is evuivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5C° + 32 =°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
ıts	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
lometers per Liter	Miles per Gallon	2.354
meters per Hour	Miles per Hour	0.621



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