

**LUBRICATION ORDER**

**LO 9 - 2 3 2 0 - 2 6 0 = 1 2**

4 November 1983

(Supersedes LO 9-2320-260-12,  
dated 26 March 1979)

TRUCK, CHASSIS: 5-TON, 6X6, M809, M809A1, M81-0, M811,  
M811A1, M811A2; ROCKET LAUNCHER CHASSIS: M812A1;  
TRUCK, CARGO: 5-TON, 6X6, M813; DROPSIDE, M813A1, M814;  
TRUCK, BOLSTER, LOGGING: M815; TRUCK, WRECKER,  
MEDIUM: M816; TRUCK, DUMP: M817; TRUCK, TRACTOR: M818;  
TRUCK, TRACTOR, WRECKER: M819;  
TRUCK, VAN, EXPANSIBLE: M820, M820A1, M820A2;  
TRUCK, STAKE, BRIDGE TRANSPORTING: M821.

REFERENCE: TM 9-2320-260-10-1, TM 9-2320-260-10-2, TM 9-2320-260-10-3, TM 9-2320-260-10-4, TM 9-2320-260-20-1, TM 9-2320-260-20-2-1, TM 9-2320-260-20-2-2, TM 9-2320-260-20-3-1, TM 9-2320-260-20-3-2, TM 9-2320-260-20-3-3, TM 9-2320-260-20-3-4, AND CI.9100SL

Intervals (on-condition or hard time) and the related man-hour times are based on normal operation. The man-hour time specified is the time you need to do all the services prescribed for a particular interval. On-condition (OC) oil sample intervals shall be applied unless changed by the Army Oil Analysis Program (AOAP) laboratory. Change the hard time interval if your lubricants are recontaminated or if you are operating the equipment under adverse operating conditions, including longer-than-usual operating hours. The hard time interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken. Hard time intervals will be applied in the event AOAP laboratory support is not available.

Clean fittings before lubricating. Clean parts with drycleaning solvent (SD) type II or equivalent. Dry before lubricating. Dotted arrow points indicate lubrication required on both sides of equipment.

Level of maintenance. The lowest level of maintenance authorized to lubricate a point is indicated by one of the following symbols: Operator/Crew (C); and Organizational Maintenance (O).

Relubricate after fording.

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

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. Your letter or DA form 2028 (Recommended Changes to Publications) should be mailed directly to: Commander, U.S. Army Tank-Automotive Command, ATTN: DRSTA-MB, Warren, Michigan 48090. A reply will be furnished directly to you.

TA 255942

—KEY—

LUBRICANTS	CAPACITIES	EXPECTED TEMPERATURES			INTERVALS
		Above 15°F (Above -9°C)	+40° to -15°F (+4° to -26°C)	+40° to -65°F (+4° to -54°C)	
OE/HDO-LUBRICATING OIL, INTERNAL COM- BUSTION ENGINE (MIL-1-2104)					OC-On condition (AOAP)  C/MR-Change gear lubricant only when required by mainte- nance repair action, or if contaminated by water or other foreign materials,  D- Daily  W- Weekly, as required, de- pending upon use; otherwise, during INTER- VAL 3  1- 1,000 miles** (1,600 km)  3- 3,000 miles (4,800 km) or 3 months, whichever occurs first  3/S- 3,000 miles (4,800 km) or semiannually, whichever occurs first  6- 6,000 miles (9,600 km) or 6 months, whichever occurs first  12- 12,000 miles (19,000 km) or 12 months, whichever occurs first  S- semiannually (6 months)  A- Annually (12 months)
OEA-LUBRICATING OIL, INTERNAL COM- BUSTION ENGINE (ARCTIC) (MIL-1-46 167)					
OIL CAN POINTS		OE/HDO 30	OE/HDO 10*	OEA	
CRANKCASE:		OE/HDO 30	OE/HDO 10*	OEA	
W/FILTER	27 qts. (25.5 l)				
W/O FILTER	23 qts. (21.8 l)				
STEERING AND HYDRAULIC SYSTEMS: (INCLUDING STEER- ING GEAR BOX)					
STEERING SYSTEM RESERVOIR	5 qts. (4.7 l)	OE/HDO 10°	OE/HDO 10°	OEA	
DUMP BODY HYDRAULIC RESERVOIR	37 qts. (35 l)	OE/HDO 10*	OE/HDO 10*	OEA	
CRANE HYDRAULIC TANK (M816)	60 gal, (227 l)	OE/HDO 10*	OE/HDO 10*	OEA	
CRANE HYDRAULIC TANK (M819)	33 gal. (125 l)	OE/HDO 10*	OE/HDO 10*	OEA	
GO-LUBRICATING OIL, GEAR MULTIPURPOSE (MIL-L-2105)					
TRANSMISSION	9 qts. (8.5 l)	GO 80/90	GO 80/90	GO 75	
W/PTO	11 qts. (10.4 l)				
DIFFERENTIAL (3)	12 qts. (11.4 l)	GO 80/90	GO 80/90	GO 75	
TRANSFER CASE	5.25 qts. (5 l)	GO 80/90	GO 80/90	GO 75	
MIDSHIP WINCH END FRAME HOUSING	1.75 pts. (.83 l)	GO 80/90	GO 80/90	GO 75	
MIDSHIP WINCH GEAR CASE	2.6 pts. (1.2 l)	GO 80/90	GO 80/90	GO 75	
FRONT WINCH GEAR CASE	2.6 pts. (1.2 l)	GO 80/90	GO 80/90	GO 75	
REAR WINCH GEAR CASE	3 pts. (1.4 l)	GO 80/90	GO 80/90	GO 75	

FOR ARCTIC OPERATION, REFER TO FM 9-21/

\* If OEA lubricant is required to meet the temperature ranges prescribed in the KEY, then the OEA lubricant is to be used in place of OE/HDO 10 lubricant for all temperature ranges.

“ See note 1.

—KEY— (Cont'd)

LUBRICANTS	CAPACITIES	EXPECTED TEMPERATURES			FOR ARCTIC OPERATION, REFER TO FM 9-207	INTERVALS
		Above 15°F (Above -9°C)	+40° to -15°F (+4° to -26°C)	+40° to -65°F (+4° to -54°C)		
GAA-GREASE, AUTOMOTIVE AND ARTILLERY, (MI1-G-10924).		ALL TEMPERATURES				
BFS***-BRAKE FLUID, SILICONE, AUTOMOTIVE, ALL WEATHER, OPERATIONAL AND PRESERVATIVE (MIL-B-46176)  ****BRAKE MASTER CYLINDER		ALL TEMPERATURES				
CW-LUBRICATING OIL, CHAIN WIRE ROPE, EXPOSED GEAR (VV-1-751)  WINCH WIRE ROPE		ABOVE +800F(+27°C)	+80° to +30°F (+27° to -1°C)	+30° to -30°F (-1° to -34°C)	-30° to -65°F (-34° to -54°C)	X
		CW-IIC	CW-IIB	CW-IIA		

\*\*\* See TB 43-0002-87 for conversion procedures from HB to BFS

\*\*\*\* See note 10.

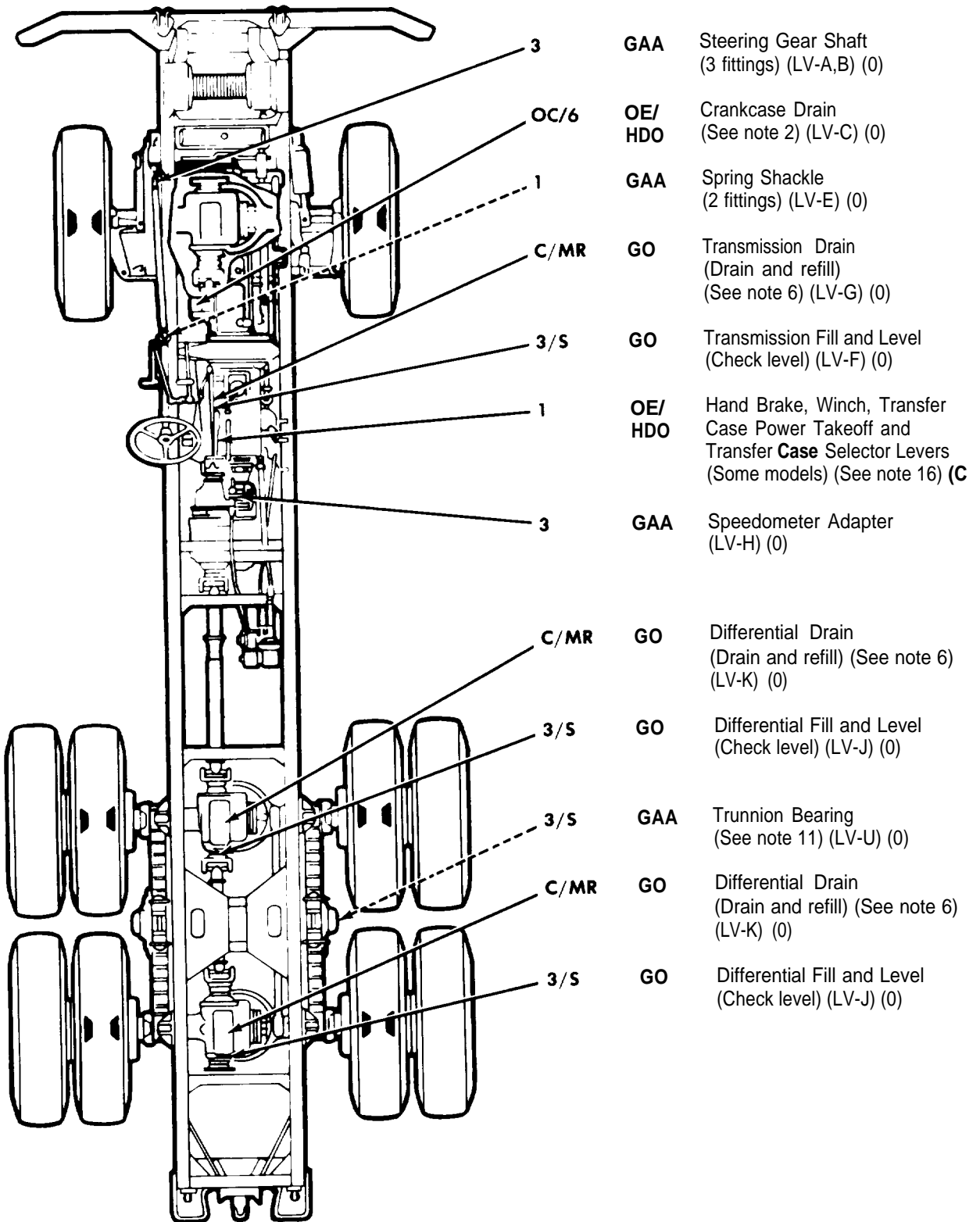
**TOTAL MAN-HOURS**

	OC	D	W	1	3/S	3	6	12	C/MR	S	A
TRUCK, CHASSIS: M809, M809A 1, M810, M811, M811A1, M811A2	1.5	.3		2.5	1.0	1.8	.9	8.0	3.9	.6	1.5
TRUCK, CHASSIS: M812A1	1.5	.3		2.5	1.0	1.8	9	8.0	3.9	.6	1.5
TRUCK, CARGO: M813, M813A1, M814	1.5	3	.8	2.3	1.0	1.8	1.0	8.0	3.9	.4	1.5
TRUCK, BOLSTER: M815	1.5	3		2.5	1.0	1.8	1.0	10.3	3.9	1.4	2.8
TRUCK, WRECKER: M816	1.5	.3	.7	2.3	1.0	1.8	10	8.0	3.9	2.0	2.5
TRUCK, DUMP: M817	1.5	.3	6	2.3	1.0	1.8	1.0	8.0	3.9	1.6	2.2
TRUCK, TRACTOR: M818	1.5	3		2.3	1.0	1.8	1.0	8.0	3.9	.4	1.5
TRUCK, TRACTOR, WRECKER: M819	1.5	.3	.5	2.3	1.0	1.8	1.0	8.0	3.9	3.0	2.5
TRUCK, VAN, EXPANSIBLE: M820, M820A1	1.5	3		1.3	1.0	1.8	1.0	8.0	4.9	.7	1.5
TRUCK, VAN, EXPANSIBLE: M820A2	1.5	.3		1.3	1.0	1.8	10	8.0	3.9	.7	1.5
TRUCK, STAKE, BRIDGE: M821	1.5	.3		2.3	1.0	1.8	Lo	8.0	3.9	7	1.5
FRONT, WINCH				.4	Lo		1.0			1.7	10

**NOTE**

- The man-hours shown above have been established on an individual vehicle basis and, accordingly, are not applicable at maintenance facilities where production line methods are employed.
- A reference to the appropriate localized view (1.V) is provided after the lubrication entry, in most cases.

INTERVAL | LUBRICANT



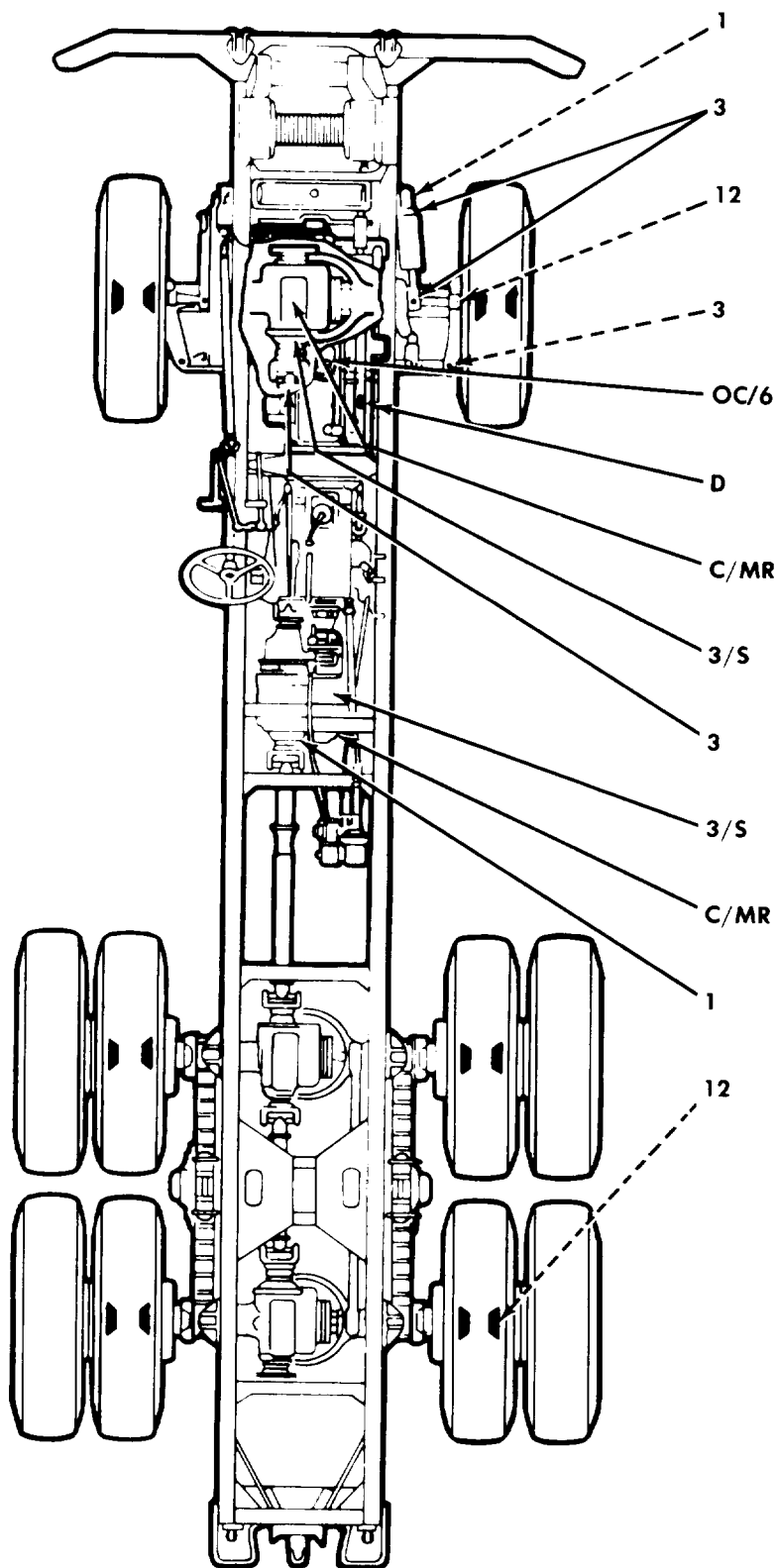
- GAA** Steering Gear Shaft  
(3 fittings) (LV-A,B) (0)
- OE/  
HDO** Crankcase Drain  
(See note 2) (LV-C) (0)
- GAA** Spring Shackle  
(2 fittings) (LV-E) (0)
- GO** Transmission Drain  
(Drain and refill)  
(See note 6) (LV-G) (0)
- GO** Transmission Fill and Level  
(Check level) (LV-F) (0)
- OE/  
HDO** Hand Brake, Winch, Transfer  
Case Power Takeoff and  
Transfer **Case** Selector Levers  
(Some models) (See note 16) (C)
- GAA** Speedometer Adapter  
(LV-H) (0)
- GO** Differential Drain  
(Drain and refill) (See note 6)  
(LV-K) (0)
- GO** Differential Fill and Level  
(Check level) (LV-J) (0)
- GAA** Trunnion Bearing  
(See note 11) (LV-U) (0)
- GO** Differential Drain  
(Drain and refill) (See note 6)  
(LV-K) (0)
- GO** Differential Fill and Level  
(Check level) (LV-J) (0)

NOTE

A REFERENCE TO THE APPROPRIATE LOCALIZED VIEW (LV) IS PROVIDED AFTER LUBRICATION POINT ENTRY, IN MOST CASES.

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INTERVAL • LUBRICANT



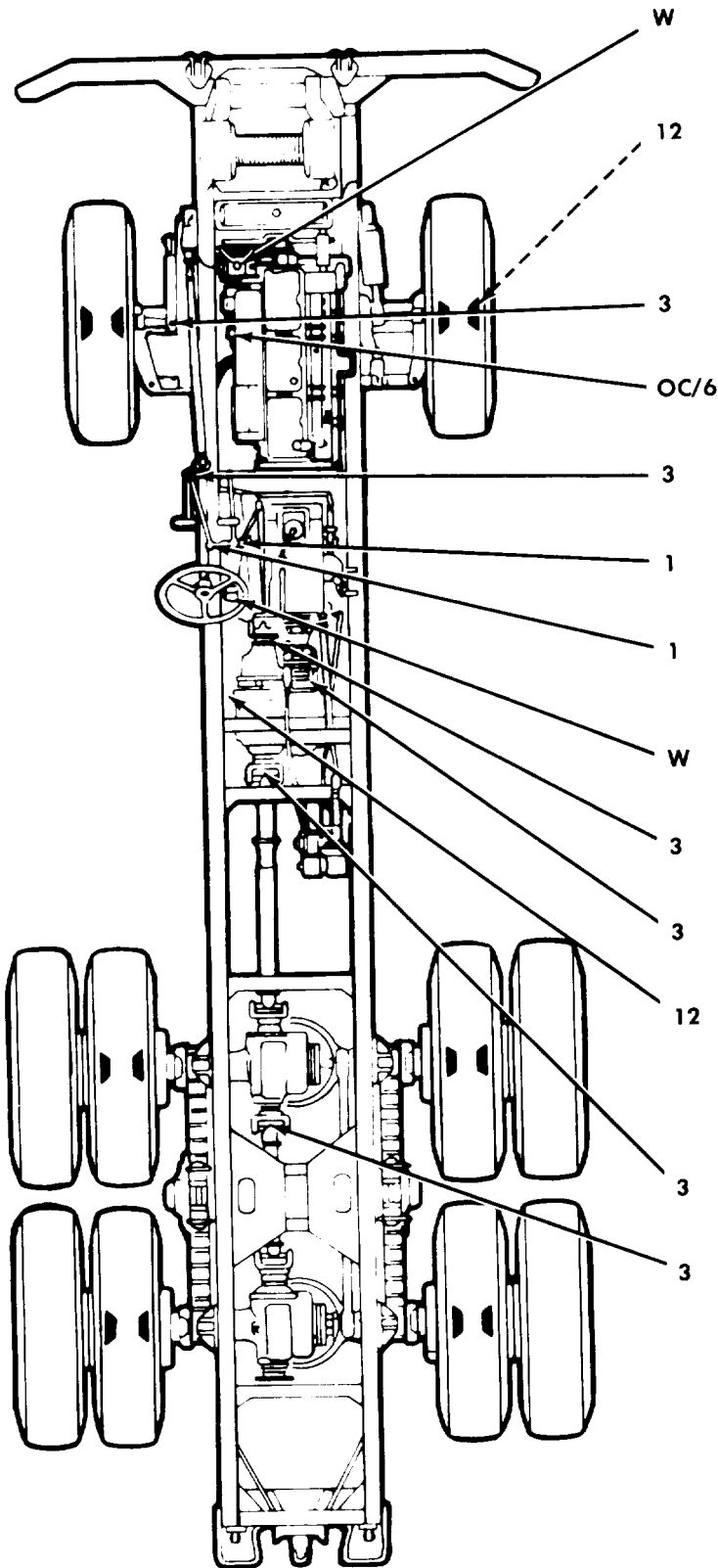
- GAA** Spring Bolt (LV-D) (0)
- GAA** Power Steering Cylinder (2 fittings) (0)
- GAA** universal Joint and Steering Knuckle Bearing (See note 7) (LV-L,M) (0)
- GAA** Tie Rod (LV-N) (0)
- OE/HDO** Crankcase Fill (See note 2) (LV-P) (0)
- OE/HDO** Crankcase Level (Check level) (See note 2) (C)
- GO** Differential Drain (See note 6) (LV-K) (0)
- GO** Differential Fill and Level (Check level) (LV-J) (0)
- GAA** Universal Joint (See note 8) (LV-AD) (0)
- GO** Transfer Case Fill and Level (Check level) (LV-Q) (0)
- GO** Transfer Case Drain (See note 6) (LV-R) (0)
- GAA** Hand Brake Shoe (4 fittings) (0)
- GAA** Rear-Rear Wheel Bearings (Every 12,000 miles [19,000 kilometers] or annually, remove, clean, dry, repack, and install) (LV-S) (c)

NOTE

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TA 255947

INTERVAL • LUBRICANT



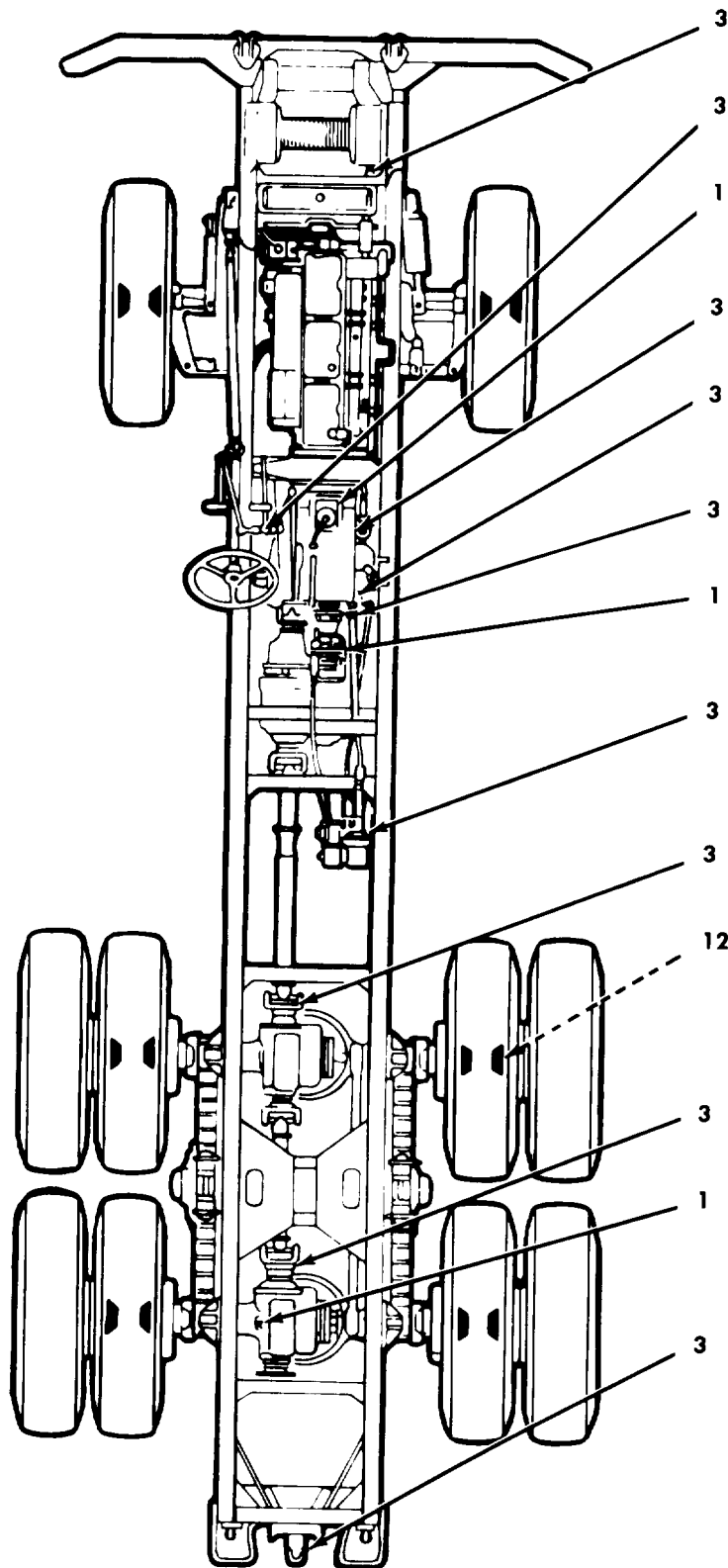
- OE/  
HDO** Steering System Reservoir  
Fill and Level  
(Check level) (See note 9) (C)
- GAA** Front Wheel Bearings  
(Every 12,000 miles [19,000  
kilometers] or annually,  
remove, dean, dry, repack,  
and install) (LV-S) (0)
- GAA** Drag Link  
(2 fittings) (0)
- OC/6** Oil Filter  
(See note 3) (0)
- 3** Fuel Filter  
(See note 4) (0)
- OE/  
HDO** Brake Pedal Yoke Pin  
(See note 16) (0)
- GAA** Clutch and Brake Pedal  
Shaft Bracket  
(LV-V) (0)
- W** Brake Master Cylinder  
(See note 10) (Ly-x) (0)
- GAA** Universal and Slip Joint  
(See note 8) (LV-AB,AC) (0)
- GAA** Universal Joint  
(See note 8) (LV-AA) (0)
- GAA** Power Divider or Dump  
Lever Cross Shaft  
(Some models) (Located back o  
driver's seat) (See note 28)  
(LV-T) (0)
- GAA** Universal and Slip Joint  
(See note 8) (LV-AB,AC) (0)
- GAA** Universal and Slip Joint  
(See note 8) (LV-AB,AC) (0)

NOTE

A REFERENCE TO THE APPROPRIATE LOCALIZED VIEW (LV) IS PROVIDED AFTER LUBRICATION POINT ENTRY, IN MOST CASES.

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**INTERVAL • LUBRICANT**



- G M** Winch Universal  
(See note 8) (IV-AD) (0)
- GAA** Brake Pedal  
(LV-W) (0)
- GAA** Clutch Cross Shaft  
(Refill cups, turn 1 full turn)  
(IV-AE) (0)
- GAA** Winch Universal and Slip Joint  
(See note 8) (LV-AB,AC) (0)
- GAA** Power Takeoff Universal Joint  
(Some models) (See note 8)  
(LV-AD) (0)
- GAA** Universal and Slip Joint  
(See note 8) (LV-Y,Z) (0)
- OE/  
HDO** Transfer Case Shift Linkage  
Pins  
(LV-AF) (0)
- GAA** Power Takeoff Universal  
and Slip Joint  
(Some models) (See note 8)  
(LV-AB, AC) (0)
- GAA** Universal Joint  
(See note 8) (LV-AD) (0)
- GAA** Rear Wheel Bearings  
(Every 12,000 miles [1 9,000  
kilometers] or annually,  
remove, clean, dry, repack,  
and install) (LV-S) (0)
- GAA** Universal joint  
(See note 8) (LV-AD) (0)
- OE/  
HDO** Power Train Breather Valves  
(All axles) (Check and oil  
sparingly if needed)  
(LV-CE) (0)
- GAA** Towing Pintle  
(3 fittings) (1. V-AG) (0)

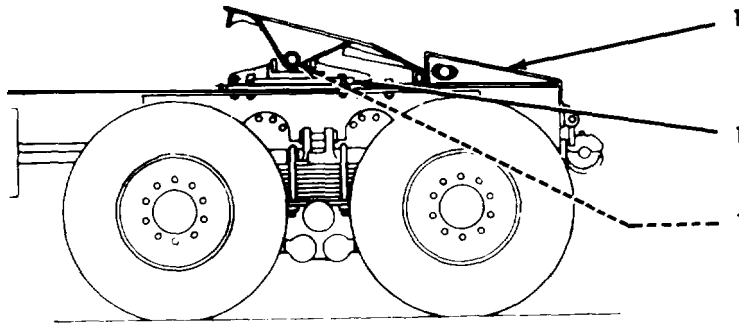
**NOTE**

A REFERENCE TO THE APPROPRIATE LOCALIZED VIEW (LV) 1.  
PROVIDED AFTER LUBRICATION POINT ENTRY, IN MOST CASES.

TA 255949



INTERVAL • LUBRICANT



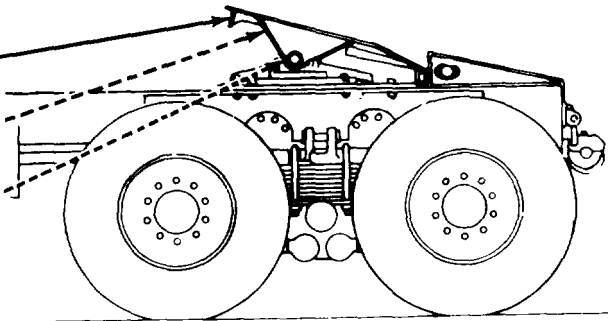
- G M** Approach Plate  
(Clean and coat)  
(LV-AN) (0)
- G M** Lateral Shaft  
(2 fittings) (LV-AL) (0)
- GAA** Rocker Shaft  
(2 fittings) (LV-AK) (0)

FIFTH WHEEL — M818, M819  
(LEFT SIDE VIEW)

LUBRICANT • INTERVAL

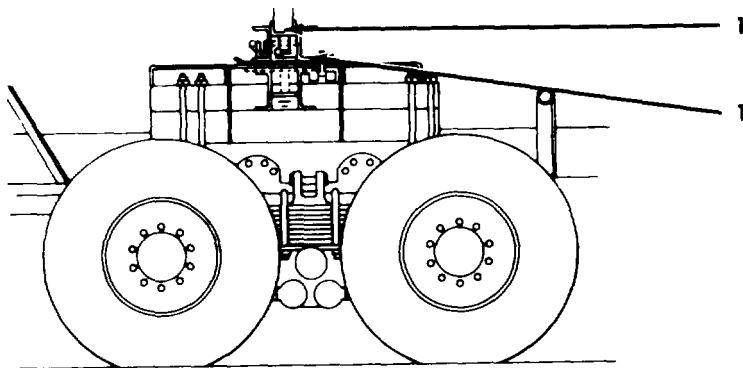
- Lock Plunger Shaft and Latch  
(LV-AM) (0)
- Base Plate  
(2 fittings) (LV-AJ) (0)
- Coupler Jaw Pin  
(LV-AH) (0)

- OE/  
HDO** 1
- GAA** 1
- GAA** 1



FIFTH WHEEL — M818, M819  
(LEFT SIDE VIEW)

INTERVAL • LUBRICANT



- GAA** King Pin  
(0)
- GAA** Bolster Base  
(0)

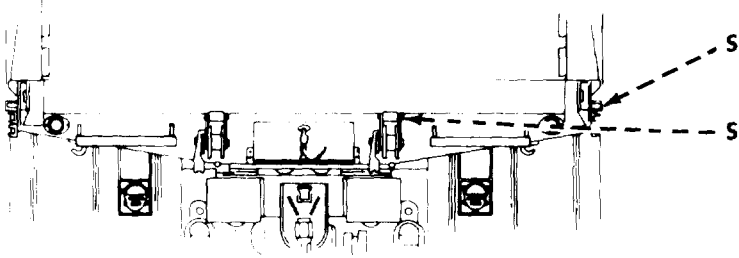
BOLSTER AND FIFTH WHEEL — M815  
(LEFT SIDE VIEW)

NOTE

A REFERENCE TO THE APPROPRIATE LOCALIZED VIEW (LV) IS PROVIDED AFTER LUBRICATION POINT ENTRY, IN MOST CASES.

TA 255951

**INTERVAL • LUBRICANT**

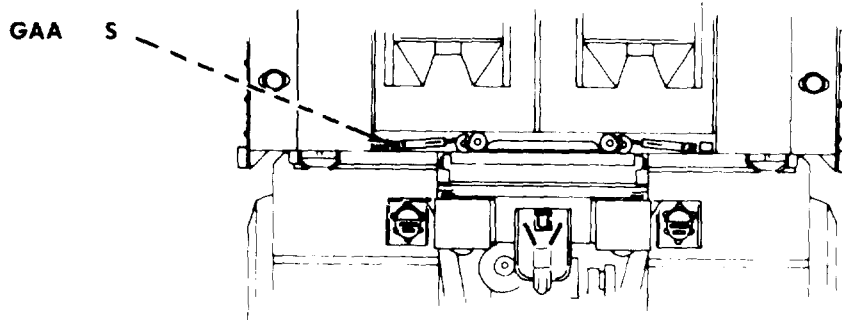


BRIDGE TRANSPORTING BODY — M821  
(REAR VIEW)

- GAA** Roller Bearings (O)
- GAA** Support Roller Pins (O)

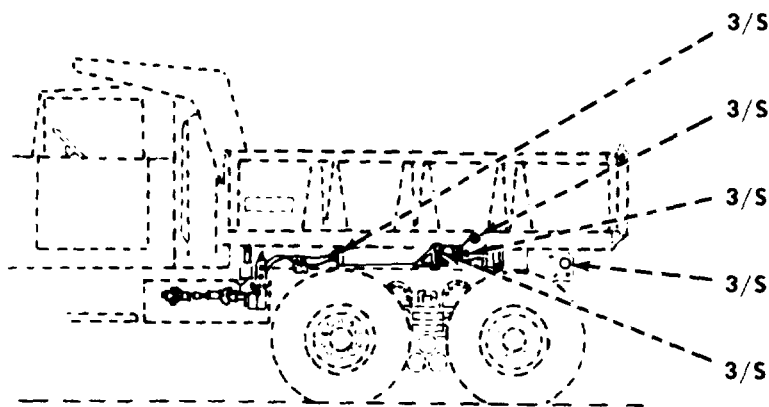
**LUBRICANT • INTERVAL**

Pawl Plunger  
(LV-AP) (O)



VAN BODY — M820, M820A1  
(REAR VIEW)

**INTERVAL • LUBRICANT**



DUMP BODY — M817  
(LEFT SIDE VIEW)

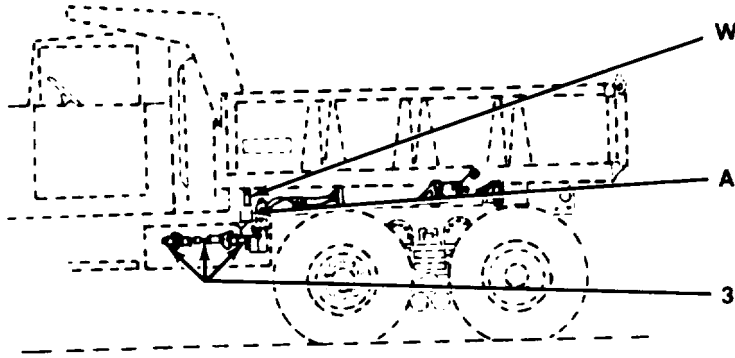
- GAA** Trunnion Pins (See note 27) (LV-AQ) (O)
- GAA** Lifting Arm (See note 27) (LV-AS) (O)
- GAA** Cylinder Crosshead (See note 27) (LV-AT) (O)
- GAA** Body Hinge Pins (See note 27) (LV-BN) (O)
- GAA** Lifting Arm Rollers (3 fittings) (See note 27) (LV-AR) (O)

**NOTE**

A REFERENCE TO THE APPROPRIATE LOCALIZED VIEW (LV) IS PROVIDED AFTER LUBRICATION POINT ENTRY, IN MOST CASES.

TA 255951

**INTERVAL • LUBRICANT**

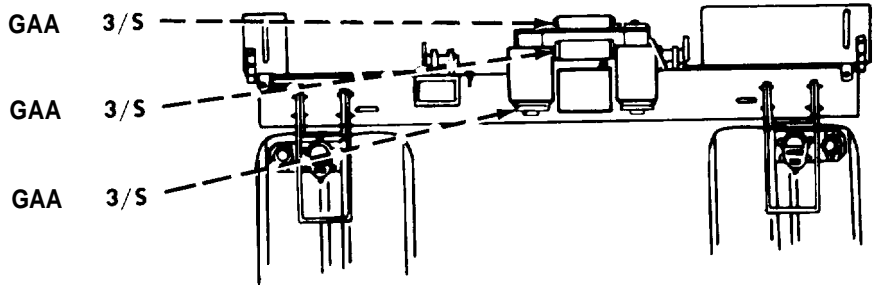


- OE/  
HDO** Hydraulic Reservoir  
Fill and Level  
(Check Level)  
(See note 15) (C)
- OE/  
HDO** Hydraulic Reservoir Drain  
(Drain and refill)  
(See note 15) (O)
- GAA** Universals and Slip Joint  
(See note B) (LV-AB,AC,AD) (O)

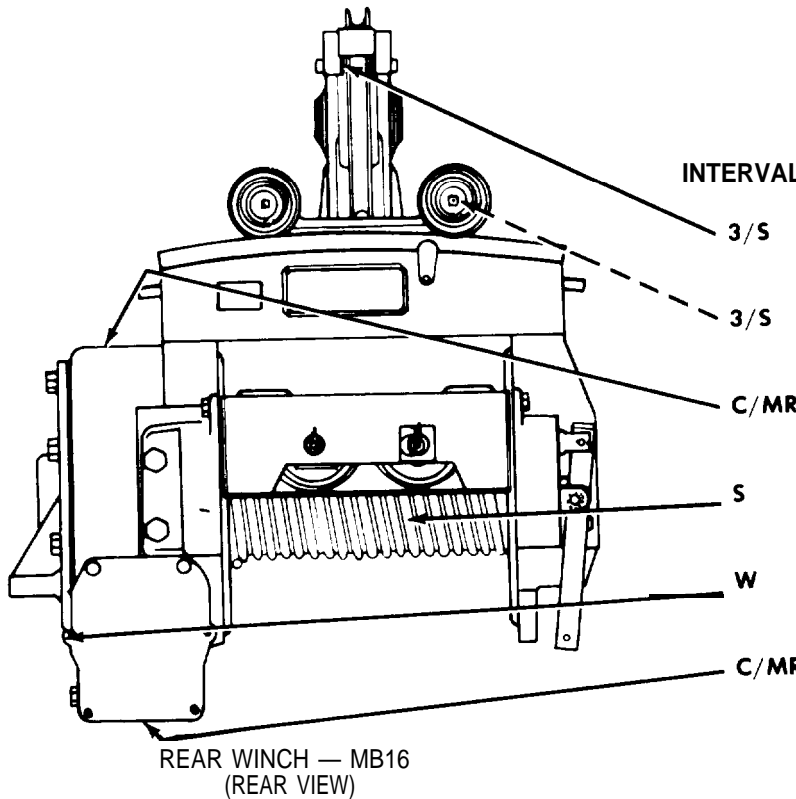
**DUMP BODY — M817  
(LEFT SIDE VIEW)**

**LUBRICANT • INTERVAL**

- GAA 3/S** Upper Cable Guide Roller  
(2 fittings) (See note 27) (LV-BU) (O)
- GAA 3/S** Lower Cable Guide Roller  
(2 fittings) (See note 27) (O)
- GAA 3/S** Vertical Cable Guide Roller  
(2 fittings) (See note 27) (LV-BT) (O)



**WRECKER BODY — MB16  
(REAR VIEW)**



**INTERVAL • LUBRICANT**

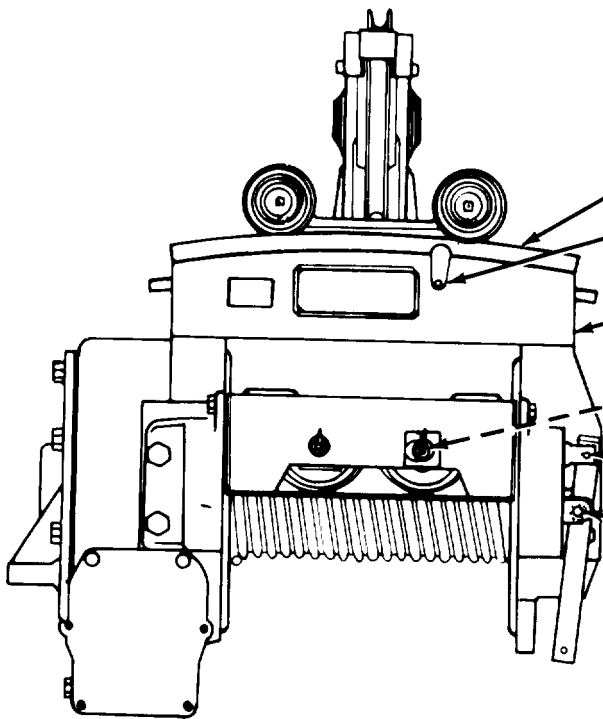
- 3/S GAA** Level Wind Sheave Bearing  
(See note 27) (O)
- 3/S GAA** Level Wind Trolley Wheels  
(See note 27) (LV-BV) (O)
- C/MR GO** Gear Case Fill  
(See note 6) (O)
- S OE/  
HDO** Winch Cable  
(See note 13) (C)
- W GO** Gear Case Level  
(Check level) (O)
- C/MR GO** Gear Case Drain  
(Drain and refill to level plug)  
(See note 6) (O)

**REAR WINCH — MB16  
(REAR VIEW)**

**NOTE**

A REFERENCE TO THE APPROPRIATE LOCALIZED VIEW (LV) IS PROVIDED AFTER LUBRICATION POINT ENTRY, IN MOST CASES.

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REAR WINCH — M816  
(REAR VIEW)

INTERVAL • LUBRICANT

- 3/S GAA Level Wind Frame (2 fittings) (See note 27) (O)
- 1 OE/HDO Level Wind Trolley Lock (O)
- 3/S GAA Sheave Frame Pin Bearing (See note 27) (O)
- 1 GAA Tensioner Sheave pins (LV-BX) (O)
- 3/S GAA End Frame Bearing (See note 27) (LV-BW) (O)
- 1 OE/HDO Tensioner Racker Lever Pins (O)

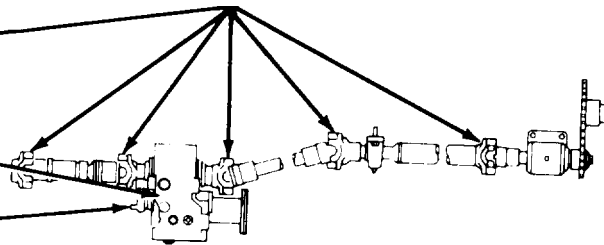
LUBRICANT • INTERVAL

Universal and Slip Joints  
~See note 8) (LV-AB,AC) (O)

Lower Divider Fill and Level  
Check level) (LV-CA) (O)

Lower Divider Shift Linkage  
See note 28) (O)

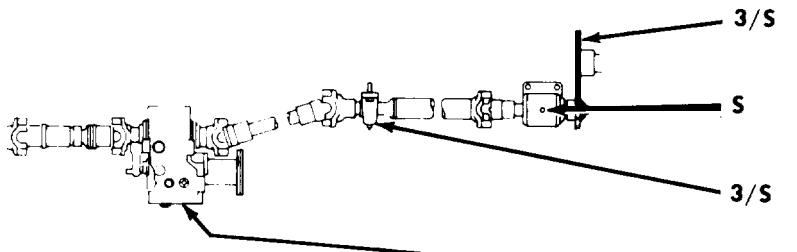
- GAA S
- GO W
- OE/HDO & GAA S



REAR WINCH DRIVE — M816  
(LEFT SIDE VIEW)

INTERVAL • LUBRICANT

- 3/S CW Drive Chain (Coat lightly) (See note 27) (O)
- S GAA Drive Sprocket Bearing (LV-CC) (O)
- 3/S GAA Pillow Block (LV-CD) (O)
- C/MR GO power Divider Drain (Drain and refill to level plug) (See note 28) (LV-CB) (O)

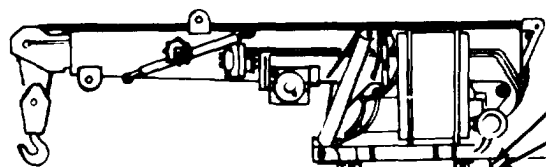


REAR WINCH DRIVE — M816  
(LEFT SIDE VIEW)

NOTE

A REFERENCE TO THE APPROPRIATE LOCALIZED VIEW (LV) IS PROVIDED AFTER LUBRICATION POINT ENTRY, IN MOST CASES,

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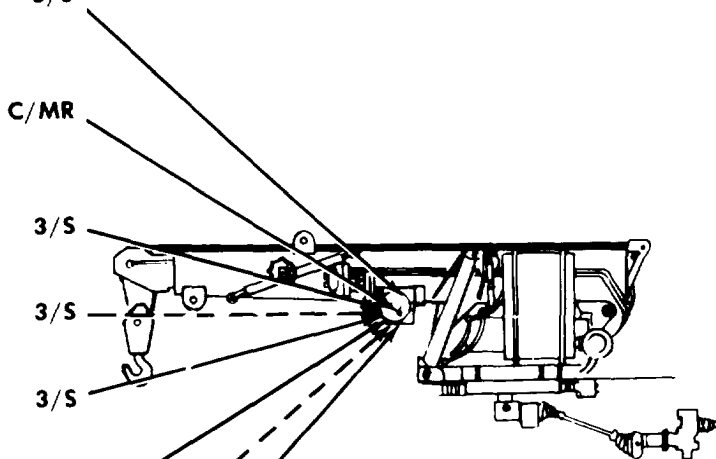
WRECKER CRANE — M816  
(RIGHT SIDE VIEW)

**INTERVAL • LUBRICANT**

3/S	GO	Swinger Gear Case Fill and level (Check level) (LV-AZ) (0)
C/MR	GO	Swinger Gear Case Drain (Drain and refill to level plug) (See note 6) (LV-BA) (0)
3/S	GO	Seal Case Fill and Level (Check level) (LV-BB) (0)
C/MR	GO	Seal Case Drain (Drain and refill to level plug) (See note 6) (LV-BC) (0)
3/S	GO	Seal Case and Bevel Gear Box Fill and Level (Check level) (LV-BD,BF) (0)
C/MR	GO	Seal Case and Bevel Gear Box Drain (Drain and refill to level plug) (See note 6) (LV-BE) (0)
S	GAA	Turntable Bearing (Rotate full range of travel when lubricating) (LV-BL) (0)

**LUBRICANT • INTERVAL**

Hoist Gear Case Fill (Check level) (See note 12) (LV-BP) (0)	GO	3/S
Hoist Gear Case Drain (Drain and refill to level plug) (See note 12) (LV-BS) (0)	GO	C/MR
Cable Guide Roller (See note 27) (0)	GAA	3/S
Winch Drum Shaft Bearings (See note 27) (0)	GAA	3/S
Hoist Winch (Fill and level) (Check level) (See note 12) (LV-BQ) (0)	GO	3/S
Cable Guide Roller (See note 27) (0)	GAA	3/S
Elevating Cylinder Bushings (IV-AU) (0)	GAA	S
Hoist Winch Drain (Drain and refill to level plug) (See note 12) (LV-BR) (0)	GO	C/MR



WRECKER CRANE — M816  
(RIGHT SIDE VIEW)

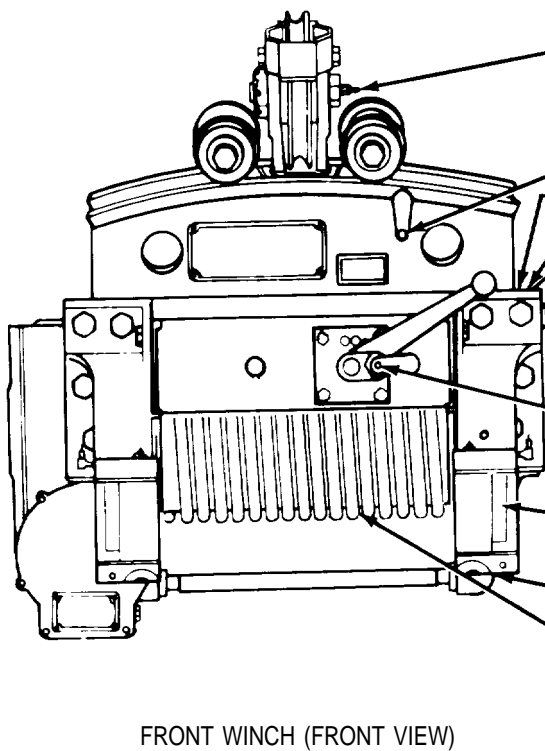
**NOTE**

A REFERENCE TO THE APPROPRIATE LOCALIZED VIEW (LV) IS PROVIDED AFTER LUBRICATION POINT ENTRY, IN MOST CASES.

1A 255954



**INTERVAL • LUBRICANT**



FRONT WINCH (FRONT VIEW)

3/S	GAA	Level Wind Sheave Bearing (See note 27) (0)
1	OE/ HDO	Level Wind Trolley Lock (o)
1	OE/ HDO	Clutch Lever Poppet (o)
C/MR	GO	End Frame Fill (o)
1	OE/ HDO	Drum Lock (o)
1	OE/ HDO	Tensioner Control Lever Lock (o)
3/S	GO	End Frame Level (Check level) (0)
C/MR	GO	End Frame Drain (Drain and refill to level plug) (See note 6) (0)
S	OE/ HDO	Winch Cable (See note 13) (C)

**LUBRICANT • INTERVAL**

Level Wind Trolley Wheels  
(See note 27) (0)

Gear Case Fill  
(See note 6) (0)

Tensioner Sheave pins  
(See note 27) (0)

vertical Cable Rollers  
(See note 27) (0)

Horizontal Cable Roller  
(See note 27) (0)

Gear Case Level  
(Check level) (LV-BY) (0)

Gear Case Drain  
(Drain and refill to level plug)  
(See note 6) (LV-BZ) (0)

GAA

3/S

GO

C/MR

GAA

3/S

GAA

3/S

GAA

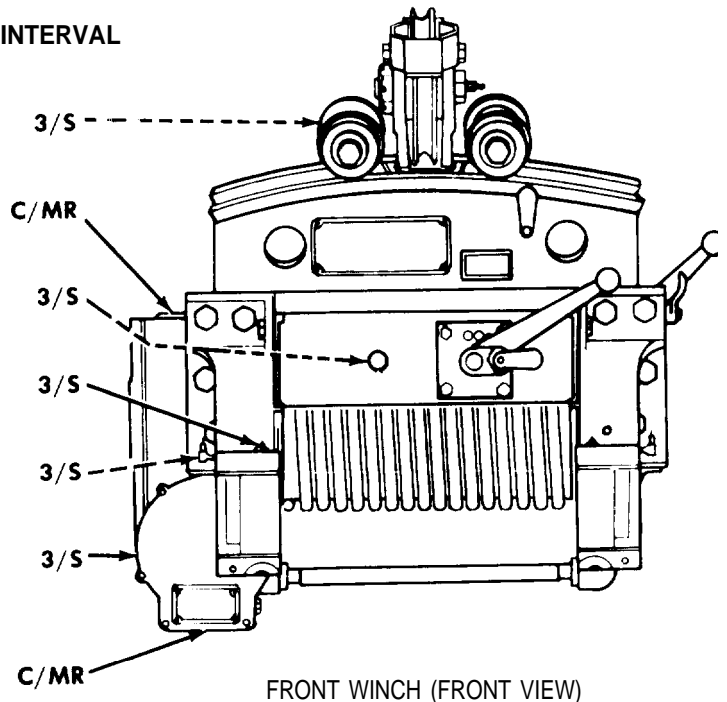
3/S

GO

3/S

GO

C/MR



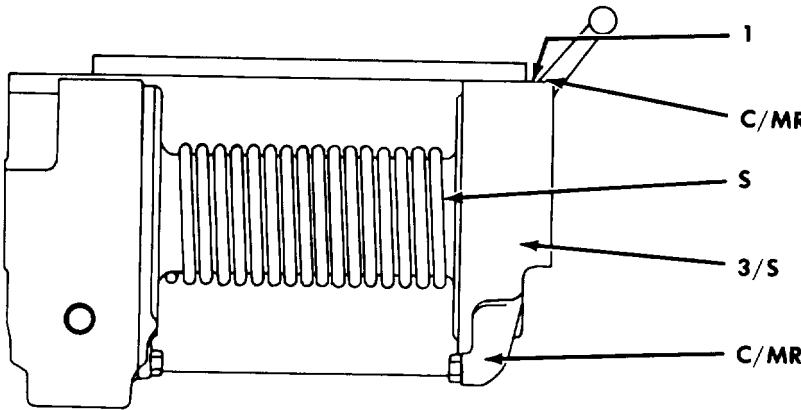
FRONT WINCH (FRONT VIEW)

**NOTE**

A REFERENCE TO THE APPROPRIATE LOCALIZED VIEW (LV) IS PROVIDED AFTER LUBRICATION POINT ENTRY, IN MOST CASES.

TA 25595

**INTERVAL • LUBRICANT**

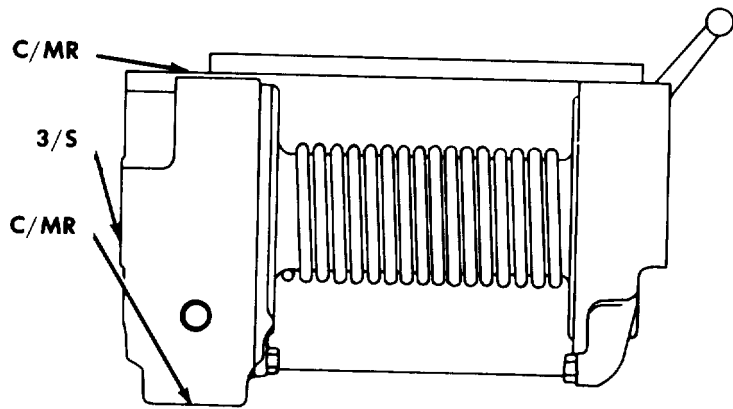


- |                    |  |
|--------------------|--|
| <b>OE/<br/>HDO</b> | Clutch Lever Poppet<br>(0)   |
| <b>C/MR</b>        | End Frame Fill (0)   |
| <b>OE/</b>         | Winch Cable<br>(See note 13) (C)                                       |
| <b>GO</b>          | End Frame Level<br>(Check level) (0)                                   |
| <b>GO</b>          | End Frame Drain<br>(Drain and refill to level plug<br>(See note 6) (0) |

MIDSHIPS WINCH — M815  
(REAR VIEW)

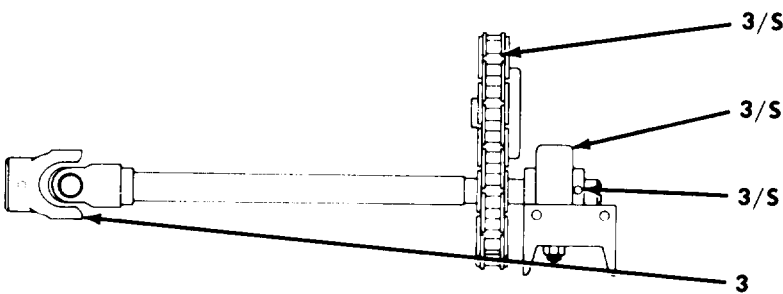
**LUBRICANT • INTERVAL**

- |  |    |
|--|----|
| Sear Case Fill<br>See note 6) (0)                                      | GO |
| Gear Case Level<br>Check level) (0)                                    | GO |
| Gear Case Drain<br>Drain and refill to level plug)<br>(See note 6) (0) | GO |



MIDSHIPS WINCH — M815  
(REAR VIEW)

**INTERVAL • LUBRICANT**



- |            |   |
|------------|---|
| <b>Cw</b>  | Drive Chain<br>(Coat lightly) (See note 27) (0) |
| <b>GAA</b> | Pillow Block<br>(See note 27) (0)               |
| <b>GAA</b> | Pillow Block sleeve<br>(See note 27) (0)        |
| <b>GAA</b> | Universal Joint<br>(See note 8) (LV-AD) (0)     |

MIDSHIPS WINCH DRIVE — M815  
(LEFT SIDE VIEW)

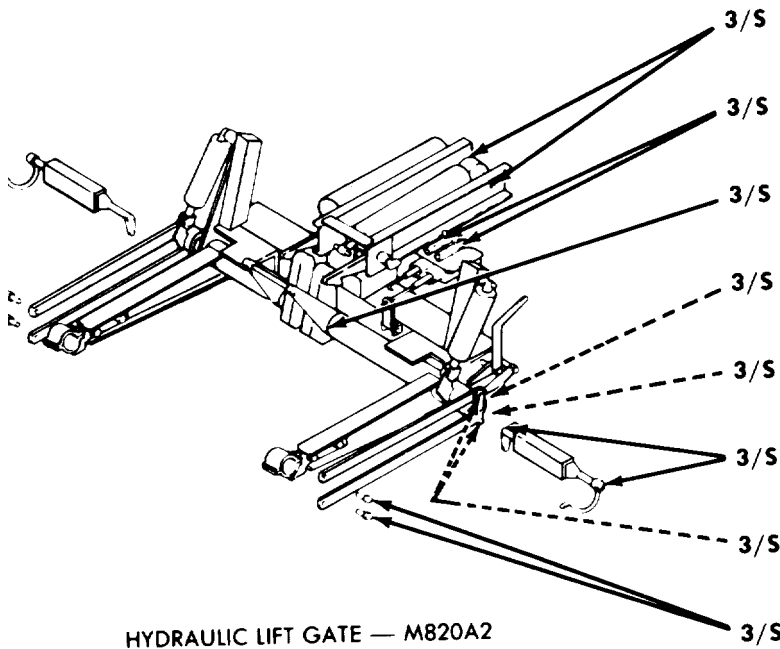
**NOTE**

A REFERENCE TO THE APPROPRIATE LOCALIZED VIEW (LV) IS PROVIDED AFTER LUBRICATION POINT ENTRY, IN MOST CASES.

TA 255957



**INTERVAL • LUBRICANT**

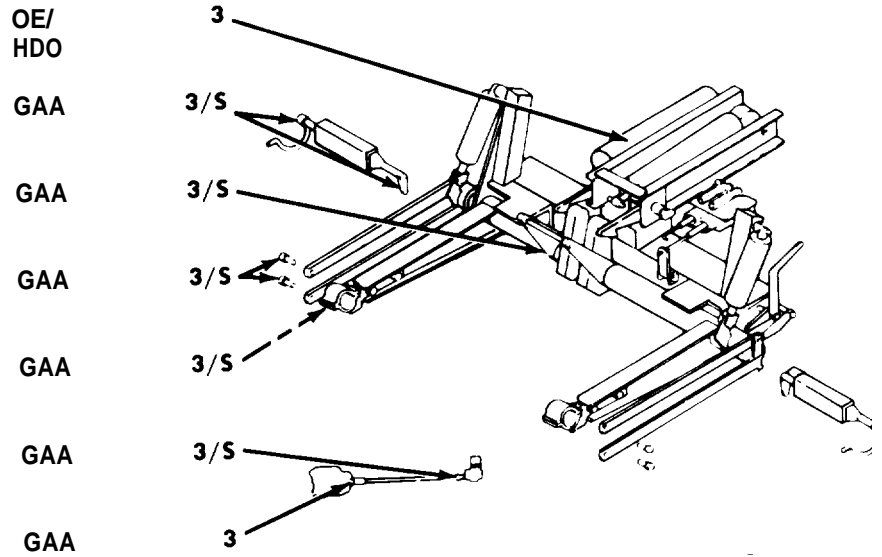


HYDRAULIC LIFT GATE — M820A2

- 3/S**    **GAA**    Elevating Cylinder Pivot Pin  
(See note 27) (0)
- 3/S**    **GAA**    Kickout Valves  
(See note 27) (0)
- 3/S**    **GAA**    Center Bearing Assembly  
(See note 27) (0)
- 3/S**    **GAA**    Inner Clutch  
(See note 27) (0)
- 3/S**    **GAA**    Lift Frame Bearing  
(See note 27) (0)
- 3/S**    **GAA**    Elevating Hand Lever Shaft  
(See note 27) (0)
- 3/S**    **GAA**    Radius Rod Pivot pin  
(See note 27) (0)
- 3/S**    **GAA**    Radius Rod Pivot Pins  
(see note 27) (0)

**LUBRICANT • INTERVAL**

- Hydraulic Oil Tank  
(Drain and refill) (See note 21) (0)
- Elevating Hand Lever Shaft  
(See note 27) (0)
- Center Bearing Assembly  
(See note 27) (0)
- Radius Rod Pivot pins  
(See note 27) (0)
- Bearing Arm Assembly  
(See note 27) (0)
- Hydraulic Pump Universal Joint  
(See note 27) (LV-AD) (0)
- Power Takeoff Universal Joint  
(See note 8) (0)



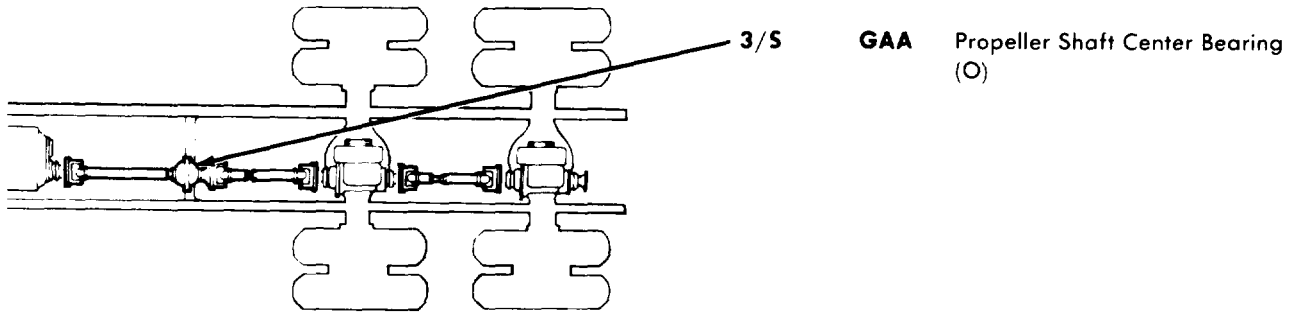
HYDRAULIC LIFT GATE — M820A2

**NOTE**

A REFERENCE TO THE APPROPRIATE LOCALIZED VIEW (LV) IS PROVIDED AFTER LUBRICATION POINT ENTRY, IN MOST CASES.

TA 25595

**INTERVAL • LUBRICANT**



PROPELLER SHAFT CENTER BEARING —  
M812A1 , M814, M819, M820, M820A1 , M820A2, M821  
(TOP VIEW)

**LUBRICANT • INTERVAL**

Pivot Post Upper Bearing  
(See note 27) (0)

**GAA 3/S**

Pivot Post lower Bearing  
(See note 27) (0)

**GAA 3/S**

Ring Gear  
(See note 24) (0)

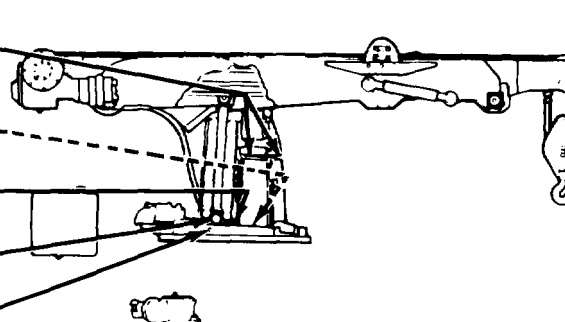
**GAA 3/S**

Idler Gear  
(See note 27) (0)

**GAA 3/S**

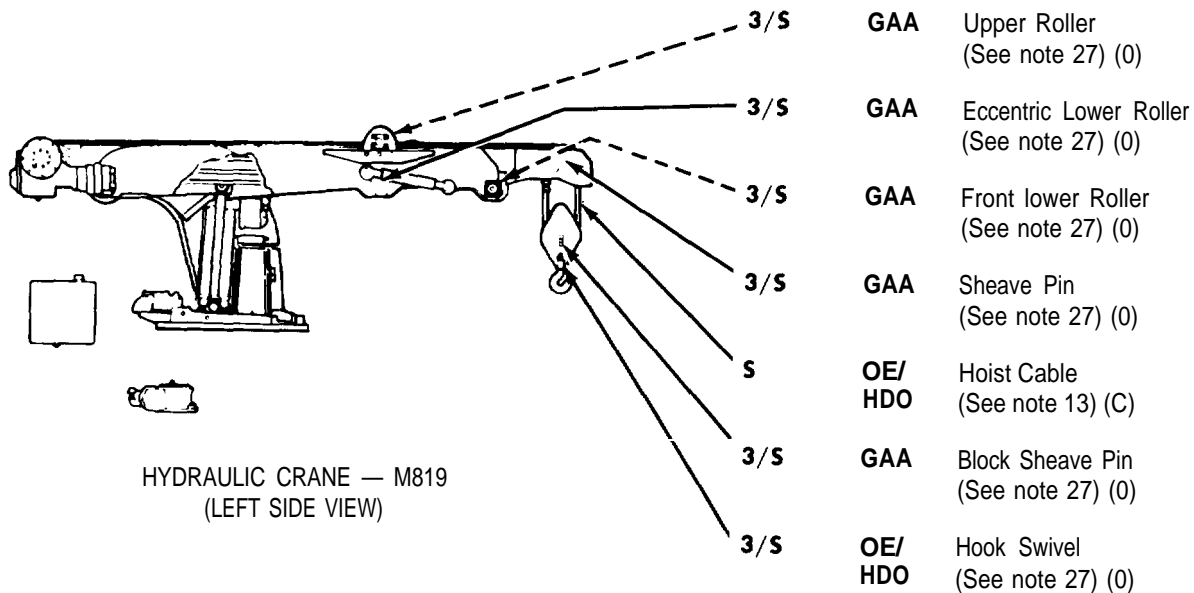
Drive Pinion  
(See note 27) (0)

**GAA 3/S**



HYDRAULIC CRANE — M819  
(LEFT SIDE VIEW)

**INTERVAL • LUBRICANT**



**3/S GAA** Upper Roller  
(See note 27) (0)

**3/S GAA** Eccentric Lower Roller  
(See note 27) (0)

**3/S GAA** Front lower Roller  
(See note 27) (0)

**3/S GAA** Sheave Pin  
(See note 27) (0)

**S OE/HDO** Hoist Cable  
(See note 13) (C)

**3/S GAA** Block Sheave Pin  
(See note 27) (0)

**3/S OE/HDO** Hook Swivel  
(See note 27) (0)

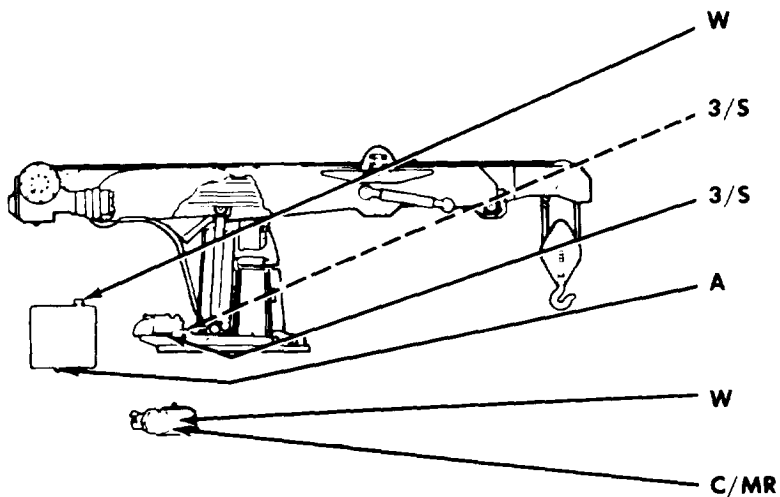
HYDRAULIC CRANE — M819  
(LEFT SIDE VIEW)

**NOTE**

A REFERENCE TO THE APPROPRIATE LOCALIZED VIEW (LV) IS PROVIDED AFTER LUBRICATION POINT ENTRY, IN MOST CASES.

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**INTERVAL • LUBRICANT**

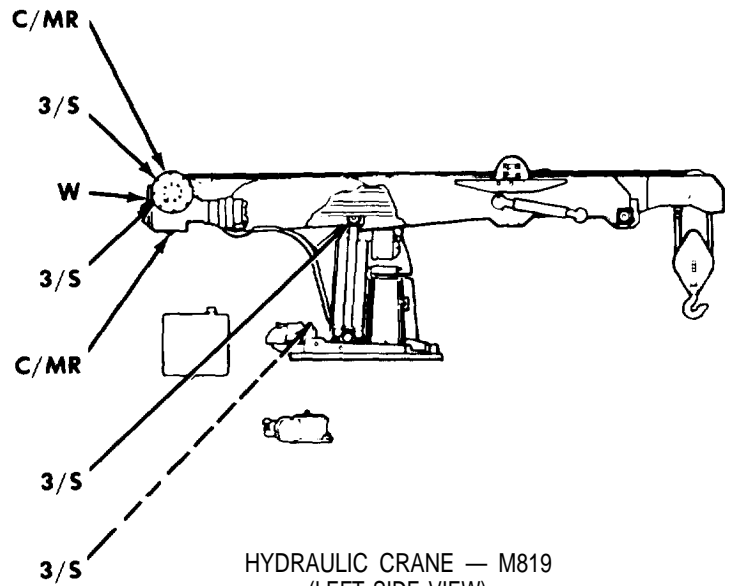


- OE/ HDO** Hydraulic Oil Tank Fill and level (Check level) (See note 23) (O)
- GAA** Cam Rollers (Coat sparingly) (See note 27) (O)
- GAA** Drive Pinion Shaft (See note 27) (O)
- OE/ HDO** Hydraulic Oil Tank Drain (Drain and refill) (See note 23) (O)
- GO** Swing Motor Gear Housing Level (Check level) (O)
- GO** Swing Motor Gear Housing Drain (Drain and refill to level plug) (O)

HYDRAULIC CRANE — M819  
(LEFT SIDE VIEW)

**LUBRICANT • INTERVAL**

- GO** Hoist Drum Fill (See note 22) (O)
- GAA** Drum Shaft (See note 27) (O)
- GO** Hoist Drum Level (Check level) (O)
- GAA** Shipper Pivot Shaft (See note 27) (O)
- GO** Hoist Drum Drain (Drain and refill) (See note 6) (O)
- GAA** born Lift Pivot Pin (3 fittings) (See note 27) (O)
- GAA** Swing Motor Base Pin (See note 27) (O)

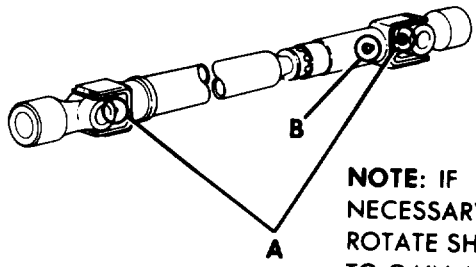


HYDRAULIC CRANE — M819  
(LEFT SIDE VIEW)

**NOTE**

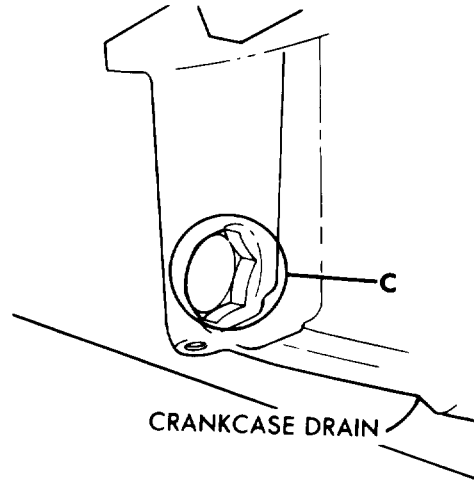
A REFERENCE TO THE APPROPRIATE LOCALIZED VIEW (LV) IS PROVIDED AFTER LUBRICATION POINT ENTRY, IN MOST CASES.

TA 255960

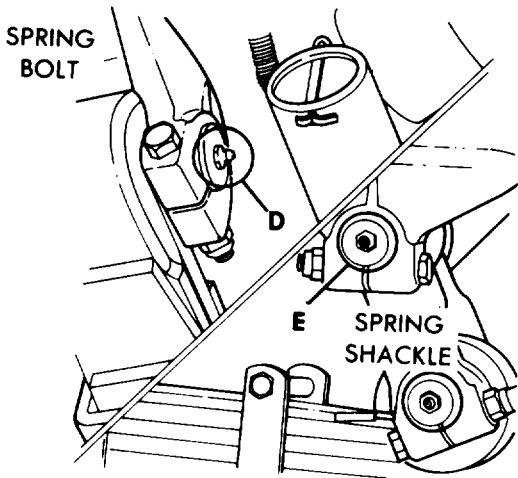


STEERING GEAR SHAFT

**NOTE: IF NECESSARY, ROTATE SHAFT TO GAIN ACCESS TO FITTINGS.**

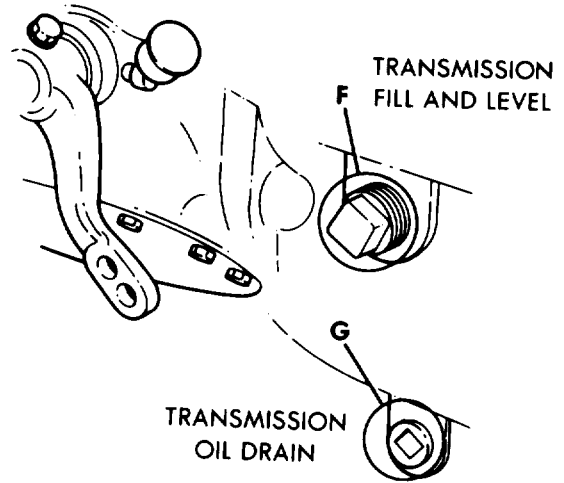


CRANKCASE DRAIN



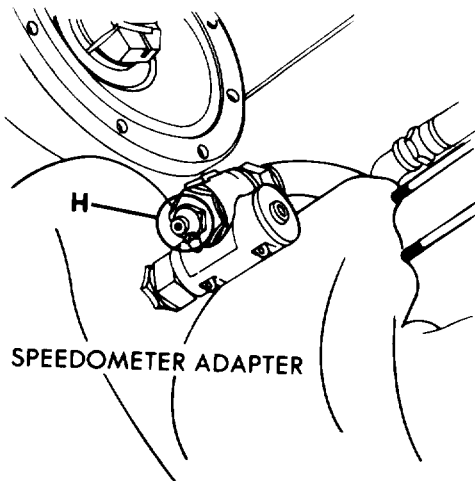
SPRING BOLT

SPRING SHACKLE

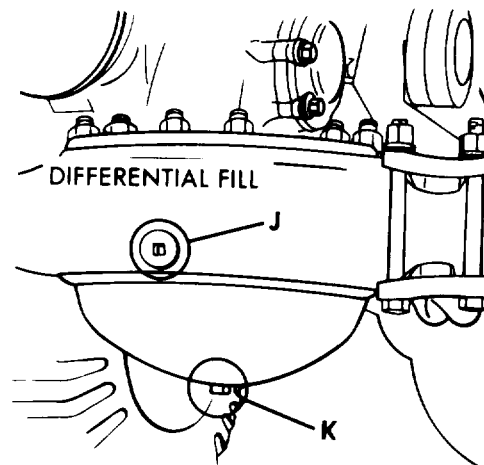


TRANSMISSION FILL AND LEVEL

TRANSMISSION OIL DRAIN



SPEEDOMETER ADAPTER

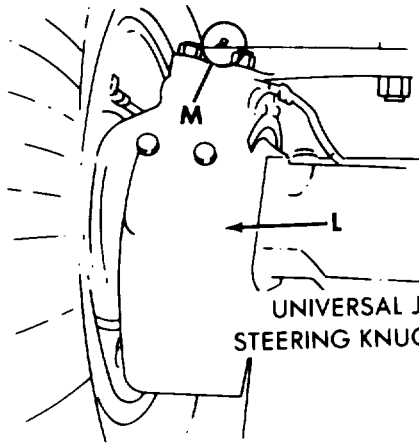


DIFFERENTIAL FILL

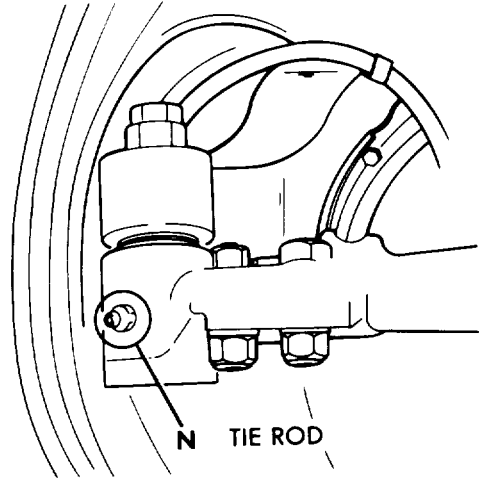
DIFFERENTIAL DRAIN

LOCALIZED LUBRICATION POINTS (A THROUGH K)

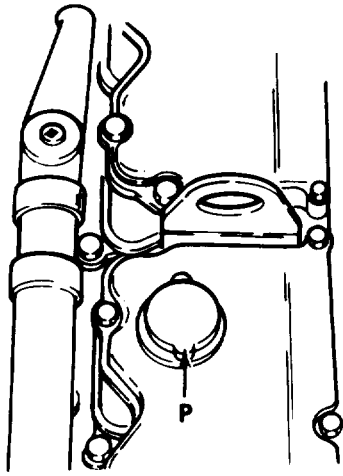
TA255961



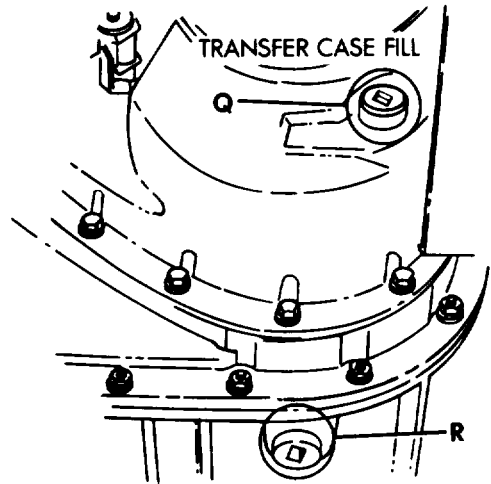
UNIVERSAL JOINT AND STEERING KNUCKLE BEARING



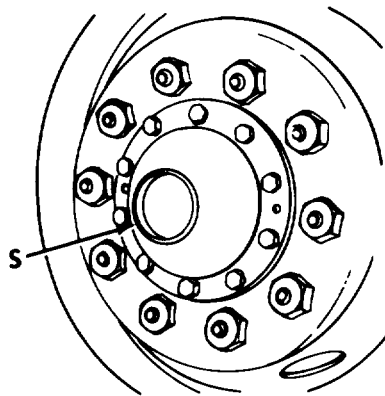
N TIE ROD



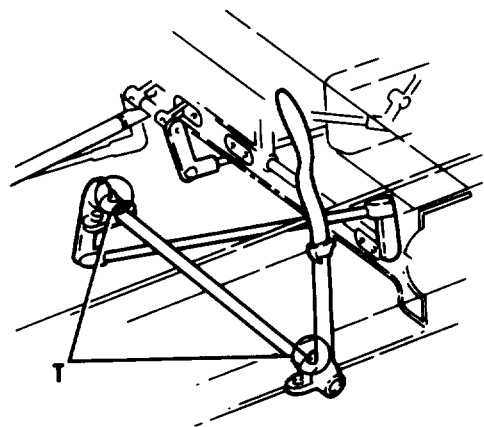
CRANKCASE FILL



TRANSFER CASE DRAIN

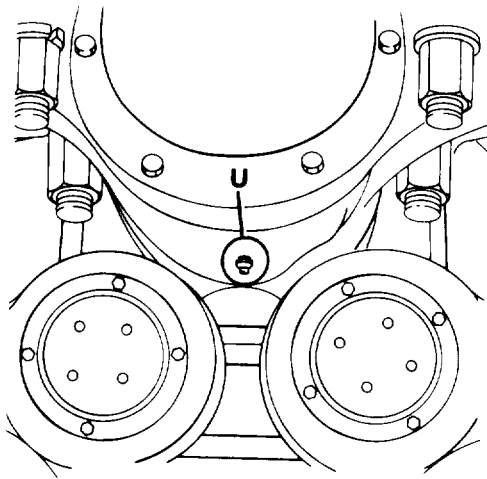


WHEEL BEARINGS



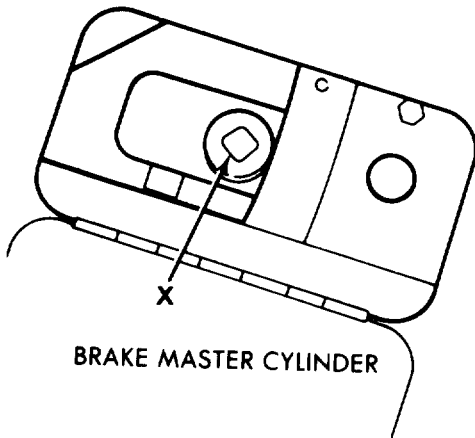
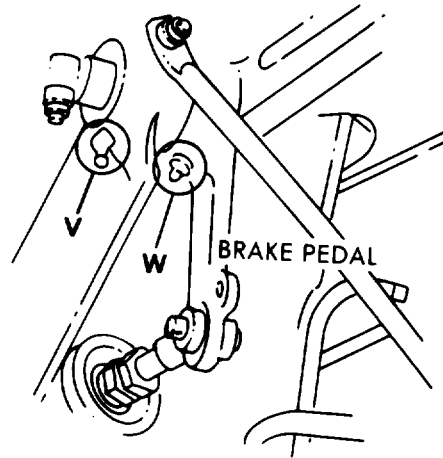
POWER DIVIDER/  
DUMP LEVER CROSS SHAFT

LOCALIZED LUBRICATION POINTS (L THROUGH T)

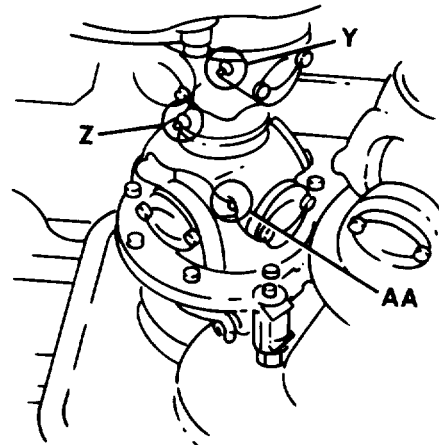


TRUNNION BEARING

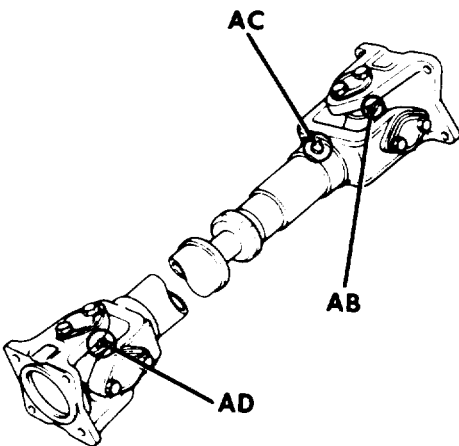
CLUTCH AND BRAKE  
PEDAL SHAFT BRACKET



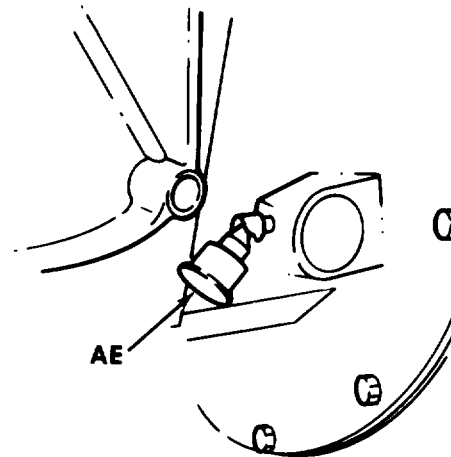
BRAKE MASTER CYLINDER



UNIVERSAL JOINT  
AND SLIP JOINT



POWER TAKEOFF UNIVERSAL  
AND SLIP JOINT

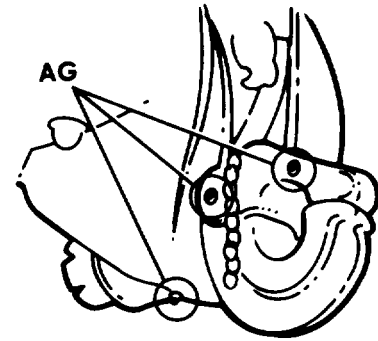
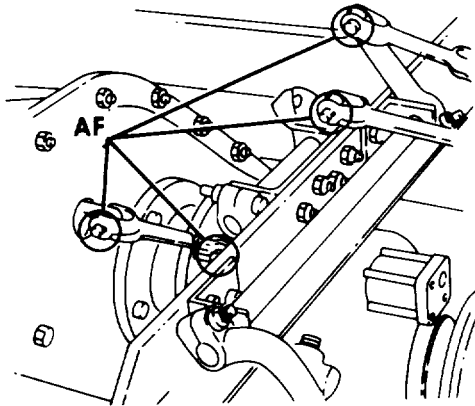


CLUTCH CROSS SHAFT

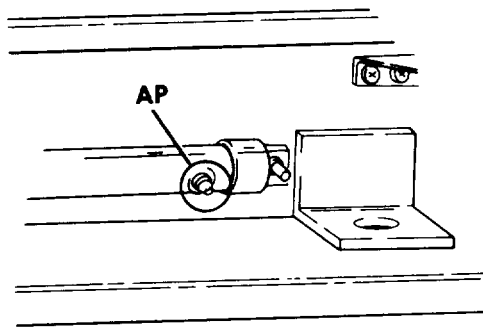
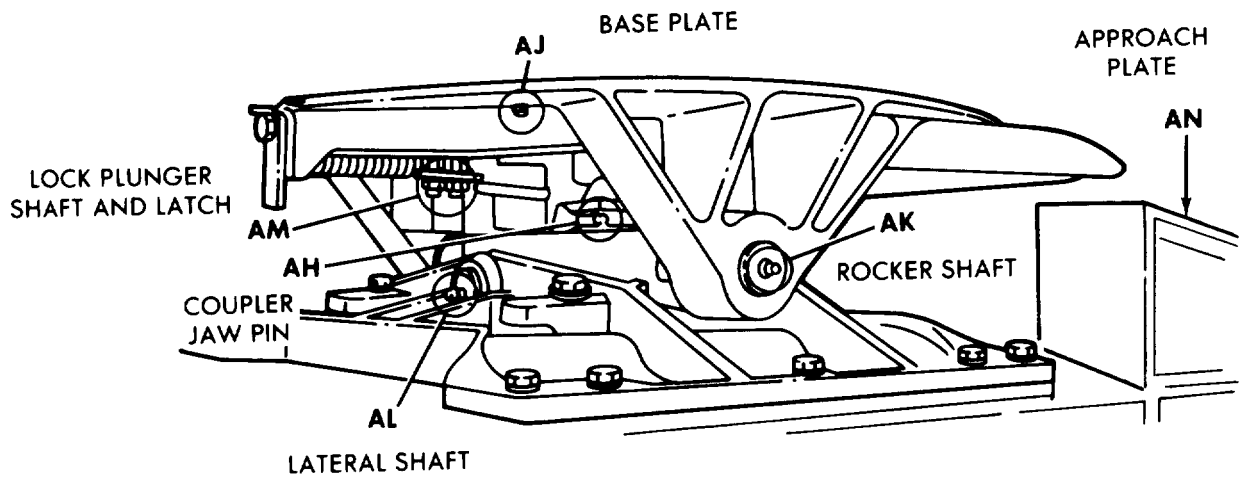
LOCALIZED LUBRICATION POINTS (U THROUGH AE)

TA 255963

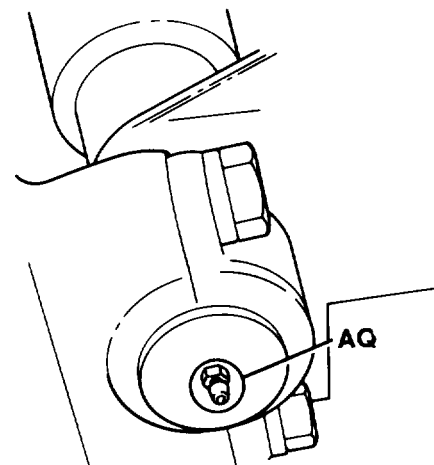
TRANSFER CASE SHIFT LINKAGE PINS



TOWING PINTLE

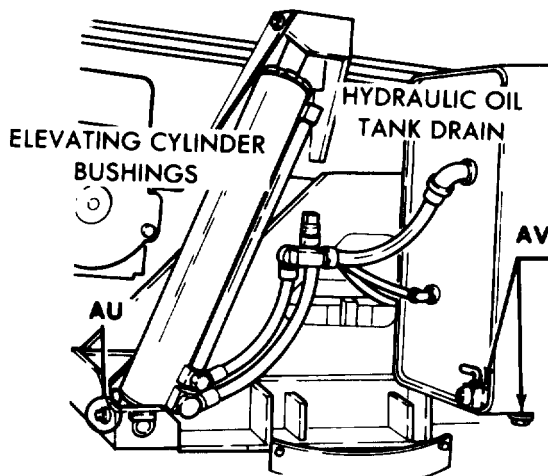
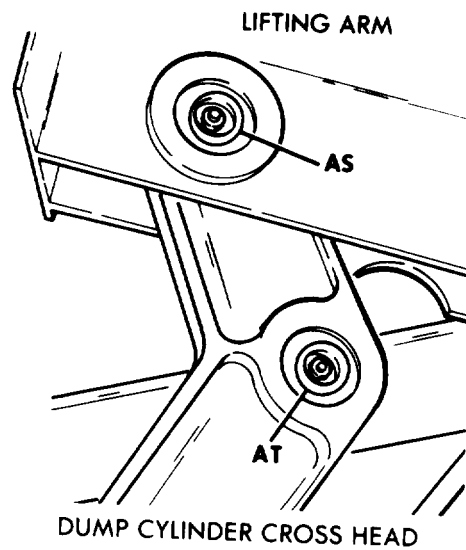
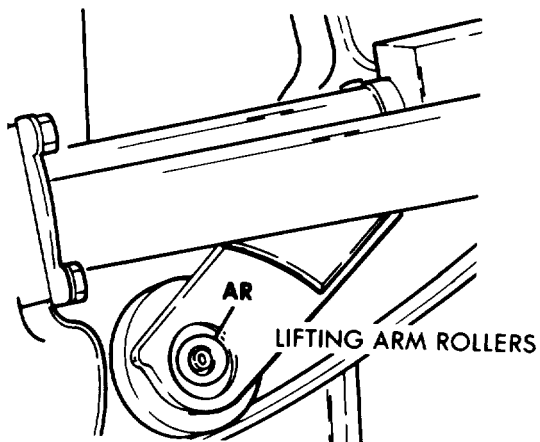


PAWL PLUNGER

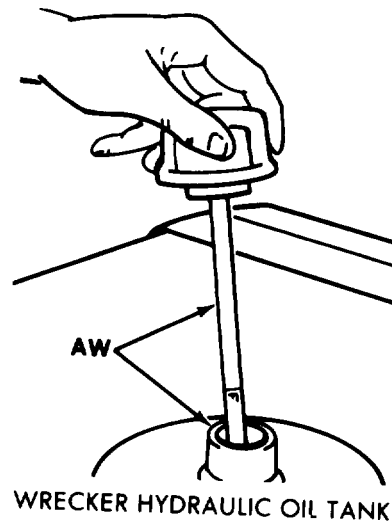


TRUNNION PIN

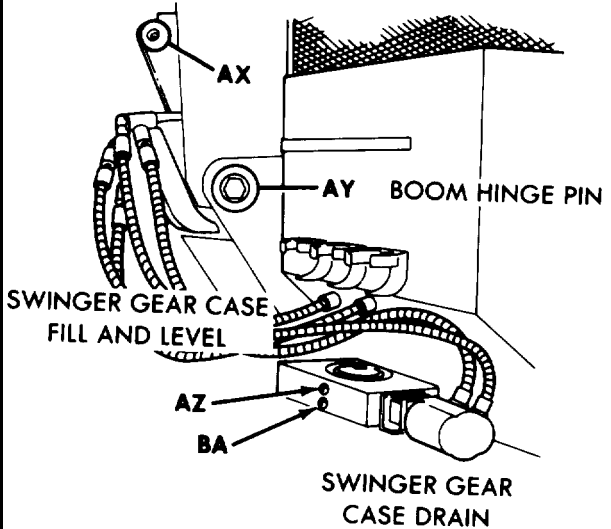
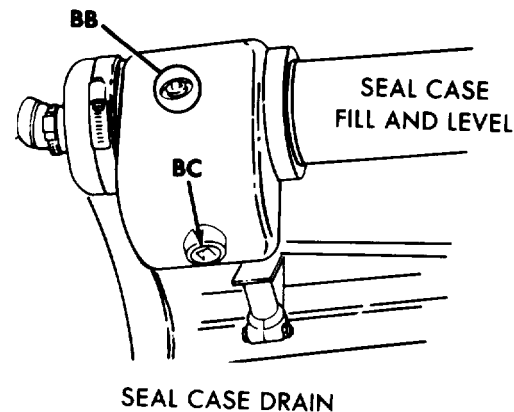
LOCALIZED LUBRICATION POINTS (AF THROUGH AQ)



**NOTE:** TO DRAIN, REMOVE PIPE PLUG FROM DRAIN VALVE AND ATTACH HOSE (FURNISHED WITH VEHICLE) AND DRAIN OIL OVERSIDE INTO CONTAINER. REMOVE DRAIN PLUG IN BOTTOM OF TANK TO COMPLETELY DRAIN TANK. ALWAYS REPLACE PLUG IN DRAIN VALVE.

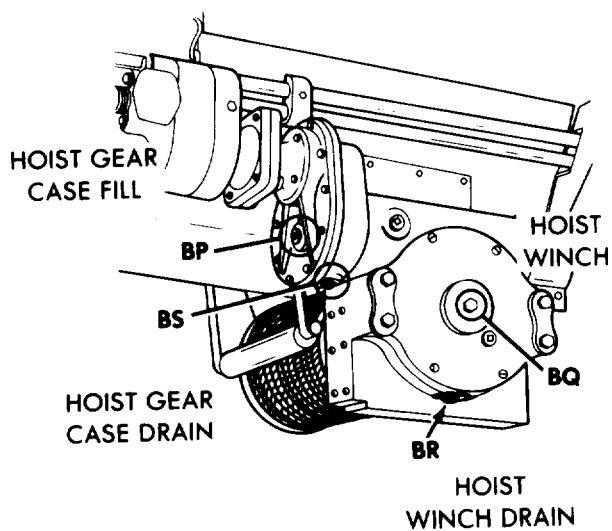
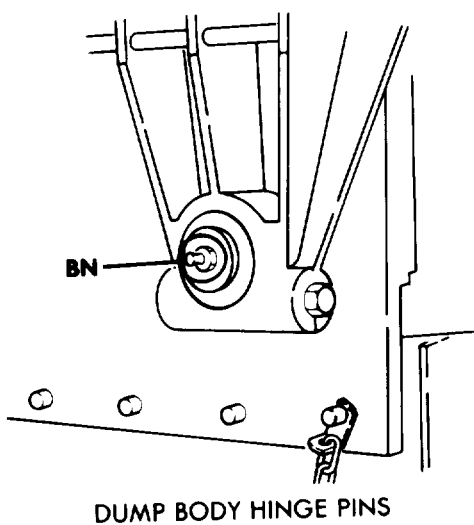
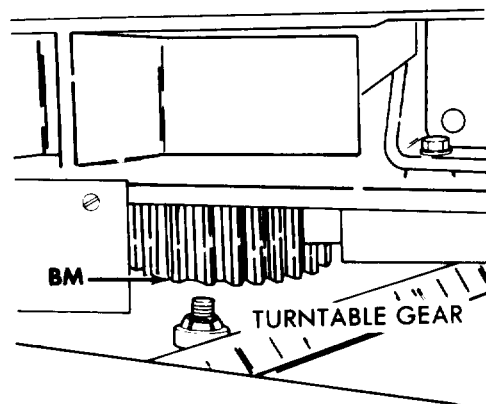
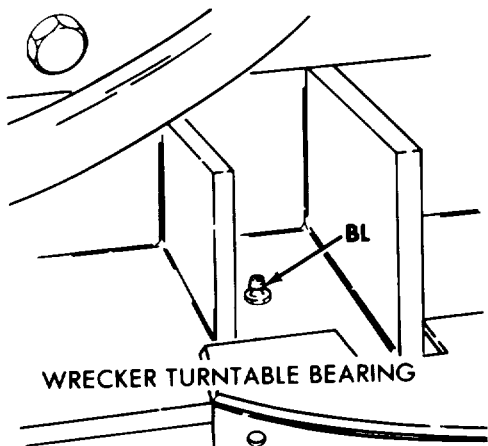
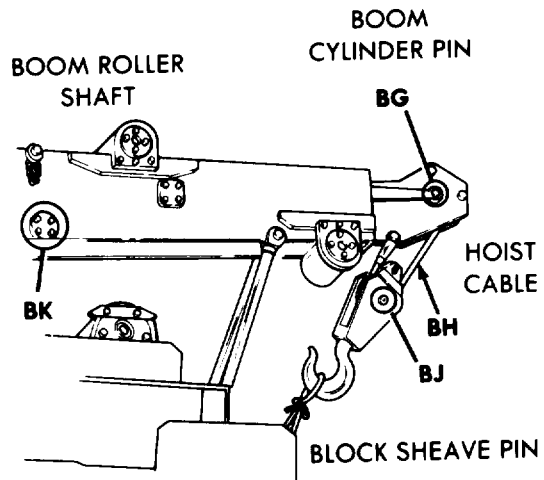
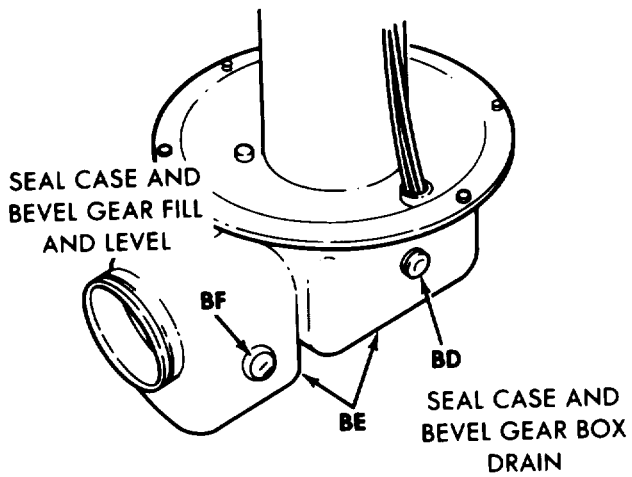


HOIST CABLE SHEAVE

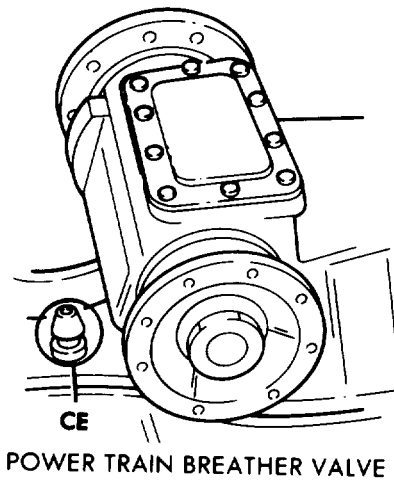
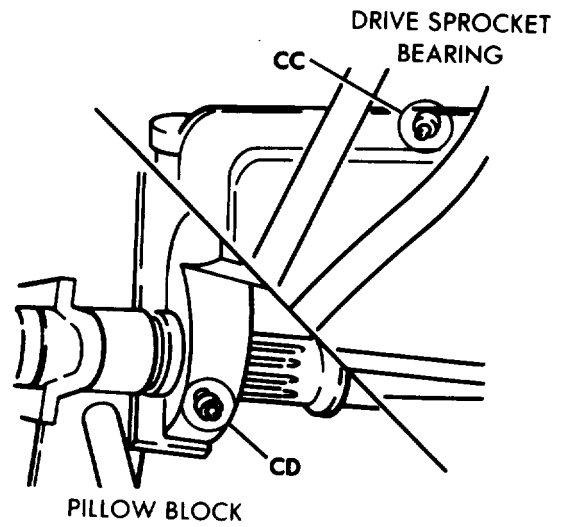
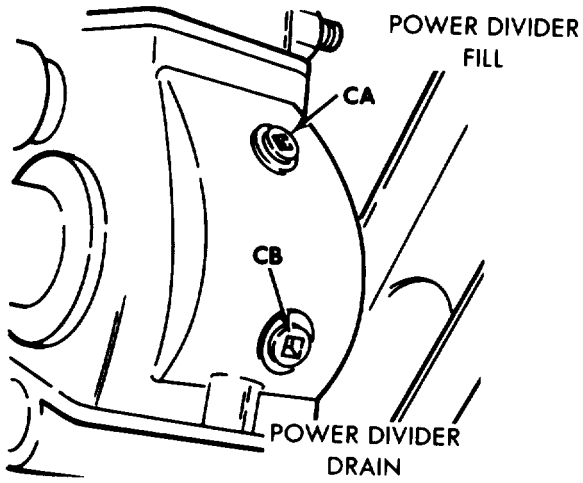
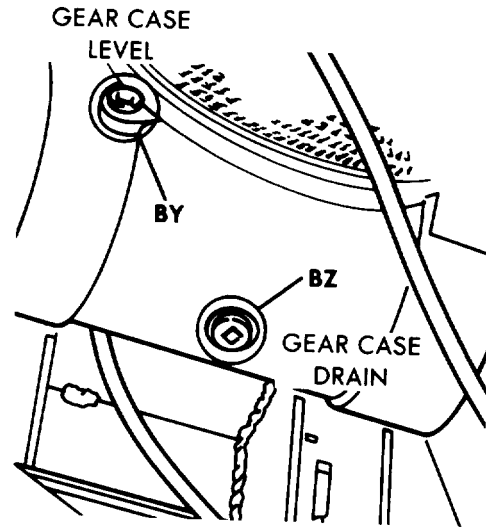
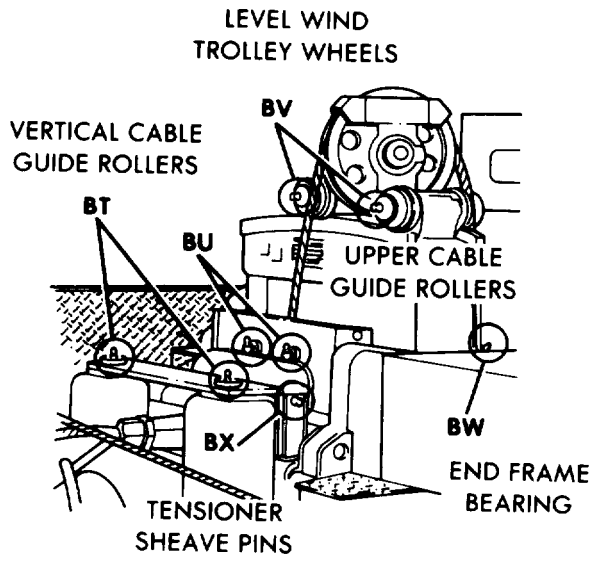


LOCALIZED LUBRICATION POINTS (AR THROUGH BC)





LOCALIZED LUBRICATION POINTS (BD THROUGH BS)



LOCALIZED LUBRICATION POINTS (BT THROUGH CE)

## NOTES

### 1. INTERVALS

This LO has been revised to comply with DA programming to extend intervals and conserve lubricants. When practicable, lubrication services will be made to coincide with the vehicle "S" Preventive Maintenance Service. For this purpose a 10% tolerance (variation) in specified lubrication point mileage is permissible. Those vehicles not accumulating 1,030 miles (1,600 kilometers) in a 6 month period will be lubricated at time of Preventive Maintenance Service.

### 2. CRANKCASE

#### CAUTION

- Withdraw dipstick slowly to ensure accurate reading. There are two marks on the dipstick, "H" and "L". The quantity of oil required to raise the oil level from "L" mark to "H" mark is approximately 7 quarts (6.6 liters). Daily, check and adjust oil level as required prior to engine operation.
- If water or metal particles are detected during crankcase draining and filter element changing, notify Direct Support Maintenance Personnel before refilling crankcase.

#### NOTE

Ž Fill crankcase with 27 quarts (25.5 liters) of engine oil. Crankcase capacity is 23 quarts (21.8 liters) and oil filter capacity is 4 quarts (3.8 liters). Start engine and visually check for oil leaks at drain plug and oil filter case. Stop engine and allow approximately one minute for oil to drain back into oil pan; recheck oil level with dipstick. The dipstick is equipped with a seal which fits into the opening of the dipstick tube. The seal is seated within the tube and must be turned counterclockwise to be released before dipstick is withdrawn. Turn clockwise to seat after oil level has been checked and dipstick installed.

- Do not hold oil samples. Submit oil samples as soon as they have been taken.

Sample oil every 60 days or 1,000 miles (1,600 kilometers). Army Reserve Units will sample every 120 days or 1,000 miles (1,600 kilometers). Oil will be changed only when directed by oil analysis laboratory.

Bring engine up to operating temperature and remove drain plug from oil pan. Inspect for presence of metal particles and water while draining oil into a drainage container. Allow sufficient draining time so that all oil has time to drain. Install drain plug and tighten to 60-70 lb-ft (81-95 N•m).

#### NOTE

- Seasonal oil changes will be made due to expected temperatures. See the Chart on page 2.
- If oil analysis laboratory is not available, use the hard time interval of 6,000 miles, 6 months or 600 engine hours, whichever occurs first. Replace the oil filter element each time oil is drained.

TA 255968

## NOTES (Cont'd)

### 3. ENGINE OIL FILTER

Oil filter will be changed only when directed by oil analysis laboratory. Remove filter drain plug, drain oil and remove filter case assembly (with element) from filter head. Remove filter element from filter case and inspect for presence of metal particles or water, Discard element after inspection has been completed. Remove seal ring from filter head and discard. Clean filter case thoroughly. Check to ensure element end seals are in place and install new element over spring support assembly. Position new seal ring on filter head with drain plug pointing down. Tighten center capscrew 25-35 lb-ft (34-47 N•m). (Follow procedure outlined in NOTE 2).

### 4. ENGINE FUEL FILTER

Replace every 3,000 miles (4,800 kilometers) or 3 months, whichever occurs first.

### 5. CRANKCASE BREATHER

Check and clean crankcase breather and lines every 6,000 miles (9,600 kilometers) under normal operating conditions.

### 6. GEAR CASE

Change gear lubricant only when required by maintenance repair action, or if contaminated by water or other foreign material. Drain only after operation when hot. Place vehicle in level position. Remove drain and filler plugs from case, and after draining reinstall drain plugs. Fill axle differentials, transfer, transmission, and power divider (M816 wrecker), within 1/2 inch (12.7 millimeters) of filler plug opening, when lubricant is cold, or to plug level when hot. Fill other gear cases to plug openings at all times, and install filler plugs. Clean vents after operation in mud or water.

### 7. FRONT AXLE UNIVERSAL JOINTS AND STEERING KNUCKLE BEARINGS

Every 12,000 miles (19,000 kilometers) or 12 months, remove plug from universal joint housing, fill to level of plug opening, reinstall plug. Do not disassemble C.V. joints.

### 8. PROPELLER SHAFT UNIVERSAL AND SLIP JOINTS

Every 3,000 miles (4,800 kilometers) or 3 months, whichever occurs first, on universals equipped with plugs, remove filler plugs and install pressure fittings; lubricate using low pressure lubrication gun. If operating conditions are severe or abnormal, service at 1,000 miles (1,600 kilometers).

### 9. STEERING HYDRAULIC SYSTEM

Fill until oil is visible in sight glass window of reservoir while engine is stopped. The steering gear receives lubrication from the power steering pump.

### 10. BRAKE MASTER CYLINDER

#### **CAUTION**

Use only brake fluid silicone (MIL-B-46176).

Check level weekly. Fill to 1/2 inch (12.7 millimeters) from top of master cylinder. Use BFS (MIL-B-46176) for brake master cylinder.

TA 255969

## NOTES (Cont'd)

### 11. REAR SPRINGS TRUNNION BEARINGS

Every 3,000 miles (4,800 kilometers) or 6 months, whichever occurs first, loosen screws on bearing cap, lubricate through fitting until lubricant appears around cap, and tighten capscrews. Every 6,000 miles (9,600 kilometers) or annually, whichever occurs first, remove, clean, dry, and repack trunnion bearings.

### 12. M816 HOIST WINCH

Change gear lubricant only when required by maintenance repair action, or if contaminated by water or other foreign material.

Weekly, with boom in horizontal position, remove level plug from winch worm gear case and winch input drive reduction gear case; if level is below level plug hole, replenish to bottom of hole.

### 13. WINCH AND CRANE HOIST CABLES

After each operation, clean and oil with new OE/HDO. Every 6 months if cable is not generally used, unwind entire cable; clean and soak; by means of a brush, with new OE/HDO. Wipe off excess and coat cable with CW. Also coat winch drum with CW before rewinding cable on drum.

### 14. M816 CRANE HYDRAULIC OIL TANK

With boom in horizontal position, remove oil filler cap and gage from top of tank. If level is below full mark on gage, replenish to full mark. Every 12 months, remove pipe plug from drain valve, attach hose (furnished with vehicle), and drain oil into a container. Remove plug in bottom of tank to completely drain. Always install plug in drain valve after draining. Refill tank to full mark on oil level gage, approximately 60 gallons (227 liters). Operate crane several times to completely fill system, and check level.

### 15. DUMP BODY HYDRAULIC RESERVOIR

#### **WARNING**

Rest weight of dump body on safety braces when performing maintenance on hoist mechanism with dump body in raised position.

#### **CAUTION**

Remove filler plug slowly to release pressure. Do not overfill.

Weekly, remove filler plug, gage, and screen; clean and install screen. Replenish with oil to third mark from top on gage with body down in lowered position. Install gage and plug. Raise and lower body several times slowly and recheck oil level. Drain every 12 months. Remove drain plug from reservoir and drain with dump body in lowered position. Clean and install drain plug. Refill reservoir with OE/HDO 10. Raise and lower body several times slowly and recheck oil level. Capacity of hydraulic system is 37 quarts (35 liters).

### 16. OIL CAN POINTS

Every 1,000 miles (1,600 kilometers) or monthly, lubricate hinges and latches, transfer and power takeoff shift linkage, clutch and brake pedal linkage, hand brake lever, rear winch control lever linkage, and dump truck tailgate bearings, with seasonal grade OE/HDO. **TA 255970**

## NOTES (Cont'd)

### 17. DO NOT LUBRICATE

Springs, clutch release bearing, alternator, shock absorbers, or clutch pilot bearing.

### 18. LUBRICATED AT TIME OF DISASSEMBLY BY DS AND GS PERSONNEL

Clutch release bearing carrier, rear winch swivel sheave frame bearing, pedestal bearing, starter, water pump and fan hub pulley.

### 19. OPERATOR PARTICIPATION

“D” maintenance is performed by the operator. Operator may assist in lubrication intervals marked “W” or “S” if supervised by qualified personnel.

### 20. M816 CRANE HYDRAULIC SYSTEM FILTER

#### CAUTION

Do not operate crane when indicator is at “BY-PASSING” position.  
Notify Organizational Maintenance.

To maintain adequate filtering, remove and clean filter element when indicator points to “Needs Cleaning” with pump running and oil at operating temperature.

### 21. LIFT GATE HYDRAULIC OIL TANK

Every 3 months check hydraulic oil level. Place lift gate in lowered position at ground level and remove filler plug. Oil supply is minimum at 2 inches (5.1 centimeters) and maximum at 3 inches (7.6 centimeters).

When necessary to add oil, operate lift gate several times up and down, open and close with filler plug removed. If there is excessive oil in the system the oil tank will overflow. Replace filler plug.

### 22. M819 HOIST DRUM

Weekly, check level, drain only when required by maintenance repair action, or if contaminated by water or other foreign material. Set boom in horizontal position and remove drain plug from case. Remove breather and level plug; fill drum to level of plug hole. Install plug. Clean and install breather.

### 23. M819 CRANE HYDRAULIC OIL TANK

Weekly, with boom in horizontal position, remove plug from top of tank. If level is below bottom mark on gage, replenish to tap mark. Every 12 months, remove plug from bottom of tank, and drain. To completely drain system, operate crane several times, disconnect hydraulic lines at lowest position, and let drain. Clean and install plug. Connect hydraulic lines. Refill tank with 33 gallons (125 liters) of oil and operate crane several times to completely fill system. Check level.

### 24. M819 RING GEAR

Remove pivot post drain plugs located on underside of crane base plate. Remove two pipe plugs on each side of pivot post gear shield and install lubricating fittings. Lubricate through fittings until lubricant appears at underside of pivot post drain holes. Install pivot post drain plugs, remove fittings, and install pipe plugs.

TA 255971

## NOTES (Cont'd)

### 25. TEMPERATURE RISES

If ambient temperature rises to 70°F (21°C) for no more than one week, use of OE/HDO 10 is permissible. If ambient temperature rises to 40°F (+4°C) for no more than one week, use of OEA is permissible.

### 26. FOR OPERATION OF EQUIPMENT IN PROLONGED COLD TEMPERATURE BELOW - 10°F (-23°C)

Remove lubricants prescribed in the key for temperatures above -10°F (-23°C). Clean parts with drycleaning solvent. Relubricate with lubricants specified in the key for temperatures below -10°F (-23°C).

### 27. WINCHES, CRANES, WRECKERS, DUMP BODY, AND LIFTGATE

Service every 3,000 miles (4,800 kilometers) or semiannually, whichever occurs first. If operation is frequent, or under severe conditions, service weekly.

### 28. POWER DIVIDER

Service every 12,000 miles (19,000 kilometers) or annually, whichever occurs first.

*Copy of this lubrication order will remain with the vehicle 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:**

JOHN A. WICKHAM, JR.  
General, United States Army  
*Chief of Staff*

OFFICIAL:

*R.M. Joyce*  
*Major General, United States Army*  
*The Adjutant General*

Distribution:

To be distributed in accordance with DA Form 12-38, LO requirements for Truck, Chassis: 5 Ton, 6X6, M809 A1, M810, M811, A1 & A2; M812 & A1; Cargo: M813; M814; M815; Wrecker: Medium, M816; Dump; M817, Tractor; M818, TractorWrecker; M819, Van; Expansive: M820 A1 & A2, Stake; Bridge Transporting M821.

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN...JOT DOWN THE  
DOPE ABOUT IT ON THIS FORM.  
CAREFULLY TEAR IT OUT, FOLD IT  
AND DROP IT IN THE MAIL.

SOMETHING WRONG WITH 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.

TEAR ALONG PERFORATED LINE

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER

SIGN HERE



# The Metric System and Equivalents

## Linear Measure

1 centimeter = 10 millimeters = .39 inch  
 1 decimeter = 10 centimeters = 3.94 inches  
 1 meter = 10 decimeters = 39.37 inches  
 1 dekameter = 10 meters = 32.8 feet  
 1 hectometer = 10 dekameters = 328.08 feet  
 1 kilometer = 10 hectometers = 3,280.8 feet

## Weights

1 centigram = 10 milligrams = .15 grain  
 1 decigram = 10 centigrams = 1.54 grains  
 1 gram = 10 decigrams = .035 ounce  
 1 dekagram = 10 grams = .35 ounce  
 1 hectogram = 10 dekagrams = 3.52 ounces  
 1 kilogram = 10 hectograms = 2.2 pounds  
 1 quintal = 100 kilograms = 220.46 pounds  
 1 metric ton = 10 quintals = 1.1 short tons

## Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce  
 1 deciliter = 10 centiliters = 3.38 fl. ounces  
 1 liter = 10 deciliters = 33.81 fl. ounces  
 1 dekaliter = 10 liters = 2.64 gallons  
 1 hectoliter = 10 dekaliters = 26.42 gallons  
 1 kiloliter = 10 hectoliters = 264.18 gallons

## Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch  
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches  
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet  
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet  
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres  
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

## Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch  
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches  
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

## Approximate Conversion Factors

To change	To	Multiply by	To change	To	Multiply by
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

## Temperature (Exact)

°F Fahrenheit temperature      5/9 (after subtracting 32)      Celsius temperature      °C

