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LUBRICATION ORDER

LO 9-1025-200-13

30 DECEMBER 1988 (Supersedes LO 9-1025-200-10, 1 April 1966.)

**HOWITZER, MEDIUM, TOWED: 155-MM M 114A1
(NSN 1025-00-322-9768) AND M 114A2 (NSN 1025-01-025-9857)**

Reference: TM 9-1025-200-12&P

Intervals and the related manhour times are based on normal operation. The manhour time 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. You may extend the interval during periods of low activity, but you must take adequate preservation precautions.

See appropriate referenced technical manual for lubrication under unusual conditions.

Clean fittings before lubricating. Clean parts with cleaning compound, PD680. Dry before lubricating. Dotted arrow points indicate lubrication on both sides of the equipment.

NOTE

CLP is the main lubricant for the oil can points and after cleaning. OL or CR may be used as an alternative unless specifically mentioned otherwise. GAA will be used as the main lubricant for organizational lubing of lube fittings.

The lowest level of maintenance authorized to lubricate a point is indicated by one of the following symbols as appropriate: operator/crew (C), unit maintenance (0), and intermediate direct support maintenance (F).

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After-Fording Lubrication.

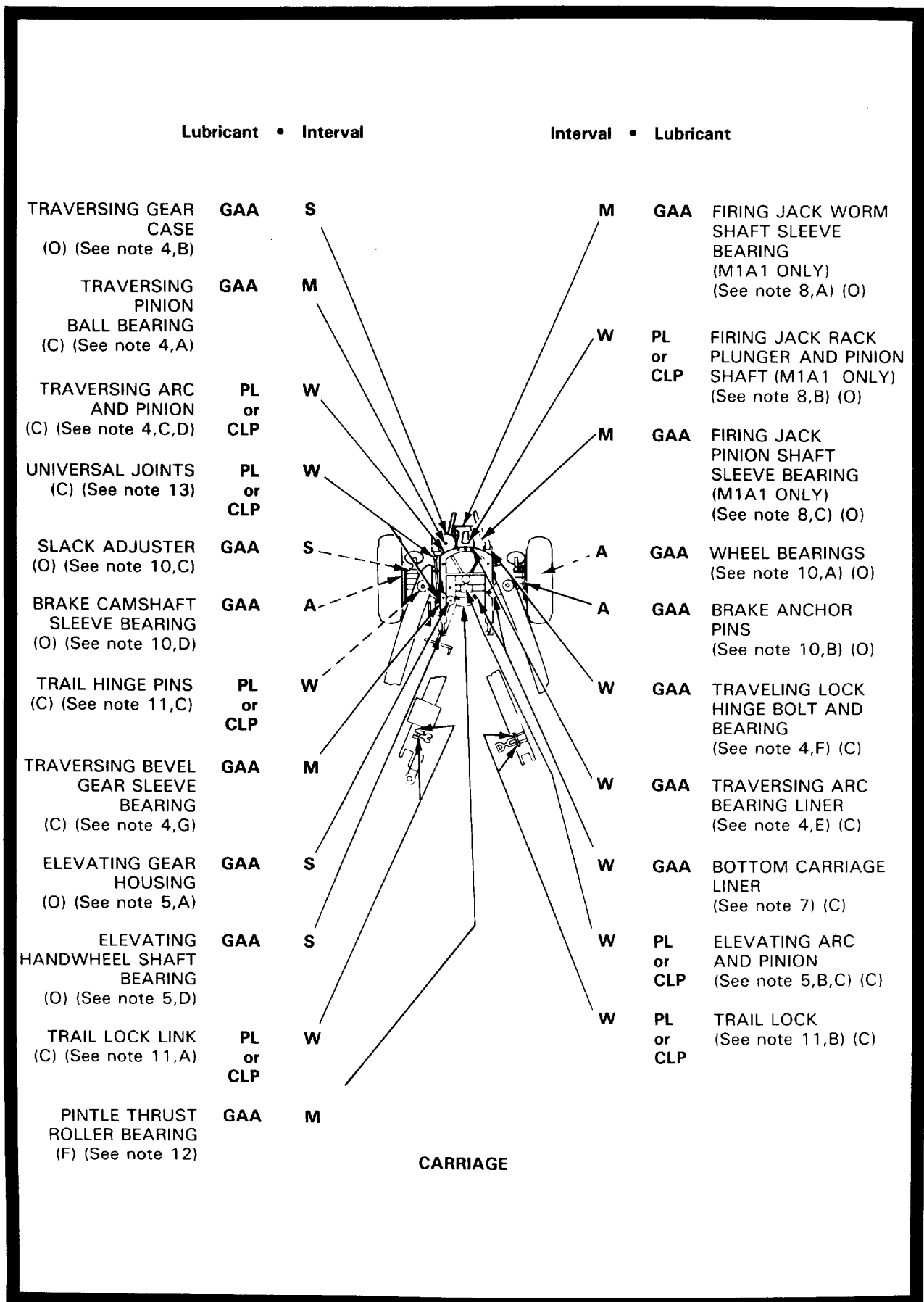
- a. Immediately after weapon is towed from the water, if the tactical situation permits, perform the following services:
 - (1) Remove the wheel and hub assemblies and thoroughly clean and dry all working parts of brakes and wheel bearings. Lubricate assemblies in accordance with lubrication order.
 - (2) Empty the materiel of any accumulated water, clean, dry, and apply prescribed lubricant to all exposed unpainted surfaces, paying special attention to bore and chamber, recoil slides, and equilibrators rods.
 - (3) Remove drain plugs from trail assemblies, allow trapped water to drain out, and install drain plugs. See that four drain holes in top carriage are open. (Refer to TM 9-1025-200-12&P.)
- b. If parts of the materiel are accidentally submerged or badly splashed, apply temporary preservation and perform necessary complete disassembly, cleaning, and lubrication as soon as possible.
- c. Saltwater immersion greatly increases rusting and corrosion, especially on unpainted surfaces. It is most important to remove all traces of saltwater and salt deposits from every part of the cannon and carriage. Apply temporary preservation and perform necessary complete disassembly, cleaning, and lubrication as soon as possible.

TOTAL MAN-HR		TOTAL MAN-HR	
INTERVAL	MAN-HR	INTERVAL	MAN-HR
A	52.0	S	1.5
D	6.9	W	15.0
M	1.5		

KEY

LUBRICANT	EXPECTED TEMPERATURE			INTERVAL
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL (MIL-L-3150 and VVL 800) -Lubricating Oil, General	PL (medium) (MIL-L-3150)	PL (special) (VVL 800)	PL (special) (VVL 800)	A - Annually
CR (MIL-C-3454) -Cleaning Compound, Solvent	All temperatures			D - Daily
CLP (MIL-L-63460) -Cleaner, Lubricant, Preservative				M - Monthly
OHT (MIL-H-6083) -Hydraulic Fluid, Petroleum Base				S - Semiannually
GAA (MIL-G-10924) -Grease Automotive and Artillery				W - Weekly
PD 680 (MIL-C-43454) -Cleaning Compound, Optical Lens				

For arctic operation, refer to TM 9-207.



Lubricant • Interval

Interval • Lubricant

TRAVERSING GEAR CASE
(O) (See note 4,B)

GAA S

TRAVERSING PINION BALL BEARING
(C) (See note 4,A)

GAA M

TRAVERSING ARC AND PINION
(C) (See note 4,C,D)

PL or CLP W

UNIVERSAL JOINTS
(C) (See note 13)

PL or CLP W

SLACK ADJUSTER
(O) (See note 10,C)

GAA S

BRAKE CAMSHAFT SLEEVE BEARING
(O) (See note 10,D)

GAA A

TRAIL HINGE PINS
(C) (See note 11,C)

PL or CLP W

TRAVERSING BEVEL GEAR SLEEVE BEARING
(C) (See note 4,G)

GAA M

ELEVATING GEAR HOUSING
(O) (See note 5,A)

GAA S

ELEVATING HANDWHEEL SHAFT BEARING
(O) (See note 5,D)

GAA S

TRAIL LOCK LINK
(C) (See note 11,A)

PL or CLP W

PINTLE THRUST ROLLER BEARING
(F) (See note 12)

GAA M

M

GAA FIRING JACK WORM SHAFT SLEEVE BEARING
(M1A1 ONLY)
(See note 8,A) (O)

W

PL or CLP FIRING JACK RACK PLUNGER AND PINION SHAFT (M1A1 ONLY)
(See note 8,B) (O)

M

GAA FIRING JACK PINION SHAFT SLEEVE BEARING (M1A1 ONLY)
(See note 8,C) (O)

A

GAA WHEEL BEARINGS
(See note 10,A) (O)

A

GAA BRAKE ANCHOR PINS
(See note 10,B) (O)

W

GAA TRAVELING LOCK HINGE BOLT AND BEARING
(See note 4,F) (C)

W

GAA TRAVERSING ARC BEARING LINER
(See note 4,E) (C)

W

GAA BOTTOM CARRIAGE LINER
(See note 7) (C)

W

PL or CLP ELEVATING ARC AND PINION
(See note 5,B,C) (C)

W

PL or CLP TRAIL LOCK
(See note 11,B) (C)

CARRIAGE

Lubricant • Interval

Interval • Lubricant

FIRING JACK
RATCHET PLUNGER
(C) (See note 9,B)

PL
or
CLP

W

W

GAA FIRING JACK
RATCHET
(See note 9,A) (C)

FIRING JACK
THRUST ROLLER
BEARING
(C) (See note 9,C)

GAA

W

S

PL
or
CLP BREATHER PLUG
(See note 9,G) (O)

FIRING JACK
HINGE SLEEVE
BEARING
(C) (See note 9,D)

GAA

W

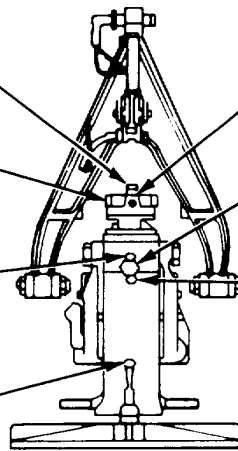
W

GAA FIRING JACK
HINGE SCREW
(See note 9,E) (C)

FIRING JACK
PLUNGER
(C) (See note 9,F)

GAA

W



FIRING JACK ASSEMBLY
CARRIAGE M1A2
Front view firing position

Lubricant • Interval

Interval • Lubricant

RECOIL CYLINDER
REPLENISHER OIL
FILLING VALVE
PLUG
(C) (See note 3,A)

EXPOSED RECOIL
SLIDE
(C) (See note 3,B)

YOKE LINER
(C) (See note 3,C)

CRADLE LINER
(C) (See note 3,G)

RECUPERATOR
CYLINDER OIL
FILLING VALVE
PLUG
(C) (See note 3,I)

BREECH MECHA-
NISM HINGE PIN
ASSEMBLY
(C) (See note 2,A)

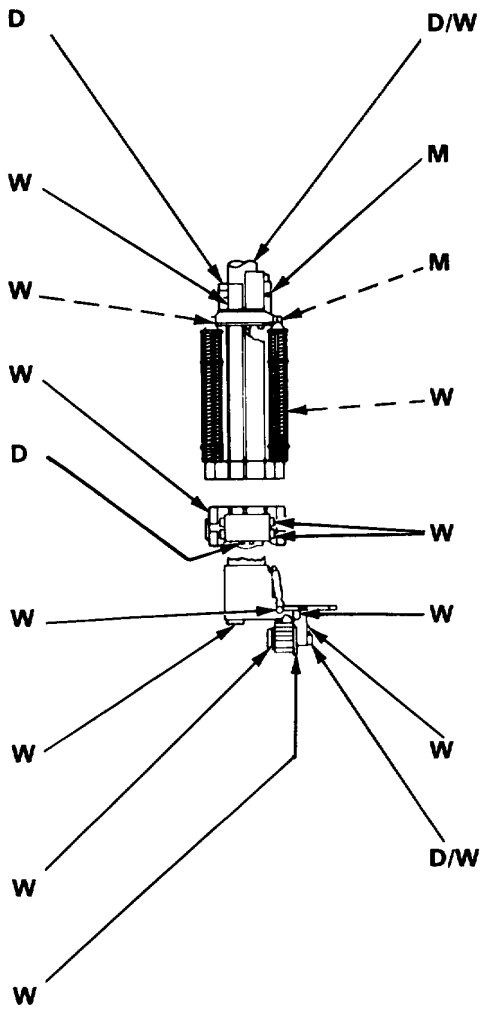
BREECH MECHA-
NISM ROTAT-
ING CAM
(C) (See note 2,E)

OBTURATOR
SPINDLE
(C) (See note 2,C)

BREECHBLOCK
ROTATING ROLLER
(C) (See note 2,D)

OHT
PL
or
CLP
GAA
GAA
GAA
OHT
PL
or
CLP
PL
or
CLP
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W

D
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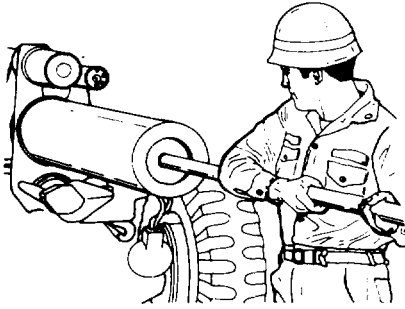
D/W
M
M
W
W
W
W
W
W
D/W

CLP CANNON BORE
(See note 1) (C)
GAA VARIABLE RECOIL
CAM ASSEMBLY
(See note 3,E) (C)
GAA EQUILIBRATOR
FRONT END
SLEEVE BEARING
(See note 3,D) (C)
PL
or
CLP EQUILIBRATOR
SPRINGS, RODS,
AND TUBES
(See note 6) (C)
GAA CRADLE KEYWAY
(See note 3,H) (C)
PL
or
CLP BREECH MECHAN-
ISM CRANKSHAFT
JOURNAL
(See note 2,B) (C)
PL
or
CLP FIRING MECHANISM
SAFETY LATCH
(See note 2,F) (C)
CLP BREECH AND FIRING
MECHANISMS
(See note 1) (C)

CANNON AND RECOIL MECHANISM

NOTE 1

CANNON TUBE AND BREECH MECHANISM ASSEMBLY



CANNON TUBE

a. Day of firing.

- (1) Make sure you have the following items from artillery cleaning kit.
 - (a) One premeasured bottle CLP
 - (b) One nylon bristle bore brush assembly
- (2) Attach bore brush assembly to standard rammer staff.
- (3) Inspect breech mechanism and cannon tube and clear obstructions.

CAUTION

Nylon brush assembly should not be used with RBC. RBC will destroy the bore brush assembly.

- (4) Wet punch the cannon tube as follows.
 - (a) Pour one quarter of bottle of CLP onto bore brush assembly and punch cannon tube once forward and once back.
 - (b) Pour second quarter of CLP onto bore brush assembly and scrub back and forth the entire length of cannon tube. Repeat this step with third quarter of CLP.
 - (c) Pour the final quarter of CLP onto bore brush assembly. Wet entire length of cannon tube once forward and once back.

b. Day after firing

(1) Make sure you have the following items from artillery cleaning kit.

- (a) Two premeasured bottles of CLP
- (b) One nylon bristle bore brush assembly
- (c) Three disposable cleaning sleeves

- (2) Attach bore brush assembly to standard rammer staff.

CAUTION

Nylon bore brush assembly should not be used with RBC. RBC will destroy the bore brush assembly.

- (3) Wet punch the cannon tube following procedures in step a(4) above.
- (4) Wrap bore brush assembly with new disposable cleaning sleeve and dry punch the entire length of cannon tube once forward and once back. Remove and dispose of sleeve.
- (5) Wrap bore brush assembly with new disposable cleaning sleeve. Pour on half of bottle of CLP. Wet punch the entire length of cannon tube once forward and once back. Remove and dispose of sleeve. Repeat this step with last half of CLP in bottle.

NOTE

If the cannon tube has not been previously cleaned with CLP and there is a heavy build up of coppering or carbon deposits or severe heat cracking, it may be necessary to repeat cleaning instructions until the cannon tube has been thoroughly cleaned with CLP.

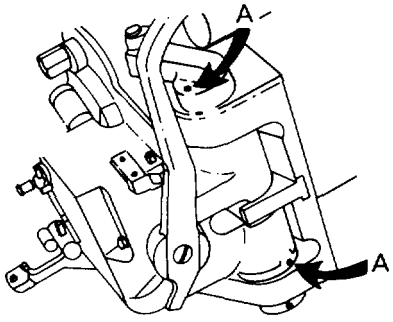
BREECH MECHANISM ASSEMBLY

a. Day of firing.

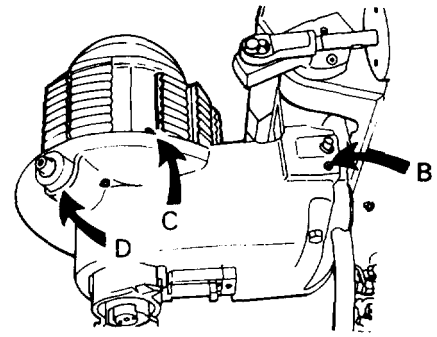
- (1) Make sure you have the following items.
 - (a) One liter bottle of CLP with trigger spray from artillery cleaning kit
 - (b) Wiping rags from general supply
 - (c) Primer vent brush
- (2) Disassemble breech mechanism and wet with CLP. Allow to soak 10 to 15 minutes and wipe off. Reapply a light coat of CLP and reassemble.
- (3) Spray CLP onto all exposed metal surfaces.
- (4) Apply CLP to primer vent and thoroughly brush with primer vent brush.
- (5) Disassemble firing mechanism, wet with CLP, and use wiping rag to remove all carbon and firing residue. Reapply a light coat of CLP and reassemble.

NOTE 2

BREECH AND FIRING MECHANISM



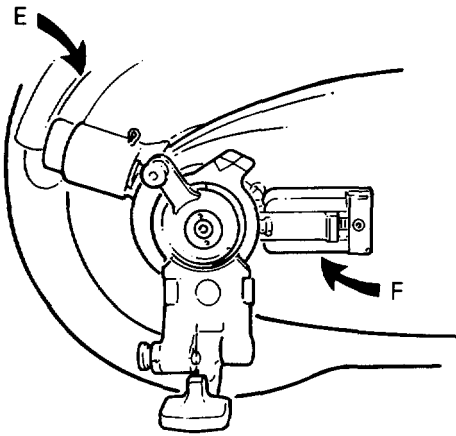
A Breech mechanism hinge pin assembly.



B Breech mechanism crankshaft journal.

C Obturator spindle.

D Breechblock rotating roller.



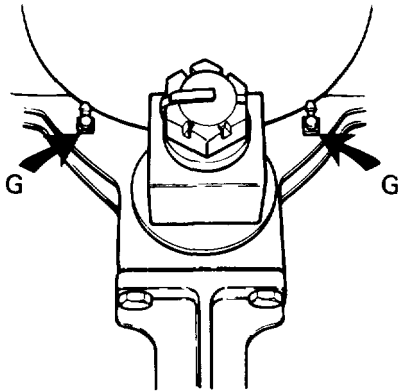
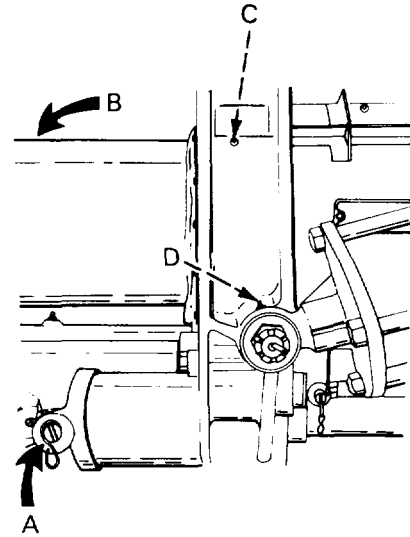
E Breech mechanism rotating cam.

F Firing mechanism safety latch.

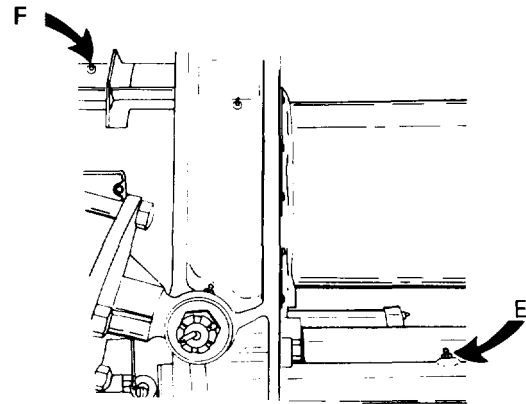
NOTE 3

GUN MOUNT AND RECOIL MECHANISM

- A Recoil cylinder replenisher oil filling valve plug. (Add hydraulic fluid as required.)
- B Exposed recoil slide. (Clean. Coat with a thin film of PL/CLP.)
- C Yoke liner.
- D Equilibrator front end sleeve bearing.
- E Variable recoil cam assembly. (Lubricate sparingly with GAA.)
- F Cradle keyway.



- G Cradle liner. (Also lubricated with GAA at time of disassembly by direct support maintenance.)

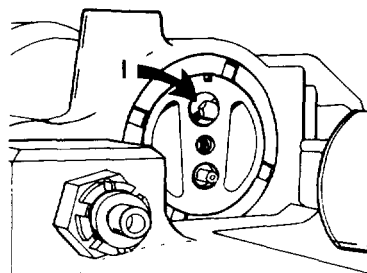


- H Cradle keyway. (Also lubricated with GAA at time of disassembly by direct support maintenance.)

NOTE 3 (cont)

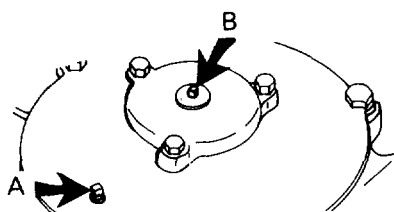
GUN MOUNT AND RECOIL MECHANISM (Cont)

I Recuperator cylinder oil filling valve plug.
(Reestablish reserve before firing.)



NOTE 4

TRAVERSING MECHANISM AND TRAVELING LOCK

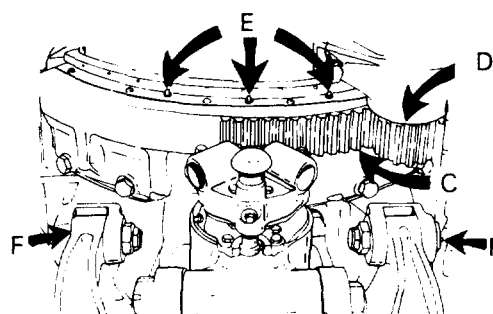


NOTE

Remove plugs and install grease fittings.

A Traversing pinion ball bearing.

B Traversing gear case. (Also lubricated with GAA at time of disassembly by direct support maintenance.)

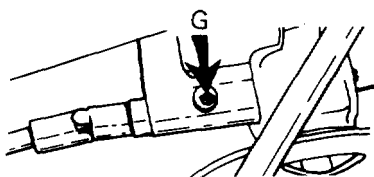


C Traversing arc. (Clean. Oil with PL/CLP.)

D Traversing pinion. (Clean. Oil with PL/CLP.)

E Traversing arc bearing liner.

F Traveling lock hinge bolt and bearing.



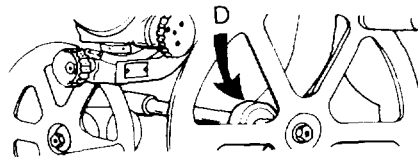
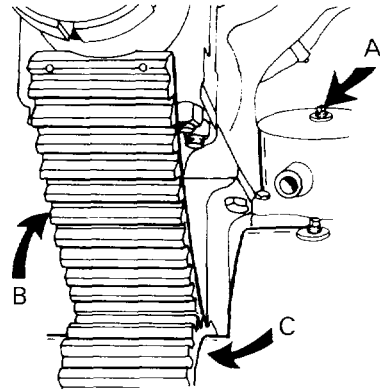
G Traversing bevel gear sleeve bearing.

NOTE 5

ELEVATING MECHANISM

- A Elevating gear housing. (Remove cover, clean, and repack.) Do not fill through plug. (Also lubricated with GAA at time of disassembly by direct support maintenance.)
- B Elevating arc. (Clean. Oil with PL/CLP.)
- C Elevating pinion. (Clean. Oil with PL/CLP.)

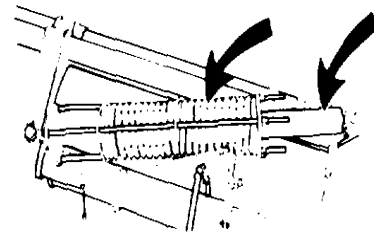
- D Elevating handwheel shaft bearing. (Remove cover, clean, and repack.) (Also lubricated with GAA at time of disassembly by direct support maintenance.)



NOTE 6

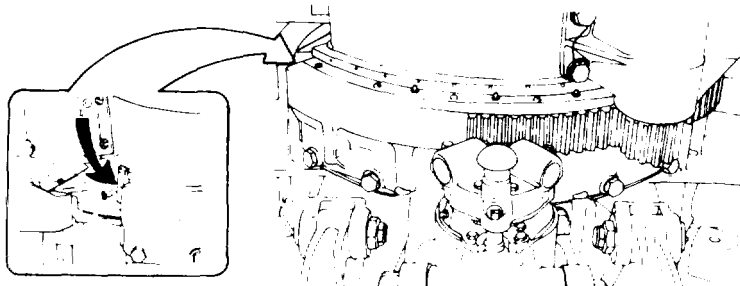
EQUILIBRATORS

Equilibrator springs, rods, and tubes. (Clean. Oil with PL/CLP.)



NOTE 7

BOTTOM CARRIAGE

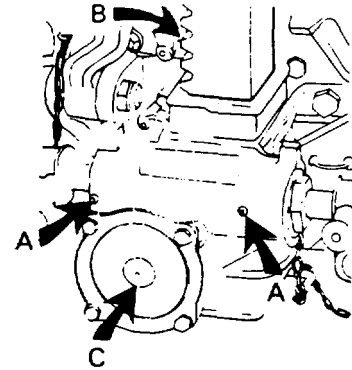


Bottom carriage liner. (Also lubricated with GAA at time of disassembly by direct support maintenance.)

NOTE 8

FIRING JACK, CARRIAGE M1A1

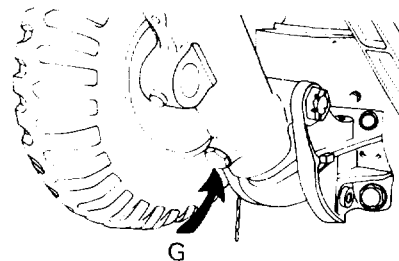
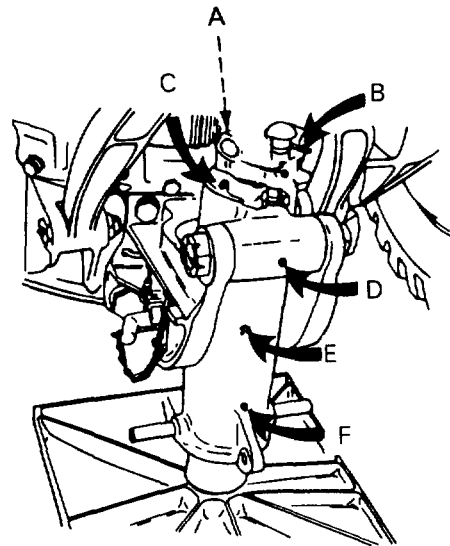
- A Firing jack worm shaft sleeve bearing.
- B Firing jack rack plunger and pinion shaft.
(Remove plunger, clean, and oil rack pinion.)
- C Firing jack pinion shaft sleeve bearing.



NOTE 9

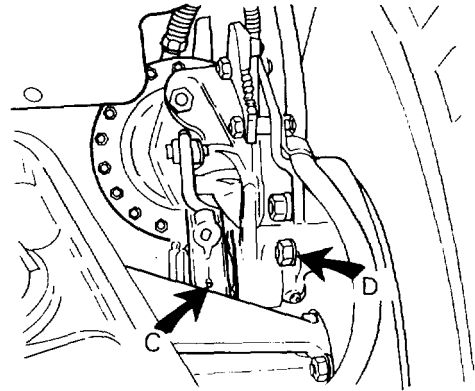
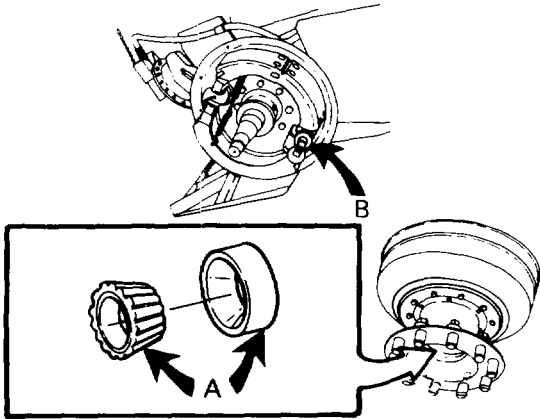
FIRING JACK ASSEMBLY, CARRIAGE M1A2

- A Firing jack ratchet.
- B Firing jack ratchet plunger. (Remove plug and apply 3 or 4 drops of PL/CLP.)
- C Firing jack thrust roller bearing.
- D Firing jack hinge sleeve bearing.
- E Firing jack hinge screw. (Before lubricating with GAA, retract the firing jack plunger to the traveling position.)
- F Firing jack plunger.
- G Breather plug. (Remove wool waste, clean with mineral spirits, air dry, and saturate with PL/CLP.)



NOTE 10

WHEEL AND HUB ASSEMBLIES AND BRAKE

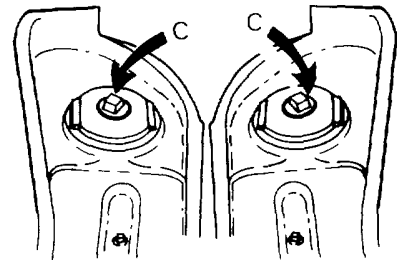
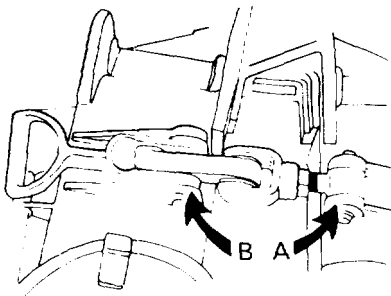


- A Wheel bearing. (Remove, clean, and repack.) (See TM 9-214 Inspection, Care and Maintenance of Antifriction Bearings.)
- B Brake anchor pins. (Lubricate with GAA at time of annual wheel bearing lubrication. Remove plug, insert a fitting, and lubricate sparingly with GAA. Replace plug after lubrication.)

- C Slack adjuster. (Lubricate with GAA through plug hole.)
- D Brake camshaft sleeve bearing. (Lubricate with GAA at time of annual wheel bearing lubrication. Remove plug, insert a fitting, lubricate sparingly with GAA. Replace plug after lubrication.)

NOTE 11

TRAILS



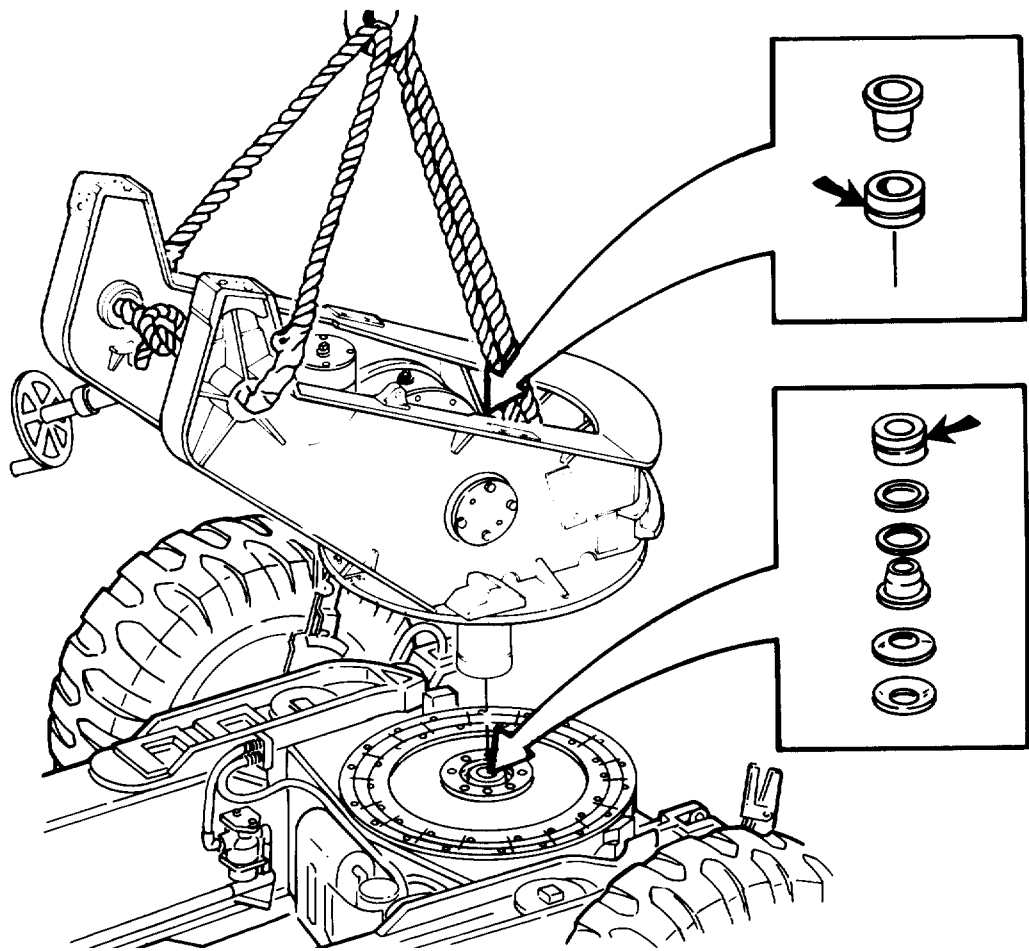
RIGHT TRAIL ASSEMBLY LEFT TRAIL ASSEMBLY

- A Trail lock link.
- B Trail lock.

- C Trail hinge pins. (To lubricate, remove plugs and saturate waste with oil (PL/CLP). Semiannually remove waste, clean with cleaning compound PD680, dry, saturate with PL/CLP, and install.)

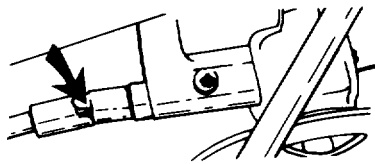
PINTLE THRUST ROLLER BEARING

NOTE 12



(Lubricate annually with GAA. Also lubricate with GAA at time of disassembly by direct support maintenance.)

NOTE 13



UNIVERSAL JOINTS
(Elevating and traversing)

NOTE 14

High humidity, moisture, or salt air tend to contaminate lubricants, necessitating more frequent service than specified for usual conditions.

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