

101-AL. Copy Sec. A



9-1400-250-20

DEPARTMENT OF THE ARMY LUBRICATION ORDER

**ORGANIZATIONAL MAINTENANCE NIKE-
HERCULES LAUNCHING AND HANDLING
EQUIPMENT**

**(NIKE-HERCULES AND IMPROVED
NIKE-HERCULES AIR DEFENSE
GUIDED MISSILE SYSTEMS)**

HC1 + C2



**HEADQUARTERS, DEPARTMENT OF THE ARMY
JANUARY 1965**

AL

CHANGE }
No. 2 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 24 August 1967

Organizational Maintenance
NIKE-HERCULES LAUNCHING AND HANDLING EQUIPMENT
(NIKE-HERCULES AND IMPROVED NIKE-HERCULES AIR DEFENSE GUIDED MISSILE SYSTEM)

LO 9-1400-250-20, 7 January 1965, is changed as follows:

1. The new pages listed below will be inserted in the lubrication order and the old pages removed. Added or changed material on new pages is indicated by a vertical line in the page margin or a letter change to the ORD G number of illustrations. Added or completely revised chapters, sections, paragraphs, tables, etc., are indicated by a vertical line by the title only.

Old pages	New pages
✓ 3, 4	3, 4
✓ 5, 6	5, 6
✓ 9, 10	9, 10
✓ 19, 20	19, 20
✓ 23 through 28	23 through 28
✓ 35, 36	35, 36

2. Retain the transmittal sheet in the front of the lubrication order for future reference.

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12-32 Section II, requirements for organizational maintenance applicable to the NIKE-HERCULES and IMPROVED NIKE-HERCULES missile system.

29/3/68
cm [Signature]

LUBRICATION ORDER

ORGANIZATIONAL MAINTENANCE
 NIKE-HERCULES LAUNCHING AND
 HANDLING EQUIPMENT (NIKE-
 HERCULES AND IMPROVED NIKE-
 HERCULES AIR DEFENSE
 GUIDED MISSILE SYSTEMS)

LO 9-1400-250-20)

CHANGES No. 1)

HEADQUARTERS
 DEPARTMENT OF THE ARMY
 WASHINGTON, D. C., 17 September 1965

LO 9-1400-250-20, 7 January 1965, is changed as follows:

1. The effectivity for material in these changes is all equipment.
2. The attached new pages, as enumerated below, will be inserted in the manual and the old pages will be removed.

Old pages	New pages
3, 4	3, 4
7, 8	7, 8
17-20	17-20
23, 24	23, 24
27, 28	27, 28
35, 36	35, 36
45	45

3. Retain the transmittal sheets in the front of the manual for future reference.

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12-32, Section II, Unclassified requirements for Organizational Maintenance for Nike-Hercules and Improved Nike-Hercules missile systems.

5-11-66

**ORGANIZATIONAL MAINTENANCE NIKE-HERCULES
LAUNCHING AND HANDLING EQUIPMENT (NIKE-HERCULES
AND IMPROVED NIKE-HERCULES AIR DEFENSE GUIDED
MISSILE SYSTEMS)**

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CHAPTER 1 INTRODUCTION

Section I. GENERAL

1. Scope

This lubrication order contains the mandatory lubrication instructions for the NIKE-HERCULES launching and handling equipment.

2. Lubricating Equipment

a. The lubricating equipment issued to the using organizations is listed in SC 4935-95-CL-A42 or TM 9-1430-250-15P/21/1.

b. This equipment should be cleaned before and after use and returned to the proper location in the storage area.

3. Lubricants

a. The lubricants specified in this lubrication order may be requisitioned through normal supply channels. Refer to SC 9100-IL and SC 9100-ML for detailed information on the lubricants.

b. Replace the lubricant container lids or caps and return the containers to the proper storage location when lubrication is completed. This will prevent contamination of the lubricants.

4. Reporting of Equipment Manual Improvements

The direct reporting by the individual user of errors, omissions and recommendations for improving this equipment lubrication order is authorized and encouraged. DA Form 2028 (Recommended Changes to DA Publications) will be used for reporting these improvements. This form may be completed using pencil, pen, or typewriter and forwarded direct to: Commanding General, U.S. Army Missile Command, ATTN: AMSMI-SMPT, Redstone Arsenal, Ala. 35809.

Section II. LUBRICATION INSTRUCTIONS

5. General

a. Before applying lubricants, clean the lubrication fittings and oil holes with dry-cleaning solvent and wipe them with a general purpose wiping rag.

b. Clean the caps and the area surrounding the caps on oil reservoirs to remove all foreign material before removing the caps.

c. Before connecting an external cable connector, apply electrical insulating compound to the threads to prevent seizure.

d. Apply lubricants sparingly to parts near electronic components and cables. Wipe excessive lubricants from these points with a

clean cloth to keep the lubricant from dripping on the chassis or cables. Oil will cause deterioration of rubber or rubber compound.

e. Unless otherwise directed, all exposed machined surfaces and exposed threads should be coated with soft film corrosion preventive compound every three months. In hot and humid area, hard film corrosion preventative compound may be used in lieu of soft film.

6. Lubrication of Unsealed Bearings

a. Refer to TM 9-1450-250-12 for the removal and installation procedures for unsealed bearings. Clean and repack the bearings as prescribed below.

Caution: Do not spin bearings before packing. Dirt in the bearings can scratch the bearing surfaces.

Warning: Avoid excessive inhalation of vapors to prevent death or injury to personnel. All cleaning procedures must be performed in a well ventilated room or outdoors. A CO₂ fire extinguisher must be positioned adjacent to the area where cleaning procedures are performed.

b. Fill a clean container with dry-cleaning solvent.

c. Attach the bearings to a wire and completely immerse in the solvent.

d. Allow the bearings to soak in the solvent long enough to loosen the old lubricant and dirt.

e. Clean the bearings by rotating them several times while they are immersed in the solvent until the dirt and old lubricant are removed.

f. Rinse in a separate clean container of clean solvent.

g. Dry bearings with clean dry regulated air.

h. Using automotive and artillery grease, place the bearings in the palm of one hand, and pack the bearings with grease by applying pressure with the other hand until grease has thoroughly penetrated bearings.

i. Wipe the excess grease from the bearings with your hand.

j. Lubricate bearing seats with a thin film of automotive and artillery grease.

Note. If bearings are not installed immediately after performing j above, wrap bearings in clean, oil proof paper for protection.

k. Immediately install bearings to prevent contamination of new grease with foreign particles.

7. Oil-Can Points

All latches, hinges, slides, doorstops, etc., will be lubricated monthly with medium preservative lubricating oil.

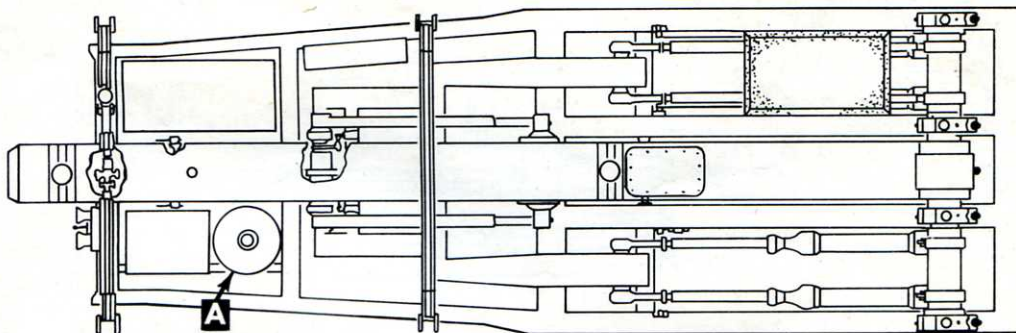
8. Lubrication Under Unusual Conditions

The lubrication intervals specified in this lubrication order are based on normal operation. Reduce or extend the intervals or vary the type lubricant to compensate for abnormal conditions. During inactive periods, the intervals may be extended commensurate with adequate preservation.

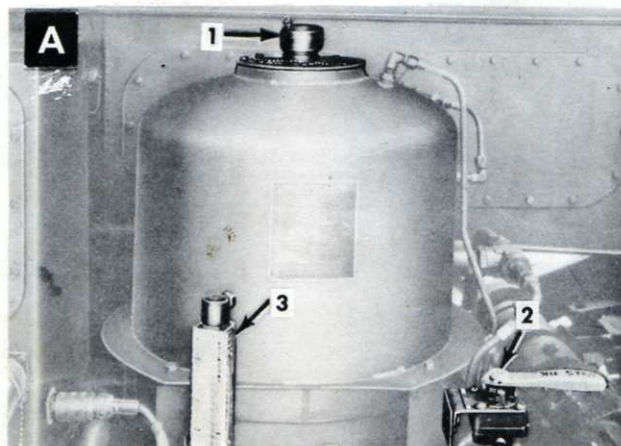
9. Care and Use of Lubricants

The use of clean lubricants and hydraulic fluids is essential to the proper functioning of the material. This is the most important single element in preventing mechanical malfunction or breakdown. To avoid contamination and to insure serviceability of these materials, they must be stored in a clean, dry location, protected from the weather and extreme temperatures. Partially used containers will not be used in missile filling operations.

Section I. GUIDED MISSILE MONORAIL LAUNCHER M36



OHA Hydraulic Reservoir



a. Maintain the fluid level between the full and refillmarks. Change the hydraulic fluid annually or more frequently when conditions are dusty or have wide temperature variations. If frequent fillings are required, notify the support unit. Quarterly, a small amount of hydraulic fluid should be drained from the reservoir to remove any accumulation of water.

Note. Replace the launcher hydraulics fluid filter element quarterly. The missile hydraulics fluid filter element should not be changed unless AJAX missiles are serviced from HERCULES launchers; in which case, change both filters quarterly.

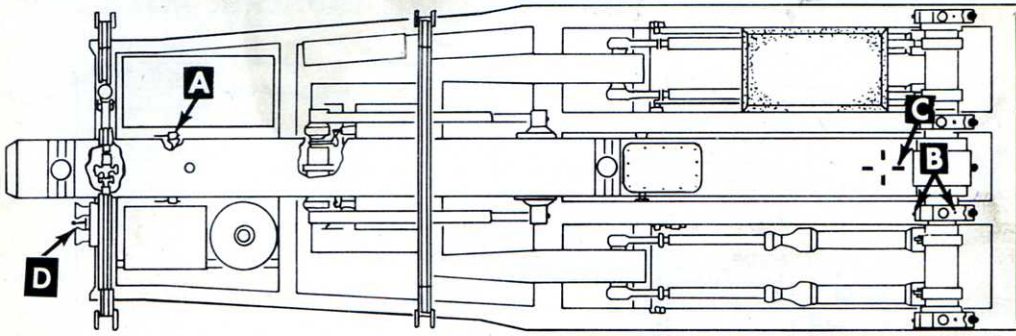
b. Check, fill, or drain the reservoir in accordance with the instructions on the reservoir-service instruction plate.

Note. If the hydraulic oil reservoir is overfilled, place a suitable container under the capped end of the drain line, remove the drain cap and drain the excess fluid. When the fluid level reaches the full mark in the sight gage, install the drain cap. If further servicing instructions are needed, refer to TM 9-1440-250-20/1.

Note. Units will submit a work request (DA Form 2407) to the support shop for inspection and servicing of gear box train on the hydraulic pump motor annually. Gear boxes equipped with lubrication fittings should be serviced quarterly with aircraft and instrument grease MIL-G-23827 and inspected at 3 year intervals.

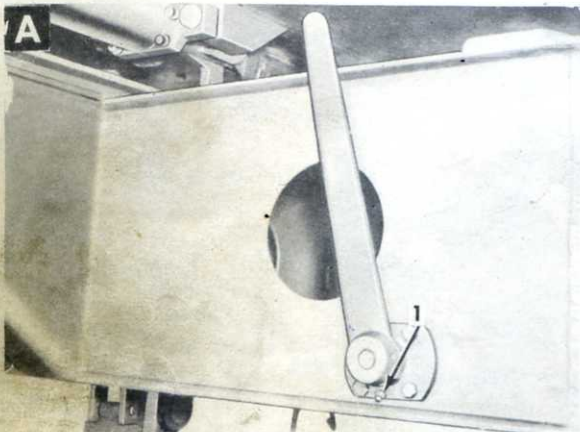
KEY

LUBRICANTS	ALL TEMPERATURES	INTERVALS
	OHA - HYDRAULIC FLUID petroleum base 9150-223-1134	



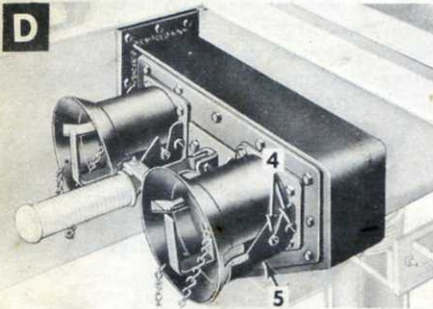
M GAA Main Trunnion Bearings

M GAA Indexing-Pin Operating Mechanism

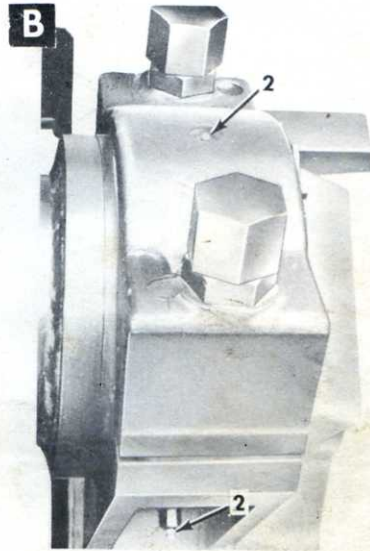


Apply grease to the fitting (1).

M PL Roller Shaft and Actuating Screw
M GAA Adapter-Locking Cams

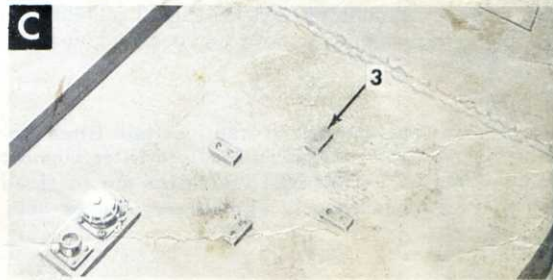


Lubricate the roller shaft and cam actuating screw (4) on the cable adapter with preservative oil. Apply a light coat of grease to the contact surfaces of the locking cams (5) and rollers.



Apply grease to the fittings (2).

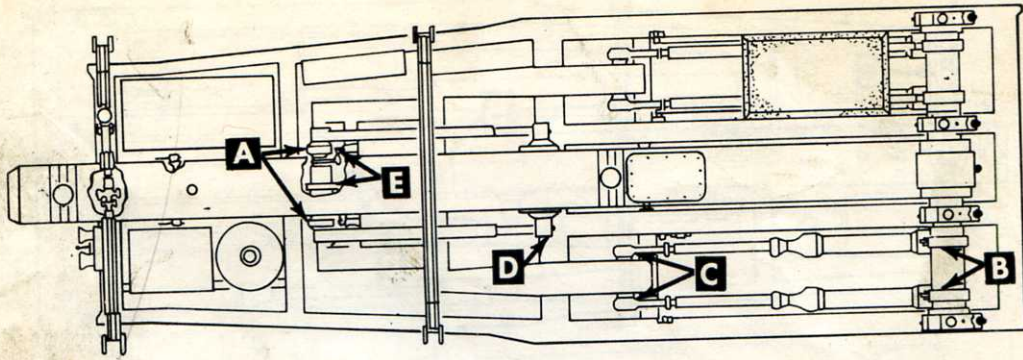
S Leveling Lugs



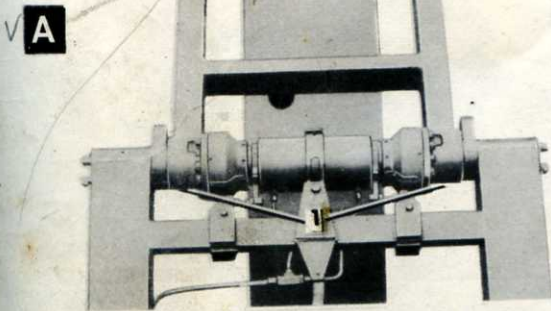
Clean the blocks (3) with metal polish and apply apply grease to the rubbing surfaces.

KEY

- LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +40°F	+40°F to -10°F	0°F to -65°F	
GAA - GREASE, automotive and artillery <i>9150-190-0905</i>	ALL TEMPERATURES			M - Monthly S - Semi-annually
PL - OIL, lubr, preservative <i>VED. PAG 3</i>	PL (Medium)	PL (Medium)	PL (Special)	

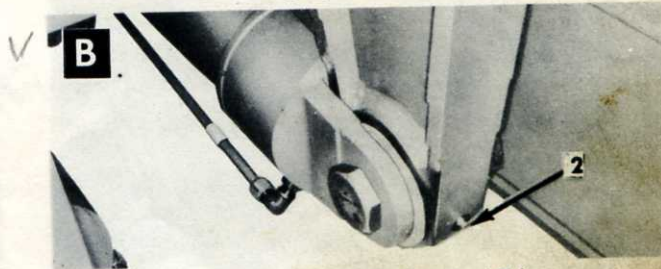


M GAA Uplock Shaft Bearing



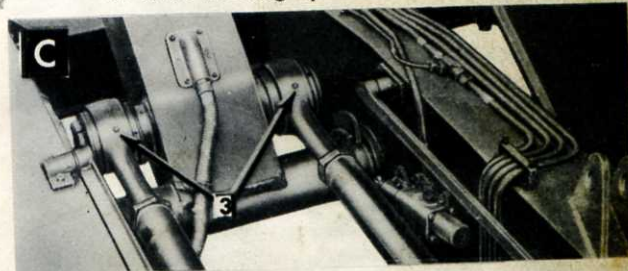
Apply grease to the fittings (1).

M GAA Erecting-Cylinder Attach Bearings



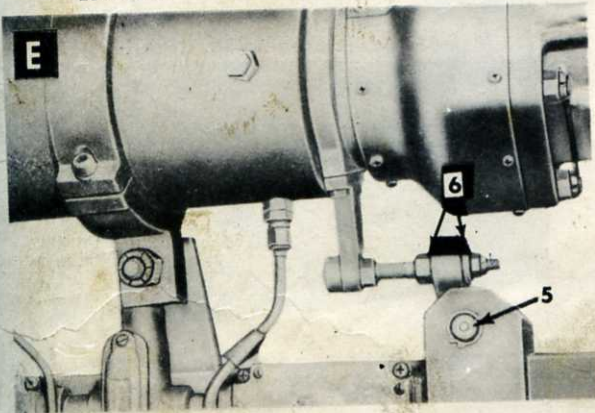
Apply grease to the fittings (2).

M GAA Erecting-Cylinder End Bearings



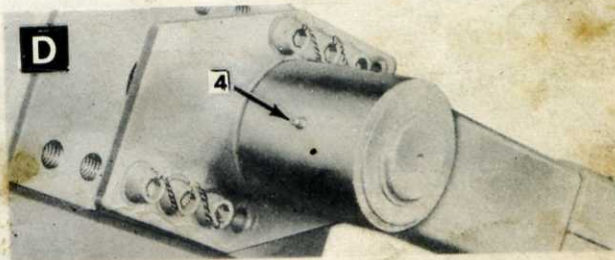
Apply grease to the fittings (3).

✓ M GAA Lever Assembly and Limit Switch Uplock Switch Lever Pin



Apply grease to the fitting on the lever pin (5). Lightly coat the rubbing surfaces of the limit switch (6) with grease.

M GAA Upper Strut Bearing

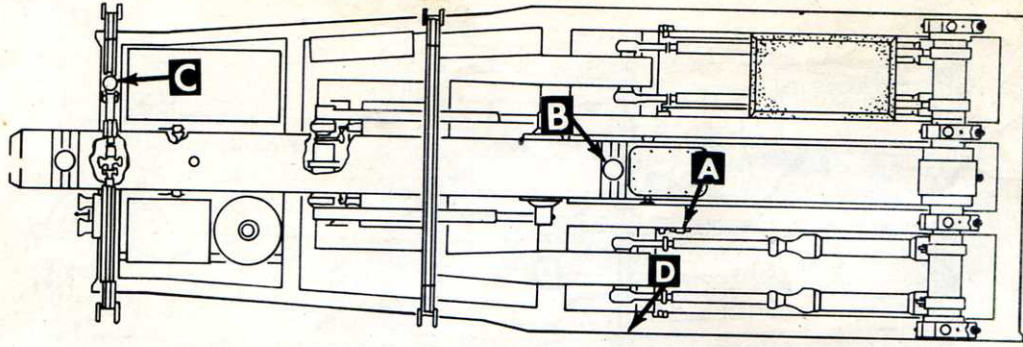


Apply grease to the fitting (4).

KEY

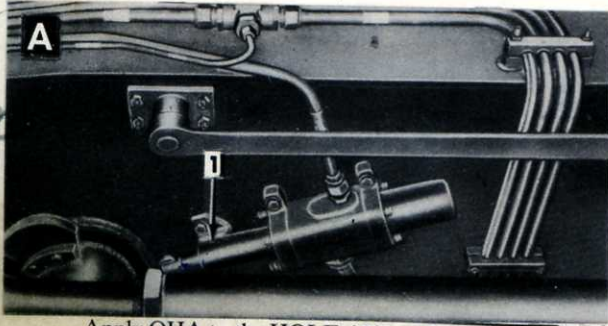
LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above 40°F	+40°F to -10°F	0°F to -65°F	
GAA - GREASE, automotive and artillery <i>9150-190-0905</i>	ALL TEMPERATURES			M - Monthly
PL - OIL, lubr, preservative <i>VEDI PAGE 3</i>	PL (Medium)	PL (Medium)	PL (Special)	

ORD G 3775 A



M GAA Roller
M OHA Hydraulic Valve

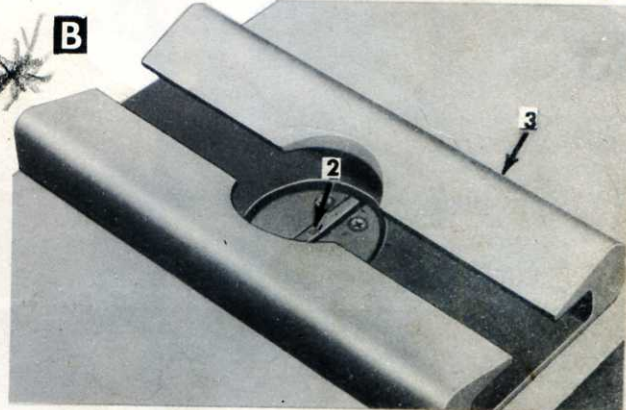
M CT Forward and AFT LOCKING CLAMPS
M GAA Forward and AFT Adjusting Plugs and Wedges.



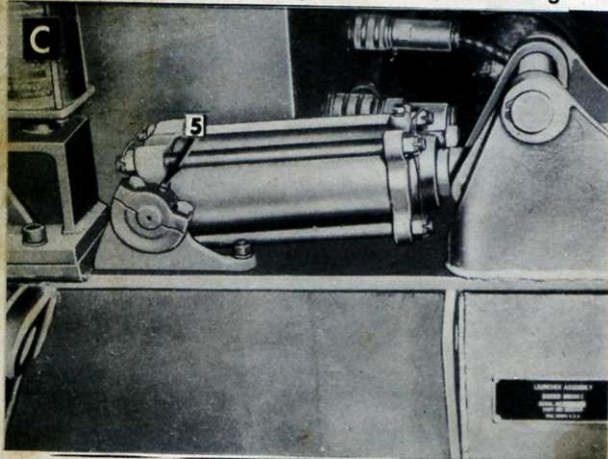
Apply OHA to the HOLE (1) on the valve.

Note—Clean the shaft and roller and apply a light coat of grease to the roller and OHA to the shaft.

M OHA Shaft
M GAA Downlatch Cylinder Trunnion Bearing



Coat the inside of the slot in the locking clamps (3) with corrosion preventive compound. Apply grease to the mating surfaces between the bottom of the adjusting plug (2) and slides on the bottom of the wedge.



Apply grease to the two fittings (5).

Note—Clean the shaft and apply OHA.

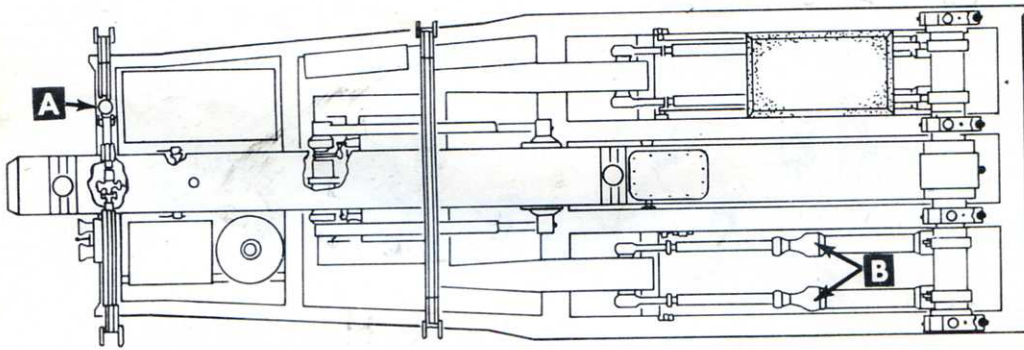
M GAA Lower Erecting Strut Bearings



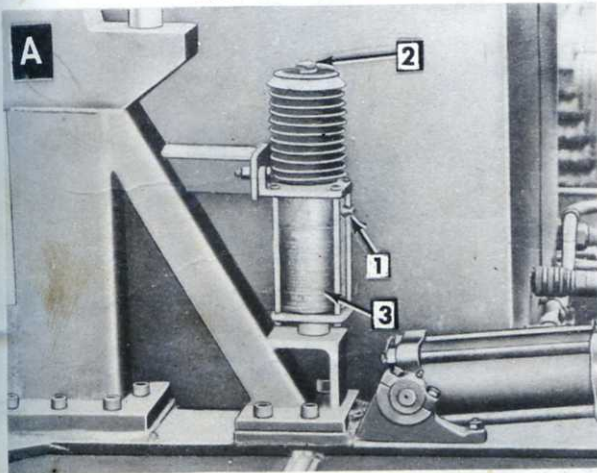
Apply grease to the fitting (4) of the four erecting strut bearings.

KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
GAA — GREASE, automotive and artillery 9150-190-0905	ALL TEMPERATURES			M — Monthly
PL — LUBRICATING OIL, general purpose 9150-231-2361	PL (Medium)	PL (Medium)	PL (Special)	
CT — COMPOUND, corrosion preventive, hard film 8030-231-2341	ALL TEMPERATURES			
OHA — HYDRAULIC FLUID, petroleum base 9150-223-1131				



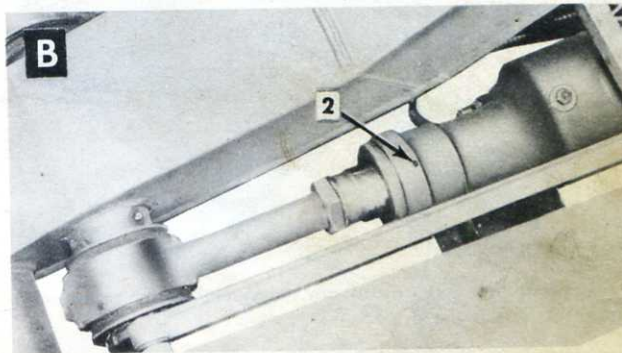
M OHA Shock Absorbers



Remove the overflow plug (1) and filler plug (2) with the strut extended and fill the shock absorber (3) to the bottom of the overflow plug. Replace the plugs and torque the filler plug to 15 lb.-ft. Secure the filler plug with locking wire.

Note—Fill slowly to insure complete air bleed.

M OHA Erecting-Cylinder Wipers



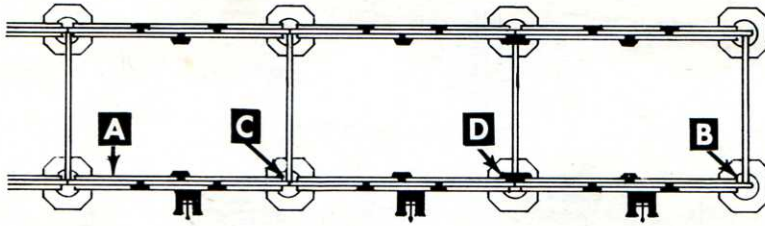
Clean the shaft and apply OHA. Fill the hole (2) with OHA.

Note—Monthly, lubricate the electrical test stations, limit switch trip-plate trunnion, down-latch hook-pin locking mechanism, power distribution box, loading-platform rollers and bearings, safety pins, hydraulic-power package, clamp assemblies, loud-speaker, etc., with PL. Monthly, lubricate exposed surfaces of index-positioning blocks, indexing pin, attach pins, height-position-pull pins, NIKE-AJAX flag stops, and end stops with CT.

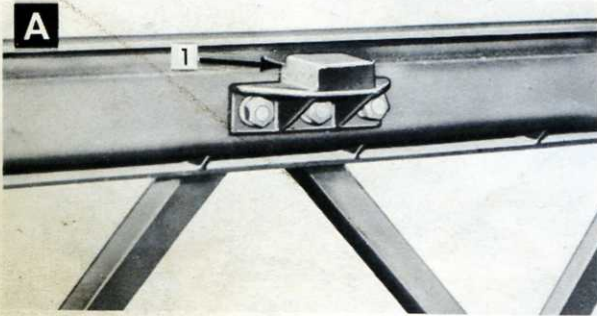
KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL — LUBRICATING OIL, general purpose <i>9150-00-231-2289</i>	PL (Medium)	PL (Medium)	PL (Special)	M — Monthly
OHA — HYDRAULIC FLUID, petroleum base <i>9150-223-4234</i> CT — COMPOUND, corrosion preventive, hard film <i>8030-231-2345</i>	ALL TEMPERATURES			

Section II. LAUNCHER ASSOCIATED EQUIPMENT



S CT NIKE-HERCULES Stop



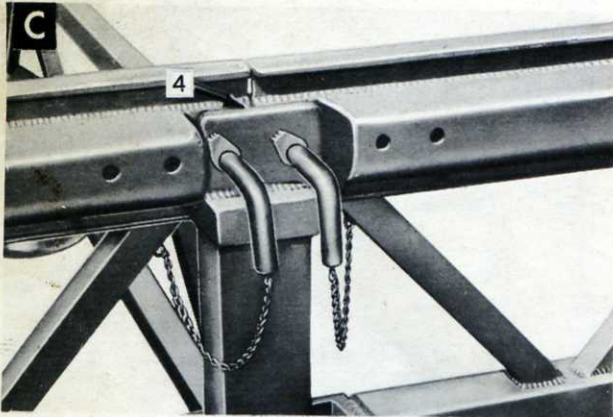
Apply a light coating of corrosion preventive compound to the surface of the stops (1).

GAA Support Base Floating Ball Joint



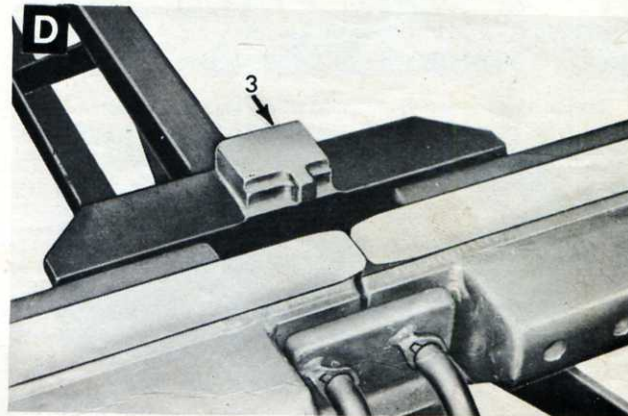
Apply a light coating of grease to the ball joint (2) at the time of emplacement.

S CT Track Attach Points



Apply a light coating of corrosion preventive compound to the rubbing surfaces of the attach points (4).

S CT NIKE-HERCULES End Stop



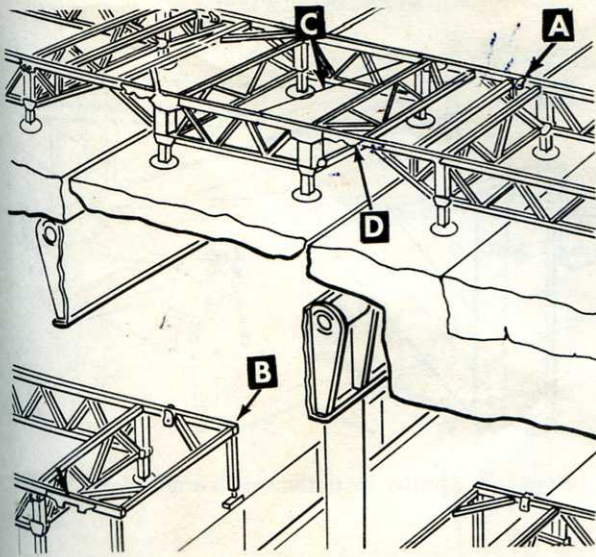
Apply a light coating of corrosion preventive compound to the surface of the stops (3).

KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
GAA - GREASE, Automotive and Artillery <i>9150-140-0905</i>	GAA	GAA	GAA	S - Semi-annually
CT - COMPOUND, Corrosion Preventive, Hard Film <i>2030-931-8345</i>				

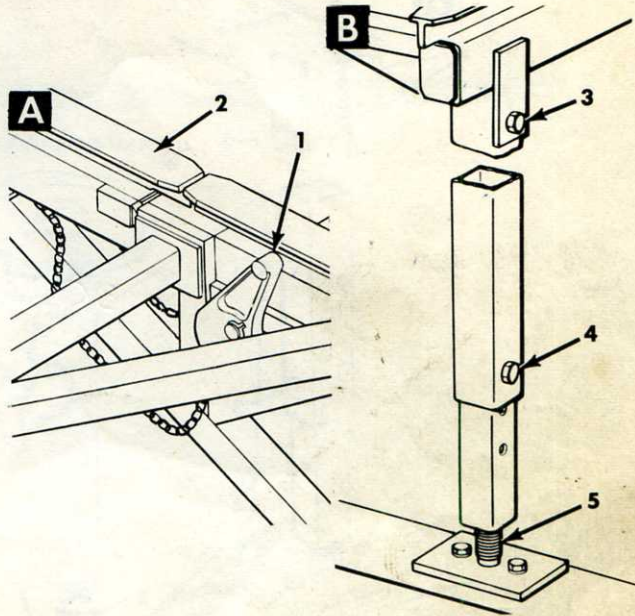
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Section III. CONUS-C AND CONUS-C MODIFIED SECTIONS

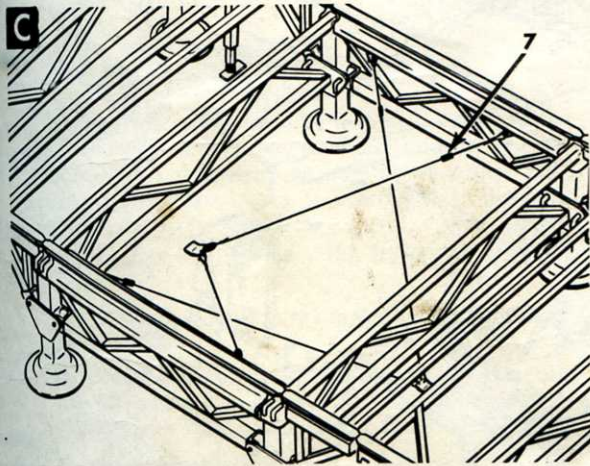


S CT Wire Rope Assembly

- S CT Removable Arm Adapter and Extension Pivot Point
- M CL Height Adjust Screw
- S CL Height Adjust Bolt
- M PL Extension Assembly Stop

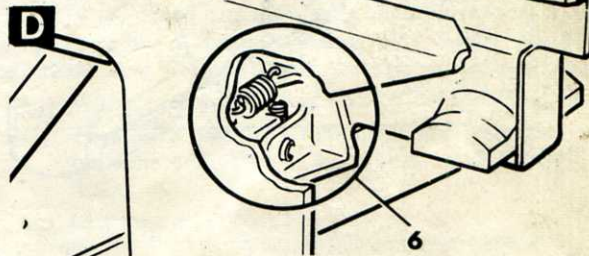


Remove the pivot point bolt (3) (Detail B) and arm adapter (2) (Detail A) and apply corrosion preventive compound to the sliding surfaces. Apply corrosion preventive compound to the exposed threads of the adjust screw (5) (Detail B) and the adjust bolt (4) (Detail B). Apply preservative oil to the stop (1) (Detail A).



Remove any corrosion and apply a coating of corrosion preventive compound to the cables and exposed turnbuckle threads (7).

M PL Switch Actuator Arm



Apply preservative oil to the switch arm springs and pins (6).

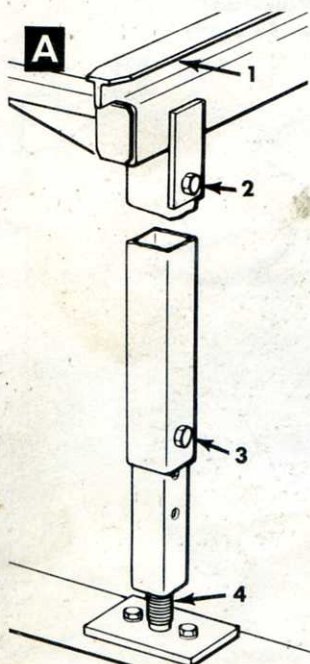
KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL - OIL, Lubr, Preservative <i>VEDI PAG 2</i>	PL Medium	PL Medium	PL Special	M - Monthly S - Semi-annually
CL - COMPOUND, Corrosion Preventive Soft Film <i>8030-225-184</i>	ALL TEMPERATURES			
CT - COMPOUND, Corrosion Preventive, Hard Film <i>8030-231-2345</i>				

ORD G 3781 A

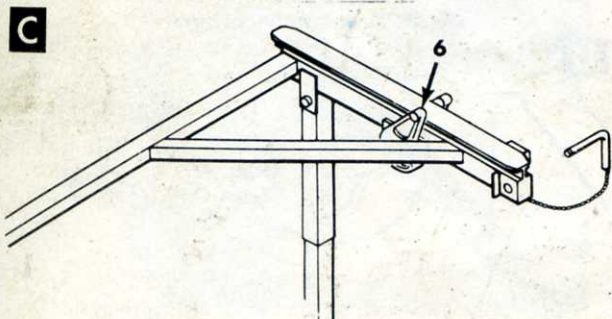
Section IV. CONUS-B-D AND RISING STAR SECTION

- S CT Removable Arm Adapter and Extension Pivot Point
- M CL Height Adjust Screw
- S CL Height Adjust Bolt



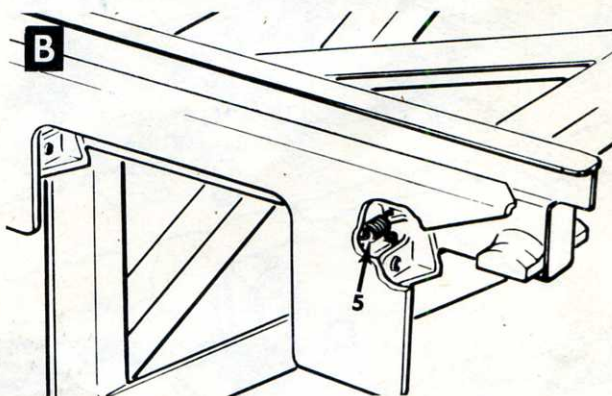
Remove the pivot point bolt (2) (Detail A) and arm adapter (1) (Detail A) and apply corrosion preventive compound to the sliding surfaces. Apply corrosion preventive compound to the exposed threads of the adjust screw (4) (Detail A) and the adjust bolt (3) (Detail A).

M PL Extension Assembly Stop

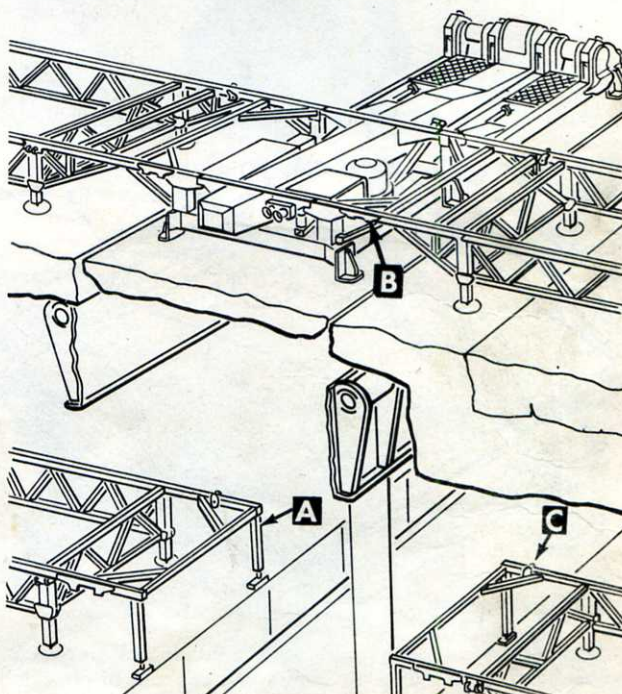


Apply preservative oil to the stop (6) (Detail C).

M PL Switch Acuator Arm



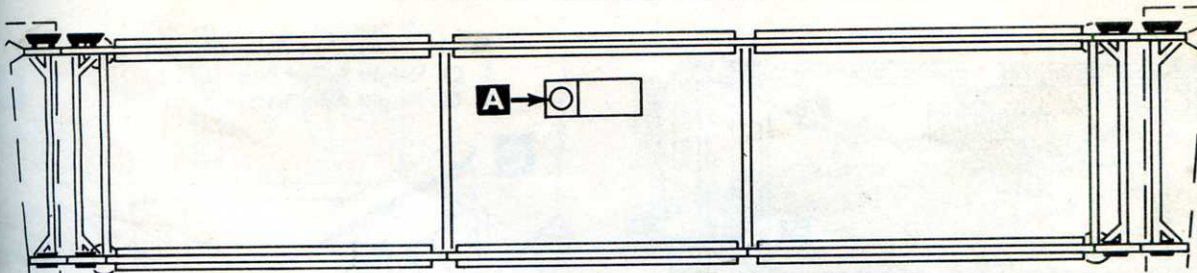
Apply preservative oil to the switch arm and pins (5).



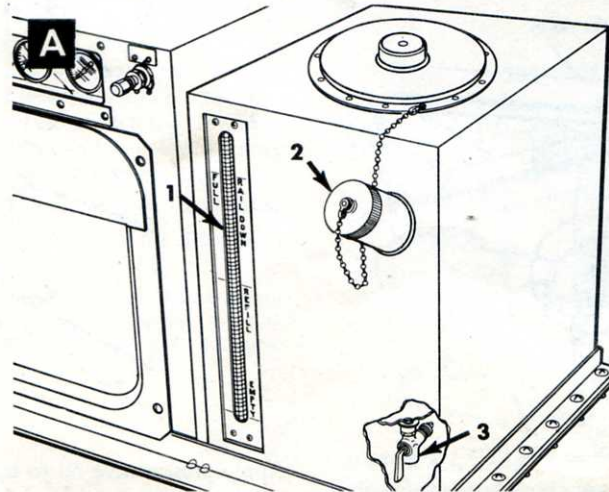
KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL — OIL, Lubr, Preservative <i>VEDI PAG e</i>	PL Medium	PL Medium	PL Special	M — Monthly S — Semi-annually
CL — COMPOUND, Corrosion Preventive, Soft Film <i>8030-5</i>	ALL TEMPERATURES			
CT — COMPOUND, Corrosion Preventive, Hard Film <i>8030-231-231.5</i>				

Section V. USARAL SECTION



D OHA Hydraulic Pumping Unit



The hydraulic reservoir should be inspected daily and before operation for the proper fluid level indication in the fluid level indicator (1). Maintain the level between the "full" and "refill" marks. Perform steps (a) through (e) below to check the fluid level and to service the reservoir when required.

- (a.) With all power off open the SYSTEM BLEED valve.
- (b.) Check the fluid level in the indicator for the proper level.
- (c.) If additional fluid is required, remove the reservoir cap (2) and fill the reservoir to the proper level in the indicator with new hydraulic fluid MIL-H-5606.
- (d.) Install the reservoir cap.

(e.) Close the SYSTEM BLEED valve.

The hydraulic fluid must be drained from the reservoir every 3 months or more frequently under dusty or wide varying temperature conditions. The fluid should also be changed if there is reason to suspect contamination of the system. Clean hydraulic fluid is of the utmost importance in maintaining an efficiently operating pumping unit. Follow the procedure outlined below to change the reservoir hydraulic fluid.

- (a) With all power off, open the SYSTEM BLEED valve.
- (b) Position a suitable container under the reservoir, open the drain cock (3), and allow all the fluid to drain.
- (c) Close the drain cock.

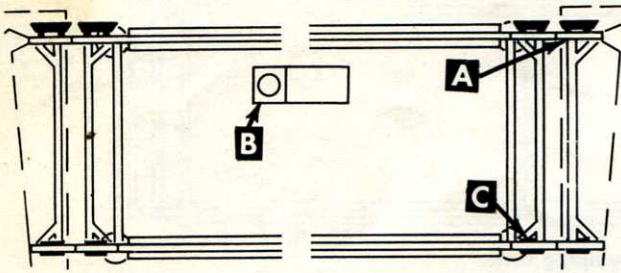
Note—The hydraulic filter elements must be replaced during all fluid changes.

- (d) Remove the reservoir cap.
- (e) Fill the reservoir to the proper level.
- (f) Install the reservoir cap.

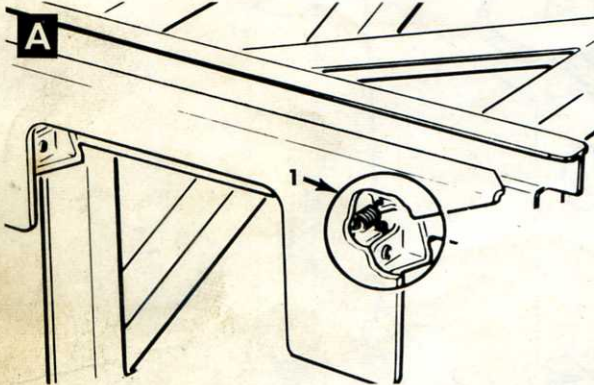
KEY

LUBRICANTS	ALL TEMPERATURES	INTERVALS
	OHA — FLUID, Hydraulic, Petroleum Base 9250-223-4134	

ORD G 3782 A

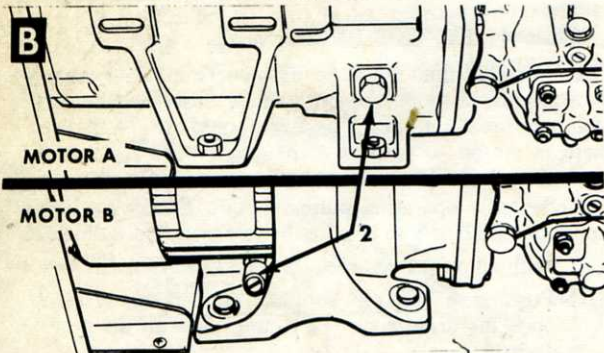


M PL Switch Actuator Arm



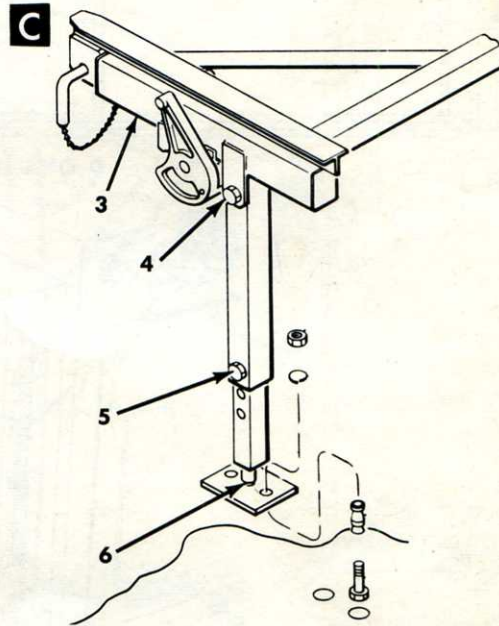
Apply preservative oil to the springs and pins (1).

200 OGR Motor Gear Boxes



Every 3 months, remove the filler cap (2), fill the gear box with lubricating oil and reinstall the filler cap. The lubricating oil should be changed after each 200 hours of operation or every 3 years by Support maintenance personnel at the request of the using unit. Change the oil more frequently if contamination is suspected.

- M PL Extension Assembly Stop
- S CL Height Adjust Bolt
- M CL Height Adjust Screw



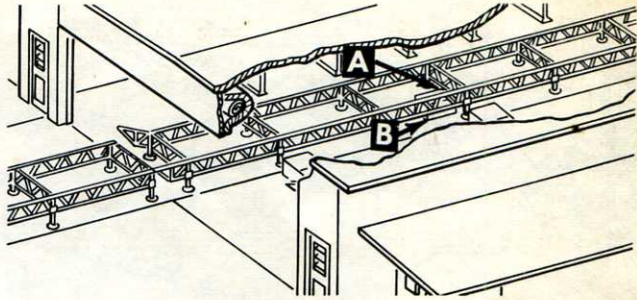
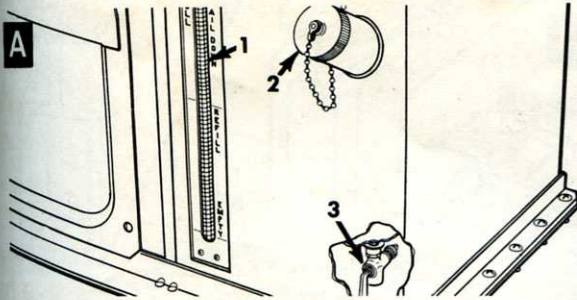
Apply preservative oil to the stops (3) (Detail C), remove the pivot point bolt (4) (Detail C) and apply corrosion preventive compound to the sliding surfaces. Apply corrosion preventive compound to the exposed threads on the height adjust bolt (5) (Detail C) and the height adjust screw (6) (Detail C).

KEY

● LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL - Oil, Lubr, Preservative <i>9150-00-231-6689</i>	PL Medium	PL Medium	PL Special	M - Monthly S - Semi-annually 200 - 200 hrs.
CL - COMPOUND, Corrosion Preventive, Soft Film <i>2030-211-1298</i>	ALL TEMPERATURES			
OGR - OIL, Lubr, Gear <i>9150-240 2250</i>				

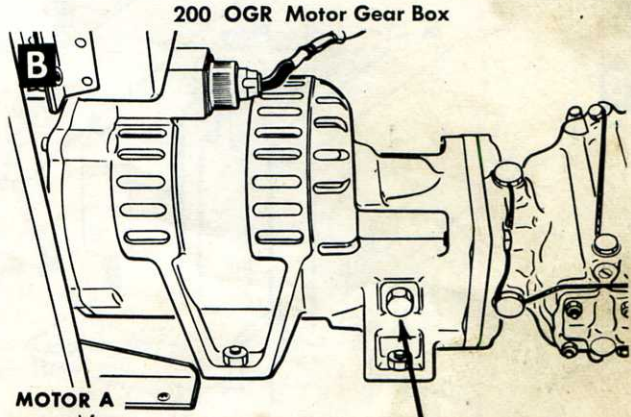
Section VI. USAREUR SECTION

D OHA Hydraulic Pumping Unit

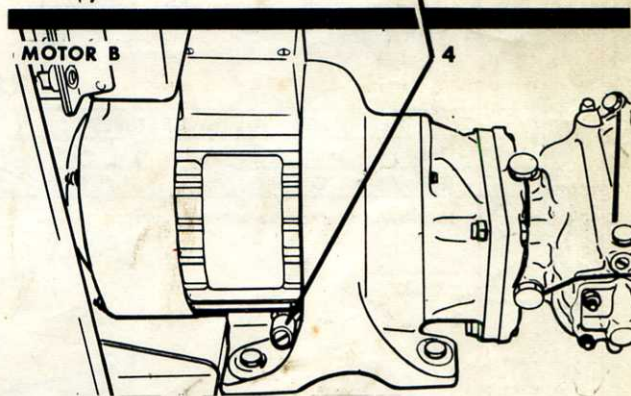


The hydraulic reservoir should be inspected daily and before operation for the proper fluid level indication in the fluid level indicator (1). Maintain the level between the "full" and "refill" marks. Perform steps (a) through (e) below to check the fluid level and to service the reservoir when required.

- (a) With all power off open the SYSTEM BLEED valve.
- (b) Check the fluid level in the indicator for the proper level.
- (c) If additional fluid is required, remove the reservoir cap (2) and fill the reservoir to the proper level in the indicator with new hydraulic fluid MIL-H-5606.



- (d) Install the reservoir cap.
- (e) Close the SYSTEM BLEED valve. The hydraulic fluid must be drained from the reservoir every 3 months or more frequently under dusty or wide varying temperature conditions. The fluid should also be changed if there is reason to suspect contamination of the system. Clean hydraulic fluid is of the utmost importance in maintaining an efficiently operating pumping unit. Follow the procedure outlined below to change the reservoir hydraulic fluid.



- (a) With all power off, open the SYSTEM BLEED valve.
- (b) Position a suitable container under the reservoir, open the drain cock (3), and allow all the fluid to drain.

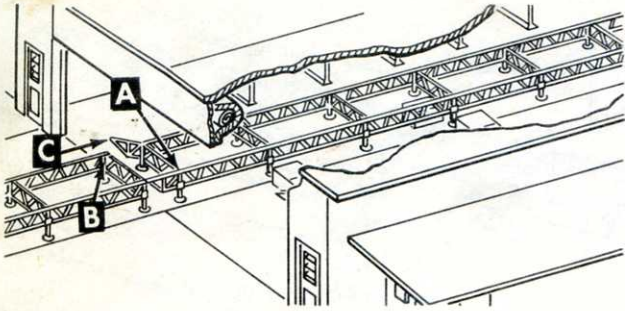
- (c) Close the drain cock.
- Note-The hydraulic filter elements must be replaced during all fluid changes.

- (d) Remove the reservoir cap.
- (e) Fill the reservoir to the proper level.
- (f) Install the reservoir cap.

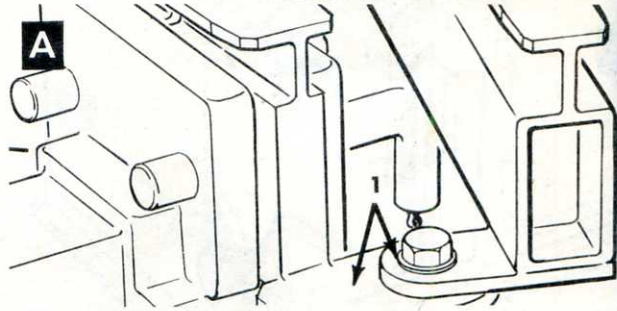
Every 3 months, remove the filler plug (4), fill the gear box with lubricating oil and reinstall the filler cap. The lubricating oil should be changed after each 200 hours of operation or every 3 years by support maintenance personnel at the request of the using unit. Change the oil more frequently if contamination is suspected.

KEY

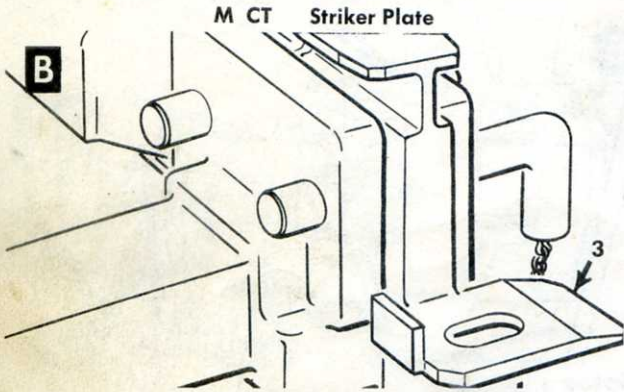
LUBRICANTS	ALL TEMPERATURES	INTERVALS
	OHA - FLUID, Hydraulic, Petroleum Base 9150-223-134	
OGR - OIL, Lubr., Gear SAE 90 (antirust)		200 - 200 hrs.



S GAA Bridge Section Hinge

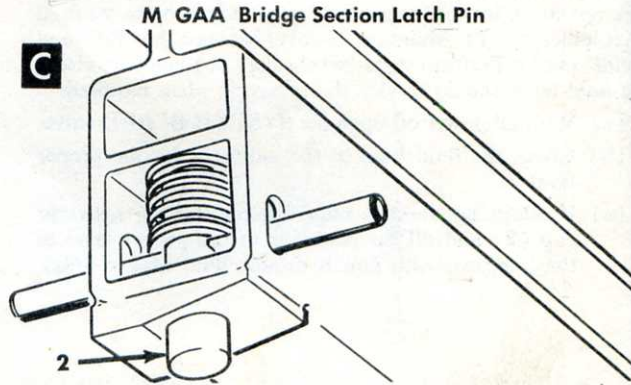


Remove the bridge section and apply grease between the sliding surfaces of the hinge (1).



M CT Striker Plate

Lightly coat the surface of the striker plate (3) with corrosion preventive compound.



M GAA Bridge Section Latch Pin

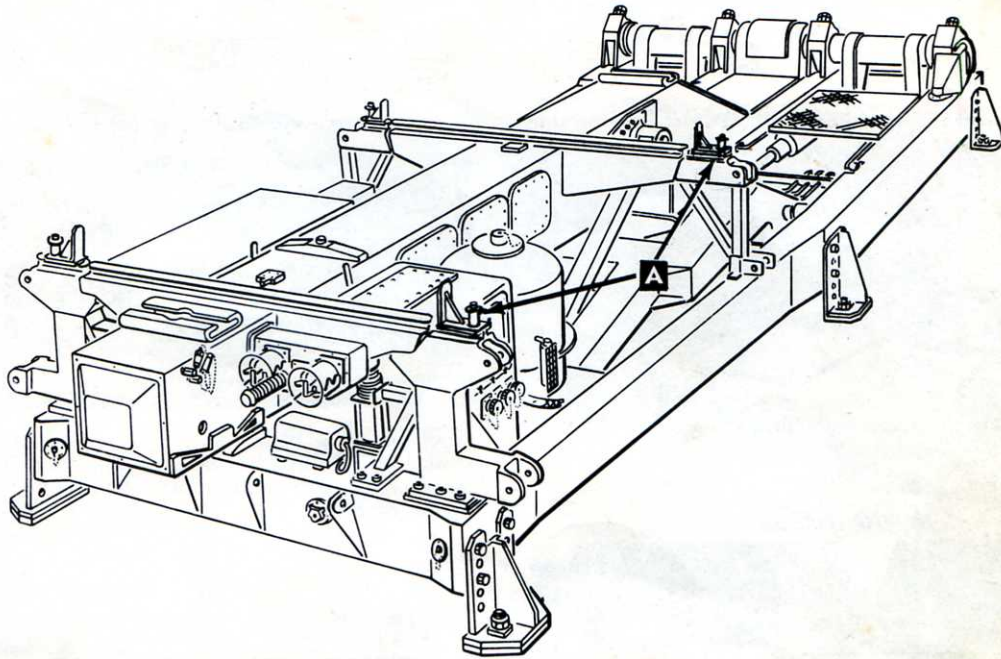
Apply grease to the bottom end of the latch pin (2).

KEY

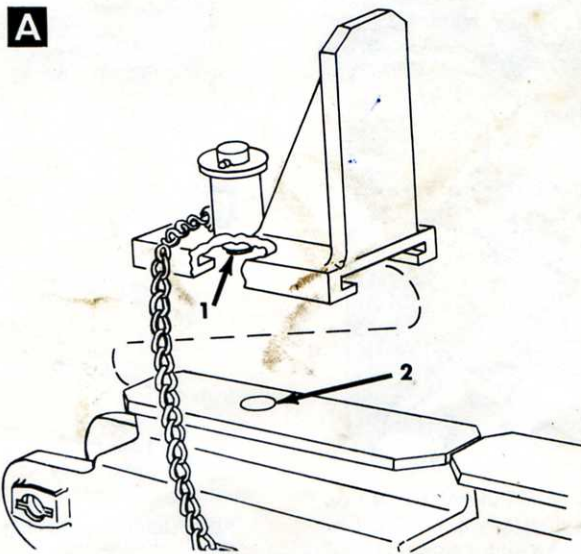
LUBRICANTS — ALL TEMPERATURES		INTERVALS
GAA — GREASE, Automotive and Artillery	9150-190-0905	M — Monthly
CT — COMPOUND, Corrosion, Preventive, Hard Film	8030-831-8345	S — Semi-annually

ORD G 3785

Section VII. SAC SITE



M GAA Missile Launcher Stop
 M CT Plunger Hole

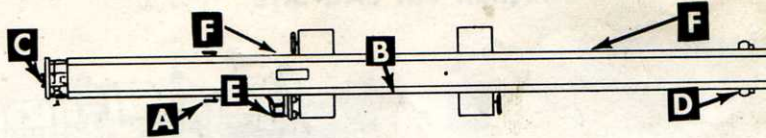


Remove the stop from the launcher and apply a light coat of grease to the bottom end of the plunger (1). Coat the inside of the plunger hole (2), located on the launcher, with corrosion preventive compound.

KEY

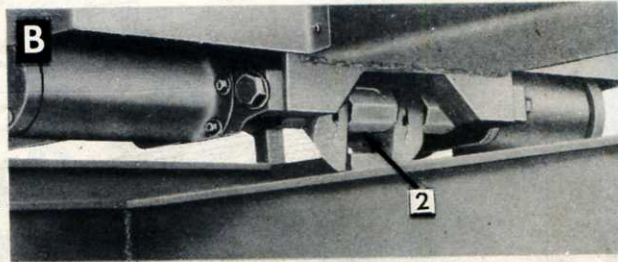
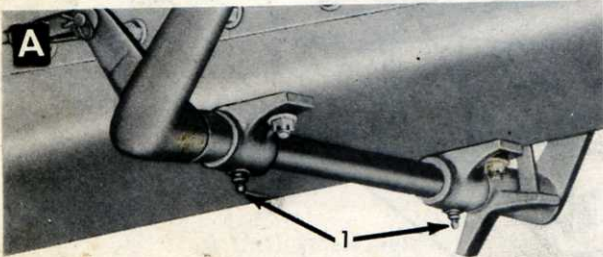
LUBRICANTS — ALL TEMPERATURES		INTERVALS
GAA — GREASE, Automotive and Artillery	9150-190-0905	M — Monthly
CT — COMPOUND, Corrosion, Preventive, Hard Film	8030-231-2345	

Section VIII. GUIDED MISSILE LAUNCHING-HANDLING RAIL M3



M GAA Forward Stop-and-Positioning Device Bearing Unit

Stop-and-Positioning Latch Assembly

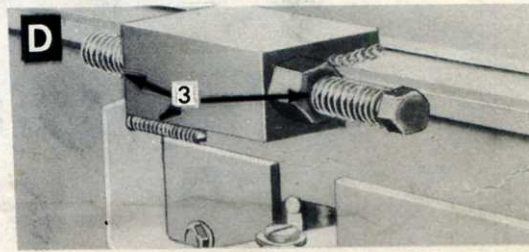
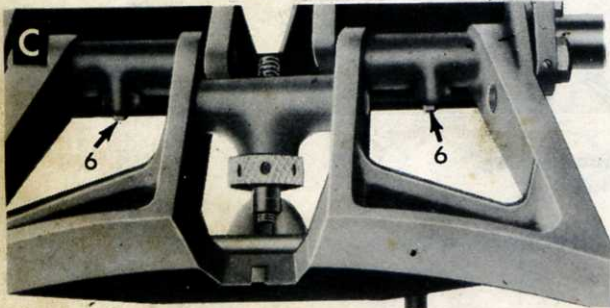


Apply grease to the fittings (1).

DO NOT LUBRICATE — Dry-film lubricant has been coated on all surfaces during manufacture. If the lubricant wears off, clean the worn surface (2) with P-S661 solvent and apply graphite.

M GAA Release

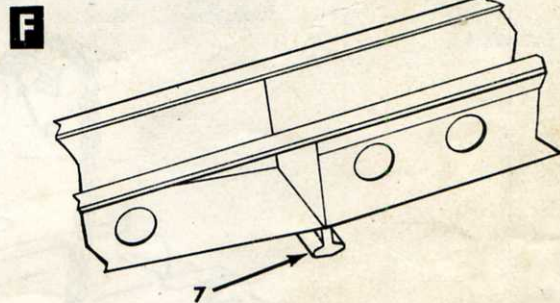
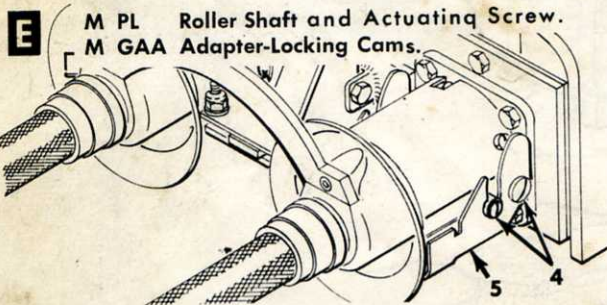
M CL Stop Bolt



Apply grease to the fittings (6).

Apply corrosion preventive compound to the exposed threads (3).

M CT Inverted T



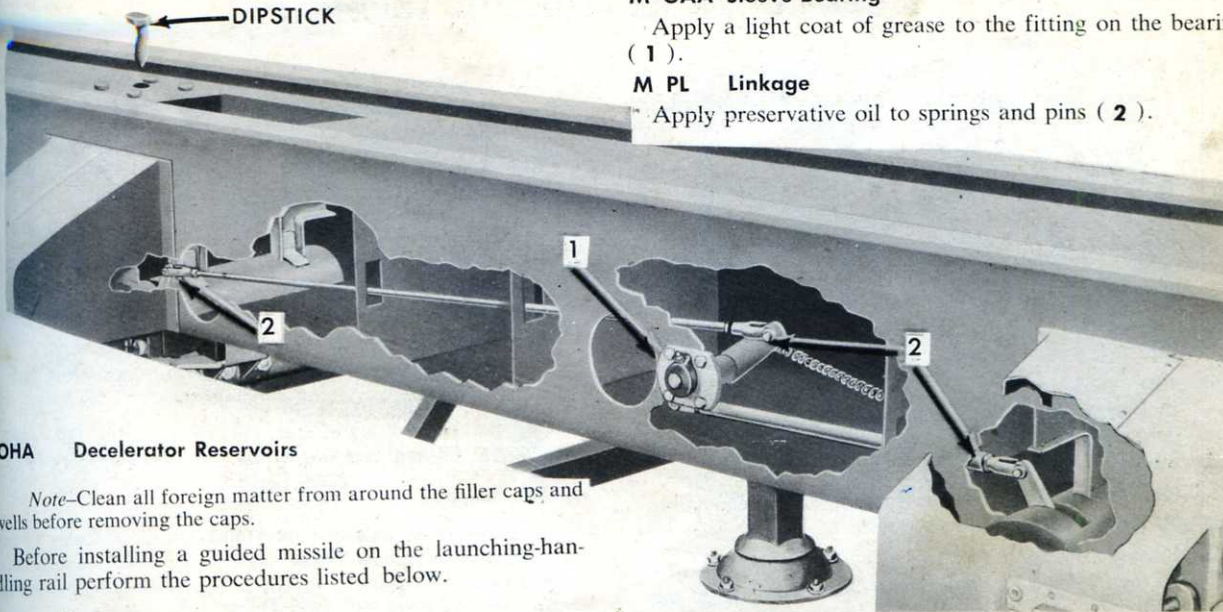
Lubricate the roller shaft and cam actuating screw (4) on the cable adapter with preservative oil. Apply a light coat of grease to the contact surfaces of the locking cams (5) and rollers.

Apply corrosion preventive to the inverted T (7).

KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL — OIL, lubrication, preservative	PL (Medium)	PL (Medium)	PL (Special)	M — Monthly
CL — COMPOUND, corrosion preventive, soft film	CL	CL	CPF	
CT — COMPOUND, corrosion preventive, hard film	ALL TEMPERATURES			
GAA — GREASE, automotive and artillery	ALL TEMPERATURES			
GRAPHITE, colloidal	ALL TEMPERATURES			

ORD G 3787



M GAA Sleeve Bearing

Apply a light coat of grease to the fitting on the bearing (1).

M PL Linkage

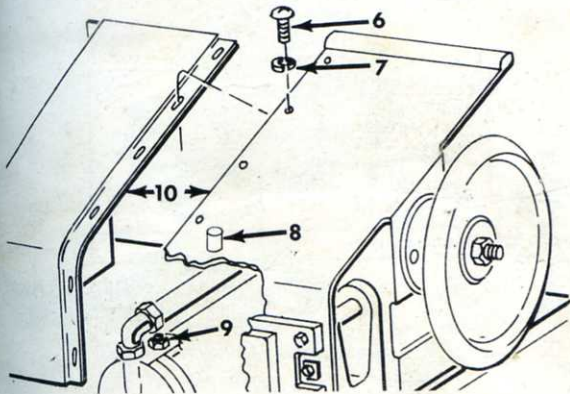
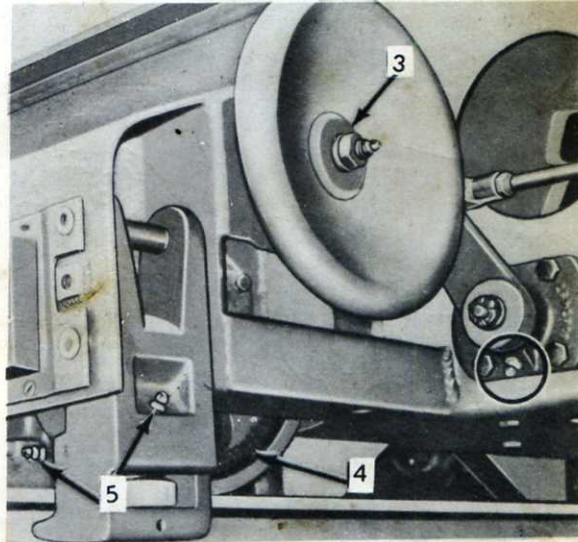
Apply preservative oil to springs and pins (2).

OHA Decelerator Reservoirs

Note—Clean all foreign matter from around the filler caps and wells before removing the caps.

Before installing a guided missile on the launching-handling rail perform the procedures listed below.

M GAA Handwheel Bearing, Inching Device Wheel Assembly, and Roller Hook Assemblies.



Forward and Rear Decelerators-Hydraulic Fluid Addition and Air Bleed without the Guided Missile on the Launching-Handling Rail. Hydraulic fluid 9150-223-4134 in the decelerator reservoirs should be kept at the FULL mark as indicated on the dip sticks. If additional fluid is required, add fluid, and air bleed the decelerator system as prescribed in (1) through (15) below.

- (1) Release the rail release and skip handle on the launching-handling rail and position the launching-handling rail along the loading rack support until the decelerator cylinder stops engage with the loading rack stops.
- (2) Remove the forward and rear decelerator reservoir caps and attached dip sticks.
- (3) Fill the decelerator reservoirs with hydraulic fluid to FULL, as indicated on the dip sticks.

KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	-40°F to -10°F	0°F to -65°F	
OHA — FLUID, Hydraulic, Petroleum Base 9150-223-4134	ALL TEMPERATURES			M — Monthly
GAA — GREASE, Automotive and Artillery 9150-190-0905	PL Medium	PL Medium	PL Special	
PL — OIL, Lubr, Preservative VED1 PAG 2				

- (4) Release the rail release and skip handle on the launching-handling rail and disengage the decelerator cylinder stops from loading rack stops.
- (5) Position the launching-handling rail to the left side of the loading rack stops.
- (6) Install the forward and rear decelerator reservoir caps fingertight.
- (7) Remove the 10 panhead screws (6) and lockwashers (7) securing each guard assembly (10) to the launching-handling rail and remove the four guard assemblies.
- (8) Push the launching-handling rail against the loading rack stops to retract the forward and rear right-side decelerator cylinder pistons, allowing hydraulic fluid to flow from the reservoirs into the cylinder.
- (9) Repeat step (8) above several times to insure that the cylinders are filling properly.
- (10) Remove the cap (8) from adapter (or elbow) (9) on the forward and rear decelerator cylinders on the right side of the launching-handling rail.
- (11) Allow the fluid to flow until it runs clear with no sign of foaming. Install the caps on the adapters (or elbows).
- (12) Remove the reservoir caps and add hydraulic fluid to the decelerator reservoirs as necessary.
- (13) Install the decelerator reservoir caps fingertight.
- (14) Position the launching-handling rail to right side of the loading rack stops and repeat steps (8) through (13) above for the left forward and rear decelerator cylinders.
- (15) Tighten the decelerator reservoir caps after completing the servicing procedures.
- (16) Install and secure each guard assembly (10) using the 10-panhead screws (6) and lockwashers (7).

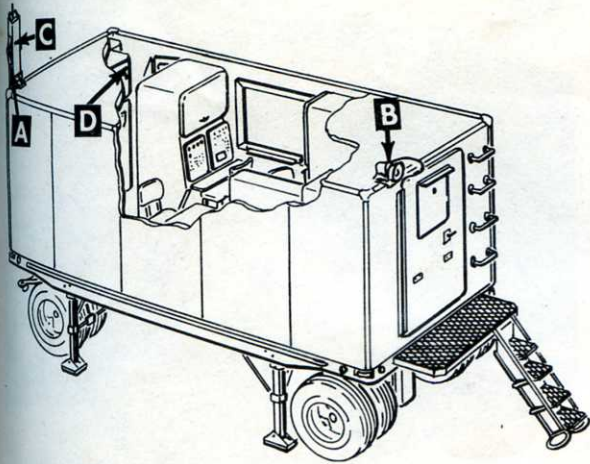
NOTE—Monthly lubricate latch pins, bracket assembly turning surface, breakaway installation hinge, spring loaded retaining pins, cable stowage lever, linkage turning points, missile-away switch actuating arm, rod hinge pins, etc., with PL.

KEY

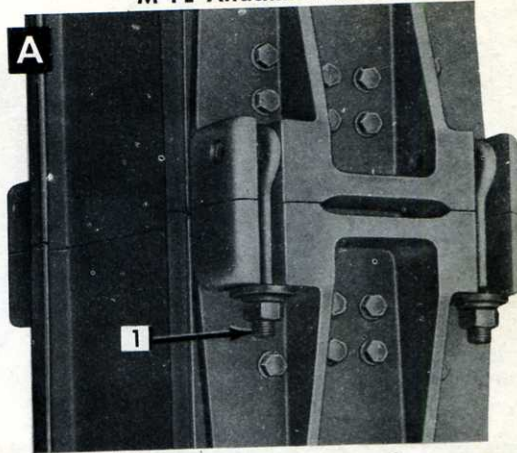
LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL — OIL, lubrication, preservative <i>VEDI PAG 2</i>	PL (Medium)	PL (Medium)	PL (Special)	M — Monthly
GAA — GREASE, automotive and artillery <i>9150-190-0905</i>	ALL TEMPERATURES			
OHA — FLUID, hydraulic, petroleum base <i>9150-225-113</i>	ALL TEMPERATURES			

ORD G 3789C

Section IX: LAUNCHING CONTROL GROUP OA-868/MSE-2 AND TRAILER-MOUNTED LAUNCHER CONTROL STATION AN/MSW-4



M PL Attachment Bolts



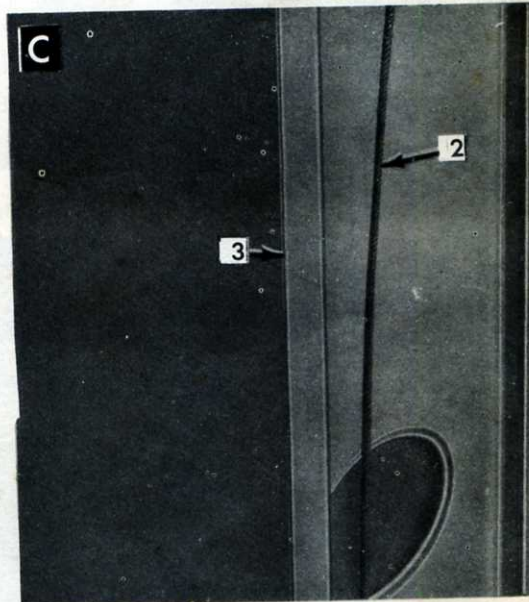
Lightly oil the attachment bolts (1) for each mast section.

S PL Alarm Siren

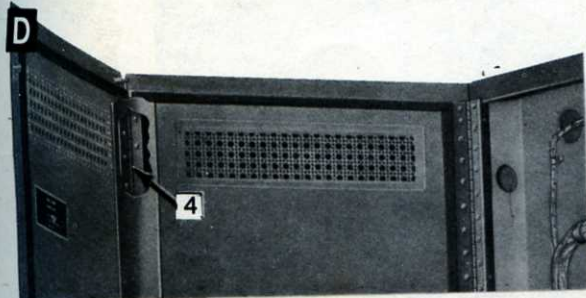


Lightly oil the attaching bolts (5).
S PL Rear-Door Piano Hinges

M PL Slide Track
M CT Cable



Lightly oil the slide track (3). Remove any corrosion on the cable (2) and maintain the coating of corrosion preventive compound over its entire length.

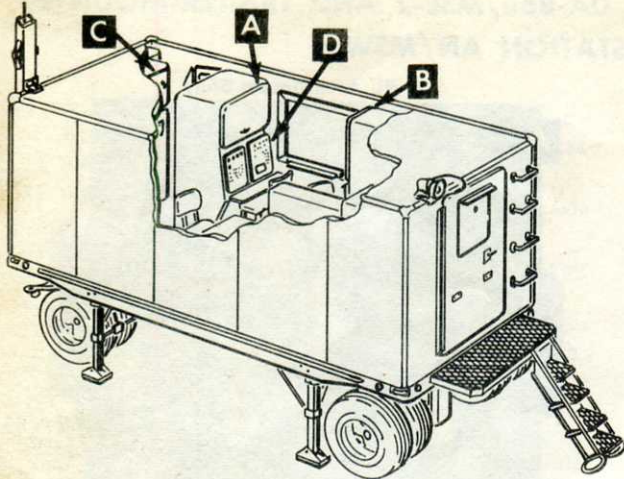


Lightly oil the rear-door piano hinges (4).

KEY

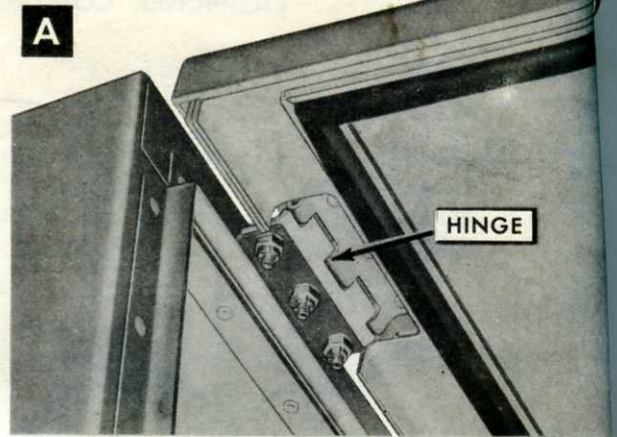
LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
CT - CORROSION PREVENTIVE COMPOUND, hard film	ALL TEMPERATURES			M - Monthly
PL - LUBRICATING OIL, general purpose	PL (Medium)	PL (Medium)	PL (Special)	S - Semi-annually

LO 9-1400-250-20

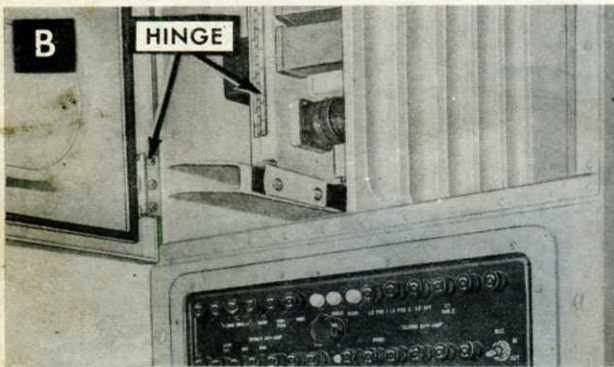


S PL Oil Can Points

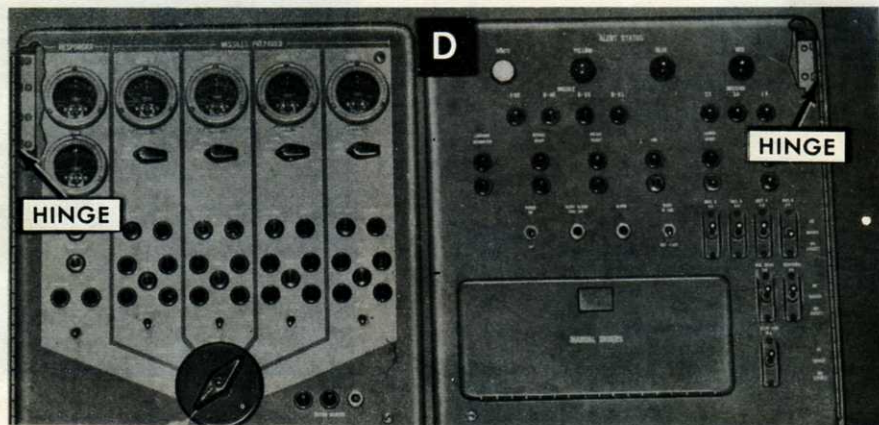
S PL Oil Can Points



S PL Oil Can Points



S PL Oil Can Points



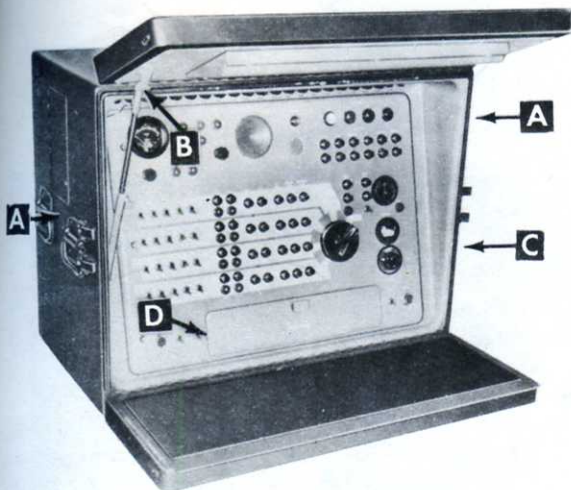
Monthly lubricate the slide track, attachment bolt threads, pivot points, etc., with PL.
Semi-annually lubricate the main-switchboard piano hinge,

rear-door piano hinges, upper-door piano hinges, panel-face piano hinges, drop-door piano hinge, panel-face support slide, upper-door support slide, handle, etc., with PL.

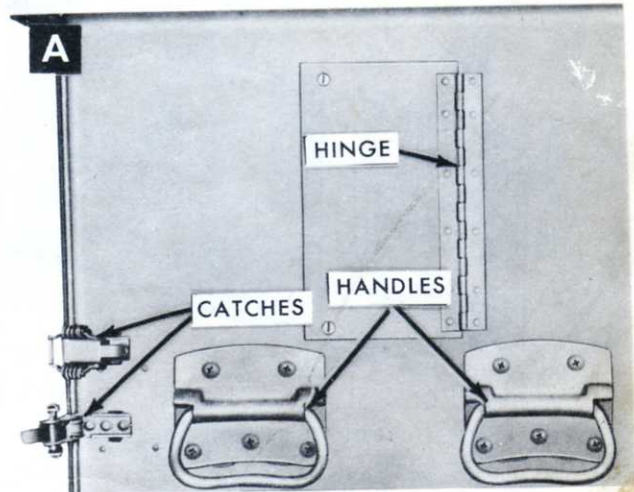
KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
CT — CORROSION PREVENTIVE COMPOUND, hard film	ALL TEMPERATURES			M — Monthly
PL — LUBRICATING OIL, general purpose	PL (Medium)	PL (Medium)	PL (Special)	S — Semi-annually

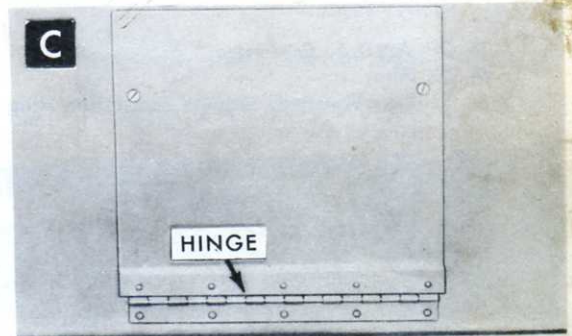
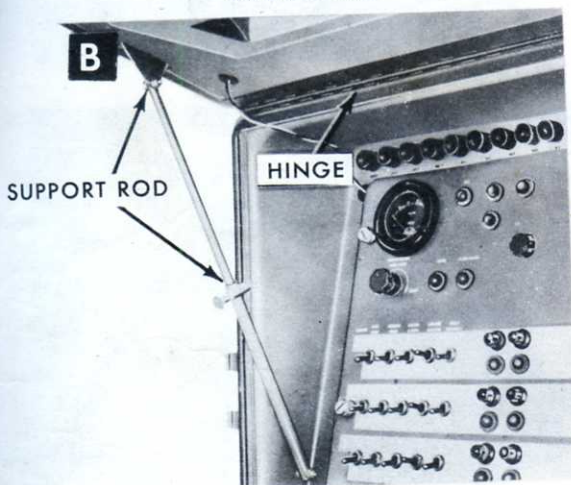
Section X. CONTROL-INDICATOR C-2620/TSW



Oil Can Points

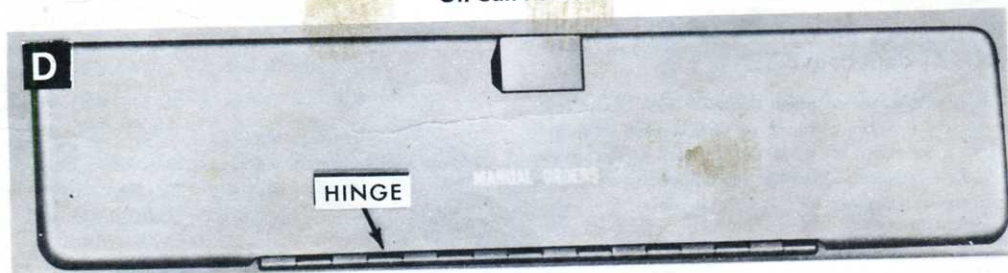


Oil Can Points



Monthly lubricate the access door hinge, handles, catches, support rod and screws; panel face piano hinge, panel lights door piano hinge, upper door piano hinge, drop-door hinge, lower door piano hinge, etc., with PL.

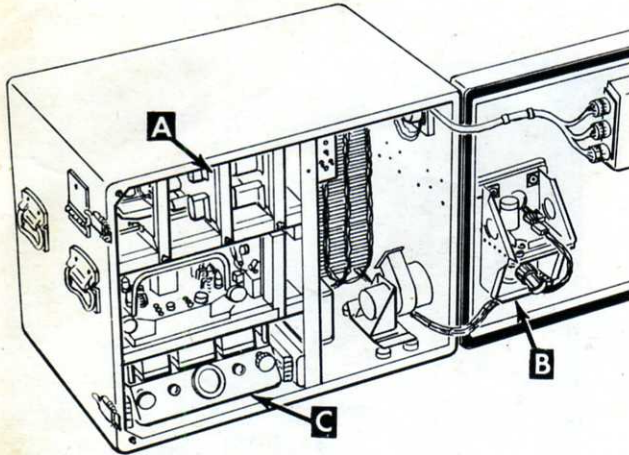
Oil Can Points



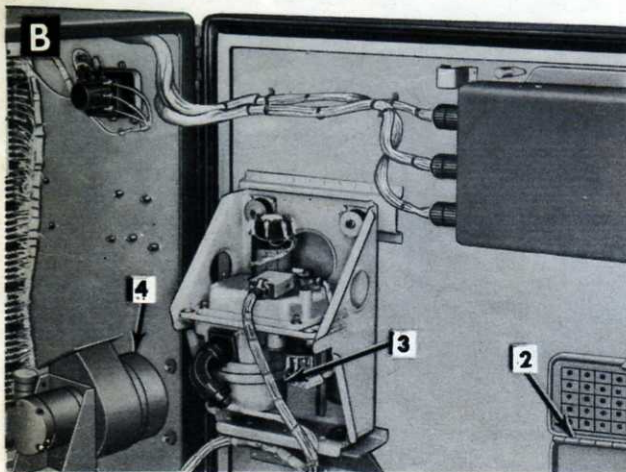
KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL - OIL, Lubr., Preservative <i>VEDI PAG. 9</i>	PL Medium	PL Medium	PL Special	M - Monthly

Section XI. SIMULATOR GROUP 0A-2060/MSW-4



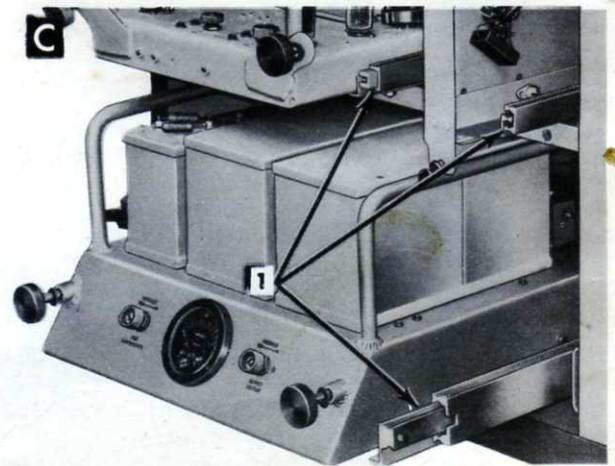
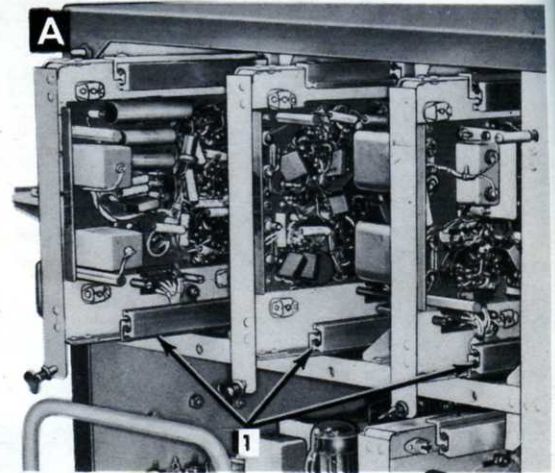
- M OP AG Data Converter
- M OE Filter
- S PL Fuse and Bulb Storage Box Piano Hinge



WARNING: Remove all sources of electricity before oiling the AG data converter.

Lightly oil the fuse storage box piano hinge (2) with PL. Clean the filter (4) by immersing it in dry cleaning solvent, coarse mesh side down. Dry and apply a light coat of OE 30 to the filter. Maintain the oil level in the AG data converter (3) to the approximate center of the oil-sight gage. Change oil annually.

S PL Slides



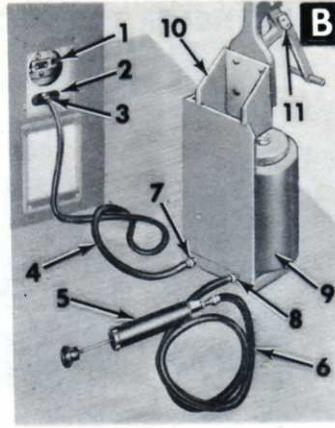
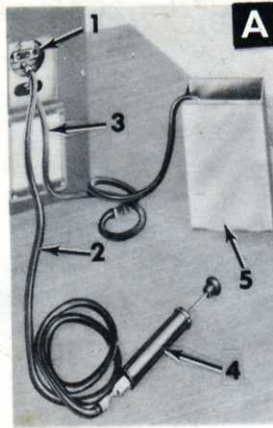
Lightly oil the chassis slides (1) with PL.

Note—Monthly lubricate the slide track attachment bolt threads, pivot points, ventilating access door piano hinges, catches, handles, access door hinges, etc., with PL.

KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
OE — OIL, Lubr, Engine 9150-261-3943				M — Monthly S — Semi-annually
PL — OIL, Lubr, Preservative VED1 PAG 9	PL Medium	PL Medium	PL Special	
OP — OIL, Insulating, Electrical 9150-662-1360	ALL TEMPERATURES			

- 1—Oil-filled variable resistor
- 2—Hose assembly 8158093
- 3—Hose assembly 8158095
- 4—Pump 8075872
- 5—Container



- 1—Oil-filled variable resistor
- 2—Vent plug
- 3—Filter adapter 8159125
- 4—Hose assembly 8158092
- 5—Pump 8015872
- 6—Hose assembly 8158093
- 7—Coupling half
- 8—Nipple
- 9—Insulating oil can
- 10—Oil dispenser 9154610
- 11—Handle

WARNING: To avoid serious electrical shock, turn off all power to the HERCULES section simulator group before starting lubrication.

AG Data Converter Oil-Filled Variable Resistor

(1) *Draining* (A)

- (a) Remove the vent plug from the oil-filled variable resistor (1).
- (b) Connect the hose assembly (2) to the vent plug opening.
- (c) Connect the pump (4) to the hose assembly (2).
- (d) Remove the filler plug from the variable resistor.
- (e) Connect one end of the hose assembly (3) to the filler plug opening.
- (f) Place the other end of the hose assembly (3) in a suitable container (5).

CAUTION: Insulating oil drained from variable resistors must not be reused.

- (g) Operate the pump (4) until all insulating oil is drained from the variable resistor.
- (h) Disconnect the hose assembly (3).
- (i) Install the filler plug.
- (j) Disconnect the pump.
- (k) Disconnect the hose assembly (2).
- (l) Install the vent plug.
- (m) Drain and discard all insulating oil from the hose assembly (3).
- (n) Clean the hose assemblies with trichloroethane.

(2) *Filling* (B)

- (a) Clean the bottom of the insulating oil can (9).
- (b) Raise the handle (11) and place the can of insulating oil in the oil dispenser (10). Lower the handle until the can is punctured.
- (c) Connect one end of the hose assembly (4) to the coupling half (7).

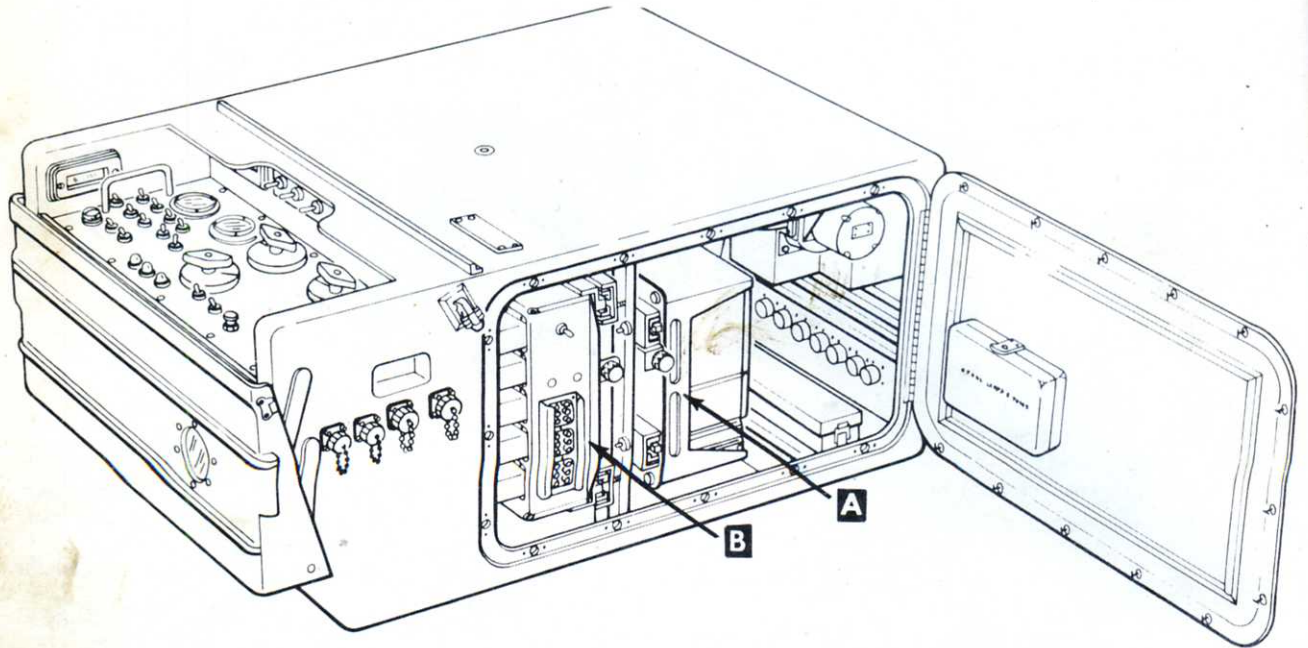
CAUTION: To prevent contaminating the insulating oil, replace fluid filter element before each filling operation.

- (d) Insert the fluid filter element into the filter adapter (3), and connect the filter adapter to the other end of the hose assembly (4).
- (e) Remove the filler plug from the oil-filled variable resistor (1).
- (f) Connect the filter adapter to the filler plug opening.
- (g) Connect the hose assembly (6) to the nipple (8).
- (h) Connect the pump (5) to the hose assembly (6).
- (i) Remove the vent plug (2).

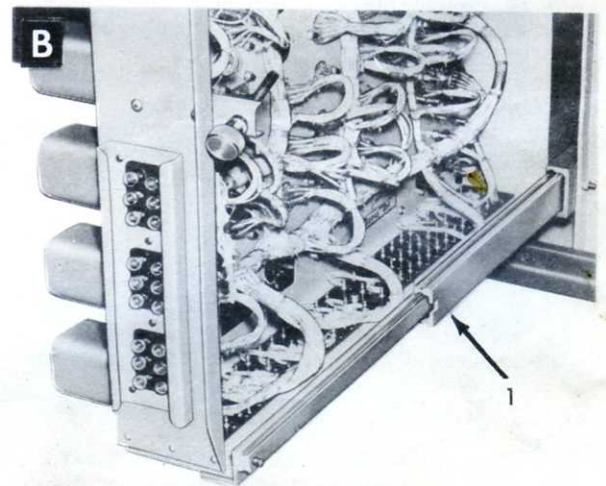
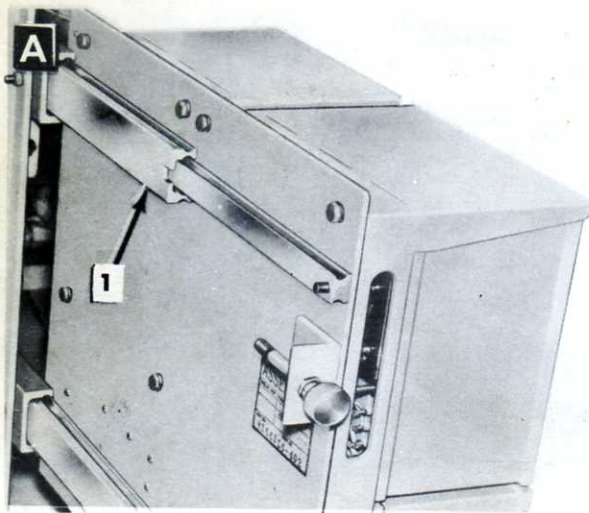
CAUTION: To prevent excessive pressure which may damage the variable resistor, do not operate the pump at a rate of more than one stroke per second.

- (j) Operate the pump (5) to fill the variable resistor until the insulating oil is to the approximate center of the oil sight gage.
- (k) Install the vent plug.
- (l) Disconnect the pump from the hose assembly (6).
- (m) Disconnect the hose assembly (6) from the nipple.
- (n) Disconnect the hose assembly (4) from the filler opening.
- (o) Install the filler plug.
- (p) Disconnect the filter adapter from the hose assembly (4), and discard the fluid filter element.
- (q) Disconnect the hose assembly (4) from the coupling half.
- (r) Raise the handle, and remove the can from the oil dispenser.
- (s) Drain and discard all insulating oil from the hose assembly (4).
- (t) Clean the hose assemblies, filter adapter, and oil dispenser with trichloroethane, and return the oil dispenser to storage.

Section XII: LAUNCHER CONTROL-INDICATOR C-4830/TSW



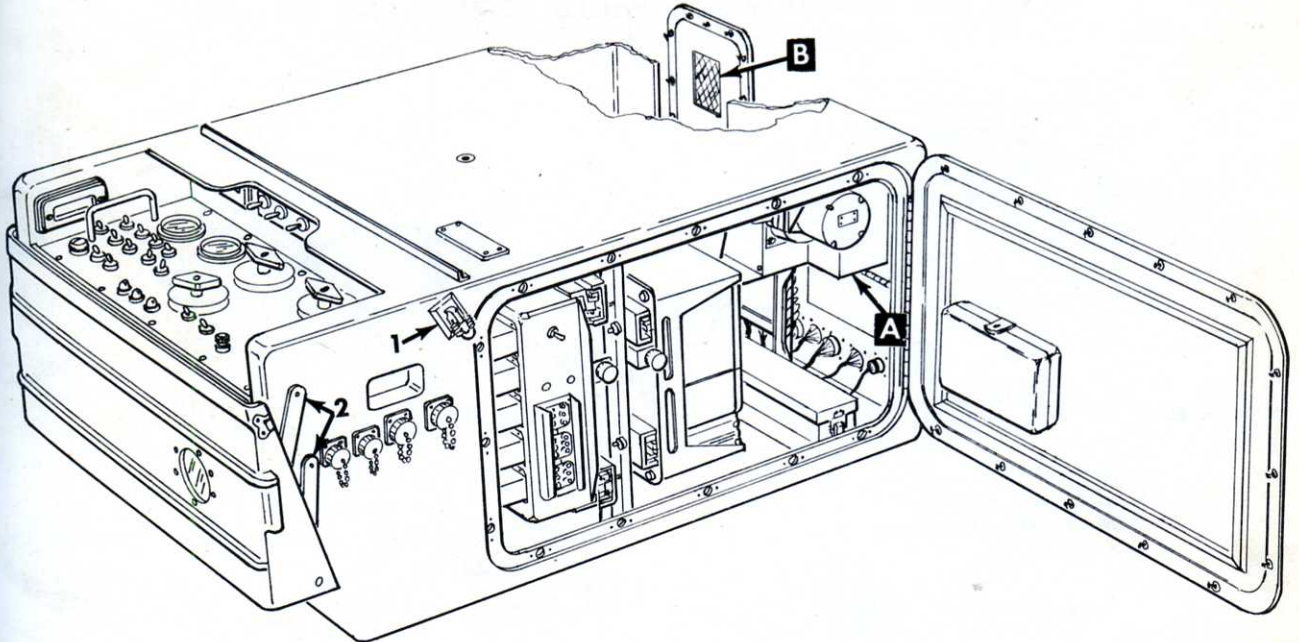
S PL Slides



Lightly oil the slides (1) with PL.

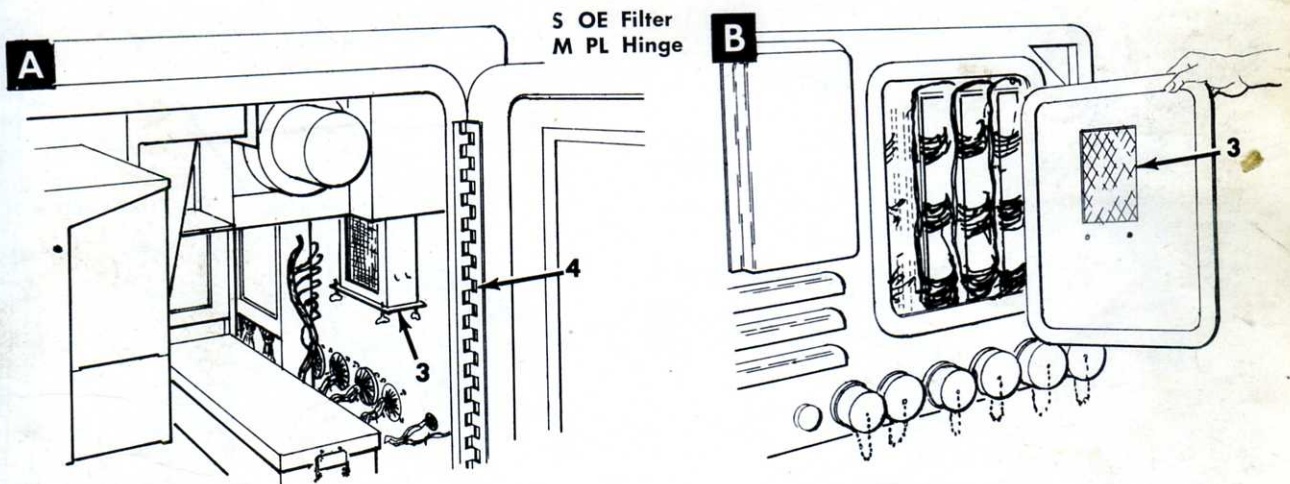
KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL — OIL, Lubr, Preservative <i>VEDI PAG 2</i>	PL Medium	PL Medium	PL Special	S — Semi-annually



M PL Catch
M PL Hinge

Lightly oil the catches (1) and hinges (2) with PL.



Clean the filters (3) by immersing in dry cleaning solvent, coarse mesh side down. Dry and apply a light coat of OE 30 to the filter. Lightly oil the hinge (4) with PL.

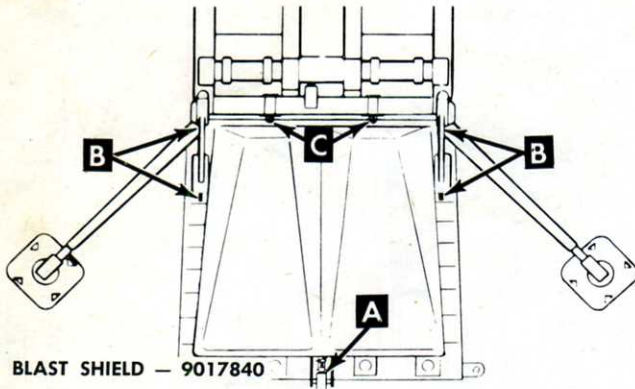
Note—OIL CAN POINTS—Monthly lubricate the slide track, attachment bolt threads, pivot points, etc., with PL. Semi-annually lubricate the storage box piano hinge, bulb box piano hinge, drop door piano hinge, panel face support slide, etc., with PL.

KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
OE — OIL, Lubr, Engine <i>4150-262-391,3</i>	PL Medium	PL Medium	PL Special	M — Monthly S — Semi-annually
PL — OIL, Lubr, Preservative <i>VEDI PAG 9</i>				

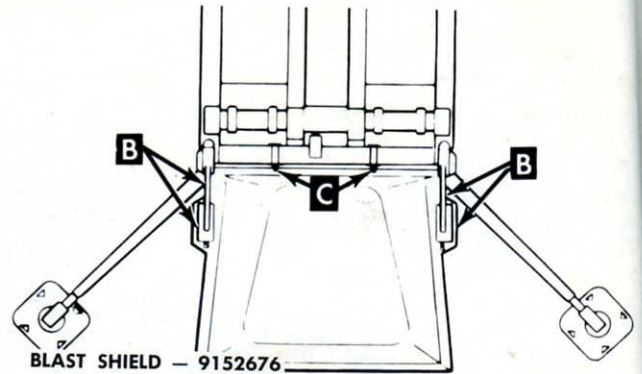
LO 9-1400-250-20

Section XIII. GUIDED MISSILE SHIELD 9017840 AND 9152676



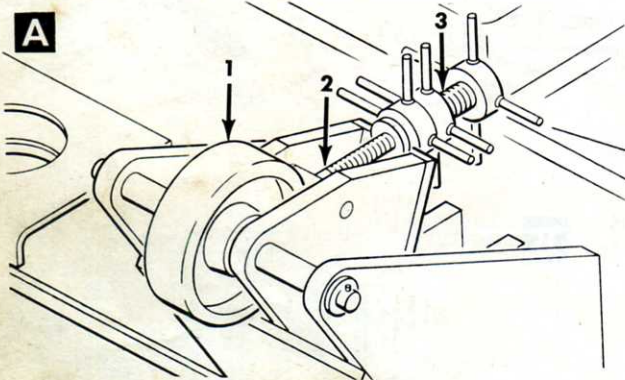
BLAST SHIELD - 9017840

- M PL Wheel
- M PL Arm Retainer
- M PL Wheel Retainer Arm



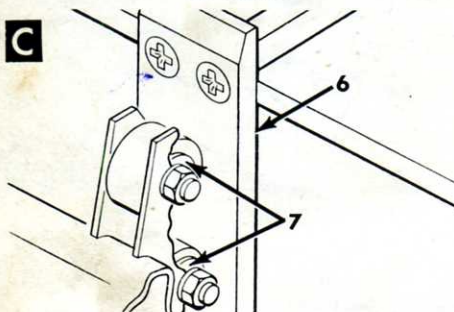
BLAST SHIELD - 9152676

- M GAA Arm
- M PL Arm
- M PL Threaded Rod

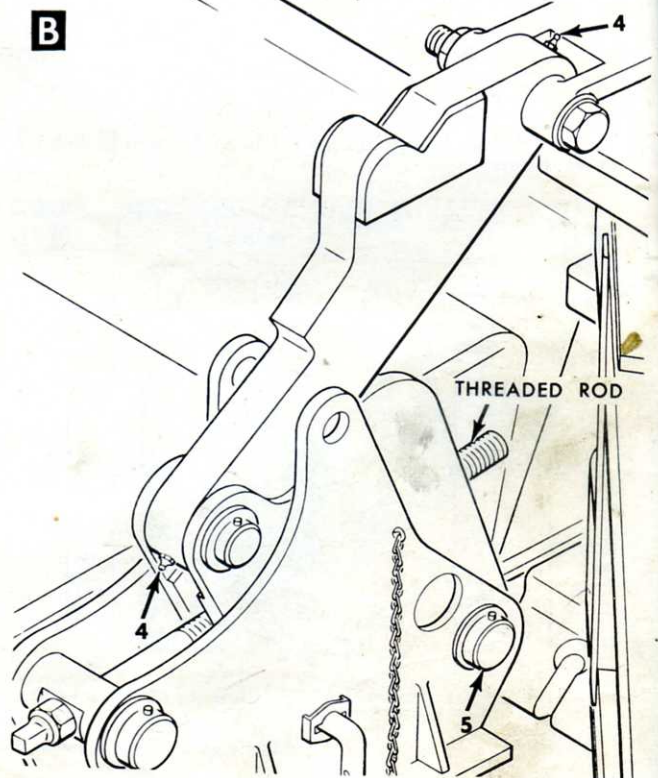


Monthly apply a light coating of oil to the wheel (1), arm retainer (3), and the wheel retainer arm (2).

- M PL Rollers
- CT Guide



At the time of emplacement, apply a light coating of corrosion preventive compound to the guide (6). Lightly oil the rollers (7) monthly.



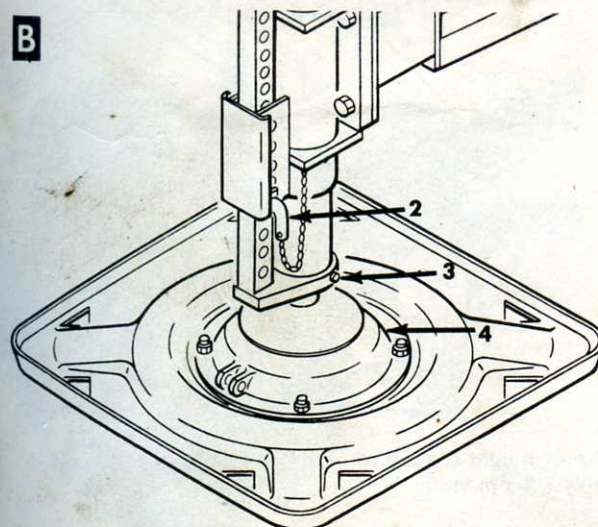
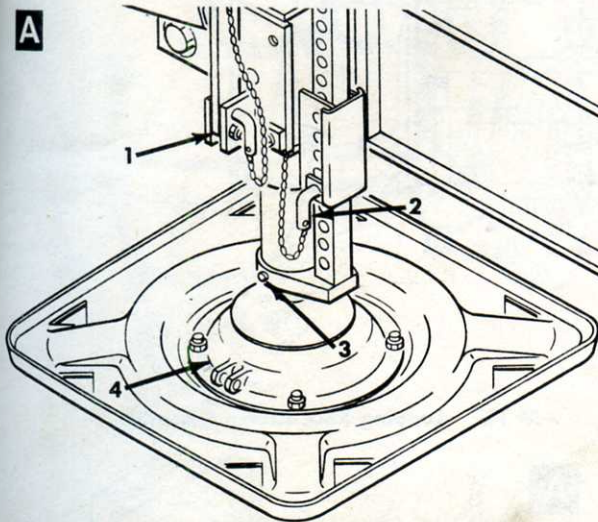
Monthly apply grease to the fitting (4) and lightly oil the arm (5). Monthly apply a light coating of oil to the threaded rod.

KEY

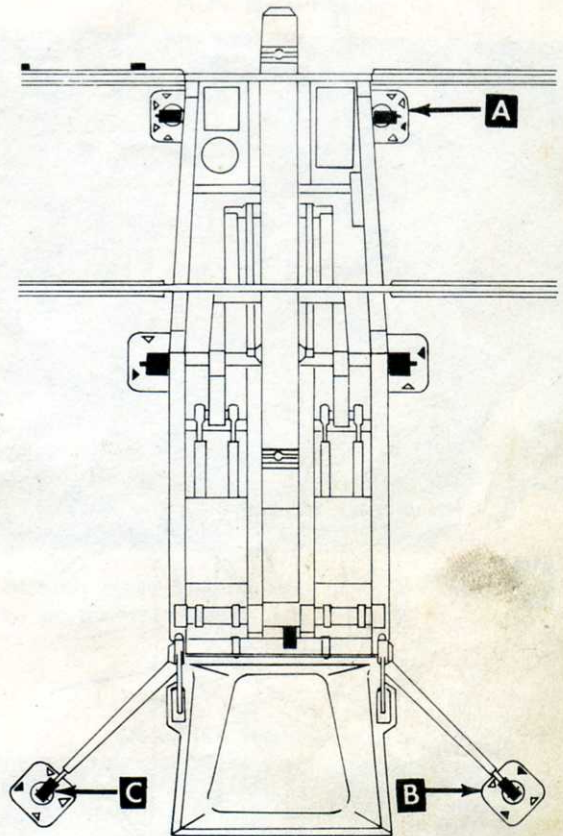
LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL - LUBRICATING OIL, general purpose 9150-90-23-66	PL Medium	PL Medium	PL Special	M - Monthly
GAA - GREASE, Automotive and Artillery 9150-190-3405	ALL TEMPERATURES			
CT - COMPOUND, Corrosion Preventive, Hard Film 8030-231-232	ALL TEMPERATURES			

Section XIV. GUIDED MISSILE LAUNCHER MODIFICATION KIT M160

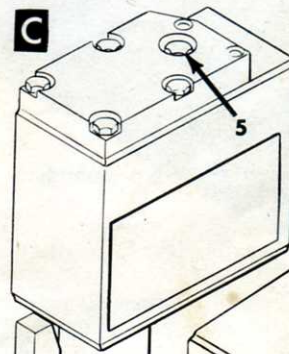
- M PL Pin
- M PL Locking Pin
- M PL Foot Plate Locking Link
- GAA Jack Swivel



Apply a light coating of oil to the pin (1), locking pin (2), and the foot plate locking link (3) monthly. Apply a light coating of grease to the jack swivel (4) at the time of emplacement.



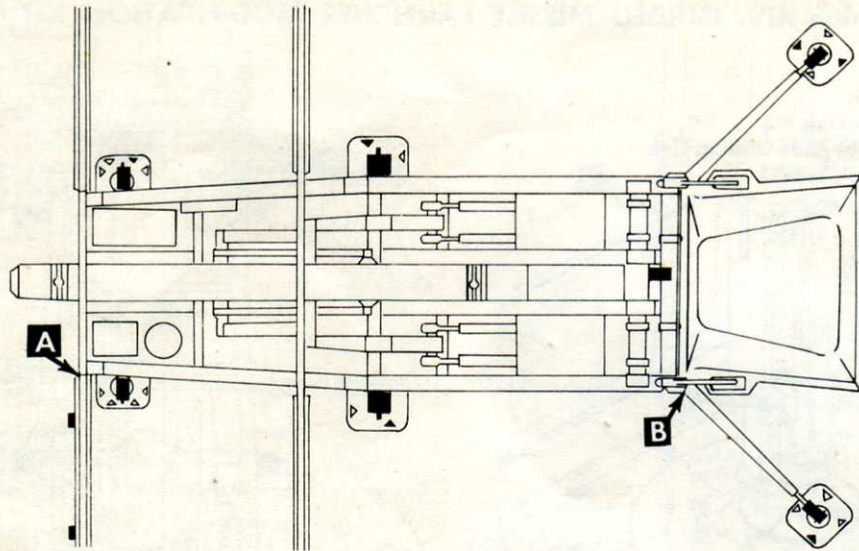
OHA Hydraulic Jack



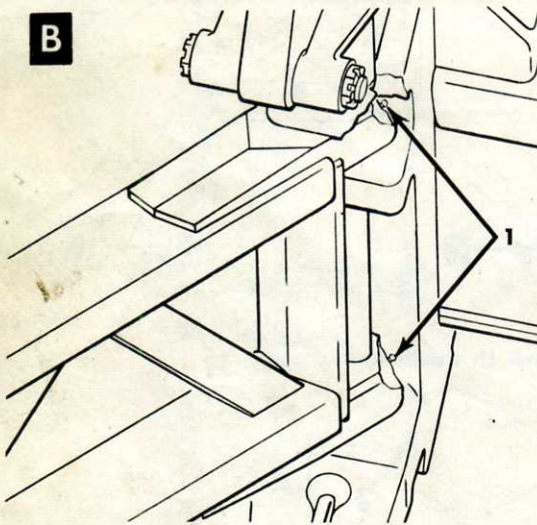
Keep filled with hydraulic fluid. To fill, remove the fluid level indicator (5) with the jack in the retracted position, fill to the full mark on the indicator, and install the indicator.

KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F -10°F	0°F to -65°F	
PL — OIL, Lubr, Preservative <i>VEDI PAG e</i>	PL Medium	PL Medium	PL Special	M — Monthly
GAA — GREASE, Automotive and Artillery <i>2150-190-0905</i>	ALL TEMPERATURES			
OHA — FLUID, Hydraulic, Petroleum Base <i>2150-229-1134</i>				

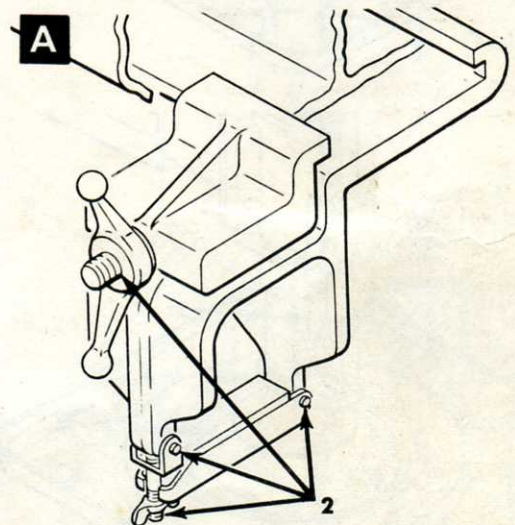


M GAA Outrigger



Apply grease to the fittings on the outrigger (1) monthly.

M PL Loading Rack Clamp Assembly

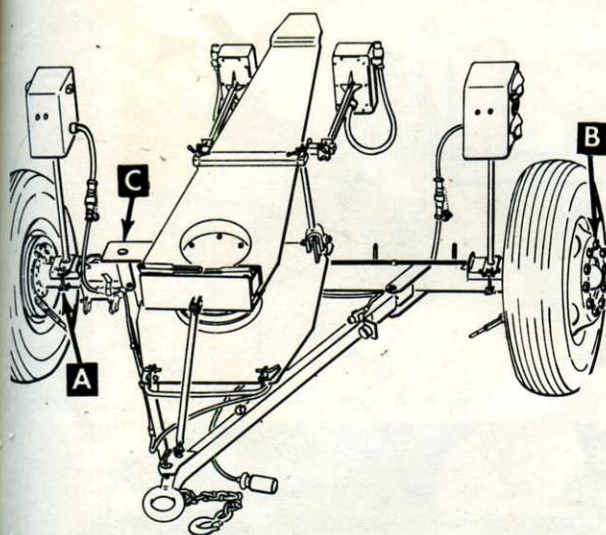


Apply a light coating of oil to the loading rack clamp assembly (2) monthly.

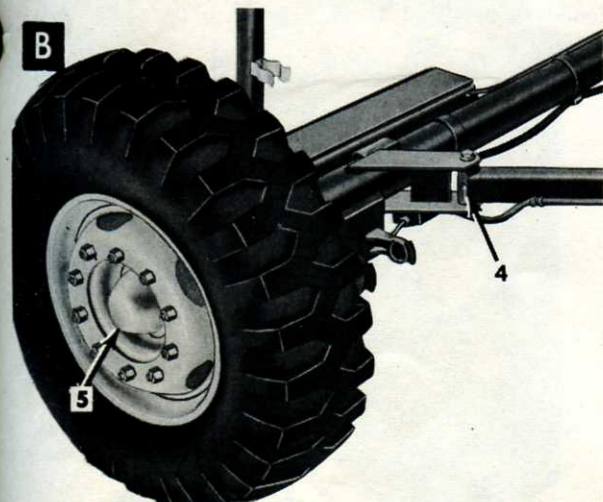
KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL — OIL, Lubr, Preservative <i>VEDI PAGE 9</i>	PL Medium	PL Medium	PL Special	M — Monthly
GAA — GREASE, Automotive and Artillery <i>9150-190-1905</i>	ALL TEMPERATURES			

Section XV. GUIDED MISSILE LAUNCHER MODIFICATION KIT XM159

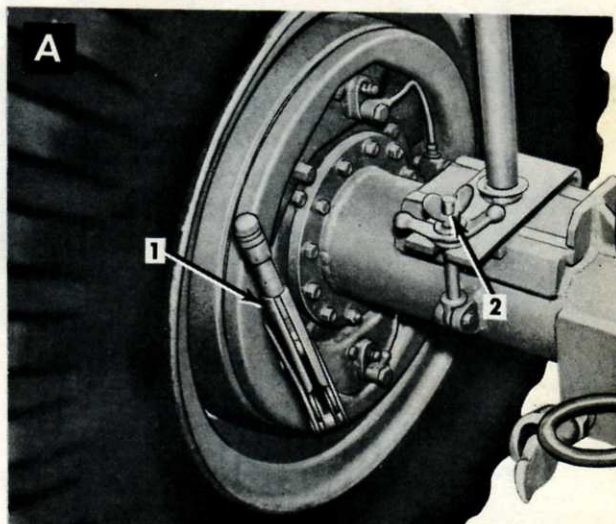


M GAA Tow Bar Arm
S GAA Wheel Bearings



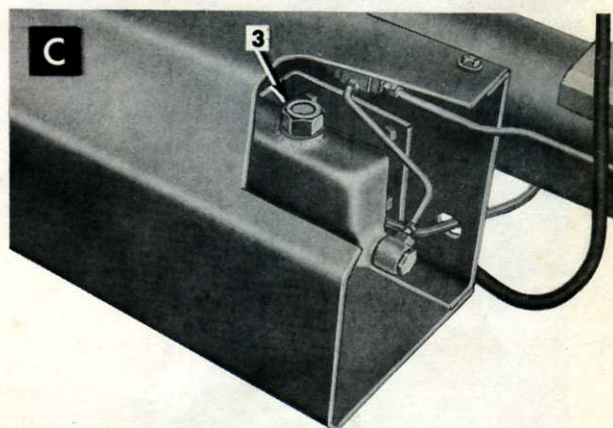
Monthly apply grease to the fittings on the tow bar arm (4). Semi-annually clean and repack the wheel bearings (5) with grease.

M PL Retaining Rod
M PL Brake Handle



Monthly apply a light coating of oil to the retaining rod (2) and the brake handle (1).

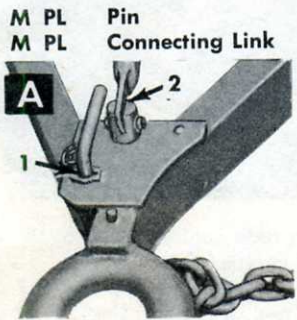
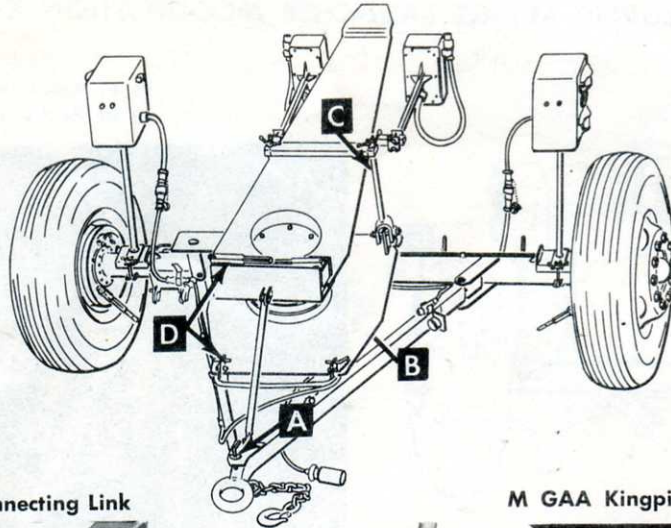
HB or HBA Master Cylinder



Keep the master cylinder filled to within 1/2 inch of the top. To fill, remove the filler plug from the master cylinder (3).

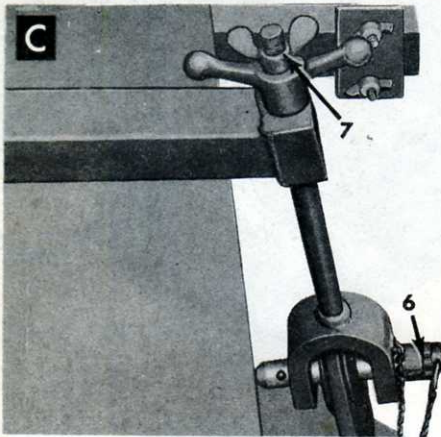
KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL — OIL, Lubr, Preservative <i>VENI PAB 2</i>	PL Medium	PL Medium	PL Special	M — Monthly S — Semi-annually
GAA — GREASE, Automotive and Artillery <i>9650-190-0905</i>	ALL TEMPERATURES			
HB — FLUID, Hydraulic Brake HBA — FLUID, Hydraulic Brake, Arctic	HB	HB	HBA	



Monthly apply a light coating of oil to the pin (1) and the connecting link (2).

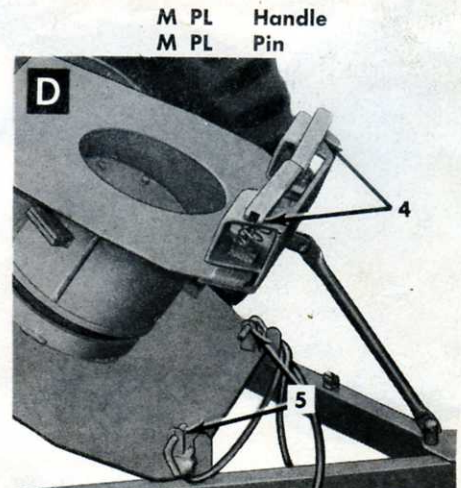
M PL Tie-down Linkage
M PL Pin



Monthly apply a light coating of oil to the tie-down linkage (6) and the pin (7).



Monthly apply a light coating of grease to the kingpin support guide (3).

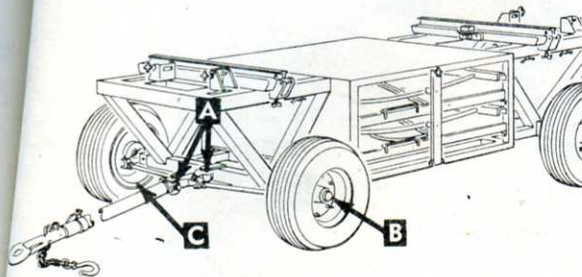


Monthly apply a light coating of oil to the handle (4) and to the pin (5).

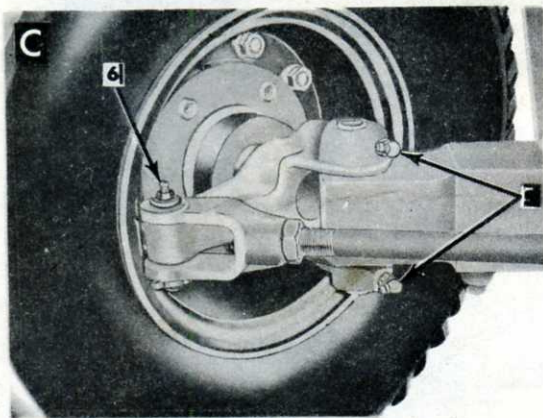
KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL — OIL, Lubr, Preservative <i>VEDI PAGE</i>	PL Medium	PL Medium	PL Special	M — Monthly S — Semi-annually
GAA — GREASE, Automotive and Artillery <i>9150-140-0905</i>	ALL TEMPERATURES			

CHAPTER 3. GROUND HANDLING EQUIPMENT
Section I. GUIDED MISSILE ROCKET-MOTOR TRUCK M442



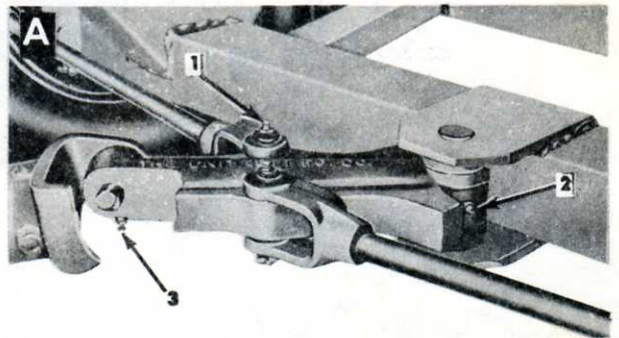
M GAA Tie-Rods and Kingpins



Apply grease to the fitting on each end of the tie-rods (6) and to the fittings on each kingpin (5).

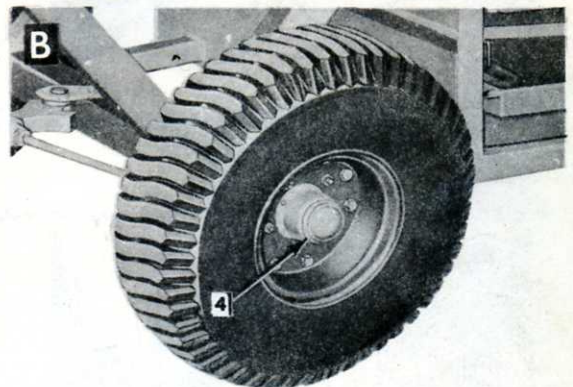
Note—Monthly lubricate lock screws, parking brake, extension lock-pin, horizontal hinge-pin, pintle hook, bar hinge tie-down, wing nut tie-down, lockpin assemblies, etc., with PL.

M GAA Towbar Pivot Bearings and Flotation Pivot Bearings



Apply grease to the fittings on the towbar pivot bearings (1) and (2) and the flotation pivot bearing (3).

S GAA Wheel Bearings

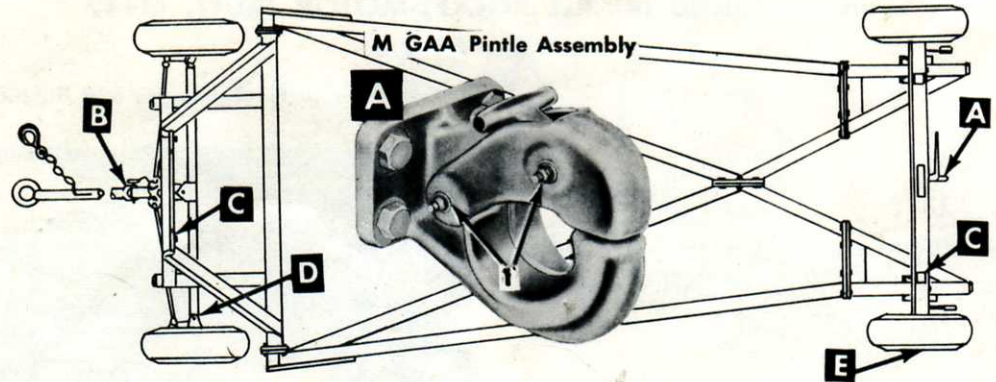


Clean and repack the bearings (4) in each of the four wheels.

KEY

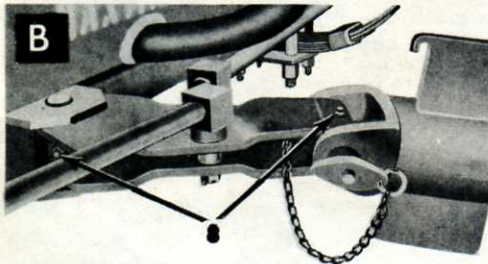
LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
GAA — GREASE, Automotive and Artillery 9450-190-0905	GAA	GAA	GAA	M — Monthly
PL — OIL, Lubr, Preservative VEDI PAGE 2	PL (Med)	PL (Med)	PL (Special)	S — Semi-annually

Section II. GUIDED MISSILE BODY SECTION TRUCK M473



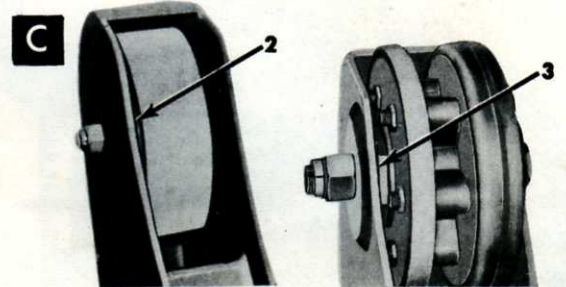
Apply grease to the fittings on the pintle (1).

M GAA Towbar Pivot Bearing and Flotation Pivot Bearing



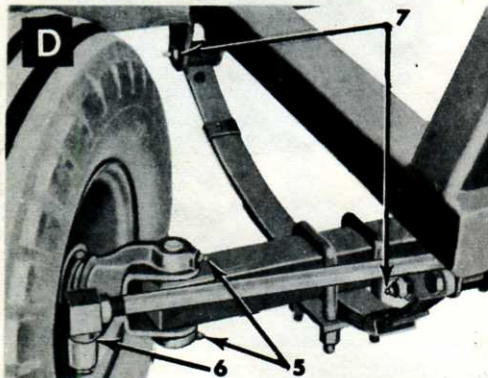
Apply grease to the fittings on the towbar pivot bearing and the flotation pivot bearing (8).

S GAA Missile Rollers



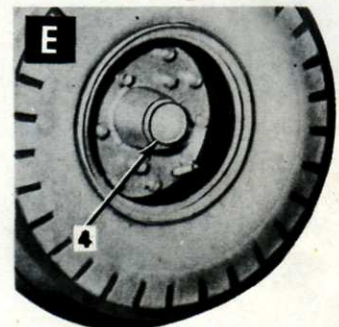
Disassemble and clean the missile rollers (2 and 3). Repack the rollers with grease.

M GAA Spring Shackle Bolts, Kingpins, and Tie-rods.



Apply grease to the fittings on the front and rear spring shackle bolts (7) of each of the four springs. Apply grease to the fittings on the side of the kingpin turning spindles (5). Apply grease to each end of the tie-rods (6).

S GAA Wheel Bearings



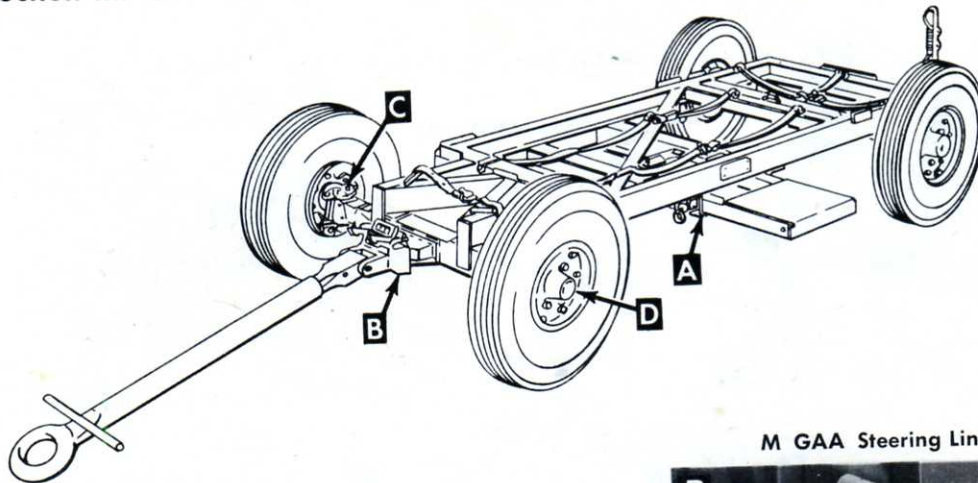
Clean and repack the bearings (4) in each of the four wheels.

Note—Monthly, lubricate towbar ball-loc pivot pin, safety chain-hook latch, rotary ring bracket, front-spring link bolts, indexing brake, rotary ring lockpins, rear-spring front shackle bolts, parking brake assembly, etc., with PL.

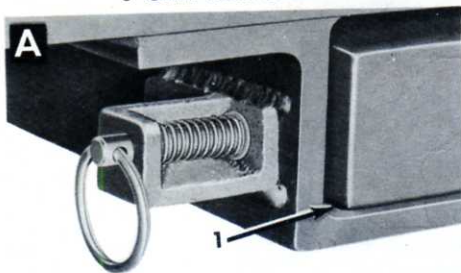
KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
GAA — GREASE, Automotive and Artillery	GAA	GAA	GAA	M — Monthly
PL — OIL, Lubr, Preventive	PL Medium	PL Medium	PL Special	S — Semi-annually

Section III. GUIDED MISSILE TEST SET TRUCK M451 AND M451A1

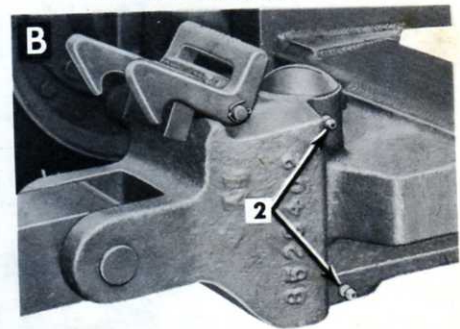


S GAA Seat Slide



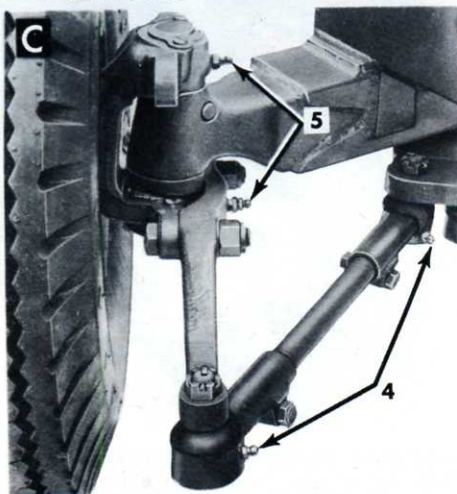
Apply a light coating of grease to the sliding surfaces (1).

M GAA Steering Link Pin



Apply grease to the fittings (2).

M GAA Kingpins and Tie-Rod Ends



Apply grease to the fittings on the turning spindle (5) and on each end of the tie rods (4).

S GAA Wheel Bearings



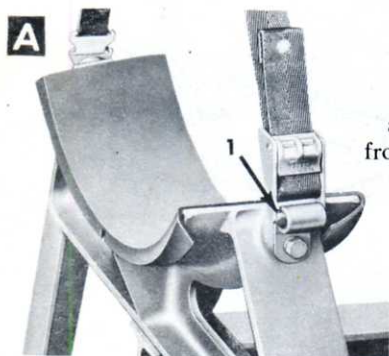
Clean and repack the bearings (3) in each of the four wheels.

Note—OIL CAN POINTS—Monthly lubricate towbar latch, towbar attach pin, seat retaining pin, brake handle, brake shaft turning points (3 places), and brake mechanism turning points (4 places), with PL.

KEY

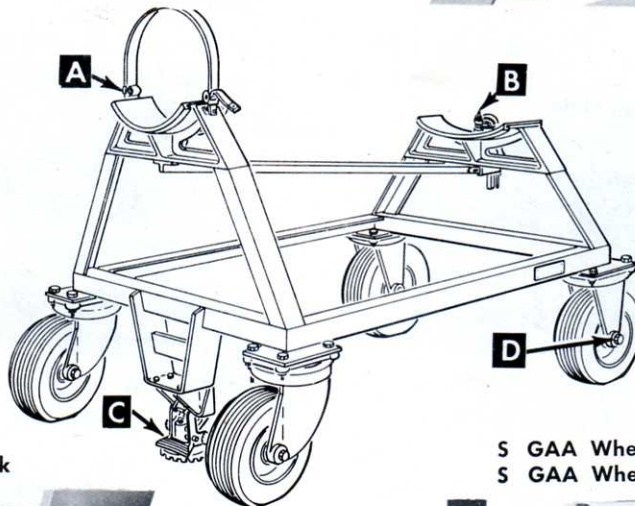
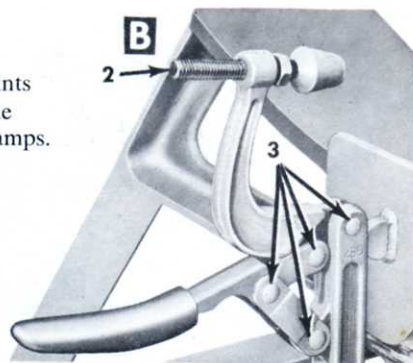
LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
GAA — GREASE, Automotive and Artillery 9150-190-090	GAA	GAA	GAA	M — Monthly
PL — OIL, Lubr, Preservative VED1 PAG 9	PL Medium	PL Medium	PL Special	S — Semi-annually

Section IV. NOSE STORAGE DOLLY ASSEMBLY

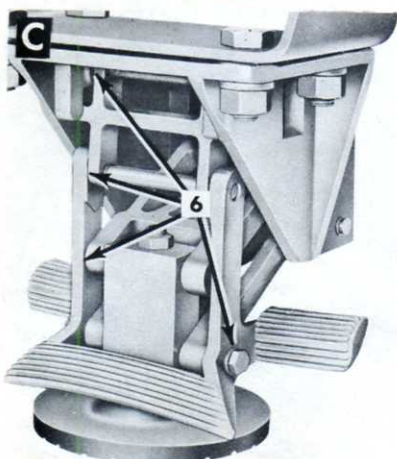


M PL Clamp

Lightly oil the turning points and exposed threads on the front (1) and rear (2,3) Clamps.

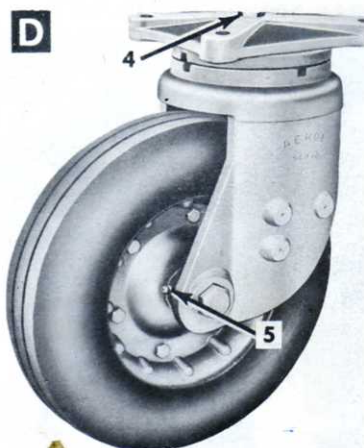


M PL Lock



Lightly oil the sliding surfaces (6).

S GAA Wheel Bearings
S GAA Wheel Swivels

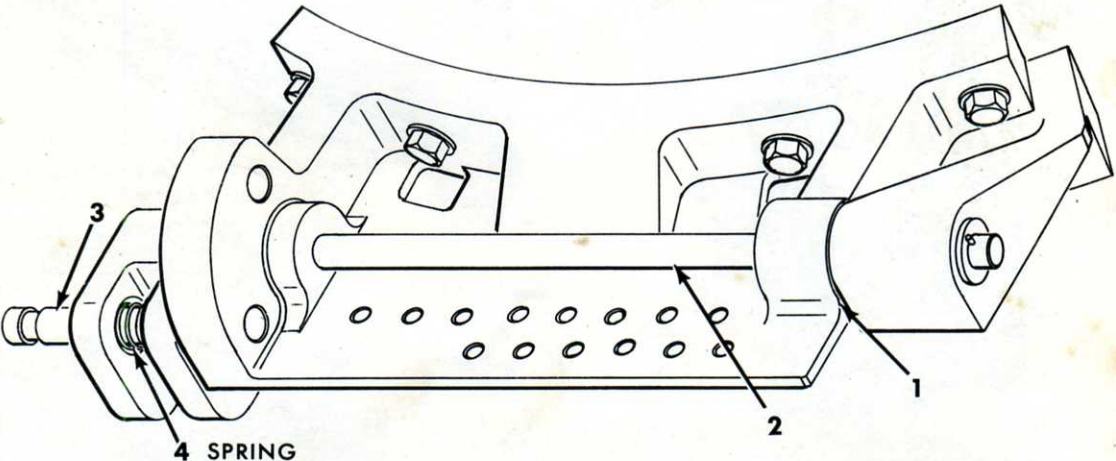


Apply grease to the fittings on each of the four wheels (5).
Clean and repack the swivel bearings (4) on each wheel.

KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
GAA - GREASE, Automotive and Artillery	GAA	GAA	GAA	M - Monthly
PL - OIL, Lubr, Preservative	PL Medium	PL Medium	PL Special	S - Semi-annually

Hinge Assy, Nose
 Q- PL Shaft and Locking Pin
 Q Graphite Washer and Pin

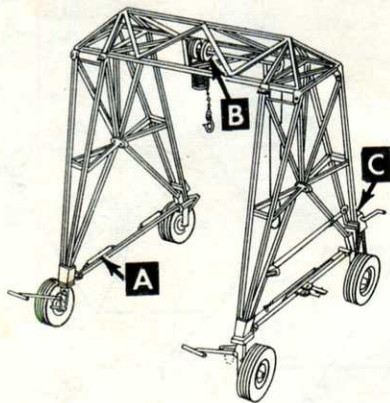


Apply graphite to all surfaces in contact with the washer (1) and pin (2). Before mounting the hinge, apply a small amount of PL to the shaft of the locking pin (3), and the spring (4). Flex the hinge.

KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL - OIL, lubrication, preservative <i>VEDI PAG 3</i>	PL (Medium)	PL (Medium)	PL (Special)	Q - Quarterly
Graphite	ALL TEMPERATURES			

Section V. GUIDED MISSILE PORTABLE HOISTING UNIT M26E1

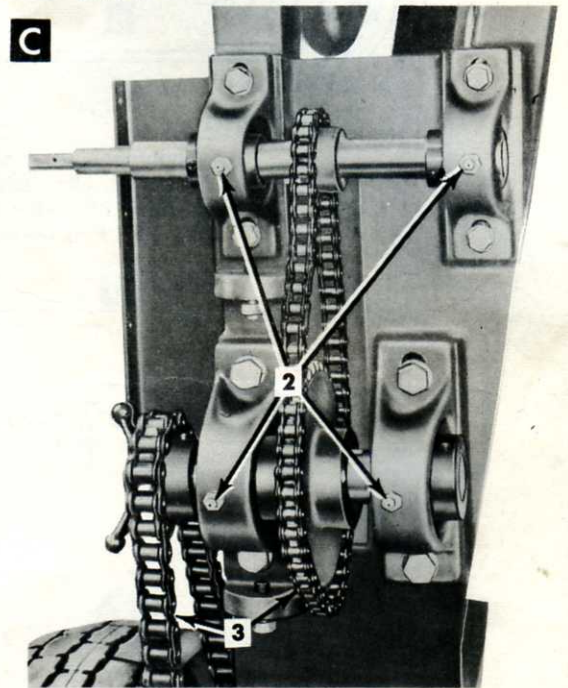


M GAA Tie-Rod Ends

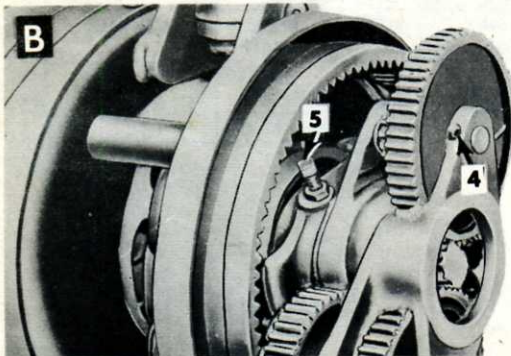


Apply grease to the fitting on each tie-rod end (1).

M GAA Pillow Blocks, Chain and Sprocket Wheels and Drivers



Q GAA Hoist Assembly Gears
GAA Hoist Main Bearing



Apply grease to the gears (4) inside the covers. If the hoist main bearing (5) is damaged, replace and repack the bearing.

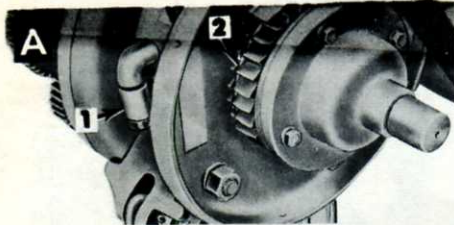
Remove the covers from the pillow blocks and apply grease to the fittings (2). Apply a light coating of grease to the chain and sprocket wheels, and drivers (3).

Note—OIL CAN POINTS—Monthly, lubricate hook swivel and safety latch, steering-arm-lock hinge pins, parking brake assembly, ratchet and handle, chain-guard pivot pin, steering arm link attach bolt, towbar assembly attach bolt, etc., with PL.

KEY

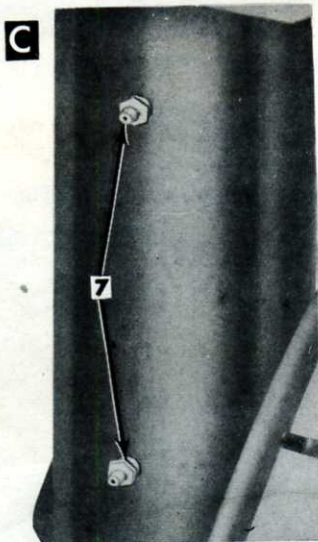
LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL — OIL, Lubr, Preservative	PL Medium	PL Medium	PL Special	M — Monthly Q — Quarterly
GAA — GREASE, Automotive and Artillery	ALL TEMPERATURES			

M GO-GOS Chain Oiler Friction Lining

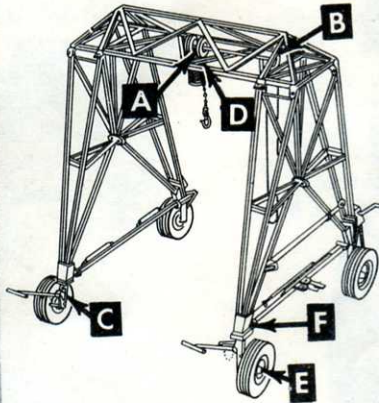


Fill the reservoir (1) with oil. Do not lubricate the friction lining (2). If the lining releases hard, check the surface for lubricant and if any is present, clean thoroughly.

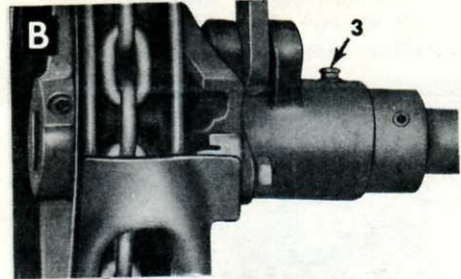
M GAA Spindles



Apply grease to the fittings (7) at each wheel.

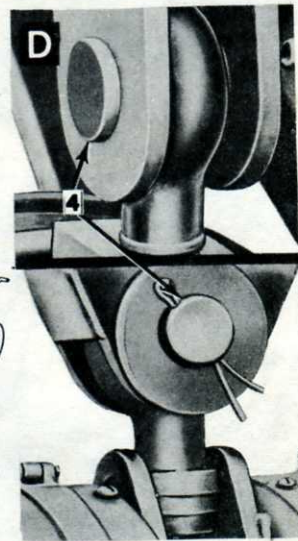


M PL Shaft Bearing



Fill cup (3) with oil.

M PL Hoist Suspension Pins



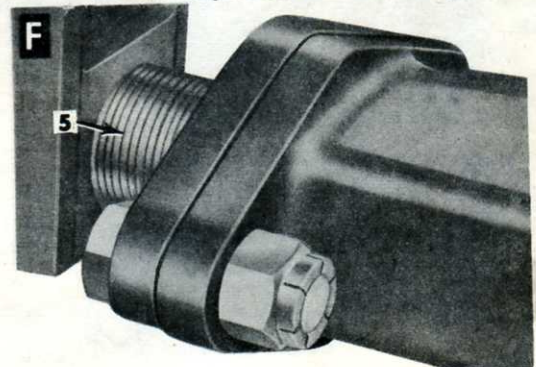
Oil the pins (4) lightly.

S GAA Wheel Bearings



Clean and repack the bearings (6) in each of the four wheels.

S GAA Adjustable Plate Assembly

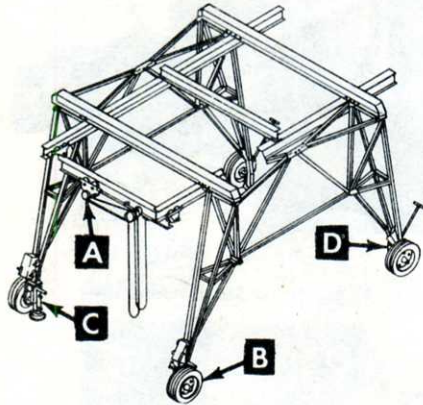


Apply a light coating of grease to the exposed threads (5).

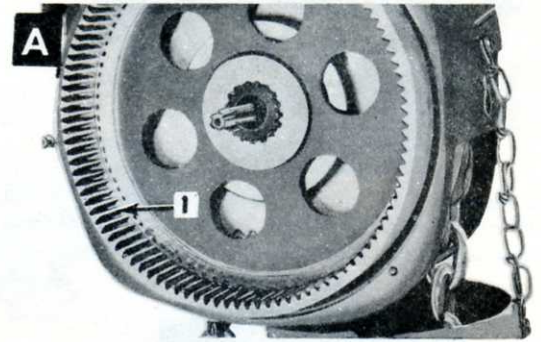
KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL - OIL, Lubr, Preservative	PL Medium	PL Medium	PL Special	M - Monthly
GO - OIL, Lubr, Gear, Universal	GO-90	GO-75	GOS	S - Semi-annually
GOS - OIL, Lubr, Gear, Sub-Zero	ALL TEMPERATURES			
GAA - GREASE, Automotive and Artillery	ALL TEMPERATURES			

Section VI. GUIDED MISSILE PORTABLE HOISTING UNIT M34



Q GAA Pocket Wheel Gear



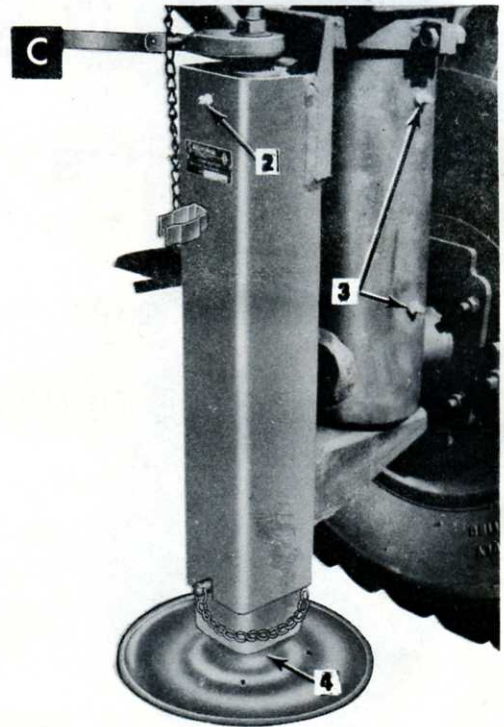
Apply a light film of grease to the gear teeth (1).

S GAA Wheel Bearings

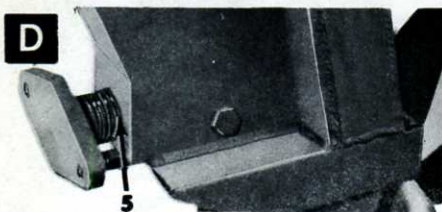


Clean and repack the bearings (6) in each of the four wheels.

- M GAA Spindles
- M GAA Leveling Jack
- Q GAA Leveling Jack Ground Plate



S GAA Adjustable Plate Assembly

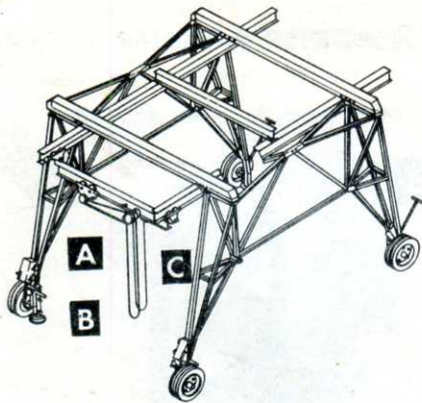


Apply a light film of grease to the exposed ends of the adjustable plate assembly (5).

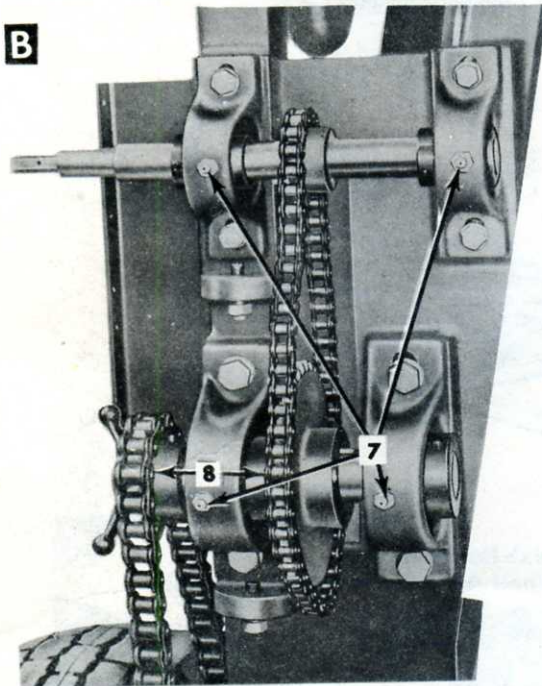
Apply grease to the fitting on the leveling jack (2) and to the exposed area of the ball joint on the ground plate (4). Apply grease to the fittings on the spindles (3) at each wheel.

KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL — LUBRICATING OIL, general purpose	PL (Medium)	PL (Medium)	PL (Special)	M — Monthly S — Semi-annually Q — Quarterly
GAA — GREASE, Automotive and Artillery	ALL TEMPERATURES			

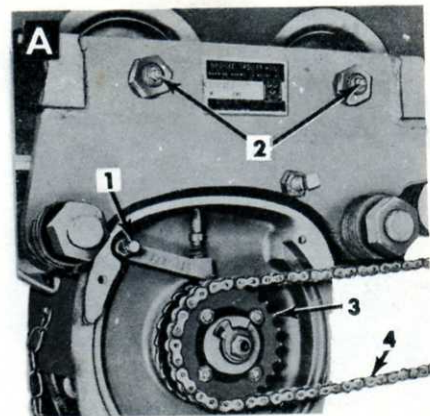


M GAA Pillow Blocks
M GAA Chain and Sprocket Wheels and Drivers



Remove the cover from the pillow block and apply grease to the fittings (7). Apply a light coating of grease to the chain and sprocket wheels and drivers (8).

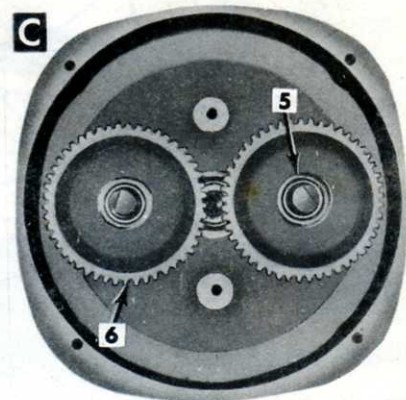
M GAA Trolley Chains
M GAA Trolley Wheels
Q GAA Brake Pawl Shaft
Q GAA Load Brake Ratchet



Apply grease to fourteen grease fittings on the trolley wheels (2). Apply a light film of grease to the mating surfaces of the brake pawl shaft (1) and to the teeth of the load brake ratchet (3).

Apply a light coating of grease to the length of the chains (4).

Q GAA Idler Gears
Q GAA Needle Bearings



Apply a light film of grease to the teeth on the idler gears (6). Remove, clean, and repack the needle bearings (5) in two gears.

Note—Monthly lubricate hook swivel and safety latch, steering-arm-lock hinge pins, parking brake assembly, manual-steering-handle pin assembly and lockpin, hand crank ratchet and handle, chain-guard pivot pin, leveling jack ratchet, etc., with PL.

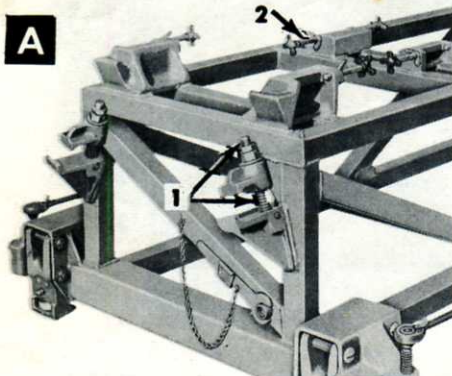
KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL — LUBRICATING OIL, general purpose	PL (Medium)	PL (Medium)	PL (Special)	M — Monthly
GAA — GREASE, Automotive and Artillery	ALL TEMPERATURES			Q — Quarterly

LO 9-1400-250-20

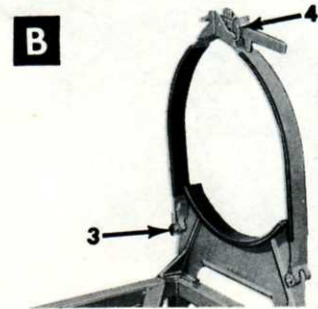
Section VII. MISSILE BODY OR ROCKET MOTOR TRANSPORTER ADAPTER ASSEMBLY

M PL Stop Support Bolt Group and Clamp Assembly

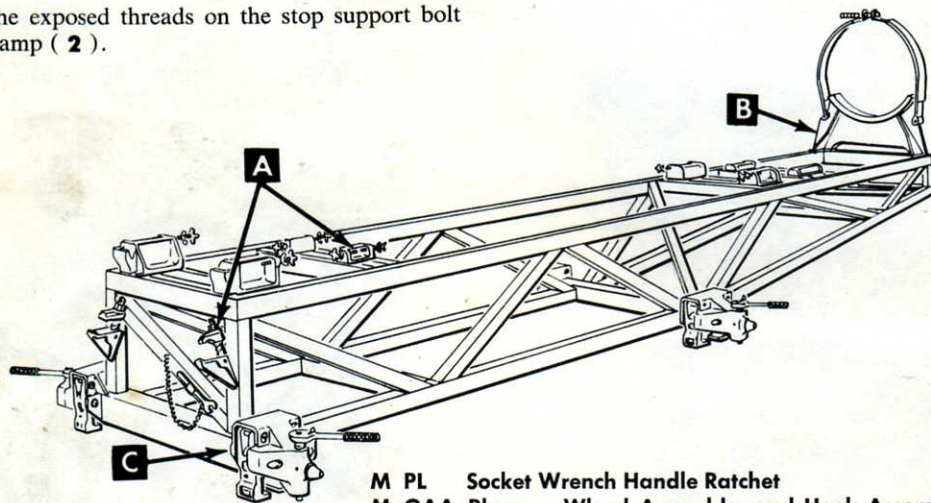


Lightly oil the exposed threads on the stop support bolt (1) and the clamp (2).

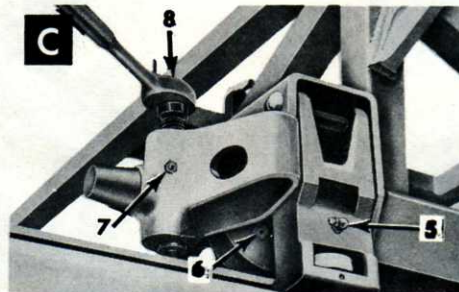
M PL Latch Assembly and Pins



Lightly oil the latch (4) turning points and sliding surfaces. Lightly oil the pins (3).



**M PL Socket Wrench Handle Ratchet
M GAA Plunger, Wheel Assembly, and Hook Assembly**



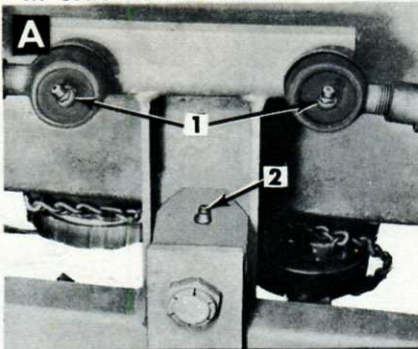
Lightly oil around the ratchet head of the socket wrench handle (8). Apply grease to the fittings on the plungers (7), and to the hook assembly (5) fitting above each roller. Apply grease to the fitting on each of the wheels (6).

KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
GAA - GREASE, Automotive and Artillery	GAA	GAA	GAA	M - Monthly
PL - OIL, Lubr, Preventive	PL Medium	PL Medium	PL Special	

Section VIII. LAUNCHER CONTROL—INDICATOR DOLLY AND FAULT LOCATING INDICATOR TRUCK

M GAA Tongue Assembly Kingpin
M GAA Tie Rod Ends

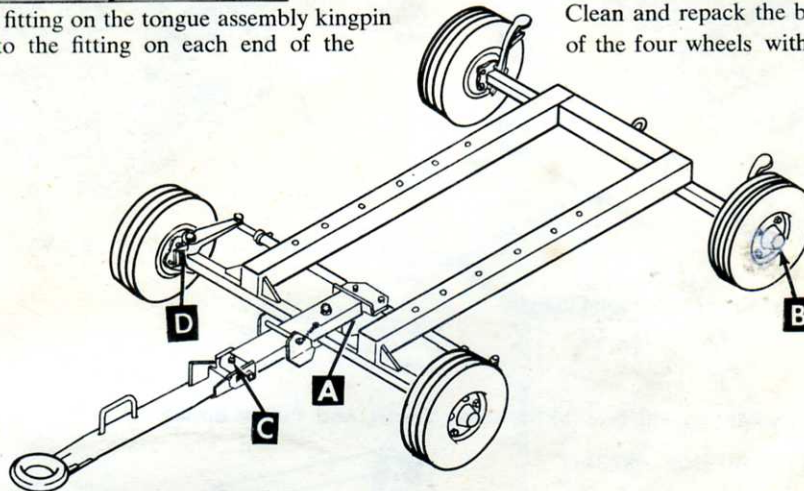


Apply grease to the fitting on the tongue assembly kingpin (2). Apply grease to the fitting on each end of the tie rods (1).

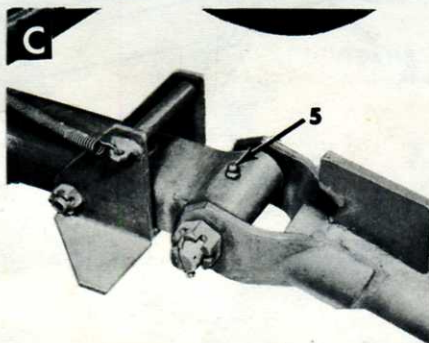
S GAA Wheel Bearings



Clean and repack the bearings in each of the four wheels with grease (3).

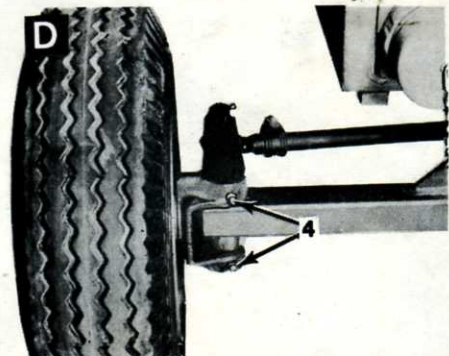


M GAA Towbar Pivot Pin



Apply grease to the fitting on the towbar pivot pin (5).

M GAA Kingpins



Apply grease to the fittings on the side of the spindle (4).

Note—OIL CAN POINTS—Monthly lubricate the turning points and sliding surfaces of the towbar latch, brake lever assembly, etc., with PL.

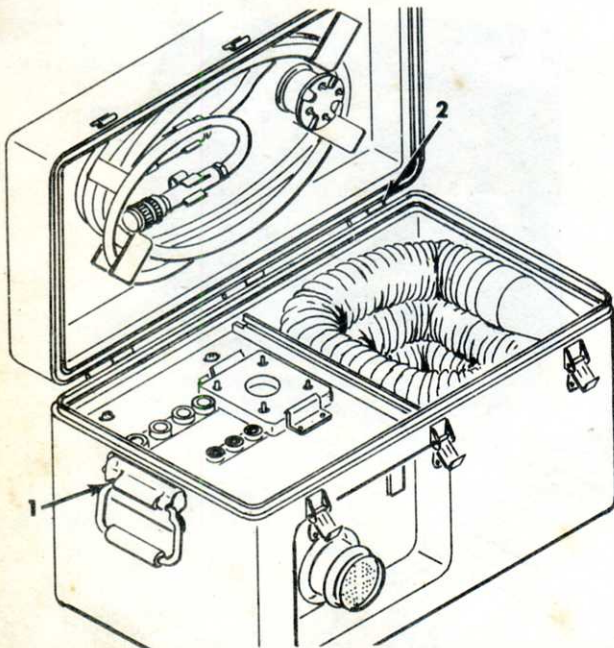
KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
PL — LUBRICATING OIL, general purpose	PL Medium	PL Medium	PL Special	M — Monthly S — Semi-annually
GAA — GREASE, Automotive and Artillery	ALL TEMPERATURES			

LO 9-1400-250-20

Section IX.— Cable Reeling Machine; Portable Oil Fill Unit; Portable Air Cooling Unit

S PL Hinges and Handles



Apply preservative oil to the hinges (2) and handles (1).

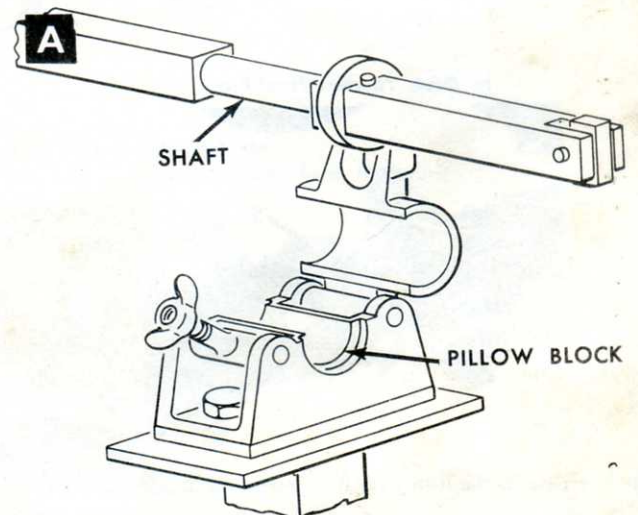
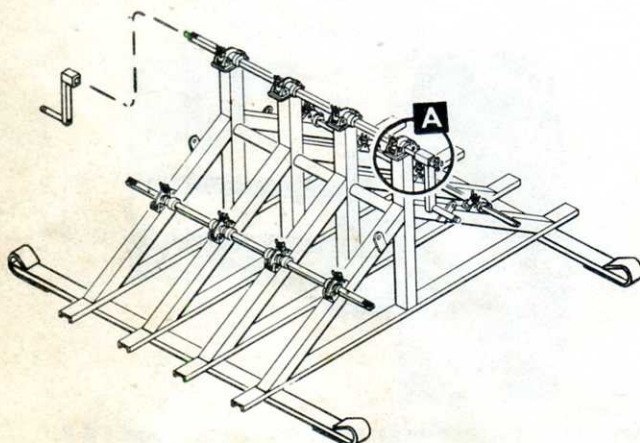
S PL Hinges



Apply preservative oil to the hinges (3).

M GAA Mating Surfaces of Handles, Shafts and Pillow Blocks

Three Models: 9978119—9978103—9978117



Apply grease to all mating surfaces of the handles, the shafts and the pillow blocks.

KEY

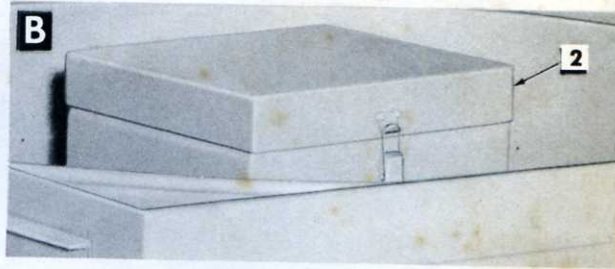
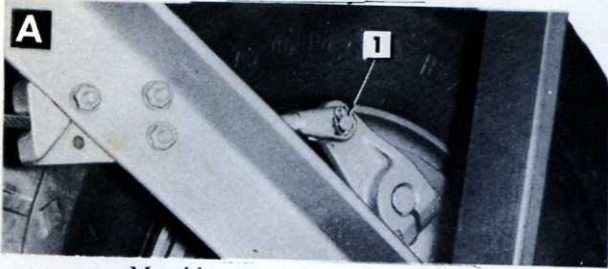
LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
GAA — GREASE, Automotive and Artillery	GAA	GAA	GAA	M — Monthly S — Semi-annually
PL — OIL, Lubr, Preservative	PL (Med)	PL (Med)	PL (Special)	

ORD G 3812A

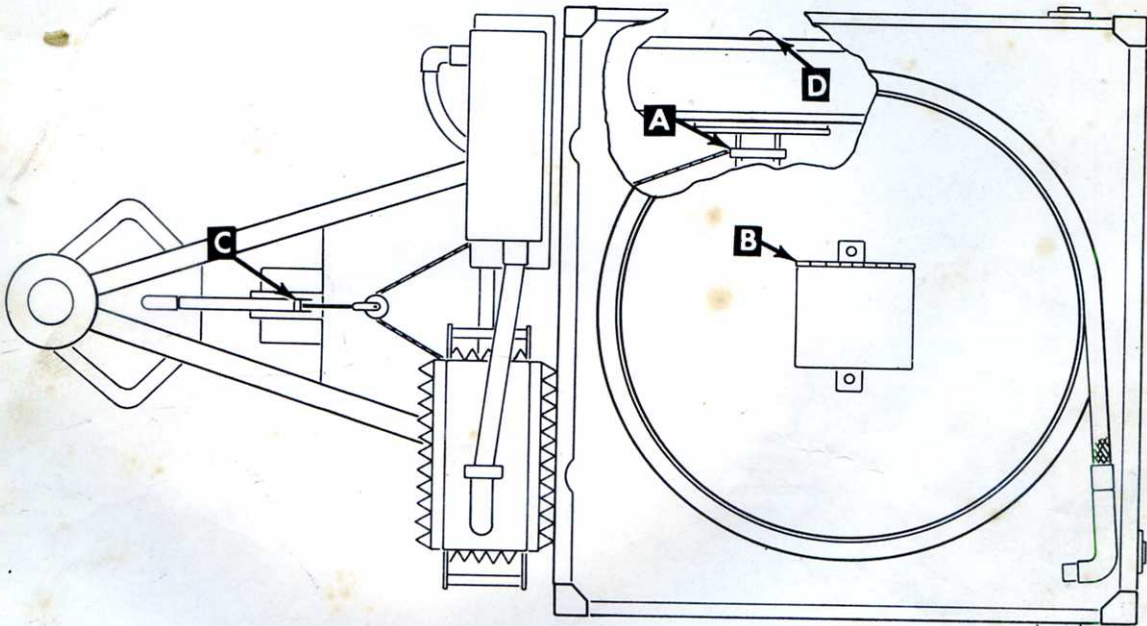
POWER CONVERSION UNIT

M PL Brake Arm

M PL Piano Hinge

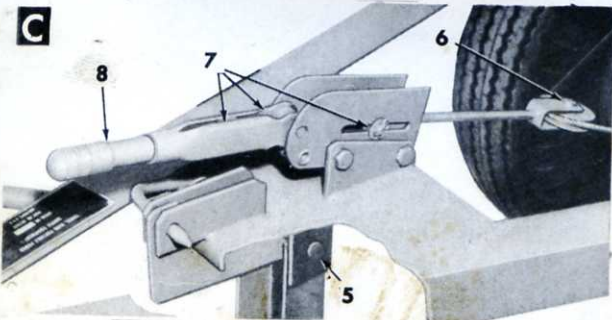


Monthly oil the (1) turning points.



M PL Oil Can Points

S GAA Wheel Bearings
S CT Brake Cable



Monthly apply a light coating of oil.

Semi-annually clean and repack the wheel bearings (3) with grease. Clean and apply light coat of corrosion preventive compound over the entire cable. (4)

KEY

LUBRICANTS	EXPECTED TEMPERATURES			INTERVALS
	Above +32°F	+40°F to -10°F	0°F to -65°F	
GAA — GREASE, automotive and artillery	ALL TEMPERATURES			M — Monthly S — Semi-annually
PL — LUBRICATING OIL, general purpose	PL (Medium)	PL (Medium)	PL (Special)	
CT — CORROSION PREVENTIVE COMPOUND, hard film	ALL TEMPERATURES			