

Issue 458

PS

January  
1991

# THE PREVENTIVE MAINTENANCE MONTHLY

TB 43-PS-458



Approved For Public Release;  
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**The Desert...  
The other Enemy**  
See Page 27



# Sandbag Desert Problems

The number one problem for rifles, machine guns, and pistols in the desert can be summed up in one word: sand.

It's everywhere. Wind blows sand into the smallest openings in your weapons, like the muzzle and ejection port. Sand mixes with lube and creates a grinding compound that acts like scouring powder, grinding up moving parts.

You're not going to shut out sand completely. Its forces are too superior.

But your weapon can do its job in the desert if you focus on these PM rules:

➤ Clean your weapon as often as possible. That means at least daily. Even wiping it off with a clean, dry cloth every chance you get will help. Clean in enclosed areas when possible where you can get away from blowing sand.

YEAH... I KNOW!

SHUT THAT FLAP!  
SAND IS A KILLER  
TO OUR WEAPONS!

➤ Give special attention to internal parts that move, like the bolt carrier. Wipe and brush them as clean as possible. Use your own lung power to blow out sand from areas like the trigger assembly that you're not authorized to disassemble.

➤ Take it easy with lubes like CLP. They will attract sand. Limit lubing to internal parts. Wipe the outside of your weapon dry.

➤ Magazines jam with sand. Then your weapon won't fire. Unload and wipe off ammo daily. Run a rag through the magazine. Do not put any lube in magazines or on ammo.

➤ Use rifle covers, muzzle caps, and spare magazine bags as much as possible. Cover mounted machine guns. On rifles, keep the ejection port cover closed and a magazine installed.

PS

THE  
PREVENTIVE  
MAINTENANCE  
MONTHLY

TB 43-PS-458, The Preventive Maintenance Monthly, is an official publication of the Department of the Army, providing information for all soldiers assigned to combat and combat support units and all soldiers with unit maintenance and supply duties. All information published has been reviewed and approved by the agency responsible for the equipment, publication or policy discussed. Application of the information is optional with the user.

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You are invited to send PS your ideas for improving maintenance procedures, questions on maintenance and supply problems, questions or comments on material published in PS. Just write to:

MSG Half-Mast  
The Preventive Maintenance Monthly  
Lexington, KY 40511-5101

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PS, The Preventive Maintenance Monthly (ISSN 0475-2953) is published monthly by the Department of the Army, Lexington, KY 40511-5101. Second Class Postage is paid at the Lexington, KY post office and at additional mailing offices.

Postmaster: Send address changes to PS, The Preventive Maintenance Monthly, US Army Pubs Ctr, 2800 Eastern Blvd, Baltimore, MD 21220-2886.

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# You Gotta Do It!

**T**HERE ARE NO *IFS, ANDS, OR BUTS* WHEN IT COMES TO HEADSPACING AND TIMING YOUR *M2 MACHINE GUN*. **YOU GOTTA DO IT!**

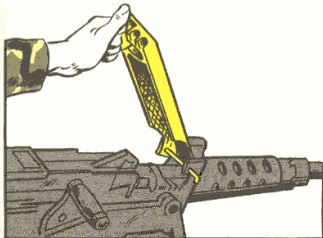
LET'S GO THROUGH IT STEP-BY-STEP!



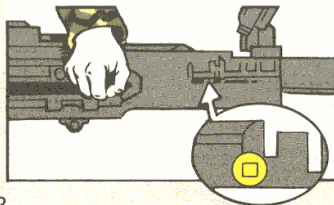
Headspace and time your M2... before firing... after assembling it... after replacing the barrel. And do it every time!

## Headspace

**One**... Raise the cover completely.



**Two**... Pull the charging handle back until the bolt is far enough back that the barrel-locking spring lug is aligned with the  $\frac{3}{8}$ -in hole on the right side of the receiver. The barrel can be turned only when the lug is aligned with the  $\frac{3}{8}$ -in hole.

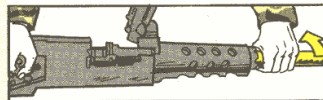


2

The easiest way to keep the bolt in that position is to insert the small loop of an M2 ammo link between the trunnion block and barrel extension. Or you can hold the bolt in place.



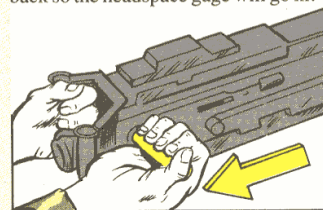
**Three**... Screw the barrel all the way into the barrel extension.



**Four**... Unscrew the barrel two clicks. Let the bolt go forward.

**Test:** With the bolt forward, try to turn the barrel in either direction. If it turns, don't try to fire. Tell your armorer. Then try the other barrel.

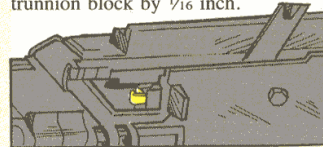
**Five**... Cock the M2 by pulling the charging handle and bolt all the way to the rear. Hold it there. This cocks the weapon and moves the firing pin back so the headspace gage will go in.



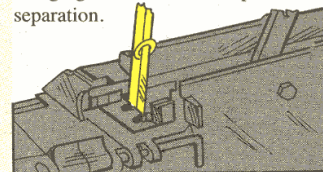
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**Six**... E-A-S-E the bolt forward. Don't press the trigger.

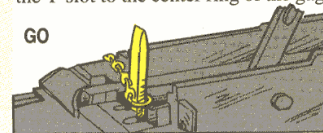
**Seven**... With the charging handle, separate the barrel extension from the trunnion block by  $\frac{1}{16}$  inch.



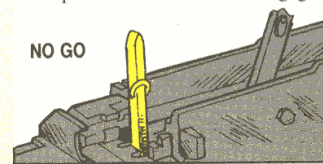
**Eight**... Raise the extractor and insert the GO/NO GO gage. Hold the charging handle back to keep the  $\frac{1}{16}$ -in separation.



**Nine**... If the GO end goes down the T-slot to the center ring of the gage



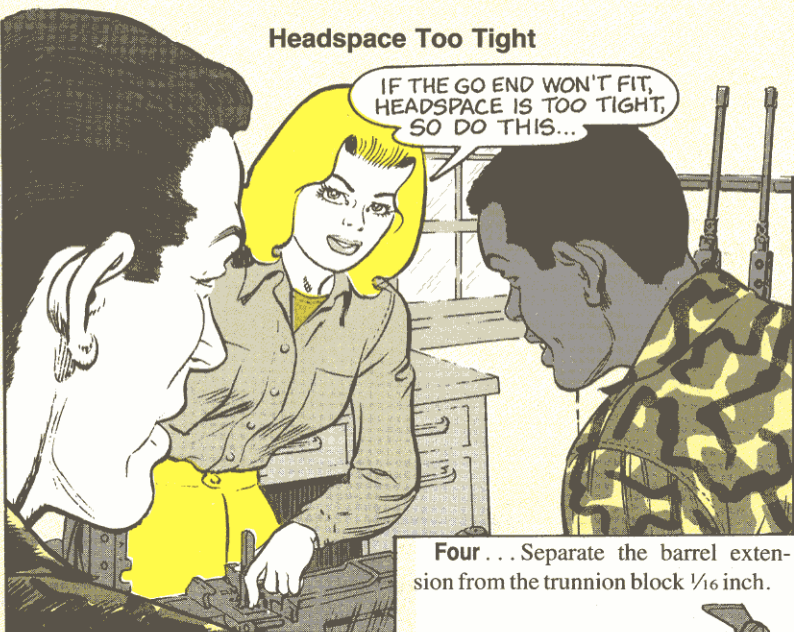
and NO GO end will not go in, headspace is OK. Remove the gage.



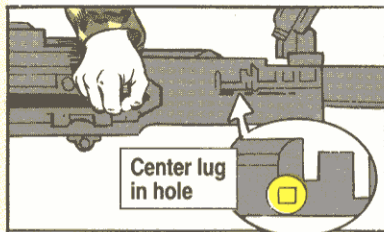
3

## Headspace Too Tight

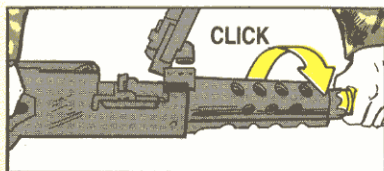
IF THE GO END WON'T FIT,  
HEADSPACE IS TOO TIGHT,  
SO DO THIS...



**One**...Retract the bolt until the barrel-locking spring lug is centered in the receiver hole.

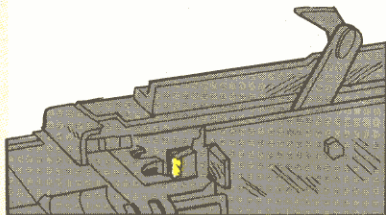


**Two**...Unscrew the barrel one click.

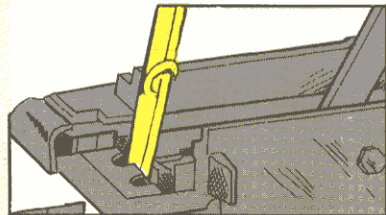


**Three**...Ease the bolt forward.

**Four**...Separate the barrel extension from the trunnion block  $\frac{1}{16}$  inch.



**Five**... Insert the GO/NO GO gage again.



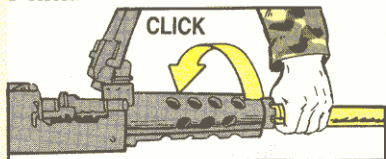
If the GO end fits and the NO GO doesn't, headspace is OK. If the GO end still won't fit, repeat these five steps until it does.



Do not unscrew the barrel more than 5 clicks in steps 1–5 beyond the first 2 clicks (7 in all). If you have to go beyond that, turn the gun in to your armorer for inspection.

## Headspace Too Loose

If the NO GO end fits, headspace is too loose. Correct loose headspace by doing the same 5 steps used for too tight headspace. But instead of unscrewing the barrel 1 click, screw it in 1 click.



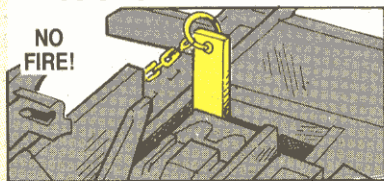
Repeat the five steps until GO fits and NO GO doesn't.

## Timing

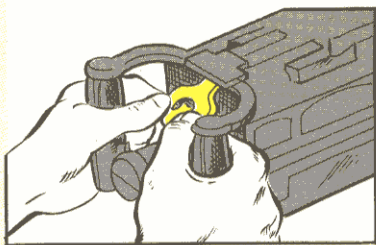
After the headspace is right, you must adjust the timing.

**One** . . . Pull the bolt all the way back to cock the gun. Then ease it forward.

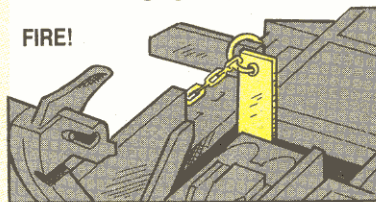
**Two** . . . Pull the bolt back far enough to insert the NO FIRE gage between the barrel extension and trunnion block. Slowly release the charging handle. Insert the beveled edge of the timing gage against the barrel notches.



**Three** . . . Trip the trigger. If the M2 won't fire, go to the next step. If it does fire, you've got early timing.



**Four** . . . Pull the bolt back just far enough to remove the NO FIRE gage and insert the FIRE gage. Slowly release the charging handle.



**Five** . . . Trip the trigger. If the M2 fires, timing's OK. If it doesn't fire, timing's late.

## Early/Late Timing

Take these steps to adjust for early or late timing.

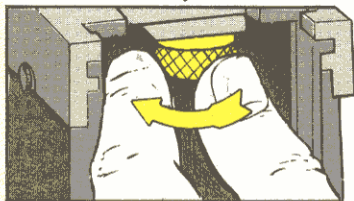
**CAUTION:** Never cock your M2 with the back plate off. The driving rod spring can shoot into you. The bolt must be forward before removing the back plate.

**One** . . . Remove the gage. Cock your M2. Ease the bolt forward.

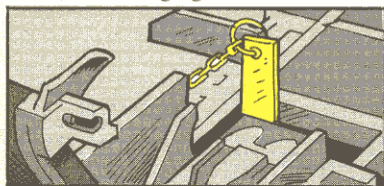
**Two** . . . Remove the back plate.



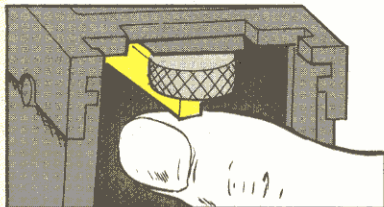
**Three**... Turn the timing adjustment nut all the way down to the left.



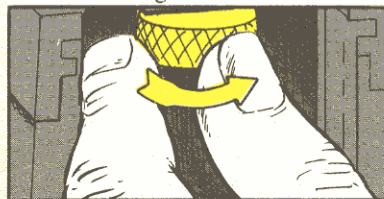
**Four**... Pull the bolt back just enough to insert the FIRE gage. Slowly release the charging handle.



**Five**... Push up on the trigger bar. Your gun shouldn't fire.



**Six**... Turn the timing adjustment nut up to the right 1 click. Push up on the trigger bar. Continue to turn the timing adjustment nut right 1 click at a time. Push the trigger bar after each click until the gun fires.



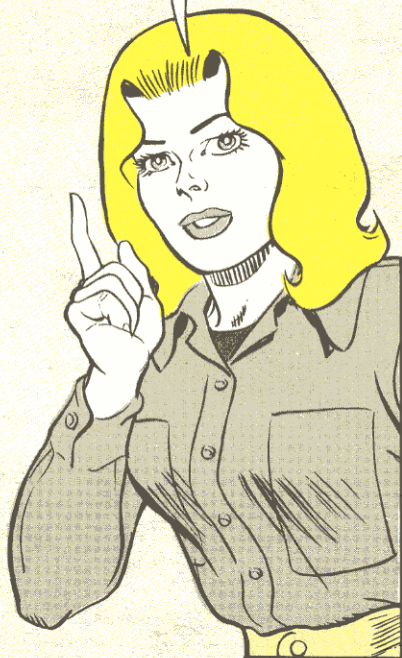
**Seven**... After the gun fires, turn the nut to the right 2 more clicks. Stop.

**Eight**... Remove the gage. Put on the back plate. Cock the gun. Ease the bolt forward.

**Nine**... With the back plate on, recheck the timing twice more. If the timing's still not right, do the early/late timing steps one more time.

If that doesn't correct the timing, something's wrong. Call your armorer.

ONCE YOU'VE GOT  
HEADSPACING AND  
TIMING DOWN PAT, YOU  
CAN DO IT IN MINUTES.  
ALL IT TAKES  
IS PRACTICE.





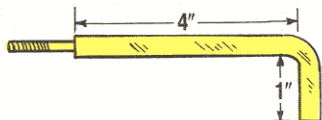
# Charging Help

OUR CHARGING CABLE  
BROKE AND YOU KEPT  
OUR M2 FIRING...  
GOOD WORK...

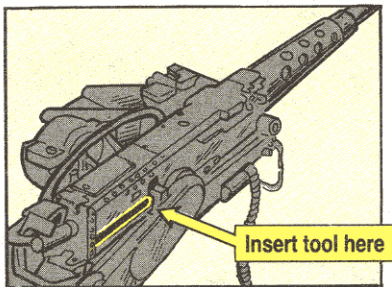
THANKS TO OUR  
EMERGENCY  
CHARGING  
DEVICE!

**I**f the M1 or M1A1 tank-mounted M2 charging cable breaks—and it often does—you have a machine gun that can't be fired unless you have an emergency charging device. Make one like this:

Take an intermediate section and the handle of an old cleaning rod and bend it like so:



Screw the bent rod section into the cleaning rod handle. Hook the bent end into the bolt stud hole on the right side of the bolt. Pull back on the handle until the bolt locks in place.



Keep the charging device for the next time you go to the field.

You can help the M2's charging cable last longer by never wrapping it around the mount when you install or remove the barrel or set the headspace and timing. Never flex the cable unless absolutely necessary.

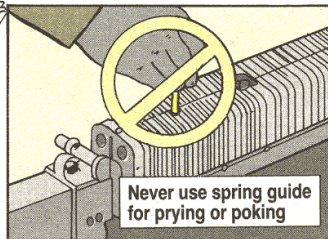


# GETTING IT TOGETHER

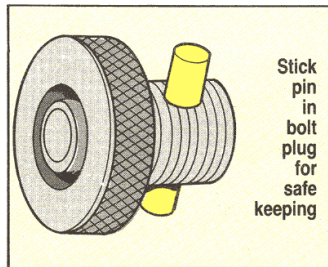


**T**o keep your M60 firing when you go to the field, keep these points in mind:

✓ The best tool for poking and prying apart parts is your combination tool. A dummy round or cleaning rod is also good. What's not good is the operating rod spring guide. Prying bends and ruins the rod.

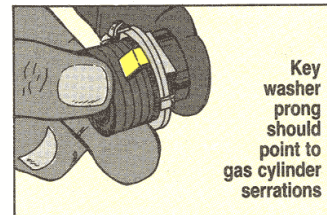


✓ When you disassemble the bolt, stick the bolt plug pin back in the bolt plug as soon as you have the plug out of the bolt. That prevents the pin from disappearing.

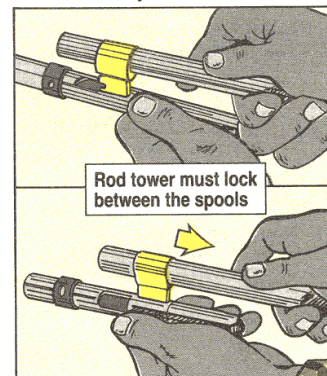


✓ During assembly, put the gas cylinder together so its long prong points toward the cylinder's serrations. If it's

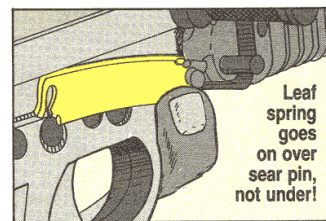
reversed, it'll be hard to take off the nut next time, plus you'll ruin the key washer doing it.



✓ Make sure the operating rod tower yoke locks in between the two firing pin spools. If you can see the end of the firing pin sticking out from the bolt face, the yoke's on wrong and you'll have a runaway M60.



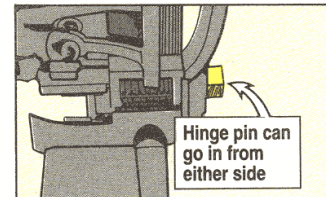
✓ Put on the leaf spring so its hooked groove goes over the sear pin, not under. If you put on the spring upside-down, the spring can slip off... and so can the trigger housing.



✓ Be careful to get the ends of the cover's torsion spring in the holes of both the cover and receiver. If you forget a hole, the cover won't stay up.

✓ Gently put on the forearm assembly. Its ribs catch and break easily. Position the assembly on the receiver and push down and in—not straight back—to snap it in place.

✓ One thing you don't have to worry about is which side of the receiver to put in the cover hinge pin and which side to put in the hinge pin latch. The pin and the latch are the same size and can be put in from either side.



✓ If you need help aligning the hinge pin and latch, use a dummy round, not the buffer. Using the buffer as a tool damages its shaft and lets the buffer's hydraulic fluid leak out. Your M60 loses its recoil protection.

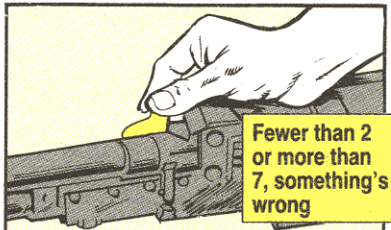


# Secure Is the Word



If you remember **SECURE** during PMCS, you give your M240 the firing security it needs. For instance:

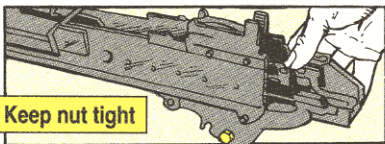
**Barrel.** If the barrel's not secure, it flies off during firing.



To lock it in, slide the barrel all the way in the receiver with the barrel release straight up. Push the barrel release to the right until it locks. If

it takes fewer than 2 clicks or more than 7, something's wrong. Tell your armorer.

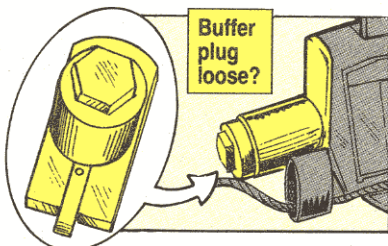
**Nuts.** You know how much the M240 shakes during firing. Vibration loosens nuts and wears out washers. If nuts loosen enough, your M240 comes apart.



Use the adjustable wrench that's part of your vehicle BII to tighten nuts before firing, especially the self-locking nut on the trigger housing assembly. If the nut just won't stay tight, have your armorer replace it.

**Buffer.** Feel to make sure the buffer plug's not loose. If it is loose, your M240 needs to go to support... and only to support. If it's fired with the plug loose, the bolt and operating rod beat the back plate to death.

Tightening the buffer plug is a specialized job. The spring washers inside the plug must be replaced and the machine plug must be pinned in place. That's why DS must do it.





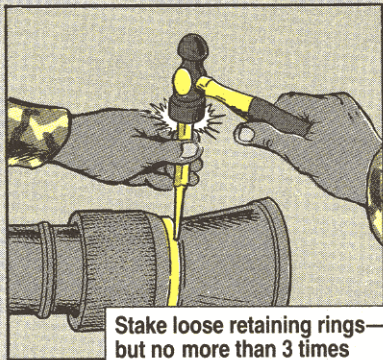
# Tighten Up on Loose Parts



**A** loose locking ring will leave your cannoneers waving good-bye to the blast attenuator device. A loose breech plug also causes problems. But you armorers can easily keep locking rings and breech plugs tight.

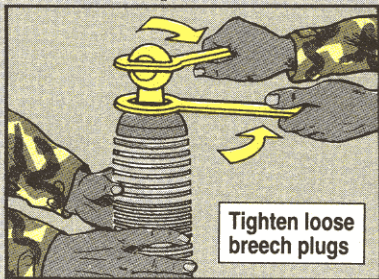
Look for shiny spots between the attenuator cone and locking ring before you send M252s to the field. Shiny spots mean a loose ring.

Cure a loose ring by staking it. Use a hammer and punch to stake the ring twice, 180 degrees apart. But do that no more than three times. After three times, staking it won't keep it tight.



Order a new ring with NSN 1015-99-794-5361. The M252's NMC until the ring's replaced.

Feel the breech plug. If it's loose, tighten the plug with your breech wrenches. If it won't stay tight, check the copper seal between the plug and the cannon. Replace it if it's bad. If

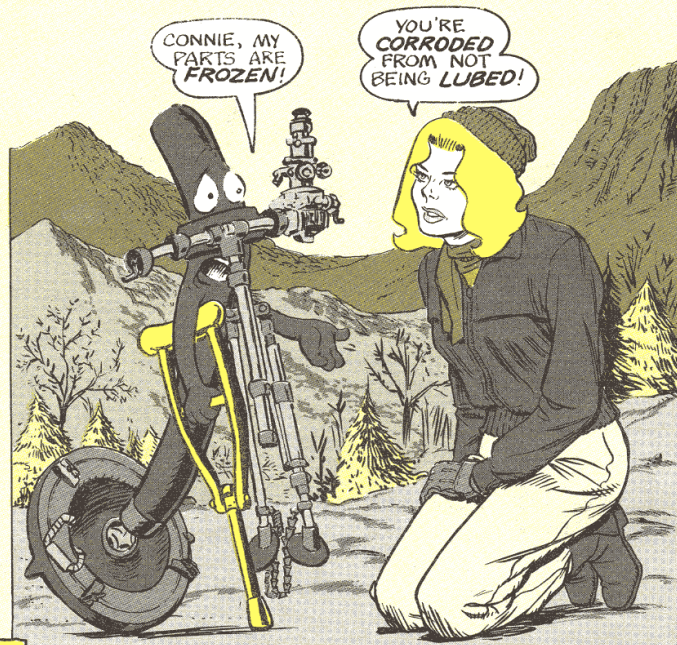


the plug still won't stay tight, turn in the cannon. Using wrench extensions or hammering on the wrench will only damage the cannon.





# The Big Freeze

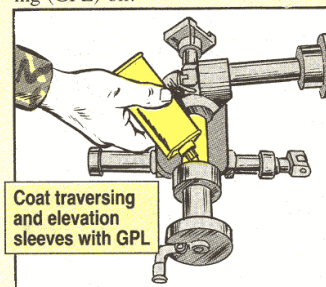


If you don't pay attention to your M29A1 mortar's lubrication needs, it'll give you the big freeze in the field. Lack of lube and the corrosion that follows cause moving parts to freeze. Your mortar can't be aimed. And because many of its parts are brass or aluminum, or are hollow, friction and corrosion can quickly do big-time damage.

The best bet to win the corrosion fight is to follow the lube instructions on Pages 3-0 through 3-3 in TM 9-1015-200-10. But also give these points a shot, especially in hot or sandy areas:

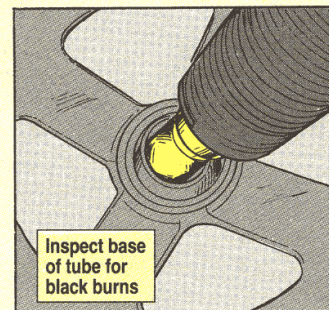
Give special attention to the traversing and elevation assemblies. They have bushings that wear out quickly if the assemblies must be forced to move because of lack of lube.

After firing, run both assemblies out as far as possible. Clean off old oil and dirt from the sleeves with dry cleaning solvent and a rag. Give the sleeves a light coat of General Purpose Lubricating (GPL) oil.



But if you're going to be firing in sandy areas, you need to wipe the oil off before you go back to the field. Otherwise, the oil attracts sand, which rubs parts raw.

Monthly, have your armorer pull out the base rotator and clean the rotator and baseplace socket with P-D-680 drycleaning solvent. Never grease the rotator. That attracts sand and dirt.



Also eyeball the base of the tube for black burns. If you spot any, it's time for a new tube. The tube is leaking gas and will cause rounds to fall short of target.

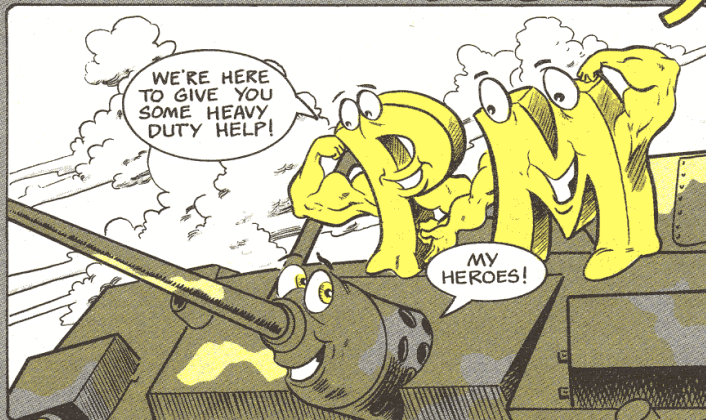


## M16A2 Rifle Sight

Forget the low light level front sight, NSN 1005-00-234-1568, when you get M16A2s, armorers. The new rifles will use only the standard front sight, NSN 1005-01-134-3625.



# Heavy Duty PM



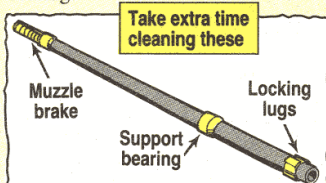
**S**ome Bradley crews get the idea that a heavy-duty piece of equipment like the M242 doesn't need the same careful PM they would give their M16 rifles. But that's a heavy-duty mistake. Because of the tremendous forces produced when an M242's fired, the gun must be in top shape to do its job. Keep this PM in sight:

## Cleaning

Carbon builds up quickly in the barrel. If the carbon sets for long, corrosion forms and eats at the barrel, especially around the muzzle brake. Eventually, the muzzle brake becomes loose enough to clip fired rounds. That's dangerous.

After each firing, clean the inside and outside of the barrel with RBC (rifle bore cleaner) and your bore

brush. When you brush away all the carbon, wipe clean with patches. Use clean, lint-free cloths on the outside. Take extra time with the muzzle brake, locking lugs, and gun barrel support bearing.

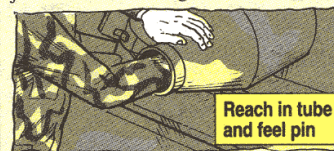
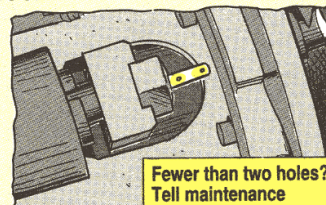


Lube the locking lugs and gun barrel support bearing only with GMD (Molybdenum Disulfide Grease), NSN 9150-00-754-2595. Never use the general purpose lube you use on the rest of the barrel. GMD will do a better job stopping corrosion.

## PMCS

Add these checks to your BEFORE PMCS:

► Receiver piston rod. If you can't see at least two holes, report it. The receiver doesn't have enough hydraulic fluid to cushion the 10,000 pounds of recoil. The breech and barrel support jacket will be damaged.

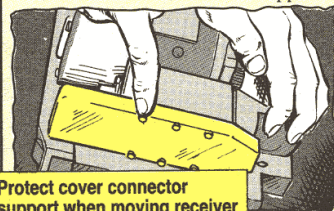


► Breech guide pin. Just reach in the barrel support tube and make sure you can feel the pin and that it's tight before you install the receiver. If the pin's loose or missing, the barrel and breech will be ruined during firing.

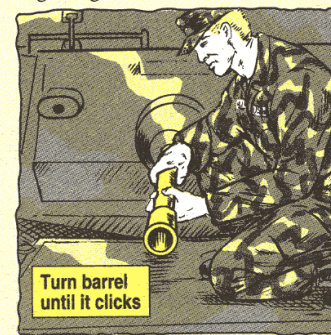
## Assembly Problems

Trying to install the 95-lb receiver in the turret's small space is about like wrestling a bear in a closet. There's not much margin for error. Never try to handle the receiver by yourself—it's a two-man job.

Protect the sear solenoid by pointing it up so that it can't be hit by the sides of the turret and knocked off. Never rest the receiver on its end where it can crush the cover connector support.

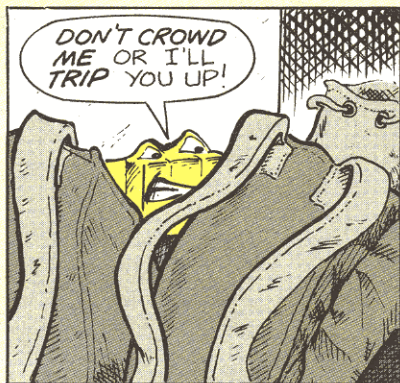


Installing the barrel is simple, but that doesn't mean mistakes don't happen. Screw it in until you hear the click that means it's locked in. Otherwise, you might watch the barrel sail off during firing.





## Give Circuit Breaker Space



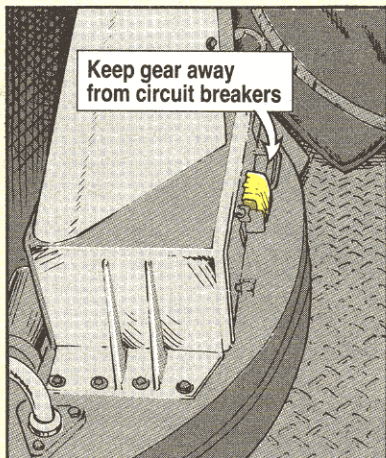
**N**o turret or targeting station control and display power? The reason may be crammed around the base of the turret.

If you don't watch how you load your FISTV with field equipment and personal gear, you can hit and trip the circuit breakers at the base of the turret.

Two resettable toggle switches that control turret and targeting station control and display power can't take too

much banging without tripping, even though the switches have covers.

Keep equipment away from the turret ring when you're loading up for the field. There'll be no snags or hangups or power losses if the turret can turn freely.

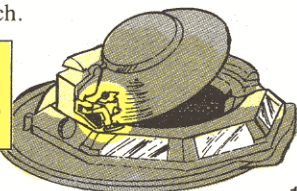


M901A1 Improved TOW Vehicle, M981 FISTV...

## Override Destroys Latches

**H**old it, mechanics. Using the M901A1 or M981's override switch during maintenance will not save you time, but it will probably cost you a hatch latch.

**Override ruins gunner's hatch**



MWO 9-2350-200-30 installed a hold-open latch on the gunner's hatch. If the M901A1's launcher or M981's target head is elevated with the hatch open, the launcher slams down the hatch and breaks the latch.

The gunner's hatch has to be down to safely elevate the launcher. If the hatch is down, there's no need for override. So do not use it.



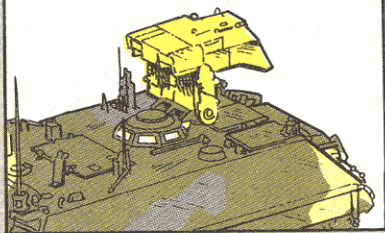
## Head Up with Engine Running

THESE POINTS WILL PREVENT INJURY TO YOU...AND DAMAGE TO YOUR BATTERY



**B**elieve it, crews, when TM 9-2350-266-10 says to erect and lower the targeting head with the FISTV's engine running.

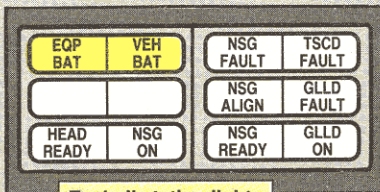
Run engine to raise or lower targeting head



The electrical power drain is especially heavy during erection and stow-

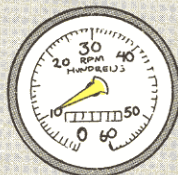
ing. The power drain can leave your batteries with a low charge unless the engine is running.

If voltage gets low enough, the erection arm locks can retract, letting the targeting head fall



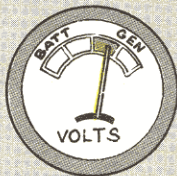
Eyeball station lights for battery condition

Run the engine at 1,000 RPM to keep the BATT-GEN gages in the GREEN.



Tach at 1,000 RPM...

...needle in GREEN



## Bradley Ammo Chute NSN

**T**o get the right ejection chute for AP ammo on your M2A2/M3A2 Bradley's cannon, order NSN 1005-01-317-9147. TM 9-2350-284-24P-2 doesn't show an NSN for PN 12295636-9, the only chute that will work on A2s. Do not try to use the ejection chute from any other Bradley model.



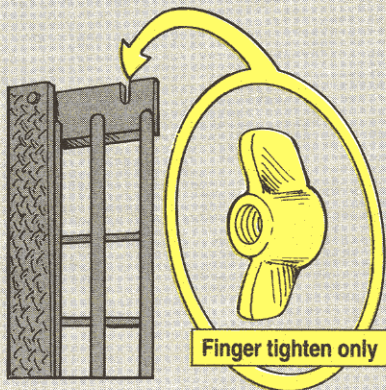
## Steel Wool for Grillwork

**E**yeball the radio grill and wing nut in front of the first aid box on your M60A3 tanks.

Getting to the first aid box will be real tough if the wing nut is over-tightened, or if there's so much paint on the threads the wing nut won't come off.

Use a wire brush or steel wool pad and cleaning solvent to remove the paint from the threads. When you install the radio grill, tighten the wing nut hand tight only.

Next time you spot paint, cover the threads to keep paint off.



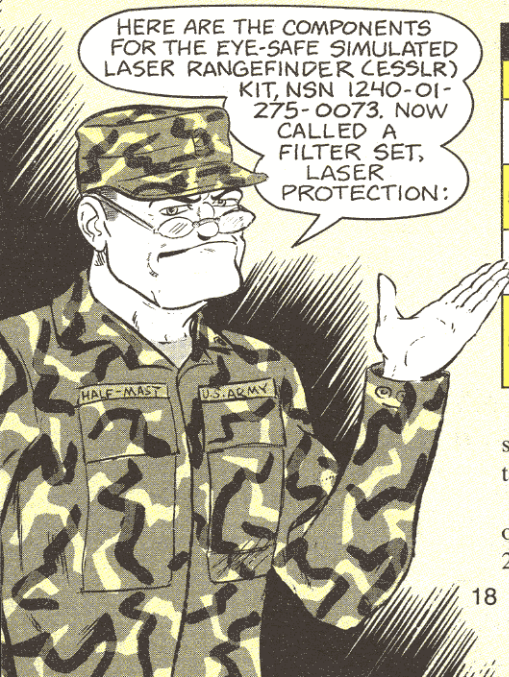
## ESSLR Kit Parts Breakdown

HERE ARE THE COMPONENTS FOR THE EYE-SAFE SIMULATED LASER RANGEFINDER (ESSLR) KIT, NSN 1240-01-275-0073. NOW CALLED A FILTER SET, LASER PROTECTION:

Size	Item	Qty
5310-00-933-8120	Washer, lock	2
5305-00-057-4593	Cap screw, socket head	2
5340-01-274-0582	Bracket, mounting	1
1240-01-275-0099	Cell assy, optic (eye-safe)	1
5935-01-282-6062	Connector, receptacle (plug)	1

Filter assembly, conditional (eye-safe), PN 9355855-2, can only be obtained with the complete kit.

The ESSLR kit is a training device only, listed in the AAL of TM 9-2350-253-10.





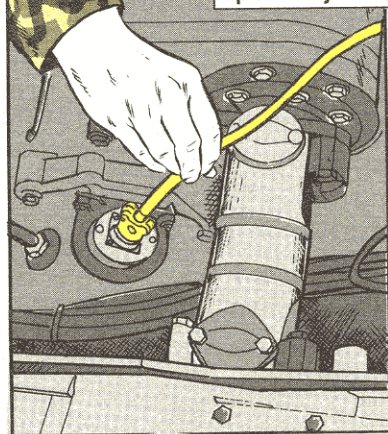
# No Secret to Encoder Problems

PSST...  
I'VE GOT THE  
SECRET TO THE  
ENCODER  
PROBLEMS.

**I**f the encoder can't do its job, the MLRS loses its accuracy. That's why you MLRS mechs need to remember a couple of cautions:

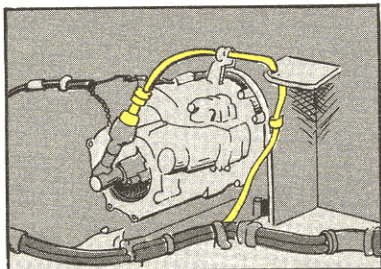
If the encoder drive tip gets bent, the encoder will give false readings—and the tip bends easily. Since you can't see what you're doing, you have to place the drive tip in the final drive by feel. Do it gently and cautiously. And don't forget the washer between the double drive adapter and the final drive... unless you want calibration problems.

**Position encoder  
tip carefully!**



THAT'S  
NO SECRET!  
THE DRIVE  
TIP'S THE  
PROBLEM!

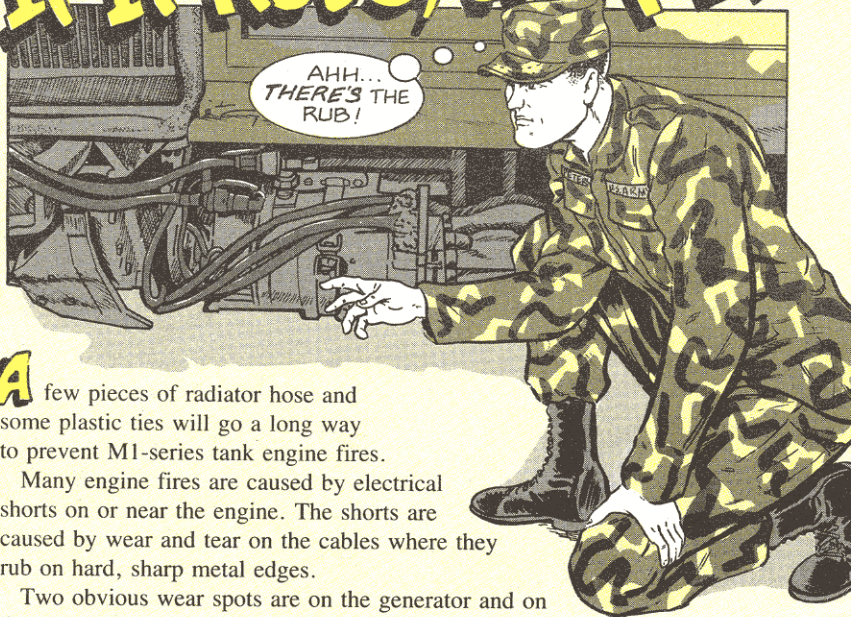
If the W80P2 power cable to the encoder is not routed correctly and tied back, the drive shaft tears it up. When you replace the cable, route it like this:



Use the cable clamps to keep the cable away from the drive shaft. During quarterly service, look to make sure the clamps are still in place.



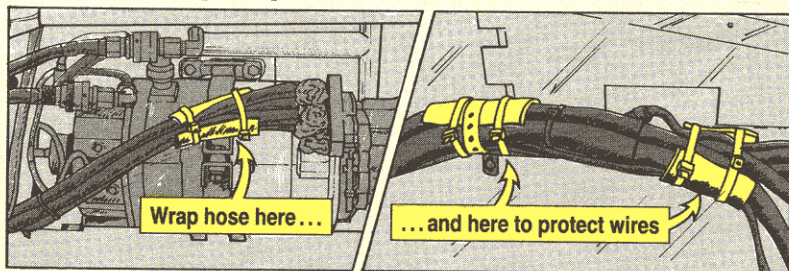
# If It Rubs, Wrap It



**A** few pieces of radiator hose and some plastic ties will go a long way to prevent M1-series tank engine fires.

Many engine fires are caused by electrical shorts on or near the engine. The shorts are caused by wear and tear on the cables where they rub on hard, sharp metal edges.

Two obvious wear spots are on the generator and on the top edge of the power pack.



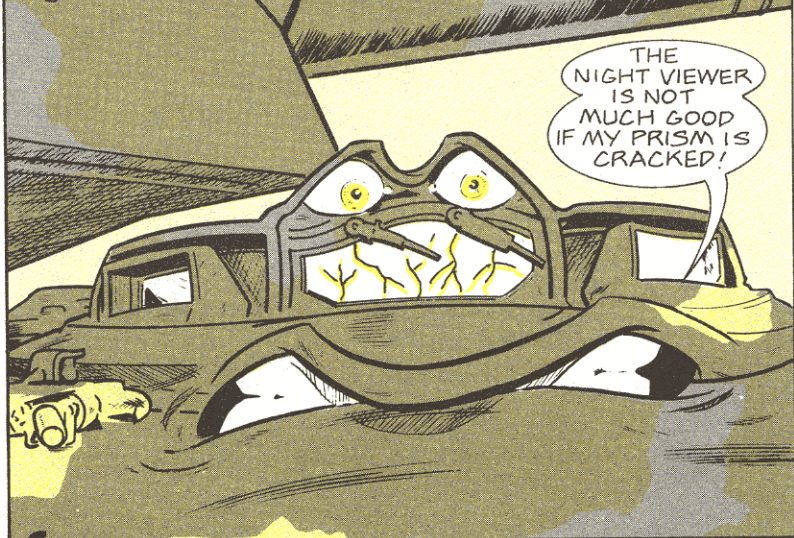
You can prevent this wear by wrapping the cables, either individually or in a bundle, with a section of radiator hose, NSN 4720-00-150-5970. That NSN gets you a 12-ft section of 2½-in ID hose.

Hold the hose in place with plastic ties. You get 6½-in ties with NSN 5975-00-074-2072 and 10¼-in ties with NSN 5975-00-570-9598.

Once the radiator hose wears through, replace the section with a new piece. That way, you keep the spark away from anything that can burn.



# Wiping Away AN/VVS-2 Prism Damage



**J**amming the AN/VVS-2 driver's night vision viewer into its mount without adjusting the windshield wipers breaks the viewer housing.

Normally, the wipers are left in the upper left or right position so they're not in the driver's field of vision. That's fine until the center periscope is removed to install the night viewer.

When the scope comes out, the wipers retract into the hatch housing just enough to become trapped between it and the night viewer. Once you tighten down on the J-hooks, the prism housing assembly gets cracked.

Make sure this doesn't happen by putting the wipers vertical (up-and-down) before removing the center



**Make sure wipers are vertical before removing center scope**

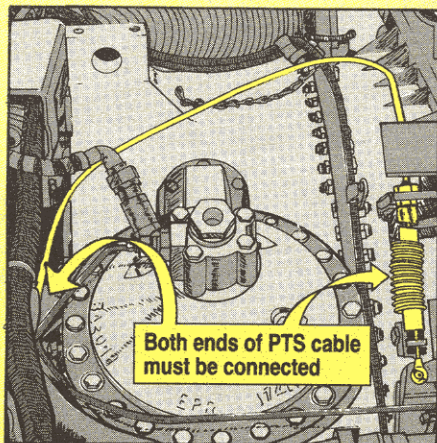
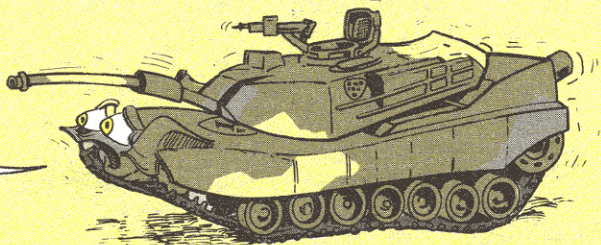
scope. That way the wipers still work if needed and the prism doesn't get cracked.

This procedure will be added to your -10 TMs, but you can use it now.



## Engine Run-up Caution

REDLINING  
RPMs CAN  
KILL ME!



**M**echs, always be sure that the PTS (power turbine stator) cable is connected before you do any engine power test.

The PTS acts like a governor for the engine, making sure it doesn't exceed a safe RPM limit. If you operate the engine while the PTS is disconnected, the engine will self-destruct as it revs past its "redline."

Ground-hopping and STE-M1/FVS testing are normal parts of good maintenance. Check the PTS cable before doing either so you don't blow an engine.

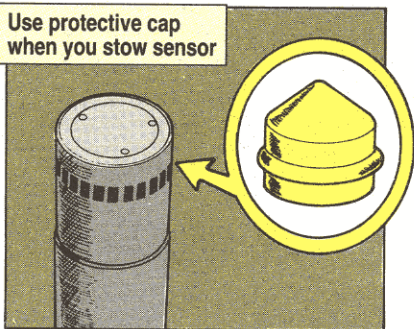
## Cap That Crosswind Sensor

**I**f your M1 tank still has the old style crosswind sensor, keep it capped when it's stowed.

Protective cap, NSN 5340-01-095-0297, prevents dirt, mud and water from contaminating the sensor head.

The new style sensors do not have caps, because they stand up to mud and dirt better. Until all M1s have the new sensors, use the cap and save an \$1,800 repair job on the old ones.

Use protective cap  
when you stow sensor





# Reduction Gearbox Leaks



**L**eaks at the reduction gearbox (RGB) on your M1-series tank give two clues that are easy to notice before too much damage is done.

**1.** If you discover oil covering the outside of the rear module and your engine oil level is low, you've probably got a leaky RGB.

**2.** If the rear of your tank smokes like it does when the smoke generator is working, but the smoke generator is turned off, and you notice a lower engine oil level, you probably have a leaky RGB.

At any rate, if you notice oil on the rear module or recuperator, if your tank smokes all of a sudden, and there's less oil in the engine, sing out to your mechanic.

He'll check it out. A leaky RGB goes to your support unit for repair.

## Extra Cleaning Sleeves

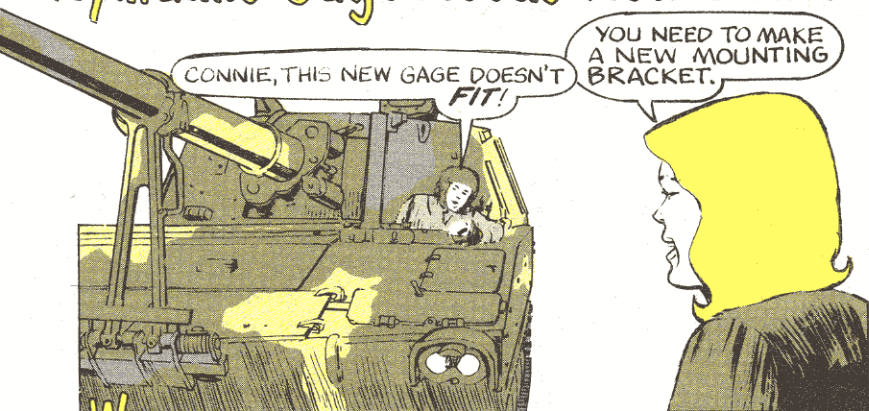
**H**ere's how you can get a box of 800 cleaning sleeves for your tank's or howitzer's cannon cleaning kit:

105/120MM cannon—NSN 1025-01-316-9250

155/203MM (8-in) cannon—NSN 1025-01-311-3770




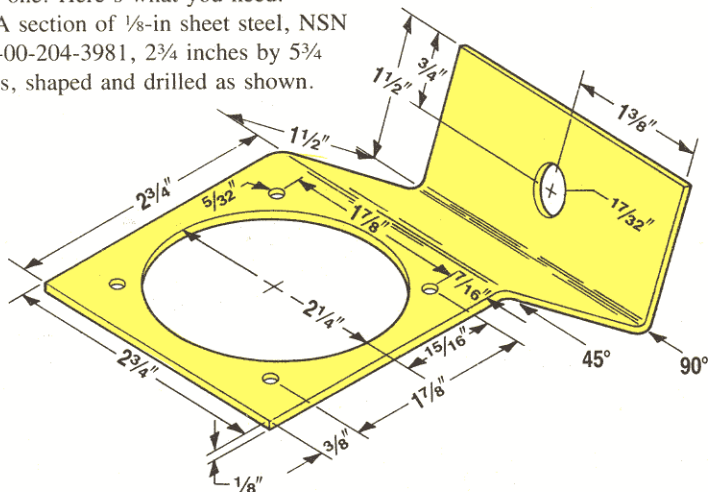
# Hydraulic Gage Needs New Bracket



**W**hen you get the new pressure gage, NSN 6685-00-580-0935, for the hydraulic power pack on your M109, you'll find the old mounting bracket won't work.

Since there's no replacement bracket in the supply system, you'll have to make one. Here's what you need:

 A section of  $\frac{1}{8}$ -in sheet steel, NSN 9515-00-204-3981,  $2\frac{3}{4}$  inches by  $5\frac{3}{4}$  inches, shaped and drilled as shown.



 4 screws, NSN 5305-00-984-4992.

 4 lock washers, NSN 5310-00-045-4007.

Paint the bracket interior white, according to instructions in TM 43-0139.



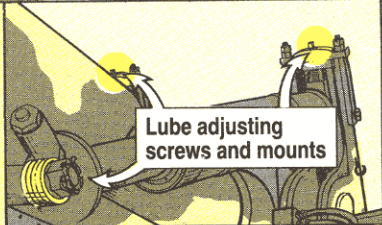
## A Little Dab'll Do You



**D**irt and corrosion take their toll on equilibrator adjusting screws and the equilibrator mount.

The screws get so hard to turn that you strip out threads or round off the screw heads. The mount "freezes" on its spindle, causing jerky movement and metal-against-metal grinding.

When the equilibrator adjusting screws get tough to turn, clean and lube them. Use CLP as shown in LO 9-2350-304-12.

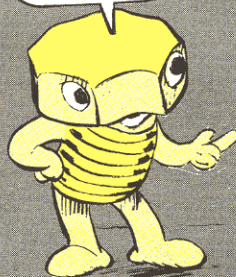


Oil the equilibrator mount during your weekly service. A couple of drops should be enough to keep elevation smooth and quiet.

## Fuel Cell Plug Corrodes

I CAN RESIST CORROSION BETTER THAN YOU.

I KNOW, BECAUSE I LEAK!



**A**dd another example of trouble caused by fuel contamination on your M110A2 howitzer—corroded fuel cell drain plugs.

The old plug corrodes and leaks.

Give the fuel cell drain plugs the eyeball. If you see evidence of leaking (dripping, wet stains), replace the bad plug with a newer, more corrosion-resistant plug, NSN 5365-01-144-5370. It'll show up as the replacement for Item 21, Fig 18, TM 9-2350-304-20P.



# Pubs

This is a selected list of recent pubs of interest to organizational maintenance personnel. This list was made from a computer print-out provided by the Adjutant General.

**TM 1-1270-476-23P-2** Sep TADS AN/ASQ-170

**TM 5-4610-228-10-HR** Jul Water distribution system (WDS) models 20K, 40K, 300K, 800K and 1000K

**TM 9-2320-280-20-2** Nov HMMWVs

**TM 9-2350-247-PCL** Aug M548 cargo carrier

**TM 9-2350-261-20-3** Jul M113-series FOV

**TM 10-1670-276-23&P** Sep Parachute, cargo type: 26-foot diameter

**TM 10-4320-314-13&P** Jun Centrifugal pump unit 1½ inch suction and discharge 24 volt DC electric motor driven

**TM 10-8400-203-23** May General repair procedures for individual equipment

**TB 9-1315-253-14** Oct 120MM cartridge

**LO 9-2350-284-12** Nov M2A2/M3A2 Bradley

## Maintenance & Safety-Of-Use Messages

**AMCCOM SOU-MSG-31-90**—Limited one-time inspection, Mine Clearing Line Charge (MICLIC), defective firing safety switch on MK155 launchers with serial numbers 90-003 through 90-446, AMSMC-MA 011400Z Oct 90.

**AMCCOM SOU-MSG-32-90**—Limited one-time inspection, M14 national match rifle and M21 sniper rifle. Screen all stock of replacement barrels made by SGW, Inc., AMSMC-MA 171400Z Oct 90.

**AMCCOM Maintenance Advisory MSG-90-38**—Procedure for lighting the M17 decon apparatus burner, AMSMC-MAR-ED(A) 151630Z Oct 90.

**AMCCOM Maintenance Advisory MSG**—Inspect and lube struts on M1A1 Abrams tank traverse mechanism monthly, AMSMC-MA 220026Z Oct 90.

**CECOM SOU-MSG-90-09-06**—Operational, OE-361(V)2/G quick reaction satellite antenna, inspect trunnions for cracks, AMSEL-SF-SEP 281800Z Sep 90.

**CECOM SOU-MSG-90-10-01**—Mandatory, Operational, Potential safety hazard with the AN/GYK-29 battery computer system (BCS) version 9 software, AMSEL-SF-SEP 051800Z Oct 90.

**CECOM SOU-MSG-90-10-02**—Mandatory, Operational, TS-4216/

G test set, check for defective safety switches on exhaust and access doors and for broken main circuit breakers, AMSEL-SF-SEC 111800Z Oct 90.

**MICOM SOU-MSG-90-14**—Advisory, Operational, OE-349/MRC Patriot antenna mast group, check casting at the middle of the lower antenna drive, AMSM-LC 021325Z Oct 90.

**TACOM SOU-MSG-90-35**—Operational, crossing restrictions for Class 60 armored vehicle launched bridge (AVLB), AMCPM-113/M60 111845Z Sep 90.

**TACOM SOU-MSG-90-34**—Operational, defective M1 engine slings made by Riverport Industries, AMSTA-M 241100Z Oct 90.

**TROSCOM SOU-MSG-23-90**—Limited one-time inspection, defective memory module spare part made by Elbit Computers, Ltd., used on the position azimuth determining system (PADS), AMSTR-MES 312312Z Aug 90.

**TROSCOM Maintenance Advisory MSG-90-40**—Check for defective main and rear panel assemblies, which are components of the Type V aerial delivery platform, AMSTR-MES 091415Z Oct 90.

**Your Direct Support or Logistics Assistance Office (LAO) can provide you with more information.**

## Desert Shield TMs

**TM 9-1000-DS-1**  
AMMUNITION

AMCCOM TM 9-1000-DS-1

OPERATION DESERT SHIELD  
MATERIEL READINESS:  
AMMUNITION

**TM 9-1000-DS-2**  
CHEMICAL DEFENSE  
EQUIPMENT

AMCCOM TM 9-1000-

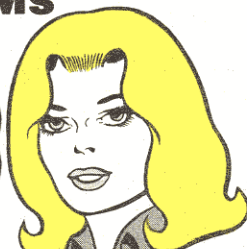
OPERATION DESERT SHIELD  
MATERIEL READINESS:  
CHEMICAL DEFENSE EQUIPMENT

AMCCOM TM 9-1000-DS-3  
OPERATION DESERT SHIELD  
MATERIEL READINESS:  
ARMAMENT

**TM 9-1000-DS-3**  
ARMAMENT

AMCCOM TM 9-1000-DS-3  
OPERATION DESERT SHIELD  
MATERIEL READINESS:  
ARMAMENT

AMCCOM HAS PRODUCED THREE TMs ON AMMUNITION, ARMAMENT, AND CHEMICAL DEFENSE EQUIPMENT. GET COPIES BY WRITING!



**Commander  
AMCCOM  
ATTN: AMSMC-MAS  
Rock Island, IL 61299-6000**

Or send an E-Mail message to:  
mas1@ria-emh1.army.mil.



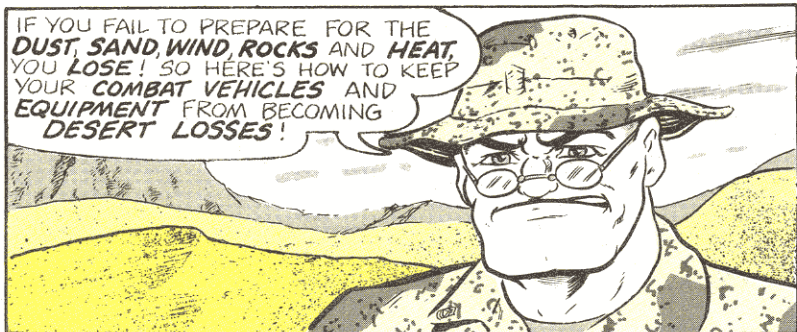
# The Desert... The Other Enemy

MASTER SERGEANT  
HALF-MAST, IT WOULDN'T  
FIRE A WHILE AGO... AND I  
LUBED IT LIKE ALWAYS!

HOLD IT!  
IN THE DESERT  
THERE'S A DIFFERENCE  
IN THE LUBRICATION  
METHOD!



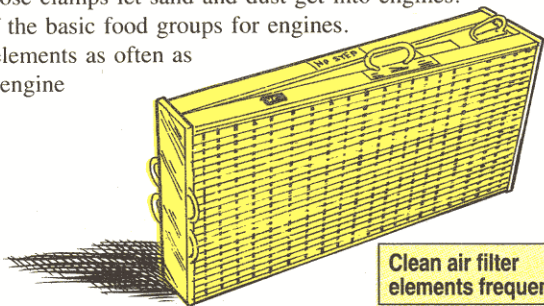




### Clean Air, and Plenty of It

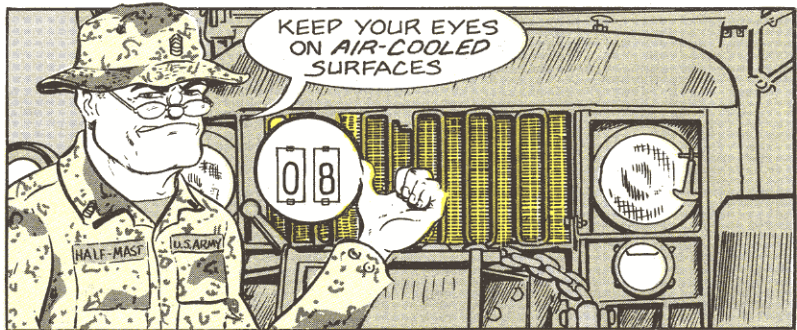
Make sure your air induction system—hoses, inlets, outlets, precleaners, filter elements—is in as good a condition as possible from the beginning. Cracks, tears, holes and loose clamps let sand and dust get into engines. Sand is not one of the basic food groups for engines.

Clean air filter elements as often as necessary to keep engine performance high.



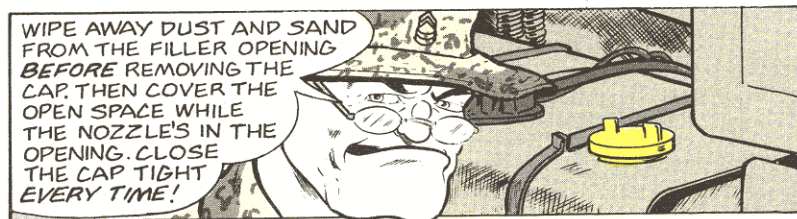
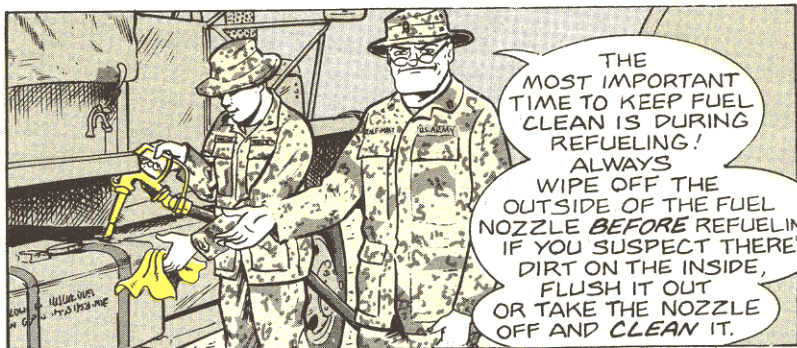
Clean air filter elements frequently

Keep all air-cooled surfaces clean of oil and grease. These surfaces, part of radiators, oil coolers and the like, transfer heat away from the water and oil inside them as air flows past them. Oil and grease attract dust and sand like magnets. The heat can't escape, and that causes engine and transmission damage.

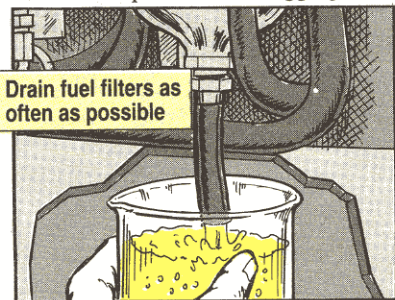




## Clean Fuel, Only



Still, some dirt gets into the fuel system. Meaning, drain fuel filters more often to keep 'em from clogging.

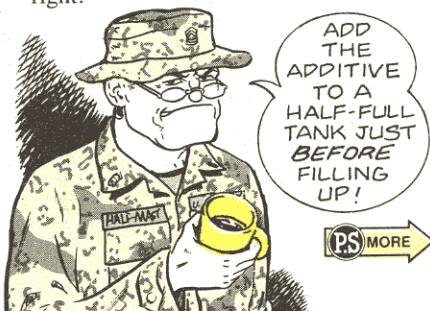


That fuel filter draining will also get rid of the condensation problem that's real bad in desert heat. You may have to drain fuel filters more than once a day to keep engine performance high, but drain 'em at least once a day to keep water from diluting your fuel.

JAN 91

You can help keep your fuel system clean in the desert by using diesel fuel stabilizer additive, MIL-S-53021. Available under NSN 6850-01-246-6544 (5-gal can) and NSN 6850-01-246-6545 (55-gal drum), the stabilizer slows fuel breakdown, kills microbial growth and inhibits corrosion.

It's used at the rate of one gallon of additive per 3,500 gallons of fuel. That works out to about 3½ ounces per 100 gallons. About half a coffee cup is right.



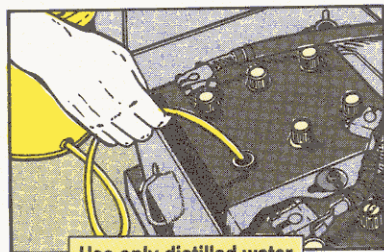
PS MORE



## Clean Water, Always

As much as possible, use only clean water from a reliable source for filling radiators. Local water supplies often contain mineral deposits that will eventually clog up radiator cores.

Use only distilled water, if available, for filling battery cells. Checking batteries in the desert must be a daily job, because the heat can cause batteries to lose much of the liquid in the cells. Water from unreliable sources can add substances to batteries that prevent them from giving normal service.



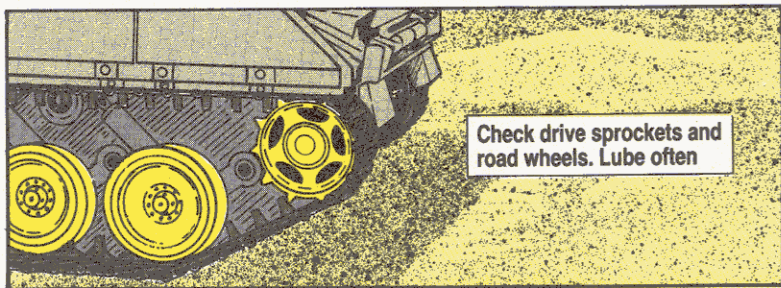
Use only distilled water in batteries. Fill daily

With the basics of clean air, fuel and water taken care of, you must also consider track, optics and weapons maintenance in order to be ready for the desert battlefield.

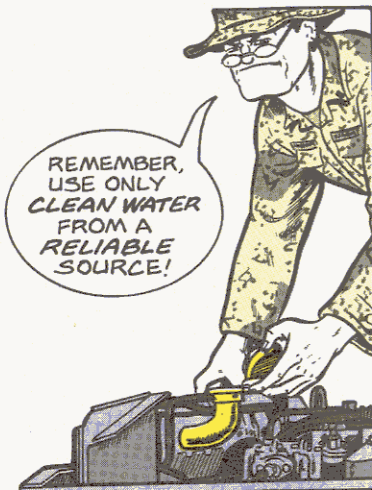
## Track Maintenance

Check drive sprocket and roadwheel mounting bolts before, during and after operation. Sand, rocks and gravel tend to break or damage lube fittings and relief valves. Rough terrain causes hardware to work loose, if it's not torqued right.

Never neutral steer in soft sand. Sand builds up in the final drive sprockets and the track is thrown in a flash. Make fast turns wide. Make short turns slow.



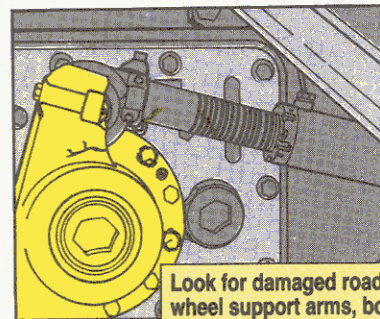
Check drive sprockets and road wheels. Lube often



REMEMBER,  
USE ONLY  
CLEAN WATER  
FROM A  
RELIABLE  
SOURCE!

Pay extra attention to the tracks during at-halt inspections. Check track tension. Look for cracked end connectors and broken link pins. On tanks, look for damage to the right front road-wheel support arm, and sheared mounting bolts on the No. 1 right or left road arm housing. M113-family carriers have more trouble with left rear idler arm bearing burnout. Check often and keep the grease gun handy.

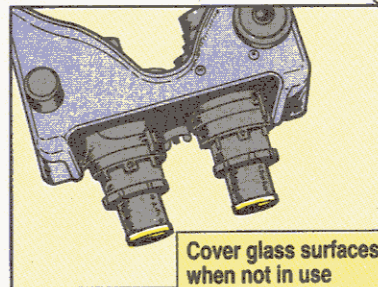
Since you'll be lubing bearings much more often in the desert, make sure you wipe away any excess lube when you're finished. Grease attracts dirt, and the two together can grind away metal real fast.



Look for damaged road wheel support arms, bolts

## Optics Maintenance

Cover glass surfaces when they're not being used. Scouring and etching by sand will ruin them. This is very important for sighting and fire control equipment.



Cover glass surfaces when not in use

In addition, the buildup of dust on surfaces can degrade low-light vision. So, keep surfaces as clean as practicable using only cleaning compound, NSN 6850-00-227-1887, or other specific cleaner called out in your equipment TM.

During a sandstorm you might consider using some sort of cling film to cover optics, until combat operations

begin. Just make sure that optics are spared as much sand and dust damage as possible.

NSN 8135-00-043-5331  
GETS YOU AN 11.5 BY 1200 INCH ROLL  
OF SELF-CLINGING FILM AND  
NSN 8135-00-476-5266 GETS  
A 15 INCH BY 6,800 FOOT ROLL  
OF NON-CLINGING  
PLASTIC  
SHEET!

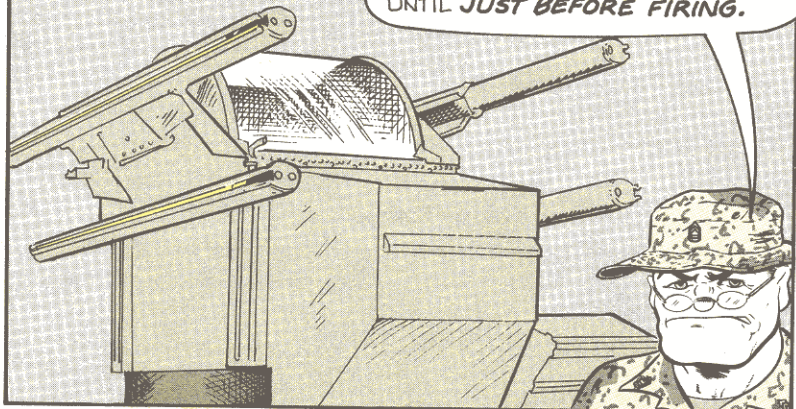




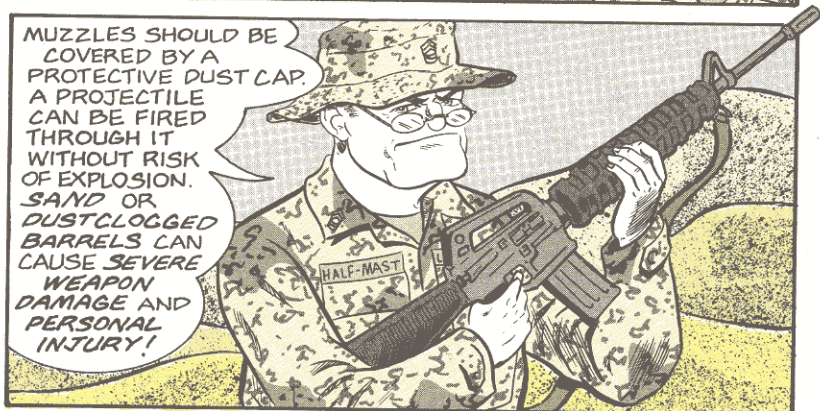
## Weapons Maintenance

On small arms and artillery, normal lubing is too much. It's a "welcome mat" for dust and sand. So you hold lubrication down to the very least that'll take care of friction.

WEAPONS MAY BECOME **CLOGGED** OR MISSILES **JAMMED** ON LAUNCHING RAILS BECAUSE OF **SAND** AND **DUST** ACCUMULATION. COVER MISSILES ON LAUNCHERS UNTIL **JUST BEFORE FIRING**.



MUZZLES SHOULD BE COVERED BY A PROTECTIVE DUST CAP. A PROJECTILE CAN BE FIRED THROUGH IT WITHOUT RISK OF EXPLOSION. **SAND OR DUST CLOGGED BARRELS CAN CAUSE SEVERE WEAPON DAMAGE AND PERSONAL INJURY!**




Even weapons that are not lubed at all will accumulate sand and dirt because of condensation, another reason for daily cleaning.

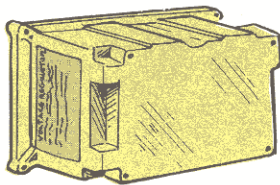
Heat may cause variations in missile tracker alignment and in laser range-finder operations. Read your weapon's TM for the right procedure to follow in extreme heat.




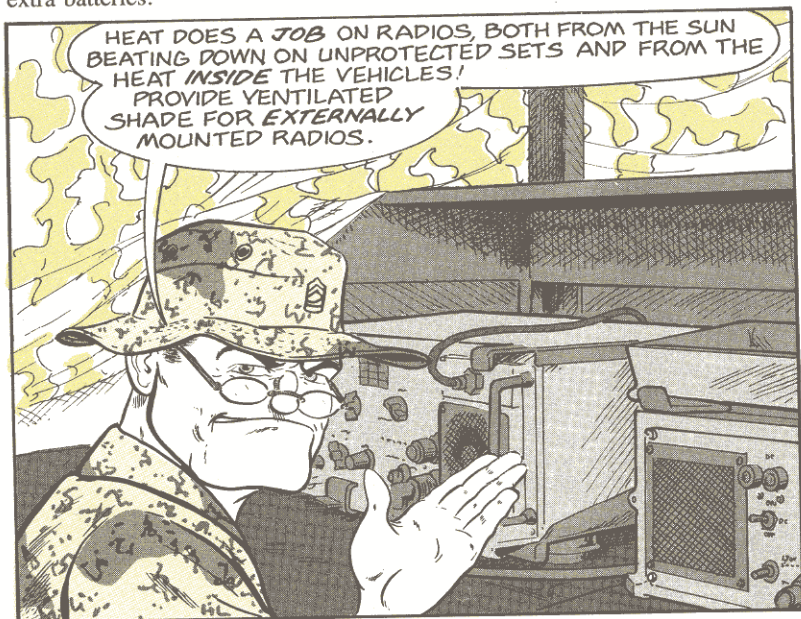
## Heat Extremes


 Heat causes great strain on vehicle solid-state electronics. Carry extra regulators for M60-series tanks and M113-series FOV. They go fast.


**Keep spare regulators handy**



 Overcharging in combat vehicle electrical systems is a real danger because of the buildup of hydrogen in the batteries. Set voltage levels right, and carry extra batteries.



 High temperatures kill synthetic materials such as electrical tape by causing them to break down chemically. Regular tape softens and unravels. If you don't want tape flapping around in an engine compartment, use high-temperature tapes or plastic ties and spiral wraps.

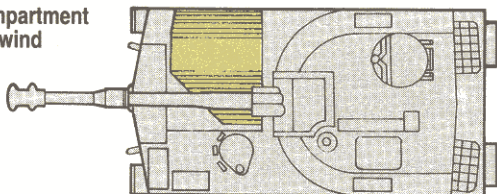
 Tires soften in high temperatures, and the thorny, spiny desert plants get harder. The damage is sure and most often unrepairable. Carry a minimum of two spares for each wheeled vehicle.



## Winds

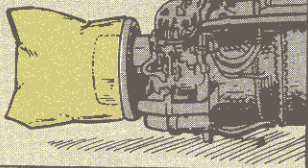
Flat deserts have high winds, carrying enough grit to shut down maintenance operations. Cover only those areas of vehicles on which you're working to save shelter space. Park vehicles so the engine compartment is downwind. Use portable shelters. Carry lots of plastic garbage bags to keep grit off greasy parts, off spindles and out of holes.

Engine compartment  
down wind



ENGINE REMOVALS IN THE DESERT  
MEAN **WEAR AND TEAR** ON SOFT ALUMINUM,  
PLASTIC AND BRASS ADAPTERS.  
CARRY AN **EXTRA SET**  
FOR **EACH TYPE OF ENGINE**  
AND GIVE EVERY MECHANIC ACCESS  
TO **ELASTOMERIC TAPE!**

Cover air inlets ...



...final drive connections ...

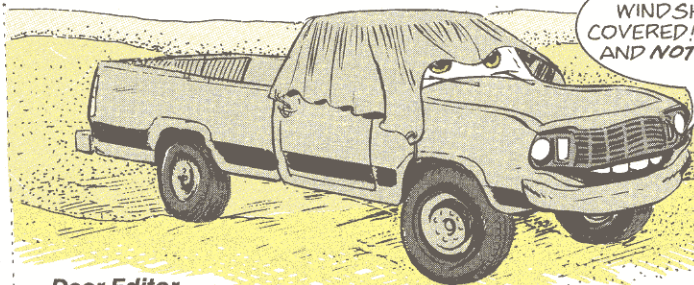


...and any other exposed  
connections that collect sand





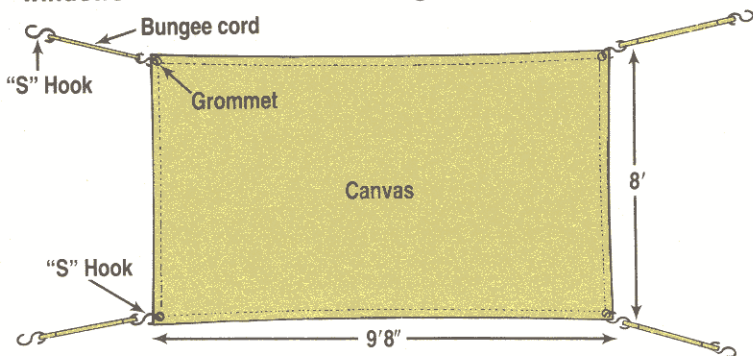
# Camouflage the Windshield



**Dear Editor,**

It's not easy to hide or camouflage the CUCV when you're out in the desert. The windshield and side windows reflect sunlight like mirrors.

If your commander OK's it, here's a quick way to hide the windows. Make a canvas camouflage cover using these parts:



Just slide the canvas over the cab and hook the S-hooks to the front wheel well and the side of the vehicle. Camouflage the canvas cover to the color of your CUCV.

**MSG Robert J. Gagnon**  
New Bedford, MA

(Editor's note: Sounds like a great cover. Thanks for the tip.)



The ON light on the control panel for the personnel heater in the M1010 ambulance gets broken when people step on it with their big feet. But CW2 Richard Haase of B Co, 55th Spt BN, APO NY, had a SMART idea on how to solve the problem by adding a protective shield around the control panel.

Here's what you need:

**1** 2 × 18-in piece of 1/8-in thick aluminum (NSN 9535-00-260-3079 gets a 12 × 36-in sheet).

**2** 1 × 8-in piece of 1/8-in thick aluminum.

**3** Eight 3/8-in long pop rivets, NSN 5320-00-903-8778, and the rivet tool, NSN 5120-00-017-2849.

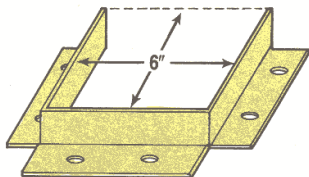
Here's how to make it:

**1** Bend the 18-in piece of aluminum so it has three 6-in sides.

**2** Make cuts at the corners so you can bend 1-in flanges on each side.

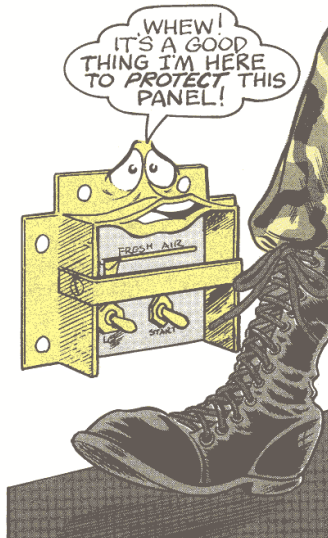
**3** Drill two 1/8-in holes in each flange.

Drill two 1/8-in holes in each flange



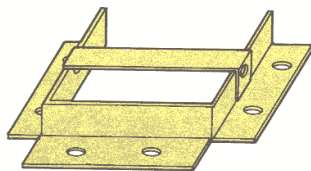
**4** Hold the shield up over the control panel to mark the holes.

# Heater Lamp Protector



**5** Drill the holes, then pop rivet the shield in place.

**6** Drill a 1/8-in hole in each side of the protective shield.



Drill a 1/8-in hole in each side of the protective shield

**7** Make a face guard from 1-in stock.

**8** Make a 1-in bend on each end.

**9** Rivet it over the protective shield to protect the face of the control box.

REPLACE  
BUM LAMPS WITH  
NSN 6240-00-155-8714.  
THE LIGHT ASSEMBLY IS  
NSN 6210-00-688-5088.

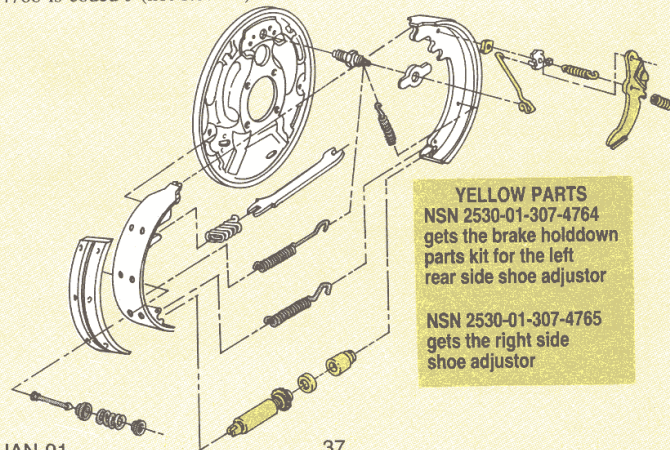


CUCV...

## Brake Shoe Hardware Kit

You can now order the hardware needed to hold down the rear brake shoes on all but the M1009 CUCV in kits. But be prepared for a long wait. On the AMDF, NSNs -4764 and -4765 are coded Z (insurance item) while -4766 is coded J (not stocked).

**GRAY PARTS**  
NSN 2530-01-307-4766  
gets you the holddown  
(spring type) hardware  
for both rear wheels



**YELLOW PARTS**  
NSN 2530-01-307-4764  
gets the holddown  
parts kit for the left  
rear side shoe adjuster

NSN 2530-01-307-4765  
gets the right side  
shoe adjuster



# Hub Removal Made Easy

NEXT TIME, USE THIS TOOL TO REMOVE THE HUB!



Removing the geared hub on the HMMWV is an awkward job. If you're not careful, the hub can fall . . . maybe on your toes. That 80-lb hub can subtract a few toes.

To make the job easier, use a home-made jig. It takes a J-hook and a guide pin to make the jig.

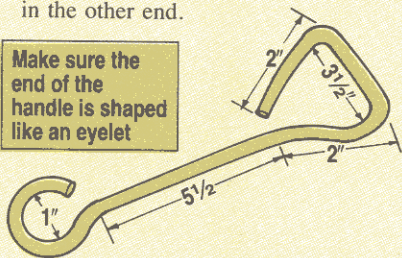
Here's what you need:

Item	NSN	Qty
Steel rod	9510-01-026-5222	15 in
Bolt, 5/16 x 5 in	5306-00-225-8516	1 ea
Flat washer	5310-01-252-7285	2 ea

Here's how you make the jig:

For the hook, bend a 1-in loop at one end of the steel rod. Make a handle in the other end.

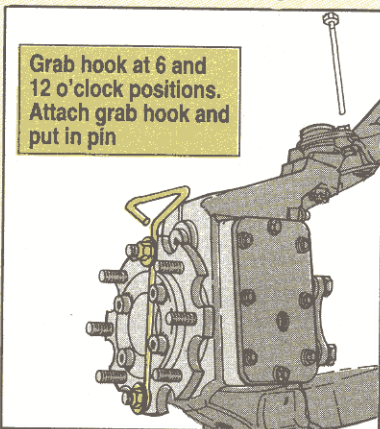
Make sure the end of the handle is shaped like an eyelet



For the guide pin, grind the threads off the bolt and round off the end.

To use the jig:

Clamp the shaft of the hook on the 6 and 12 o'clock wheel studs with the 2 flat washers and 2 lug nuts.



Put the guide pin in the top rear ball joint hole.

Grab the upper hub arm with one hand and the J-hook handle with the other.

Pull the hub from the lower control arm by forcing the J-hook handle in.

After it's loose, lower the hub to the floor using the pin as a guide.



# Sticky Zipper Zappers

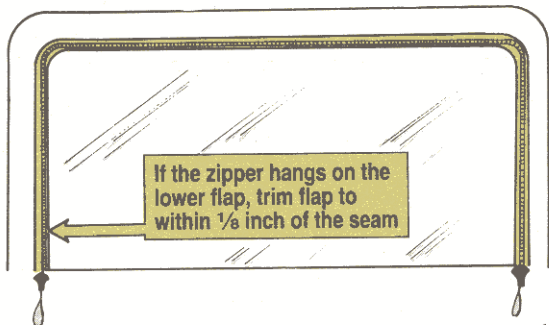


Using muscle to unstick a sticky window zipper on a HMMWV soft top will leave the truck zipperless.

The window zippers need a slow, steady hand and an easy touch. But even with a little TLC, they get stuck. That's when some extra care is needed.

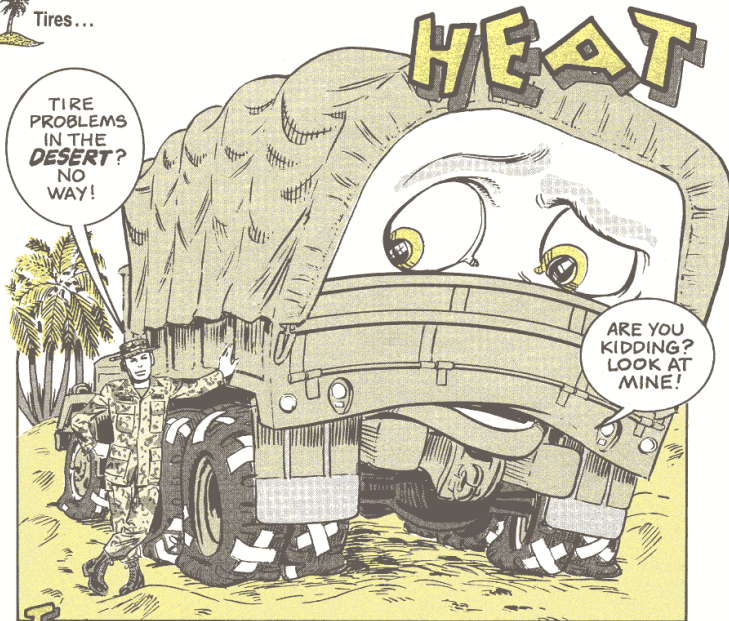
Rub the teeth with zipper lube, NSN 9150-00-999-7548, to keep the slider sliding freely. That NSN gets a box of 24 sticks.

The zipper slider hangs on the flap because the flap that covers the lower zipper teeth is a little too wide on some soft tops. If this happens, carefully free the slider and then trim the bottom flap to about  $\frac{1}{8}$  inch of the seam.



Be careful not to cut the seam. Measure twice and cut once, or the truck may have to make a trip to your canvas shop for repair.

Grit and sand get caught inside the zipper flap and choke up the zipper. Normal washing does not get it all out. Brush the zipper teeth with an old tooth brush to get them clean.



**T**ires on vehicles suffer when you drive in the desert. Heat and the terrain team up to give them a 1-2 punch.

Heat will damage tires. During normal operation in a temperate climate, tires get hot as they flex under a load. When the air temperature is high, the tires can't cool off, and the excess heat weakens the tire.

You can't do anything about the heat from the air. But you can help by not overloading the vehicle. This puts extra strain on the tires.

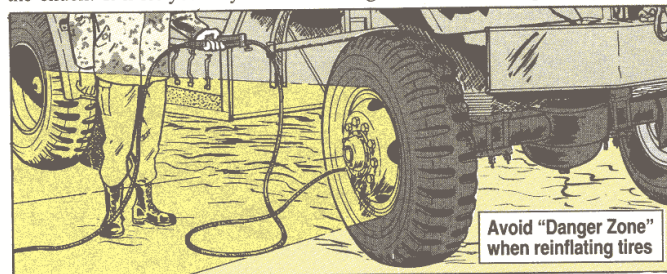
Your operator's manual may list a lower tire pressure for driving in sand. A lower pressure can give the tires more flotation and traction in sand. If you lower the pressure in your tires, be sure to add air when you drive on pavement.

#### Check -10 TM for tire pressure

VEHICLE (TIRE SIZE)	FRONT		REAR	
	Standard (psi) H CC	Metric (kPa) H CC	Standard (psi) H CC	Metric (kPa) H CC
M923,M924,M925,M926, M927,M928,M929,M930, M931,M932,M934,M935	80 60	551 413	50 30	344 206
M936 (11:00x20)	70 60	482 413	70 60	482 413
All Models: Spare	Maximum Highway Pressure			
All Models: Mud, Sand, and Snow	25 25	172 172	25 25	172 172
H: Highway CC: Cross-Country				

# RELIEF

If you have to add more than 10-15 pounds to the tires, be sure to use a tire inflator gage, NSN 4910-00-441-8685, with a 10-ft hose between the gage and the chuck. It'll let you stay out of the danger zone from the split ring.



Heavily loaded trailers pulled through loose sand can bog down. Reduce the load on the trailer, as well as the pressure in the tires.

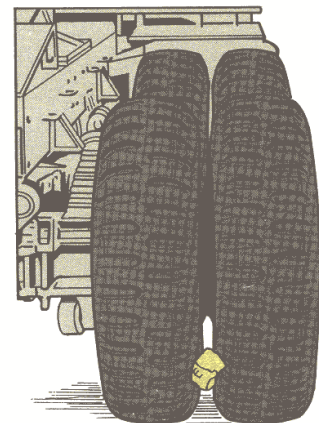
During stops, look for rocks caught between dual tires. A rock caught between the sidewalls will rub holes in them.

## Flat Avoidance

Try not to run over cactus or brush. Many have spines and thorns that break off in tires—where you can't see them—and work their way through. You'll have more leaks than you know what to do with.

Take it easy in rocky, rough terrain. The sidewalls on radial tires are thinner, and rocks cut them to ribbons. Small Emplacement Excavators (SEEs) are prone to tire damage because their mission puts them right out there where the going is rough and tough.

Tubeless tires lose air during travel through rocky terrain because of "bead breaking." That's when the tire breaks loose from the rim. Check the pressure in your tires more frequently.



Rocks stuck between duals kill tires



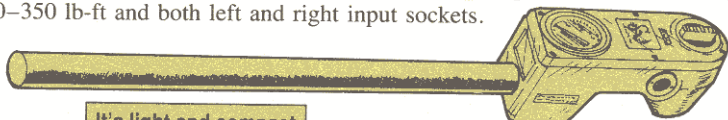
# Torquing in Tight



**T**orquing in tight spots is like scratching an itch in the middle of your back. You might reach the spot, but it's hard to do the job right.

To turn your itch into an ah-h-h-h, grab a back-scratcher. To get a hard-to-reach bolt torqued to spec, grab torque wrench, NSN 5120-01-251-0149. It's authorized for your AVUM No. 2 Shop Set.

This dial indicating torque multiplier is light and compact. It has a load range of 0-350 lb-ft and both left and right input sockets.

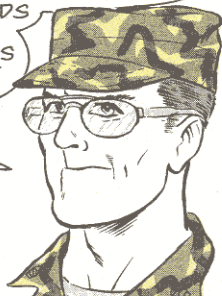


It's light and compact

Other mechanics have found it good for the main transmission mount bolts on the Black Hawk, the mixer support bolt on the Apache and the main rotor hub drag brace on the Huey.

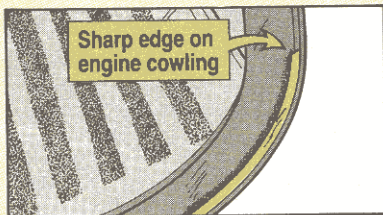
The 50-1 multiplication of the input torque can produce large reaction torques.

DON'T LET THE HOUSING OR THE HANDLE PUSH AGAINST CONTROL RODS OR OTHER STRUCTURES THAT CAN'T TAKE THESE LOADS!



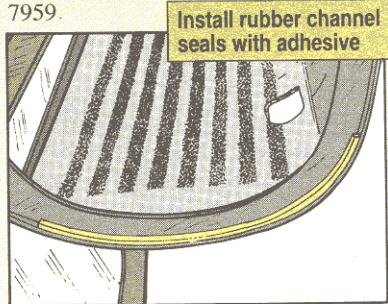
# Yowling from the Cowling

Raise those scarred hands all you Black Hawk mechs who have been sliced and diced by the sharp-cornered, raised edge of the engine cowling. Thirty-five stitches in his right hand put SGT Marc Morganti of the Kentucky National Guard into your ranks. That's why he came up with this fix.



Order five rubber channel seals, NSN 5330-00-948-9912. They are the same seals used on the Huey's cowlings, Item 11 of Fig 76 in TM 55-1520-210-23P-1.

Glue one seal on each of the two edges on both the left and right cowling with adhesive, NSN 8040-00-390-7959.



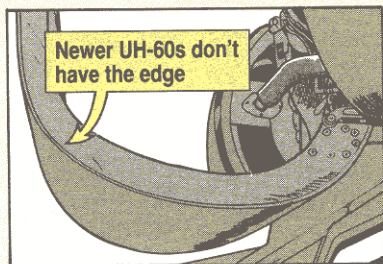
The seals are not long enough to cover the entire edge. So, cut the fifth seal into four pieces and glue one piece on each edge to finish the job.

JAN 91



For a more permanent solution, get your AVIM to grind the edge away.

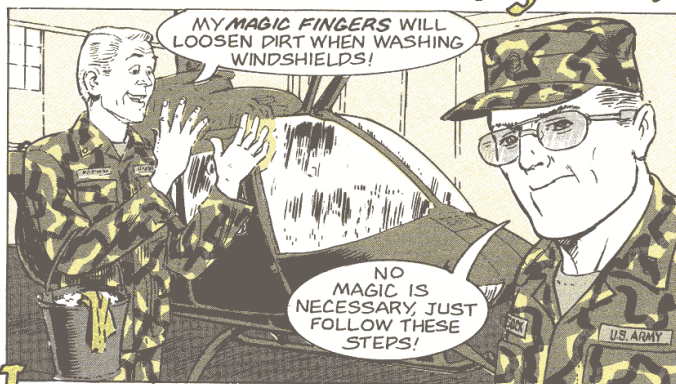
Newer Black Hawks don't have the edge and the old ones sure don't need it!



Either way, get your commander's approval first.



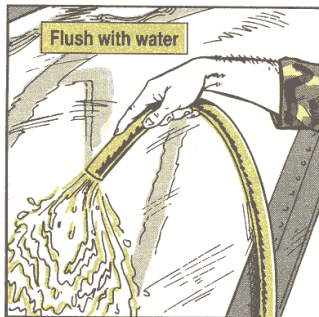
# Doing the Windshield Wash



**I**t's no song and dance, Kiowa mechs... dirty and scratched windshields cause accidents.

It's your job to keep windshields as clean and scratch-free as possible. Here's how:

Remove your rings and watches. Flush the windshield with running water and loosen the dirt by rubbing with your hand.



Wash the windshield with a mild detergent and water solution. NSN 7930-00-880-4454 gets a gallon of detergent, NSN 7930-00-281-4731 a 50-lb box.

Carry the solution from your bucket to the windshield with flannel cloth, NSN 8305-00-641-5606, or chamois, NSN 8330-00-965-1725. Careful. Never use the cloth or chamois on the windshield until your hand tells you there is nothing abrasive, such as sand or dirt, left to scratch the surface.

Rinse off all the suds before you dry the windshield. Otherwise, the scum will increase windshield glare.

Dry the windshield with a clean, damp chamois, or a soft, clean cloth, NSN 8305-00-656-1259. Do a good job to prevent water spots and streaking.



Check closely for minor scratches and crazing. Polish them out with polishing kit, NSN 1560-00-450-3622.

After you've cleaned and polished the windshield, gently pat it with a clean, damp chamois to remove any electrostatic charge that might have built up from the rubbing.

Clean the greenhouse windows with soap and water, too. Then remove minor scratches and mild distortion with cheesecloth and a little Brasso. Never use Brasso to clean any of the other windows, though. You'll scratch them.



## Aviation Messages

CAT 1 EIR Phone:  
DSN 693-2066  
(24 HOURS)

If your unit has not received a message you have an interest in, check with your next higher headquarters.

**OH-6-90-07**, SOF, Maint Mandat-  
ory, OH-6A and OH-58A/C maint  
of the Casey heater system,  
041630Z Sep 90.

**OH-58-90-10**, SOF, Maint Mandat-  
ory, OH-6A and OH-58A/C maint  
of the Casey heater system,  
041630Z Sep 90.

**OH-6-90-08**, SOF, Maint Mandat-  
ory, OH-6A inspect main and tail  
rotor control tubes, 041730Z Sep  
90.

**OH-6-90-09**, SOF, Maint Manda-

tory, OH-58A and OH-6A, inspect  
OH-58A and OH-6A with Casey  
heater system and T63-A-700  
engine, 111800Z Sep 90.

**OH-58-90-11**, SOF, Maint Mandat-  
ory, OH-58A and OH-6A, inspect  
OH-58A and OH-6A with Casey  
heater system and T63-A-700  
engine, 111800Z Sep 90.

**CH-47-90-12**, SOF, Maint Manda-  
tory, CH-47D, inspect and mod  
hydraulic line clamps, 112000Z  
Sep 90.

**CH-47-90-13**, SOF, Tech, inspect  
and removal of CH-47D forward  
transmissions containing suspect  
rotor shafts prior to next flight,  
261400Z Sep 90.

**OH-58-90-12**, SOF, Maint Mandat-  
ory, OH-58A/C, inspect and recall  
of tail rotor blades, 272000Z Sep  
90.

**OV-1-90-ASM-02**, ASM, OV/RV-  
1D, nose and main landing gear  
wheel locking nuts, 061800Z Sep  
90.

# It's Mast Corrosion!

LOOK  
AT THIS  
CORROSION!



**C**orrosion works like a cancer, eating at the heart of main rotor masts. But it's a cancer that can be prevented.

The bottom-line is this: No moisture ... no corrosion. And there is just one way for moisture to seep into the mast—through a cap that's not sealed!

Remove any water you can reach with lint-free cloth, NSN 7920-00-044-9281.

Water you can't reach can be removed using compressed air (up to 30 PSI).

See any corrosion? Even a speck?

Send the mast off to AVIM for repair like it says in Para 6-92c.(1) of TM 55-1520-228-23.

No corrosion? Then seal the lip of the cap with sealant, NSN 8030-00-753-4599. One more thing: Anytime you remove the cap, replace the sealant.

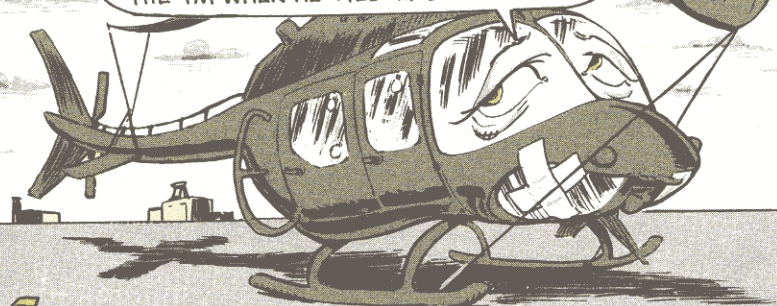
Keep the  
lip sealed

Moisture  
gets in  
here



# Stop Bubble Abrasion

I WISH THE CREW CHIEF WOULD FOLLOW THE TM WHEN HE TIES MY BLADES DOWN.

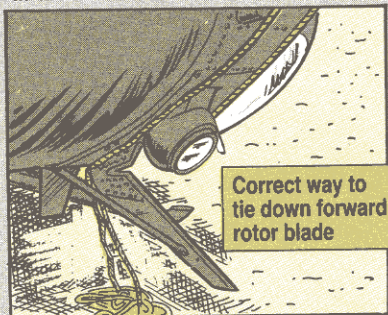
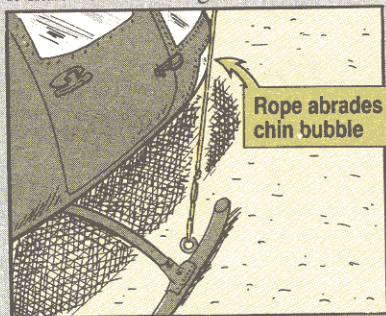


**S**ome crew chiefs still use the tow rings on their bird's skids to tie down the forward rotor blade.

Then the wind whips the tiedown ropes against the chin bubble, causing the ropes to abrade the bubble, making it hard to see through.

So follow the instructions in Para 1-40.3 of TM 55-1520-228-23-1 to tie down the forward blade.

Route the tiedown ropes between the base of the wire cutter and the side support struts of the cutter. Tie it off at the rear of the cutter base.



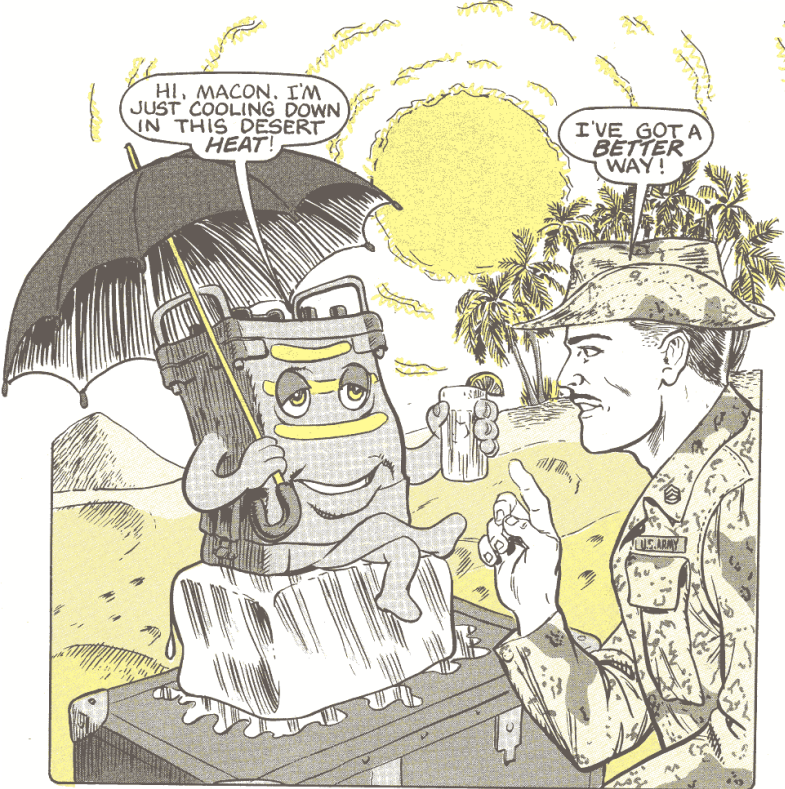
## Film for Crash Kit Camera

**N**eed film for the 35-MM camera in your aviation unit's crash investigation tool kit? Order a 24-shot roll of color film with NSN 6750-01-238-5391 or a 12-shot roll with 6750-01-176-5450. If you need black and white film, get a 24-shot roll with NSN 6750-00-986-0468. The NSNs are not on the AMDF, so order on a DD Form 1348-6 from RIC S9G.





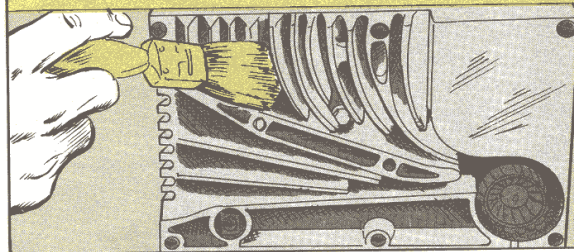
# Let Hot Radios Breathe



**Y**our radios can be cool communicators or dead duds in the heat of the desert. One of the main keys to desert radio survival is to keep them cool. Here are some hot tips to keep your radio cool and keep you on the air:

Clean your receiver-transmitter (RT) often. If the fan vent gets clogged with sand, dust or dirt, the RT motor gets hot and burns out.

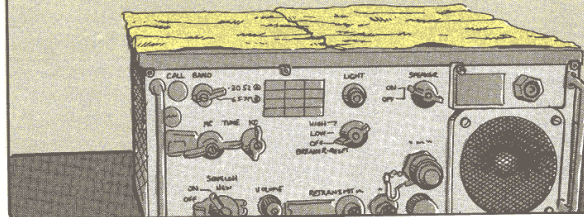
Take the side and rear panels off the RT so you can get at these commo killers. Use a brush or compressed air—whatever your equipment TM says—to clean the heat exchanger vanes and power transistor assembly. Be sure to replace the panels. They funnel air from the fan to the vanes where it's needed.



Clean heat exchanger vanes

Keep coats, field gear, maps, manuals and other items away from the RT blower fan. Blocking the air flow will cause the heat to build up inside your set.

Put damp rags on the radio to keep it cool. Make sure the rags are damp, not wet. Soggy rags let water get inside the radio. Also, be sure that all screws are snugged down before you put the rags on the radio.



Cool radio down with damp cloths

Shade your radio with the vehicle's canvas top, or park in a shaded spot... anything to keep the glaring sunlight off the radio. When the sun beats down on the radio, the fan runs itself to death trying to cool your radio.

Another way to block the sun is to tape a piece of corrugated cardboard to the top of the radio.



If you're transmitting more than 15 miles, use high power but keep transmissions short. When you're through, switch back to low power.

A diagram of a circuit breaker switch. It features a yellow circular component with a handle. To the left of the handle are three horizontal lines labeled 'HIGH', 'LOW', and 'OFF' from top to bottom. Above the handle is the word 'POWER'. Below the handle is the text 'BREAKER-RESET'.


You need to give your radios extra attention in the desert. That means more frequent checks and services on your equipment.

**Knobs, switches and connectors.** If any are broken or missing, get them replaced.

MIT R/W SPKR ANT CON

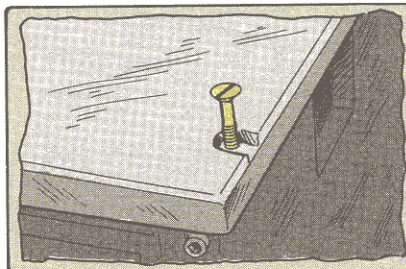
MIKE

Use erasers on contacts



Keep caps on connectors



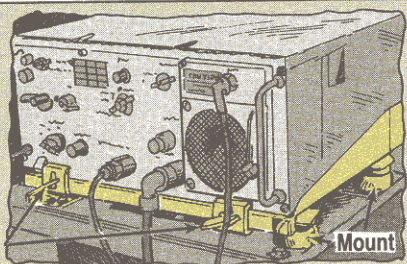


**Panel or cover screws.** If one is loose or missing, tighten or replace it. A missing screw lets dirt and sand get inside your set.

**Tighten 'em down**

**Latches and mounts.** Loose latches and mounts can cause commo equipment to bounce out on a rough desert ride.

**Check latches and mounts before heading out**



Latches

Mount



AN/UXC-7...

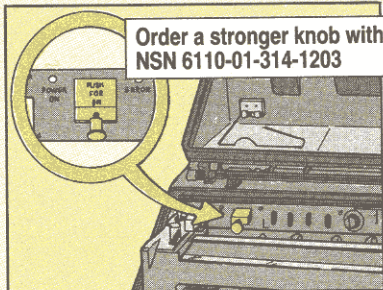
## Keep FAX on Line

**Y**our AN/UXC-7 lightweight digital facsimile sends crystal clear copies from one user to another, unless it's down because the power switch is broken.

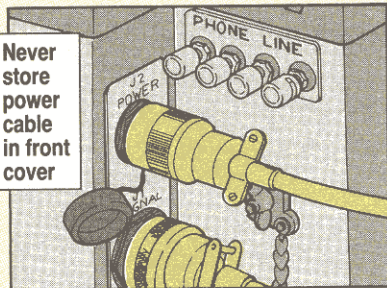
The switch is easily broken, especially when the power cable is stored in the front cover. Because there's not

enough room inside the cover for the cable, the power switch shaft/knob gets snapped in half. Keep the original ship-

**Order a stronger knob with NSN 6110-01-314-1203**



**Never store power cable in front cover**

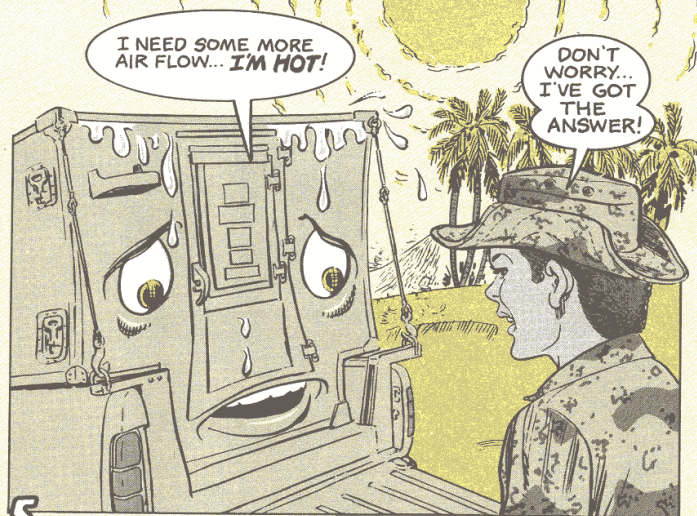


ping carton and use the tray to store the cable in.

When you replace the power switch shaft/knob, order a stronger one with NSN 6110-01-314-1203.



# KEEP AIR FLOWING



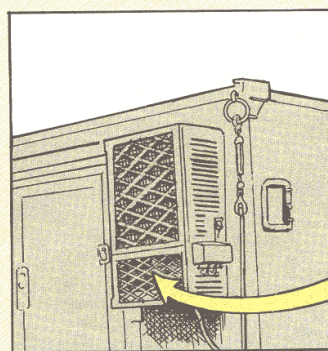
**S**helters need a steady flow of air to keep inside temperatures down.

Radio teletypewriter equipment inside the shelter puts out enough heat to burn up a radio or power supply. They need moving air to stay in good shape.

Keep the temperature down by leaving the shelter door's inlet cover open enough to let cooling air into the shelter.

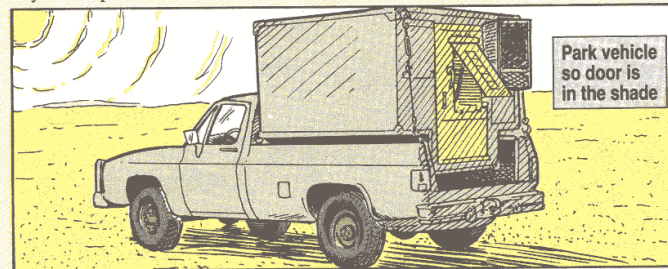
Exhaust vents are behind the radio and power supply. Make sure these vents are open and that they're not blocked by clothing or other items. These vents let hot air escape.

Some equipment needs air conditioning to keep it operating. If your shelter has an air conditioner, use it. You'll need to close the vents and inlets, of course.



Open valve to get cool air

The most important thing about vehicle-mounted shelters is where you park them. Park your vehicle so that the shelter door is in the shade for most of the day to keep the inside area cooler.



Generators should be put in front of the vehicle to keep the exhaust and noise from entering the shelter.

If your shelter is not air conditioned, lower the inside temperature by hanging a water-soaked burlap cloth over the door's air inlet cover. Soak the cloth often and be sure to keep the door closed.

The door filter often gets overlooked when PMCS is pulled. Make it a habit to check the door filters when you check the radio air filters. Clean the door air filter by using the instructions in Para 3-10 of TM 11-5815-334-10.



# Shock Prevention



**W**hen you transmit in the lower frequency range of your AN/PRC-104(A) manpack radio, you may get shocked, especially in wet/humid weather when you touch bare metal. To prevent shock:

- ⚡ Never touch exposed metal on the radio case, key, and handset when keying the transmitter.

- ⚡ Paint badly scratched surfaces and exposed edges of the radio, as outlined

in TM 11-5820-919-12. Painted surfaces are good shock insulators.

- ⚡ Use a ground rod or counterpoise when operating the radio at a single location for very long. This not only reduces shock but also improves radio performance.

- ⚡ Keep the AM-6874 amplifier at the specified 20W power output. Higher power outputs increase the chance of shocks.



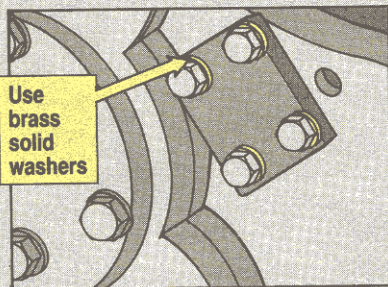
# Washers Stop Leaks



OH, NO... DON'T BLAME ME...

**K**its to add electronic governors to 15- and 30-KW 400-HZ generator sets add an oil leak, too.

The kit, NSN 6115-01-193-4251, uses  $\frac{5}{16}$ -in split lock washers on the bolts holding the blanking plate that covers the pump mount.



I NEED SOME BRASS WASHERS!

But what's needed there are  $\frac{5}{16}$ -in brass solid washers, NSN 5310-00-639-6385. They prevent oil from leaking around the bolts.

So if you replace the hydro-mechanical governor with the electronic governor, replace the washers, too.

M12A1 Decon...

## Get 'em Modified

**A**ll M12A1s need to be modified. You can tell if yours has been by checking for an "MWO applied" plate by the nomenclature plate.

If yours hasn't been modified, contact your local AMCCOM Logistics Assistance Representative.

Or call the AMCCOM M12A1 item manager at (309) 782-3262/3111 or DSN 793-3262/3111. Or write:

**AMCCOM**  
**ATTN: AMSMC-MMN-C**  
**Rock Island, IL 61299-6000**



# NBC in the Desert



**D**esert conditions present special problems for surviving chemical attacks. Here are a few:

- ☀ Extreme heat makes wearing MOPP gear very difficult.
- ☀ Soil soaks up liquid agent. The sun's heat can revive the agent after you think the danger's passed.
- ☀ High winds and lack of vegetation let nerve agent spread quickly.

Here's what you can do:

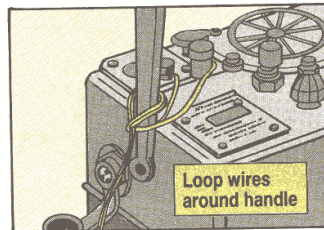
- ☀ Do strenuous activities as much as possible at night when cooler air makes MOPP suits more bearable.
- ☀ Wear masks while you sleep. Work out a buddy system to ensure mask seals are not broken.
- ☀ Place the M8A1 alarm so it has the widest possible coverage.

And heed these PM tips on the NBC equipment you'll be using.



## M8A1 Alarm

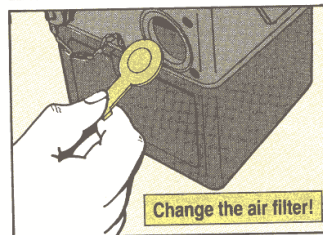
When you connect the M43A1 detector to the M42A1 alarm, tie off 9 inches of the telephone wire at the loop on the side. That prevents someone from tripping on a wire and breaking the wire or binding post. If the loop is missing, wrap the wire around the detector handle.



Don't depend on your commo people for telephone cable. Your NBC NCO can order as much as you need with NSN 6145-00-226-8812. It's part of the M8A1's AAL. You don't want to run out of cable.

Never leave a test paddle in an M8A1 longer than 2 minutes or try more than 2 paddles during BEFORE PMCS. Otherwise, you contaminate the detector cell. It takes hours to purge the cell.

Keep the inside of the M43A1 case clean. Dirt and detection don't mix. Change the air filter every 24 hours. The M8A1 won't detect with a dirty filter.



If the remote binding posts stick or are weak, report 'em. Sticking posts make it difficult to connect the alarm. Weak ones make for a weak connection and an unreliable alarm.

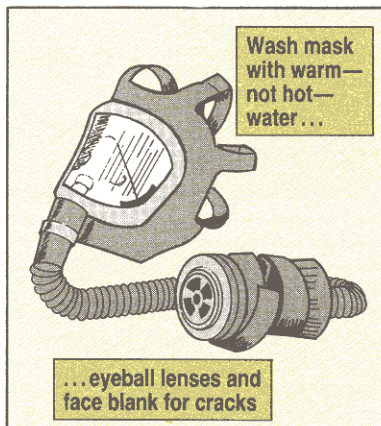


## Masks

Temperatures above 120°F crack the lenses of the M24 and M25A1 masks. That ruins a mask's protection.

Protect masks as much as possible from the heat. Keep your mask in its carrier when it's not in use to shield it from the sun.

Never lay your mask down on hot metal... like a vehicle that's been sitting in the sun. Don't leave the mask shut up in a vehicle or aircraft where the temperatures can quickly zoom up.



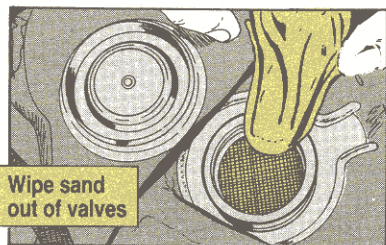
Use warm water—below 120°F—to wash your mask.

If the mask does get hot, put it in a cool place for 15 minutes before you try to flex it or stow it. That may give the mask enough flexibility not to crack.

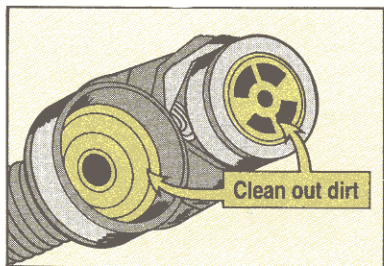
Sand is also a major problem. If it gets on the areas where valve assemblies and cannisters fit together, nerve agent can seep in the mask. If sand clogs the filters and valves, breathing will be difficult.

The solution? Clean valves and brush off cannisters as often as possible. Clean in areas protected from blowing sand.

Wipe sand out of M17 valve assemblies with a clean cloth. Use a clean cloth to wipe away sand from the mesh covering the inlet valves. Rotate valve discs with your finger to be sure the discs are not stuck and are seated properly.



On M24 and M25A1s, pull the coupling off the top of the cannister and wipe sand out of the coupling and cannister with a clean cloth. Make sure the valve discs lie flat and completely cover the air inlets.



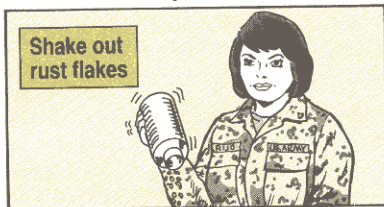
Don't forget the masks' carriers. Sand gets in them even if they've not been opened all day. Sand in the carrier will scratch the lenses and clog the inlet and outlet valves and drinking tube disconnect. Shake sand out of the carrier before you repack the mask.



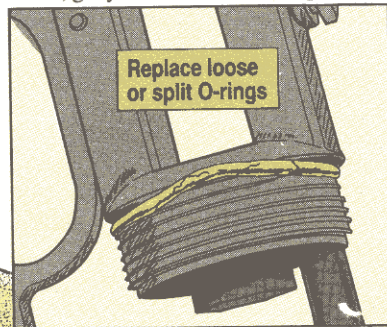
## M11 Decon

Rust and O-rings are the main things to watch on the M11. Rust doesn't automatically knock out an M11. As long as rust doesn't break off and block off the siphon tube strainer, keep using the M11. Just wipe out rust flakes and shake them from the container.

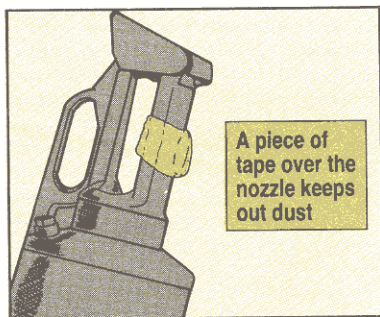
But if the M11 is badly pitted, get a new one from your NBC NCO.



Eyeball an M11's O-rings often. A bad O-ring won't let the M11 pressurize. If an O-ring's split, cracked, or loose, get your NBC NCO to replace it.



Tape over the M11's nozzle to prevent sand from clogging it. Form pull tabs on each side of the nozzle by bending the tape back. That makes it easy to pull the tape off even when you're wearing protective gloves.

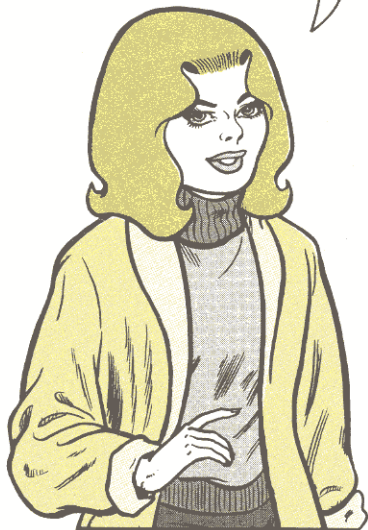


KEEP SAND  
OUT OF MASK  
CARRIERS, CANISTERS  
AND DECON  
NOZZLES.



## They Work For You!

EQUIPMENT REPORTING IS A TWO-WAY STREET. YOU FURNISH THE EQUIPMENT INFORMATION AND IN RETURN YOU GET THE SUPPORT THAT YOU NEED!



Reports on equipment readiness, Army Oil Analysis Program (AOAP), Standard Army Maintenance System (SAMS), The Army Maintenance Management System (TAMMS) and the Army Vehicle Registration Program help higher headquarters know what type of support to give you.

**Readiness Reporting.** Fill out DA Form 3266-1 (missile), DA Form 1352 (aircraft) and DA Form 2406 (ground equipment) to report equipment status. AR 700-138 tells you what, when and how to report.

For Desert Shield units, send all readiness reports direct to:

**USAMC Materiel Readiness Support Activity**

**ATTN: AMXMD-ER**

**Lexington, KY 40511-5101**

**DA Message DALO-SMD 071740Z**

Sep 90 has the word.

**AOAP Reporting.** Check out DA Pam 738-750 for nonaeronautical equipment or TB 43-0106 for aeronautical equipment oil sampling requirements and fill out DA Form 2026. Turn these into the folks at your supporting AOAP lab and the reports will flow to those needing the information.

**SAMS Reporting.** Fill out your DA Form 5504 work requests and turn them into your DS or GS support. A SAMS site operator consolidates all information for that materiel management center and mails a floppy diskette weekly to the Materiel Readiness Support Activity (MRSA). DA Pam 738-750 gives the details on SAMS reporting.

**TAMMS/Vehicle Registration Reporting.** Fill out DA Form 2408-9 and submit it to MRSA through your data reduction center. Check out DA Pam 738-750 and AR 710-3 for detailed reporting instructions.

Remember—prompt, accurate reporting is necessary and very important to everyone in the logistics support chain to make decisions which are “soldier smart”.



Connie's  
POST  
SCRIPTS

IN THE DESERT, PM CAN  
MAKE THE DIFFERENCE  
BETWEEN SUCCESS  
AND FAILURE!



### Desert Tan Coating for Canvas

You can get a desert tan coating to camouflage the canvas on your truck or trailer. A 55-gal drum comes with NSN 8030-01-327-2998. The NSN's not on the AMDF, so order on a DD Form 1348-6 from RIC GSA. Write "NSN not on AMDF" in the Remarks Block. TACOM Msg AMSTA-KP-OC 052345Z Oct 90 tells how much to use on each vehicle's canvas. See your TACOM Logistics Assistance Rep for a copy.

### CPOs and BDOs May Be Usable

A split barrier bag doesn't necessarily mean a battle dress overgarment (BDO) or a chemical protective overgarment (CPO) has lost its ability to protect.

Tests have shown that as long as a CPO or BDO has not been exposed to moisture, smoke, or fuel vapors, it's still OK to use. CPOs or BDOs in bags damaged during shipment most likely are still good.

Seal barrier bag rips with duct tape.

See AMCCOM Maintenance Advisory Message 90-37 for more info. Your AMCCOM Logistics Assistance Representative will have a copy.

### NBC Bag NSN

You can get the NBC bag on Page 55 in PS 456 with NSN 8465-01-216-6259.

### OOPS! Supply Excellence Award Error

The runner-up for the Army Reserve MTOE Unit in the FY 90 Supply Excellence Awards is HHC, 326th Support Group, Kansas City, KS—not the 325th as stated on Page 60 of PS 456.

### SB-22 Switchboard Battery NSNs

TM 11-5805-262-20P shortchanges you on SB-22 switchboard battery NSNs. Here's what's available:

Item	NSN
Battery box	6135-00-635-5223
Battery retainer	6135-00-284-0249
Electrical contact	5999-00-305-0008

### Mount NSN Change

Hold one before using the NSN on Page 21 in PS 455 to order the M66 ring mount for machine guns. AMCCOM now says to use NSN 1005-00-701-2810.

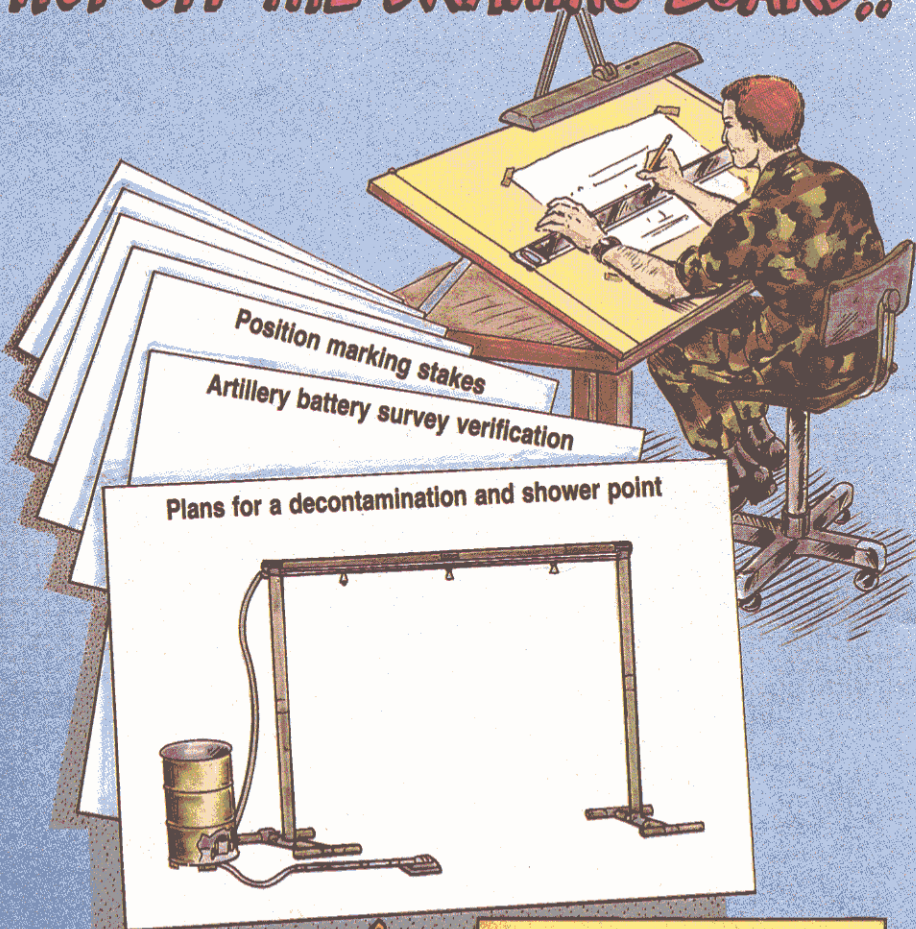
### M3A4 Strainer NSN

The fuel sediment strainer for the M3A4 smoke generator listed in TM 3-1040-276-23P won't work because it has the wrong fitting size. Instead, order strainer, NSN 4730-00-570-6948.

Distribution: To be distributed in accordance with DA Form 12-34-C-R, for TB-43-series.

**Would You Stake Your Life <sup>right now</sup> on  
the Condition of Your Equipment?**

# HOT OFF THE DRAWING BOARD!!



Get the plans from  
**BATTLEKING**  
at Ft Sill

Call DSN 639-3717/4075  
or write to:

President  
TEXCOM Fld Arty Bd  
ATTN: ATCT-FAO (BATTLEKING)  
Ft Sill, OK 73503-6100

PIN: 064836-000