Issue 512

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THE PREVENTIVE MAINTENANCE MONTHLY

TB 43-PS-512

Choose the Right Road

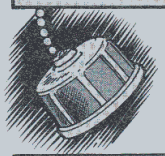
An old English proverb says that the road to Hell is paved with good intentions. That proverb reminds us that all too often things that start out right end up wrong.

What derails a good idea?

What makes a well-intentioned maintenance action turn into a nightmare?

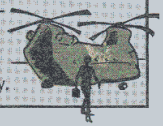
The answer is carelessness.

The guy who left the shop towel in the engine compartment started out to get that engine spotless.



The man who left the filler cap off was proud that he always kept his fluids at the right level.

The mechanic who failed to latch the aircraft engine cowling had pulled a spot check for extra safety.



The inspector who pulled himself up by grabbing a fuel hose had looked over every inch of the equipment.

The man who left the brush. The woman who left the screwdriver.

Every maintenance job has a beginning, a middle, and an end. The end starts when you think you've finished. After you say, "That job's done," it's time to start the end of the job. Go over every single detail. Take nothing for granted. Leave nothing behind, leave nothing undone.

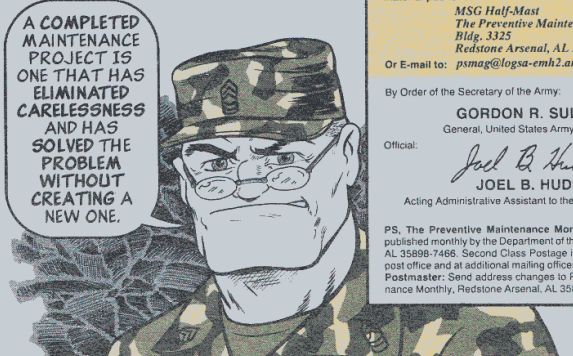
No maintenance job is done until your tools are inventoried.

No maintenance job is done until you have covered every inch of your work area with your eyes.

No maintenance job is done until you make sure that everything in your pockets when you started the job is still there.

No maintenance job is done until you ask yourself, "What have I forgotten?"

If the road to Hell is paved with good intentions, then the road to Heaven is paved with completed projects.



PS THE PREVENTIVE MAINTENANCE MONTHLY

TB 43-PS-512, 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, suggestions for articles, or comments on material published in PS. Just write to:

MSG Half-Mast
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Bldg. 3325
Redstone Arsenal, AL 35898-7466

Or E-mail to: *psmag@logsa-emh2.army.mil*

By Order of the Secretary of the Army:

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Charge to PM Account

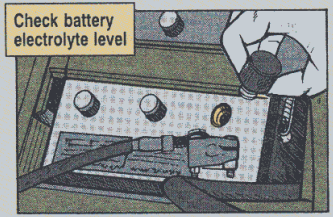
To keep your MLRS' batteries charged, you must make regular contributions to its PM account.

What happens if you miss a payment? Weak batteries cause bad prompts and stop firing.

Even strong launcher/loader module (LLM) batteries last only 20 minutes max if you're firing on battery power alone. Weak batteries will leave you dead—as in can't move—before you can ask "Did anybody check the batteries?"

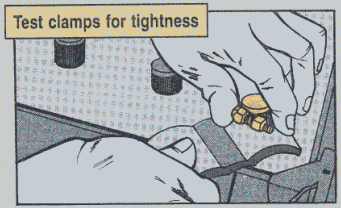
Battery Musts

Before you go to the field, check the electrolyte levels in all 10 batteries. The electrolyte must be over the tops of the plates. If it's low, your mechanic needs to add distilled water, not water out of the tap. Plain water actually weakens the electrolyte. NSN 6810-00-107-1510 brings five gallons of distilled water.



Remember in hot weather electrolyte will drop even if your MLRS's just been sitting.

Feel the terminal connections for tightness. Grab the clamp between your thumb and two fingers and gently twist. If it's loose, tell your mechanic.



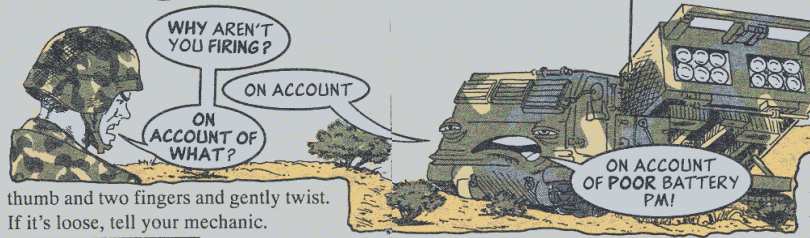
Look for dirt and corrosion on the connections. Corrosion is the white stuff. Wipe them off with a clean cloth. If that doesn't get it all, report it.

Make sure the cables from the electronics box to the batteries are lockwired. If a cable works loose, it can short out the box.

Power Points

Before you do system PMCS, turn on the system power and check the BATT-GEN gauge to see if the indicator's at least in the upper yellow zone. No? Run the engine at high idle—1,200 to 1,400 RPM—with the LAUNCHER INTERCONNECT switch on for at least 15 to 20 minutes.

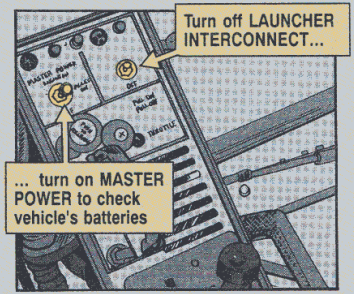
Keep an eye on the gauge. A normal reading is when the needle rests in the green zone.



High idle is the only way to charge the LLM batteries. Low idle, in fact, further drains the batteries. Tip: The batteries charge faster if you turn off all electrical systems.

After the batteries are recharged, turn off the engine and turn on the LAUNCHER INTERCONNECT switch. Note the position of the voltage indicator. It should be in the upper yellow zone.

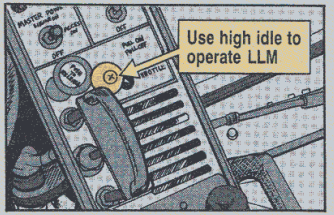
Turn off the LAUNCHER INTERCONNECT and turn on the MASTER POWER switch to check the condition of the vehicle batteries. If there's a big difference between the two voltage readings, something's wrong.



After you've finished PMCS, check the reading on the BATT-GEN gauge with the LAUNCHER INTERCONNECT on to see if the batteries still have enough juice. If not, recharge 'em.

In the Field

When possible, operate the LLM with the engine running at high idle. That keeps the LLM batteries charged.



If you must operate on battery power, recharge after every LLM cycle to prevent dead batteries. Run the engine for at least 15 minutes at high idle. With the engine off, check that BATT-GEN gauge is in the upper yellow. If not, recharge more.

Back from the Field

With your mechanic's help, pull the batteries and clean the battery box. Water gets in the box, corrosion grows, and soon the box and brackets are worthless.

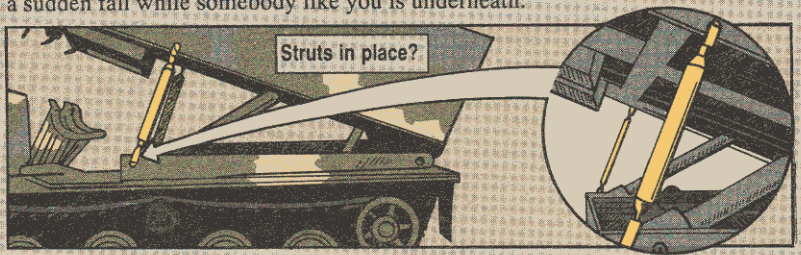
MLRS . . .

Better Safe Than Dead

With a weapon system as big and quick as the MLRS, it's always best to follow all safety rules. A falling launcher or flying latch handle can have you playing harp before you can yell "Look out!"

Strutting to Safety

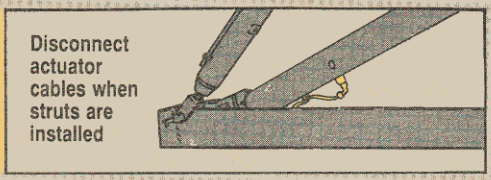
Jury struts are safety rule No. 1. Any time you or your repairmen are working under the launcher, use the jury struts. Then there's no way the launcher can take a sudden fall while somebody like you is underneath.



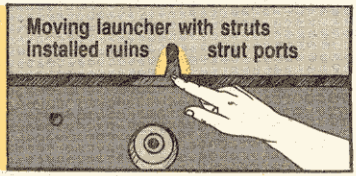
The basic poop on installing the struts is in Para 3-6 in TM 9-1425-646-10-1. But here are couple of other things to remember:

Use both struts. One strut won't cut it. If the launcher gives way with only one strut installed, the strut crumples...and the launcher falls.

Once the struts are installed, disconnect the elevation actuator cables. That makes sure the launcher can't be moved.



Crews often forget about the struts and try to move the launcher. That destroys either the strut ports or the ball screw actuator support housing. If the cables are disconnected, that won't happen.



Don't Overlook Hooks

Connect the safety hooks before unlatching the latch handles. The handles are under tremendous pressure. They can fly forward and catch you square in the face...if they're not wearing safety hooks.

Patriot Generator . . .

Cooldown...or Meltdown

To keep your 150-KW Patriot generator's starter from getting hot under the collar, give it a 15-minute cool-down period after three unsuccessful starts. Otherwise, it could wind up out of commission indefinitely.

Then, before you try starting the engine again, make sure the MASTER switch is in the OFF position (down).

Go by TM 5-6115-598-12 for complete, safe prestart and start procedures.

Also be very careful when draining fuel from the fuel system. Always use a fuel catch pan. And make sure there is no fuel around the fuel atomizer assembly when you test the igniter or the ignition exciter.

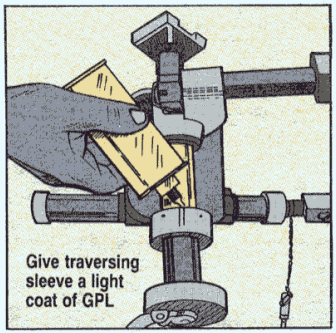
Mortar Matters that Matter

A big, hulking M29A1 mortar looks like it can take anything and still hit the target when the bell rings.

Well, it can't. Neglect and rough handling can leave your M29A1 staggering when it's time for action. Give your M29A1 the punch it needs with this PM:

Lube it. The M29A1 has brass and aluminum parts. Without lube, friction and corrosion can soon sap your mortar. All the basic lubing info is on Pages 3-0 through 3-3 in TM 9-1015-200-10.

But in hot areas, lube more often. Give special attention to the traversing assembly. It has bushings that wear out fast if they're not lubed. Put a light coat of General Purpose Lubricating (GPL) oil on the traversing sleeve. Run the traversing assembly back and forth to work in the oil.



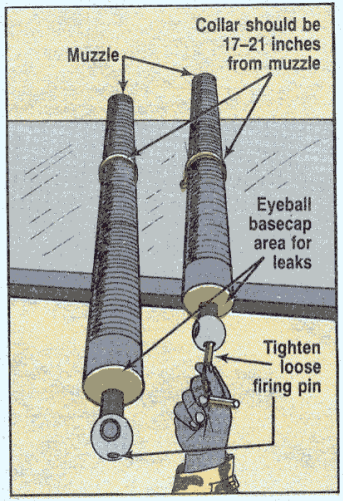
In sandy areas, less lube is better. Sand sticks to oil and rubs moving parts raw. Before going to the field, wipe off the elevating and traversing sleeves and any other exposed lubricated parts with a clean rag.

Take rags to the field. During breaks, wipe off any sand that's stuck on your M29A1. Keep the mortar covered with a tarp when you're not firing.

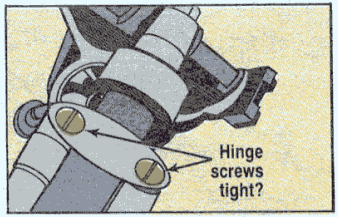
Check it out. Before you go to the field, tighten the firing pin with your socket head key. If the firing pin's loose, it will work out during firing.

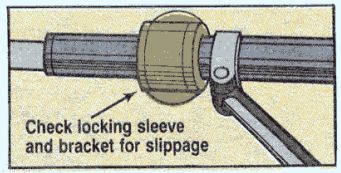
Eyeball the basecap where it joins the cannon tube for burn spots or discoloration. They mean gas leaks. Your armorer needs to check them out.

Make sure the collar is 17 to 21 inches from the muzzle. Ask your armorer to measure if you're unsure. An out-of-place collar causes poor recoil and missed targets.



Feel the bipod's locking hinge screws for tightness and the locking sleeve and bracket for slippage. If the hinge and sleeve can't hold tight, accuracy dips as the mortar slips. You can tighten the screws yourself. Your armorer takes care of slipping sleeves.



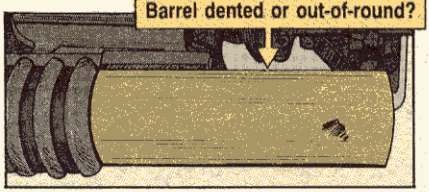


M203 Grenade Launcher . . .

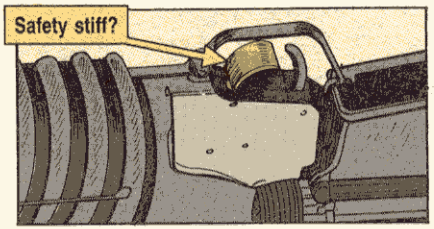
SUCCESSFUL LAUNCHING

Count down like this to a successful launch with your M203 grenade launcher:

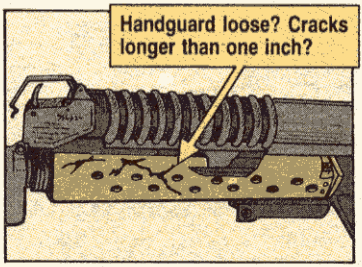
1. Look at the barrel. If it's out-of-round, dented, or cracked, your M203 is in no shape for firing. Get it to your armorer ASAP.



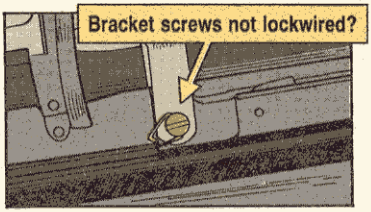
2. With the weapon cocked, test the safety. It should lock and unlock easily. If the safety doesn't move easily, put two or three drops of CLP in the safety detent—but no more than three drops. If CLP doesn't cure a stiff safety, the safety assembly needs cleaning or its spring is shot. Report it.



3. Feel the handguards for looseness and eyeball them for cracks. Small cracks are OK, but if they're longer than one inch you need a new handguard. If the handguard's loose, report it.



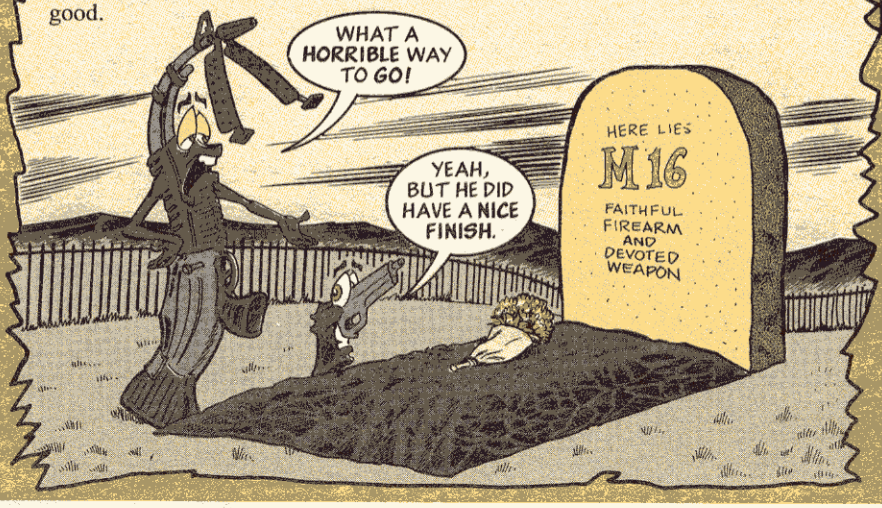
4. Are the screws for the mounting bracket lock-wired? If not, get 'em lock-wired. Otherwise, the screws will work loose and your M203 will not fit tight on the M16.



Small Arms . . .

Dull Good, Shiny Bad

Shiny is bad. Sandpaper and heavy-duty cleaners remove the dull coating that protects weapons against corrosion. A shiny weapon is a dying weapon. Dull is good.

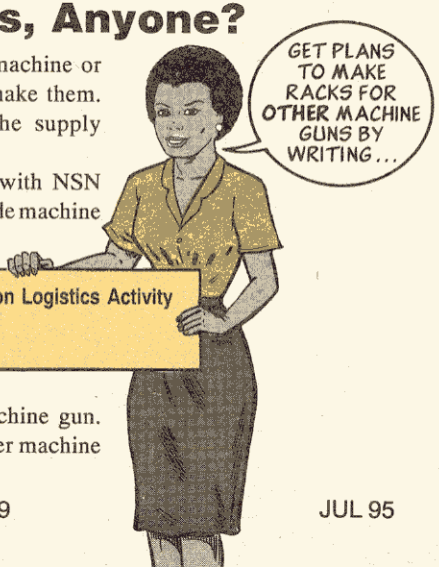


Machine/Submachine Guns . . .

Rack Plans, Anyone?

If you armorers need racks for your machine or submachine guns, have your support make them. There are no ready-made racks in the supply system...with two exceptions.

Order the M249 machine gun rack with NSN 1095-01-197-7902 and the MK 19 grenade machine gun rack with NSN 1095-01-216-9295.

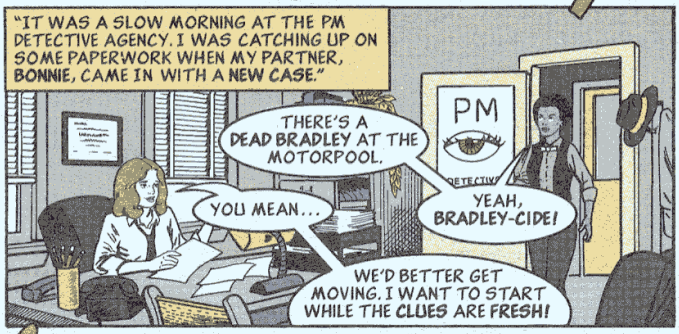


Armament, Chemical Aquisition Logistics Activity
ATTN: AMSTA-AC-MAW-S
Rock Island, IL 61299-6000

Plans include NSNs for material.

One set of plans is for the M60 machine gun. Other plans can be adapted to fit the other machine and submachine guns.

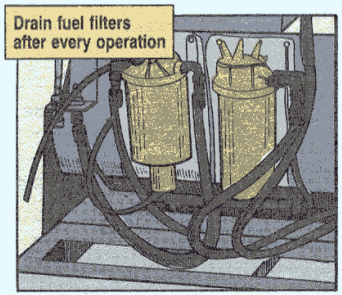
Anatomy of a Bradley-cide



Crewmen, when it comes to preventing a Bradley-cide, nothing beats the info in the -10 TMs.

Of course, that doesn't have to be your only source. Here's a bundle of PM clues to keep your Bradley alive and kicking:

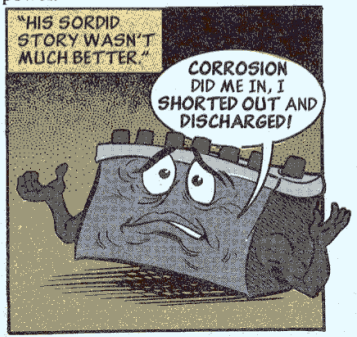
Fuel filters. Make sure you drain off water accumulation after every operation. If you forget, the water causes rust and gunk buildup that forms a plug in the bottom of the separator. The water builds until the fuel flow is cut.



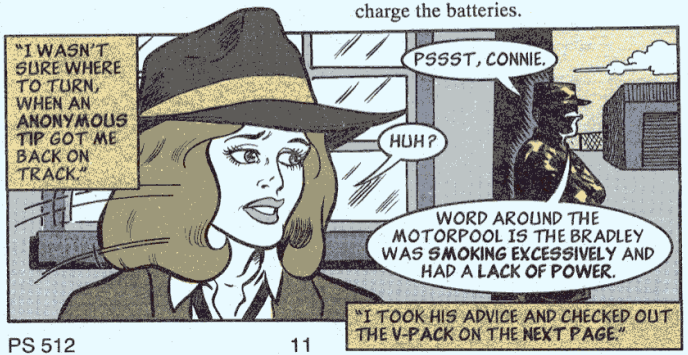
If the filter is already plugged, have your mechanic remove and clean the separator with liquid detergent, NSN 7390-00-990-7391, mixed with water. Make sure the filter's been rinsed and thoroughly dried before using it again.

Transmission low oil pressure switch. The mounting tee for this switch can't take much pressure without breaking or cracking. That includes a carelessly placed foot. Cracks will start an oil leak that could result in a fire.

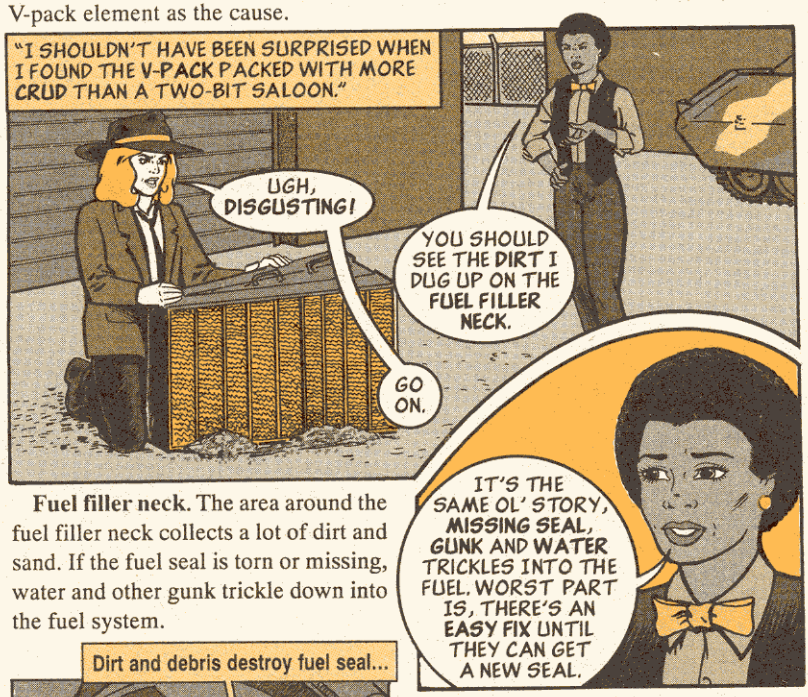
Batteries. Out-of-sight, out-of-mind can leave you out-of-action when it comes to the turret emergency batteries. Discharged batteries mean no back-up power.



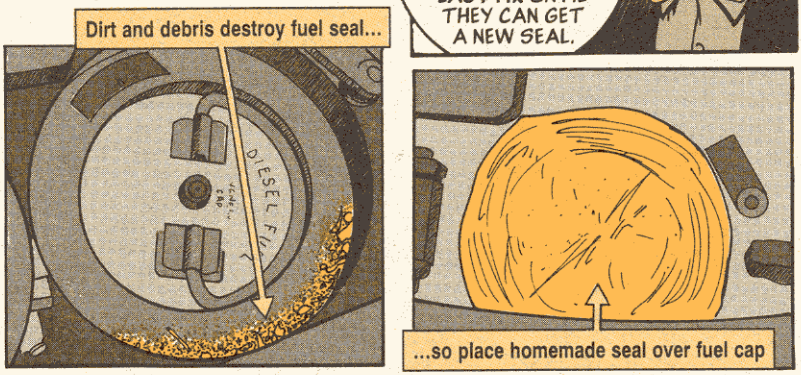
Check the batteries for loose clamps and low electrolyte. Also, look for corrosion on terminals and water and dirt on top of the batteries and in the battery tray. Corrosion, dirt and water on top can short across connections and discharge the batteries.



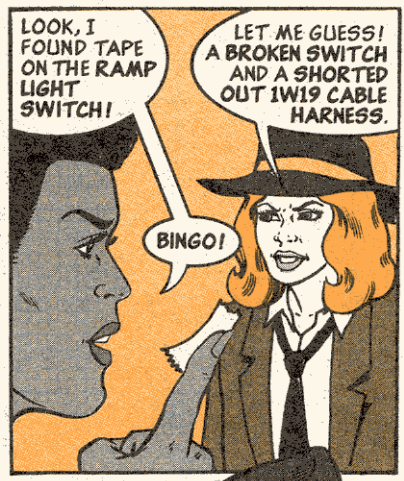
Air filters. Between regularly scheduled cleanings, keep a close eye on the AIR CLEANER CLOGGED light and watch engine performance. If your vehicle starts blowing too much black smoke or engine power is lagging, look to a clogged V-pack element as the cause.



Fuel filler neck. The area around the fuel filler neck collects a lot of dirt and sand. If the fuel seal is torn or missing, water and other gunk trickle down into the fuel system.

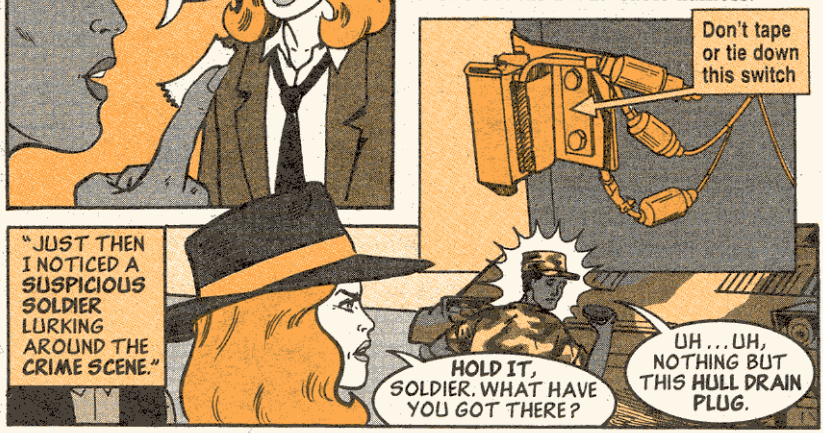


Until you can get a new seal, NSN 5330-01-107-3315, try this temporary fix: Cut out a piece of old rubber innertube about the size of the fuel cover. After cleaning out any dirt and sand from around the filler neck, place the homemade seal over the fuel cap and latch down the cover.

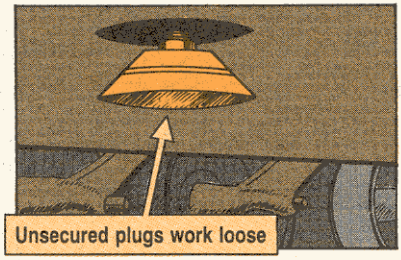


Ramp light switch. The ramp light switch is there to turn off the interior dome lights whenever the ramp is lowered. It keeps you from being easy to spot on a dark battlefield.

That's why you should never use tape or wire ties on the switch to keep the lights on. It also damages the switch and shorts out the 1W19 cable harness.



Hull drain plugs. Make sure the hull drain plugs are closed right and tight before operation. Do it wrong and the plugs work loose. They hang below the hull and are knocked off by rocks and brush. That means you have to replace them before you try to ford or swim.



Wipe each plug free of any mud or sand that might prevent it from seating properly. Make sure the bar is placed firmly between the hull's two mending plates, then tighten the plug in place.

Sprockets. Reverse final drive sprockets when they're worn down to the wear circles. You'll get more wear out of the sprockets and keep those vehicles on the road.

When both sides of the sprocket are worn to the circle, replace the sprocket.

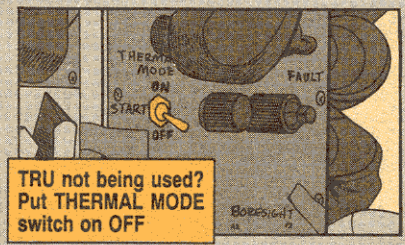
Lubing. If it moves, lube it. That means hatch hinges, seat slides, cargo and driver hatch switches, ballistic shield door hinges, and the commander's hatch pop-up release pins. A couple of squirts of CLP quarterly will keep those moving parts moving smoothly.

Staying cool is the key to preventing thermal receiving unit (TRU) failure on your M1-series tank. To do that, you have to make sure the dewar/cryogenic cooler assembly doesn't lose helium pressure.

Keep your TRU cool with these PM tips:

For Those Who Use It

- Keep the TRU turned off during daylight hours and at night when it's not in use. Unnecessary use increases the chance of a failure.

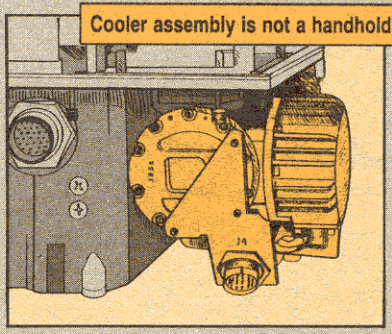


TRU not being used? Put THERMAL MODE switch on OFF

- Pay attention to how long it takes the TRU to cool down. If it consistently takes longer than 15 minutes, the cooler assembly is probably low on helium. Report it.

For Those Who Replace It

- Keep your hands off the cooler assembly when removing or installing the TRU. Use it as a handhold and the seals will give way. Then the entire assembly has to be replaced.



- Use the TRU's reusable container whenever storing or shipping the unit. That protects the cooler assembly from knocks and bangs that damage seals.

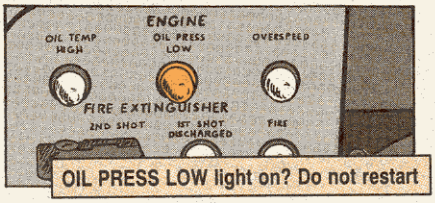
M1-Series Tanks . . .

Fight Your Reflexes

Drivers, when your M1-series tank aborts just after startup, what's your first reaction?

If you try to restart it, you may wreck the engine.

Instead, eyeball the OIL PRESS LOW caution light on the master panel. If it's on, you just found the reason for the abort. The tank's electronic control unit shut down the vehicle because of low oil pressure in the engine.



OIL PRESS LOW light on? Do not restart

Trying to restart the vehicle will result in another abort—and could wreck the engine.

Call in your mechanic. He'll troubleshoot the problem to find out why the OIL PRESS LOW light came on and the reason for the abort.

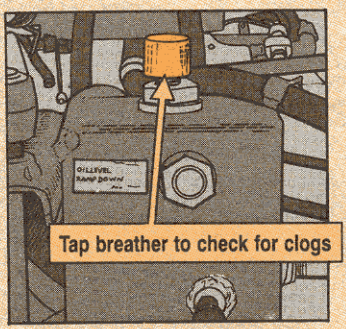
M113-Series FOV . . .

Vent that Pressure

Here's a tip for you carrier crewmen and mechanics: Check the hydraulic reservoir breather at least once a month to make sure it's not clogged.

Just give it a couple of light taps with your finger. If the breather moves freely, it's good to go.

Even so, you mechanics should make sure the breather is removed and cleaned semiannually with PD-680. A clogged breather allows pressure to build up. That leads to leaks.



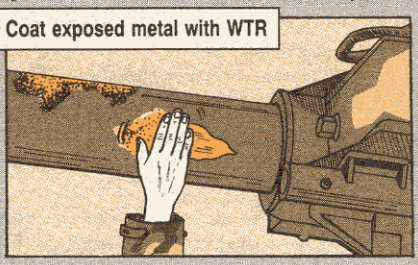
Tap breather to check for clogs

M198 Towed Howitzer . . .

Smooth Tube Lube

Operators, LO 9-1025-211-13 is pretty specific about what you're supposed to do when the dry film lube wears off the cannon tube on your M198 towed howitzer.

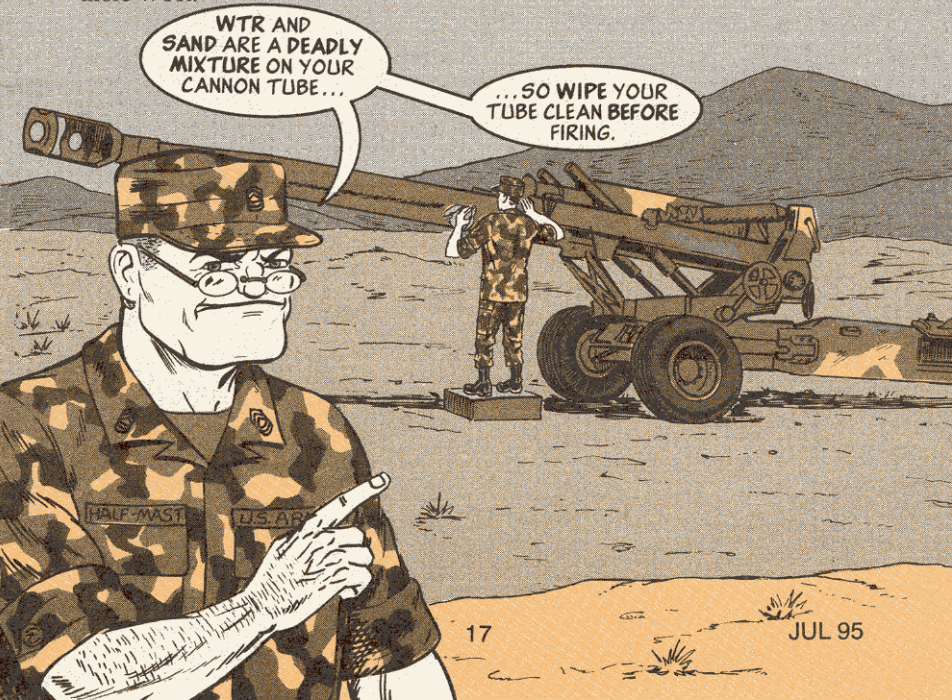
First, you're supposed to clean the exposed area with crocus cloth. Then you're supposed to put on a dab of WTR to keep rust from setting in.



If you work in a desert environment, however, you'll have to go one step further.

WTR attracts sand like a magnet. So before firing the gun, wipe off the WTR with a cloth. If you don't, the sand and WTR gunk up inside the bearing unit. That's like rubbing the cannon down with sandpaper every time the gun is fired—not to mention the wear and tear on the seals.

When you're finished firing and the gun tube's cooled down, remember to put on more WTR.



Door Springs Losing Gas

When the HMMWV's rear cargo door keeps falling on your head, it's time for new gas spring assemblies.

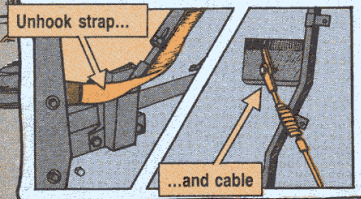
The door drops because the long gas spring seals don't get enough lube when the springs are in their natural position—long end up.

If the springs on your HMMWV let the door fall, get them replaced. If they're still good, your mechanic can extend their life by flopping them to put the short spring on top, and moving them to the opposite sides.

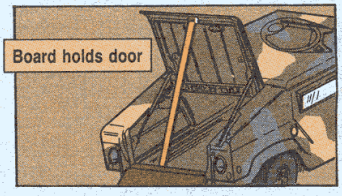
Here's how to flop the springs:

1. Be sure the forward end of the door is locked.

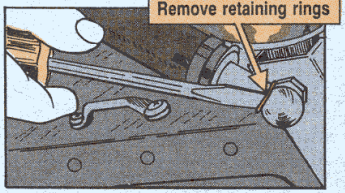
2. Unhook the cargo door strap and retention cables.



3. Use a board (2 x 4 x 79 1/4 inches) to hold the door open.

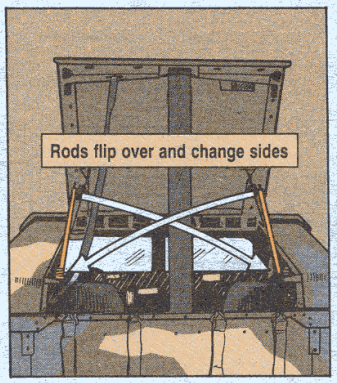


4. Pull the four retaining rings from the rod sockets.



5. Remove the gas spring assemblies only when the door is fully opened. If it isn't, somebody can get hurt as the springs open.

6. Flip the springs end for end and side to side.



7. Put in the retaining rings and remove the board.

8. Hook up the retention cables and the cargo door strap.

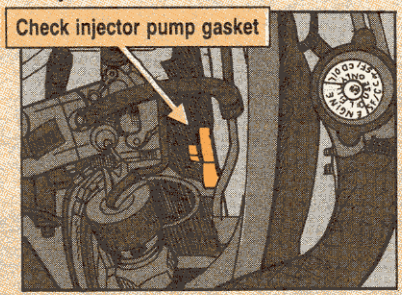
This switch will show up as a maintenance task in the semiannual PMCS someday, but you can use it now with your CO's approval.

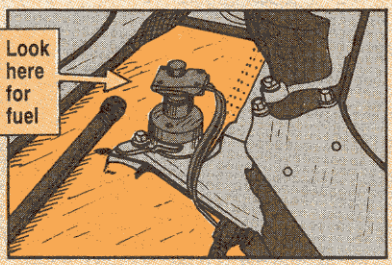
HMMWV . . .

Look for Fuel on the Block

The gasket that fits between your HMMWV's fuel injector pump and the timing gear cover is a known leaker. Your PMCS says to inspect the pump every six months for leaks.

Take that to heart every time you remove the engine access cover. Eyeball the block valley with a flashlight. See any fuel? If so, have support replace the pump gasket, NSN 5330-01-150-5944.



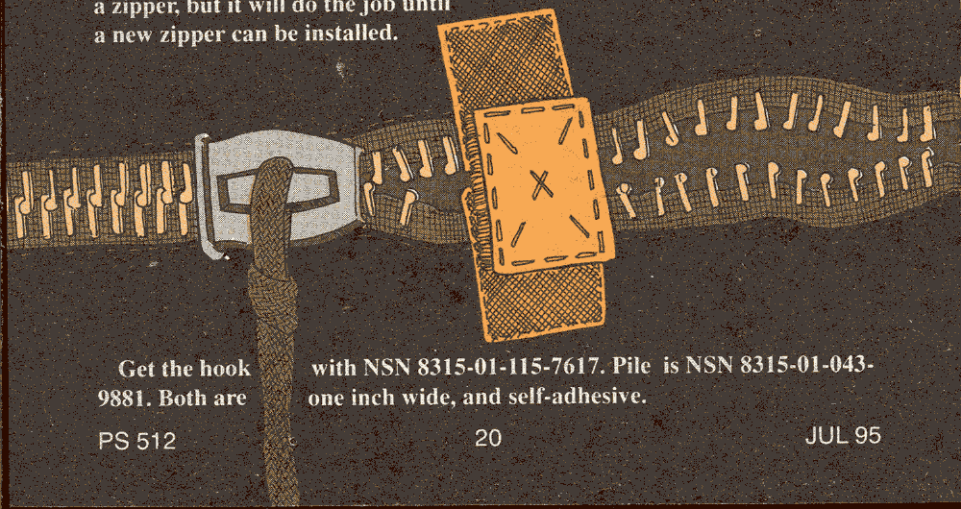


Tactical Vehicles . . .

Quick Zipper Fix

When a zipper breaks on your vehicle, close things up—temporarily—with hook and pile tape.

Hook and pile won't give you a waterproof seal, and is not as strong as a zipper, but it will do the job until a new zipper can be installed.



Get the hook with NSN 8315-01-115-7617. Pile is NSN 8315-01-043-9881. Both are one inch wide, and self-adhesive.

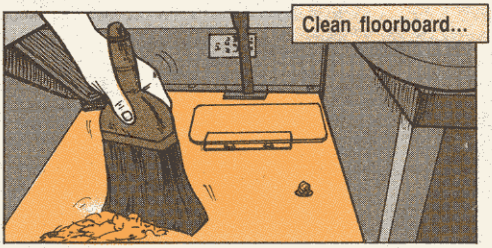
2 1/2-, 5-Ton Trucks . . .

Keep Brake Fluid Clean

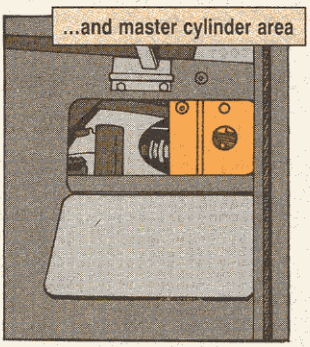
Before you open the master cylinder on your M44-, M39- or M809-series trucks, make sure the area around it is clean.

That includes the floorboard above the cylinder, too. Dirt, water or debris can all be knocked into the brake fluid—and foul up your braking.

Before you lift the access door to get at the master cylinder, clean it and the floor around it.



If you have to leave for any reason—to get brake fluid, for instance—cover the cylinder. Even a tiny speck of dirt can lead to brake trouble.

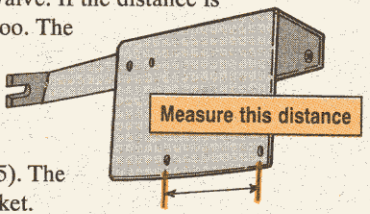


HEMTT Tanker . . .

Measure Mounting Bolts

Before you order a new control valve (Item 21 in Fig 267 of TM 9-2320-279-20P) for your M978 fuel tanker's primary pump hydraulic motor, measure the distance between the angle bracket holes.

If it measures 4 7/8 inches, order just the valve. If the distance is 5 3/4 inches, though, you need the bracket, too. The new valve won't fit the old bracket.



If you have to change to the new valve and bracket, replace the cotter pin (Item 19), valve lever (Item 20), the clevis (Item 24) and the straight pin (Item 25). The old hardware won't work with the new bracket.

No More Lost Keys

Dear Editor,

Keeping steering wheel padlock keys from getting lost is a real problem. We solved it by attaching a key chain and reel, NSN 5340-00-787-0148, to the logbook for each of our vehicles.

We drill an 1/8-in hole through the logbook and the belt loop of the reel. Then we attach the reel with an 1/8-in pop rivet to the upper, left-hand corner of the logbook.

Since this quick fix, we have lost no keys, and have not had to order any new padlocks for our vehicles.

SSG Mark A. Wiedmer
Troy, KS

FROM THE DESK OF THE *Editor*

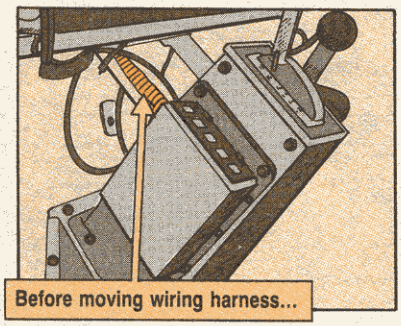
A riveting key idea! Good job! But remember to keep the key secured when not in use.

M939A2-Series Trucks . . .

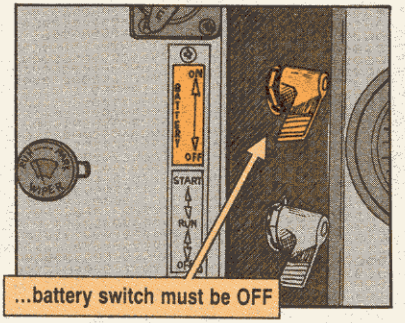
Switch Battery OFF

Before connecting or disconnecting the central tire inflation system's (CTIS) wiring harness connector from the electronic control unit (ECU) in your 5-tonner, set the vehicle battery switch to OFF.

Making a harness move while the battery switch is ON can damage the ECU, and leave you with no CTIS.



Before moving wiring harness...



...battery switch must be OFF

M929/M930-Series Dump Trucks . . .

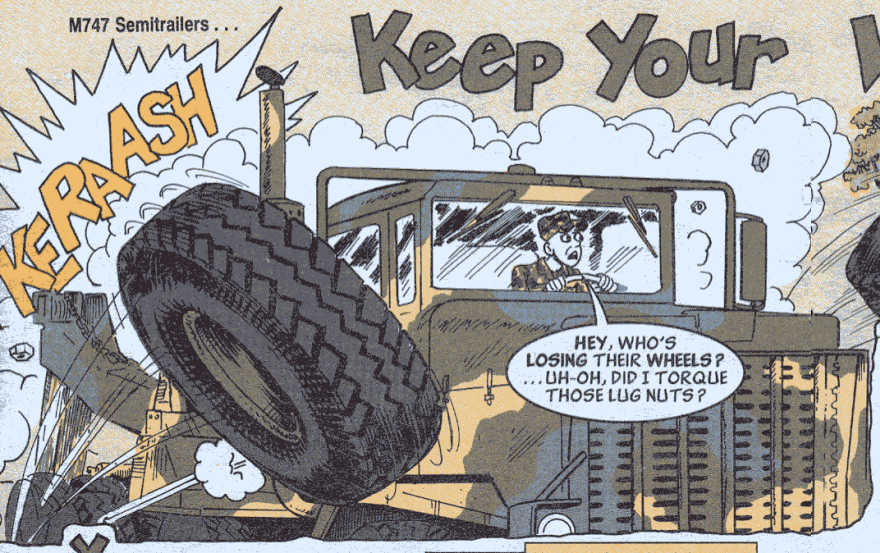
Hook 'n Save Flaps

Drivers, be sure to hook up the dump truck's mud flaps before dumping your load. If you don't, the flaps end up on the ground.

When backing up and dumping, flaps get caught under the rear wheels. Before you know it, they're gone.

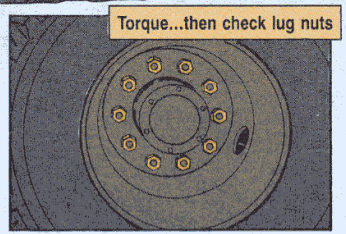
Those mud flaps have special hooks to keep 'em out of the way of the wheels when dumping.

Keep Your Wheels On



You HET drivers know it's important to keep the M747's wheels rolling. Some of you are finding out it's even more important for the wheels to be attached to the trailer while they roll.

There are reports of loose lug nuts and cap nuts flying off, letting wheels do the same thing. That's big trouble if a trailer has an M1A1 tank sitting on it.



Torque...then check lug nuts

Torque all lug nuts and cap nuts before the trailer leaves the motor pool. Because of the heavy loads the M747 carries, you must also check that torque halfway through your trip or at 50 miles, whichever comes first. Then test torque each 50 miles after that.

Trailer	Nut	NSN
Older trailers (1-200)	Lug nut (left side)	5310-00-880-2004
	Lug nut (right side)	5310-00-161-9964
	Cap nut (left side)	2530-00-693-1029
	Cap nut (right side)	2530-00-359-1162
New trailers (201 and up)	Self-locking nut	5310-00-538-0800

Tire Tips, Too

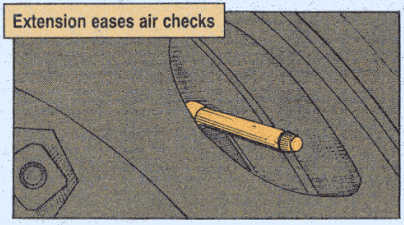
Now that the wheels are secure, give the tires some PM.

Test air pressure when tires are cold. Once the tires move, friction builds heat, which increases the reading. Letting air out will underinflate the tires, increasing friction and tire wear.

Proper pressure for the trailer tires is — Bias ply: 80 - 85, Radial ply: 90 - 95.

Always make sure that inner and outer tires on dual wheels have the same pressure, too. Uneven pressure makes one tire carry more of the load. That leads to uneven wear and shorter tire life.

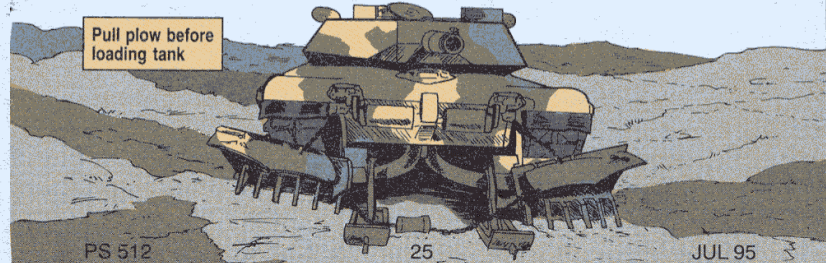
Use a valve stem extension, NSN 2640-00-338-2705, to help you get faster and more accurate pressure readings from the inner tire of dual wheels.



Extension eases air checks

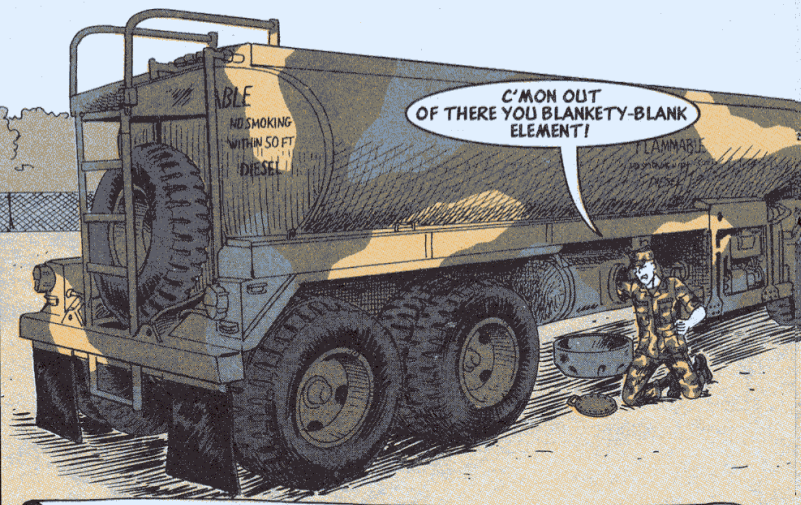
Watch Your Weight

An M747 semitrailer can only carry 70 tons. So, never push it. That means removing a mine plow or roller before transporting a tank.



Pull plow before loading tank

Filter Pulling Made Easy

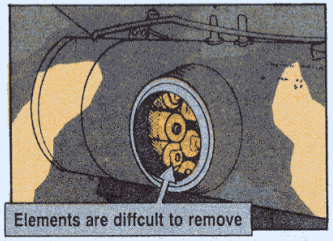


Dear Half-Mast,

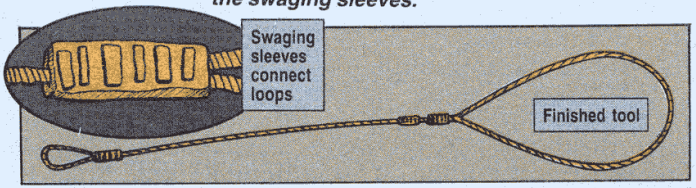
Removing the filter elements from the M969/A1 or M970/A1 fuel tanker's filter-separator is a tough job. The separator opening is small, it's hard to get hold of the elements, and the elements don't come out easily.

I've made a simple tool that makes the job much easier. To make one, all you need is 30 inches of stainless steel cable, NSN 4010-00-222-4482, and four swaging sleeves, NSN 4030-01-112-6238.

Make a loop at both ends of the cable. One loop should be 14 inches around (big enough to go around a filter element), and the other loop about three inches (big enough to loop around a pry bar).



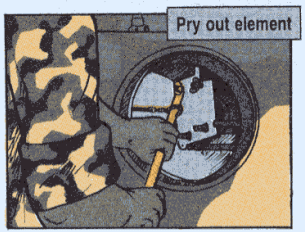
Once the loops are made, fasten the loose end to the cable with the swaging sleeves.



To pull out the elements, slide the big loop around the filter element. Push it as far back as it will go.

Then, slip the smaller loop around the pry bar. Wedge the bar against the far wall of the filter-separator and pry out each filter element.

SSG Danny Campbell
Selma, AL

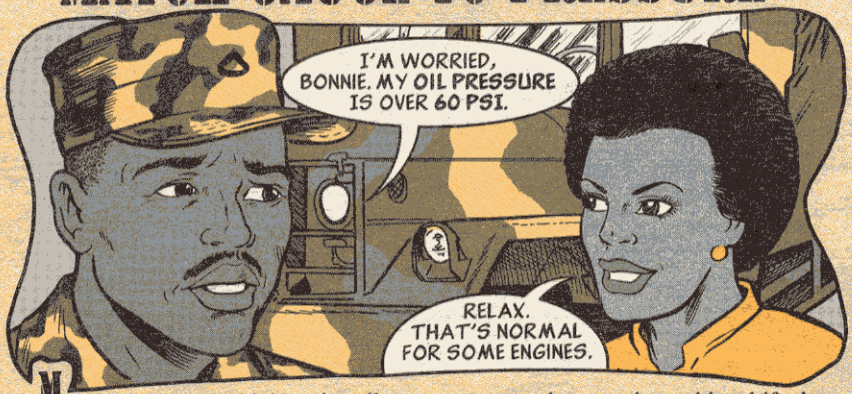


Dear Sergeant Campbell,

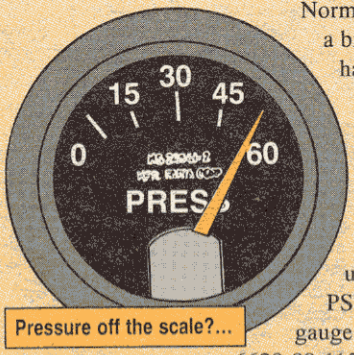
Thanks for the tip. Your suggestion will save a lot of sweat and skinned knuckles. Units should get their CO's OK before using the tool.

Half-Mast

MATCH GAUGE TO PRESSURE



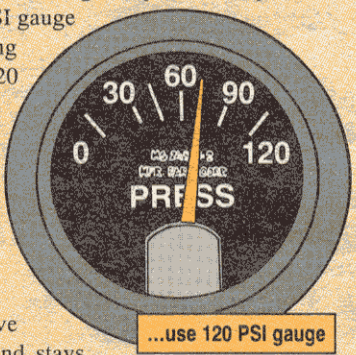
Mechanics, don't let high engine oil pressure get you down on those old multifuel trucks. Just because the pressure gauge reads a maximum of 60 PSI at idle doesn't mean your engine's in danger.



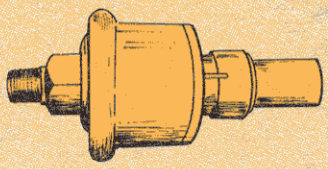
Pressure off the scale?...

Normal multifuel engine oil pressure can vary quite a bit from one engine to another. Some engines have a normal pressure higher than 60 PSI. In fact, oil pressure as high as 75 PSI at 2,600 RPM is OK.

To keep tabs on multifuel engines that normally show high oil pressure, replace the 60 PSI gauge and sending unit with 120 PSI parts: gauge NSN 6620-00-115-9042 and pressure transmitter NSN 6620-00-993-5546.



...use 120 PSI gauge



Replace pressure transmitter, NSN 6620-00-993-5546

If oil pressure goes above 80 PSI and stays there after the engine reaches normal operating temperature, get your support unit to check it out. Eighty PSI is too high.

FINER FILTER FACTS

Dear Windy,

We've had our L-model Black Hawks a couple of months now and every time we add oil to the transmission, the filter button pops soon after. What gives?

SGT B.S.G.

Dear Sergeant B.S.G.,

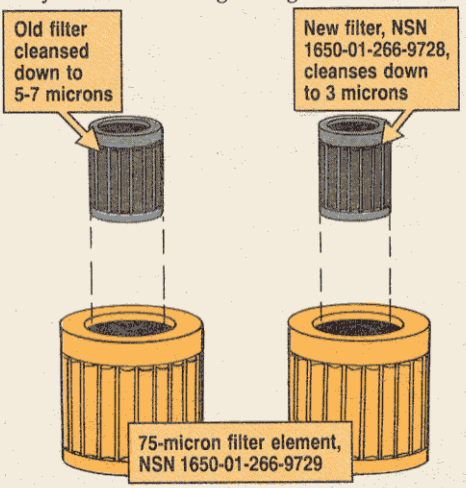
L-models have a transmission oil filter that will stop contaminants as small as three microns. The current transmission oil is only cleansed down to 5-7 microns. It doesn't take long before 5-7 micron-filtered oil running through a 3-micron filter will clog it.

When it does, change the filter, but not the oil.

Eventually, this finer filtration will mean fewer filter changes and more reliable transmissions. Initially, however, it means more filter changes.

Keep in mind, too, that the filtration system has two filters. In addition to the 3-micron primary filter, there's a 75-micron secondary filter. When you change the primary filter, also change the secondary filter if you find debris on the element.

Windy



AH-1P, E, F...

Just Another Screwy Story

Laying bare your Cobra's tail rotor drive gearbox is a cinch. With a few twists of your trusty screwdriver, out come the 32 screws and off come the covers.

When it's time to cover up, though, the screws have turned. Of those 32 screws, 16 are short and 16 are long. Which go where, and does it matter?

Darn right it does!

NSN 5305-00-912-7307

NSN 5305-00-849-4642

Put the long screws where the short ones belong and you'll damage the gearbox case. Put the short ones where the long ones belong and your covers won't stay on. They become a FOD risk.

The 16 short screws, NSN 5305-00-849-4642, are Item 58, Fig 44, in TM 55-1520-236-23P-1. The 16 long screws, NSN 5305-00-912-7307, are Item 57.

The solution is simple. Know that the screws are not interchangeable. Put them in separate containers during maintenance. Make sure to put them back in the correct holes.

Or maybe a screw "jig" will work for the situations where someone else may have to install the screws. The jig could mark where the screws belong.

AH-1S (MOD) . . .

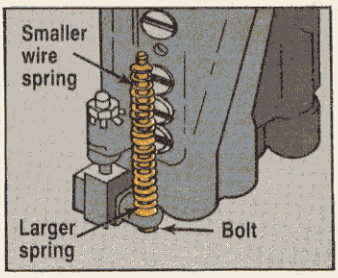
STOP THE COLLECTIVE CREEP

If your Cobra's collective control stick is a "creeper," it may be caused by a worn bolt on the servo cylinder.

Take out the bolt, Item 23 in Fig 128 of TM 55-1520-234-23P-1, and check for grooves worn into the bolt shank. Replace a bad bolt with NSN 5306-00-638-5777.

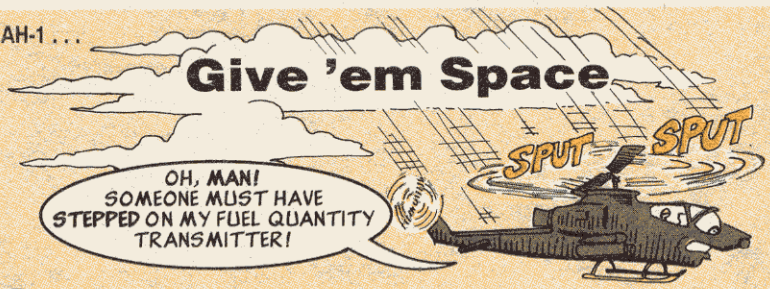
When you reassemble the bolt and springs, make sure the springs, Items 21 and 22 in Fig 128, go on correct. The smaller diameter spring is on top.

Also, don't forget that both ends of each spring take a washer.



AH-1 . . .

Give 'em Space

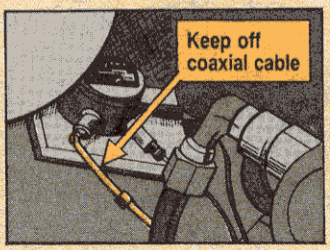


Some things you just want right: Christmas with snow; cherry pie with vanilla ice cream; movies with butter-soaked popcorn; and a Cobra with an accurate fuel gauge.

When the trucks below you look like ants it's no time to run out of fuel.

So, mechanics, be extra careful when you're working around the fuel quantity transmitter. Never step on it, bump it, or even touch it unless you have to.

That goes for the coaxial cable from the transmitter to the fuel gauge, too. If you step on it or bend it too sharply, you'll flatten the cable and ruin it. If you find a broken or cracked coax cable, don't try to repair it. Report it.



OH-58 . . .

Get Some Wingtips

Dear Windy,

On our Kiowas that have been modified by MWO 55-1520-228-50/25, the fasteners for the tail rotor driveshaft covers are a real pain.

You have to use a flat-tip screwdriver and a lot of force to turn the fasteners.

If the screwdriver slips when you apply pressure, you could easily damage the cover—maybe even put a hole in it—and injure your hand.

Someone said PS solved that problem years ago. So what's the solution?

SSG I.M.P.

Keep Your Punch Potent

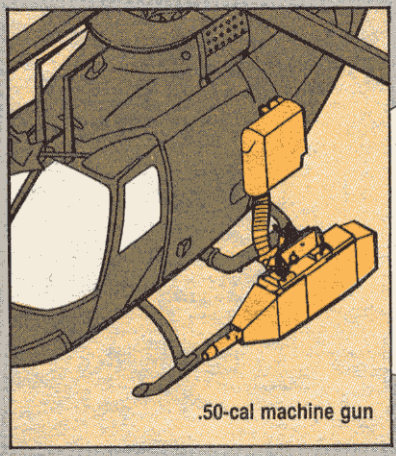
The M296 .50-cal machine gun strapped to the weapons pylon on your Warrior packs a potent punch. But that punch will weaken to a love tap if your gun's not lubed right.

Use LSA-T, MIL-L-46150, to lube the M296. It stands up to the tough rain and sand conditions your Warrior might fight in.

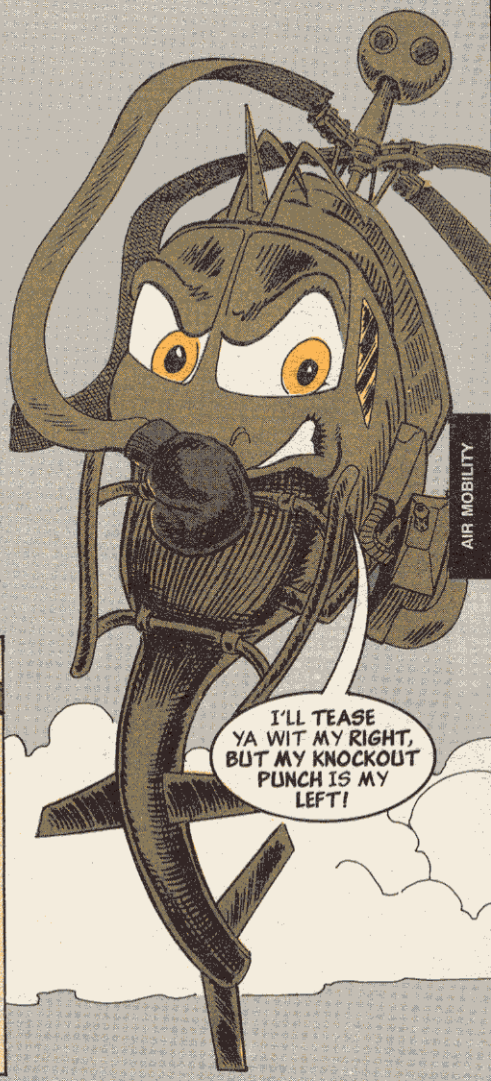
Order a 1-lb can with NSN 9150-01-109-7793. NSN 9150-00-949-0323 brings an 8-oz tube. NSN 9150-00-458-0075 brings a 16-oz can of alternate lube, VV-L-800.

For cold-weather operation use lube, MIL-L-14107, NSN 9150-00-292-9689. That brings a quart. NSN 9150-00-687-4241 brings a quart of an alternate cold-weather lube, MIL-L-46000.

Make a note until TM 9-1090-214-23&P is updated.



.50-cal machine gun



CH-47D . . .

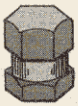
S-S-S-S-S-S-S-S-S

Dear Windy,

When the job calls for letting air out of a Chinook tire, most deflation methods can hurt the tire stem or core.

Too many times a slipped screwdriver has done more harm than good.

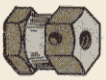
So we made this simple deflation tool. All you need is a stem cap, NSN 1650-00-222-4525, and a standard 6-32 screw.



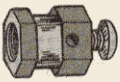
Have your machine shop drill and tap a hole in the top of the cap to fit the screw.

Cut the screw so that it only goes about half-way into the cap.

Drill a 1/16-in hole in the side of the cap. This will let the air escape.



Here's your finished product.



Now when you want to deflate a tire, just screw on the cap.

SSG Lewis Hood
Birmingham, AL

CPC PQDR

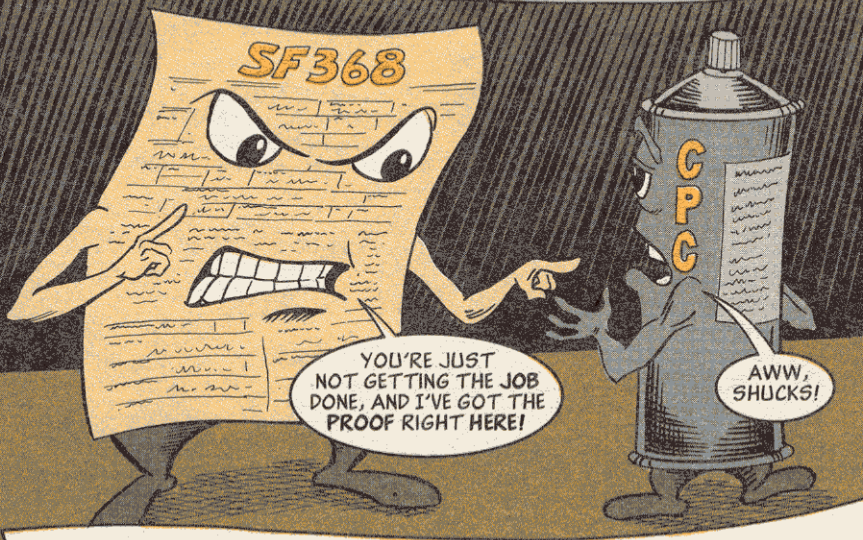
Dear Windy,

When we order corrosion preventive compound (CPC) for our avionics equipment, we use NSN 8030-00-546-8637.

In years past, several brands came under that NSN. Some brands were good, some were not, but we made do and got by.

Now we're getting just one brand and it's not very good. Its biggest drawback is that it gets gummy. How can we get the good stuff again?

SSG H.E.P.



Dear SSG H.E.P.,

A couple of years ago, the supply system went to one source for CPC. Only a few people have complained, so most users must like the product.

If you think differently, send in a SF 368, Product Quality Deficiency Report to GSA. Be specific in your complaint. Then suggest a better product.

If enough users complain, the bad CPC will be replaced. If no one complains, the system thinks you're happy with the stuff and you'll keep getting it.

Windy

GET WITH THE PROGRAM!

Operators, next time you start up your AN/PSN-11 Precision Lightweight GPS Receiver (PLGR), eyeball the software version number.

Look for it on the second display after you press the ON/BRT key. If you see software version number 3.1 or 4.1, it means the PLGR is classified SECRET when keyed with a COMSEC cryptovariable and must be safeguarded.

If you have a PLGR that's classified SECRET when keyed, turn it in to your unit maintainer. He'll notify the Global Positioning System (GPS) project manager's office and arrange to get the current software version installed. Once the current software is installed, your PLGR will be unclassified when keyed.

Here's where the unit maintainer can call or write for software help:

DSN 992-5758/6135
Commercial (908) 532-5758/6135
FAX DSN 992-6299
Commercial (908) 532-6299

Project Manager
Global Positioning System
Bldg 915, ATTN: SFAE-CM-GPS-RMD
Murphy Drive
Ft Monmouth, NJ 07703-5000

COPYRIGHT 1989
Rockwell Intl.
HNV-560A 4.1
AN/PSN-11 PLGR

Software version 3.1 or 4.1? Turn PLGR in to unit maintainer

The unit maintainer must provide both the software version number and the PLGR's serial number on the ID plate. After the GPS folks have reprogrammed the PLGR, they'll etch a large A on the ID plate.

AN/PSN-11
NAVIGATION SET, SATELLITE SIGNALS
NSN 5825-01-374-6643
SER NO. 4386
DSGN ACT. CODE 13499 PN 82[illegible]
CONTRACT [illegible]

...and serial number

COPYRIGHT 1989
Rockwell Intl.
HNV-560A 4.1
AN/PSN-11 PLGR

Tell PM GPS the software version number...

If the PLGR's display shows software version V04b.1, V04b.2, V04b.3 or higher, your PLGR is unclassified when keyed. PLGRs with these software versions DO NOT need reprogramming.

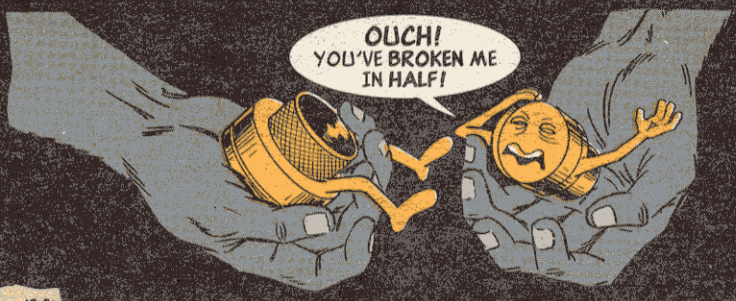
Software version V04b.1, V04b.2, V04b.3 or higher? It's OK

COPYRIGHT [illegible]
Rockwell Intl.
HNV-560A V04b.3
AN/PSN-11 PLGR

One final thing to remember: No matter which software version you have—old or current—any time you enter classified mission data, the PLGR is classified and must be safeguarded.

AN/PVS-7A NVG . . .

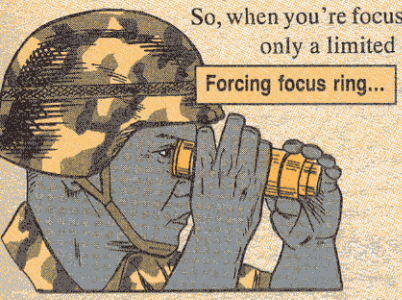
RINGS AND THINGS

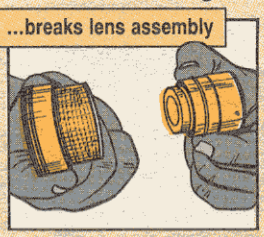


Here are two helpful hints for operating and storing your AN/PVS-7A night vision goggles. Read and heed these words to keep your night eyes seeing clear.

Focus Ring

The objective focus ring adjusts the objective lens to give you a sharp image. So, when you're focusing the goggles, remember that the ring will move only a limited distance before it stops. Never force the ring beyond the stop point, even if the viewing image is out of focus. If you force the ring, you'll break the objective lens assembly and it'll end up in pieces.





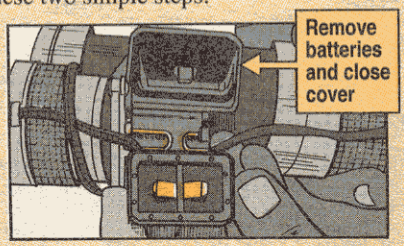
If you can't bring the goggles into sharp focus, turn them in to DS. They can safely adjust the ring and the objective lens.

Battery Compartment

Before stowing your goggles, follow these two simple steps:

❶ Take out the two alkaline batteries or the single lithium or mercury battery. Left inside, batteries can leak and corrode the battery compartment.

❷ Close the battery compartment cover. If you leave the cover open, you risk breaking the battery contacts or the clip that holds the cover to the goggles.



KY-57 COMSEC Equipment . . .

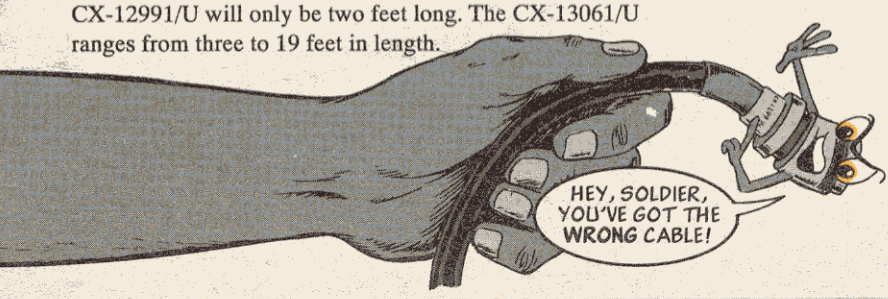
GET the RIGHT CABLE

Just because two things look alike doesn't mean they're interchangeable.

Take the KY-57's CX-12991/U and CX-13071/U cables for example. They look identical, but the CX-12991/U is used in the manpack while the CX-13071/U is used on the vehicular mounted AN/GRC-160 and AN/VRC-64.

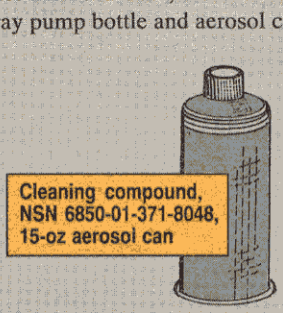
If you try to hook up the CX-13071/U cable to the power connector on the manpack RT, you'll damage the connector pins and the receptacle.

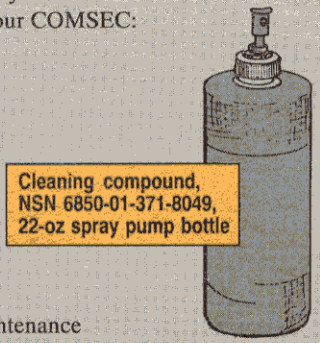
Prevent that damage by checking the label on the cable before each mission to make sure you've got the right one. If the label's missing, remember that the CX-12991/U will only be two feet long. The CX-13061/U ranges from three to 19 feet in length.



Get the Safe Cleaner

Trichlorotrifluoroethane is no longer an approved cleaner for use on any commo gear, including COMSEC equipment. That's because it harms the atmosphere. Since trichloro is out, the COMSEC folks say to use this cleaner — available in both spray pump bottle and aerosol can — on your COMSEC:





It's perfect for electrical equipment maintenance and general wipedown cleaning. The cleaner removes grease, oil, carbon and organic resins. And it's safe to use on most plastic and rubber items.

These cleaners will show up in COMSEC TMs eventually, but you can use 'em now.

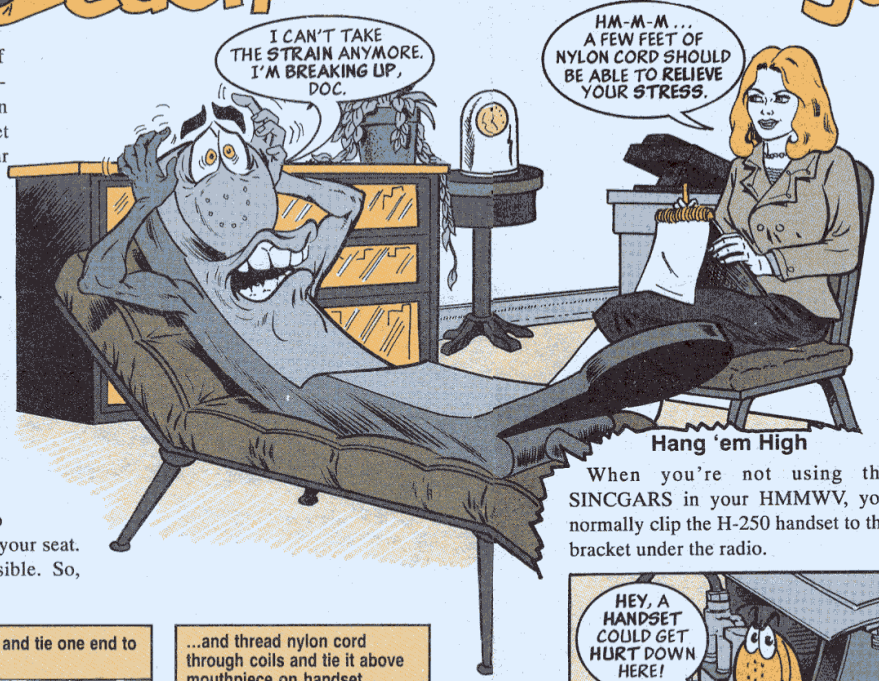
A Leash and a Hanger

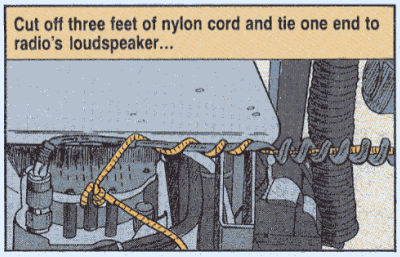
A few short strands of nylon cord, NSN 4020-00-246-0688, go a long way in protecting the H-250 handset on your SINCGARS vehicular radio.

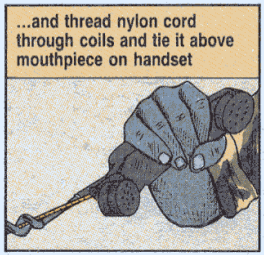
Stretched to the Limit

Stepping outside your HMMWV while talking on the H-250 stretches the handset cord too far. It strains the cord in two places: Just below the connector and at the base of the handset. Internal wiring bends and breaks. Soon, transmission and reception break up or go out altogether.

The most obvious way to avoid the strain is to stay in your seat. But that's not always possible. So, here's the next best thing:



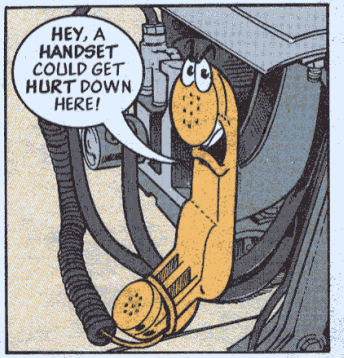




The nylon cord acts as a short leash that keeps you from stretching the handset cord to the breaking point.

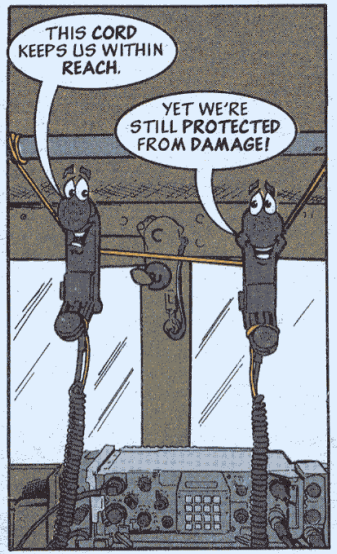
Hang 'em High

When you're not using the SINCGARS in your HMMWV, you normally clip the H-250 handset to the bracket under the radio.



That's OK unless you're carrying an M17 or M40 protective mask on your hip. Then, when you sit in the bucket seat, the mask hits the handset. The handset clip cracks or breaks.

A 3-ft length of nylon cord keeps the handset safe. Just tie each end of the cord to the front canvas bow in the HMMWV cab. Hang the handset on the cord by its clip. Hang it high and in the center of the windshield so it doesn't block your view.



SINCGARS . . .

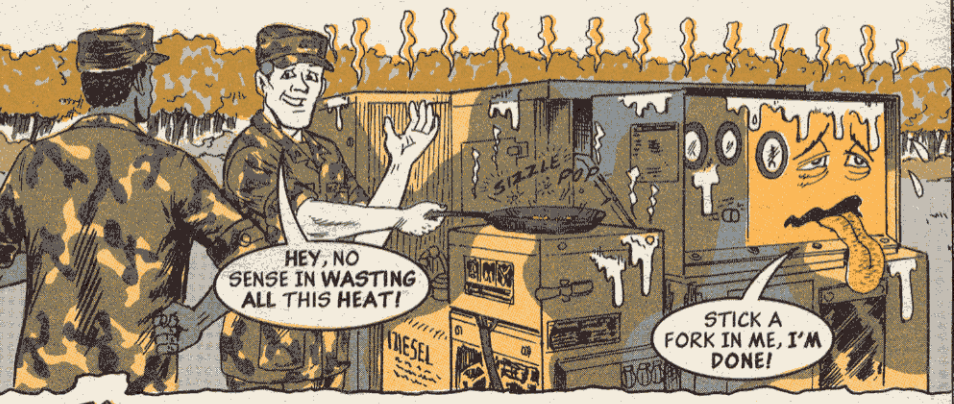
Before You Paint

Paint and your SINCGARS vehicular radio don't mix. Paint clogs connectors, binds switches, and dry rots the keypad and cables.

So, before you send your HMMWV to the shop for a paint job, remove the radio. That includes the receiver-transmitter, amplifier-adapter and any cables that can be removed.

Cables that can't be removed need protection, as does the mounting base. Put masking tape over any exposed cable connectors. Then cover the mounting base and the cables with a large plastic trash bag. Tape the trash bag to the radio shelf.

Too Hot to Operate



Your 5-KW or 10-KW DED generator with acoustic suppression kit (ASK) has a high temperature protection device that shuts down the generator when it gets too hot.

Although the ASK cuts down generator noise, it also restricts the amount of air flow around the generator. A steady flow of air is needed to keep in-side temperature down.

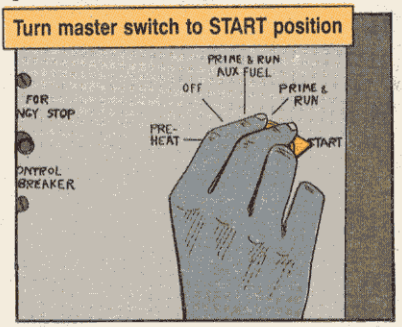
When the engine overtemp protective device's temperature reaches 394°F, the generator engine is shut off. The device will not let you start the generator until it cools down.

To cool down your generator, open all the doors. Wait 15 minutes. Then try to restart the generator.

If you need power in a hurry, though, you can bypass the device like this:

1. Place the output breaker to OPEN.

2. Turn the master switch to START. After the engine turns over, hold the switch in the START position for 2 1/2 minutes. This keeps the fan turning to cool the generator and high temperature protective device.



3. Release the master switch. It automatically moves to PRIME and RUN.

4. Switch the output breaker to CLOSE.

600-GPH Trailer-Mounted ROWPU . . .

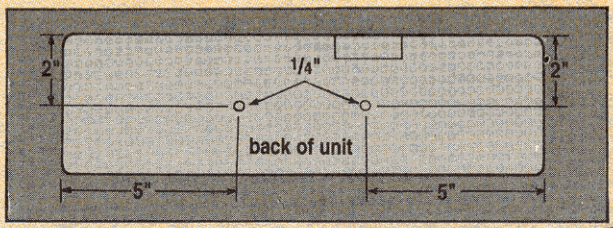
Drain Instrument Control Panel

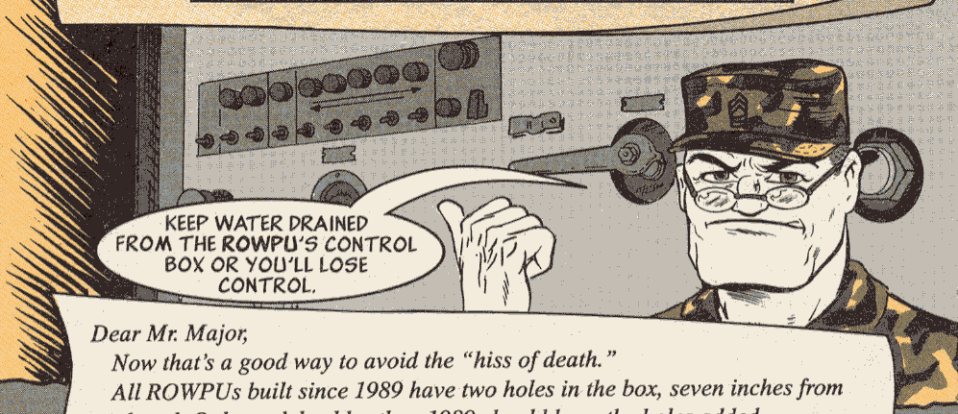
Dear MSG Half-Mast,

When we cleaned our 600-GPH ROWPUs, water leaked into the control box through the lamps and toggle switches. Water filled the control box up above the toggle switches on the bottom row! This caused our control boxes to short out.

We solved this problem by drilling two 1/4-in holes in the bottom of the control box, two inches from the front of the box and five inches from the end. Using two holes means water will drain whether you park the trailer on level ground or not.

Mr. Wesley Major
Ft Polk, LA





Dear Mr. Major,

Now that's a good way to avoid the "hiss of death."

All ROWPUs built since 1989 have two holes in the box, seven inches from each end. Only models older than 1989 should have the holes added.

However, be careful when you drill holes—the box is only 1/10 inch thick. One drain hole will work as long as you park the trailer where water will drain to the side with the hole.

Half-Mast

600-GPH ROWPU . . .

REMEMBER THE GENERATOR

When you pull PMCS on the 600-GPH ROWPU, you're not done until you pull maintenance on the 30-KW generator.

Too many operators quit early and neglect the generator.

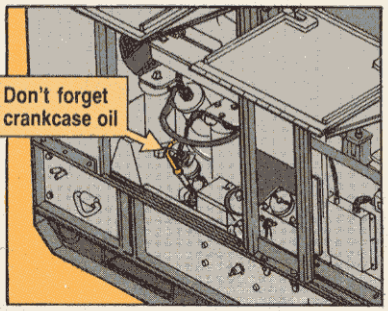
Remember, if your generator doesn't run, neither does your ROWPU. And your generator won't run without oil.

The 30-KW generator engine is covered by the Army oil analysis program (AOAP). Sample the crankcase oil like it says in the LO, and send the sample to the AOAP lab.

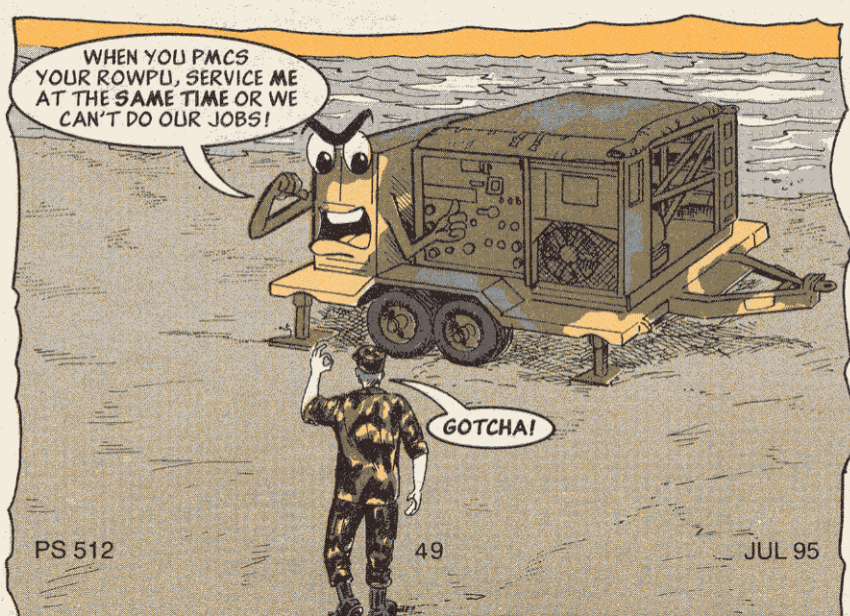
If a lab isn't available, drain and refill the crankcase oil and change the oil filter by the LO.

After an oil change, run the engine for five minutes and check for leaks.

After shutdown, check the crankcase oil level and make sure it's at the "FULL" mark. Do not overfill the crankcase because too much oil will blow seals.



For complete generator PM, read TM 5-6115-465-12 and follow LO 5-6115-465-12.



Fix 'Em, Don't Replace 'Em

You no longer have to keep expensive spares on-hand or worry with faulty patch kits for repairing rubberized fuel and water tanks.

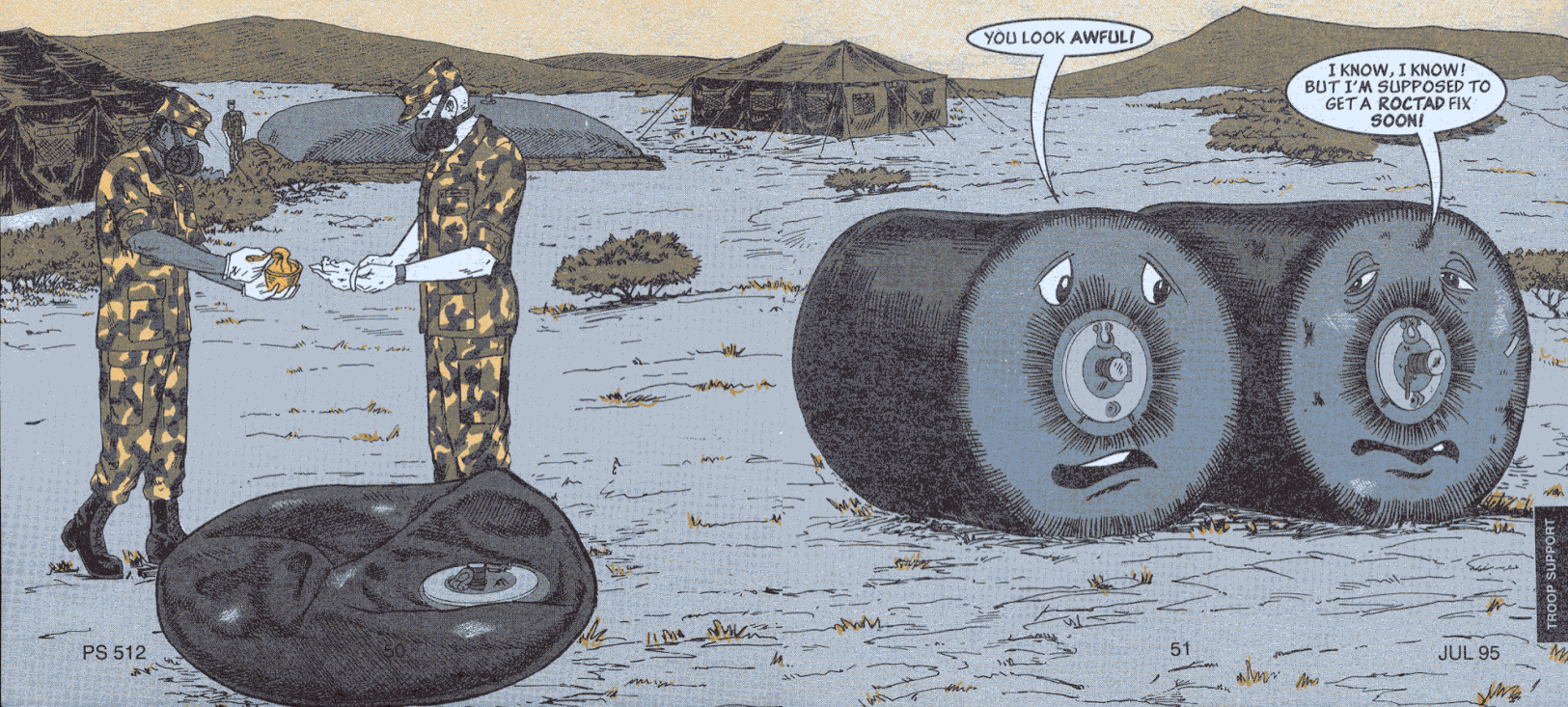
Instead, get Repair Outfit, Collapsible Tanks and Drums (ROCTAD), NSN 5430-01-359-1078.

The kit has two components that you mix together in a bowl and apply with a brush. You're actually painting on new rubber. It uses a cold temperature curing process that requires no special training for application. But the mixture is hazardous, so be sure to wear a respirator mask.

You can repair tanks in dry weather at temperatures between 40° and 80°F. A cured repair made on a tank, drum or berm liner tolerates outside temperatures of +125°F to -25°F. It also holds up under folded conditions at +150°F to -30°F stored. And best of all, continuous contact with rainwater, ground water and all types of fuels and oils has no affect on the repair.

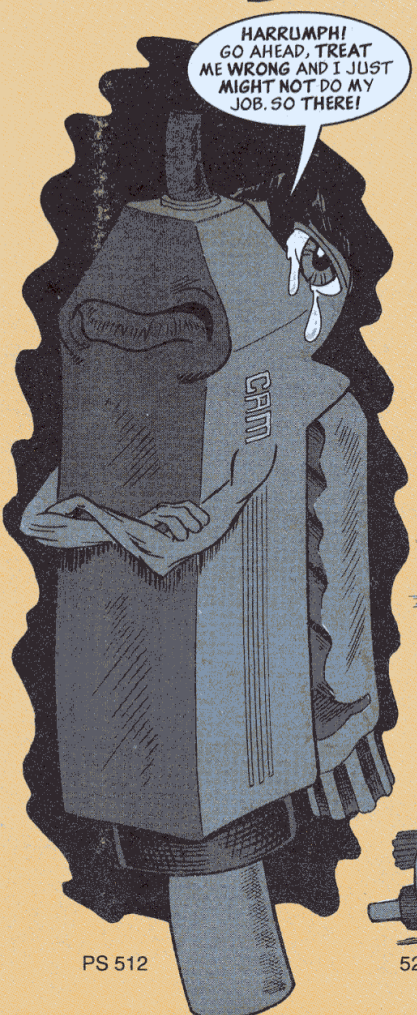
The ROCTAD saves money because repairs cost about one tenth of what a replacement tank costs.

The kit includes complete, simple instructions with pictures. However, if you have questions, get in touch with your local ATCOM Logistics Assistance Representative.



Chemical Agent Monitor . . .

Be Sensitive to Your CAM



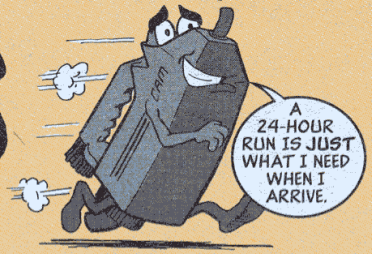
Sensitivity is what the chemical agent monitor (CAM) is all about. If it is to warn you of chemical agents, it has to be very sensitive.

Unfortunately, that's where the problem arises. Because the CAM's so sensitive, it takes just a moment of insensitve treatment to really foul it up.

There are two basic things NBC NCOs and operators must do to prevent saturation: Run it regularly and watch how you run it.

Run It

When you get new CAMs, immediately run them 24 hours. Give them a sniff of confidence sampler. If a CAM



doesn't pass the first confidence test, run it until it passes—but no more than 72 hours. After 72 hours, turn it in. It needs help.

Run a CAM at least 30 minutes per week and at least five minutes after all bars from the confidence-test have cleared. That's the single most important thing you can do to keep CAMs in shape.

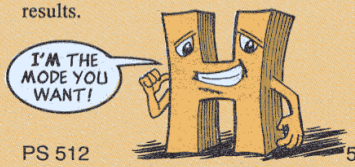
How to Run

The most important how-to is: **never leave the sampler on more than one second.** If the sampler's left on just one second longer, the CAM's saturated.

If the CAM doesn't pass the self-test, wait 10 seconds and try again. But do the test no more than five times. Doing the self-test more will only saturate it. Turn it in for maintenance.

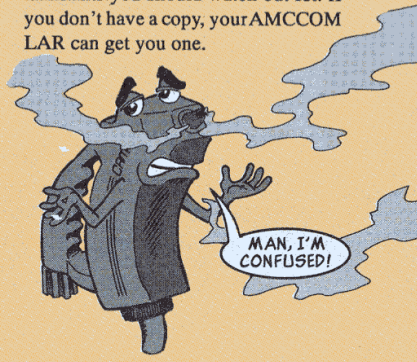
Any time you detect something with your CAM, pull it away immediately to prevent saturation.

Start and stop your CAM in the H mode. That's how the CAM's designed to be operated to give you the best results.

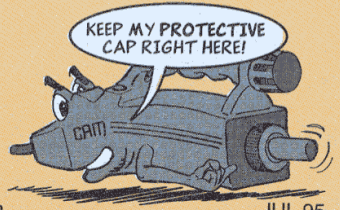


Clear the CAM to one bar before switching modes to prevent clearing problems.

Operate the CAM as much as possible in the open away from cleaning fluids, engine exhaust, and solvents. Contaminants make it very hard to clear it. Training Circular 3-4-1 lists the contaminants you should watch out for. If you don't have a copy, your AMCCOM LAR can get you one.

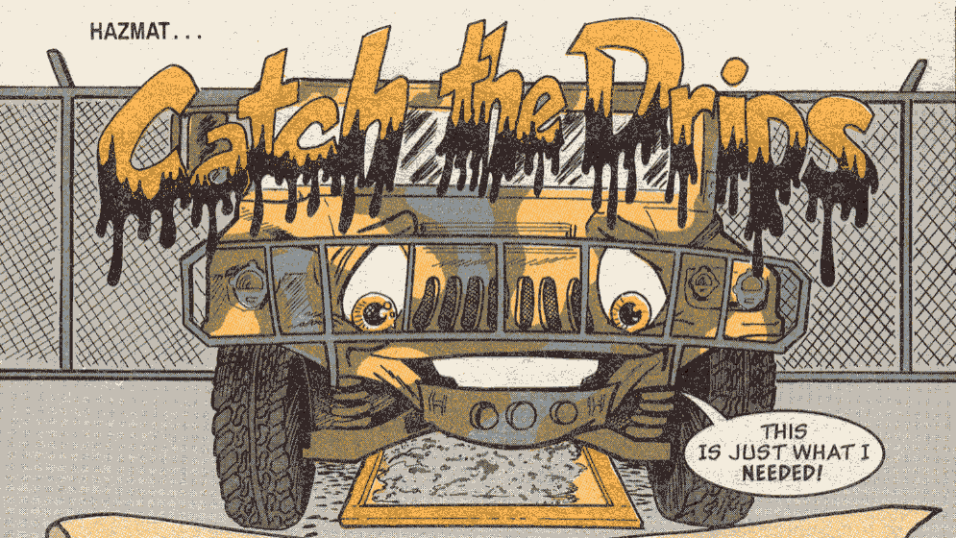


Any time you take off the nozzle protective cap, put it on the environmental cap. That keeps the protective cap free of dust and contaminants. In the field, use a nozzle standoff only once. That will give you the truest reading.



HAZMAT . . .

Catch the Drips



Dear Pablo,

Putting drip pans under vehicles every time you park them is a hassle. Even then there's no guarantee you'll position the pan where there's a leak. Our environmental folks came up with a solution.

We nail scrap 2x4s to a sheet of plywood to make a drip box that fits between the vehicle's wheels. To seal any cracks, we run glue where the 2x4s meet the plywood. When the glue is dry, we paint the drip box so no oil seeps through the wood.

After the box is completely dry, we cover the bottom with a small amount of sweep compound, NSN 7930-00-269-1272. If there's an oil leak, the oil doesn't get on the ground. We just scoop the contaminated sweep compound out of the box and dispose of it in an approved hazardous waste container.

We leave the drip box in the parking space and just back the vehicle into place. Now it's easier for us to determine where the vehicle's leaking.

SFC William D. Miller II
Ft Carson, CO

Dear Sergeant Miller,

Sounds like that's a good way to catch leaks! In some states, the oil in the sweep compound may not be a hazardous waste, but other vehicle fluids may be! Check with your local environmental people for state and local regulations.

Pablo

POL . . .

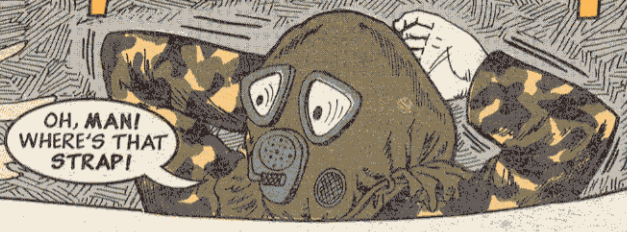
HANDY USER'S GUIDE

The info you need for proper storage, use and disposal of Army petroleum, oils and lubricants (POL) products is yours for the asking.

It's available in a booklet published by the TACOM fuel and lube folks. This booklet also identifies the hazardous or toxic components that are in POL products. It even gives hotline numbers for information on state and local restrictions.

M17-Series Masks . . .

Trap Hood Strap

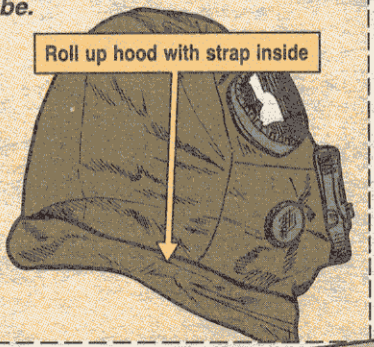


Dear Editor,

The strap tiedown on the M17 mask's hood was removed because it caused the hood strap to catch and rip the hood. But without the tiedown, the hood strap hangs free and is hard to find quickly. I have two suggestions to hold the strap:

1. Cut off a velcro tiedown from a hood that's no good. Glue the tiedown on the hood where the old tiedown was. Wrap the velcro strap around the hood strap and fasten them both to the velcro tiedown. The velcro tiedown holds the hood strap in place, yet not so tightly that it would cause the strap to rip the hood.

2. Center the strap on the back of the hood. Roll up the hood three or four times with the strap inside. Pull the hood over the mask with the strap still rolled in the hood. Put the mask in the carrier. Now when you put on the mask the strap will stay at the back of the hood where it's supposed to be.



SFC Wayne S. Melton
Hayes Center, NE

FROM THE DESK OF THE Editor

You have, indeed, trapped the elusive strap. We tip our hoods to you.

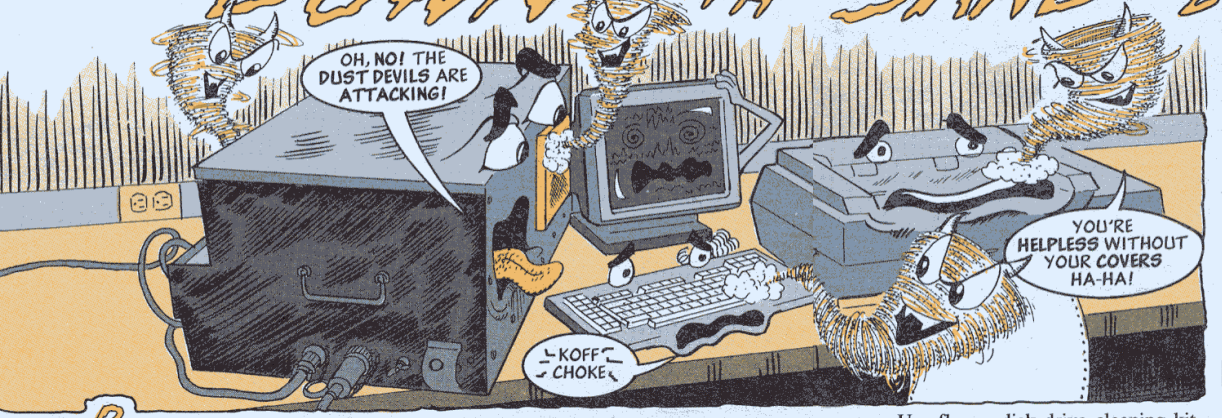
Maintenance Posters Available

Here are six new color maintenance posters available through the Baltimore Pubs Center:

DA Poster	Title
750-91	The deadly triangle—unsafe practices, unsafe conditions, and unsafe acts.
750-92	Your barrel's not clean 'til the patch is!
750-93	PMCS—The trucker's dozen.
750-94	Take off all jewelry before working on electrical equipment!
750-95	Use only tools designed and authorized for tire maintenance.
750-96	For SFDLR initial failure claims, just follow the yellow brick road!

If your unit didn't receive these posters on initial distribution, your pubs clerk can order them on DA Form 4569. To be sure you receive all new maintenance (750-series) posters, get your pubs clerk to add them to DA Form 12-04E, Block 0069. That way, when new posters are printed you'll get them automatically.

DOWN WITH SAND AND DUST



Dust and sand are the two top enemies of your AN/TYQ-33 (V), Tactical Army Combat Service Support Computer System (TACCS).

To conquer these tricky foes, you must fight them every chance you get.

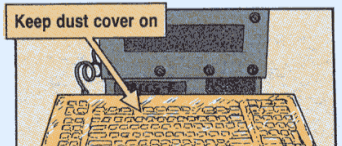
First, clean your TACCS equipment by the book—TM 11-7010-213-12. Then use these pointers to keep your system up and running.

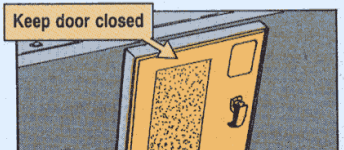
- Keep the dust cover on the KY-903 keyboard. It protects the keyboard from dust and dirt damage.

Never press the keys with a pencil or sharp object. You'll poke holes in the cover. That leaves a way for dust to get in.

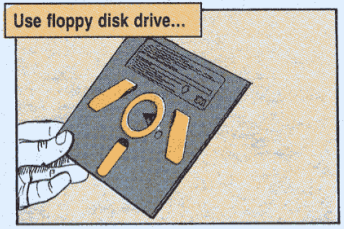
If the cover needs to be replaced, pack the keyboard and its parts in the transit case and turn them in to DS for exchange.

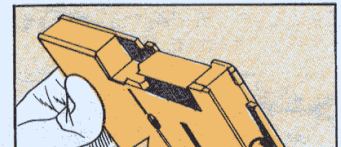
- Keep the door to the floppy disk and tape drives closed. Dirt on the heads of these drives damage the floppy or tape. Also, dirt prevents the computer from reading your files.





Use floppy disk drive cleaning kit, NSN 7035-01-154-1315, and tape drive cleaning kit, NSN 7035-00-348-1864, to keep the drive heads clean.





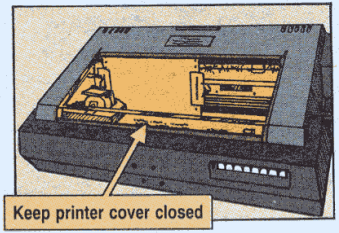
To make sure the floppy diskettes stay free of dirt, put them in storage boxes. Here are the boxes that are available:

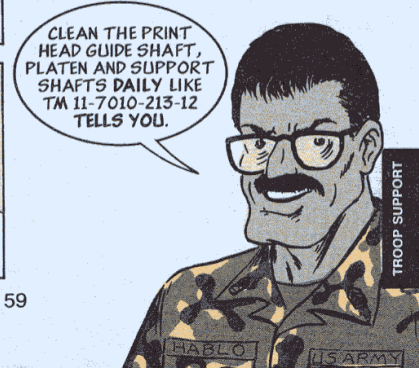
NSN	Diskettes held
7520-01-239-1504*	100
7045-01-179-2980	50
7045-01-196-7227	50 (with Key Lock)

Local Purchase

Or save the storage box the tape cartridges come in. Put the cartridges in their boxes when not in use.

- Keep the RP-336 printer cover closed. Dust and paper bits stop the printer from doing its job.





Connie's Post Scripts

Semitrailer Side Rack

Use NSN 2510-01-063-0263 to get the correct roadside (forward) side rack for M872-, A1-, A2- and A3-series 34-ton semitrailers. The NSN shown in Fig 45 of TM 9-2330-359-14&P is for the M871A2 semi.

Fire Extinquisher Bracket

There is no NSN for the fire extinguisher bracket on 5,000-gal fuel tankers. Order on a DD Form 1348-6 using CAGE 03670, PN 14228 from S91. Make a note until TM 9-2330-356-24P is updated.

M939A2 Needs O-ring

Add an O-ring to Fig 84 of TM 9-2320-358-24&P as part of the M939A2's rear axle wheel valve adapter. The O-ring, NSN 5330-00-285-9842, is needed between Items 8 and 9 to prevent air leaks.

HEMTT Dust Plug

If the air brake chambers on your HEMTT don't have a cap and screw to keep dust and water out, use dust plug, NSN 5340-01-163-2073. Only newer chambers come with the cap and screw, but all chambers need the protection.

Power Steering V-belt

NSN 3030-00-832-4312 gets the V-belts for power steering pumps on M939- and M939A1-series 5-ton trucks. The NSN shown in TM 9-2320-272-20P is wrong.

M870A1 Hub Cover NSN

NSN 5340-01-042-0573 gets the axle hub cover for the 40-ton semitrailer. The NSN shown in TM 5-2330-378-14&P is wrong.

USMC HMMWV Winch Kit

Marines, note this NSN change for the self-recovery winch for the M998 HMMWV. It's NSN 2590-01-316-9636. It's the same winch that's used on the M1038 HMMWV. Get your CO's OK before ordering.

Distribution: To be distributed in accordance with DA Form 12-34-E, Block 0312, for TB-43-Series

Would You Stake Your Life right now on the Condition of Your Equipment?

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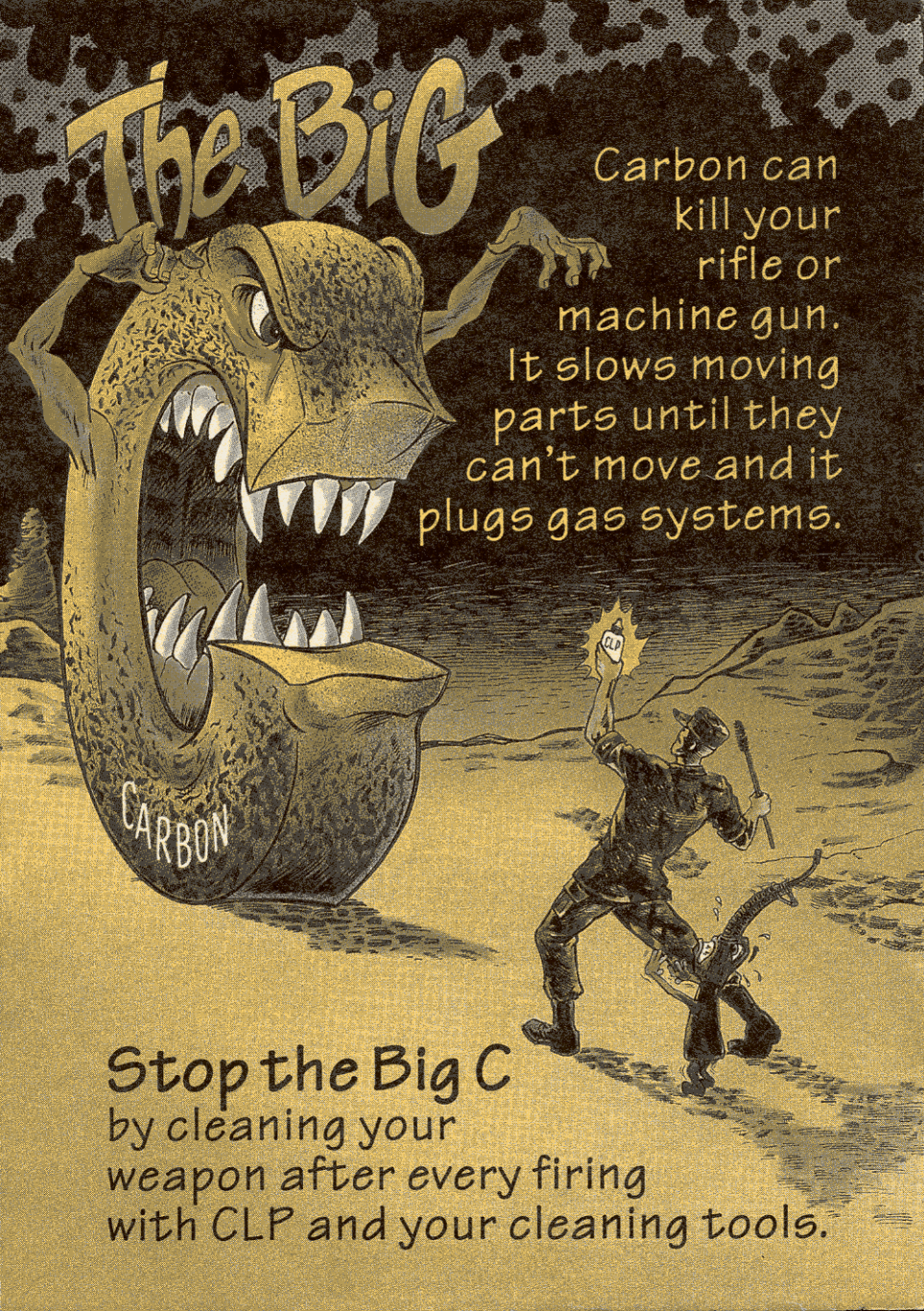
The BiG
Carbon can kill your rifle or machine gun. It slows moving parts until they can't move and it plugs gas systems.
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Stop the Big C
by cleaning your weapon after every firing with CLP and your cleaning tools.