



**THE
PREVENTIVE
MAINTENANCE
MONTHLY**

TB 43-PS-565, 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. Masculine pronouns may refer to both genders.

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

**MSG Half-Mast
The Preventive Maintenance Monthly
LOGSA, Bldg. 5307
Redstone Arsenal, AL 35898-7466**

Or E-mail to:

psmag@logsa.army.mil

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PS

December 1999

THE PREVENTIVE MAINTENANCE MONTHLY



'Twas late in December and all 'round the world,
There was hope in the heart of each boy and girl.
Call it Kwaanza, Hanukah, or Christmas, that's fine,
It was holiday season and gift-giving time.
Trouble was, there were problems with assembly and parts.
And anxious parents were clutching their hearts.

When out of the mist there arose such a clatter,
It was Half-Mast who quickly saw what was the matter.
For the old sergeant knew, and would bet his last dime,
Only one thing would make those toys ready in time.

'Twas PREVENTIVE MAINTENANCE, the same sort of stuff
That pulls soldiers through when the going gets rough.
Get the right parts, and read the instructions,
And your toys will be humming like elfin constructions.
For toys or equipment, the story's still true,
With PM in your stocking, there's no worry for you.

In a flash all was ready and he drove out of sight,
Saying—

Happy Holidays to all—
Keep PM shining bright!



GIMME A TM ANY DAY!

THANK GOODNESS PM IS NEVER THIS COMPLICATED!

HOME IS WHERE THE ARMY SENDS US

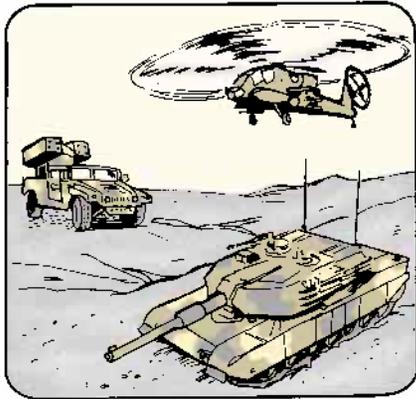
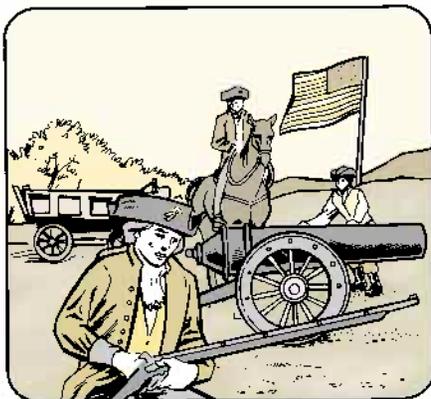
Approved for Public Release, Distribution Is Unlimited

Times Have Changed?

AS WE GET READY TO TAKE OUR BIG STEP FORWARD INTO THE YEAR 2000, I THINK WE CAN LEARN A VALUABLE LESSON BY TAKING A LONG LOOK BACK AT WHERE WE'VE BEEN.

OUR ARMY HAS CHANGED A LOT SINCE '76—THAT'S 1776 FOR YOU YOUNGSTERS—WHEN OUR FOREFATHERS TOOK UP THEIR WEAPONS TO EARN THEIR FREEDOM.

YES, TIMES HAVE CHANGED, BUT ONE MIGHTY IMPORTANT THING THEY DID—AND YOU STILL DO—HAS NOT CHANGED. THAT'S MAINTAINING YOUR EQUIPMENT. IN FACT, THE JOB IS BIGGER TODAY THAN IT WAS THEN. THE SOLDIERS OF '76 HAD FLINTLOCKS, MUZZLE-LOADING CANNONS, AND WOODEN WAGONS.



YOU HAVE THE BEST THAT OUR MODERN COUNTRY CAN PRODUCE OF SLICK-OPERATING WEAPONS, TANKS, TRUCKS, COMMO GEAR, AND ALL THE OTHER HIGH-TECH STUFF YOU COULD ADD TO THE LIST.

THAT'S WHERE YOU—THE MODERN-DAY MINUTEMAN AND MINUTEWOMAN—COME IN. YOU'VE GOT TO MAINTAIN THAT EQUIPMENT SO IT'S READY TO GO WHERE AND WHEN IT'S NEEDED, AND WILL KEEP OPERATING WHEN IT GETS THERE.

LIKE I'VE BEEN TELLING YOU SINCE '51—THAT'S 1951 FOR YOU SMART-ALECKS—“YOU'VE GOT THE WORLD'S BEST EQUIPMENT, TAKE CARE OF IT.”



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Running Gear

Will the transmission on a basic model M998 work on a M998A2?

Will the front prop shaft on an M998A2 work on an M1114?

Will the engine from an M998A1 work in a basic M998? (Answers at the end of this article.)

Questions like these are common these days, since the HMMWV has so many different models and series in the field.

There's the original M998-series trucks; the M998A1-series; the M998A2-series; and the M1113 and M1114 models.

To keep things straight in the maintenance bay, here's what each series of models uses for running gear:

Basic M998-series (except M1097)

Engine and container:

- 6.2L pre-1990, NSN 2815-01-231-3672 (used on serial numbers 1-99,999)
- 6.2L post-1990, NSN 2815-01-314-7940 (used on serial numbers 100,000 and above)
- 6.5L detuned, NSN 2815-01-406-6675 (1996)
- 6.5L detuned, NSN 2815-01-439-6664 (1997)

Transmission:

3L80E, NSN 2520-01-161-2136

Transfer case:

- 218 model, NSN 2520-01-163-4999 or
- 242 model, NSN 2520-01-409-2512 (Conversion kit, NSN 2520-01-434-0822, installs the 242 model (slip-type yoke) in

Wrap-up

trucks once the 218 model (bolt-type flange) is no longer available)

Front prop shaft (off front axle differential):

NSN 2520-01-200-3097 (U-joint repair kit, NSN 2520-00-722-7074, contains cross assembly, retaining rings and bearing race caps)

Front prop shaft (off transfer):

- with 218 model transfer installed—NSN 2520-01-200-3096 (U-joint repair kit, NSN 2520-00-722-7074)
- with 242 model transfer installed—NSN 2520-01-357-5043 (U-joint repair kit, NSN 2520-01-189-2135)

Rear prop shaft:

- with 218 model transfer installed on trucks serial numbered 1-44,824 with

out parking brake MWO 9-2320-280-35-1 applied—NSN 2520-01-171-8258

- with 218 model transfer installed on trucks serial numbered 44,825 and above or with parking brake MWO 9-2320-280-35-1 applied—NSN 2520-01-346-1374

- with 242 model transfer installed—NSN 2520-01-459-0050 (U-joint repair kit, NSN 2520-01-189-2135, for all rear shafts)

M1097 and M998A1-series

Engine and container:

- 6.2L post-1990, NSN 2815-01-314-7940
- 6.5L detuned, NSN 2815-01-406-6675 (1996)
- 6.5L detuned, NSN 2815-01-439-6664 (1997)

Transmission:

3L80E, NSN 2520-01-161-2136

Transfer case:

242 model (three bolts holding extension housing), NSN 2520-01-356-9197 or 2520-01-452-8365 (with container)

Front prop shaft (off front axle differential):

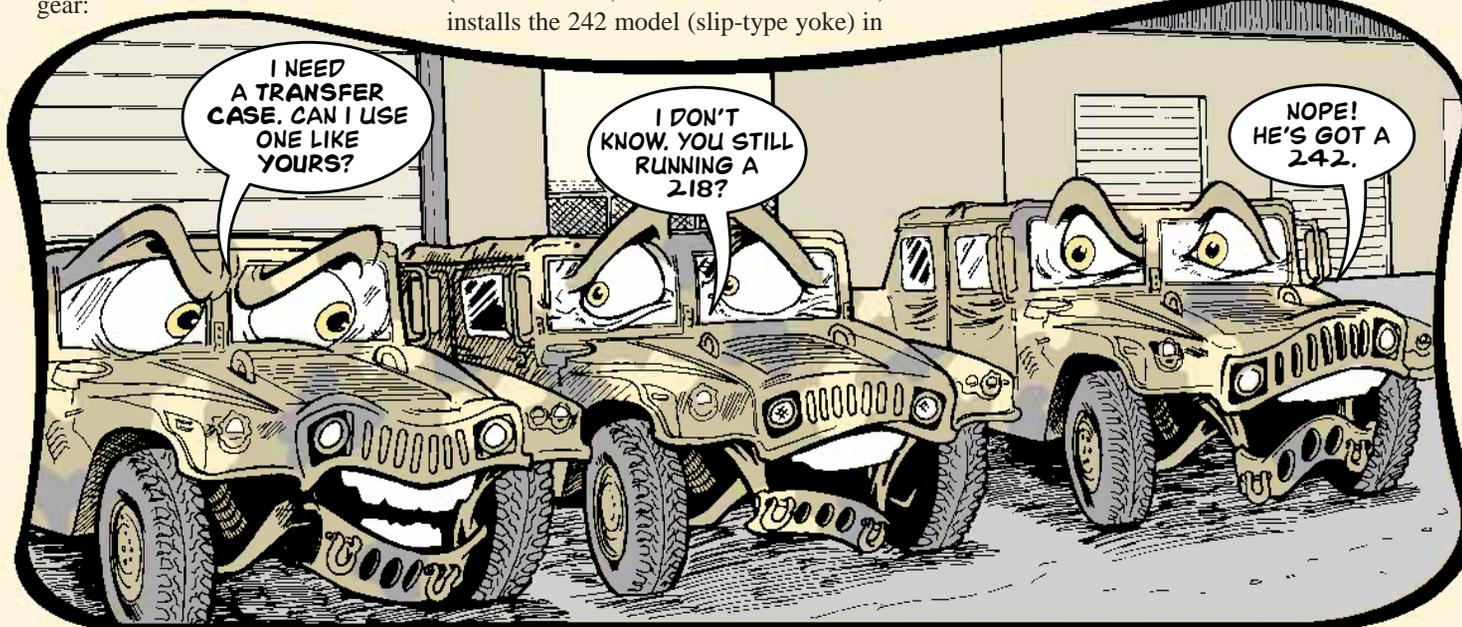
NSN 2520-01-356-9189 (U-joint repair kit, NSN 2520-01-189-2135)

Front prop shaft (off transfer):

NSN 2520-01-357-5043 (U-joint repair kit, NSN 2520-01-189-2135)

Rear prop shaft:

NSN 2520-01-357-5044 (U-joint repair kit, NSN 2520-01-189-2135)



M998A2-series

Engine and container:

- 6.5L naturally aspirated, NSN 2815-01-410-9710 (1996)
- 6.5L naturally aspirated, NSN 2815-01-439-6665 (1997)

Transmission:

4L80E, NSN 2520-01-430-5294 (1996) or NSN 2520-01-439-6830 (1997)

Transfer case:

242 model (four bolts holding extension housing), NSN 2520-01-409-2512

Front prop shaft (off front axle differential):

NSN 2520-01-423-5120 (U-joint repair kit, NSN 2520-01-189-2135)

Front prop shaft (off transfer):

NSN 2520-01-413-0080 (U-joint repair kit, NSN 2520-01-189-2135)

Rear prop shaft:

NSN 2520-01-424-0425 (U-joint repair kit, NSN 2520-01-359-8444)

M1113 and M1114

Engine and container:

6.5 turbo, NSN 2815-01-420-4180 (1996) or NSN 2815-01-439-8164 (1997)

Transmission:

4L80E, NSN 2520-01-430-2765 (1996) or NSN 2520-01-439-6831 (1997)

Transfer case:

242 model, NSN 2520-01-409-2512

Front prop shaft (off front axle differential):

NSN 2520-01-423-5120 (U-joint repair kit, NSN 2520-01-189-2135)

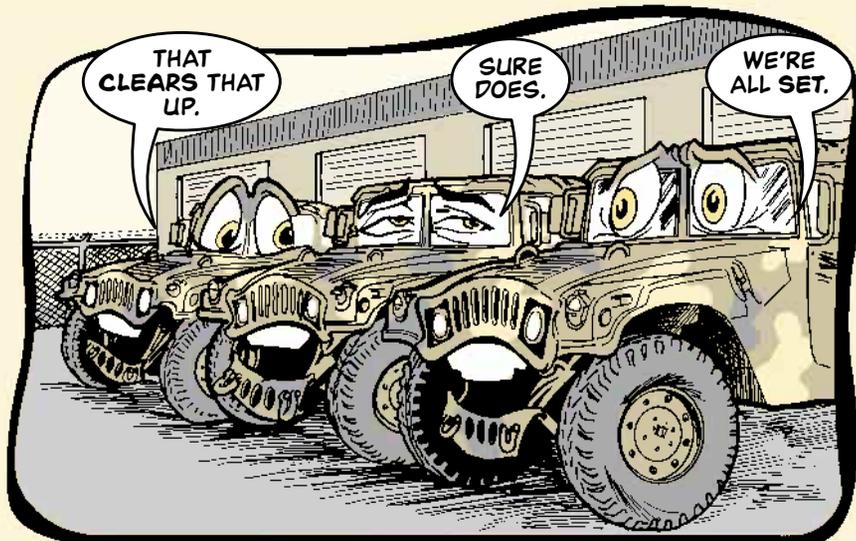
Front prop shaft (off transfer):

NSN 2520-01-413-0080 (U-joint repair kit NSN 2520-01-189-2135)

Rear prop shaft:

NSN 2520-01-424-0425 (U-joint repair kit, NSN 2520-01-359-8444)

Now you've read this article, you know the answers are NO, YES and YES using the charts.



HMMWV...

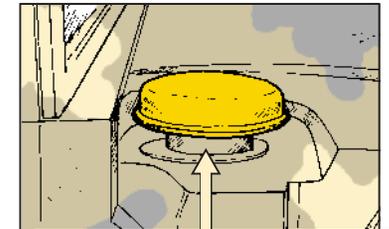
Don't Squash the Cap!



It's a little thing, drivers and mechanics, but if the air cleaner weather cap on your HMMWV is pushed down too far, snow and ice that accumulates around the cap will cut off the airflow through the cap to the engine.

Check the weather cap to see how high it sits above the air intake duct. If the cap is right down on the duct, grasp it with both hands and pull it up.

Leave about two inches between the duct and the bottom of the cap. That'll keep the air flowing. In heavy snow, of course, you'll need to remove the stuff as it piles up to prevent ice from forming in the filter.



Keep weather cap raised two inches

Tactical and Combat Vehicles ...

Save Slave Cover

When temperatures drop, the plastic cover on your vehicle's slave receptacle starts to shrink. That shrinkage makes the cover stick like glue to the receptacle.

A screwdriver will pry it off, but that often breaks the cover.

Make sure it doesn't stick in the first place by adding a thin layer of waterless hand cleaner, NSN 8520-00-965-2109, to the inside of the cover. That'll keep it slick enough to let the cap come off easily in any weather.



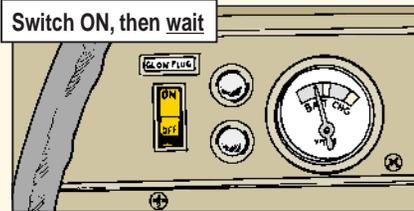
Smear cleaner in slave receptacle cover

Getting Cold

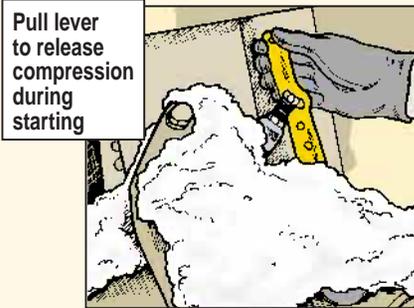
Starting F5070 dump trucks in cold weather has never been a snap, but as the trucks get older, the chore gets tougher.

You operators can make starting these 20-ton monsters a little easier. Here's how:

- * Flip the glow plug switch to ON and wait 20 seconds as the intake manifold warms.



- * Have a buddy pull the compression release lever at the front of the engine to allow the engine to turn over easier.



I DON'T THINK I CAN MAKE IT THROUGH ANOTHER WINTER OF COLD WEATHER STARTS.



Weather Starts

- * Pump the fuel pressure primary pump until you get 80–100 psi.

- * Crank the engine. When it's turning over, have your buddy let go of the compression lever.

- * After the engine starts, pump the primer slowly for a few minutes until the engine warms up and runs smoothly.

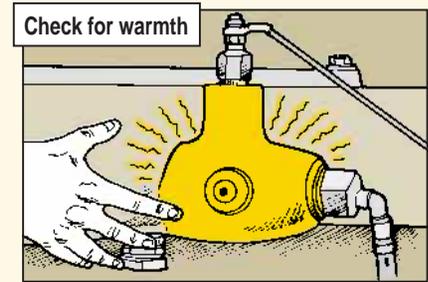
Then push the primer handle in and lock it. Turn the glow plug off so it'll be ready for the next time.

Never use ether to help start the F5070. Mix ether with a glow plug and you can cause a fire or an explosion.

If the engine doesn't start after 20 seconds, stop cranking and stop pumping the primer. Let the starter cool for two minutes.

Make sure the glow plug is working by feeling the intake manifold below the plug. If it's warm, the

plug's working. If the manifold is cold, get your mechanic to check out the plug.



If the plug's working, try the starting routine again.

IF YOU CAN'T GET THE ENGINE STARTED AFTER THREE ATTEMPTS, STOP AND CALL YOUR MECHANIC.



Radiator Testing Kit . . .

You've Got to Adapt

There's an exception to every rule.

ST255 and SVT262 radiator testing kits are great for testing the cooling system on your vehicle—except when your vehicle happens to be a 2½-ton or larger truck.

The tester head in the ST255 and SVT262 kits won't fit on the radiator neck in those trucks, so use adapter kit, NSN 4910-01-447-5586.

The kit comes with everything you need to test the radiators and radiator caps of those big trucks. Order the kit on a DD Form 1348-6, adding "NSN not on AMDF" in the REMARKS block.

Hub Air Seal Installation

If you can't keep air in a CTIS-equipped wheel after you've done hub repair or maintenance on your M939A2-series truck, you probably installed one or both air seals backward.

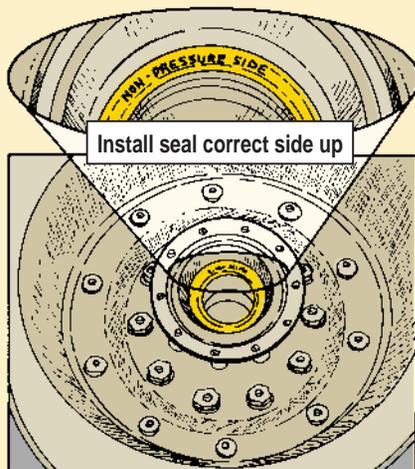
Putting either of the two seals in backward lets air escape through the wheel. The trouble is that the seals don't look much different from side to side, making it easy to install them backward—if you don't know what to look for.

One side of the seal has **NON-PRESSURE SIDE** imprinted in the rubber. That's the key to correct installation.

Eyeball Para 3-460 and Para 3-461 of TM 9-2320-272-24-2. These installation instructions tell you to use the long end of the air seal installer to install an air seal with the spring facing out.

This spring, which gives the seal its shape, is often hard to see. Just remember that the spring side is opposite from the imprint non-pressure side. For this first seal, the imprinted side should face away from you when it's seated.

The second air seal is installed with the short end of the installer. For this seal, the imprinted side must face toward you when it's seated.

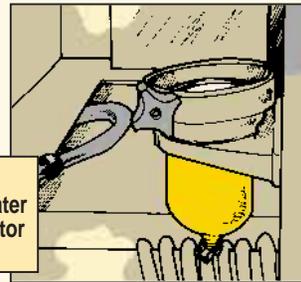


Keep 'em Pumping

Whether your 350-gpm fuel pump is pumping or parked, use these tips to keep it ready:

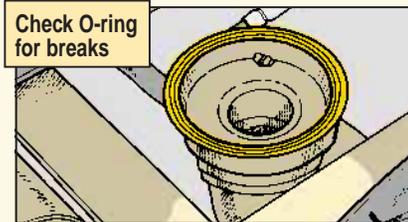
The TM's PMCS calls for draining the fuel/water separator weekly. If you don't, corrosion quickly creates crud in the filter. Most of the crud is caught by the filter, but some gets to the fuel pump, causing a pump failure.

Drain fuel/water separator weekly



Additionally, operators need to check the O-ring in the top of the separator

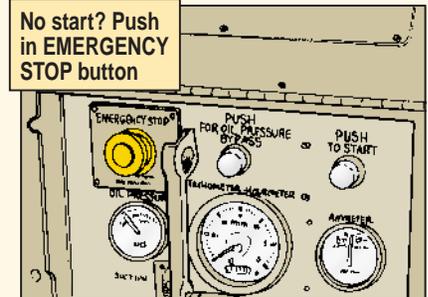
Check O-ring for breaks



when they do the draining. A broken O-ring lets air into the fuel system, preventing starts.

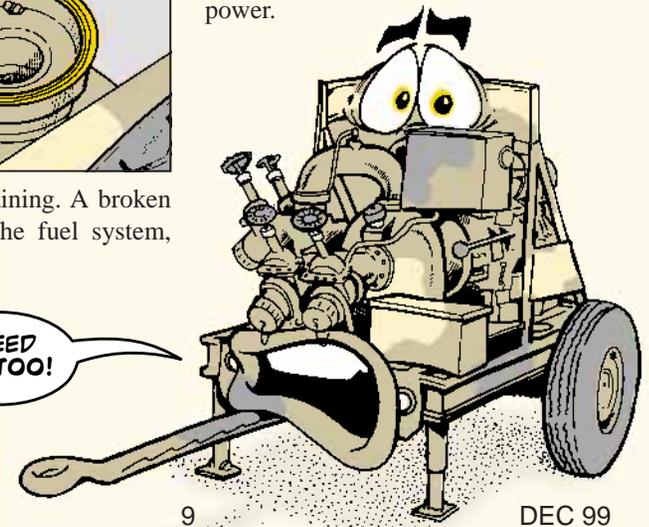
Starting procedures require that you pull out the EMERGENCY STOP button, push in the PUSH FOR OIL PRESSURE BYPASS button and push in the PUSH TO START button.

If you don't get a start, and have to call in a mechanic, remember to push in the EMERGENCY STOP button.



As long as the button is out, the battery is supplying power. If the button's out overnight, for example, bye-bye power.

I NEED PM, TOO!



HEMTT ...

Warm Up to Fuel Transfer Hose

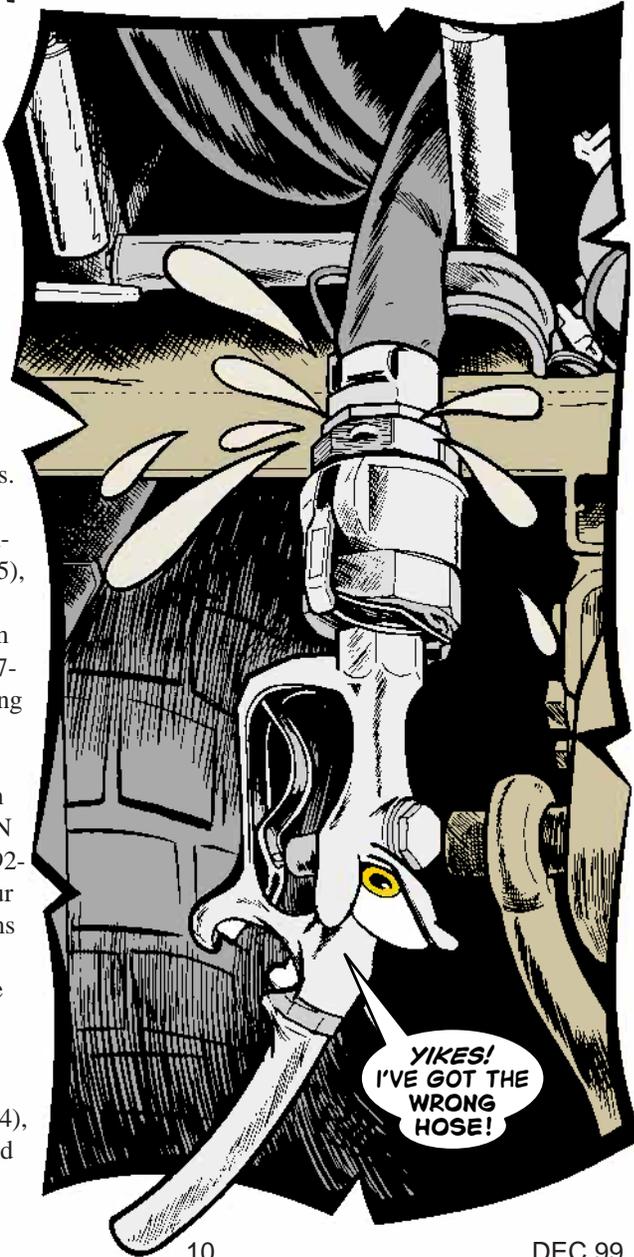
The fuel transfer hose assembly that most of you need for your M978 fuel tanker is NSN 4210-01-381-2846. That's Item 1 in Fig 396 of TM 9-2320-279-24P (Dec 98).

The hose and coupling info in Fig 395 of the -24P is for an arctic hose. It has a short service life if used in other climates.

If you really need the arctic hose assembly (Item 1 in Fig 395), NSN 4720-01-433-3141, bulk hose (Item 6), NSN 4720-00-957-2434 or arctic coupling (Item 7), NSN 4730-01-155-5037, you must contact the item manager at S9C, DSN 850-2786 or (614) 692-2786. Otherwise, your request for these items will be rejected to head off leaking hose problems.

The information in Fig 254 of TM 9-2320-279-20P (Jun 94), which was superseded by the -24P, is also for the arctic hose.

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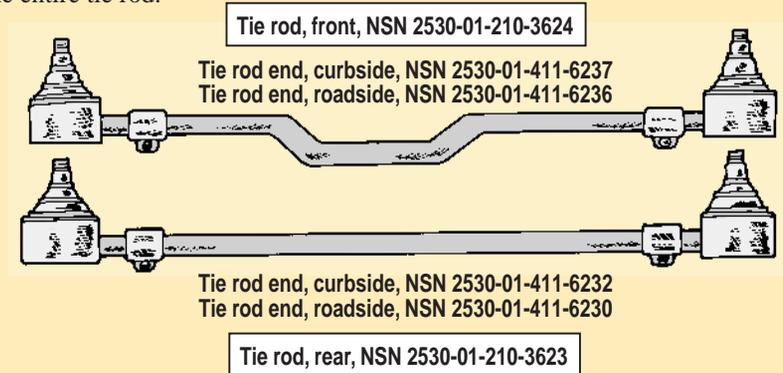


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DEC 99

Tie Rod Parts Update

HEMTT tie rod ends are available, mechanics, so you don't have to replace the entire tie rod.



This information is in Fig 219 of TM 9-2320-279-24P-1. It affects Fig 153 of TM 9-2320-279-20P, which has been replaced by the -24P-1 and -24P-2.

M915-Series Trucks ...

Stop Those Transmission Blues

Drivers, remember you can take two steps forward in your M915A1-series truck, but only one back. If you forget, you'll be taking a lot of steps back to the motor pool.

TM 9-2320-273-10 says it's OK to upshift two gears at a time through your tractor truck's gear range up to 11th gear. Above that, it's only one gear at a time.

But, some operators think it's OK to downshift two gears at time from 11th gear.

No way! Your truck's transmission was made to be downshifted only one gear at a time, with the engine at 1,650 rpm or less. Two gears at a time tears up the transmission.

It can also make the engine rev at more than 2,050 rpm, which disconnects it from the transmission. That's a deadly situation going downhill.

PS 565



11

DEC 99

TRACK TENSION

Crewmen, if your tank has constant problems with worn end connectors and cupped sprocket teeth, the problem could be how you adjust track tension.

Do you think that adjusting the tension means stopping the tank, whipping out your grease gun and pumping

grease into the track adjusting link until you see it coming out of the relief valve? That's partly right, but you're forgetting a small but very important step.

The TM says to move the tank forward on a level surface and let it coast to a stop before drawing your grease gun. That's so the track adjusting link

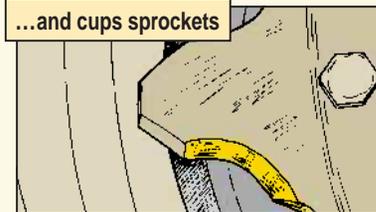
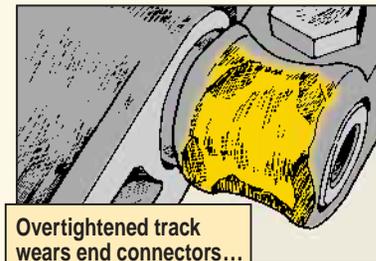


TROUBLE

is the only thing pressing against the track when you add grease.

With room at a premium in most motor pools, this step gets skipped. But, if you use the brakes, the weight of the tank is thrown forward when you stop. That leaves some track tight and other track loose. Adjusting the track then results in **overtightened** track that wears out end connectors and cups sprockets.

Adjusting track tension by following **all** the steps in the TM is the only way to keep your track on track.



The Real Seal Deal

Mechanics, how would you like to extend the life of a tank's exhaust grille seal by six months or more?

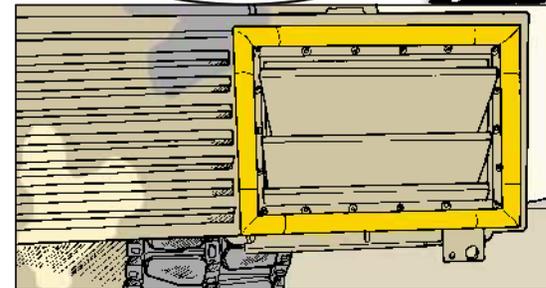
All you have to do is rotate the seal 180° during semiannual maintenance.

Usually, a new seal shows little wear after the first six months, but has to be replaced during the next service because of excessive wear.

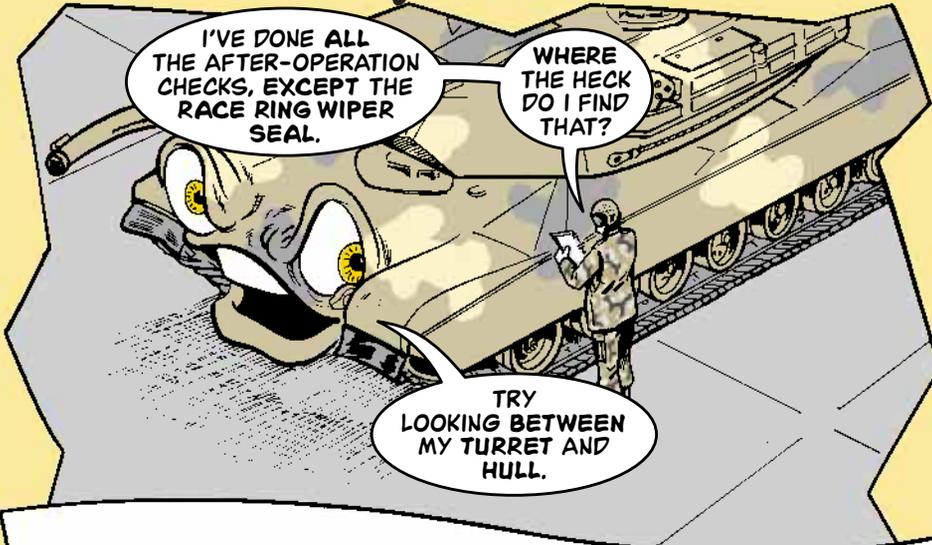
That's because most of the damage is to the bottom of the seal while the top stays relatively untouched. Why? Because the weight of the grille and most of the engine heat is directed toward the bottom of the seal.

Rotating the seal during semi-annual maintenance evens out the wear and results in longer life. An added benefit is that the screws that hold the seal in place get retreated with antiseize compound. That makes 'em easier to remove each time and less likely to corrode and break off.

ROTATING THE SEAL AND USING ME ON THE SCREWS KEEPS THE SEAL WORKING LONGER.



Find Seal, Then Check It



Dear Half-Mast,

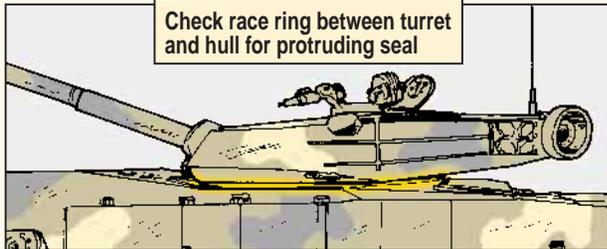
Item 38.1 on Page 2-80 of TM 9-2350-264-10-1 says to inspect the M1A1 tank's race ring wiper seal to make sure it's not protruding from the race ring.

Problem is, no one in our unit knows where to look. Any clues?

PFC J.K.Y.

Dear Private J.K.Y.,

The felt wiper seal is actually located on the outer edge of the race ring. You won't be able to see it from inside the turret. If the seal is damaged, you will be able to see it protruding around the **outside** of the turret. If you find a protruding seal, call in your mechanic.



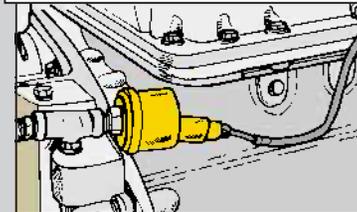
Half-Mast

Damage Control



Mechanics, when you bend over the engine compartment to make a repair on that M113A3 vehicle, be careful not to cause any **more** damage.

Use care working around sending unit



The transmission oil pressure sending unit, NSN 5930-00-944-1660, is badly positioned for engine work. If you press or lean against it, the pin inside snaps.

Replacement costs for the unit aren't much—about \$17. But your carrier is NMC until you replace it. So keep your elbows, arms and bellies **off** the sending unit.

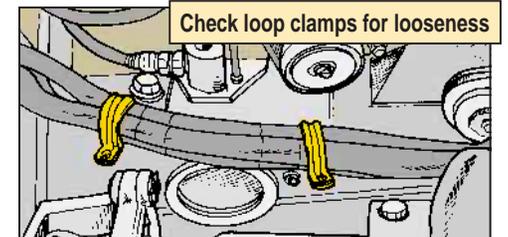
Out of the Loop

Drivers, don't let the engine wiring harness on your M113A2 vehicle get out of the loop—the loop clamps, that is.

Vibration loosens the two loop clamps that hold the wiring harness in place. When the clamps loosen enough, the wiring harness flops around until it gets caught in the water pump pulley.

It won't take long for the pulley to chew up a perfectly good wiring harness, so check the clamps during your before-operation PMCS. Report loose clamps to your mechanic for tightening.

He'll replace damaged clamps with NSN 5340-00-200-3041 for the larger clamp and NSN 5340-00-200-3045 for the smaller one.



GIVE LOOSE SCREWS

Vibration, that old enemy of every crewman and mechanic, has struck again. This time the victim is the mounting screws on the cargo hatch latch catch of M2A2 and ODS Bradleys.

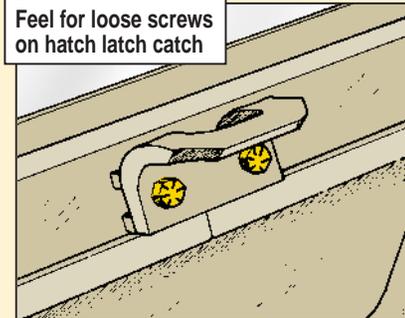
Loose screws keep the cargo hatch from locking down. If it won't lock again, your Bradley is NMC, so make a habit of checking the screws after every operation.



THE SHAKE

Crewmen, try moving the screws with your fingers. Then look for shiny marks around the head of the screws. Shiny areas indicate movement. Report loose screws to your mechanic.

Feel for loose screws on hatch latch catch



Mechanics, before you tighten the screws, make sure the right ones were used in the first place. Some vehicles have screws that are the wrong grade, the wrong size, or both. Either can result in loose screws.

Here's what to look for:

○ Eyeball the head of the screw. It should have six dashes indicating a grade 8 screw. Anything else should be replaced.

Six dashes equals grade 8



○ Remove the screw and measure it. The correct screw will be exactly 1 1/2 inches long.

NSN 5305-00-725-2317 brings 100 of the right screws. Make sure you use a flat washer, NSN 5310-00-080-6004, with each screw and torque the screws to 32–34 lb-ft.

The screw and washer NSNs aren't listed in the parts TMs, so make a note until they can be added.

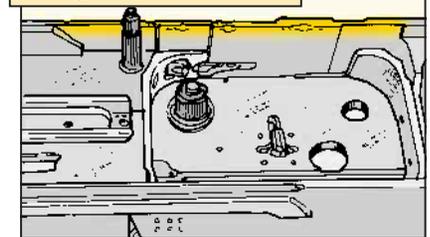
Minor M242 Rail Damage OK

Just because the receiver rails on the Bradley's M242 automatic gun are a little banged up doesn't mean the receiver needs repair, armorers. A little damage is OK.

As long as the banged-up area is no longer than six inches or no deeper than 1/2 inch, the receiver is good to go. This info is being added to the revision of TM 9-1005-200-20&P.

But you can avoid even slight damage by telling your crews to always elevate the M242 to 200-300 mils before installing the feeder. That protects the rails.

Damage minor? Rails are OK



REMEMBER GRILLE COVERS



Whenever you park a SUSV, be sure to install the front and rear grille covers.

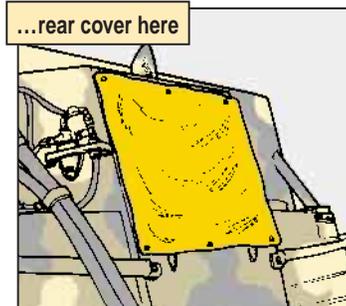
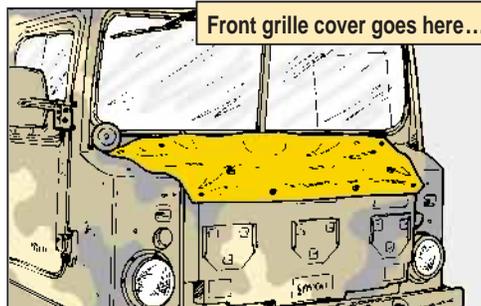
The covers keep snow and debris out of the air intake and cooling systems.

Course, before you start and operate the SUSV, remove the covers. If you don't, the vehicle may overheat, which can ruin the engine and other components.

The grille covers are part of your basic issue items (BII), stored in the passenger side door. But, the NSNs for the covers aren't in TM 9-2350-285-10.

The front cover is NSN 2540-01-309-1078 and the rear cover is NSN 2540-01-309-1079. If you want to save some money, you can make your own using scrap canvas.

You'll need a piece of canvas 62x20 inches for the front and 30x28 inches for the rear. Use an existing cover as a pattern. Remember to cut holes for the fasteners on the vehicle.



Engine Fire System Checks

Now that your SUSV has an engine compartment fire detection and extinguishing system, your worries about fires are over, right? Wrong!

There is no guidance in the unit PMCS on when to check or recharge the high pressure CO₂ bottle. If you don't make sure the bottle is full, you could be headed for trouble.

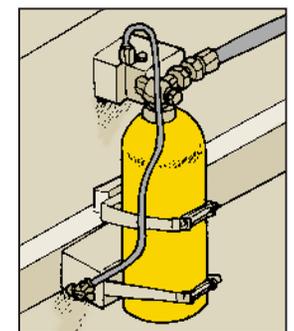
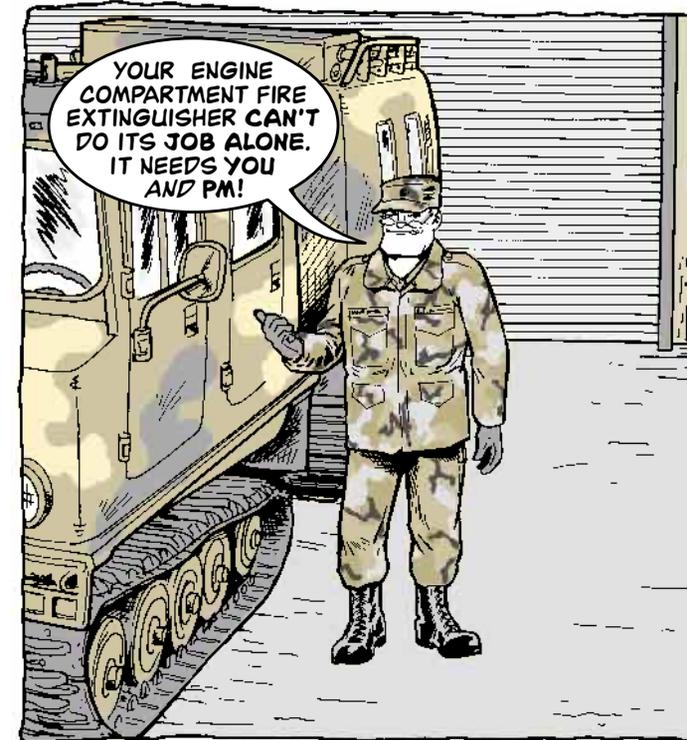
Here's what you need to know now. It will be added to your -20 TM's PMCS next time it's updated.

High pressure carbon dioxide cylinders used in fire extinguisher systems should be weighed at least every six months. That information and the date of the last hydrostatic test of the cylinder should be posted on the bottle tag.

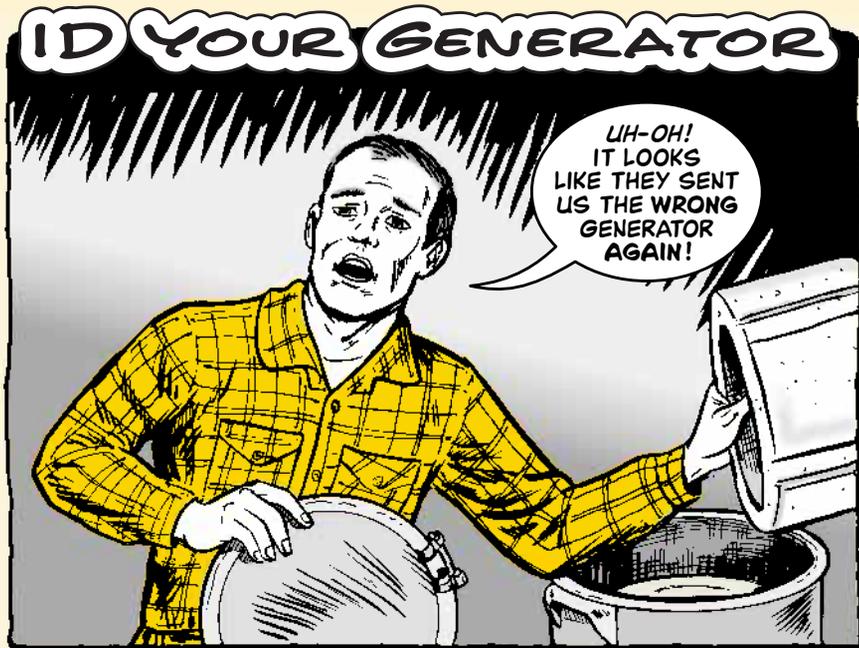
Weighing and testing is usually done by the post fire department or a contractor hired by the department. In many cases, the testers come to units for the work. But sometimes you have to take the cylinder to them.

If your cylinders do not have tags or you need new tags, ask your supervisor or safety officer to get you some.

Remember, it serves no purpose to have a fire extinguishing system if the system's cylinders are empty or out of service. It's your responsibility—and your life.



Weigh extinguisher regularly



The Paladin's 650-amp generator container, NSN 8145-01-442-2752, can hold either the Allied generator, NSN 2920-01-306-9406, or the Lucas generator, NSN 2920-01-442-8078.

Once the generator is in its container, though, there's no way to tell which one it is. Since the generators go to different repair facilities for overhaul, that could be a problem.



Label identifies generator

Get your generator to the right place by slapping an ID label on the container. Two labels come with each spare generator and container. Just use the label that matches the generator you are returning for repair.

If you have the older model generator container, NSN 8145-01-433-0911, don't fret. Even though it was made to hold only the Allied generator, you can still use it to ship the Lucas generator. Just tear loose enough of the packing to allow a good fit for the Lucas generator.

Make sure you mark or paint the container to show which generator it holds. Once the container arrives at the repair facility, the packing will be modified so that the container can properly hold either generator.

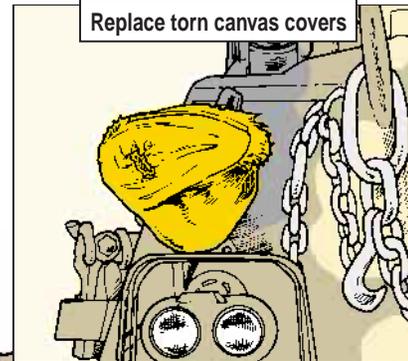
Undercover Covers

If you've got worn canvas covers on your combat vehicle's M239 or M250 smoke grenade launcher, don't bother looking for replacements in the vehicle's parts TM. The covers aren't listed there.

The smoke grenade launchers have their own TMs. You'll find the covers for the M239 listed in Fig C-1 of TM 9-1055-642-20&P. NSN 1040-01-042-3861 gets the left-hand cover; NSN 1040-01-043-7896 gets the right-hand cover.

The M239 smoke grenade launcher is used on the M88A1 recovery vehicle, the M728 CEV and the AVLB with M60 chassis.

Those same covers are used on the M250 smoke grenade launchers found on M1-series tanks. The M250's covers are listed in Fig C-5 of TM 3-1040-268-20&P.



Detecting Mine Detector Problems

A few simple precautions can keep your AN/PSS-12 mine detecting set hot on the trail of mines—and you and your buddies out of the morgue.

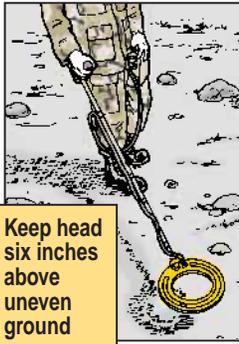
Head Protection

The search head is very sensitive. If you bang it against rocks, it becomes as sensitive as a rock. If you're working uneven ground, raise the head to six inches above the ground instead of the normal two.

And watch out for rocks.

For best detection, keep the head parallel to the ground and sweep slowly.

When you collapse the



Keep head six inches above uneven ground

telescopic pole, don't brace the head on the ground. That damages the head. Instead, push the sections together with both hands.

Pole to Pole

The pole is adjustable, so adjust it until it's comfortable for you. A good

Adjust pole to fit you comfortably

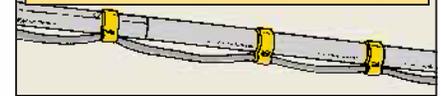


test is to hold the detector with your arm straight and its head parallel with the ground. If the head is about six inches from the ground, you've got it right.



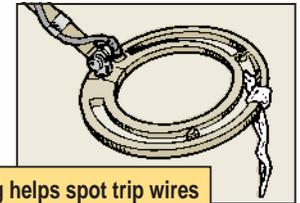
The longer the pole, the more clamps are needed to keep the head cable off the pole. If the cable touches the pole, you get mine sightings where there are no mines. The detector has seven clamps—use them all if necessary. NSN 5340-21-905-5919 brings one clamp.

Use enough clamps to keep cord off pole



Night Ops

When the light's bad, you can't see mine probes or trip wires. Give yourself an edge by tying a strip of white cloth to the front of the head so it hangs down about six inches. The cloth will hang up if you brush against something.

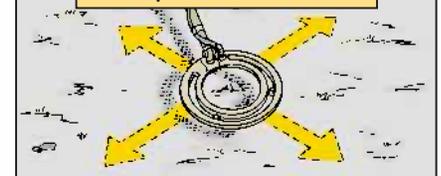


Rag helps spot trip wires

X Marks the Spot

When you think you've found something, do a slow X-pattern over the spot. If you've found a mine, you should get beeps in all parts of the X.

Slow X pattern identifies mine



A-HA! BUSTED!

DRAT! FOILED AGAIN!

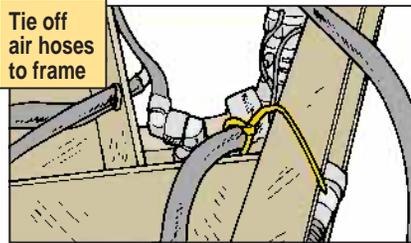
YOU CAN'T HIDE FROM PM!

Clear Minefields

If you expect your MK-155 mine clearance line charge (MICLIC) to clear minefields for you, you need to clear its way with PM.

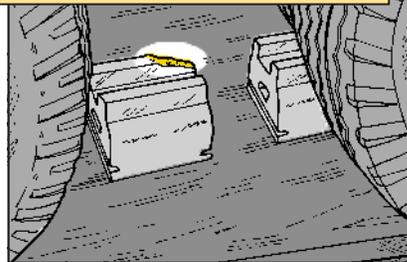
On the Road

Tie air hoses to the trailer frame before you hit the road. If hoses are left dangling, they can become crimped or drag the ground. Then you lose your trailer brakes.



Because the MICLIC has both tires **and** track, a misalignment can wear out both fast. Before travel, check the insides of all eight tires for gouges or bad wear. Also look at the track teeth for uneven wear.

Check tracks and tires for unusual wear



Worn tires or teeth usually mean the track is aligned or adjusted wrong. Your

with PM

repairman can align the track with the procedure beginning on Page 4-33 in TM 9-2330-389-14&P.

Get bad tires replaced. You don't want a flat tire in the field.

If you're travelling through mud, clean between the tracks and tires at every stop. Too much mud between the track and tires will throw the track. It's no easy job to put track back on in the field.

Use the truck or APC pioneer tools to clean out the mud. Scrape out the

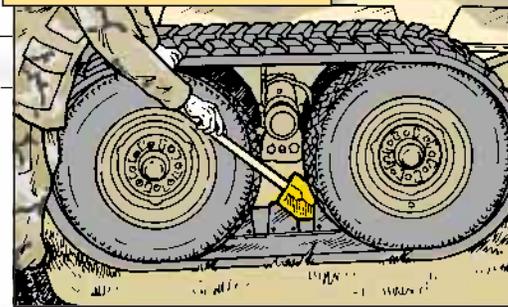
mud, move the MICLIC forward, and scrape out the rest.

Any time the MICLIC goes through heavy mud or deep water, the wheel bearing lube is washed out. So lube again ASAP. Without more lube, the bearings seize. The lube chart is in Chap 3 of TM 9-2320-389-14&P.

Make gradual turns. Turns that are too sharp allow the back of the prime mover to shear air lines and inter-vehicular cables. Steep dips in the road can cause the same problems.

If you can't avoid a dip, take it slow and easy.

Clean it, move it, and clean again



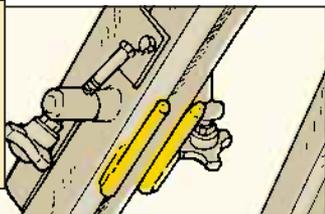
ALL RIGHT!
THE MICLIC HAS
DONE ITS JOB,
LET'S MOVE
OUT!

IT'S THE
LEAST I COULD
DO AFTER THE GOOD
PM CARE YOU
GIVE ME!



around and suffer damage. Gently bend the guides back in place.

Make sure rocket guides are not pointing outward

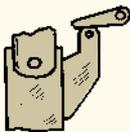


Check that the rocket release catch is on the front of the launcher arm stop. If it's on the rear of the stop, the rockets fire but stay on the launcher. One MICLIC crew suffered burns when that happened.

Release catch should be at front of stop



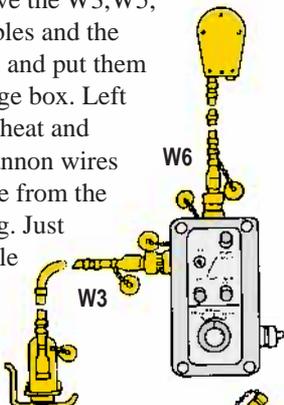
RIGHT



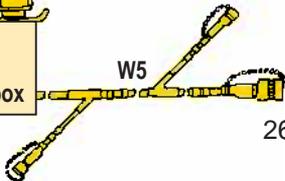
WRONG

Storage

When the MICLIC is going to sit for days, remove the W3, W5, and W6 cables and the control box and put them in the storage box. Left exposed to heat and cold, the cannon wires can separate from the cannon plug. Just the W3 cable alone costs more than \$1,200.



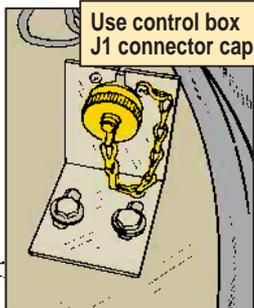
Store control box and cables inside storage box



If the cap for the W5P3 connector disappears, dirt can plug the connector fast. There is no replacement cap.

Solution: Use a cap for the control box J1 connector. NSN 5935-01-195-2337 gets the cap for \$6. Tape a plastic bag over the connector until the cap comes.

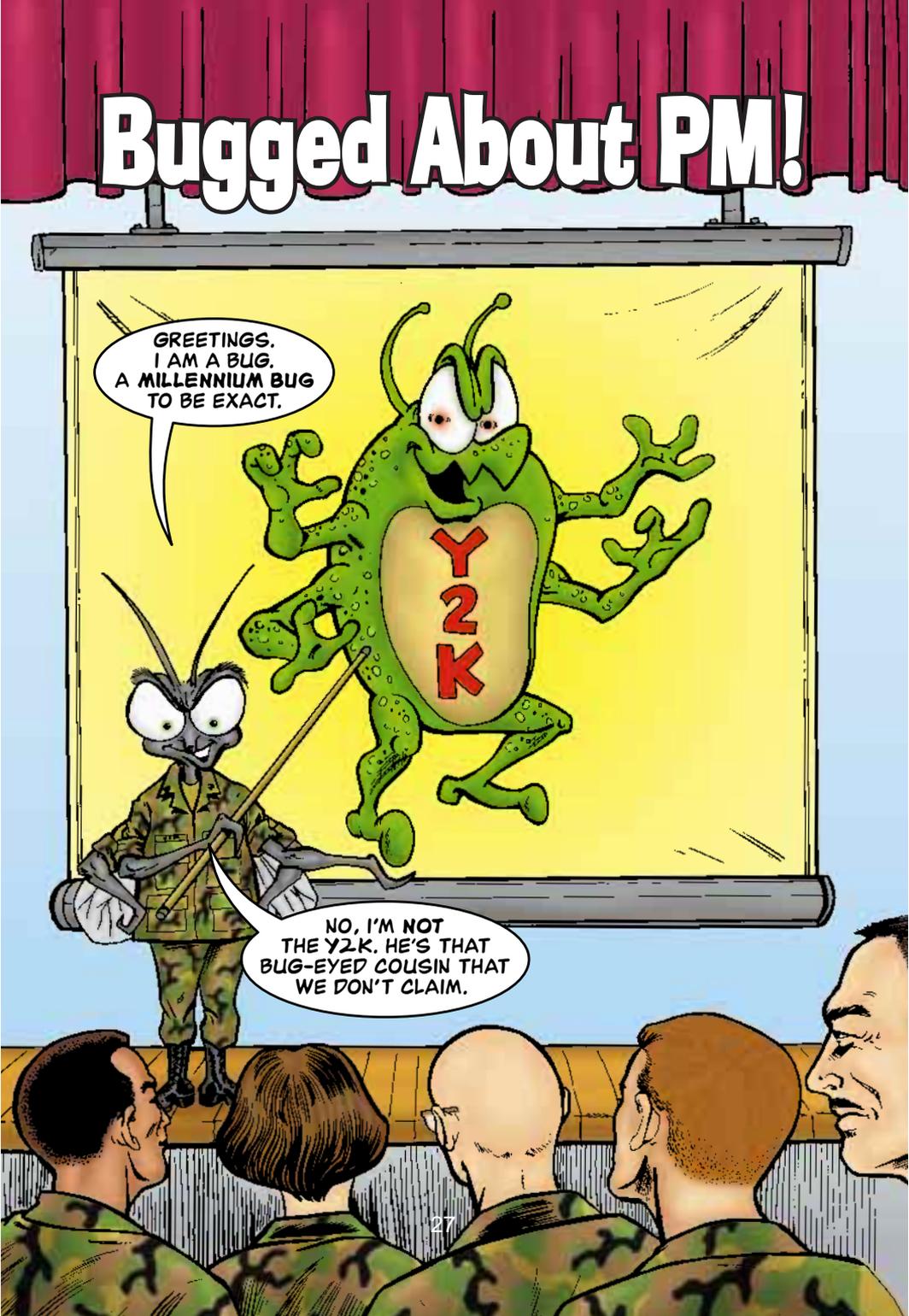
Use control box J1 connector cap



REMEMBER, PM IS THE PATH TO SUCCESS!



Bugged About PM!



GREETINGS.
I AM A BUG.
A MILLENNIUM BUG
TO BE EXACT.

NO, I'M NOT
THE Y2K. HE'S THAT
BUG-EYED COUSIN THAT
WE DON'T CLAIM.

I'M THE YPM BUG.
AT THE START OF EVERY
MILLENNIUM ONE OF MY KIND
SHOWS UP TO ANSWER THE QUESTION,
"WHY PREVENTIVE MAINTENANCE?"
WHY PREVENTIVE MAINTENANCE,
Y-P-M, GET IT?

WHY PREVENTIVE MAINTENANCE?

WE ANSWER THAT
QUESTION EVERY
DAY FOR A THOUSAND
YEARS, THEN PASS
THE TORCH ON.
I MEAN, LET'S FACE
IT, BY THEN WE'RE
A LITTLE BUGGY
AND READY FOR
RETIREMENT.
A-H-H-H!

IT HAS ALWAYS
BEEN OUR MISSION TO
PUT THE BITE ON YOU AND
INFECT YOU WITH THE
DESIRE TO DO PM AND
DO IT WELL. I START
MY MISSION NEXT
MONTH AND I'LL BE BACK
THEN TO BRIEF YOU ON
WHAT LIES AHEAD.

BUT FIRST, LET'S
LOOK BACK AT THE LAST
THOUSAND YEARS AT SOME OF
THE CHALLENGES MY FATHER FACED.
WHY DON'T WE LET MY DAD TELL THE
STORY? HERE HE IS, THE YPM BUG
OF THE LAST 1,000 YEARS, MY
OLD INVERTEBRATE.

THANK YOU,
SONNY. NOW
BUG OFF!



THIS IS MY FINAL
CHANCE TO PREACH PM
AND I WANT THE PUPA, EH,
PULPIT, TO MYSELF.

I STARTED MY PM
JOB WITH A REAL CHALLENGE.
THE KING OF ENGLAND IN THE YEAR
1000 WAS AITHELRED THE FIRST,
BUT WE ALL CALLED HIM
AITHELRED THE UNREADY—AND
BOY, WAS HE EVER!

WOULD YOU GO INTO BATTLE
WITH THIS GUY? I TOLD HIM,
AITHEL, BABY, DO A LITTLE PM.
VICTORIOUS WARRIORS WIN
THE PM BATTLE FIRST, THEN
THEY GO TO WAR. BUT DID HE
LISTEN? HAVE YOU EVER
HEARD OF HIM?

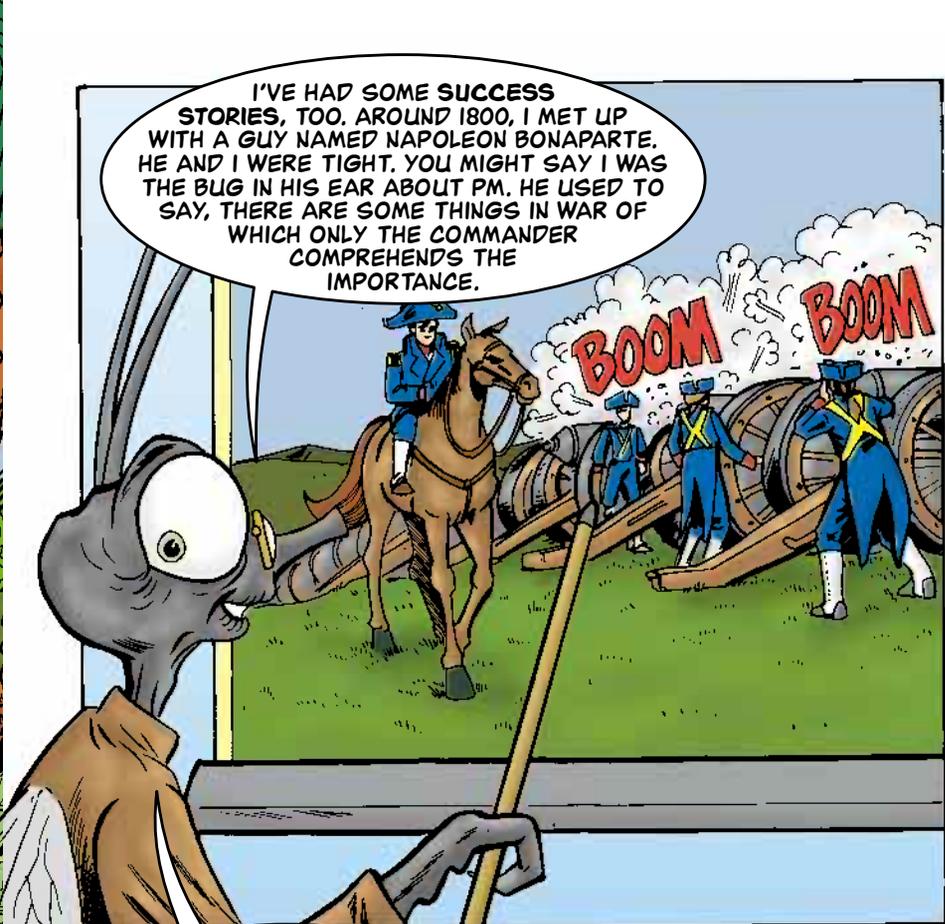


"AROUND 1500 OR SO, I TRIED TO HELP OUT AN EXPLORER NAMED PONCE DE LEON. THIS GUY WAS LOOKING FOR THE FOUNTAIN OF YOUTH IN FLORIDA. HE FOUND IT, YOU KNOW—JUST A LITTLE SOUTHWEST OF ORLANDO. BUT TRY AS HE MIGHT, HE COULD NOT BRING BACK THE FOUNTAIN'S WATER. ALL HIS BARRELS HAD HOLES IN THEM."

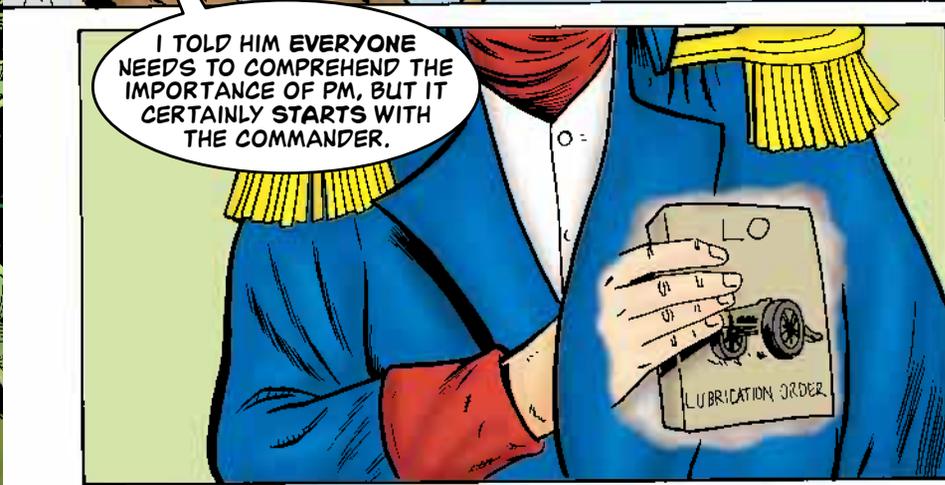


"I TOLD HIM BEFORE WE LEFT ON THE TRIP, 'PONCE, MAKE SURE THE BARRELS ARE WATER-TIGHT AND COATED WITH PRESERVATIVE. DO A LITTLE PM NOW AND IT WILL SAVE YOU HEARTACHE LATER.' DID HE LISTEN? IS HE STILL YOUNG? THE FOUNTAIN WAS FINALLY TAPPED BY A PIONEER NAMED DISNEY, BUT THAT'S A STORY FOR ANOTHER TIME."

I'VE HAD SOME SUCCESS STORIES, TOO. AROUND 1800, I MET UP WITH A GUY NAMED NAPOLEON BONAPARTE. HE AND I WERE TIGHT. YOU MIGHT SAY I WAS THE BUG IN HIS EAR ABOUT PM. HE USED TO SAY, THERE ARE SOME THINGS IN WAR OF WHICH ONLY THE COMMANDER COMPREHENDS THE IMPORTANCE.



I TOLD HIM EVERYONE NEEDS TO COMPREHEND THE IMPORTANCE OF PM, BUT IT CERTAINLY STARTS WITH THE COMMANDER.

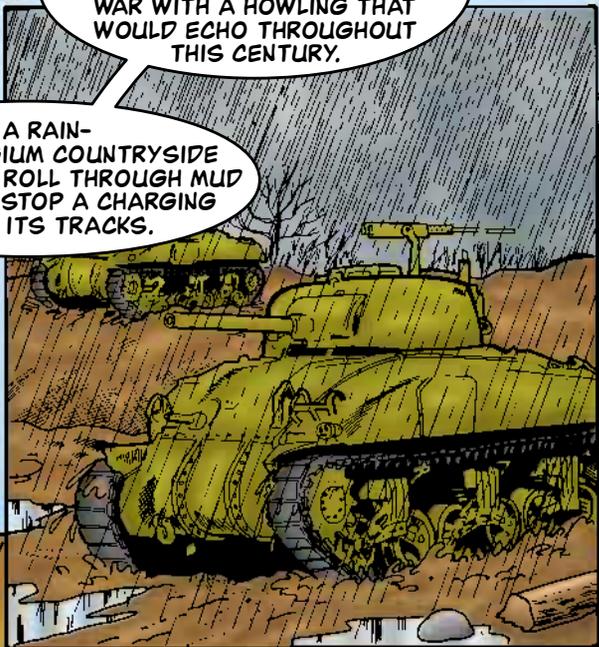


NAPOLEON WAS A SUCCESS, BUT OF ALL THE CENTURIES IN THIS MILLENNIUM, THE TWENTIETH WAS THE BEST FOR ME AND MY PM MESSAGE.



IN THE FROZEN TRENCHES OF FRANCE I SAW MACHINE GUNS LET LOOSE THE DOGS OF WAR WITH A HOWLING THAT WOULD ECHO THROUGHOUT THIS CENTURY.

ON A RAIN-SOAKED BELGIUM COUNTRYSIDE I SAW VEHICLES ROLL THROUGH MUD THAT WOULD STOP A CHARGING RHINO IN ITS TRACKS.



"ON THE BLEAK HILLS OF KOREA I SAW RIFLES FIRE IN COLD THAT WOULD MAKE POLAR BEARS PACK THEIR BAGS AND HEAD SOUTH."



"IN THE TROPICAL JUNGLES OF VIETNAM I SAW GENERATORS RUN IN HEAT AND HUMIDITY THAT WOULD MAKE A FLORIDA GATOR SWEAT."



"IN THE DESERTS OF KUWAIT I SAW HELICOPTERS FLY IN SAND-FILLED AIR THAT WOULD CHOKE A CAMEL."

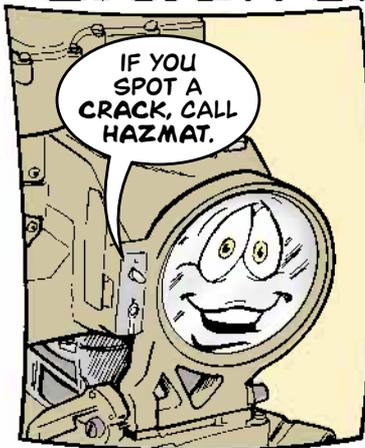


IN FACT, I SAW THE WORLD'S BEST EQUIPMENT AND I SAW IT BEING TAKEN CARE OF BY THE WORLD'S BEST SOLDIERS. SO AS I LEAVE THE STAGE AND LET MY SON TAKE OVER, I GIVE YOU THIS ADVICE FOR THE NEXT MILLENNIUM: KNOW THE ENEMY, KNOW YOURSELF, TRAIN AND DO PM—AND IN A HUNDRED BATTLES YOU WILL NEVER BE DEFEATED.





Broken Sight Dangerous



The night sights for the TOW and Dragon missile systems, the G/VLLD and the NODLR (night observation device, long range) contain radioactive components. That's no big deal—unless a sight gets broken. Then it becomes a very big deal.

A broken sight can leak radiation. One soldier became seriously ill from handling a broken sight and ingesting radioactive particles.

If your night sights are ever cracked or smashed, clear the area immediately and notify your HAZMAT folks, in that order. Don't take chances.

Integrated Family of Test Equipment . . .

Nifty IFTE Tip

Dear Editor,

When we troubleshoot a system as complex as the IFTE, we've found it's a good idea to keep a journal of what we do. So we write down everything we check and every component we replace.

That way we KNOW exactly what we have done—and so do the other IFTE repairmen. Time is not wasted repeating steps and defective components aren't accidentally reinstalled.

And, of course, we always follow the troubleshooting steps in the TM. That's the quickest way to isolate a problem. Guessing at the problem almost always takes longer.

SFC Felix Moreno

SSG K.C. Cockrill

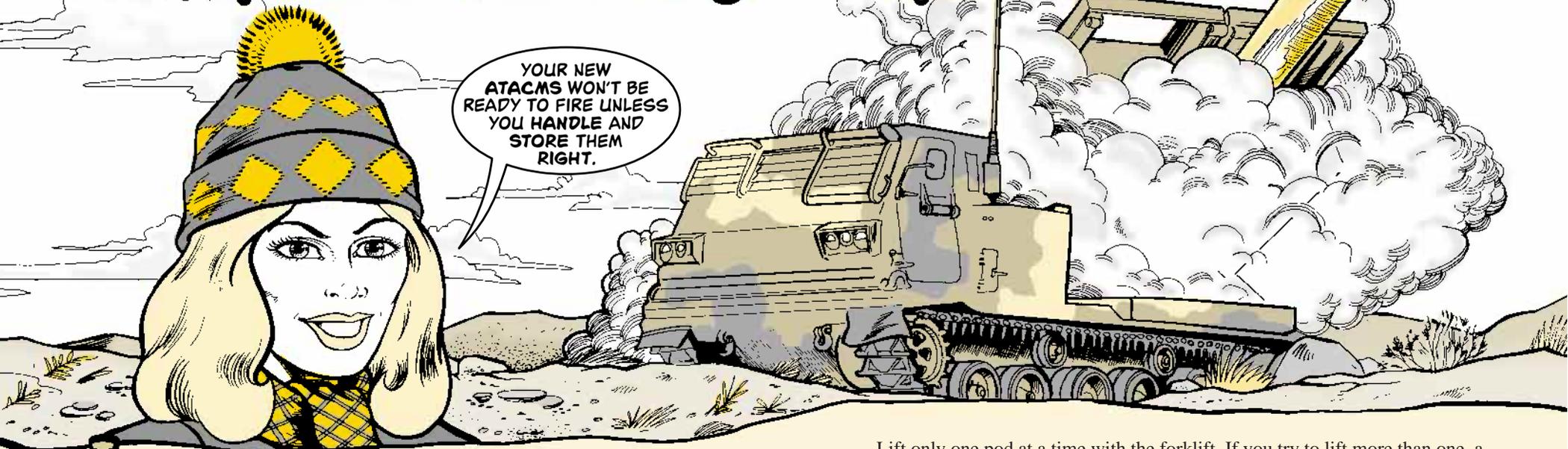
U.S. Army Ordnance Missile and Munitions Center and School
Redstone Arsenal, AL

FROM THE DESK OF THE Editor



Writing down troubleshooting steps as you do them is a good idea for any complex system. Thanks for the suggestion.

Special Handling Required



The new Army tactical missile system (ATACMS) requires careful handling. The guided missile launch assembly (GMLA) can withstand slight bumping, but can easily be damaged by mishandling.

In fact, ATACMS has a zero-inch drop standard. **Any time** the GMLA is dropped, you must call in quality assurance specialist ammunition surveillance (QASAS) personnel to inspect the missiles before they are issued.

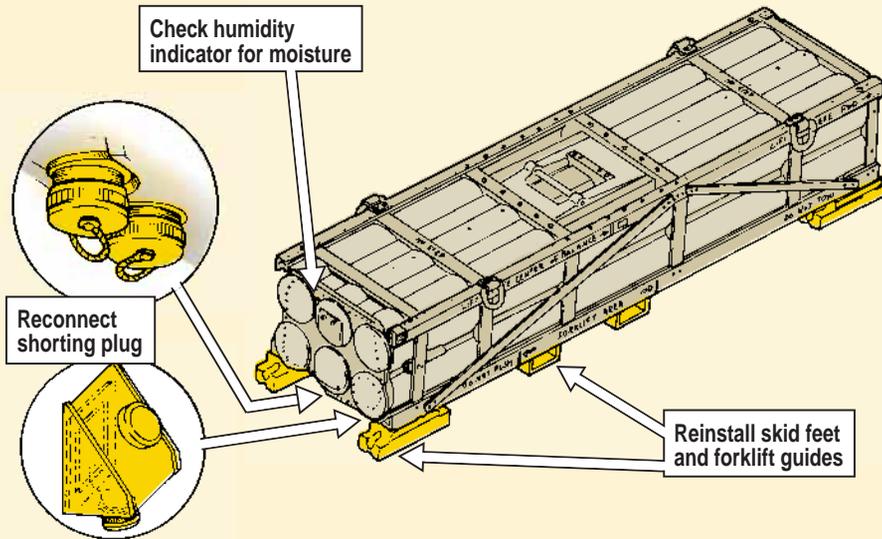
When you download GMLAs, make sure to...

- ☛ reconnect the shorting plugs to the GMLA before putting it on the ground. That prevents stray voltage from damaging the GMLA.
- ☛ reinstall the four skid feet to the bottom four corners of the GMLA. The feet cushion the GMLA and help absorb shock during movement.
- ☛ reinstall forklift guides on the GMLA before moving it with a forklift.

Lift only one pod at a time with the forklift. If you try to lift more than one, a pod could fall off. Be careful not to insert the forklift tines so far that they go all the way through the forklift guides. That could damage GMLAs on the other side. A good tip to prevent that is to lay two 4-in x 8-in x 6-ft blocks of wood across the forklift tines. That will keep the tines from poking through to the other side of the forklift guides.

If you store GMLAs in temporary shelters in the field, they must be stored in a well-drained area with at least six inches of dunnage. Water can put GMLAs out of action fast. Protect them from direct sunlight by covering them with a tarp, but raise the tarp off the pods so air can circulate.

During storage, keep an eye on the GMLA's humidity indicator. If it turns black or is discolored, the indicator's detected moisture. Your repairman needs to replace the desiccant and humidity indicator.



A SIGHT BETTER



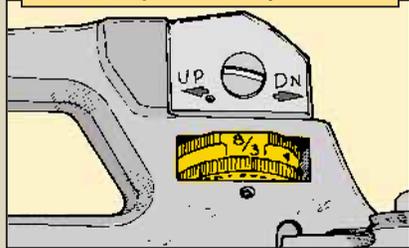
No matter how well you've taken care of the rest of your M16 rifle or M4 carbine, you won't be hitting much if you haven't also taken care of the sights.

One quick check tells you if your rear sight is out of adjustment. Turn the elevation knob down (DN) to the 8/3 mark (6/3 for the M4). If it turns down another full click past 8/3 (or 6/3 for the M4), it's out of adjustment. Tell your armorer.

**U
NEED
SOME SIGHT
PM OR U WON'T
BE ABLE TO HIT THE
BROAD SIDE OF A BARN**

**NO PROBLEM!
I'M IN TIP-TOP
SHAPE! LET'S SEE...
I-R-E-O-UH-Q-
T-IS THAT
AN L?**

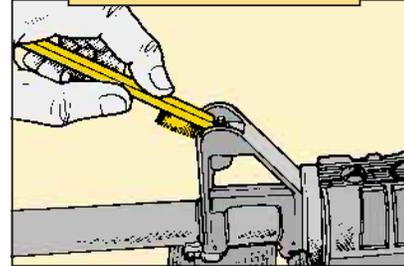
Knob turns past 8/3? Tell your armorer



When you clean your rifle, clean the sights. Otherwise, dirt and rust cause them to bind. Use a toothbrush to clean

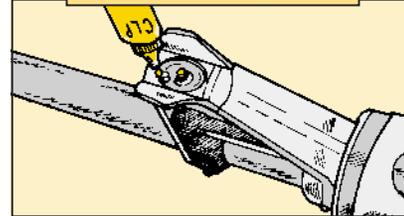
both the rear and front sights. Get into all the crevices.

Clean sights with toothbrush



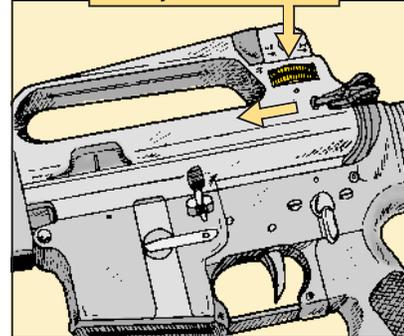
Depress the front sight detent and give it two drops of CLP (or other approved lube like LAW or LSA). Work the detent up and down until it moves smoothly.

Give detent two drops of CLP



Squirt two drops of lube on the rear sight's moving parts. Rotate the windage knob clockwise five clicks and

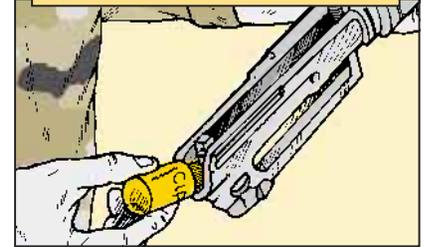
Rotate elevation knob all the way to work in lube



the elevation knob clockwise as far as it will go to work all the lube in. Return the windage knob to its original position.

Remove the charging handle and turn the upper receiver upside down. Put a few drops of lube on the bottom of the elevation screw shaft and detent spring hole.

Lube bottom of elevation screw shaft



With the receiver still upside down, move the elevation knob back and forth several times. Return the elevation knob to its original position.

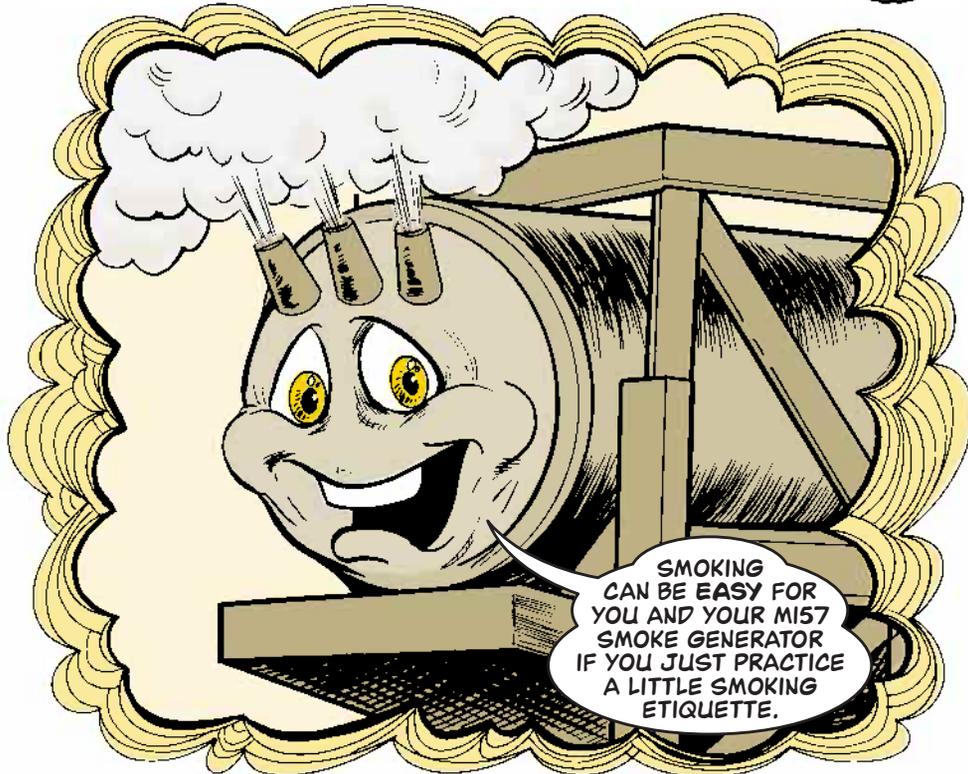
Wipe off any excess lube from the sights. It will just collect dirt.

If the sights are still hard to adjust, tell your armorer. He needs to have support take them apart and clean them.

When you zero the rifle, use both the front and rear sights. If you use only the elevation knob, you won't be able to adjust for ranges longer than 300 meters.

Remember, the M16A2 and M4 aren't zeroed the same. The M16A2 elevation knob is set one click up from 8/3 for zeroing, while the M4 elevation knob is set at 6/3. The 25-meter target for M4 zeroing is on the **back** of the M16 target, NSN 6920-01-395 2949. Make sure you're using the right target or your shooting will be way off.

Easier Smoking

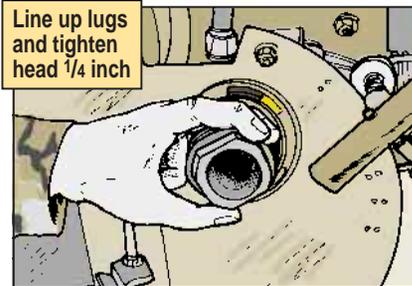


SMOKING CAN BE EASY FOR YOU AND YOUR M157 SMOKE GENERATOR IF YOU JUST PRACTICE A LITTLE SMOKING ETIQUETTE.

Take it easy

Hand-tight is tight enough for the engine head and the fog oil strainer cap screws. If you muscle the engine head tighter, you damage the head gasket, head, and combustion chamber flanges. That causes a poor seal with the combustion chamber and poor smoking.

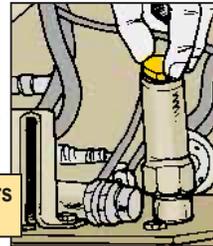
Line up the head so that the lugs in the head fit into the cutouts of the combustion chamber. Tighten the head 1/4 inch—and stop.



Line up lugs and tighten head 1/4 inch

Using a wrench on the fog oil strainer cap screws tears the strainers' O-rings and can even damage the strainers. Then you get leaks and low fog oil

pressure. Screw in the strainers' caps by hand. When a cap feels tight, stop.



Screw in strainers hand-tight

Successful starting and stopping

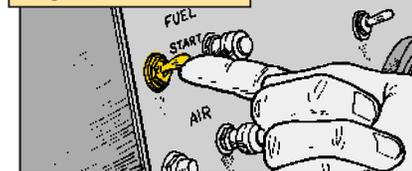
Wait for the AIR light to come on before you turn on the engine. Otherwise, you'll have starting or purging problems.

Wait for AIR light to come on before starting engine



Hold the FUEL switch up—you can't flick it up—until the fuel indicator lights. But don't hold it up longer than 30 seconds. Holding it longer can damage the fuel pump.

Hold FUEL switch no longer than 30 seconds



Your M157 may need a little extra fuel and air in cold weather after sitting all night. So, hold the ENGINE switch in START for one to two seconds and then release it before it starts. Wait three seconds and hold the ENGINE switch in START again. After the engine is running, release the switch to RUN.

If the AIR indicator goes out and the engine won't start, release the ENGINE switch.

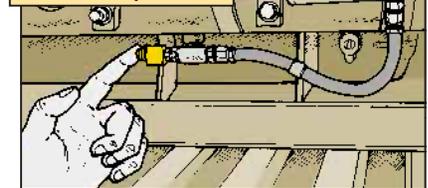
In cold weather, release ENGINE switch if AIR light goes out



Wait until the AIR indicator comes on again and then try to re-start the engine. Completely drain the air tank

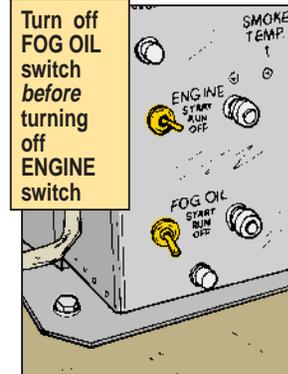
after operations. That prevents moisture from collecting in the air lines and pressure tank.

Hit air pressure drain valve after operations



Turn off the FOG OIL switch before turning off the ENGINE switch to let excess fog oil burn off. Let the engine heat up to 1,000° F to burn off excess

Turn off FOG OIL switch before turning off ENGINE switch



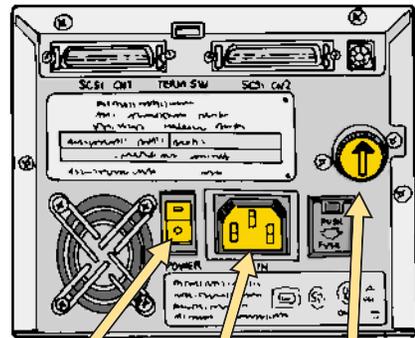
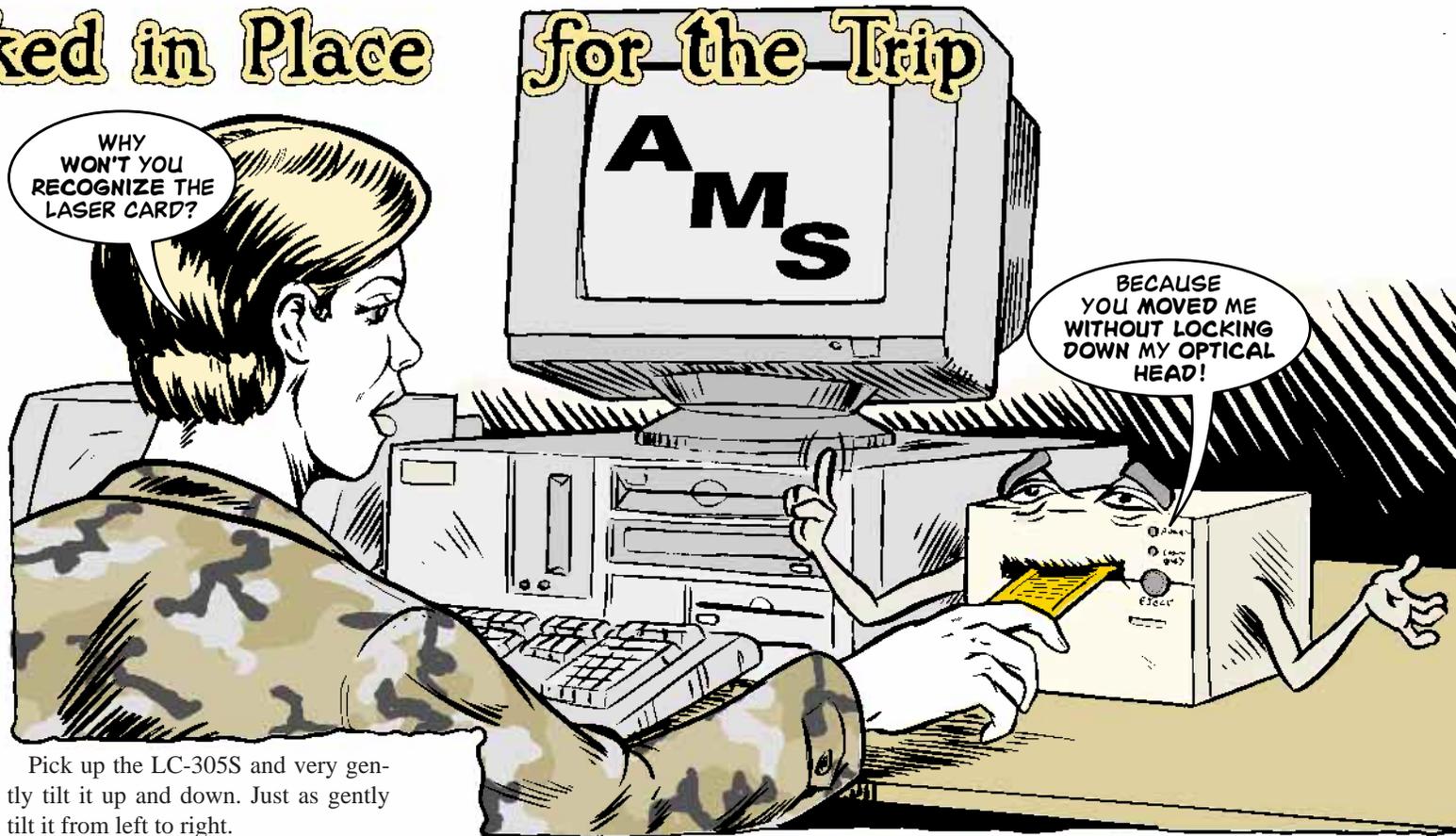
fog oil. If fog oil collects in the engine chamber, the M157 won't start and the fog oil must be dumped out manually.

Locked in Place for the Trip

Just like a squirming toddler, the automated manifest system's (AMS) LC-305S optical reader needs to be locked in place to make a trip safely.

The LC-305S processes supply receipts by reading a laser card and showing you the data on your computer terminal. It doesn't take much vibration to the optical head inside the reader to cause damage. Your reader won't be doing any reading if its internal glass mirrors are broken or the optical head is misaligned.

To make sure that doesn't happen, the shipping set lock on the rear of the reader must be used anytime the reader is moved. That means even from desk to desk.

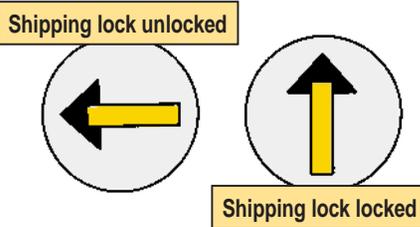


- ON/OFF switch to OFF
- Power source
- Turn lock switch straight up

Pick up the LC-305S and very gently tilt it up and down. Just as gently tilt it from left to right.

Gently! This is not a shake. Just a slight tilt.

The shipping lock is set if you don't hear a sound from anything moving inside the reader.



To set the lock, turn the LC-305S switch to OFF and disconnect the reader from its power source. Then turn the shipping lock switch clockwise until the arrow points straight up.

If you hear a sound, like a clunk or clicking noise, that's the unsecured optical laser head hitting the optical head retainer. Set the shipping lock again.

If you still hear that sound, turn the reader in for repair or replacement. The shipping lock is not working.

When the reader's trip is over, release the lock **before** connecting the power and turning on the LC-305S. Just turn the shipping lock counter clockwise until the arrow points to the UNLOCK position. The

shipping lock will then be released and you're ready to use the reader.

If you do not release the shipping lock before turning on the LC-305S, the Loaded/Busy indicator will show red and you will not be able to process data.

If you have questions about service, warranty or maintenance of the reader, call the Intermec Hotline at 1-800-892-7007. Or e-mail them at:

support@intermec.com

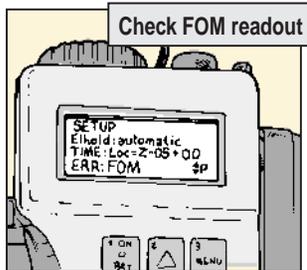
Keep on

There's a glitch in the software of the AN/PSN-11 precision lightweight global positioning system receiver (PLGR) that could lead you way off course.

That glitch lets the PLGR display a large position error with no indication in the figure of merit (FOM) that the position is wrong.

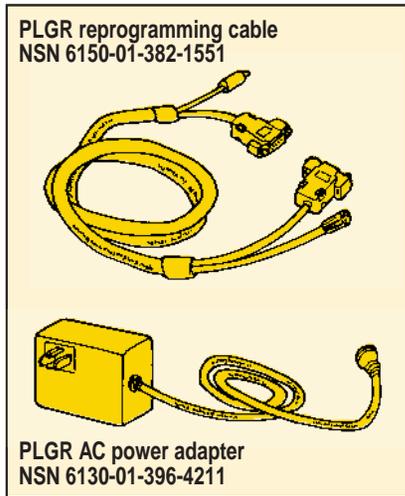
The glitch mostly rears its ugly head when a PLGR, using external power, has been in continuous mode for more than two hours.

The problem is a recycling one. A PLGR on battery power usually recycles—shuts down—and goes into STANDBY mode. This breaks up long periods of use. This shutdown doesn't happen when using external power.



When the PLGR doesn't shut down, a software filter doesn't reset, and prior data is used to calculate your position.

To kill the glitch, get your PLGR reprogrammed. You can do that yourself if you still have the hardware, the reprogramming cable and the AC power adapter, provided in the PLGR field reprogramming kit issued in 1997, and if you have Internet access.

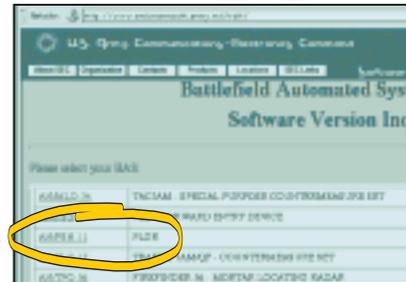


Course

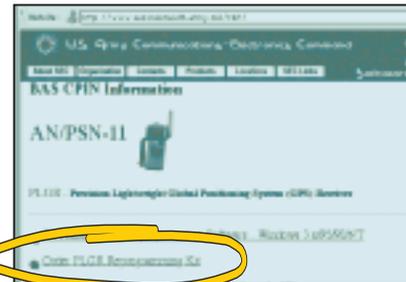
Go to Internet site:

<http://www.sed.monmouth.army.mil/rdit>

Click on Order or Download Battlefield Software.



Then click on AN/PSN-11. Download the PLGR Reprogramming Software.



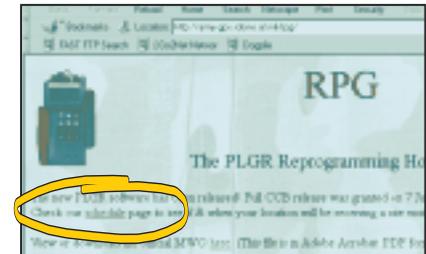
If you didn't get the reprogramming kit, or no longer have it, contact your installation MWO coordinator or LAR. They'll get the reprogramming kit and PS 565

the needed software from CECOM and will help you apply MWO 11-5825-291-30-3.

They may also tell you that your unit is scheduled for a visit from a field reprogramming assistance team. These teams are making the rounds to areas with a lot of PLGRs to help with the reprogramming effort.

You can check the reprogramming schedule for these teams on the Internet at:

<http://army-gps.robins.af.mil/rpg>



If you're in the National Guard or Army Reserve and don't have a LAR or MWO coordinator nearby, contact CECOM at DSN 992-6136 or (732) 532-6136 or DSN 992-6133 or (732) 532-6133.

Some PLGRs already have the new software. Check yours. If the screen reads 613-9854-003 or 613-9544-008 when you power up, your PLGR is good to go.

If your PLGR hasn't been modified and you run it on external power for hours at a time, manually reset the PLGR every two hours until you get the MWO applied.

It's Supposed to Float

The AN/GRC-103 radio's power cable base plate on the T-983 transmitter is supposed to float.

But some of you mechanics don't seem to believe it. You're cranking down the two attachment screws and making the plate stationary.

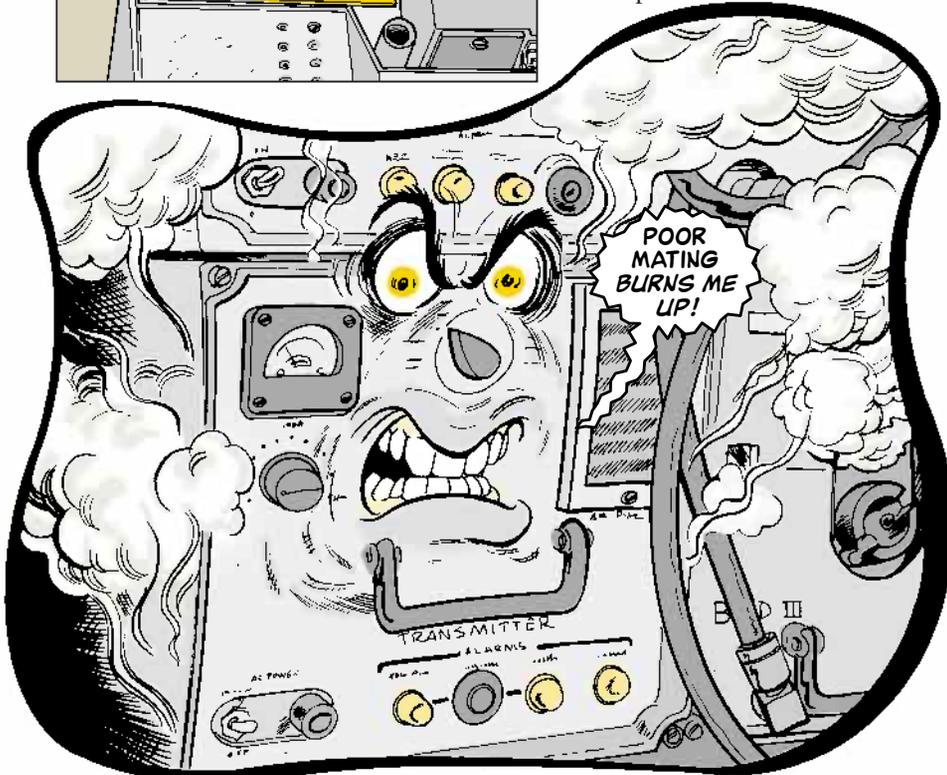
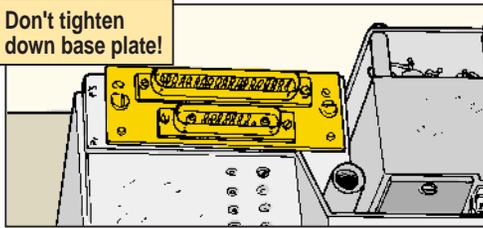
When that happens, the flexibility to mate the connector is gone. If you're

off just a fraction when you try to make the connection, you'll damage pins. Then you get arcing and a burned-up connector.

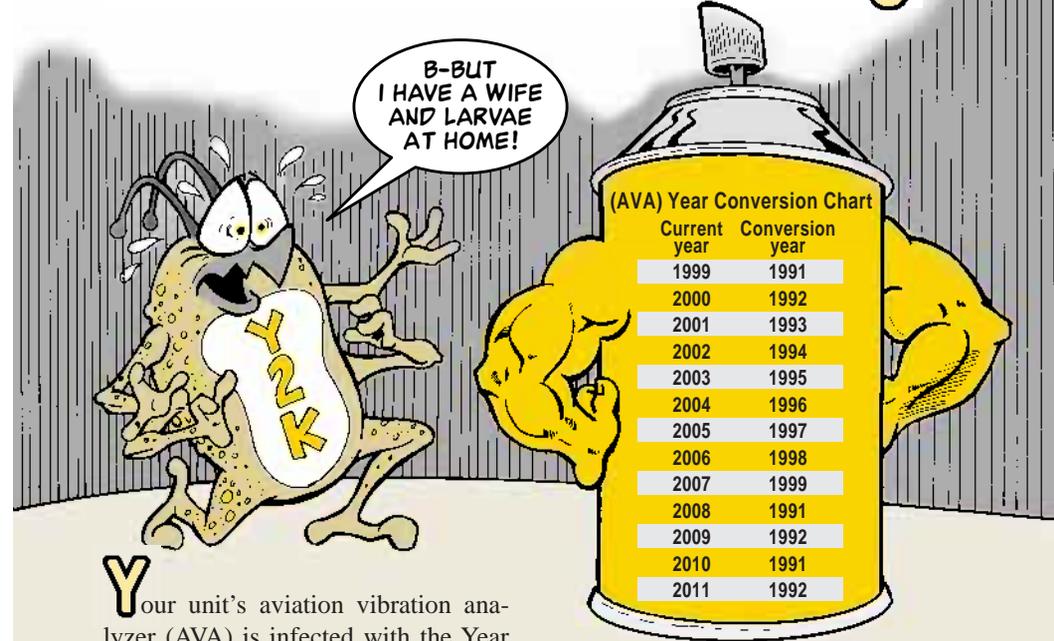
Mating a transmitter to a floating base plate still takes care. When you remove or install the transmitter make sure you go straight and slow!

Line up the guide pins and the case locating pins. Slide the case in easy until you feel the pins mate. Then seat the transmitter. Don't force it! If it resists, you're not lined up.

Don't tighten down base plate!



Exterminate the Y2K Bug



(AVA) Year Conversion Chart

Current year	Conversion year
1999	1991
2000	1992
2001	1993
2002	1994
2003	1995
2004	1996
2005	1997
2006	1998
2007	1999
2008	1991
2009	1992
2010	1991
2011	1992

Your unit's aviation vibration analyzer (AVA) is infected with the Year 2000 (Y2K) bug—meaning the AVA will shut down on 1 Jan 00 unless you take action to prevent it. Change 4 to TM 1-6625-724-13&P (Aug 94) tells you how to keep it working.

You need to change the current year (99) to the conversion year (91) before 1 Jan 00. Here's what you do:

- ☞ Turn on the AVA Control and Display Unit (CADU).
- ☞ Select MANAGER by pressing the F4 function key.
- ☞ Using the directional arrow buttons, highlight SETUP on the next screen and press the DO button.
- ☞ Highlight SET TIME & DATE and press the DO button.

☞ Enter the conversion year (91) in place of the current year (99) and press the DO button to save and exit.

If you don't change the current year to the conversion year before 1 Jan 00, you will need to REFORMAT your CADU. Assistance is available by contacting Robert Branhof at (256) 313-4948 or DSN 897-4948 or by e-mail at:

robert.branhof@redstone.army.mil

This work-around holds the Y2K bug at bay until a permanent fix can be fielded.

Change 4 also changes the AVA calibration requirement from once every 360 days to once every three years.

Look Sharp in BDUs



YOU SPEND A LOT OF TIME IN YOUR BDUs. HERE'S HOW TO KEEP THEM LOOKING GOOD.

Washing

Your BDUs and camouflage cap are machine-washable, so clean them regularly.

But make sure the machine's set on permanent press, and you use warm water and a mild detergent. **Never** add bleach to the wash water. It weakens the fabric, shortens the life and can change the color of the clothing.

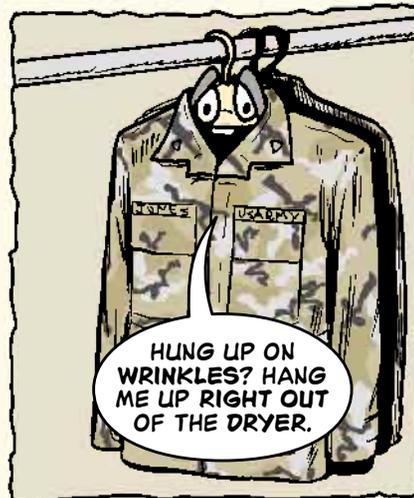
DON'T USE ME—I'M A BDU KILLER!



In a pinch, you can hand wash BDUs, using warm water and a mild detergent. Be sure to rinse all the soap out. Don't wring or twist the uniform to get the water out—squeeze it out. Wringing and twisting adds wrinkles and can damage the fabric. Instead, try wrapping the uniform in dry towels. Then gently apply pressure to the bundle, letting the towels pick up the moisture in the BDUs.

Drying

Set the dryer on its permanent press cycle (130°F or less) to machine dry the cap, shirt and trousers. Take them out and hang them up as soon as the cycle stops, to prevent wrinkles.



Ironing

If you press your uniform, set the iron on a permanent press or low setting. **Never** press dirty clothing. Press-

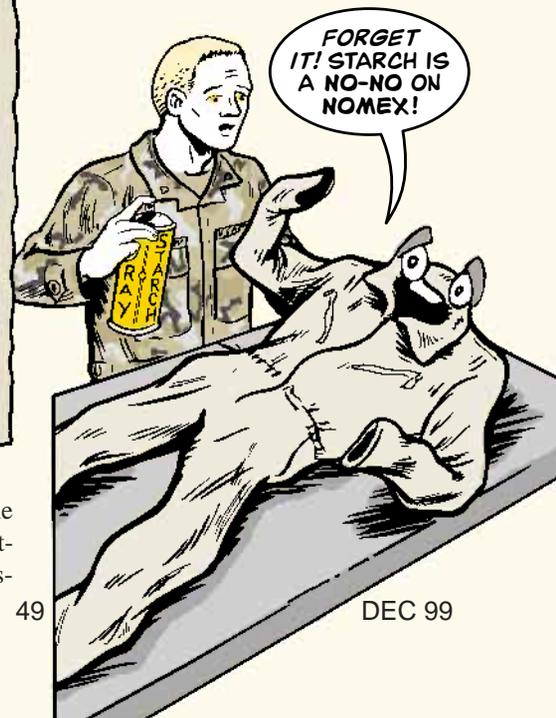
ing clothing that hasn't been washed sets dirt and stains permanently into the fabric.

To Starch or Not

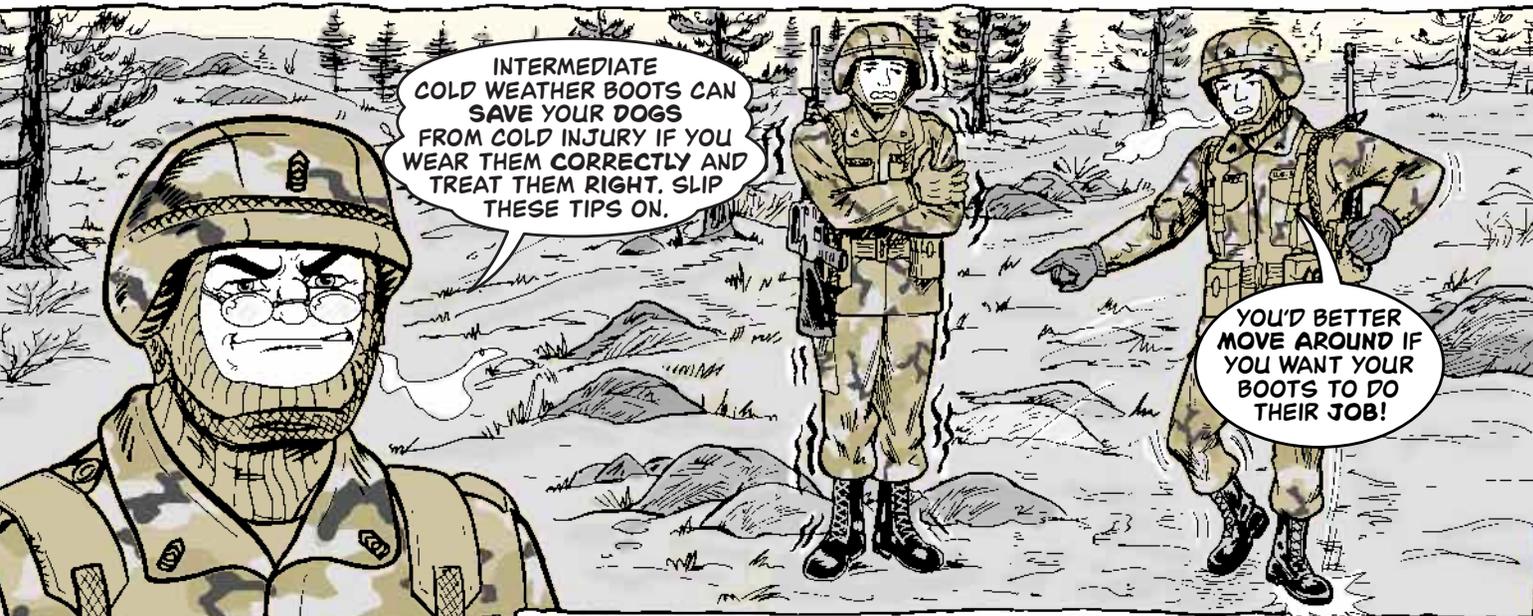
Some soldiers want a crisp look to their BDUs, so they starch them. That's OK, according to DA Msg DAPE-HR-S 2017332 Nov 92, but remember that starch shortens the life of your duds. The message says commanders will not require starch.

Exception

When it comes to aviation BDUs or any NOMEX coveralls—**don't starch**. They are made to be fire-resistant and heat-resistant, but if you starch them, the protection is defeated. Starch will burn and you're toast.



Best Friend to Your Feet

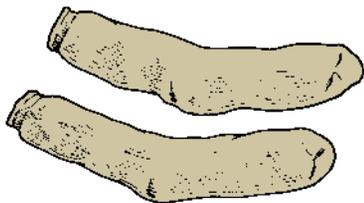


Wear and Tear

 Make sure you get a boot size that allows for swelling, which means one that's a half-size or a full size larger than your normal shoe size. These boots come in narrow, regular, wide and extra wide, in whole and half sizes 3 through 14.

 Before you put on your new boots, put on some wool socks with cushion

Wear wool cushion socks



soles. They provide comfort and wick moisture away from your feet.

 Pull the boots on with both hands by grasping them firmly at the top. Make sure your heel is firmly set into the boot before lacing. Boots should fit firmly but not feel tight. You should have about a 1/2-in gap between your foot and the toe of the boot.

 Carry extra socks. Change them at least once a day, or any time you feel the socks getting moist.

Care

When your boots need cleaning, brush them off and wipe them with a damp cloth. Let them dry naturally at room temperature. Don't place them next to a heat source—the heat can dry out and crack the leather.

The boots do not need waterproofing, but mink oil or a similar conditioner can help maintain the leather and extend its life.

Beware

If you feel your feet getting cold, button up all your clothing and exercise your whole body. Swing your arms, stamp your feet and try to move your toes as much as you can to increase circulation to your feet. Trench foot and frostbite can cause painful injuries or even permanent disability.

Finally, no boot can keep your feet from freezing if you remain motionless for several hours in cold and wet conditions. Keep moving!

MAKE YOUR MARK

Put guide marks and warning lines down inside your motor pool with easy-to-use and environmentally friendly paint.

Yellow paint, NSN 8010-00-900-3648, has been the paint of choice for years. Unfortunately, it's flammable and pollutes the air. Also, paint thinner is needed for proper cleanup. Leftover paint and paint thinner are hazardous waste.

Use yellow paint, NSN 8010-01-019-1776, instead. It's a water-based latex that's easy to clean up. The paint is non-flammable and presents fewer health and safety hazards.

Before disposal of any leftover paint or cleanup materials, though, check with your environmental safety office for state and local regulations.



USE LATEX PAINT FOR SAFETY LINES.

Leaks Can Sneak Up on You



Tents used to be made out of cotton duck, usually called canvas. New tents are a coated polyester fabric. No matter—they all leak.

You want to stay dry, you pull some PM. But first, you gotta know what kind of tent you have—canvas or polyester. There are differences in the two kinds—how they look, feel and smell.

Cotton duck is olive drab and has a coarse, rough feel. It develops a musty smell.

Coated polyester is bright green, and feels slick. It has a vinyl smell.

Treating Canvas

Procedures for fixing leaky canvas are spelled out in FM 10-16, *General*

Fabric Repair. All tents start out repelling water, but the repellency wears off after awhile. Once they've been put up, taken down and cleaned a few times, it's time to renew that water protection.

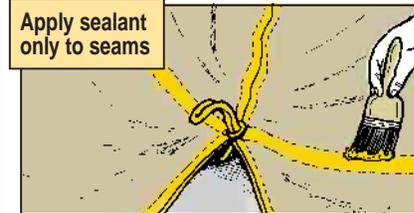
✓ To re-treat canvas, you'll need canvas preservative paste, NSN 8030-00-281-2346.

✓ Make sure the canvas is dry. Brush off any loose soil.

✓ Stir the canvas preservative paste thoroughly. Then dilute it with an equal amount of dry cleaning solvent, adding the solvent a little at a time. Stir the mixture continuously until all the

I-I-I-LL SAY!

Apply sealant only to seams



4984. You'll also need a 1-in wide paint brush to apply the sealant, rags and some small disposable containers with lids.

Seal the tent seams like so:

✓ Spread the clean, dry tent on a flat surface in a well-ventilated area, preferably outdoors.

✓ Put the seam sealant into the small containers and keep the lids on the ones not in use. This keeps the sealant from thickening as you work.

✓ Brush a light coat of sealant onto the stitched areas of the seams, flaps and webbing.

✓ Use a 1-in brush turned sideways. The sealant should only go on the thread and holes left by the stitching needles. Try not to let it slop over beyond the width of the seam on to the fabric.

✓ Let the tent dry about 30 minutes.

✓ Apply a second light coat. Dry thoroughly. Two light coats work better than one thick one.

The sealant isn't flame retardant, so keep it off the polyester fabric. Apply it **only** to the tent's seams. It increases the fabric gloss and makes it more likely to crack. If it cracks, your leaks are worse than ever.

solvent is blended into the preservative paste. Stir it again before you start.

✓ Apply the coating mixture with a brush or spray gun. Be sure you have lots of ventilation. If you use a spray gun, wear protective clothing, a respirator, and a helmet liner.

✓ Put the coating on thicker over patched areas and places that have previously been repaired.

✓ Let the canvas dry until it loses its tacky feel.

Polyester Tents

If your tent is made of polyester fabric, it doesn't need re-treatment. Just the seams need to be re-sealed.

Use seam sealant NSN 8030-01-350-

Up and Running or Up in Smoke?

The personal computer (PC) has become a vital part of Army supply, maintenance and other operations.

Whether you are using a PC for ULLS, SAMS, SIDPERS-3, FED LOG, electronic technical manuals (ETMs) or surfing the Internet for Army pubs, it has become your work horse.

Anytime you move that work horse to another country, take the time to set it up correctly when you are ready to use it again. Otherwise, you may find your PC up in smoke when you need it to be up and running.

Most initial computer hardware failures happen when the PC is plugged into the wrong power type. In the US, the most common voltage is 115/120-volts AC.

However, some OCONUS locations use 230-volt power. Plug adapters are available that allow you to plug your PC into a 230-volt outlet, **but they are not power transformers.** Plugging a 115/120-volt PC into a 230-volt outlet will blow the the PC power supply.

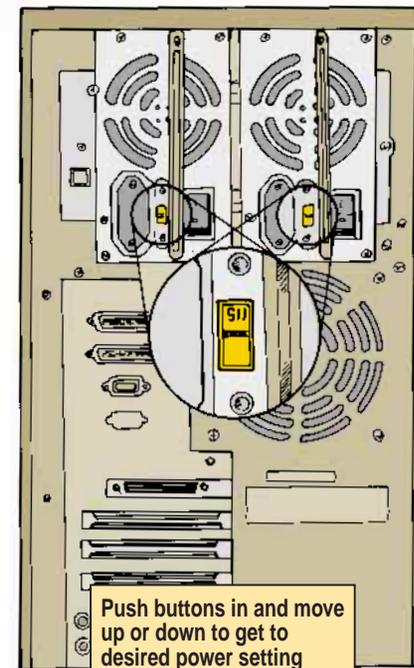
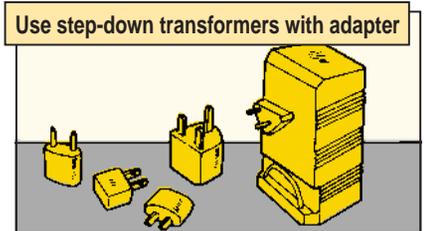
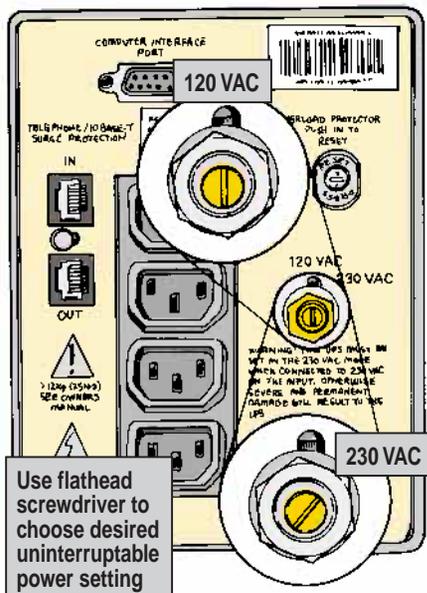
The same goes for plugging your PC into a straight 230-volt uninterruptible power supply. Your computer will burn up if it is set at 115/120 volts.

When going to an OCONUS location, you should:

1. Determine your power requirements **before** you move the equipment. Check with your prime power engineering support or see Appendix C of FM 5-422, *Engineer Prime Power Operations* (May 93). Although a bit old, it still identifies a number of different power types available in countries around the world.



2. Switch your computer input settings to meet the voltage you're going to be using before you pack your PC. Most PCs use recessed switches located next to the power cable on the rear panel of the computer. You should be able to change your settings by pushing in the button and moving it up or down with a screwdriver or pen. No switches? Then you will need to use the proper transformer to convert the power to meet your computer equipment's operating needs.



3. **Before** you set up your PC at your destination, have the prime power engineers verify the power output right where you plan to plug in (not miles away or even next door). Then verify your equipment settings **before** you power up your equipment.

These simple precautions can save you a Report of Survey and keep you and your unit up and running!

Do You Copy?



When your copier breaks down, it seems like nothing else works right all day. But if your copier isn't properly maintained, or if the paper is stored or loaded wrong, your machine **will** break down and jamming **will be** a fact of life.

Here are some things you can do to keep copies coming:

Make sure the copier is serviced according to the manufacturer's maintenance schedule.

- * After long print jobs, especially two-sided runs, let the copier cool off for a few minutes before starting a new job.
- * Add new toner when the warning light calls for it.
- * Clean accessible areas on the copier as needed. And keep the copy room as clean and dust free as you can. Dirt is a leading cause of copier jams.

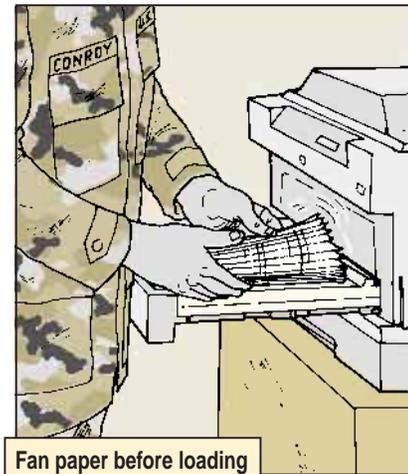
- * Make sure the copier paper is stored in a dry place, and off the floor, especially if the floor is concrete.



Keep paper high and dry

- * In humid areas, try to keep the paper away from the outside moisture. Keep the paper boxes as far from outside doors as possible. Try to store the paper at normal room temperature—72°F or so.

- * If the paper is stored in an area with a different temperature than the copy room, let it sit near the copier for several hours before you use it. This lets the paper adjust to the working temperature.
- * Don't remove the paper from the wrapper until it's time to load it in the machine. Leave the wrapped paper sealed in its packing box as long as possible.
- * Eyeball the paper to find the manufacturer's arrow on the ream label before loading the paper into the copier. This helps orient the curl of the paper in the correct direction. If the machine is jamming frequently, try turning the paper over
- * Fan paper before loading it in the copier. That will help it feed easier. Don't load the machine with any paper that has bent corners or ragged edges.



Fan paper before loading

- * When you get a paper jam, make sure you get the entire sheet of paper out. Small pieces of paper left in the

- roller mechanisms can cause further jamming.
- * If you can't get all the jammed paper out, call the service tech.
- * Keeping the document glass clean will help get clean copies and fewer misfeeds. Use a paper towel or soft cloth and a liquid, nonabrasive glass cleaner, or water. Do **not** put the liquid directly on the glass where it can seep into the works—put it on the cloth. Use the cloth on the glass and wipe it dry.



Keep document glass clean

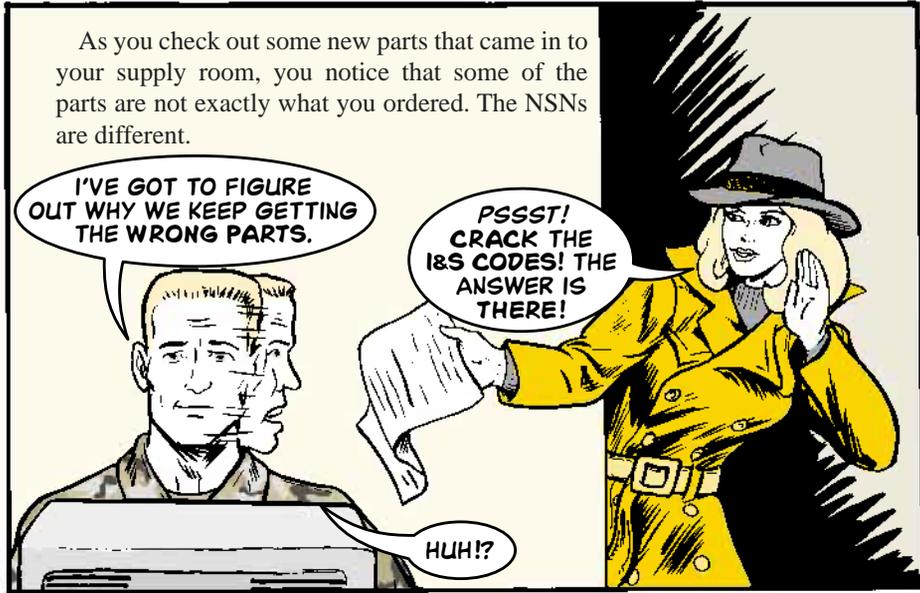
- * If the machine continues to jam, call for service immediately. Have the copier model and serial number handy when you make the call. Some models may be under warranty, or due for replacement.

Use Recycled Paper

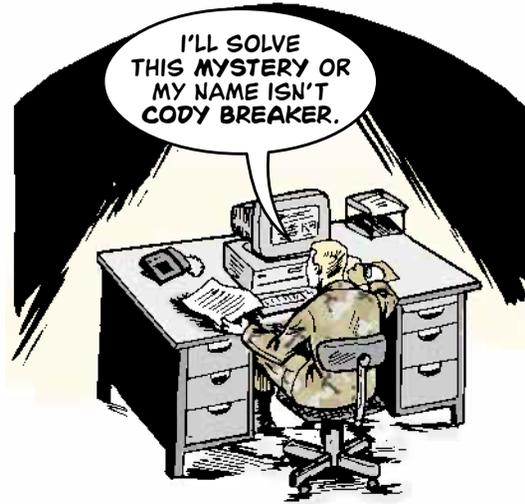
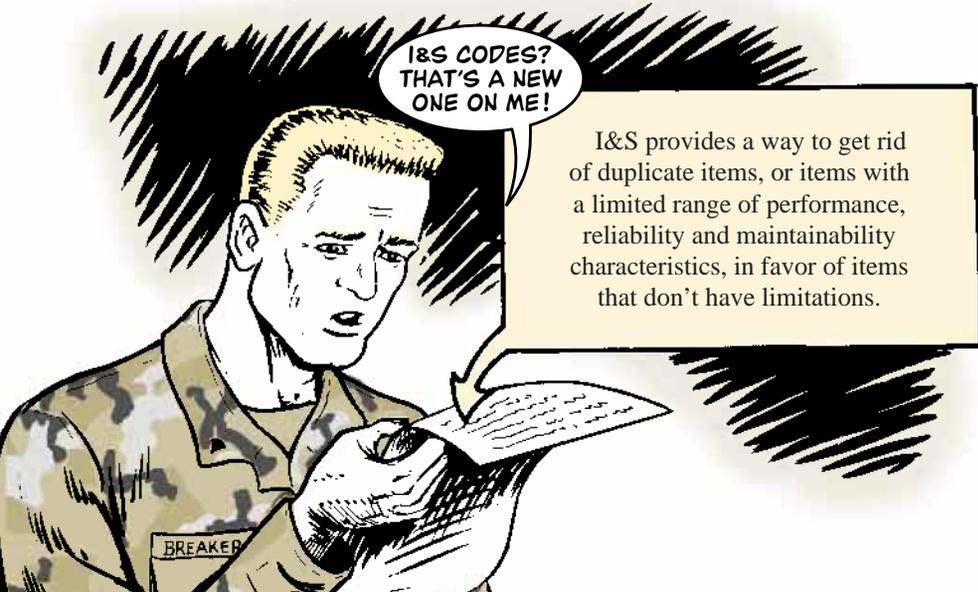
Since Jan 99, recycled paper has been required for government copy machines. The following NSNs bring a ream of recycled copier paper:

- NSN 7530-01-335-2623 8 1/2 x 11 inches
- NSN 7530-01-334-7817 8 1/2 x 14 inches

I&S: IT'S ALL IN THE CODES



But, before you excess those parts and reorder the original NSNs, using advice code **2B - Do Not Substitute**, check 'em out in the FED LOG Army Master Data File (AMDF). Those new parts may be the result of a process called Interchangeability and Substitutability (I&S).



The relationship may be interchangeable, substitutable or a combination of both. All family members will have a phrase code (PC) that points them to the master NSN. How the items are selected for issue is based on the order of use (OOU) file.

Interchangeable items can be substituted for each other with little or no adjustment required. Their performance, reliability and maintainability are identical

Substitutable items aren't identical to each other, but are enough alike that they can be substituted for one another under specific conditions and applications.

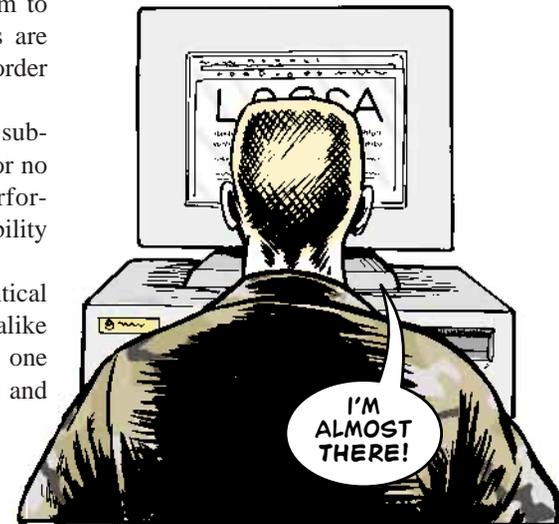
When an item manager decides there is a relationship among similar items, he establishes an

I&S family. AN I&S family consists of one master NSN (the head of the family) and one or more related NSNs.

To find out more about how I&S works, go to the LOGSA I&S home page at:

<http://www.logsa.army.mil/avc/iands.htm> and click on the DOD I&S Training Module.

You can also click on the LOGSA I&S problem report form. This report can be filled out on-line and submitted to the LOGSA I&S team for review. You can use this I&S problem report any time you think there is an I&S problem. Report the problem as soon as you can so it can be corrected before it becomes an even bigger problem.



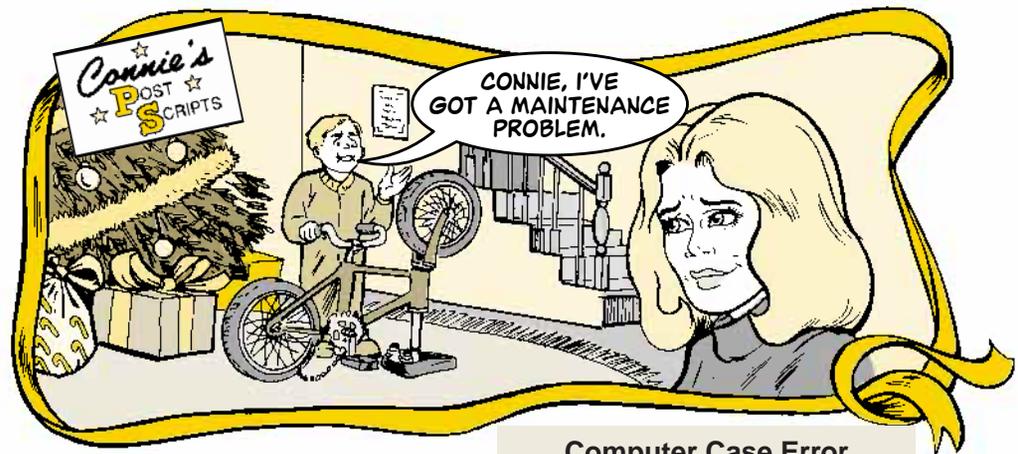
IF YOU HAVE QUESTIONS ABOUT THE TRAINING OR THE REPORT, CONTACT...

Clyde Whitman at DSN 645-0778, (256) 955-0778, or by e-mail: clyde.whitman@logsa.army.mil or Charles Zepfel, DSN 645-0791, (256) 955-0791, or by e-mail: charles.zepfel@logsa.army.mil



THIS I&S CODE BREAKER IS INVALUABLE.
THANKS FOR CLUING ME IN, CONNIE!

PS END



Computer Case Error

We slipped a digit in our computer case story on Page 60 of PS 562. The correct toll-free phone number for Barry Cases is (800)844-3440.

AN/PSG-8(V)2 Battery

The BA-5600/U lithium battery used in the AN/PSG-8(V)2 handheld terminal unit, has been replaced by BA-5600A/U, NSN 6135-01-441-0402. The new battery comes in a package of eight that costs \$224.

Expandable Tent Liner

Getting your expandable tent, NSN 8340-00-782-3232, ready for winter? Don't forget the new thermal liner, NSN 8340-01-452-7049. It comes with all new tents, but it can also be requisitioned as a separate item. It's lightweight, installs easily and will keep you comfortable down to -60°F.

M88A1 Wiring Harness

Don't order the dual voltage regulator harness, NSN 6150-01-235-0467, shown as Item 1 in Fig 12 of TM 9-2350-256-24P-1. It causes electrical charging problems that cannot be solved by troubleshooting and will soon be deleted from the TM. So, when you need a new harness, order NSN 5995-01-245-7651. It's Item 1 in Fig 119.

M1A1 Roadwheel Torque

TM 9-2350-264-20-1-4 says to torque the nuts to 320-350 lb-ft when you replace a roadwheel on your M1A1 tank. But that's not tight enough. The roadwheel nuts should be torqued to 380-420 lb-ft. Make a note until the TM is updated.

M22 Binocular Parts

If you need to replace the rubber armor bushing that attaches to the objective lens filter frame of your green M22 binoculars, use NSN 5365-01-348-7037. This information has been added to Item 6, Fig 1 of TM 9-1240-403-12&P with Change 1.

Food Container Paint

When painting your old food containers, use NSN 8010-00-081-0809 to get a quart of olive drab enamel. Use NSN 8010-00-297-0586 to get a gallon. We had it wrong in PS 562.

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