

Issue 563

October  
1999

# THE PREVENTIVE MAINTENANCE MONTHLY

TB 43-PS-563

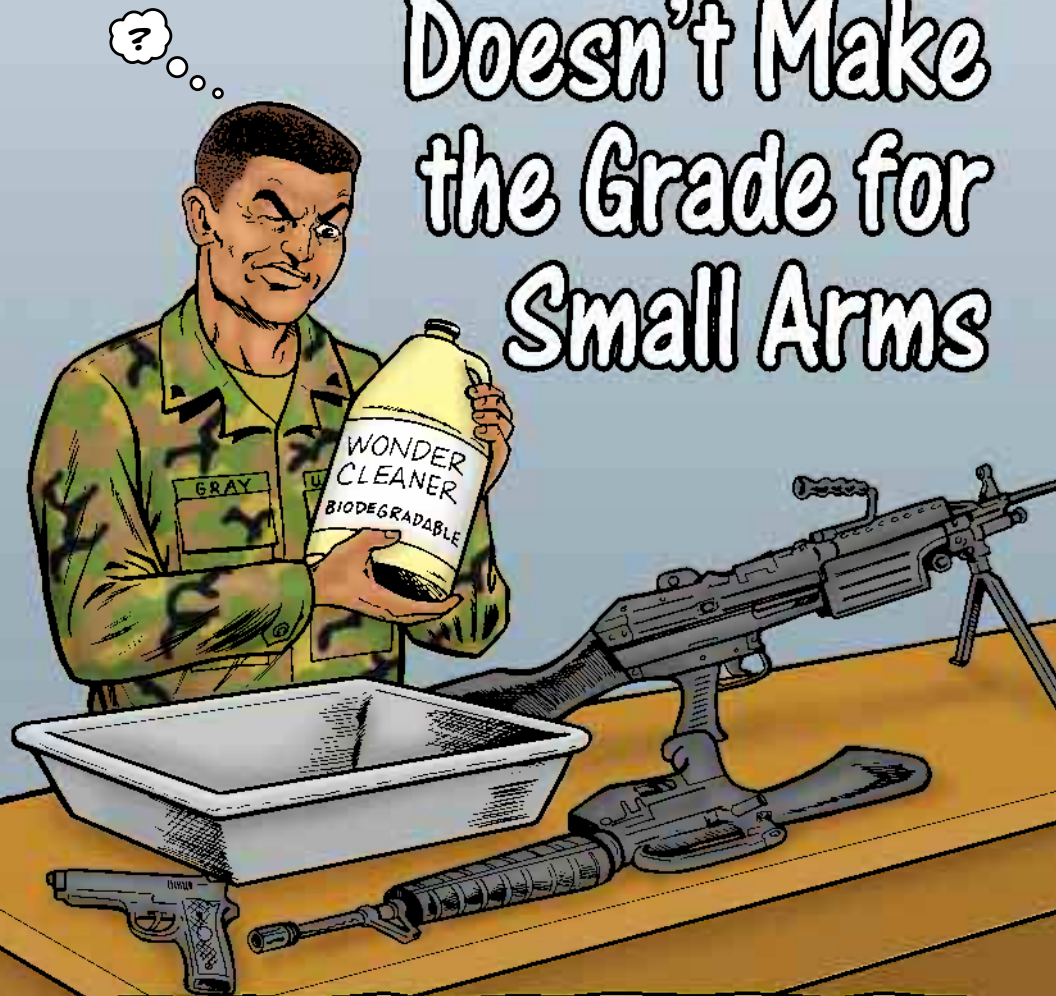


IT JUST  
GOES TO SHOW  
YOU—YOU NEVER  
START AN IMPORTANT  
MISSION WITHOUT  
DOING PM.



Approved for Public Release;  
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# Biodegradable Doesn't Make the Grade for Small Arms



Biodegradable cleaners are water-based and cause weapons to rust. Clean and lube only with what's called for in your weapon's TM, or with authorized substitutes.



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# THE PREVENTIVE MAINTENANCE MONTHLY

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TB 43-PS-563, 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](mailto:psmag@logsa.army.mil)

Internet Address:

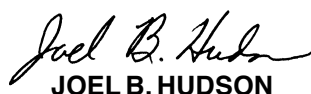
<http://www.logsa.army.mil/psmag/pshome.html>

By Order of the Secretary of the Army:

**ERIC K. SHINSEKI**

General, United States Army Chief of Staff

Official:

  
**JOEL B. HUDSON**

Administrative Assistant to the Secretary of the Army

9922104

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# Change Is Good

You do need to change, at least when it comes to your TMs.

Even though the Army is putting most of its TMs on CD-ROMs, making changes to your remaining paper TMs is important. The changes contain updates to maintenance and repair procedures and to part numbers and NSNs. More importantly, changes often correct errors that have caused accidents or damage.

Say, for instance, you have gotten M4 carbines in your unit. If you try to zero the M4 sight like it says to zero the M16 rifle in the M16's -10 TM, your shooting will be off. The correct M4 zeroing procedure was published in Change 3 to the M16's TM.

So, you gotta change. A TM isn't a complete, valid manual until those changes are posted.

Here's how to change paper TMs:

- Check the change pages against the transmittal page to make sure you've got all the pages.
- Replace the old pages with the change pages.
- Put the transmittal sheet at the front of the TM so you can quickly tell what is the last posted change.

Binders are the best way to store TMs. They protect the TMs and make it easy to post changes. Get a 2-in binder with NSN 7510-00-149-0604.

Of course, when your TMs—and SCs—go electronic, all you need to remember is to replace the TM's old CD-ROM with the new updated disc. You can get a case for storing 50 of the CDs with NSN 7045-01-179-2980.



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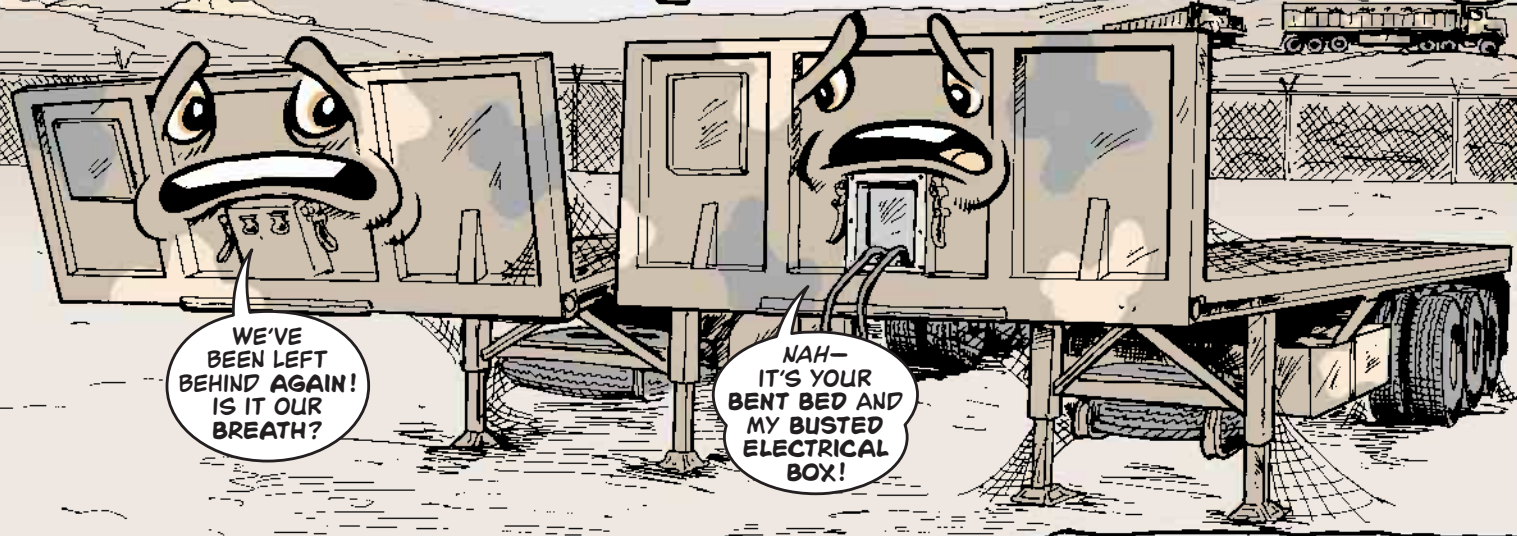
*Joel B. Hudson*  
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# Keep 'em Hauling with PM

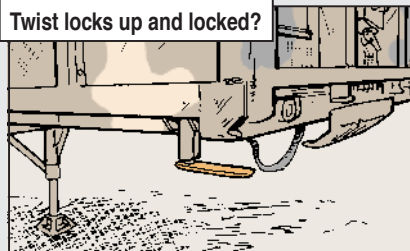


**Y**our M872-series semitrailers don't make good flower boxes or bookends, so use these maintenance tips to keep 'em at work hauling cargo.

## On the Table

The front container tie-down twist locks will damage M915-series tractors if you leave them down. During turns, the lock handle hits the splash guards.

Twist locks up and locked?



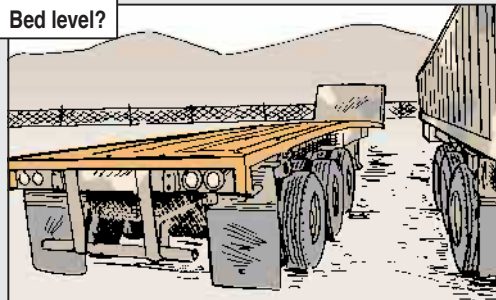
PS 563

Prevent damage by raising the twist locks and locking them.

Twist-lock handles aren't built to be used as steps, either. If you need to climb onto or off the trailer, use something else for a step. The rear end protection bar works, for example.

Eyeball your trailer bed for an obvious bend toward the bed front. If it has

Bed level?



2

a bend, that goes a long way to explain why 35-ft and 40-ft containers won't sit flush and why the removable container locks (F pins) can't be installed right.

If you notice a bend or have other problems securing cargo or containers, let your mechanic know. Never haul containers that you cannot lock into place.

Can't find a bulkhead pin in TM 9-2330-359-14&P? Use NSN 5315-01-270-1875. Note the NSN in Fig 48.

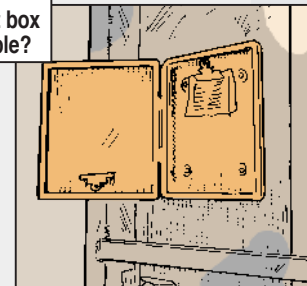
Side clearance lights need rubber mounting grommets. They're shown as Item 10 in Fig 1.

## In the Boxes

Need a new pamphlet box? Use NSN 2540-01-100-3894, and add it to the TM.

PS 563

Pamphlet box serviceable?



Missing grommets can doom air lines when they pass through the nose box. If the lines get cut through, bye-bye air pressure to the brakes. Use NSN 5325-00-291-9366 to get the grommets.

Check out the nose box for loose screws. Not only does this open the box to water damage and electrical shorts, it can lead to the box cover being ripped off the trailer by the tractor electrical cable.

If enough screws are missing, tractor cable can yank off cover and break wires



3

PS MORE



## Under the Floor

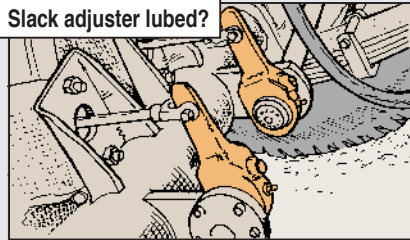
Wrench, NSN 5120-00-203-4766, is needed to tighten lug nuts. It has openings of  $\frac{13}{16}$ ,  $\frac{13}{16}$ ,  $1\frac{1}{4}$  and  $1\frac{1}{2}$  inches.

Hub grease seals can be a problem, since you can get three different seals with NSN 5330-01-049-4093.

To get the right one, order on a DD Form 1348-6 using the NSN, part number B370036BGO and CAGE 01212 from RIC S9I. Write "2B" in card columns 65 and 66 so no substitution will be made.

Check slack adjusters before you move out. Make sure the adjusters and camshafts get lubed. There are six fittings on each axle. Without lube, brake freeze-up is a real possibility—and real trouble on the road.

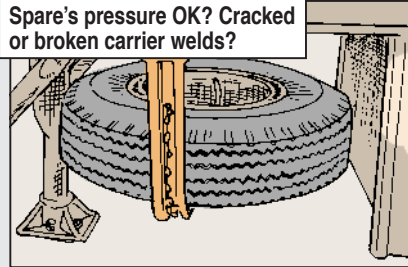
Slack adjuster lubed?



Check the spare tire for air so you don't end up all flat in the boonies. It's

no joking matter to find the spare flat. Also check the spare carrier for broken or missing welds. You don't need to drop a tire while you're moving.

Spare's pressure OK? Cracked or broken carrier welds?



## Not the Only One

Get right with the Usable On Code (UOC) in the -14&P so you get the right parts for **your** trailer. M872-series semitrailers were built by more than one manufacturer, so the UOCs not only identify models, but makers, too.

Find the manufacturer on the trailer data plate.

Don't be put off if a repair part you get from supply looks different from the original. More than one manufacturer is involved, so if it fits and works, use it. If it doesn't fit, turn it in so your supply can return it.

Trucks and Trailers ...

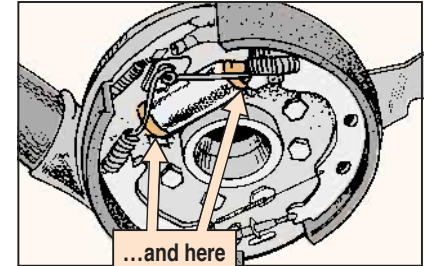
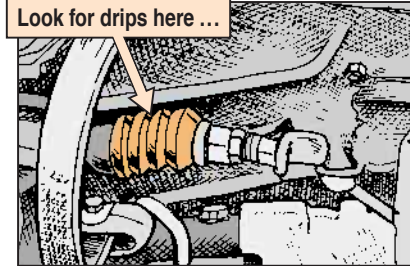
# Don't Touch Rubber Boots



**M**echanics, leave well enough alone when it comes to the rubber boots on a vehicle's brake master cylinder or wheel cylinder.

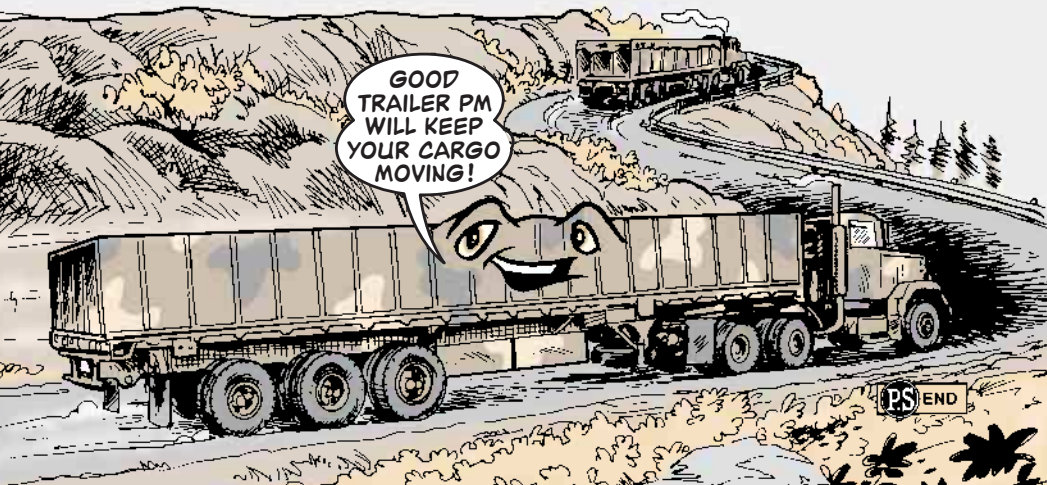
When you check the vehicle's brake system, look for leaks from the seals on those cylinders, but **never** pull the boots back to find a leaky seal. If the seal is bad, brake fluid will be dripping from the boot.

Look for drips here ...

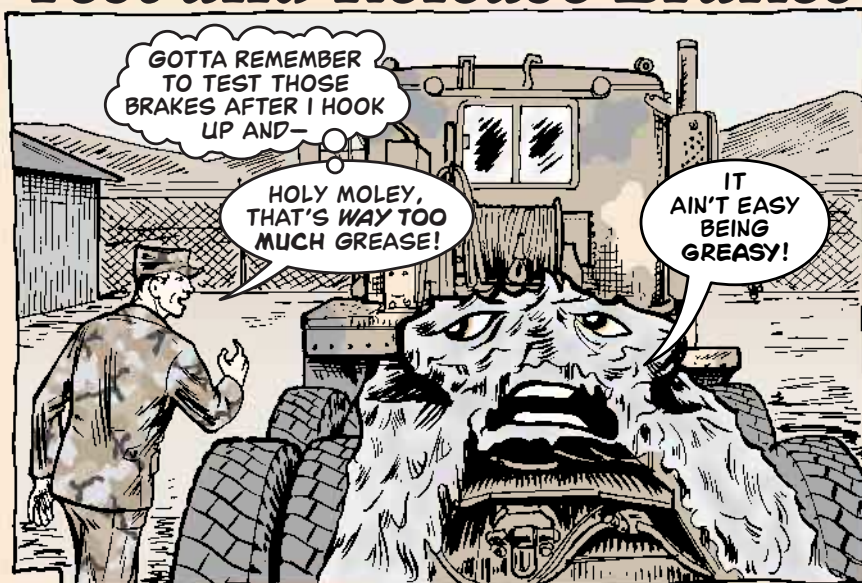


Pulling back the boot can **cause** a leak. And, grit gets in if you don't re-seat the boot just right.

The best way to find a leak is to check the fluid level in the reservoir. If it's low, fill it. Check the level daily for at least a week. If it drops during that period, you've got a leak. So, go over the system until you find it and get it fixed.



# Test and Release Brakes

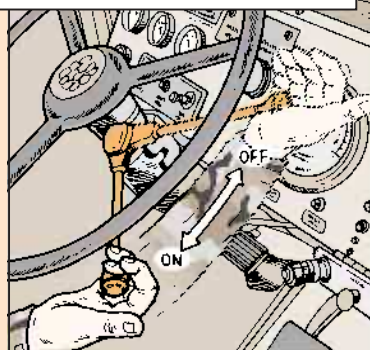


**B**efore you head out of the motor pool with your M916 tractor and M870 semitrailer, you test the trailer's brakes, right? But, do you always remember to release them after testing?

If you forget, you can burn up the brake pads.

Test the trailer's brakes by setting them with the M916's trailer brake hand control. Move the tractor slightly ahead to make sure the brakes hold—then release the brakes by pushing the hand control all the way back to OFF. If you don't, the brakes are still applied and you can burn them up when you hit the road.

Test trailer brakes with hand control



## Coat the Fifth Wheel

Another tractor PM tip is to go lightly with the GAA on the tractor's base plate and approach plate. Lube them according to LO 9-2320-273-12. A 1/4-in coat of grease is plenty.

Too much lube attracts dirt and crud that can damage the fifth wheel or the trailer's kingpin.

# UNIT IDS AND CAMOUFLAGE

**T**here's no secret in adding unit identification numbers to a wheeled or tracked vehicle.

But if you check around your post or installation, you'll probably see several different methods in use.

There is a right way, but you need two pubs to find it.

## TB 43-0209

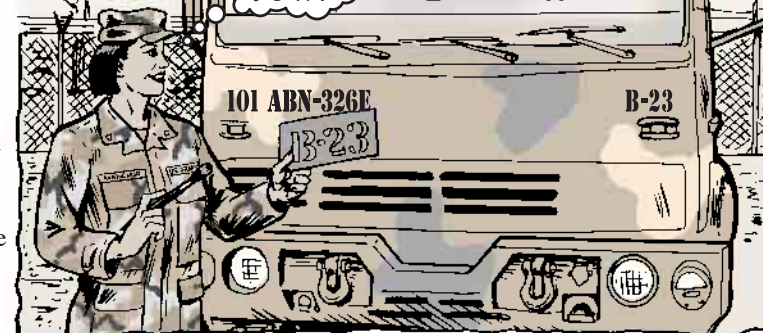
TB 43-0209, *Color, Marking and Camouflage Painting of Military Vehicles, Construction Equipment and Materials Handling Equipment* (Oct 90 with Change 1, May 91), has the info for unit ID numbering and painting on Pages 3 through 17.

In Para 9 of the TB, markings are divided into four elements, arranged left to right:

1. Major command, organization or activity
2. Intermediate organization or activity
3. Unit or activity
4. Vehicle or equipment number (for road march purposes)

Para 9 also has some painting information, but not everything

THAT OUGHT TO DO IT!



you need. It doesn't touch on camouflage differences.

## TM 43-0139

TM 43-0139, *Painting Instructions for Army Materiel* (Oct 88 with Changes 1-3), has the rest of the painting story for ID markings.

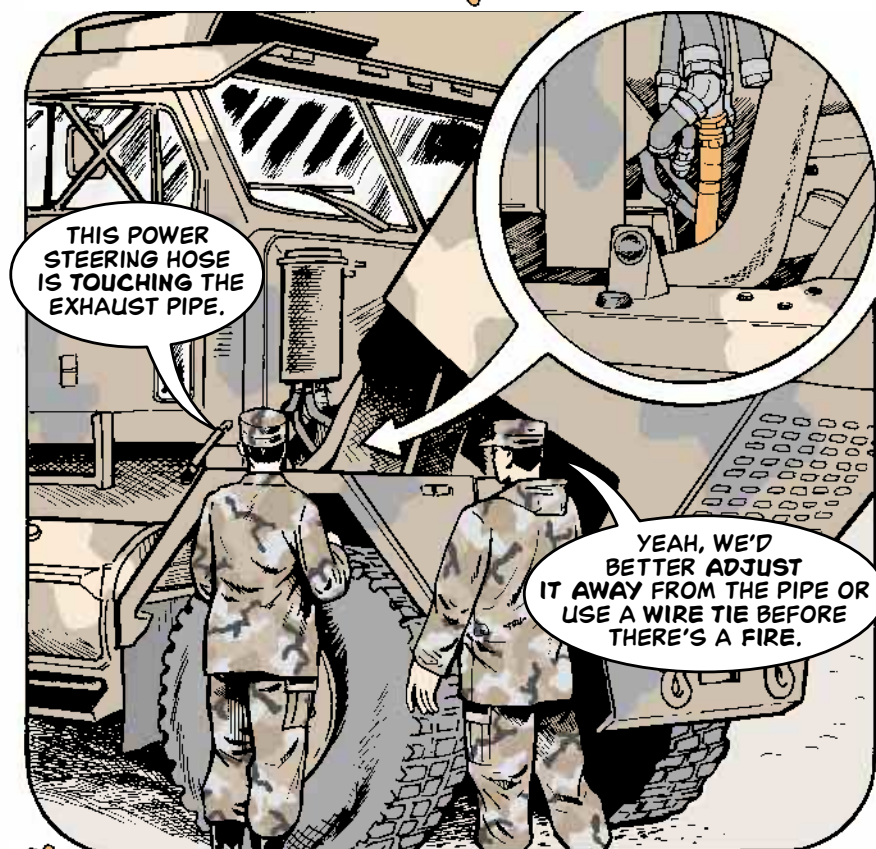
Para 4-9 and Fig 4-2 are keys to applying ID markings over camouflage colors. You use black over brown or green, green over black, and brown over white or tan.

Always use CARC paint to add any markings to a CARC-painted vehicle.

Woodland Camouflage	Desert Camouflage
<p>Black over brown</p> <p>Green over black</p> <p>Black over green</p>	<p>Brown letters over tan (or white in Arctic conditions)</p>



# Steer Hose Away from Exhaust



**N**ext time you have the engine covers off an M1070 HET tractor, note how close the power steering hose is to the exhaust pipe.

If the hose and pipe touch at all, you've got a big problem waiting to happen. A hole rubbed or burned into the power steering hose means hydraulic fluid on the exhaust, and that means a fire.

Since the power steering hose is not very flexible, moving it away from the exhaust pipe will be tough. Try to use a wire tie to get space between the hose and pipe. NSN 5975-00-156-3253 gets 100 ties that are 13½ inches long.

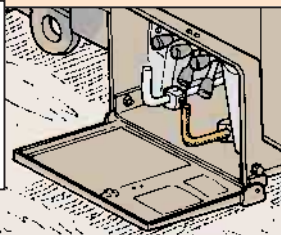
If that won't work, you'll have to reposition the hose. Loosen it at its connections and turn the hose so it is as far away from the pipe as possible.

# GOOSENECK SAFETY CHECKS

**D**rivers, when you uncouple the M1000 HET semitrailer from the M1070 tractor, make sure the gooseneck's isolation valve handle is pulled out to the adjust (outward) position.

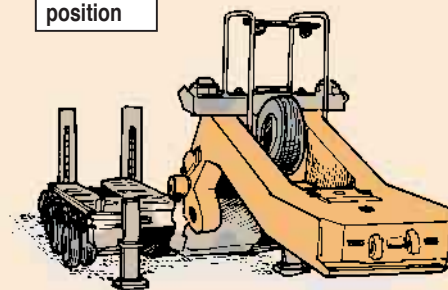
If it isn't, the gooseneck can fall, damaging equipment, or worse, hurt someone.

Pull isolation valve handle out to prevent gooseneck from falling



Likewise, when you park the semitrailer, make sure the gooseneck is in the lowered position. Left in the elevated position, the gooseneck can drop without warning.

Park with gooseneck in lowered position

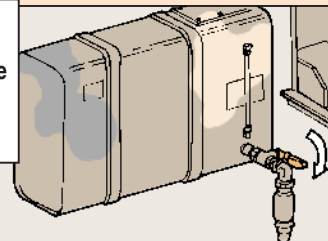


## Hydraulic Tank Handle

Prior to running the auxiliary pump unit (APU), make sure the valve handle

on the hydraulic oil tank is in the down (open) position.

Valve handle must be down to run APU



In the up (closed) position, there's no oil flowing through the hydraulic lines. Then the APU's hydraulic pump isn't pumping anything but air. That burns out the pump.

A BURNED-OUT PUMP MEANS NO OIL CAN FLOW THROUGH THE HYDRAULIC SYSTEM. NO HYDRAULIC SYSTEM MEANS THE SEMITRAILER IS NMC.





## Saved By the Bar



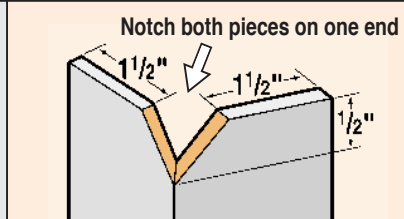
**W**recker operations involve hard work and heavy metal, so your M984A1 wrecker is built tough to take punishment.

Except for the retract supply lines on some tow bar lift cylinders, that is.

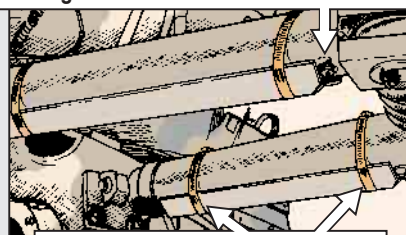
The lines are on the bottom of the cylinders, where they get smashed a little bit every time a towed truck's bumper or hood bumps them. Eventually, they get crushed and leak or burst during a lift.

Here's how to prevent the constant damage and eventual failure:

**1. Cut two 24-in pieces of 1/8 x 2-in angle iron. Order by the foot with NSN 9220-00-277-4911**



**2. Place guards over lines so they don't cover cylinder check valves. Notched ends butt against valves**



**3. Hold guards in place with four loop clamps, NSN 4730-00-908-6294**

If your wrecker already has the guards, you're good to go.

## Line 'em Up with Wheel Lift

**M**echanics, what do bunged-up axle threads, leaky axle seals and leaky axle bearings often have in common with a sore back?

Bunged-up threads?



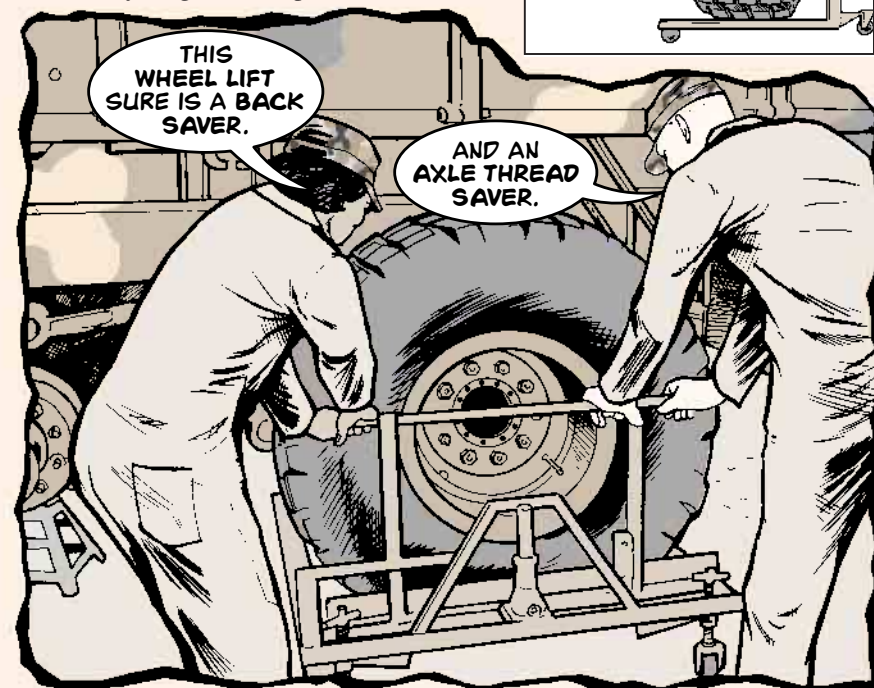
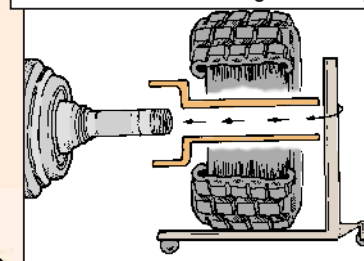
The answer: They're the result of not getting everything lined up when you wrestle a truck's wheel and hub assembly back onto an axle.

Head off wheel and axle damage as well as a sore back by using the wheel lift, NSN 4910-00-554-5983, from the Common shop sets.

The wheel lift picks up the wheel and hub assembly and lets you line everything up before you slide it into place.

Even with the lift, though, get a buddy to help you. An extra pair of eyes can make sure everything is lined up.

Wheel lift truck makes alignment easy

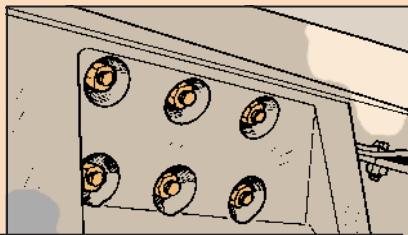


# The Ups and Downs of Cab Raising

**R**aising and lowering the cab on your MLRS seems easy enough, but there are some potential problems to watch out for.

## Raising

Before raising the cab, eyeball the cab hinge studs and nuts for cracks. If you find any, let your mechanic know. Don't raise the cab until cracked studs and nuts have been replaced. You don't want to be under that cab if the hinges fail!



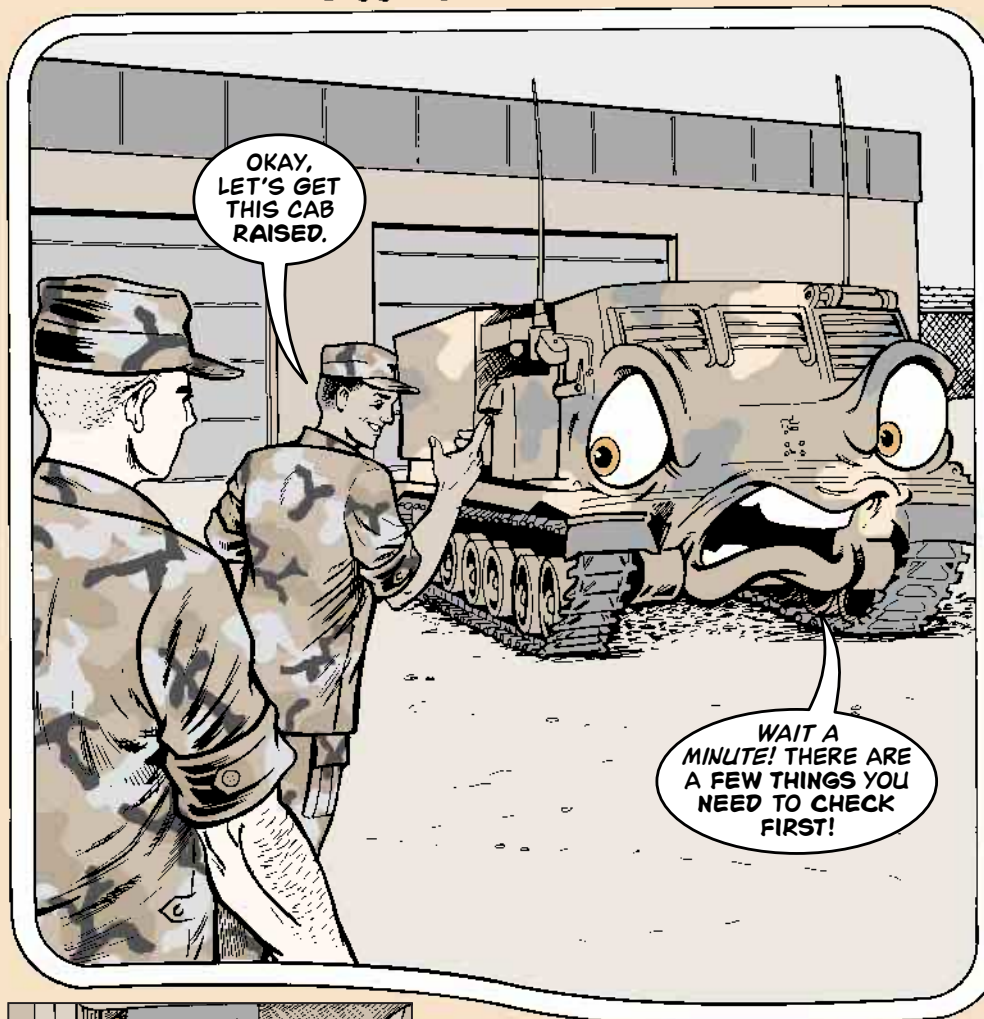
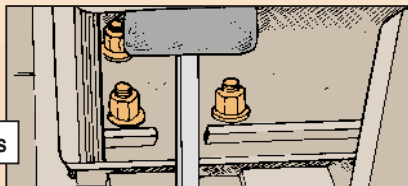
Check hinge studs and nuts on outside...

Also, remove all equipment stowed on top of the cab before raising it. The elevating jack assembly can't take the extra strain, and falling equipment could kill or injure you or others.

Slow and easy is the way to raise the cab. The faster you go, the more the cab rocks up and down. That puts a lot of strain on the hinges.

Once the cab is up, check the hinge studs and nuts on the inside, too. Again, your mechanic should replace any damaged ones.

...and inside for cracks or looseness

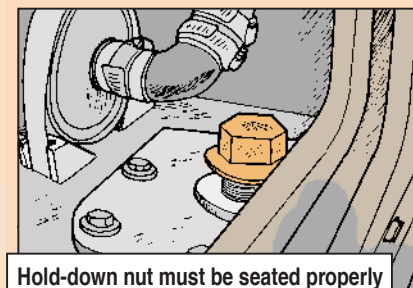


While the cab is up is also the best time for your mechanic to replace any loose hinge nuts. That's when the torsion bar is under the least strain, so most of the torque will go on the nuts.

## Lowering

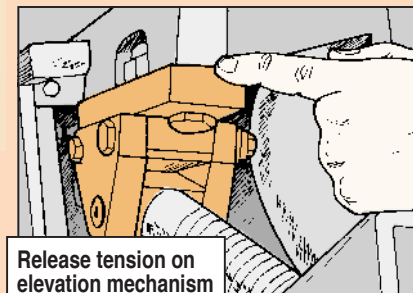
After lowering the cab, lock it down right or you could ruin the threads on the hold-down nuts or crack the frame.

If the nuts are not seated or tightened right, the cab sits cockeyed. The frame can crack as the cab flexes. The nuts can bind, too, so keep the threads clean. Never cross-thread 'em or the entire hold-down assembly has to be replaced. Use a little oil on the threads occasionally to make the job easier, too.



Hold-down nut must be seated properly

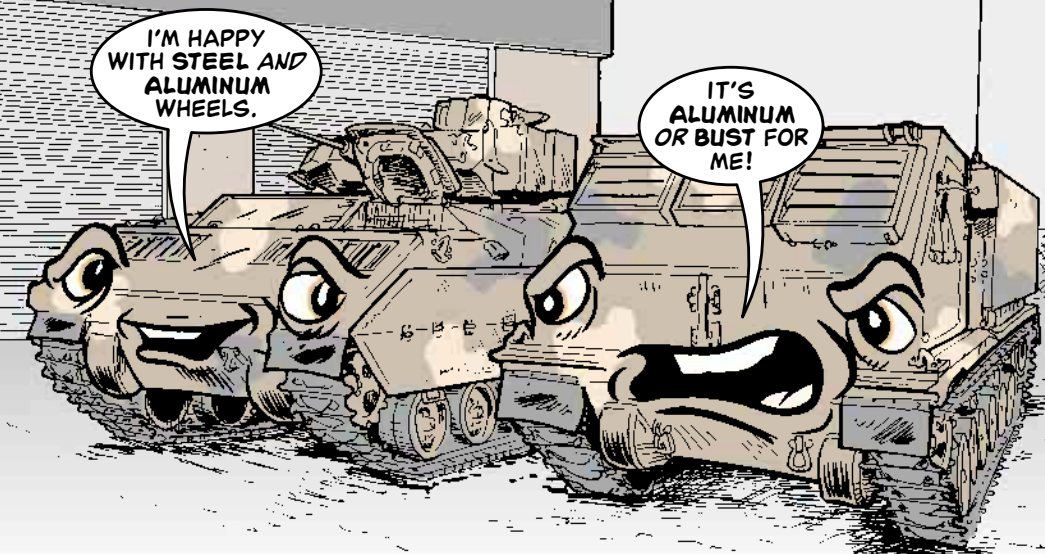
Release the tension on the elevation mechanism after the hold-down nuts are tightened. That way, there's no pressure on the mechanism while you're in operation. It'll save on busted parts.



Release tension on elevation mechanism



## Mix and Match?



**W**ith two types of roadwheels available for your Bradley and MLRS carriers, the question is whether you can mix steel wheels with aluminum ones.

The answer is yes...and no.

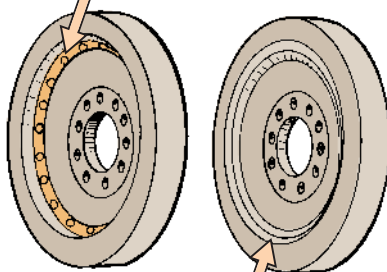
The steel roadwheel, NSN 2530-01-310-2237, and the aluminum roadwheel, NSN 2530-00-801-6702, are interchangeable on any Bradley model as long as you follow this rule:

The two roadwheels used on each individual road arm **must** be made of the same material. In other words, never pair a steel wheel with an aluminum wheel on the same road arm. If you do, you'll get uneven wear and early failure.

Unlike the Bradley, MLRS carriers are restricted to **aluminum roadwheels only** in order to meet air transportation weight restrictions.

It's easy to tell the two roadwheels apart. The aluminum wheels have a steel wear plate riveted to them. Steel wheels have no wear plate and no rivets.

Aluminum roadwheel has rivets...



...while steel roadwheel has none

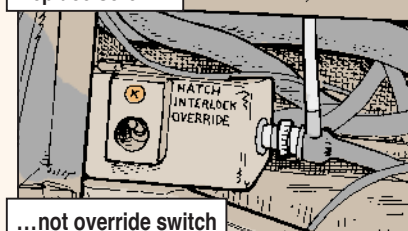
## Missing in Action

**M**echanics, the screw that holds the protective guard on the Bradley's hatch interlock override switch, NSN 5930-01-115-7334, is often missing in action.

Vibration loosens the screw, making it fall out or snap off. Then the guard falls off.

The TM says to replace the entire switch at a cost of more than \$100. The headshed says you can save your unit some dough by replacing the screw instead. NSN 5305-00-995-3440 gets 100 screws for less than \$3.50.

Replace screw...



## Cycling to Good Repair

Dear Editor,

M242 automatic gun feeders are being returned from repair with one important check not being done: the feeder manual cycle check. If a feeder can't cycle rounds, it won't be feeding and the M242 won't be shooting.

Support and unit repairmen should always finish any repair on the feeder by doing the feeder manual cycle check that begins on Page 2-28 in TM 9-1005-200-20&P. Cycle a dummy round, NSN 1305-01-105-4095, through the feeder in both the HE and AP modes. Only then is a feeder ready for duty again.

CW4 John Moore  
D Co, 703d MSB  
Ft Stewart, GA

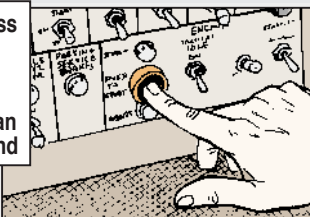


# startup & Shutdown Made Easy

**D**rivers, if you want your tank to start tomorrow, you'd better start it up and shut it down properly today. So, follow these four critical steps:

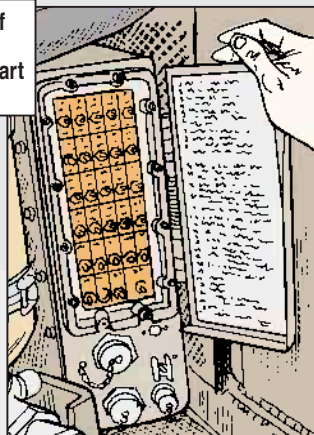
1. Never use the combat start info in TM 9-2350-200-BD-1, *Battlefield Damage Assessment and Repair*—unless you are in combat and your engine has sustained battle damage.
2. Never press the START button for more than one second at a time.

Don't press PUSH TO START button longer than one second



3. Never turn OFF any circuit breaker once the start cycle has begun.

Hands off breakers during start cycle

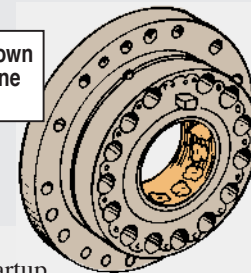


Violating steps 2 or 3 puts too much fuel into the engine. The extra fuel explodes, causing internal damage to the engine.

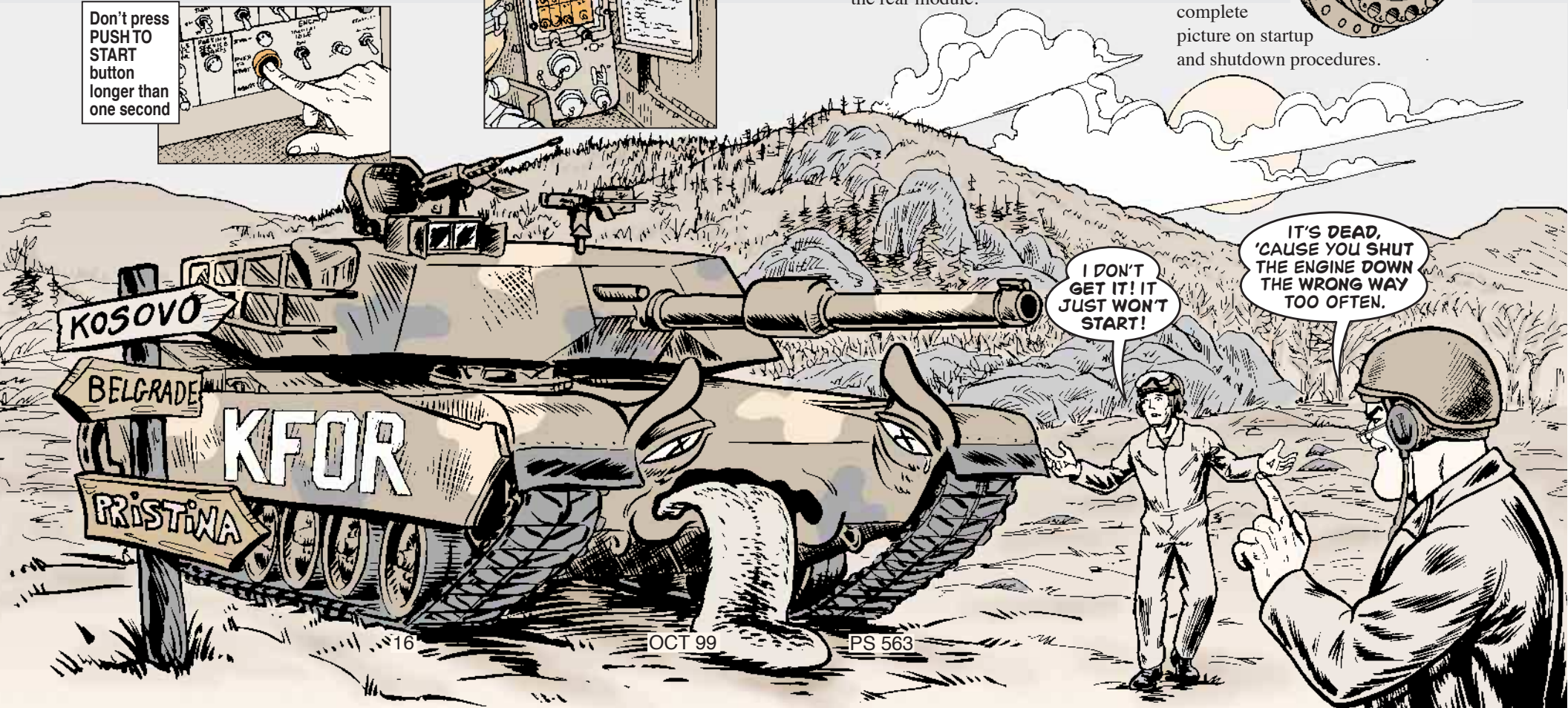
4. Always idle the engine at least **two minutes** to cool it off before shutdown. And never gun the engine during or after the cool-down period. That prevents heat soak, which cracks turbine rotors, clogs oil passages, and ruins the rear module.

Also, ignoring the cool-down period results in enough heat to boil the engine oil. That cokes bearings and clogs oil ports. Dry bearings will ruin the engine.

No cool-down ruins engine bearings

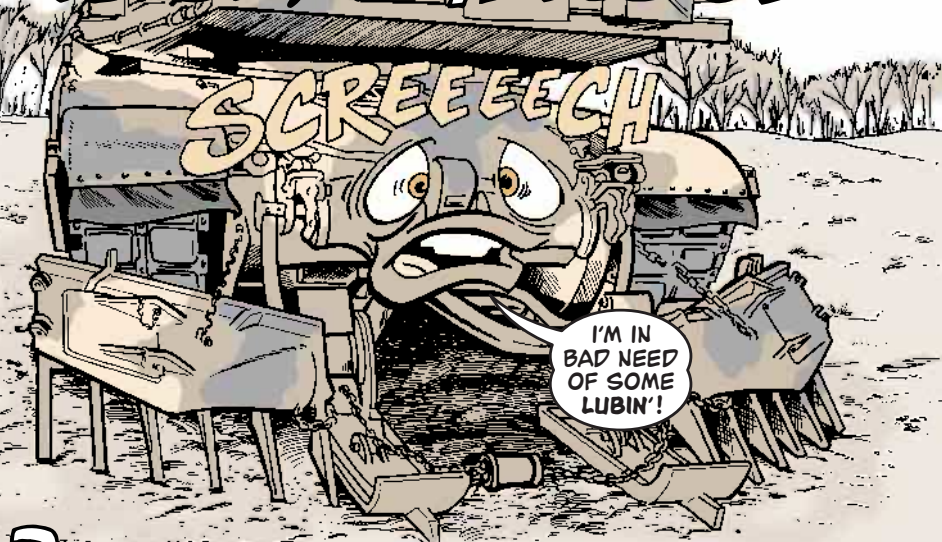


Refer to your -10 TM for the complete picture on startup and shutdown procedures.





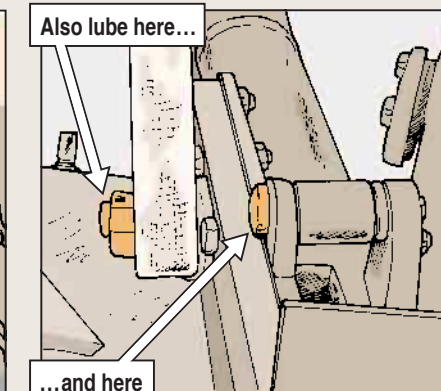
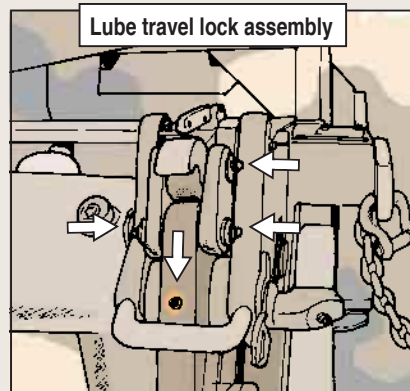
# Lube It, Don't Leave It



**D**rivers, there are only six lube points on each side of the mine clearing blade on your M1-series tank. It doesn't sound like much to remember, but far too many blades are going down for lack of lube.

There are four lube points on each of the travel lock assemblies. The rest are at the base of the lifting straps.

Give each of these lube points a good shot of general purpose aircraft grease after every operation. NSN 9150-00-145-0268 brings a 6.5-lb can of the grease.



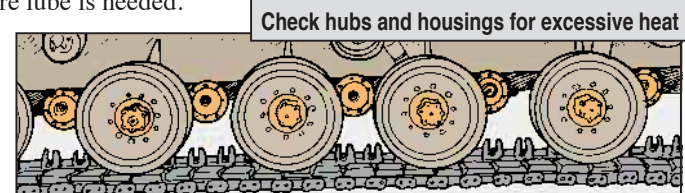
# Don't Go Light on the Lube

**O**lder vehicles like the M88A1 and AVLB may need to be lubed a little more often than the LO indicates. That's particularly true of their roadwheels and road arms.

The LO calls for quarterly lubing, but that may not be often enough, especially if your vehicle gets a good workout on a regular basis.

After operation, take a few minutes to check the roadwheels and arms. Hold your hand close to each of the hubs and arm housings. If they're too hot to touch, chances are more lube is needed.

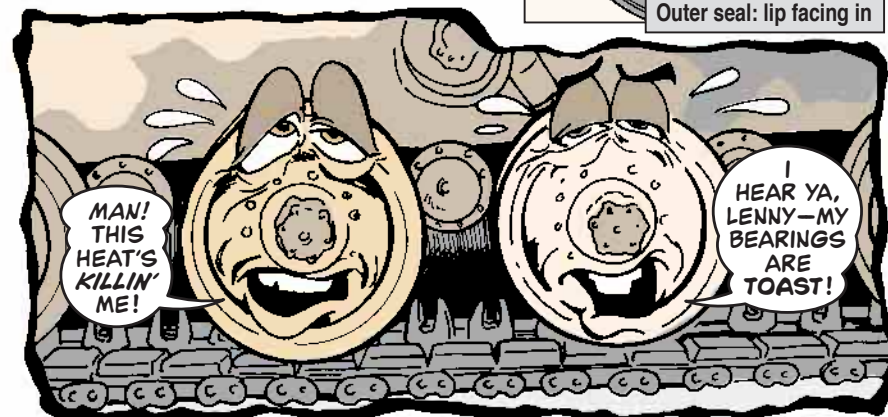
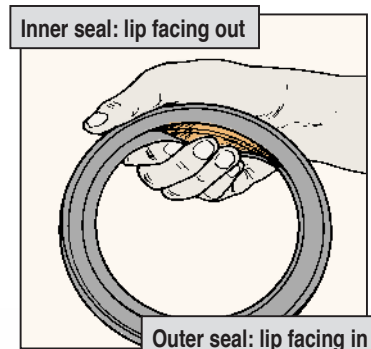
Of course, it won't matter how much lube you use if the roadwheel arm's inner



and outer grease seals were installed wrong.

If the seals are in backward, any grease you pump in leaks out of the arm and into the hull. It won't take long for the roadwheel arm bearings to burn out.

Mechanics, remember to install the inner seal with the lip facing away from the vehicle's hull. Install the outer seal with the lip facing in toward the vehicle's hull. That keeps the lube where it's needed.



# KEEP YOUR BRIDGE FROM FALLING DOWN

**I**t takes a steady eye, slow speeds, and good PM to keep your AVLB crossable. Here's the best way to keep that bridge from fallin' down:

## Keep Launchings Level

Choose your launching site carefully. Both banks should be level or at least have the same slope. If they aren't, the weight of a tank will twist the bridge's braces and angles.

That could leave you with a permanently twisted bridge that is no longer FMC. Not sure what deadlines a bridge? Check out the PMCS guidelines in TM 5-5420-203-14.

## Slow Down, Please

Speed is a real bridge bender, too. Tanks and M88-series recovery vehicles can tear up a bridge in a single pass if they move too fast.

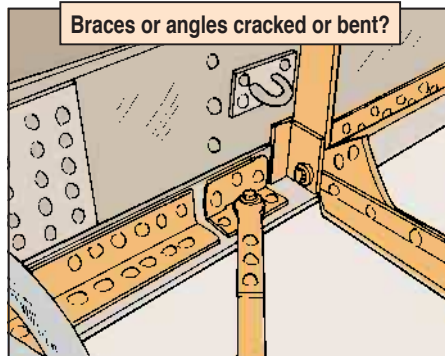
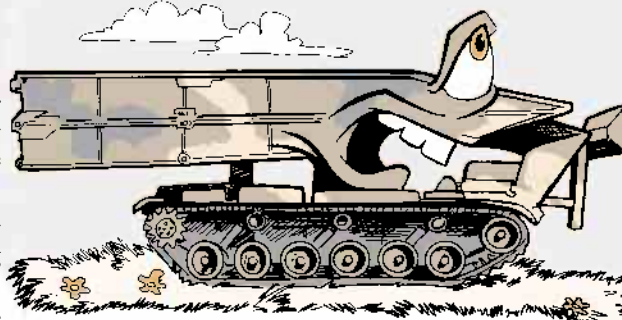
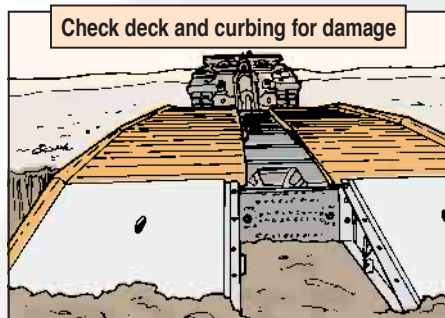
And, since these vehicles are almost as wide as the bridge, going too fast can lead to accidents.

Drivers, to prevent damage to the bridge—and your vehicle—keep these details in mind when crossing:

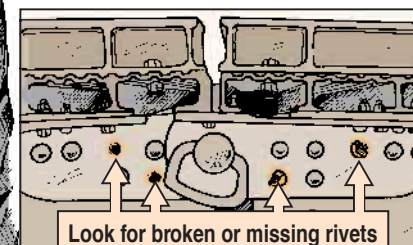
- \* Keep the vehicle centered on the bridge.
- \* Go no faster than eight mph for **normal/caution** crossings and three mph for **risk** crossings.
- \* Never stop, accelerate or shift gears while on the bridge.

## Before and After Checks

Before and after any vehicles cross your bridge, check carefully for damage to the deck or curbing. Then look for bent, twisted or cracked bracing and angles.



Look for broken or loose rivets or bolts, too. A shiny spot or corrosion around the head of a fastener is a tipoff that it's loose. Report 'em.



The center panel hinges and the upper and lower connectors on the center and end panels need special attention. Missing or corroded rivets in these areas can lead to bridge collapse.

If you see a broken or missing rivet, look for a white powder residue in the rivet hole or on the remaining portion of the rivet.

If you find any corrosion, your AVLB is NMC until the entire panel can be replaced.



# Move Those Mountains

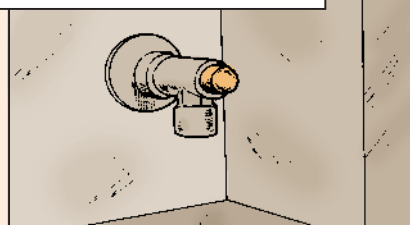
Operators, part of your job is to make sure your ACE can move mountains of dirt and sand when it has to. So, follow the PMCS in TM 5-2350-262-10 and these PM pointers before the vehicle leaves the motor pool.

## Drain Air Tanks

Temperature changes let condensation form in the vehicle's brake system. Water leads to rust and corrosion in brake valves and cylinders, which leads to brake failure.

So keep ACE brakes braking by draining air tanks daily. Hold the valve open until air stops escaping. That keeps moisture from stopping you cold.

Hold until no more air comes out

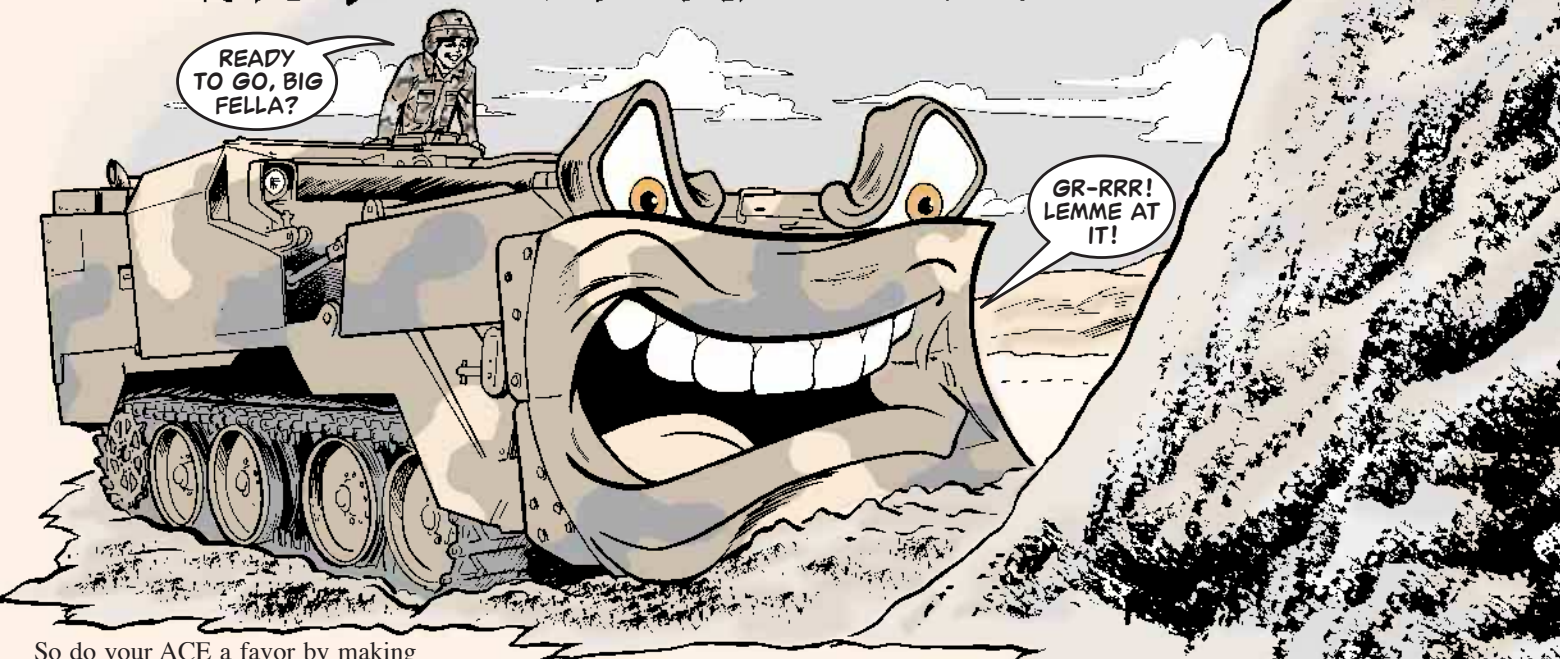


## Dust Cap Stays Put

The ACE's NATO slave receptacle becomes a water bucket when it's left uncovered.

The receptacle is mounted straight up—that means it will hold water if the cap's missing. Water corrodes the receptacle's metal contacts.

If ice forms in the receptacle, you won't be able to connect the cable to slave start a dead vehicle. The ice could crack the insides, too.



So do your ACE a favor by making sure the dust cap is in place on the receptacle. If it's missing, have your mechanic replace the cap and cord assembly with NSN 5340-01-059-0114. Until the assembly comes in, tape over the receptacle.

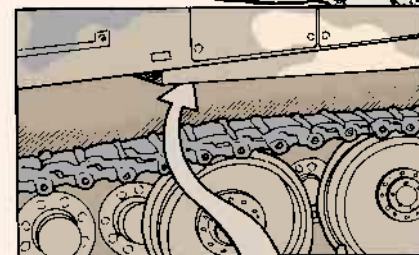


## Sponson Fording Reminder

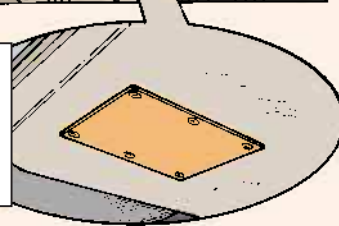
Water can get past leaky access plates during fording and fill the ACE's sponsons with water. During cold weather, trapped water can freeze, cracking the sponsons, or damaging the apron's hydraulic hoses and connectors.

So have your mechanic remove both left and right hydraulic access plates and then use sealing compound, NSN 8030-00-081-2339, on the self-locking screws when remounting the access plates. That keeps 'em good and tight—and keeps water out.

If you see any bulges or stress cracks near the access plates, report them.



Remove access plate to release trapped water



# Get Back to Basics



Taking over a toolroom is a big job that can be a big headache if you don't have a plan.

If the previous toolroom manager had a plan, you can just keep it going. If not, here are some pointers you can use to install a system and keep track of your unit's tools.

## Read the Book

First, get familiar with the toolroom literature. Read Para 2-4 of DA Pam 750-35, *Guide for Motor Pool Operations*, and Chap 6 of DA Pam 710-2-1, *Using Unit Supply System*.

Basically, they tell you that tool sets, special tools, and all test, measurement and diagnostic equipment (TMDE) must be maintained, controlled and accounted for. When tools and test equipment are not in use, keep them under lock and key.

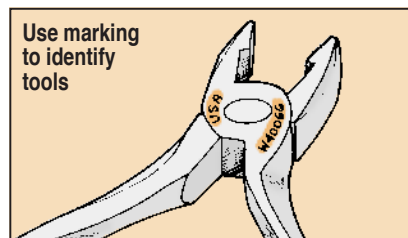
Para 3-22 of AR 190-51, *Security of Unclassified Army Property*, gives PS 563

more information on security measures for tools.

## Identify/Mark Tools

Come up with a tool identification system. Mark the tools with the letters "US" or "USA" and the unit identification code (UIC) or some other name and number combination that identifies the tools as yours.

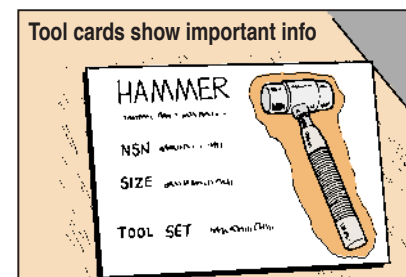
Mark similar tools in the same place on each tool using the same method (etching, stamping or painting).



Identify each tool on a card in a visible file. On the card, list the nomen-

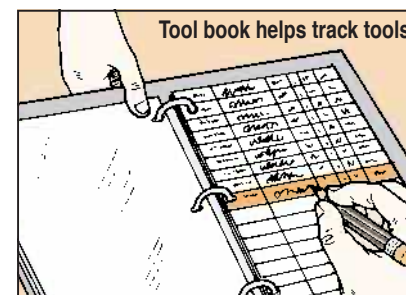
clature, NSN, size and the tool set the tool belongs to, if it does belong to one.

Colored tabs or colored tape can be used to identify cards and tools belonging to specific sets. If possible, clip out a picture of the tool (from a PS article or a supply catalog) and tape that to the card.



## Check It Out

What goes out should come back in. Make sure it does by establishing a checkout system for the tools. Many units use a tool book. When a tool is needed, the mechanic goes to the toolroom. The tool manager enters the name of the tool, the mechanic's name and section or ID number, and check-out time. Then, the mechanic signs his name or leaves a special tool tag, NSN 9905-00-473-6336, that identifies him as the one who's checked out the tool.



Other units draw or paint the outline of each tool on a board with hooks or nails placed to mount the tool over its "shadow". The tool manager can see at a glance which

tools are out. Metal tags assigned (by name and/or number) to each mechanic are turned in and hung over the hooks while the tool is checked out.

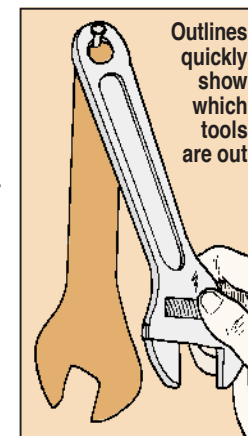
Tools should be checked in as soon as a job is finished. However, specific check-in times should be set for jobs that are not completed by lunch time or the end of the day. For example, check-in time might be 15 minutes before the break for lunch and 30 minutes before the end of work each day.

## Maintenance

Getting back to basics means cleanliness, too—it's a part of toolroom maintenance. Keep the tool area uncluttered. Put a lint-free cloth near the turn-in point for users to clean tools.

Inspect each tool closely when you get it back. Turn in the tool if it needs to be repaired. If the tool no longer does its job, replace it. Never issue a tool that might be unsafe.

Remember, how you organize and maintain your toolroom can make the difference in how well PM is performed in the motor pool.





# Bolts 'n' Screws

**N**eed some help finding nuts and bolts to finish off a do-it-yourself project? You know, like adding shelves in the tool room or repairing a tool room cage.

Help is close at hand. The Defense Industrial Supply Center Philadelphia (DSCP) has a pair of catalogs for you. One lists 2,000 NSNs for non-metric hex-head machine bolts.

Sizes range from 0.190-in diameter up to 1 1/4-in diameter with tensile strength listed. Each bolt comes in various lengths and can be made of steel, cadmium-plated corrosion-resistant steel or aluminum alloy.

## More Good News

The other DSCP catalog which contains NSNs and characteristics of more than 600 grade-8 hex-head cap-screws, either zinc or cadmium plated.

To get a copy of either catalog, call DSN 442-6301 or (215) 697-6301 or fax DSN 442-0909. E-mail them at:

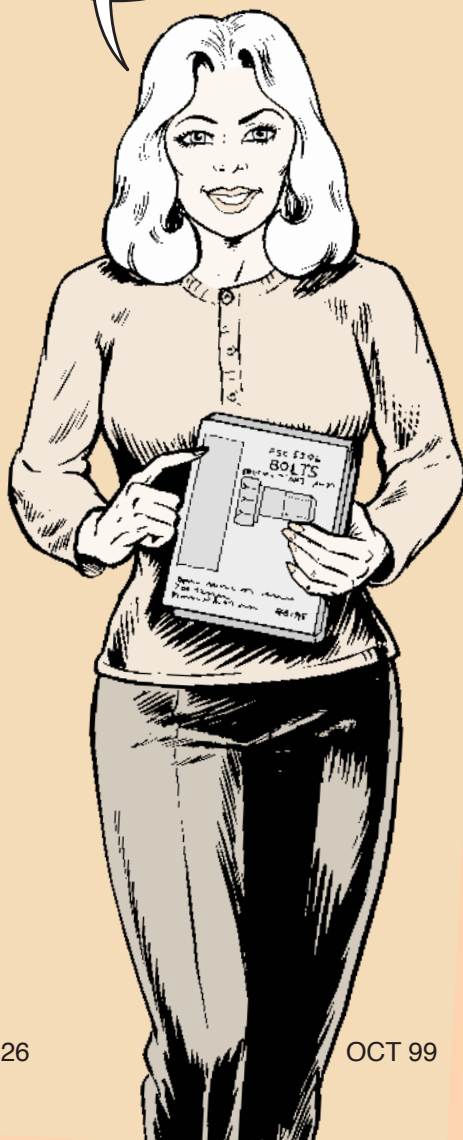
**chenderson@dscp.dla.mil**

Their mailing address is:

**Defense Supply Center Philadelphia  
ATTN: DSCP-IBAB  
700 Robbins Avenue  
Philadelphia, PA 19111-5096**

Never use these fasteners to repair your equipment without checking the TM. Use only the ones recommended by your equipment's TM. The wrong bolt or screw could snap under stress, causing major damage.

**BOLT  
AFTER THESE  
CATALOGS!**



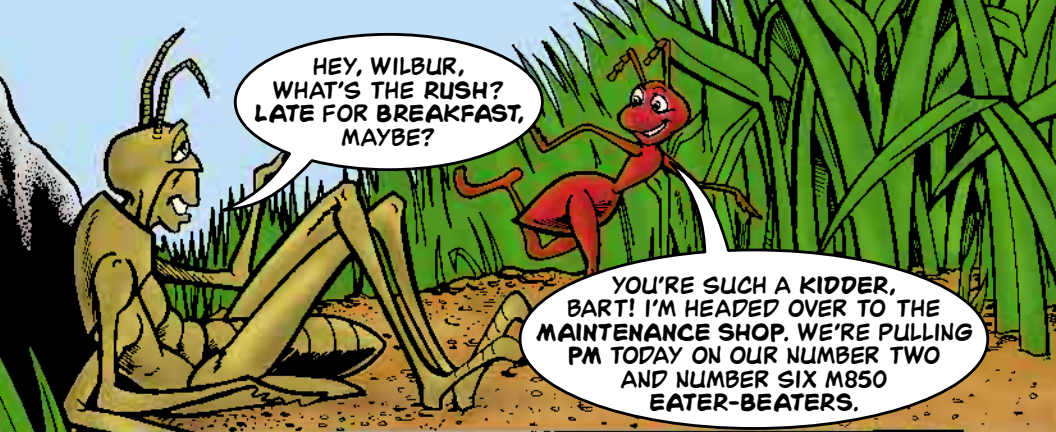
# THE GRASSHOPPER AND THE ANT

THE SUN RISES  
AS A BUGLER  
ANT BLOWS  
REVEILLE.

THE WELL REGIMENTED  
ANTS QUICKLY PREPARE  
FOR THEIR DAY...

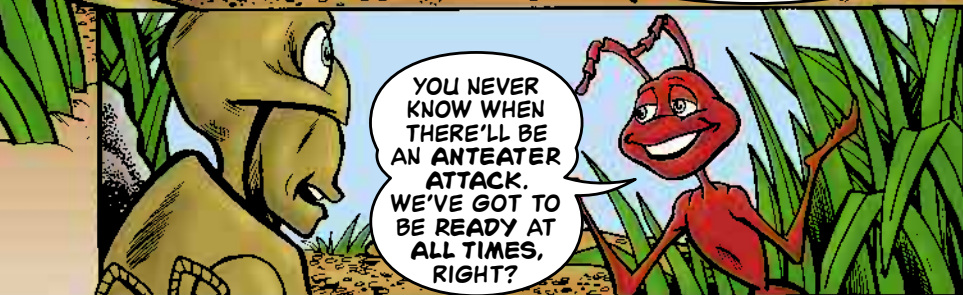
...WHILE THE DISORDERLY  
GRASSHOPPERS SLOWLY  
AWAKEN AND STUMBLE  
ABOUT AIMLESSLY.



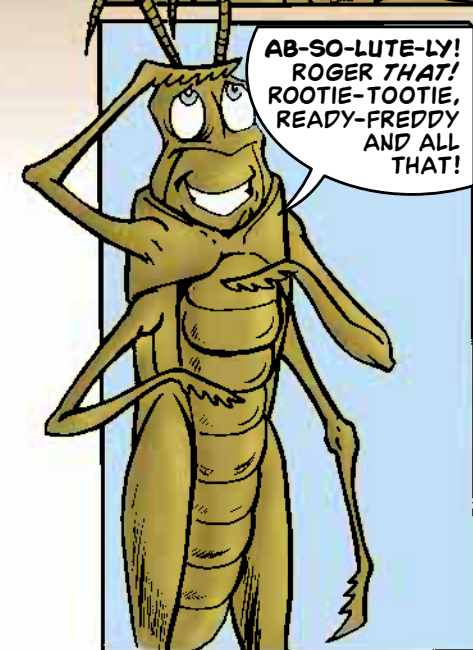


HEY, WILBUR,  
WHAT'S THE RUSH?  
LATE FOR BREAKFAST,  
MAYBE?

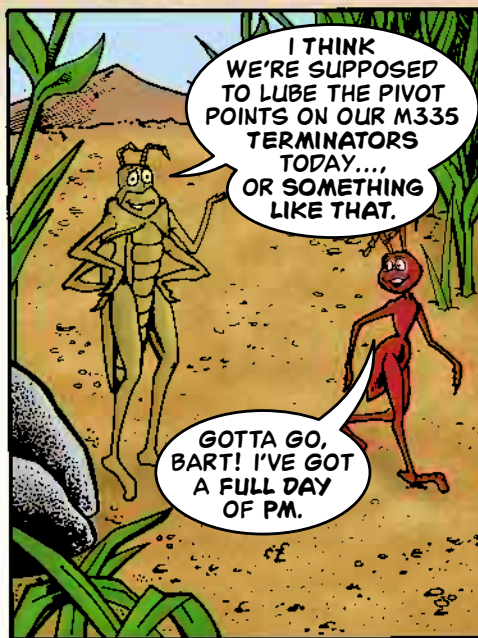
YOU'RE SUCH A KIDDER,  
BART! I'M HEADED OVER TO THE  
MAINTENANCE SHOP. WE'RE PULLING  
PM TODAY ON OUR NUMBER TWO  
AND NUMBER SIX M850  
EATER-BEATERS.



YOU NEVER  
KNOW WHEN  
THERE'LL BE  
AN ANTEATER  
ATTACK.  
WE'VE GOT TO  
BE READY AT  
ALL TIMES,  
RIGHT?

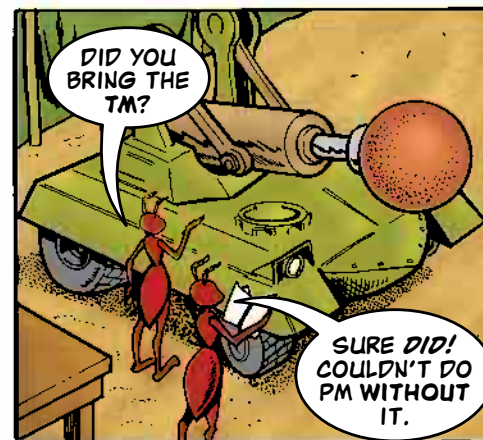


AB-SO-LUTE-LY!  
ROGER THAT!  
ROOTIE-TOOTIE,  
READY-FREDDY  
AND ALL THAT!



I THINK  
WE'RE SUPPOSED  
TO LUBE THE PIVOT  
POINTS ON OUR M335  
TERMINATORS  
TODAY...,  
OR SOMETHING  
LIKE THAT.

GOTTA GO,  
BART! I'VE GOT  
A FULL DAY  
OF PM.

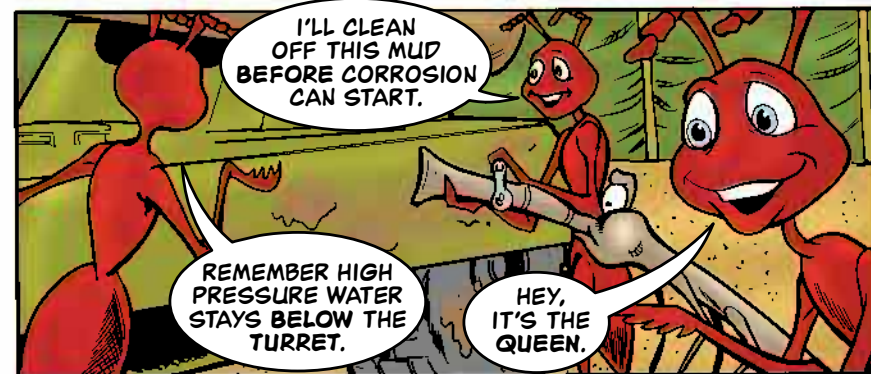


DID YOU  
BRING THE  
TM?

SURE DID!  
COULDN'T DO  
PM WITHOUT  
IT.



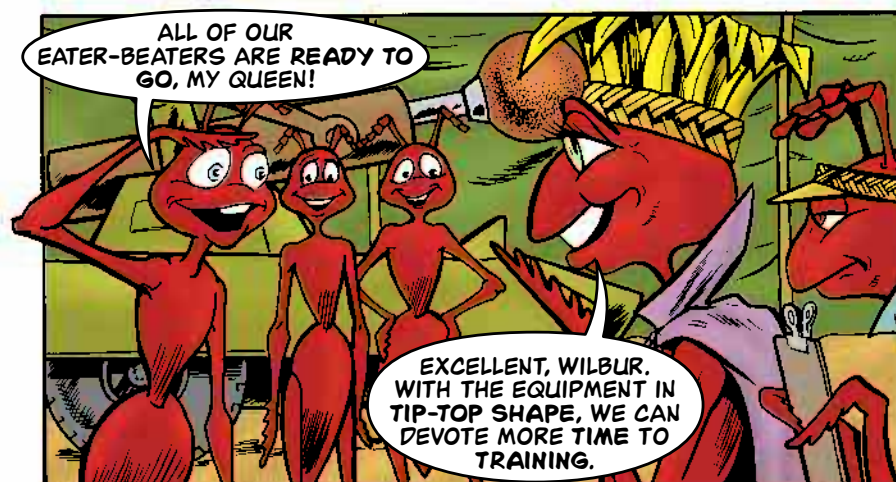
LUBIN'  
IT BY THE  
BOOK!



I'LL CLEAN  
OFF THIS MUD  
BEFORE CORROSION  
CAN START.

REMEMBER HIGH  
PRESSURE WATER  
STAYS BELOW THE  
TURRET.

HEY,  
IT'S THE  
QUEEN.

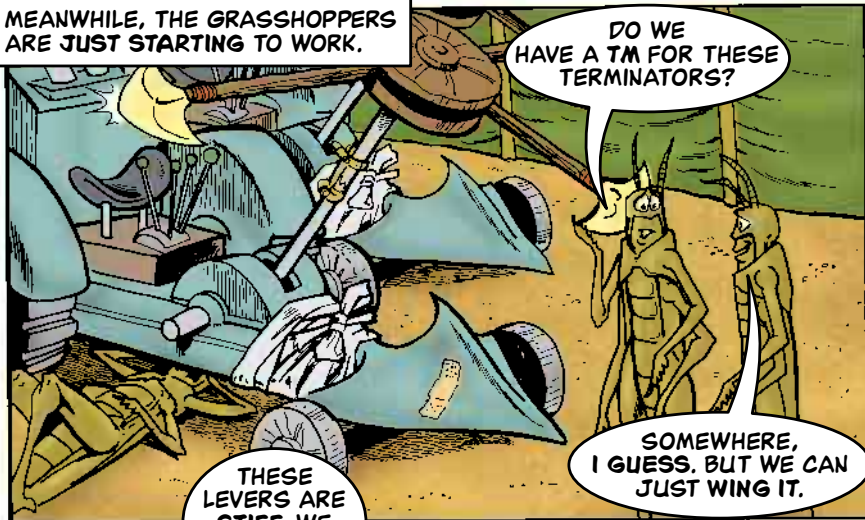


ALL OF OUR  
EATER-BEATERS ARE READY TO  
GO, MY QUEEN!

EXCELLENT, WILBUR.  
WITH THE EQUIPMENT IN  
TIP-TOP SHAPE, WE CAN  
DEVOTE MORE TIME TO  
TRAINING.



MEANWHILE, THE GRASSHOPPERS ARE JUST STARTING TO WORK.



DO WE HAVE A TM FOR THESE TERMINATORS?

SOMEWHERE, I GUESS. BUT WE CAN JUST WING IT.

THESE LEVERS ARE STIFF, WE NEED SOME LUBE.



SHUCKS, ALL YOU NEED IS A LITTLE MUSCLE.

I COULDN'T FIND THE HUB PULLER, BUT THIS HAMMER WILL DO THE JOB.

OH, YEAH—THE 'PERSUADER'!

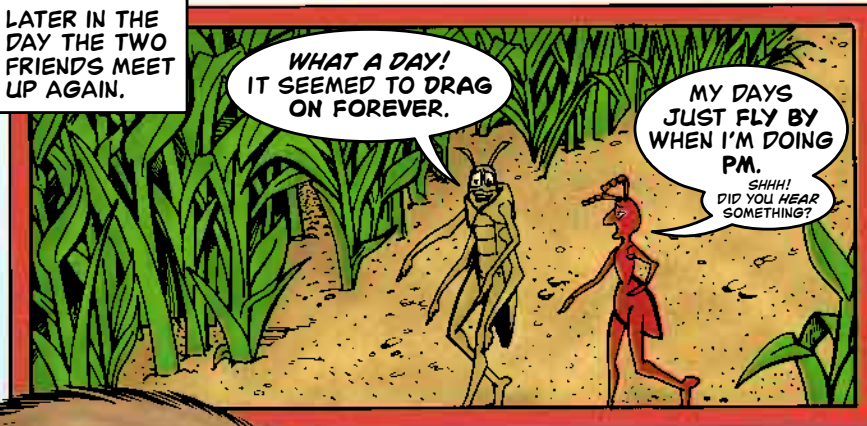
GOOD IDEA—WAY TO IMPROVISE.



—PHEW— ENOUGH WORK. I NEED A BREAK!

ME, TOO!

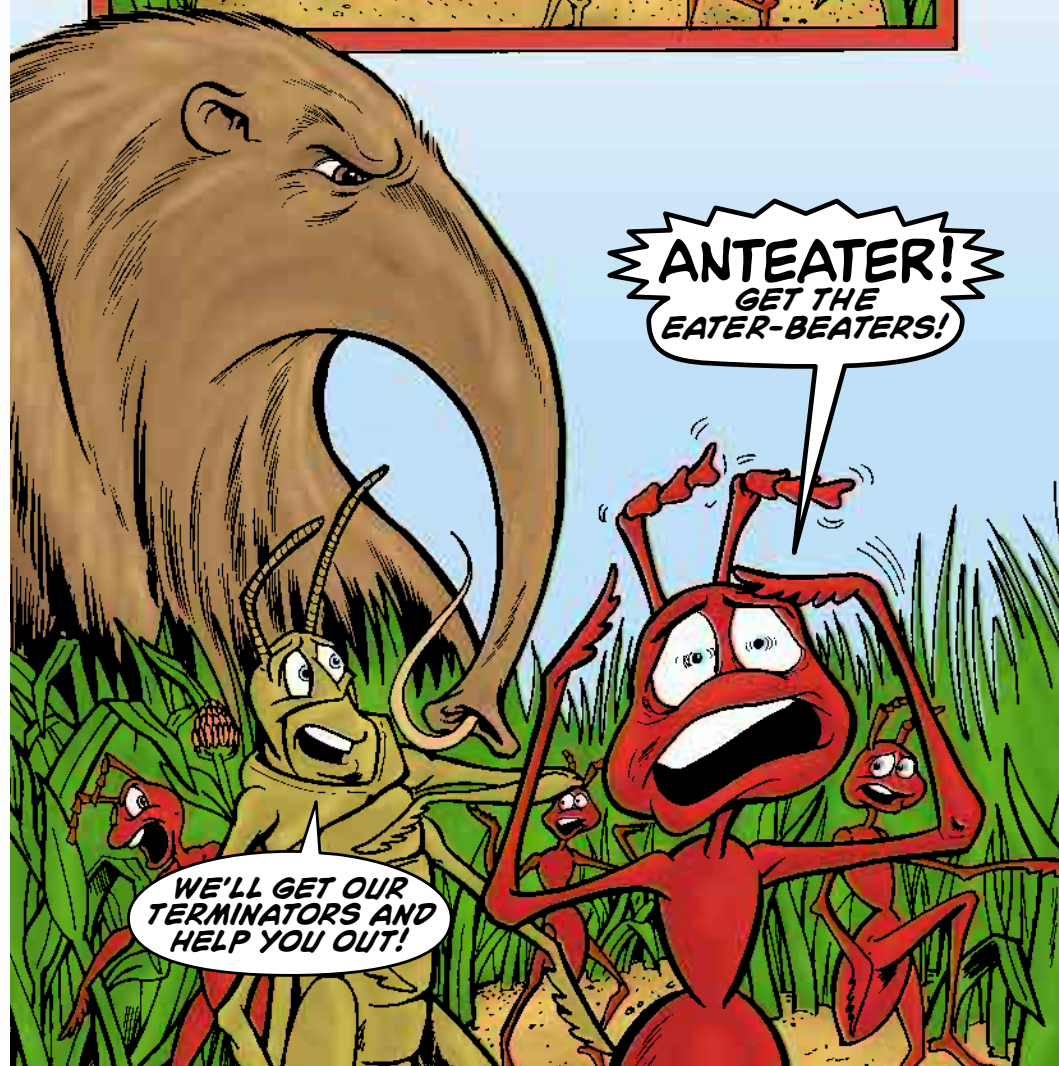
LATER IN THE DAY THE TWO FRIENDS MEET UP AGAIN.



WHAT A DAY! IT SEEMED TO DRAG ON FOREVER.

MY DAYS JUST FLY BY WHEN I'M DOING PM.

SHHH! DID YOU HEAR SOMETHING?



ANTEATER! GET THE EATER-BEATERS!

WE'LL GET OUR TERMINATORS AND HELP YOU OUT!





THE GRASSHOPPERS AND ANTS QUICKLY POSITION THEIR WEAPONS.

THESE THINGS AREN'T WORKING!

READY...

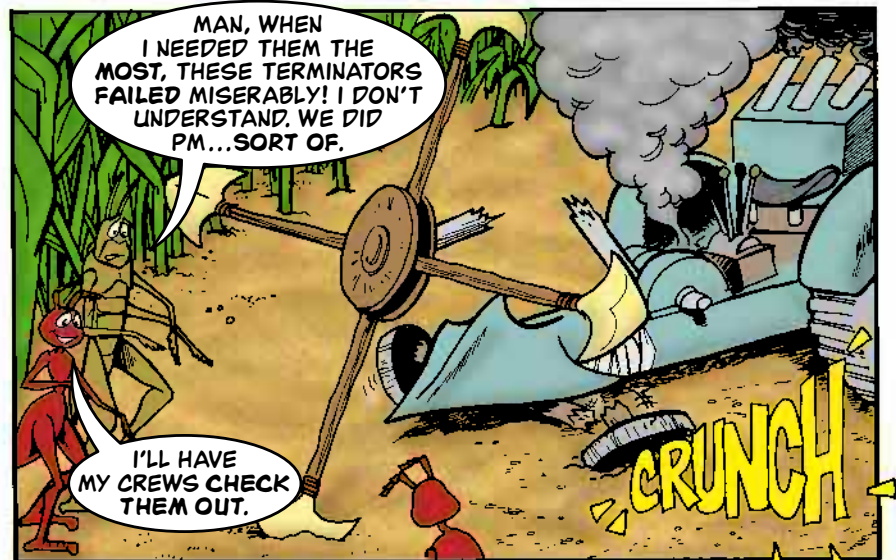
AIM...

RUN!

YELP!

HE'S RUNNING AWAY! WE'VE DONE IT, WILBUR! THAT ANTEATER WON'T BE BOTHERING US ANYMORE.

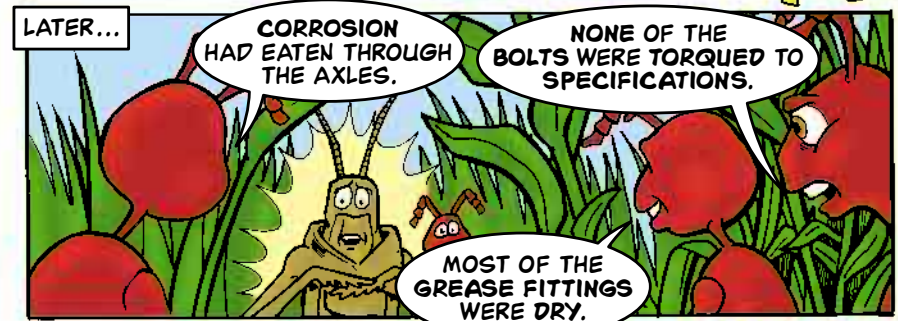
GOOD PM AND SUPERIOR TRAINING WIN EVERY TIME!



MAN, WHEN I NEEDED THEM THE MOST, THESE TERMINATORS FAILED MISERABLY! I DON'T UNDERSTAND. WE DID PM...SORT OF.

I'LL HAVE MY CREWS CHECK THEM OUT.

CRUNCH

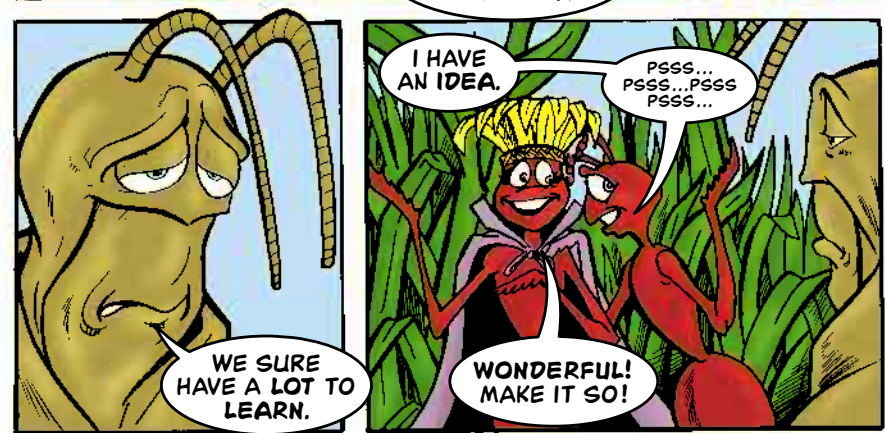


LATER...

CORROSION HAD EATEN THROUGH THE AXLES.

NONE OF THE BOLTS WERE TORQUED TO SPECIFICATIONS.

MOST OF THE GREASE FITTINGS WERE DRY.




WE SURE HAVE A LOT TO LEARN.

I HAVE AN IDEA.

PSSS... PSSS...PSSS PSSS...

WONDERFUL! MAKE IT SO!






I'M GOING TO  
MAKE WILBUR AVAILABLE  
TO TEACH PM TO YOU AND  
ANY OTHER INTERESTED  
GRASSHOPPERS.



GEE,  
THANKS! WE'VE  
LEARNED OUR  
LESSON.



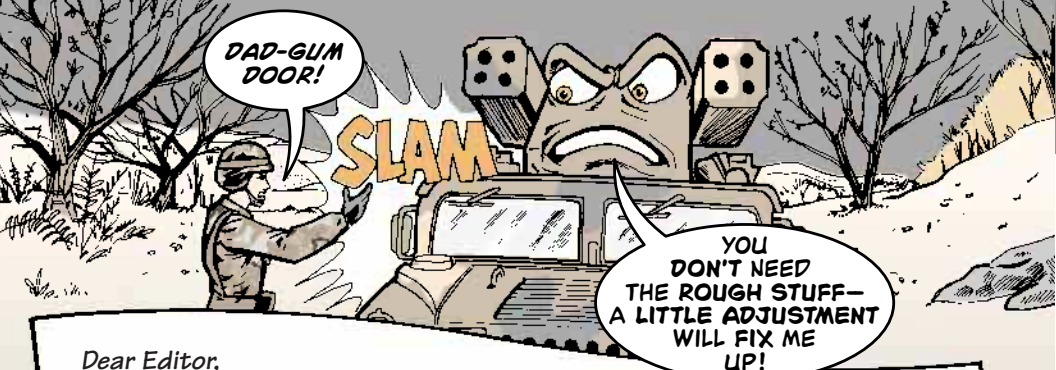
SO THE  
GRASSHOPPERS LEARNED  
THE VALUE OF PM, AND THE  
NEXT TIME THERE WAS AN  
ATTACK— THEY WERE  
READY.

EXCEPT FOR BART,  
WHO HAD AN UNFORTUNATE  
ENCOUNTER WITH A YOUNG  
BOY WHO TOOK HIM  
FISHING.  
THE END.

Don't mimic our grasshopper, Bart,  
who failed to take PM to heart.  
Like Wilbur, be ready,  
prepared and rock-steady  
through PM and doing your part.



# Shut Door Problems

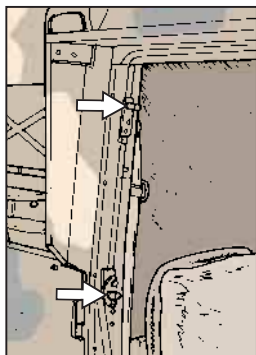


Dear Editor,

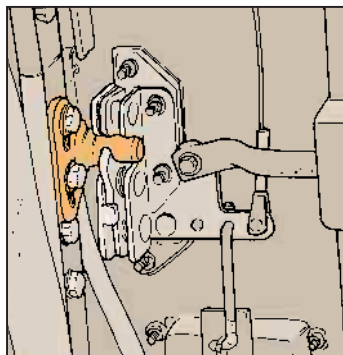
The doors on the Avenger's HMWWV often don't shut tight. Crew members slam a door to make it latch, but usually only one latch catches. If the door only partially latches, it doesn't seal well and fumes from the missile firings can get in the truck. Not only that, but slamming eventually ruins the door gasket and that deadlines the Avenger.

But soldiers won't have to slam the doors if repairmen adjust the door latch studs. It takes just minutes. Here's how:

Loosen  
the four  
bolts for  
the two  
studs



Close the  
door and  
align the  
studs  
with the  
latches.  
Retighten  
the bolts.  
You're  
done.



CW2 Rick Gale  
C Btry, 2/6th ADA  
Ft Bliss, TX

**FROM THE DESK OF THE Editor**



Thanks for the warning and the quick adjustment. For more on the door latch adjustment, see page 15-8 in TM 9-1440-433-24-2.

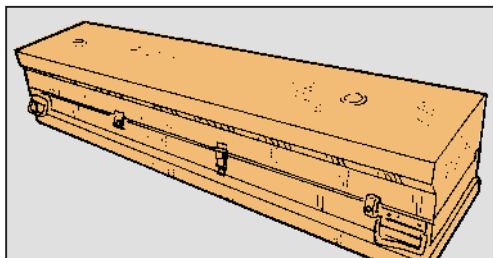
# Connect to Connector Defense

If the connectors for the Hellfire's missiles or launcher have dirt and sand in them, the missile connector pins will be bent when the missile is slid into place on the launcher. That puts the missile out of action. In the case of a tactical Hellfire, it has to go to depot for repair.

Apache crews and repairmen can protect Hellfire connectors by following two simple rules:

♦ **Keep Hellfires shut up in their cases until you're ready to load them on the launcher.** If missiles are left unprotected on the ground, dirt and sand will be blown inside the connectors. When you download missiles, shut

them up in their cases as soon as possible.



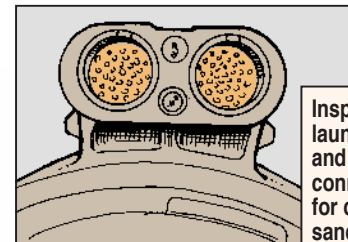
Keep missiles in cases as much as possible

If you're ever in a position where you don't have the cases, cover the connectors with a plastic bag or anything that will seal out dirt.

♦ **Inspect both the launcher and missile connectors before loading**

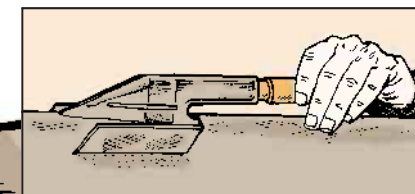
**missiles.** Use a flashlight to check the launcher connectors for plugged holes. If you spot any, clean them with soap, water, and an acid swab brush. See Para 3-12 in TM 9-1425-475-23&P for more cleaning info.

Then, check the missile connectors with the flashlight and clean out any dirt or sand the same way you did the launcher connectors.

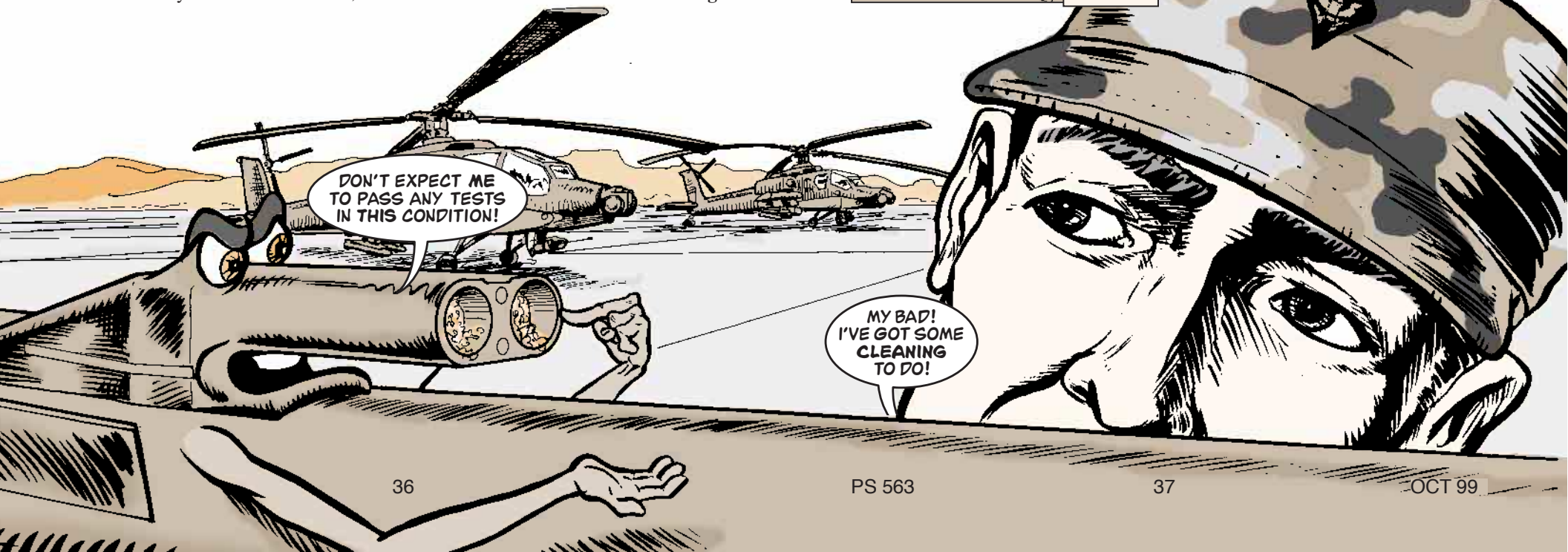


Inspect launcher and missile connectors for dirt or sand

If the connectors pass this test, gently insert the missile verification tool, NSN 1450-01-437-9670, in each missile connector. The tool should seat easily in the connector. If it doesn't, clean the connector again. If the tool still won't seat in the connector, turn in the missile for inspection and get a new missile.

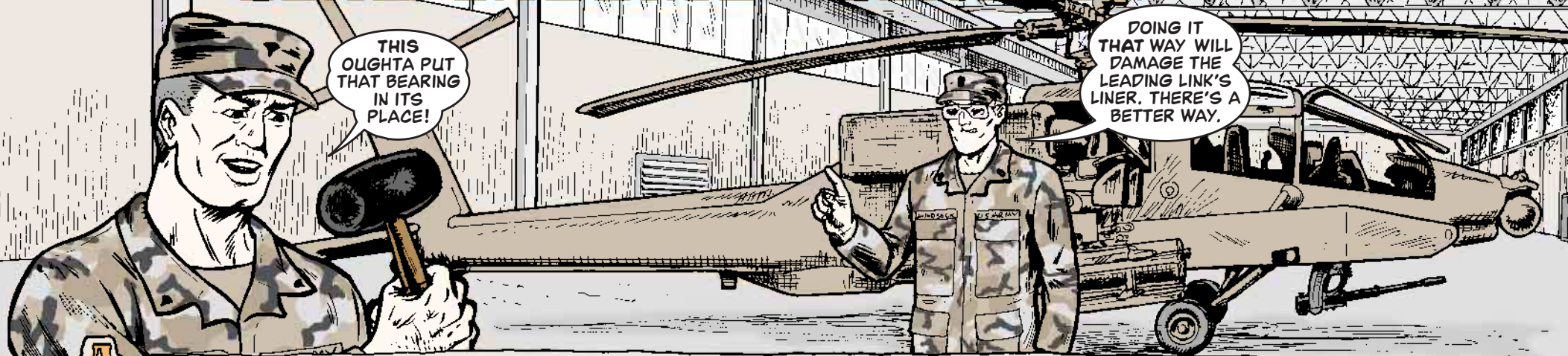


Check connectors with verification tool





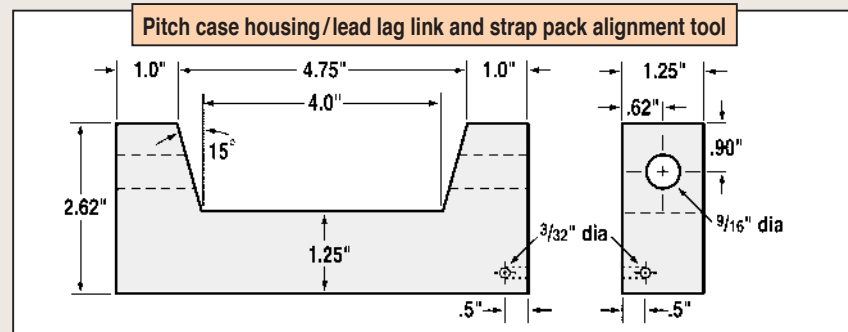
# LEAD LAGGING BEHIND?



**A**pache repairers, do you find it difficult to align the pitch housing while inserting the main rotor lead lag link bearing? Often, this struggle leads to forcing and pounding the bearing into place, and ends with damage to the lead lag link's Teflon liner.

Don't force, don't pound—there's an easier way. You can have a spacing fixture tool made that lets you install the bearing without forcing or pounding. It aligns the lead lag link bore hole, saves installation time and saves your unit the replacement cost of lead lag links with damaged liners.

The aviation intermediate maintenance (AVIM) unit that supports your Apache aircraft can make this spacing fixture for you, using 2024 T3 aluminum.

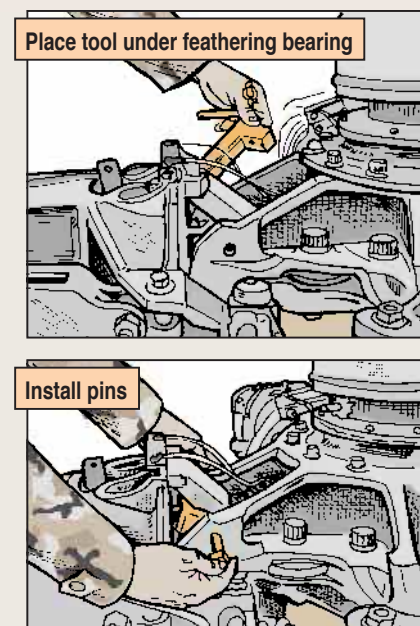


You will need two quick release pins, NSN 5315-01-195-6060, to attach the spacing fixture to the main rotor feathering bearing.

Just position the spacing fixture under the main rotor feathering bearing and install its pins. After the fixture tool is attached, the pitch housing is correctly aligned and you can install the bearing without damaging the liner. The bearing falls right into place—no pounding.

Don't forget to attach red "Remove Before Flight" streamers, NSN 8345-00-673-9992, to the spacing fixture and to the two quick release pins when the tool is in use. Swaging sleeve, NSN 4030-00-960-1654, and wire rope, PN 17054, CAGE 4R506, can be used to attach the streamers to the spacing fixture tool. You need to submit an exception data requisition, DD Form 1348-6, to obtain the swaging sleeve and wire rope. For the swaging sleeve, write "NSN not in the AMDF" in the REMARKS block.

This tool will be added to Appendix D, TM 1-1520-238-23, and the procedure to use it will be added to the existing procedure in para 5-32 of the same manual.



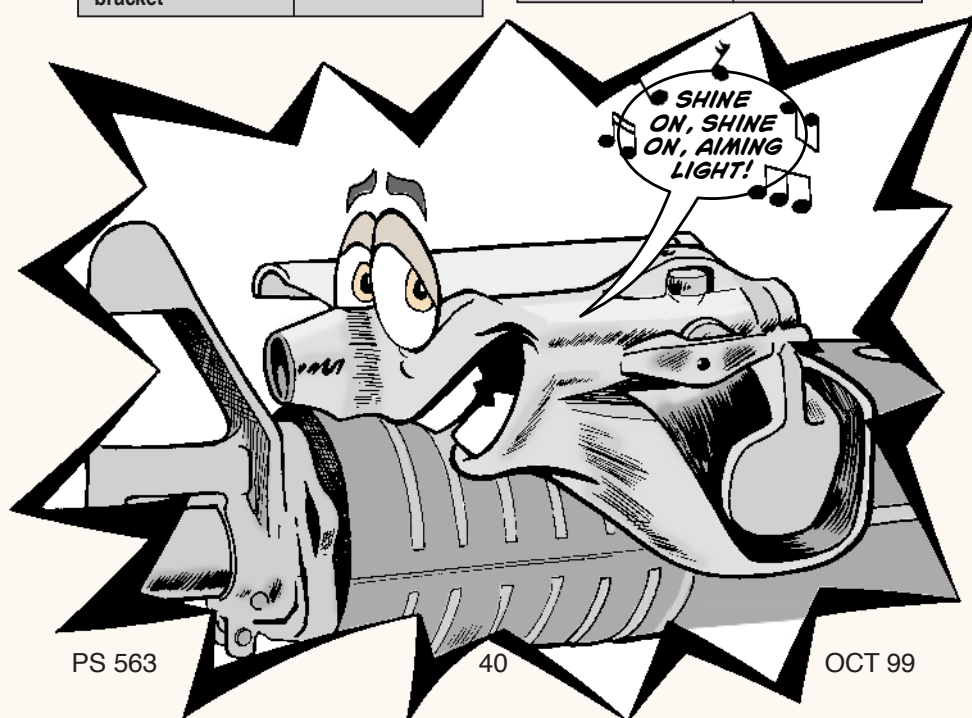
# Keep Your Lights

If the AN/PAQ-4 aiming light on your M16 rifle or M60 machine gun has stopped working, don't despair. Parts are available for repairable lights and new lights are available for those that can't be repaired.

Here are the available parts. They will be in the next update to TM 11-5855-301-12&P.

Item	NSN
Battery box cover	6160-01-378-0517
Optical baffle	5330-01-368-3730
Louver light	6210-01-362-9867
Thumbscrew	5305-01-367-6369
M2/M60 adapter bracket	5340-01-362-9873

Item	NSN
M16A1 barrel adapter	5340-01-368-5076
Cable hanger	5975-01-377-2498
Electric cable assembly-switch	6150-01-363-2798
Textile bag	8105-01-368-6253
Optical instrument case	1240-01-363-2796
Switch lever shroud	5930-01-447-2698
Boresighting filter	1290-01-438-2530
M16A1/M203 mounting bracket	5340-01-363-2797
M16A2 (Marine) mounting bracket	5855-01-446-9545



# Shining

Item	NSN
M4/M16A2 universal mounting bracket	5340-01-390-3812
M60 mounting bracket	5855-01-046-7272
M2 mounting bracket	5855-01-045-5482
MILES extender	5340-01-462-2376
Non-rechargeable AA battery	6135-00-985-7845
Railgrabber mounting bracket	5340-01-458-0473

To get replacement aiming lights, your installation property book officer, force modernization officer, or G4 must contact the AN/PAQ-4 item manager Mary Grasdorf at DSN 992-3969, commercial (732) 532-3969, fax -1645, or e-mail:

[grasdorf@mail1.monmouth.army.mil](mailto:grasdorf@mail1.monmouth.army.mil)

or item manager Gale Golden, DSN 992-9989, (732) 532-9989, or e-mail:

[goldeng@mail1.monmouth.army.mil](mailto:goldeng@mail1.monmouth.army.mil)

Specify how many aiming lights you need. The higher priority your mission, the more priority will be given to your request.

Unrepairable lights can be disposed of locally. They contain no hazardous materials. Just be sure to take out the optical baffle and use a screwdriver to break the light emitting diode. Then crush the aiming light to prevent anyone outside the Army from trying to use it.

# Palm Up for Cocking

Dear Editor,

I notice in many of your machine gun articles that you show gunners pushing or pulling the cocking handle with their palm forward or down. This position exposes more of their hand and arm to danger if there's a cookoff.

I think gunners should always move the cocking handle with their palm facing up or back.



This position keeps most of the hand and arm BELOW the receiver and offers more protection in case of an accident.

SPC Eric David O'Bar  
3/3d ACR  
Ft Carson, CO

THIS  
PALM IS UP  
FOR IT.

FROM THE DESK OF THE Editor  
Great idea! Anything that protects the gunner is OK in our book. Thanks for the suggestion.



# EASY INVENTORY

Dear Editor,

Armorer's know that inventorying the small arms tool kit by SC 5180-95-A07 can be time-consuming and frustrating as they try to figure out which tool is which.

So I developed a system to make inventory easy. I got some of the styrofoam packing that is used to cushion items during shipment. The packing should be about one inch thick. Your central supply point will have plenty of the stuff.

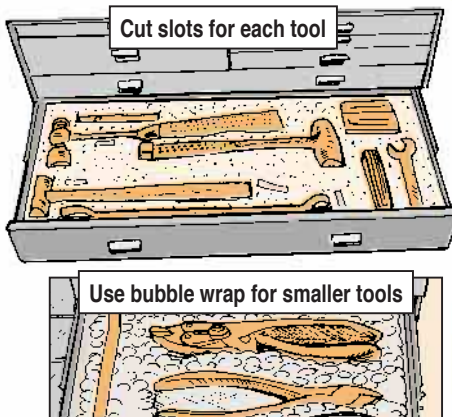
Use a small sharp knife to cut the packing so it fits inside the large drawers of the tool kit. Use a marker to trace the tools on the packing. Then cutout the traced areas so the tools fit in them.

For the shallow drawers, use bubble wrap instead of packing, then trace and cut areas for smaller tools like the driftpins or pliers.

Make a copy of the hand receipt and cut out the name for each tool. Use a clear glue—auto epoxy is good—to stick the tool's name beside the tool's slot. Brush glue over the paper so it's laminated to packing.

Put the tools in their places. You can now inventory the kit in minutes.

CPL Robert Sutton  
N Btry, 5/14 Regt, 4th Marine Div  
El Paso, TX



FROM THE DESK OF THE Editor

Good idea. The Army is working on providing foam inserts with the small arms tool kit. Your suggestion will help in the meantime.

# A Bottle of Protection

Dear Editor,

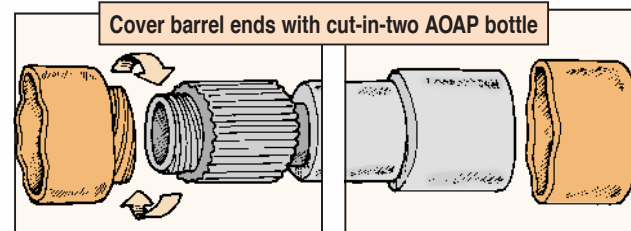
The M2 machine gun barrel gets banged up during transport and storage, particularly the barrel threads. If the threads get too scratched up, dented, or burred, the barrel can't be screwed into the receiver.

We've found that an old AOAP bottle does a good job of protecting the barrel. After washing out the bottle, cut it into two pieces about an inch below the bottle

threads. Turn the bottle's threaded end around and screw it on the barrel's threaded end. Poke a hole in the other end of the bottle and put it over the muzzle.

Keep the bottle ends on the barrel any time the barrel's not being used.

SGT Raymond Smith  
461st Engr Co  
Casper, WY



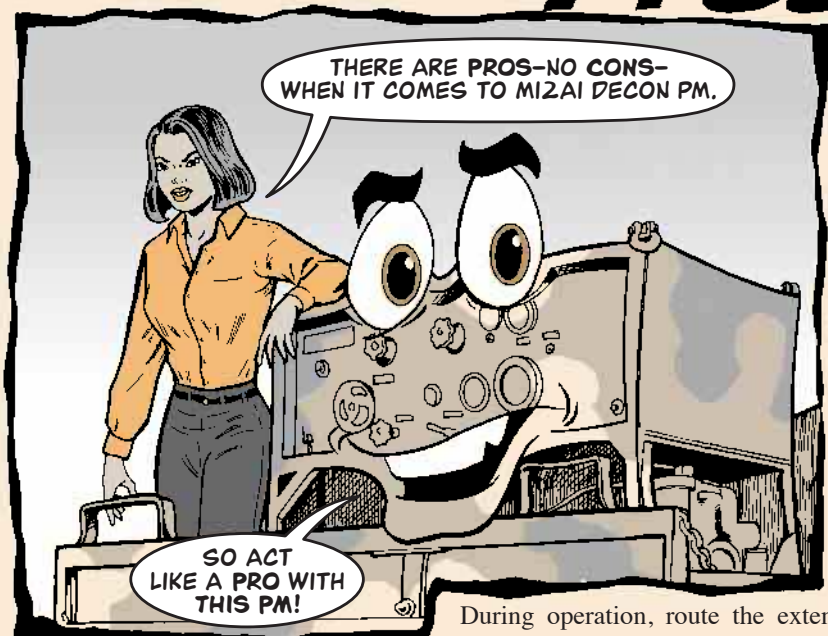
FROM THE DESK OF THE Editor

We won't keep your suggestion bottled up. M2 gunners also need to protect barrels by not letting them roll around during transport. Block them in or tie them down. Don't leave a barrel standing on end, either, where it can take a fall.

GUNNER, NEXT TO YOU, SOMETIMES I THINK PM IS MAN'S BEST FRIEND.

# Pros

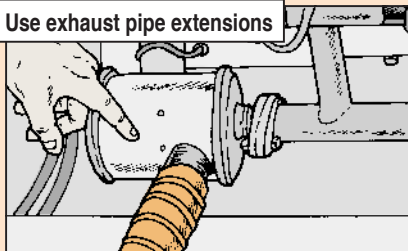
# and Decons



## In the Motor Pool

The M12 produces exhaust that can knock you out when you're deconning. So make sure both exhaust pipes have exhaust extensions, NSN 2990-00-994-0827. If an extension is missing, report it. While waiting for a replacement, find a 1<sup>3</sup>/<sub>4</sub>-in diameter truck exhaust extension in the motor pool. It makes a good temporary replacement.

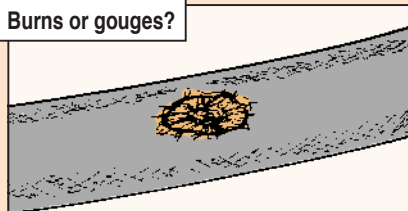
### Use exhaust pipe extensions



During operation, route the extensions away from people. But the extensions become as hot as the exhaust pipes, so use heavy gloves or a thick rag to handle them.

Eyeball the heater hoses for gouges or burns from touching hot stuff like the heater or exhaust extensions. Gouges and burned spots can lead to bad leaks. Report them.

### Burns or gouges?



If you spot grease on the hoses, wash it off with a mild detergent and hot water. Grease causes dry rot and leaks.

## In the Field

Check the fuel sediment bowl before cranking up the M12. If you see clear liquid, water's in the fuel. Water causes starting problems and makes the M12 run rough.

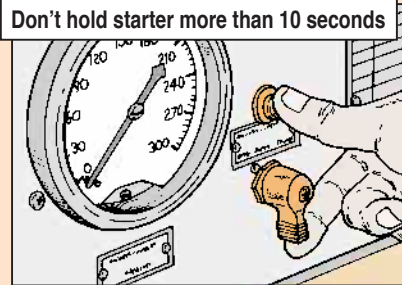
Use two hands to drain the water—one to hold the bowl, the other to turn the nut. Draining one-handed can split the bowl. Then you've got a fuel leak.

### Use two hands to drain bowl



The engine starter heats up fast if you let it turn over and over, so don't hold the starter longer than 10 seconds. Then give it three minutes to cool off before trying again. If it doesn't start after five tries, tell your mechanic.

### Don't hold starter more than 10 seconds

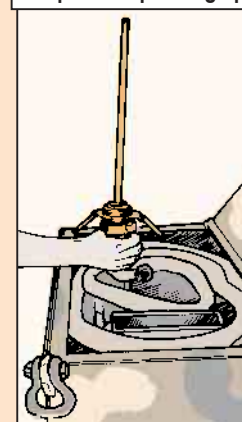


As soon as the engine sounds like it's starting, release the starter, but keep

the OIL PRESSURE SWITCH pushed in until the oil pressure reads more than 20 psi. Otherwise, the low oil pressure safety switch will prevent the engine from running.

When you pull the heater fuel hose out of the storage compartment, keep its nozzle pointing up so that any fuel in the hose won't drain into the compartment. That can be a fire hazard. If fuel does puddle in the compartment, mop it up before starting the heater.

### Keep nozzle pointing up



At the end of operations, walk the heater fuel hose out to its full length to drain out all fuel.

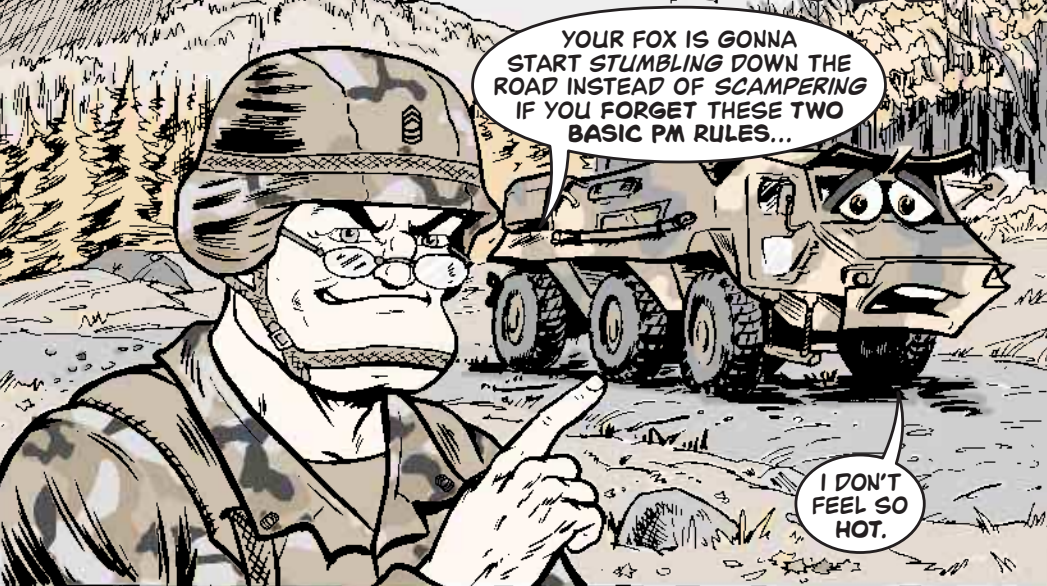
Stand as far back as possible when you turn on the heater. Flames can come out the heater exhaust.

### Stand back when starting heater





# FOXY PM



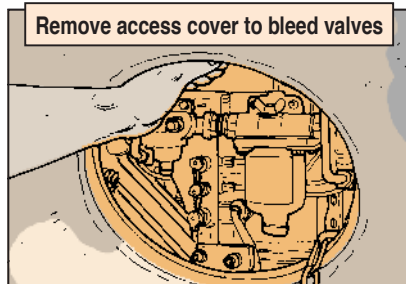
## Bleed Air Tanks

Bleed the air tanks after every operation. Bleeding is part of the after-operation PMCS in TM 3-6665-339-10 (Sep 98).

The air tanks have alcohol reservoirs that keep moisture in the air tanks from freezing. But if too much moisture builds up, it dilutes the alcohol and keeps it from doing its job. Then moisture can freeze in the brake lines.

You will need to remove the access cover to the air tanks to get at the three bleed points. See Step 74 in Procedure APG-Fox-10-M-001 in the -10 for the bleeding procedure. Note the warning. If you don't do it right, alcohol can spray out.

PS 563



## Towing Procedures

If your Fox must be towed, do **not** disconnect the main drive shaft. If you disconnect the shaft, it turns during towing and tears up the transmission and main flange of the drive shaft.

See Procedure APG-Fox-10-O-230 in the -10 for the towing procedure.

46

OCT 99

# Assembly Line Cleaning

Dear Editor,

When a unit comes back from the field, M40 masks usually need to be cleaned.

Instead of leaving it up to the soldier to clean his mask on his own, I've found it's faster and more efficient to create a cleaning assembly line.

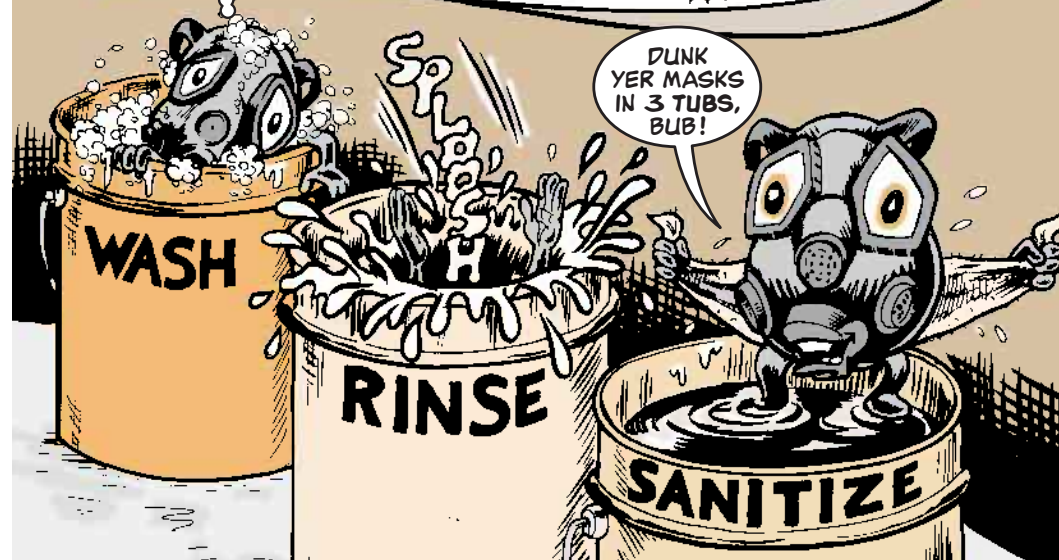
I fill one 5-gal bucket, NSN 7240-01-094-4305, with warm, soapy water and another with clear water. If the masks need to be sanitized, I fill a third bucket with five gallons of water mixed with 2 1/2 teaspoons of calcium hypochlorite, NSN 6810-00-242-4770.

After everyone has removed the canister, hood, outserts, and outlet valve cover from his mask, I have each soldier first clean his mask in the soapy water with a nylon brush or cheesecloth, then rinse it in the clear water and, if the mask needs sanitizing, rinse it in the water-hypochlorite mixture. Finally, each mask is wiped dry with cheesecloth.

I put out a stack of dry, clean cheesecloth at the end of the line.

You may need to refill the buckets with clean water and additives if masks are particularly dirty or you're cleaning a large number of masks.

SPC Allen Simmons  
HHD, 108th ADA  
Ft Bliss, TX



# Don't Mess with These Batteries

**T**here are a few rotten apples in the Army's battery barrel. And using them could give you more than a tummy ache. Defects in the batteries could cause them to **violently** vent or rupture during operation.

If you have any of these batteries, get rid of them:

ARE YOU  
LOOKIN' FOR  
TROUBLE?

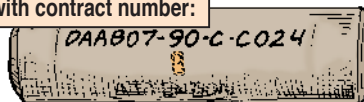
WE'LL  
GIVE YOU  
ALL YOU CAN  
HANDLE!

Battery	Contract Number	Manufacturer	NSN 6135-
BA-5800/U	DAAB07-90-C-C024	Ballard	99-760-9742
BA-5800/U	DAAB07-91-C-R014	Crompton Eternacell	99-760-9742
BA-5590/U	DAAB07-88-C-C045	SAFT	01-036-3495
BA-5590/U	DAAB07-90-C-C020	SAFT	01-036-3495
BA-5590/U	DAAB07-90-C-C020	SAFT	01-435-3097

The BA-5800/Us must be disposed of as hazardous waste. The BA-5590/Us can be disposed of as non-hazardous waste only after you have completely discharged them using the complete discharge device (CDD). If you cannot completely discharge them, they must be disposed of as hazardous waste.

The BA-5800/Us must be disposed of as hazardous waste because the Crompton Eternacell battery does not have a CDD and the CDD on the Ballard battery **should never be used!**

**NEVER activate CDD on Ballard batteries with contract number:**



Using it could cause the battery to **violently** vent or rupture.

You can find the deadlining info on the BA-5590/Us in CECOM

Safety-of-Use-Message (SOU) 97-017. The Ballard BA-5800/U info is in CECOM SOU 98-001. The Crompton Eternacell BA-5800/U info is in CECOM Ground Precautionary Message 96-011.

## Safe Stuff for Commo Cleaning

TB 43-0135, *Environmentally Safe Substances for Use with Communications-Electronics Equipment*, is a must pub on your commo gear maintenance shelf.

HERE'S A  
SAMPLE OF WHAT'S  
INSIDE THE PUB...



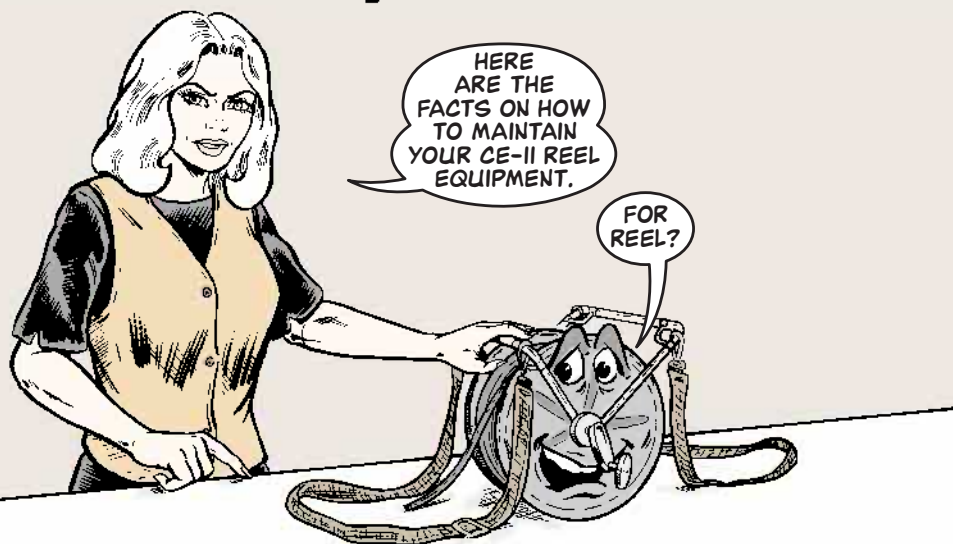
- A list of environmentally safe solvents available in the supply system.
- A list of chemical and cleaning solvents no longer approved for use because they harm the atmosphere.
- Descriptions and characteristics of approved solvents.
- Guidelines for cleaning commo gear.
- Cleaning solvent and protective equipment WARNING statements.

If you didn't get TB 43-0135 during initial distribution, ask your pubs clerk to order it. Or read it on the Internet at:

<http://p2.monmouth.army.mil>



# Repair Parts and Maintenance



When TM 11-3895-203-15 for CE-11 reel equipment first found its way into the hands of operators and repairmen, most of you weren't born.

But the heart of the CE-11 is the RL-39 reel and it has aged well. Still, there have been a few parts changes and maintenance updates over the last 30 years that you should know about.

## Supply

Here is an updated unit-level repair parts list for the RL-39:

Item	NSN
Crank and handle	5340-01-142-9478
Handle	3895-01-135-2538
Cotter pin	5315-00-842-3044

You can also order the sling strap, NSN 8465-00-269-0682. It replaces straps ST-34, NSN 8465-00-498-7991, and ST-35, NSN 8465-00-498-7992, which are no longer available.

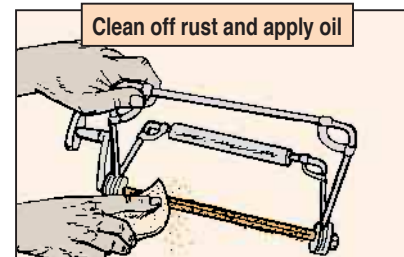
Here are some other parts that support can replace for you:

Item	NSN
Bearing	3895-01-133-9995
Housing assembly	5805-01-151-9929
Stop	3895-01-134-0308
Plate assembly (with stop)	3895-01-151-9928
Retaining ring	5365-00-803-7306

The stop is a terminal item. Once the on-hand stock is used up, you must order the next higher assembly, which is the plate assembly.

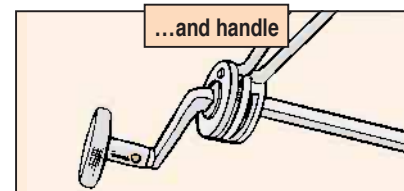
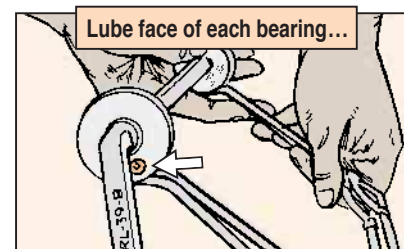
## Maintenance

Rust on your reel makes paying out wire tougher than it needs to be. Remove heavy rust with steel wool, NSN 5350-00-242-4404. Remove lighter rust with fine sandpaper, NSN 5350-00-193-7211.



After the rust is removed, apply a light coat of oil, NSN 9150-00-273-2389, to the axle.

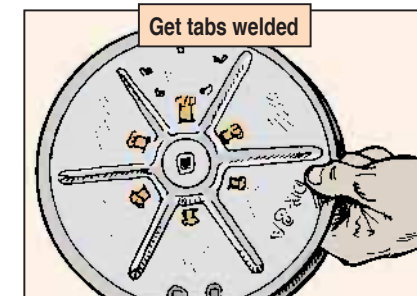
While you have the lube handy, hit the reel's lube points—one on the face of each bearing and one on the crank handle.



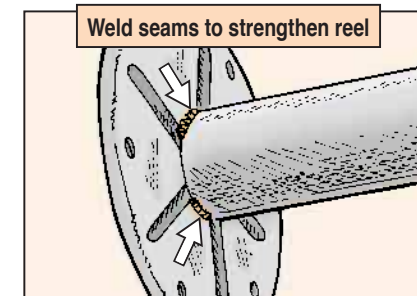
After that, lube the reel at least quarterly to keep it rolling smoothly.

The newest reels have nylon bearings that don't need oil, so they won't have lube points.

The DR-8 spool that holds the wire to be reeled needs a little attention, too. Look at the spool's end plates. If the tabs are only bent over, not welded, get support to spot weld them. Bent tabs are too weak to hold the end plate if you drop a loaded spool.



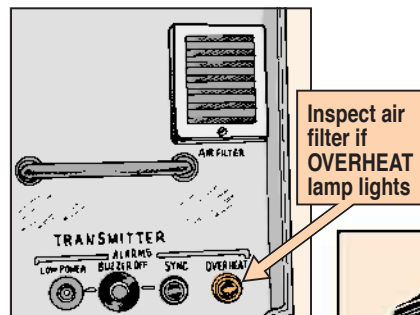
For added strength, spot weld the seams where the spool shaft joins the end plates. Three welds at each end will do the trick. Clean up the welds with a wire brush, then touch up with paint.



# Don't Be

**S**ome things just shouldn't happen. Waiting for the overheat alarm on your AN/GRC-103 radio's T-983 transmitter to go off before you clean the air filter is one of them.

When the panel light lights and the alarm buzzes, your radio isn't getting ready to overheat—it is overheating!

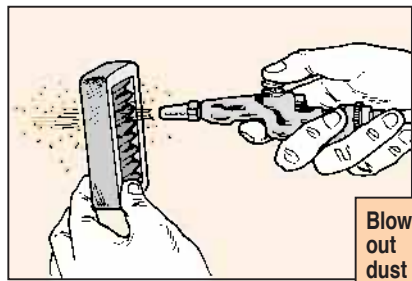


A clogged filter makes the ventilating fan work harder. Then the transmitter overheats and the signal weakens or goes out altogether. Eventually, other components fail, too.

So check the filter before every operation like TM 11-5820-540-12 says. And clean the filters and change them as often as the environment you're operating in demands. That could be weekly, it could be daily, but you should know how fast the filter clogs.

Clean a dirty filter and the inside of the transmitter with low-pressure (no more than 30 psi) air. NSN 4940-00-333-5541

brings an air gun to attach to your air hose.



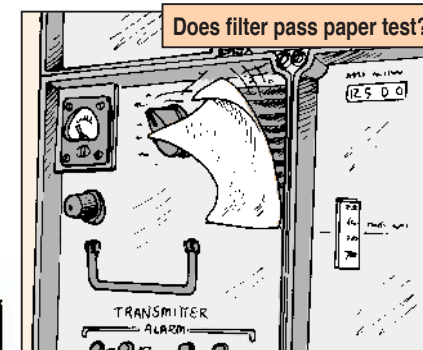
If you don't have an air hose, tap the filter against the heel of your hand. Wipe out the transmitter with a clean rag.



# Alarmed

If the filter is very dirty, wash it in warm water and a mild detergent. Let the filter air dry completely before you use it.

Periodically during the operation of the radio, give the filter the paper test.



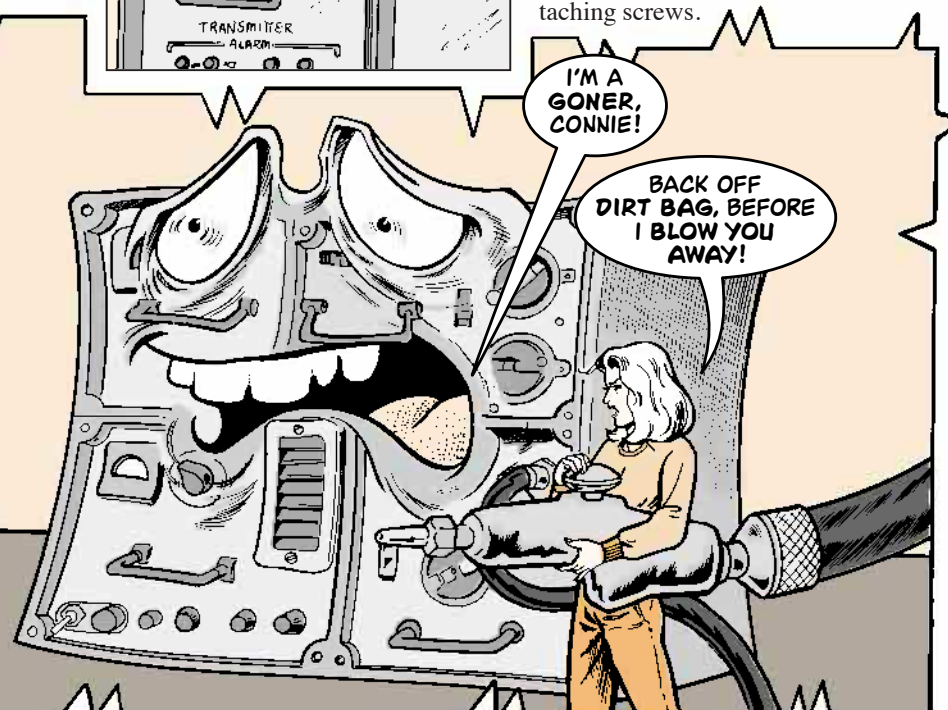
Take a square of paper a little bigger than the transmitter filter and hold it flush against the filter frame.

If the paper sticks, you're getting enough air to keep your radio cool. If it falls, clean the filter.

Now, try the test again. If the paper falls this time, replace the filter.

Try one more time. If the paper still falls, turn the transmitter in for repair.

When you clean a filter, check its condition. Replace a filter that has a broken frame or whose filtering material is frayed or torn. NSN 4130-00-879-2280 brings a new filter with attaching screws.





# Don't Hold Your Breath



**Y**our health may depend on how well your respirator filters out dangerous particles produced by sanding, grinding, welding, spot painting, brake and clutch repair, and use of adhesives in your workplace.

You can't grab just any respirator and go to work. Different respirators are designed to protect you from different hazards. It's important to know which type of respirator you need for each job.

Here's how to get started:

- u First, get your local safety or industrial hygiene/preventive medicine folks to identify and measure the hazards in your work area. They'll figure

out which respirator is best for each job. National Guard and Reserve units fall under the Safety and Occupational Health Office of their state.

- u Next, you need medical clearance to wear a respirator. Certain medical conditions, such as asthma, allergies, or high blood pressure could prevent you from being issued a respirator.

- u Then, you must be trained to use the respirator. Your installation's respiratory protection (RP) specialist or industrial hygiene office will tell you why the respirator is required, what it protects you from, how to tell if it fits properly, and how to care for it. You

will also learn how to determine the end of the service life of the cartridges and canisters.

## Fit Testing

Fit testing is required before using **any** respirator. During fit testing, your installation's respiratory protection (RP) specialist will help you select the most comfortable respirator for your facial shape and features. You'll fill out a medical questionnaire. You'll also wear the respirator in a test atmosphere and perform the required function tests. These tests let you know if your respirator fits or if it needs repair.

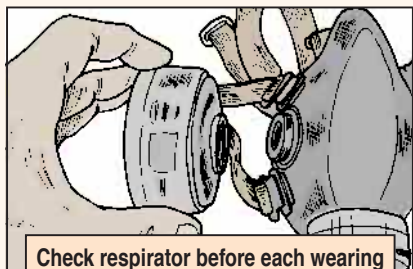
Be sure and let your supervisor or RP specialist know if there is any problem. Better to be safe than sorry.

Fit testing and medical clearance are not one-time affairs. Depending on your unit's particular hazard, the RP specialist will schedule fit-testing and medical clearance once or twice a year.

## Maintaining the Mask

Before and after each use, check your respirator for cracks, holes, nicks and cuts. Work the buckles and feel the rubber facepiece and elastic parts for flexibility and signs of wear. If you find any problems, turn in the mask to your supervisor. Remember, wearing a

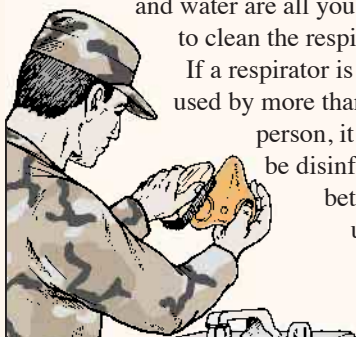
faulty or ill-fitted respirator can be as bad as wearing no respirator at all.



Check respirator before each wearing

If you are the only user, mild soap and water are all you need to clean the respirator.

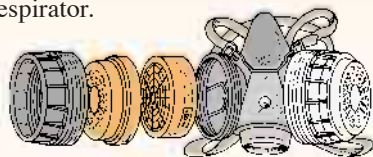
If a respirator is to be used by more than one person, it must be disinfected between users.



Disinfect if more than one person uses

Also, always disinfect the respirator before you store it. Here's how:

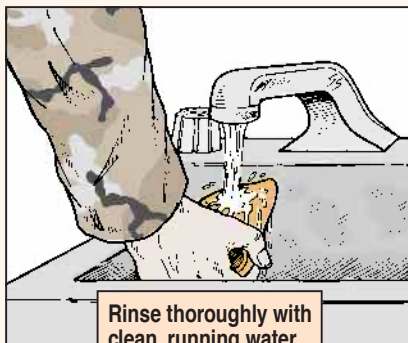
1. Remove filter cartridges or canisters, headbands, speaking diaphragms, and valves from the rubber face piece. Remember, filter cartridges, canisters, and filter items cannot be cleaned. Keep them out of the way until you're ready to put them back in the clean respirator.



Filter cartridges, canisters and filter items cannot be cleaned

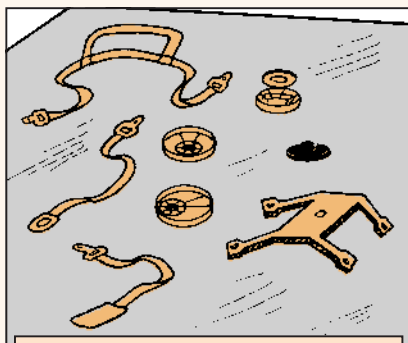
2. Put all other pieces in a warm solution of cleaner/sanitizer such as liquid bleach, NSN 6810-00-598-7316. Use one tablespoon of bleach for each four gallons of water. Let the pieces soak for a few minutes. If necessary, lightly scrub them with a soft bristle brush to remove things like paint specks.

3. Rinse all parts thoroughly with clean, running water.



Rinse thoroughly with clean, running water

4. Place all the parts on a clean surface to air dry.

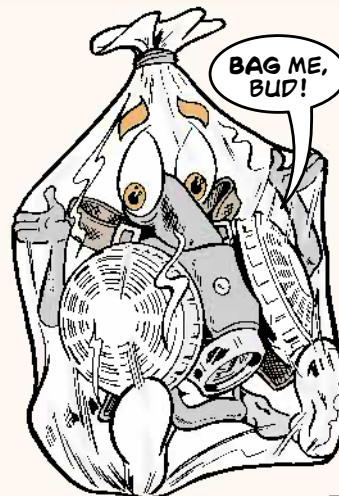


Place parts on a clean surface to air dry

### Storage

After the respirator is cleaned and disinfected, store it away from dust, sunlight, heat, extreme cold, chemicals and excess moisture.

Respirators used on a routine basis can be stored in plastic bags, NSN 8105-00-837-7755. Never store them in lockers or tool boxes unless they are in protective containers or cartons.



If left unprotected, the face piece could get damaged, and then it won't fit you properly.

If a respirator is used for emergencies, keep it in a special compartment at your work area. Make sure the compartment is clearly marked to show what's inside.

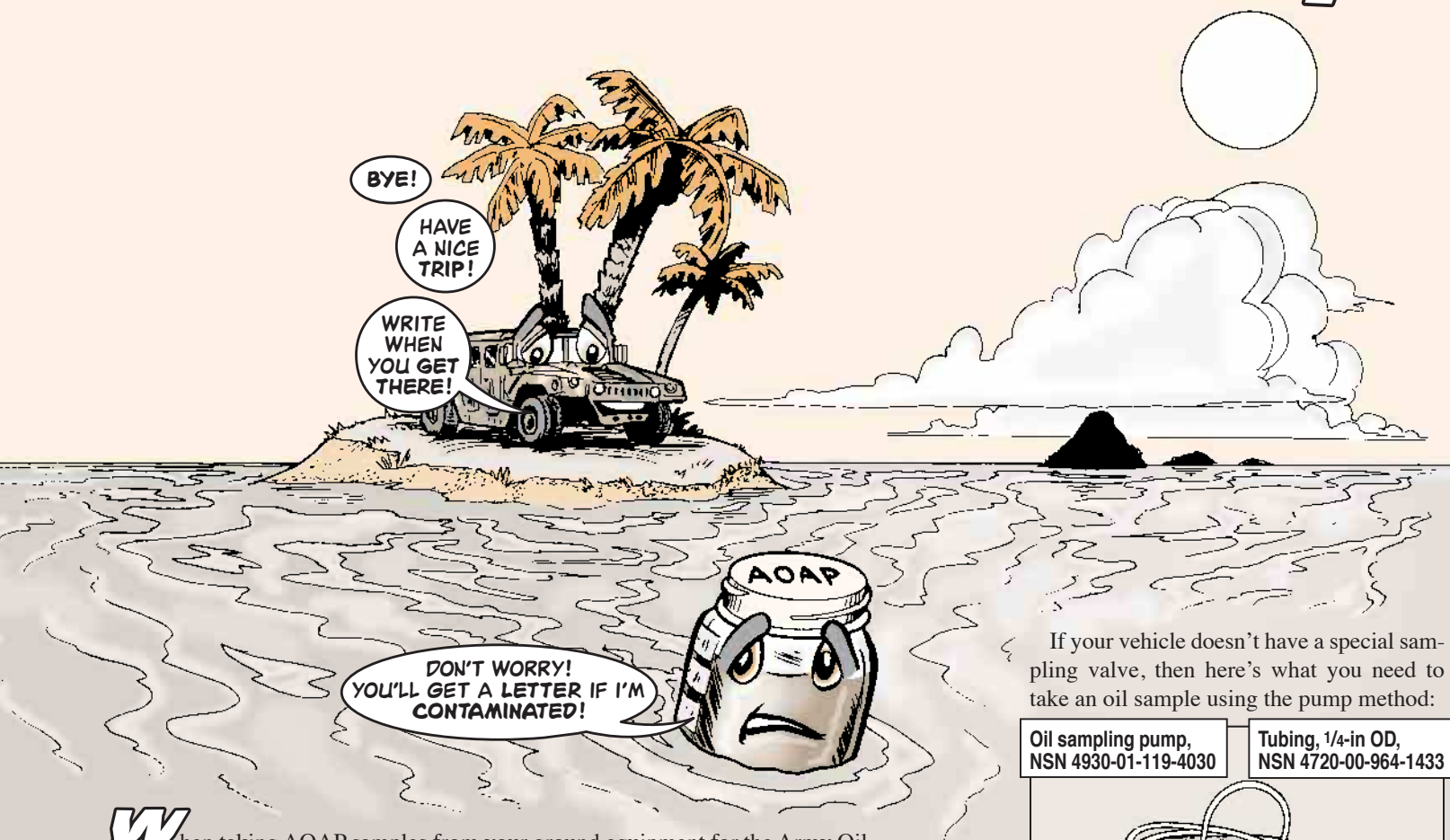
Some respirator manufacturers offer free training assistance, fit testing and guidance on setting up a respiratory program. But check with your installation's respiratory protection program director before calling the manufacturer directly.

For more information on the respiratory protection program, see AR 11-34, *The Army Respiratory Protection Program* and TB Med 502 *Occupational and Environmental Health Respiratory Protection Program*.





# Good Samples



**W**hen taking AOAP samples from your ground equipment for the Army Oil Analysis Program (AOAP), you want to get it right the first time. If the lab doesn't get good samples, you wind up taking another one.

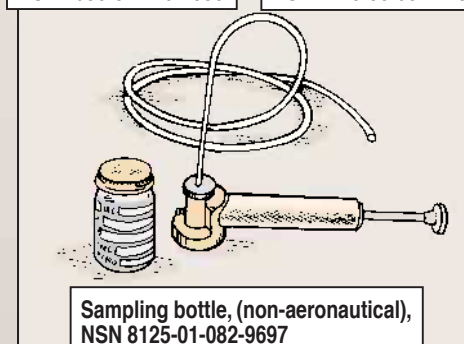
To get it right, you need the right equipment. To make sampling easy, many components are equipped with a special sampling valve, installed according to instructions in your equipment TM.

To take a sample with a valve, you may need to start the engine to pressurize the system. Once the oil starts to flow, flush a small amount of oil from the line to clear out contamination, then fill the sample bottle from the valve.

If your vehicle doesn't have a special sampling valve, then here's what you need to take an oil sample using the pump method:

Oil sampling pump,  
NSN 4930-01-119-4030

Tubing, 1/4-in OD,  
NSN 4720-00-964-1433

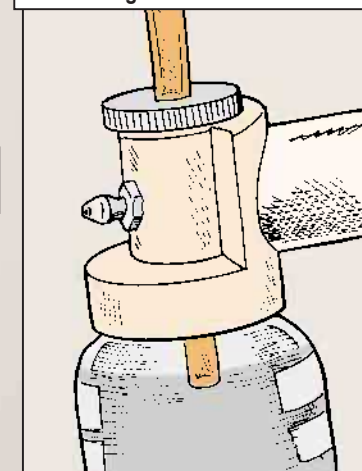


Sampling bottle, (non-aeronautical),  
NSN 8125-01-082-9697

Take the pump method sample like this:

1. If the equipment hasn't been operated for the past 30 days, or if new oil has been added, run the equipment to normal operating temperatures.
2. Rest the tubing on the dipstick. Put a mark on the tubing where the dipstick ends. Measure about 10 inches beyond that mark before cutting the tubing.
3. Loosen the T-handle on the pump. Insert the tubing about two inches into the pump head, making sure the tubing goes about 1/4 inch into the bottle. Tighten the handle just enough to grip the tubing firmly.

Push tubing about 1/4 inch into bottle



4. Attach the bottle to the sampling pump.

5. Insert the tubing into the reservoir. Go slowly so you don't hit the sides of the reservoir. Be careful not to go past the mark you made on the tubing. That way you won't hit the bottom of the reservoir. If the tube touches the bottom or sides, sludge will be picked up, and the lab will request another sample.

6. Hold the pump horizontally and pull the pump handle out slowly. Oil should enter the bottle. Fill the bottle to the bottom of the bottle's neck or about 1/2 inch from the top. Push the vacuum relief valve (on top of the pump) to stop the flow. Be careful not to get oil in the pump. If you do, the pump will be contaminated. Then you'll have to clean the pump thoroughly before taking another sample.

7. Unscrew the bottle from the pump and replace the bottle cap. Wipe off any oil with a clean rag.

8. Remove the tubing from the reservoir. Loosen the T-handle and pull the tubing from the pump. Put the used tubing in an approved hazardous waste container.

9. Replace the reservoir cover.

**Whether the pump method or the valve method is used, the next steps are:**

➤ On the sample bottle label, fill in the equipment's bumper number, component serial number, and hours and miles.  
➤ Put that same information on the DD Form 2026 or the ULLS DA Form 5991E.

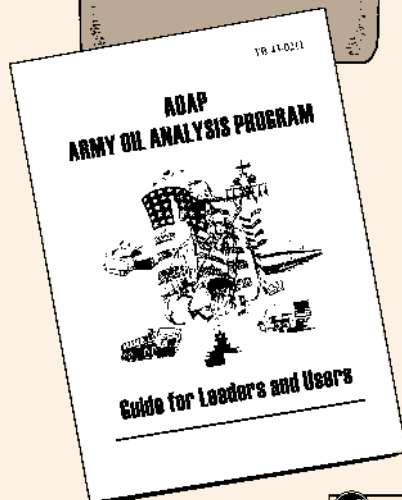
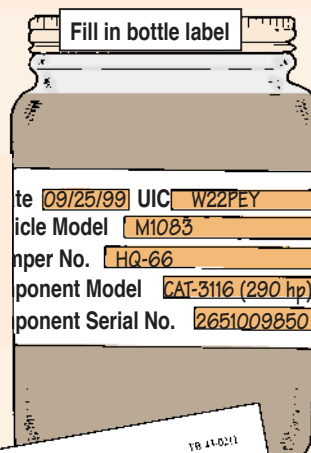
If you want more info on AOAP, read TB 43-0211, *AOAP Guide for Leaders and Users*. It has full details on how AOAP works and answers to frequently asked questions. If your unit doesn't have the TB, tell your pubs clerk to use publications identification number (PIN) 033805-000 to get a current copy, and initial distribution number (IDN) 340333 to get on distribution for TB revisions.

For further AOAP assistance, contact AOAP directly. Call DSN 645-0869, (256) 955-0869, e-mail:

[aoap@logsa.army.mil](mailto:aoap@logsa.army.mil)

or write to:

Commander, USAMC LOGSA  
ATTN: AMXLS-LA, Bldg 3627  
Redstone Arsenal AL, 35898-7466



### HEMTT Tanker Service Correction

The correct interval for checking and cleaning the line strainer and filter separator on M978 fuel tankers is every two years. Make a note for Item 15 in the PMCS in Change 3 to TM 9-2320-279-20-1 that the interval is biennial. 'Course, if an operator PMCS shows a possible fuel line strainer or filter separator problem, the interval can be shortened.

### E-mail for Training Videos

In PS 559, you learned about training videos that are available from the Defense Automated Visual Information System/Defense Instructional Technology Information System. Next time you e-mail them, use their updated address:

[vibuddy@hq.afis.osd.mil](mailto:vibuddy@hq.afis.osd.mil)

Their website remains:

<http://dodimagery.afis.osd.mil>

### Caps for Water Cans

Got water cans, NSN 7240-00-089-3827, that are missing caps? You can get the cap assembly, which includes the lid and cap, with NSN 7240-00-089-7312.

### Expandable Tent

To get the expandable frame tent, LIN: V48510, you used to have to order each individual part. No more. NSN 8340-00-782-3232 now gets you the complete tent. It is authorized by CTA 50-909, *Field and Garrison Furnishings and Equipment* (Aug 93). TM 10-8340-220-23P lists the tent components but you still need FM 10-16, *General Fabric Repair*, for maintenance.

### HMMWV Rifle Mount Kit

Need to add a rifle mount to your HMMWV? NSN 2590-01-380-8283 brings a kit with the hardware, upper and lower clamps and butt mount for one rifle. The kit contains the piece parts shown in Fig 217 of TM 9-2320-280-24P-1. It mounts on the passenger side or driver side.

### GSA Customer Help

GSA's Federal Supply Service has set up a national customer service help line. Call DSN 465-1416, or (800) 488-3111 from 0700-1730 eastern time. Press 1 for customer service or questions on GSA products or services. Press 2 to place an order.

DISTRIBUTION: To be distributed in accordance with the initial distribution number (IDN) 340312, requirements for TB 43-PS-Series.

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