

**THE  
PREVENTIVE  
MAINTENANCE  
MONTHLY**

TB 43-PS-587, 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.

**ISSUE 587 OCTOBER 2001**



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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  
PS, the Preventive Maintenance Monthly  
USAMC LOGSA (AMXLS-LP)  
5307 Sparkman Circle  
Redstone Arsenal, AL 35898-5000**

Or e-mail to:

**psmag@logsa.army.mil**

Internet address:

**http://www.logsa.army.mil/psmag/pshome.html**

By order of the Secretary of the Army:

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Administrative Assistant to the Secretary of the Army  
0122801

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## IT'S A DIRTY BUSINESS

After a few days in the field, you and dirt become real close companions. There's dirt in your hair, on your face, and under your nails. It gets ground into your uniform. You can taste it in your meals. After a while, you begin to forget what clean feels like.

As rough as that is for you, dirt is even rougher on your equipment. Unlike you, though, your gear can't wait for that Saturday night bath. You gotta keep it as clean as you can now or it won't work later.

First, try to operate your equipment where less dirt will be stirred up. For example, don't run a generator in the dust when you can put it up on a trailer or on dunnage.

Second, make sure the air filters on engines and electronic equipment are clean enough to let in the air they need to operate. A choked-up air filter will kill even the toughest equipment.

The same goes for choked-up fuel filters. So when you fuel up equipment, for instance, do all you can to keep dirt out of fuel tanks.

Let's face it. It's a dirty world out there and you can't always keep a showroom finish on your gear. But you can do everything possible to minimize the effects of dirt on operations. That's just good PM.



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By order of the Secretary of the Army:

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General, United States Army Chief of Staff

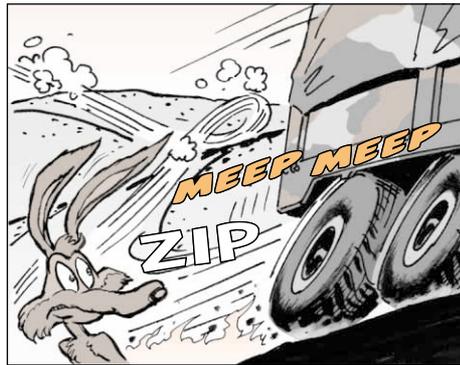
Official:

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# 40 MPH Speed

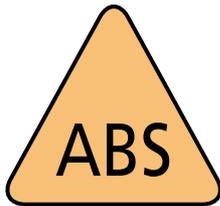


Unless your M939-series 5-ton trucks have had MWO 9-2320-272-55-1 applied, their highway speed limit is still 40 mph.

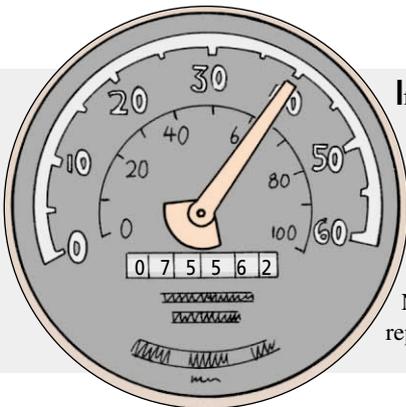
TACOM Safety-of-Use Message (SOU) 00-018 (Jul 00), *Resumption of Safe Operating Speeds for M939 Family of Vehicles Following Retrofit of Anti-lock Braking System (ABS)*, authorizes you to resume normal operating speeds only after MWO 9-2320-272-55-1 is applied.

Application of ABS to your trucks rescinds the requirement for MWO 9-2320- 272-20-7 and removes the brake proportioning valve installed during that modification. Never add MWO -20-7 to a truck that has been modified by MWO -55-1. It's not needed then.

Look for decal on windshield...



# SPEEDOMETER MUST WORK

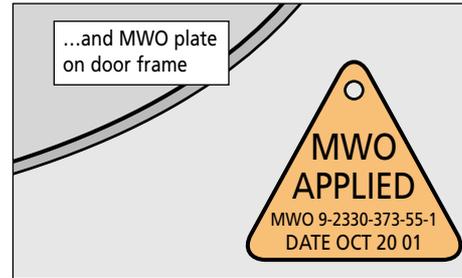


If your M939-series 5-ton truck has a speedometer that does not work right or doesn't work at all, your truck is NMC until it is repaired or replaced.

# Limit Continues



Trucks with the ABS MWO have a yellow triangular decal with black lettering "ABS" in the lower left corner of the windshield. 'Course, there'll be a regular MWO tag on the cab reinforcement just inside the driver's door, too.



MWO 9-2320-272-20-7, which still has not been applied to some vehicles in the fleet, installed a brake proportioning valve kit to prevent front-wheel lockup during heavy braking when driving on slick surfaces with little or no load on-board.

TACOM SOUM 98-07 (Apr 98), *Safe Operating Speeds for M939 Series Trucks*, dropped speeds to 40 mph and outlined safe driver practices. It is still in effect until MWO -55-1 is installed.

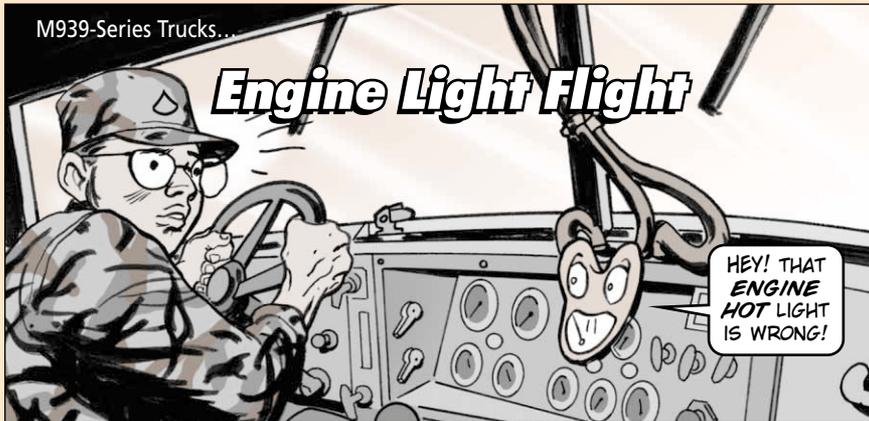
Eyeball TACOM Safety-of-Use Message (SOU) 01-006 (Jan 01), M939 Speedometer NMCS Criteria, for the details.

Since no M939-series truck can be driven faster than 40 mph unless MWO 9-2320-272-55-1 has been applied, you must have a working speedometer to know how fast you're going.

Insert these words in TM 9-2320-272-10 on Page 2-53 in PMCS Item 19's "Not Fully Mission Capable If" column:

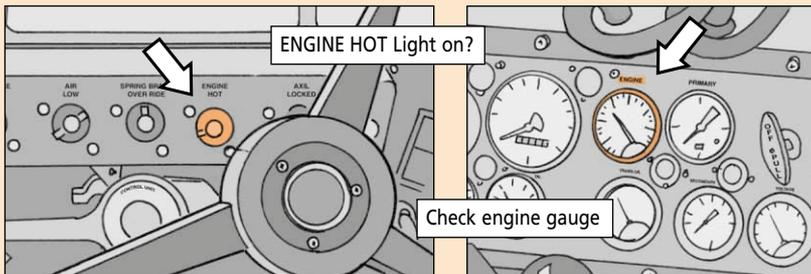
"Gauges—speedometer/odometer is inoperative. Report vehicle immediately to unit maintenance if speedometer needle does not move, jerks unevenly during sustained speeds or appears stuck."

# Engine Light Flight



Even when engine temperature is normal, the ENGINE HOT light on early M939-series 5-ton trucks may come on.

If the light comes on while you're driving, don't pull over until you take a look at the temperature gauge. If the gauge reads in the normal range, keep on truckin'. 'Course, if it reads hot, pull over and get help.



Early on, the headshed decided the warning light wasn't needed. So, they dropped the light on later production trucks.

If your truck has a light that doesn't work right, get your mechanic to remove it. The procedures are in EIR Digest TB 43-0001-39-2 (Apr 86).

If your unit doesn't have a copy, see your TACOM LAR or write to Half-Mast.

## M35A3 Compressor Parts

Fig 114 of TM 9-2320-386-24P gives some bum info on the M35A3 truck's air compressor. Item 5, check valve, and Item 6, check valve seat, are not used on the M35A3. Additionally, you only need one gasket (Item 4) instead of the two called for in the figure. That means you'll never need kit, NSN 2530-01-321-2243, that contains all four of these parts. Just order the single gasket, NSN 5330-01-423-3412.

# STOPLIGHT ADJUSTMENT



A stoplight switch that's slightly out of adjustment can be a pain in your neck, HMMWV operators—in more ways than one.

If your truck's brake lights don't come on when you push the brake pedal down ¼ inch or less, you could be slowing down and the folks behind you won't know it until it's too late for them to stop.

So check now to see if your stoplights are working. Here's how:

- ✓ While another soldier watches at the rear of the vehicle, depress the brake pedal. The stoplights should come on within ¼ inch of pedal travel.
- ✓ If the lights don't come on until the pedal is depressed more than ¼ inch, get your mechanic to do some maintenance.
- ✓ The adjustment info for basic and A1 models is on Pages 4-98 and 4-99 of TM 9-2320-280-20-2. For A2 models, see Pages 4-100 and 4-101.

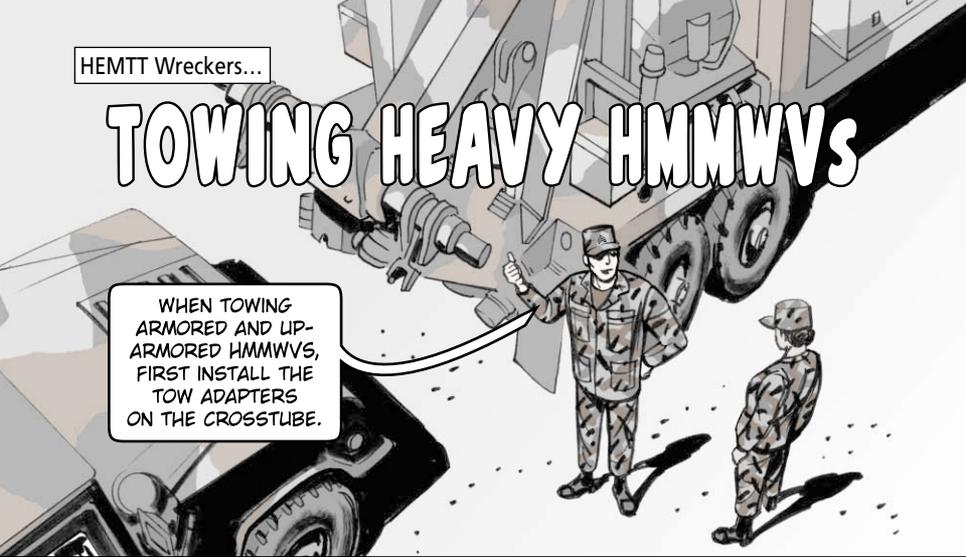
The reference to ½ inch of pedal travel on Page 4-98 is wrong. One-quarter inch is right.

## FMTV Van Air Conditioner

Make a note in Fig 267, TM 9-2320-365-24P, that you do not get the air conditioner, NSN 4120-00-974-7206, when you order air conditioner kit, NSN 4130-01-456-0718. The kit NSN, Item 1, brings all the items listed in the figure except Item 2, the air conditioner. The next TM update will correct this error.

# TOWING HEAVY HMMWVs

WHEN TOWING ARMORED AND UP-ARMORED HMMWVs, FIRST INSTALL THE TOW ADAPTERS ON THE CROSSTUBE.



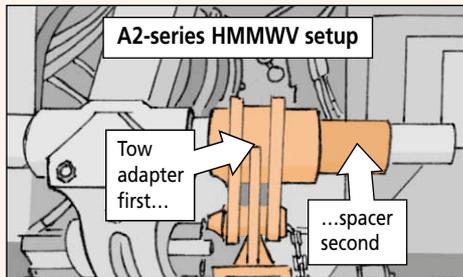
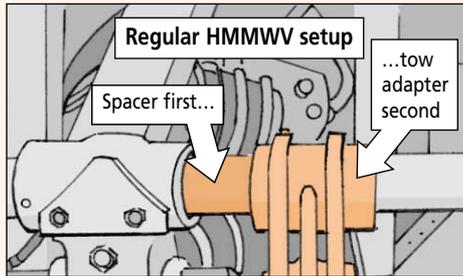
The correct procedures for towing M998A2-series trucks without winches with HEMTT wreckers are just a little different from those shown in TM 9-2320-279-10-2.

The towing procedures in the -10-2 TM don't take into consideration that towing eyes on A2-series trucks without winches are closer together than towing eyes on other HMMWVs.

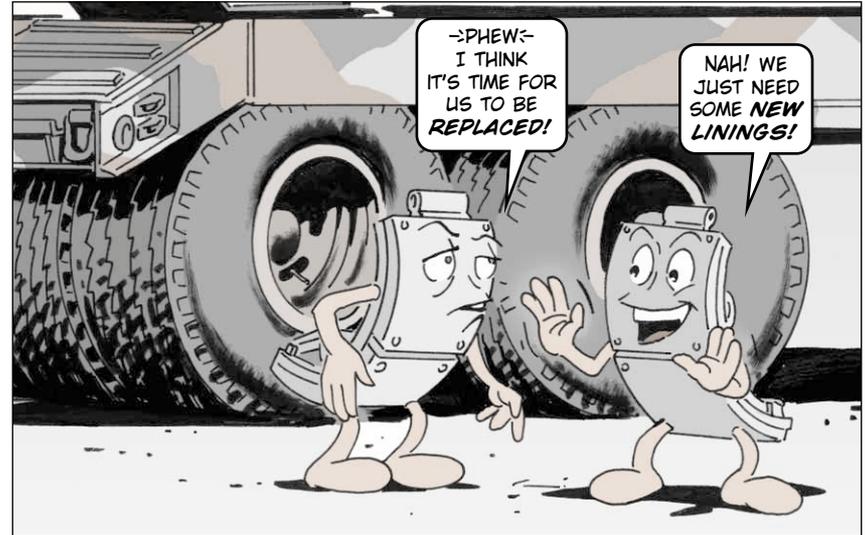
So the HEMTT wrecker's tow adapters need to be moved closer together, too. Just follow the towing procedures found in Para 2-83 until you get to Step 12.1.

Then, instead of installing two 5-in spacers on the crosstube before adding the front tow adapters, install the tow adapters on the crosstube first. Then install the spacers.

Remember, too, to keep the HEMTT wrecker's speed down to the limits shown in Table 1-4 in the -10-2. Safety chains are attached to a HMMWV's A-frame during the tow and exceeding the speed limits will damage the A-frame.



# Add Brake Linings to Old Shoes



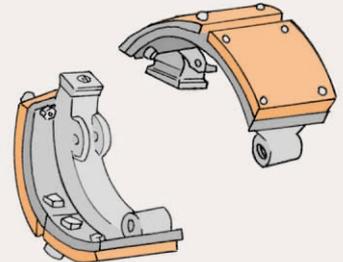
Since brake shoe assembly, NSN 2530-00-678-6133, is no longer available for M172A1 semitrailers, you might want to reuse the bare metal shoe with new linings.

That's because a new bare shoe, NSN 2530-00-378-9036, costs more than \$280.

So get together with your direct support folks since it's their job to remove the old linings and add new ones. They'll use the following parts on each wheel:

Item	NSN
Friction lining (4)	2530-00-678-6135
Wear plate screw (8)	5305-00-958-5253
Wear plate (4)	2530-00-678-6128
Hex nut (16)	5310-00-732-0559
Lock washer (16)	5310-00-194-1483
Bearing sleeve (4)	3120-00-427-2213
Machine screw (16)	5305-00-053-1102

You can't get entire assembly, so have DS order parts and re-line old shoes



If you need a new brake drum, use NSN 2530-00-204-3214. The NSN is missing from Item 19 of Fig 16 in TM 9-2330-211-14&P.

# Making the

# Daily Checks



MAINTENANCE EQUIPMENT THAT GETS THE **MOST** USE OFTEN GETS THE **LEAST** MAINTENANCE.

THAT'S THE CASE WITH JACKS AND STANDS.

"YOU SEE JACKS AND STANDS ALL OVER MAINTENANCE BAYS..."

"...SOME IN USE AND SOME IN THE CORNER WAITING TO BE USED."

BUT WHEN WAS THE LAST TIME THEY GOT PM OR WERE INSPECTED?

I DUNNO ...

IF YOU **DON'T** KNOW, CHANCES ARE IT'S BEEN TOO LONG. **APPENDIX E OF TB 43-0142, SAFETY INSPECTION AND TESTING OF LIFTING DEVICES, HAS THE WORD.**

## Daily Inspection

CHECK FOR PROPER MARKING (LOAD RATING)

CHECK FOR CLEANLINESS AND PROPER LUBRICATION

CHECK FOR BROKEN, CRACKED OR DISTORTED PARTS OR HOUSINGS, LOOSE BOLTS OR RIVETS, AND OTHER EVIDENCE OF MISHANDLING

CHECK FOR LEAKS; WORN, BENT OR DAMAGED SCREW THREADS; CRACKED OR BROKEN RACK TEETH; SCORED OR DAMAGED RAM; MALFUNCTIONING SWIVEL HEADS AND CAPS; IMPROPER ENGAGEMENT OR EXTREME WEAR OF PAWL AND RACK

CHECK THAT HANDLE IS FREE FROM GREASE AND OIL

THEN CHECK ANY OTHER ITEMS SPECIFIED IN TMS OR MANUFACTURER'S INSTRUCTIONS THAT MAY AFFECT OPERATION.

CHECK!

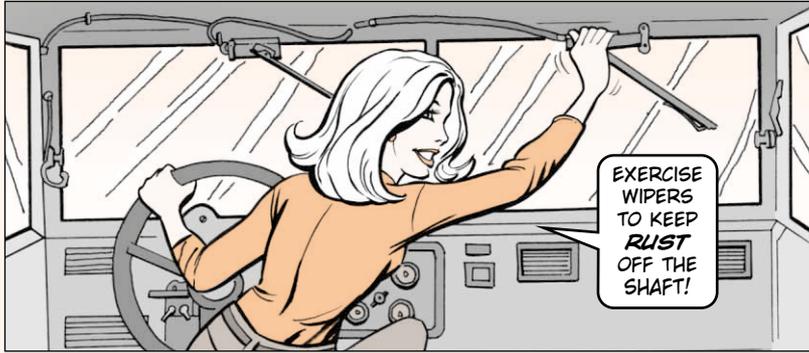
## Periodic Inspection

- Every 6 months, in addition to performing each daily inspection, check for corrosion of metal parts.
- Disassemble jacks for cleaning and examination for internal wear or damage if external appearance indicates there may be internal problems.

USE THE INSTRUCTIONS FOUND IN THE LIFTING DEVICE TM OR MANUFACTURER'S PAMPHLET TO DISASSEMBLE.

WHEN TESTING IS NECESSARY, SEE PARA E-3 IN THE TB FOR DETAILS.

# Wiper Motor Needs Exercise



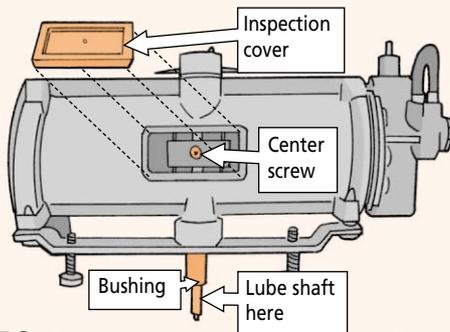
Operators, "use it or lose it" applies to your M44A2-series 2 1/2-ton or M809-series 5-ton truck's air-actuated wiper motor, too.

Left unused, rust can build up on the shaft of the windshield wiper motor and keep the motor from working when you need it most.

So give rust the boot. When you hop into your truck, reach up and give the wipers some exercise by moving the manual paddle lever back and forth. That'll spread any lube left on the shaft. If the lever catches or won't move freely, get your mechanic to work it over like so:

Remove the wiper motor like it says in the TM.

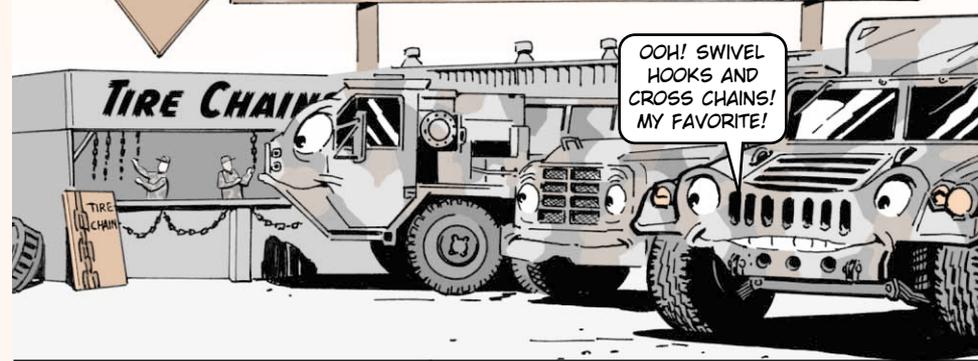
- ✓ Lift the rectangular inspection cover from the motor.
- ✓ Line up the screw in the center of the inspection hole and remove it.
- ✓ Squirt 10W oil between the shaft and the bushing to loosen the rust.
- ✓ Install a nut on the threaded end of the shaft. Gently tap the shaft until it's loose. Remove the nut and pull the shaft out of the bushing and motor.



- ✓ Remove rust from the shaft and interior of the bushing with steel wool, fine sandpaper or emery cloth.
- ✓ Coat the shaft with GAA. Install the shaft, center screw and inspection cover.
- ✓ Install the wiper motor. If the motor still won't work right, replace it with NSN 2540-00-391-4322.

Wheeled Vehicles...

## GET YOUR TIRE CHAINS



Tire chains for your wheeled vehicle are usually listed in the additional authorization list (AAL) in the -10 TM. But not all -10s have the info.

Plus, the TMs don't give you replacement cross chain and swivel hook NSNs for the chains. So here is the right chain info for some common tire sizes:

Tire Size	Chain Assembly (Pair) NSN 2540-	Cross chain NSN 2540-00-933-	Swivel hooks NSN 2540-00-937-
7.50 x 16	00-528-7360	6960	0404
9.00 x 20	00-933-9024	6916	0404
9.50R x 16.50	00-057-0204	6916	0404
10.00 x 15	01-185-8306	6916	0404
10.00 x 20	none	6916	0404
11.00x16	none	6915	0404
11.00x20	00-933-9022	6915	0404
11.00x24	00-933-6935	6915	0404
12.00x20	00-933-6922	6915	0404
14.00x20	00-933-9033	6992	0404
14.00x24	00-933-9023	6992	0404
16.00x20	00-933-6937	N/A	N/A

If dual tire chains for your tire size are not listed here, use singles on the outside tires. Parts are the same for single and dual chains of the same size.

If your vehicle has a tire size not listed here, have your supply clerk check out FSC 2500 in FED LOG for other chains. Authority to order chains comes from Appendix A, CTA 50-970.



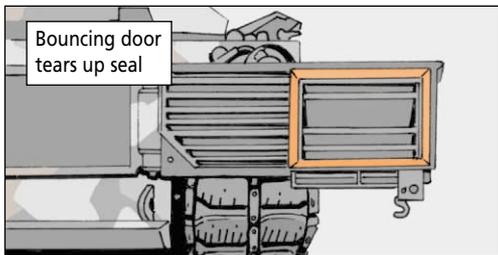
# CHECKING SEAL TAKES TEAMWORK



Checking your tank's engine exhaust seal is a monthly check, crewmen. But what you do after the check can make or break the seal.

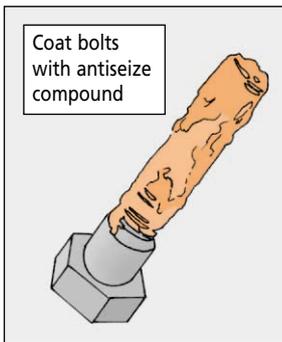
After closing the exhaust grille doors, you need to secure them in place with two bolts and J-hooks. The bolts are supposed to be torqued to 295-350 lb-ft. Since crewmen don't have a torque wrench, a mechanic should do the job.

Unfortunately, some crewmen tighten the bolts anyhow. When the bolts come loose, the grille doors bounce up and down and tear the seal. Then you have to call in a mechanic to replace it.

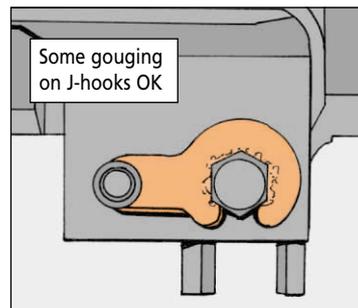


So do the job right the first time and ask your mechanic to torque those bolts.

Mechanics, before you do, make sure you coat the bolt threads with antiseize compound, NSN 8030-00-597-5367. That makes the bolts easier to remove next time.



Also, you may notice a little gouging on the surface of the J-hooks as you torque down the bolts. The J-hooks are made from a lower-grade steel, so gouging is common.

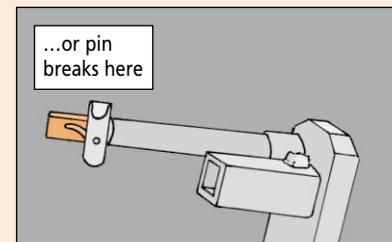
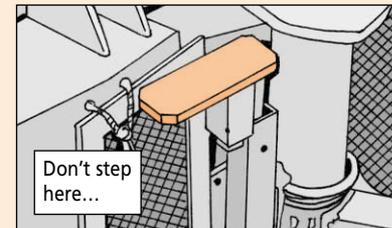


Don't let it stop you from tightening the bolts to the proper torque, though. Replacing a J-hook is a lot cheaper than buying a new grille door or exhaust seal.



A tank loader's seat adjuster is good for only one thing—to adjust the loader's seat.

It may look like a good step when getting in or out of your tank, but guess what? Your weight will strip and break the seat adjuster's pin, NSN 5315-01-285-4536.



So use the seat adjuster for its intended purpose and keep your big feet off!

# Replace Setscrew Right

WHADDYA MEAN THE SETSCREW ON THE BREECH EXTRACTOR IS MISSING? I JUST REPLACED IT YESTERDAY!



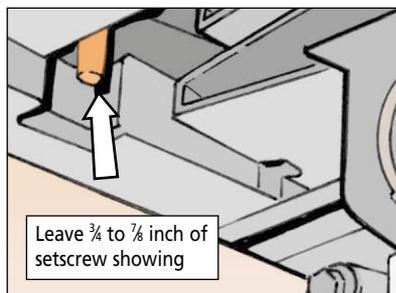
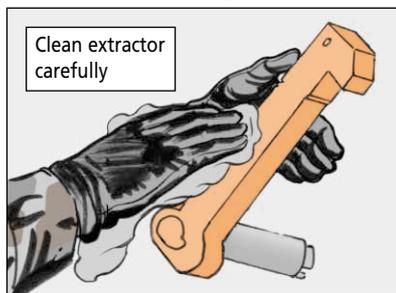
It's no fun to replace a broken or missing setscrew in the breech mechanism of an M1A1 tank's left extractor—especially if you just did it a few days ago.

So make sure you do it right the first time, mechanics.

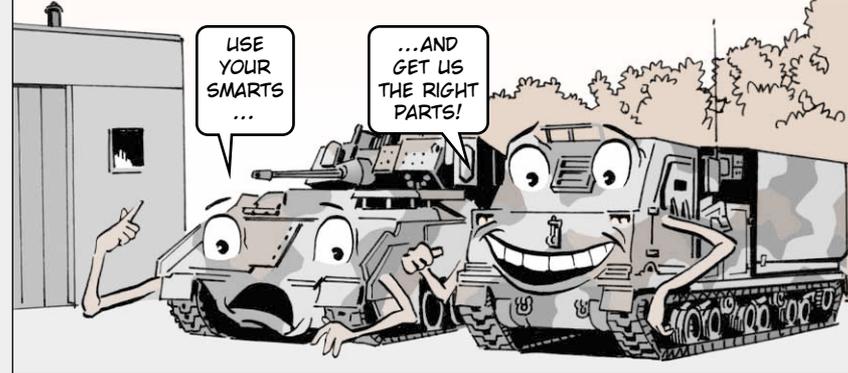
First, clean the extractor with dry cleaning solvent, NSN 6850-00-285-8011, and a clean rag, NSN 7920-00-205-1711. Cleaning gets rid of old sealing compound, carbon and grease that can keep the setscrew from bonding tightly to the extractor. Pay special attention to the threads in the setscrew hole.

Next, coat the threads of the new setscrew, NSN 5305-12-189-0277, with sealing compound, NSN 8030-01-025-1692. If you forget the sealing compound, the setscrew will vibrate loose and fall out.

Finally, screw the setscrew in place. Leave  $\frac{3}{4}$  to  $\frac{7}{8}$  inch of the setscrew showing. If the setscrew's too tight, it'll break. But if it's too loose, it'll fall out.

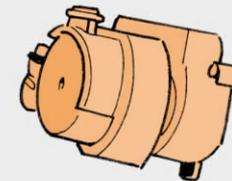


# GET THE RIGHT PARTS



The 300-amp generator assembly, NSN 2920-01-204-4470, for the Bradley and MLRS is no longer stocked. You now have to order the individual parts separately.

Order generator assembly by its component parts



But the parts are not the same from one vehicle to another, so here's what to order for all Bradleys except the M2A3/M3A3.

Item	NSN
Generator (300-amp)	6115-01-458-0096
Regulator	2920-01-438-4767
Pigtail	5995-01-429-8209

The new M2A3/M3A3 Bradleys use a completely different 400-amp generator and also require an electronic control module.

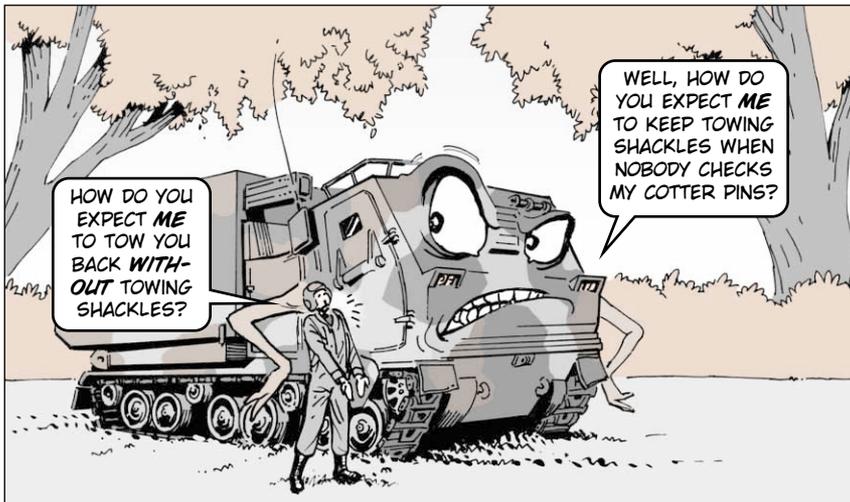
Item	NSN
Generator (400-amp)	6115-01-465-5822
Regulator	2920-01-438-4767
Pigtail	6150-01-468-3235
Electronic control module	5998-01-462-0122

The MLRS cannot use the universal regulator listed for the Bradleys because it puts out too much voltage and can damage the vehicle.

Here's what the MLRS needs:

Item	NSN
Generator (300-amp)	6115-01-458-0096
Regulator / Pigtail	2920-01-226-4601

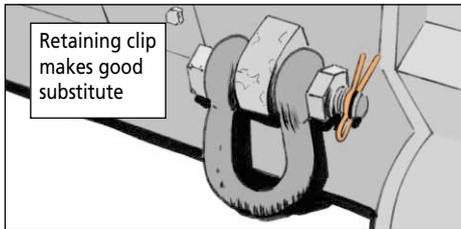
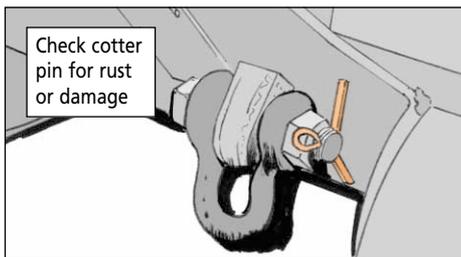
# MAKE SHACKLES STAY PUT



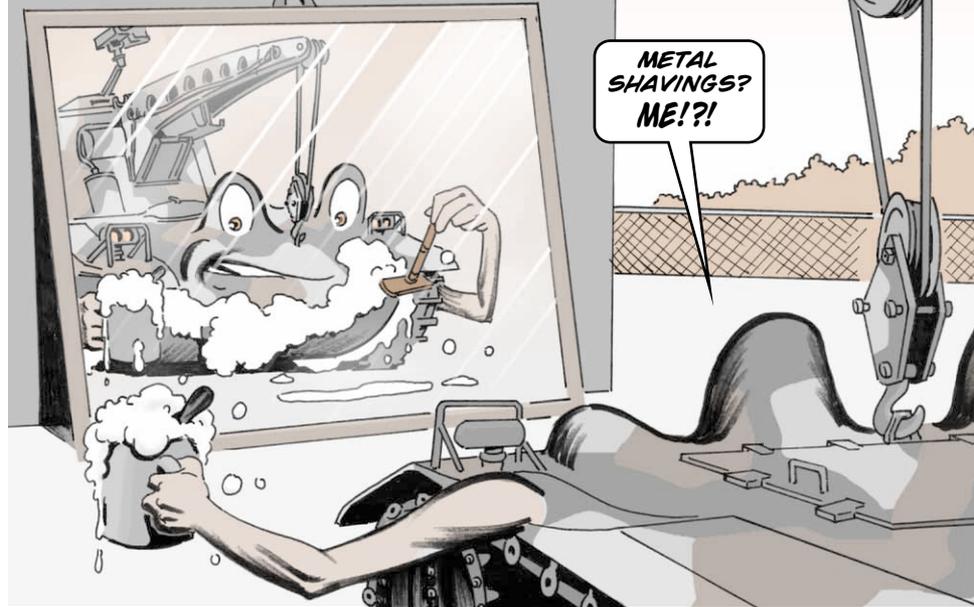
It's tough to tow a disabled MLRS when its towing shackles, NSN 4030-01-187-0964, are missing. But that's exactly what happens if a cotter pin breaks or falls out of a shackle.

So check the cotter pin on both shackles for cracks and rust during your before-operation PMCS. Replace bad or missing cotter pins with NSN 5315-00-050-5632. Order the cotter pins on a DD Form 1348-6 and put "NSN not on AMDF" in the REMARKS block.

You can also substitute a retaining clip, NSN 5315-01-188-4490, in place of the cotter pin. The retaining clip is made of thicker metal, so rust and damage are less of a problem. It's held in place with tension, so it's also more likely to stay put.



# CLOSE SHAVE



So you just got back the first AOAP report after putting a new 8V71T engine in your vehicle. The report shows high wear metal contamination in the sample.

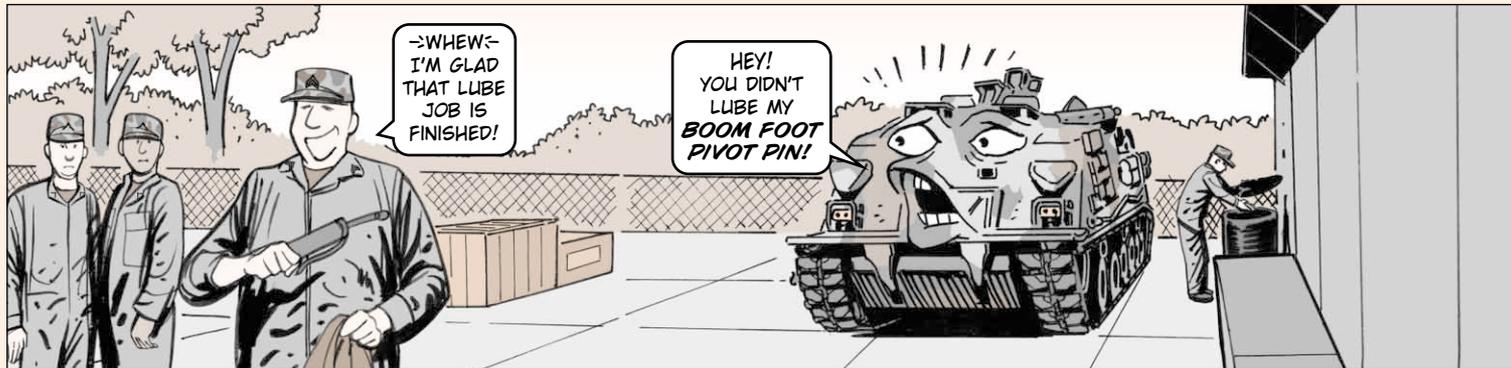
Panic time, right?

Not really. High wear metal content is not unusual for new 8V71T engines during their break-in period. That period lasts through the first two oil changes. Because of the metal wear, each oil change interval should not exceed 150 hours of operation or 6 months duration for the break-in period.

So, if there are no other problems—noise, high temperature, low power—during the break-in period, don't worry about changing the oil more often than 6 months or 150 hours. Continue operating and resample at the next prescribed interval. But make sure you enter the engine's hours of operation on the AOAP form so the laboratory knows it's a new engine.

If you have questions about the AOAP report or the break-in period, contact your local AOAP lab.

# Boom Foot Needs Lube



Appendix J in TM 9-2350-256-20 says to lube your M88A1 recovery vehicle's boom foot pivot pins and boom pivot pins quarterly with GAA. But a lot of pins don't get the lube they need.

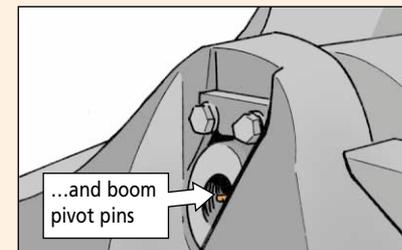
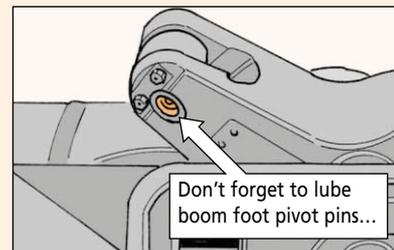
Eventually, unlubed pins rust to the boom foot. You can tell that's happened when the boom pivot pin rotates as you raise or lower the boom.

By then it's too late to lube and you'll have to call in DS for help. They'll pull the pin, inspect the hull trunnion and the boom foot for rust, and remove any rust with steel wool.

Once the boom pin is reinstalled, make sure it's locked in place by the retainer. The pin shouldn't slide in or out of the trunnion.

If you don't get the pin and trunnion fixed, the trunnion will eventually elongate. The boom is shot until it can be repaired at depot level.

Check the gap between the pin and the trunnion wall, too. A gap of .005 to .025 inch is OK. Anything more and you should have your vehicle inspected for depot overhaul. 'course, you can save yourself this extra work and downtime if you just lube all the boom pins when the TM calls for it.



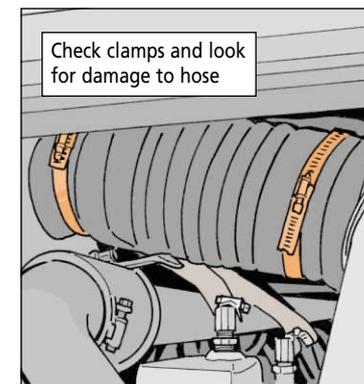
# CLAMP DOWN ON LOOSE HOSE



Dirty air is an engine killer for your M113A2 carrier. That's why your crewmen need to keep a close eye on the engine's air duct hose, NSN 4720-01-060-2550.

Vibration loosens the two clamps, NSN 4730-00-908-6294, that hold the duct hose in place. Then dirty, unfiltered air is pulled in past the clamps and the engine is damaged.

Help keep your carrier breathing easy by checking the clamps for tightness before each operation. Eyeball the hose for cuts, tears or other damage. Report any problems to your mechanic.



# A-20 HEATER WON'T START?



The Stewart-Warner and Hupp personnel heaters have been around so long that most combat vehicle crewmen have the start-up procedures memorized.

You can hold the RUN-OFF-START switch to START for up to 2 minutes for the Stewart-Warner and no longer than 4 minutes for the Hupp. If the heater won't start in that time, you have to let it cool down or risk burning out the ignitor or ignition control resistor.

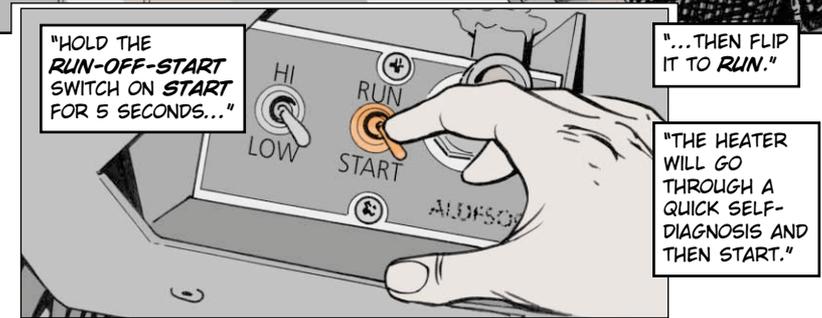
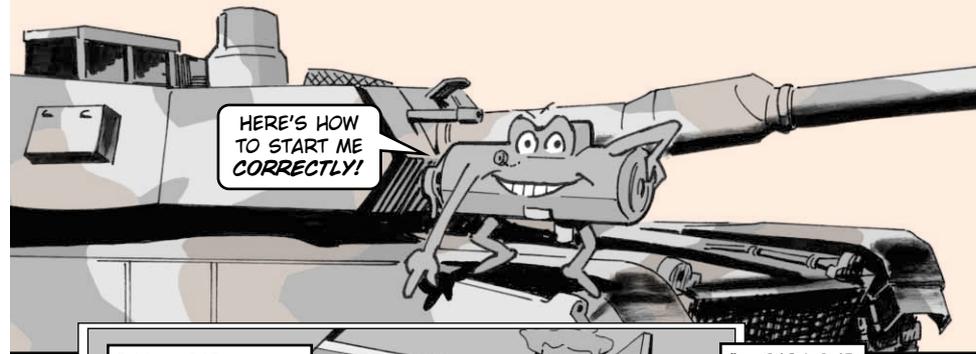
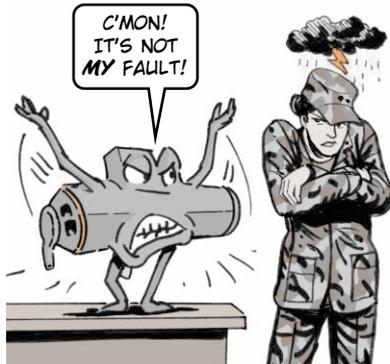
But those start-up procedures will cause no end of trouble if you try to use 'em on the new A-20 Global heater, NSN 2540-01-396-2826.

After holding the switch on START for just 10 seconds, the heater automatically goes into a 4-minute purge mode.

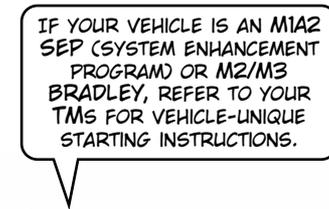
The heater's fuel supply is cut off and all remaining fuel inside the heater is burned off.

Because the heater doesn't start, most operators assume it's defective and turn it in for repair.

But the heater's not the problem! It's the improper start-up procedure that causes all the trouble.



If the heater won't start when you do it the right way, check out the troubleshooting procedures in TM 9-2540-207-14&P. While you're waiting for the new TM to arrive, check it out on-line at <http://www.tacom.army.mil/immc/ltcombat/heater/heater.html>



## A-20 Global Personnel Heater...

# Remove Before Welding

The brains of the A-20 Global personnel heater are its electronic circuit boards. That's why it's so important to **remove** the heater from your vehicle before doing any welding.

If you don't remove it, transient current from the welder travels through the hull of your vehicle to the heater and destroys the circuit boards.

SEE...

# HERE'S THE SCOOP!



STAY UP ON BUCKET PM ...



...WHEN IT COMES TO THE SMALL EMPLACEMENT EXCAVATOR'S FRONT SCOOP LOADER.

## Back to Basics

Use the front bucket **only** for loading and backfilling loose dirt. Never use it to excavate banked or compacted soil. It doesn't have the digging power of a bulldozer or an M9 ACE. Hydraulic system and bucket failure are the sure results if you try to dig.

## Busted Bucket

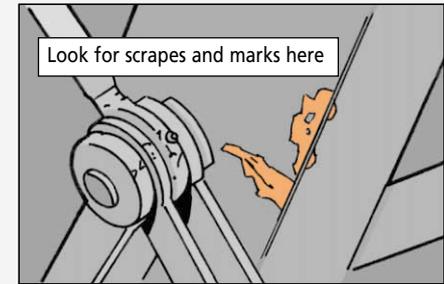
A front loader that sways left and right when loading probably has a bent connecting link. The connecting links connect the hydraulic cylinder to the bucket and get damaged from digging in rocky or compacted soil.

So get down on your hands and knees and grab the upper connecting link to see if it moves left or right—away from the loader's swing arm. If you spot any movement, report it to your mechanic.



CAN YOU MOVE THE UPPER CONNECTING LINK?

Other clues to a bent connecting link are dents or scrape marks on the loader's swing arm next to the link's bushing pin. Any marks mean a connecting link is bent. If links are bent, the bushing pin hits the swing arm when the front loader's bucket is retracted or elevated during construction operation. Report any marks or scrapes to your mechanic.



Look for scrapes and marks here

## Use Travel Locks

Before traveling long distances, make sure you install the loader's travel locks.

They hold the bucket boom arms in place about a foot above the ground. That way the bucket's weight won't ride on the hydraulic cylinders—which can blow seals or hydraulic lines—and the bucket won't hit the ground if the cylinders let it drop.

The locks also keep the bucket teeth pointed up and out of the way of ground obstacles. Pages 2-87 and 2-88 in TM 5-2420-224-10 show how to install and remove the travel lock's spring clips.



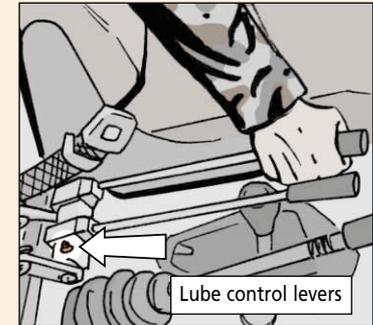
WHEN YOU'VE GOT A WAYS TO TRAVEL, DON'T FORGET TO INSTALL TRAVEL LOCKS.

# Control Levers Need Lube

**C**ontrol levers for the front loader's boom and bucket get a continuous workout during operation. When a lever gets hard to pull or push, it's because its linkage needs lube.

The grease fitting for both levers is next to your right hand when you're sitting in the driver's seat. It gets skipped over simply because it's inside the cab.

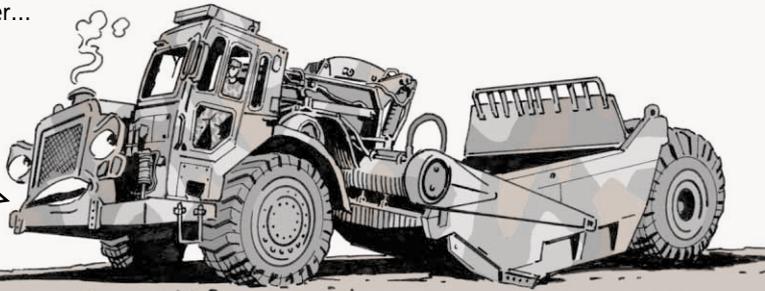
To put some ease back into operating those levers, be sure to lube them during scheduled services.



Lube control levers

621B Scrapper...

HEY, BUB! YOU FORGOT TO LUBE MY FAN FITTINGS!



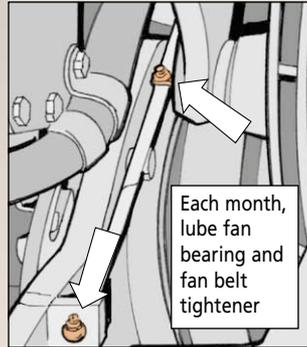
## Don't Scrape By on Lube

**T**wo grease fittings that often get missed during scrapper services are the ones that lube the fan bearing and fan belt tightener. Both fittings are hard to find unless you reach in—behind the engine's fan blades—and find them.

Without lube, the fan clutch pulley's bearing can seize up. Then the blades stop turning freely, causing the engine and transmission to overheat.

The fan belt tightener puts the right amount of tension on your scrapper's fan belts. Without lube, its bearing will also seize up. That means the fan belts come loose. They'll slide or get ripped off the pulley—causing the engine and transmission to overheat. Your construction operations come to a screeching halt.

These two fittings are next to each other. Lube each fitting every month or 250 service hours.



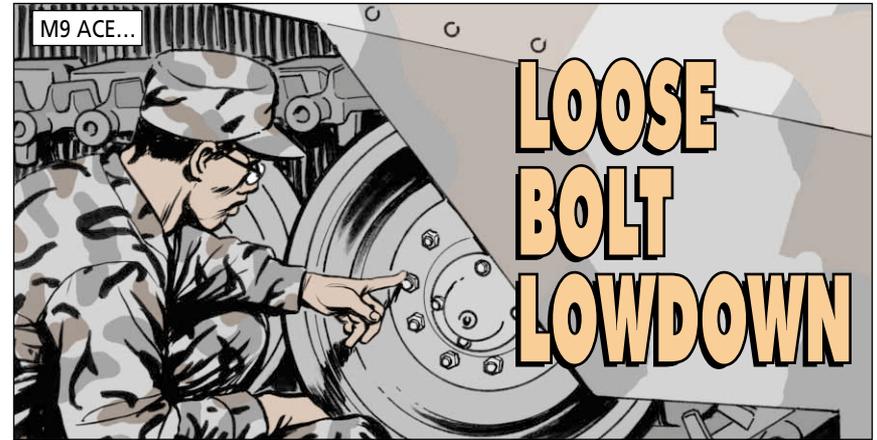
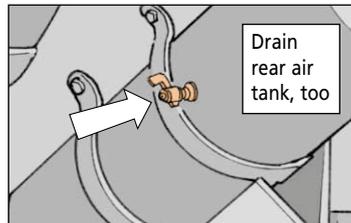
## Drain Rear Air Tank, Too!

**A**fter the day's run, operators, you know to open the manual drain cocks on the 621B scrapper's front air tanks near the cab step (curbside).

Opening those drain cocks allows condensation to drain out of the scrapper's air brake system. Condensation leads to corrosion and causes slow stops and brake failure.

So don't forget to also open the drain cock on the rear air tank, behind the scrapper's bowl. Because of its location, this tank is usually missed.

Finish the job by making sure all drain cocks are closed. Otherwise your scrapper can't build up the air pressure it needs to release its brakes.



**O**ne loose bolt on an earthmover's roadwheels could leave you with no visible means of transport.

That one loose bolt puts more stress on the other bolts and that can make them loose, too. Then the wheel begins to wobble, wallowing out the stud holes and ruining the roadwheel.

Enough wobble and wallow and the wheel breaks off.

So before you head out, kneel down and rub your finger against the washers behind the roadwheel nuts. A washer that moves freely is an indication the nut is working itself loose.

Tighten bolts if you can and report 'em whether you can or not.

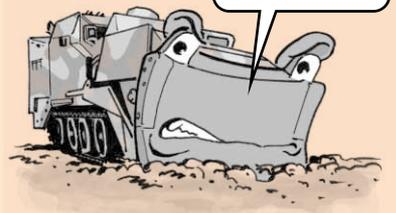


## NO STEERING WHEN DOZING!

**R**ead and heed the words on Page 2-69 of TM 5-2350-262-10, operators. **Never** steer the ACE during dozing operations! Turning the wheel while dozing puts so much stress on the track that it can be thrown. Thrown track can crack road wheels, bend road arms and rip actuators from the hull.

And during other operations, forget sharp turns. You can throw a track that way, too.

FOLLOW THE WORD IN TM 5-2350-262-10! **NEVER** STEER DURING DOZING OPERATIONS!



# Take Off the Tape

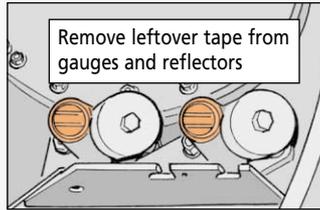
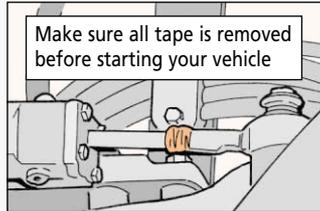
Your construction equipment came back from the paint shop and it looks great, just like a new vehicle.

You're ready to get behind the wheel and go. But before you do, walk around the vehicle and look at the areas that were covered by tape in the paint booth...especially the cylinder rods.

Any tape left on a cylinder rod will scrape or cut the rod's seals when the rod is extended or retracted. A damaged seal leads to fluid leaks, which lead to NMC equipment.

If you see any tape on the rods, take it off.

Walk around the vehicle a few more times and look for tape and paint on gauges, tail light covers, grease fittings and reflectors, too.



## AN/PSS-12 Mine Detector...

# KEEP YOUR HEAD

Dear Editor,

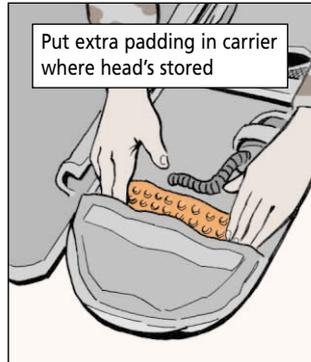
Our unit was having trouble with the head of the AN/PSS-12 mine detector getting broken in the field—even while it was stowed in its carrier. Once the head's broken, the detector's useless.

So we made a change that helped save our heads:

We put padding in the part of the carrier that holds the head. Bubble wrap, sponge foam, or styrofoam work fine and so does a sponge—anything that will give the head a cushion against bumps.

SPC Richard Massey  
41st Engr Bn  
Ft Drum, NY

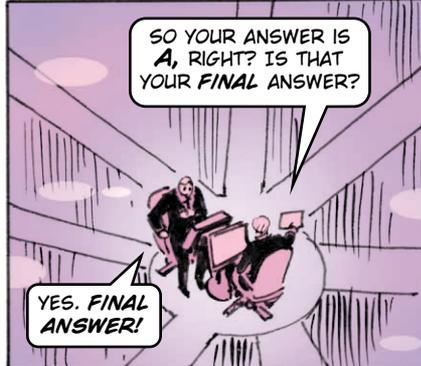
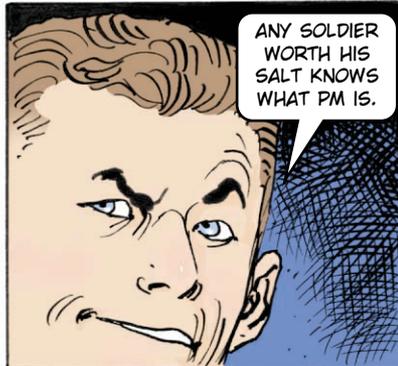
*(Editor's note: Thanks. It's also a good idea to ask operators to attach the detector carrier vertically to the top of their packs so that it won't catch on trees. They should also be careful not to damage the head when they remove their packs or rest while wearing them.)*





**WHAT DOES PM STAND FOR?**

A. PREVENTIVE MAINTENANCE  
 B. POORLY MADE  
 C. PART-TIME MAINTENANCE  
 D. MAINTENANCE DONE ONLY AFTER LUNCH



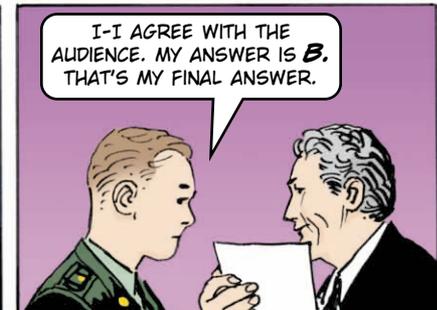
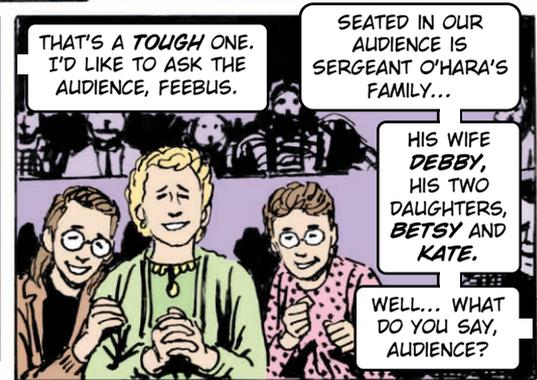
YOU'RE **RIGHT!** YOU'VE JUST WON A **THOUSAND DOLLARS!**

A. PREVENTIVE MAINTENANCE	B. POORLY MADE
C. PART-TIME MAINTENANCE	D. MAINTENANCE DONE ONLY AFTER LUNCH



**WHAT MAKES A TRUCK SLOBBER?**

A. POOR UPBRINGING  
 B. IDLING TOO LONG  
 C. IDLING AT TOO HIGH A SPEED  
 D. BAD FUEL



**B IS THE RIGHT ANSWER!** YOU'VE JUST WON **FIVE THOUSAND DOLLARS!**

A. POOR UPBRINGING	B. IDLING TOO LONG
C. IDLING AT TOO HIGH A SPEED	D. BAD FUEL



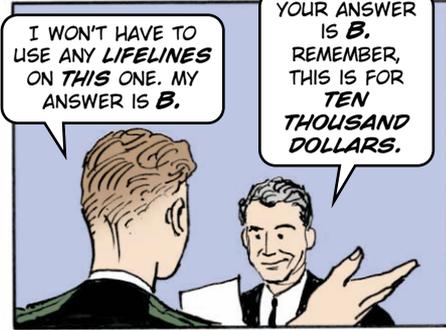
NOW WE'RE MOVING UP, SERGEANT. YOUR NEXT QUESTION IS WORTH TEN THOUSAND DOLLARS.



"WHAT SHOULD YOU DO IF YOUR WEAPON HAS A FEW SHINY SPOTS?"

"HMM... SHINY SPOTS ON MY WEAPON?"

- WHAT SHOULD YOU DO IF YOUR WEAPON HAS A FEW SHINY SPOTS?**
- A. SEND IT TO THE DEPOT FOR REPAIRS
  - B. COVER SHINY SPOTS WITH SOLID FILM LUBE
  - C. COVER SPOTS WITH BLACK SHOE POLISH
  - D. MAKE THE REST OF THE RECEIVER JUST AS SHINY



I WON'T HAVE TO USE ANY LIFELINES ON THIS ONE. MY ANSWER IS B.

YOUR ANSWER IS B, REMEMBER, THIS IS FOR TEN THOUSAND DOLLARS.



ARE YOU SURE? IS THAT YOUR FINAL ANSWER?



Y-YES FEEBUS...

THAT'S MY FINAL ANSWER.

**B IS CORRECT! YOU'VE JUST WON TEN THOUSAND DOLLARS!**

- |                                       |  |
|---------------------------------------|--|
| A. SEND IT TO THE DEPOT FOR REPAIRS   | B. COVER SHINY SPOTS WITH SOLID FILM LUBE      |
| C. COVER SPOTS WITH BLACK SHOE POLISH | D. MAKE THE REST OF THE RECEIVER JUST AS SHINY |

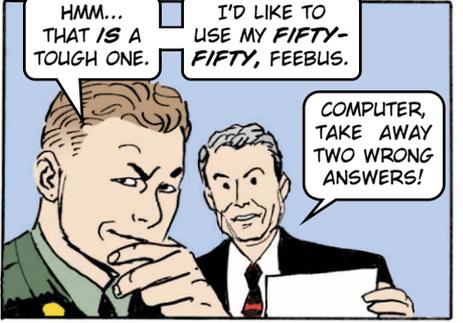


NOW WE'RE GETTING INTO SOME REAL MONEY, SERGEANT. YOUR NEXT QUESTION IS WORTH A HUNDRED THOUSAND DOLLARS.



"WHAT IS THE MOST COMMON REASON A M-40 MASK LEAKS?"

- WHAT IS THE MOST COMMON REASON A M-40 MASK LEAKS?**
- A. NOSECUP VALVE DISC MISSING
  - B. SIDE VOICEMITTER INSTALLED WITH FOUR BUMPS FACING IN
  - C. HARNESS PUT ON BACKWARD
  - D. OUTSERTS LEFT ON



HMM... THAT IS A TOUGH ONE.

I'D LIKE TO USE MY FIFTY-FIFTY, FEEBUS.

COMPUTER, TAKE AWAY TWO WRONG ANSWERS!

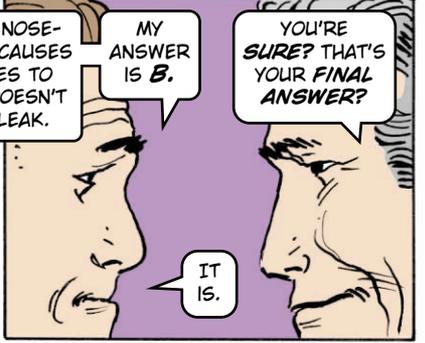


THAT LEAVES A AND B, SERGEANT. WHAT'S YOUR ANSWER?

A MISSING NOSECUP VALVE CAUSES THE LENSES TO FOG, BUT DOESN'T CAUSE A LEAK.

MY ANSWER IS B.

YOU'RE SURE? THAT'S YOUR FINAL ANSWER?



IT IS.

**YOU MADE IT, SERGEANT. YOU'VE JUST WON A HUNDRED THOUSAND DOLLARS!**

- |                               |   |
|-------------------------------|---|
| A. NOSECUP VALVE DISC MISSING | B. SIDE VOICEMITTER INSTALLED WITH FOUR BUMPS FACING IN |
|-------------------------------|---|



YOUR NEXT QUESTION PAYS FIVE HUNDRED THOUSAND DOLLARS.

I-I'M READY, FEEBUS.

"OKAY, WHICH GUN NEEDS TO BE HEADSPACED AND TIMED EVERYTIME YOU USE IT?"



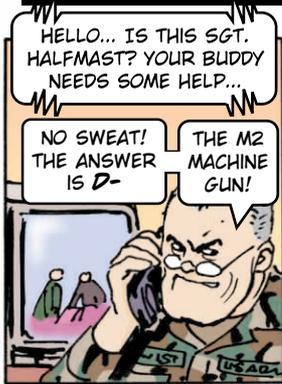
**WHICH GUN NEEDS TO BE HEADSPACED AND TIMED EVERYTIME YOU USE IT?**

- A. M16 RIFLE
- B. MK 19 MACHINE GUN
- C. M240 MACHINE GUN
- D. M2 MACHINE GUN

I-I'D LIKE TO USE MY LAST LIFELINE TO ANSWER THIS ONE, FEEBUS.

I WANT TO CALL MASTER SERGEANT HALF-MAST.

OKAY... DSN, GET SERGEANT HALF-MAST.



HELLO... IS THIS SGT. HALFMAST? YOUR BUDDY NEEDS SOME HELP...

NO SWEAT! THE ANSWER IS D-

THE M2 MACHINE GUN!



HALF-MAST SAYS THE ANSWER IS D.

IS THAT YOUR ANSWER? YOUR FINAL ANSWER?



Y-YES...IT IS.

OKAY. LET'S ALL SEE THE ANSWER.

HALF-MAST IS RIGHT! YOU'VE JUST WON FIVE HUNDRED THOUSAND DOLLARS!

A. M16 RIFLE

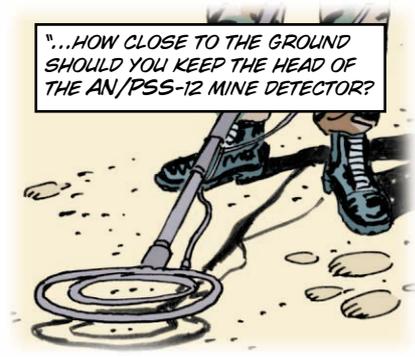
B. MK 19 MACHINE GUN

C. M240 MACHINE GUN

D. M2 MACHINE GUN



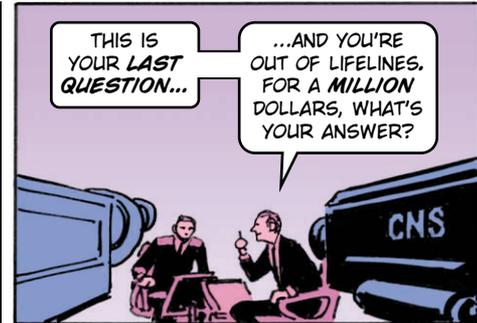
THIS IS IT, SERGEANT. YOUR QUESTION FOR A MILLION DOLLARS...



"...HOW CLOSE TO THE GROUND SHOULD YOU KEEP THE HEAD OF THE AN/PSS-12 MINE DETECTOR?"

**HOW CLOSE TO THE GROUND SHOULD YOU KEEP THE HEAD OF THE AN/PSS-12 MINE DETECTOR? NO HIGHER THAN:**

- A. 1 INCH
- B. 2 INCHES
- C. 6 INCHES
- D. 12 INCHES

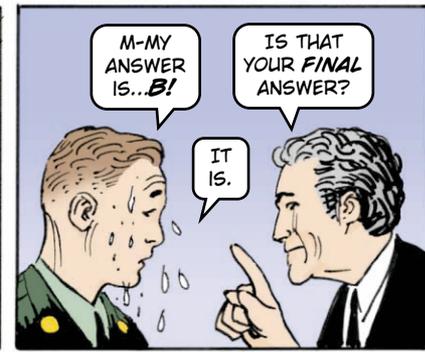


THIS IS YOUR LAST QUESTION...

...AND YOU'RE OUT OF LIFELINES. FOR A MILLION DOLLARS, WHAT'S YOUR ANSWER?



ANY HIGHER THAN 2 INCHES AND YOU COULD MISS A MINE.



M-MY ANSWER IS...B!

IS THAT YOUR FINAL ANSWER?

IT IS.

**B IS THE CORRECT ANSWER!**

A. 1 INCH

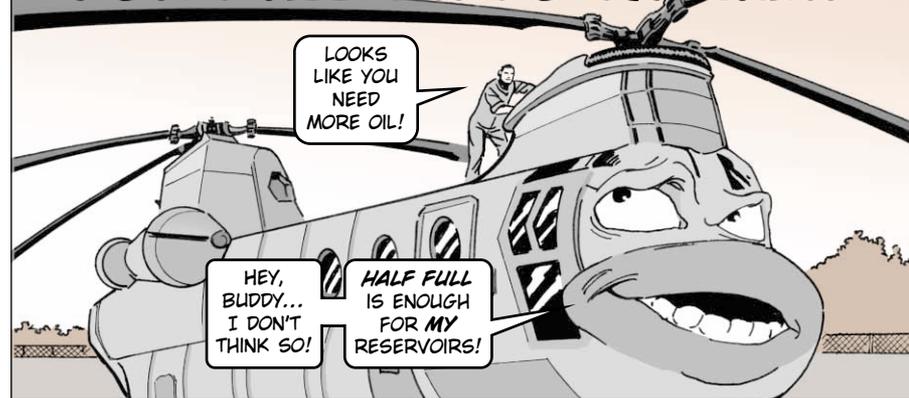
B. 2 INCHES

C. 6 INCHES

D. 12 INCHES



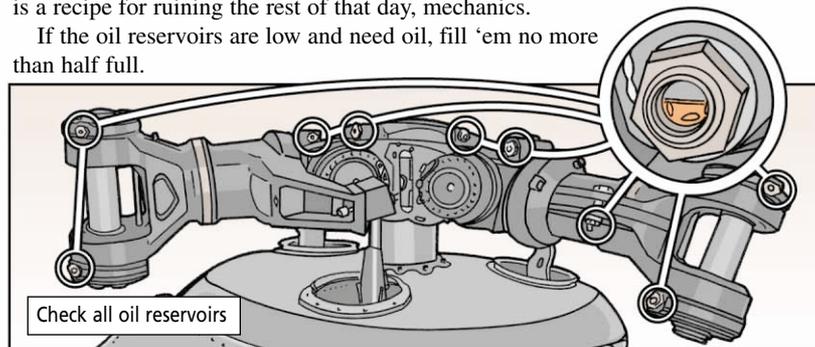
# DON'T FILL 'EM TO THE BRIM



Filling a morning coffee cup to the brim is most mechanics' recipe for a perfect start to the day.

But filling the forward and aft rotor head oil reservoirs to the brim on a Chinook is a recipe for ruining the rest of that day, mechanics.

If the oil reservoirs are low and need oil, fill 'em no more than half full.



When aircraft broil in the summer heat on the flight line, oil heats up and expands. If it has no place to expand, it will blow out rotor head seals. Then oil gets on the rotor blades and on top of your aircraft. That makes the aircraft dangerously slippery for anyone walking or working there.

When you service the oil reservoirs on the hub oil tank, the pitch bearing oil tank, or the vertical hinge pin oil tank, rotate the blades. That levels off the oil in the sight indicators so you can get a correct reading before you start filling reservoirs. Then fill the reservoirs until the level reaches only halfway on the sight glass. That's the word in Tasks 1-55 to 1-57 of TM 55-1520- 240-23.

AH-64A...



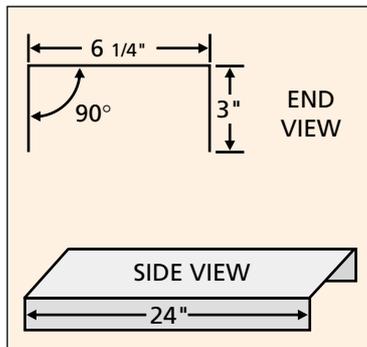
## PROTECT RADIO CONSOLE

Your Apache's radio console takes a beating when you take out the heavy crew seats. It also gets dinged during other maintenance inside the cockpit.

Once you bend or break knobs, switches and dials, you've ended your communicating.

So protect the console. Get your sheet metal shop to make a cover from .040-in aluminum sheet.

Use these dimensions:



Make sure all edges are smooth before you use the cover. And paint it red so you won't forget to remove it when your work is done.

Make sure the cover does not rest on any knobs, dials or switches when you install it. Keep your feet off the cover too—it's not a foot rest.

Drill a small hole in one corner of the cover and attach a "Remove Before Flight" streamer.

OCT 01

UH-60, AH-64A...

## Spitting Oil and Blowing Smoke?



You might think, crewmen, that spitting oil and blowing smoke from a re-installed engine means pulling it again to have AVIM replace a bad seal. But, the problem may be that you tilted the engine when you removed it for AVIM repair or when you re-installed it after repair.

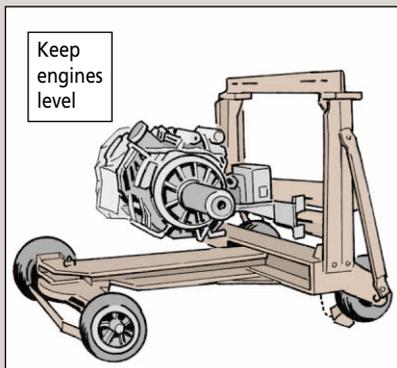
When you remove and install an engine or maneuver it around on a maintenance stand, sometimes the engine gets tilted.

When that happens, oil seeps from the A-sump through internal seals and puddles in the bottom of the swirl frame. Some of that oil gets blown through the inlet particle separator, or leaks through the stage 4 bleed tubes of the compressor stator split line.

You won't be aware of those leaks until the engine is back on the aircraft spitting oil and blowing smoke.

So it's steady as you go when removing and installing an engine or maneuvering one on a maintenance stand. Just like with pinball games, tilting means you lose. Tilt an engine and you'll have an oily mess to clean up.

If you see smoke in the exhaust, clean the engine and continue to operate it to burn off the oil like it says in Troubleshooting Procedure 59 of TM 1-2840-248-23.

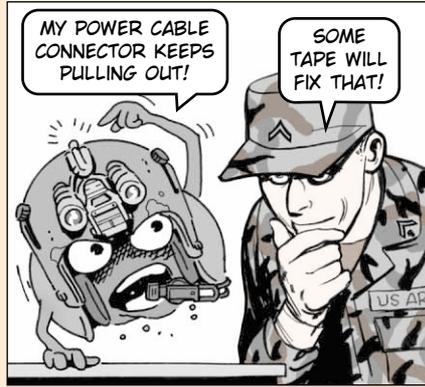
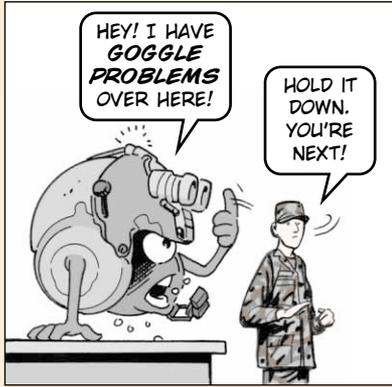


PS 587

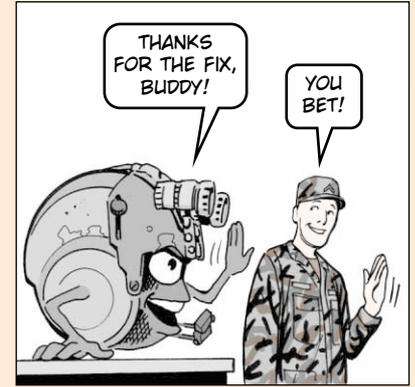
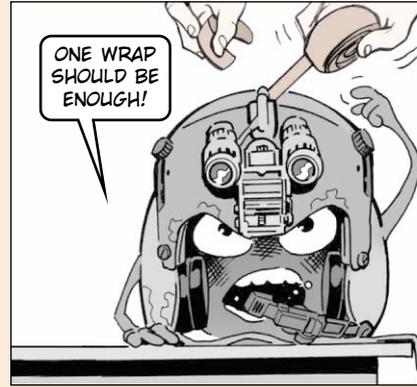
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OCT 01

# TAPE CONNECTOR

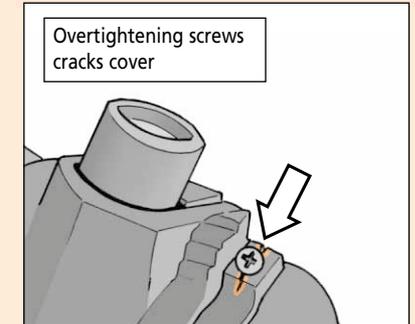
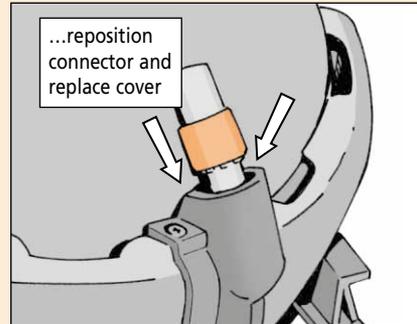
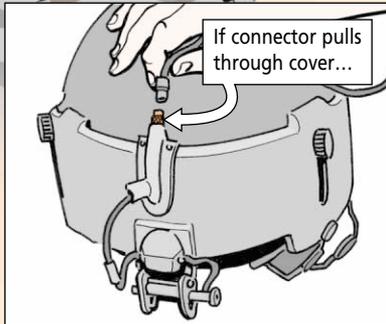
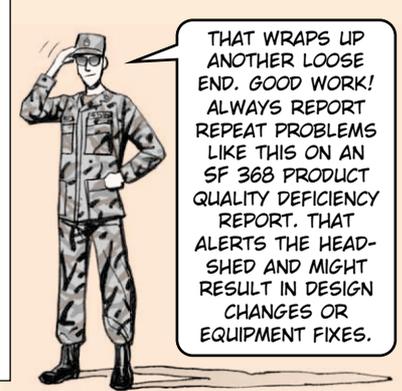


# FOR A SNUG FIT

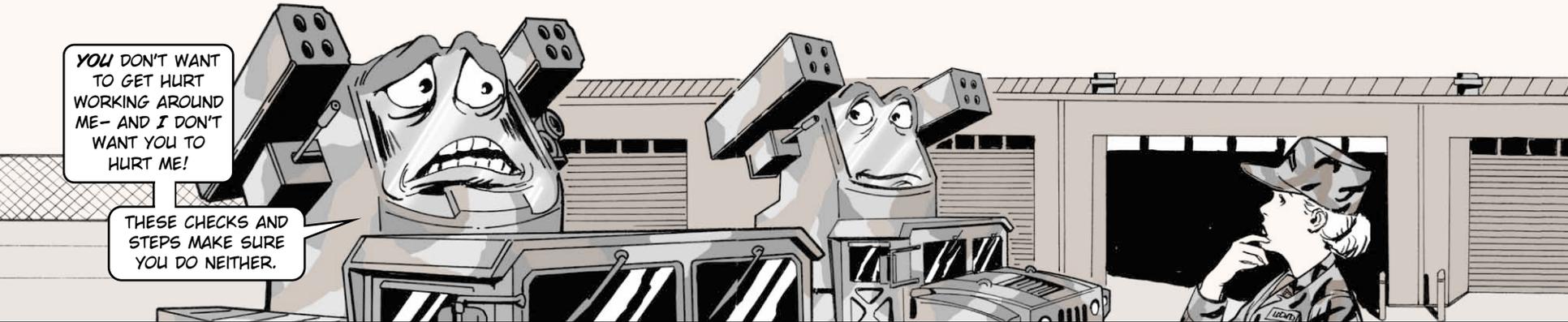


Dear Windy,  
 Our pilots have a problem with the AN/AVS-6(V)1/2 night vision goggles' power pack cable. If the fairlead block on the HGU-56/P helmet is worn, the goggle's power cable may not fit snugly into its connector.  
 That shaky connection is a safety hazard because it could result in loss of night vision or intermittent operation. That's dangerous.  
 The loose fit also creates a second problem. Pilots try to secure the connector by overtightening the access cover screws. That cracks the cover and makes the loose connection looser.

Our ALSE shop has come up with a temporary fix for worn blocks and cracked covers. Until the new blocks, NSN 5340-01-397-0321, come in, we put one wrap of doubled-sided pressure-sensitive tape, NSN 7510-00-634-1549, around the slotted and grooved section of the connector. This shim keeps the connector tight and in place.  
 SSG Jesus Rodriguez  
 HHC, 2/82 Avn Bn  
 Ft Bragg, NC



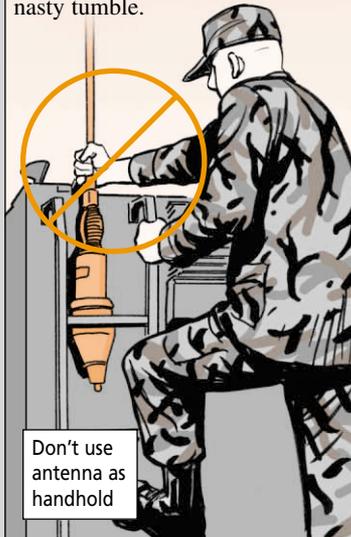
# PROTECT YOURSELF AND YOUR AVENGER



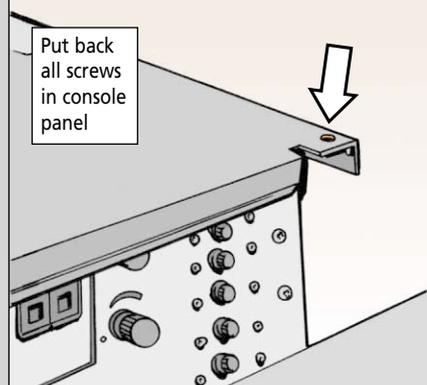
❏ **Store your M16 rifle inside the HMMWV, not inside the Avenger turret.** If you store your rifle upright beside the Avenger gunner's seat, it punches a hole in the gyro housing when the missile pods are lowered. So store it in the brackets inside the truck cab. That's what the brackets are for.



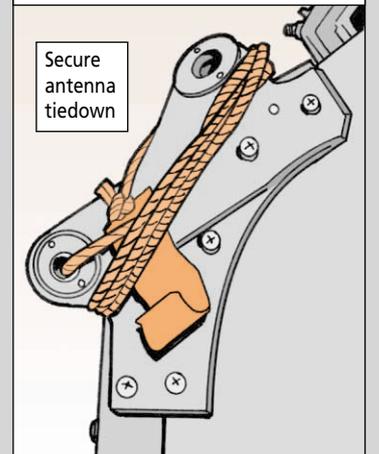
❏ **Don't use the antenna as a handhold when you climb the ladder.** The antenna can't take your weight. If it gives, you can take a nasty tumble.



❏ **When you remove the radio, put all screws back in the console cover.** Without **all** of the screws in place, the cover flaps around and tears up the area around the remaining screws. If the cover slides forward, it can cause the Avenger canopy to bow. It costs more than \$10,000 to replace the canopy. It costs much less to replace missing screws, NSN 5305-00-925-9716.

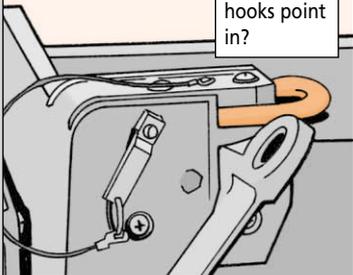


❏ **When you untie the antenna, secure its tiedown.** If the tiedown dangles, its metal hooks will bang against the turret and the truck cab during travel. So wrap the tiedown around the projections that the rope is connected to.

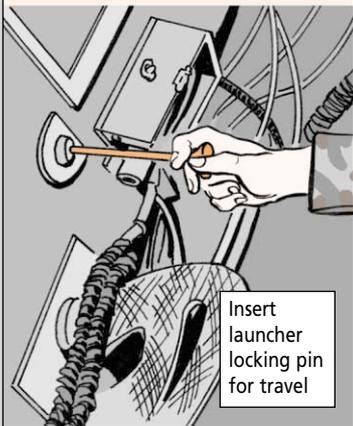


❑ After slingloading the Avenger, make sure the slingload hooks point in, not out. If the hooks are pointing out, they will tear out the top corner of the turret when the missile pods are raised.

Sling load hooks point in?

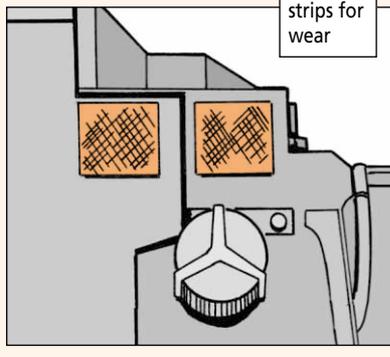
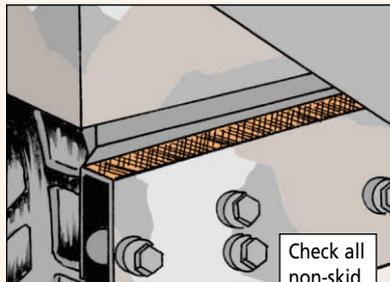


❑ Before travel, insert the launcher locking pin and the turret floor pin and set the azimuth motor brake. If you forget, the turret spins around on its own during travel. The turret body is banged around and damaged and someone could be injured.

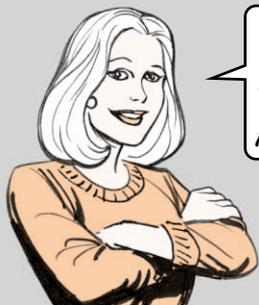


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❑ Inspect the non-skid strips on the ladder, bumper, and the environmental control unit (ECU). If the non-skid strips are worn or gone, climbing up and down the Avenger is dangerous, especially in icy or rainy weather. Order new strips with NSN 7220-00-823-7419, which brings 60 feet of the strips. The strips are coded for local purchase, so if you can't find them locally, order them with an advice code of 2A.



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NOW YOU AND YOUR AVENGER WILL BE ON BETTER FOOTING!

PS END

Patriot Missile System...

## NSNS HAVE CHANGED

### Air Filters

New NSN 4130-01-469-	End Item	TM reference
7202	launcher	9-1440-600-24P (Item 3 in Fig 10)
7689	launcher	9-1440-600-24P (Item 16 in Fig 4)
7695	radar set	9-1430-601-24P-2 (Item 211 in Fig 161) and 9-1430-1601-24P (Item 225 in Fig 256)
7699	radar set	9-1430-601-24P-2 (Item 29 in Fig 10 and Item 27 in Fig 5) and 9-1430-1601-24P (Item 29 in Fig 19 and Item 27 in Fig 23)
7682	ECS	9-1430-600-24P (Item 6 in Fig 21 and Item 6 in Fig 23)
	ICC	9-1430-602-24P (Item 6 in Fig 23 and Item 6 in Fig 21)
	CRG	9-1430-604-24P (Item 6 in Fig 23A)
7678	ECS	9-1430-600-24P (Item 5 in Fig 16 and Item 5 in Fig 22A)
	ICC	9-1430-602-24P (Item 5 in Fig 16 and Item 5 in Fig 15A)

### Generator Radiator

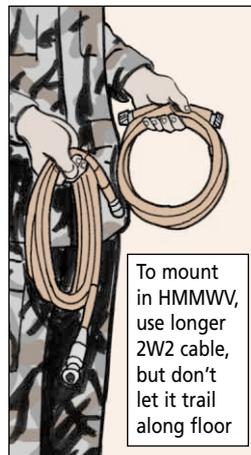
For the 15-KW TQG generator's radiator, use NSN 2930-01-470-0217. That replaces NSN 2930-01-368-1071.

PATRIOT REPAIRMEN, MAKE A NOTE OF THESE NEW NSNS FOR PATRIOT AIR FILTERS AND THE 15-KW GENERATOR'S RADIATOR.



TOW 2 Missile System...

## Careful with 2W2



The 2W2 power cable to the TOW 2 missile system's night sight is real touchy. If you don't handle it just right, it will snap right off—and sometimes take the J1 connector with it. Then your night vision is gone.

First thing to remember is that you never jerk on the 2W2 cable. To disconnect it, you must first unlock its retaining ring.

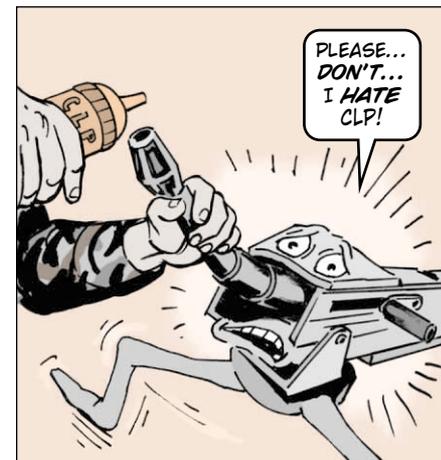
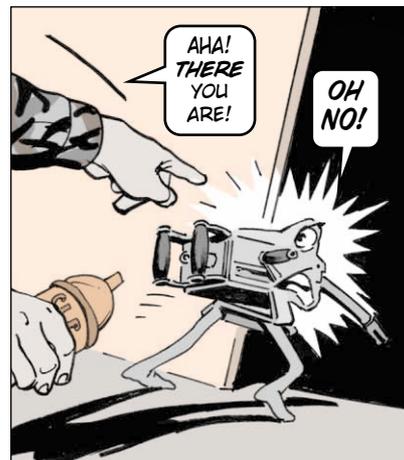
If you're mounting the TOW on a HMMWV, use the longer 2W2 cable. The shorter 2W2 cable is too short. It will snap off the first time you traverse the TOW.

But don't let the longer 2W2 cable trail along the HMMWV's floor. One misplaced boot can snap the cable right off. Use enough cable to give the TOW plenty of slack for traversing, but not so much slack that it lies on the floor.

# Lubing Power



# for Your MK 19

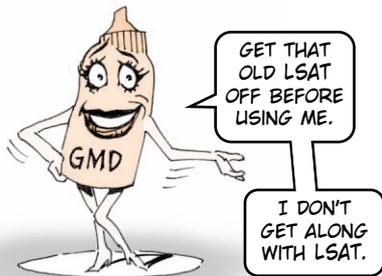


The MK 19 machine gun is far different from other machine guns when it comes to lubing. It requires something that withstands heat better than CLP, which gums up the MK 19's moving parts instead of helping the parts move smoothly.

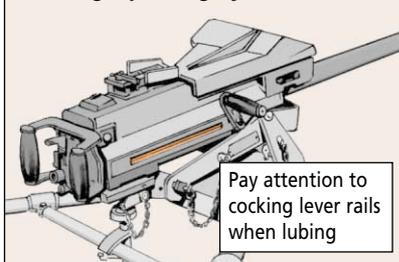
The best MK 19 lube is LSAT. Use NSN 9150-00-949-0323 for 8 ounces and NSN 9150-01-109-7793 for 1 pound. But it's hard to get. GMD (grease, molybdenum disulfide) is a good substitute and is in stock. It comes in three sizes:

GMD	NSN 9150-00-
14-oz	935-4018
6 ½-lb	223-4004
35-lb	965-2003

Remember that when you switch lubes, you need to completely wipe off the old lube before wiping on the new one. Mixing lubricants weakens them.

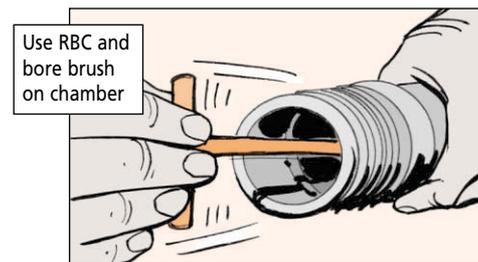


Give extra lubing attention to the feed pawls, the cocking lever rails, the pivot posts on the primary drive lever, and the bolt assembly. You'll have trouble firing if you forget just one of them.

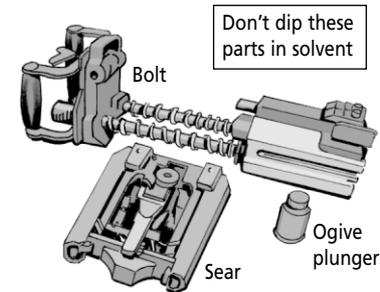


## Cleaning

The chamber is the worst carbon collector. If carbon is not cleaned out of the chamber, the chamber eventually becomes pitted and the receiver must be replaced. To clean the chamber, soak your bore brush in RBC and run it through the muzzle into the chamber. Do this again and again until the brush stops pulling out carbon.



Armorers, you're authorized to use dry cleaning solvent on the MK 19 for cleaning off carbon. But never dip the bolt, ogive plunger, or sear in solvent. They have sealed components with grease inside. Instead, clean these parts with a rag or brush dipped in solvent.



# Engine Pulling Help

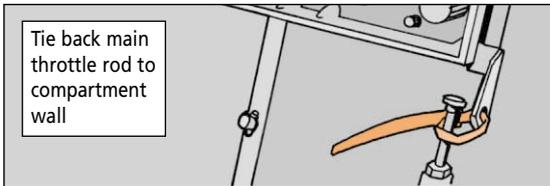
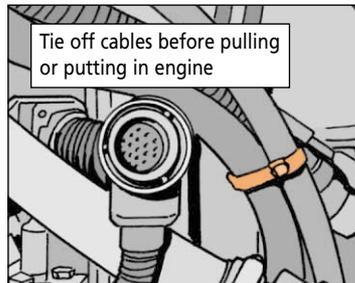
**HOLD IT!**  
TIE BACK MY CABLES BEFORE YOU PULL MY ENGINE!

When you pull or put in the Fox's engine, there are a few things you mechanics can do to prevent expensive damage:

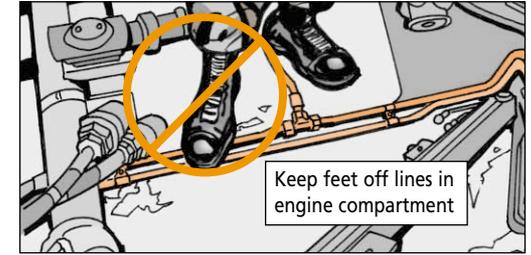
>> Make sure you carefully review the procedures in TM 9-6665-377-20's maintenance instructions module (MIM) 2-001, which gives detailed instructions on removing and installing the engine.

>> Tie back all engine cables, particularly the main power cable and the auxiliary power cables, before you hoist the engine. Connect the cables going to the engine to the dummy receptacles inside the engine compartment. Cables left dangling can catch on the hull and get ripped out. Hoist the engine slowly out of the compartment so that you can stop quickly if cables do catch on anything.

>> Also tie back the throttle rod to the engine compartment wall. The rod has a hole in the end you can run the cord through.



>> When you work inside the engine compartment while the engine's removed, watch your feet. If you step on hydraulic, fuel, or fire extinguisher lines, they can break and leak or they can be crimped. Either way, the lines must be replaced.



# SPECTACULAR SPECTROMETER HELP

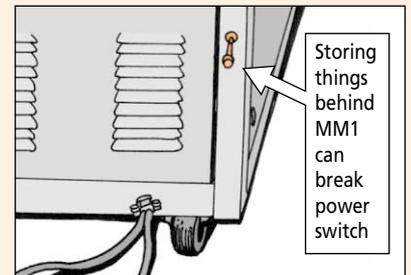
THANKS TO THE ATTENTION PAID TO MY SPECTROMETER, I CAN SNIFF OUT CHEMICAL THREATS!

SNIFF  
SNIFF

Remembering two points can make a spectacular difference in how your Fox's MM1 spectrometer performs.

Point No. 1: Never do more than two auto-calibrations in a 24-hour period. If the MM1 doesn't respond correctly after two auto-calibrations, it's time to call your repairman. Something's wrong.

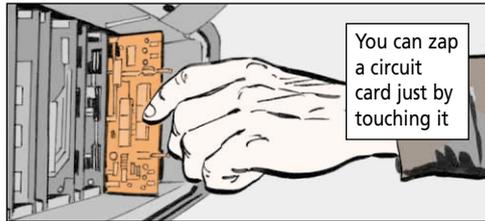
Point No. 2: Don't store things behind the MM1. That can break off the MM1 power switch and put it out of business until the switch is replaced.



# HOW TO DEFEAT TOO MUCH STATIC



Electrostatic discharge (ESD) destroys or degrades your commo by damaging circuit cards, transistors, resistors and integrated circuits. ESD can strike during packing, shipping, handling or installation of circuit cards.



## What Causes ESD?

ESD comes from electrically charged objects in your work area: clothing, rugs, chairs, paper, ordinary packaging materials, or the work surface itself.

But the main source of ESD is you! You build up thousands of volts of static electricity just by walking across the floor or combing your hair. Then, just by touching a circuit card, you'll discharge static electricity, often without realizing it.



A spark as little as 30 volts can ruin a sensitive electronic device. You may not feel the discharge or see the damage, but you can bet it's happened. The circuit card may fail now, or be weakened enough to cause intermittent current problems or even complete failure at a later time—just when you least expect it.

## Static-safe Workstations

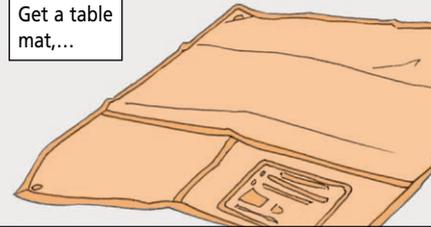
So, protect your circuit cards from ESD. Handle them only at static-safe workstations that include a grounded static-dissipative table mat, floor mat and wrist strap. They're designed to limit static buildup and carry already-existing charges to ground.

HERE'S WHAT'S AVAILABLE!

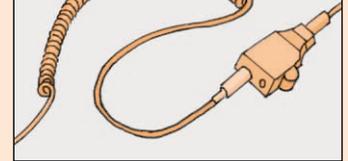


NSN 4940-01-250-4236 will bring you a static dissipative table mat, common point ground system, and an adjustable wrist strap cuff to use in all areas other than clean rooms. It also includes a small/medium and large/extra large wrist cuff.

Get a table mat,...



...a common point ground system...



...and a wrist strap cuff

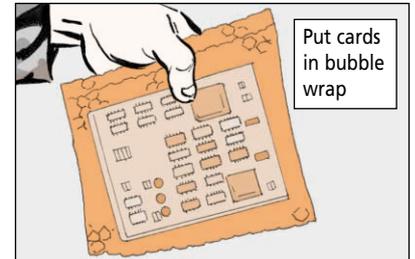


NSN 4940-01-253-5368 BRINGS A FIELD SERVICE KIT WHICH HAS THREE POUCHES, THREE BARRIER BAGS, TWO WRIST STRAPS, ONE GROUNDING CORD AND A WORK SURFACE MAT.



If you're going to be packaging ESD-sensitive (ESDS) circuit cards, here are a couple of ways to protect them:

First, wrap the cards in anti-static bubble wrap, NSN 8135-01-234-6649. Then make a bag from static shielding barrier material, NSN 8135-01-185-6816. Heat seal the bag with a handheld sealer, NSN 3540-00-975-4255.



IF THE PIECE OF ELECTRONIC EQUIPMENT IS SMALL ENOUGH, PUT IT INTO ONE OF THESE ESD-FREE FLEXIBLE CUSHION POUCHES...



Pouch Size (inches)	NSN 8105-01-
12x12	197-2965
11x15	215-4752
10x10	197-2966
10x12	197-7846
8x8	215-0462

Whichever way you go, finish the job with a fast pack. Two useful ESD fast packs are NSN 8115-01-019-4084 for 12x18x3-½ inches and NSN 8115-01-057-1244 for 10x10x3-½ inches.

There's much more to know about packaging, and you can get the word from a LOGSA pub. To get your copy of *Packaging—The Basics*, write to:

LOGSA-PSCC  
ATTN: AMXLS-TP-P  
11 Hap Arnold Blvd  
Tobyhanna, PA 18466-5097

Or call DSN 795-7685,  
or (717) 895-7105

A FEW PRECAUTIONS AND SOME REGULAR PM AROUND YOUR WORKSTATION WILL KEEP STATIC ELECTRICITY UNDER CONTROL.



## High Charge

These common items have a high static charge: candy wrappers, folders, paper, styrofoam cups, cigarette packs, plastic and masking tape, plastics, vinyl, heat guns with blowers and common packing material. Keep them away from the work site. If you must have technical manuals and paperwork at the workstation, store them in antistatic bags.

When you package a circuit card in the protective plastic wrap, put a rubber band around it—**never** use tape to fasten it. The tape holds static electricity.

Things like magnets, radios, tape players and telephones can create an electromagnetic field. Keep them clear of the workstation.

If as part of your job, you must package an item in stretch-wrap or shrink-wrap, do it away from your workstation. Packaging an item with these wraps generates static electricity.

## Training

Anyone handling ESDS items should be trained in ESDS precautionary procedures. Untrained personnel should **never** handle ESDS items when the items are outside the ESDS protective packaging.



Train your soldiers in ESD

## Clean Means Safe

Dirt and dust on the table and floor mats act as insulators, making it harder for the mats to carry electrical charges to ground. Clean the mats with a soft cloth or brush them with a whisk broom.

Use only brushes made with natural bristles, such as horse hair. Brushes made with nylon or other synthetic bristles will generate static electricity.

Never wax or polish the table or floor mats. That leaves a residue that insulates the mats.



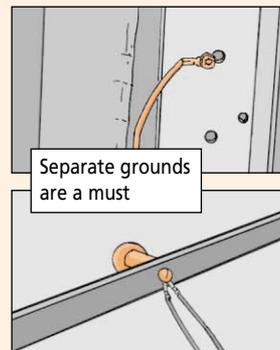
## Grounding

Connect table and floor mat grounding cords directly to shop ground. Ground each workstation individually. Never connect workstations in series to ground them. If connected when one goes out, they all become ungrounded.

Make sure your grounding cords are firmly attached to bare metal, not paint.

Wear your wrist strap on your skin, not over your sleeve, or it won't work.

Replace grounding cords if they're badly worn or cut.



## Resistance Checks

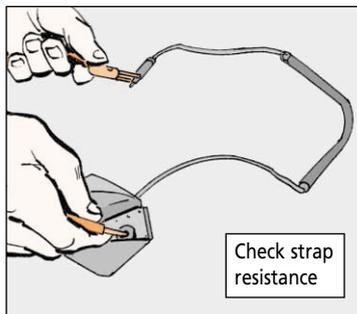
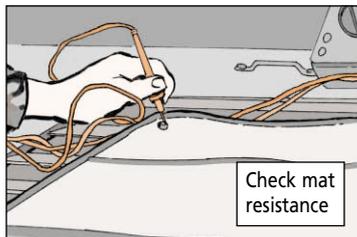
Follow the manufacturer's instructions for measuring the resistance of your workstation components. That's the only way to be sure your workstation's doing its job of carrying static charges to ground.

Measure grounding cord resistance once a week with an ohmmeter or multimeter. All readings should be in accordance with manufacturer's specifications.

Measuring resistance in the wrist strap is especially important. The strap gets more wear and tear than any other part of your workstation. Measure it at least daily.

The wrist strap has a resistor to protect you against high-voltage shocks. If the resistance is too low, the strap can't protect you. Too much resistance means the strap can't draw static electricity away from your body. Either way, you'll need to replace it.

Have your workstation tested for resistance from the surface of the table or floor mats to ground. That takes special testing equipment and special support. Contact your local TMDE support folks or CECOM LAR for help.



FOR MORE INFO ON ESD PROTECTION, SEE THESE PUBLICATIONS...



**MIL-HDBK-773,**  
*Electrostatic Discharge Protective Packaging;*  
**DOD-HDBK-263B,**  
*Electrostatic Discharge Control Handbook;*

**MIL-STD-1686B,**  
*Electrostatic Discharge Control Program;*  
and **MIL-W-87893,**  
*Electrostatic Discharge Control Work Station.*

If you can't find copies locally, order them from the

Defense Automated Printing Service (DAPS)  
ATTN: DPM-DODSSP  
Bldg 4D  
700 Robbins A  
Philadelphia, PA 19111-5094

Or just call DSN 442-2179 or (215) 697-2179, or fax your request to DSN 442-1462, (215) 697-1462.

You can also enroll in a correspondence course on electrostatic discharge.

It's called *Packaging and Handling of Electrostatic Discharge Sensitive Items*, 908F36-PT3600.

Go to web site: [www.atsc.army.mil/accp/dlsd.htm](http://www.atsc.army.mil/accp/dlsd.htm) to enroll in the course. Click on LOGIN/REGISTER. Apply for a password to enter the site. Once you have your password, find the packaging course in the course listings.



PLGR...

# IT'S A TOUGH CASE!

WHAT'S THE CRIME, JOE?

TRANSIT?

THAT'S RIGHT.

A PRECISION LIGHTWEIGHT GPS RECEIVER, THAT GOES BY THE ALIAS PLUGGER, IS DEAD.

WHAT KILLED HIM?

SOME CARELESS USER TOSSED HIS PLUGGER IN THE BACK OF THIS TRUCK WHEN HE WAS TAKING IT TO THE FIELD.

OR MAYBE IT WAS A COMMO REPAIRMAN WHO HAD A LOAD OF PLUGGERS BOUNCING AROUND IN A BOX AS HE TOOK THEM TO TURN-IN.

SOUNDS LIKE A CRIME YOU'RE FAMILIAR WITH.

UNFORTUNATELY, I AM. IT'S A CRIME THAT HAPPENS ALL TOO OFTEN!

TRANSIT!

HOW CAN IT BE PREVENTED FROM HAPPENING AGAIN?"

"A LITTLE PATIENCE— A LITTLE CARE— WOULD GO A LONG WAY. SO WOULD A NEW CARRYING CASE FOR THE PLUGGER. IT'S AVAILABLE NOW."

DOES IT HAVE A STOCK NUMBER?

SURE, NSN 6760-01-379-3139.

HOW ABOUT THAT— A CASE SOLVED BY A CASE.

THAT' A FACT, BILL. THAT'S A FACT.

IT BRINGS A CASE THAT THE PLUGGER CAN SNUG UP IN LIKE A BEAR IN A CAVE ON A COLD WINTER NIGHT.

EXPENSIVE?

THIRTY-TWO BUCKS, BUT WORTH EVERY PENNY.

DUM-DAH-DUM-DUM.  
DUM-DAH-DUM-DUM-DUM!  
DUM!

# SAFETY BOARD IS



Safety is a priority when you work around electrical equipment. Even low voltages can lead to deadly results.

So make sure your electrical safety board is equipped to handle any problems that arise.

In an electrical emergency, a fully equipped safety board can save your life. So make sure your safety board has all the items you may need.

Get acquainted with the instructions and recommendations in TB 385-4, *Safety Requirements for Maintenance of Electrical and Electronic Equipment*, and get your board set up.

TB 385-4 suggests including the following items on your safety board:

- \* FM 21-11, *First Aid For Soldiers*, and local safety instructions
- \* Emergency procedures
- \* Ambulance, hospital, and doctor emergency telephone numbers
- \* Rope, halyard, 3/8 inch, 25 feet, NSN 4020-00-174-3031
- \* Flashlight, NSN 6230-00-264-8261
- \* Safety goggles, NSN 4240-00-052-3776
- \* Rubber gloves which provide protection up to 3,000 volts, are available in these sizes:

Size	NSN 8415-01-158-
9	9449
10	9450
11	9451
12	9452

# LIFE-SAVING TOOL



A SAFETY BOARD SHOULD ALSO INCLUDE A GROUNDING STICK, SAFETY HOOK AND GROUNDING CABLES.



You can make those items locally using the instructions in TB 385-4. If you don't have a copy of the TB, you can read it or print a copy from the Logistics Support Activity (LOGSA) web site at <http://www.logsa.army.mil>. Enter the site, click on Publications & Forms. Then click on Go to Electronic Technical Manuals Online and ACCEPT to enter the site to search for the TB.

Check with your local medical authority for approval to include other items on your board, such as first aid kits, hearing protectors, snake bite kits and resuscitators. Your safety office may have suggestions, too, so give them a call.

Get familiar with all the items on your board and be ready to use 'em if an emergency pops up.

Make sure you inspect the board monthly and keep all items in good shape.

Field Feeding Equipment...

# TEMPERATURE RISING?

GLUB-GLUB!

AND THEY WONDER WHY THEY CAN'T READ MY TEMPERATURE?!



Your food thermometers need a little special care when you pack up your kitchen equipment for the field. A bump or more can knock them out of kilter. Here's how to keep thermometers measuring up:

- ❑ Keep your thermometers clean with just a damp cloth. Never submerge them in soap and water. If suds get inside, you'll get a false reading next time you use it. Keep those food thermometers in perfect condition so that when your food reaches the proper cooking temperature, you'll know it.
- ❑ Put each thermometer in its own carrying case—don't double them up. The plastic face cover can get scratched, which makes it unreadable, or they can even break bouncing against each other.
- ❑ Place each case separately in several layers of bubble wrap, NSN 8135-00-926-8991, or barrier material, NSN 8135-00-753-4661.
- ❑ On the way to the field, let the wrapped units ride on top of the burner units. It's an easy place to store them, and you can't help but see them when you unpack and fire up the burner. With the new MBU, put your thermometers in the drawer of the MKT or in the tool kit. When you arrive, unwrap the thermometers and give them a quick look-see for any damage. Eyeball these areas in particular:

MY STEM- IS IT STRAIGHT?

A BENT STEM COULD DAMAGE MY BI-METAL SENSOR. THAT'LL GIVE YOU A BUM READING!

MY HEX NUT- IS IT LOOSE?

A LOOSE HEX NUT COULD CAUSE MY THERMOSTAT TO BE OUT OF CALIBRATION!

MY GLASS- IS IT CRACKED?

IF IT IS, MOISTURE KEEPS IN AND RUINS MY TEMPERATURE DIAL!



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CLICK ON IT TO GET TO ITS TABLE OF CONTENTS



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Select an article on the TOC screen and click on it

Small Arms...

### Clean, Then Touch Up



Solid film lubricant (SFL) does a great job of touching up spots on your rifles and machine guns where the finish has worn off. SFL stops corrosion before it starts and erases shiny spots that can signal your position to the enemy. But SFL does no good unless you clean

When you click on an article subject or page, the system takes you directly to the article.

you've got a clean spot again.  
M2 Machine Gun Only

...AND TWO:  
LINKS TO INDEXES FOR  
1990-1998, 1999 AND  
2000 ARE AT THE BOTTOM  
OF THE WEB PAGE.



You can page through the index using the arrows

Just click on the first letter of the subject you need and you will get the first article that starts with that letter. Then page through the listing until you find the article you need.

IF YOU WANT TO READ THE **WHOLE** ISSUE, JUST PAGE THROUGH IT BY CLICKING ON THE ARROWS AT THE TOP OF THE SCREEN.



## Search Back Issues of PS.

YOU HAVE **TWO** WAYS TO SEE BACK ISSUES.

1999

2000

2001

IF YOU **STILL** DON'T FIND WHAT YOU NEED, THERE ARE OTHER WAYS TO SEARCH FOR AN ITEM.

FOR EXAMPLE, YOU MAY LOOK FOR A BLACK HAWK ARTICLE UNDER "B" AND FIND NOTHING.

AN ALTERNATIVE WOULD BE TO LOOK UNDER "A" FOR AIRCRAFT, UH-60, OR BLACK HAWK.

## Let Your Server Help

Your server should have a search engine that allows you to search on-line documents. The Acrobat plug-in uses an icon of binoculars to activate its search engine. Click on the icon and type in what you want to search for. The system will bring up the first article about the subject. If that's not what you want, click on the binoculars icon to get the next article that contains your typed-in words.

# POST SCRIPTS

## FY00 MAINTENANCE AWARDS CORRECTION

Page 56 of PS 584 lists FORSCOM as the major command (MACOM) for the Active Army TDA Intermediate (206th MI Bn) and Heavy (527th MI Bn) Category winners of the FY00 Maintenance Excellence Awards. The correct MACOM for both units is the US Army Intelligence and Security Command (INSCOM).

## M872A2 Trailer CORRECTION

In PS 580, Page 11, we said you could mix radial and bias tires on different axles of the M872A2 trailer. That is wrong! The trailer must use all radial tires or all bias tires, not a mix. Mixing tire types can cause loss of steering control, poor handling, tire failure and equipment damage.

## Mounting Volcano on FMTV

Change 6 to the M139 mine dispenser's TM 9-1095-208-10-1 authorizes mounting the Volcano on the FMTV's M1090 5-ton dump truck. To do that, you need an adapter kit, which you can get for free by contacting the Armament Research, Development and Engineering Center's ARDEC at: [restaino@pica.army.mil](mailto:restaino@pica.army.mil). (Mounting the Volcano on the FMTV 5-ton cargo truck is not authorized.) If you have Volcano questions, contact ARDEC's Peter Giotis at DSN 880-5651/(973)724-5651. Or e-mail him at: [pgiotis@pica.army.mil](mailto:pgiotis@pica.army.mil)

## ANTISEIZE COMPOUND

The antiseize compound listed on Page 18 of PS 579 (NSN 8030-00-251-3980) is available only if you order a minimum of 12 1-gal cans. If you don't need that much compound, it's also available in an 8-oz can, NSN 8030-01-087-8254; a 16-oz can, NSN 8030-00-155-6444; or a 5-lb can, NSN 8030-00-286-5453.

## C-2298 Mounting Plate

If the mounting plate for the AN/VIC-1 intercom's C-2298 control box is missing from your M113-series FOV, you won't find a replacement in the parts manuals. Get a new mounting plate with NSN 5820-00-875-0893.

## M109A6 Taillight Gasket

If your Paladin's left or right taillight, NSN 6220-00-669-5623 or 6620-00-337-6471, gets wet because of a missing or damaged gasket, don't order a whole new taillight. Instead, get a new gasket with NSN 5330-00-297-7106. Then, make a note until the gasket is added to Fig 69 of TM 9-2350-314-24P-1.

## M249 BFA

The NSN listed for the M249 machine gun's blank firing attachment (BFA) on Page C-5 in TM 9-1005-201-10 is no longer good. Use NSN 1005-21-912-8997 instead.

## PLS Flatrack Box Door

If you ordered the right-hand stowage box door, NSN 2540-01-373-6510, for the M1077 flatrack and received one that's the wrong size, order another one. Then contact the Defense Supply Center-Columbus' Will Kern about submitting a Quality Deficiency Report for that bum door and any others you may have on-hand. His numbers are DSN 850-2806, (614) 692-2806; fax DSN 850-1402, (614) 692-1402; e-mail [wilhelm.kern@dssc.dla.mil](mailto:wilhelm.kern@dssc.dla.mil). Faulty stock at the depot has been purged, so new requests will get the right door.

## BRADLEY BORE BRUSH BAG

Need a new carrying bag for your M2/M3-series Bradley's 25mm bore brushes? Get it with NSN 5140-00-473-6256. The bag's not listed with the bore brushes in Appendix B of the -10-2 TMs.

## M17 Decon Belt

The NSN listed for the M17 decon unit's water pump/engine drive belt (Item 2, Fig C-4) in TM 3-4230-228-23&P is wrong. To order the belt, use NSN 3030-01-238-2368. Make a note until the TM is updated.

## RL-39 REEL SLING STRAP

Order sling strap, NSN 8465-00-269-0682, to carry your RL-39 reel. It has replaced straps ST-34, NSN 8465-00-498-7991, and ST-35, NSN 8465-00-498-7992, which are no longer available.

## RS-28 Roller Headlight Bulb

Order NSN 6240-00-836-2079 if you need only the bulb for the roller's headlight assembly. The NSN shown as Item 1 in Fig 51 of TM 5-3895-346-24P gets the whole assembly

## Wolverine Web Site

Info on operating, maintaining, fielding and training on the M104 Wolverine bridge launching carrier can be found on the Internet at <http://www.tacom.army.mil/dsa/pms/cms/hab/index.htm>

## FUEL TANKER VALVE REPLACEMENT

Vibration does a job on the brass butterfly valve on the Onan engine used on 5,000-gal fuel tankers. So Tank-automotive and Armaments Command wants you to change it to a stainless steel valve, NSN 4820-01-145-4185. Make a note for Item 3 in Fig 64 of TM 9-2330-356-24P for M967/M967A1, M969/M969A1 and M970/M970A1 tankers and for Item 3 in Fig 39 in TM 9-2330-398-24P for M969A2 tankers.

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

# HOLD IT!

HUH?



**Mixed recyclables can't be recycled and must be disposed of as hazardous waste. That costs your unit \$\$\$!**

Issue 587

# PS

October 2001

## THE PREVENTIVE MAINTENANCE MONTHLY

TB 43-PS-587

Approved for Public Release; Distribution is Unlimited



**WHO WANTS TO BE A PM MILLIONAIRE?**

**PLAY ALONG ON PAGE 27!**