

Issue 586

PS

September
2001

**THE
PREVENTIVE
MAINTENANCE
MONTHLY**

TB 43-PS-586

Approved for
Public Release;
Distribution is
Unlimited

SAVIN' A
DOLLAR
CAN SAVE
YOUR
LIFE!



K/JOE
KUBER

**FIND OUT
HOW ON
PAGE 27**



Do Your Best *Every Time*

Have you ever noticed that when people whose work we admire—entertainers, scientists, athletes, businessmen—talk about their success, they usually have one trait in common?

They say that to succeed, they have to do their best—every time. So-so effort, or sloppy work, won't cut it. They slack off, they lose.

Well, Army maintenance isn't as interesting as the latest movie blockbuster; it's not a cure for cancer; and it's not the latest Internet site.

But, it is important. Real important! Done right, it saves lives, dollars and time.

Doing your best during maintenance means you don't guess about torque values. You get the right ones out of the tech manual. It means you fix anything you can during PMCS, even if it means going back into the shop to get a tool. It means you lube all the grease fittings, not just the ones that are easy to reach.

Doing your best doesn't mean you have to be really smart, or really inventive, or really strong, or really anything.

IT JUST
MEANS YOU
DO YOUR
BEST—
EVERY
TIME!



Use Only Silicone Brake Fluid

MECHANICS, THERE'S ONLY ONE TYPE OF BRAKE FLUID FOR USE IN MILITARY VEHICLES—**SILICONE BRAKE FLUID (BFS)**.



BFS, provided under MIL-B-46176 and also known as DOT 5 brake fluid, replaced the old brake fluid, VV-B-680, also known as DOT 3 or DOT 4. BFS is more stable at high temperatures and won't absorb water.

So, when it's time to add brake fluid to a master cylinder containing BFS, make sure that what you add is also BFS. A combination of BFS with old fluids will still absorb water, creating corrosion and deposits which can cause stopping problems.

Mixing old brake fluid with BFS can also lead to seal leakage, as the seal protective properties of BFS are diluted by the old stuff.

So how do you tell which fluid is which? Go by the color, if you can. BFS is purple or blue in color, though the dye that gives it the color can break down. Then the fluid in the master cylinder becomes brown or amber.

There's no cause for alarm if the color varies—the BFS is still good. But if the color is not purple or blue, you can't tell what kind of fluid is in your brake system.

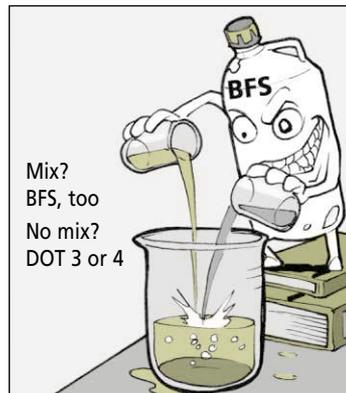


HERE ARE TWO OTHER WAYS TO TELL WHAT KIND OF BRAKE FLUID YOU HAVE...



BFS + unknown fluid

1. Try mixing a few tablespoons of the unknown fluid with a little BFS. If the two mix, the unknown fluid is BFS, too. But if the two fluids separate into layers, the unknown stuff is DOT 3 or 4. Your vehicle needs to have the brake fluid changed.



Unknown fluid + water

2. Put some of the unknown fluid in a jar with a little water and shake it. BFS does **not** mix with water, and you'll see distinct layers. DOT 3 and 4 fluids, on the other hand, do mix with water and remain mixed. You won't see separate layers.



OLD FLUIDS SHOULD BE **FLUSHED!**

SEE YOUR TMS FOR DETAILS.



Watch Your 180s

IN THE GRAND CIRCLE OF LIFE, THE DIFFERENCE BETWEEN RIGHT AND WRONG IS 180°.

FOLLOW THIS... THERE'S A RIGHT PLACE FOR A TIRE VALVE STEM IN RELATION TO THE SPLIT RING GAP ON MULTI-PIECE WHEELS.

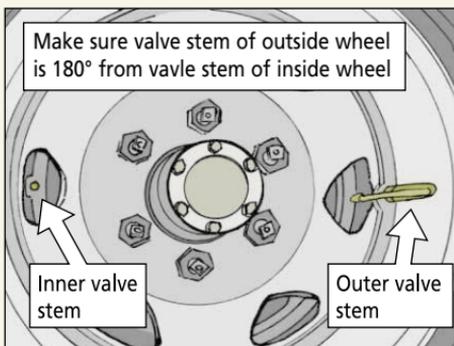
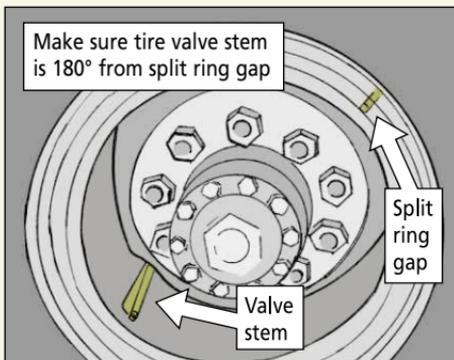
THERE'S ALSO A RIGHT PLACE FOR ONE VALVE STEM IN RELATION TO ANOTHER WHEN WHEELS ARE MOUNTED AS DUALS ON A TRUCK OR TRAILER.

READY? THE RIGHT PLACE IS 180° APART.

When you put a multi-piece wheel together, make sure the tire valve stem is 180° from the split ring gap. The wheel is weak at the spot where metal was removed for the valve stem. The split ring is weak at the gap. Put the two together at the same place and you ask for problems. Put 'em as far apart as possible and you've done the best you can.

When you mount duals on a truck or trailer, make sure the valve stem of the outside wheel is 180° apart from the valve stem of the inside wheel. Doing this makes finding the inside wheel stem simple.

The word's found in TM 9-2610-200-14 (Sep 00), *Care, Maintenance, Repair and Inspection of Pneumatic Tires and Inner Tubes*. Check out Para 2-4(7) for the split ring gap/valve stem info and Para 2-9 for the duals/stems info.



FITTING AIR BRAKE GOVERNORS



Air brake governors on M939-series and M939A1-series trucks can be a source of confusion for maintenance personnel.

There have been two makers of the brake governor assembly, NSN 2530-00-854-4457. One of the governors, FL Industries' part number (PN) N-20856-D, is no longer available. The other assembly, Allied Signal's PN 7003-03C068537, is available—and interchangeable with FL's—as an assembly, but not in parts.

If you have problems interchanging these governor assemblies, ask your support unit to add a tee, NSN 4730-00-782-5461, to the hookup. It's Item 15 in Fig 214, TM 9-2320-272-24P-1.

Details on how to install the tee are found on Pages 3-580 through 3-583 of TM 9-2320-272-24-1.

Do not try to mount either of these assemblies on M939A2-series trucks. They do not have the low-pressure cutoff for CTIS that reserves air pressure for braking in case of air system failure. You must use governor assembly, NSN 2530-01-287-4529 (PN 106400), for A2-series vehicles.

To ensure that you get the correct assembly when ordering, add the part number to your requisition's REMARKS block.

UPS AND DOWNS OF HYDRAULICS

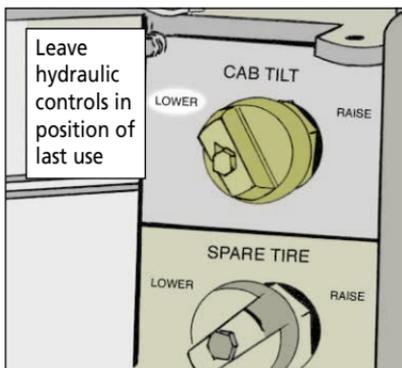


If you keep up to speed on how your FMTV's cab and suspension hydraulics work, you won't find yourself down in the dumps. Just remember these two rules:

1 Once you've used one of the hydraulic function controls, leave it in the last position used until the system is powered up next time.

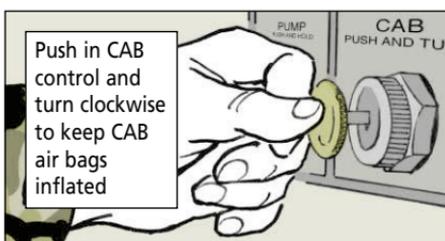
For example, you've raised the cab for service. Leave the cab tilt function control at RAISE until you're ready to lower the cab again.

Otherwise, the system will begin to lower the cab as soon as you turn it on. This could be extremely dangerous if you aren't ready for it.



2 Before operation, always make sure the CAB function control knob is pushed in and turned to the right. That ensures that the cab air bags are inflated.

If you drive on deflated air bags, they get damaged—and you get an awful ride.



FMTV...

ONE MORE WAY TO LOCK



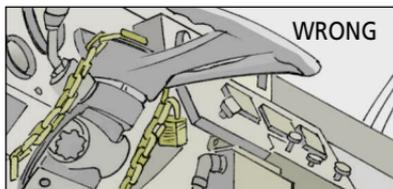
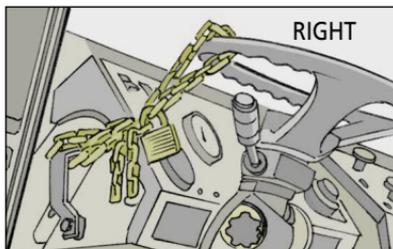
Securing the steering wheel on your FMTV should be as simple as possible, to make sure it gets done quickly and surely, and with no damage to your truck.

You can find almost as many ways to do the job as there are people doing the work.

Problem is, there's only one right way by the book. Eyeball Para 2-27 in TM 9-2320-366-10-1, under the heading, "Securing Vehicle" for the 5-ton models. Para 2-21 of TM 9-2320-365-10 has the info for the 2 1/2-ton models.

Still, you see some folks loop the chain around the wheel and steering column, which causes wiring harness damage. And you see some folks use the chain as a handhold to get in and out of the cab, which can damage the turn signal lever.

Install the chain and lock correctly and use the handhold provided to get in and out.



HERE'S THE RIGHT WAY TO SECURE THE TRUCK, PER THE TM...

1. Remove the chain and padlock from the tool kit.
2. Turn the steering wheel either full left or full right **before** installing the chain.
3. Wrap the chain around the steering wheel and the cab handhold.
4. Connect the padlock to the chain and lock it.

NOW, THAT'S REAL SIMPLE ... AND REAL QUICK.



Get to that Fuel Tank



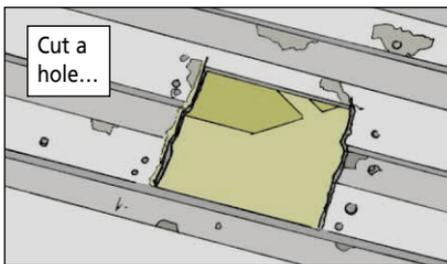
Mechanics, save yourself the time and trouble of dropping the fuel tank to get to the tank's sending unit or to replace a leaking sending unit gasket on your HMMWV.

Instead, add a cargo floor access hole and cover kit, NSN 2510-01-454-7077. The kit has the instructions, hardware and plate to install an access cover in the truck's cargo floor.

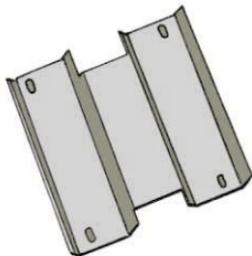
Order the kit, and then the next time you have to drop the fuel tank, install the cover while the tank's off. With the cover installed, you can remove and replace the sending unit or gasket with the fuel tank in place.

The instructions show how to cut the cargo floor and install the cover plate. But note that this kit cannot be used on HMMWV ambulances (M996/M997) or Avengers because of their design.

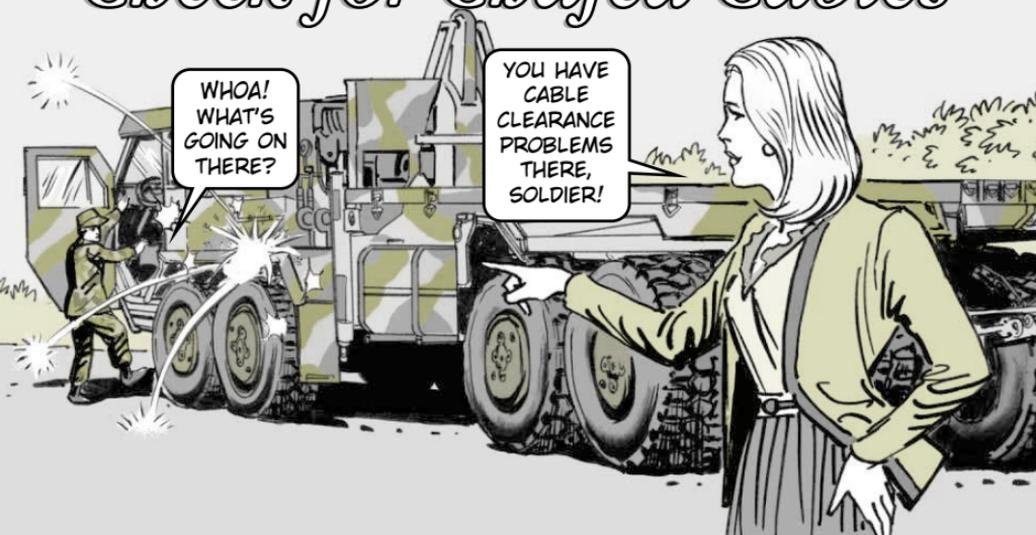
PS 586



...and
add this
removable
plate



Check for Chafed Cables

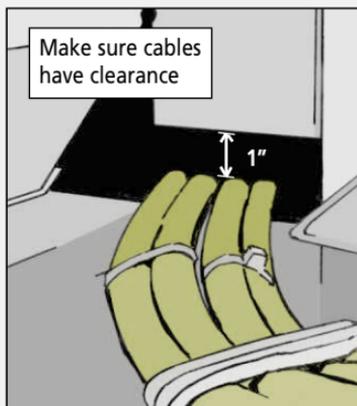


If your PLS tractor has a 200-amp alternator, take time to eyeball where the battery disconnect cable goes under the engine access panel.

Some alternators were installed in the field using instructions that didn't call for cutting or bending the corner of the access panel to allow enough clearance for routing the cable. So many of the cables are chafing and shorting out on the panel.

Other 200-amp alternators were installed on the assembly line. They have a modified access panel that doesn't chafe the cable.

If any of your PLS tractors have cable clearance problems, bend or cut the panel to provide about 1 inch of space between the panel and the wire.



M915, M916, M917 Tires

Fig 223 of TM 9-2320-363-24P lists wrong NSNs for tires on M915A2, M916A1/A2 and M917A1 trucks. Item 1 should be NSN 2610-01-045-3688. Item 2 is NSN 2610-01-436-3334. Item 3 is NSN 2610-01-436-3332.

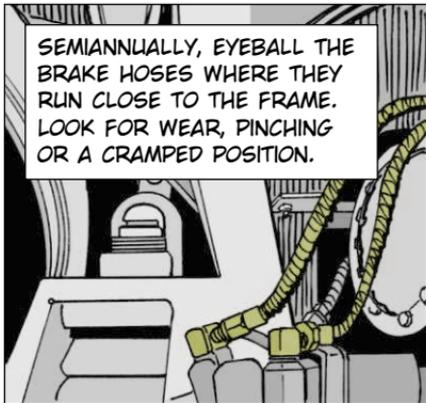
Prevent Brake Hose Damage

OPERATORS,
YOUR TRUCK'S TECH
MANUAL SAYS TO
CHECK THE FLEXIBLE
HYDRAULIC BRAKE
HOSES DURING
PMCS.

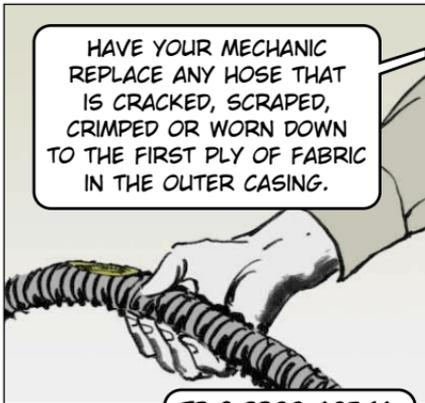
PROBLEM IS, THE
MANUAL DOESN'T SAY
HOW TO CHECK 'EM
OR WHAT TO LOOK
FOR. SO HERE'S
HOW AND WHAT...



SEMIANNUALLY, EYEBALL THE
BRAKE HOSES WHERE THEY
RUN CLOSE TO THE FRAME.
LOOK FOR WEAR, PINCHING
OR A CRAMPED POSITION.

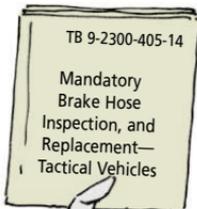
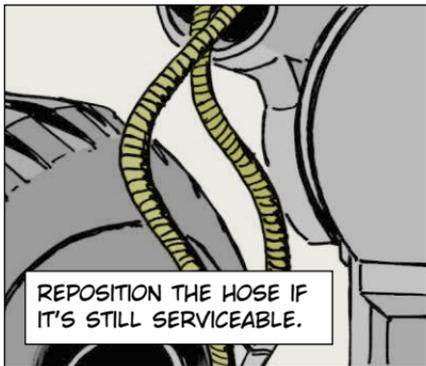


HAVE YOUR MECHANIC
REPLACE ANY HOSE THAT
IS CRACKED, SCRAPED,
CRIMPED OR WORN DOWN
TO THE FIRST PLY OF FABRIC
IN THE OUTER CASING.



TB 9-2300-405-14,
MANDATORY BRAKE
HOSE INSPECTION,
AND REPLACEMENT—
TACTICAL VEHICLES,
HAS THE INFO.

REPOSITION THE HOSE IF
IT'S STILL SERVICEABLE.



GET A SAFE GRIP

Most mechanics wear the results of their close encounters with balky electrical connectors. They're called scars.

The scars come from trying to remove connectors that are so close to a fender, firewall or other obstruction that you can't get a good grip on them.

So some "persuasion" is used, which is not kind to mechanics or connectors.

Save yourself some scars and new connectors by using a spanner wrench or plier wrench to remove those hard-to-get-at connectors.

If the connectors are cannon plugs, the 3/4-in to 2-in spanner wrench found in the General Mechanic's tool set or in the No. 1 Common shop set works just fine.

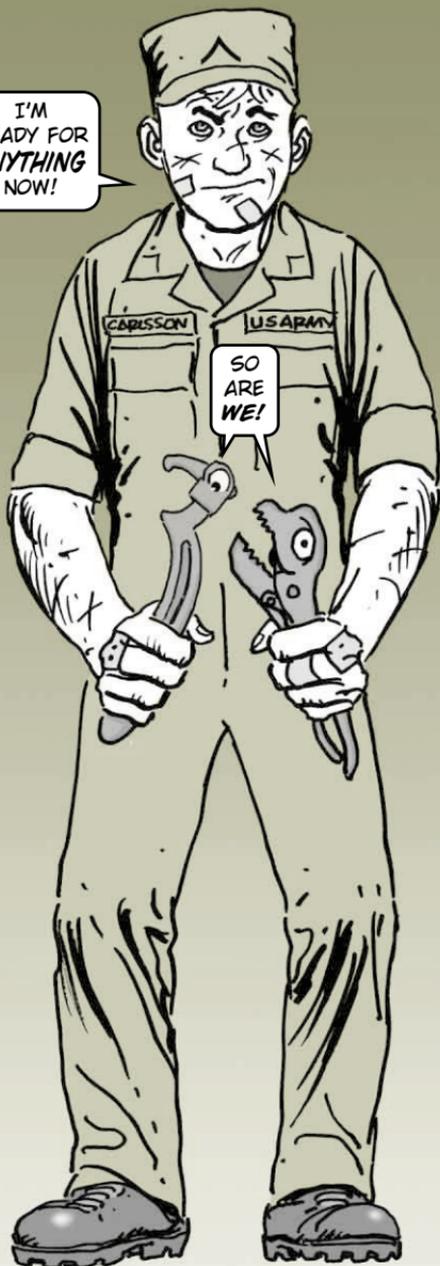
If the connectors are any other style, and you cannot loosen them by hand, use the curved jaw plier wrench found in the new General Mechanic's tool set, SC 5180-95-B47.

Never use more grip than needed or you could damage the connector.

Once you have the connectors off, clean them with spray cleaner, NSN 2640-00-138-8324, to keep them from sticking next time.

I'M
READY FOR
ANYTHING
NOW!

SO
ARE
WE!



GUARD AGAINST LOOSE SHIELD

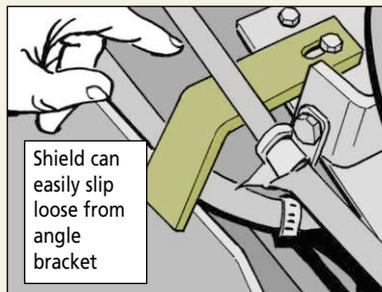
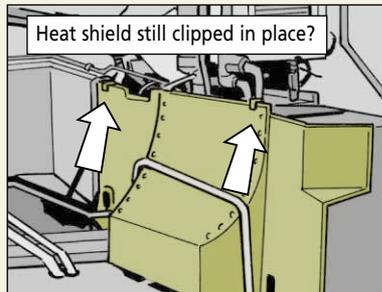


The heat shield, NSN 5640-01-083-5375, on the right side of your tank's engine compartment protects the fuel cell from the extreme heat of the engine. If the shield is missing or damaged, your tank could be so much kindling.

That's why you need to treat the shield with care, especially when reinstalling the powerpack. The top of the heat shield is held in place with two angle brackets. These brackets are a bit short, so it's easy for the shield to slip loose from them.

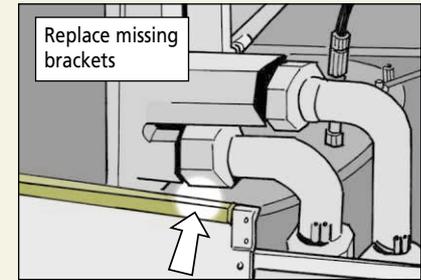
When that happens, the top of the heat shield leans out and gets crushed by the powerpack as it's lowered into place. Your tank is NMC until the heat shield is replaced.

Before reinstalling the engine, check the angle brackets. Make sure they're tightened down and the heat shield is held in place by **both** brackets.



Never try to make do with just one bracket. Both are needed to properly secure the heat shield.

Replace missing brackets with NSN 5340-01-115-0628. You'll also need a new screw, NSN 5305-00-068-7837; lock washer, NSN 5310-01-374-5430; and flat washer, NSN 5310-01-379-0804, to hold each bracket in place.



Heads Up on Stowage



Having a stowage box in your tank's turret doesn't mean you can stick anything you want into it—unless you're prepared to face the consequences.

Anything that sticks out the top of the loader's stowage box, NSN 2540-01-203-3134, gets crushed by the coax machine gun box when the main gun is fully raised.

The stowage box itself gets crushed if it's not bolted down properly. Loose bolts let the box stick up too far and...CRUNCH!

So, by all means use the stowage box. That's why it's there. Just be sure it's secure and nothing sticks out the top.



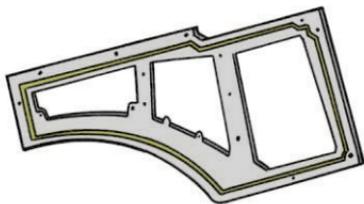
Seal Out Water Problems



Like oil and vinegar, water and a tank's NBC sponson box just don't mix, mechanics. Water and dirt that get inside the sponson box leaves behind rusted bolts, shorted wiring and an NBC system that won't protect the crew when it's most needed.

A bad seal on the underside of the sponson box cover is the number one cause of leaks. Check it closely during semiannual maintenance.

Check seal for cuts, tears and loose spots



IF THE SEAL IS LOOSE, CUT OR TORN, REPLACE IT LIKE THIS...

1. Use a knife to remove the seal from its groove in the cover.
2. Clean the groove with dry cleaning solvent, NSN 6850-00-274-5421, and a rag. Make sure you wear rubber gloves, NSN 8415-00-266-8675, and splash goggles, NSN 4240-00-269-7912, for protection.
3. Measure and cut 146½ inches of new seal, NSN 5330-00-222-2592. The seal is ordered by the foot, so you'll need 13 feet for each tank.
4. Apply adhesive, NSN 8040-00-273- 8717, to one side of the seal with an acid swabbing brush, NSN 7920-00-514-2417.
5. Slip the seal into the groove and press it firmly in place.



MLRS Carrier . . .

MAKE TRACKS WITH TENSION TOOL



Dear Editor,

After every operation, MLRS crewmen are supposed to use a ruler to check track tension. The distance between the bottom of the track and the top of the rear support roller should be about 1/4 inch.

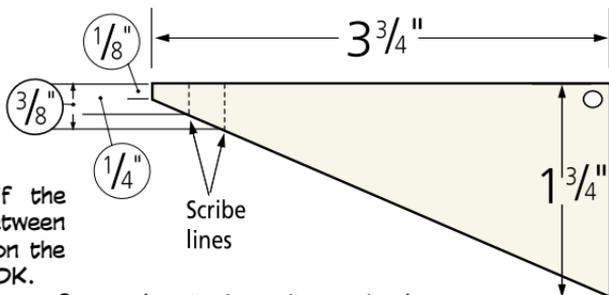
Unfortunately, rulers are easy to lose and hard to come by in the field. Even if you have one, lining the ruler up for a proper measurement isn't easy.

A lot of crewmen end up guessing at the measurement or don't measure at all. Because of that, track wears out faster and there's always a danger of throwing a track.

We designed a tool that does the same job as the ruler. Because it's so small, you can slip the tool on your key ring and have it handy whenever it's time to check track tension.

Make the tool out of 1/4-in aluminum plate following these dimensions:

Place the flat top of the tool against the bottom of the track. Slide the tool forward until the angled bottom side of the tool touches the top of the rear support roller. If the measurement falls between the two scribed lines on the tool, track tension is OK.



If the tool won't go in as far as the 1/4-in scribe mark, the track is too loose. If it goes in past the 3/8-in scribe mark, the track is too tight. Adjust the tension as necessary.

SSG Les Kolden
2/147th FA
Watertown, SD



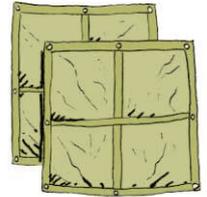
TIPs PROTECT YOUR TOPSIDE

SOMEHOW, I DON'T THINK THAT'LL DO MUCH GOOD WHEN THE BOMBS START TO FALL!



IT'LL HAVE TO DO UNTIL MY TIPs PANEL ARRIVES!

The combat identification panels (CIPs) on Pages 12-15 of PS 578 make ground-to-ground thermal identification of Army vehicles easy. But what about air-to-ground identification? That's where thermal identification panels (TIPs) come in.

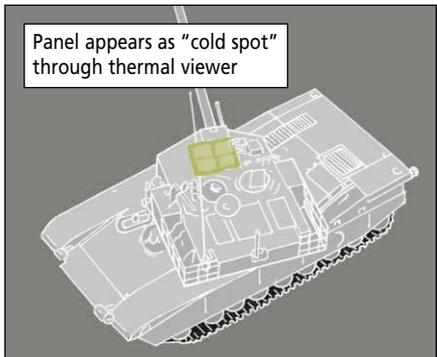


TIPs provide air-to-ground identification

What are TIPs?

TIPs are 4 x 4-ft thermal cloth panels that are used to identify stationary friendly vehicles from the air and prevent casualties caused by friendly fire.

When viewed through thermal sights—such as those found on AH-64 Apache helicopters and the Air Force's LANTIRN system—a TIPs panel appears as a large cold spot that marks the vehicle as friendly.



Panel appears as "cold spot" through thermal viewer

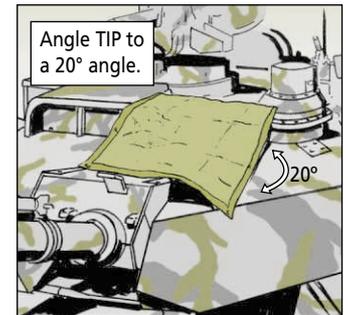
How To Get TIPs

TIPs and CIPs are being fielded as free-issue items. Units that don't receive TIPs, or need replacements after the initial distribution, must order the panels through the regular supply system.

TIPs are available in OD green or desert tan to match vehicle camouflage patterns. The opposite side of each panel is international orange for use during air-to-ground visual operations. Get the green/orange panels with NSN 2590-01-447-8997 and the tan/orange panels with NSN 2590-01-448-4531.

How to Install TIPs

1. Remove the cloth panel from its storage bag.
2. Place the panel on the rear deck or similar flat spot that allows exposure of the panel without interfering with vehicle operations. For example, the turret ammunition vent doors are a good spot on M1-series tanks.
3. Position the TIP so that it presents approximately a 20° angle from the surface it sits on. The slight tilt lets the panel act as a thermal mirror that reflects the cooler temperature of the sky.



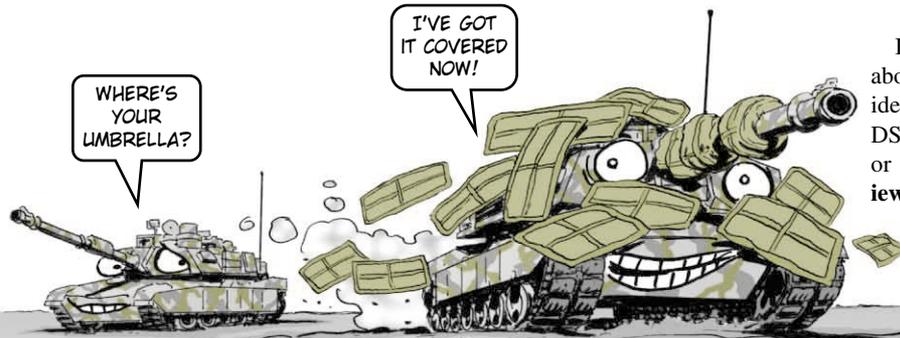
Angle TIP to a 20° angle.

4. Tie the TIP in place using the metal grommets around the outside edge of the panel.
- A filled sandbag or duffel bag placed under the panel can be used to create the required angle.

TIPs can also be used as primary markers for positions and structures where CIPs are not installed.

WHERE'S YOUR UMBRELLA?

I'VE GOT IT COVERED NOW!



More Info?

If you need more information about TIPs, contact the combat identification product manager at DSN 987-5324 or (732) 427-5324 or e-mail Wayne.Calabretta@iew.s.monmouth.army.mil.

Replace Nuts Every Time



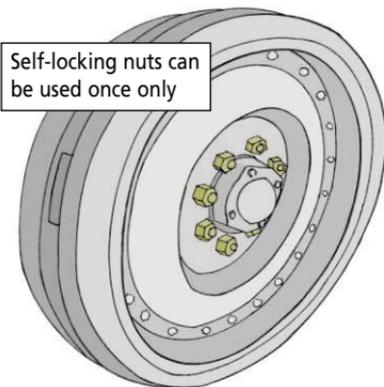
Just because money is tight is no reason to cut corners on repairs for your M113-series vehicle.

Take the self-locking nuts, NSN 5310-00-982-6809, used to mount the vehicle roadwheels and idler wheels, for instance. Some mechanics try to save money by reusing the nuts when installing a new wheel.

That's a bad idea. Those nuts have nylon inserts that mold themselves to the bolt threads during installation.

Once the nuts are removed, the inserts are ruined and the nuts will no longer lock. At best, you end up with a wobbly wheel. At worst, the wheel falls off completely during operation.

If you want to save a few pennies, reuse the flat washers, NSN 5310-00-149-9126, that go under the roadwheel and idler wheel nuts. But **never** use self-locking nuts more than once.



Put Away Your Paint Brush!



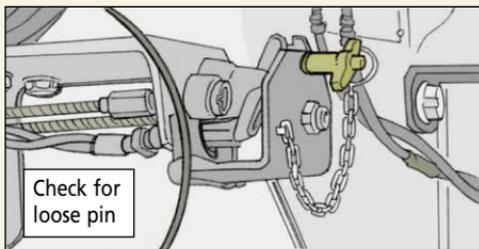
Weather fades the Red Cross markings on your M113-series ambulances. Driving through brush scrapes them up. Time to paint? Maybe not.

Instead of painting, you can order a set of Red Cross decals for your vehicles. NSN 7690-01-103-6312 gets four Red Cross decals large enough for your medical carrier. Three are 36 inches square and one is 32 inches square.

Each vehicle needs five decals—one on each side, the front, top and rear.



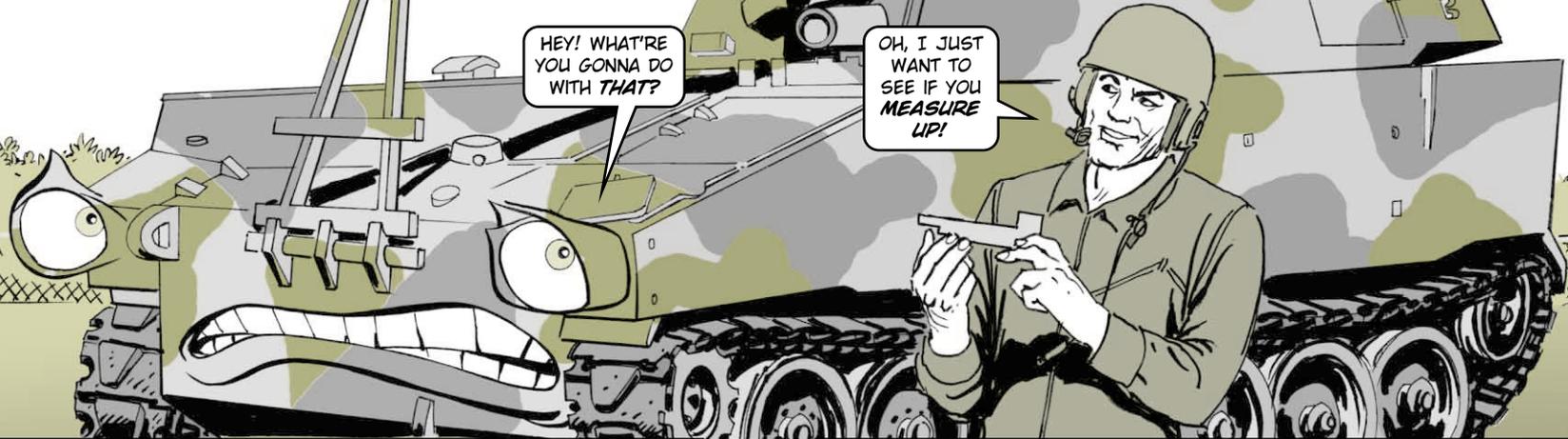
When you drivers exit your M88A1 recovery vehicle, it's easy to snag the back of your coveralls on the engine fire suppression system safety pin. If the pin is pulled out—even slightly—it activates a sensor that keeps the engine from starting the next time.



So if you feel a little tug on the back of your coveralls at the end of the next mission, reach back and make sure the safety pin is pushed in all the way.

If the engine won't start next time, you may not have noticed the snag. So always make the safety pin your first check.

HOMEMADE TOOL MEASURES UP

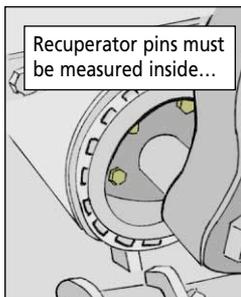
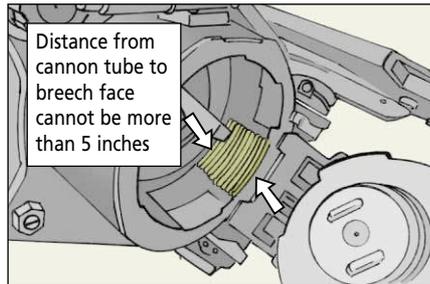


Dear Editor,

Some of the pre-fire checks for your M109-series howitzer require taking measurements.

For instance, the distance from the rear face of the cannon tube to the rear of the breech ring cannot be more than 5 inches. If it is, the gun tube and breech ring are out of alignment and you could be seriously injured or even killed when the howitzer is fired.

You also must measure the length of the recuperator's indicator pins inside and outside the vehicle. If the pins extend less than 1/8 inch, or more than 3/4 inch, your howitzer is NMC until the hydraulic fluid level in the recuperator is adjusted. That's to prevent damage to the recuperator when the gun is fired.

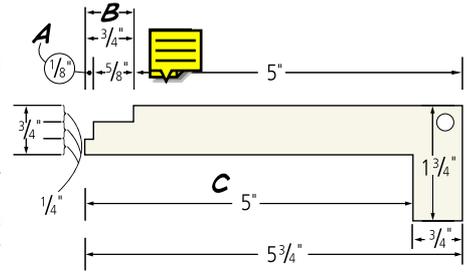


We've developed a tool that makes taking these measurements quick and easy. Make the tool from 1/8-in steel plate.

A is the minimum length the recuperator guide pins must protrude.

B is the maximum length the guide pins can protrude.

C is the maximum distance from the face of the cannon tube to the face of the breech.

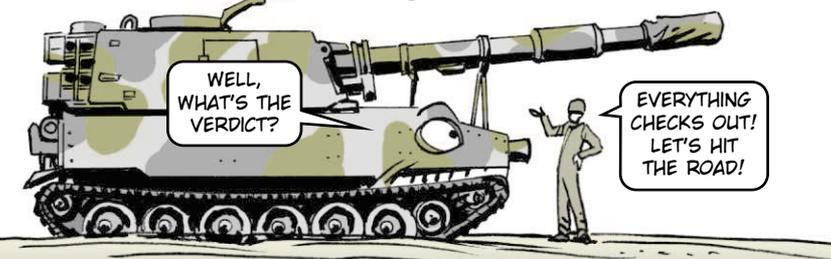


We added a 1/4-in diameter hole to one corner of the tool so a lanyard can be attached to hang it up.
SSG Les Kolder
2/147th FA
Watertown, SD

From the desk of the Editor



That's a lot easier than using a ruler or tape measure. Good job!



KNOCK OUT DIRTY FUEL



The diesel engine in your road grader can take a lot of punishment on the job. But one thing it can't take is contaminated fuel.

Dirty fuel clogs the engine's fuel injectors. Over time, it causes hard starting, engine knocking, misfiring, black exhaust and loss of power.

It's real simple: there is no fuel like clean fuel—always keep it free from dirt and water!

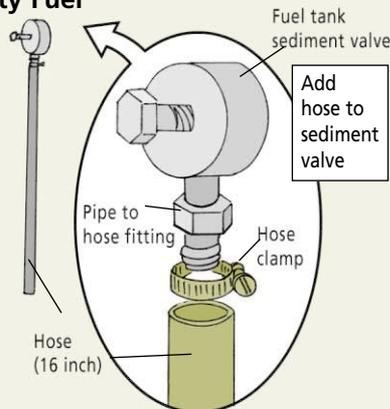
Wipe Away Crud

Before you start re-fueling, wipe off any dirt and water (that includes snow and ice) from around the filler cap. If it's raining or dusty, wrap a clean rag around the nozzle when you add fuel to the tank. When you're done, make sure the fuel cap is snapped down tight to keep dirt and water out.

Drain Dirty Fuel

Get rid of any dirty fuel by opening the fuel tank's sediment valve before operation. Clean up that dirty job by having your mechanic make a valve extension. Here's how:

- * Cut a 16-in piece of 1/4-in rubber hose, NSN 4720-01-164-7803, and slide it onto a pipe fitting, NSN 4730-00-200-0531.
- * Use a hose clamp, NSN 4730-00-908-3195, to tighten down the hose.
- * Screw the pipe fitting into the grader's drain valve.



Fuel Drain Reminder

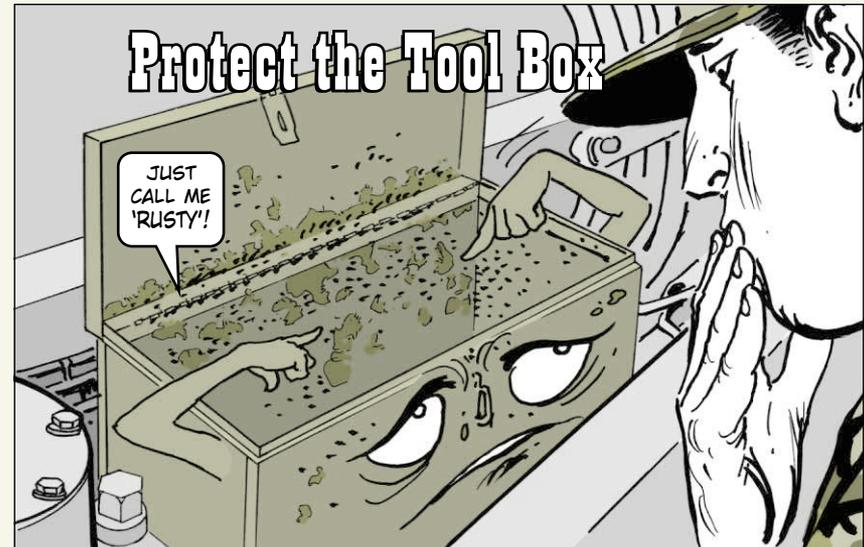
With the extension on the sediment valve, drain water and crud into a clean glass container.

If the fuel is clear, you're OK. If the fuel does not run clear, close the valve and report it to your mechanic.

Put drained fuel into an approved hazardous waste container. **Never** dump it down a drain or onto the ground.



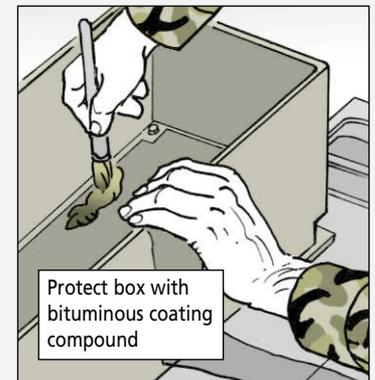
Protect the Tool Box



After you mechanics clean out the 130G grader's battery boxes, check out the tool box. It's right above the circle drive on the vehicle's main frame.

Any water or mud that sits in the bottom of the box will turn to rust. So eyeball the area around the box's mounting bolts. Enough rust in this area could let the box fall off the frame!

Use a wire brush to scrape off rust and old paint. After cleaning, protect the bare metal inside the box with bituminous coating compound, NSN 8030-00-290-5141.



SEE...

TRAVEL LOCK LOCKUP

WHAT
GIVES?

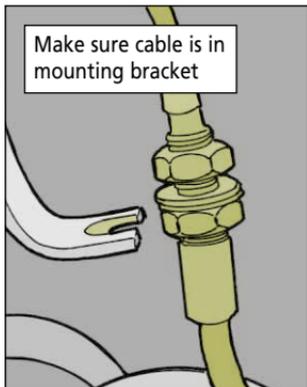
You'll be asking "What gives?" when the SEE's backhoe stays in the transport position after you pull the lock's release lever.

When that happens, take a look at the release lever's pull cable where it mounts into its bracket between the rear cab window and spare tire.

Vibration loosens the mounting bracket nuts and lets the cable slide out. So, nothing happens when you pull the release lever. Since the lock won't release, you can't move the excavator's backhoe into the upright position for digging operations.

If the travel lock on your SEE won't release, eyeball the cable where it fits into the mounting bracket. If the nuts are loose or the cable has slipped out of the bracket, report it to your mechanic.

Make sure cable is in
mounting bracket



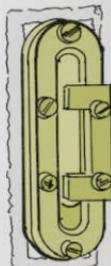
Stop Indicator Oil Leak

An oil leak from the sight indicator gauge on either of the SEE's hydraulic tanks usually means the screws that hold the gauge in place were overtightened.

Too much muscle on those screws will crush and split the rubber gasket behind the sight indicator. Then oil seeps past the gasket and runs down the side of the tank.

So easy does it, repairmen. The screws should only be snugged down by hand. If the gasket is leaking, replace it with NSN 6680-01-144-8984. It's part of the sight indicator assemblies shown in Figures 317 and 318 of TM 5-2420-224-24P.

Oil seeping
past gasket?

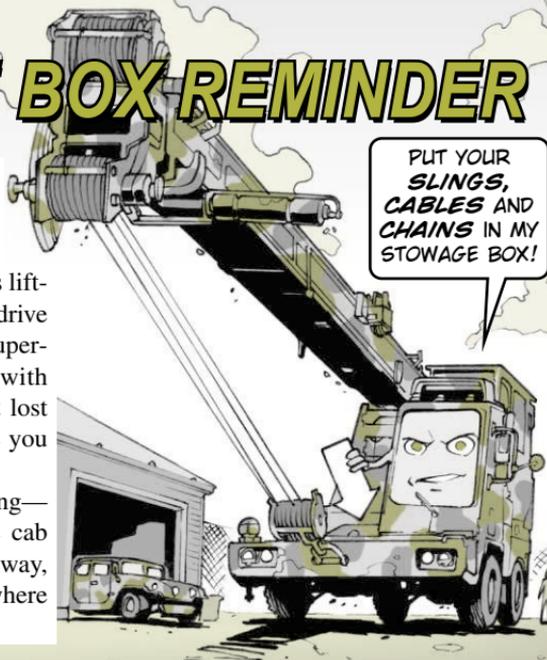


STOWAGE BOX REMINDER

You're not done with your crane, operators, until you've done your "good housekeeping."

That is, never leave the crane's lifting slings, cables, chains or pile drive attachments on the vehicle's superstructure when you're done with them. Anything left out can get lost when the crane moves, or cause you to slip and fall off the vehicle.

Put the items where they belong—in the stowage box next to the cab carrier—so they're out of the way, won't get lost, and you'll know where to find them.



Construction Equipment...

Cap Off Grease Fittings

Dear Half-Mast,

Our units just got some new excavators. They had small protective caps on the grease fittings. These caps keep the fittings clean and unclogged during field exercises. It's easier to take the cap off when it's time to lube than it is to replace the fittings because they won't take grease. Can we get more of these caps for other construction equipment?

SFC S.M.F.

Dear Sergeant S.M.F.,

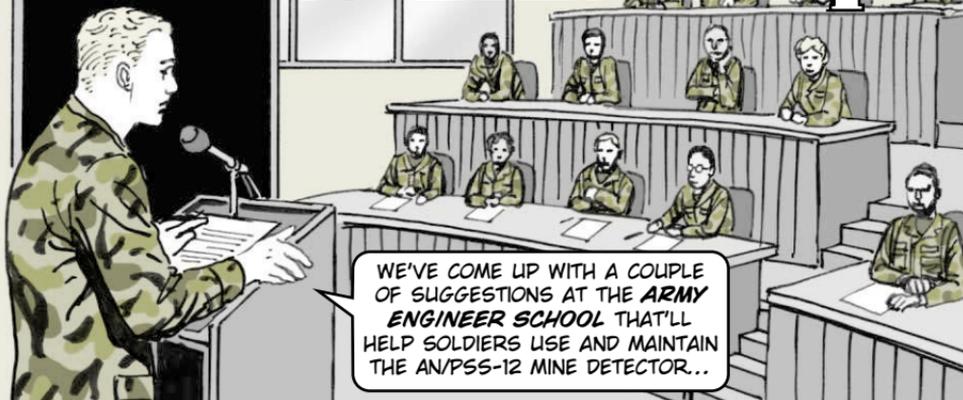
Caps are put on some equipment during manufacture. Other construction equipment gets them during rebuild to protect them against paint and dirt during that process.



They weren't intended to be replacement items, but if they're doing the job, use 'em. You can get more with NSN 4730-00-289-8148.

Half-Mast

Detect This Help



WE'VE COME UP WITH A COUPLE OF SUGGESTIONS AT THE **ARMY ENGINEER SCHOOL** THAT'LL HELP SOLDIERS USE AND MAINTAIN THE AN/PSS-12 MINE DETECTOR...

✱ When you adjust the detector's sensitivity, you're supposed to hold the head 2 feet off the ground and away from any metal that could interfere with the reading. It's hard to hold the head like that while making the adjustment, so we drop to one knee and brace the detector handle on the other knee.

That gives you the right height and makes it easier to hold the head in that position.



✱ When you're assembling the mine detector, plug the covers on the cable and earphone connectors into the covers for the electronics unit. That keeps the covers from disappearing and also keeps the covers from filling with dirt and sand that can find their way to the connectors.



SGT Mark Mitchell
USA Engineer School
Ft Leonard Wood, MO



ONE DENARIUS A DAY

IT'S THE YEAR 205 BC. JUST OUTSIDE CARTHAGE IN NORTH AFRICA, **PUBLIUS CORNELIUS**, THE COMMANDER OF THE ATTACKING ROMAN ARMY, IS TOTALLY BUMMED OUT...

WHY SO GLUM, BOSS?

YOU ARE MY SECOND IN COMMAND, ANTONIUS... I WILL TELL YOU.

HANNIBAL IS ATTACKING ROME. EVERYONE IS SICK OF THE SMELL OF **ELEPHANTS**. PEOPLE ARE SLIPPING AND FALLING IN THE STREETS. **PEANUT SUPPLIES** HAVE BEEN **EXHAUSTED**.

TO STOP HANNIBAL, WE MUST DESTROY **CARTHAGE...** AND MAKE HIM GIVE UP HIS ATTACK AND **COME HOME**.

IT'S IN THE **BAG**, BOSS. JUST LAY SOME DENARII ON ME FOR NEW EQUIPMENT AND WE'LL HAVE THE JOB DONE IN **NO TIME**.



CAN'T. ROME SAYS WE'RE SPENDING TOO MUCH MONEY. WE'VE GOT TO SAVE ONE DENARIUS A DAY... BUT... I CAN'T FIGURE OUT HOW WE'LL DO IT.



AND TO TOP IT OFF, MY GIRLFRIEND IS TEEED OFF BECAUSE WE'RE FIGHTING A **SECOND PUNIC WAR**.

WHY DIDN'T YOU GET THE JOB DONE THE **FIRST** TIME?



SORRY, BOSS... I GAVE UP TRYING TO FIGURE OUT WOMEN AFTER **PSYCHE** FELL FOR THAT LITTLE TWERP, **CUPID**.

BUT ONE DENARIUS A DAY SHOULDN'T BE TOO HARD.



WHAT'S HAPPENING THERE?

THE BLADES OF THEIR **PILLUMS** ARE **BUSTED**... SO... THEY'RE TURNING THEM IN FOR **NEW** ONES.

HOW MUCH DOES A **PILLUM** COST?

TWO DENARI-- THE **STAFF** COSTS ONE AND THE **BLADE** COSTS ONE.



IF YOU ONLY REPLACED THE **BLADE**, YOU'D SAVE A DENARIUS ON **EVERY PILLUM!**

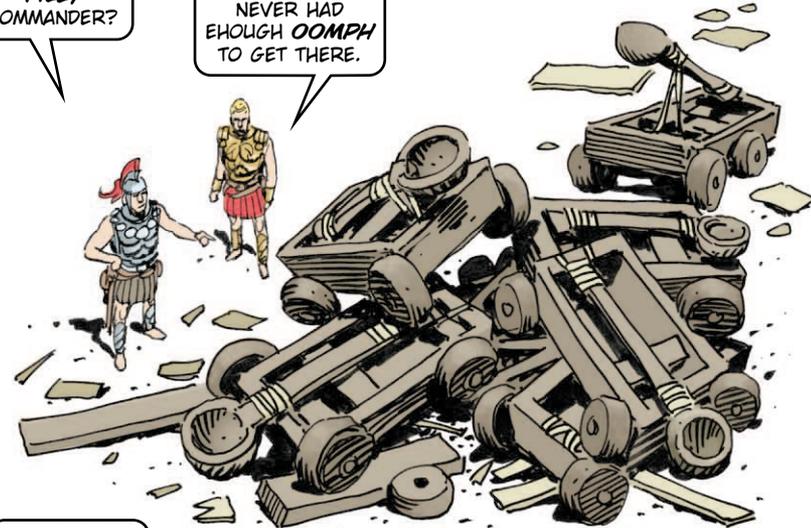
THAT'S **RIGHT!** REPAIR INSTEAD OF REPLACE. **GREAT IDEA!**



WHY ARE ALL THESE SMALL CATAPULTS IN THE **JUNK PILE**, COMMANDER?

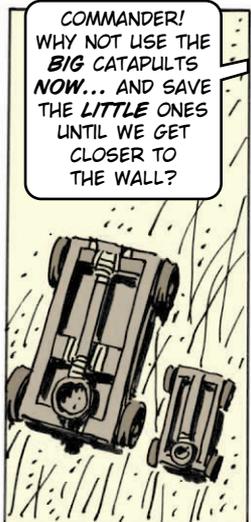


WE WORE THEM ALL OUT TRYING TO REACH THE WALL. THEY NEVER HAD ENOUGH **OOMPH** TO GET THERE.



HOW MUCH DOES A SMALL CATAPULT **COST?**

A **HAND-FUL** OF DENARI.

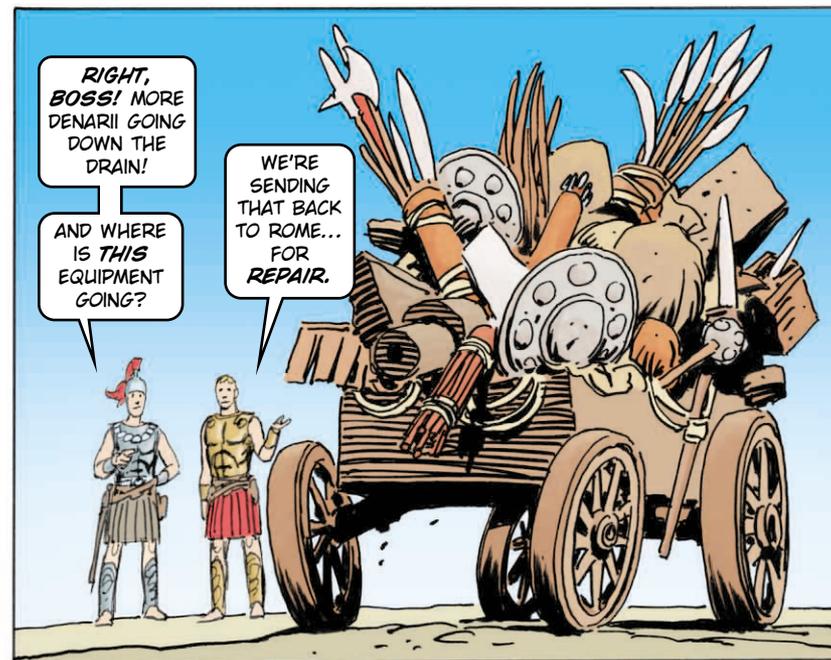
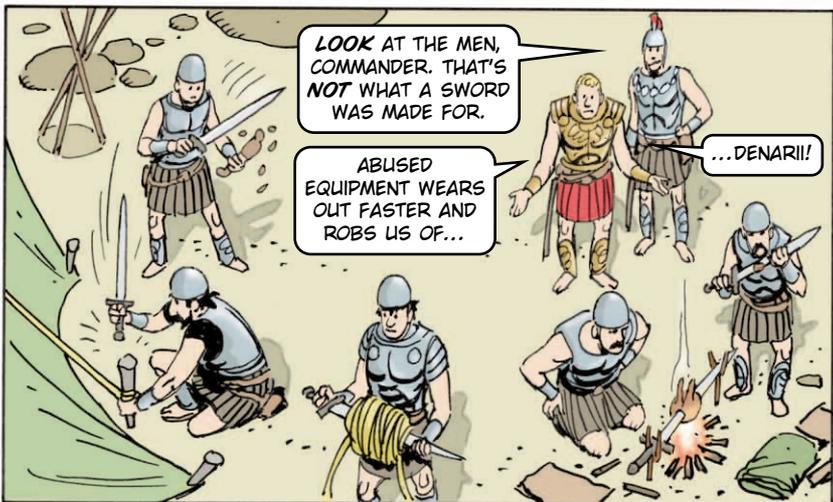
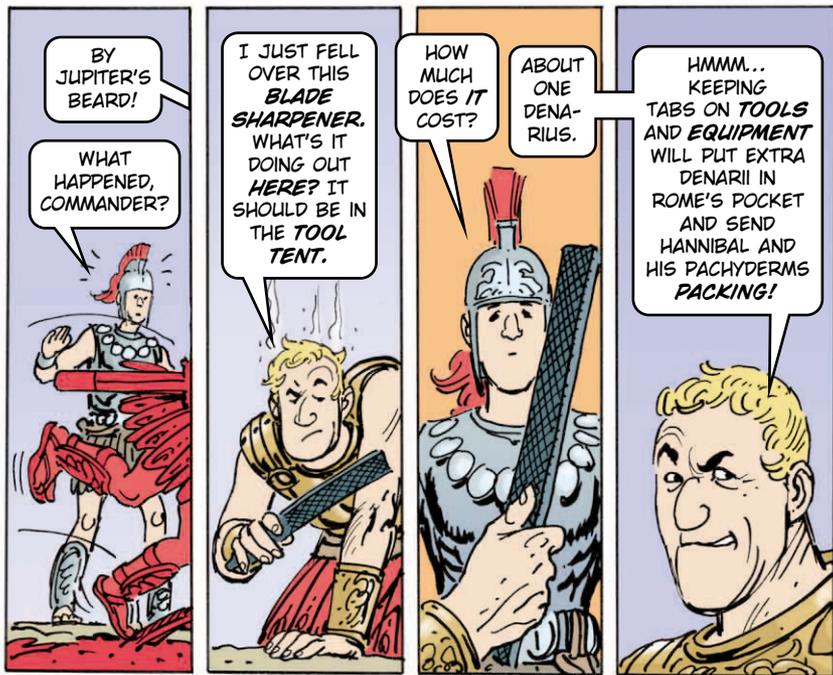


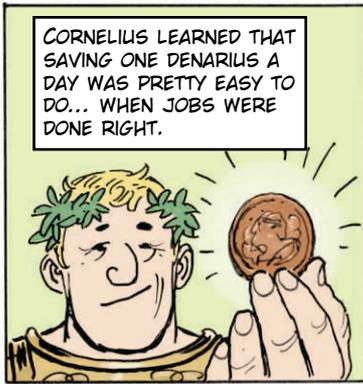
COMMANDER! WHY NOT USE THE **BIG** CATAPULTS **NOW**... AND SAVE THE **LITTLE** ONES UNTIL WE GET CLOSER TO THE WALL?



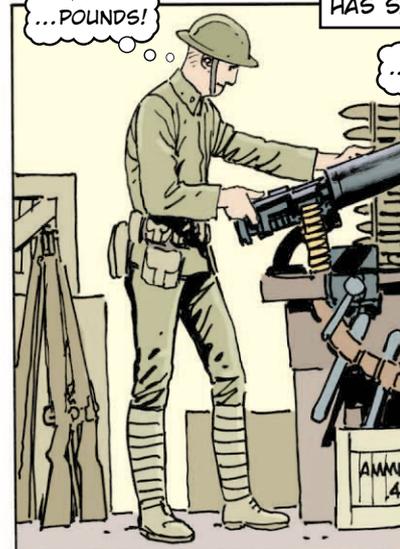
HMM... NOT ALL CATAPULTS ARE MADE TO DO THE **SAME** JOB. IT'S IMPORTANT TO USE THE ONE MADE FOR THE JOB AT HAND.

THE DENARIII ARE **PILING UP!**





THROUGHOUT HISTORY, GOOD PREVENTIVE MAINTENANCE HAS SAVED...

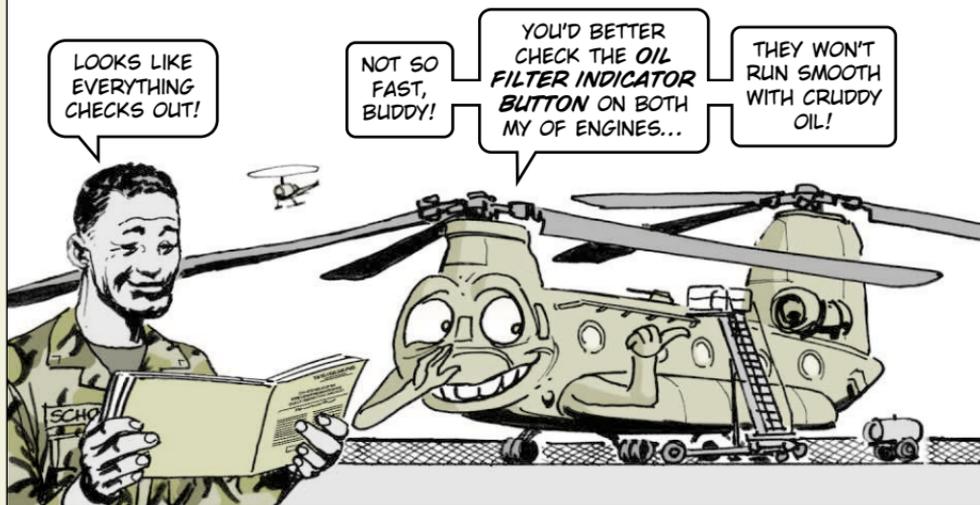


THE MORAL OF
THE STORY IS
"PREVENTIVE
MAINTENANCE
**SAVES
DOLLARS.**"

AND THOSE EXTRA
DOLLARS WILL
ENSURE THAT YOU
CONTINUE TO HAVE
"THE
**WORLD'S
BEST
EQUIPMENT**"
AND CONTINUE TO
MAINTAIN IT!



Check Oil Filters Daily

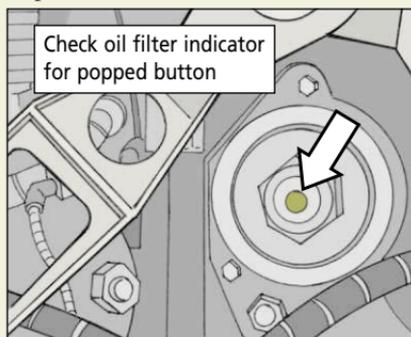


Repairmen, your Chinook engine's main oil filters are routinely replaced during 400-hour phase maintenance, but don't just blow off the daily check of the oil filter indicator buttons. Dirty oil filters can shut down your aircraft at any time, even in the air.

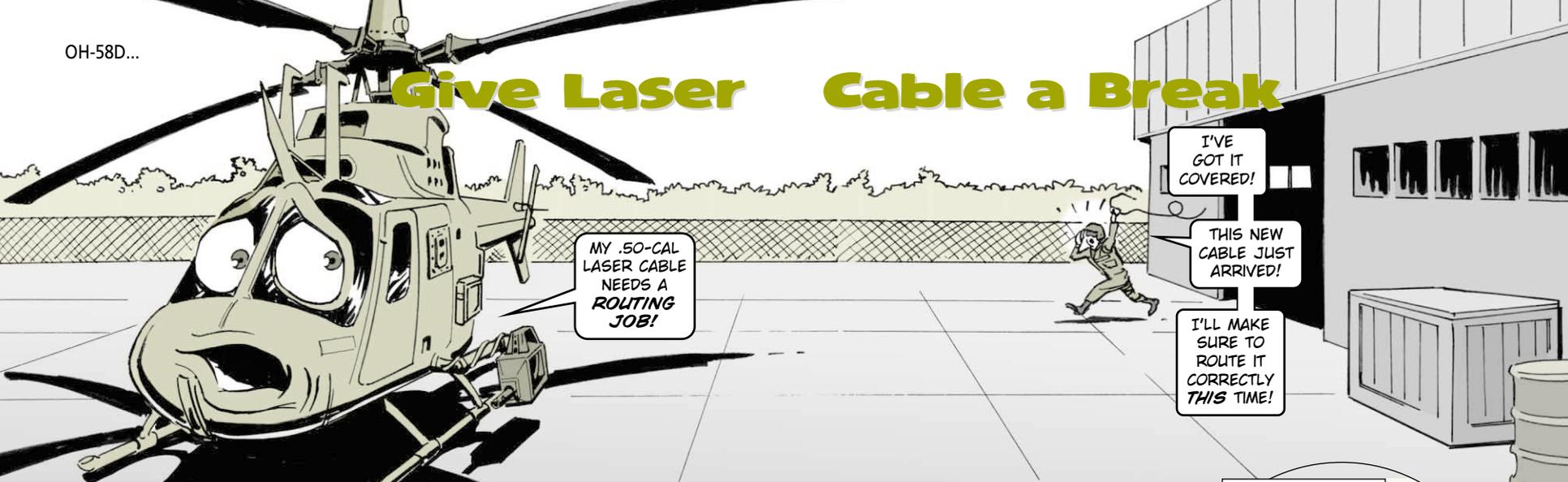
If your bird works like a workhorse, your engine's oil filters are working hard, too. If the filters get clogged during operation, the oil filter indicator button pops out to tell you it's time to change the oil, **now**.

If the button is popped and daily inspections are ignored, clogged filters let dirty oil pass through the engine system. That could damage engine bearings, then your aircraft is down for extensive and expensive repairs.

So, if you want those engines to run smoothly, inspect them every day, like it says in Sequence 7.8 and 8.6 of TM 1-1520-240-PMD. If the button is popped, service your oil filter like it says in Task 1-99 of TM 55-2840-254-23 on helicopters with T55-L-712 engines and Task 1-45 of TM 1-2840-265-23 on helicopters with T55-GA-714A engines. That'll keep your engines from getting burned by contaminated or dirty oil.



Give Laser Cable a Break



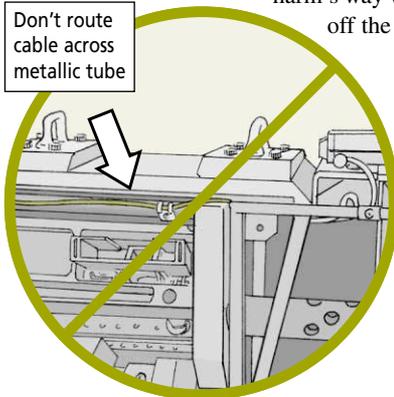
Armorers, you no longer have to make your own AIM-1 laser cable for the Kiowa Warrior's M296 .50-cal machine gun. A ready-made cable, NSN 6150-01-463-6570, is now available. It is Item 12 in Fig C-35 of TM 9-1090-214-23&P.

Now all you have to do is protect whichever cable you use. Do that by routing it inside the cage, along the gun charger harness assembly.

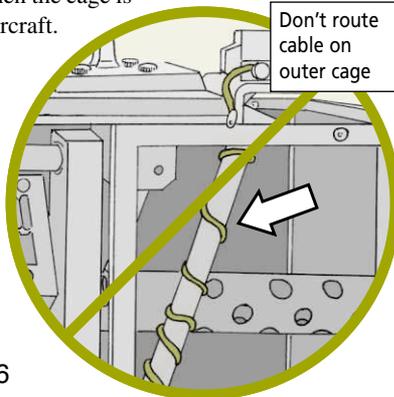
Homemade cables are often made too long. If you've still got your homemade cable and it's routed differently than the TM shows in Fig C-35, just re-route it. If the length makes it hard to get it all inside the cage, use the wire ties shown as Item 13 in Fig C-35. If you've run it underneath the gun, looped it up the side, or across the metallic tube of the cage or anywhere outside the cage—you've put the cable in

harm's way when the cage is off the aircraft.

Don't route cable across metallic tube



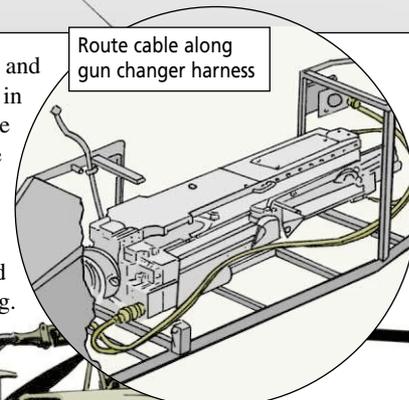
Don't route cable on outer cage



The cable is especially prone to snags and breaks. When you haul the cage around in a vehicle, for instance, the weight of the cage can pinch, crush or damage the long laser cable if it's not tied off.

To make matters worse, when you toss in flight vests and other gear, the cable gets tangled in the equipment and snags or breaks when you start unloading.

Route cable along gun charger harness



GIVE YOURSELF A **BREAK** FROM MAKING LASER CABLES...



...AND AVOID ALL THE **BREAKS, SNAGS AND ENTANGLEMENTS** FROM CLUTTER.

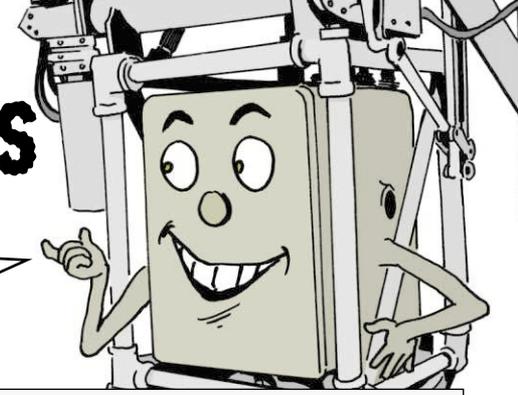
CLARIFYING ATC



THE ATC (AIR TRAFFIC CONTROL) EQUIPMENT COLD FACTS ARTICLE ON PAGE 37 OF PS 579 TELLS YOU HOW TO AVOID SHORT CIRCUITS AND BLOWN SEALS.

COLD FACTS

BUT IT DOES NOT TELL YOU HOW TO VENT THE RADAR SETS OR CHECK THE AZIMUTH DRIVE OIL LEVEL. HERE'S THE SCOOP...

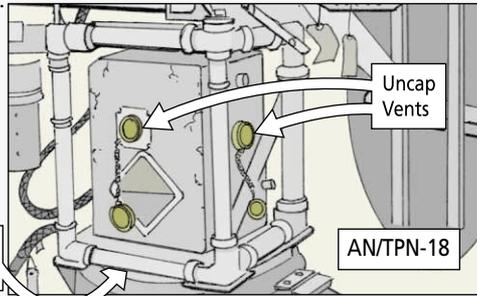


Venting Your Radar Set



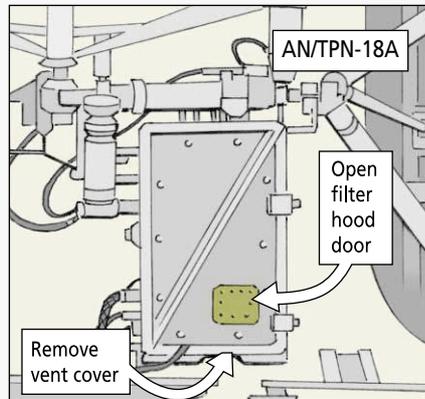
The AN/TPN-18 radar set has three ventilation points.

- ★ There are two capped vents. One is on the receiver-transmitter (RT) side panel and one is on the rear panel. Uncap both vents before turning the radar set on.
- ★ A vent cover is located on the underside of the RT. Remove the cover before turning the radar set on.



The AN/TPN-18A radar set has two ventilation points.

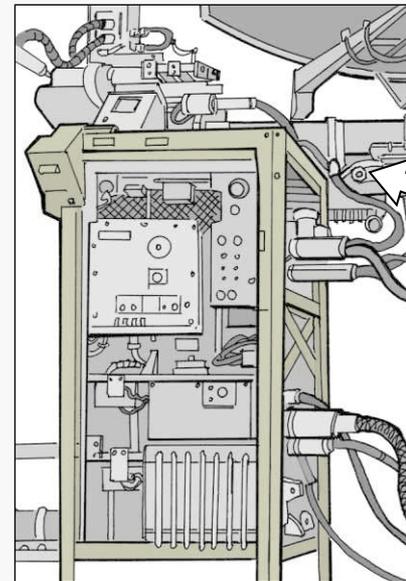
- ★ A vent cover is located on the underside of the RT. Remove the cover before turning the radar set on.
 - ★ A filter hood door is located on the front of the RT. Open this door before turning the radar set on.
- When the radar set is turned off, replace the covers, close the filter door and cap the vents when internal components have cooled down enough to prevent moisture buildup. You know the unit is **cooled down** when no heat radiates from the unit and it is cool to the touch.



Check Azimuth Drive Oil

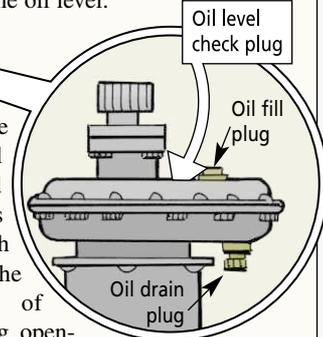


The azimuth drive illustration in TM 11-5840-281-12, and -12-1, tells you to check the oil level at the azimuth oil fill plug opening. But that spells trouble because the oil fill plug doubles as a vent for the azimuth drive. If you fill this reservoir with oil, you'll plug the vent and the overfill condition will lead to a blown azimuth drive seal.



The oil level check plug is located on the opposite side of the drawing pictured in your TM—and in PS—next to the J1003. You must remove the plug to check the oil level.

The oil level should always be flush with the bottom of the plug opening. Otherwise, you need to add oil. Check the oil level at the oil level check plug and overfill problems will be a thing of the past. So will blown seals.



Avenger Missile System...

PM WITH A VENGEANCE WILL KEEP YOUR AVENGER AVENGING.

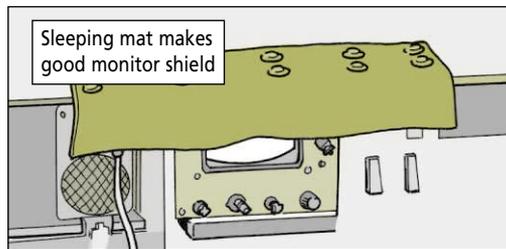
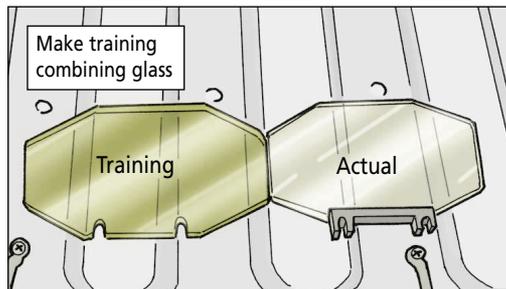
YOU GOT THAT RIGHT!

This and That for Your Avenger

Fabrication

Don't use the combining glass for training. It's breakable and very expensive. Have a training combining glass cut from plexiglass using the real glass for a pattern. Take the cheap sub to the field and leave the real one safely locked up.

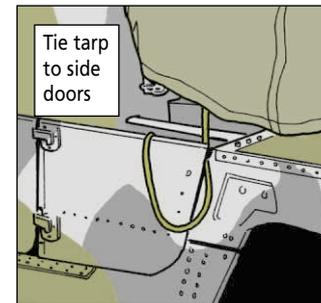
If the monitor shield for the forward looking infrared (FLIR) is broken, make a temporary replacement with an old sleeping mat, NSN 8465-01-109-3369. Use a good shield as your pattern. Order a new shield with NSN 1430-01-416-1436.



Tarp

If you use an old Bradley tarp to cover the entire Avenger when it's sitting in the motor pool, don't tie off the tarp inside the truck. That ruins the doors' seals. The best way to tie down the tarp is to use bungee cords attached to the tarp's ropes and to the underside of the HMMWV. No bungee cords? Tie off the ropes in the HMMWV's two half doors.

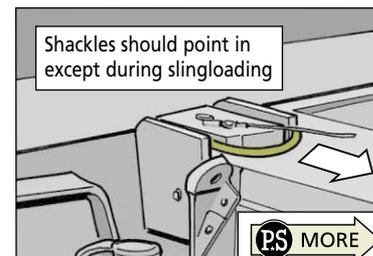
To order just the canopy cover, use a DD Form 1348-6 with PN 13265043 and a CAGE code of 18876 and RIC of B64.



Slingloading

Make sure the sling-lifting shackles point inboard except during slingloading. If they point out, they will gouge the missile pods when the pods are raised.

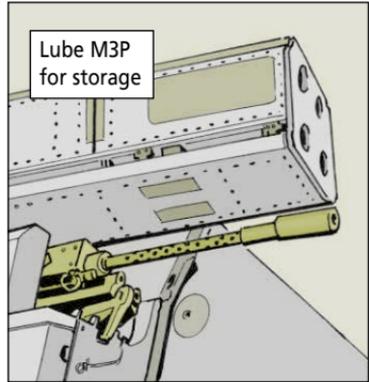
For slingloading, tie the ropes just to the HMMWV, but use the Avenger shackles as sling guides, not tie points. Never tie the ropes to any part of the Avenger. The back of the Avenger could be torn off.



M3P Machine Gun

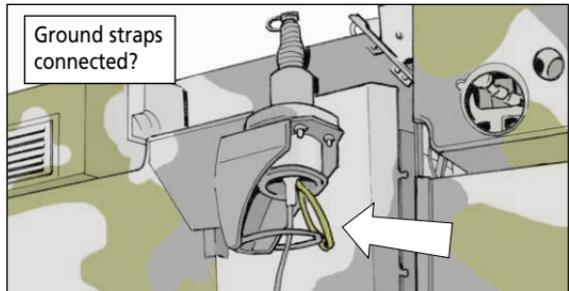
The M3P must be cleaned and lubed before it's stored in the arms room. Otherwise, corrosion can eat it up. Some units in humid areas report that the barrel is especially prone to corrosion. If the M3P hasn't been fired in 5 days, clean and relube it to boost its corrosion protection. Do not lube inside the bore or chamber, though—just lube the barrel's outside. Para 4-2 in TM 9-1425-433-10 gives the cleaning and lubing procedure.

Order a cover for the M3P on a DD Form 1348-6 with PN 13265042 and a CAGE code of 18876 and a RIC of B64.



Antenna Ground Straps

Make sure the antenna grounds are good during before-operation PMCS. If they're not, you'll have poor comms and you can also set off MILES when you use the radio. Good grounds are tight and have metal-to-metal contact with no corrosion.

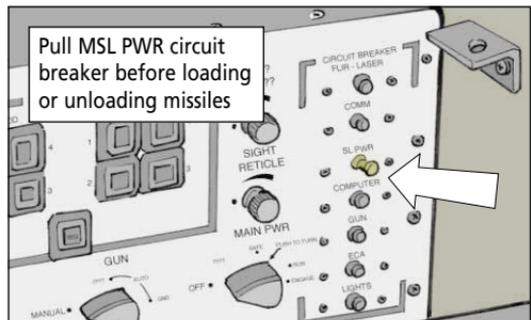


Travel

Don't strap camo netting to the canopy. The netting's weight throws the canopy out of alignment and ruins its seal.

Loading Missiles

Before you load or unload missiles—real ones or the training kind—in the standard vehicle mounted launcher (SVML), pull the missile circuit breaker on the gunner's console. If you forget, voltage will fry the launcher electronics assembly (LEA) cables and the ground pin in the launcher connector.



DRAIN AWAY DAMAGE



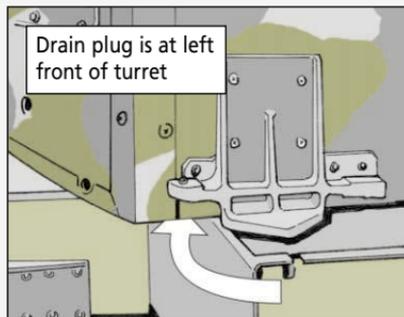
If water is collecting on the floor of your Avenger turret, something is wrong. The Avenger is supposed to be water-tight.

The problem is probably a defective access panel gasket or canopy seal. Tell your repairman. He can check it out and replace the gasket or seal if necessary.

In the meantime, you should get rid of the water before it causes electrical problems or damage to the floor. Just remove the drain plug from the floor panel at the front left of the turret and let the water drain out. Be sure to put the plug back in when you're finished.

If the plug is missing or damaged, your repairman can replace it with NSN 5340-01-026-3251.

One other place to check for water is the fuel catch pan for the heater ventilator. If water collects there, it can get into the fuel tank and contaminate fuel. So drain the pan weekly or after it rains.





Dear Editor,

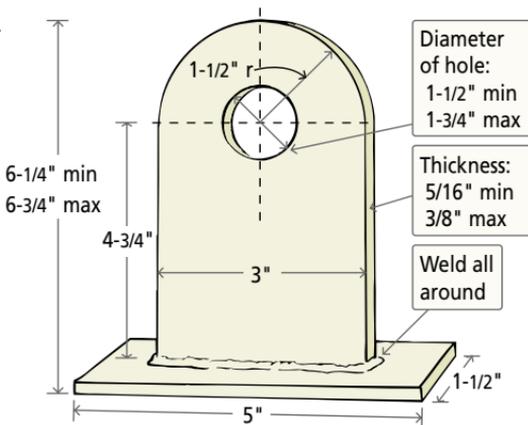
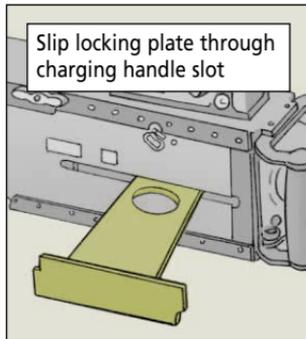
If you don't have a rack for your M2 machine guns when you go to the field (as is often the case with the National Guard), you must secure them by running a chain through the barrel extension holes.

Unfortunately, the holes aren't always the same diameter, so it's a pain to find a chain that fits all of them.

But I made a locking plate that solves the problem. Simply slide the plate through the charging handle slot and run the chain through the plate's hole. The plate can also be used to secure M2s in the arms room.

Your support can fabricate the locking plate using these plans and two pieces of 5/16-in steel, one 6 1/4 x 3 inches and the other 5 x 1 1/2 inches.

SSG Carl Young
TXARNG
Port Neches, TX



Small Arms...

HOW MANY DOES RACK HOLD?

Dear Half-Mast,

I know the Army prefers that units no longer fabricate racks for weapons that do not have a specific arms rack. They would rather have armorers use the universal arms rack, NSN 1095-01-454-6320, instead. Exactly how much does this rack hold? Armorers need to know so they will know how many racks they need.

SGT M.O.

Dear Sergeant M.O.,

The universal rack is 72 ½ inches tall, 25 inches deep and 54 ½ inches wide. It comes with five shelves (one shelf is removable). It fits six M16-series rifles or M4/M4A1 carbines or three of any of the machine guns per shelf.

The change to AR 190-11 covers the new rack policy. If you have questions about fabricating a small arms rack or have any rack questions, contact TACOM-RI's James Rollins at (309) 782-1797, DSN 793-1797, or e-mail rollinsj@ria.army.mil. You can also visit the small arms website at http://www-acala1.ria.army.mil/LC/cs/csl/small_arms_storage_racks.htm.

Universal arms rack



M16-Series Rifles, M4/M4A1 Carbines...

Half-Mast

CRACK DOWN ON CRACKED BOLTS

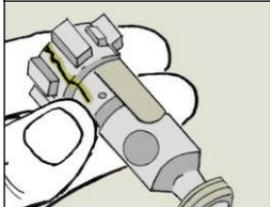
The bolt in an M16-series rifle or M4/M4A1 carbine can crack after it's slammed into the chamber enough times. A cracked bolt can cause jamming and other firing problems.

That's why you armorers need to check the bolts in your M16 and M4/M4A1s for cracks at least quarterly.

But a quick eyeballing won't catch all cracks. To spot small cracks, you have to first clean the bolts and then examine them under a bright light. Pay particular attention to the area around the locking lugs, especially on the extractor side.

If you spot any cracks, get support to replace the bolt.

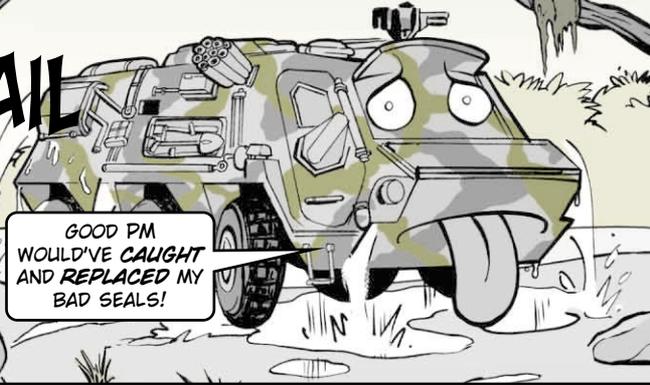
Check for cracks around locking lugs and extractor



KEEP FOX ON THE TRAIL



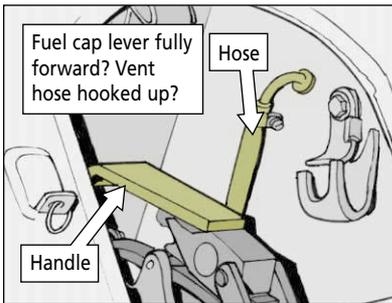
GOOD PM
WOULDN'T HAVE
CAUGHT
AND REPLACED MY
BAD SEALS!



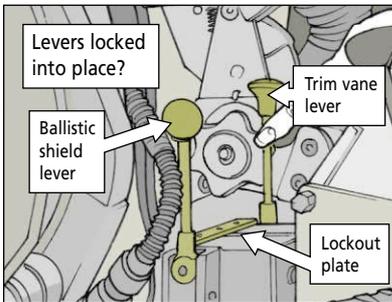
Remember a few precautions to help your Fox stay on the trail of chemical threats. Begin by making sure you have a copy of the Fox IETM, TM 9-6665-339-10. It's on EM 0177 and has an IDN of 280850 and PIN 076787-000.

Swimming and Driving

Before you swim the Fox, check that seals for the fuel tank access door and fuel cap are in good shape. Also make sure the fuel cap handle is fully forward. If the seals are bad or the handle's not forward or cap's not centered, water gets in the fuel and the Fox stalls. Also make sure the vent hose is hooked up, or water gets in there, too. See Item 51 in the PMCS in TM 9-6665-339-10's APG FOX 10-M-001.1 for more details.



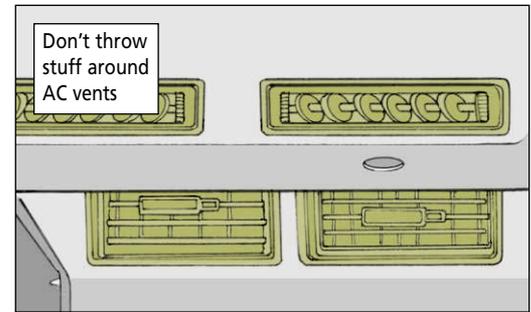
Before starting your Fox, make sure both the windshield ballistic shield lever and the trim vane lever are pushed forward. Once they are, be sure the lockout plate is all the way to the right and secured by its wing nut. That will keep the ballistic shield and trim vane from activating and blocking your vision.



When shutting down the Fox, make sure the ballistic shield and trim vane levers are locked either forward or rearward. That keeps hydraulic fluid from seeping back into its reservoir. That loss of oil makes the hydraulic pump run constantly to keep up the pressure. That can burn out the pump.

AC Knobs and Vents

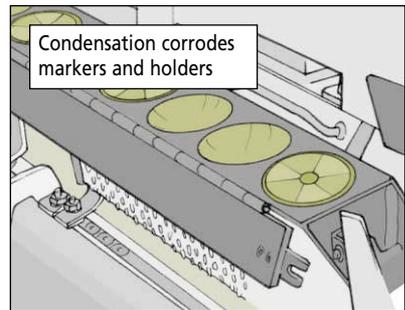
Take it easy with the air conditioning knobs and vents. Turn the AC knobs, don't pull on them. Never use pliers on the knobs if they jam. That just strips them. Keep stuff like camouflage away from the AC vents. That can damage vents and keep you from staying cool.



Fighting Humidity

If the Fox is going to sit for long periods in humid conditions, open the glove port. That lets air flow through the Fox and helps keep mildew from forming.

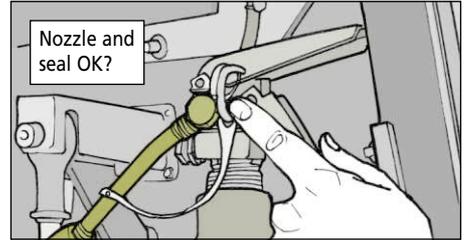
Moisture causes corrosion, which can ruin the markers and their holders. So, in humid weather, wipe the markers and their bases dry at least monthly.





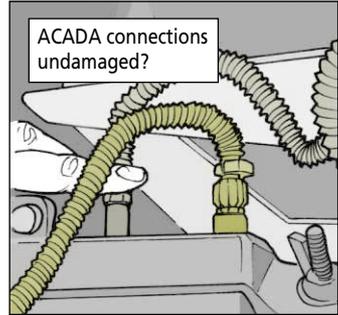
✓ **Fire Extinguisher Nozzle and Seal**

Some FOX units have had trouble with the rear door hitting the fire extinguisher and damaging its nozzle and seal. Make sure there's clearance between the door and fire extinguisher. If you spot problems, report them. You don't want to go to the field with an extinguisher that doesn't work. See Item 16 in APG FOX 10-M-001.1.



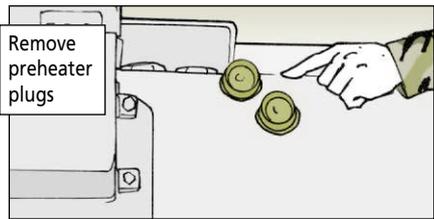
✓ **ACADA**

The back door has damaged some ACADA hose connections, too, which means no chemical alarm. The ACADA hoses should be routed behind the ACADA. Report any damaged connections.

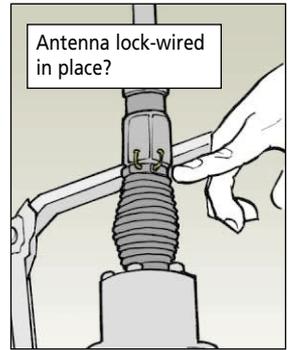


✓ **Preheater Plugs**

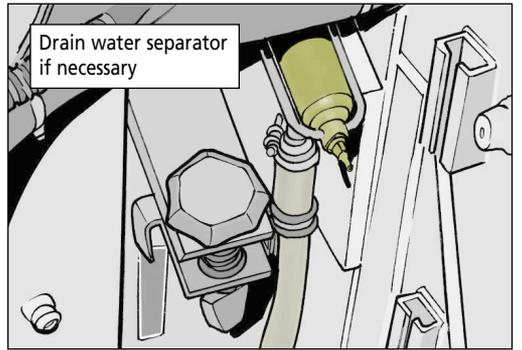
If you're going to operate the preheater in the field, remove the plugs. Otherwise, the heater will melt the plugs into the heater exhaust holes. Remember to reinstall the plugs when you're done. See the caution and note in APG FOX 10-0-042.



✓ **Antenna**
Make sure the antenna is lock-wired in place. That keeps the antenna tight and your communications clear.



✓ **NBC Collective Protection System**
Check the water separator and drain it if necessary. Make sure the filter housing is sealed. The water separator keeps the overpressure alarm gauge reading accurately.



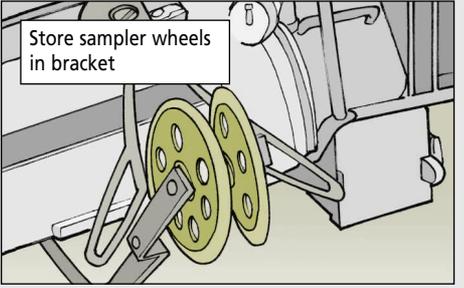
✓ **Drain Valves**

If mud or leaves clog any of the three drain valves, you won't be able to close them for operation. So clean the valves with rags and a wire brush, being careful not to use the brush on the valves' O-rings. Clean O-rings with the rag only. See Item 9 in APG FOX 10-M-001.1 for more info.

Trim Vane Caution
Never test the trim vane with the doors open. That will snap off the side mirrors. Close the door first. This is spelled out in Item 69 of APG FOX 10-M-001.1.



Stowing the Sampler
Keep the sampler wheels stored in the stow position. If you don't, the wheels can be bumped and the arms bent. Then the arms jam and you can't collect sample.





5 TO KNOW BEFORE YOU GO

Before you start to chemically clean your commo equipment, there are a few things you need to do:

1 Read TB 43-0135, *Environmentally Safe Substances for Use with Communications-Electronics Equipment*. This will tell you the things you can and can't use when cleaning your commo equipment.

Don't depend on your equipment TM to tell you what chemicals to use. Some still contain out-of-date information.

Don't have the TB? Have your pubs clerk order it. It's also available on the Logistic Support Activity (LOGSA) website at: <http://www.logsa.army.mil/pubs.htm>. Click on [Go to Electronic Technical Manuals Online](#).

If you have questions about a cleaning substance, e-mail CECOM at: John.Myer@mail1.monmouth.army.mil.

2 Use a face shield or splash goggles when using a chemical cleaner. NSN 4240-00-202-9473 or NSN 4240-00-542-2048 brings a face shield. NSN 4240-00-190-6432 or NSN 4240-01-292-2818 brings a pair of splash goggles.

Sometimes the scuttlebutt will tell you that a shield or goggles is not needed for a certain chemical. They may be right, but why chance it? Besides, is there **any** chemical that you want splashed in your eyes?

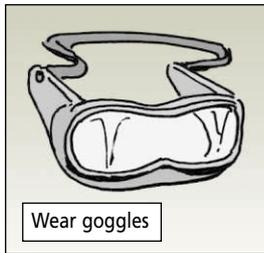
TB 43-0135

TECHNICAL BULLETIN

ENVIRONMENTALLY SAFE
SUBSTANCES FOR USE WITH
COMMUNICATIONS-
ELECTRONICS
EQUIPMENT

Distribution Statement A.
Approved for public release;
distribution is unlimited

HEADQUARTERS, DEPARTMENT OF THE ARMY
1 JUNE 1994



3 Wear disposable chemical resistant gloves. Chemicals not only ruin the skin on your hands, but soak into your body. If you use them regularly, you're putting more toxic chemicals into your body than you really want.



4 Never use more than 30 psi compressed air to dry commo equipment you've cleaned. And use only compressed air when the equipment was cleaned with soap and water or a water-based compound.

Never use compressed air to dry parts when a solvent cleaner has been used. Solvents must dry at their own pace to ensure they dissipate over a period of time. Quick-drying with compressed air puts a higher concentration of solvent fumes in the air and could cause illness or an explosion.



5 Good ventilation is a must when you clean with chemical cleaners. Ventilation disperses fumes over a wide area and dilutes their toxic potential. Poor ventilation concentrates those fumes and allows them to be drawn into your lungs.

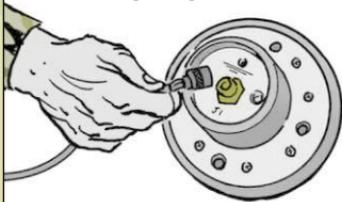
Most cleaning jobs don't require a respirator, but some might. If you have any doubts, check with your supervisor or safety office before you begin your cleaning chore.



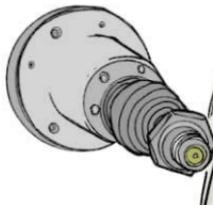
Signals Soar with Clean Contacts

DIRTY AND CORRODED CONTACTS ON THE AS-3900 SINGGARS VEHICULAR ANTENNA MEAN INTERMITTENT OR BROKEN TRAFFIC. WORSE YET, DIRT AND CORROSION CAN LEAD TO HIGH REFLECTED RF POWER, WHICH CAN DAMAGE THE RECEIVER-TRANSMITTER. SO HEED THESE TIPS FOR CLEAN CONTACTS...

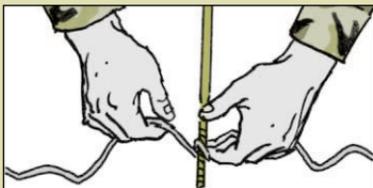
Unhook the RF cable before you begin cleaning. Don't take a chance on getting burned.



Unscrew the top and bottom antenna elements and clean the contacts with isopropyl alcohol, NSN 6810-01-190-2538, and a soft cloth. Clean the contact on the antenna base the same way.



Clean stubborn dirt and corrosion off the top element contact with 550 cord, NSN 4020-00-014-6699. Loop the cord once around the contact and pull it back and forth to clean out the ridges. Then wipe the contacts down with isopropyl alcohol.



After cleaning, apply a light coat of silicone compound, NSN 6850-00-177-5094, on the top and bottom element contacts. That'll help protect against corrosion.



If you remove the top element for any length of time, put a piece of electrical tape over the opening of the bottom element to keep out dirt and moisture. If you remove the bottom element, put a rubber dust cap, NSN 5340-01-316-0883, over the antenna base's contact to keep it clean and dry.



SINGGARS...

SPEAKER-FREE IS THE WAY TO BE



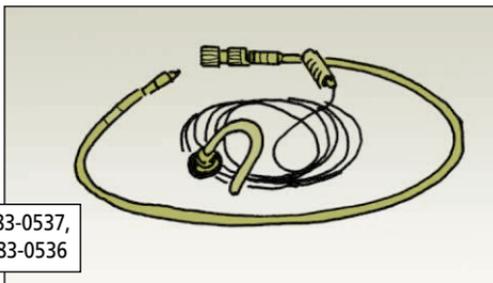
Want to monitor radio transmissions without the use of external speakers? Want a quieter and more secure environment while receiving radio messages?

If you answered yes, take that speaker off the hood of your HMMWV and replace it with an earphone cable, NSN 5995-01-483-0536, and a 10-ft extension cable, NSN 5995-01-483-0537.

Plug the extension cable into the AUDIO OUT receptacle at the top of your RT. Connect the earphone cable to the extension cable. Turn off any SINGGARS speakers you have hooked up. Now you, or your commander, are free to roam up to 10 feet away from the radio and monitor radio traffic without sharing the information with everyone in the surrounding area.

It also works with your manpack RT and any other radio having a standard 329/U audio connector.

Both cables are water resistant and joined together with a quick-disconnect. You must have the extension cable to use the earphone cable.



Get extension cable, NSN 5995-01-483-0537,
and earphone cable, NSN 5995-01-483-0536

Back Up Batteries with PM

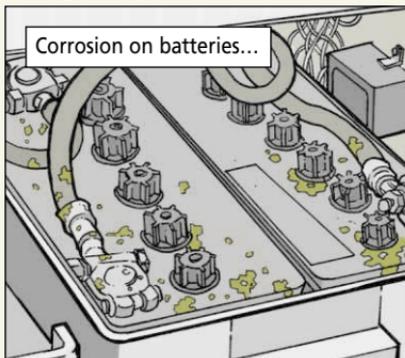
MY BATTERIES
HAVEN'T BEEN
CHECKED FOR
A LONG TIME!

I FEEL A
BAD BOLT OF
CORROSION
COMING ON!



The backup batteries in your mobile subscriber equipment (MSE) shelter aren't its primary power source, but that doesn't mean you should treat them like second-class citizens.

Unless you have maintenance-free batteries, ignoring them will lead to corrosion. When enough corrosion builds up, it drips onto the vent fan and its wiring. Pretty soon, wires short out and the vent fan won't work at all.



That lets dangerous fumes build up in the shelter. And it takes only one small spark to ignite the fumes.

So check the backup batteries and the battery box fan daily prior to performing the equalize charge procedure. You'll not only stop corrosion and its related problems, but the backup batteries will work when you need 'em.

Tools...

LET'S TALK TORQUE WRENCHES

KEEPING TORQUE WRENCHES UP TO SNUFF IS A TOUGH JOB. YOUR GENERAL AIRCRAFT MAINTENANCE MANUAL, TM 1-1500-204-23-9 HAS SOME INFO ON TAKING CARE OF THEM.

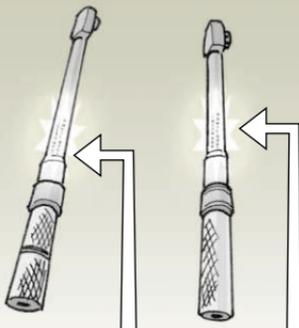
EVEN MORE INFO CAN BE FOUND IN TM 9-243, USE AND CARE OF HAND TOOLS AND MEASURING TOOLS.

PLUS, KEEP THESE POINTS IN MIND...



NOT ALL TORQUE WRENCHES ARE ALIKE. SOME TORQUE WRENCHES MAY LOOK THE SAME, BUT THEY CAN BE QUITE DIFFERENT.

IF A MAINTENANCE TASK REQUIRES TORQUE IN INCH-POUNDS, DON'T GRAB A FOOT-POUNDS WRENCH. EYEBALL THE WRENCH MARKINGS TO PICK THE CORRECT TOOL.



Check markings for foot-pounds...

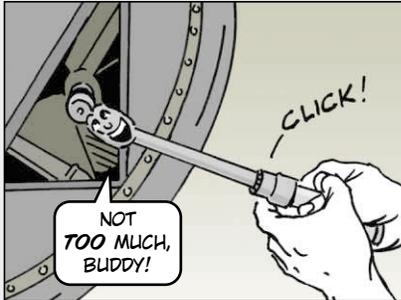
...or inch-pounds

REMEMBER THAT THE HIGH AND LOW READINGS OF A TORQUE WRENCH SCALE WILL NOT BE AS ACCURATE AS THE READINGS IN-BETWEEN. SO USE A WRENCH WHERE THE TORQUE YOU NEED FALLS IN THE MIDDLE TWO-THIRDS OF THE SCALE.

BEFORE YOU TORQUE, CLEAN ALL PARTS INVOLVED WITH DRY CLEANING SOLVENT. CLEAN THE THREADS OF THE FASTENER, THE MATING SURFACES AND THE HEAD OF THE WRENCH.



LUBRICATE A BOLT ONLY WHEN YOUR TM TELLS YOU TO LUBE IT. OILY THREADS REDUCE RUN-UP FRICTION AND ALLOW OVERTORQUE.



TORQUE THE NUT, NOT THE BOLT, UNLESS YOUR TM TELLS YOU DIFFERENTLY, AND WHEN THE TORQUE IS REACHED, **STOP**. SOMETIMES YOU **HAVE** TO TIGHTEN THE BOLT END—WHEN SPACE IS LIMITED, FOR INSTANCE. IN THAT CASE, ALWAYS TORQUE TO THE HIGH SIDE OF THE TORQUE RANGE. THAT'S BECAUSE YOU'VE ALREADY USED UP SOME TORQUE GETTING THE BOLT MOVING IN THE HOLE OR TO ALIGN PARTS.

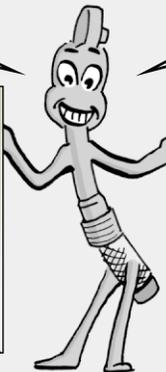
GETTING AN ACCURATE TORQUE MEANS GOING SLOW AND STEADY UNTIL YOU REACH THE REQUIRED TORQUE. HERKY-JERKY MOTIONS MAKE FOR BAD READINGS.

IF YOU THINK A READING IS BAD, BACK OFF THE NUT WITH A STANDARD WRENCH AND RETORQUE. NEVER USE A TORQUE WRENCH FOR LOOSENING. THAT'LL DAMAGE ITS CALIBRATION.



SEIZURES RUIN READINGS. DURING THE LAST FEW TURNS, JUST BEFORE YOU REACH THE TORQUE YOU WANT, YOU MIGHT HEAR A POPPING SOUND. IT MEANS THE FASTENER HAS STOPPED TURNING MOMENTARILY. SO BACK OFF THE FASTENER WITH A STANDARD WRENCH AND RETORQUE.

A TORQUE WRENCH IS **NOT** A HAMMER, SO DON'T USE IT LIKE ONE.



LIKewise, DON'T TOSS OR DROP THE WRENCH. ROUGH TREATMENT KO'S CALIBRATION.



ONCE YOU'VE FINISHED TORQUING ME, TAKE THE PRESSURE OFF MY BUDDY'S SPRING BEFORE YOU PUT HIM AWAY!



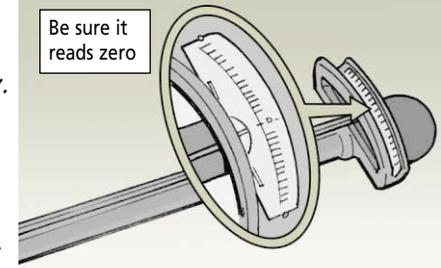
WHEN YOU FINISH A JOB, CHECK THE MANUFACTURER'S MANUAL THAT CAME WITH THE TORQUE WRENCH. IT SHOULD TELL YOU WHAT SETTING TO USE FOR STORING THE WRENCH.

IF YOU HAVE A BENDING-BEAM TORQUE WRENCH, JUST STOP TURNING AND REMOVE THE WRENCH. THE POINTER RETURNS TO ZERO. BE CAREFUL, THOUGH. THE POINTER IS NOT PROTECTED. IF YOU BEND OR DAMAGE IT, IT WON'T MAINTAIN CALIBRATION. THEN THE NEXT GUY WON'T BE ABLE TO USE THE WRENCH. IT MUST BE TURNED INTO YOUR LOCAL TMDE SHOP FOR CALIBRATION AND REPAIR.

MICROMETER AND OTHER TORQUE WRENCHES CAN BE SET AT ZERO BEFORE STORAGE UNLESS YOUR TOOL ROOM SOP SAYS DIFFERENTLY.

SETTING THE READING TO ZERO TAKES PRESSURE OFF THE SPRING WHILE IT'S NOT IN USE. IF YOU LEAVE THE PRESSURE ON, THE CALIBRATED SPRING WILL STRETCH, WEAKEN, COLLAPSE OR LOSE TENSION. THAT CAN RUIN ITS ACCURACY.

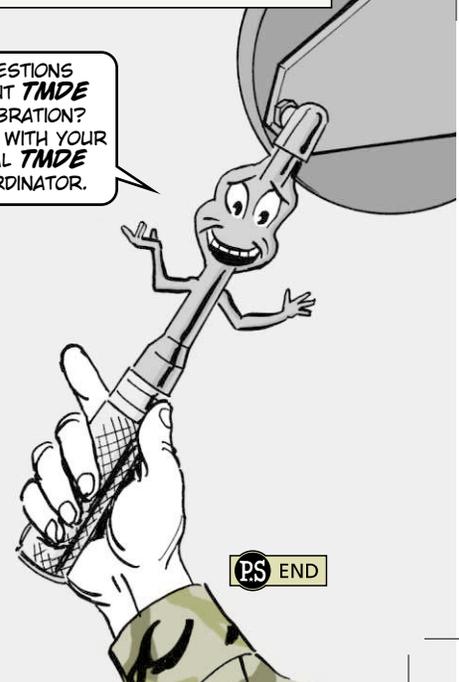
Be sure it reads zero



FINALLY, STORE EACH WRENCH IN ITS OWN BOX. NEVER THROW ONE INTO A TOOL BOX WITH OTHER TOOLS. YOU'LL DAMAGE IT EVERY TIME.



QUESTIONS ABOUT **TMDE** CALIBRATION? CHECK WITH YOUR LOCAL **TMDE** COORDINATOR.



Ideas + SMART = \$\$\$



| Name/ Location | Approved Suggestion | Recommended Award |
|--------------------------------------|--|----------------------|
| SFC John Haver ARCOM, KY | Use a wheel dolly to remove brake drums | \$ 500 |
| SFC Patrick Flatley Ft Carson, CO | Designed a target to zero the carbine's advanced combat optical gun sight | \$ 4,651 |
| Peter Kohler Vilseck, Germany | Change stud size markings from symbols to industry size marking standard | \$ 100 |
| SPC Robert Whelan Ft Bragg, NC | Redesign of locking bar to secure the ASIP radio | \$ 100 |
| SPC Mickey Delo Ft Campbell, KY | Use Earthday products on non-tactical vehicles (local use only) | \$ 100 |
| SGT F Silvestrucci TX ARNG | Use guard to prevent accidental discharge of halon on Bradley Fighting Vehicles (local use only) | \$ 100 |
| 2LT Jerry Diamond Ft Riley, KS | Use bracket mod on FISTV digital message device (local use only) | \$ 100 |
| Hitoshi Namihira US Army-Japan | Use newly designed trailer light set (local use only) | \$ 250 |
| SGT Andres Chamorro Otis ANGB, MA | Created special tool to remove the UH-60 engine output drive shaft | \$ 1,000 |
| CW3 Robert Selje Ft Campbell, KY | Change OH-58D TMs to require the pulling of AVTR circuit breakers before changing engine throttle from flight to ground idle | \$ 250 |
| SPC Barry Pribis Ft Bragg, NC | Use silicone fluid and a tighter cap to reduce rust on brake parts | \$ 250 |
| CPT David Dejardins Ft Irwin, CA | Created concertina wire holder | \$ 1,000 |
| Jeffery Hazel Johnson, IA | SMR code change authorized unit level repair of Items 7 & 8, Fig C-6, TM 11-5855-238-23&P | \$ 500 |

| Name/ Location | Approved Suggestion | Recommended Award |
|--|--|----------------------|
| SSG Lawrence Owens San Diego, CA | Designed unexploded ordnance (UXO) marker | \$ 500 |
| Johnny Massingill Waco, TX | Add fuel additive to M1022A1 fuel pump to decrease costly repairs | \$ 250 |
| 1SG David Leak Hope Hall, AL | Designed UH-60 transmission oil adjustment tool to increase safety and cut repair costs | \$ 750 |
| Jeffery Comet Ft Drum, NY | 15-KW generator governor repair option authorized at installation level | \$ 750 |
| SSG Scott Roth Redstone Arsenal, AL | Designed CLU basic sight and housing alignment tool to prevent CLU circuit card/pin damage | \$ 2,577 |
| SGT S. Williamson Johnson City, TN | 130G grader tire repair safety increased by requiring tire cage use for tires with split rings | \$ 250 |
| SGT John Theobald Ft. Hood, TX | ID'd NATO slave cable for optional use on MIL-STD generators | \$ 250 |
| WO1 Adam Hagenston Ft Lewis, WA | ID'd brass elbow replacement for use instead of ECU plastic elbow | \$ 100 |
| Ken Hynes Tom Kirchgessner Rochester, NY | Created special tool for repairing HEMTT transfer case | \$ 250 |
| SGT Jason Greegor APO AE 09054 | Fabricated M871-series semi-trailer bulkhead wing panels | \$ 250 |
| SFC J. B. Thomas APO AP 96257-0456 | Redesigned locking bar for ASIP radio set | \$ 1,000 |
| SGT Daniel Martin Cp Beauregard, LA | Designed mod kit to add plate on generator door | \$ 250 |
| CSM Robert Heaps Davenport, IA | Change to the CH-47D hydraulic purification procedures | \$ 3,748 |
| Gary Grubbs Grand Prairie, TX | Modified retaining clips on CH-47D cowling door strut | \$ 500 |
| CW2 R. Mitchell Ft Wainwright, AK | Created hands-free earpiece and microphone headset for SINCGARS | \$ 1,000 |
| CW2 Mark Chapman Ft Wainwright, AK | Changed SINCGARS RT-1523E radio display glass repair procedure | \$ 250 |



Here's how to get your idea to the SMART program. Go on-line to http://www.cascom.army.mil/multi/project_smart/index.cfm and click on Initiate a SMART Idea Here! Complete the on-line SMART form and click on Submit. Call (804) 734-2435/2406 or e-mail SMART@lee.army.mil for additional SMART program information.

POST SCRIPTS

M35A3 CTIS Fittings

Note these NSN corrections for the CTIS manifold fittings in Fig 174 of TM 9-2320-386-24P for the M35A3 2 1/2-ton truck until the TM is changed or updated:

| Item | NSN 4730- |
|----------------------------|-------------|
| 1- pipe plug | 01-407-9281 |
| 2- pipe elbow | 00-278-4497 |
| 3- elbow boss | 01-406-8756 |
| 4- elbow, pipe-to-boss | 01-412-5201 |
| 5- pipe elbow | 00-277-8257 |
| 10- pipe bushing | 00-278-3167 |
| 11- elbow, pipe-to-tube | 01-419-0301 |

Items 6 through 9 are OK as shown.

M9 ACE Vents

The engine and radiator on an M9 ACE need lots of air to keep things running cool. So never lay cargo nets, duffle bags or ALICE packs on the engine intake grilles. A covered screen causes the engine and transmission to overheat.

MLRS CALKING COMPOUND

Use NSN 8030-00-965-2397 to get calking compound for coating the hull drain plug threads on your MLRS carrier. The calking compound listed as Item 14 in Appendix D of TM 9-1450-646-20-5 is no longer available.

M796/M796A1 BRAKE PARTS

Items 2 and 14 are reversed in Fig 9 of TM 9-2330-287-14&P for the M796/M796A1 bolster trailer. Item 2 is a metal tube assembly, NSN 4710-01-115-0647, and Item 14 is a non-metallic hose assembly, NSN 4720-01-162-4361. Make notes 'til the TM is updated.

SOAK UP SPILLS

NSN 7930-00-269-1272 gets a 51-lb bag of absorbent compound for soaking up oil and fuel spills. Just sprinkle the compound on the spill and sweep it up after the spill is absorbed. Then dispose of the compound in a proper HAZMAT container. Table 1 of CTA 50-970 is your authority for ordering.

The Latest on SKOs

The most up-to-date info on sets, kits, and outfits (SKO) can be found on the Internet at <http://158.2.5.50/codebase/index.html>. The info is updated each April and September. For questions about SKOs, contact TACOM-RI's Byron Gaskins, (309) 782-1123, DSN 793-1123, gaskinsb@ria.army.mil.

STE-M1/FVS Probe Assembly

Don't waste time using NSN 6625-01-102-6878 to get a new TA1 test probes assembly for your STE-M1/FVS test set. The only way to get the assembly is by ordering each of its 12 components. They're listed in Fig F-6 of TM 9-4910-751-14&P.

Patriot Tire Change

The Firestone bias tires, NSN 2610-00-142-5136, that were used on the Patriot missile system's M860A1 trailer are no longer available. So use Goodyear or Michelin radial, NSN 2610-01-286-5798. Neither radial tire should be used with the Firestone bias tire, but radials can be used together no matter who the manufacturer is. Radial tires should be inflated to 100-105 psi cold. Inflate bias tires to 65 psi. This info will be added to TM 9-2330-383-14&P.

Unsafe 7-Ton Trestles

Last month, we said to destroy unsafe 7-ton trestles, NSN 3950-00-251-8013. Unfortunately, there was confusion as to which trestles are unsafe. TACOM-RI says to destroy all 7-ton trestles made by Martinez & Sons under their 1979 contract (look for DAAA09-79-C-4216 on the ID plate) and all 7-ton trestles which have no ID plates and whose manufacturer can't be confirmed. Questions? Contact TACOM-RI's Betty Maytas at DSN 793-1997, (309) 782-1997 or by e-mail at MaytasB@ria.army.mil.

H-350 Handset Cables

Get a 15-ft extension cable for the 6-pin, H-350 telephone handset with NSN 5995-01-386-5152. A 25-ft extension cable comes with NSN 5995-01-386-5153.

ELECTROSTATIC DISCHARGE PROGRAM

You can enroll over the Internet in the Army's correspondence course program on electrostatic discharge called *Packaging and Handling of Electrostatic Discharge Sensitive Items*, course number 908F36-PT3600. Go to: <http://www.atsc.army.mil/accp/dlstd.htm>

LOOKING FOR MAPS?

Lost on how to find maps for your unit? Follow these directions. Classified maps are ordered by NSN, but are controlled by battalion S-2/S-3 shops. Unclassified maps have NSNs, too, but are ordered and controlled by unit supply.

Unclassified maps are listed on an Army-approved web site that provides detailed ordering info. Go to <http://www.dsccr.dla.mil/pc9/rmf.htm>. If you still have questions, contact the US Army Combined Arms Support Command (CASCOM) at DSN 687-1167, (804) 734-1167 or by e-mail at bella@lee.army.mil.

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

Do YOU Know This Form?

IF YOU KNOW IT, *WHY* AREN'T YOU FILLING IT OUT PROPERLY?

DA FORM 5988-E

DATE: 28-APR-90
EQUIPMENT INSPEC: B CO. 101
WK4WRG

EQUIPMENT DATA
EQUIP SERIAL NUM: 050493
REGISTRATION NUM: NG38NA
TYPE INSPECTION: W
CURRENT READING: M 010987

ADMIN NUM: B12
EQUIP MODEL: TRK UTL CSO 1.25T 4X4
EQUIP NSN: 2320011077155

PUBLICATION: TM 9-2320-280-10
EQUIP NSN: 2320011077155

SIGNATURE: _____ DATE: 02
TIME: 00

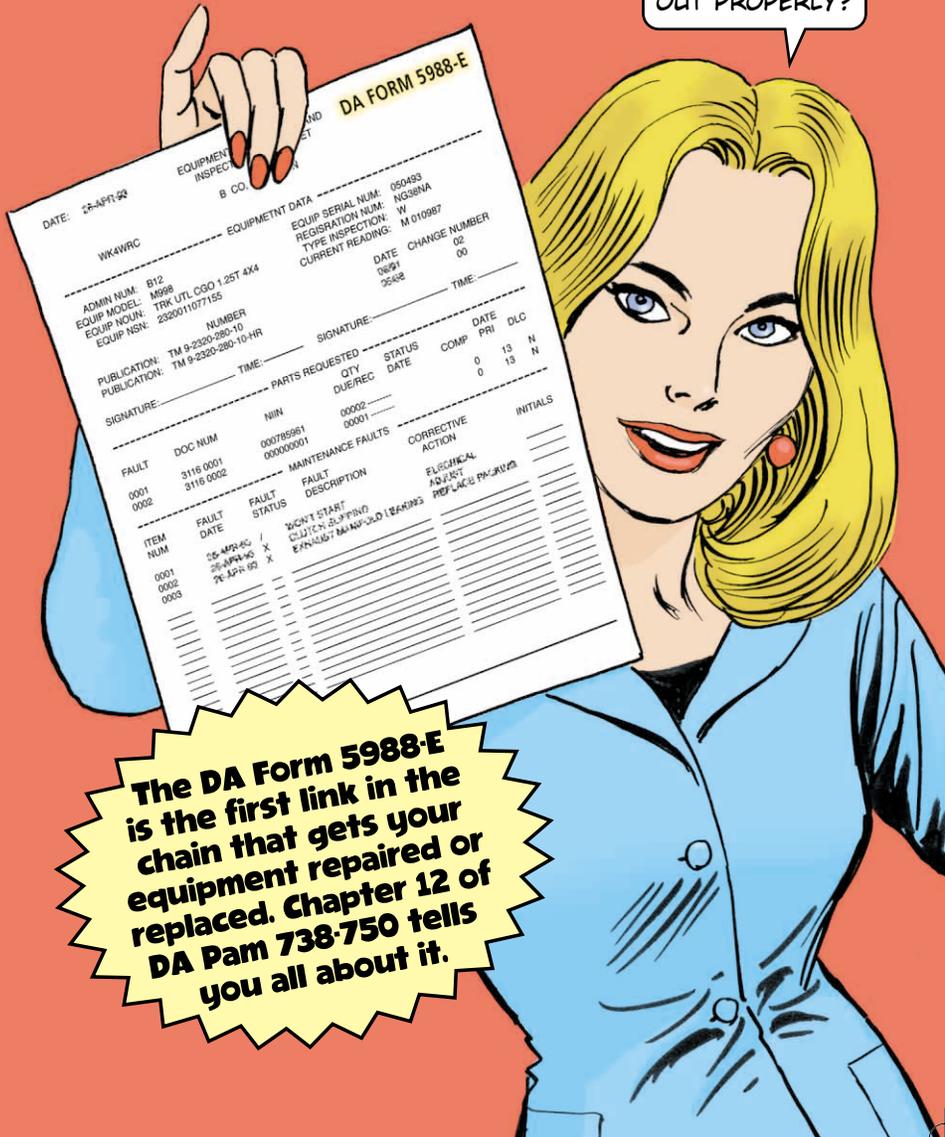
| FAULT | DOC NUM | NIN | 0002 | SIGNATURE | DATE | DLC | |
|-------|-----------|-----------|-------|-----------|------|-----|-----|
| | | | | | | | QTY |
| | | | | | | | |
| 0001 | 3116 0001 | 000785961 | 00002 | | 0 | 13 | N |
| 0002 | 3116 0002 | 000000001 | 00001 | | 0 | 13 | N |

| ITEM NUM | FAULT DATE | FAULT STATUS | FAULT DESCRIPTION | CORRECTIVE ACTION | INITIALS |
|----------|------------|--------------|-------------------|-------------------|----------|
| | | | | | |
| 0001 | 28-APR-90 | X | | | |
| 0002 | 28-APR-90 | X | | | |

The DA Form 5988-E is the first link in the chain that gets your equipment repaired or replaced. Chapter 12 of DA Pam 738-750 tells you all about it.

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