



# THE PREVENTIVE MAINTENANCE MONTHLY

ISSUE 756 NOVEMBER 2015



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TB 43-PS-756, 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. The use of product or company names does not constitute endorsement of those products, services or companies by the U.S. Army. The use of non-DoD hyperlinks, along with their content, does not constitute endorsement by DoD or DA. Neither DoD nor DA exercises any editorial control over, and cannot vouch for, content on non-DoD websites.

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2015

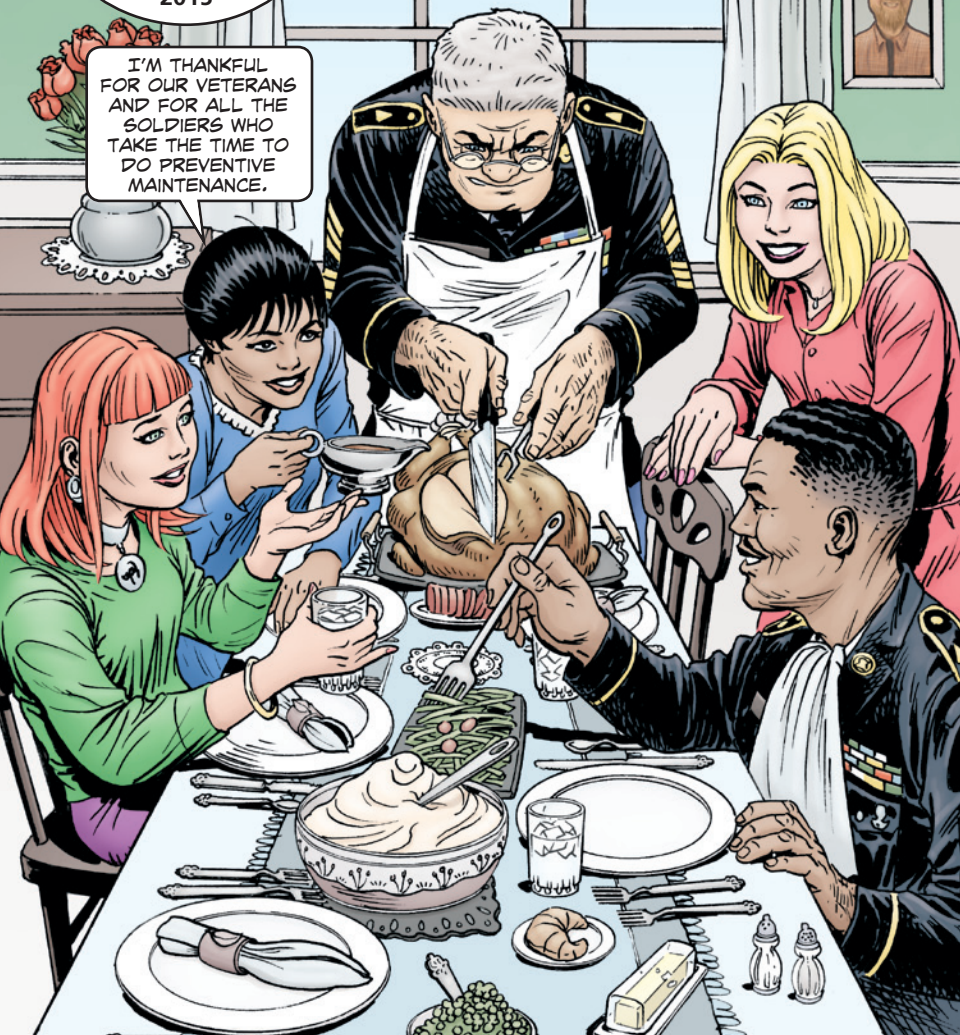
# THE PREVENTIVE MAINTENANCE MONTHLY

TB 43-PS-756

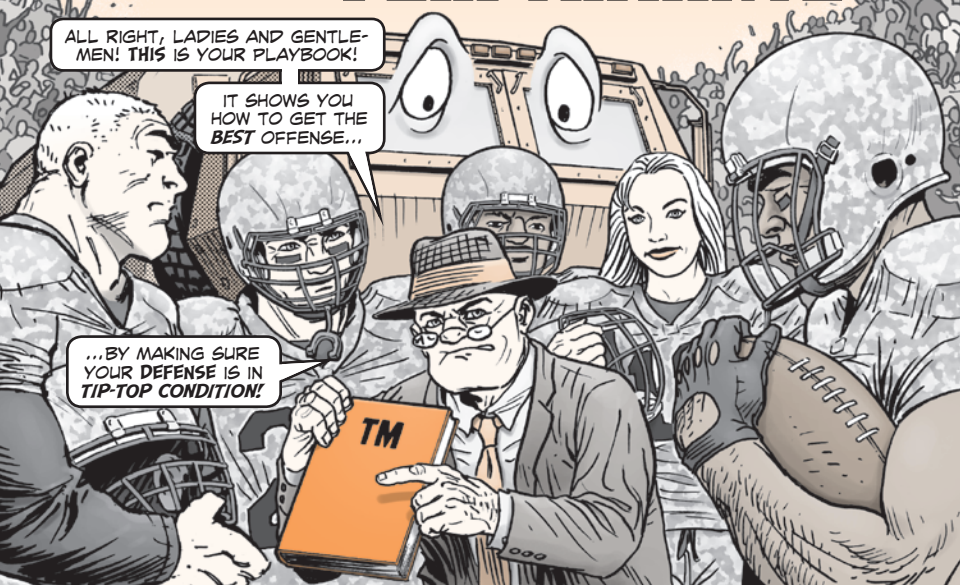
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I'M THANKFUL  
FOR OUR VETERANS  
AND FOR ALL THE  
SOLDIERS WHO  
TAKE THE TIME TO  
DO PREVENTIVE  
MAINTENANCE.



# PM PROPELS PERFORMANCE



*"The best offense is a good defense."* Ever heard that saying? Successful sports teams like to say that, meaning that if the other team doesn't score much (or at all), it's a lot easier to win.

Translate that to winning on another field—the battlefield. If the enemy can't beat your defense, he's not going to win many battles.

So how do you toughen up your defense for the battlefield? By constant application of preventive maintenance to your vehicles and equipment.

While military tactics deploy Soldiers and equipment as situations dictate or where advantage can be gained, it is the condition of equipment that holds the line and helps carry the mission.

*Would you stake your life right now on the condition of your equipment?*

If there's any doubt, get out the operator and maintenance pubs for your equipment and do what they tell you. Just as the pros like their chances of winning when the defense is top-notch, our chances greatly improve when your defense is PM.

**WE HAVE THE WORLD'S BEST EQUIPMENT...**  
**TAKE CARE OF IT!**





THIS HAS  
BEEN A GREAT  
NTC ROTATION!

YEP,  
THANKS TO  
GOOD PM!

### Combat Vehicles!

- M1-series final drives
- M1-series turret cracks
- M119A3 firing pins
- Bradley M242 connector
- Bradley engine access door
- Bradley IETM

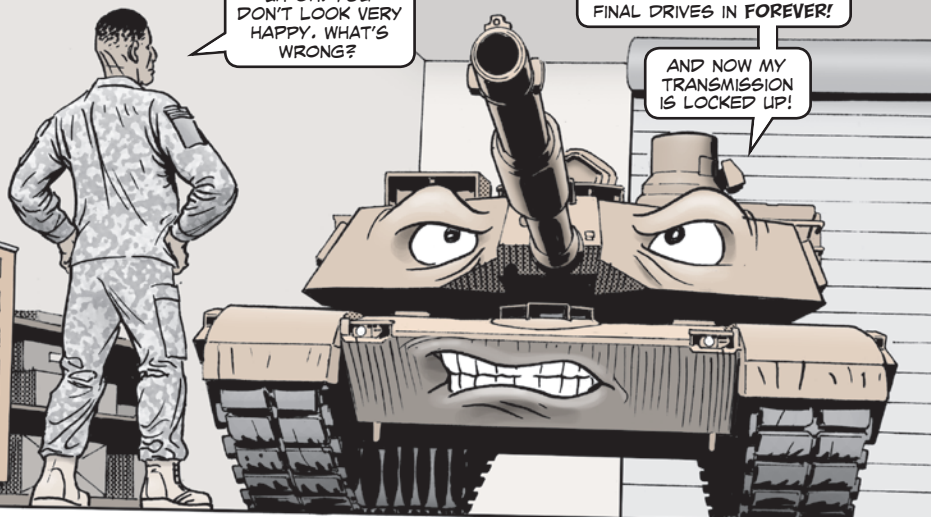


# Drive Home Final Drive PM

UH-OH, YOU  
DON'T LOOK VERY  
HAPPY. WHAT'S  
WRONG?

YOU HAVEN'T CHECKED MY  
FINAL DRIVES IN FOREVER!

AND NOW MY  
TRANSMISSION  
IS LOCKED UP!



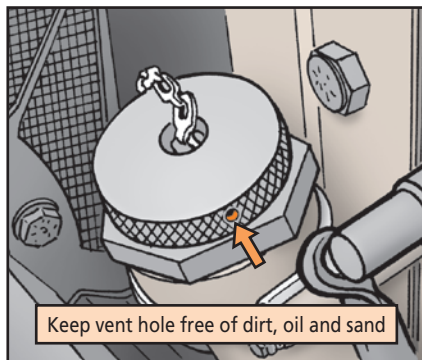
If you don't keep enough oil in your M1-series tank's final drives, your tank's next drive might be a short one!

Final drives that go dry will seize and lock up the transmission. The repairs will cost your unit big bucks! But a team effort from crewmen and mechanics can keep those final drives full and on the job.

## Crewmen

Using the -10 TM's PMCS charts, inspect the final drives weekly for oil leaks, especially at the drain and check plugs. Tell your mechanic about any leaks. While you're at it, take a quick look at the final drive filler cap. Dirt, oil and sand can clog the vent hole on each of the filler caps. When that happens, pressure can build until the final drive seal ruptures.

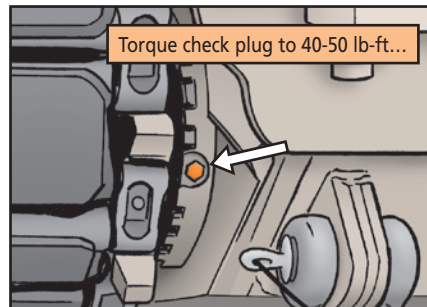
If you're operating in a dusty or muddy environment, check the filler cap after every mission.



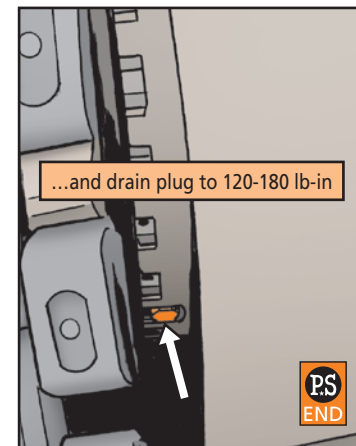
## Mechanics

After checking the final drive oil levels during semiannual services, make sure you use the right torque when replacing the drain and check plugs.

The plugs look the same but they don't take the same torque. The check plug is tightened to 40-50 lb-ft, but the drain plug can't take that kind of pressure. It either cracks—and leaks—or shears off altogether.



Make sure you torque the drain plug to 120-180 lb-in. Yes, that's pound-inch! You'll find the step-by-step instructions in the -23 TMs.

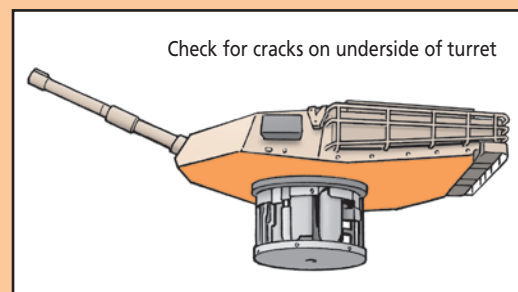


# STAY VIGILANT FOR TURRET CRACKS

Crewmen, if you see cracks on the underside of your M1-series tank's turret, don't be alarmed. Your tank isn't necessarily falling apart.

In most cases, these aren't cracks in the armor but in the thin metal skin that covers the bottom of the turret.

The cracks do need to be checked out, though, so keep an eye out for them or other signs of metal fatigue during your PMCS. If you spot any, let your mechanic or TACOM LAR know right away.



M119A3 Towed Howitzer...

# UNSTICK STICKY FIRING PIN!

HEY, WHY  
AREN'TCHA  
FIRING?

YOU MIGHT  
WANNA CHECK  
MY FIRING PIN!

CREWMEN, A  
STICKY FIRING PIN  
RETAINING PLUNGER  
WILL PUT A DAMPER  
ON ANY FIRE  
MISSION IN A HURRY!

UNFORTUNATELY,  
THAT'S BEEN  
HAPPENING WITH  
SOME NEWLY-  
FIELDIED M119A3  
HOWITZERS.

YOU CAN KEEP YOUR HOWITZER FIRING  
DOWNRANGE BY DOING THE **FIRING PIN  
PROTRUSION TEST** LIKE IT SAYS IN  
WP 0100-12 OF TM 9-1015-260-10 (OCT  
14). IF YOUR HOWITZER'S FIRING PIN  
FAILS THE TEST, ORDER A NEW SPRING,  
NSN 5360-01-643-9517, AND SCREW,  
NSN 5305-01-643-7398, AND INSTALL  
THEM IN THE BREECHBLOCK AS SHOWN  
IN FIG 15 OF THE TM.

Sticking retaining  
plunger pin can  
cause firing pin  
to fail protrusion  
test

GAUGE FIRING PIN PROTRUSION

.186 .206

FIRING PIN  
FAIL

Install spring and screw in breech block

Spring

Screw



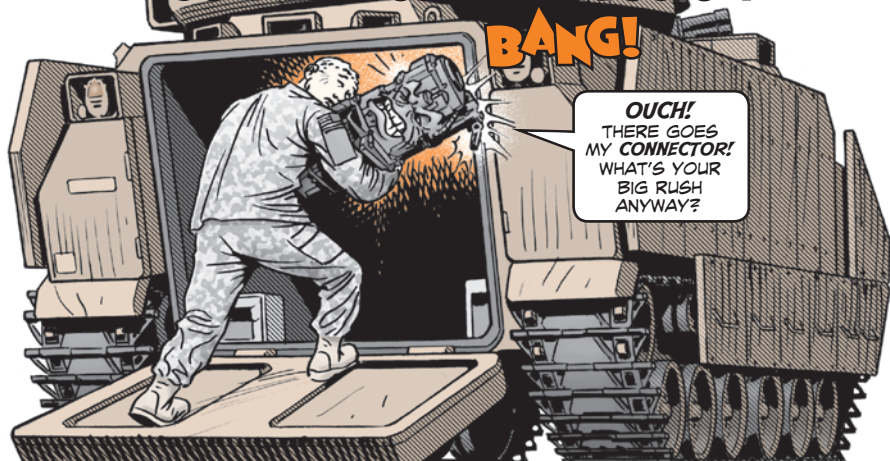
Order new spring,  
NSN 5360-01-643-  
9517, and screw,  
NSN 5305-01-643-  
7398, if firing pin  
fails protrusion test



 NEW HOWITZERS ARE BEING RETROFITTED WITH THE UPGRADED PARTS PRIOR TO  
FIELDING. A RETROFIT IS ALSO IN THE WORKS FOR EARLIER FIELDIED HOWITZERS.



# Connect to M242 Connector Protection



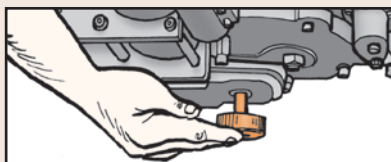
The Bradley's M242 gun is a giant of a weapon, but it definitely has an Achilles' heel: the feeder's 14-pin connector. Just a moment of carelessness can ruin the connector and that knocks out the M242.

The situation has gotten so bad that the Army is running out of M242 drive current motors.

So every Bradley unit needs to connect to these 14-pin connector precautions so they don't end up with NMC M242s:

The connector is often damaged when the feeder is being positioned on the receiver because crews are doing timed drills and they haven't trained with the M242 in a long time. They rush things and BANG the connector is bent. To prevent that, do refresher training before doing timed drills. Let crews get used to putting the feeder on the receiver before starting the stopwatch.

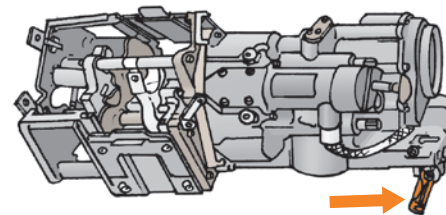
The connector is also damaged when crews try to lock the feeder on the receiver when the feeder's not positioned correctly. Avoid that by first pushing up the vertical drive shaft before trying to lock the feeder in place. If the drive shaft won't slide up, the feeder isn't positioned right. Reposition it and try again. Once the drive shaft is locked in place, the feeder handle should easily lock in the down position. If it doesn't, something is wrong. If you force the handle, you damage the connector. Tell your repairman.



Lock drive shaft in up position  
before trying to lock feeder handle

When you remove the feeder, make sure its handle is in the down position before you lay the feeder on the ground. That protects the connector.

Put feeder handle down before putting feeder on ground

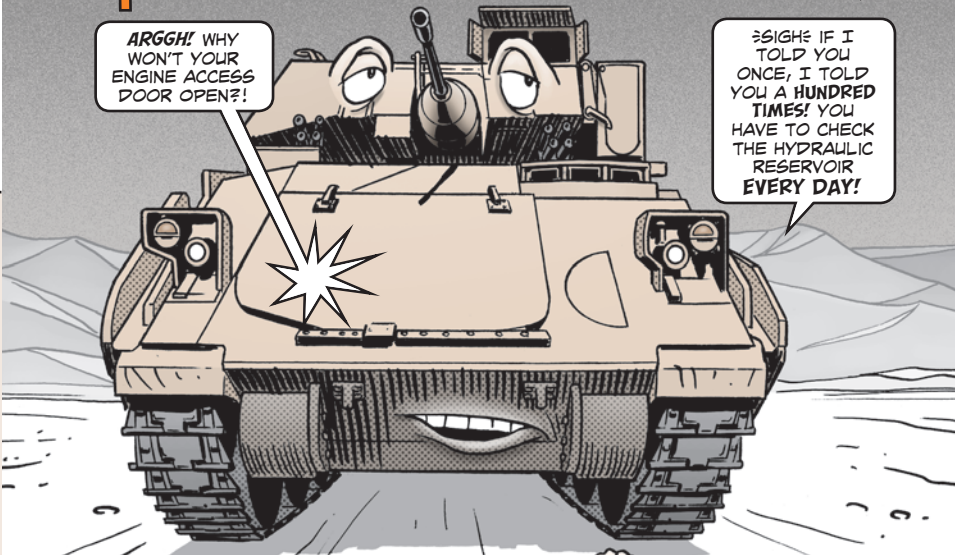


M2A2/M3A2, M2A2/M3A2 ODS, M2A3/M3A3 Bradleys, M3A3 FIST...

## Open the Door to Reservoir PM

ARGGH! WHY WON'T YOUR ENGINE ACCESS DOOR OPEN?!

SIGH! IF I TOLD YOU ONCE, I TOLD YOU A HUNDRED TIMES! YOU HAVE TO CHECK THE HYDRAULIC RESERVOIR EVERY DAY!



HAVING TROUBLE OPENING YOUR BRADLEY'S POWER UNIT ACCESS DOOR?

YOU WILL IF YOU DON'T MAKE CHECKING THE HYDRAULIC RESERVOIR A PRIORITY.

YOUR ARMS WILL GET A WORKOUT BECAUSE YOU'LL END UP OPENING THE DOOR MANUALLY.



PS MORE





CHECKING THE RESERVOIR LEVEL IS A **DAILY TASK**. FOLLOW THESE **THREE STEPS** TO ENSURE THE RESERVOIR HAS THE **CORRECT AMOUNT OF FLUID...**

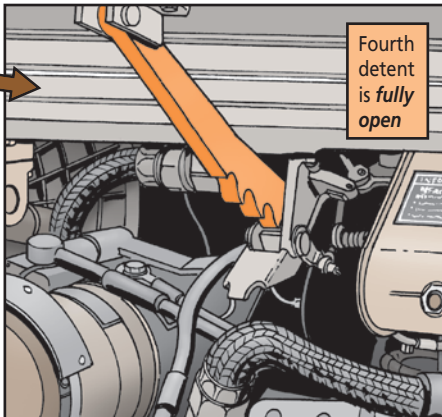
### STEP 1 PARK THE VEHICLE ON LEVEL GROUND.

THE RESERVOIR SIGHT GLASS **WON'T** GIVE AN ACCURATE READING IF YOUR BRADLEY IS PARKED AT AN ANGLE.

### STEP 2 OPEN THE ACCESS DOOR ALL THE WAY BEFORE CHECKING THE FLUID LEVEL.

WHEN THE DOOR IS ONLY PARTIALLY OPEN, YOU'LL GET A HIGH READING BECAUSE THE HYDRAULIC CYLINDERS AREN'T FULLY EXTENDED. IF YOU DRAIN FRH FROM THE RESERVOIR TO LOWER THAT HIGH READING, THE SYSTEM WILL BE UNDER-FILLED. THEN YOU CAN GET AIR IN THE SYSTEM THAT MAY KEEP THE DOOR FROM OPENING.

AVOID THIS PROBLEM BY OPENING THE ACCESS DOOR TO THE **FOURTH DETENT** ON THE SUPPORT LINK. THAT'S FULLY OPEN.

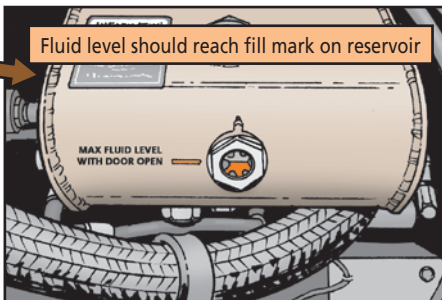


### STEP 3 EYEBALL THE FLUID LEVEL IN THE RESERVOIR.

THE LEVEL IN THE SIGHT GLASS SHOULD REACH THE FULL MARK LINE INSCRIBED ON THE RESERVOIR.

IF IT DOESN'T, ADD FRH UNTIL IT REACHES THE LINE. IF THE LEVEL PASSES THE MARK, DRAIN SOME OF THE FLUID. USE AN AOAP VAMPIRE PUMP, NSN 4930-01-119-4030, TO REMOVE THE EXCESS FLUID.

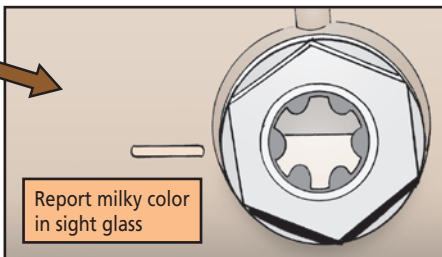
Fluid level should reach fill mark on reservoir



### AN EXTRA STEP WHILE YOU'RE CHECKING THE SIGHT GLASS. PAY SPECIAL ATTENTION TO THE COLOR OF THE FLUID.

FLUID THAT IS MILKY IS PROBABLY CONTAMINATED WITH WATER. LET YOUR MECHANIC KNOW RIGHT AWAY BECAUSE CONTAMINATED FLUID WILL RUIN THE SEALS.

Report milky color  
in sight glass



# Download Or Order New IETM

WHATCHA  
DOIN', PAL?

DOWNLOADING  
THE NEW IETM.

IT'S REALLY  
EASY TO DO!

Dear Editor,

Your readers might like to know that TM 9-2350-408-13&P (IETM EM 0356, Apr 15) is now available for the Bradley FOV. The IETM is available free through the Army Publishing Directorate (APD) or by downloading from the Logistics Information Warehouse (LIW) website.

Mark Weiman  
Bradley Publications Manager  
TACOM LCMC

**Editor's note:** Outstanding! Units, set up a publications account by emailing a completed DA Form 12 to APD's Account Processing Team at:

[usarmy.stlouis.106-sig-bde.mbx.dolwmdcustsrv@mail.mil](mailto:usarmy.stlouis.106-sig-bde.mbx.dolwmdcustsrv@mail.mil)

Instructions for setting up an account are at:

<http://www.apd.army.mil/Orders/HowtoEstablishAcct.pdf>

Once your account is set up, order the IETM through the Point & Click Ordering System at: <https://dol.hqda.pentagon.mil/ptclick/index.aspx>

To order, Search and fill out the form on the next webpage.

Download IETMs on the LIW website at: <https://liw.logsa.army.mil>

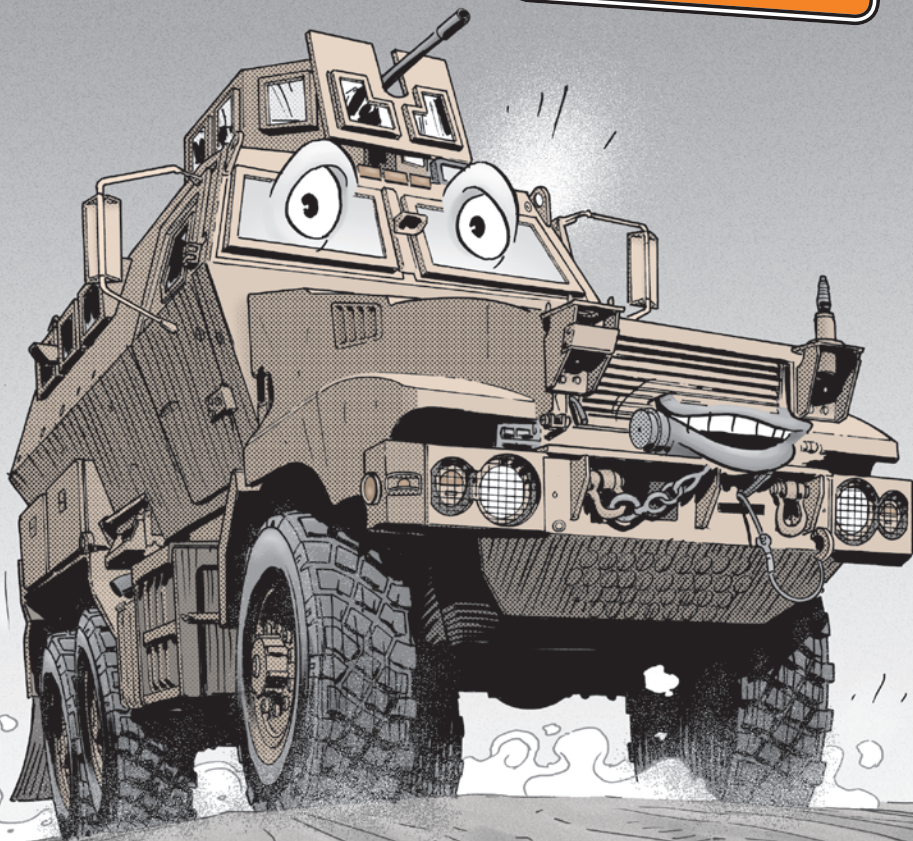
Pages 48-51 of PS 746 (Jan 15) have instructions for downloading IETMs:

<https://www.logsa.army.mil/psmag/archives/PS2015/746/746-48-51.pdf>

PS

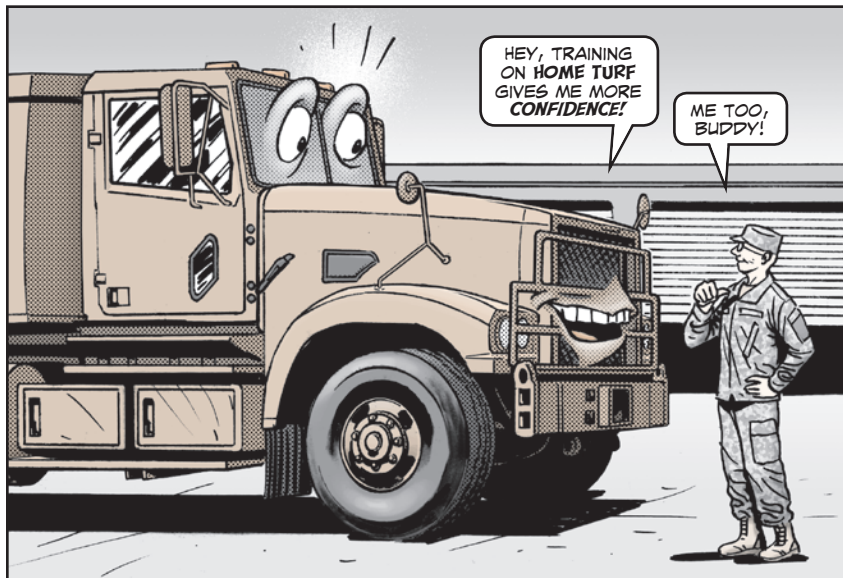
# TACTICAL VEHICLES

- Drivers training comes to you
- HMMWV transfer gear grinding
- HMMWV geared hub torque
- EMALL houses DLA tire catalog
- Battery box liner





# MDTQC Takes Show on the Road



**G**ood news, units! The Army's Transportation School at Ft Lee, VA, has put its popular Master Driver Trainer Qualification Course (MDTQC) on the road.

MDTQC is still offered as a resident course at Ft Lee, but now a mobile training team (MTT) offers a second option for getting the qualification. Units with high op tempo that find it hard to spare NCOs for TDY training may find the MDTQC MTT option is a great alternative.

The mobile course follows the same program of instruction as the resident curriculum, lasting two weeks and three days. The schedule includes both classroom and hands-on training.

Topics include convoy operations, risk management, accident avoidance and investigations, unit licensing and driver's training program management.

The MDTQC MTT tailors instruction to a unit's specific needs and local resources, meaning units train on their home turf with their own equipment.

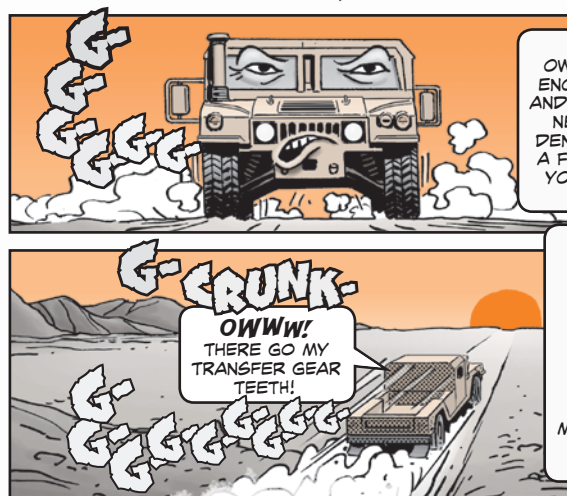
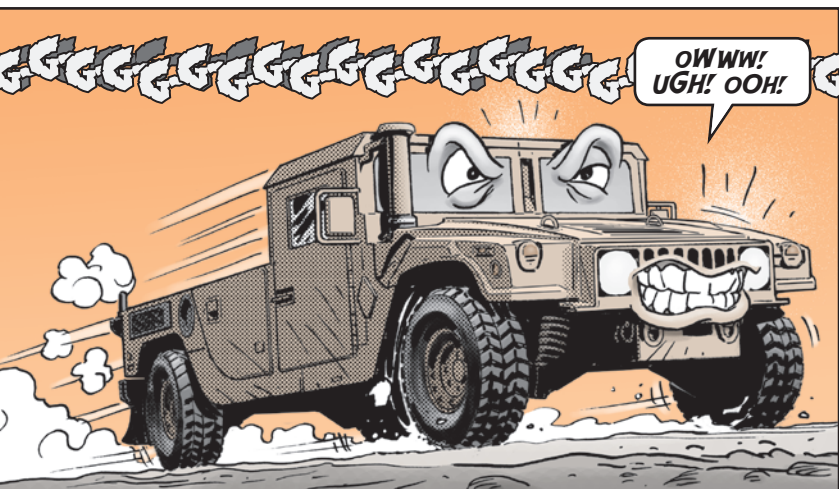
To learn more about MDTQC, see Page 57 in PS 730 (Sep 13):

<https://www.logsa.army.mil/psmag/archives/PS2013/730/730-57.pdf>

For questions about MDTQC or the MTT option, contact Jeffrey Skinner, DSN 539-1955, (804) 765-1955, or email: [jeffrey.e.skinner4.civ@mail.mil](mailto:jeffrey.e.skinner4.civ@mail.mil)

# TOO MUCH GEAR GRINDING

# ...NOT GOOD!



GRIND YOUR OWN TEETH LONG ENOUGH, DRIVERS, AND YOUR FRIENDLY NEIGHBORHOOD DENTIST WILL HAVE A FIELD DAY WHEN YOU GO IN FOR A CLEANING.

EXCESSIVE GRINDING ISN'T GOOD WHEN YOU SHIFT TRANSFER GEARS WITH THE ENGINE RUNNING ON YOUR HMMWV, EITHER. IT MEANS THAT SOMEDAY A MECHANIC MAY HAVE TO REPAIR GEAR DAMAGE.

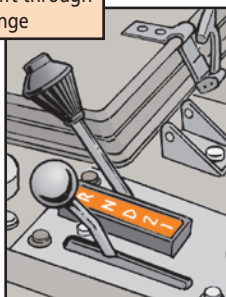
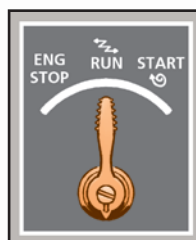
## HERE'S WHAT YOU CAN DO TO SAVE THE TEETH ON TRANSFER GEARS:

- When a transfer range change is necessary with the engine running, stop the truck and shift the transmission to neutral. Never shift on the fly. That'll tear up driveline parts.

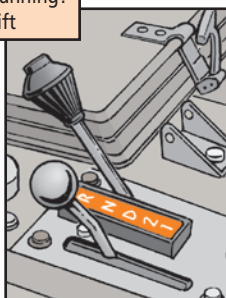
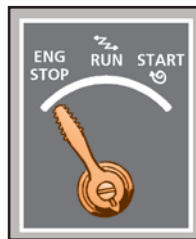
Shift the transfer shifter through neutral to the desired range. Some gear clash may occur and is normal, but you should be able to make the shift easily. Keep in mind, though, that the longer you leave the shifter in neutral, the more gear clash will occur. That's because even in neutral, engine rotation spins the transmission output shaft.

- If you can't shift easily, turn the engine off and then shift the transfer. Restart the engine and continue the mission.
- When your mission is complete, let your mechanic know that you had to stop the engine to shift the transfer. He'll troubleshoot for problems such as excessive engine idle rpm.

With engine running, shift through neutral (N) to desired range

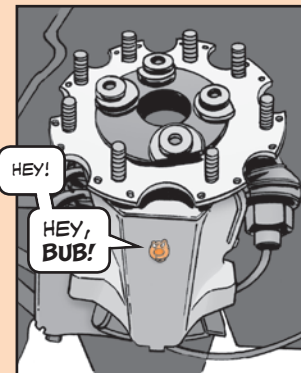


Can't shift with engine running? Turn engine off, then shift



HMMWV...

## SOME TORQUE TALK FROM HUB PLUG



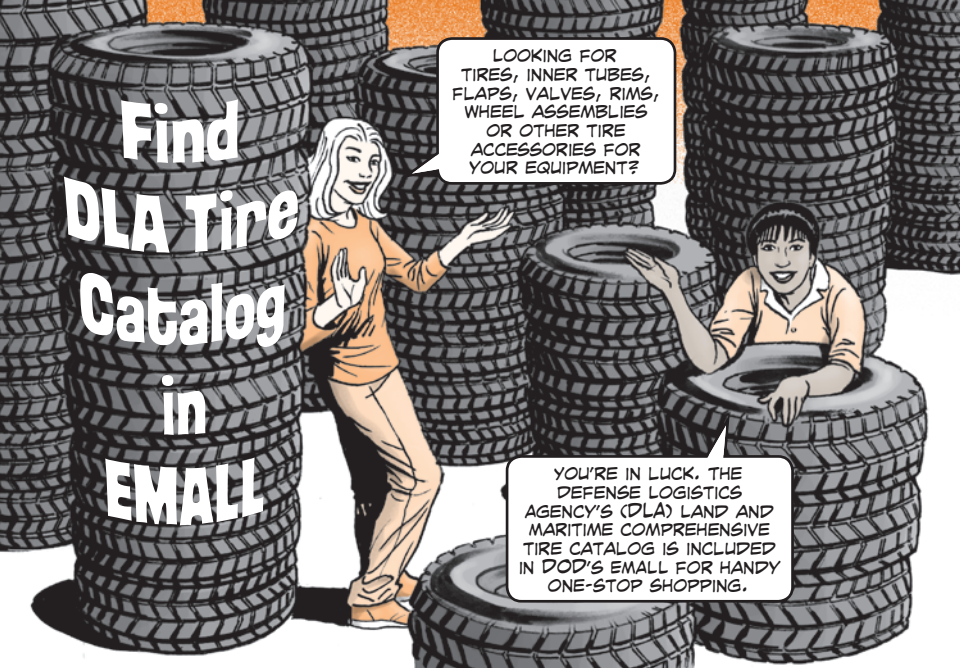
The magnetic drain plug, NSN 4730-00-045-9769, on your HMMWV's geared hub has a few complaints. Seems mechanics are being a little heavy-handed when they remove or install it.

The plug sees a lot of action. The hubs have to be drained during PMCS, before any repair work is done to the geared hub, and after any operation where water contaminates the gear oil.

It takes only a little torque—8-13 lb-ft—to keep the plug in place. Any tighter and you'll strip the threads.

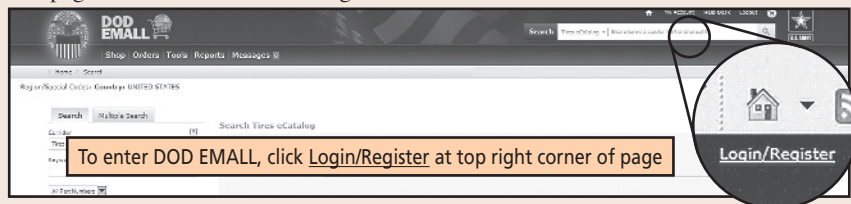
Make sure you use a  $\frac{3}{8}$ -in hex head driver to remove the plug. You'll round off the plug's head with anything else. That makes removing it a lot harder next time.



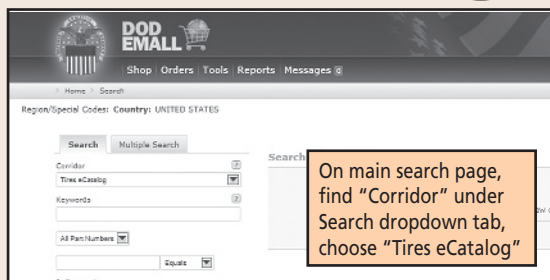


Access DOD EMAIL at: <https://dod.email.dla.mil/acct/>

If it's your first visit, select the [Login/Registration](#) link at the upper right corner of the page. You'll need a CAC to register.



After registering and logging into DOD EMAIL, you'll be on the main search page. You can search for items by keyword or NSN, but the easiest way is to navigate to the search tab on the left side of the page and choose the "Corridor" dropdown menu.



Select the Tires eCatalog from the dropdown menu list. You'll go to the Tires eCatalog homepage. Here you can search sub-catalogs (Tires, Accessories, Wheel Assemblies or Rims) and narrow down results even more by NSN, size or other filters.

Search Catalog: **Tires**

(Selecting a new catalog will clear all search keywords, NSNs, and item numbers.)

Nomenclature:

Tire Specification:

Tire Size:

Wheel Assembly NSN:

Weapon System Name:

CAGE Code:

Search for specific tires using various filters

If you still can't find what you're looking for, email the DLA Tire Team at:

[DSCC.TiresTeam@dlamail.mil](mailto:DSCC.TiresTeam@dlamail.mil)

Need help ordering from DOD EMAIL? Contact customer service at CONUS 1-877-352-2255, OCONUS (269) 961-7766, or by email:

[DLAcontactcenter@dlamail.mil](mailto:DLAcontactcenter@dlamail.mil)

Tactical Vehicles...

MECHANICS, BATTERY BOX LINER MAKES A GREAT ADDITION TO YOUR VEHICLE'S BATTERY BOX.

THE LINER NOT ONLY ABSORBS EXCESS BATTERY ACID, BUT NEUTRALIZES IT, TOO. THAT PROTECTS THE BATTERY BOX FROM CORROSION.



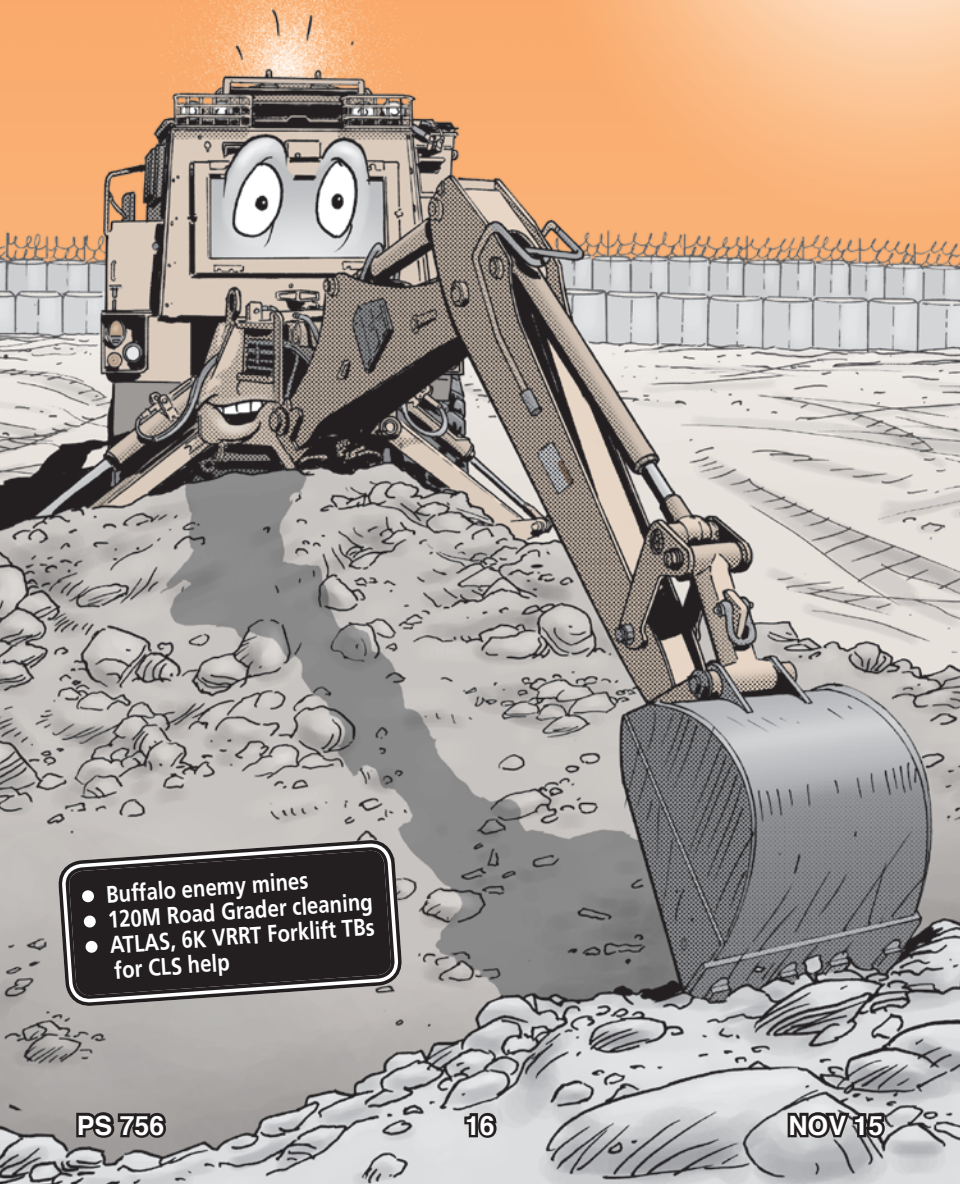
**LINER LIMITS BATTERY BOX BUMMER**

A ROLL OF 1/8-IN THICK LINER COMES WITH NSN 6160-01-389-1966. JUST CUT IT TO THE DIMENSIONS YOU NEED TO LINE YOUR VEHICLE'S BATTERY BOX.

THE LINER IS 13 INCHES WIDE X 100 FEET LONG, SO THERE'S PLENTY TO TAKE CARE OF ALL THE VEHICLES IN YOUR UNIT'S MOTOR POOL.

CHANGE THE LINER ONCE IT BECOMES SOAKED WITH BATTERY ACID OR STARTS TO DETERIORATE.

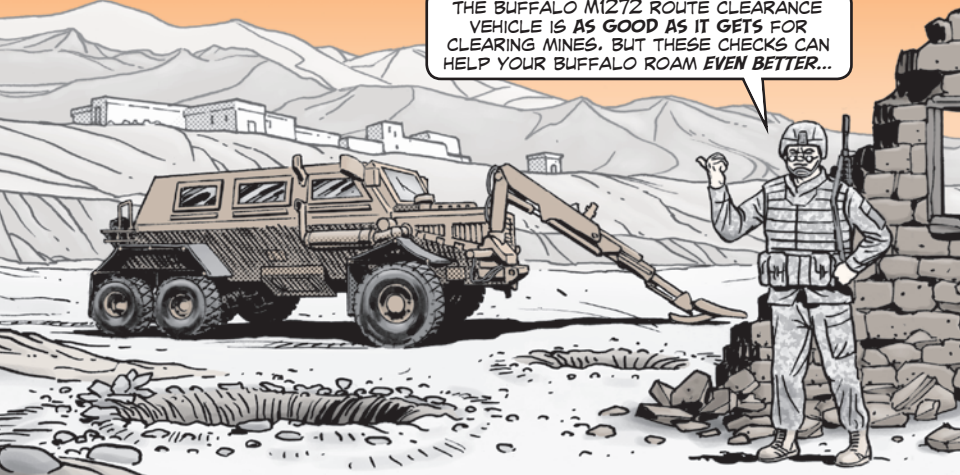




- Buffalo enemy mines
- 120M Road Grader cleaning
- ATLAS, 6K VRRRT Forklift TBs for CLS help

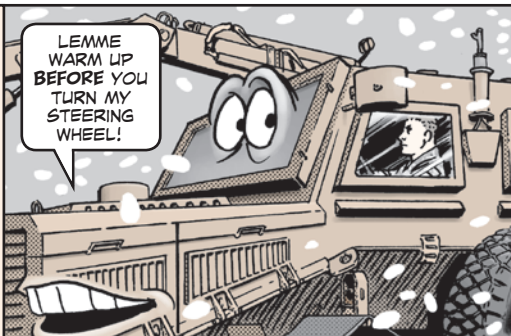
# BUFFALOING ENEMY MINES

THE BUFFALO M1272 ROUTE CLEARANCE VEHICLE IS **AS GOOD AS IT GETS** FOR CLEARING MINES. BUT THESE CHECKS CAN HELP YOUR BUFFALO ROAM **EVEN BETTER...**



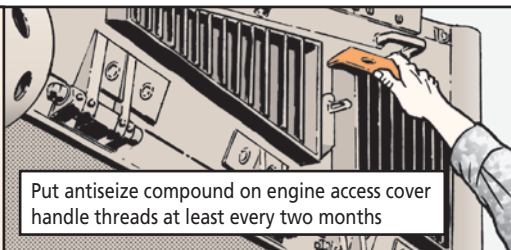
In cold weather, let the fluid warm up before moving the steering wheel (about 30 minutes). Follow the CAUTION placard on the instrument panel: **DO NOT FORCE THE STEERING WHEEL TO TURN WHILE VEHICLE IS STATIONARY.** That can cause power steering cooler leaks.

LEMME WARM UP BEFORE YOU TURN MY STEERING WHEEL!



Put antiseize compound on the engine access cover handle threads at least every two months. Without the antiseize compound, it's easy to crossthread or over-torque the handles. Eventually they break off.

Put antiseize compound on engine access cover handle threads at least every two months



Don't yank on the air tank pressure relief cables. That breaks the cable after enough yanks. It takes hours to replace a cable. Pull on the cable just until you hear air come out. That's far enough.

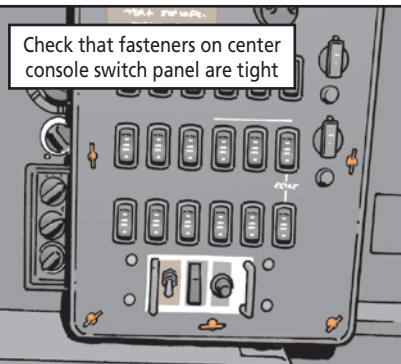
**AIR TANK RELEASE**



Gently pull air tank cables until you hear air

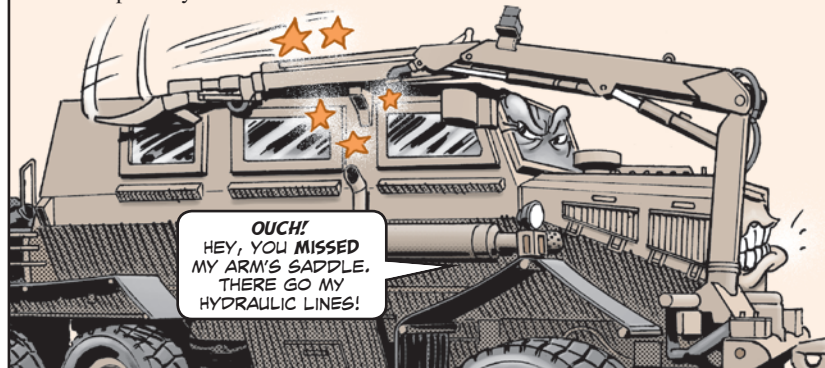
Check during PMCS that the fasteners on the center console switch panel are present and secure. The wing-head fasteners (stud, NSN 5325-00-767-8125; retainer, NSN 5330-00-190-1095) usually work loose and disappear. That can leave the panel hanging. But when you tighten the fasteners, don't muscle up. It's easy to strip them out. Just turn the 8 wing-head fasteners 90 degrees clockwise to secure the center switch panel to the center dashboard.

Check that fasteners on center console switch panel are tight



Careful with the interrogation arm when you move it to the driver's side. The arm must pass close to the vehicle. If you're not alert, you can hit the hood and break the arm's hydraulic fittings. Make sure to hit the cradle when you stow the arm. If you miss the cradle, you can tear up the hydraulic lines in the steel channel.

**OUCH!**  
HEY, YOU MISSED MY ARM'S SADDLE. THERE GO MY HYDRAULIC LINES!

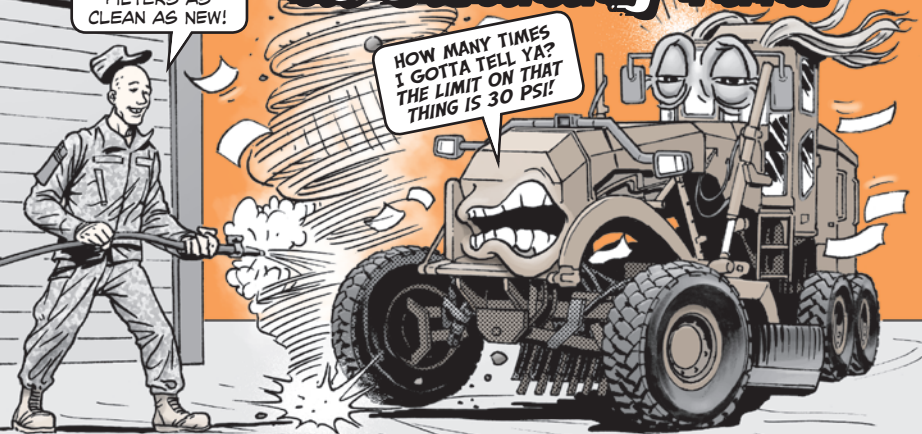




# Blow Away Grime at Cleaning Time

I'M GONNA  
GET YOUR AIR  
FILTERS AS  
CLEAN AS NEW!

HOW MANY TIMES  
I GOTTA TELL YA?  
THE LIMIT ON THAT  
THING IS 30 PSI!



CLEAN AIR  
KEEPS YOUR  
120M GRADER  
GRADING  
SMOOTHLY.

SO WHEN IT'S CLEANING TIME,  
YOU'LL NEED TO OPEN THE GRADER'S  
AIR FILTER ELEMENT CANISTER  
AND PULL OUT THE PRIMARY AND  
SECONDARY FILTERS.

USE AN AIR HOSE  
TO BLOW LOW-  
PRESSURE AIR (30  
PSI OR LESS) FROM  
THE INSIDE OUT.

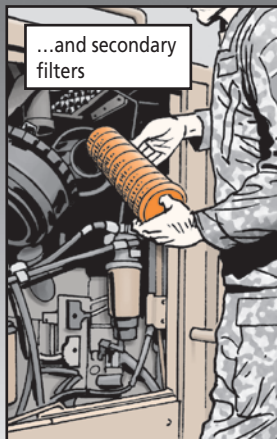


NEVER BANG THE FILTER ON  
A ROCK OR HARD SURFACE  
LIKE THE GRADER'S TIRE OR  
MOLDBOARD.

Use 30 psi air to  
clean out primary...



...and secondary  
filters



THAT **DAMAGES** THE  
FILTER AND ALLOWS  
DIRT TO GET INTO  
THE ENGINE.

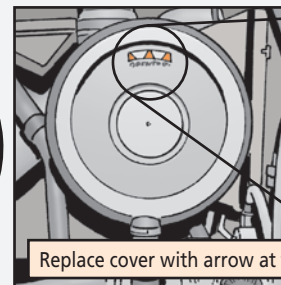
REPLACE THE PRIMARY AIR FILTER ELEMENT, NSN 2940-01-580-0028,  
ONCE A YEAR OR AFTER SIX CLEANINGS, WHICHEVER COMES FIRST. SAME  
GOES FOR THE SECONDARY FILTER, NSN 2940-01-579-8964.



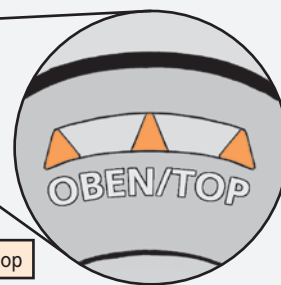
## Make the Seal Tight

WITH THE CLEANED FILTER ELEMENTS REINSTALLED, MAKE SURE THE CANISTER LID IS CLOSED COMPLETELY. A TIGHT SEAL IS NEEDED TO KEEP OUT DIRT AND SAND WHICH CAN RUIN YOUR GRADER'S TURBOCHARGER AND ENGINE.

HERE'S HOW:  
PLACE THE LID  
BACK IN PLACE WITH  
ITS TOP ARROWS  
POINTING UP TO THE  
12 O'CLOCK POSITION.  
THEN USE THE THREE  
LATCHES TO LOCK  
THE LID SNUG IN  
PLACE.

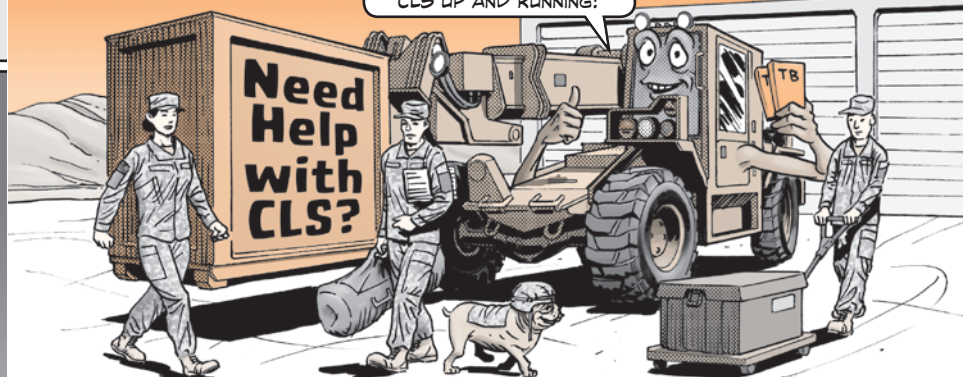


Replace cover with arrow at top



ATLAS, 6K VRRT Forklifts...

HERE ARE THE MANUALS  
YOU'LL NEED TO KEEP MY  
CLS UP AND RUNNING!



Dear Half-Mast,

One of our units had a question about the central lubrication system (CLS) on their 10K ATLAS and 6K variable reach rough terrain (VRRT) forklifts. The CLSs weren't working and they had no idea how to order parts or service them.

I did some research, but couldn't find anything in the vehicle TMs. Is there a service or parts manual for the CLS installed on these forklifts?

Mr. M.G.

Dear Sir,

Yes, there is. The 10K ATLAS CLS is covered in TB 10-3930-673-13&P-1 (Feb 09). TB 10-3930-660-13&P (Feb 09) covers the 6K VRRT CLS.

Both TBs include installation, maintenance and parts information for the CLS. Units will need to order and install the CLS at their own expense.

Half-Mast





CAV  
YESTERDAY...

...CAV  
TODAY!

- Read about Proper Shutdown for UH-72A Lakota

# AIRCRAFT SHUTDOWN DONE RIGHT

I'M GLAD THIS MISSION IS OVER!

ME, TOO. LET'S GET GOING!

NOT SO FAST! THE MISSION'S NEVER OVER UNTIL YOU'VE DONE A **FULL AND COMPLETE** SHUTDOWN BY THE PILOT'S CHECKLIST!

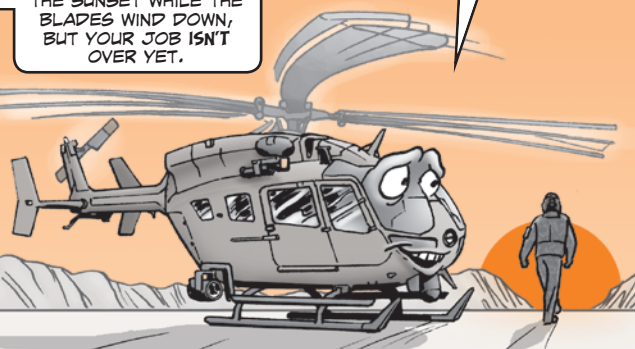
YOU WOULDN'T WANT YOUR ENGINE **DAMAGED** BY A TOT SPIKE, WOULD YOU?

CREWS, AFTER A LONG STRESSFUL MISSION, YOU CAN BREATHE A SIGH OF RELIEF WHEN YOU TOUCH DOWN SAFELY BACK AT HOME STATION.

IT MAY SOUND NICE TO ROLL THE THROTTLES OFF AND WALK INTO THE SUNSET WHILE THE BLADES WIND DOWN, BUT YOUR JOB ISN'T OVER YET.

THAT'S RIGHT!

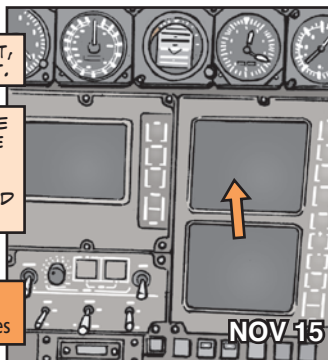
HEY, BUDDY! GET BACK HERE!



BEFORE LEAVING YOUR AIRCRAFT, FOLLOW THE PILOT'S CHECKLIST.

THAT INCLUDES MONITORING THE TURBINE OUTLET TEMPERATURE (TOT) DURING SHUTDOWN TO PROTECT THE ENGINE FROM A TEMPERATURE SPIKE THAT COULD CAUSE SERIOUS DAMAGE.

During aircraft shutdown, monitor panel for TOT spikes



NOV 15

## TOT Spike Causes

THE BIG QUESTION IS **HOW** DOES A TOT SPIKE HAPPEN? ACTUALLY, THERE ARE A FEW **DIFFERENT** POSSIBILITIES.



DURING OPERATION, THE ENGINES ARE SUPPLIED WITH HIGH PRESSURE FUEL FROM THE PUMP INSIDE THE FUEL CONTROL UNIT (FCU).

THE PUMP IS DRIVEN BY THE GAS GENERATOR SECTION OF THE ENGINE. WHEN THE TWIST GRIPS ARE CLOSED, THE FUEL SUPPLY TO THE COMBUSTION CHAMBER SHOULD STOP.



BUT SINCE THE ENGINE IS STILL TURNING AT A RELATIVELY HIGH RATE OF SPEED, THE PUMP IN THE FCU KEEPS **MOVING** FUEL.

VALVES BUILT IN TO THE SYSTEM SHOULD REDIRECT THE FUEL WHEN THE THROTTLE TWIST GRIPS ARE CLOSED, BUT A **THROTTLE MALFUNCTION** COULD ALLOW FUEL TO CONTINUE FLOWING INTO THE COMBUSTION CHAMBER.

IF THAT HAPPENS, FUEL INSIDE THE ENGINE WILL CONTINUE TO BURN, THOUGH IT'S LIKELY NOT ENOUGH TO KEEP THE ENGINE RUNNING.



THE MOST COMMON CAUSE FOR THIS SITUATION IS THE RIGGING OF THE FCU.

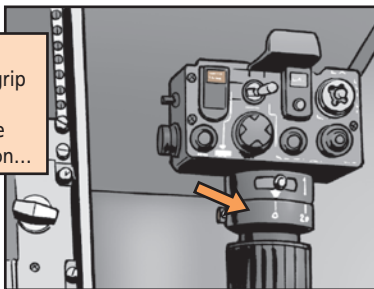
THE PILOT MAY ROLL THE TWIST GRIP ALL THE WAY TO THE **OFF** POSITION, BUT IF THE RIGGING ISN'T CORRECT, THE INPUT TO THE FCU MAY STILL KEEP THE MAIN FUEL VALVE SLIGHTLY OPEN.

UNWANTED FUEL FLOW CONTINUES AND CAUSES A TOT RISE.

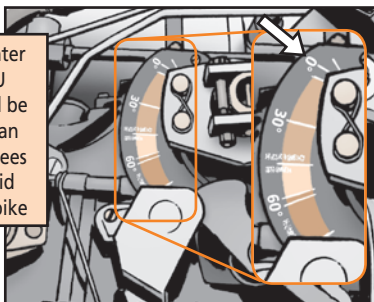
THE TWIST GRIPS ARE CONNECTED TO THE FCU BY FLEX BALL CABLES. IT'S NOT UNCOMMON FOR THE CABLES TO **STRETCH** SLIGHTLY OVER TIME, CAUSING THIS OUT OF RIG CONDITION.

THE AIRFRAME'S MAINTENANCE MANUAL STATES THAT WHEN THE TWIST GRIP IS AT THE 0 DEGREE POSITION, THE POINTER ON THE FCU SHOULD BE **"AT OR LESS THAN 0."**

When twist grip is at 0 degree position...



...pointer on FCU should be less than 0 degrees to avoid TOT spike



THERE IS ABOUT 5 DEGREES OF TRAVEL AVAILABLE BELOW THE 0 MARK ON THE FCU.

RIGGING THE SYSTEM TO HAVE A -2 OR -3 DEGREE FCU SETTING WHEN THE TWIST GRIP IS COMPLETELY CLOSED IS A GOOD IDEA AS LONG AS THE OTHER RIGGING POINTS CAN BE MAINTAINED LIKE THE MAINTENANCE MANUAL SAYS.

WHAT DO I DO IF THIS HAPPENS TO MY AIRCRAFT?



IF THE STARTER IS ENGAGED, THE ENGINE SPINS FASTER AND SHOULD CREATE ENOUGH **AIR FLOW** TO "BLOW OUT" THE FIRE AND COOL DOWN THE ENGINE.



THAT'S SOUND LOGIC! IT'S **POSSIBLE** THAT VENTING THE ENGINE **WON'T** EXTINGUISH THE FIRE, SO CREWS NEED TO BE READY TO VENT THE ENGINE AGAIN OR TAKE OTHER ACTIONS IF NEEDED.

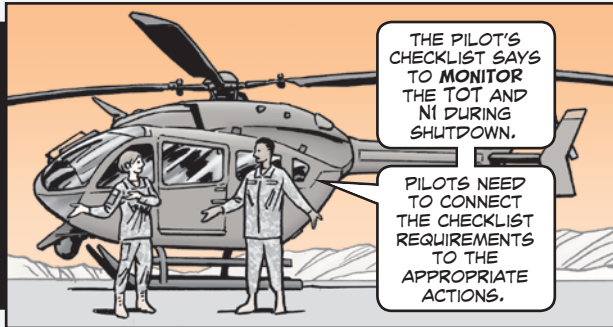
BECAUSE OF THE DIFFERENT VALVES IN THE FUEL SYSTEM, VENTING **USUALLY** TAKES CARE OF THE PROBLEM.



## What to Do?

THE PILOT'S CHECKLIST SAYS TO **MONITOR** THE TOT AND NI DURING SHUTDOWN.

PILOTS NEED TO CONNECT THE CHECKLIST REQUIREMENTS TO THE APPROPRIATE ACTIONS.



THE **ROTORCRAFT FLIGHT MANUAL** (PG 4-25, SEC 4.12) AND **PILOT'S CHECKLIST** (PG N-29) BOTH DESCRIBE HOW TO VENT THE ENGINES.

SO FLIGHT CREWS NEED TO BECOME FAMILIAR WITH THESE PROCEDURES AND HOW TO STOP TEMPERATURE SPIKES AND THE POSSIBILITY OF A FIRE SHOULD THEY OCCUR.

THE KEY TO EXTINGUISHING THE FIRE INSIDE THE ENGINE IS **AIR FLOW**.

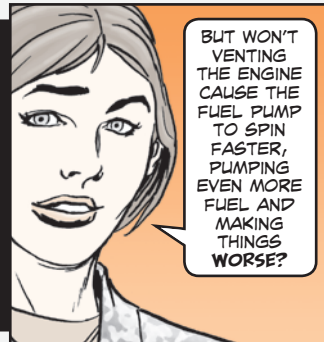
THE LAKOTA IS EQUIPPED WITH **TWO** ENG VENT SWITCHES ON THE OVERHEAD PANEL, ONE FOR EACH ENGINE, THAT WERE DESIGNED PRECISELY FOR THIS PURPOSE.

CREWS NEED TO BE VERY FAMILIAR WITH THE LOCATION OF THE VENT SWITCHES SINCE THEY'RE NOT OFTEN USED. THAT'LL HELP AVOID DELAYS IN VENTING THE ENGINE SHOULD A TOT SPIKE OCCUR.

DEPENDING ON THE REASON FOR THE TOT SPIKE AND THE SEVERITY OF THE CONDITION, THE TEMPERATURE CAN RISE VERY FAST.

VENTING THE ENGINE **QUICKLY** TO PUT THE FIRE OUT COULD MEAN THE DIFFERENCE BETWEEN A **SIMPLE** RIGGING ADJUSTMENT AND AN **EXPENSIVE** ENGINE REPLACEMENT.

BUT WON'T VENTING THE ENGINE CAUSE THE FUEL PUMP TO SPIN FASTER, PUMPING EVEN MORE FUEL AND MAKING THINGS **WORSE**?



IF IT **DOESN'T**, YOU'LL NEED TO STOP THE FUEL FROM FLOWING INTO THE COMBUSTION CHAMBER.

FIRST, ENSURE THAT **BOTH** THE PILOT AND COPILOT TWIST GRIPS ARE ACTUALLY **CLOSED** ALL THE WAY.

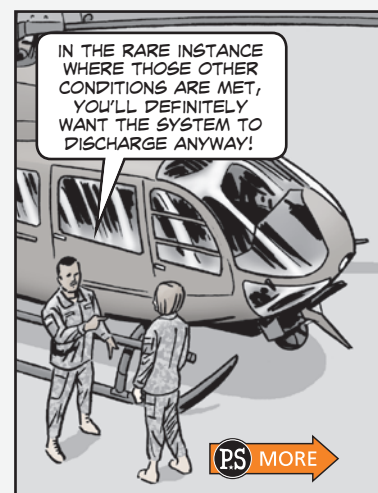
THERE IS USUALLY SOME SLACK BETWEEN THE PILOT AND COPILOT CONTROLS, SO FULLY CLOSED ON ONE SIDE MAY CAUSE THE PROBLEM, WHILE FULLY CLOSED ON THE OTHER SIDE COULD BE JUST ENOUGH ADDITIONAL TRAVEL TO STOP FUEL FLOW.

IN A VERY FEW CASES, THE ACTIONS ABOVE MAY STILL **NOT** SOLVE THE PROBLEM.

IN THOSE CASES, USE THE APPROPRIATE "EMERG OFF" BUTTON ON THE WARNING UNIT.

THIS ACTIVATES THE FUEL SHUT OFF VALVE FOR THE AFFECTED ENGINE. THIS WON'T AUTOMATICALLY DISCHARGE THE FIRE EXTINGUISHING SYSTEM BECAUSE OTHER CRITERIA HAVE TO BE MET BEFORE THAT CAN HAPPEN.

IN THE RARE INSTANCE WHERE THOSE OTHER CONDITIONS ARE MET, YOU'LL DEFINITELY WANT THE SYSTEM TO DISCHARGE ANYWAY!





## What's Next?

NOW THAT THE FIRE IS OUT AND DISASTER AVERTED, THERE'S STILL SOME WORK LEFT TO DO.

BEFORE THE LAKOTA MAINTAINERS CAN CORRECT THE PROBLEM, THEY NEED A GOOD DESCRIPTION OF WHAT HAPPENED.

YOU NEED TO INCLUDE **ALL** THE STEPS TAKEN AS WELL AS THE MAXIMUM TOT REACHED AND ITS DURATION. ALL OF THIS INFORMATION IS NEEDED TO **DETERMINE** THE PROPER INSPECTIONS AND MAINTENANCE ACTIONS NEEDED TO RETURN THE AIRCRAFT TO SERVICE.

I WROTE A SHORT ENTRY IN MY LOGBOOK: "ENGINE OVERTEMP ON SHUTDOWN." HOW'S THAT SOUND?

NOPE. THAT'S **NOT** GOING TO CUT IT.

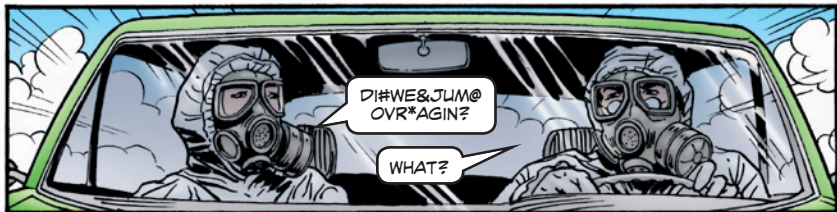
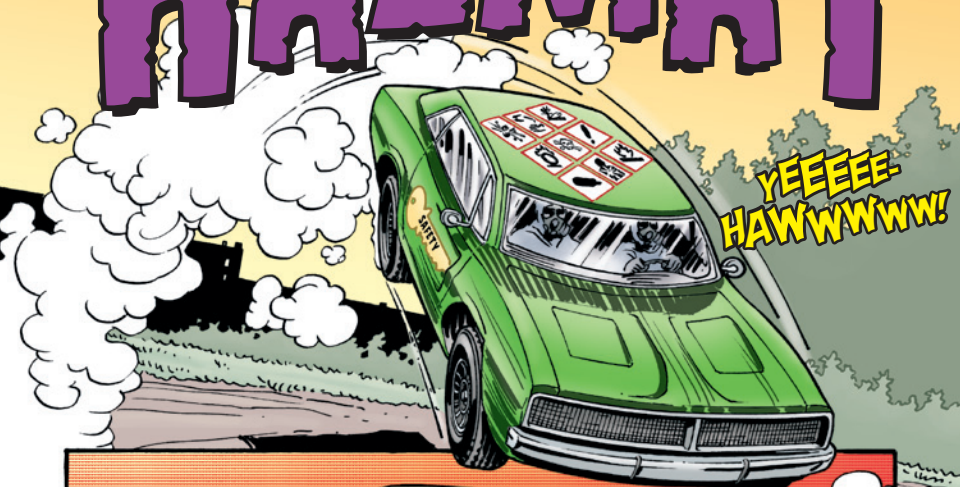
DON'T BE AFRAID TO DISCUSS THE ISSUE WITH YOUR MAINTENANCE STAFF BEFORE MAKING THE ENTRY. THAT CAN AVOID CONFUSION AND CORRECTIONS LATER.

WHILE THERE ARE OTHER, MORE COMMON ISSUES, IT PAYS TO KNOW WHAT TO DO IN THE RARE CASE OF A TOT SPIKE.

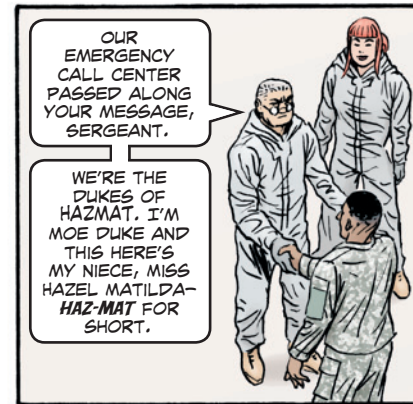
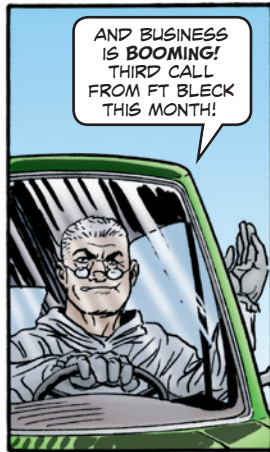
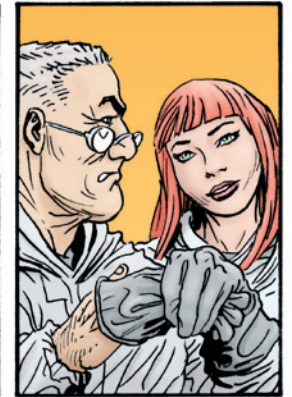
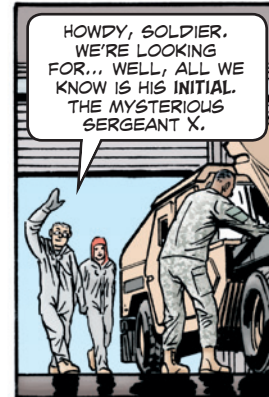
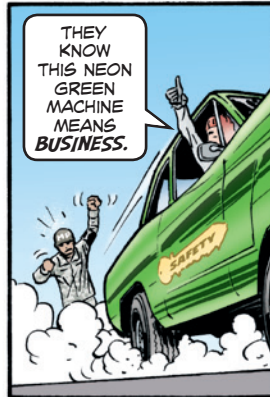
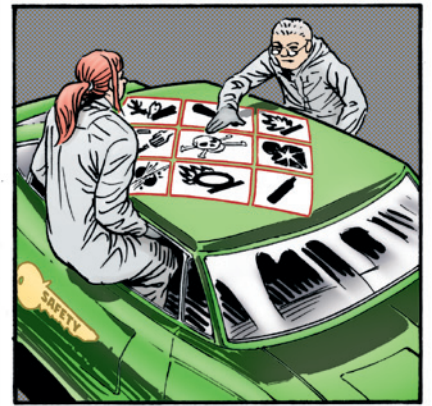
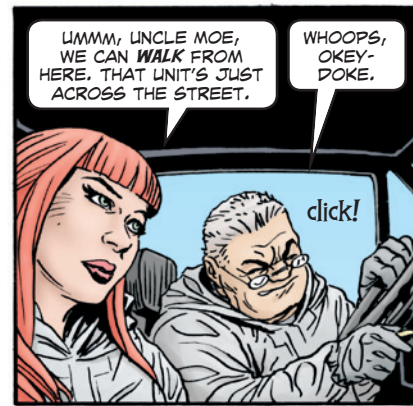
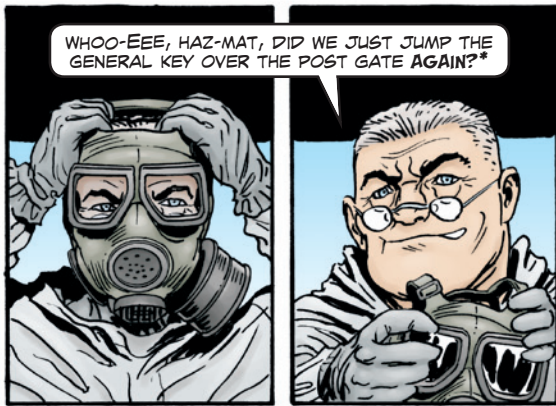
A FEW EXTRA MINUTES OF ATTENTION DURING SHUT DOWN CAN KEEP A SUCCESSFUL FLIGHT FROM TURNING INTO A VISIT FROM YOUR FRIENDLY NEIGHBORHOOD SAFETY OFFICER.



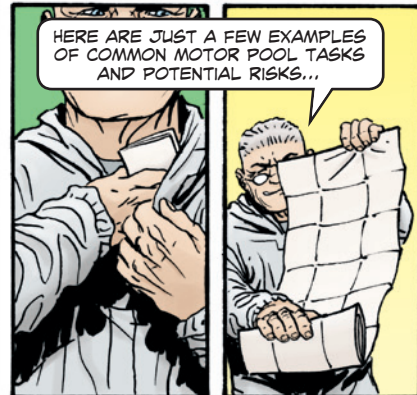
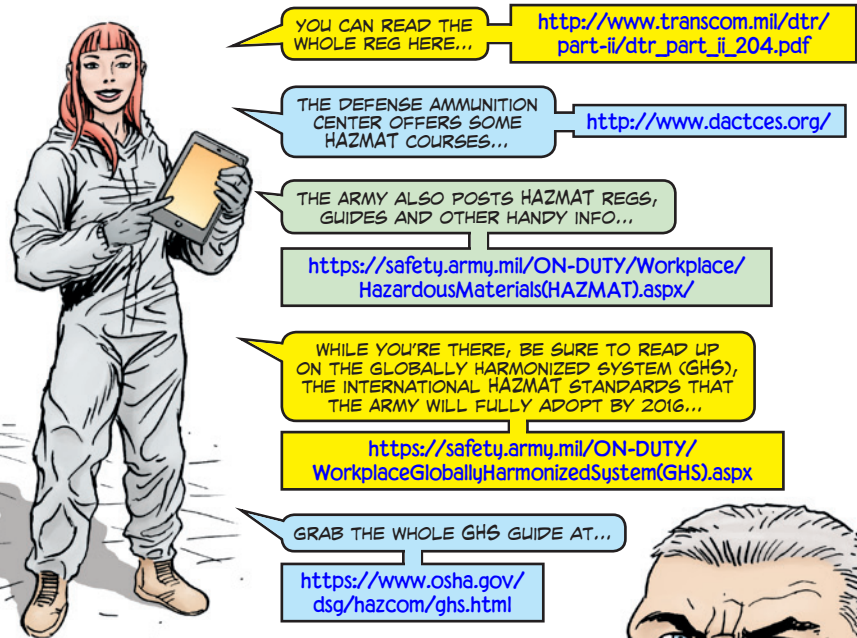
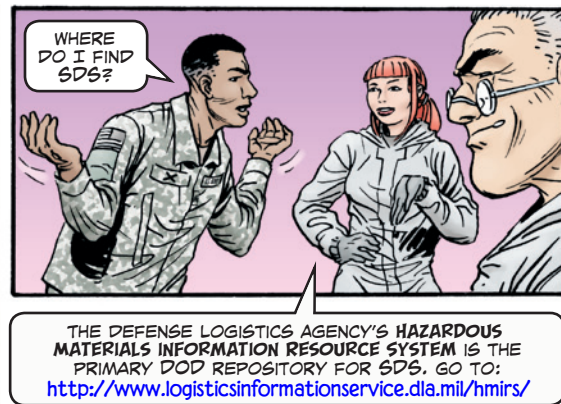
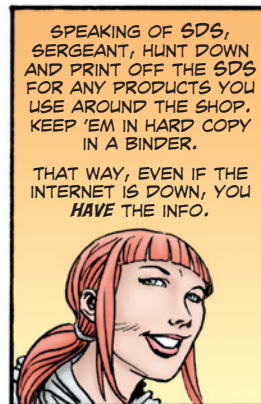
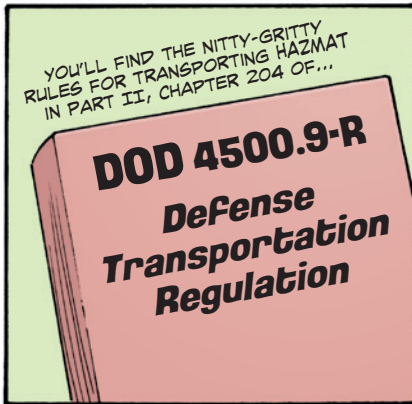
# THE DUKES OF HAZMAT







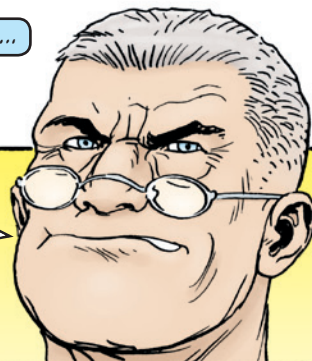




LOTS OF CHANGES COMING WITH GHS.

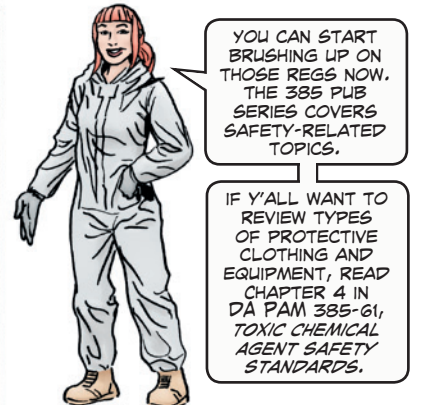
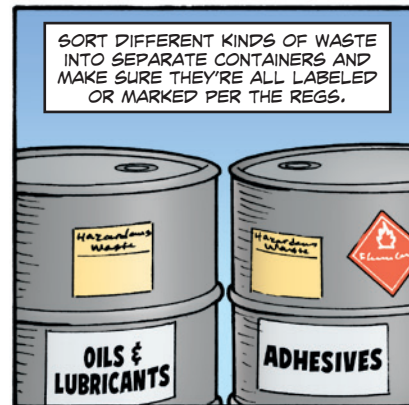
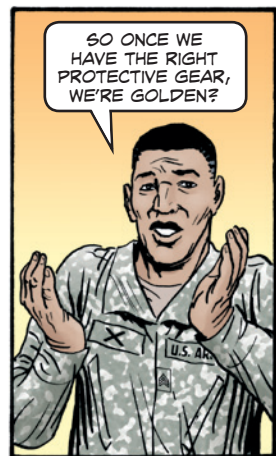
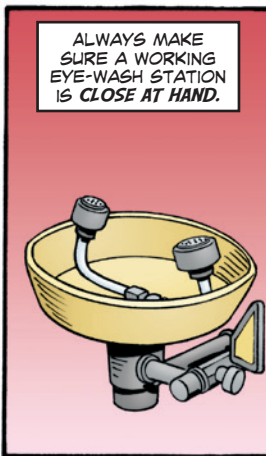
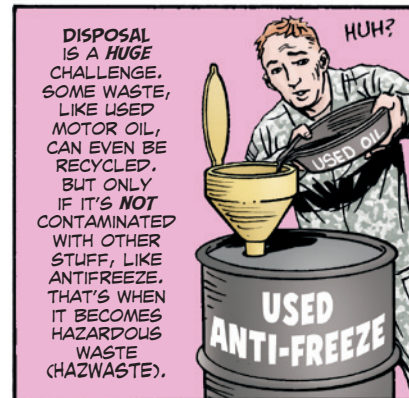
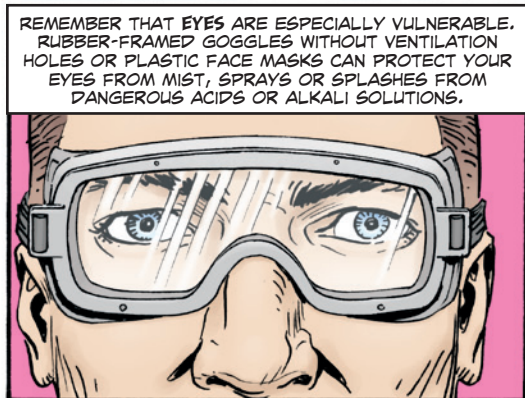
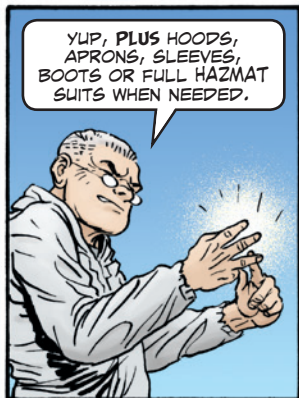
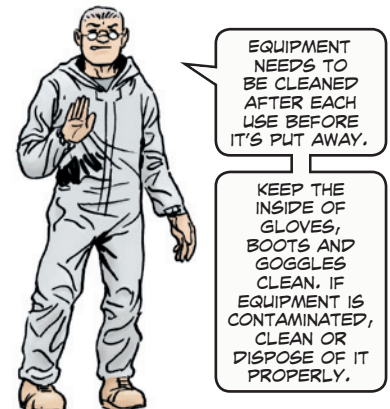
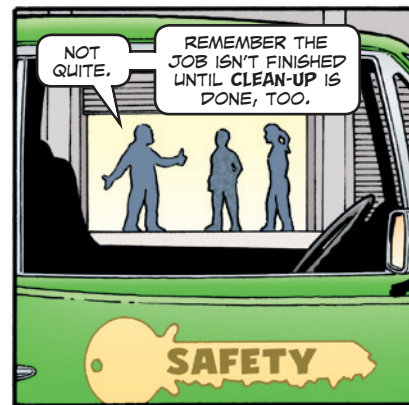
FOR STARTERS, STANDARD PICTOGRAMS WILL BE REQUIRED ON ALL LABELS TO ALERT USERS OF CHEMICAL HAZARDS.

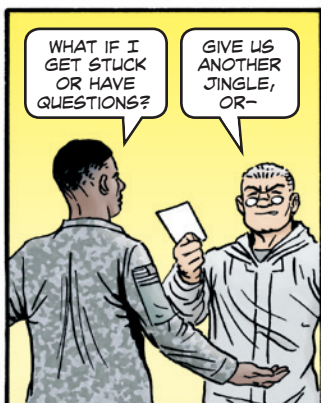
WHAT THE ARMY CALLED MATERIAL SAFETY DATA SHEETS (MSDS) ARE NOW CALLED SAFETY DATA SHEETS (SDS).



Operation or Process	HAZMAT Sources
Painting	Thinners, heavy metals, polyurethanes, waste epoxy, paint strippers
Vehicle maintenance	Used oils, lubricants, coolants, petroleum, alcohols, solvents, asbestos (brake linings)
Cleaning, degreasing	Solvents, detergents, ketones, refrigerants
Electrical/electronic maintenance	Heavy metals, PCBs
Battery shop operations	Acids, bases, cyanides, heavy metals
Washracks and motor pools	Used oil, solvents, heavy metal contaminated sludges
Disaster/CBRN preparedness	Bleach, decontaminating gasses (ethylene oxide) and liquids



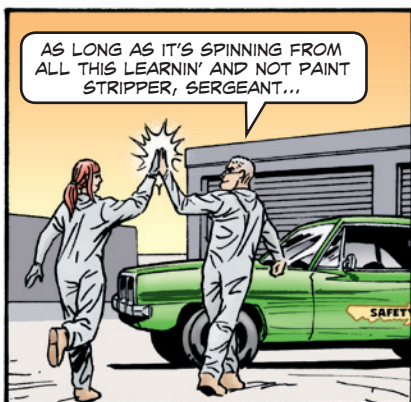




## Need HAZMAT Help?

The Logistics Support Activity's Packaging, Storage and Containerization Center (PSCC) offers packaging and shipping help for **HAZMAT**.

Call DSN 795-7144/7685,  
(570) 615-7144/7685,  
or email:  
[usarmy.tyad.usamc.mbx.pt@mail.mil](mailto:usarmy.tyad.usamc.mbx.pt@mail.mil)





# MISSILES **PS**

- Improved Mini Thermal Monocular for Urban Operations Squad Set
- M240B can use M240L long barrel
- New equipment for Urban Ops Sets
- Fastener Measurements
- Solid tips for sights PM
- Javelin PM

ALSO  
FEATURING  
**SMALL  
ARMS AND  
TOOLS**



# CBRN **PS**

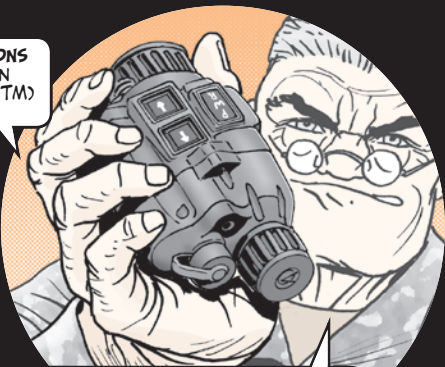
- Use or Lose M40/M42-Series masks
- JCAD needs M42 alarm



## Urban Operations Squad Set...

IF YOUR UNIT USES THE **URBAN OPERATIONS SQUAD SET**, NSN 5180-01-563-6719, AN IMPROVED MINI THERMAL MONOCULAR (MTM) IS NOW AVAILABLE.

# Improved Mini Thermal Monocular Available



THE MTM-PRODUCT IMPROVED (MTM-PI) IS AN **UPGRADE** TO THE SET'S CURRENT MTM.

ITS THERMAL VIEWER/CAMERA HAS **BETTER RANGE CAPABILITY, RESOLUTION, AND PHOTO AND VIDEO CAPTURE.**

THE IMAGES THE MTM-PI RECORDS CAN BE DOWNLOADED TO A CD/DVD FOR LATER USE.

IT'S DESIGNED TO BE HAND-HELD, BUT CAN ALSO BE MOUNTED ON A HELMET OR TRIPOD.

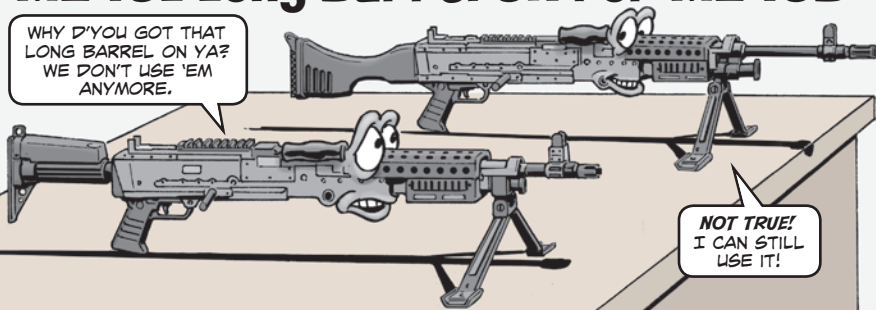
ORDER THE MTM-PI WITH NSN 5855-01-590-9103.

QUESTIONS?

CONTACT DAN STARK AT (586) 239-3678 OR EMAIL: [daniel.g.stark.civ@mail.mil](mailto:daniel.g.stark.civ@mail.mil)

## M240L Long Barrel OK For M240B

WHY D'YOU GOT THAT LONG BARREL ON YA? WE DON'T USE 'EM ANYMORE.



**MWO** 9-1005-313-23-4 replaced the M240L long barrel with a short one to increase the M240L's usefulness.

But that doesn't mean those long barrels, NSN 1005-01-549-8497, no longer have a purpose. The Army has authorized them for the M240B. Use them on the M240B until they fail gaging. If you don't have the M240B, transfer the long barrels to a unit that does.

For more info, see TACOM LCMC maintenance information (MI) message 15-004. It's available at: <https://tulsa.tacom.army.mil/Maintenance/message.cfm?id=MI15-004.html>

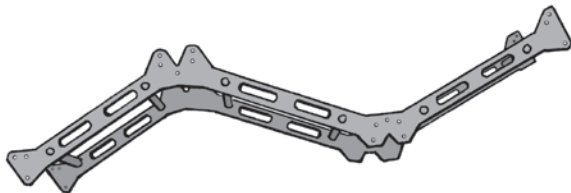
# New Equipment Available for Urban Operations Sets

IF YOUR UNIT USES THE **URBAN OPERATIONS SQUAD SET**,  
NSN 5180-01-563-6719, OR THE **URBAN OPERATIONS PLATOON SET**,  
NSN 5180-01-631-3029...

**...NEW  
EQUIPMENT IS  
AVAILABLE!**



FOR THE **SQUAD SET**, YOU CAN ORDER AN  
**ASSAULT LADDER KIT**, NSN 5440-01-627-0561.

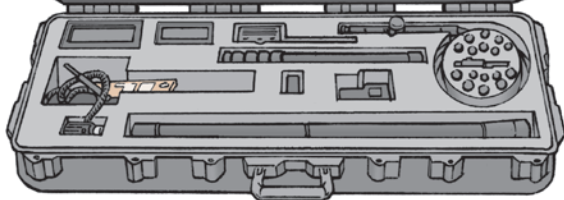


THE LADDER IS 12 FEET LONG AND CAN BE USED FOR  
BRIDGING HORIZONTAL GAPS AND FOR VERTICAL CLIMBING.

IT'S MADE OF AIRCRAFT-GRADE ALUMINUM, HAS 2-FT  
REPLACEABLE SECTIONS AND CAN HOLD UP TO 350  
POUNDS VERTICALLY OR HORIZONTALLY.

THE LADDER KIT INCLUDES THE LADDER, HOOKS, WHEEL  
ATTACHMENT, LANYARD, BALLISTIC SHIELD AND CARRIER.

FOR THE **PLATOON SET**, YOU CAN ORDER A  
**TACTICAL INSPECTION KIT**, WITH NSN 6650-01-631-2615.



THE KIT INCLUDES AN UNDER-DOOR CAMERA, INFRARED POLE  
CAMERA, FIBERSCOPE AND A REVERSE PEEPHOLE SCOPE.

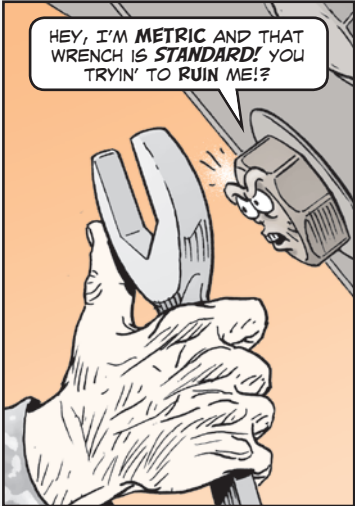
THE UNDER-DOOR AND IR POLE CAMERAS CAN BE USED IN  
EITHER WIRED OR WIRELESS MODE AND CAN RECORD TO AN  
SD CARD (VIDEO/AUDIO FOR THE UNDER-DOOR CAMERA, BUT  
VIDEO ONLY FOR THE IR CAMERA).

THE KIT HAS A 16-HR RECORDING CAPACITY AND MORE THAN  
100 FEET OF LINE-OF-SIGHT TRANSMISSION.

IF YOU HAVE **QUESTIONS** ABOUT EITHER URBAN OPERATIONS KIT, CONTACT PM SKOT'S  
DAN STARK AT (586) 239-3678, OR EMAIL: [daniel.g.stark.civ@mail.mil](mailto:daniel.g.stark.civ@mail.mil)



# STANDARD VS METRIC: IT MAKES A DIFFERENCE!



Dear Editor,

I often find new mechanics using standard wrenches and sockets on metric bolts and vice versa. They either don't know how to tell the difference or they think it doesn't make any difference.

But it does make a difference. Using the wrong tool rounds off the bolt head and eventually it becomes difficult to remove the bolt. And when the wrench slips off the bolt, you can be injured.

It would be great if PS showed how to tell the difference between standard and metric fasteners and how to ID their grade/class.

CW2 Melissa Fredericks  
KYARNG  
London, KY

**Editor's note:** We agree, Chief. Here's the lowdown:

Bolts can be IDed by their head markings. If the bolt head is marked with 8.8, 10.9 or 12.9, it's a metric bolt and diameter, head, length and thread pitch are measured in millimeters.

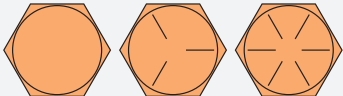
If the bolt has only three or six lines pointing toward the center of the head, the bolt is standard SAE (Society of Automotive Engineers).

Bolts are also classed for strength: grade for SAE and class for metric. Strength is measured by tensile strength, the load that the bolt can withstand before breaking, and yield strength, the maximum load at which the bolt shows .2 percent deformation.

## SAE Steel Bolts

Head Marking	Grade and Material	Bolt Diameter (inches)	Minimum yield strength (Ksi)*	Minimum tensile strength (Ksi)
No markings	Grade 2 (low or medium carbon steel)	1/4 - 3/4	57	74
3 radial lines	Grade 5 (medium carbon steel, quenched and tempered)	1/4 - 1	92	120
6 radial lines	Grade 8 (medium carbon alloy steel, quenched and tempered)	1/4 - 1 1/2	130	150
Stainless markings vary. Most stainless is non-magnetic	18.8 stainless steel	1/4 - 5/8	40-90	100-125

### STANDARD



### METRIC



## Metric Steel Bolts

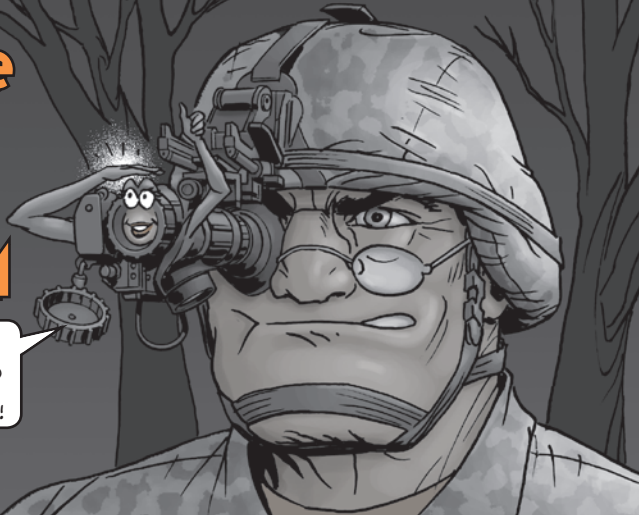
Head Marking	Grade and Material	Bolt Diameter (inches)	Minimum yield strength (Ksi)*	Minimum tensile strength (Ksi)
8.8	Class 8.8 (medium carbon steel, quenched and tempered)	up to 72 mm	93	116
10.9	Class 10.9 (alloy steel, quenched and tempered)	5mm-100mm	136	151
12.9	Grade 12.9 (alloy steel, quenched and tempered)	1.6mm-100mm	160	177
Metric stainless typically marked A-2	A-2 stainless steel	up to 20mm	65	102

This is a good story for repairmen to copy and keep in their tool boxes.

\*KSI=1,000 psi

# A Whole Sight Better with PM

OH! I AM SEEING A WHOLE LOT BETTER THANKS TO THESE TIPS FROM FT LEONARD WOOD!

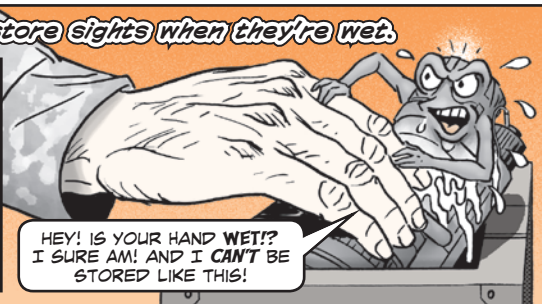


Dear Editor,

We repair sights here at the Ft Leonard Wood LRC. We think these tips might help units keep their sights a whole sight better.

## Don't store sights when they're wet.

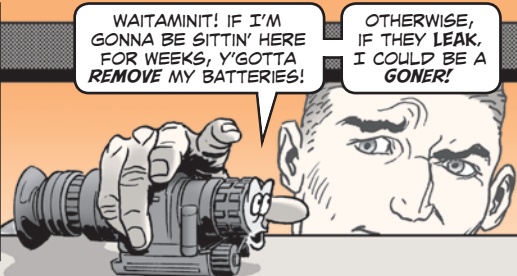
If your sight is wet and you stick it in its storage case, count on corrosion and electrical problems next time you use it. Wipe the sight dry before you store it.



HEY! IS YOUR HAND WET?? I SURE AM! AND I **CAN'T** BE STORED LIKE THIS!

## Never leave batteries installed when sights are stored for long periods.

Batteries leak and often ruin sights. The Army loses thousands of dollars every year because Soldiers don't follow this rule. Make it SOP to remove the sight batteries when turning in the sight for storage.



WAITAMINIT! IF I'M GONNA BE SITTING HERE FOR WEEKS, Y'GOTTA REMOVE MY BATTERIES!

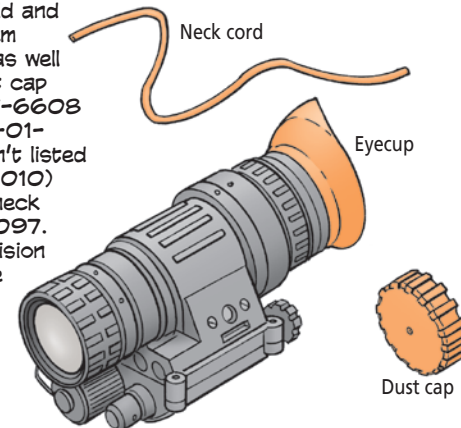
OTHERWISE, IF THEY LEAK, I COULD BE A GONER!

## Keep the AN/PVS-14 night vision device dust cap, neck cord and eyecup installed.

They often disappear in the field and Soldiers don't bother getting them replaced. Your sight won't work as well if these items are gone. The dust cap comes with NSN 5340-01-397-6608 and the eyecup with NSN 5855-01-246-8273. The eyecup NSN isn't listed in TM 11-5855-306-10 (Oct 2010) but is listed in the -23&P. The neck cord is NSN 4020-01-446-8097.

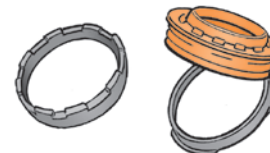
If you're not using your night vision device, keep the lens cap on. The cap protects not only the lens, but also protects the image intensifier from sun damage.

Keep track of AN/PVS-14 neck cord, eyecup and dust cap



## If you remove the AN/PVS-14's light interference filter (LIF), remember to reinstall it.

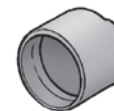
The LIF is another item that's often forgotten. It protects the sight from lasers and the sun.



Remember to reinstall AN/PVS-14 light interference filter

## Make sure the battery cap for the COMP M4 M68 reflex sight doesn't lose its contact.

The cap's rubber grommet and coiled spring contact can easily disappear when the cap is off. Then when the cap is screwed back on, you can't figure out why the M68 has no power. If the contact does disappear, order a new cap with NSN 6160-01-547-4333.

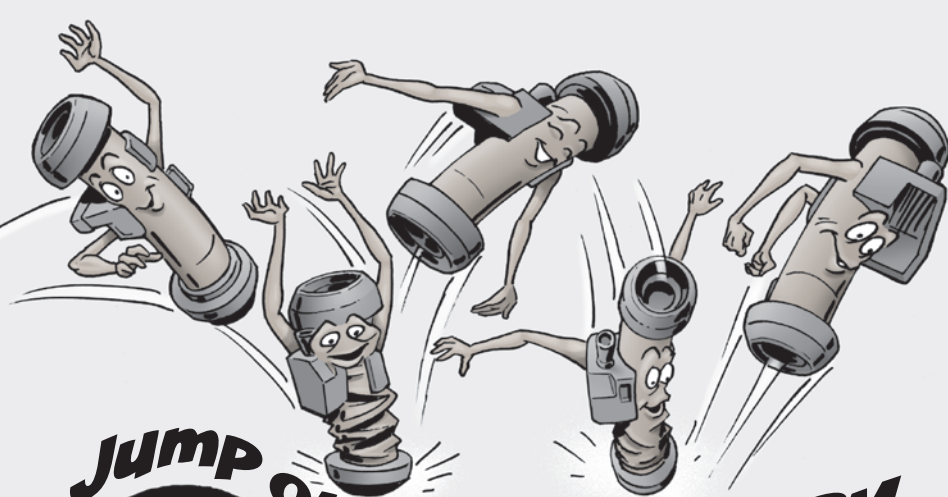


Check M68 reflex sight battery cap for contact **before** screwing it in

Johnny Vaughn  
Dal Campbell  
Ft Leonard Wood, MO

**Editor's note:** We can clearly see these are great tips! Thanks again for all the help from Ft Leonard Wood LRC.





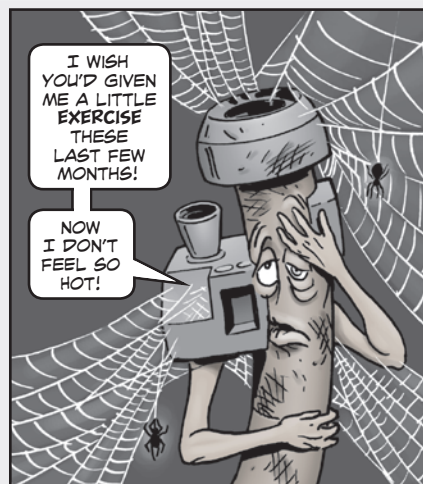
## Jump on This Javelin PM



**Exercise, exercise, exercise.** If you sat in the corner for months without any attention, you'd be in sad shape. It's the same with your Javelin. If you ignore it, it'll be in sad shape when you do need it.

Just putting the battery in and letting the command launch unit (CLU) run for 30 minutes at least monthly gives the built-in-test a chance to detect problems. And if you do the PMCS in the TM, you can be sure your Javelin is ready for action. This also gives operators a chance to refresh their Javelin training.

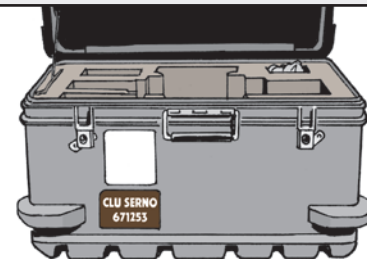
But remember to remove the battery when you're done.



**Keep and use the storage case.** The storage case is specifically designed to protect the CLU. But often the case disappears and units substitute another case. Bad move! If a Javelin is shipped in the wrong case and is damaged, units can be held responsible. Plus units are accountable for the case itself.

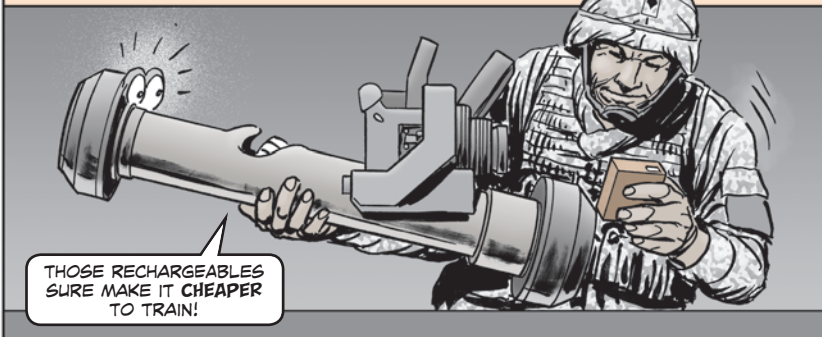
If a storage case disappears or is damaged, get it replaced ASAP. Contact the Javelin Integrated Technical Operations Center at (888) 528-4862 or email:

[jvitoc@jvjavelin.com](mailto:jvitoc@jvjavelin.com)



**Use Javelin storage case...  
and nothing else!**

**Use rechargeable batteries for training, but not for the real thing.** Use rechargeable BB-390B/U batteries, NSN 6140-01-490-4317, for training. But for actual Javelin firing, use the standard BA-5590/U battery, NSN 6135-01-438-9450, or the BA-5390/U battery, NSN 6135-01-501-0833.



## Equipment with Radioactive Material? You Need RSO Training

If your unit has any equipment with radioactive material, you need a radiation safety officer (RSO). Since a variety of sights, aiming devices and CBRN equipment contain radioactive material, that means practically every unit needs an RSO.

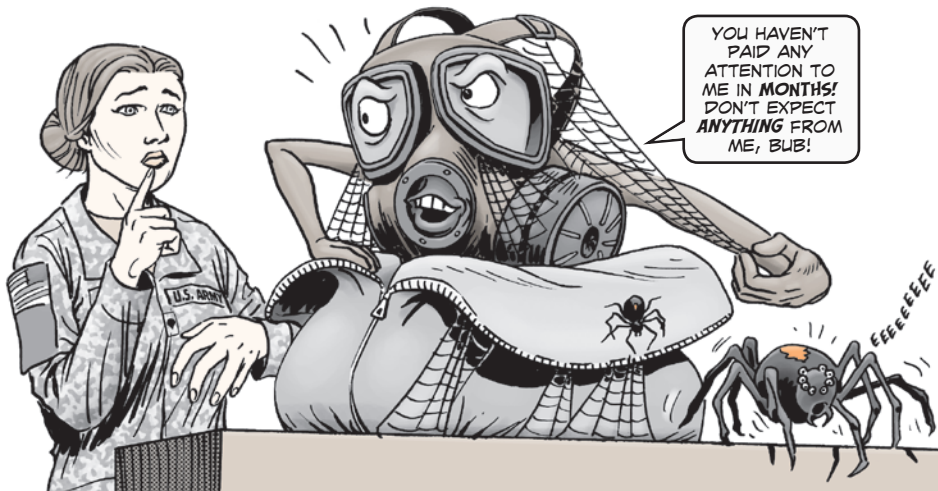
To become an RSO, a Soldier must complete the U.S. Army Chemical School's Basic Radiological Safety Course. The 5-day course covers all the basics of radiation and radioactive materials, including DOD certification for oversight of any radiation-emitting items.

To sign up for the course, go to: <https://www.atrrs.army.mil/atrrscd/Enter4J-F2/494-F9> for the COURSE NUMBER.

The Chemical School also offers courses in advance radiation safety and DOT Class 7 Radiological Packaging.

For more information, contact the Chemical School's Eric Hanson at DSN 676-6207, (573) 563-6207, or email: [eric.r.hanson1.civ@mail.mil](mailto:eric.r.hanson1.civ@mail.mil)

# USE IT OR LOSE IT!



Dear Editor,

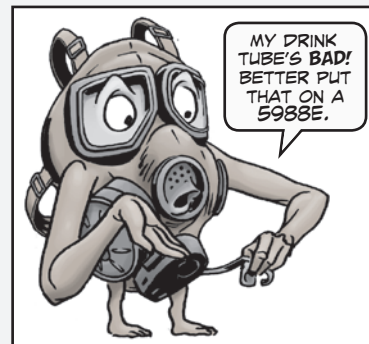
From my experience maintaining M40/M42 masks, I offer a few suggestions to help CBRN specialists keep their masks breathing freely.

**Use it or lose it.** Too many M40/M42s sit in their carriers until the annual trip to the gas chamber. Soldiers have no idea how to PMCS their masks or what condition their masks are in.

Sergeants' Time is a good time to go over how to PMCS a mask. But Soldiers should also practice wearing the mask. Shooting a rifle while wearing a mask is much different than without. Some units play a sport like softball or volleyball with everyone wearing masks just to give Soldiers an idea of what's it like to be active with a mask on.



**Make sure Soldiers fill out a DA Form 5988E when they do PMCS.** That's the only way problems they find will be fixed.



**Teach Soldiers not to route the drink tube through the hole in the facepiece.** That's a drainage hole for sweat and spit and other things you don't want in your mask.

Keep drain  
hole clear



**Don't fold the mask when you put it in the carrier.** That ruins the mask. The mask goes in the carrier in the upright position with the eye lenses facing away from your body when worn in the shoulder, leg or load-bearing harness positions.

If you fold  
mask, you  
ruin it!



Store mask upright with eye  
lenses facing away from body



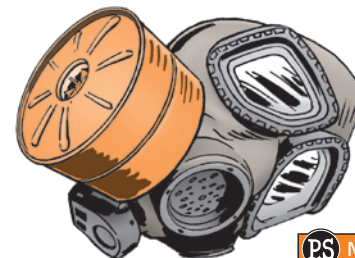
**Track canisters.** I still see the old black C2 canisters being used. Those were replaced by the green C2A1 canisters years ago.

Also, watch for the C2A1 expiration dates. The easiest way is to create a spreadsheet listing each mask number along with its canister number. You can then easily check for expired canisters in JACKS:

<https://jacks.jpeocbd.osd.mil/Default.aspx>

**Look for cracks in the facepiece.** Improper storage and dry rot take a toll on M40/M42 masks.

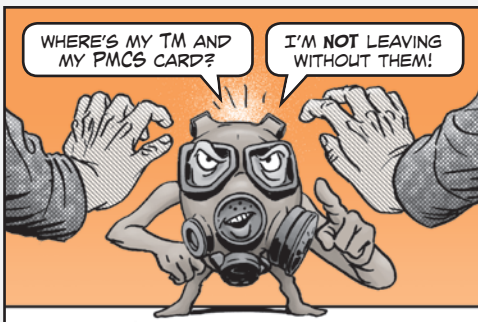
Canisters should be green only





*Make sure each carrier has both the -10 TM and the operator's cards. Soldiers need both when they're doing PMCS and you'll need both to pass inspection. Order the cards with NSN 7960-01-491-9282.*

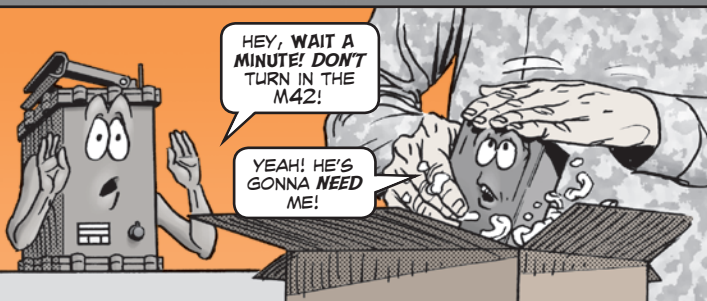
SSG Brandon Milhouse  
CBRN School  
Ft Campbell, KY



**Editor's note:** Great info, Sergeant. Lots of Soldiers will breathe easier thanks to your tips.



## JCAD Needs M42 Alarm!



CBRN SPECIALISTS, WHEN YOU GET THE NEW M4 JCAD (JOINT CHEMICAL AGENT DETECTOR), NSN 6665-01-552-2704, OR M4AI, NSN 6665-01-586-8286, YOU SHOULD **TURN IN** THE M22 ACADA (ALARM, CHEMICAL AGENT, AUTOMATIC) OR M43AI CHEMICAL AGENT DETECTOR.

BUT **DON'T** TURN IN THE M42 ALARM, NSN 6665-00-859-2215. YOU **WILL** NEED IT FOR THE JCAD. TURN IN THE M42 ONLY IF IT'S EXCESS.



IF YOU HAVE QUESTIONS, CONTACT TACOM'S AARON BENNETT AT DSN 786-1551, (586) 282-1551, OR EMAIL: [aaron.m.bennett5.civ@mail.mil](mailto:aaron.m.bennett5.civ@mail.mil)



# COMMUNICATIONS & SOLDIER SUPPORT

## Get the word on:

- Turning in SINCGARS RT-1523s
- Fixing 3kW TQG fuel lines
- Replacing DISE with PDISE

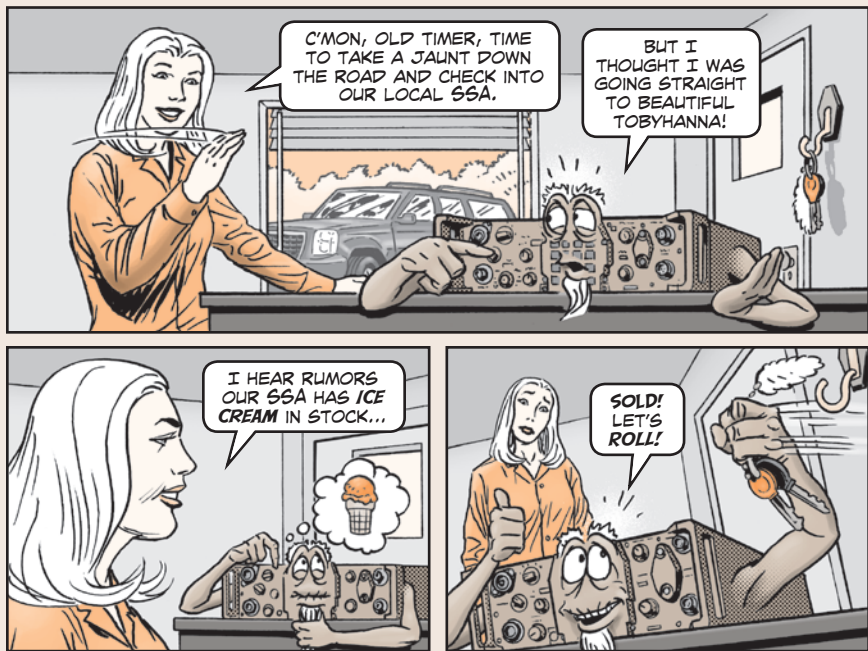
## For Soldier Support, get info on:

- New email for packaging help
- Food service portal





# Turn in SINCGARS RT-1523s to SSA



**T**he Army's Single Channel Ground and Airborne Radio System (SINCGARS) Receiver-Transmitter (RT) Exchange Program has been a big success.

More than 30,000 SINCGARS RT-1523s, Plain through D models, were sent to Tobyhanna Army Depot for demil. The RT models to be swapped out included NSNs 5820-01-234-8093, 5820-01-318-7990, 5820-01-365-2725, 5820-01-363-6929 and 5820-01-410-8981.

However, with the huge number turned in, CECOM LCMC found that property accountability issues popped up if units bypassed their servicing supply support activity (SSA) when returning swapped-out SINCGAR RT-1523s.

The main problem is that there are long delays for units to get signed DD Form 1348s for the swapped-out RT-1523s. That's because there's no automated process at the Defense Logistics Agency (DLA) to retrieve DD Form 1348s and return them to units.

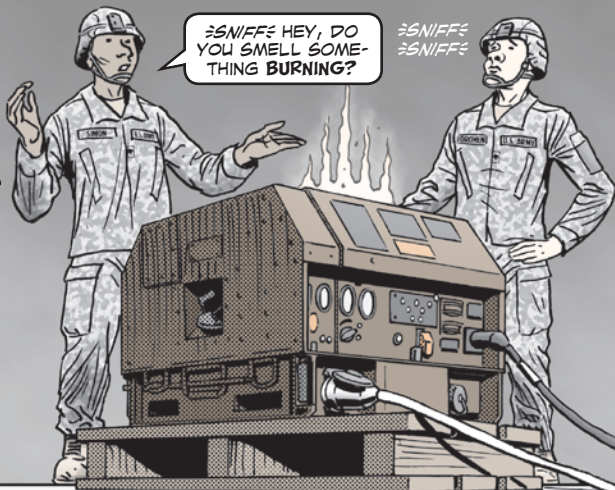
If your unit returned RT-1523s to Tobyhanna, you can request a signed DD Form 1348 for the swapped-out RTs by emailing DLA at: [dlacontactcenter@dla.mil](mailto:dlacontactcenter@dla.mil)

Units, turn in any remaining RT-1523s directly to your supporting SSA. That way a property book transaction occurs immediately, removing the RTs from your property book and relieving your unit of accountability.

For questions or help, contact Michael Dooney at DSN 648-6296, (443) 395-6296, or email: [michael.dooney1.civ@mail.mil](mailto:michael.dooney1.civ@mail.mil)

3-KW TQG...

# FUEL LINE FIX DOES THE TRICK



D RIP,

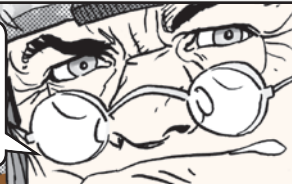
D RIP,

D RIP,

  
**YARRGG!**  
THAT  
DRIPPING!  
IT'S  
DRIVING ME  
**CRAZY!**

IT'S A  
SOUND  
THAT  
CAN  
DRIVE  
YOU  
**NUTS.**

BUT IF THAT  
DRIPPING IS COMING  
FROM A FUEL LEAK,  
YOU'VE GOT A LOT  
MORE TO WORRY  
ABOUT THAN A LITTLE  
DISTRACTION!



THE FUEL INJECTOR RETURN LINE ON THE MEP-831A AND MEP-832A 3-KW TACTICAL QUIET GENERATORS (TQGS) IS A **KNOWN LEAKER**.

THE HOSE IS JAMMED ONTO THE FUEL INJECTOR INLET AND RELIES ON FRICTION TO KEEP IT IN PLACE. CONSTANT VIBRATION CAN **LOOSEN** THE HOSE AND DRIPPING FUEL IS THE RESULT.

**THAT CAN LEAD TO A FIRE.**

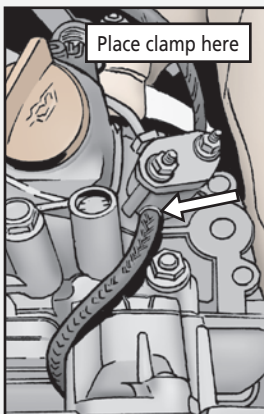
## HERE'S THE FIX:

REMOVE THE FLEXIBLE HOSE FROM THE FUEL INJECTOR.

SLIDE A CLAMP OVER THE HOSE, THEN RECONNECT IT TO THE INJECTOR. SLIP THE CLAMP UP TO THE CONNECTION POINT AND TIGHTEN.

YOU'LL FIND THE PROCEDURE ON PAGE 3-18 OF TM 9-2815-257-24 (NOV 00).

Place clamp here



ORDER THE CLAMP USING PN 9579K62 AND CAGE 30554 ON A DD FORM 1348-6.

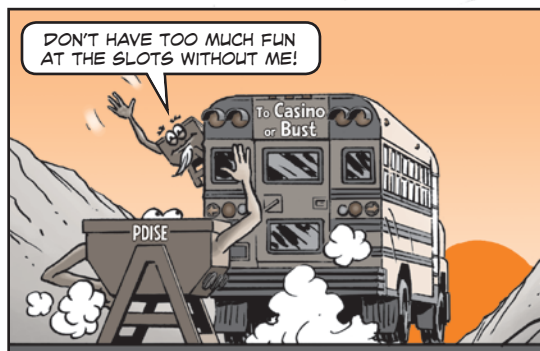
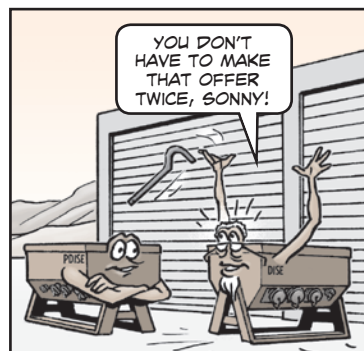
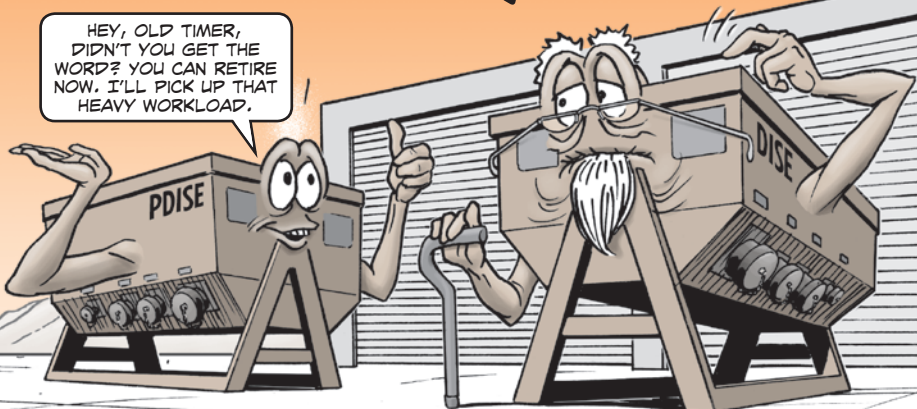
WITH THE CLAMP IN PLACE, THE FIRE THREAT IS **GONE**.

**AND**

YOU WON'T HAVE TO WORRY ABOUT THAT **DRIP, DRIP, DRIP** NOISE ANYMORE, EITHER.



# DISE MEL Drops to Zero



**T**ake note of an important change, units. CECOM LCMC reviewed the maintenance expenditure limit (MEL) for the M40, M60, M100 and M200 distribution illumination systems, electrical (DISE). CECOM determined that the MEL of 25 percent listed in TB 43-0002-32 (Jul 95) is too high for these systems.

THE TB IS UNDER REVISION.

IN THE MEANTIME, NOTE THAT THE MEL PERCENTAGE FOR THE FOLLOWING OLDER DISE SYSTEMS IS NOW **ZERO**...

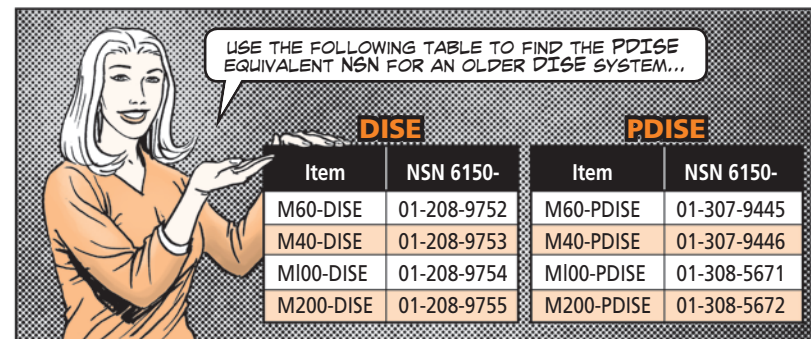
Nomenclature	NSN 6150-
Distribution system elec: 120V 1PH 60 AMP	01-208-9752
Distribution system elec: 120/208V 3PH 40 AMP	01-208-9753
Feeder system electrical: 3PH 100 AMP	01-208-9754
Feeder system electrical: 3PH 200 AMP	01-208-9755

PM-E2S2 has fielded the newer power distribution illumination systems, electrical (PDISE) to replace the remaining DISE sets in the field. If your unit still has authorized DISE sets or has DISE sets in lieu of PDISE authorized systems, contact Randy Morgan, DSN 654-3168, (703) 704-3168, or email:

[randy.j.morgan.civ@mail.mil](mailto:randy.j.morgan.civ@mail.mil)

Or Israel Sanchez, DSN 654-1080, (703) 704-1080, or email:

[israel.sanchez4.ctr@mail.mil](mailto:israel.sanchez4.ctr@mail.mil)



When requesting PDISE from PM-E2S2, include your unit's UIC, the PDISE NSN(s) and the quantity needed to fill your authorizations. PM-E2S2 will work with you and higher headquarters to issue replacement PDISE ASAP.

Also include your unit's property book officer's contact information and a complete DODAAC shipping address to expedite shipment.

Note that any on-hand DISE sets must be turned in to DLA Disposition Services after receipt of equivalent, authorized PDISE.

Questions? Contact John Mansfield at (410) 670-5737, or email:

[john.k.mansfield2.civ@mail.mil](mailto:john.k.mansfield2.civ@mail.mil)

Or Scott Mahoney, DSN 648-6242, (443) 395-6242, or email:

[scott.h.mahoney4.civ@mail.mil](mailto:scott.h.mahoney4.civ@mail.mil)

## New LOGSA PSCC Email for Packaging Help

The Logistics Support Activity's (LOGSA) Packaging, Storage and Containerization Center (PSCC) Packaging and Transportation Division has a new email address for support: [usarmy.tyad.usamc.mbx.pt@mail.mil](mailto:usarmy.tyad.usamc.mbx.pt@mail.mil)

## Pop into Food Services Portal

The Quartermaster School's Joint Culinary and Food Services portal is now open. It includes training materials, regulations and a virtual library covering the ins-and-outs of military food services. Grab your CAC, log in to AKO and check it out at: <https://www.us.army.mil/suite/page/697080/>

PS

# LOGISTICS

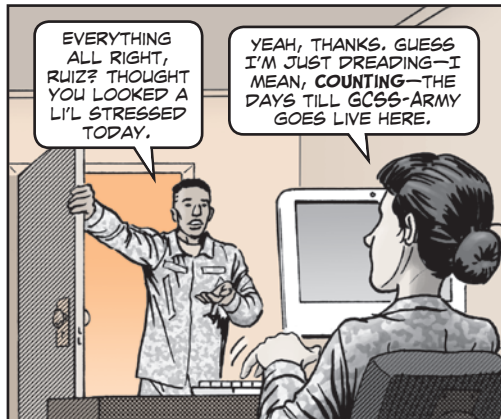


Check out:

- GCSS-Army training
- SDDCTEA's website
- SMR codes in AR 700-82



# Get GCSS-Army Training For Record from GTRAC



CLOE, WHERE DO I GET GCSS-ARMY TRAINING FOR RECORD?

SERGEANT, THE GCSS-ARMY TRAINING AND CERTIFICATION (GTRAC) SYSTEM IS THE **MAIN SOURCE** FOR WEB-BASED TRAINING (WBT) FOR RECORD.

IT'S GOOD THAT YOU'VE ASKED THIS QUESTION NOW BECAUSE GCSS-ARMY'S WBT IS A **PREREQUISITE** FOR ATTENDING THE NEW EQUIPMENT TRAINING (NET) TAUGHT IN THE CLASSROOM **BEFORE** GCSS-ARMY GOES LIVE.

YOUR GO-LIVE DATE VARIES DEPENDING ON WHERE YOU'RE LOCATED, SO CHECK SCHEDULES IN THE GCSS-ARMY FIELDING CENTER. GO TO:

<https://gcss.army.mil/>  
CLICK ON **FIELDING CENTER** IN THE TOP MENU.

IDEALLY, THE WBT SHOULD BE COMPLETED 1-2 MONTHS BEFORE NET TRAINING. GIVE YOURSELF PLENTY OF TIME TO COMPLETE THE WBT LESSONS, PASS THE EXAMS AND GET YOUR CERTIFICATE OF COMPLETION FROM GTRAC.

NEW STUDENTS SHOULD START WITH THESE FOUR COURSES:

- GCSS-Army Overview
- Basic Navigation
- Intermediate Navigation
- Use GCSS-Army Reports

FOLLOW UP THE BASIC COURSES WITH OTHERS IN YOUR FUNCTIONAL AREA. YOU MUST PASS AN ENTIRE SET OF WBT LESSONS FOR YOUR SPECIFIC ROLE TO MEET NET PREREQUISITES.

## GTRAC

EACH COURSE MUST BE COMPLETED **BEFORE** YOU CAN TAKE THE FINAL ASSESSMENT EXAM.

AFTER THREE FAILED ATTEMPTS TO PASS THE ASSESSMENT, YOU MUST RETAKE THE COURSE.



TO LEARN MORE AND TO DOWNLOAD THE GTRAC SMART BOOK, VISIT:  
<https://www.gcss.army.mil/Training/GTRAC.aspx>



## SDDCTEA Shows New Face

There's a fresh new face on the web! Check out the Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA) public website at:

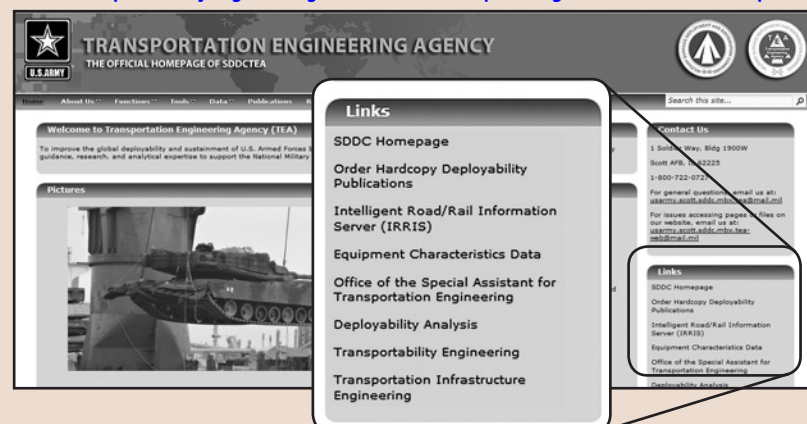
<http://www.sddc.army.mil/sites/tea/Pages/default.aspx>

To get free hard copies of various deployability pubs, click on **Order Hard Copy Deployability Publications** in the right-hand "Links" column. Click the **Transportability Engineering** link to get transportation mode criteria, TEA modal instructions, papers on vehicle weight growth and other transportation assets.

A new rail tiedown lessons learned section also supplements TEA MI 55-19, *Tiedown Instructions for Rail Movements* (Apr 15). You'll find the rail tiedown lessons learned at:

<http://www.sddc.army.mil/sites/TEA/Functions/Deployability/>

[TransportabilityEngineering/MODES/RailTransport/Pages/LessonsLearned.aspx](http://www.sddc.army.mil/sites/TEA/Functions/Deployability/TransportabilityEngineering/MODES/RailTransport/Pages/LessonsLearned.aspx)



# SMR Codes Updated

WE GET A LOT OF QUESTIONS HERE AT PS THAT CAN BE ANSWERED BY THE SMR CODES FOUND IN YOUR TMS.

TIME TO GO BACK TO SCHOOL, TROOPS, AND GET THE STRAIGHT SCOOP ON SMR CODES.

PACLZA  
KAOZAG  
XDOOK

AR  
700-82

U.S. ARMY

HAVE YOU BRUSHED UP ON YOUR SOURCE, MAINTENANCE AND RECOVERABILITY (SMR) CODES LATELY?

IF NOT, YOU SHOULD!

THAT'S BECAUSE OF CHANGES MADE TO REGULATIONS THAT AFFECT THE JOINT SERVICES.

FOR THE ARMY, THESE CHANGES ARE COVERED IN A MAJOR REVISION OF AR 700-82, JOINT REGULATION GOVERNING THE USE AND APPLICATION OF UNIFORM SOURCE MAINTENANCE AND RECOVERABILITY CODES (AUG 14).

ONE MAJOR CHANGE IS THAT CODE C IS NOW USED IN THE THIRD, FOURTH OR FIFTH POSITIONS OF THE MAINTENANCE AND RECOVERABILITY CODES TO REPRESENT FIELD-LEVEL CREW OR OPERATOR MAINTENANCE.

SINCE WE'RE ON THE SUBJECT, NOW'S THE PERFECT CHANCE TO TAKE A MINI SMR CODE REFRESHER COURSE!

NEW SOLDIERS AND OLD HANDS WHO FEEL A LITTLE RUSTY ON THE TOPIC MAY FIND THIS SUMMARY **HELPFUL**.



## Breaking Down SMR Codes

PACLZA  
KAOZAG  
XDOOK



YOU CAN FIND SMR CODES AT THE BEGINNING OF EVERY REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL) SECTION IN TMS ENDING WITH A "P" OR "&P."

THE CODE FORMAT HAS **FOUR PARTS**:

- A TWO-POSITION **SOURCE CODE**
- A TWO-POSITION **MAINTENANCE CODE**
- A **RECOVERABILITY CODE**
- AN **OPTIONAL SERVICE-SPECIFIC CODE**

### Source

THE FIRST AND SECOND POSITIONS OF THE CODE BOTH REFER TO AN ITEM'S **SOURCE**.

THE FIRST POSITION GIVES A GENERAL CATEGORY AND IS **ALWAYS** ONE OF FIVE LETTERS... P, K, M, A AND X



- **P - Procured.** Items with a P are centrally procured.
- **K - Kit.** Sometimes items in kits don't have NSNs. In cases where an item is part of a kit and is also an item outside the kit, the P series source code is used.
- **M - Manufactured.** The item is manufactured or fabricated at specified maintenance activities.
- **A - Assembled.** The item is assembled at a maintenance activity.
- **X - Not stocked.** (See "Key to X Codes" for descriptions).

### Key to X Codes

- **XA** - Item is not procured or stocked because this item requires you to replace the next higher assembly.
- **XB** - A support item not expected to fail and not stocked. In some cases, it may be available through salvage. If not available or authorized through salvage, order the item through normal supply channels using its CAGE code and part number.
- **XC** - An installation drawing, diagram, instruction sheet or field service drawing identified by a manufacturer's part number.
- **XD** - A support item that is not expected to fail but **cannot** be replaced by salvage/cannibalization. Local purchase or requisition this item through normal supply channels using its CAGE code and part number.

X SERIES SOURCE CODES ARE ITEMS FOR WHICH LITTLE OR NO DEMAND IS EXPECTED.

## Second Position

THE SECOND POSITION ADDS SPECIFIC INFO TO THE GENERAL SOURCE CODE OF THE FIRST POSITION.

PACLZA

FOR EXAMPLE, PA IS A PROCURED AND STOCKED ITEM. PH IS A STOCKED AND PROCURED ITEM BUT CONTAINS HAZMAT, SO IT HAS SPECIAL REPORTING REQUIREMENTS. PZ MEANS AN ITEM WAS ONCE PROCURED BUT IS NOW TERMINAL OR OBSOLETE WITH NO REPLACEMENT, SO YOU CAN'T ORDER IT.

## Maintenance

THE THIRD AND FOURTH POSITIONS DEFINE WHAT LEVEL OF MAINTENANCE IS ASSIGNED TO AN ITEM.

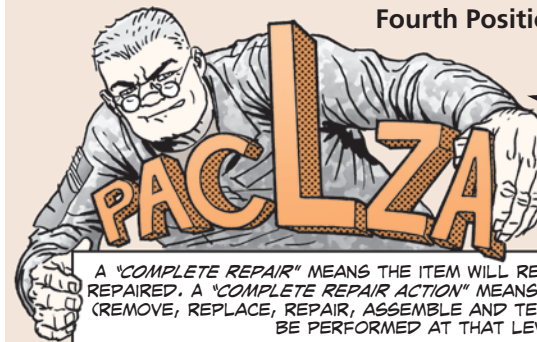
### Third Position

THE LOWEST LEVEL AUTHORIZED TO REMOVE, REPLACE OR USE THE ITEM IS DEFINED BY THE FOLLOWING CODE...



- **C** Operator/crew
- **O** Organization/unit
- **F** Installation/field/intermediate level or aviation support battalion (ASB)
- **H** Installation/field/below depot sustainment
- **K** Contractor facility
- **L** Specialized repair activity or Theater Aviation Sustainment Maintenance Group (TASMG)
- **D** Depot

### Fourth Position



THE FOURTH POSITION USES THE SAME CODES AS POSITION THREE, BUT TELLS YOU THE LOWEST MAINTENANCE LEVEL THAT IS CAPABLE AND HAS THE RESOURCES TO PERFORM A COMPLETE REPAIR.

A "COMPLETE REPAIR" MEANS THE ITEM WILL RETURN TO SERVICE WHEN REPAIRED. A "COMPLETE REPAIR ACTION" MEANS THAT ALL MAINTENANCE (REMOVE, REPLACE, REPAIR, ASSEMBLE AND TEST) FOR THE ITEM MUST BE PERFORMED AT THAT LEVEL.

PS MORE

# Keep This SMR Chart Handy!

JOINT SERVICE CODING				REFERENCE CHART														
SOURCE				MAINTENANCE		RECOVERABILITY												
1ST	2ND POSITION			3RD POSITION	4TH POSITION	5TH POSITION	6											
	Means of Acquiring Support			USE:	REPAIR:	DISPOSITION:												
P (Procured)	A	ITEM: Stocked	FIELD	Maintenance level and/ or maintenance activity authorized to remove/ replace the item.	Maintenance level and/ or maintenance activity with capability to perform complete repair actions.	When unserviceable or uneconomically repairable, condemn or dispose.	SERVICE OPTION CODES											
	B	ITEM: Stocked, Insurance																
	C	ITEM: Stocked, Deteriorative																
	D	ITEM: Support, Initial Issue or Outfitting and Stocked Only for Additional Initial Issue																
	E	EQUIPMENT: Support, Initial Issue or Outfitting and Stocked Only for Additional Initial Issue		C	Operator/Crew	C		Operator/Crew										
	F	EQUIPMENT: Support, Non-Stocked, Centrally Procured on Demand		O	Organization / Unit	O		Organization / Unit										
	G	ITEM: Stocked for Sustained Support, Uneconomical to Produce at Later Time		F	Installation/Field/ Intermediate level or afloat	F		Installation/Field/ Intermediate level or afloat										
	H	ITEM: Stocked, Contains hazardous materials, Hazardous Materials Information System/Material Safety Data Sheet reporting required		G	Both ashore and afloat	G		Ashore and afloat										
	R	Terminal or Obsolete, Replaced		SUSTAINMENT	H	Installation/Field/ Sustainment or ashore		H	Installation/Field/ Sustainment or ashore									
	Z	Terminal or Obsolete, Not Replaced								K	Contractor Facility	K	Contractor Facility					
K (Kit)	D	ITEM: Depot on hand and Maintenance Kits	G	Both ashore and afloat	G	Ashore and afloat	L	Specialized Repair Activity	L	Specialized Repair Activity	L	Not Authorized Below Depot Level						
	F	ITEM: Maintenance Kit, Place at O,F,H,L											D	Depot	D	Depot	D	Field level repairable: Condemn or Dispose at Depot
	B	ITEM: in Both Depot Repair & Maintenance Kits																
M (Manufactured)	O	Manufacture (MFG) or fabricate (FAB) at Unit Level	SUSTAINMENT	H	Installation/Field/ Sustainment or ashore	H	Installation/Field/ Sustainment or ashore	K	Contractor Facility	K	Contractor Facility	A	Nonrepairable, needs special handling					
	F	MFG OR FAB at intermediate/field level																
	H	MFG OR FAB at intermediate/sustainment level																
	L	MFG OR FAB at Specialized Repair Activity (SRA)																
	G	MFG OR FAB Both Afloat and Ashore (Navy Only)																
	D	MFG OR FAB at Depot Maintenance Level																
A (Assembled)	O	ITEM: Assembled at Unit	SUSTAINMENT	L	Specialized Repair Activity	L	Specialized Repair Activity	L	Not Authorized Below Depot Level	D	Field level repairable: Condemn or Dispose at Depot							
	F	ITEM: Assembled at intermediate/field level																
	H	ITEM: Assembled at intermediate/sustainment level																
	L	ITEM: Assembled at Specialized Repair Activity (SRA)																
	G	ITEM: Assembled Afloat and Ashore (Navy Only)																
X (Not Stocked)	D	ITEM: Assembled at Depot Maintenance Level	SUSTAINMENT	D	Depot	D	Depot	D	Field level repairable: Condemn or Dispose at Depot	B	Recondition							
	A	ITEM: Requisition Next Higher Assembly																
	B	ITEM: Not Procured or Stocked. Available thru salvage. Requisition by CAGE/Part Number.																
	C	Manufacturer/installation Drawing, Diagram, Instruction Sheet. Identify by Cage/Part Number.																
	D	Not Stocked. Obtain via Local Purchase.																

PS 756

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NOV 15

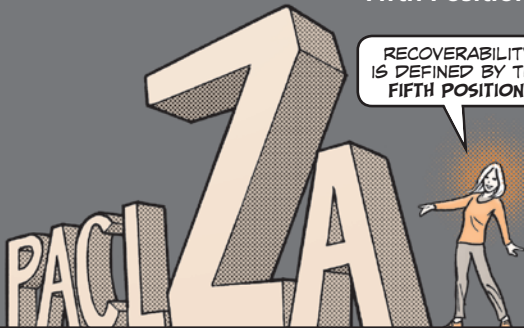




IN ARMY PROGRAMS, CODE **L** MEANS A SPECIALIZED REPAIR ACTIVITY OR TASMG. CODE **O** IS FIELD LEVEL MAINTENANCE PERFORMED AT AVIATION MAINTENANCE COMPANIES.

CODE **Z**, MEANING **NON-REPAIRABLE**, MAY BE USED IN THE FOURTH OR FIFTH POSITIONS. **Z-CODED** PARTS NEED TO BE REPLACED WHEN THEY GO BAD.

### Fifth Position



RECOVERABILITY IS DEFINED BY THE **FIFTH POSITION**.

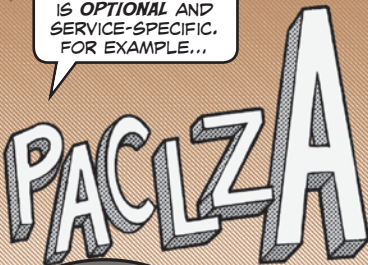
THE CODE TELLS YOU WHAT MAINTENANCE LEVEL CAN DETERMINE WHEN AN ITEM IS UNSERVICEABLE OR TOO EXPENSIVE TO REPAIR, AND WHO CAN CONDEMN OR DISPOSE OF THE ITEM.

THE FIFTH POSITION GENERALLY USES THE **SAME** CODES AS THE THIRD AND FOURTH POSITIONS.

### Sixth Position

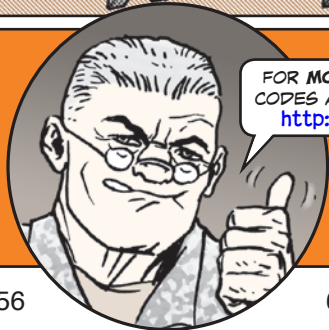


A **SIXTH POSITION** IS **OPTIONAL** AND SERVICE-SPECIFIC. FOR EXAMPLE...



CODE **A** IN THE ARMY'S SIXTH POSITION MEANS NO DEMILITARIZATION IS REQUIRED BEFORE DISPOSAL.

CODE **G** APPLIES TO AMMUNITION, EXPLOSIVES OR DANGEROUS ARTICLES THAT MUST BE DEMILITARIZED BEFORE THEY GO TO DLA DISPOSITION SERVICES.



FOR MORE INFORMATION AND A **COMPLETE LIST** OF CODES AND DEFINITIONS, DOWNLOAD AR 700-82 AT:  
[http://www.apd.army.mil/pdf/files/r700\\_82.pdf](http://www.apd.army.mil/pdf/files/r700_82.pdf)

**PS** END



## Connie's POST SCRIPTS



### FMTV Lift-Towing Restrictions

Operators, **do not** lift-tow any FMTV vehicles with armor using the M1089/A1 wrecker. Only flat towing is authorized when using these wreckers, just like it says in TACOM ground precautionary action (GPA) message 10-019:

[https://tulsa.tacom.army.mil/safety/gpm/tacom\\_wn/gpa10-019a.html](https://tulsa.tacom.army.mil/safety/gpm/tacom_wn/gpa10-019a.html)

The GPA does not apply to the M1089A1P2 wrecker, however. The M1089A1P2 **can** lift-tow armored FMTVs.

### GCSS-Army Reminder

Remember to check the GCSS-Army website for alerts, updated fielding and training schedules and other important info. Visit: <https://gcss.army.mil/>

Or sign up to get automatic notifications at: <https://gcss.army.mil/Support/register.aspx>

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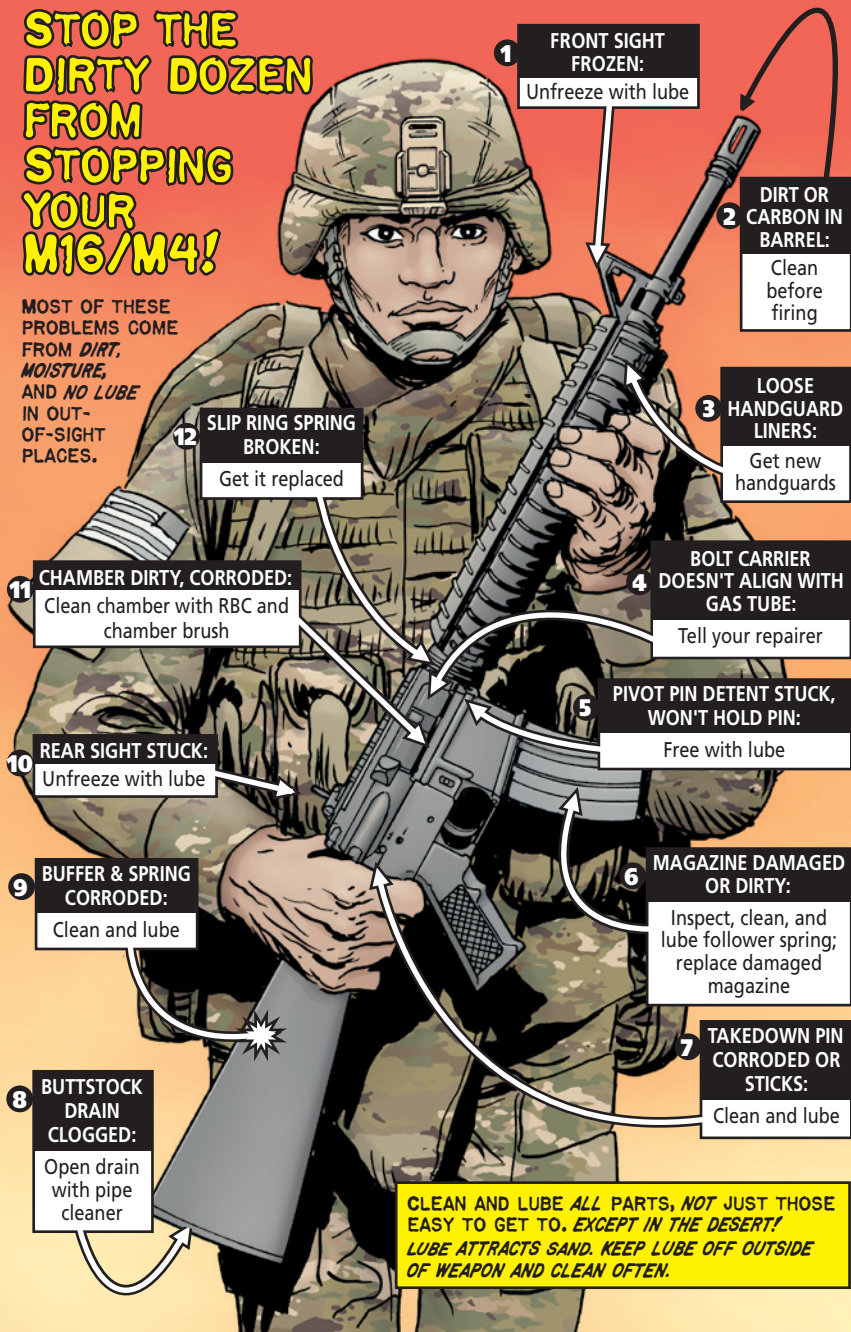
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**Would You Stake Your Life <sup>right now</sup> on the Condition of Your Equipment?**



# STOP THE DIRTY DOZEN FROM STOPPING YOUR M16/M4!

MOST OF THESE PROBLEMS COME FROM *DIRT, MOISTURE, AND NO LUBE* IN OUT-OF-SIGHT PLACES.



**1 FRONT SIGHT FROZEN:**  
Unfreeze with lube

**2 DIRT OR CARBON IN BARREL:**  
Clean before firing

**3 LOOSE HANDGUARD LINERS:**  
Get new handguards

**4 BOLT CARRIER DOESN'T ALIGN WITH GAS TUBE:**  
Tell your repairer

**5 PIVOT PIN DETENT STUCK, WON'T HOLD PIN:**  
Free with lube

**6 MAGAZINE DAMAGED OR DIRTY:**  
Inspect, clean, and lube follower spring; replace damaged magazine

**7 TAKEDOWN PIN CORRODED OR STICKS:**  
Clean and lube

**CLEAN AND LUBE ALL PARTS, NOT JUST THOSE EASY TO GET TO. EXCEPT IN THE DESERT! LUBE ATTRACTS SAND. KEEP LUBE OFF OUTSIDE OF WEAPON AND CLEAN OFTEN.**

**12 SLIP RING SPRING BROKEN:**  
Get it replaced

**11 CHAMBER DIRTY, CORRODED:**  
Clean chamber with RBC and chamber brush

**10 REAR SIGHT STUCK:**  
Unfreeze with lube

**9 BUFFER & SPRING CORRODED:**  
Clean and lube

**8 BUTTSTOCK DRAIN CLOGGED:**  
Open drain with pipe cleaner