



# THE PREVENTIVE MAINTENANCE MONTHLY

TB 43-PS-564, The Preventive Maintenance Monthly, is an official publication of the Department of the Army, providing information for all soldiers assigned to combat and combat support units and all soldiers with unit maintenance and supply duties. All information published has been reviewed and approved by the agency responsible for the equipment, publication or policy discussed. Application of the information is optional with the user. Masculine pronouns may refer to both genders.

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

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

Or E-mail to:

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

Internet Address:

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By Order of the Secretary of the Army:

**ERIC K. SHINSEKI**

General, United States Army Chief of Staff

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 9924411

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THANK YOU, VETS!

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PS

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PREVENTIVE  
MAINTENANCE  
MONTHLY

TB 43-PS-564

Approved for  
Public Release;  
Distribution Is  
Unlimited



SAME  
AS ALWAYS,  
SIR! GOOD,  
OLD-FASHIONED  
PM!

I WONDER  
HOW TODAY'S  
SOLDIERS KEEP THIS  
NEW-FANGLED  
EQUIPMENT  
RUNNING?

HOW DO  
THEY KEEP THESE  
OLD THINGS  
RUNNING?

SAME  
AS ALWAYS,  
YOUNG FELLER!  
GOOD,  
OLD-FASHIONED  
PM!

# Willing!



YES SIR, WHEN?

# Able!



YES SIR, WHERE?

# Ready?



NOT ME!

**S**oldiers have a can-do attitude.

If trouble is looming on the world horizon, and your commander asks you if you are willing to go, chances are you'd simply say, "Yes, Sir. When?"

If your commander asks if you are able to go to an international hot spot, you would undoubtedly say "Yes, Sir. Where?"

So the big questions aren't: Are you willing or are you able?

The big question is: Are you ready? Is your moving, shooting and communicating equipment ready to do the job they'll be asked to do?

And this question won't stand up to a "can-do, anything is possible" answer. This one isn't a state of mind, it's a state of fact. Your equipment is either ready or it's not ready.

That puts things squarely on your shoulders, operator. Because the only way equipment will be able to do its job is if you do your PMCS completely, and on time.

If PMCS is done, and done by the book, and parts are replaced on time, and lubrication is done like the LO says, your gear will be ready. Then, when you tell your commander you're willing, able and ready to go—you will be.



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# PM in Three-Part Harmony



**M**echanics, you can keep your vehicle's batteries singing a happy tune by following this score for three-part harmony:

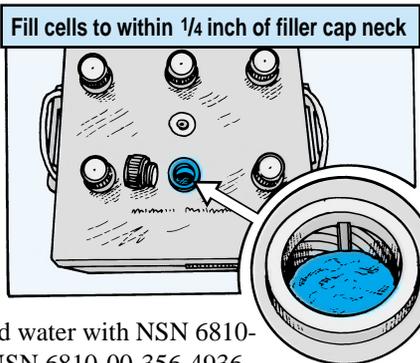
**1. Make sure battery plates are covered with electrolyte by adding distilled water when needed.**

Without electrolyte—a mix of sulfuric acid and distilled water—there is no chemical reaction with the cell plates. Without the reaction, there is no electricity, and the battery discharges and dies.

More is not better when it comes to adding water, though. Too much water—like filling cells to the top—is just as bad as too little. When the cell is too full, electrolyte is flushed out during charging. Then, the battery can't recharge itself, so it dies. Fill cells with distilled water to within 1/4 inch of the filler cap necks.

You can get six 1-gal bottles of distilled water with NSN 6810-00-682-6867. Get one 5-gal bottle with NSN 6810-00-356-4936.

Don't use non-distilled water unless you must. Impurities in non-distilled water can disrupt the chemical reaction that provides electricity.



But, in a pinch, rainwater, air conditioner condensation or even tap water can be used. Filter it through a clean cloth before using it, though.

Fill the battery using battery filler syringe, NSN 6140-00-808-7325. Carry a supply of water in the gravity battery filler, NSN 6140-00-635-3824. Both items are in the Common shop sets.

Even with the syringe you can overfill, so be careful.

Keep in mind that during hot weather this water and electrolyte solution expands. If batteries were full at cooler temps, they'll be overfull when it's hot. You can remove water with the syringe, too.

Run the engine for 20–30 minutes after adding water in freezing temperatures. The charging system will then mix the water and electrolyte. A fully charged battery won't freeze even at temps as low as -90°F.

If you don't mix the two, the water just sits on top and will start freezing at 32°F.



You can tell how much charge a battery has by measuring the electrolyte's specific gravity with the antifreeze and battery tester, NSN 6630-00-105-1418, that is also in the Common shop sets. The right charge is shown by a specific gravity reading of 1.280.

Put the battery tester to work when:

- You're pulling the equipment's semiannual service.
- You suspect electrolyte was flooded out by overfilling.
- You're troubleshooting the charging system.
- Cold weather is just around the corner.
- You're putting the battery into service for the first time.

Instructions for battery testing are printed on Pages 3-5 through 3-11 of TM 9-6140-200-14 (Sep 98).

### 2. Clean dirt and corrosion from the battery and battery box.

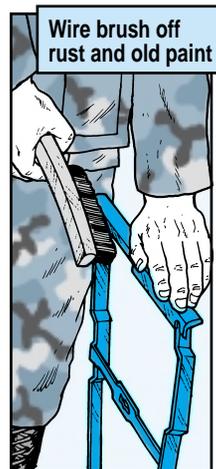
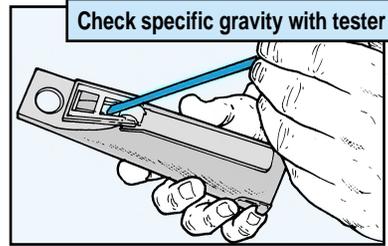
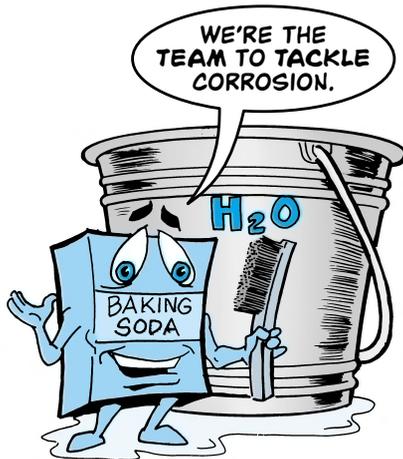
Corrosion eats up metal parts on and around batteries. Dirt and corrosion also hold moisture. This moisture can close the circuit between the positive and negative terminals and discharge the battery.

Wipe off light dirt and corrosion with a cloth. To fight heavy corrosion, remove the battery and any metal parts that can be removed. Scrub the battery with a baking soda and water mix. Mix 1/2 pound of soda in a gallon of water. A pound of baking soda is NSN 6810-00-264-6618. Get 100 pounds with NSN 6810-00-290-5574.

Soak metal parts in the mix, then use a wire brush to scrape off rust and old paint. Use a scraper, if necessary, but only on the metal parts you've removed.

After cleaning, rinse the battery with lots of clean water and dry it well. Protect bare metal with bituminous coating compound, NSN 8030-00-290-5141.

Shine up battery posts and clamps with the battery terminal cleaner, NSN 5120-00-926-5175, from the Common shop sets.



### 3. Protect the battery from damage.

Snug battery holddowns tight enough to keep the battery from banging around, but not enough to crack the casing.

Protect terminals and cable connectors, too. Always use the right size wrenches—not an adjustable wrench—when loosening or tightening nuts.

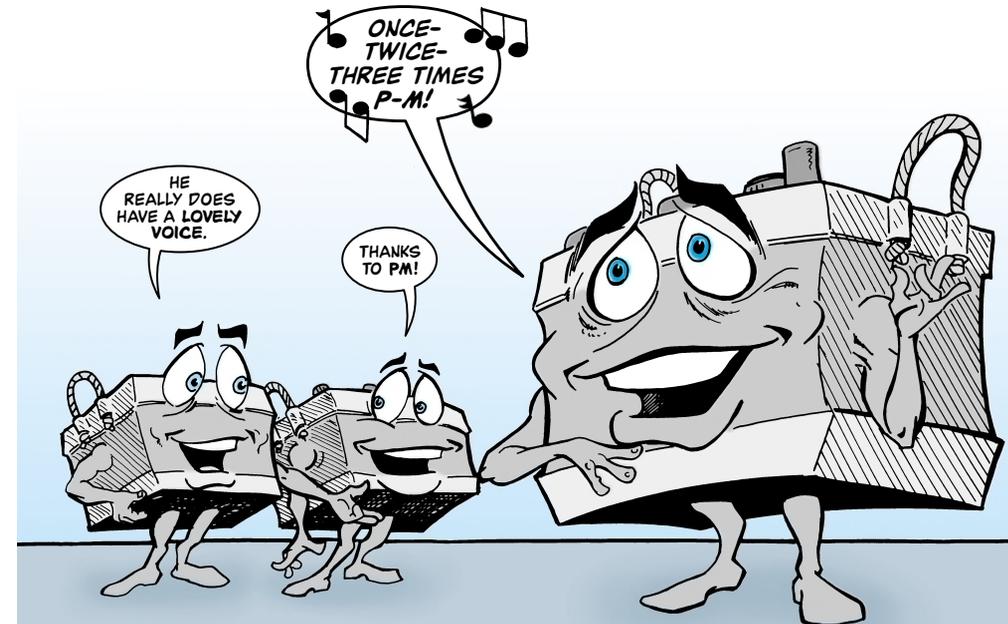
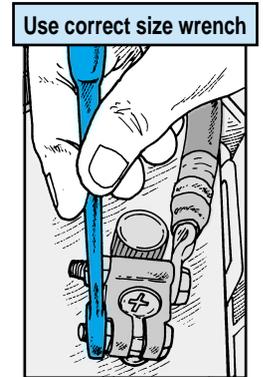
Never overtighten the connectors. That can stretch the clamp and loosen the connector's grip.

Loosen the bolt to remove the connector. Never pry it off with a screwdriver. Chances are you'll break the battery post or punch a hole in the battery.

Assure tightness of battery connectors visually or with an easy touch, not with a pair of pliers or other tools.

Protect battery posts by supporting long cables with tiedown straps, NSN 5975-00-074-2072.

When you change a cable, remove the bolt and cable only. Leave the terminal connected to the post. That keeps your connection secure.



# 'Tis the Season for Testing

Getting the drop on old man winter means checking your vehicle's batteries and antifreeze **before** the weather turns frosty.

That means testing both liquids with the antifreeze and battery tester, NSN 6630-00-105-1418, from your Common shop sets.

Before you do anything, though, you have to ensure that the readings you get from the tester are good. Here's how to test the tester:

Take a reading using distilled water, NSN 6810-00-682-6867. If the reading is more than 34°F or less than 30°F, your tester needs adjusting. Take three or four readings to be sure.

If the reading is off, remove the instruction plate on the bottom by working a knife blade under the edge. Carefully dig out the sealer over the screws closest to each end.

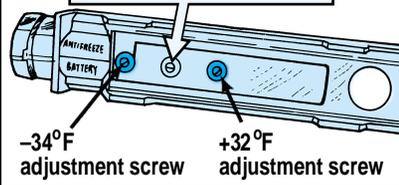


Remove metal cover on bottom



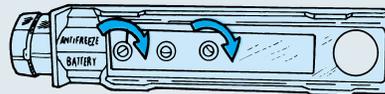
Never touch the middle screw. It holds the lens in place.

Don't touch middle screw!



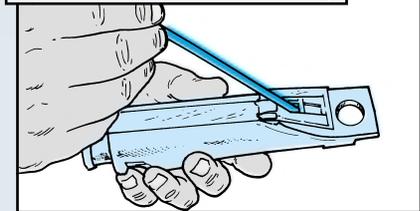
The screw farthest from the eyepiece controls the 32°F end of the scale. Use a small screwdriver to adjust the screw. Clockwise increases the reading; counterclockwise reduces it. Make sure the final adjustment to 32°F is clockwise.

Both final adjustments must be clockwise



Now that you've checked the plus side of the scale, check out the minus side.

Recheck and readjust if necessary



Mix up a solution of **exactly** one part distilled water and one part antifreeze, NSN 6850-01-441-3218. Stir it well.

Take several readings with the antifreeze solution. If the reading is more than -32°F or less than -36°F, adjust to -34°F using the screw closest to the eyepiece. Again, make sure the last adjustment to -34°F is clockwise.

Rinse the tester and recheck with distilled water. Repeat the adjustment for 32°F if needed. Then recheck using the antifreeze solution.

Repeat the tests until both readings check out. Then use a little adhesive, NSN 8040-00-843-0802, to hold the screws in place. Replace the instruction plate.

Then go out and test your vehicle's antifreeze and batteries confident that the tester is good to go!

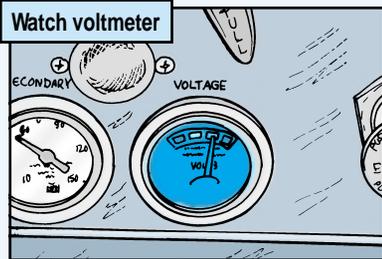
# What's an Operator to Do?

**Y**ou, as a vehicle or equipment operator, may look at your preventive maintenance responsibilities for lead-acid batteries as a low priority. After all, you can't do any more than eyeball the batteries, cables, connections and battery box.

But don't forget it's your eyes that see things first when it comes to battery PM. If you don't look and report what you see, you've got no one to blame if those batteries let you down.

In addition to what your operator TM requires for PMCS, here's what you must do to get the most out of your equipment batteries:

Most vehicles have either a voltmeter or a BAT-GEN indicator. By watching this gauge, you can get a good picture of the shape the batteries are in. The gauge tips you off to trouble, so you can tip off your mechanic that the batteries need help.



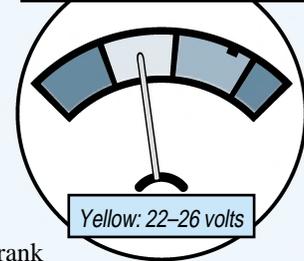
Before you check the gauge, turn off all electrical components. Then, it's just the battery and your alternator/generator showing up on the gauge.



## Watch Color Coding

Watch the gauge when you turn the switch ON and before you crank up the engine. The gauge needle should hang in the yellow section, or between 22–26 volts. If the needle goes into the red at the left of the gauge, your batteries are weak, defective, need charging or there's a short in the system.

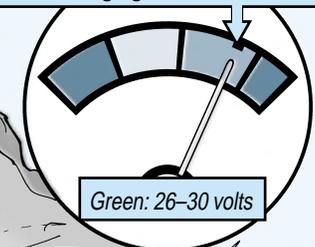
Charge is OK to start engine



Now, crank up the engine. If the needle hangs to the left after you've started the engine, one battery could have a bad cell.

After the engine starts, run it at fast idle—about 1,500 rpm. The battery charging system's working OK if the needle settles at about 28.5 volts, shown by the notch in the green section.

Correct charging at about 28.5 volts



## Overcharging

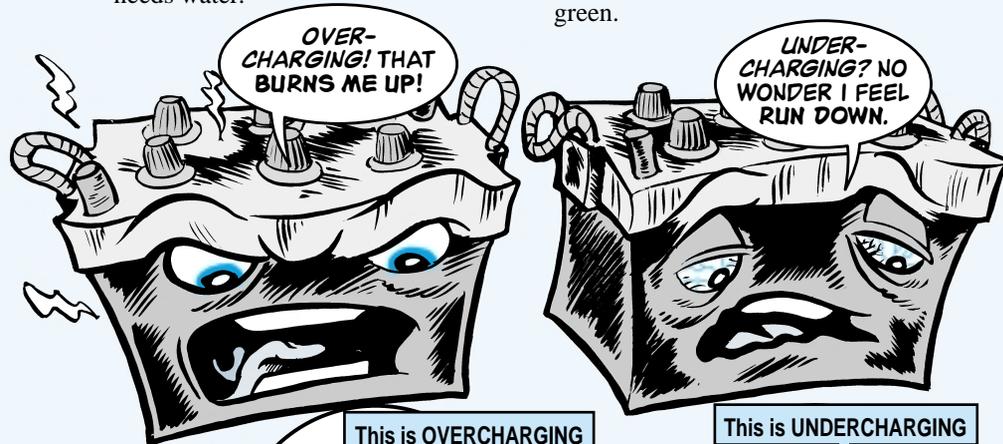
Overcharging is the culprit when the needle hangs in the red section on the right side of the gauge.

Overcharging means water will boil out of the batteries and the plates inside can be damaged. Another clue to overcharging is a battery that often needs water.

If the gauge shows a high rate of charge after the engine's been running for 30 minutes, there's a good chance the battery's being cooked to death.

## Undercharging

Undercharging is the villain when the needle settles well below that 28.5 volt mark, even though it's still in the green.

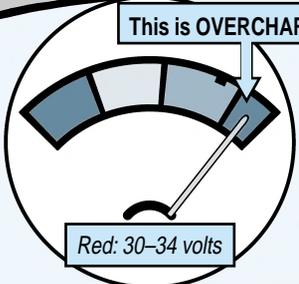


OVER-CHARGING! THAT BURNS ME UP!

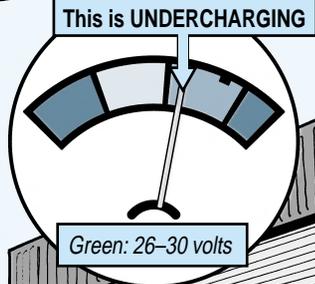
UNDER-CHARGING? NO WONDER I FEEL RUN DOWN.

This is OVERCHARGING

This is UNDERCHARGING



Red: 30-34 volts



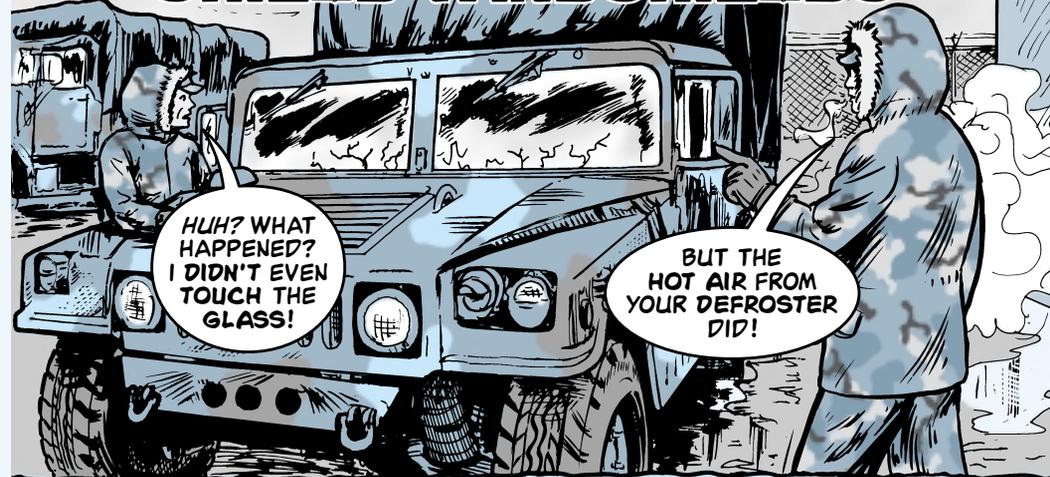
Green: 26-30 volts



HAVE ANY OF THESE PROBLEMS? GET YOUR MECHANIC TO CHECK OUT THE CHARGING SYSTEM.

HMMWV...

## SHIELD WINDSHIELDS



HUH? WHAT HAPPENED? I DIDN'T EVEN TOUCH THE GLASS!

BUT THE HOT AIR FROM YOUR DEFROSTER DID!

A blast of hot air from a HMMWV defroster can crack a cold, frosty windshield.

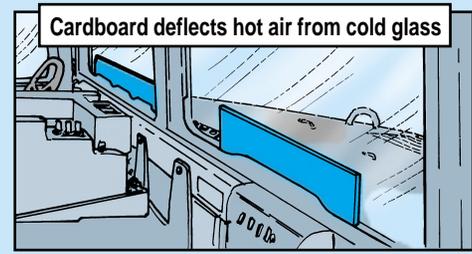
One solution is to let the windshield warm up as the cab warms up before you direct hot air to it.

That works well enough, but it slows down your ability to start and go when you need to.

A "quicker" solution is to put a temporary shield of cardboard or plastic across the bottom of the windshield to prevent most cracks

caused by hot air blowing on cold glass. Once the windshield is clear, remove the shield and move out.

Having that "edge" may be enough to get you moving sooner.



Cardboard deflects hot air from cold glass

Trucks...

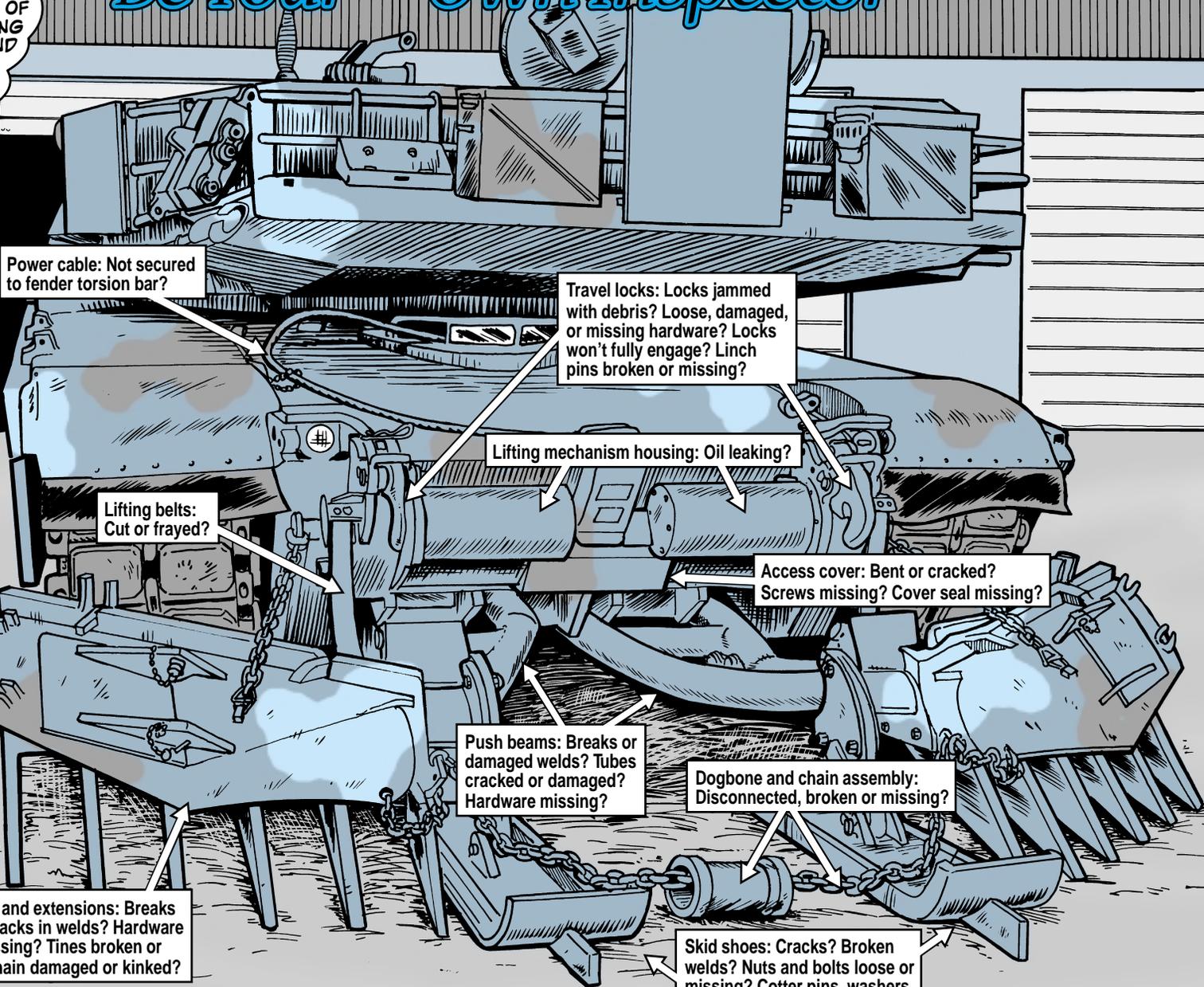
## Stop Air Line Freeze-up

Drivers, moisture in your truck's air brake lines will freeze in cold weather and block the lines. That leaves you without brakes.

If your vehicle has an alcohol evaporator to keep moisture out of the air lines, make sure it has the alcohol it needs to do the job. NSN 6810-00-597-3608 gets one gallon of methyl alcohol. NSN 6810-00-275-6010 gets a 5-gal can.

# Be Your Own Inspector

KEEPING A MINE CLEARING BLADE ON THE JOB TAKES A LOT OF P.M. THAT MEANS TAKING A SLOW WALK AROUND YOUR TANK EACH DAY TO LOOK FOR PROBLEMS. HERE'S WHAT TO LOOK FOR...



Power cable: Not secured to fender torsion bar?

Travel locks: Locks jammed with debris? Loose, damaged, or missing hardware? Locks won't fully engage? Linch pins broken or missing?

Lifting mechanism housing: Oil leaking?

Lifting belts: Cut or frayed?

Access cover: Bent or cracked? Screws missing? Cover seal missing?

Push beams: Breaks or damaged welds? Tubes cracked or damaged? Hardware missing?

Dogbone and chain assembly: Disconnected, broken or missing?

Moldboards and extensions: Breaks in metal? Cracks in welds? Hardware loose or missing? Tines broken or missing? Chain damaged or kinked?

Skid shoes: Cracks? Broken welds? Nuts and bolts loose or missing? Cotter pins, washers and mounting pins missing? Shoes won't move freely?

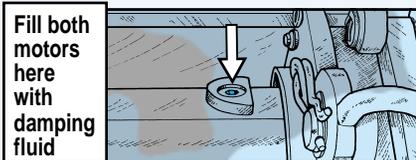
# Do the PM

Crewmen, following the info in TM 9-2590-509-10 is a good first step to keeping your tank's mine clearing blade up and running. Here's step two:

## Motors

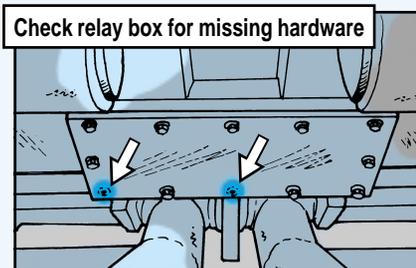
If the blades come crashing down when the electrical or manual blade release is used, too little oil or oil contamination could be the culprit.

Use the electrical switch to raise and lower the blades once more. If they come crashing down again, have your mechanic drain the old oil from each motor and replace it with four ounces of damping fluid, NSN 9150-00-607-0897.



## Water Damage

Heavy rain or high-pressure water seeps into the relay box if any of the cover assembly bolts are missing or if the cover seal is missing or damaged. Water buildup causes electrical shorts.



Your mechanic can replace a missing or damaged seal with NSN 5330-01-277-5647. New bolts come with NSN 5305-00-269-3235. NSN 5310-00-637-9541 gets new lock washers.

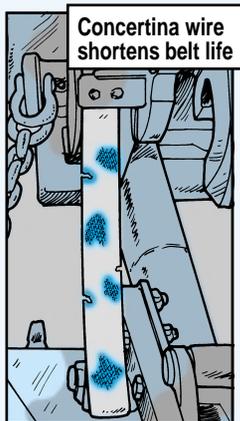
## Lifting Belts

Take care of the mine clearing blade's lifting belts and they won't let you down. That means using the right lifting techniques.

During operations, always make sure you back the vehicle 8-10 feet before lifting the blades. That keeps the blades from hanging up on anything that'll snap the belts.

Never use the mine clearing blade to recover mired vehicles or to lift anything. Either the lifting belts will break or the motors will burn out.

Never drive the blade through concertina wire. It'll nick and cut the belts. When that happens, your mechanic has to replace them with new belts, NSN 4020-01-289-8249.



## Depth Adjustment

When you're training with the mine clearing blade, keep the adjusting plate

# Two-Step

set at its shallowest depth—eight inches. That prevents damage to your tank's engine and the blade's teeth.

## More Help

If you're having trouble mounting the mine clearing blade, or just need some refresher training, get a copy of the training film, *Blade, Mine Clearing, M1 Tank Mounted*. The PIN is 707727.

Order the film from the Joint Visual Information Services Activity by fax at DSN 795-6106 or (717) 895-6106, or by e-mail at:

vibuddy@ptd.net

Or write to:

JVISDA  
Warehouse 3/Bay 3  
11 Hap Arnold Blvd  
Tobyhanna, PA 18466-5120

Include your name, full mailing address, the title and PIN number of the film, format (VHS, for example), and the quantity of tapes you need. APO addresses must include their unit/box number, CMR/box number, or PSC/box number.

You can also order over the Internet at: <http://dodimagery.afis.osd.mil/dvi/Top/davis>

Once there, click on PIN/ICN Search in the left column. At the next screen, type 707727 in the block provided and click on Search.

At the next screen, click on the film title. At the bottom of the next screen, click on Add to Shopping Cart!

Next, click on Check Out. Fill out the order form and click on Order. The film will be shipped within 15 working days.

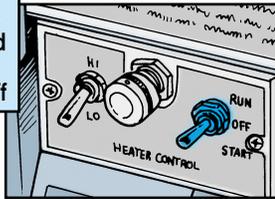


# Hot Ideas for a Cold Start

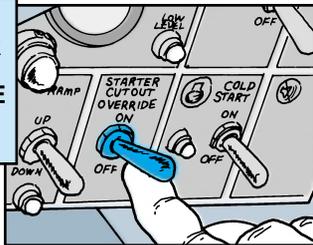
**T**o get the very best starts, follow this routine:

**1.** Unfold the grille cover to expose the exhaust grille. Leave the intake grille covered.

**2.** Make sure personnel and winterization heaters are off



**3.** Move STARTER CUTOUT OVERRIDE switch to ON



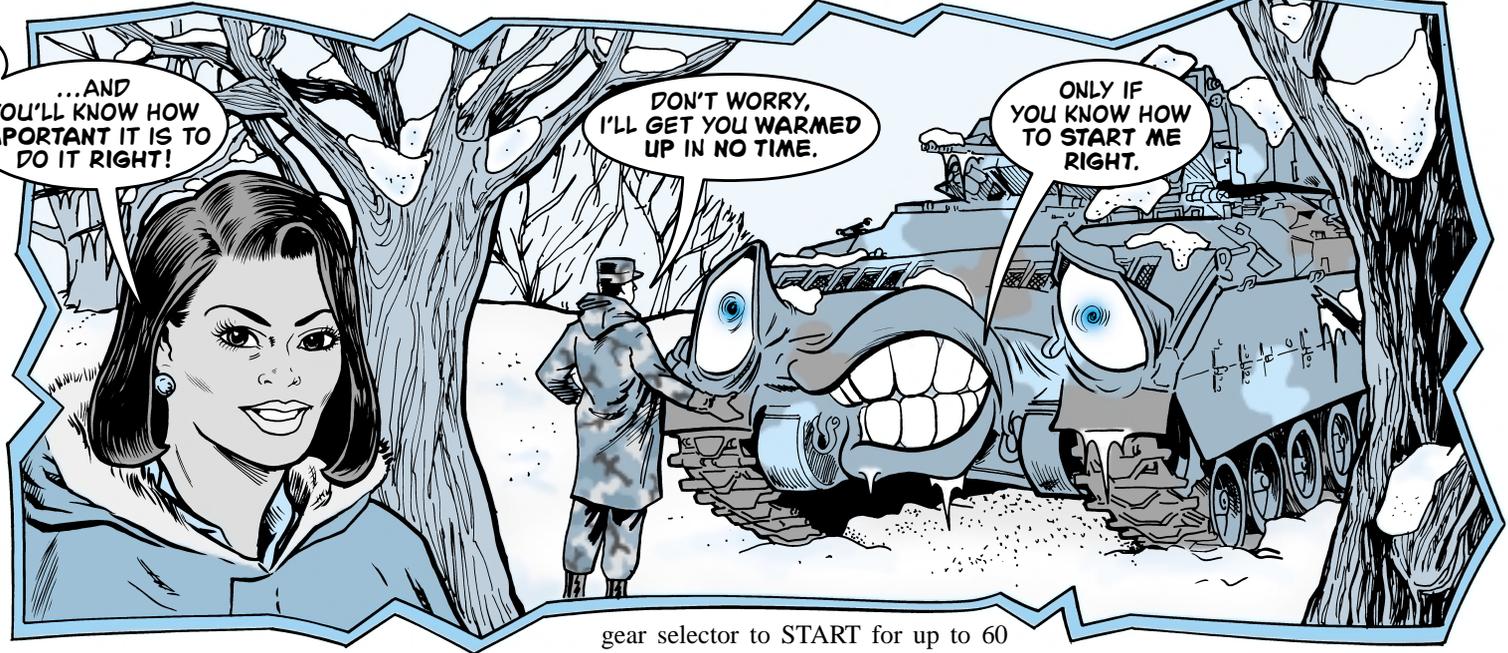
**4.** Move the COLD START switch to ON and hold for 15 seconds. That preheats the glow plugs and pumps fuel into the air intake manifold.

Flip COLD START switch to ON



**5.** With the COLD START switch still held to ON, move the gear selector to START. Hold it there until the engine starts, but no

...AND YOU'LL KNOW HOW IMPORTANT IT IS TO DO IT RIGHT!



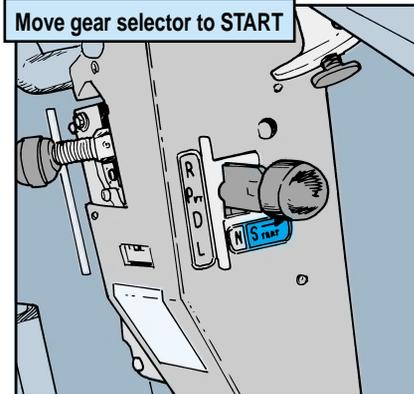
DON'T WORRY, I'LL GET YOU WARMED UP IN NO TIME.

ONLY IF YOU KNOW HOW TO START ME RIGHT.

longer than 30 seconds. If the engine won't start, repeat steps 4 and 5.

If the engine still won't start, repeat steps 4 and 5, but this time hold the

Move gear selector to START



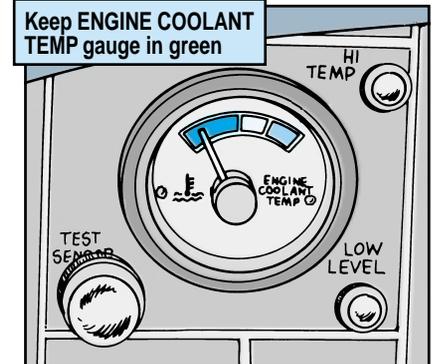
gear selector to START for up to 60 seconds. Call in your mechanic if it still won't start.

**6.** If the engine starts, move the STARTER CUTOUT OVERRIDE switch to OFF and release the COLD START switch. If it's **really** cold outside, the COLD START switch can be held in the ON position for up to five minutes to help keep the engine running.

**7.** Let the vehicle warm up by idling for about one minute. Then partially uncover the intake grille.

Drive slow and easy for the first mile or so. Running the Bradley at high speed right after a cold start can damage the engine.

Keep ENGINE COOLANT TEMP gauge in green



Keep an eye on the ENGINE COOLANT TEMP gauge. If it moves into the yellow or red zone during operation, completely uncover the intake grille to allow more air flow.

# Keep Pressure on Damper



There may not be any tires on the SUSV, mechanics, but you still need an air pressure gauge to keep the steering damper in good working order.

The SUSV manual, TM 9-2350-285-20, calls for a 29–102 psi range of air pressure in the damper accumulator. But that range is too wide.

A better range is between 55–85 psi. Air pressure of at least 55 psi in the accumulator will prevent damper bottoming, which causes steering component damage and rough handling. More than 85 psi can overstress seals and steering lines. Table 2-5 on Page 2-10 of the TM will be updated with this info at the next change or revision.



If drivers complain that the SUSV rides or steers hard, and you find the air pressure is between 55–85 psi, check out the accumulator hydraulic fluid level. That information is found in Para 8-11 on Page 8-28 of TM 9-2350-285-20.

# REPAIR KIT FOUND

Mechanics, when you send a Stewart-Warner heater with a bad burner to DS for repair, you don't want to pay for a new burner, do you?

Since the burner repair kit, NSN 2540-00-255-0777, was left out of TM 9-2540-205-24&P, chances are support will replace—not repair—the burner.

Let DS know the repair kit is still available and that it works with Stewart-Warner models 10560C, 10560G, 10560M and 10560M24B1. Here's what's in the kit:



HERE'S WHAT'S IN THE KIT.

Item	PN/NSN	Qty
Nut, hex castellated	705587*	3
Wick	9390-01-070-5959**	1
Washer	5310-01-126-0466	2
Washer	705136*	2
Washer, shouldered	5310-01-059-0988	1
Vaporizer, fuel	2910-01-124-9284**	1
Washer	5310-01-126-0467	1
Washer, flat	5310-01-137-6801	1
Shield, fuel vaporizer	2540-01-057-7443	1
Screw, machine	5305-01-136-8734**	1
Screw	5305-01-066-3431	3

\* Order on a DD Form 1348-6 using part number and CAGE 38385 from RIC AKZ.

\*\* Available only by ordering the burner repair kit.

Personnel Heaters ...

# WINNING THE COLD WAR

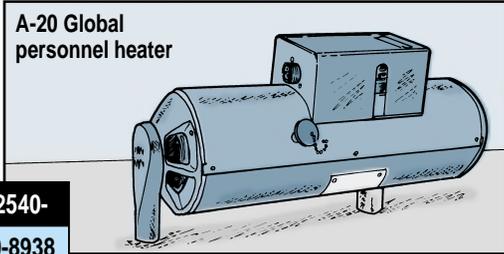
The old Stewart-Warner and Hupp combat vehicle personnel heaters have been around forever. When cold weather arrives, that same tired refrain is heard: "Why can't they come up with something better?"

They can and they did. The A-20 Global personnel heater, NSN 2540-01-396-2826, is now available as a replacement for the following single- and dual-air heaters:

W-W-E'RE  
F-F-FREEZIN'  
AND YOU'RE NICE  
AND WARM!

W-W-WHAT'S  
YOUR SECRET?

I'VE GOT  
THE NEW A-20  
GLOBAL PERSONNEL  
HEATER.



Type	Model	NSN 2540-
Hupp	MF60A-24V	00-930-8938
Stewart-Warner	10560C	01-083-0691
Stewart-Warner	10560G	01-262-6013
Hupp	MF510B	01-071-0652
Hupp	MF60B-24V	01-162-3834
Stewart-Warner	10560M24B1	01-169-5159

The Stewart-Warner and Hupp heaters are being phased out of the supply system. So when your heater breaks down and can't be repaired, replace it with the A-20 Global personnel heater. The diesel-fueled A-20 heater works with all driver's instrument panels as well as the Valcom heater test stand. It puts out 60,000 BTUs on high and 30,000 BTUs at the low setting.

No adapter kits are required for installation. The heater looks a lot like the older models, but the differences are impressive:

- Microprocessor-controlled. That assures ideal combustion. There are no manual adjusters, so don't bother looking for them.

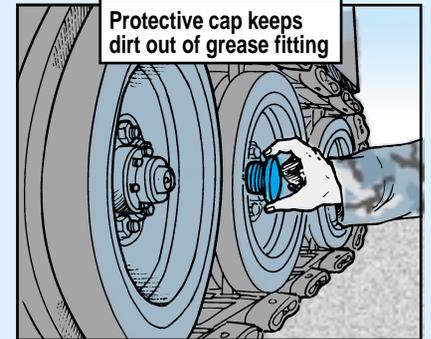
- ✧ Built-in diagnostics. A two-digit LED readout on the heater tells you when the heater's OK and when there's a problem. A malfunction makes the pilot light on the driver's instrument panel flash.
- ✧ Improved igniter design and fuel delivery system. A handful of extra igniters won't be needed. However, a spare igniter comes stowed under the heater housing for emergencies.

M109A2-A6 SP Howitzers, M992-Series Ammo Carriers ...

## Cap Protects Grease Fitting

Grease fittings on the M992 and M109 idler and roadwheel hubs get caked with mud. Once the mud hardens, you can't put the grease gun on the fitting until the fitting is cleaned off.

Save yourself that time and trouble with a protective cap, NSN 5340-01-463-0885. The cap snaps right into place over the center of the hub.



# LOOK WHO'S STUCK



Careful, operators, where you park your dozer, loader, grader or scraper overnight. Mud that's soft during the day can freeze as hard as concrete when temperatures plummet overnight, leaving your equipment stuck fast.

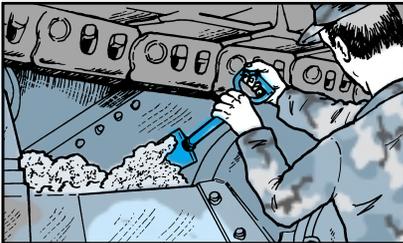
Don't think you can rock your vehicle loose, either. You'll break a dozer's track or snap its drive sprocket teeth. On the loader, you'll damage the U-joints. Trying to move a grader or scraper moldboard that's stuck in the mud damages the vehicle's hydraulics.

The time to prevent these problems is the night before:

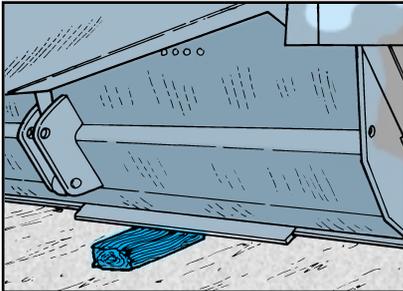
- Park your vehicle on high ground if possible. Water drains downhill so the mud won't be quite as deep.

- Avoid parking in the deep ruts worn by other vehicles. Some are deep enough to bottom out your vehicle's frame. Park your vehicle there and you might not move it until late spring.

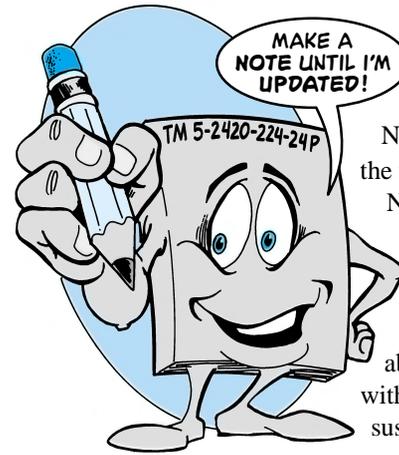
- Use a shovel to scoop out mud that's collected between and on rollers and drive sprockets.



- Put a board between the ground and any moldboard. That way the mud can't freeze the moldboard in place.



# Shock Absorber Update



**M**echanics, the parts info for SEE and HMMH shock absorbers in Figs 189 and 190 of TM 5-2420-224-24P is wrong.

NSN 2510-01-298-8417 (Item 4 in Fig 189) gets the front shock absorber for the HMMH only.

NSN 2510-01-256-9156 (Item 5 in Fig 190) gets the HMMH's rear shock absorber and the front and rear shock absorbers for the SEE.

Never swap the front and back shock absorbers of an HMMH. The front shocks come with a port that connects into a hydraulic line for suspension lockout during forklift operations.

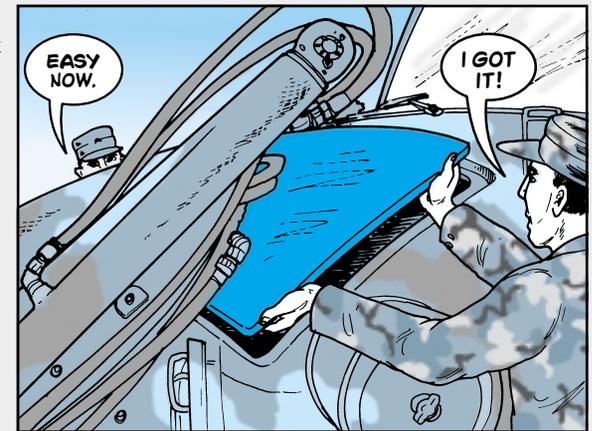
# Brake Reservoir Wire Disconnect

**A**lways get a buddy to help you when you want to remove the SEE's hood for service checks. Then, remember to lift before sliding the hood out sideways.

That's because of the wires that clip into the brake and clutch fluid reservoir sending unit. They stick out like a sore thumb.

It's easy to tear them loose if you just slide off the hood without lifting it first. Once the wires are broken, you won't get a reading inside the cab when the fluid levels are low or when the brake pads are worn.

If you remember to lift the hood clear of the reservoir's wires when you and your buddy remove it, you won't have to worry about that disconnect.



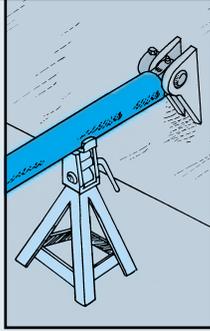
# SUPPORT EJECTOR CYLINDER

GIVE THE INJECTOR CYLINDER THE SUPPORT IT NEEDS.



**M**echanics, before you disconnect the ACE's ejector hydraulic cylinder, make sure you have straps, rope and a jack-stand to support it. If you don't support the 325-lb cylinder, chances are it will drop—damaging the steer unit shifting splines, and possibly injuring you. As always, follow the word on Pages 4-290 through 4-295 of TM 5-2350-262-20-1 to remove and install the cylinder.

Support cylinder before disconnecting



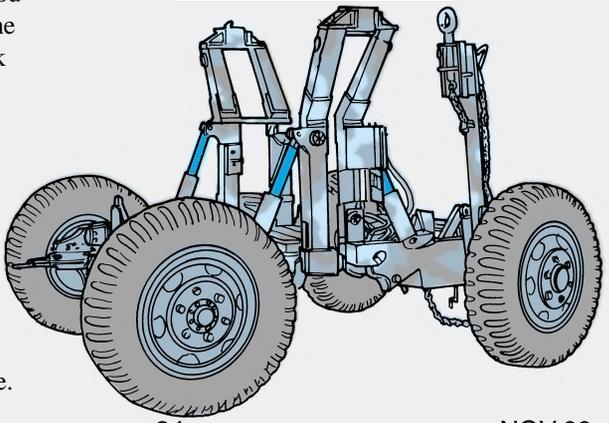
## Protect Your Dolly

**D**rivers, lower your transportable shelter's dolly set when you're not using it.

Lowering the dolly retracts the lift jack cylinder rods which:

- Protects the rods from the elements and prevents corrosion
- Solves the frozen lifting jack problem because you just pump 'em and let the hydraulic pressure break 'em loose
- Pushes hydraulic fluid back into the reservoir, which leaves less room for air, thus reducing condensation in the tank
- Tilts the pump so that water runs off instead of seeping inside.

Lower dolly to protect rods



# Hand Throttle Reminder

**O**perators, never use your 130G grader's hand throttle like a cruise control.

Unlike the cruise control on your POV, the hand throttle doesn't cut off when you hit the brakes. If you need to stop in a hurry, you won't have time to mess with the hand throttle. The end result is loss of control.

Use the hand throttle only for non-driving operations, like moving the blade.



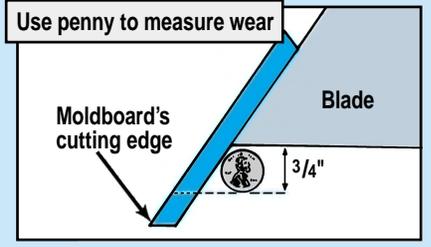
## Enough Edge?

**O**perators, the maintenance check on the D7G dozer's moldboard cutting edge is often overlooked. That's because the blade is usually sitting in the dirt at the work site.

The cutting edge protects the moldboard. If the edge wears down too far, the moldboard is damaged and the blade has to be replaced or sent to DS for repair. That means big bucks.

So, always clear away the dirt or mud to eyeball your dozer's moldboard. If the edge is worn to less than 3/4 inch—that's about the diameter of a penny—report it.

Your mechanic can reverse the edge or replace it if it can't be reversed.



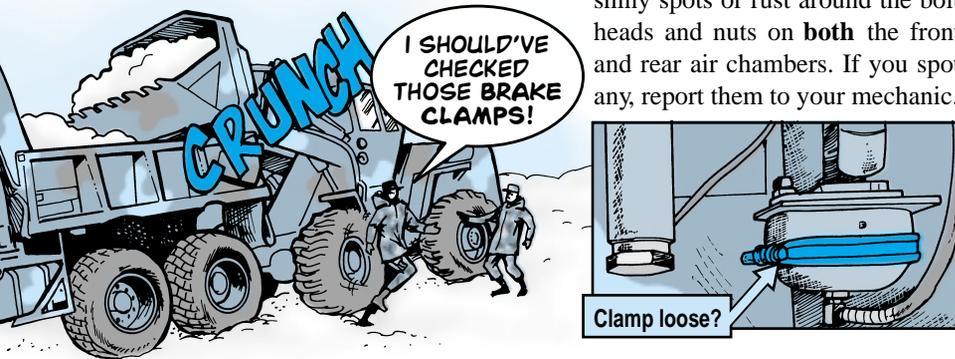
MW24C Scoop Loader . . .

## Loose Bolts Mean No Brakes

Operators, before you head out to the work site, eyeball the clamps holding together your scoop loader's brake actuator air chambers.

The retaining bolts and nuts vibrate loose. When that happens, air leaks from the chamber. No air means no brakes.

So, grab the clamp to see if it's loose. If it is, get your mechanic to torque the nuts to 70–80 lb-ft. Between scheduled 250-hr services, look for loose nuts, shiny spots or rust around the bolt heads and nuts on **both** the front and rear air chambers. If you spot any, report them to your mechanic.



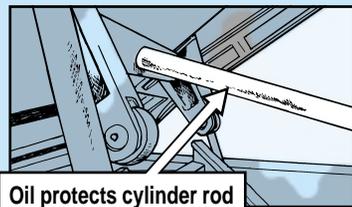
Dump Trucks . . .

## Oil Seepage Protects Cylinders

Operators, your dump truck's hydraulic cylinders leak. Some leak just a dab, others a bit more. But don't call your mechanic—the cylinders are supposed to leak.

The single ram cylinders on all M929/M930 dump trucks seep just enough to keep the rod coated with oil and the seal wet. The oil protects the rod from the elements and corrosion.

Telescoping hydraulic cylinders—like the hoist cylinders on M917 and F5070 dump trucks—have seals at each segment of the cylinder. Each seal seeps a bit to lube the seal and coat the cylinder. The seepage adds up—as much as a quart a day. But, this type of leakage does not make your truck NMC.



If the hoist cylinder will raise the empty body, your truck's OK.

Check the fluid level daily. If it takes more than a quart a day to refill the reservoir, get your mechanic to look things over.

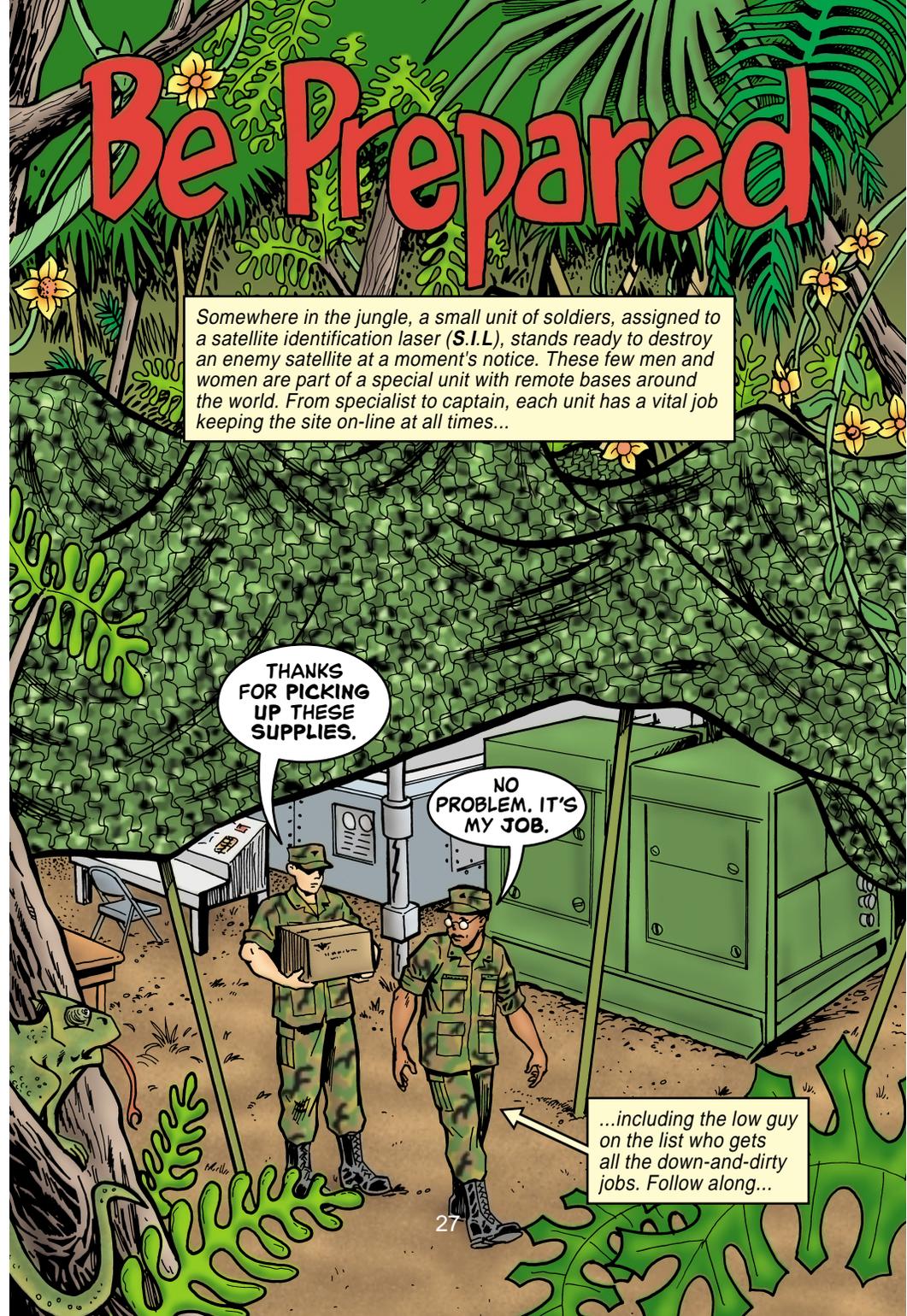
# Be Prepared

Somewhere in the jungle, a small unit of soldiers, assigned to a satellite identification laser (S.I.L.), stands ready to destroy an enemy satellite at a moment's notice. These few men and women are part of a special unit with remote bases around the world. From specialist to captain, each unit has a vital job keeping the site on-line at all times...

THANKS FOR PICKING UP THESE SUPPLIES.

NO PROBLEM. IT'S MY JOB.

...including the low guy on the list who gets all the down-and-dirty jobs. Follow along...





Meet Specialist Iam Prepared.

HEY, SPECIALIST PREPARED, HOW'D YOU LIKE TO CHECK OUT HOW THE S.I.L. WORKS?

I'LL HAVE TO TAKE A RAINCHECK. I'VE GOT PM TO DO.

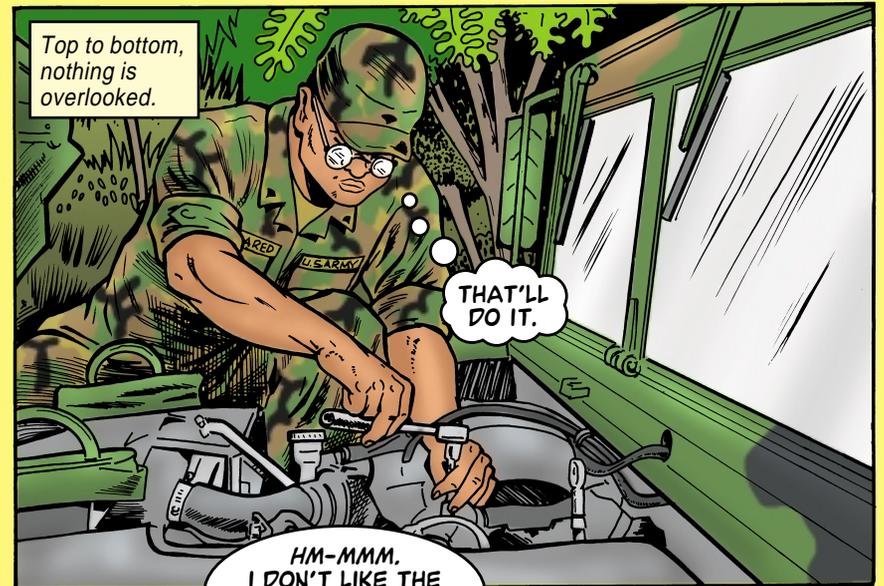


CAN'T IT WAIT?

I WENT THROUGH A LOT OF MUD AND WATER GETTING THOSE SUPPLIES, SO I WANT TO CHECK OUT THE TRUCK.



Prepared checks his vehicle after each use.



Top to bottom, nothing is overlooked.

THAT'LL DO IT.

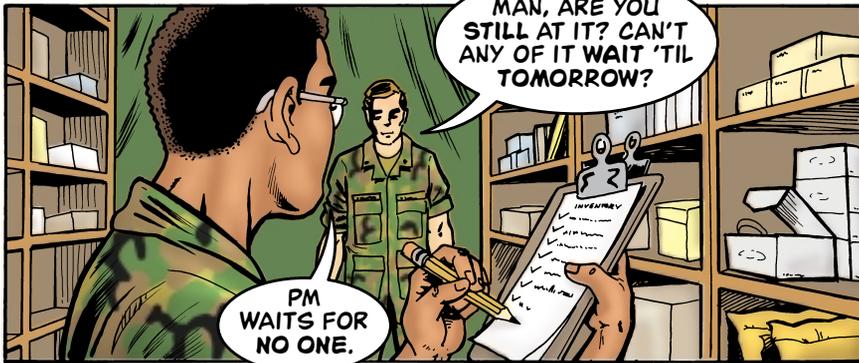
HM-MMM, I DON'T LIKE THE CORROSION REPORT FOR THE S.I.L.

He keeps his eyes and ears open.



MORE FREQUENT INSPECTIONS SHOULD TAKE CARE OF THAT.

HM-MMM... WITH ALL THIS HUMIDITY AND DIRT DOWN HERE, I'D BETTER DO MY OWN CORROSION INSPECTION!

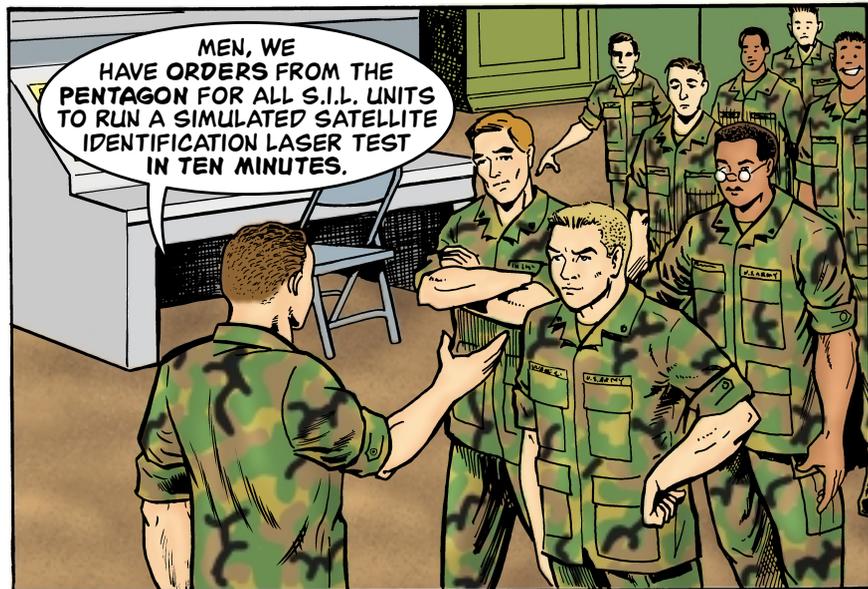
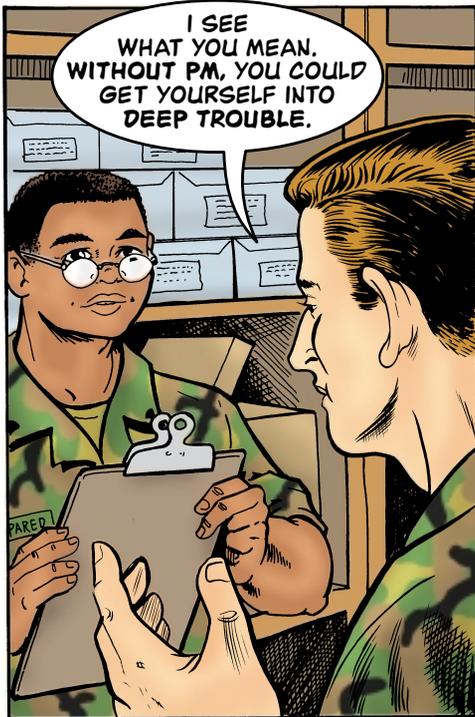


"WHAT IF I WAS DOUBLE-TIMING IT BACK TO CAMP AND THE HUMVEE OVERHEATS BECAUSE I DIDN'T CHECK THE HOSES?"

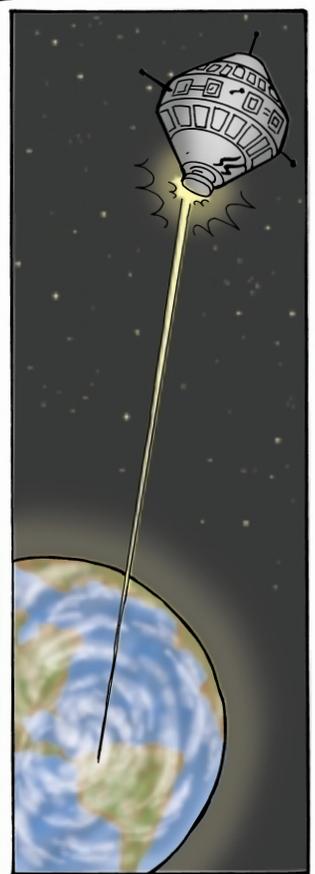
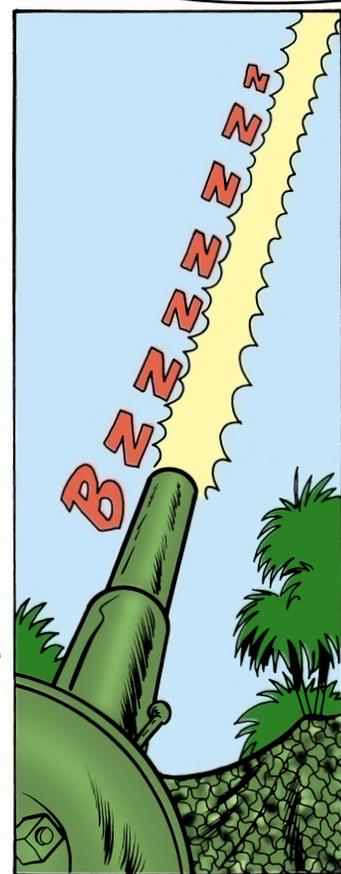


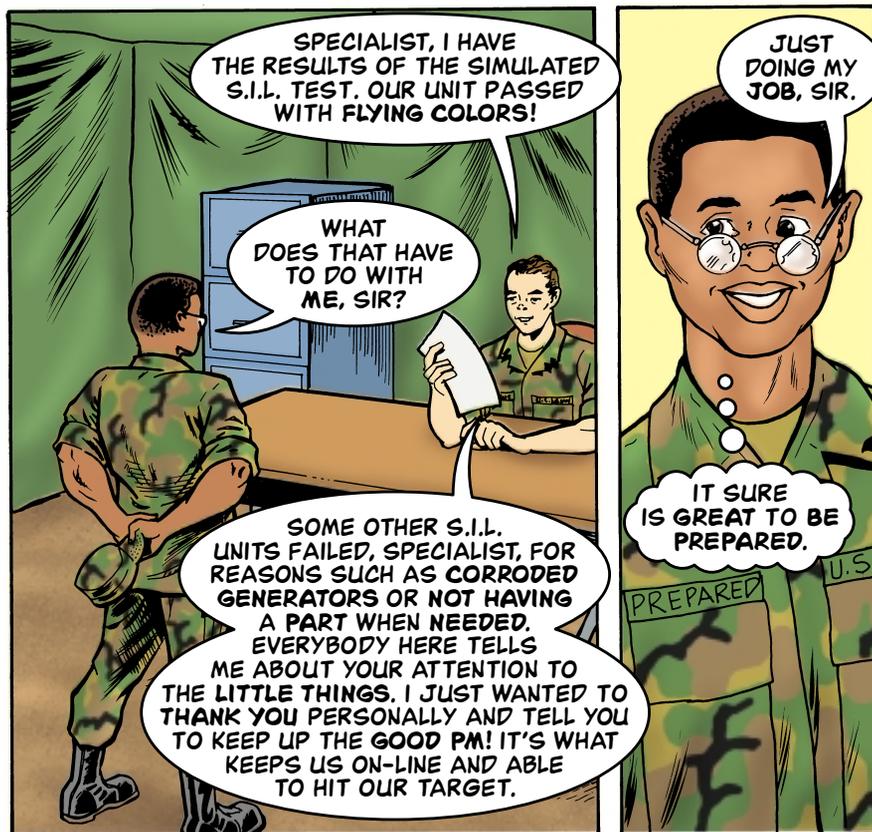
"THEN MAYBE I GET A VISIT FROM ONE OF THE LOCAL KITTIES."





**FIRE**

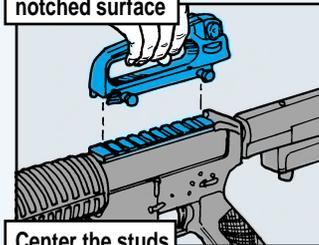




# Attention Armorer's!



Seat handle flush against notched surface

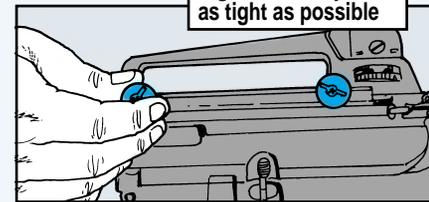


Center the studs in two notches

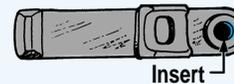
**T**hank you for your attention. This will take just a couple of minutes but may save you armorer's lots of aggravation with your M4 carbines.

The carrying handles often disappear because the handle nuts work loose. To stop that, make sure the bottom of the handle is flat against the notched surface of the receiver, with the two studs centered in the notches. Tighten the nuts as tight as possible by hand. Tell everyone in your unit to do that every day when they're in the field.

Tighten nuts by hand as tight as possible



M4 extractor has black insert



If you still have M16 extractor springs, which have blue inserts, use them only in M16s. They're too weak for the M4. The stronger M4 extractor springs, which have black inserts, can be used in both the M16 and M4.

When you install the spring for either extractor, insert the large spring end and gently twist it clockwise into place. That seats the spring and keeps it from coming out.

# ADVICE FOR ARMORERS



LIKE SOME GOOD ADVICE THAT WILL MAKE YOUR JOBS EASIER, ARMORERS? THEN SIT BACK AND LISTEN UP.

## Cleaning

If your CO tells you a weapon must be cleaned three times before it's clean enough for storage and inspection, tell him respectfully "No, sir, not if we do it right the first time."

Once is enough if a weapon's cleaned like the -10 TM says.

Once a weapon's cleaned right, it doesn't need to be cleaned again for 90 days, unless it leaves the arms room or shows signs of corrosion.



SIR, ONE CLEANING IS ENOUGH IF IT'S DONE RIGHT.

## Solvents

It's OK to use dry cleaning solvent to clean your rifles, machine guns, and pistols. There are some sealed assemblies, however, like the MK19's sear housing, that shouldn't be dunked in solvent. Solvent breaks down the lubricant inside the sealed assemblies. See your -10 TM for cautions on solvent.



SOLVENT CLEANS ME WELL, BUT DON'T FORGET TO RELUBE ME!

But once you've finished cleaning with solvent, **wipe the solvent completely off and lube the weapons.**

# ARMORERS

Solvent completely removes lubricant, so if weapons are stored without lube, corrosion is on the way.

## Shiny Spots

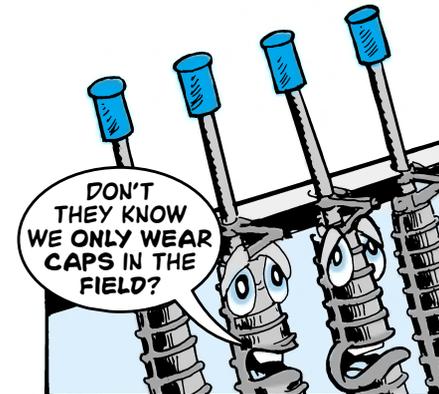
Shiny spots on your weapons mean their finish has worn off and they're helpless against corrosion. You can protect against shiny spots with solid film lubricant, NSN 9150-00-754-0064.



SEE THESE SHINY SPOTS? I NEED A LITTLE SFL!

## Storage

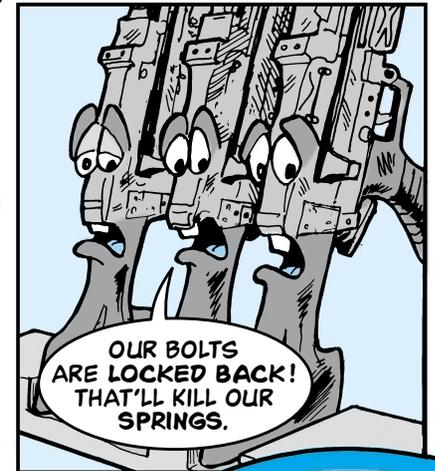
Barrel caps are for the field, not the arms room. They trap condensation inside the barrel, which leads to corrosion.



DON'T THEY KNOW WE ONLY WEAR CAPS IN THE FIELD?

If you have trouble with humidity in the arms room, get a dehumidifier, NSN 4440-00-566-0616. It will suck up most of that moisture. Use Chap 63 of CTA 50-909 as your ordering authority.

Last but not least, store all your weapons with the bolts forward. If you store them cocked, their springs are left compressed. Soon the springs have little spring and you've got problems like poor recoil and feeding.



OUR BOLTS ARE LOCKED BACK! THAT'LL KILL OUR SPRINGS.



SO TAKE AIM WITH SMALL ARMS PM!

# DON'T LET TUBE GO DOWN THE TUBES



Dear Editor,

We recently finished an inspection of our post's M120/M121 mortar gun tubes. Humidity and temperature changes had left condensation in the bottom of several tubes that had caused extensive corrosion. The tubes had to be replaced at a cost of \$22,000 each.

These tubes could have been saved if mortar crews had just paid a little attention to PM. Pages 2-50 to 2-51 in TM 9-1015-250-10 say to clean and lube the tube thoroughly after firing and to clean and lube it again for the next two days. When the mortar just sits, clean and lube the tube weekly.

It's also a good idea to store the tube in the arms room, NOT in the M1064 carrier. Condensation is less of a problem in the arms room.

Just doing a little bit of PM weekly can save units thousands of dollars.

CW2 Angel Roman  
B Co, 203d FSB  
Ft Benning, GA

FROM THE DESK OF THE *Editor*

Thanks, Chief. We hope mortarmen take your advice. Units don't need to be spending big bucks on replacing tubes that could easily be protected with PM.

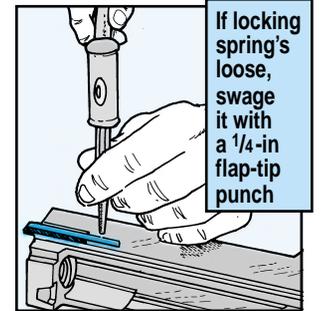
# A Whole Lot at Stake

**T**here's a lot at stake in how you stake parts of the M2 machine gun. If you stake the wrong part, you hurt the M2 so badly that it has to go all the way to depot for repair. Here are the rights and wrongs of staking:

## Right

The barrel locking spring needs staking. If the spring works loose, the machine gun can't hold headspace and it starts rupturing cartridges. That's dangerous.

So, if the spring's loose, swage the barrel extension once firmly with a 1/4-in flat-tip punch. Swaging is just staking with a flat-tip punch. If the barrel extension is damaged in the swaging area, swage the opposite side of the barrel extension. As long as you don't crack the spring or punch a hole in the spring and the spring lets you install the barrel, the spring is usable. Use a stone on any burrs.



## Wrong

Never stake the front sight cover or the breech lock depressors.

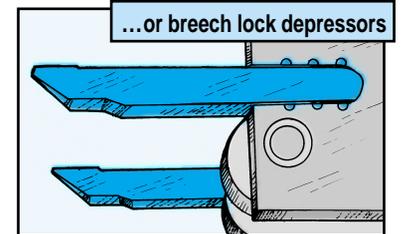
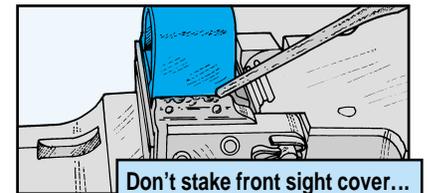
The front sight cover is held on by pins that run

through the receiver.

Staking the cover makes it impossible for the pins to do their job.

So get support to replace a loose sight cover. They can do it for around 50 cents.

The breech lock depressors are supposed to be loose so they can move up slightly when they hit the cam in the barrel extension.



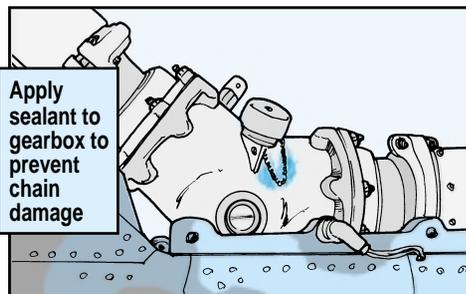
# Seal Off Corrosion



Dear Editor,

I've spent many years working around Kiowa and Huey aircraft. During that time I've seen a lot of corrosion and dirt build up on gearboxes because the oil filler cap safety chain rubs against the gearbox housing. Once the bare metal is exposed, moisture accumulates and attracts dirt and corrosion.

We stopped this problem by applying a thin film of sealant, NSN 8030-00-723-2746, where the chain rubbed. This eliminated the corrosion problem—and the complaints from aircrews who had to clean up the mess during preflight inspections.



SFC Fred Sapasap  
CAARNG  
Los Alamitos, CA

FROM THE DESK OF THE Editor 

It was a dirty job but you cleaned it up. Good work. The AMCOM experts say this fix will work on the AH-1 Cobra, too.

# JP-8: Pass the Tests?

If your unit refuels aircraft, you must perform daily water (Aqua-Glo) tests and monthly particulate contaminant (Millipore) tests on the JP-8 aviation fuel you use. These tests can mean the difference between mission success and disaster.

The millipore test looks for fine sediment that can gum up the engine and lead to engine failure. The daily Aqua-Glo test looks for water that can freeze at high altitudes and cause the engine to flame out.

All you need to know is in FM 10-67-1, *Concepts and Equipment of Petroleum Operations* (Apr 98). It tells how to set up refueling operations, how to handle the fuel and lists the NSNs for the test kits.

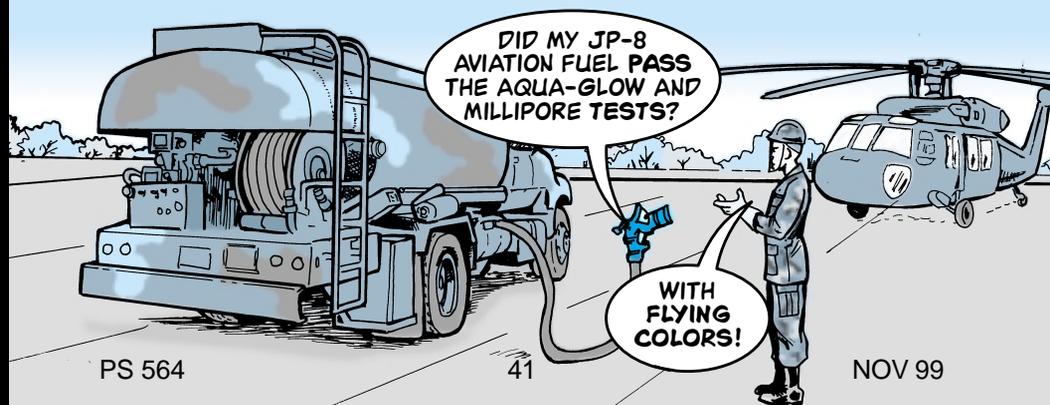
Chapter 13 has the details on how to qualify personnel to perform the tests. It also defines the various tests and their purposes.

Appendix E tells you how to do the Aqua-Glo test and Appendix G tells you how to do the monthly millipore test. The daily millipore test, noted in Appendix G, is not required except during the initial set-up of a tactical refueling system. Once the tactical system is operational, the monthly millipore test is all that's needed. Unfortunately, the guidance is misleading in the FM, but the next change to the pub will clarify this point.

If the JP-8 fails any of these tests, a fuel sample must be sent to the nearest petroleum lab. **Do not use** the fuel until you get the lab report back. The lab will tell you if the fuel is good to use, must be disposed of or reclaimed. Appendix C of AR 710-2, *Inventory Management Supply Policy Below the Wholesale Level* (Oct 97), tells you how to process fuel for disposal or reclamation.

For more info on testing JP-8 aviation fuel or to find out the location of the lab closest to you, call the U.S. Army Petroleum Center, at (717) 770-8580/4392 or DSN 977-8580/4392. You can e-mail the center at:

[tmartell@usapc-emh1.army.mil](mailto:tmartell@usapc-emh1.army.mil)



# Is Kingpin Strong Enough?

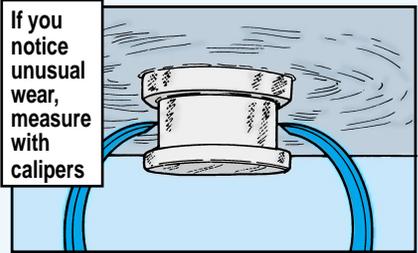
If the M860A1 trailer kingpin's not strong enough, it snaps off. When that happens, the Patriot's launcher or radar or whatever component is being pulled stops right there. One Patriot unit had several break in just a few months.

### Use these checks to catch weak kingpins:

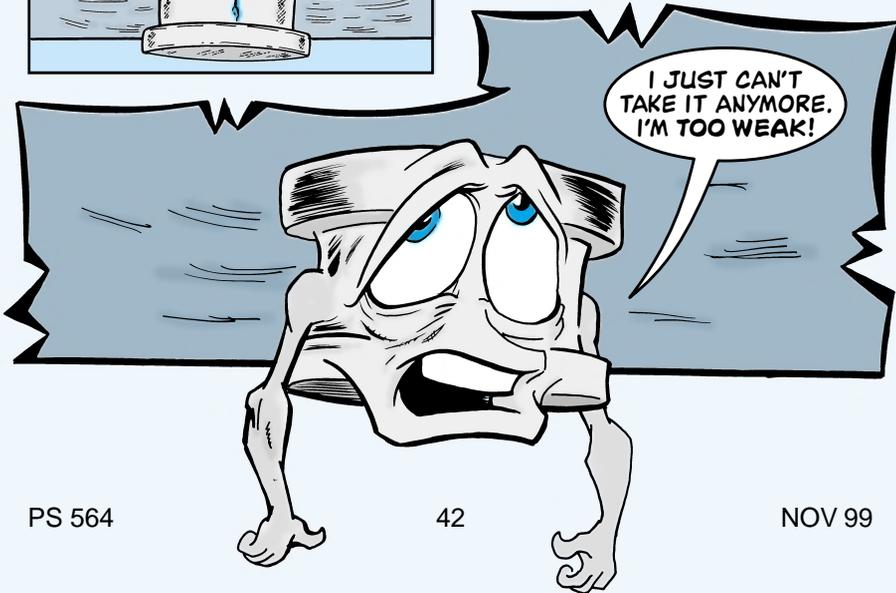
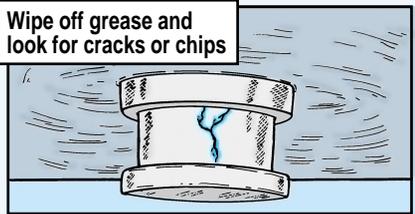
- ☛ Completely wipe off all grease from the kingpin and then clean it with dry cleaning solvent. Grease hides problems.
- ☛ Look for cracks, gouges, and chips. Any cracks in the kingpin make it NMC, as do any nicks, chips or gouges deeper than 1/8 inch.

☛ If the kingpin has lots of wear, use a micrometer or calipers to see if it is out-of-round. If you don't have these tools, your support probably will.

Measure at the 12-6 and 3-9 o'clock positions on the kingpin. A variance of 1/16 inch or more over 25 percent of the kingpin means it needs to be replaced.



If you have **any** doubts about the condition of a kingpin, report it. Do these checks after every mission.



# ECS and ICC Help



Dear Editor,

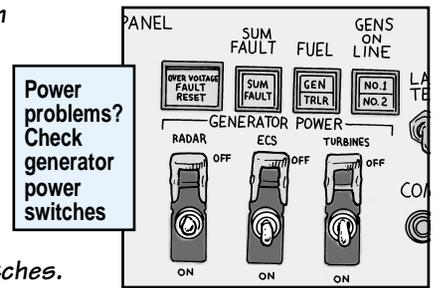
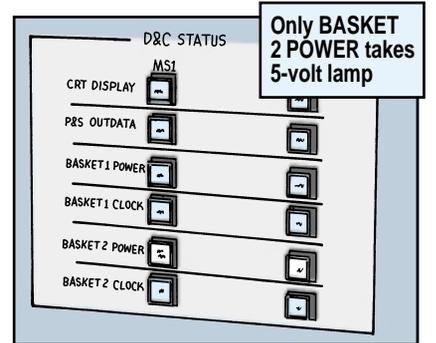
Through hard experience, we've come up with a couple of tips that will help other Patriotees operate the engagement control station (ECS) and information control center (ICC).

☐ On the A51 byte indicator panel, the BASKET 2 POWER indicators take a 5-volt lamp, while all the other indicators take 28-volt lamps. So you can't swap lamps. If you do, you'll either blow the lamp or it won't work. Be careful to keep the replacement 5-volt lamps separate from the 28-volt ones. The base of the lamp shows its voltage.

☐ On the A64 generator control panel, most crews assume that when the red covers are down the three switches are in the ON position. But that's not necessarily true. The covers just keep the switches from being bumped ON or OFF. The switches can be OFF even if the covers are down. If you're having power problems, check the three switches.

You could save lots of troubleshooting time.

SFC Brandon Brennan  
SGT Terry Bonham  
B Btry, 3/6th ADA  
Ft Bliss, TX



# No Ifs on IFTE PM

THERE ARE NO IFS, ANDS, OR BUTS WHEN IT COMES TO A SENSITIVE SYSTEM LIKE THE INTEGRATED FAMILY OF TEST EQUIPMENT (IFTE).



## Be Cool

All that electronic equipment needs plenty of cool air to operate properly. Monthly, clean the filters from all four of the circuit card bays with soapy water. Rinse them with clean water and blow them dry with low-pressure air.

Clean filters monthly



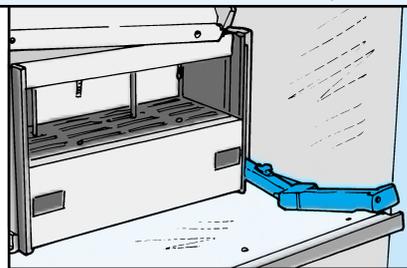
As part of your before-operations PMCS, run the environmental control unit (ECU) for 15 minutes and check its sight glass. If it's milky or yellow, tell your air conditioning repairman. That ECU won't keep you cool in the field.

Carefully follow the ECU startup and shutdown procedures in TM 9-4120-389-14. Be especially careful at shutdown to turn off the ECU ON/OFF switch and then the ECU circuit breaker before turning off the IFTE's power distribution circuit breaker. Otherwise, the ECU's controller will burn out next time the ECU's turned on.

## That Hurts

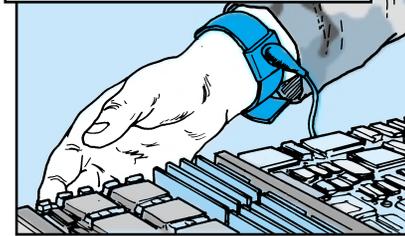
Before you run the IFTE's automatic test equipment surveys, make sure the handle for the gold dot receiver is down as far as it will go. That shuts off voltage between the interconnection device (ICD) and the test station. Otherwise, voltage can knock out virtual interface chassis (VIC) circuit cards or the VIC power supply or damage the ICD. They're all expensive.

Gold dot receiver handle all the way down?



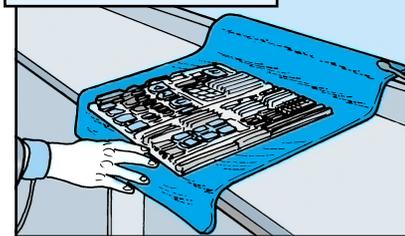
Electrostatic discharge (ESD) can KO circuit cards. When handling cards, always ground yourself with an ESD grounding strap connected to the receptacle on the auxiliary interface

Wear ESD strap when handling cards



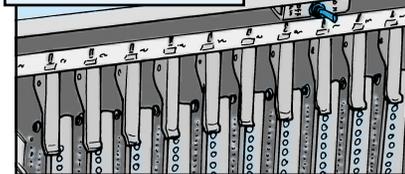
panel. Even with the strap on, keep your fingers off the card's components. Hold the card by its edges. Never lay down a circuit card on a bare surface. Put it in an anti-static bag or lay it on an ESD-safe mat.

Put cards on ESD-safe mat



If you change or check a circuit card, make sure the power is really off to prevent card damage. After you flick off the +/-5V power switch on the VIC, check the LED indicators on the cards.

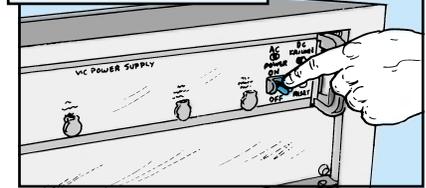
LED indicators still on?



If they're still lit, the VIC's power supply relay is not working and power is still going to the circuit cards.

Solution: Turn off the VIC power supply. That stops power to the cards, but holds the remote process codes.

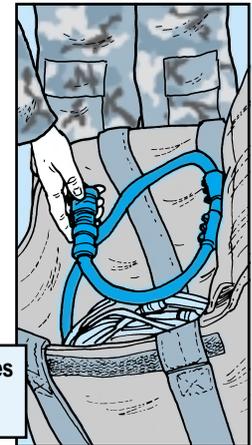
Turn off VIC power supply



When you're through working on the cards, first turn on the VIC power supply and then the +/- 5V power switch.

When you disconnect cables from the IFTE, cap them and put them in their storage bag. That protects them from dirt and feet.

Cap cables and bag them



## Troubleshooting

A good circuit card tip when you troubleshoot is to type:

**scmboot sds -d2 -t4.**

That gives you the status of the VIC circuit cards. Any card that shows a -1 in the ACT column is not working. Often, just reseating a circuit card will put it back in business and save you more troubleshooting time.

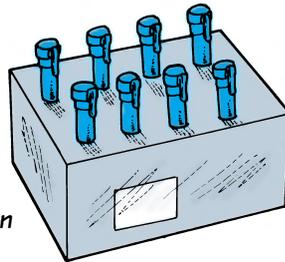
# Radac Ready

OUTTA SIGHT...  
OUTTA MIND...AND  
OUTTA CHARGE!

Dear Editor,

If IM-93 radiacmeters are stored loose in a drawer or cabinet, dirt and anything magnetic can discharge them. Since there's no recommended way to store them, I made my own storage box that works well.

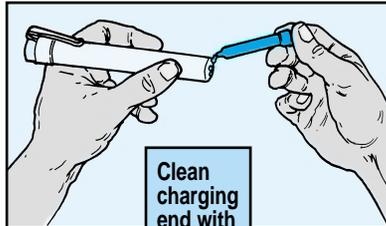
I used the box that the M256A1 chemical agent detector kit comes in, but any box at least three inches deep will work. Fill the box halfway with styrofoam peanuts or wadded newspaper. Reseal the box. Cut round holes in the top of the box for the IM-93s to fit in.



Store IM-93s upright in box

Store your IM-93s with the charging end down in the box. Don't put the box near your M8A1 alarms. The M8A1's radioactive source can throw off the radiacmeters.

Another good tip is to clean both the IM-93 charging end and the charger's pedestal before charging. If either is dirty, you'll get a poor charge and you can damage both the IM-93 and the charger.



Clean charging end with alcohol

Both can be cleaned with denatured or isopropyl alcohol. Just put a few drops on the charging end or pedestal. Let it air dry. Don't dry it with a cloth or blow on it. Both the charger and IM-93 should be kept lint and moisture free. Lint or moisture can cause discharging.

Remember, IM-93s should be charged every 30 Otherwise, you have to charge them every day for five days before they can be used again.

SGT Louis Gonzales  
2/43d ADA  
Ft Bliss, TX



# Saving Drink Tubes

HERE'S A TIP FOR MY NEXT TRIP!



Dear Editor,

Every NBC NCO worth his salt knows the biggest problem he faces is improper storage of the M40 and M42 masks. Soldiers forget that they're not supposed to fold the mask when they put it in the carrier. Result: The drink tube is sheared and the facepiece must be replaced.

We've saved many masks from this fate by demonstrating to our unit the proper way to stow the mask before they go to the field. Most units must attend a safety briefing before an exercise. We ask for a two-minute slot during the briefing to do our stowing demonstration. That way the procedure's fresh in their minds when they go to the field.

SPC Allen Simmons  
PV2 Fernando Cahuantzi  
HHD, 108th ADA  
Ft Bliss, TX

FROM THE DESK OF THE Editor 

Good idea. Remember, stow masks upright in their carriers, facing away from your body.

## Chemical/Biological Maintenance Hotline

If you have chemical/biological equipment maintenance questions, the Soldier and Biological Chemical Command (SBCCOM) has the answers.

Just call their Chemical/Biological Maintenance Hotline. It's a one-stop shop for chemical/biological equipment problem solving.

The number for CONUS calls is (800) 831-4408. In Germany, dial PS 564

0130810280 and in Korea, dial 0078-14-800-0335.

After normal duty hours, you can leave a message on voice mail.

The hotline also has a fax number, but it's not toll free. Dial DSN 584-3912 or (410) 436-3912.

You can also e-mail:

Linda.Riley@sbccom.apgea.army.mil

# All About the

# Batteries



## Main Power Battery

**A**utomatic identification technology (AIT) equipment makes it easier to navigate through the Standard Army Retail Supply System (SARSS). One of the big guns in the AIT inventory is the radio frequency bar code laser scanner terminal (BCLST).

But the BCLST needs regular doses of preventive maintenance, just like other sensitive equipment.

A good place to start your PM education is with the batteries.

The BCLST uses two batteries—the main power battery and the backup battery.

The main power battery is a 6-volt, rechargeable nickel-cadmium (Ni-Cad). It can be discharged and recharged around 500 times and, if maintained correctly, should last five years or more.

But many Ni-Cads are not lasting nearly that long because of forced removal, incorrect installation of the battery pack and incorrect charging procedures.

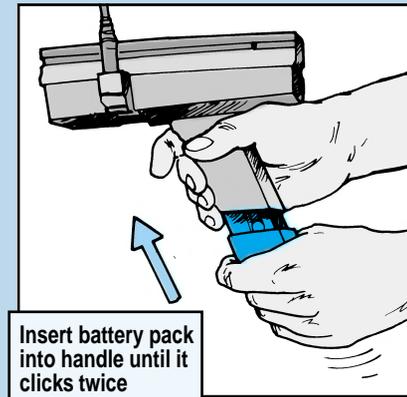
**Installation and Removal**—Here's how to install a battery pack:

First, hold the BCLST by the handle with one hand.

Hold the battery pack below the handle with the other hand.

Then press the battery pack into the handle firmly until it locks in place.

You should hear two clicks as the battery pack latches into the reader. Don't settle for one click! At one click, the pack is partially seated. It may



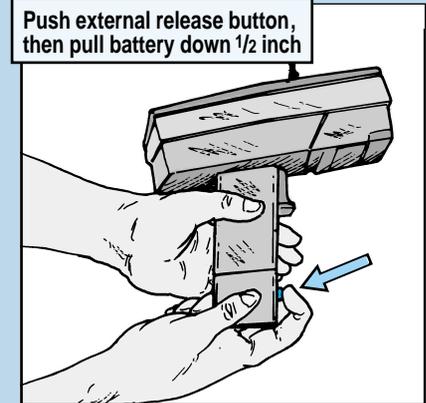
work, but it won't work right. Your readings will be wrong and you'll have other power problems—like spikes that can lose data.

That second click tells you that the end cap tab has engaged and the pack is firmly seated.

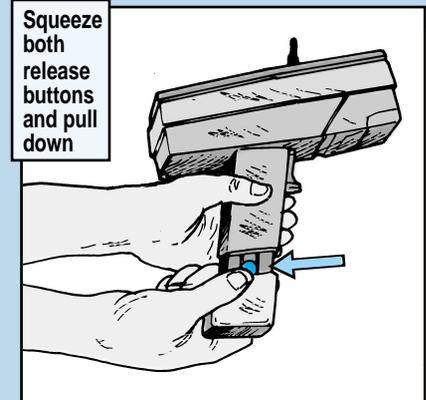
Here's how to remove the battery pack:

First, press the external release button on the battery end cap.

Then pull the battery pack down by the end cap about 1/2 inch or until it stops. You should see two yellow release tabs on either side of the battery pack.



Push the battery pack end cap up slightly while squeezing in the two yellow release buttons. This lets the tabs disengage from inside the handle.



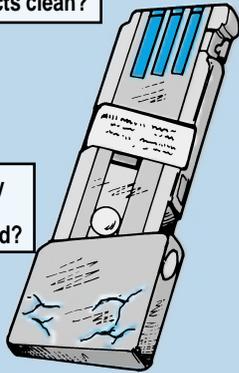
When the release tabs disengage, pull the battery down gently and remove it from the BCLST handle.

If you yank out a battery before the tabs are disengaged, you'll break the tabs or round them off. Then you won't be able to seat the battery pack.

**Check & Clean**—While you have the battery pack in hand, check the plastic casing for cracks.

Contacts clean?

Battery pack cracked?



Look for signs of moisture or corrosion damage. Make sure the contacts are clean and dirt-free.

Clean them if they're dirty to maintain good contact with the reader. Use a cotton swab and some rubbing alcohol to clean the gold contacts on the sides of the battery pack like the manufacturer directions tell you.

**Charging**—When the BCLST displays the battery symbol, the Ni-Cad battery pack has 15 to 45 minutes of operating power left.

You should also hear a warning "chirp" every five seconds for one minute.

These are signs that the BCLST Ni-Cad is depleted and must be replaced immediately.

Here's how to charge a Ni-Cad battery in the battery charger:

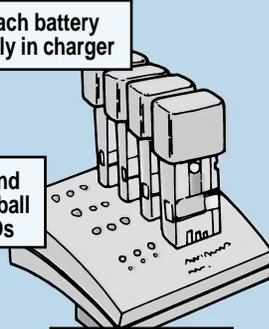
**1.** Insert up to four batteries into the battery slots on the battery charger. Make certain that each battery

is properly seated in its battery slot.

**2.** Look at the battery charger LEDs to verify that the battery packs are charging correctly.

Seat each battery properly in charger

...and eyeball LEDs



Use these codes to interpret LEDs

DISCHARGE	CHARGE	READY	
●	●	●	The dock or charger is waiting for a battery, or there is no power to the dock or charger.
●	☀	●	The battery is about to begin charging.
☀	☀	●	The battery is charging.
●	☀	○	The battery is charged and ready.
○	●	●	The discharge button has been pushed and the slot is waiting for a battery to discharge.
☀	●	●	The battery is discharging.
●	●	☀	The battery did not charge in the allotted time. The battery may be damaged.
☀	●	☀	The battery has poor contact with the battery slot contacts or the battery may be damaged. (Discharge and Ready LEDs flash alternately.)
☀	☀	☀	A battery has been inserted that is not supported by the dock or charger. (All three LEDs flash in order.)
☀	☀	☀	The battery temperature is out of range. (Discharge and Ready LEDs flash alternately with Charge LED.)
☀	☀	☀	A battery has been inserted that may be damaged. (All three LEDs flash together.)

● = off   ○ = on   ☀ = flashing

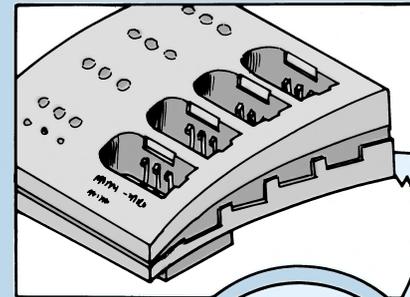
NOTE: When an LED flashes, it is either a strong, slowly flashing light, or a dim, rapidly flashing light.

It is important to keep the contacts on the battery charger clean. Dirty contacts may mean a poorly charged or discharged battery and can shorten battery life.

CECOM recommends using a pencil eraser and a dry, lint-free cloth to clean the contacts, but do it carefully. It's easy to bend and break the contacts and to remove the gold and silver plating.

To discharge a battery:

**1.** Press the discharge button on the back panel of the battery charger or communications dock.



Discharge button is here

Once the discharge LED turns on, you have

15 seconds to insert a battery pack. If the discharge light goes out, press the button again.

**2.** Insert the battery pack into any empty slot on the charger. The discharge LED flashes and the charger begins discharging the battery. Allow several hours to completely discharge the battery.

Once the battery pack is discharged, the discharge and charge LEDs start flashing and the charger begins charging the battery pack.

You should discharge and charge every battery being actively used at least once every two weeks.

If you don't, you'll shorten the life of the battery.

When a battery pack is fully charged, you can leave it in the battery charger until needed. It won't overcharge. After fully charging, the battery charger automatically transfers to trickle charge mode, and can be left indefinitely.

Each battery slot on the charger is individually controlled. You can charge a battery, maintain a charge on a battery and discharge a battery at the same time.

Always keep a charged battery pack in the BCLST and keep it set to Suspend mode or Storage mode. If you don't, you'll drain the lithium backup battery.

ALWAYS KEEP ME LOADED WITH A CHARGED BATTERY PACK.



**Suspend Mode**—During times when the BCLST won't be used for one to seven days, insert a fully-charged main battery in the BCLST. Then place the BCLST in the Suspend Mode by pressing the i/o key. In the Suspend Mode, the BCLST saves all memory contents and turns off the power to most of the unit hardware, including the display screen.

**Storage Mode**—When the Ni-Cad battery pack charge is low or when you know you won't be using the BCLST for one week or longer, set the BCLST to Storage Mode and remove the Ni-Cad battery pack.

To enter the Storage Mode press i/o to turn off the reader.

Press the F3 key, the 2 key and the left arrow key simultaneously. If the reader asks for a password, enter it.

Then press the 2 key again. Press the i/o key one more time. Press the down arrow to highlight Storage on the menu. Press the ENTER key. Now remove the battery pack.

To exit the Storage Mode, install the reader's Ni-Cad battery pack. Press i/o to turn on the reader. If the reader asks for a password, enter it.

When the Boot Loader menu appears, select Reboot. Press enter to exit the Storage Mode.

**Backup Battery**—A 3.6-volt lithium battery backs up the BCLST's memory and the clock when the Ni-Cad battery is discharged or removed.

When the backup battery is low, you should hear a warning "chirp" every 15 seconds for one minute.

To prevent premature discharge of the lithium battery, replace the main battery as soon as possible.

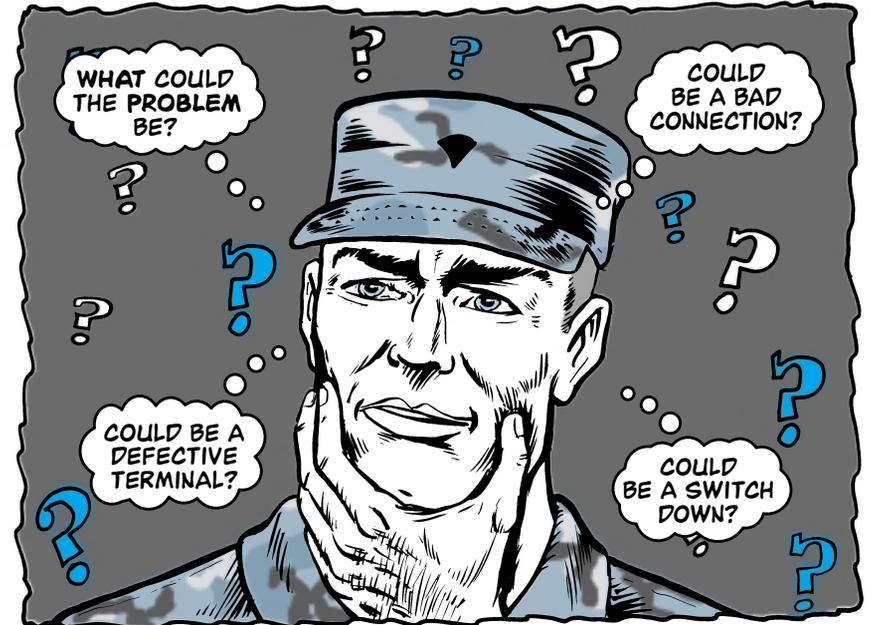
The lithium battery can be replaced only by the BCLST manufacturer. So, turn the BCLST in to your support when it needs to be replaced.

If you have questions about maintenance on the BCLST, contact the Intermec Hotline at 1-800-892-7007. Or e-mail them at:

[support@intermec.com](mailto:support@intermec.com)

Mobile Subscriber Equipment . . .

# Give It a Test



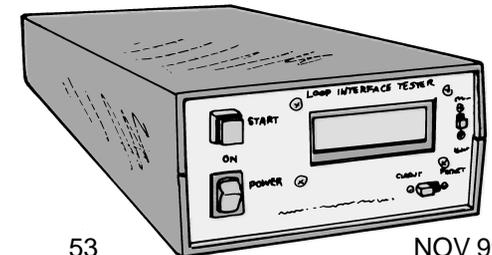
**U**ntil now it's been all guesswork. If something went wrong in between your terminal and the mobile subscriber equipment (MSE) switch, you just scratched your head and said, "Could be."

Could be a bad connection. Could be the switch is down. Could be the terminal is defective. Could be this. Could be that. Now you can change "could be" to "is" with a loop interface tester, NSN 6625-01-448-8798. The tester takes the guesswork out of connecting to circuit and packet loops of the MSE system.

This hand-held, battery-operated tester can tell you where your problems are, whether your four-line wire is a circuit switch telephone loop or a packet switch data loop, and even give you your Internet protocol address.

Use loop interface tester, NSN 6625-01-448-8798

For more information on the tester, contact the CECOM POC at DSN 992-8311 or (732) 532-8311. Or e-mail them at: [foster@mail1.monmouth.army.mil](mailto:foster@mail1.monmouth.army.mil)  
PS 564



# Sleeping on the Snow

THE SELF-INFLATING MAT, NSN 8465-01-393-6515, HAS INSULATING QUALITIES THAT MAKE IT IDEAL FOR USE IN EXTREME COLD. BUT THE COLDER IT IS, THE SLOWER THE FOAM INSIDE THE MAT INFLATES. HERE'S THE EASIEST WAY TO INFLATE THE MAT IN COLD CONDITIONS.

1. Carry the mat next to your body or unroll the mat and lie down on it for a few minutes before inflation. Your body heat will warm the foam, allowing it to inflate quicker.



2. Open the valve and let the mat inflate as much as possible.

3. Close the valve, fold the mat two or three times, and sit on it. Your weight stretches the foam, increasing its ability to inflate.



4. Open the valve again and let the mattress fully inflate.

If you're going to be sleeping on snow, over-inflate the mat a bit by blowing extra air into the mat after it stops self-inflating.



The mat will be a little firmer, but the added air increases the loft of the foam and provides better insulation. As the air in the mat cools, it also contracts. The extra air will compensate for that.

When subfreezing temperatures are the norm for several weeks, though, stop using breath inflation.

Condensation from your breath will accumulate inside the valve and form an ice plug. Then the mat can't be inflated or deflated. Ice can also form inside the mat and tear the foam core.



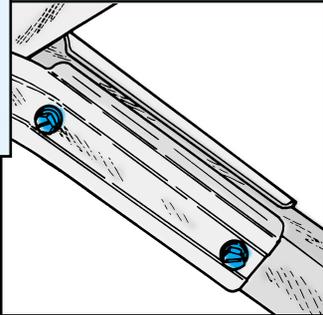
# Riveting Cot P.M.



If your cot seems more tired than you are, here's what you can do to refresh it. Look for:

➔ **Broken or missing rivets.** There are no replacement rivets for the aluminum cot. Replace each missing rivet with a machine screw, NSN 5305-00-050-9236; washer NSN 5310-00-933-0120; and nut, NSN 5310-00-934-9760.

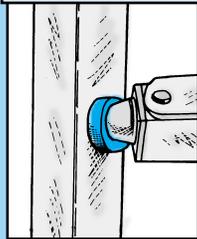
Replace missing rivets with machine screws



➔ **Damage to the rivet holding the tiedown strap.** Replace it with self-tapping screw, NSN 5305-00-432-4251, and washer, NSN 5310-00-809-3078.

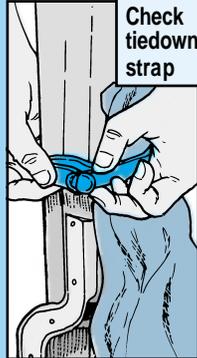
➔ **Sagging cover.** Use spacing plugs, NSN 7105-00-935-0434, between the end stick and the frame to tighten the cover. A new cover may be nice and firm, but when it starts to sag, you'll need the plugs. Be prepared by storing spacing plugs in the hollow part of an end stick.

Spacing plugs keep cot from sagging



➔ **Bent bar on tiedown strap.** When you pack the cot to move out, check to see if the bar is bent on the tiedown strap. If it's bent, the strap tab can catch and tear off. Straighten the bar with a screwdriver so the tab will glide through easily.

Check tiedown strap



# On the Cutting Edge



Roping in the NSNs needed to put up concertina wire, NSN 5660-00-921-5516, can tie you up in knots, especially since screw pickets have been replaced by slotted posts. Untie yourself and get the posts you need:

Slotted post	NSN 5660-00-270-
5 feet with 4 slots	1587
2 feet with 1 slot	1588
32 inches with 2 slots	1589

Pages 3-8 through 3-11 of FM 5-34, *Engineer Field Data*, have instructions for putting up the concertina wire.

Wear barbed wire/tape gloves, NSN 8415-00-926-1674, when you're working with the wire. Your authority to order the gloves is CTA 50-900.

## Mark the Drop Zone

Having trouble finding something to mark drop zones or landing areas? Go with VS-17 panels, NSN 8345-00-174-6865. That gets you a 2x6-ft nylon-laminated cloth panel that's orange on one side and red on the other, at a cost of about \$18.00. The panels are authorized by CTA 50-970.

# Repair 'em with ROCTAD



THIS ROCTAD OUTFIT WILL GET YOU BACK IN THE ACTION.

THANKS, I WAS FEELING A BIT FRAZZLED.

Save your unit lots of money by repairing collapsible fabric fuel and water tanks and drums with repair outfit, collapsible tanks and drums (ROCTAD), NSN 5430-01-359-1078.

Repairs cost about one-tenth of a new replacement tank, plus they stand up to almost everything nature can throw at them.

The repair kit has two components that you mix together in a bowl and apply with a brush. You're actually painting on new rubber. It uses a cold temperature curing process that requires no special training for application. But the mixture is hazardous, so be sure to wear a respirator mask and gloves.

You can repair tanks in dry weather at temperatures between 40° and 80°F. A cured repair made on a tank, drum or berm liner tolerates outside temperatures of -25°F to 125°F. It also holds up under folded conditions at -30°F to 150°F stored. And best of all, continuous contact with rainwater, ground water and all types of fuels and oils has no effect on the repair.

The kit includes complete, simple instructions with pictures. But if you have questions, get in touch with your local TACOM logistics assistance representative.

# STEAM-TO-ICE

Your steam cleaner is a hot item when it's doing its thing, but leave it out in the cold and it'll freeze in a heartbeat.

It's impossible to drain all the water out of it, but if it freezes, you're left dealing with burst coils, pipes and fittings.

Here's how to save yourself that heartache:

- ☒ Store and use the steam cleaner inside a heated building or shop in winter.
- ☒ If you can't bring it into a heated area, it should be charged with a 50/50 mixture of antifreeze and water. Make a note on the cleaner's DD 314

that there is antifreeze in the equipment. Before using the steam cleaner, pump out the antifreeze and save it for reuse.

If you're looking at long-term storage, get a copy of Cold Weather Technical Bulletin TB 43-0246-50. Paragraph 7-10 tells all about winterizing cleaners.

To get your copy, write:

Commander  
US Army ACALA  
AMST-AC-MCML  
Rock Island, IL 61299-7630

Or e-mail:

griffin@ria-emh1.army.mil



Reduced Price Initiative ...

# The Army's Blue Light Special

**A**ttention, Army maintainers.

Have you stretched your maintenance dollar to the breaking point? If so, the Army's reduced price initiative (RPI) may be for you. As the Army's blue light special, RPI offers selected items at half price.

RPI was established in 1995 as a way to increase the spending power of Army field maintenance customers. That first year units saved money on 200 items. The list grew to more than 1,200 items in FY 99 and continued to grow as force modernization and Army-managed field-level reparable were added to the list beginning in FY 00 (1 Oct 99).

In the early days, units paid the item's surcharge. Now, the FED LOG AMDF price will be reduced by 50 percent of the standard price. This price lets the Army recover some of its cost and gives units some credit for serviceable turn-ins of RPI items.

The RPI also allows item managers to reduce slow-moving stock or overstocked items.

To find out which items are in the FY00 RPI program—and current RPI policies—log on to the Internet at:

[www.hqda.army.mil/logweb/directorate/s/m/smhp.htm](http://www.hqda.army.mil/logweb/directorate/s/m/smhp.htm)

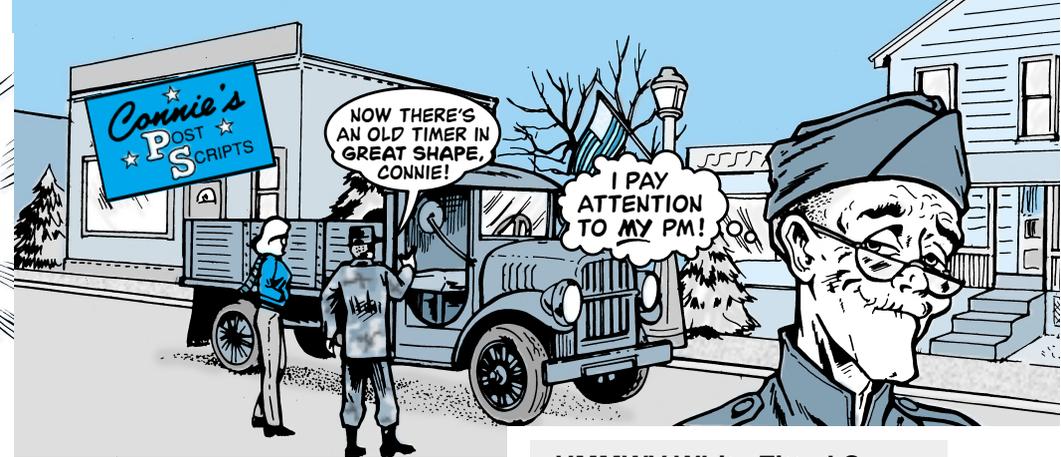
If you do not have Internet access, you can get a copy of the RPI list by contacting Nancy Barth at (703) 614-8304, DSN 224-8304 or e-mail:

[barthnp@hqda.army.mil](mailto:barthnp@hqda.army.mil)

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**BARGAINS!  
GALORE!**



### HMMWV White Fitted Cover

Need a white fitted cover for your 4-door HMMWV? TM 9-2320-280-24P-1 only gives you one fitted cover part number—12340676—and it's green. Get the white cover with NSN 2540-01-412-2661 (PN 12340676-21).

### Jack Fluid, Checks

If you need fluid for your hydraulic jack, order a quart with NSN 9150-00-935-9807, a gallon with NSN 9150-00-935-9808 and five gallons with NSN 9150-00-935-9809. Once the jack is full of juice, make sure it can hold a load. Inspect it and load test it per the instructions in Para 4b (a) and Appendix E of TB 43-0142, *Safety Inspection and Testing of Lifting Devices*.

### ACCP Internet Correction

The internet address on Page 60 of PS 559 (Jun 99) for the Army Correspondence Course Program (ACCP) has changed. Get information about the correspondence course program at:

<http://www.atsc.army.mil/accp/dlsd.htm>

### Speedometer Settings Revisited

Mechanics, on Page 4 of PS 559 we gave you the wrong switch settings for the back of the FMTV speedometer. Here are the settings you need to make sure the speedometer registers the right mph:

- ★ Switches 1 and 2: up
- ★ Switch 3: down
- ★ Switches 4 and 5: up
- ★ Switches 6 and 7: down
- ★ Switch 8: up
- ★ Switch 9: down
- ★ Switch 10: up

### SINGARS Antenna Correction

If your vehicle is packing a SINGARS series radio and you're using the AS-3900 antenna, there is no need to use tape on the tip cap, like we said on pages 48-49 of PS 561. The SINGARS antenna tip cap, NSN 5820-00-437-2352, stays on tight without tape.

### FMTV Desert Cover Correction

We had the NSNs switched on Page 61 of PS 560 (Jul 99) for desert tan cargo covers for FMTVs. Use NSN 2540-01-437-1463 to get the cover with bows for the 2 1/2-ton trucks and NSN 2540-01-436-9658 to get the same stuff for 5-ton trucks.

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

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