

Issue 461

PS

April
1991

THE
PREVENTIVE
MAINTENANCE
MONTHLY

TB 43-PS-461



HUBBA,
HUBBA, I'D
WALK TEN MILES
FOR THAT
CAMEL!

HUH!
YOU NEED
SOME R&R!

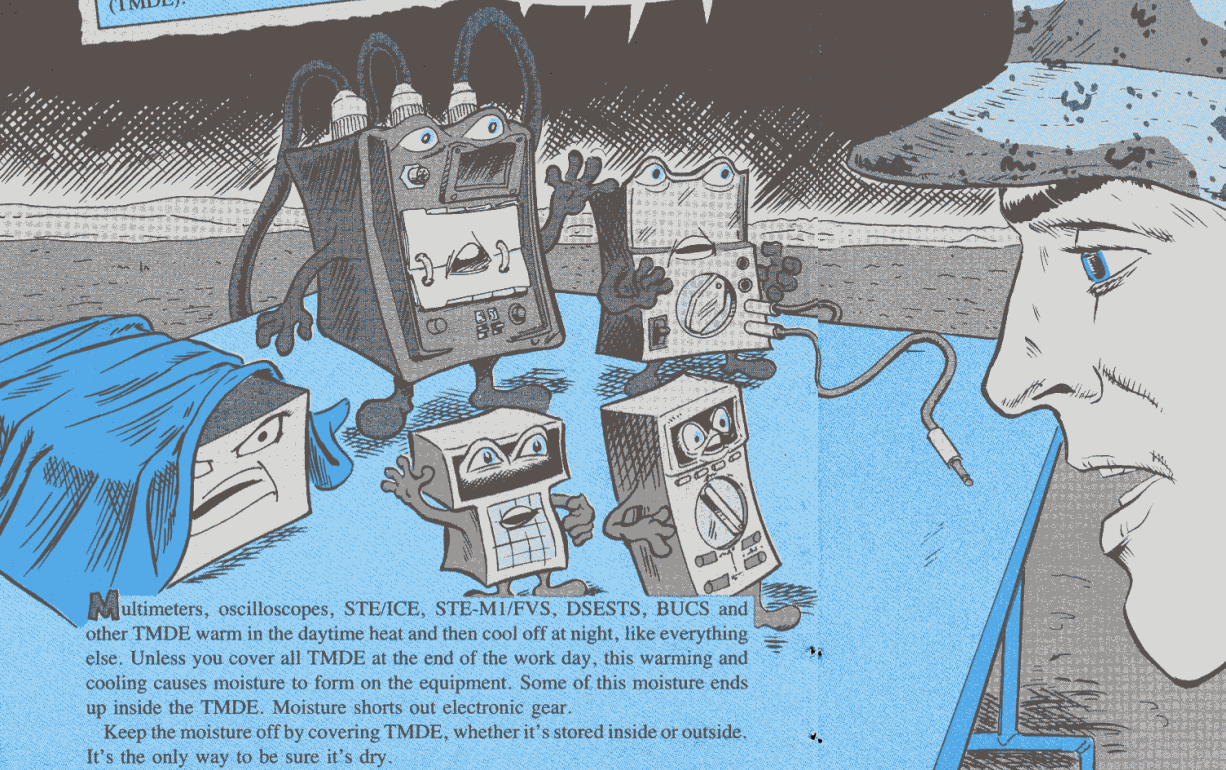
Approved For Public Release;
Distribution is Unlimited

Special Tool Pullout Section
See Page 27

COVER UP AT NIGHT

Temperature swings play havoc with electronic gadgets, including test measurement and diagnostic equipment (TMDE).

IF YOU'RE GOING TO LEAVE US OUTSIDE OVERNIGHT, **COVER US UP!**



Multimeters, oscilloscopes, STE/ICE, STE-M1/FVS, DSESTS, BUCS and other TMDE warm in the daytime heat and then cool off at night, like everything else. Unless you cover all TMDE at the end of the work day, this warming and cooling causes moisture to form on the equipment. Some of this moisture ends up inside the TMDE. Moisture shorts out electronic gear.

Keep the moisture off by covering TMDE, whether it's stored inside or outside. It's the only way to be sure it's dry.

PS THE PREVENTIVE MAINTENANCE MONTHLY

TB 43-PS-461. 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.

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

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Don't Decon Inside with M11

NEVER USE THE M11 DECON INSIDE THE M1. USING THE M11 IN THOSE CONFINED SPACES CAN DAMAGE YOUR CHEMICAL PROTECTIVE GEAR AND YOUR TANK'S ELECTRICAL AND OPTICAL GEAR.

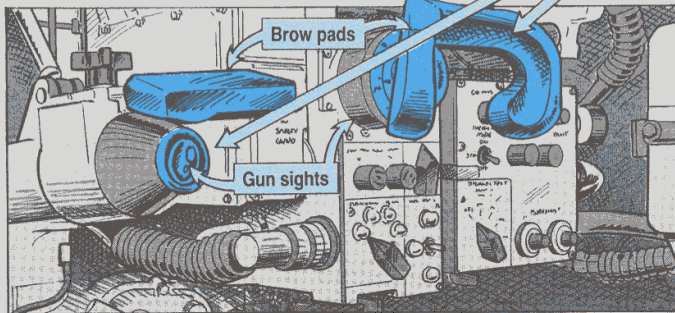
THEN WHAT SHOULD WE USE?

WE CAN USE THE NO.2 WIPES IN OUR M258A1 KIT TO WIPE DOWN ANY EQUIPMENT WE MAY DIRECTLY HANDLE.

If you're hit in a chemical attack, decon like this: Decon yourself first with your M258A1 decon kit. You're in the most danger. Use only M258A1 kit No. 2 wipes to decon inside your M1 within 15 minutes after the attack. You'll need several kits, so keep plenty on hand.

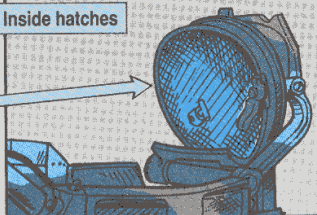
Wipe these areas:

- Driver's, loader's, gunner's, and commander's controls
- All headrests and brow pads
- Gun sights



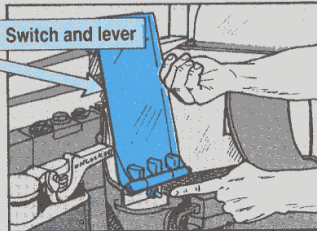
- Insides of all access hatches and hatch latches or handles

Inside hatches



Ammo door knee switch

Switch and lever



- Any other equipment that you may directly handle, like the main gun arming lever.

Dispose of used M258A1 kits outside the tank. Put them in a sealed container or plastic bag if possible. Turn them in for proper disposal according to your local SOP.

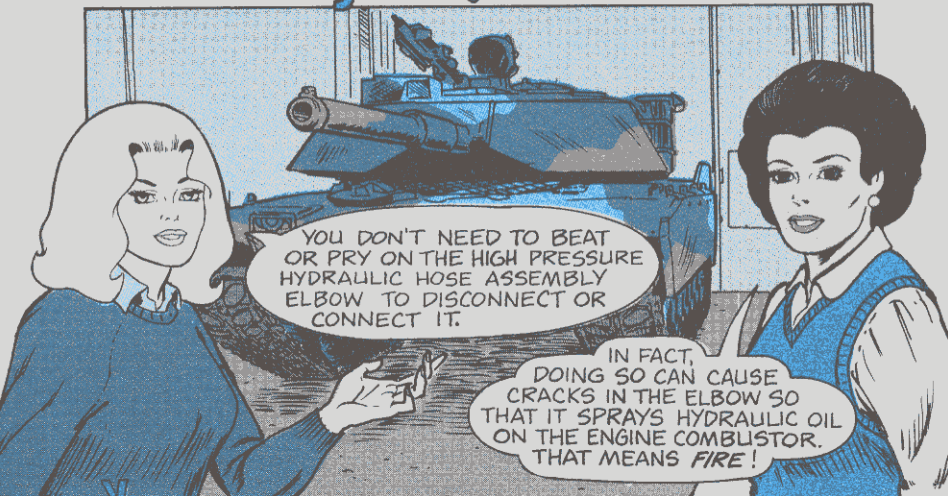
Rinse the gun sights to remove any chemical residue with lens cleaning fluid.

Continue to use the M11 to decon a path for yourself on the M1's outsides. Never get DS2 on the vision blocks. DS2 damages optics.

Use the chemical agent monitor (CAM) if your unit has one to be sure you've wiped up all contamination.

For more info, see AMCCOM Safety of Use Message 29-90. Your local AMCCOM Logistics Assistance Representative will have a copy.

Hands Only on Quick Disconnect



Yes, it's a tough job getting to the quick-disconnect with enough hand to do the work, but it can be done.

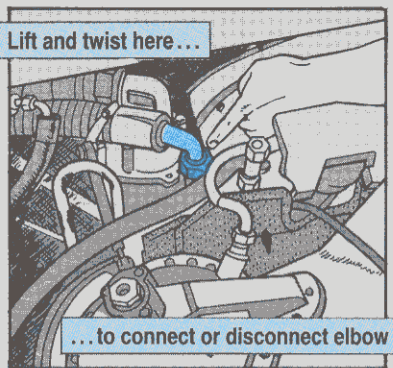
Here are a few tips.

If your hose assembly quick-disconnect has a collar, lift it up before you try to twist the quick-disconnect loose.

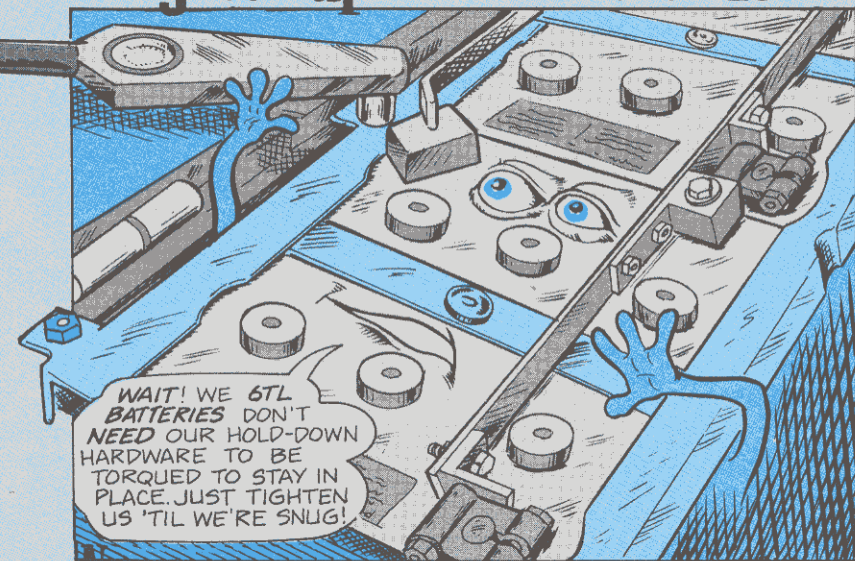
To install the quick-disconnect, lift the collar and reverse the removal process. Once the quick-disconnect is tight, push the collar down. Then grasp the elbow (not the quick-disconnect or the hose assembly) and try to pull it away from the hydraulic pump. If it comes loose, try again.

If your tank has a positive locking quick-disconnect (it has lock-down bolts instead of a lifting collar), the job is much easier. Wiggle the elbow while you unscrew the collar. For installation, everything's back in place right if the lock-down bolts will tighten.

Eyeball the elbow any time you disconnect it. Cracks, deep gouges and leaks in the elbow make your tank NMC until repairs are made. TACOM Safety of Use Msg AMSTA-M 90-14 has the word.



Lighten Up on 6TL Batteries



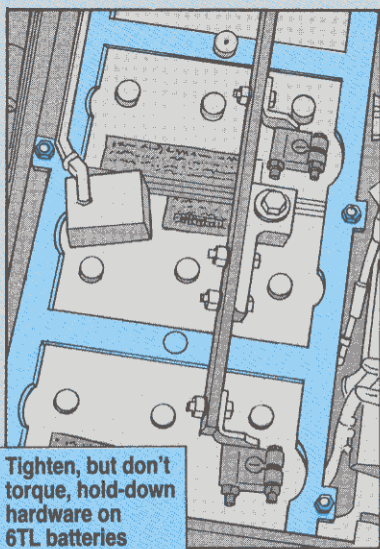
Now that 6TL batteries are in the system and you may get them as replacements for those in your tanks, you need the latest hardware for installing all M1-series tank batteries.

The reason for the change in hardware is simple: 6TL batteries are made of a flexible material that deforms and cracks when hold-down clamps are torqued to 120 lb-in.

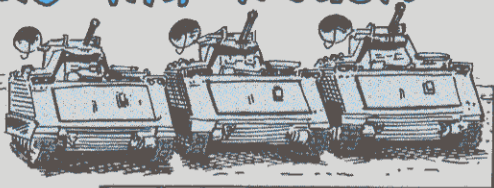
To be ready for the new batteries, here's the hardware change you need to apply right now:

🌀 Replace the old nuts and lockwashers with self-locking nuts, NSN 5310-01-249-0904.

🌀 Tighten the self-locking nuts until the retainer is firmly on the batteries. That's enough.



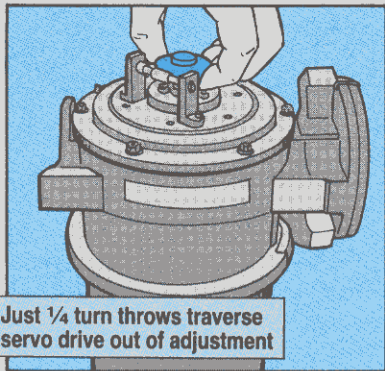
Save Time and Trouble



✓ When you remove the traverse servo drive assembly for repair, treat it with care. If you absentmindedly turn its upper gear even a quarter-turn, the assembly's thrown out of adjustment and the Vulcan will have poor accuracy. Never hold it by the gear. That bends the gear shaft. Hold it by the base.

Time is one thing always in short supply around the motor pool. And it always seems like there's more than enough trouble. Here are a few points that will save Vulcan repairmen time and prevent trouble:

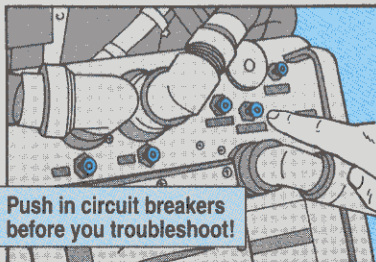
✓ If you're having power supply problems, push in all the circuit breakers before you do any troubleshooting. Often the circuit breakers pop out only part way and look OK. Pass this tip on to your Vulcan crews, too. It could save you a trip to the field.



Just $\frac{1}{4}$ turn throws traverse servo drive out of adjustment

✓ Caution your unit about how easy it is to damage the external range control assembly. One good knock destroys it. If the assembly's NMC, so is the PIVAD system.

Being rough with the range control cable when a crew member is walking the range control into position also causes damage. One good jerk ruins the cable wiring.



Push in circuit breakers before you troubleshoot!

Water Drain Fix

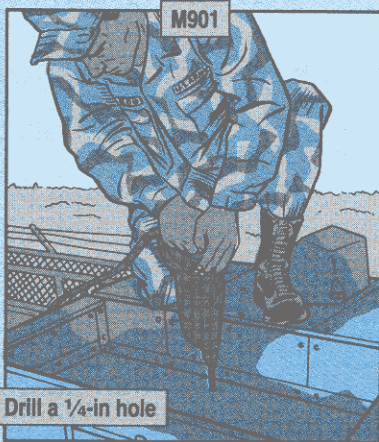


Rain water collects on the rear access panels of the stowed launcher of the M901 Improved TOW Vehicle (ITV) and target head of the M981 Fire Support Team Vehicle (FISTV). Over time, the access panel bolts rust.

You turret mechanics can stop rust by letting the water out. Here's how:

M901 ITV

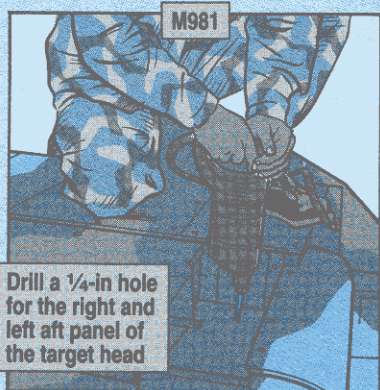
- ☞ Place the launcher in the stowed position.
- ☞ Use a center punch and mark a spot 17¼ inches from the side plate and 12¼ inches from the rear plate.



M981 FISTV

- ☞ Place the targeting head in the stowed position.
- ☞ Mark a spot for a hole 2¾ inches from the panel mounting bolts and 2 inches from the rear end of the panel.

Apply green CARC paint, NSN 8010-01-229-7546, to the holes.



Grease-fitting Caps



Dear Half-Mast,

We just received new M113A3 carriers with small protective caps over the grease fittings. The caps are real handy for keeping the fittings clean and unclogged during field exercises. It's easier to take the cap off than to replace the fittings. How do we get more of these caps for other combat vehicles?

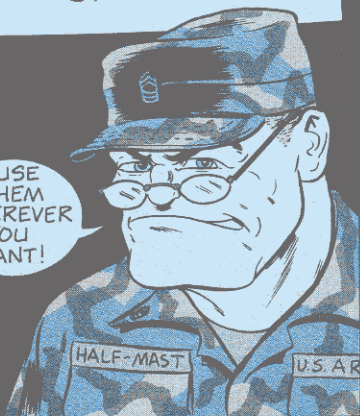
SFC G.L.D.

Dear Sergeant G.L.D.,

The caps are put on the A3s during manufacture. Other combat vehicles get them during rebuild to protect against paint and dirt. They weren't intended for field use or replacement, but if they're doing the job, you can get them with NSN 4730-00-289-8148.

Half-Mast

USE THEM WHEREVER YOU WANT!



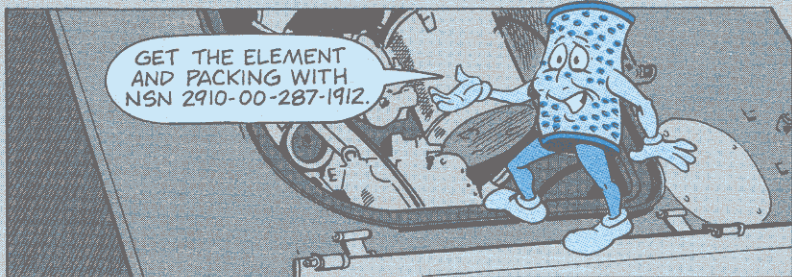
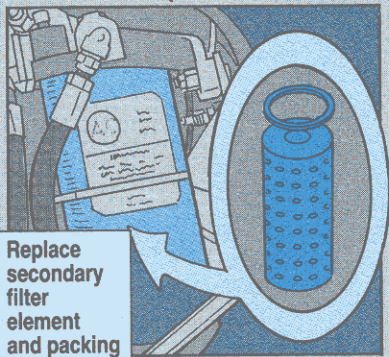
M113-Series FOV...

Fuel Filter Element Replacement

Whoa-a-a there, mechanics! Before you fire off an order for the entire secondary fuel filter, NSN 2910-00-781-1354, for your M113-series carrier, ask yourself this question:

Do I really need the whole 9 yards, or do I just need to replace the element?

Makes a big difference. The whole shebang—housing, head, element, packing, everything—costs more than \$39. The element and packing cost less than \$3.

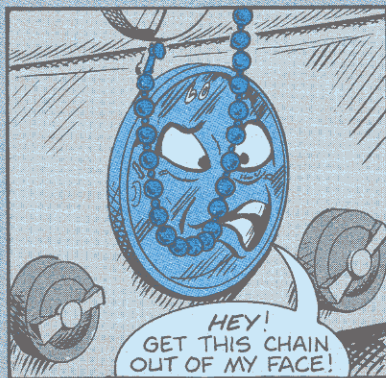


M548A1, M1015/M1015A1 Carriers...

Face-Saving Fix

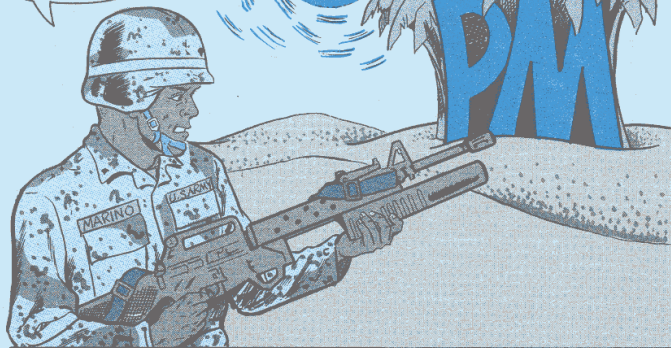
The chain holding the utility receptacle cover onto the dash of the M548A1 cargo carrier and M1015/M1015A1 electronic warfare systems carrier rubs the face of the air pressure gage on vehicles with air brakes. The chain scratches the face cover, making it hard to read the gage.

In a SMART move, SGT Gene E. Baldwin of Ft Lewis, WA, says to stop the scratches by removing the chain from the utility cover, cutting off two inches and reconnecting it.



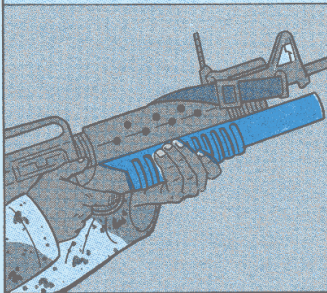
PM Is Oasis in Desert


MY GRENADE LAUNCHER IS A MESS... HMMM, I WONDER IF I CAN GET SOME HELP AT THAT OASIS.




The desert's heat and sand can turn your powerful M203 launcher into a powerless piece of junk. Heat dries up lube and sand jams moving parts. Your M203 grinds to a halt. PM is its only oasis in the desert. Help your M203 like this:

Protect your M203 from sand. Cover it when not in use. Keep the barrel closed.

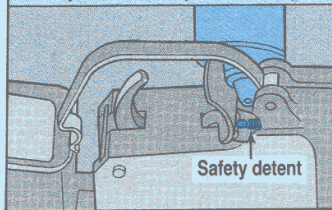


 Clean your M203 as often as possible. That means at least daily. Wipe it off every chance you get with a clean, dry cloth. Clean in enclosed areas where you can get away from blowing sand.

Pay particular attention to the breech insert, firing pin hole, and locator slot. They'll need the most help. Clean them with a rag and CLP or RBC and LSA or LAW and wipe away excess lube.

 Lube often... after every cleaning... but lightly. Lubricants attract sand, so limit lubing to internal parts. Wipe the M203's outsides dry.

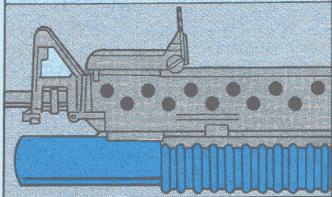
Be sure to lube the locator slot, barrel tracks, firing pin hole, and safety detent... but just a few drops.



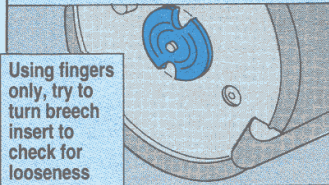
Too much lube gunks up the insides. If it gets hard to make your M203 function, it probably needs cleaning and lubing.

During your daily PMCS, look for these common problems:


Barrel cracked, dented, out-of-round or difficult to move?



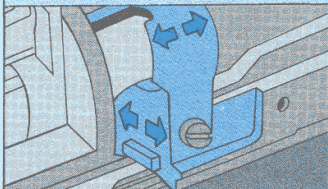
Breech insert loose or sticks up above the breech face?






Using fingers only, try to turn breech insert to check for looseness

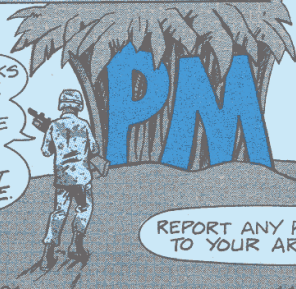
 Firing pin sticks out of breech insert?

Barrel assembly bracket moves all along the barrel? Bracket moves side-to-side more than 1/8 inch each side of center for a total of 1/4 inch?



-  Barrel extension loose?
-  Leaf sight or quadrant sight mounting screw loose?
-  Make sure bore is clear of obstructions prior to firing.

LOOKS LIKE I CAME TO THE RIGHT PLACE.



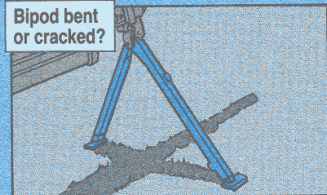
REPORT ANY PROBLEMS TO YOUR ARMORER.



Tip Top PMCS

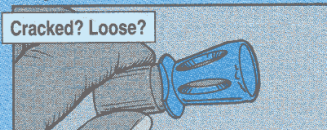
For your M249 machine gun to be in tip-top firing condition, you need to do tip-top PMCS. Here are the most common problems to look for:

Bipod. Legs bent or cracked? Won't stay in stowed position? Bad bipods make it difficult to set up for steady firing.



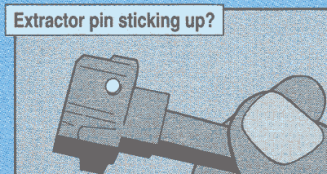
Bipod bent or cracked?

Flash Suppressor. Cracks? Dents? Loose? A loose or bent suppressor can catch the side of a fired bullet. That's dangerous.

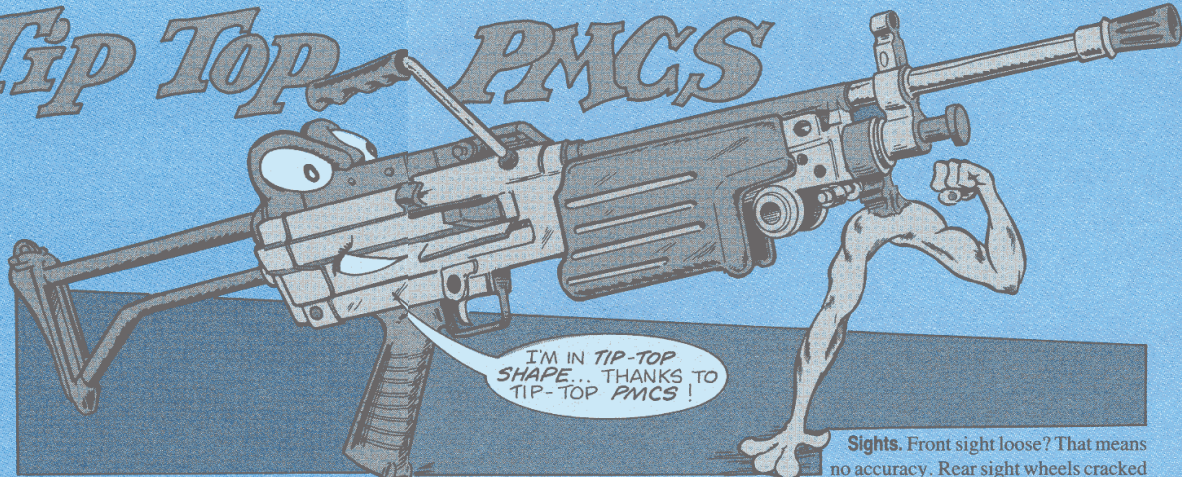


Cracked? Loose?

Bolt. Slide bowed or cracked? Your armorer needs to inspect the bolt slide and piston assembly. Extractor pin not flush? If the pin works out, the bolt will lock up in the locking lugs.

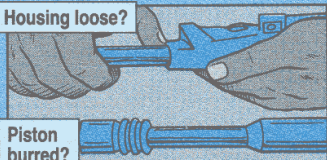


Extractor pin sticking up?



I'M IN TIP-TOP SHAPE... THANKS TO TIP-TOP PMCS!

Piston. Burred? If the piston's burred, it will be hard to charge. Housing loose? If the housing moves at all, the piston rod needs to be replaced. Report it.

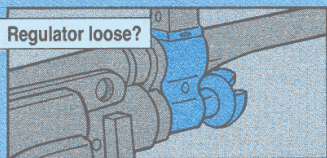


Housing loose?



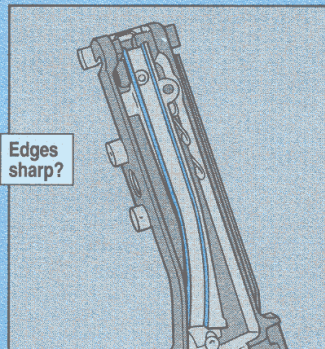
Piston burred?

Gas System. Cylinder cracked? If the cylinder splits, your M249 stops firing. Regulator loose? That causes loss of pressure and sluggish firing.



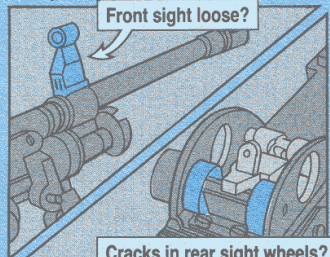
Regulator loose?

Feed Tray Cover. Cover, feed pawl, and safety springs missing or broken? Missing or broken springs cause problems, like a cover that won't stay up, a jammed gun, or a safety that won't catch. Sharp edges? The cam roller wears edges so sharp they can cut your hand. Your armorer can stone them dull.



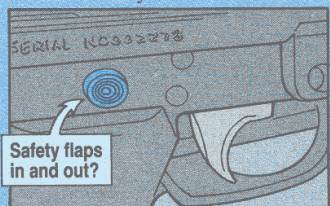
Edges sharp?

Sights. Front sight loose? That means no accuracy. Rear sight wheels cracked or loose? The rear sight will be difficult to adjust.



Front sight loose?

Cracks in rear sight wheels?



Safety flaps in and out?

A Leg to Stand on

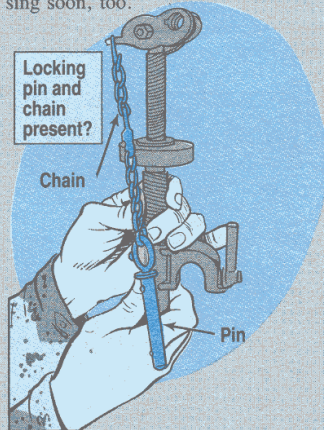
I CAN BE IN FIGHTING CONDITION, BUT IF YOU'VE IGNORED MY TRAVERSING AND ELEVATION (T&E) MECHANISM AND TRIPOD MOUNT, I WON'T HAVE A LEG TO STAND ON!

YOU'VE BEEN LEFT ALONE TOO LONG!

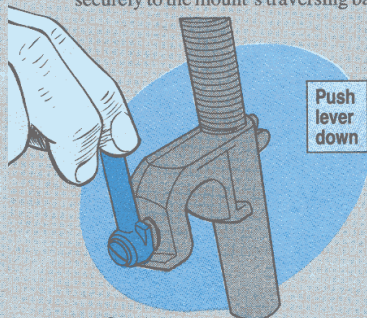


Just a little attention before you go to the field will keep your M2 firing on solid ground. For instance:

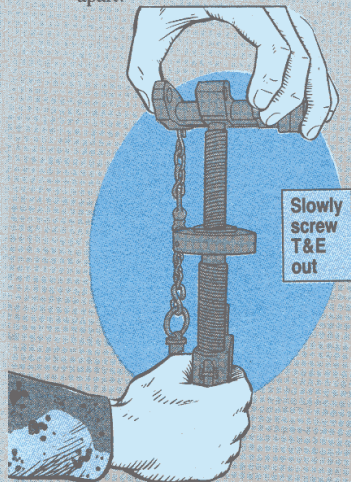
Locking pin and chain. Look for 'em. If the pin's missing, the M2 can't be locked onto the T&E. If the chain's missing, the pin will probably be missing soon, too.



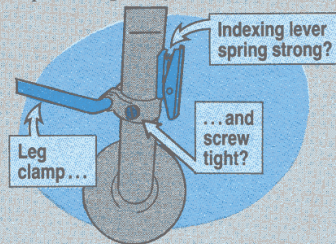
Locking lever. Push it down and see if it pops back up. If the lever's spring is weak, the T&E will not clamp securely to the mount's traversing bar.



Stop. Slowly screw the T&E out to make sure its stop holds. If the stop has worn off, the whole T&E can screw apart.



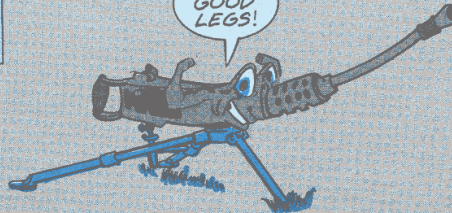
Mount legs. Make sure each leg's clamp, handle and front screws are tight and each indexing lever spring is strong. If a screw works loose or the spring is weak, the mount legs can collapse during firing.



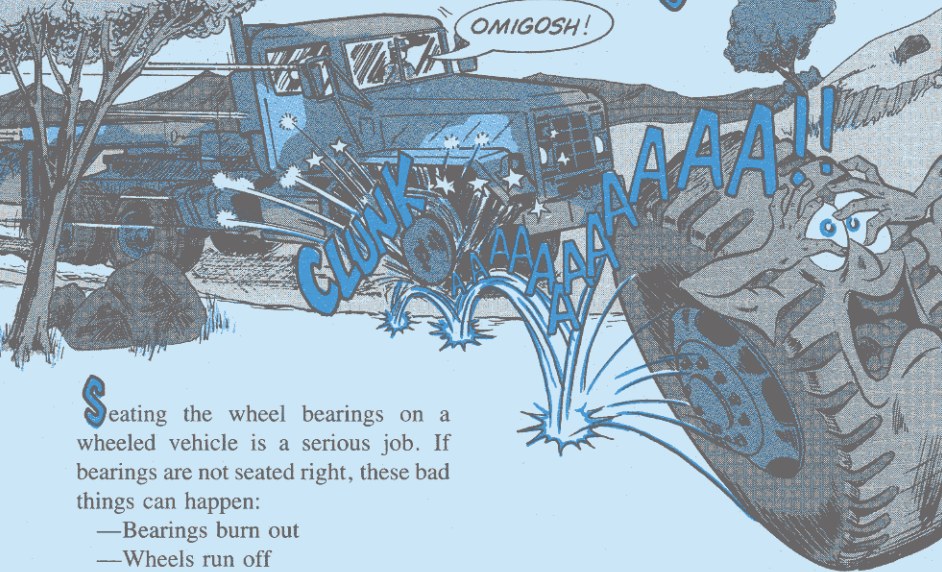
Problems? Tell your armorer.

All of this PMCS will be for nothing if you toss T&Es and mounts in the back of a truck for transport or stack mounts on top of each other. That's what breaks such things as leg clamping handles. By the time you get to the field your mount is unusable. Handle it with care.

IT'S GREAT TO BE BACK UP ON THREE GOOD LEGS!



Seat Wheel Bearings Right



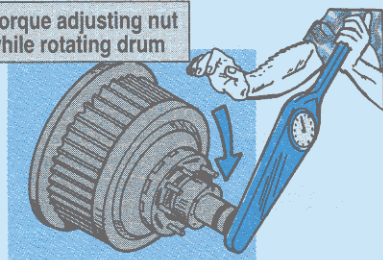
Seating the wheel bearings on a wheeled vehicle is a serious job. If bearings are not seated right, these bad things can happen:

- Bearings burn out
- Wheels run off
- Hubs and axles get damaged
- Accidents occur.

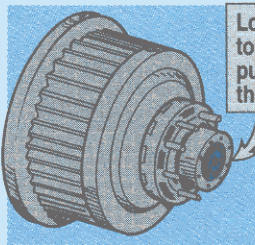
Always adjust bearings like it says in the -20 TM. Rotate the wheel hub back and forth as you torque the adjusting nut.

After you reach the torque required, it is important to loosen the nut enough to align the key or tab washer or what-

Torque adjusting nut while rotating drum



Turning the hub while torquing makes sure the bearings are seated, and that the bearing is not too tight.

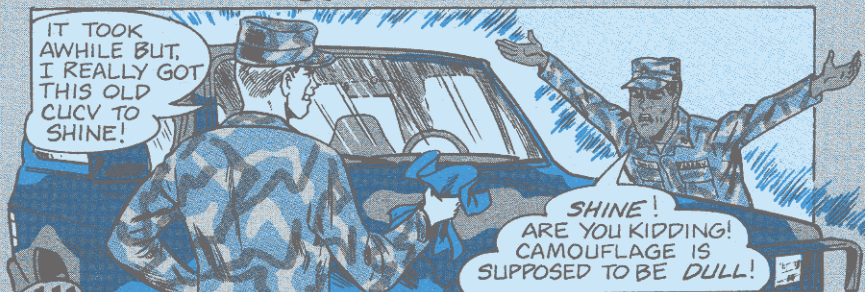


Loosen nut enough to align key hole... put in key... seat the retainer

ever locking arrangement you have. This releases the torque enough so the bearings can turn freely.

Now that you have seated the bearings and relieved the pressure, put it all back together again.

Dull Is Beautiful



When it comes to tactical or combat vehicles, shiny is out and dull is in!

Some folks think their vehicles should shine like their car or pickup. So they use Armor-All, baby oil, brake fluid, diesel fuel or their own concoction to put a shine on their truck or tank.

But vehicles that shine on the parade field stand out in the field, too. They're easy to spot and destroy.

A lot of effort and expense have gone into developing coatings and camouflage patterns to help your vehicle blend in. Don't blow that by adding "improvements" or "protection" to the paint. Military vehicles aren't supposed to shine like your POV!

The use of any coating not called for by a regulation, specification, standard, TM or TB is banned by TACOM Msg AMSTA-MTC 091700Z Jul 86.

Not only are the coatings not needed, but they are a waste of scarce unit funds. Silicone brake fluid, for example, costs more than \$20 a gallon. With money tight, be sure every dollar goes to keeping your equipment combat ready!

If you need to "dull" a vehicle that is shiny, wash it with an ammonia and water mix. Soap and water will work, too, but takes longer.



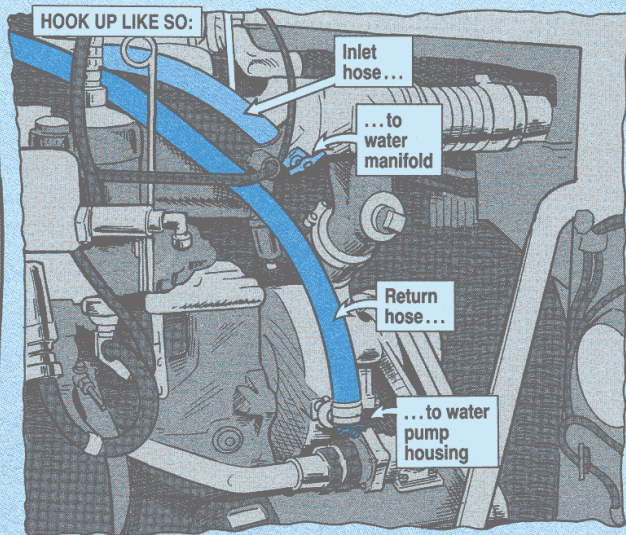
Hot Water

Dear Editor,

There are no instructions on how to hook up the hot water personnel heater on 2½- and 5-ton multifuel trucks. So, mechanics rig them the best way they can.

Most of the heaters I've seen are connected so the engine coolant bypasses the thermostat. That's wrong!

The heater will never work right and the engine does not warm up even in mild weather. That puts an extra strain on the engine that blows head gaskets and causes turbo failures and internal engine problems. The right hot water heater for these multifuels is NSN 2540-00-020-8591.



Heater Hook-up

Here's how it should go:

- Remove the pipe plug at the rear of the elbow on the manifold and put in a bushing, NSN 4730-00-186-3028. Then screw in a shutoff cock, NSN 4820-00-026-8473.
- Remove the pipe plug from the water pump housing and install another bushing and shutoff cock.
- Connect a 3½-ft length of hose, NSN 4720-00-235-4134, from the inlet side of the heater to the cock on the manifold.
- Connect a 4½-ft length of hose from the outlet side of the heater to the cock on the water pump.

Sgt Steven W. Becker
APO San Francisco

(Editor's note: Thanks, Sarge. Looks like you've found the way to warm up some cold trucks.)

Vinyl Tarps...

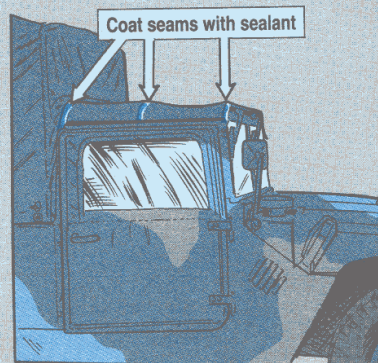
Seal Out the Rain

If the soft top on your truck or tarp on your semitrailer lets in the rain, there's an easy way to stop it.

Water usually comes in at the seams. Block its path with a sealant. Get it with:

Size	NSN 8040-00-
1 pt	262-9028
1 qt	262-9031
1 gal	281-1972

Just use a small brush and apply the sealant to the seams. It'll also seal up any pinholes in the fabric.



Bad Brakes Lead to Bad Breaks



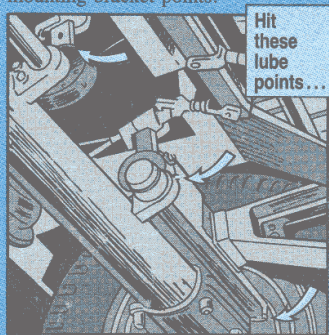
You may not have a leg to stand on if you forget to lube the brake camshafts and the brake shoe anchor pins on your M172-series semitrailer. In fact, your leg might not be the only thing that breaks when your semitrailer's brakes fail.

If the shafts and pins are not greased at least twice a year, the brake shoes seize on the anchor pins, and the brackets seize on the camshaft. The semitrailer's brakes will leave in a hurry.

Camshaft

eyeball the lube chart on Page 4-3 of TM 9-2330-211-14&P. Lube the

shaft through the grease fittings at the mounting bracket points.



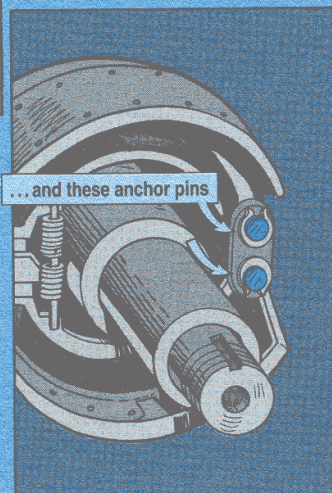
Brake Shoes

Pull the wheels, brake drum and bearings. Loosen the shoes and grease the anchor pins. Be careful not to get grease on the linings.

Hook up your trailer to a truck tractor about every other month or so. Apply the trailer brakes and move out—slowly. Have your buddy help you check the trailer's wheels. Like so:

- If the wheels stay locked, the brakes are good to go.
- If the wheels jerk and turn, get the brakes repaired.

This will exercise the camshafts and brake shoes to make sure you have brakes next time you use the trailer.



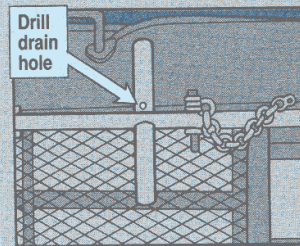
Hood Support Drain

WHEN WATER FREEZES IN THE HOOD SUPPORT, IT SPLITS THE TUBING.

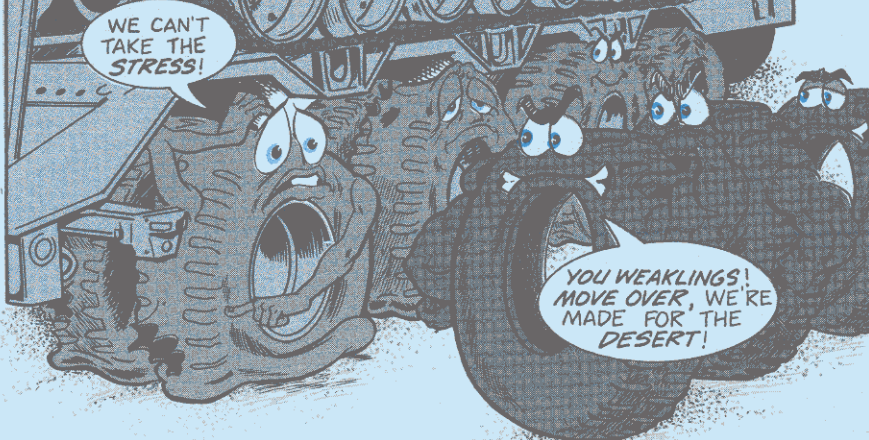


The hood support on M939-series 5-ton trucks is hollow and fills up with water. When the temperature drops, it freezes and splits the tubing. You can drain the water by drilling a 1/8-in hole in the bottom of the handhold.

Use green CARC paint, NSN 8010-01-229-7546, for touch-up!



Desert Tires Are Tough



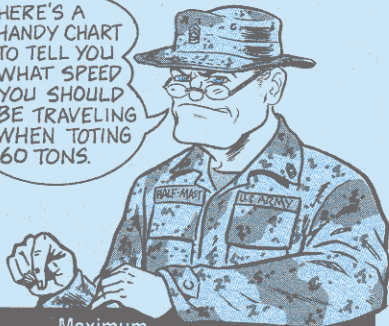
The M747's highway tires, called out in TM 9-2330-294-24P, are weaklings when it comes to holding up under 60 tons of tank in the desert. The stress, strain and heat get the best of these tires, causing blow-outs.

Not so with desert tires, NSN 2610-00-177-7022. They're rough and tough enough to handle the job . . . and won't leave you stranded in the middle of no man's land.

Always measure the air pressure on the tires before moving out. It should read 80-85 PSI on the gage.

Remember:
Speeding on hot roads,
causes even the best tires to blow,
So when you have heavy loads,
go slow . . . slow . . . slow.

HERE'S A
HANDY CHART
TO TELL YOU
WHAT SPEED
YOU SHOULD
BE TRAVELING
WHEN TOTING
60 TONS.



Maximum Speed Limit (miles per hour)	Temperature
15	80°F and up
25	50°-80°F
35	Below 50°F

2½-, 5-ton Trucks...

Engine Won't Quit?

If the engine won't die when you pull the engine stop handle, have your mechanic adjust or replace the control.

To begin with, the cable may just be disconnected. Your mechanic can reconnect it.

It'll help, too, to lube the control so the inner wire will slide easier. Use silicone grease, NSN 6850-00-880-7616. Also, put a couple drops of oil where the engine stop control ends up.

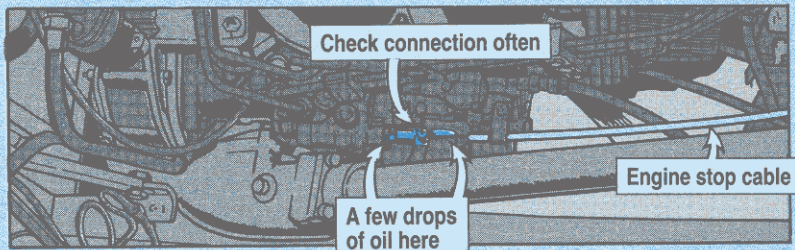
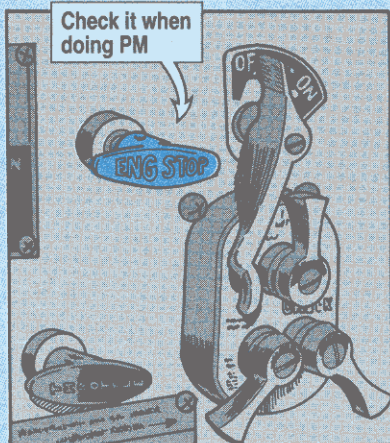
If the cable is bad, replace it with:

2½-ton, M44-series

NSN 2990-00-077-1940

5-ton, M39-series

NSN 2590-00-880-3797



M915-Series Mat

NSN 2540-01-181-1014 gets the floor mat for the M915-series trucks. The NSN is missing from TM 9-2320-273-24P. Make a note until the TM is updated.

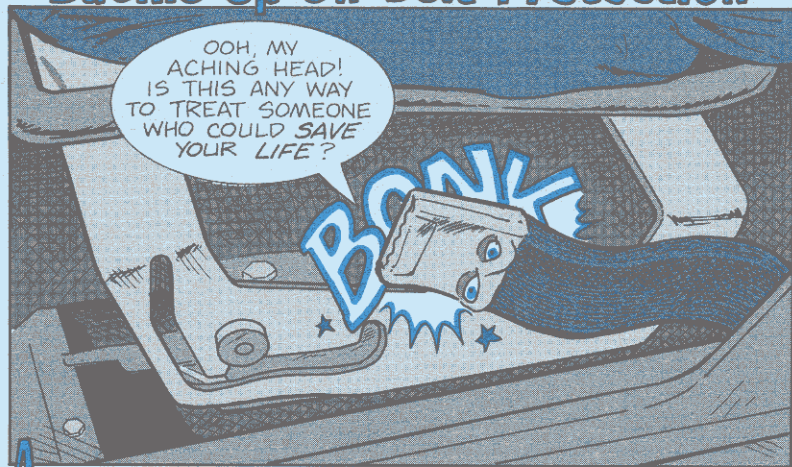
M915 Mud Flap Holders

Mud flap holders on M915, M915A1, M916 and M920 tractor trucks come with these NSNs:

Driver's side—NSN 2510-01-115-2273

Curb side—NSN 2510-01-164-1872

Buckle Up On Belt Protection



A flapping seat belt turns into a belt that can't be buckled.

If you don't buckle all HMMWV belts—even for empty seats—the female half of the belt bangs the side of the vehicle and cracks. Moisture seeps in and locks up the belt's locking mechanism with corrosion.

Before you move out, buckle all belts . . . especially your own.

Drain Plug

NSN 4730-00-045-9769 gets the magnetic drain plug for the geared hub assembly. The PN for Item 29 in Fig 72 of TM 9-2320-289-20P is wrong. It should be CAGE 96906 and PN MS 49006-6.

Seat Bumper

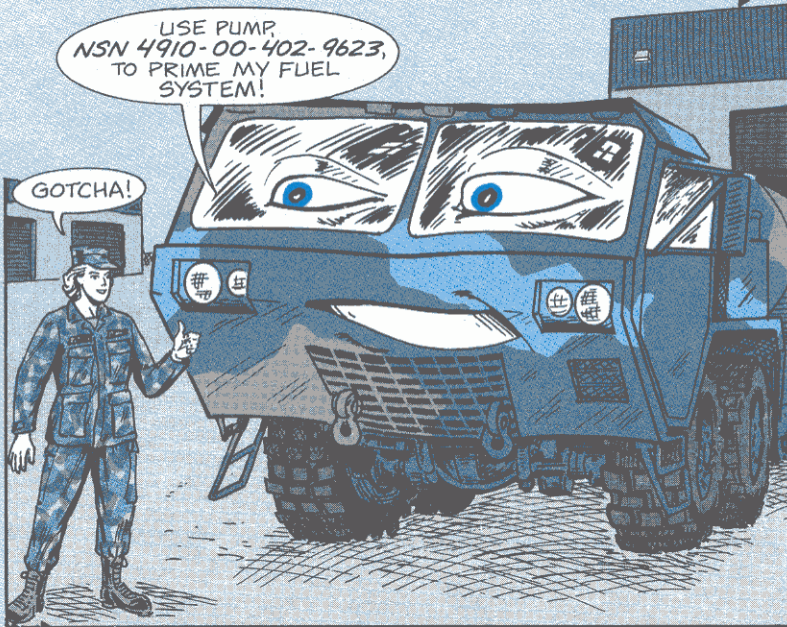
Use NSN 5340-01-196-2573 to get the bumper for the troop seat that shows up as Item 20 in Fig 191 of TM 9-2320-280-20P. That NSN also brings you the retaining clip, Item 19.

HEMMT Prop Shaft

LO 9-2320-279-12 does not tell you to lube the transmission-to-transfer case propeller shaft. But while you're doing your semiannual or 3,000-mile scheduled services, give those three fittings—view D in the LO—a couple of shots of GAA.

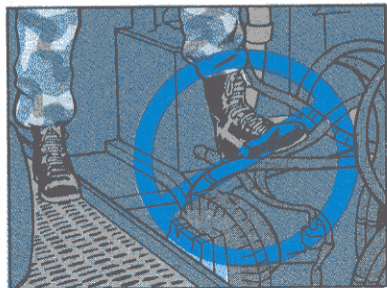
HEMTTs...

HEMTT Fuel Primer Pump



When you need to prime the fuel system on a HEMTT, use pump, NSN 4910-00-402-9623. The procedure for using it is listed in Para 2-18b of TM 9-2320-279-20-1, but the pump's NSN is not listed in the -20P TM. It's authorized by Appendix A of CTA 50-970.

Watch Your Step



Feet are made for walking, and that's what you'll be doing if you don't watch where you step on the M983.

There's enough room on the back deck to walk around without harming a thing. But if you plant your boot on the transmission oil lines, you'll break the transmission oil temperature sending unit.



This is a selected list of recent pubs of interest to organizational maintenance personnel. This list was made from a computer print-out provided by the Adjutant General.

TM 5-2350-262-10 Oct 90 M9 armored combat earthmover
TM 5-2350-262-10-HR Oct 90 Armored combat earthmover M9
TM 5-2350-262-20-1 Nov 90 M9 armored combat earthmover (ACE)
TM 5-2350-262-20-2 Nov 90 M9 armored combat earthmover (ACE)
TM 5-2350-262-34 Oct 90 M9 armored combat earthmover (ACE)
TM 5-3605-260-10 Dec 90 Scraper, tractor, model 613BSS, model 613BSS1, model 613BSNS and model 613BSNS1
TM 5-3805-261-24P Dec 90 Model 130G grader
TM 5-3825-225-14&P Dec 90 Model WD6S distributor, water
TM 5-3825-226-24 Dec 90 Distributor, water, 613BWD5, 613BWDNS
TM 5-3895-330-24P Dec 90 Aggregate spreader, model FF-8
TM 5-4110-241-23P Jul 88 Refrigerator, model AA600PF, model AA1200PFA, model AA4000PF and model TRK600C
TM 5-4310-452-14 Dec 90 Compressor, rotary, air, DED, 250 CFM
TM 9-1005-201-23&P Dec 90 M249 machine gun
TM 9-1425-473-24P Nov 90 TOW airborne system
TM 9-2320-283-24P Nov 90 M915A1 tractor truck
TM 9-2330-235-14&P Oct 90 M514 and M390C trailers
TM 9-2330-356-14 Oct 90 M967/M969/M970 fuel tank semitrailers
TM 9-2330-356-24P Oct 90 M967/M969/M970 fuel tank semitrailers
TM 9-2330-384-14&P Jul 90 M1062 7500-gal fuel tank semitrailer
TM 9-2330-386-14&P Sep 90 M871A2 22½-ton semitrailer
TM 9-2350-222-24P Dec 90 M728 CEV
TM 9-2350-255-PCL Mar M1/IPM1 tank
TM 9-2350-264-24P-1 Dec 90 M1A1 tank

TM 9-2350-264-PCL Jan M1A1 tank
TM 9-2350-284-24P-2 Feb M2A2/M3A2 Bradley
TM 9-2350-284-PCL Feb M2A2/M3A2 Bradley
TM 9-2610-200-14 Nov 90 Care, maintenance repair and inspection of pneumatic tires and inner tubes
TM 9-6920-450-12 Nov 90 TOW and TOW 2 weapon system training set
TM 10-3930-242-24P Dec 90 MLT-6, MLT-6CH, ARTFT-6 6,000-lb forklift
TM 10-3930-641-24P Dec 90 Rough terrain container handler
TM 10-4310-391-13&P Sep 90 Sargent-Welch vacuum pump
TM 10-4310-392-13&P Sep Atlas Copco reciprocating compressor
TM 10-4320-320-13&P Sep 90 Model 1P914 Teel submersible pump
TM 10-6625-3127-13&P Sep 90 VOM multimeter model 310
TM 10-6630-219-13&P Sep 90 Precision distillation testing equipment model TS-74730-A-XI
TM 10-6630-234-13&P Sep 90 Precision high temperature bronze block gum bath model TS-74801-AR-3
TM 10-6630-235-13&P Sep 90 Koehler closed cup flash tester

TM 10-6630-237-13&P Sep 90 Chemtrix field PH meter model 4012
TM 10-6635-212-13&P Sep 90 Precision universal penetrometer model TS-73510 AN-2
TM 10-6640-222-13&P Sep 90 Emcee micro-separator mark V deluxe model No. 1140
TM 10-6640-228-13&P Sep 90 Koehler foaming characteristics determination apparatus model K43000
TM 11-5805-764-23P Jan AN/TTC-48(V)1, AN/TTC-48(V)2, AN/TTC-48A(V)1, and AN/TTC-48A(V)2 small extension node switch
TM 11-5805-765-23P Jan AN/TTC-46, AN/TTC-46A(V)1 and AN/TTC-46B(V)1 large extension node switch
TM 11-5805-766-23P Jan AN/TTC-47, AN/TTC-47A(V)1 and AN/TTC-47B(V)1 node center switch
TB 11-2300-480-12 Jan MK-2564/VRC-97 and MK-2565/VRC-97 installation kits
FM 23-1 Mar Bradley fighting vehicle gunnery
LO 9-2350-277-12 Feb M113A3 carrier
LO 9-2350-284-12 Nov 90 M2A2/M3A2 Bradley
DA Pam 710-2-120 Jan Combat PLL/ASL for aircraft on microfiche

Maintenance & Safety-Of-Use Messages

AMCCOM SOU-Msg-1-91—Advisory, Rescinds using DS2 decontaminating apparatus on M109-series and M110A2 howitzers and M578 recovery vehicle, AMSMC-MA 171735Z Jan 91.

AMCCOM Maintenance Advisory Msg 91-06—M1A1 tank TM changes, AMSMC-MA 240900Z Jan 91.

CECOM SOU-Msg-90-12-02—Advisory, Operational, Transfer of commo shelters from CUCV to HMMWV might result in overload, AMSEL-SF-SEC 141800Z Dec 90.

CECOM SOU-Msg-90-12-03—Mandatory, Operational, AN/TLC-17A(V)3 countermeasures set, Hazard in raising telescoping antenna mast, AMSEL-SF-SEC 191800Z Dec 90.

MICOM SOU-Msg-91-01—Potential hazard with heat transfer fluid used with HAWK radars, AMSMI-LC-AM 301530Z Jan 91.

TACOM SOU-Msg-91-01—Operational, Off road restrictions for M870 lowbed semitrailer, AMSTAM 120100Z Jan 91.

TACOM SOU-Msg-91-03—Advisory, Technical/Maintenance, Corrects info on Abrams exhaust duct seal in SOU Msg 90-40, AMSTAM 241700Z Jan 91.

TROSCOM SOU-Msg-03-91—Advisory, Gives K-20-D divers air compressor filter life, AMSTR-MEP 171930Z Jan 91.

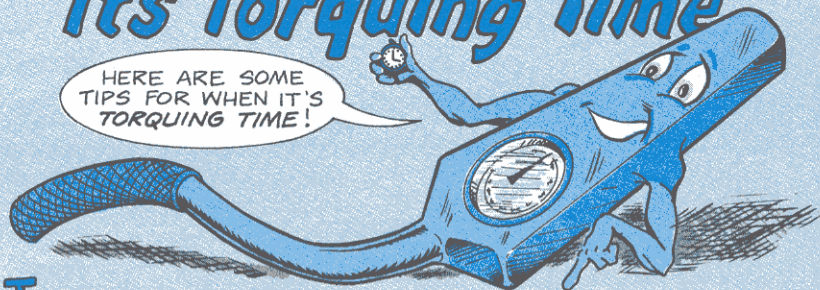
TROSCOM SOU-Msg-05-91—One time inspection, 15-man inflatable landing boat, AMSTR-MEP 281530Z Jan 91.

TROSCOM SOU-Msg-06-91—Operational, Alternate sensitivity test for AN/PSS-11 mine detector, AMSTR-MEP 061500Z Feb 91.

TROSCOM Maintenance Advisory Msg-91-03—Generator replacement info on lubrication and servicing units, AMSTR-MEP 051405Z Feb 91.


It's Torquing Time


HERE ARE SOME TIPS FOR WHEN IT'S TORQUING TIME!

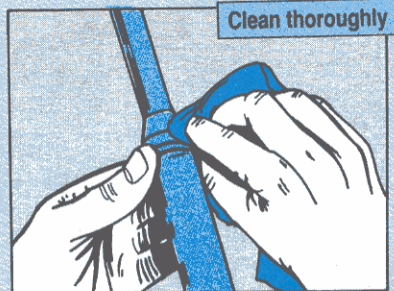



The TM 9-243, *Use and Care of Hand Tools*, is a little short on info about torque wrenches. So hang on to those maintenance instructions that come with your wrench.


Here are some more torquing tidbits:

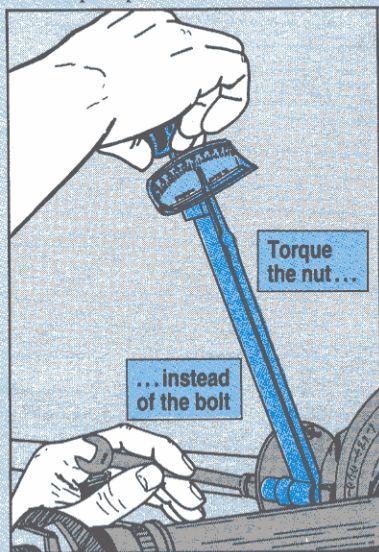
 Make sure you choose a wrench so that the torque of the bolt you're tightening falls in the middle $\frac{2}{3}$ of the scale. The high and low limits of a torque wrench scale are not as accurate.


 Drycleaning solvent is great for cleaning parts, but take safety precautions. Clean the threads, the mating surfaces, and the head of the wrench, too.



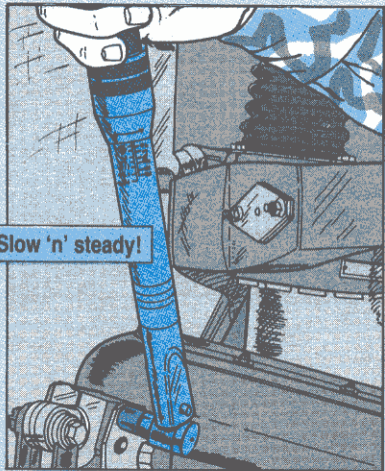
 Don't grease or oil a bolt unless the TM tells you to use wet torque. Lubed threads reduce run-up friction and could cause overtorque.

 Torque the nut instead of the bolt—unless your TM says something different. Quit turning when you reach the torque specified.



 If you're working in a narrow space, you may have to tighten a bolt at the head end. If so, always torque to the high side of the torque range. This is because you use up some of the torque getting the bolt moving in the hole or to align parts.

To get an accurate torque, turn the wrench s-l-o-w and s-t-e-a-d-y until you get the torque required.



Retorque by backing off the nut with a standard wrench. Never use the torque wrench to back off the nut because you'll mess up the wrench's calibration. Eyeball the TM for torque specs.

Seizures ruin readings. Sometimes you get a popping effect—during the last few turns—when you're about to reach the correct torque reading. The wrench stops turning. Just back off with a standard wrench—and retorque.

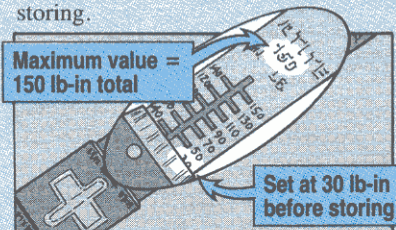
Treat the torque wrench with care. Never hammer—bang—toss—drop. You'll damage the calibration, and have to send it to DS for repair.



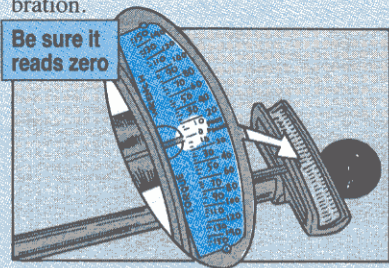
When you're through for the day, take a moment to put your torque wrench to bed! Leaving it set wrong can knock the wrench out of calibration.

Begin by checking the manufacturer's manual that came with the torque wrench. Then set the wrench to the value called for.

No manual? Then set micrometer-type torque wrenches to 20 percent or less of the maximum value before storing.



If you have a bending-beam torque wrench, check that it is returned to zero. If it didn't, turn it in for calibration.



Set other types of torque wrenches to zero before storing them, unless your local SOP says differently. That takes pressure off the spring. The wrench will stay calibrated better and give better service.

Put the torque wrench in its own box for storage. Never toss it into a tool box with other tools.

Get 'em One-by-One

The electrical tool kit, NSN 5180-00-876-9336, in the No. 1 and No 2. Common shop sets includes the tools to install the electrical connectors. But it does not include the connectors!

The connectors are authorized by SM 9-4-5935-S01, but that supply manual is older than a lot of you mechanics, and NSNs have been changed.

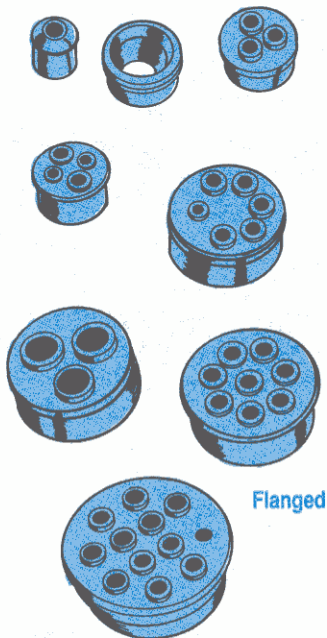
Here are the parts that make up the Bendix and Douglas kits. Don't order the complete kits unless you need every type of connector listed. Instead, order just the connectors you need.

**Bendix kit,
NSN 5935-00-570-1380**

Bushing, rubber: 30° chamfer			
NSN 5365-00-	ID	OD	Length (inches)
641-8645	0.495	0.715	0.481
514-4455	0.620	1.057	0.717
514-4457	0.682	1.057	0.697
514-4454	0.745	1.057	0.633
514-4456	0.932	1.370	0.684

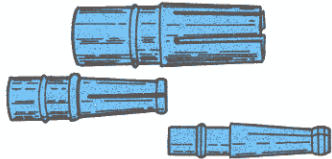


Bushing, rubber: flanged		
NSN 5365-00-	# holes	OD (inches)
772-2343	1	0.375
752-7630	1	0.625
559-0283	3	0.625
752-7628	4	0.625
772-2323	6	0.625
338-1274	3	1.000
772-2322	8	1.000
090-5426	12	1.240



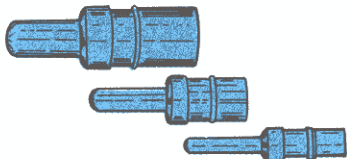
Connector, electrical: solder, female

NSN 5999-00-	Size	Length (inches)
771-6523	0	1.75
771-6525	4	1.438
771-6527	8	1.438



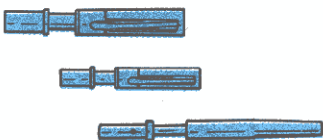
Connector, electrical: solder, male

NSN 5999-00-	Size	Length (inches)
368-4852	0	1.750
771-6524	4	1.438
771-6526	8	1.438



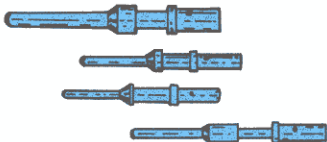
Connector, electrical: solderless, female

NSN 5999-00-	Size	Length (inches)
636-6876	12	1.438
752-7648	16M	1.047
259-3143	16M(lg)	1.438



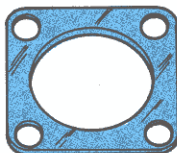
Connector, electrical: solderless, male

NSN 5999-00-	Size	Length (inches)
752-7655	12	1.438
752-7651	16	1.047
752-7649	16M	1.047
491-8194	16M(lg)	1.250



Gasket: square, 1/32-in rubber

NSN 5330-00-	ID (inches)	IN. sq
593-6442	3/4	13/32
641-4338	7/8	13/16
543-6849	1	13/32
641-4336	1 3/8	1 5/8



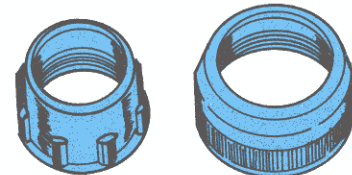
Retainer, Packing: 30 degree countersink

NSN 5330-00-	ID (inches)	OD (inches)
514-4461	0.516	0.710
514-4460	0.614	1.052
514-4462	0.703	1.052
514-4459	0.766	1.052
514-4458	0.953	1.365



Nut, Bushing Retainer:

NSN	Description
5935-00-333-3088	5/8-24 NEF-2 x 1 5/16
5935-00-772-3307	7/8-20 NEF-2 x 1 5/16
5935-00-333-9414	1 1/4-18 NEF-2 x 1
5310-00-393-6685	1 5/8-18 NEF-2 x 1



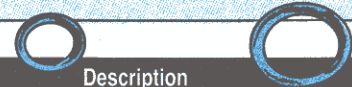
Nut, Coupling, Electrical Conduit: hex

NSN 5975-00-	Description
522-7125	3/4-20 NEF-2 x 45/64-in thick
752-7644	7/8-20 NEF-2 x 1/2-in thick
697-7769	1-20 NEF-2 x 45/64-in thick
697-7860	1 3/8-18 NEF-2 x 45/64-in thick
771-6634	1 3/4-18 NEF-2 x 25/32-in thick



Washer, Spring Tension: curved

NSN 5310-00-	Description
752-7639	1/4-in screw size (17/64-in ID, 7/16-in OD), 4 leaves
752-7640	1/2-in screw size (33/64-in ID, 21/32-in OD), 2 leaves
595-7486	3/4-in screw size (49/64-in ID, 1-in OD)
771-6722	7/8-in screw size (15/16-in ID, 1 5/16-in OD)



Silicone Compound, 2-oz tube
NSN 5970-00-177-5094



Methyl Ethyl Ketone, 3-oz bottle
NSN 6810-00-264-8983

**Douglas kit,
NSN 5935-00-570-1060**

Bushing	
NSN	Description
5975-00-614-9460	1/2-in long, 5/16-in wide, for two No. 16 AWG wires
5975-00-629-7273	1/2-in long, 5/16-in wide, for one No. 14 AWG wire
5975-00-614-9458	1/2-in long, 5/16-in wide, for two No. 14 AWG wires



Contact, Electrical	
NSN 5999-00-	For AWG wire
925-6495	No. 12
057-2929	No. 14
926-3144	No. 16



**Cutting oil: 2-oz bottle
NSN 9150-00-234-5198**



Shell, Electrical: female	
NSN	Description
5935-00-201-8143	For female assy of waterproof Y-type 3-conductor assy (mates with shell, NSN 5935-00-030-1563)
5935-00-768-7042	For female assy of waterproof straight 2-conductor assy (mates with shell, NSN 5935-00-300-9909)

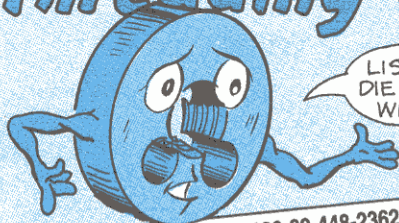
Shell, Electrical: male	
NSN	Description
5935-00-030-1563	For male assy of waterproof Y-type 3-conductor assy (mates with shell, NSN 5935-00-201-8143)
5935-00-300-9909	For male assy of waterproof straight 2-conductor assy (mates with shell, NSN 5935-00-768-7042)



**Splice, Connector: Y-type
NSN 5935-00-501-7177**



Threading Set Rundown



THERE'S NO SUPPLY LISTING FOR SEVERAL TAP AND DIE THREADING SETS. HERE'S WHAT MAKES UP THREE COMMON SETS.

Size, Pitch	Die	Tap
1/4-20 NC	NSN 5136-00-224-1461	NSN 5136-00-729-5693
5/16-18 NC	NSN 5136-00-189-3216	NSN 5136-00-276-1031
3/8-16 NC	NSN 5136-00-189-3217	NSN 5136-00-276-1032
7/16-14 NC	NSN 5136-00-189-3218	NSN 5136-00-729-5691
1/2-13 NC	NSN 5136-00-189-3219	NSN 5136-00-729-5692
9/16-12 NC	NSN 5136-00-189-3220	NSN 5136-00-729-5690
5/8-11 NC	NSN 5136-00-189-3221	NSN 5136-00-223-6228
3/4-10 NC	NSN 5136-00-189-3222	NSN 5136-00-729-5702
7/8-9 NC	NSN 5136-00-189-3223	NSN 5136-00-729-5701
1.0-8 NC	NSN 5136-00-189-3224	NSN 5136-00-227-7260
Diestock, for 1 1/2-in dies		NSN 5136-00-224-7113
Diestock, for 2 1/2-in dies		NSN 5136-00-224-7114
Wrench, tap and reamer, 18 to 21 inches long		NSN 5120-00-289-0537
Case, threading set		NSN 5140-00-322-5976

CHECK THESE OUT!

Die



Diestock

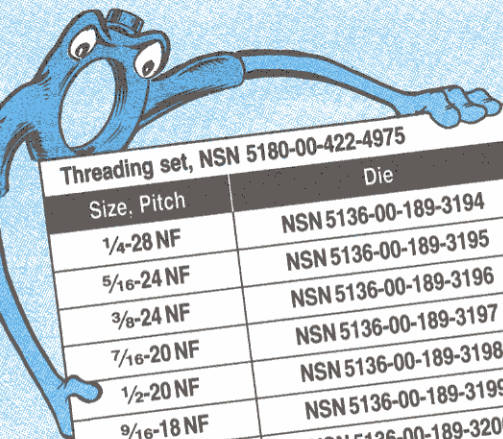


Tap



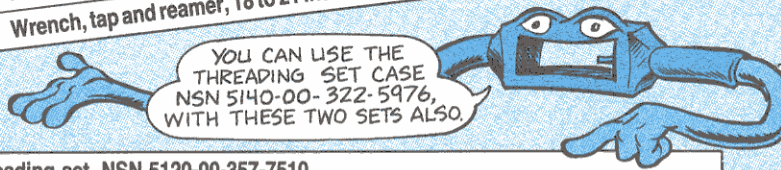
Tap wrench





Threading set, NSN 5180-00-422-4975

Size, Pitch	Die	Tap
1/4-28 NF	NSN 5136-00-189-3194	NSN 5136-00-580-7360
5/16-24 NF	NSN 5136-00-189-3195	NSN 5136-00-580-7359
3/8-24 NF	NSN 5136-00-189-3196	NSN 5136-00-555-8910
7/16-20 NF	NSN 5136-00-189-3197	NSN 5136-00-580-7182
1/2-20 NF	NSN 5136-00-189-3198	NSN 5136-00-580-7184
9/16-18 NF	NSN 5136-00-189-3199	NSN 5136-00-580-7186
5/8-18 NF	NSN 5136-00-189-3200	NSN 5136-00-254-4518
3/4-16 NF	NSN 5136-00-189-3201	NSN 5136-00-580-7342
7/8-14 NF	NSN 5136-00-189-3238	NSN 5136-00-580-7188
1.0-12 NF	NSN 5136-00-820-8090	NSN 5136-00-841-2837
1.0-14 NS	NSN 5136-00-189-3239	NSN 5136-00-580-7343
Diestock, 18 inches long, for 1 1/2-in die		NSN 5136-00-224-7113
Diestock, 32 inches long, for 2 1/2-in die		NSN 5136-00-224-7114
Wrench, tap and reamer, 15 to 16 inches long		NSN 5120-00-289-0539
Wrench, tap and reamer, 18 to 21 inches long		NSN 5120-00-289-0537



YOU CAN USE THE
 THREADING SET CASE
 NSN 5140-00-322-5976,
 WITH THESE TWO SETS ALSO.

Threading set, NSN 5120-00-357-7510

Size, Pitch	Die	Tap
6-32	NSN 5136-00-239-2777	NSN 5136-00-729-5695
8-32	NSN 5136-00-239-2778	NSN 5136-00-729-5694
10-24	NSN 5136-00-239-2779	NSN 5136-00-585-6760
10-32	NSN 5136-00-239-2769	NSN 5136-00-228-1008
12-24	NSN 5136-00-239-2780	NSN 5136-00-221-7874
Diestock, 8 inches long, for 1 3/16-in dia dies		NSN 5136-00-221-1236
Wrench, tap and reamer, for 0 to 1/4-in shanks		NSN 5120-00-277-4069

Use or Lose

HEY, SERGEANT... WE HAVE ANOTHER FUEL PUMP THAT LEAKS! HOW COME WE CAN'T GET BETTER PARTS?

COMPLAINING IS NOT ENOUGH! THE ANSWER IS SF368!



Smart mechanics and tech inspectors do more than just complain about bum equipment—they do something about it!

You can, too, by submitting an SF 368, Quality Deficiency Report (QDR), when a part fails.

Para's 2-14 and 2-15 of DA Pam 738-751 have the telephone numbers, addresses and other instructions on how to report equipment failures. Fig 2-10 has the lowdown on how to fill out an SF 368.

Be sure to include all information that could be useful to investigators, like: troubleshooting and rigging checks you've performed and phone

conversations with others you've talked to about the part failure.

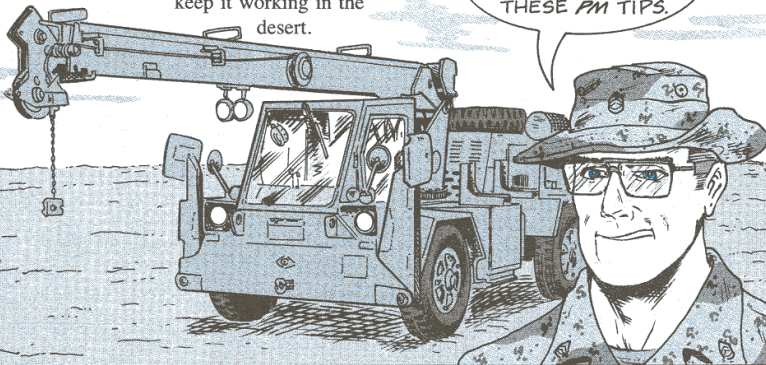
Always tag the failed part with a materiel condition tag and hold it until the headshed tells you what to do with it. They may need the part for breakdown analysis.

If you feel that time is critical due to the nature of the failure, ask your Logistics Assistance Representative for help. Under certain circumstances, he's authorized to bypass the normal process of waiting for AVSCOM disposition instructions.

Follow the word in Para 2-16 of the DA Pam when you're told to ship or dispose of the failed part.

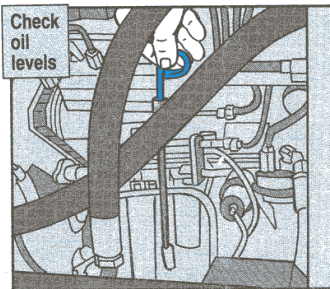
A SCAMP in the Desert

Your 4-ton self-propelled crane for aircraft maintenance and positioning (SCAMP) needs large doses of preventive maintenance to keep it working in the desert.



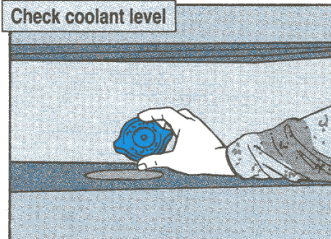
Keep Oil Levels Up

Before you start the day's run, pull the dipstick and measure the engine, transmission and hydraulic system oil levels. Add oil to bring the level between the ADD and FULL marks.



Check Cooling System

Remove the radiator cap and look inside. The coolant should be about one inch below the filler neck.



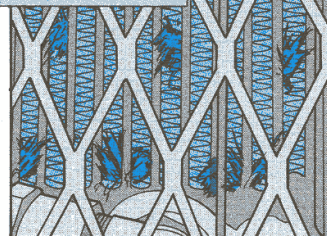
It should be clean and clear colored by antifreeze. If the coolant's muddy or has bits floating in it, report it.

If you see a rainbow of oil on top of

the coolant, exhaust gas or oil is getting into your cooling system. Report it.

Look at the radiator fins. Sand, grit, and trash in the fins keep air from flow-

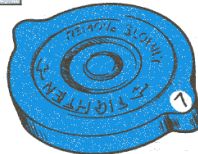
Look for trash on fins



ing through. Then the engine overheats. Brush off the front of the radiator to remove bugs and trash. Use a water hose from the back to clean out stubborn sand or grit.

If your SCAMP still overheats, report it. Your mechanic can make sure you have the right radiator cap. Just

Right cap?

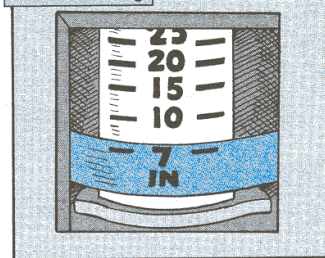


any scrounged cap won't work. It may have the wrong pressure rating. Too low a rated cap cuts the boiling point of the coolant. Too high a rating can build up pressure that'll pop seams and blow hoses. Use only cap, NSN 2930-01-115-4995.

Clean Air's a Must

Keep a close eye on the air filter's restriction indicator. A red flag means STOP. Take out the filter element. Tap

Look for red flag

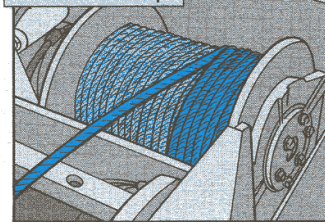


it on your hand to knock out the big pieces. Never bang it against a rock or tire. You'll bend its sealing edge or crush its fibers. For stubborn grit, use an air hose with an air gun rated at no more than 30 PSI. Wipe out the canister before you put the element back in.

Never Lube Wire Rope

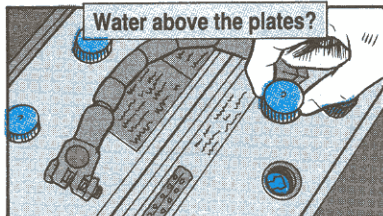
Never lube the crane's wire rope. Lube attracts sand. Sand and lube form a grit that wears and tears the rope as it's wound on and off the drum.

Never lube wire rope

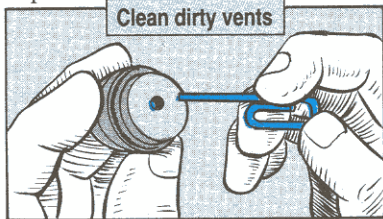


Battery Basics

Electrolyte is the life blood of your battery. Remove the battery caps and look inside. Water should be above the plates. If not, get your mechanic to add water.

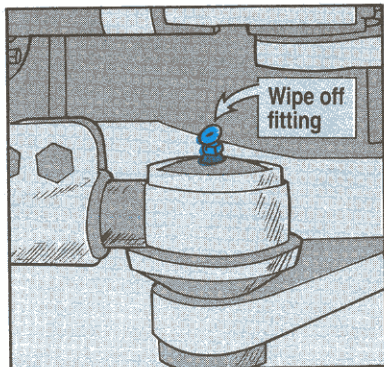


Make sure the vents in the cap are open. Plugged vents cause gases to build up that can cause the battery to explode. Clean dirty vents with a paper clip.



Keep Lube Clean

To keep sand out of lubed areas, wipe off grease fittings before you apply the grease. Pumping in grease with sand will make a grit that will chew up the bearings. Have your mechanic replace any fittings that will not take grease.



The desert is not a forgiving place. Follow the PMCS in your -10 TM and these tips to keep your SCAMP in tip-top shape.



Aviation Messages

If your unit has not received a message you have an interest in, check with your next higher headquarters.

AH-64-91-ASAM-01, ASM Info, AH-64A tail rotor swashplate de-ice brush block removal, 051930Z Dec 90.

AH-64-91-ASAM-02, ASM, Maint Mand, AH-64A in ODS recurring erosion inspection of main rotor blade tip caps, 071800Z Dec 90.

OH-58-91-ASAM-02, ASM, Maint Mand, OH-58A/C/D in ODS

recurring erosion inspection on tail rotor blades, 102200Z Dec 90.

UH-60-91-ASAM-01, ASM, Maint Mand, H-60 in ODS recurring erosion inspection of main rotor blade tip caps, 062000Z Dec 90.

UH-60-91-ASAM-02, ASM Maint Mand, H-60 in ODS recurring erosion inspection of main rotor blade tip caps, 101800Z Dec 90.

CAT 1 EIR Phone:
DSN 693-2066
(24 HOURS)

UH-60-91-ASAM-03, ASM, Info, Extended time between overhaul (TBO) hours under Desert Shield operations for H-60 A/L oil cooler blower and tail rotor pitch change shaft bearings, 202030Z Dec 90.

OH-58-91-ASAM-03, ASM, Maint Mand, OH-58A/C, Inspection and sealing of engine particle separator to reduce sand erosion, 202200Z Dec 90.

UH-1H LIGHT PAINTING

Dear Windy,

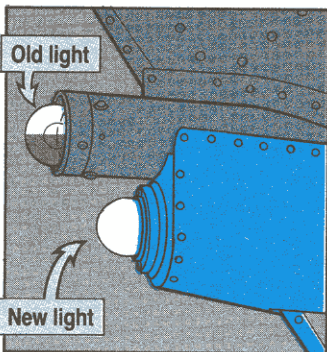
Are we still required to paint the bottom half of the lens of the position lights for night vision goggle operations? If not, should the paint be removed from the ones that are painted?

SFC T.D.L.



Dear Sergeant T. D. L.,

Your depot folks should have applied MWO 55-1520-210-50-10, which adds a light next to the position lights. If you have the



second light, there is no need to paint the old one. As to removing the old paint, that's up to your commander. There is no requirement.

Windy

Troubleshooting TM Binders

Order a box of 25 11 × 17-in pressboard binders for those long aircraft troubleshooting TMs with NSN 7510-00-281-4310.

Tool Kit Mirror

When you break the glass of inspection mirror, NSN 5120-00-618-6902, replace the glass, not the mirror. The glass, NSN 5120-00-363-3914, costs 23 cents. The mirror costs \$2.48.

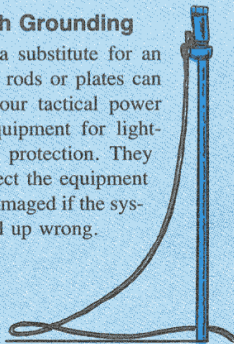
DOWN TO EARTH TIPS



GETTING A GOOD GROUND FOR YOUR GENERATOR SET OR COMMO SHELTER IS A DEFINITE CHALLENGE IN THE DESERT. HERE ARE SOME TIPS TO MAKE YOUR CHALLENGE EASIER TO FACE!

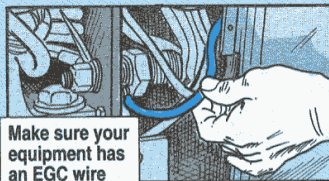
Earth Grounding

While not a substitute for an EGC, ground rods or plates can be used in your tactical power generating equipment for lightning or surge protection. They can also protect the equipment from being damaged if the system is hooked up wrong.



Equipment Bonding

The generator set and all the equipment it supplies with power must be connected together with an equipment grounding conductor (EGC). On a standard 5-wire cable, the EGC is the green wire. This protects you from

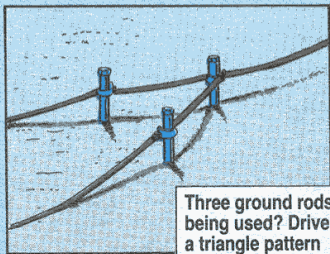


Make sure your equipment has an EGC wire

being shocked when you touch the equipment, and it protects the equipment from being damaged.

If your equipment does not have an EGC, put an external ground wire of 6 AWG or larger to the chassis frame of the generator set. Then connect it to each piece of load equipment.

In poor soil conditions, you can get a better ground by driving more than one ground rod. If three rods are used, drive them in a triangle pattern. If more rods are used, put them in a straight line and connect all the rods together, then run a single connection between the grounds and your equipment.



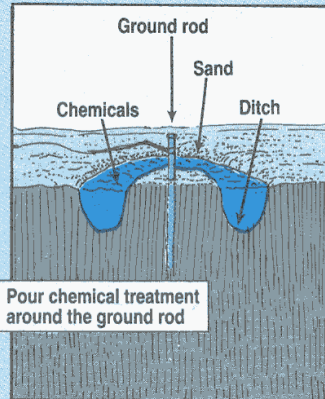
Three ground rods being used? Drive a triangle pattern

If additional ground rods are not available, use a metal ground plate. There's no NSN for this plate so you'll need to make one. The plate is 1/4-in thick metal that's three feet square. A ground strap is put in the middle of the plate with a bolt or screw, then buried at least four feet deep.

When the grounding plate is used with trailer mounted equipment, you can improve the contact of the plate with the soil by placing the trailer tire directly over the buried plate.

Chemical Treatment

Adding a chemical treatment to the soil gives a better ground. If water is available, mix five pounds of table salt with five gallons of water and pour into the hole around the ground rod or plate. Keep the soil around the rod or plate moist at all times.



Ground Rod Parts

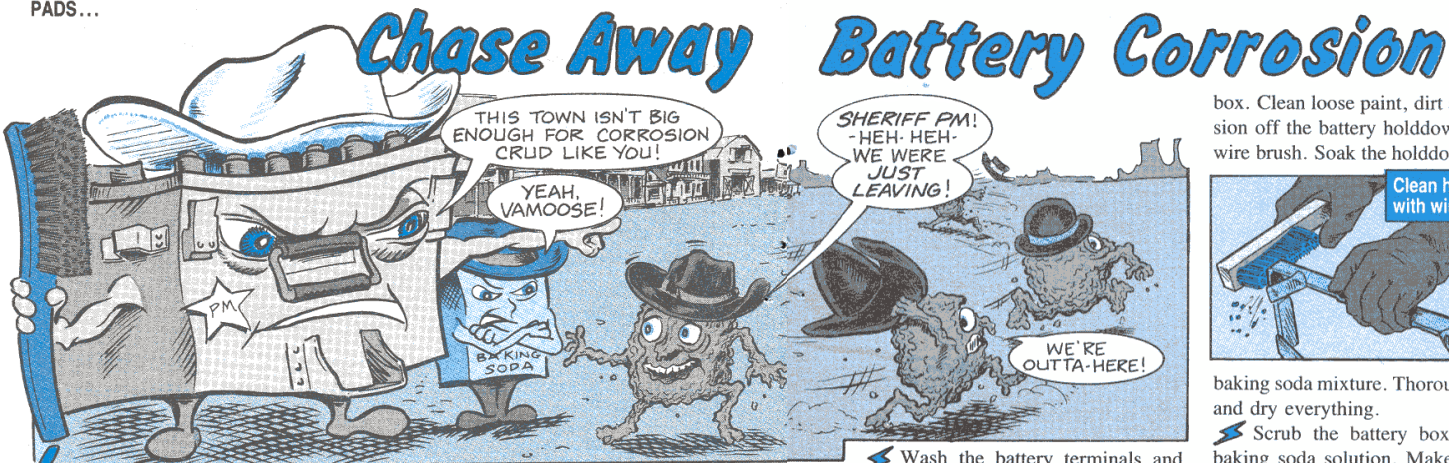
Ground rod assembly, NSN 5975-00-878-3791, consists of three rods, each 3 feet long, 6 feet of No. 6 AWG stranded copper wire, 1 terminal lug, 1 driving stud, 1 clamp and 3 couplings.

If you need parts for your ground rod assembly, use these NSNs:

Item	NSN
Coupling (3)	5975-00-794-2523
3-ft Ground rod (3)	5975-01-143-7340
No. 6 AWG wire (6 ft)	6145-00-395-8799
Clamp	5999-00-186-3912
Ground terminal	5940-00-271-9504
Drive head/stud	5975-00-924-9927



CHECK OUT TC 11-6 AND FM 20-31 FOR MORE GROUNDING TIPS.



lots of AN/USQ-70 Position and Azimuth Determining System's (PADS) batteries are being destroyed because operators let corrosion feed on battery connectors and terminals.

Corrosion builds up on the PADS' battery terminals and increases resistance which causes the fusible link in the W11 cable to fail. There's one thing for certain—you can't operate your PADS without good battery power.

When you notice that white stuff building up on the batteries, get your mechanics on the job. They can chase away corrosion with these PM tips:

Be sure to wear safety goggles and gloves any time you're handling the batteries.

⚡ Disconnect the vehicle ground first.

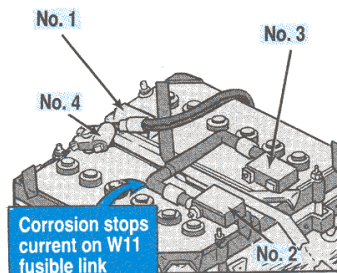
⚡ Then disconnect the ground end of the jumper wire.

⚡ Disconnect the positive end and remove the jumper cable.

⚡ Now disconnect the positive cable.

If the clamps are hard to get off, use clamp puller, NSN 5120-00-944-4268.

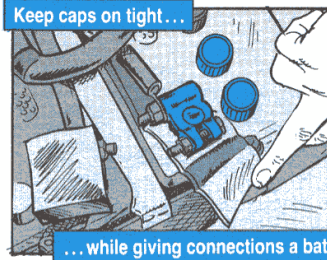
Disconnect in this sequence:



⚡ Remove corrosion from the battery terminals and clamps with terminal cleaner, NSN 5120-00-926-5175.

⚡ Wash the battery terminals and cable clamps with a mixture of ½ pound of baking soda, NSN 6810-00-264-6618, in a gallon of water. Brush the solution on with a soft-bristle brush. Keep the battery caps on tight to keep the baking soda mixture out of the battery. Baking soda will neutralize

Keep caps on tight ...



... while giving connections a bath

the acid in the electrolyte. Use plenty of water to rinse the mixture off. Dry with a clean cloth.

⚡ Pull the batteries if corrosion has spread to the battery holddowns and

box. Clean loose paint, dirt and corrosion off the battery holddowns with a wire brush. Soak the holddowns in the



baking soda mixture. Thoroughly rinse and dry everything.

⚡ Scrub the battery box with the baking soda solution. Make sure you get the corners where corrosion breeds. Use lots of water to rinse and then dry everything completely.

⚡ Put a light coating compound on the bare metal parts of the holddowns and battery box before you put the batteries back in. The coating can be either epoxy, NSN 8010-00-959-4661, or bituminous, NSN 8030-00-290-5141.

After you hook up the cables, put a light coating of GAA on the terminals. That keeps out corrosion. Or you might want to try RTV sealant, NSN 8040-00-145-0020, on the terminals like CW2 William Moore of Ft Bragg does to give extra protection against corrosion.

Another good way to keep corrosion on the run is to put felt washers, NSN 5970-01-101-4147, under the battery cable clamps.

Check out TM 9-6140-200-14 for more information on battery PM.

Computer Care

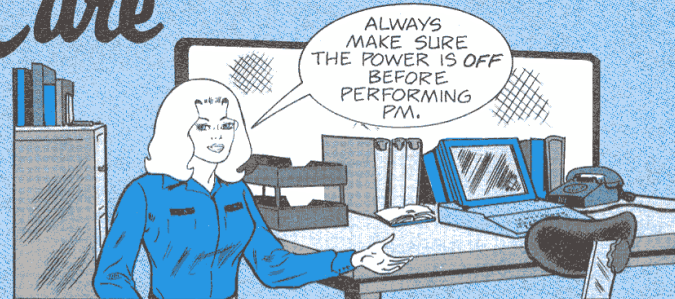


Dust and dirt on the heads of the floppy disk or tape drives can damage the floppy or tape. If the dirt buildup gets bad, the computer can't read your files.

Keeping the computer clean is one of the most important parts of ULLS computer PM.

How often you perform PM depends on how clean your work area is. If it's dusty, you'll need to clean more often.

Since there's no minimum PMCS on the ULLS computer, use the following chart to keep your system up and running:



DAILY

Make sure vents are not blocked. Feel cable connections to be sure that they are firmly connected. Lightly tighten the connections with a small screwdriver.

CAUTION

Never use sprays or liquids directly on computer equipment. Don't apply cleaning solutions to cloths or diskettes while holding them over the keyboard.

WEEKLY

Clean outer casing and monitor of the computer and its components with a clean cloth dampened with a nondetergent cleaner or water.

Clean the floppy disk drives with a floppy disk cleaning kit. Kits may be different but most will come with a cleaning disk/pad and cleaning fluid. Follow the instructions that come with the kit. To engage the "HEADS" as instructed in the cleaning kit instructions, type "DIR A:" or "DIR B:." Do this three times for about 30 seconds.

Clean the tape device using a tape cartridge cleaning kit. These kits also come with the instructions.

Clean the keyboard by holding it upside down and using a soft bristle brush to get items from between the keys. If you don't have a brush, gently tap the bottom of the keyboard while it's upside down.

MONTHLY

(ALPS P2000G Printer Only)

Clean ink buildup from the printer platen using 90% isopropyl alcohol and a soft cloth. You can also use type-writer cleaner to clean the platen.

CAUTION

Don't use alcohol on other printer platens. When alcohol is used on some printer platens, they harden, which can damage print heads.

ULLS II Computer Power

Dear Half-Mast,

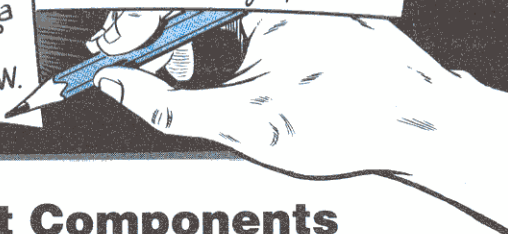
We have several Level Logistics Systems (ULLS) II (Zenith-248) computers. The operators are complaining that their tactical generators are not able to power the PC's reliably for any length of time. Can you recommend a solution to this problem?

MAJ. K.W.

Dear Major K.W.,

Use the MEP002A 5KW generator set, NSN 6115-00-465-1044. Most other unregulated small power generators have a voltage swing of such a degree that computer, data and hardware systems could be damaged.

Half-Mast



MK-356/G...

Splicing Kit Components

The MK-356/G splicing kit, NSN 5805-00-657-2183, is no longer available as a kit.

However, you can order the components to complete your old kit.

Here they are:



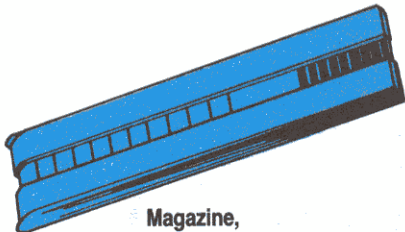
Splicing sleeves,
NSN 5940-00-818-1774



Sleeve compressing tool,
NSN 5120-00-679-2380



Bag, cotton duck,
NSN 8105-00-810-9875



Magazine,
NSN 5975-00-659-9905

Give Parabolas a Helping Hand



When the RO-526/MYQ-4 or RO-526A/MYQ-4 card reader/punch on the DAS-3 computer misreads a card, you usually wind up replacing one or both of the parabolas. While this might correct the misread problem, it costs more than \$83 each to replace them.

Here are some PM tips to help extend the life of these parabolas and help correct the misread problem:

- **CLEAN.** Make sure the parabolas are free of dust. See Para 3-7 of TM 11-7040-200-10 for cleaning instructions.
- **CUSHION THE BACK.** Before operating the card reader/punch, put

electrical tape on the back of the parabola, especially the curved edge. The tape pads and protects the parabola from being chipped or damaged.

- **APPLY A NEW COAT OF PAINT.** When the sides or curved edge of the parabola become chipped, repaint the damaged areas. Before painting, mask the clear plastic window. Use flat black paint, NSN 8010-00-616-9143.

- **POLISH THE FACE.** If the face of the parabola is scratched, use Brasso, NSN 7930-00-056-7874 (local purchase item), or other polish to restore a smooth finish.

If you continue to get misreads, see Table 3-1 in TM 11-7040-200-10.

Wheel Cylinder NSN

Use NSN 2530-00-741-2065 to get the wheel cylinder for all the TM 9-2330-213-14&P trailers. The NSN is missing from Item 6, Fig 12. The PN should be F56114.

It Takes an Ace to Drive an ACE



One thing's for certain, ACE drivers: Mistakes made while driving the M9 can do a whole lot more than scare you. Serious mistakes can kill you.

To be an ace ACE driver, you must eliminate as many mistakes as possible. Here are a few driving tips to keep your ACE bowl-up:

An empty ACE is butt-heavy, which is no problem on flat ground, hard-top road or when you're going downhill.

But, if you're going uphill in loose sand, that heavy rear end can mean no traction at all.

Keep the bowl about half-full of sand and push the ejector forward. This moves enough weight to the front of the ACE that you can scale those sand dunes much easier.

✓ Keep to a reasonable speed on the highway. Sure the ACE will do about 30 MPH on hardtop. But what about road conditions? Slow down if it's wet, foggy, slick, or if you are not sure of what's just around the bend.

Off-road conditions require skill in driving, too. If the blade digs into a ridge or other obstruction, your ACE is gonna stop real fast.

✓ Slow down to make turns. Sharp turns must be made at slow speed to prevent overturning.

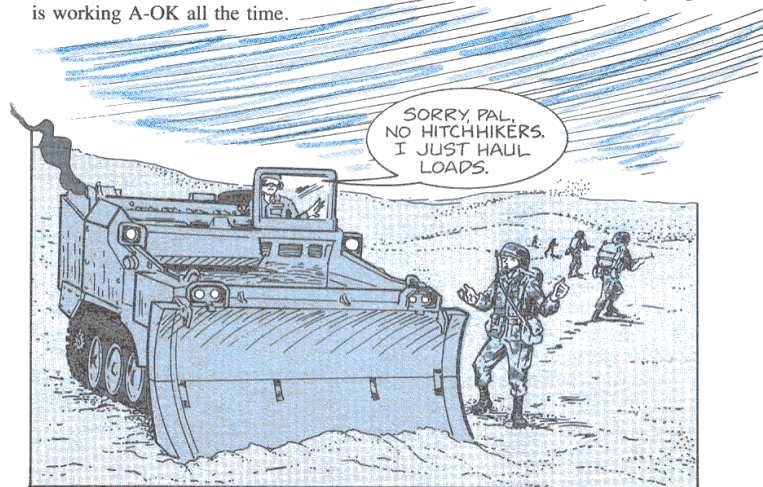
✓ Avoid jackrabbit starts. Steady as it goes is best.

✓ Avoid panic stops. Your ACE cannot stop on a dime. Give yourself plenty of distance to stop.

✓ Never haul troops in the bowl. The bowl's for dirt, sand or cargo, not people. Also, never haul people on the rear of the vehicle.

Really want to be an ace ACE driver? Make the driving instructions in the -10 TM your bible. Read them every night if you need to. Also get a copy of FM 21-306, Manual for Tracked Combat Vehicle Drivers and read it.

An ace always knows the condition of his vehicle and makes sure everything is working A-OK all the time.



Watch for Water!

IF THEY KEEP UP THIS REGULAR PM WE'LL NEVER GET TO CORRODE THIS BRAKE LINE!

YIKES! WE'RE GETTING FLUSHED!

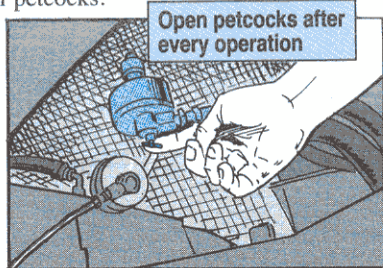
A PROMISING CAREER DOWN THE DRAIN!

Your Clark scoop loader's brakes lock up or fail if water gets in the brake air lines.

When water gets into the emergency quick-release valves or the power clusters, corrosion forms. Then, no brakes!

The air tanks (the wet tank and the two emergency tanks) have automatic drain ("spitter") valves and manual drain petcocks.

Spitter valves automatically expel water—but not all of it. That's why you've got to make sure you always open the petcocks after you operate. You should see a little moisture. But a lot of water means the automatic valve's not working. Report it so your friendly mechanic can replace the valve.



A Little Dab'll Do It!

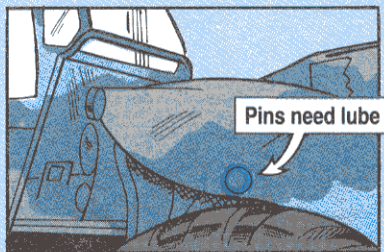
If the boom pins that attach the lift cylinders to the boom freeze up in the boom, you've got a big job! It's tough trying to remove the cylinder when the boom pins won't budge!

There's a grease fitting on the lift cylinder to keep the bushing lubed where it rotates on the pin. But once the pin is in place it won't move and it's impossible to grease the pin where it passes through the boom arm.

So, next time you have the pins out for any reason, dab a light coating of

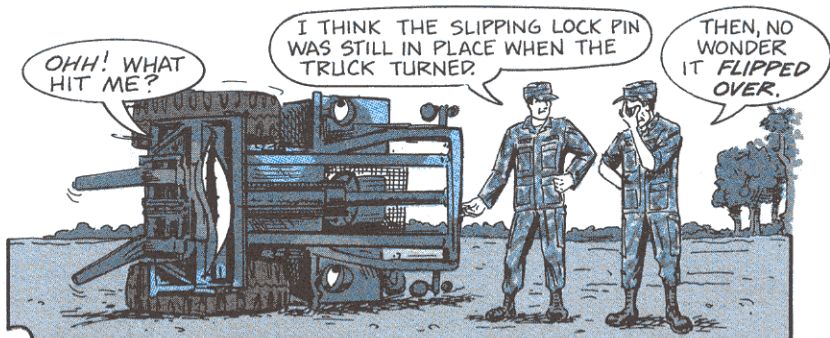
silicone grease, NSN 9150-00-145-0161, on them before replacing them.

That will keep the pins free so you can get 'em out the next time.



M4K Forklift...

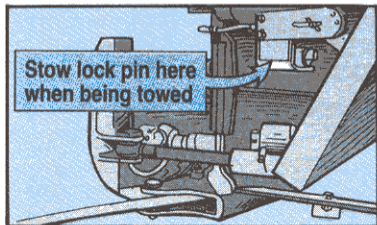
Towing Caution



It happened again. A soldier tried to tow an M4K with the shipping lock pin in place. The forklift flipped over on its side when the towing vehicle turned a sharp corner.

Para 2-10 in TM 10-3930-638-10 says to never install the shipping lock pin when towing. The pin is supposed to be used when you jack up a forklift or when you chain it down on a semi-trailer during shipping.

So, when you tow, stow the shipping lock pin under the right side of the driver's seat.



Handle with Care

NEVER JUST TAKE OFF THE OUTLET FILTER AND THROW IT AWAY.

THE FILTER HAS TRACES OF RADIATION THAT MAKE IT DANGEROUS IF NOT HANDLED RIGHT!

WEAR DISPOSABLE GLOVES, NSN 8415-00-682-6786, EVERY TIME YOU HANDLE THE FILTER. KEEP YOUR HANDS AWAY FROM YOUR MOUTH. WASH YOUR HANDS WITH SOAP AND WATER WHEN YOU'RE FINISHED!

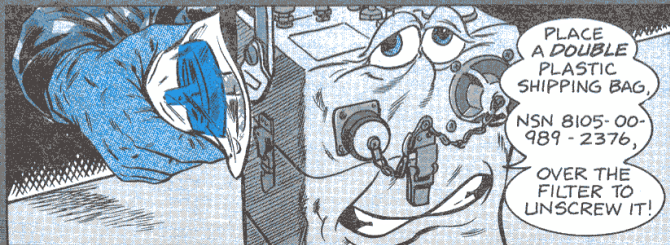
WHEN THE AIR FLOW DROPS BELOW THE GREEN BAND ON THE FLOWMETER, REPLACE THE FILTER. HERE'S HOW...



PLACE A DOUBLE PLASTIC SHIPPING BAG,

NSN 8105-00-989-2376,

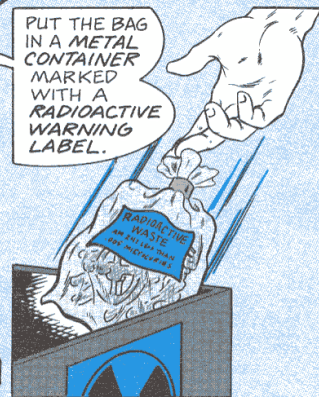
OVER THE FILTER TO UNSCREW IT!



PUT YOUR GLOVES IN THE BAG WITH THE FILTER. SEAL THE BAG WITH TAPE. NSN 7510-00-802-8311.

MARK THE BAG RADIOACTIVE WASTE AM-241 LESS THAN 0.005 MICROCURIES.

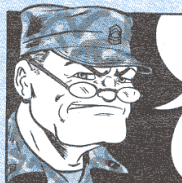
PUT THE BAG IN A METAL CONTAINER MARKED WITH A RADIOACTIVE WARNING LABEL.



ON A DA FORM 2765-1 (TURN-IN DOCUMENT) WRITE **M8A1 OUTLET FILTER-RADIOACTIVE**. LIST THE GLOVES AS **LABORATORY WASTE**.

TURN IN THE BOX AND FORM TO YOUR LOCAL **RADIATION PROTECTION OFFICER**.

SEE PARA 4-13 IN **TM 3-6665-312-128P** (MAR 85) FOR MORE INFO.



Ballistic Goggle Lens

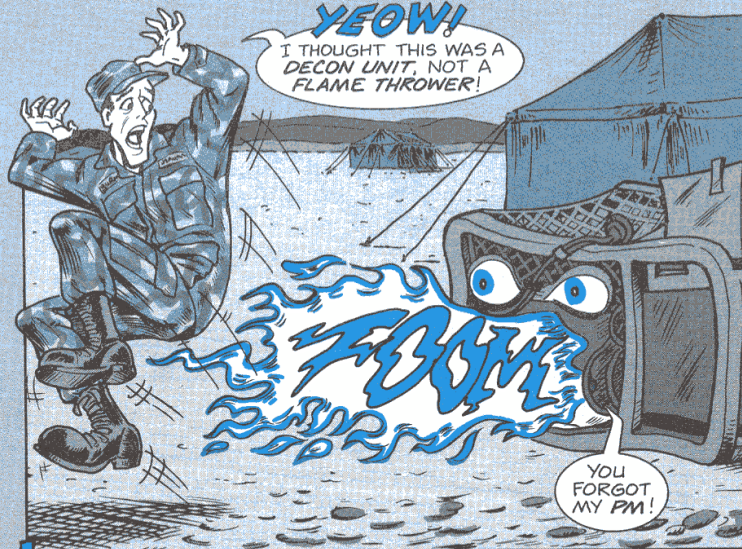
Blowing desert sand scratches the lenses on your sun, wind and dust goggles, NSN 8465-01-004-2893. Order replacement lenses with these NSNs:

Lenses	NSN 8465-01-109-
Clear	3997
Neutral	3996

Clear lenses protect from blowing dust and sand. Neutral lenses cut out glare from the sun.



Light Up with PM

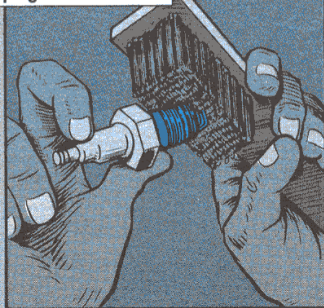


If you push your Sanator's burner too hard to light, fuel collects in the bottom of the heat exchanger—sometimes as much as a half gallon. All that fuel can lead to the burner not lighting at all—or a flash ignition—or back firing.

But lighting the burner is easy if its spark plug and heat exchanger coil are free of carbon. A dirty plug won't ignite fuel and a dirty coil needs much more fuel to heat water.

Before operation, unscrew the burner spark plug and clean off any carbon with a wire brush. Set the plug gap at .07 inch.

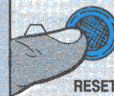
Clean off spark plug with wire brush



Your repairman needs to take care of cleaning the heat exchanger. It should be done at least every 100 hours of operation. If the heat exchanger doesn't immediately heat water, tell your repairman.

If the automatic ignition fails to ignite the burner while operating in the shower or syphon injector modes, push the BURNER RESET INDICATOR. Hold for no more than one second. If the burner fails to ignite, it's OK to

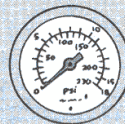
Do not hit RESET more than 1 second at a time



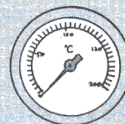
RESET



EMERGENCY STOP



FUEL PRESSURE



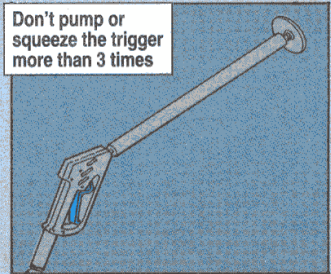
WATER TEMPERATURE

hit the indicator twice more, but for no more than one second at a time. If the burner still doesn't ignite, troubleshoot like Page 3-15 in TM 3-4230-228-10 says. If that doesn't solve the problem, call your repairman.

If the burner doesn't ignite in the steam wand mode after three one-second squeezes of the steam wand

trigger, do the same troubleshooting procedure. Never pump the trigger or squeeze it more than three times. Wait about five seconds between squeezes.

Don't pump or squeeze the trigger more than 3 times



If fuel does collect in the heat exchanger, you and your repairman can pull off the top of the burner, tip the Sanator on its side, and drain the fuel. Wash out the burner with water. Let the burner air dry. Then troubleshoot to find what's wrong.

AMCCOM Maintenance Advisory Message 90-38 has the word. Your local AMCCOM Logistics Assistance Representative has a copy.

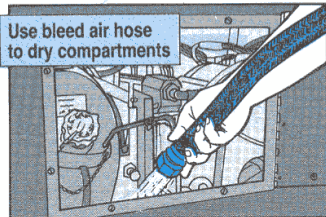


U-Pack PM's a Must

Here's a prescription for keeping your Medical Unit, Self-contained Transportable (MUST) hospital unit reliable and in great shape: Give the U-pack large doses of PM!

Here're a few tips:

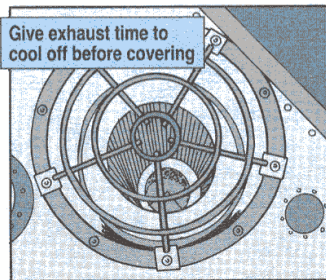
■ Use the bleed air hose during service periods to dry out each compartment in the unit.



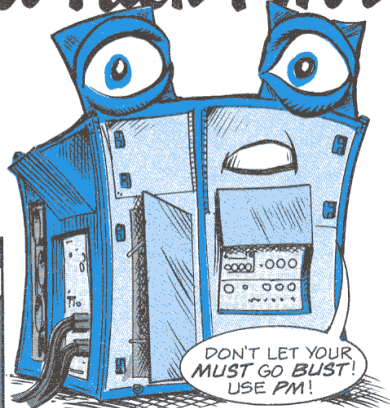
Use bleed air hose to dry compartments

■ To reduce condensation in the combustion compartment, run your U-pack's engine one to two hours during each scheduled service.

■ After shutdown, give the gas turbine engine's exhaust time to cool off before putting the waterproof cover on the U-pack—or the exhaust will melt the canvas.



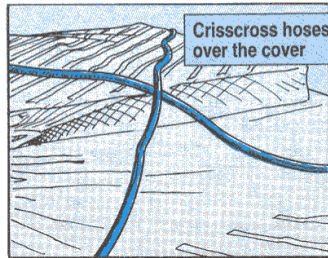
Give exhaust time to cool off before covering



DON'T LET YOUR MUST GO BUST! USE PM!

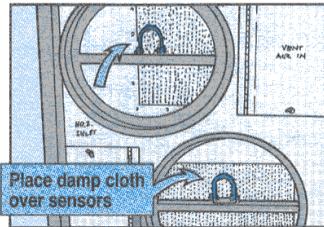
■ Replace damaged or missing tiedown brackets on the canvas cover with NSN 5340-00-764-2334. Get the rivets with NSN 5320-00-721-9062.

■ Before moving your U-pack, run the brake connecting and electrical hoses through the hoist rings and crisscross the hoses over the top of the cover. That keeps the hoses on top of the unit—out of harm's way. If necessary, tape the hoses together.



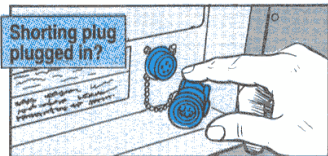
Crisscross hoses over the cover

■ Place a damp cloth over the heat temperature sensors in the shelter return air system during hot weather. This will cool the sensors to help you get a faster, better test of the heating system.



Place damp cloth over sensors

■ Eyeball the remote temperature sensing connector to see if the shorting plug is installed. If it's not, your unit will cool, but not heat.



Shorting plug plugged in?

■ When lifting your U-pack with a forklift, make sure the forklift has more than a 5,000-lb capacity. Also use fork extensions long enough to go completely through the base.

GP Medium Tents...

Solid Sand

USE GROUND ANCHORS OR STEEL TENT PINS TO SET UP TENTS.



Trying to drive anchors or stakes in desert sand, when securing a general purpose medium tent, is no easy job. The sand's usually loose on top, but when you get a few inches below the surface, it's packed together like a brick!

Use ground anchors, NSN 8340-00-951-6423, or steel tent pins, NSN 8340-00-985-7461, instead of wooden stakes, when setting up your tent in the desert sand.

Pounding the anchors or stakes in the hard sand might ruin some of them, so bring along extras—just in case.

Ordering Made Easier

Keeping your DA 12-series forms up-to-date is easier than ever. Now when you request a tailored index of equipment publications from the Materiel Readiness Support Activity, Section II of the computer listing you get back will have the 12-series form and block numbers for each publication.

HERE'S HOW TO GET THE INDEX OF EQUIPMENT PUBLICATIONS TAILOR-MADE FOR YOUR UNIT.

WRITE DOWN THE LINS AND NSNs OF ALL YOUR UNIT'S EQUIPMENT FROM THE PROPERTY BOOK.

SEND THE LIST OF PROPERTY BOOK ITEMS TO:

USAMC
Materiel Readiness Support Activity
ATTN: AMXMD-MP
Lexington, KY 40511-5101

Be sure to include the maintenance level range you want the listing to cover, your name, rank, unit, address and DSN(AUTOVON) number.

The computer printout that you get back shows every equipment publication you need in your unit to support the equipment you have on hand.

Reading the List

The listing will be in two parts. Part I shows the pubs in LIN and NSN sequence. It tells you which supply manuals and bulletins, technical bulletins, lubrication orders, modification work orders and supply catalogs you need.

DATE: 12-OCT-90 PAGE: 0002
 FOR: NSN: 4413812344

INDEX OF EQUIPMENT PUBLICATIONS
PART I: LINE ITEM NUMBER (LIN) SEQUENCE

FOR: **GENERIC-NOMENCLATURE** **NSN** **DATE** **CHG-IN-FORCE** **L-CH-DATE** **TACOM**

109346 TRUCK CANOID TACTICAL 5/4 TON 4X4 W/COMD KIT
 232009EN300000 TRK CGO 5/4T M1008A1 JUN 1986
 BASIC-PUBLICATIONS
 LO 9-2320-289-12 JUN 1986
 TB 9-2320-289-12/24 SEP 1985
 JUL 1986
 JUN 1986
 JUN 1986
 JUN 1986
 JUN 1986
 JUN 1986
 JUN 1985
 JUN 1985
 JUN 1987
 JUN 1987

1-2 OCT 1989
 1 DEC 1989

109482 TRUCK CANOID TACTICAL 5/4 TON 4X4 W/E M1008
 232009EN300000 TRK CGO 5/4T M1008A1 JUN 1986
 BASIC-PUBLICATIONS
 LO 9-2320-289-12 JUN 1986
 TB 9-2320-289-12/24 SEP 1985
 JUL 1986
 JUN 1986
 JUN 1986
 JUN 1986
 JUN 1986
 JUN 1986
 JUN 1985
 JUN 1985
 JUN 1987
 JUN 1987

1-2 OCT 1989
 1 DEC 1989

PART I is in LIN and NSN sequence

Part II provides a pub-to-end item cross-reference. This is helpful in ordering the pubs you need. For example, you have different models of the CUCV—M1008, M1009 and M1028—but LO 9-2320-289-12 covers all three models. You'll order the number of copies you need for all these models.

DATE: 12-OCT-90 PAGE: 0002
 FOR: NSN: 4413812344

INDEX OF EQUIPMENT PUBLICATIONS
PART 2: PUBLICATION TO END ITEM CROSS-REFERENCE

FOR: **PUBLICATION-NUMBER** **DATE** **CHG-IN-FORCE** **L-CH-DATE** **DR-FORM-12** **B/C LIN** **ITER-NSN** **NOMENCLATURE/BB700-20**

(CONTINUED FROM PREVIOUS PAGE)

LO 9-2320-209-12-1 APR 1983 1 AUG 1988 12-38-E BLK 0488
 LO 9-2320-211-12 FEB 1984 12-38-E BLK 0506

LO 9-2320-240-12 NOV 1983 12-38-E BLK 0537

LO 9-2320-289-12 JUN 1986 12-38-E BLK 0589

B 441831 2320-00-050-4818 TRK MTR M54301 W/MN
 B 442299 2320-00-051-1489 TRK MTR M816 W/MN
 B 705028 2320-01-123-2865 TRK UTIL 347 M1009
 B T53346 2320-01-123-2871 TRK CGO 5/4T M1008A1
 B T59482 2320-01-123-6827 TRK CGO 5/4 TON M1008

PART 2 gives pub to end item cross reference and 12-series form and block numbers



Using the List

When you receive the index, you need to inventory your pubs. Make a list of the ones you don't have or those you have but that are out-of-date. Send the list to your publications clerk so he can order the publications you need from the Baltimore Pubs Center on DA Form 4569.

To get future changes of these publications, have your pubs clerk update your 12-series forms. Part II of the listing shows the form and block numbers so the pubs clerk's job is easy as 1-2-3.

STEP 1

Copy 12-99 form
from DA PAM 25-33

DA FORM 12-SERIES SUBSCRIPTION CHANGE SHEET

For use of this form, see DA Pam 25-33, the proponent agency is ODISC4

1. ACCOUNT NUMBER *20000*

2. DATE *25 OCT 90*

3. FROM: (Include 9-Digit ZIP Code)
*Commander
C Co, 34th Sig Bn
APO New York 09176*

4. THRU: (Include 9-Digit ZIP Code)
*Commander
HQ
34th Sig Bn
APO New York 09176*

5. TO:
*Commander
USA Publications Distribution Center
300 Eastern Blvd
Baltimore, MD 21220-2896*

FORM NUMBER	BLOCK NUMBER	QUANTITY REQUIRED	FORM NUMBER	BLOCK NUMBER	QUANTITY REQUIRED	FORM NUMBER	BLOCK NUMBER	QUANTITY REQUIRED
12-38E	488	2	12-			12-		
12-38E	589	3	12-			12-		
12-51E	4216	3	12-			12-		
12-51E	899	9	12-			12-		

STEP 2
Fill in blocks at top

STEP 3
Write form number, block number and number of copies needed

PS END

Fixing the Carrier

The M15A1 carrier for the M17A1 mask is temporarily out-of-stock. Until the carrier is available, units are authorized to replace snaps and hooks, resew frayed seams, and patch small holes and damaged webbing.

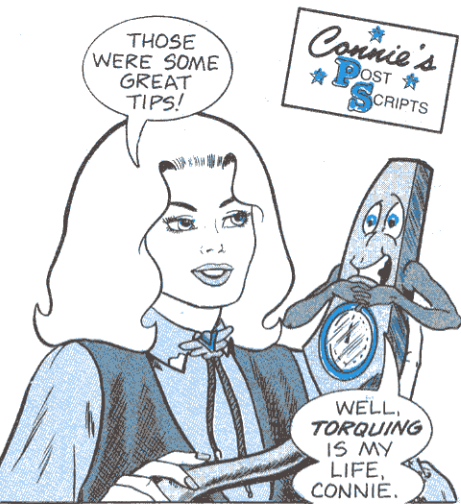
HERE'S
WHAT YOU
NEED!



Do not use Velcro. It will not hold the carrier securely shut.

AMCCOM Msg AMSMC-MAR-EP 121400Z Oct 90 has the word. See your AMCCOM Logistics Assistance Representative for a copy.

Item	NSN
cotton webbing	8305-00-261-8851
snaphook	5340-01-187-9402
polyester thread	8310-00-988-1298
fastener snap	5325-00-061-3260
cotton webbing	8305-00-260-1748
snaphook	5340-00-780-8074
fastener snap	5325-00-721-7424



M13 Mounting Info

Info on mounting the M13 decon on the scoop loader, 25-ton shovel crane and on motorized rollers is in Paras 4-3 through 4-7 in TB 43-0001-39-3 (Oct 90).

M12A1 Needs 15W-40 Oil in Desert

Desert heat breaks down 30W oil in the M12A1 decon. Substitute 15W-40 oil instead. The word's in AMCCOM Msg AMSMC-MAR-ED (A) 301630Z Nov 90.

Turn in Bad CPOs

There are some defective chemical protective overgarments (CPO) in the field. They are size medium, NSN 8415-01-137-1704, manufactured by Camel Manufacturing Co under contract number DLA100-89-C-0428. Turn in any you find in your stock. The word's in TROSCOM Safety of Use Message 31-90. See your TROSCOM Logistics Assistance Representative for a copy.

HMMWV Belt NSN Change

The V-belt set used on the HMMWV's power steering and water pump is being dropped from the supply system. The replacement belt set comes under NSN 3030-00-379-2815. Make a note until the listing for Item 2 in Fig 27 of TM 9-2320-280-20P is changed.

IM-174 Radiacmeter Update

If you have an IM-174A/PD radiacmeter that hasn't been converted to a single dry-cell battery power source, send it to your local TMDE support unit. They do the conversion.

Aviation Desert Storm Info

See your AVSCOM Logistics Assistance Representative (LAR) for Operation Desert Storm Aviation Lessons Learned. To find your LAR, call AVSCOM at DSN 693-2066 or Commercial 314-263-2066.

M1 Arm Bearing NSN

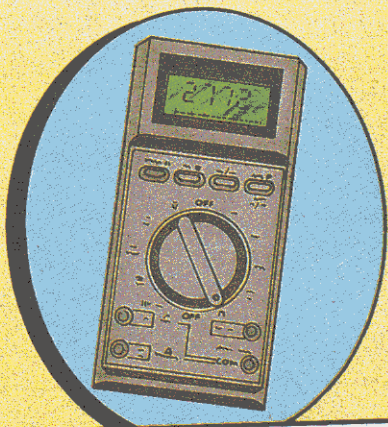
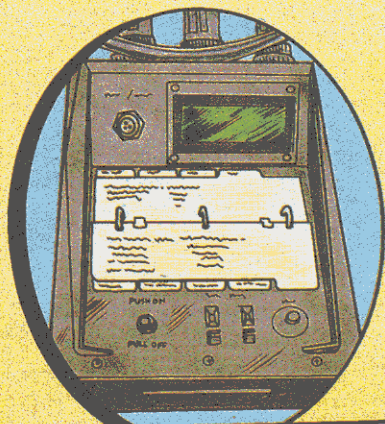
Get the bearing that goes between the arm and hub for all M1-series tank road-arms and idler arms with NSN 3110-00-101-4194. The bearing is not the one identified in either TM 9-2350-255-24P-1 or -264-24P-1 as PN 703255. This new one carries PN 749A742. Make a note until your parts TM is updated.

M110A2/M578 LOs Have Bad Info

Both LO 9-2350-304-12 (M110A2 SP howitzer) and LO 9-2350-238-12 (M578 recovery vehicle) are wrong in calling for OEA to be used in vehicle transmissions when the temperature is above 0°F. The right oil is OE/HDO-15/40. Make a note of this until the LOs are corrected.

Distribution: To be distributed in accordance with DA Form 12-34-C-R, for TB-43-series.

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



**TEMPERATURE CHANGES
CAUSE MOISTURE.**

**MOISTURE CAN RUIN YOUR
TEST, MEASUREMENT &
DIAGNOSTIC EQUIPMENT.**

**KEEP IT INSIDE OR
UNDER COVER!**

**SEE
PAGE 1**

