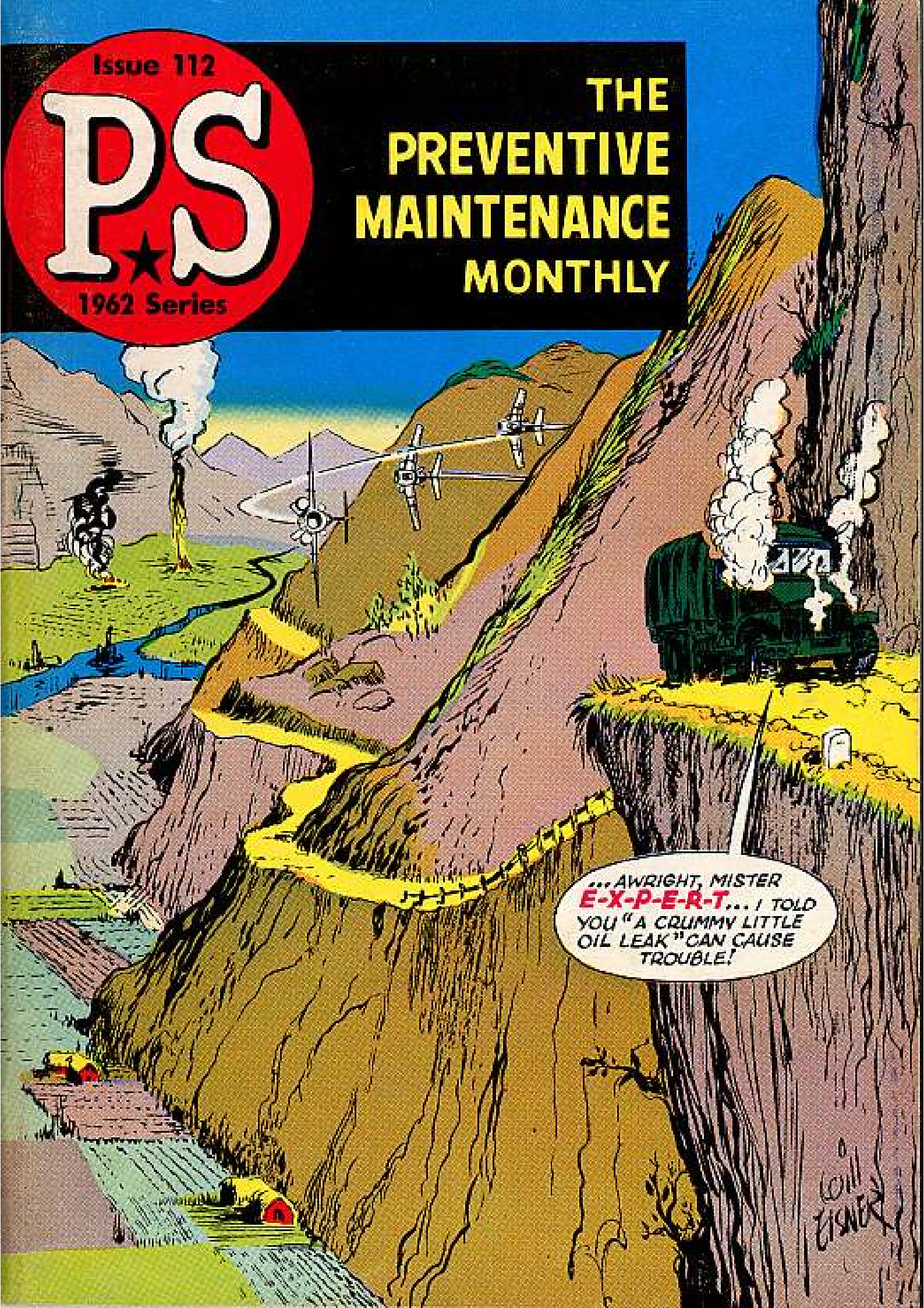
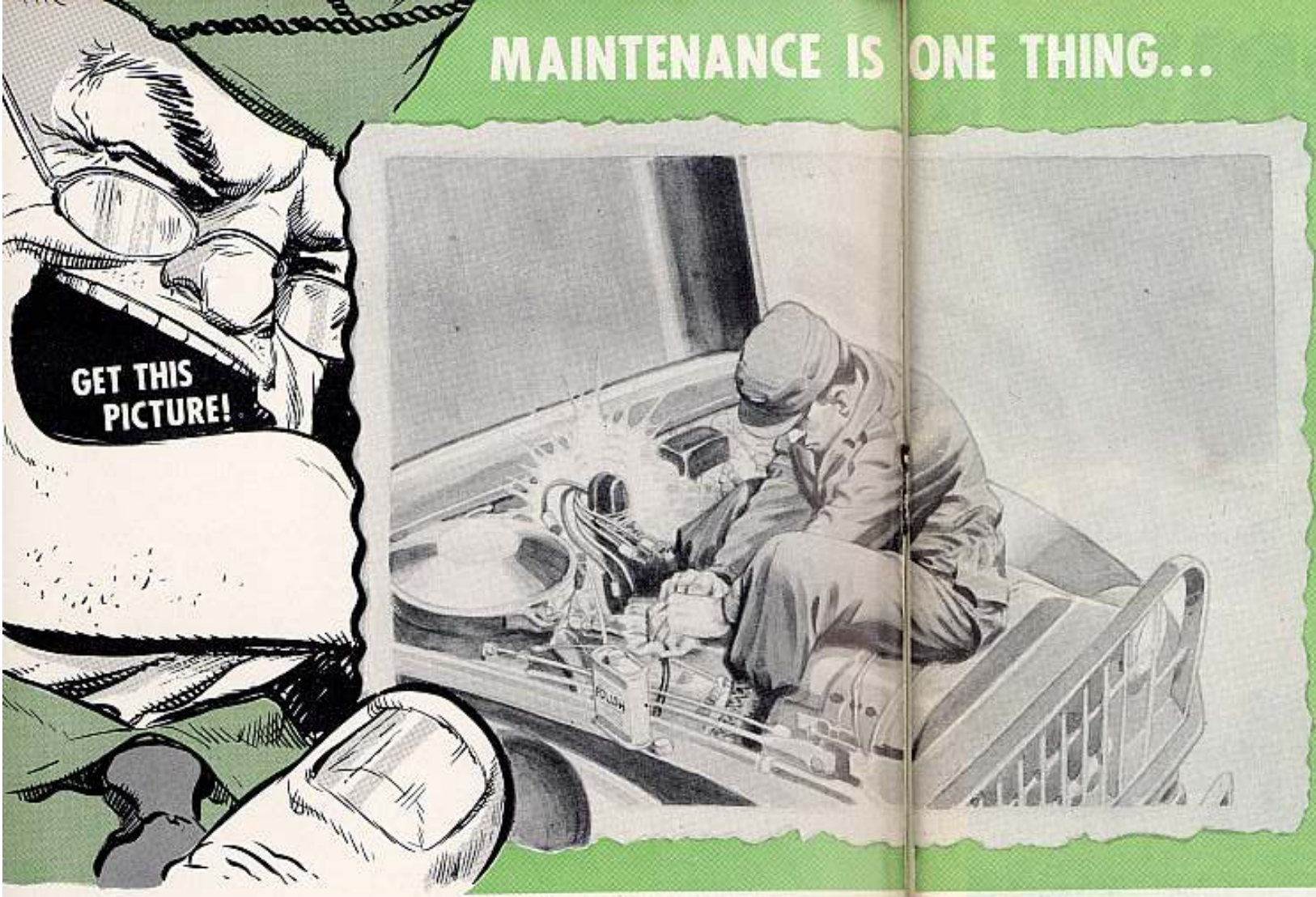

Issue 112
PS
1962 Series
THE PREVENTIVE MAINTENANCE MONTHLY
...AWRIGHT, MISTER E-X-P-E-R-T... I TOLD YOU "A CRUMMY LITTLE OIL LEAK" CAN CAUSE TROUBLE!
WILL EISNER

MAINTENANCE IS ONE THING...



There's nothing in his TM that says he has to spit-and-polish—but you should've seen this guy.

He had the hood up on the truck . . . and was sitting on the radiator —facing toward the rear of the vehicle.

And was he polishing the fuel lines. He had them cleaned like new. No . . . that's not right. They weren't that bright and clean when they were new.

Trouble is . . . he had to brace himself with his feet while he was working—to keep from falling face-first on the engine. So he stuck his feet down around the engine. And as he pushed his right foot for better support, his 12D ripped a potful of wiring right out by the roots!

Another guy had to spend a coupla hours to get the wiring back in shape—time that could've been spent on important maintenance.

It just goes to show you that the price of spit-and-polish can come high.

PS THE PREVENTIVE MAINTENANCE MONTHLY

Issue No. 112 1962 Series

Published by the Department of the Army for the information of organizational maintenance and supply personnel. Distribution is made through normal publication channels. Within limits of availability, older issues may be obtained direct from PS Magazine, Raritan Arsenal, Metuchen, New Jersey.

IN THIS ISSUE

ARTICLES

PS wants your ideas and contributions, and is glad to answer your questions. Names and addresses are kept in confidence. Just write to:

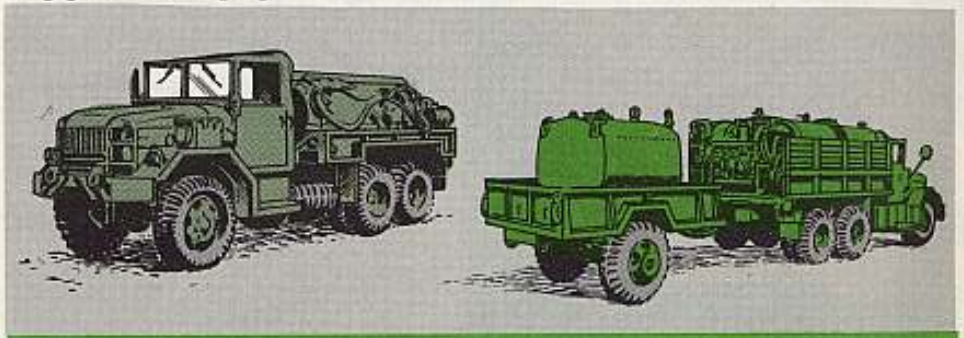
Sgt Half-Mast,
PS Magazine,
Raritan Arsenal,
Metuchen, New Jersey.

DISTRIBUTION:
In accordance with requirements submitted on DA Form 12-4.

The Heads-Up Fuel Vehicle Operator Must Be A Sharp...

PRIVATE EYEBALL

No doubt about it, if you drive an M49C or a pump and tank unit or any other fuel vehicle, you're one of the guys directly responsible for keeping the big gas birds chirping.



Reason: These gas turbine-powered aircraft digest only the purest kind of fuel and it's up to you to see they get it. A great big chore that begins the minute you take over your vehicle.

You've got to be real hip not only on your truck but also on its fuel-handling equipment and on the fuel itself. You've gotta know why the fuel's got to be absolutely free from dirt and water . . . and why it can be dangerous less'n you follow the rules on fire, fumes and static electricity.

Who does what on fuel handling chores around tank vehicles may change according to local SOP, but here're the things every driver must know whether he does the job himself or helps someone else.

Use this guide every day when you do the inspections called for in TM 10-1113 (Sept 59) and Change 1 (22 Sept 58) to TM 10-1101 (Sept 55) before you load your vehicle and while you're loading it.

Just remember, when you handle avfuel—and especially JP-4—there's no room for guesswork. The fuel must be **clean** (free from solids) and **dry** (free from water). The tiniest amounts of dirt and water that get past you can ground a plane with a deadly thud.

There's one big difference between this inspection and others you're likely to make. Here every deficiency is serious. You've got to fix it right off . . . you may never get another chance. If you can't fix it yourself, tell the man in charge. This is no place for secrets.

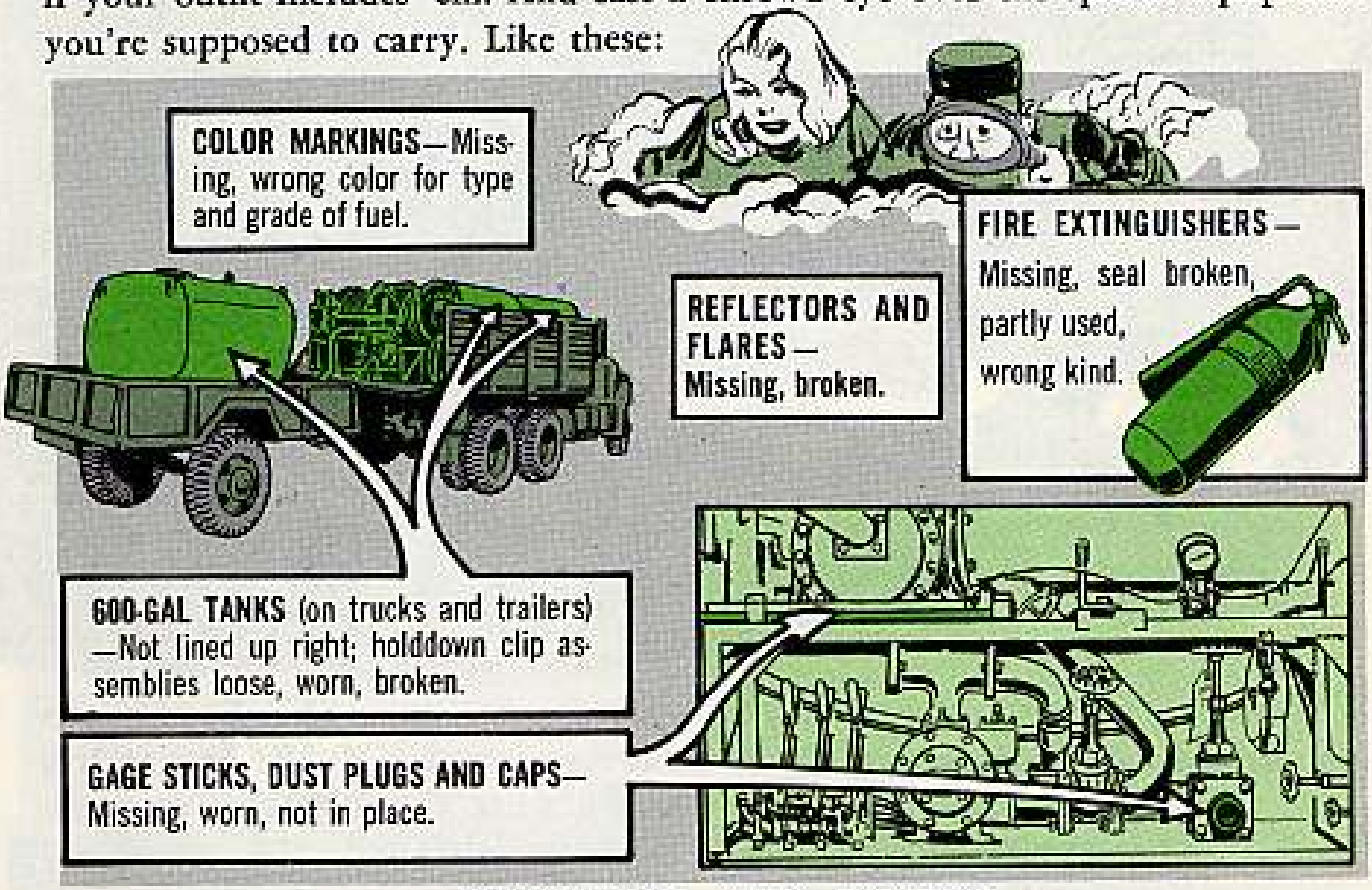
One more thing: **No Smoking** is more'n a slogan, it's the way to live around fuels. This also means no smoking in the cab, ever.

MORE

BEFORE STARTING UP

Even before stepping on the starter to get where you'll load up, make good and sure your vehicle can travel and is fit to tote fuel safely—safe for people and safe for the fuel.

Do the best job you know how on all the before-operations PM your rig's TM calls for. Pay special attention to the power take-off and the pump engine, if your outfit includes 'em. And cast a shrewd eye over the special equipment you're supposed to carry. Like these:



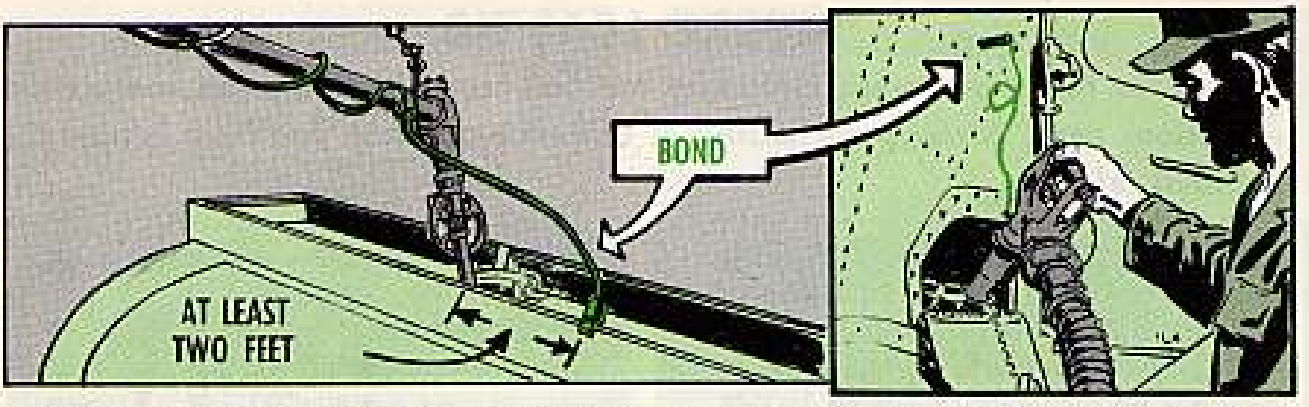
GROUNDS AND BONDS

Right here, before you stir another muscle, is a good place to give a healthy thought to static electricity—the hidden enemy. Knowing how the enemy works is half the battle.

Static electricity is actually electricity at rest — just waiting to pounce. It's caused by friction—any friction (even liquid flowing through a hose or pipe or just falling free) — and its charge stays on the surfaces of the object or liquid that holds it. You can't prevent static electricity. All you can do is control it—keep it from arcing or sparking.

It's this sparking that's so dangerous around any gasoline fumes, and especially jet juice.

Like was said, you can't prevent static electricity. But you can drain it off or equalize it so's it won't do any harm by using the grounds and bonds your rig and the loading station are equipped with. Unless the static charge is drained off, it could build up to the sparking point.

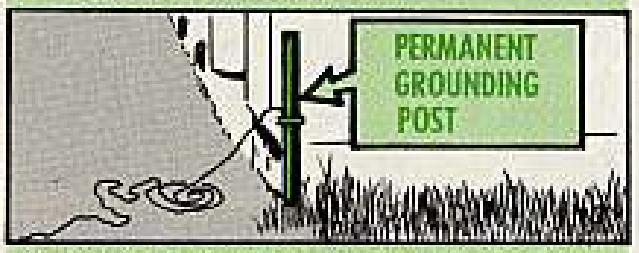


The most dangerous "sparking point" is when you go to open a manhole cover on your truck or remove a filler cap on the aircraft. It's at this exact moment that you have all the makings for a first-class boom—gas vapors pouring out of the tank and the static charge set to spark as you touch one metal surface to another. Less'n you have your grounds and bonds hooked up first, you'll get a boom you'll never hear the end of.

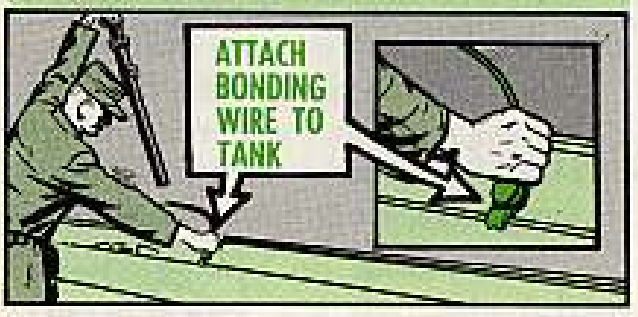
Here's how you connect up the bonding and grounding under the different fueling operations.

AT THE LOADING RACK:

1. Ground the truck to the permanent grounding post at the loading rack.



2. Attach the bonding wire from the loading arm to the tank shell.

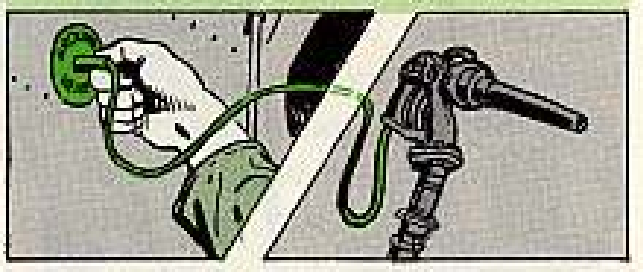


But, whether at the loading rack or at the aircraft, be mighty sure you make the bonding and grounding connections before opening the manhole or filler cap.

WHILE FUELING AIRCRAFT:

1. After parking in front of the aircraft—and at least 20 feet from it—stop the engine till grounding and bonding is completed. Leave the driver's door open.

2. Ground the truck and plane by clipping one end of the Y-cable to the ground stake and the other end to the aircraft, using the landing gear or other unpainted part except the propeller or radio antenna. Then complete the **bonding** by attaching the nozzle bonding wire to the plane's frame or wing-tip jack plug.



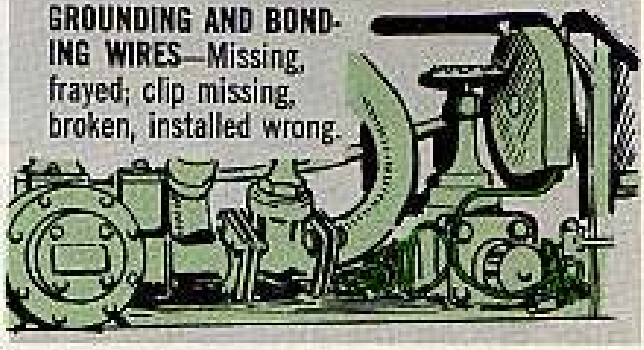
P3 MORE

BEFORE LOADING

With the thought of static electricity notched firmly in your mind, make these inspections next. A sharp eyeballing at this time can keep you from behind the eightball later on.

TANKS AND COMPARTMENTS—Dirty, rusty, have old fuel in 'em. Use an explosion-proof flashlight (FSN 6230-117-0928—Eng) or extension light (FSN 6230-268-9246—Eng) to give the insides of the tanks a good going-over. Be sure, though, you attach the bonding and grounding wires first. And keep the cable attached till the last manhole cover and filler cap are put back. Also doublecheck to see that any fuel left in the tank from the last time is the same type and grade as the stuff you're gonna load.

GROUNDING AND BONDING WIRES—Missing, frayed; clip missing, broken, installed wrong.

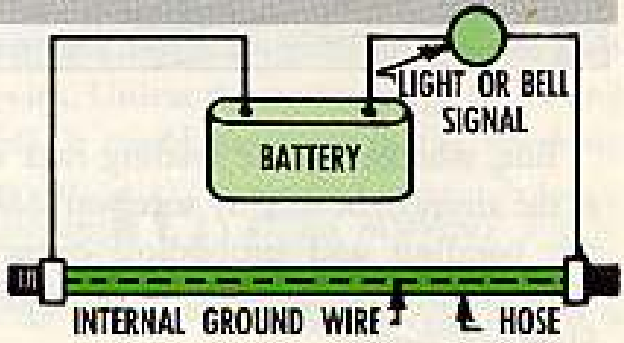


SUCTION AND DISPENSING HOSES—Bulges, blisters, cuts, gouges, soft spots; static wires missing, broken.

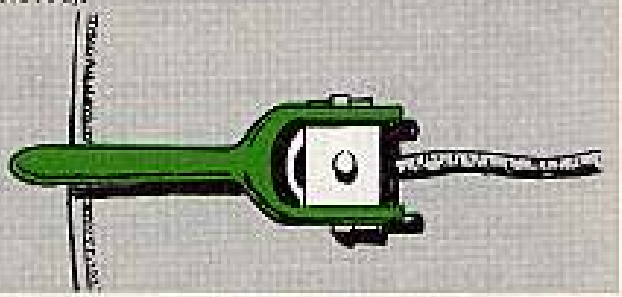
NOZZLE ASSEMBLY—Cracked, threads worn, rusted; spout dirty, dented; cap missing, threads fouled up; ground wire broken, not hooked up right; clamp, jack plug missing, broken, badly rusted; lever and parts bent, broken.

MANHOLE COVERS—Gaskets missing (replace quick); cover not seated right.

You oughta check your hoses at least once a month—like it says in Para 9a(3), TM 5-679 (Nov 46)—to see that the internal ground wire's OK. All your other grounding and bonding's for the birds if the hose grounding's NG. Check 'em with a test circuit and bell and dry-cell battery. But first make sure the hose is free of vapor and not in a hazardous area.

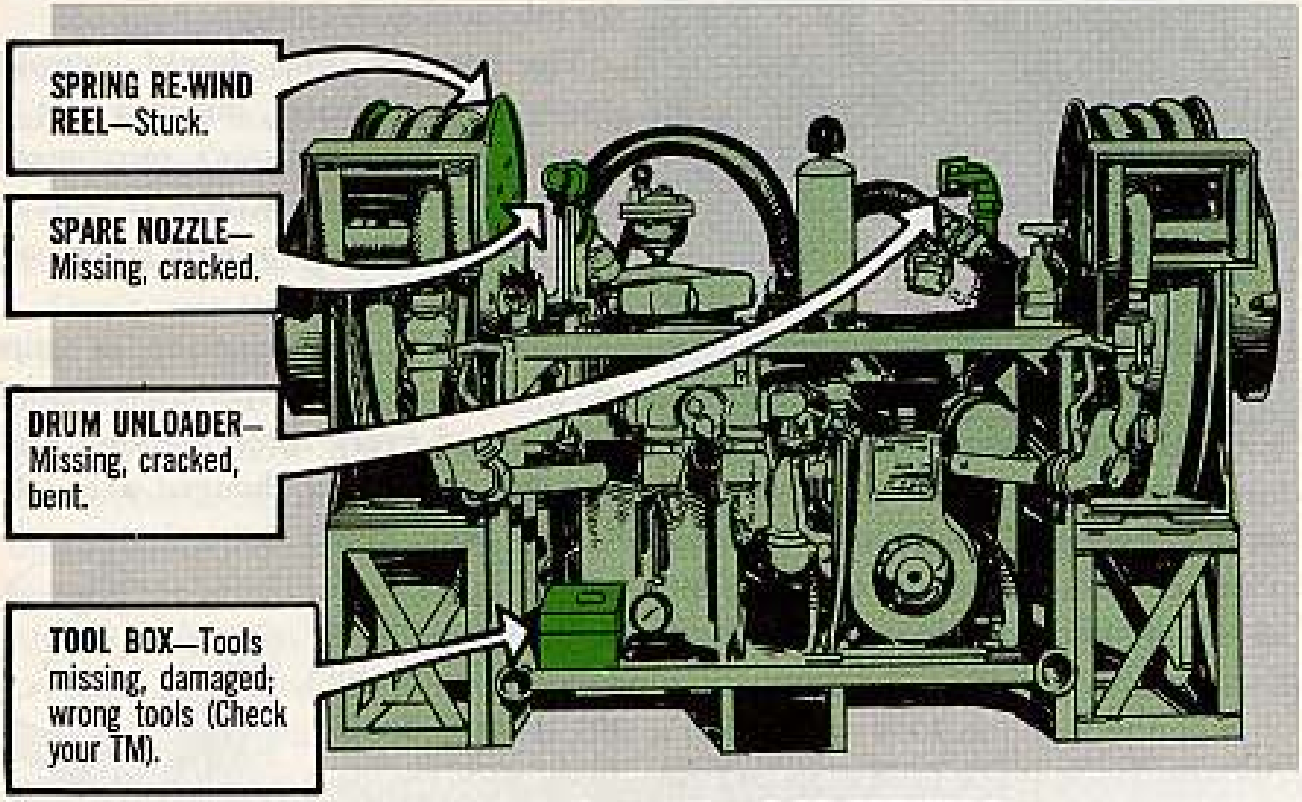


EMERGENCY VALVE CONTROL LEVERS—Stuck (open or closed).



DRAIN VALVES—Frozen (in cold weather), cracked, leaks, stuck. Always leave drain valves open to keep water from collecting. If they're frozen or stuck, never force 'em. Get help if you need it.

TANK FAUCET W/QUICK COUPLER—Rubber gasket missing.



FILTERING AND SCREENING

Your nozzle, filter, water separator (filter/separator on some units) and gasoline meter are the gadgets that make your vehicle fit to carry aircraft fuels—if they work right. You have to use 'em when taking on fuel at the loading rack and again when dispensing fuel into the aircraft.

What you've got to understand is that it takes only a teenie-weenie amount of solids and water to clobber that plane. Bits of rust, dirt, sand, dust, lint or rubber even 20 times skinnier than a single hair from yon bald head can do it. They'll clog up the aircraft's fuel filters, selector valves, flow meters, capacitor-type fuel gages, shutoff valves, fuel pumps and injection

PS MORE

nozzles any one of the tiny openings through which fuel flows in the plane's complex system.

As for water contamination — that's just as bad, if not worse. The water witch works in a couple of nasty ways . . . as free water and as dissolved water. The water separates when the plane hits different ranges of temperature—

like when it picks up tremendous speed or enters sky-high altitudes. Water has a further nasty habit of collecting bits of solids and even a special kind of bacteria that scums up jet juice.

But, any way you look at it, water's dangerous . . . as the pilot may find out when he's breezing along and ice starts to clog up the fuel lines, etc., just like the solid contaminants would.

Now these solids and water can get into the fuel any time . . . while it's in storage . . . while it's being moved from one container to another. That's why aircraft fuel has to be filtered and screened and tested every step of the way.

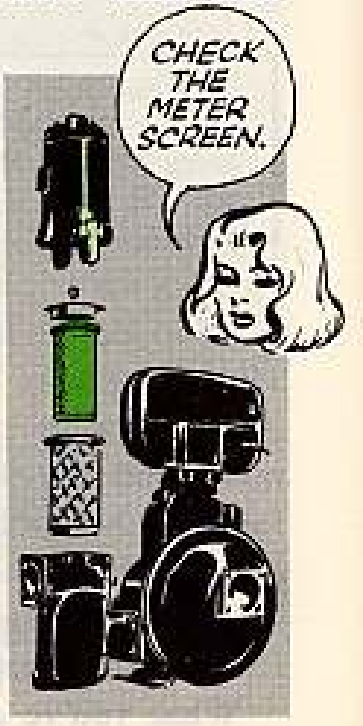
As the fuel goes into your tanker, the nozzle keeps out solids bigger'n 37 microns in size; the filter, meter screen and water separator remove smaller solids (down to about 5 microns) and water. Provided, that is, this equipment's clean and working right.

Like it says in TM 10-1107, you should inspect and clean meter screens every day. All avfuel must go through filter separators to get rid of water and fine particles of dirt before it goes into aircraft. Filter separators have pressure gages to show drop in pressure between the inlet and outlet side.

The pressure drop should increase slowly and gradually, but don't let it exceed the manufacturer's recommendations because the screens're apt to bust if you do. Keep a daily record on the drop in pressure.

Incidentally, filter elements in units of refuelers with uncoated tanks should be changed every three months. And elements should be changed annually if the tank shells have been rustproofed.

The nozzle you've already checked and the filter and separator you'll check while they're operating. But the meter screen should be examined carefully right now. Take the screen off and clean it if need be . . . just like it tells you in Para 20c of TM 10-1113.



TIPS ON GETTING LOADED

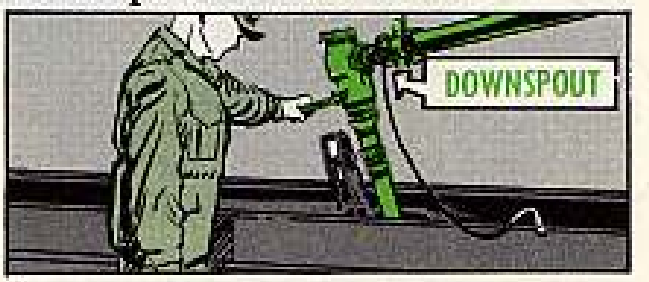
Before taking on fuel, though, there're couple other things you should do to be sure to avoid fire and keep the fuel pure . . . besides making sure the equipment's working right and keeping your fire extinguisher loaded and aimed during operations.

Play it safe. Keep your truck at least 25 feet from the nearest other vehicle waiting to be loaded. Stop the engine and set your brakes while you wait.

When your turn comes, set your brakes after you drive into loading position. Turn off all other electrical switches. ON OFF OFF OFF OFF

Ground the vehicle and attach the bonding wire like was said back yonder before opening the first manhole. And open one manhole at a time for loading. (You only open two if two crew members are each using a loading arm at the same time.) Don't forget to close 'em as the compartments are filled.

Always lower the downspout of the loading arm to the bottom of the tank. This'll keep you from splashing and stirring up the fuel too much which creates additional vapor and static electricity.



Don't ever leave the loading arm untended while the control valve is open. The valve's spring-loaded—so never tie it or block it open.

Keep a hawk-eye on the loading markers and top off at a reduced rate to avoid overfilling. Allow the downspout and loading arm to drain before taking the downspout from the manhole. If you accidentally spill any gas, halt the operation immediately. Don't start the truck or let any other equipment nearer than 50 feet till the area's been washed down or pronounced safe by the fire marshal or his representative.

When you load jet fuel, load it at a reduced rate — ¼ to ⅕ rated capacity —till the lower end of the loading arm is covered.

Here's another tip: If a thunderstorm's brewing or there's radar activity in the immediate neighborhood, hold off on your fueling operation. Doesn't pay to play roulette with Dame Nature.

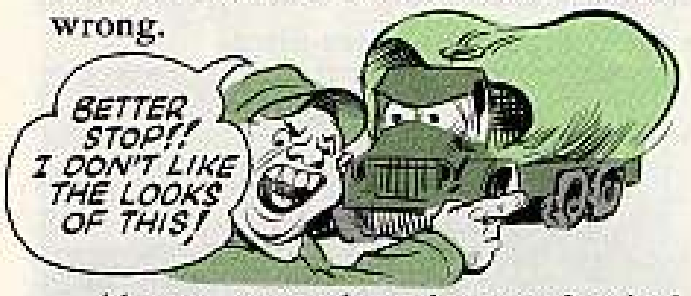
Another thing, don't move the loading arm if there's a fire at a manhole—you don't want to spread the flames. Instead, smother the fire with canvas, burlap or a wet blanket. Incidentally, if the downspout's not in the tank when fire breaks out, just close the manhole cover. Don't panic!

P3 MORE

By the way, if you're running a pump and tank unit, always keep the trailer coupled while loading or discharging. And always stand by your vehicle so you can move it in a hurry if you have to.

WHILE YOU'RE LOADING

Here's where your six senses'll do overtime duty. While your rig's pumping away, keep tuned to how it's doing. If any part of your equipment looks, sounds, feels or smells wrong, halt the operation pronto and find out what's wrong.

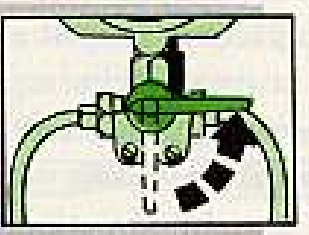


Always remember that mechanical equipment like the filter/separator, meter, etc., can fail. So play it safe. Check the equipment while it's running and check the fuel after the job's done.

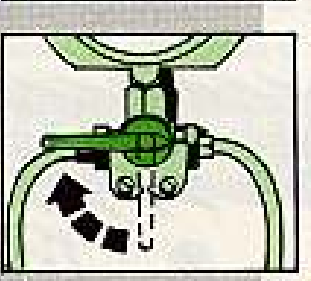
Your quickest check on the equipment is to take the pressure differential readings on both pressure gages—the one on the walkway by the filter and the other by the water separator in the rear compartment. They work in different ways, though, so watch it.

To get the pressure differential on the filter:

1 Push the shutoff valve lever to the right (toward the rear of truck) to get a reading on the intake side of the filter.



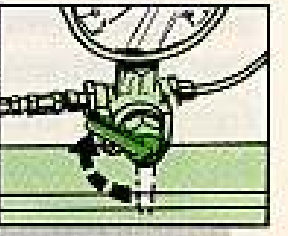
2 Push the lever to the left (toward the front of the vehicle) to get the reading on the outlet side of the filter.



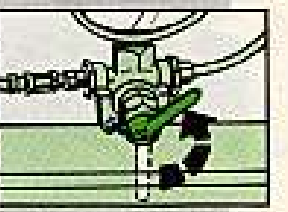
3 Compare the two readings. Normally they'll be 2-3 PSI off, but if there's a 10-PSI or more difference between 'em, you'll know the filter's not doing its job. Change the filter before the next fueling operation, like it says in Para 21 of TM 10-1113.

To get the pressure differential on the water separator:

1 Push the shutoff valve lever to the left to get the pressure on the inlet side.



2 Push the lever to the right to get the reading on the outlet side.

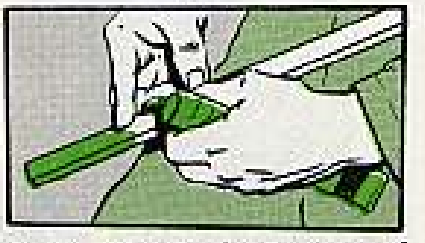


3 Compare the two readings. If there's more'n a 10-PSI difference, it means the cartridge is clogged and needs replacing. This job's spelled out in Para 19 of the same TM.

On tank and pump units where the filter and separator are combined in one gadget (filter/separator), you check the pressure differential just like you'd check it on the water separator mentioned a minute ago.

The best way to check the fuel to see the equipment's doing its job is:

You can take a sample of the fuel any time after it's passed through the filter/separator by easing up on the flow and letting some of it into a glass bottle or jar. Let the sample set for a spell before eyeballing it.



If the gas is OK, it'll be clean and bright. But if it has water in it, it'll be cloudy. Of course, you'll be able to tell if there's rust or dust in the fuel. Figure 1 in TM 10-1107 (Feb 60) will help you get the right slant.

This test has nothing to do with the color of the gasoline. The dye put in the gas — except JP-4, which is clear or straw-colored — is just to identify the type and grade of fuel. (You'll find a handy color chart on fuels in Figure 5 of this same TM.)

Use the water-finding paste after your tanker's been loaded and has been standing a while. Smear some paste lightly on the bottom couple inches of the gage stick and shove the stick gently to the bottom of the tank. The paste'll change color wherever it hits water, so you'll be able to measure just how much water's in the fuel.

The big thing in both these tests is to spot fouled up fuel. If it looks at all suspicious, tell your QM lab men to double-check it. Don't fool around with it. Spread the word pronto.

And, of course, these tests'll tell you how good a job your filter and screen equipment's doing. Do what's needed to fix them.

You want to check the pressure differentials right often while the rig's running. But don't forget a couple other important checks on all the other equipment. Here're the things to look for:

LEAKS — Tank compartments, piping, hoses, gaskets, pumps.

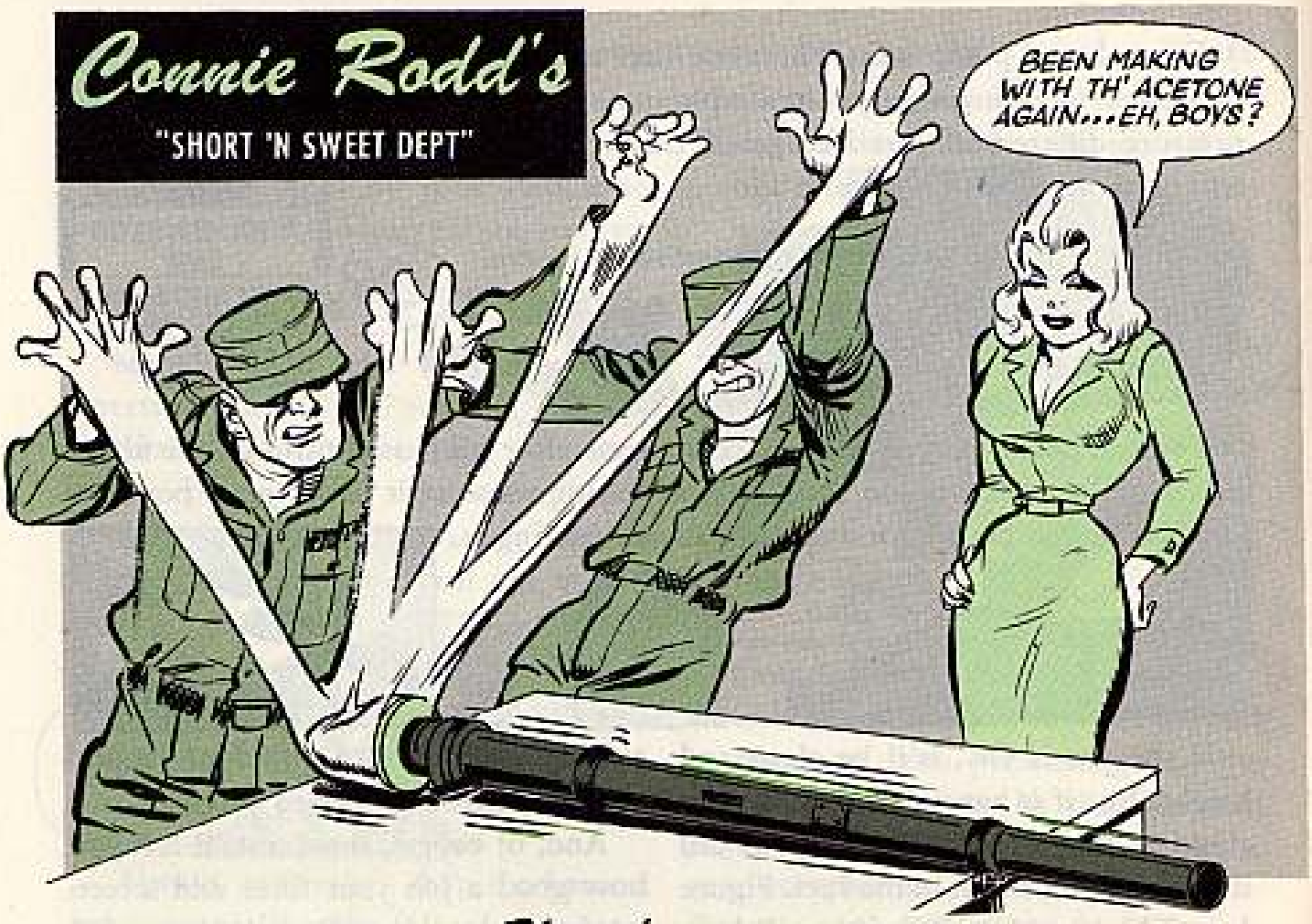
OVERHEATING—pump, pump engine, meter.

UNUSUAL NOISES — Pump: Whines (engine speed too high). Gasps (line passages partly clogged). Chatters or Grinds (pump NG, needs replacing). Speed varies (governor NG, needs replacing). Meter: Whines (meter screen needs cleaning).

A FINAL THOUGHT

Just remember, it took Nature (with a final assist from Man) a couple million years to produce that fuel. Please don't foul it up in the last few minutes.

PS END



Keep 'em as is

No doubt by this time you know two different types of instrument eyeshields are showing up in some of your tanks. Right?

One's a white latex job and the other's made of black rubber . . . and friend, each stays as it is—puhleeze.

Only three things Uncle Sam is loaded with go on the eyeshields—soap, water and elbow grease.

This three-horse parlay has been kicking around for a long time . . . but nothing beats it for giving out with the tender loving care that'll keep your eyeshields in the running all the way.

How-so-ever, if some hot-shot gunners have jumped the gun and painted the new black shields white to match the older ones, here's the solution—after you've read the riot act.

Get your supply man to pick up some Acetone, Technical (FSN 6810-281-1861, 1 gal CHEM) through regular channels.

Acetone will remove the paint from the black shields without chewing up the rubber—then you can finish up the job with the soap and water routine.

But don't, like never that is, use Acetone on the white latex shields. It'll turn them into a gummy, sticky mess.

So much so, you'll think you're pulling salt water taffy at the seashore on a hot, humid day.

A light touch with some fine sandpaper, followed by soap and water will take care of any paint problems on the white shields.

Adjust the adjustment

Valve tappets for both intake and exhaust valves on your G741-series ¾-ton truck engines should be set at 0.014 to 0.016 inches.

So, make sure you note this when adjusting valves like it says in para 113h of TM 9-8030 (2 May 55). This is the latest poop for old and new T-245 engines . . . just like the decals on the new engines' tappet covers say . . . tappet adjustment should give a clearance of .015, plus-or-minus .001.

And the same info applies to the M601 1-ton special power wagon, covered by TM 9-8854 (18 Oct 57).

Pubs for office machines

You say you need publications for office machines and can't get 'em locally? Here's the latest dope:

Wind up a DD Form 1149-4 (1 Jul 56)—Requisition and Invoice/Shipping Document—and chute it through regular supply channels to the QM Equipment and Parts Commodity Center, Miscellaneous Equipment Parts & Supplies Division, Columbus General Depot, Columbus 15, Ohio. Be sure you give all the poop on your equipment . . . its manufacturer, model, serial number, etc.

Of course, if you're overseas, your "regular channels" would be through the Overseas Supply Agency, right?

'Scope dope

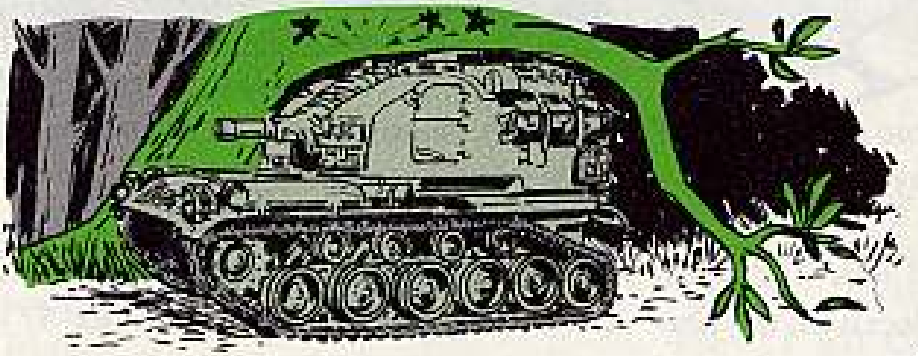
Ask the man who has one. He'll tell you the M100 panoramic telescope is used on his tracked vehicle to lay the main armament for indirect fire.

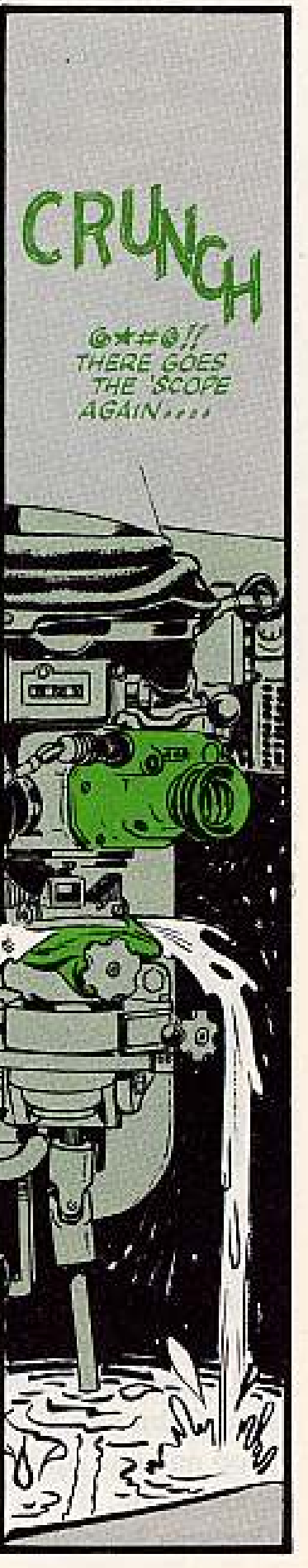
He'll also tell you that the 'scope can take just so much of a beating—then it's going to yell, "Uncle."

That means like leaving the M100 in its mount when you're finished with it. Comes a low-hanging branch as you're cruising along . . . and the 'scope gets clobbered.

Or maybe it gets good and wet from rain. The water works its way down into the base of the 'scope . . . and plays hob with the gears.

In other words . . . it's worth taking the time to get that M100 off its mount and into its box. And don't forget to put the travel insert in the place of the 'scope—to keep the gimbal assembly in the M99-series mount from taking a beating when your vehicle's on the move.





Easy on the seal

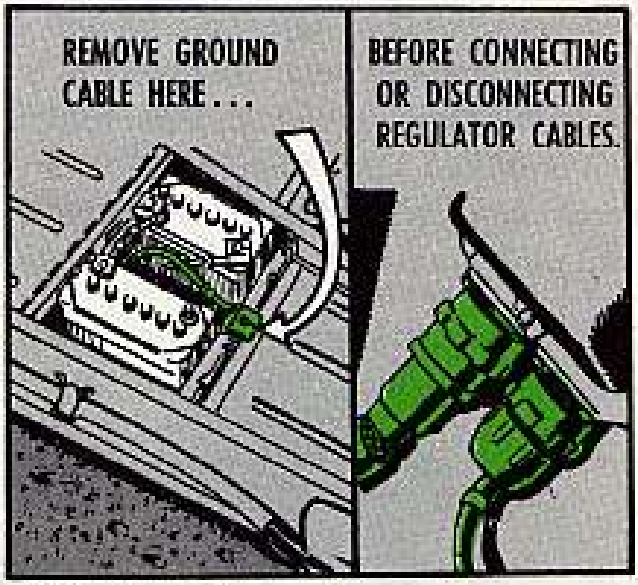
Sure . . . you handle the M100 panoramic telescope inside your tracked vehicle as careful as you'd tote a tray of 3-point-2 across a crowded dance floor.

And the seal covering the azimuth assembly on the telescope mount is a nice soft spot to rest the 'scope before you put it in the mount. Trouble is . . . it's also a good way to put a hole in the seal.

When that happens, you're fouling up the whole idea of the seal—to keep dust, water and what have you out of the azimuth assembly.

So . . . please to be careful with the seal.

Take heed



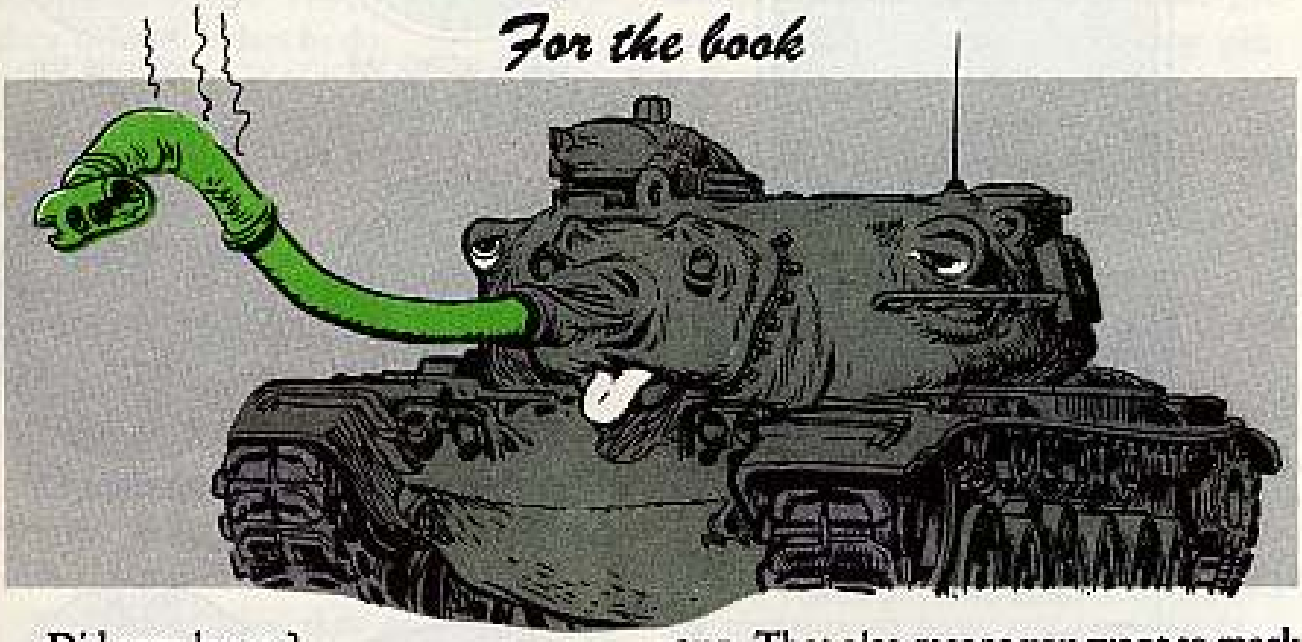
Most generator regulators on your tactical wheeled vehicles have a warning stamped on 'em that reads something like this—"disconnect leads at battery before servicing unit". If not, it should be there—or in your vehicle TM.

Always remove the battery ground cable any time you connect or disconnect the regulator cables. If you don't the regulator's contacts could close and burn up some parts of the electrical system.

F'rinstance, a mechanic left the battery hooked up in his M151, ¼-ton truck and took a hammer and screwdriver to tighten the waterproof connector (instead of the spanner wrench in his #1 and #2 common tool kit). Burned out the generator, regulator, and cables when the contacts closed.

A sudden impact on any regulator can close the relay contacts in it. So get the cotton pickers busy, and remove the ground cable first.

For the book



Did you know?

The M41 90-mm gun on your M48-series tank is good for seven re-tube jobs. It's a fact, sure enough.

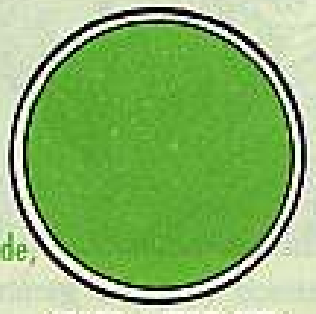
So it's important to keep track of the tubes in your Weapon Record Book to make sure you get the most out of your gun. That also means you want to mark down the kind of ammo you use 'cause the life of the tube depends on the kind of stuff that goes through it on the way to the target.

And don't let the book get away from its weapon.

IS THIS YOUR LINE . . . ?
RADIOACTIVE TEST SAMPLES . . . ALPHA-BETA-GAMMA

For the vital ABC know-how you must have if you're going to be anywhere near radioactive test samples, you'd best get right chummy with these new Chemical Corps radioactive test sample TB's.

You'll find them sharp and to the point. They tell you how you can identify, care, use, store, and even how to get rid of radioactive test samples. You'll also find safety cautions spelled out for handling the stuff. They're all dated October 1960.

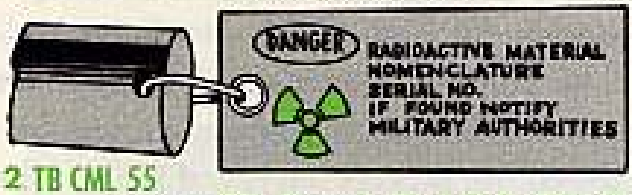


COATED (ACTIVE) SIDE

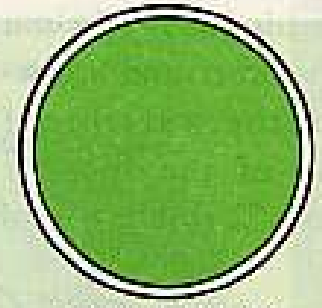
UNCOATED SIDE (EARLY MODELS)

UNCOATED SIDE (LATE MODELS)

1. TB CML 53 Uranium Oxide, Alpha, M3.



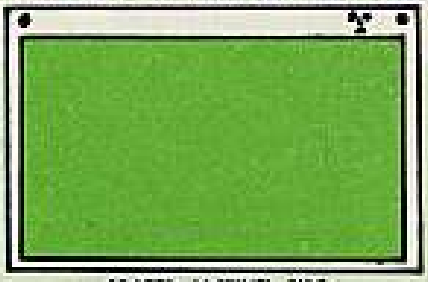
2. TB CML 55 Radium 226, Gamma, MX-1083B/PDR-27.



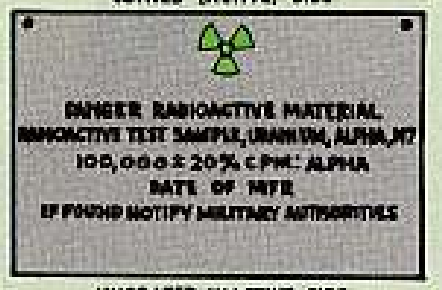
COATED (ACTIVE) SIDE

UNCOATED SIDE

3. TB CML 62 Uranium Oxide, Alpha, M5.

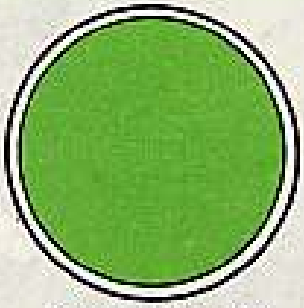


COATED (ACTIVE) SIDE



UNCOATED INACTIVE SIDE

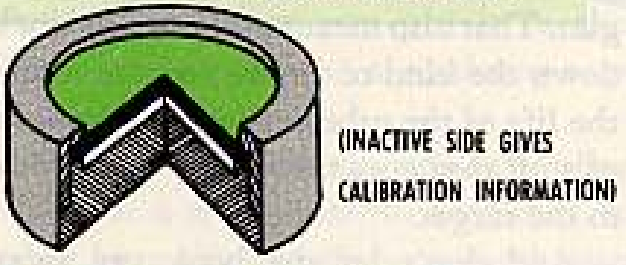
4. TB CML 63 Uranium Oxide, Alpha, M7.



COATED (ACTIVE) SIDE

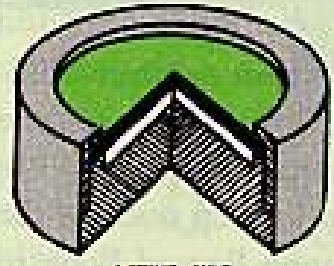
UNCOATED SIDE

5. TB CML 64 Uranium Oxide, Alpha, M4.



(INACTIVE SIDE GIVES CALIBRATION INFORMATION)

6. TB CML 65 Lead 210, Gamma, M2.



ACTIVE SIDE

INACTIVE SIDE

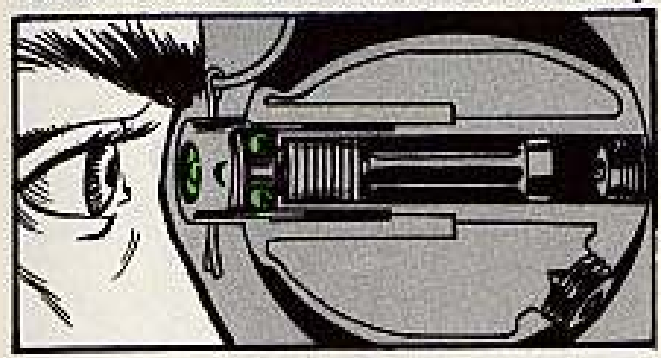
7. TB CML 66 Cobalt 60, Gamma, M1.

GRENADE SAFETY CHECK

All M25A1 hand grenades (hand, riot, CN-1), FSN 1330-219-8578, from Lot No. SF-229-2049, must be checked quick-like to see if they're equipped with safety balls.

The check's easy to make—just take a careful look into the fuze collar.

You can see the safety balls through the openings along the inside of the fuze collar. There should be two safety balls—one on each side of the collar.



If you see two tiny, shiny, "ball-bearing" type balls, the grenade's OK. But, if you don't find any balls, the grenade's risky and has to be destroyed. So, don't let anybody put their cotton-pickin' fingers on the safety pin . . . quick-like yell for your safety officer, or your ammo support people . . . they'll know what to do.

Safety balls, as you know, provide an added safety device. After you pull the safety pin the balls will keep the grenade from arming . . . as long as you

hold the arming sleeve down with your thumb, that is. So check this lot of M25A1's extra close . . . and make it strict SOP to always look for the safety balls in any M25A1 hand grenade—before you pull the safety pin.

TRIM THE PIN

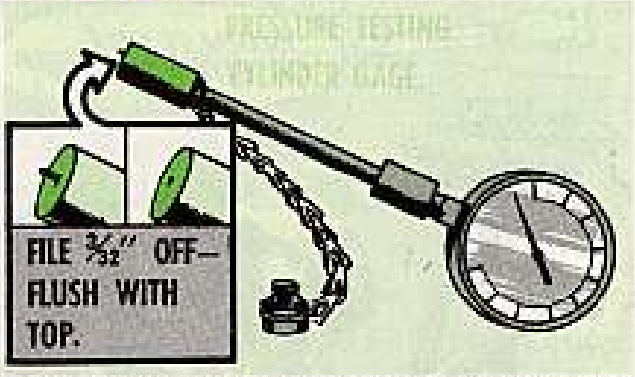
Best see that this cutting chore is tended to soon.

Take the pressure cylinder testing gage in the M2A1 portable flame thrower service kit (FSN 1040-095-0063), and get its pressure-release pin shortened just a wee bit.

The pin needs filing down about 3/32-in—just so's its point is exactly flush with the top of the adapter.

Make sure, tho, that an expert with a light touch does the job. He can pull the pin out of the gage and trim off 3/32-in with a fine emery wheel, and then smooth off the point with a fine file.

If he can use a fine file very, very lightly, and gently—without pushing too hard, he won't have to remove the pin to do the job. And he can use light air pressure to blow out any filings.



When the pin is shortened it'll be easier to seat the gage right without any pressure being lost and the pin'll last longer 'cause it'll not get its nose rammed every time the gage is attached to the flame thrower's pressure tank.

AND AWAY SHE GOES

That may be the story at your missile site.

It's not the missile taking off—it could be your cylinders on your M15 compressed air breathing apparatus.

Some outfits have their cases fastened on the wall so they'll have their masks handy. If that's where yours is located, there's something to keep in mind.

If you aren't careful when you open the lid you're liable to have everything come toppling out of the case.

The mask could fall out and be damaged which would put it out of commission when you need it. But you could run into real trouble if the cylinders fall out and the compressed air launches them like a misguided missile.

So remember easy does it when you reach for your M15.

BAL's OUT

The latest word on BAL ointment (in the M5A1 protection and treatment kit, FSN 6505-368-6152), is to toss it out.

Some of you may've already gotten rid of leaky BAL tubes 'cause they were messing up your kit. Well, don't bother replacing 'em . . . as of now, all BAL, leaky or not . . . gets dumped. The eye ointment no longer belongs in your M5A1 protection and treatment kit.

You can get rid of the ointment by burning it (which is the preferred way) on an open fire, or if a fire's not practical, you can bury it. If BAL has to be buried, its resting place should be in a deep hole in a restricted area.

If in doubt as to which one applies to your situation, see your safety officer.

VARIATIONS, ANYONE?

Dear Half-Mast,

We figure you're the one to settle the dust of an argument we've been kickin' up for quite a few moons. It's all about the installation instructions used in mounting our radios in ¼-ton's, APC's, and so forth.

Here's the deal: Some of us say these installation instructions are really guides to follow and are not necessarily directive. Others insist the communication equipment must be installed according to the installation instructions—with no messin' around.

Maybe the answer lies somewhere in the middle, Sarge. How about a helping word or two?

SFC M. I. C.

Dear SFC M. I. C.,

Good question. Tough question. And, like you suspect, the answer lies somewhere in the middle.

Bear in mind, Sarge, that any set of instructions for installing communications equipment in a vehicle is a compromise. A compromise involving size, weight, space and use.

For example, if a set needs to be driver-operated, it should be bolted into place where a driver can reach it without turning himself into a pretzel. But you and I know that these sets are heavy, and the demands of weight distribution—in the space available—may mean it has to be installed in a less handy location.

And you know, the experts have figured out these compromises to a pretty fine degree. I figure a man would have to be mighty, mighty shrewd to improve on 'em all around. So, you might say the instructions are "unofficially" directive since there's just about no room for variation.

But lookin' at it another way, Sarge, the special situation facin' your CO may push him into having to approve some installation changes. This may require re-positioning of equipment in a vehicle to meet special requirements. Your CO can have it anyway he sees it—in order to get the best results.

Sarge, I'd say stick to the instructions unless—unless your CO approves otherwise.

Half-Mast

REEL OIL

Dear Half-Mast,

Our outfit has been gigged for using the wrong oil on our RL-39 reels. We've tried to find an LO telling us what to use, but there doesn't seem to be any.

Can you tell us the right lubrication?

Sgt B. R. J.

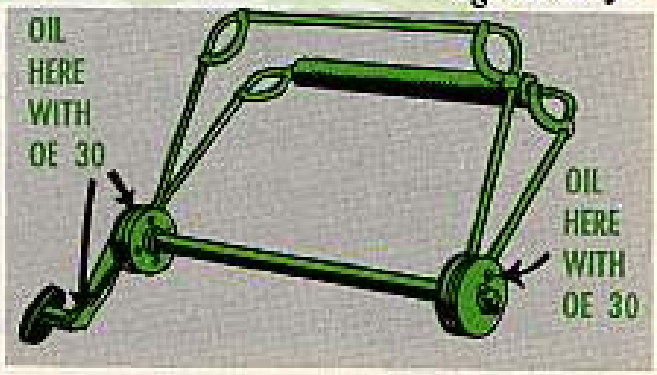
Dear Sgt. B. R. J.,

A squeaky reel has double importance. Besides the maintenance angle, there's always the danger of it becoming the final reel for the operator.

TB SIG 314 (7 Oct 57) on Reel Equipment CE-11 tells you not only what you should use on Reel RL-39-(*) but where to use it.

In short, it's OE 30.

Drip a few drops each month into the small oil fittings in each bearing assembly and into the oil hole of the crank handle.

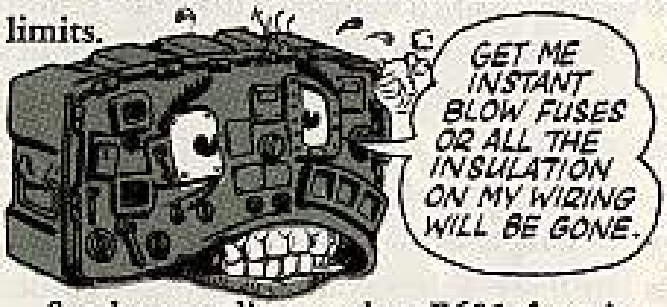


And, whenever you take the reel apart to clean the bearing bushing, remember to put a few drops in each oil cup after you've got her reassembled.

Half-Mast

SLO BLO—NO GO

One thing a fuse doesn't want to do is hold out. The thing to do is blow out—as soon as the load climbs above safe limits.



So the word's out that F601 fuse in your transmitter T-195/GRC-19 filament circuit is holding out longer than it should. Seems she fails to blow during brief overloads, resulting in overheating and breakdown of wiring insulation.

The solution is simple. Just replace the slow-blow 15 amp fuse (FUSE, CARTRIDGE FSN 5920-281-0813) with an instant-blow version (FSN 5920-012-0151).

Y'might make that switch soon . . . so's to eliminate any possible confusion on fusing.

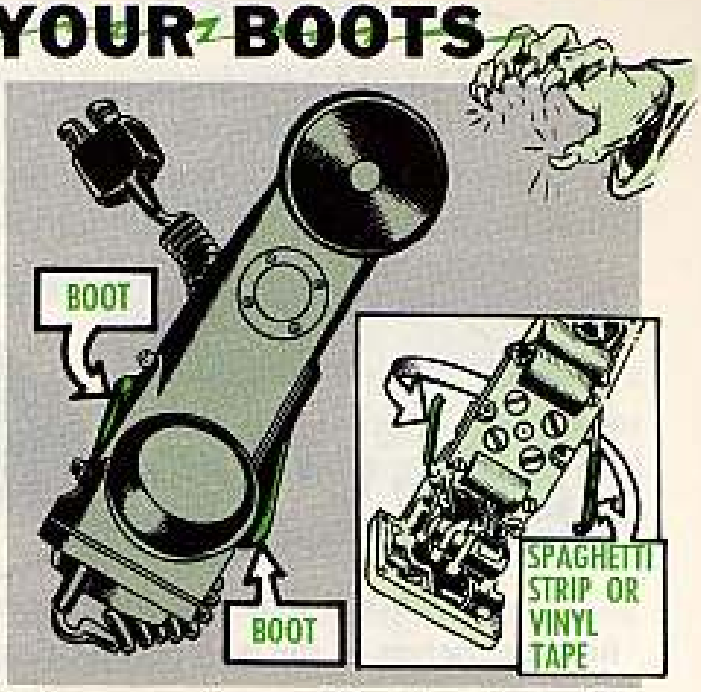
DON'T NAIL YOUR BOOTS

Vital but fragile.

That's the soft rubber boots covering the push-to-talk and ringing switches of your telephone set TA-1/PT.

These boots live a short life even in normal use. But they can die a quick death if operators spend the time between messages digging their fingernails into them.

It doesn't take long for the nail marks to grow into large cracks which expose the set's interior to dust, dirt and moisture . . . and deadlines it to boot.

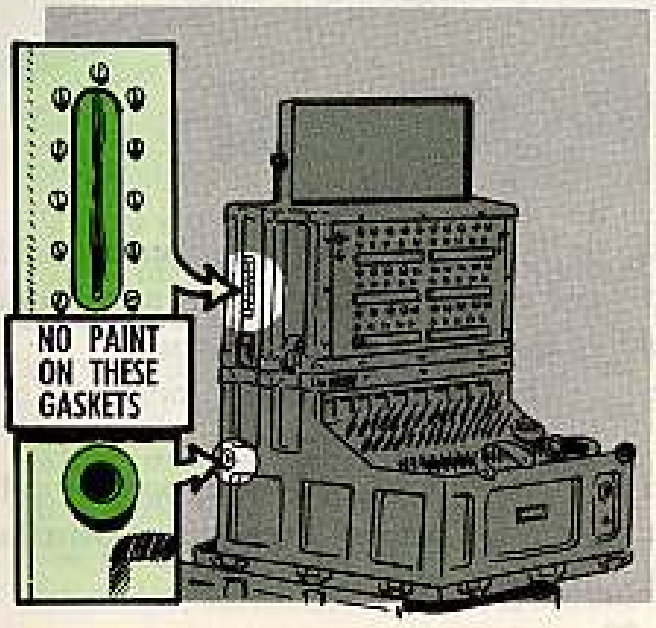


A little PM can also go a long way during normal operation since the rubber boots rub against the switches. While this lets you ring or talk, it also works up friction.

You can cut down on this by putting a thin plastic "spaghetti" strip over the switch levers. Or, if you're fresh out of spaghetti, wrap some vinyl electrical tape around them.

SPARE THOSE GASKETS

Next time you spot paint your switchboards, SB-22/PT, SB-22A/PT, or SB-86/P, spare those little rubber gaskets covering the slots where wires go inside the sets.



On the SB-86/P you'll find the gaskets around the field wire entries of the jack field section and around the power cord entries of the keyshelf.

They're on the sides of the SB-22/PT and SB-22A/PT.

Keeping paint away from the gaskets may take a bit longer to complete the job but it'll save somebody the job of replacing them later.

The reason is simple . . . paint has a way of breaking down rubber.

And without the gaskets, your switchboards have nothing to protect them from moisture, dust or dirt.

As any good operator knows, the gaskets should be cleaned daily to protect them from dust and dirt.

WATCH THOSE POSTS

Those L1 and L2 binding posts on your remote control C-433/GRC and local control C-434/GRC appear to lead sheltered lives.

That's because they seem to be protected by the flanges around the edges of these controls.

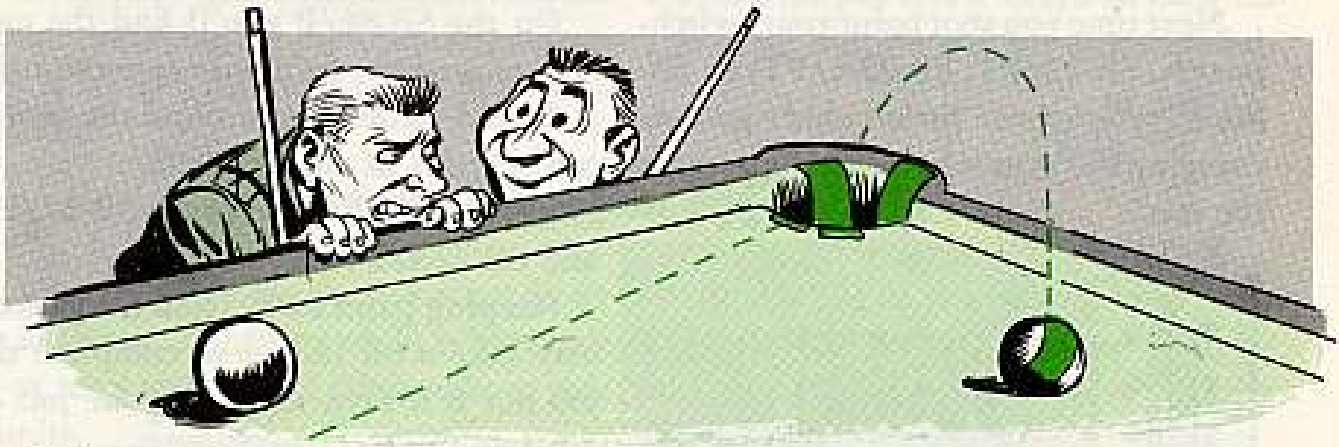
But, the truth is that they sometimes find themselves in the way of a passing wrench . . . or worse.

When that happens, the biggest damage is suffered not by the posts, but by the molded plastic washers insulating them. These washers crack often, leaving you with a short circuit . . . and no local control.

As for the posts, they may bend under the same blow. Although usually this can be straightened out with a pair of pliers.

But the best medicine for the posts and washers is the brand used by a careful operator. It's called BC or Being Careful . . . which means you don't bang 'em up in the first place.

STRIPPING FOR PROTECTION



Have any holes you'd like to give a rubber lining to? Think maybe your electronic gear should be protected against shocks . . . electrical or otherwise?

If so, there's a handy little rubber strip waiting to take the edge off things. The strip's got a cross-sectional channel, or "U" form. It can be snapped quickly and easily over most of the metal edges of electronic chassis or panels.

The strip's three feet long, but can be cut to any length.

You can get your mitts on it by calling for: Cushion, Transmitter Distributor, FSN 5815-125-4920.

EARRINGS

Many a Joe has circles under his eyes, but have you noticed some tankers or air types with rings around their ears?

Unlike the circles, these don't come from a shortage of sack time. They're made by the sweat and skin oils that work into the headset cushions. This happens to the cushions on headset-microphone kit MK-400/G or MK-401/G, both used in the T-56-6 crewman's helmet; headset H-75( )/AIC, used in the APH-5 flying helmet, and headset H-101 ( ) AIC.

Besides running rings around a man, the sweat and oils damage the cushions.

You can prevent this with just three clean cloths and some mild soap.

Just to play it safe, you might let the cushions stand in a shady spot for a while.

When you do this, you've got to keep the soap and water from getting into the receivers.

And, don't try any shortcuts with strong soaps, such as yellow issue soap, or cleaning fluids. These'll do more harm than good in the long run.

When your cushions begin to show that dying look, replace them with new ones.

BOOMERANG

That's right!

Lots of communication equipment has been behaving like a boomerang lately. It gets tossed up to field maintenance for repair—and bounces right back at its unit without so much as a particle of dust switched around.

So the rules of the game are simple: Make triple sure that all first and second echelon maintenance has been pulled on your Signal equipment before sending it up to field maintenance.

It figures. Because you want to keep your equipment within your unit whenever and wherever possible.

After all, it's tough enough to lose the gear for legitimate repair needs—let alone for unnecessary ones.

SHELTERED THOUGHTS

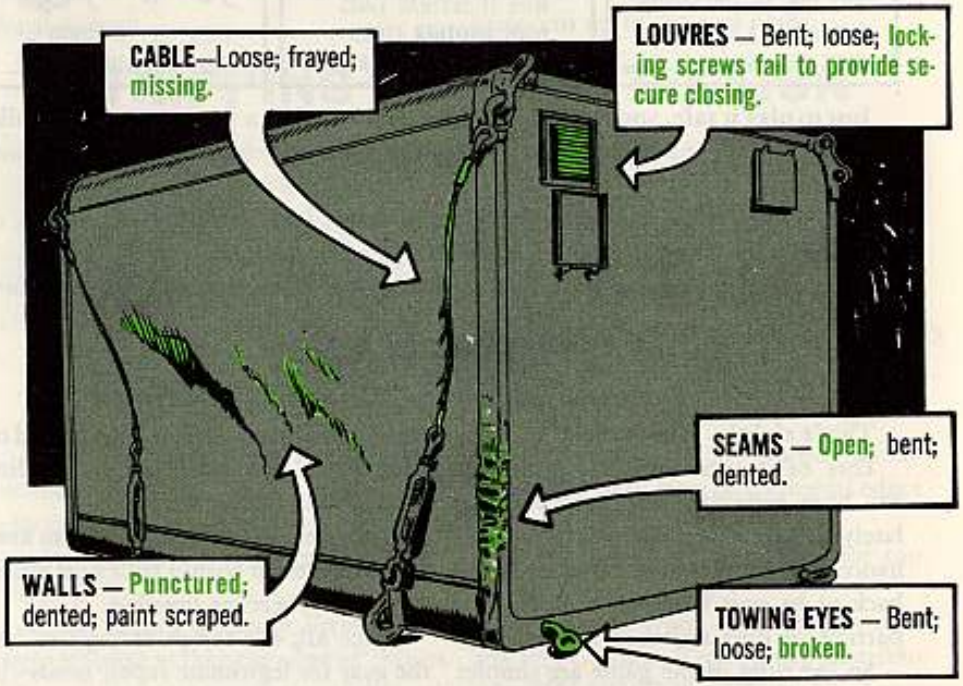
No matter how you figure—or configure—them, your S-141/G electrical equipment shelters pack the kind of protection your field communication equipment needs to handle the message and get it through.

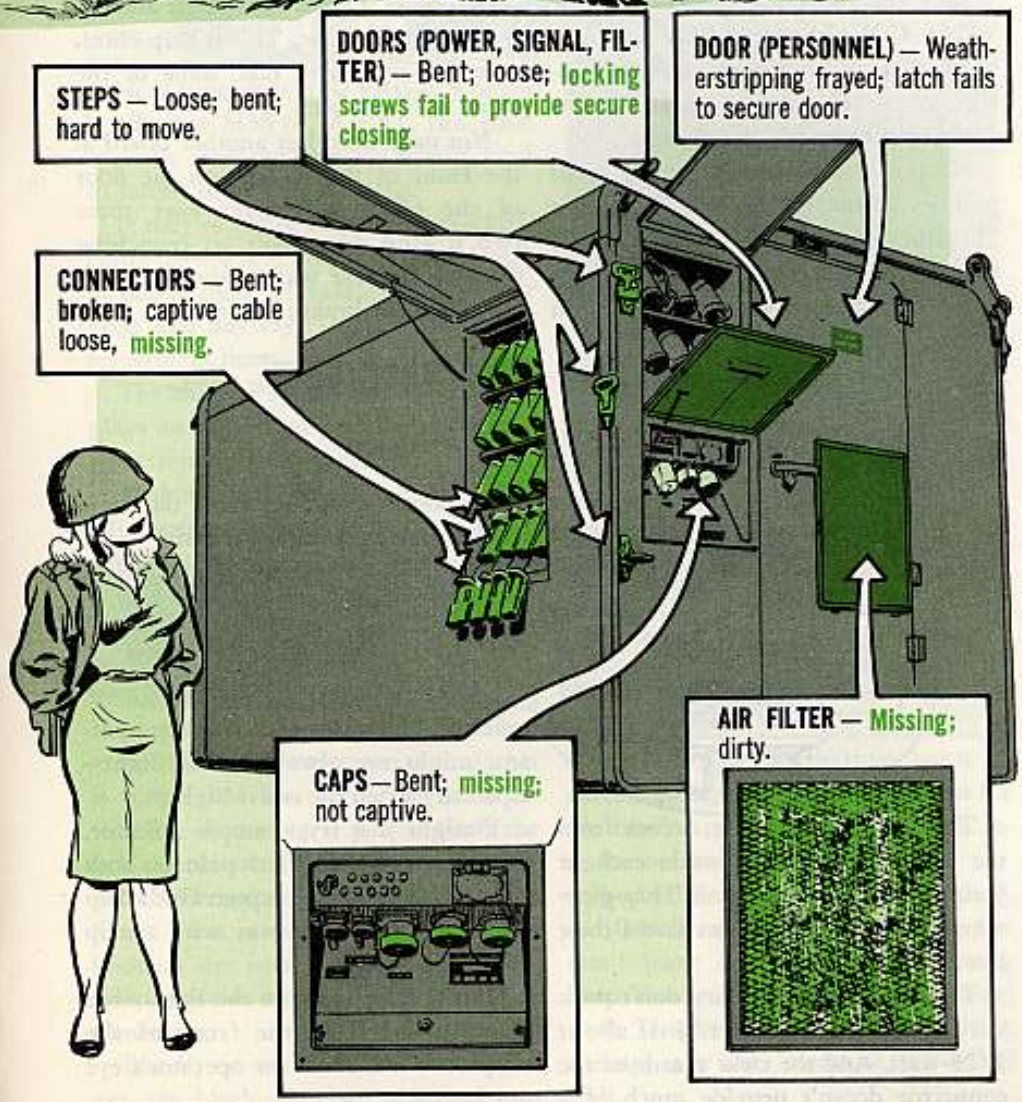
She's light enough for air lift . . . sturdy enough for cross-country humping in a deuce-and-a-half . . . and roomy enough to house the electronic brains vital to modern battlefield communications.

Still, she needs a constant touch of PM to make sure she comes through—in all kinds of weather and under all tactical conditions.

A handy check list will help ease that chore—and increase the payoff of your preventive maintenance.

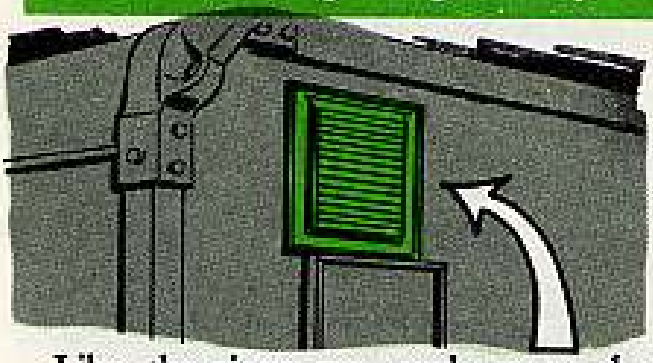
The items in **bold type** are real serious and need prompt action.





MORE

A few sheltering thoughts for your S-141:



Like the signs say, make sure the VENT COVERS are OPEN for AIR LIFT. Otherwise, the changes in pressure as the shelter goes up and comes down will cause big, big trouble.

Keep a weather eye open for small puddles inside the shelter. Your hut "breathes" to a certain extent, forming moisture on the inside as she heats up and cools off. And when moisture and electricity get together, they produce electrocuting results.

After you've slung your hut into its deuce-and-a-half—and tightened up on its cables—you might want to add an extra measure of security. Slide some two-by-fours onto the bed of the truck, between the sides of the shelter and the walls of the vehicle. This'll help eliminate side-sway and take some of the strain off the cables.

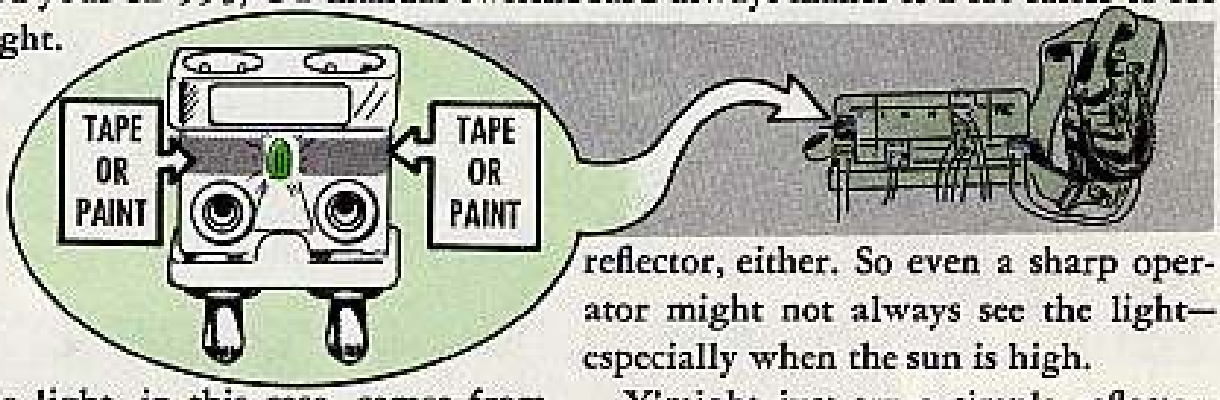
Not only that, but another board at the front of the shelter—on the floor of the truck—will make sure those two towing eyes don't go crunching through the rear wall of the truck cab next time the brakes go on.

GLOWING THOUGHT

A little darkness comes in handy sometimes. . . .

Heh. Heh.

And from a strictly communications standpoint, wrapping some darkness around your SB-993/GT manual switchboard always makes it a lot easier to see the light.



The light, in this case, comes from the small glow lamps inside each of your U-184/GT connectors. They glow whenever a message comes down their line.

Trouble is, though, they don't pack very much candlepower. Just about 1/25-watt. And the clear plastic of the connector doesn't provide much of a reflector, either. So even a sharp operator might not always see the light—especially when the sun is high.

Y'might just try a simple reflector, then. Just dab some black paint on both sides and rear of the adapter. Or darken the adapter the same way with a strip of black tape.

This'll serve to beam the light more directly out from the front of the adapter so it'll catch the operator's eye quicker and easier.

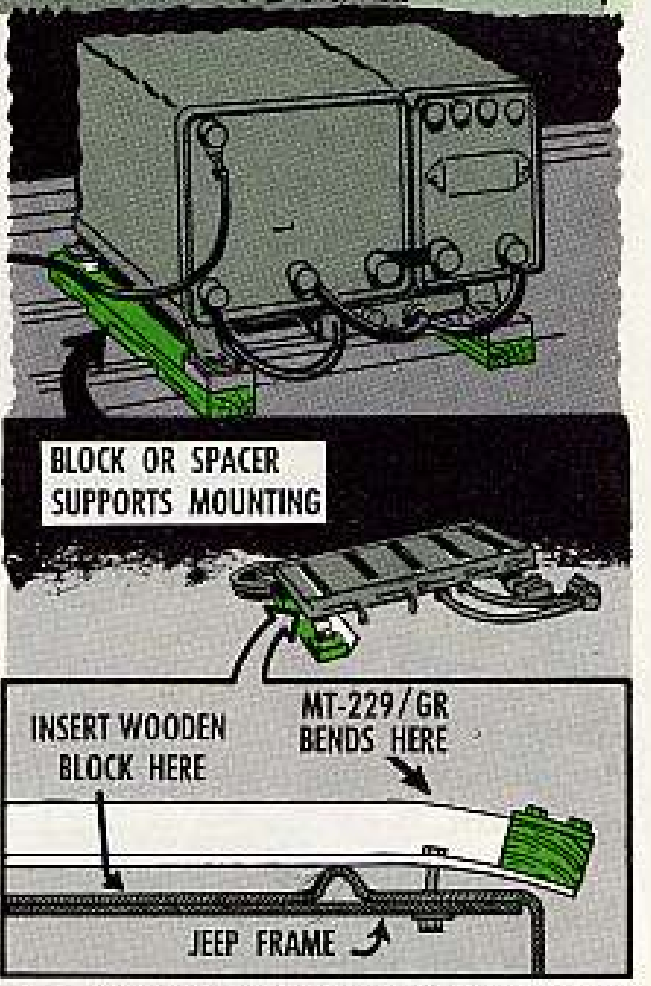
DON'T KNOCK THE BLOCK

Next time your AN/VRC-8, 9 or 10 is off your M38 or M38A1, run your eyeballs over the wooden blocks used to fasten the set's mounting.

If they're badly chipped or cracked, better chuck 'em for new ones. Don't be one of those who say, "Well, I don't need that anyway," and re-mount the set without them.

The block, or spacer as it's also called, plays an important part in supporting your commo equipment.

Without it, the mounting, MT-299/GR, bends where it sticks out beyond the vehicle's wheel well. And almost before you know it, your set starts bouncing up and down because its solid base is no longer solid. The final stop is a trip to the shop for the set as well as the mounting.

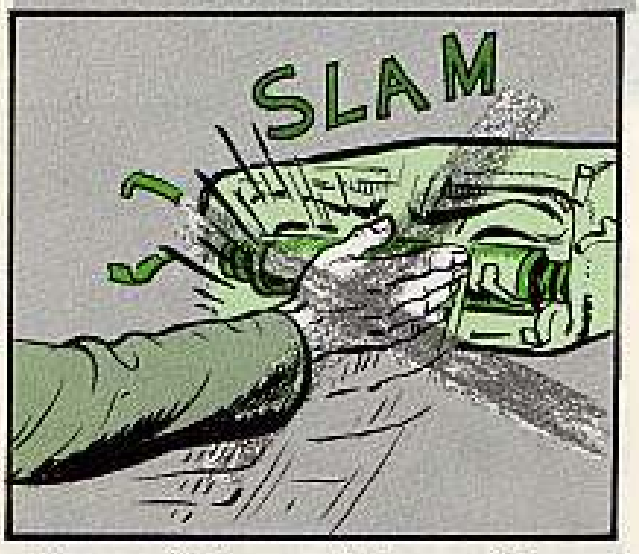


Of course, the way to prevent all this is simple PM for that block from the time the mounting is pulled from the vehicle till it's replaced. Put it some place where you'll be able to lay your hands on it, comes time to put the set back on the jeep, and where it won't fall or get in the way of someone or something.

But if, no matter how careful you are, the block does get racked up, no sweat. It'll take a little time, but a replacement can be made easily. Plans for the block are shown in your set's installation instructions.

And while you're putting that 8, 9, or 10 back on its steed, make sure you don't leave out the steel reinforcing strip that goes underneath the wheel well. That keeps the nuts from pulling through the thin metal of the wheel well.

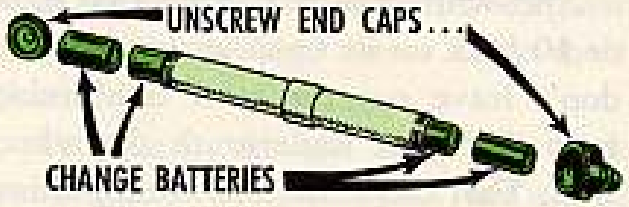
CONTACT



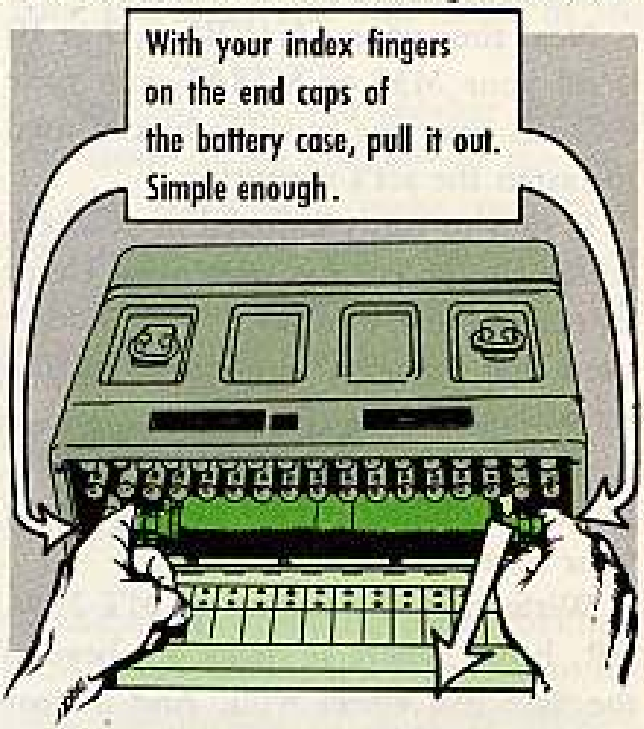
Just a little word—but without it your manual telephone switchboards SB-22/PT and SB-22A/PT can't do their jobs.

And a little carelessness can cost you a good contact . . . if you're lucky. If you're not, it'll mean a trip shopside for your board.

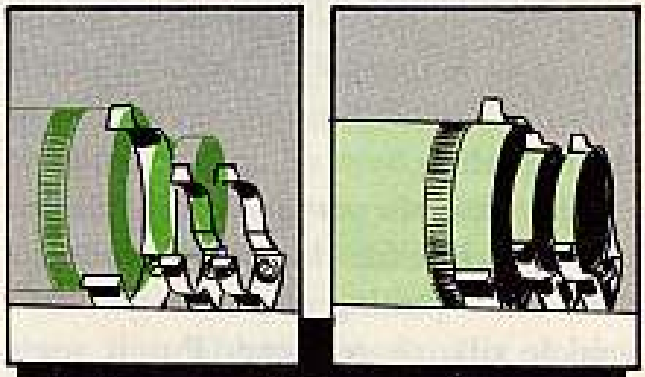
Replacing batteries is one of those little jobs that can grow into bigger ones. If you handle the battery case roughly, you might bend the contacts slightly. Then if you're not careful you can break them completely when you try bending them back into place.



So, to keep your spring contacts and retaining springs in good shape, do like it says in TM 11-5805-262-12 (15 Dec 60) when you have to change batteries:



Replacing it is just as simple.



Put the case on the contacts and press it into the spring contacts.

Do that and you'll not have your contacts sprung open. But if you do come across a sprung spring, bend it back carefully.

***ALFA COMPANY** was the hottest outfit in the Battle Group! They had a citation for the best performance during exercise Blue Cloud at Fort Flagg . . . They were twice commended during Division inspections . . . They were the only outfit to lead the 4th of July parade at Shangri-La three years in a row . . . Like, they were Gung Ho!*

They were, in fact, the first 'READY' *company on the apron on the day the balloon went up!*


48 hours after they hit the line, A Company took ROTGUT HILL . . .


. . . and buttoned down for the expected enemy counterattack.

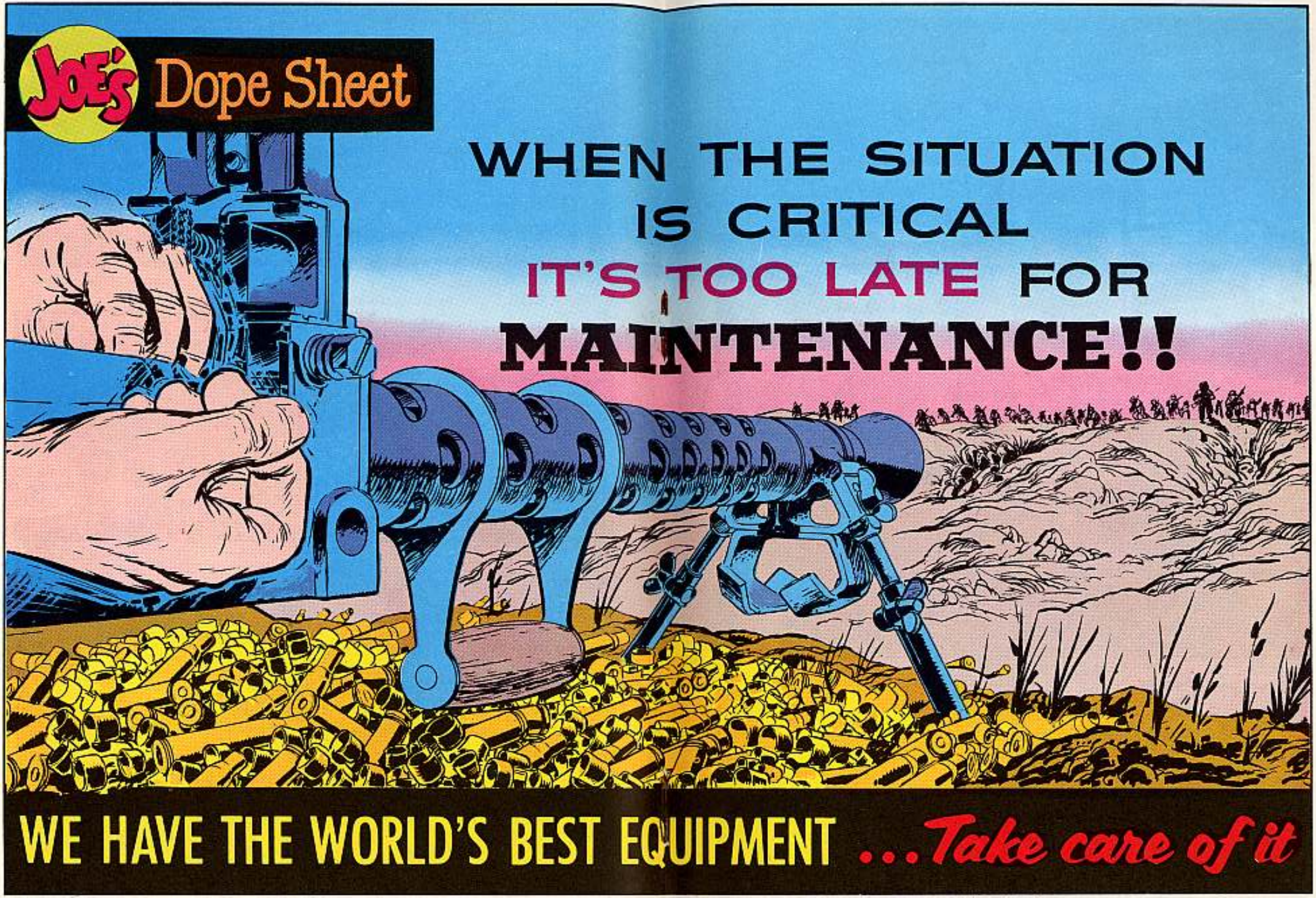

ARE YOU IN CONTACT WITH BATTLE GROUP YET? WE'VE GOT TO GET HELP ON THE LEFT FLANK... INFANTRY AND ARMOR ARE MOVING IN AROUND HILL 701.
SIR, THE RADIO'S ON THE BUM AGAIN... I'M TRYING TO FIX IT UP...


ARROW SIX FROM ALFA FOW-OR... WHAT... SAY AGAIN... CHUH? SAY AGAIN, PLEASE... OVER... *?*@!! OUT!
?+★!@?! I SHOULDA MADE SURE THIS DARNED THING WORKED WHEN I HAD THE CHANCE!


RADIO'S STILL ON THE BLINK, CAP'N, ER... GOTTA DO A LITTLE MAINTENANCE ON IT.
TOO LATE... GET A RUNNER TO BATTLE GROUP... HOT FOOT IT!!!


ONE HOUR LATER . . . at Battle Group
AND THEY NEED HELP PRONTO... THERE'S TANKS AND INFANTRY BACK OF HILL 301.
YOU DID THE BEST YOU COULD, BROWN... CAPT. PETE -- GET BRAVO MOVING TO THE "NOTCH" TO PROTECT ALPHA'S LEFT FLANK.
SADDLE UP, McHOOLIVITCH...


MEANWHILE . . . Back on Rotgut Hill
TIME'S RUNNIN' OUT! THEY'LL COUNTERATTACK ANY TIME NOW...
PROBABLY COME THIS WAY--SO KEEP THIS OUT-POST ON THE STICK 'N CHECK Y'R WEAPONS NOW!! GOT IT?
WILL DO, SARGE, OL' SOCK!
AHHH...SHE'S OK... THO' TH' HEAD SPACE OUGHT TO BE ADJUSTED... WHERE'S THE HEAD SPACE GAGE?
I DUNNO-- THOUGHT YOU CARRIED IT!
AND THEN IT CAME. Ol' Rotgut shook like gelatin in the hands of a nervous waiter . . . VAVAVOOOMM!

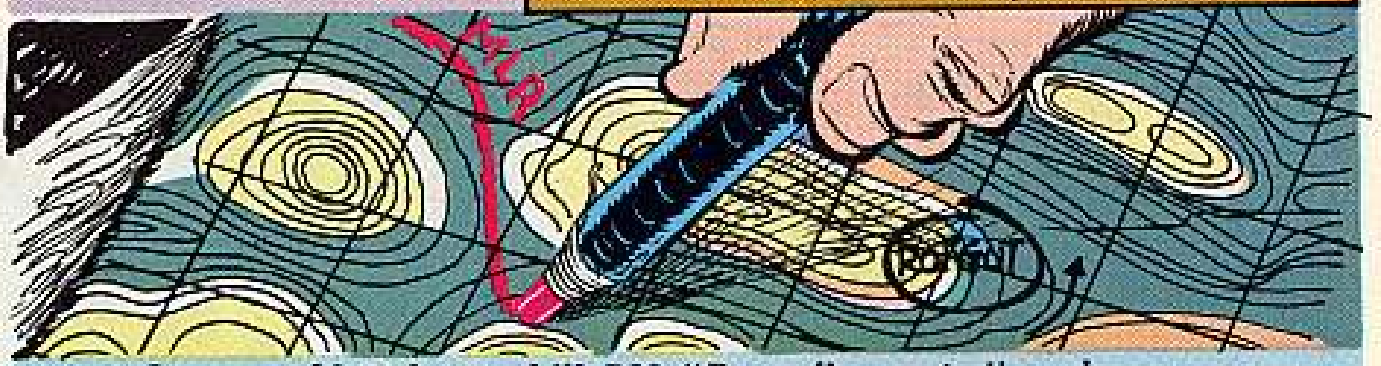


IF YOU WANT TO DISPLAY THIS CENTERPIECE ON YOUR BULLETIN BOARD, OPEN STAPLES, LIFT IT OUT AND PIN IT UP.


AT THAT MOMENT trucks carrying Bravo Co. were Jackrabbiting along Snakebelly Canyon ridge . . . when, suddenly—
In the lead truck . . .
WOTCHA LOOKING AT?
?
OIL PRESSURE'S ALMOST ZERO, THAT'S WOT!!
AHH... SO THE CRANK CASE HAS BEEN LEAKING LATELY, NO SWEAT...
?
OH! OH! BETTER HALT!
GRIND
NOK
15 minutes later . . .
GET THAT HEAP MOVING... YOU'VE STALLED THE COLUMN!
SHOVE IT OVER THE ★!!+@?!! CLIFF, McHOOLIVITCH!
TOO LATE... LOOK!!
It took enemy planes only a couple of passes to cream the column . . .

WHILE . . . *up on Rotgut, Alfa Company braced for the assault.*

At the crest, ALFA Co. fought for its life . . . Fierce hand to hand flurries, as they closed with the determined enemy . . .

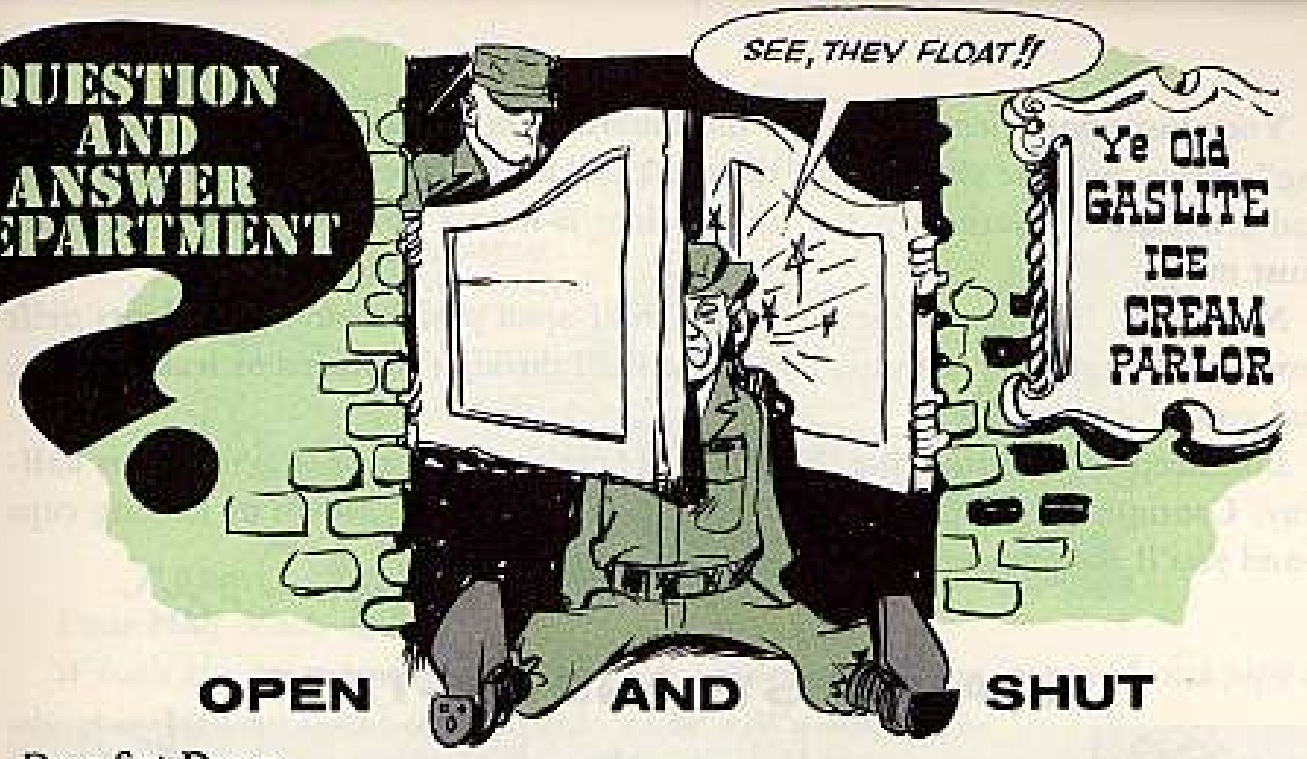


So . . . at 2342 hours, hill 709 "Rotgut", was indicated as forward of M L R . . .

WHY DID THIS HAPPEN TO COMPANY 'A'??

WHEN THEIR SITUATION GOT CRITICAL... IT WAS TOO LATE FOR MAINTENANCE!!

QUESTION AND ANSWER DEPARTMENT



OPEN AND SHUT

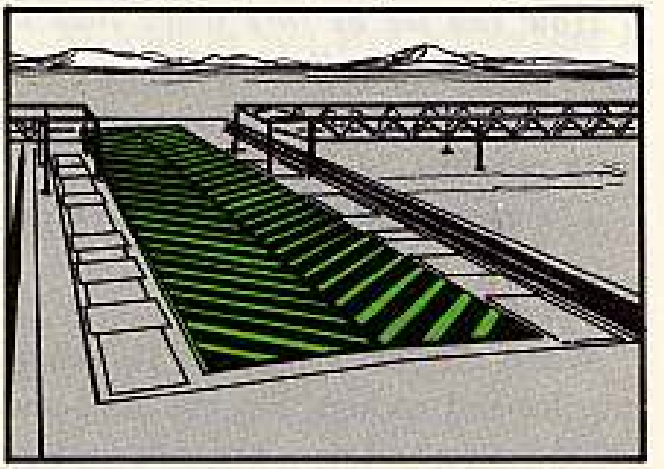
Dear Sgt Dozer,

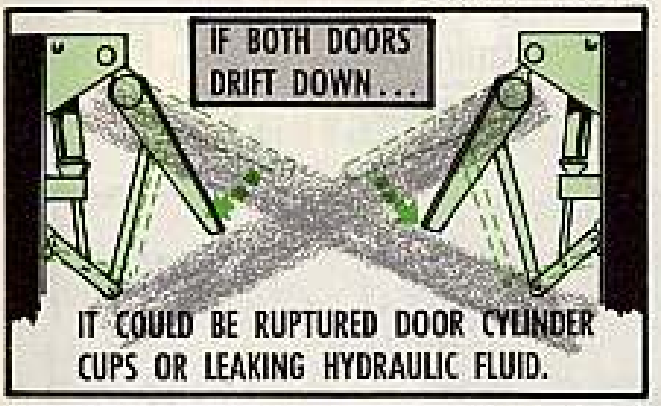
Our Nike battery was gigged for "floating" elevator doors. We checked with our field maintenance people and they said it was OK for the doors to "float" when they're stopped in a half-open position.

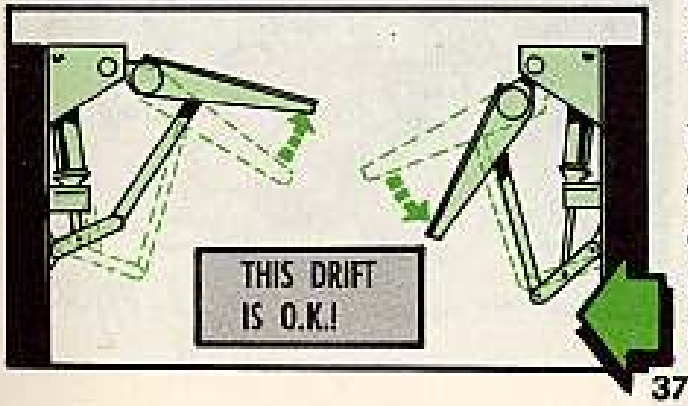
But, since we didn't want to get gigged again, we had the door cylinders replaced on the inspector's say-so. At the next inspection, same thing again. The doors "floated" when stopped half-way—we were gigged for faulty door cylinders.

What's the score? Who's right—our field maintenance or the inspector? Do we keep replacing door cylinders until the doors stop "floating"?

SSgt W. L. W.







Dear Sergeant W. L. W.,

Whoa, hold on there now. Replacing door cylinders is a lot more than a 5-and-10 cent store deal. Besides, your field maintenance people are right.

"Floating" doors are OK—it's covered by para 15, TM 5-1450-201-35. When elevator doors are stopped in a half-open position, it's normal for the doors to "float". That is, one door drifts up and the other down.

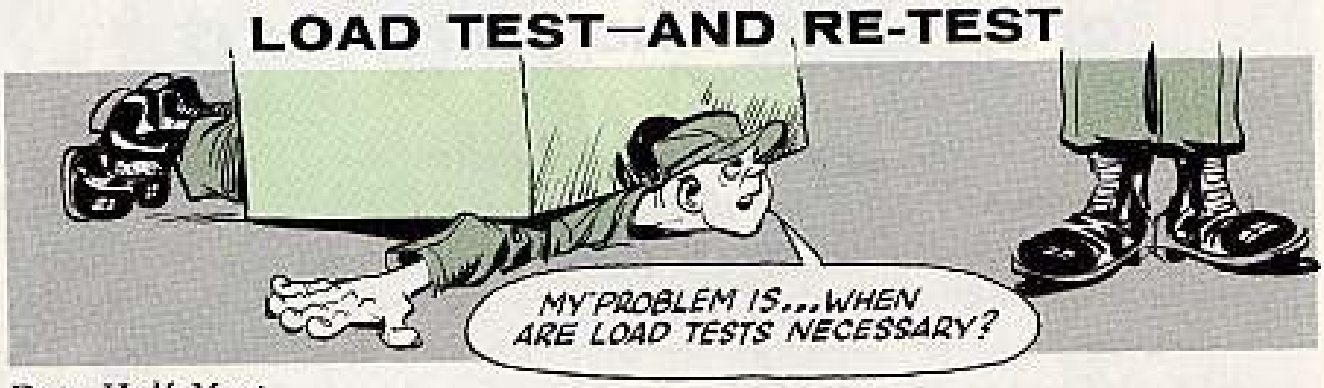
MORE

Your inspector friend overlooks the difference in the door weights. The "floating" occurs because the heavier door overcomes the pressure in the fluid lines and drifts down. Naturally, the lighter door is forced upward. But—both doors must move.

Now then, if you stop the doors in a half-open position and both doors drift down, you know you're losing hydraulic fluid through ruptured or leaking cups, and you've got troubles.

But, keep your testing to a minimum. There's no reason to stop the doors halfway. Continually stopping them in this position leads to blown or leaking cups —and you'll have to replace door cylinders for real.

Sgt Dozer



Dear Half-Mast,

How can we be sure when load tests are necessary on our M62 and M246 cranes used to handle missiles?

Inspectors say our tests are invalid because of cable replacements and control bank repairs.

The question is: What type of repairs or changes make the load tests invalid?

Capt W. K.

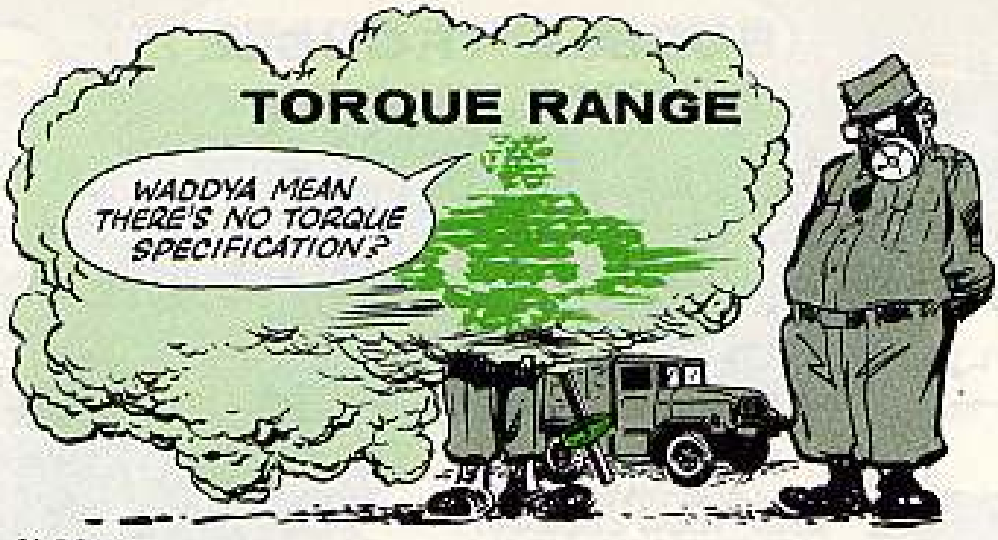
Dear Captain W. K.,

When they're being used to handle missiles and rockets, Sir, the M62 and M246 cranes and their controls have to be re-tested after any repairs, replacements or adjustments . . . before they're returned to use.

So, when you're testing like it says in TB 9-352 (14 Jul 60), it's almost impossible to be too careful. If in doubt, re-test it, 'cause you've got to be sure.

And re-test once-a-year even if there've been no repairs, replacements or adjustments on the crane.

Half-Mast



Dear Half-Mast,

What's the torque rating for the bolts used to attach the front exhaust pipe to the manifold on G742-series trucks? The TM's don't say.

Getting the right torque when tightening the nuts might stop a lot of flange breakage.

Sp5 D. F. J.

Dear Specialist D. F. J.,

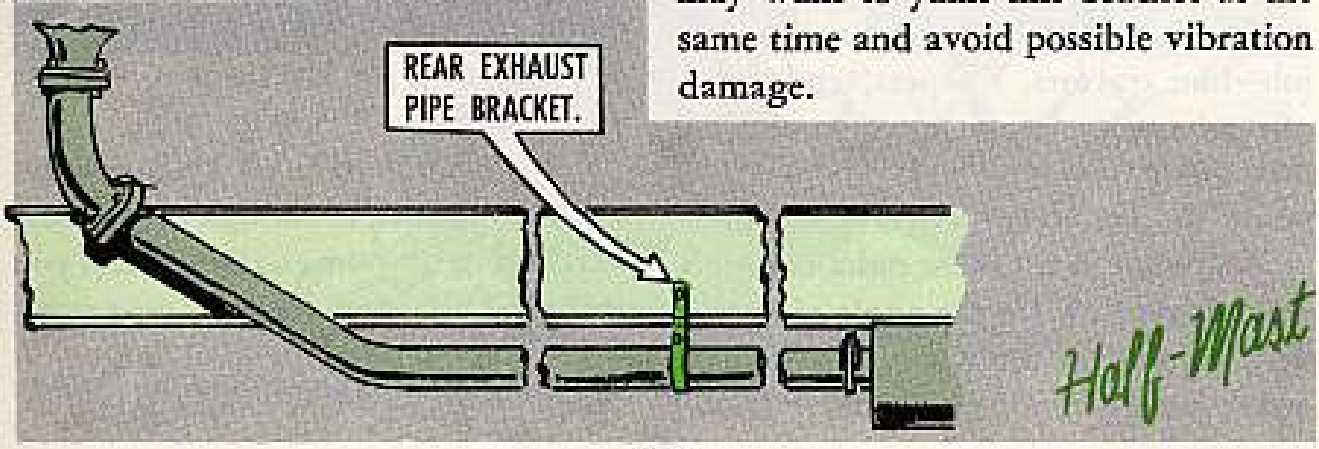
There're no torque specifications in your G742-series TM's for those bolts. But I'll give you a coupla hints that should get the job done.

A general torque rating for ⅜-in bolts is 275 to 325 inch-pounds, or about 23 to 27 foot-pounds. And that's about in line with the 25 to 29 foot-pounds torque rating listed for G742-series manifold stud nuts in TB Ord 529 (20 Jul 53).

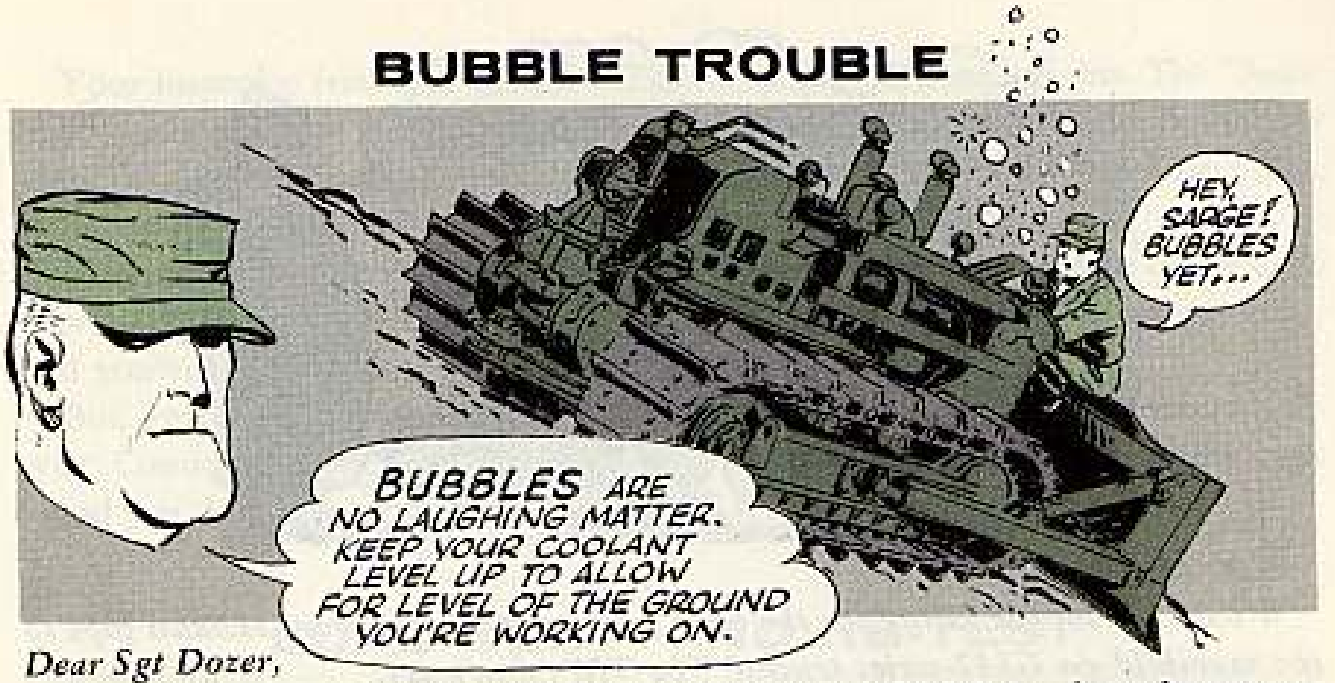
As long as you stay somewhere in this range, the torque shouldn't cause any breakage.

But when you're installing the pipe, like it says in para 180c of TM 9-8022 (17 Dec 54), you'll want to check to see if MWO Ord G742-W28 (25 Sep 57) has been applied.

The MWO's been rescinded, but if the rear exhaust pipe bracket's still there and if your CO gives his OK, you may want to yank this bracket at the same time and avoid possible vibration damage.



BUBBLE TROUBLE



Dear Sgt Dozer,

Do bubbles in an engine coolant system mean trouble? If so, how do you get rid of 'em?

Sgt J. H. C.

Dear Sergeant J. H. C.,

Bubbles are fine in a beaker of brew. But bubbles in your rig's engine cooling system are up to no good.

In the cooling system, bubbles just hang around—holding heat and slowing down circulation. To make a bad situation worse, bubbles tend to cluster in corners of the water jackets where the engine heat is highest.

Now it's no trick to keep coolant free from bubbles in most engines. Air bubbles get sucked into the system through open tube ends in the radiator. So, to prevent this, you refill the radiator often enough to be sure the tube ends are covered.

But on rigs that rock and roll on the job—like tractors, scrapers, and other offroad equipment—it's not enough to make sure the tube ends are covered while the rig stands on level ground.

You want to fill these radiators high enough to allow for the angle of operation, as well as for the suction of the water pump.

Then there's another kind of bubble trouble, sometimes known as "after Boil." This happens when you cut off a hot engine without idling it for two or three minutes—like it says in your TM.

Without the heat-tapering effect of this short idling period, engine temperature can flare up as much as 100 degrees, causing the coolant to expand in steam.

This expanding steam lifts the pressure valve in the radiator cap, and lets coolant escape through the overflow pipe.

Then, when engine temperature drops, the coolant condenses and pulls down the vacuum valve in the radiator cap—replacing the lost coolant with air in the radiator.

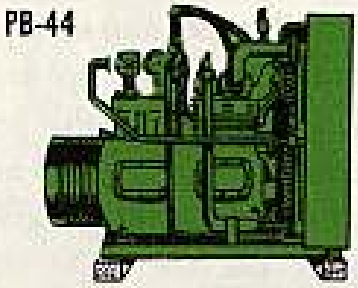
This "after boil" can spill enough coolant, and suck in enough air to cause overheating of your engine, unless you refill the radiator before the next start.

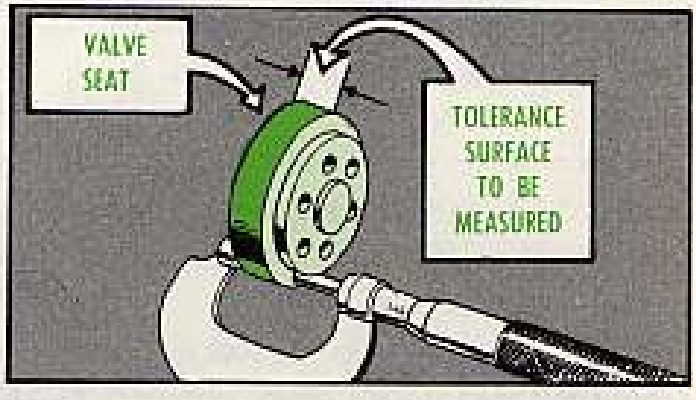
Dear Sgt Dozer,

Like any other rig, the intake and exhaust valves in our Model PB-44 air compressors—used on Air Products LON-5 and A2 generating and charging plants—have to be rebuilt every so often.

What are the minimum thicknesses allowed before the valve seats become unserviceable?

Sp6 F. J. Z.





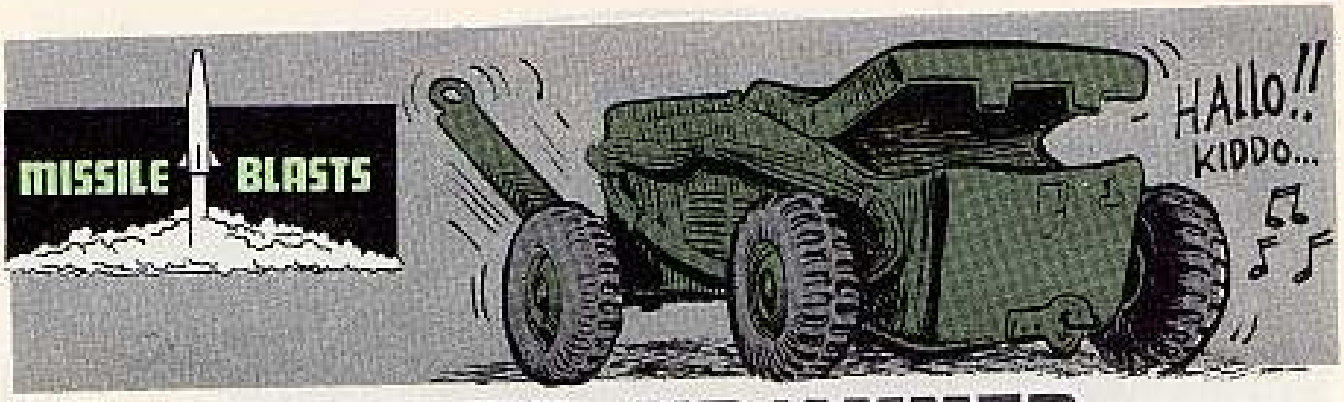
Dear Specialist F.J.Z.,

Here's the dope you want—

Valve Seats	Minimum Thicknesses
First Stage Inlet	.780 in
First Stage Discharge	.780 in
Second Stage Inlet	1.160 in
Second Stage Discharge	.660 in
Third Stage Inlet	.985 in
Third Stage Discharge	.985 in
Fourth Stage Inlet	2.410 in
Fourth Stage Discharge	1.040 in

Your support people can give you a hand in checking these out.

Sgt Dozer



JOY-FUL AIRJAMMER

There's a spang new capping compressor that's starting to strut its stuff at missile sites.

It's the electric-driven Model 415-HEP2 Joy rig that puts out 15 CFM at 3500 PSI, and it shapes up like a big winner.

This new Joy compressor is a double-breasted brute with tall wheels and a long drawbar that give it a smooth ride to and from the job.

Its long electrical cable reaches back from the far launcher to the power outlet. Its wide range of controls and gages make operation simple as shucking peas. And there's enough room to swing a cat in the hull that houses this 100% reciprocating compressor.

You can use the same ORC oil in its crankcase all year 'round unless winter brings a stretch of real subzero weather.

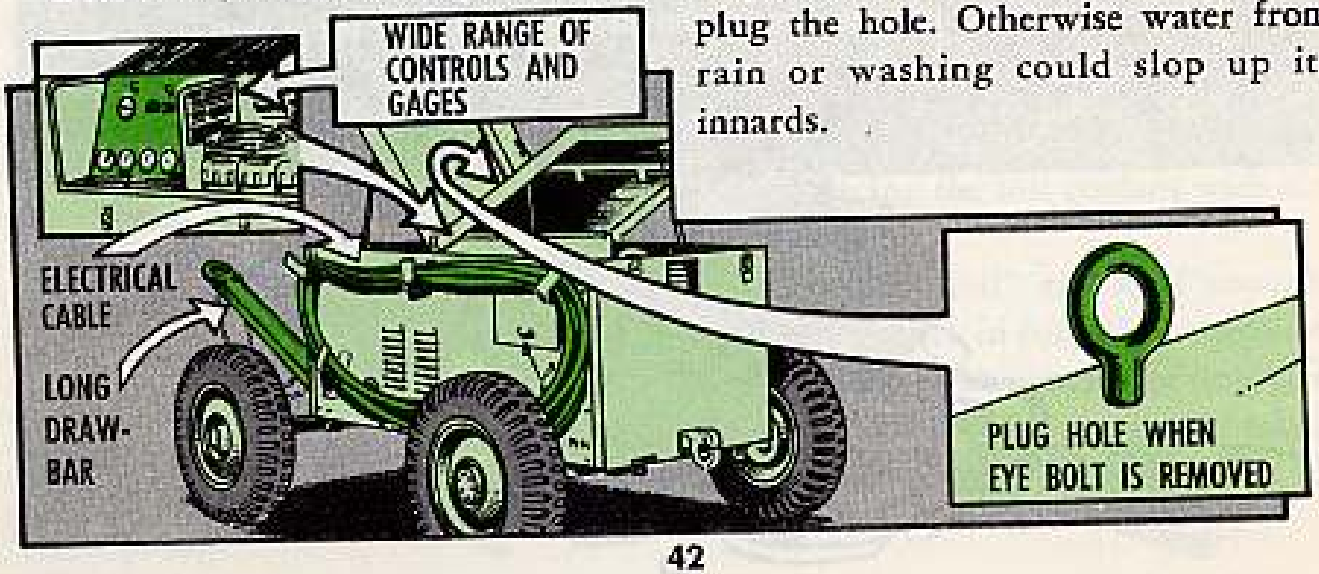
Best of all, this new compressor does away with a flock of problems that come with compressors complicated by a combination of rotary and reciprocating components.

There's no oil cooler and no separator with felts that can load up and foul the operation. So there's nothing to stop you from using this Joy unit to fill your M15 air breathing apparatus. Of course, you'll use the M23 detector kit and M4 adapter in conjunction with this compressor while filling the air breathing apparatus.

And the V-belt drive on this Joy will do the job with less sweat than the collet, nut and sleeve combo that comes with rotary units.

The scoop on this rig is spelled out in TM 5-4310-231-10, -20, and -20P.

There's one little item you might add. When you pull the I-bolt lifting ring to free up the hood panels, better plug the hole. Otherwise water from rain or washing could slop up its innards.



BE YOUR OWN INSPECTOR ON THE . . .

ROCKET MOTOR CLUSTER TRUCK

When it comes to luggin' JATO's around your Nike site, you'd be up that creek without a paddle if you didn't have a M442 rocket motor cluster truck around.

It also comes in mighty handy when a launching-handling rail's gotta be moved. And, in a pinch with the help of an adapter, the M442 can also handle a missile body.

The rocket motor truck's a pretty rugged hunk of iron . . . but rugged or no, it still needs its regular dose of PM medicine.

Here's a guided tour of the M442 that's reckoned to keep you one step ahead of the gig parade.

Items that'll really cause serious damage and pile up gig points fast are underlined.

First give the truck a general look-see. Check for damaged or missing rivets, cracked welds and bent frames. Watch for chipped or worn painted surfaces and make sure there's no sign of fungi, corrosion or rust.

If your truck looks like it could use a bath—break out the hose and wash it down.

PS MORE

NOW CHECK THESE POINTS.

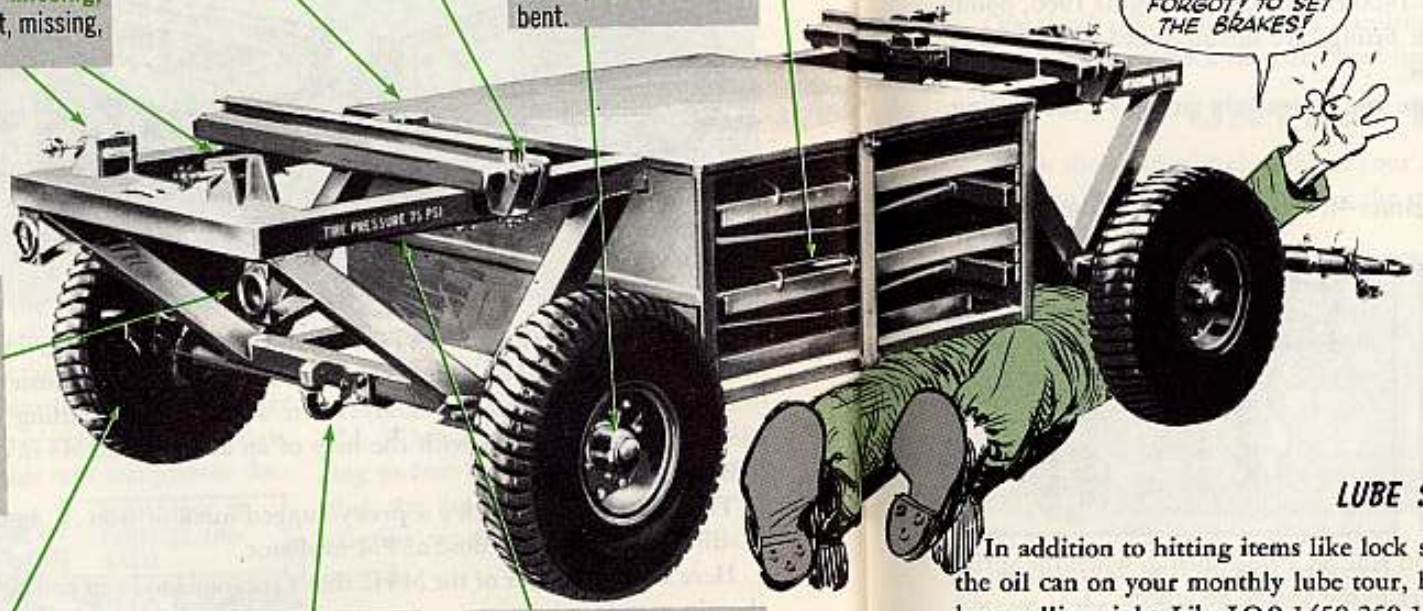
INTERMEDIATE LOADING RACK STOP —Twisted out of shape, missing, loose; hexagon bolt, missing, loose.

TRACK PIN GROUP—Pin twisted, sheared, missing; spring weak, missing; spring pin missing; knob loose; knob pin loose, missing; tie down pins, missing, burred.

FIN STORAGE RACK — Knobs bent, missing; rubber bumpers worn, missing; threads, burred; spring pin, bent, twisted; racks battered, loose, hexagon nuts and washers loose, missing; eye bolt, worn, missing, loose.

STOP SUPPORT ASSEMBLY — Stop bolt missing, sheared, threads burred, stripped; knob, loose, missing; spring pin, missing, bent, hexagon nut, missing, loose.

WHEELS — Rims loose; hexagon nuts loose, missing; ribbed neck bolts stripped, burred, sheared; flap bent.



REFLECTORS —Shattered, missing, discolored, dirty; assembly loose, screws missing, loose, sheared.

TIRES — Dangerously or unevenly worn; treads cut deep to the fabric; valve stems pinched; valve core leaking, broken; valve caps missing; nails, glass, stones imbedded in tires; wrong pressure 75 PSI is correct).

PINTLE — Assembly loose, missing; screws loose, missing, sheared; pintle hook battered, twisted out of shape, binds; latch broken, will not close, spring weak, missing.

STENCILS—Missing, not clear, incorrect, wrong height (½ inch letters are right). (Maximum speed 10 MPH on front end of truck, tire pressure 75 PSI two places on each side of truck).

CONTROLS

Here's what to keep a lookout for in the steering and stopping department.

TOW BAR—Bent, twisted, cracked; drain hole plugged; ball lock pin, missing, bent, sheared; retaining ring broke, loose, missing; chain, not attached, links open, hook open, twisted, missing.

STEERING — Steering arm twisted, bent; cotter pins, missing, sheared; clevis, twisted, bent; tie rods, loose, bent, out of adjustment.

BRAKES—Assembly bolt loose, broken, missing; ratchet, loose, worn; gears stripped; spring worn, weak, missing; pawl worn, battered; lever loose, releases hard.

PUBS

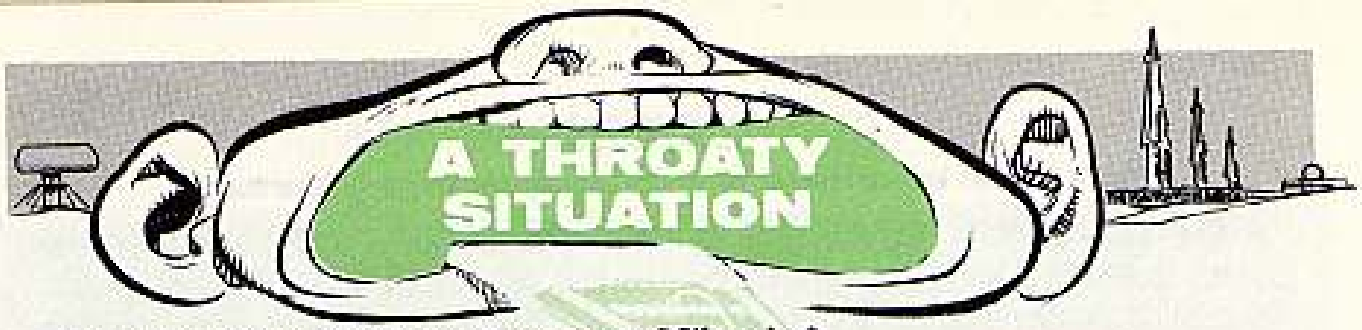
Just as a double check, here's a rundown of the publications that'll give you the scoop you need to know to keep the M442 in tip top shape.

TM 9-1450-250-12
TM 9-1450-250-10P
TM 9-1450-250-20P/2
MWO ORD Y87-W2 (August 1959) provides for replacement of booster fin holding channel.
MWO ORD Y87-W6 (December 1959) adds drain holes to towbar assembly.

LUBE SPOTS

In addition to hitting items like lock screws, hinges and bolt assemblies with the oil can on your monthly lube tour, here're seven spots that need greasing to keep rolling right. Like LO 9-1450-250-12A says, lubing should be done monthly and semi-annually under normal operations. And remember to relube after washing or fording.

END



Pulled a throat check lately at your Nike site?

Nope, nobody's trying to make a pill-pusher out of you—it's throat-check lube fittings that're being talked about.

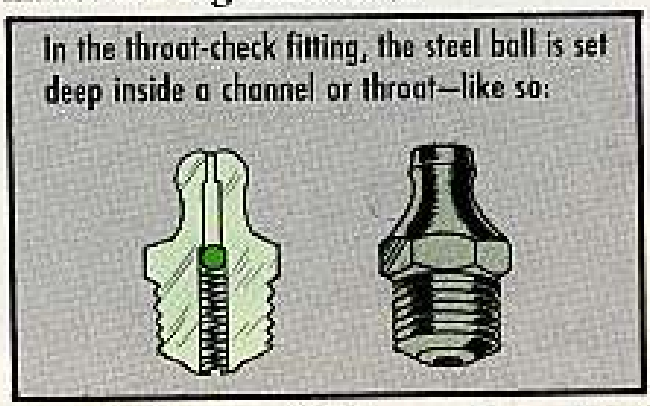
Like those you just might have on some of your ground-handling equipment and launcher.

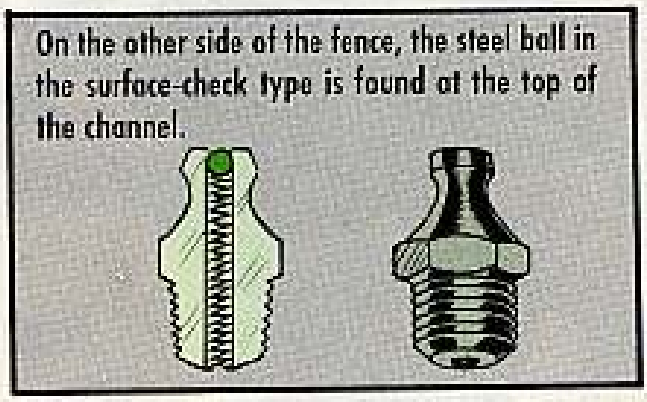
Might is the word because—as TB 9-1400-604-20, dated August 1960, points out loud and clear—the old throat-check fittings are unauthorized and are to be replaced by the surface-check type jobs.

Throat-check, surface-check, mox nix you say—a lube fitting's a lube fitting, no matter how you slice it.

Not so.

Like golf, pool and a lot of other games—it's the location of the ball that makes the big difference.





In both types of fittings, the steel balls ride on a steel spring, when the spring is compressed, the balls let the grease get to the area to be lubed.

The throat-check fitting was tossed out of the window because it gave no protection to the channel opening—allowing dirt, dust and other junk to build up on the inside walls. So when the lube was pumped in it carried everything down into the bearings—making for one abrasive mess.

When your lube points are equipped with the surface-check fittings, your problems are over. The steel ball, riding the spring at the top of the throat keeps out everything except the lubricant.

Once you've made sure all your fittings are of the surface-check variety—except those on the rod bearing end of your acquisition antenna—all you hafta do is wipe the fittings clean with a rag and follow the word of the equipment's LO when lubing.

The lube fittings on the rod end bearings in your acq antenna get replaced as a part of the bearing assembly—and only when the entire assembly shows signs of wear and tear.

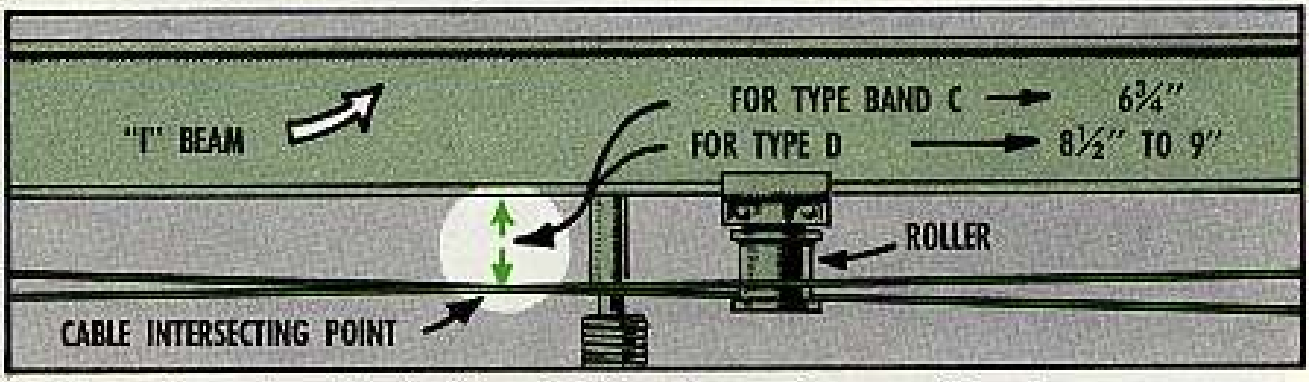
Here are the three surface-check fittings found in your guided missile systems—complete with Federal Stock Numbers:

Pull your inspection, order the replacement parts and you'll be in business.

One final tip . . . mark your requisition "No Substitute Accepted" to make sure you don't get back the same type fittings you're trying to replace.

UNTILT THE TILT

When the hydraulic elevator at your Nike missile site shows tilt with one end settling on the locking bars before the other, then an equalizer cable adjustment is called for.



Now, when the cable is adjusted, it's important that the distance between the bottom of the chassis I-beam and the intersecting point of the equalizer cable be measured accurately. For Type B and C elevators, the distance should be 6¾ inches. For Type D elevators, 8½ to 9 inches.

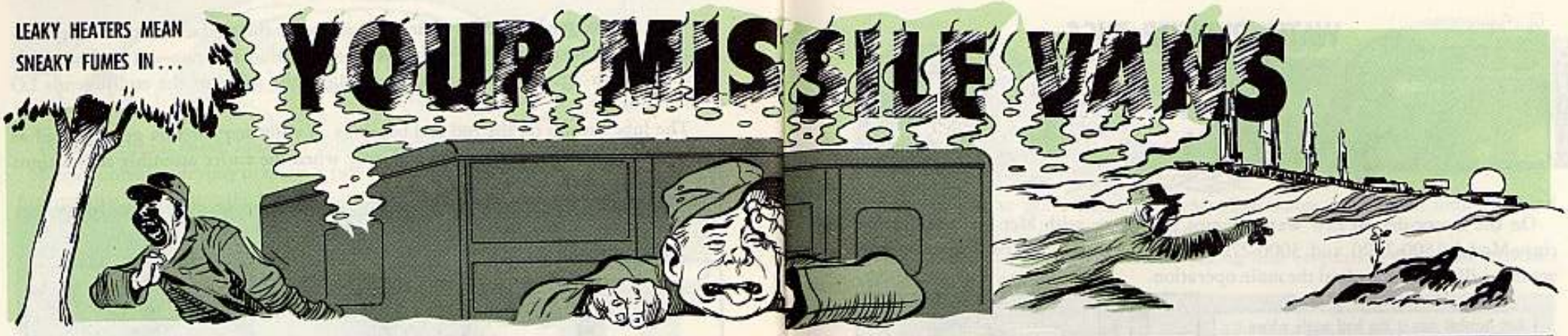
Since the cable separator rollers are at the point where the cables cross—and from where you'll make your measurement—they should be taken off before you make any adjustments.

The full scoop on making the adjustment for the Type B and C elevators can be found in TM 5-1450-201-20, while adjustments for the Type D elevator are covered in TM 5-1450-200-20.

Be sure to reinstall the rollers after you make the final adjustments.

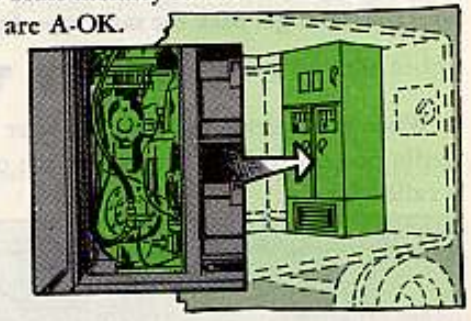
LEAKY HEATERS MEAN SNEAKY FUMES IN...

YOUR MISSILE VANS



Gasoline burning heaters in the trailer vans at your missile site may keep you as warm as July during the cold, cold months. But leaking fumes from these heaters could also make your van a fitting room for a wooden overcoat.

With this in mind, the coming of the brass monkey season means that missilemen had better make sure their heaters are A-OK.

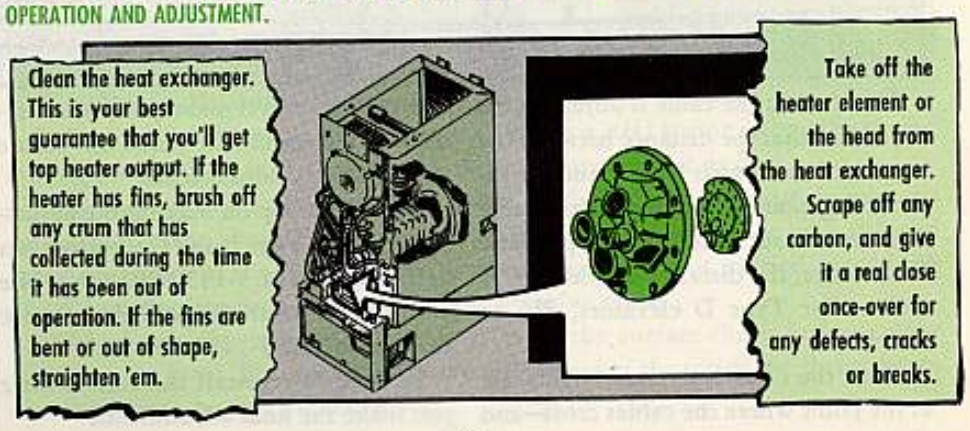


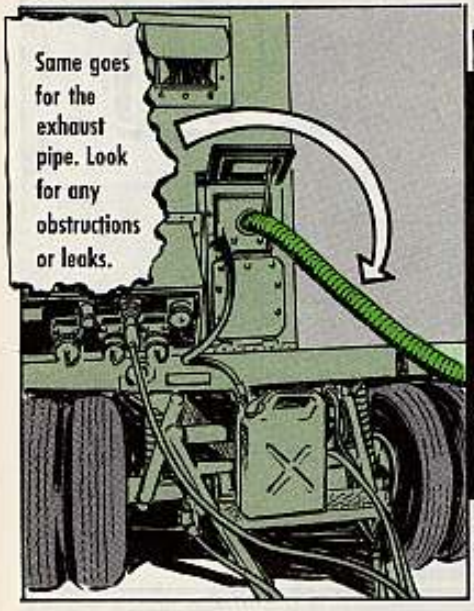
A cracked or burned out heat exchanger will let fumes sneak into the heated area and that means curtains.

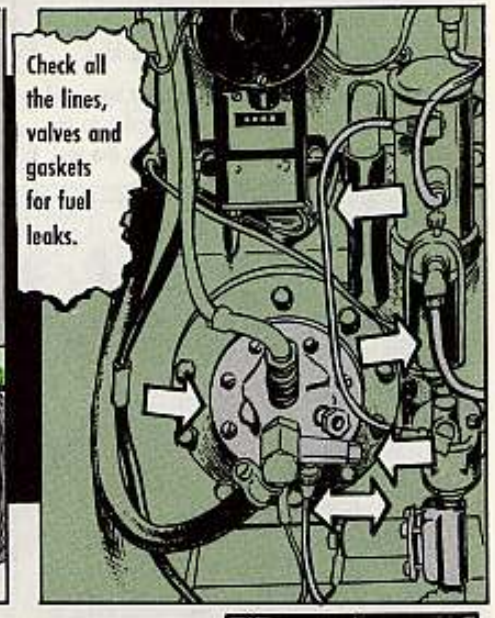
To be sure you're going to be comfortable inside the vans this winter without leaks and fumes, now's the best time to play it safe and give your heaters a thorough check-out.

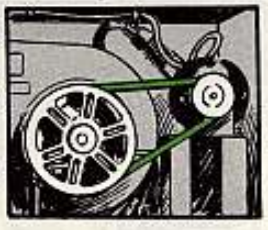
LOOK 'EM OVER

FIRST OFF, GIVE ALL THE SAFETY DEVICES ON YOUR HEATER A GOING-OVER FOR THE RIGHT KIND OF OPERATION AND ADJUSTMENT.









If the heater has a belt-drive, eyeball the belt and make sure it's in working order and that it's adjusted right. Never take chances with a frayed or glazed belt or one that has outlived its usefulness.

Wrap up your maintenance chores by replacing all parts and components that are not up to snuff.

OPERATING TIPS

Always operate the heater with circulating air blowers going.

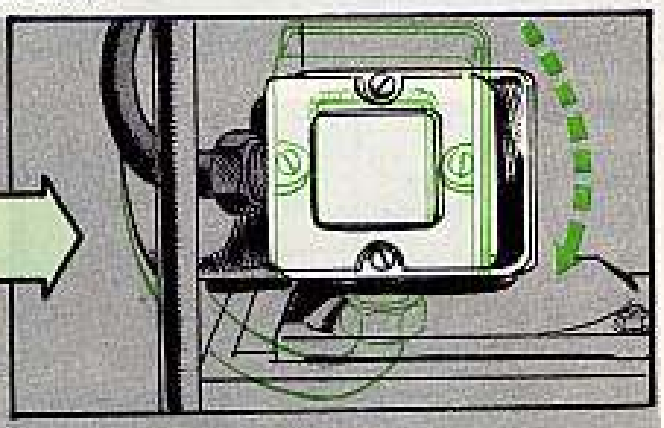
If the combustion blower motor is controlled by hand, let it run for about a half-minute after you've shut off the fuel. This forces the unburned fuel out.

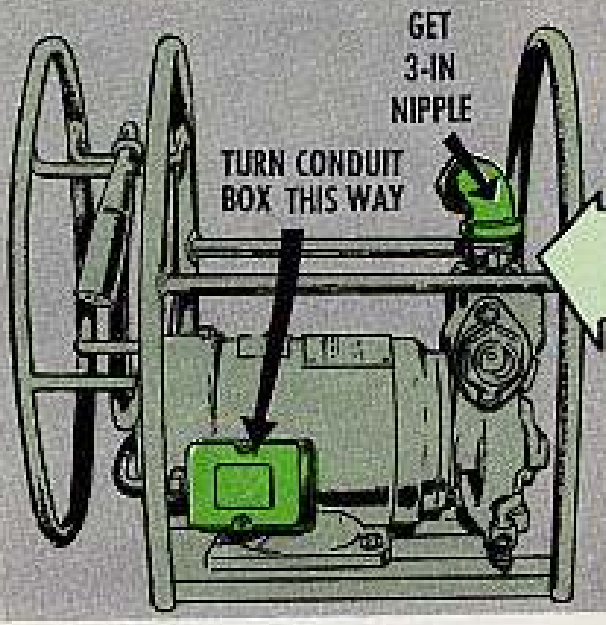
WATER PURIFIER BUGS

On the motor-driven raw water pumps that come with Met-Pro purification rigs—Model 1500-2600 and 3000-2700—there's a couple of two-bit bugs you want to kill before they foul the main operation.

Bug number one is the bad angle where the power cable plugs into the conduit box. At this angle, the cable can drag and kink.

So you want to take off the conduit box, and put it back one quarter turn clockwise to the right. Now the cable connector faces the reel, free and easy on the draw.





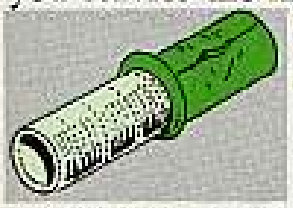
Bug number two is the short-nippled plumbing on top of the pump. It pulls the coupling so close to the frame there's not enough room to swing your wrench.

You can polish off this problem by trading the present 2-in nipple for the 3-in size, stocked in regular Eng supply lines under FSN 4730-186-0418. That extra inch will get you a lot more action.

FILTER SLEEVE JOB

You say you've got a Permutit or Met-Pro water purification unit—the kind with a plastic sleeve on each filter element?

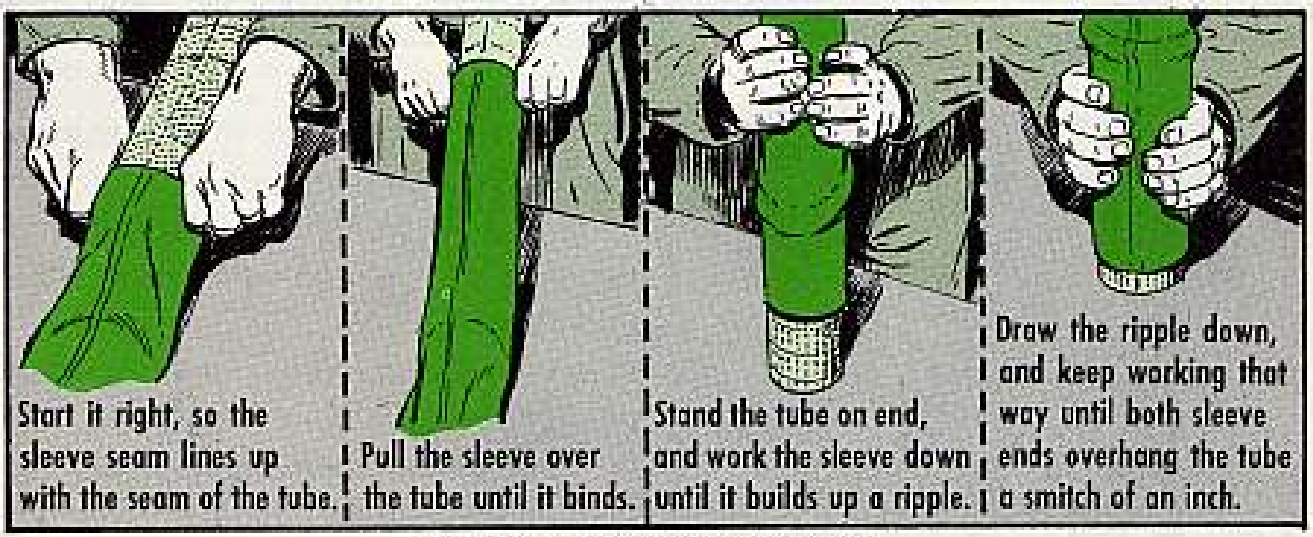
Then here's the latest scoop for off-taking and on-putting those sleeves when you service the filters.



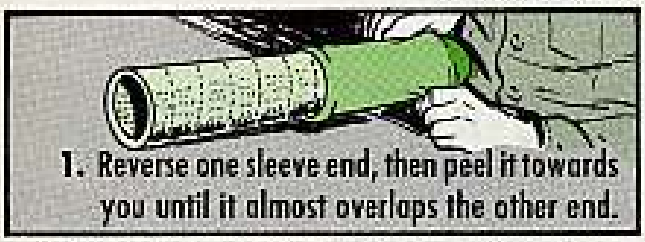
Rolling 'em like socks—either on or off—is out. You lose too many sleeves that way, even with fresh stock. Rolling rips the plastic and splits the seams, so you wind up with peekaboo sleeves.

The new scoop says you want to slide sleeves on, and peel 'em off—somethin' like a one-way stretch.

TO SLIDE A SLEEVE ONTO THE TUBE



TO PEEL A SLEEVE FROM THE TUBE



When you peel a sleeve, might as well reverse it all the way for inspection. Open seams, holes, or other damage tell you the sleeve needs to be replaced.

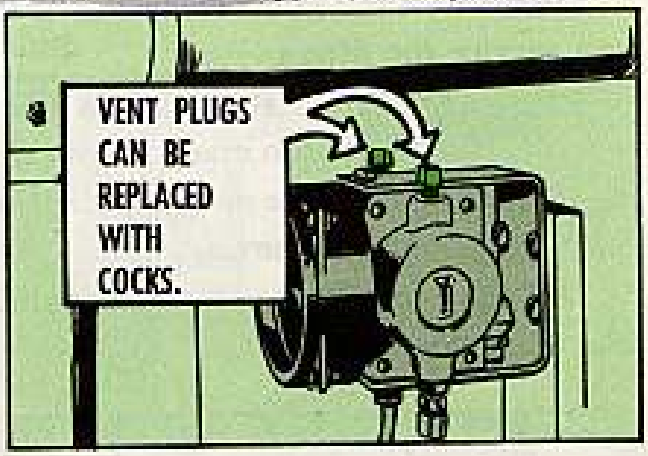
And whenever the purification unit is shut down for a few days, that's the best time to hop onto the filter cleaning operation.

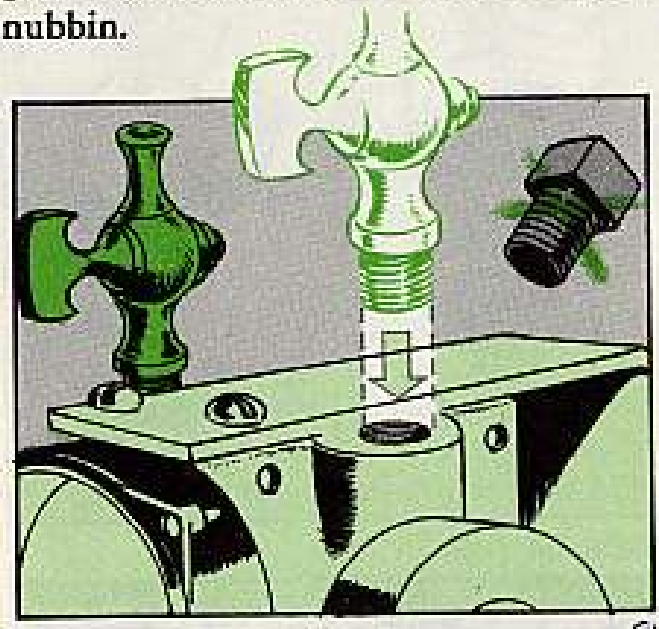
For washing you use only drinkable water, then dry 'em down to the bone. And you don't replace the filter assembly dome until it's time to operate the unit again.

HEY, JOESAN... SWAP PLUGS FOR COCKS

So you have one of those Model 3000-2700, or Model 1500-2600 Met-Pro water purification units.

And every so often you have to bleed air from the raw water line. This could get to be a project—specially after the square heads on those brass vent plugs get worn down to a knob-headed nubbin.





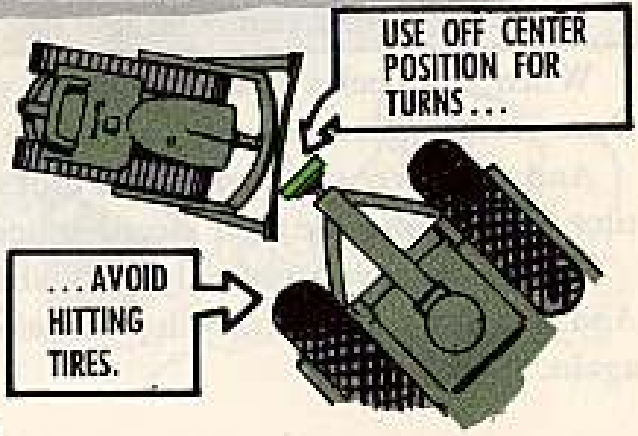
You can keep ahead of the game—scrap those plugs, and replace 'em with a fresh pair of drain cocks on the pressure unit of the raw water flow indicator.

It's no sweat. You just requisition two Cocks, Drain: brass, ⅛-in, 27 NPT, tee handle, straight nose, 125 PSI, MIL Spec D-1203, Type A. They're listed in SM 5-1-4800 under FSN 4820-287-4276 (Eng).

OFF CENTER PUSH

When you're using a dozer to push a wheeled tractor or a scraper, you can save a lot of tires on the rig you're helping by moving off center when pushing around a corner or a curve.

Off center, the edge of the dozer blade won't be long enough to reach the tire and slice rubber in a tight turn.



A selected list of recent publications of interest to Organizational Maintenance Personnel. This is a list compiled from recent Adjutant General's Distribution Center Bulletins.

TECHNICAL MANUALS

TM 3-220 Sep CBR Decon.

TM 5-2815-207-20P Oct Eng, Hornischfeger Mod 87C-18 series.

TM 5-3655-204-10 Oct Gen Plant, Air Prod Mod LON-5.

TM 5-3805-219-20P Sep Loader, Scoop Type: Hough Mod H-90M.

TM 5-3895-224-15 Oct Spreader, Aggregate Garwood Mod M5-8 Ft.

TM 5-3910-202-25P Oct Conveyor, Belt: 300 Tons per Hr; Barber-Greene Mod PG-70.

TM 5-4120-219-25P Oct Air Conditioner Hughes Aircraft 593637.

TM 5-4310-221-15 Sep Compressor, Rotary; Ingersoll-Rand Mod GEB-125.

TM 5-4310-238-20P Oct Compressor, Reciprocating: Air, 210-CFM Le Roi Mod 210Q1.

TM 5-4320-218-20P Sep Pump, Centr Pet, Gorman-Rupp Mod 04A12-MVG4D.

TM 5-4320-222-25P Oct Pump, Reciprocating: Rice Pump & Machine Co. Mod 4D-327.

TM 5-4520-204-15 Oct Heater, Space: Hunter Mod UH-73-2HA.

TM 5-4520-204-25P Oct Heater Space, 50,000 BTU Hunter Mod UH-73-2HA.

TM 5-4520-205-20P Sep Heater, Duct Type, Hunter Mod PH-150-GE.

TM 5-6115-269-20 Oct Gen Set, 10 KW, AC, Hal-Gar Mod CE 106AC/WK9.

TM 5-6115-294-13 Oct Gen 30 KW, Sperry Utah Eng Lab Mod GTGE70-2-1.

TM 5-6115-301-20P Sep Gen, 45 KW, AC, Hollingsworth Mod JHDX45A.

TM 8-605 Oct Org Maint of Med Equip.

TM 9-238 Oct Deepwater Fording of Ord Mat.

TM 9-1055-215-20P Oct 115-MM Mk Rkt Lchr MPI (T145).

TM 9-1430-257-20/3 Oct Schematics High Power Acq Radar (Imp-Herc).

TM 9-1430-500-12/1 Sep Radar Set AN/MPQ-35 and Trans Bty Cont Ctr (Hawk).

TM 10-3930-202-20P, C3, Oct Yale & Towne MHE 156.

TM 10-3930-210-20P, C2 Oct Yale & Towne MHE 119.

TM 10-3930-216-10 Sep Trk, Lift, Fork, Gas, 4,000-Lb.

TM 10-3930-216-20P Sep Truck, Lift, Fork, Gas, Pneumatic Tires 4,000 Lbs. Mod MHE 170.

TM 10-3930-223-10, —20P, C2, Sep & Oct 10,000-Lb Clark Rough Terrain Forklift-MHE 145.

TM 11-5805-216-25P Oct Cont, Remote Switching C-1509-TC.

TM 11-5805-217-20P Oct Modem, Tele MD-179/TC.

TM 11-5805-219-20P Oct Power Supply PP-691/G.

TM 11-5820-218-20P Oct Receiver Grp AN/TRA-10.

TM 11-5820-219-20P Oct Receivers, Pulse Form TD-68/G and TD-68A/G.

TM 11-5820-292-20 Oct Radio Sets AN/PRC-8, —8A, —9, —9A, —10, —10A and —28.

TM 11-5820-335-10 Oct Transmitters, Radio T-195/GRC-19, T-195A & T-195B.

TM 11-5820-207-20P Sep Hospital Program Dist Sys.

TM 11-5835-212-15 Sep Sound Recorder-Reproducer Set RD-173/UN.

TM 11-5840-229-20P Oct Radar Set AN/TPS-33.

TM 11-5840-248-20P Oct Radar RT-406/FPS-36.

TM 11-5840-258-14 Sep Coder-Decoder Gp AN/UPA-39.

TM 11-5930-202-12P Sep Chest Set TD-4.

TM 11-5965-263-12P Sep Microphones M-29/U, M-29A/U, & M-29B/U.

TM 11-6115-221-15 Nov Gen Set, PU-407/M, 408/M.

TM 11-6130-225-12 Oct Charger, Bty PP-2926/U.

TM 11-6625-308-12 Oct Voltage Std, Radio Freq AN/ URM-93A.

TM 11-6625-396-20P Sep Stroboscopes TS-805B/U and TS-805C/U.

TM 11-6625-400-20P Oct Meter, Modulation ME-57/U.

TM 11-6625-406-12 Oct Sig Gen SG-336/U.

TM 11-6625-415-15 Oct Mtr, Elect Instr TS-265A/UP.

TM 11-6625-422-12 Oct Test Sets Teletypewriter AN/GGM-1, AN/GGM-2, AN/GGM-3, AN/GGM-4 & AN/GGM-5.

TM 11-6625-446-15 Oct Wattmeter AN/URM-120.

TM 11-6720-203-20P Sep Camera, Still Picture KA-20A.

TM 11-6740-230-20P Sep Processing Unit, Photo Print AN/TFQ-9.

TM 11-7440-200-10 Oct Computer Set, Digital Data, General Purpose, AN/MYK-1 (V).

LUBRICATION ORDERS

LO 5-3895-221-20-1, —2 Oct Mixer, Concrete Chain Belt Mod HBC.

LO 5-3895-226-15 Oct Heater, Bituminous Bitu-Inc, Mod SG-52TA.

LO 5-4310-229-15 Aug Compr, Rotary Driven: 210 CFM; 100 PSI Davey Mod M-210-RF.

LO 5-4320-222-15 Oct Pump, Reciprocating Rice Pump & Mach Co Mod 4D-327.

LO 5-4320-219-12 Sep Pump, Centr Carver Mod KN6H-5.

LO 5-4490-280-12 Oct Shop Equip, Con Maint Trk Mtd, Set No. 3, Southwest Tlk Body Co, Mod SECM.

LO 5-6115-274-20 Oct Gen Set, 45KW, AC Stewart & Stevenson Mod 52300.

LO 9-1055-205-10 Oct Lchr, 762mm RK.

LO 9-2002 Aug Lchr, Rkt, 3.5-in M20A1, M20A1B1.

LO 9-5048-12 Oct Erector M2 (Corporal).

LO 9-U6 Sep Gun, Mach Cal .30.

LO 9-U7 Sep Mach Gun Cal .50 M2.

LO 10-4930-204-10 Aug Pumping Assy Flammable Liq Bulk Transfer.

LO 55-2220-202-20 Aug Rail, Ambulance Unit 56-1/2-In Gage, (Amer Car & Fdry).

MWO'S

MWO 5-4940-203-35/1 Sep Shop Equip Elect Repair: Set No. 4.

MWO 5-6115-229-35/2 Oct Gen Set, 5KW, AC, HOL-GAR Mod CE-55-AC/WK4.

MWO 5-9100-2 Oct Gen and Chrg Plant, Air Prod Mod LON-5.

TECHNICAL BULLETINS

TB 9-1220-227-12 Oct AA Fire Cont Sys M33A1C.

TB 9-1400-511-12 Oct Contr Envir Cond Set (Hawk).

TB 9-5013-1/20 Nov Air Cont Cab N/Herc.

TB 9-2320-211-12/1 Oct Trk, Wrecker, Medium, 5 Ton 6x6 M543.

TB 55-3 Oct Trans Guid I Trk, Dump, 2-1/2 Ton, M215.

TB 55-4 Nov Transportability Guid Trk, Water, 2-1/2 Ton, 1000 Gal, M222.

TB 55-5 Nov Transportability Guid Trk, Tractor 2-1/2 Ton, M221.

TB 55-6 Nov Trk, Cargo, 5-Ton, M41.

TB 55-7 Nov Trk, Wrecker, 2-1/2 Ton, M60.

TB 55-2200-202-25/1 Oct Loco, Dsl-Elec, 44 thru 131 Tons, Dem Opr Over Yard Tracks of Com Carriers in Interstate Commerce.

TB CML 86 Oct Grenade, Hand, Tear, CS, M7A2.

TB ORD 1030 Oct Ord Veh; Inst and Use of Overhead Instr Plates.

TB ORD 1033 Oct Ord Gas Eng Com Compr Pressure Readings.

MISCELLANEOUS

AR 600-58 Nov Personnel-Gen Mech Equip Oper – Selection, Testing, and Licensing.

DA Form 9-204 Sep Radar Set AN/MPQ-37 (Hawk) Checksheet.

GTA 3-32 Oct M8A2 Gas-Particulate Filter Unit with Combat Vehicle, Protective Masks.

GTA 5-35, 1961 Bridge Classification Card.

SB 5-111 Nov Extinguisher, Fire, CF3BR.

SB 55-28 Oct TC Regulated Items.

SB 55-34 Oct TC Critical Item.

SM 10-1-C6-5-SM, Vol 3, May, Hand Tools, Nonedged, Nonpowered FSC Class 5120.

SM 10-1-C6-13-SM, Vol 1, Oct, Type Composing Machines.

SM 55-4-4220-502 Oct Life Preserver Set Vest: Mk II.

SM 55-4-5180-503 Sep Tool Kit, Machinists Railway.

TOE 5-177D Oct Engineer Pipeline Const Sup Co.

FOR COMMERCIAL-TYPE VEHICLES—

LUBE LINGO LINE-UP

Can the guess work. Pin this lube identification chart near your vehicle's grease rack. You'll find it helpful when lubing commercial-type vehicles per instructions in the manufacturer's manual.

Normally For Lubing	Commercial Lubricants	Military Lubricants	Temperature Range and Military Lube Symbols		
			Above +32°F	+40°F to −10°F	0° to −65°F
Engine (all), Air Cleaner (oil bath type), Air Compressor (If not lubed by engine or power steering)	ML, MS, MM, DG, or DS SAE 10, 20, 30, 40, 50	Engine Oil Hvy Duty (MIL-L-2104A) MIL-L-10295	OE 30	OE 10	OES
Automatic Transmission, Power Steering Units, Reduction Units	Automatic Transmission Oil, Type A	Engine Oil, Light (MIL-L-2104A) MIL-L-10295	OE 10	OE 10	OES
Front and Rear Axles	Gear Oil SAE 90 and 140 Hypoid	Lube, Oil Gear, Universal MIL-L-002105 (ORD)	GO 90	GO 90	GOS
Mechanical Transmissions	Gear Oil SAE 140 EP Gear, SAE 140	Lube, Oil Gear, Universal MIL-L-002105 (ORD)	GO 90	GO 90	GOS
Transfer Cases	Oil SAE 90 and 140MP Gear	Lube, Oil Gear, Universal MIL-L-002105 (ORD)	GO 90	GO 90	GOS
Steering Gear Unit	Lubricant SAE 90, and 140 Steering Gear Lube SCL, EP	Lube, Oil Gear, Universal MIL-L-002105 (ORD)	GO 90	GO 90	GOS
Winches	Gear Oil SAE 90, and 140 ES lubricating oil special	Lube, Oil Gear, Universal MIL-L-002105 (ORD)	GO 90	GO 90	GOS
Overdrive	Hypoid Lubricant. Straight Mineral Oil SAE 160 and 250. Straight Mineral Oil SAE 50	Lube, Gear, Universal (MIL-L-2105)	GO 90	GO 90	GOS
Wheel Bearings, Universal Joints. All gun-type fittings and all grease-type lube points on chassis	Wheel Bearing Grease, Chassis Grease, Cup Grease	GAA Am 2 GAA Am 3 GAA Rev A	GAA Am 2 GAA Am 3 GAA Rev A	GAA Am 2 GAA Am 3 GAA Rev A	GAA Am 2 GAA Am 3 GAA Rev A
Water pumps (as outlined in SB 725-9150-1 (31 Mar 58)	Water Pump Grease	GAA Am 2 GAA Am 3 GAA Rev A	GAA Am 2 GAA Am 3 GAA Rev A	GAA Am 2 GAA Am 3 GAA Rev A	GAA Am 2 GAA Am 3 GAA Rev A

Normally For Lubing	Commercial Lubricants	Military Lubricants	Temperature Range and Military Lube Symbols		
			Above +32°F	+40°F to −10°F	0° to −65°F
Hydrovac units (vacuum portions—only. Do not put in master brake cylinders)	Shock Absorber Fluid, Vacuum Cylinder Oil	Hydraulic Oil, Preservative (MIL-H-6083A), or Hydraulic Oil, Petroleum Base (MIL-O-5606)	OHC, or OHA	OHC, or OHA	OHC, or OHA
Shock Absorbers	Shock Absorber Fluid	Hydraulic Oil, Preservative (MIL-O-6083A) or Hydraulic Oil Petroleum Base (MIL-O-5606); Castor Oil, Technical Heavy, shock absorber, JAN-F-461 (for Houdaille shocks only)	OHC, OHA, SAH (for Houdaille shocks only)	OHC, OHA, SAH (for Houdaille shocks only)	OHC, OHA, SAH (for Houdaille shocks only)
Hydraulic Brake Cylinder	Heavy Duty Fluid, SAE 70R1	Fluid, Hydraulic Brake (VV-F-451A)	HB	HB	HBA
Oil can points	Engine Oils: Special Oils	Preservative Lubricant (MIL-L-3150)	PL (med)	PL (sp)	PL (sp)
Speedometer Cables	Grease, Aircraft and Instrument	Aircraft and Instrument Grease (MIL-G-3278)	GL	GL	GL

THINGS TO REMEMBER—

1. Study the local SOP, AR 58-5 and its C1 (25 Sep 59) and TM 38-660-2 (20 Aug 59).
2. **Give your vehicles OE 10 when the manufacturer's manual calls for SAE 20 or SAE 20W. Use OE 30 when the call is for SAE 40.**
3. Where temperatures remain steady at +90 and above, (on continual long and heavy hauling), use OE 50 when the maker's manual calls for SAE 40, 50 or 70.
4. **Use OE 10 in automatic transmission. When manufacturer's LO recommends a special transmission fluid you'll have to check AR 715-30, C1 (18 Jul 60) for authorization of local purchase.**
5. Lubrication, including changing the engine oil and filters, is done at intervals given in the manufacturers' manuals—or more often during abnormal or severe operating conditions.
6. **Specific uses of GAA Am 1, Am 2, Am 3 and Revision A are covered in SB 725-9150-1 (31 Mar 58).**
7. TM 9-207 (Sep 59), covering extreme cold weather, provides a wealth of lubing information.

THE NEW MIG WELDING SET

Lean in close, man, and get the latest info on the MIG (Metal Inert Gas) welding rig that's just hit the scene.

MIG-welding is the deal you've been waiting on for better welding of aluminum.

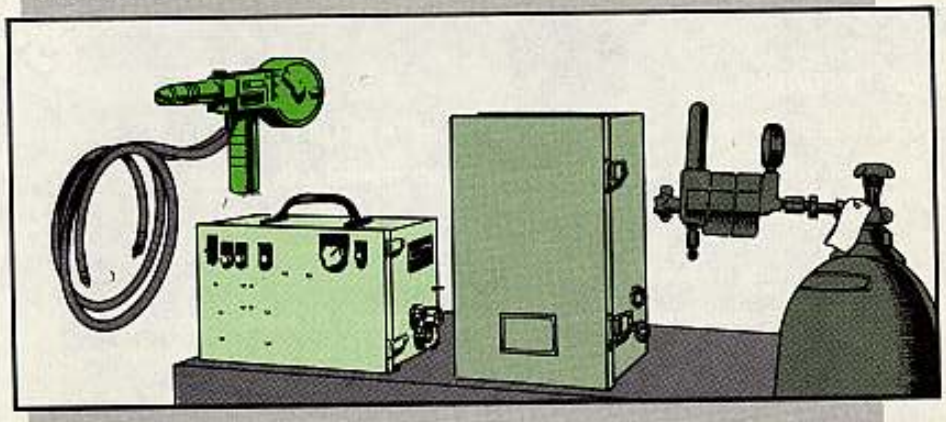
The new welding set's been in the Army for some time now, and it's being issued to company welders.

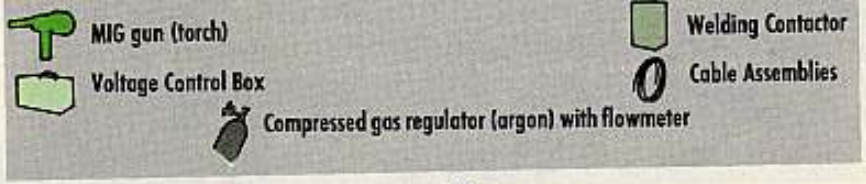
The process calls for argon (inert) gas, generator welding power (300-amp arc welder with 115-volt, AC or DC auxiliary panel), a beauty of a gun-torch . . . and, of course, the steady hand and the keen eye of a good welder.

The welding set's complete calling name and FSN are:

Welding Set, Arc, Inert Gas Shielded, FSN 3431-691-1415.

It breaks down like this:





The set was designed for use with the Arc Welder, FSN 3431-222-1722, or Arc Welder, FSN 3431-542-1072.

And the set's issued as part of the Automotive Maintenance, Organizational Tool Set No. 2 (Supplemental), FSN 4940-754-0743.

It's also part of the Field Maintenance Welding Shop Set, FSN 3431-357-7268.

You'll find it listed in SM 9-4-4940-A08, and in SM 9-4-3431-A05. And the set is an Engineer item.

You might run into MIG sets which differ slightly in looks . . . a button, or switch, a fuse or screw in a different spot, different brand name, etc., but regardless of looks, you'll find they work very much the same.

HOW'S IT WORK . . . ?

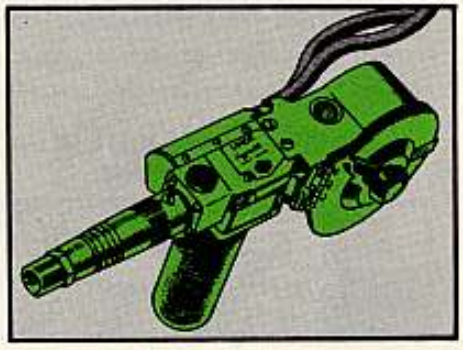
The MIG technique in brief: As you weld with a bare electrode, argon gas flows steadily to the torch where it forms a shield over the arc to shut out all chance of the atmosphere contaminating the weld. Men who know, call it welding at its best. There's no flux, no slag to worry with, and the equipment's easy to use and maintain. Its special needs are few and simple, but before you sidle-up any closer here's something you have to learn real good:

With MIG-welding the generator MUST BE SET ON REVERSE POLARITY.

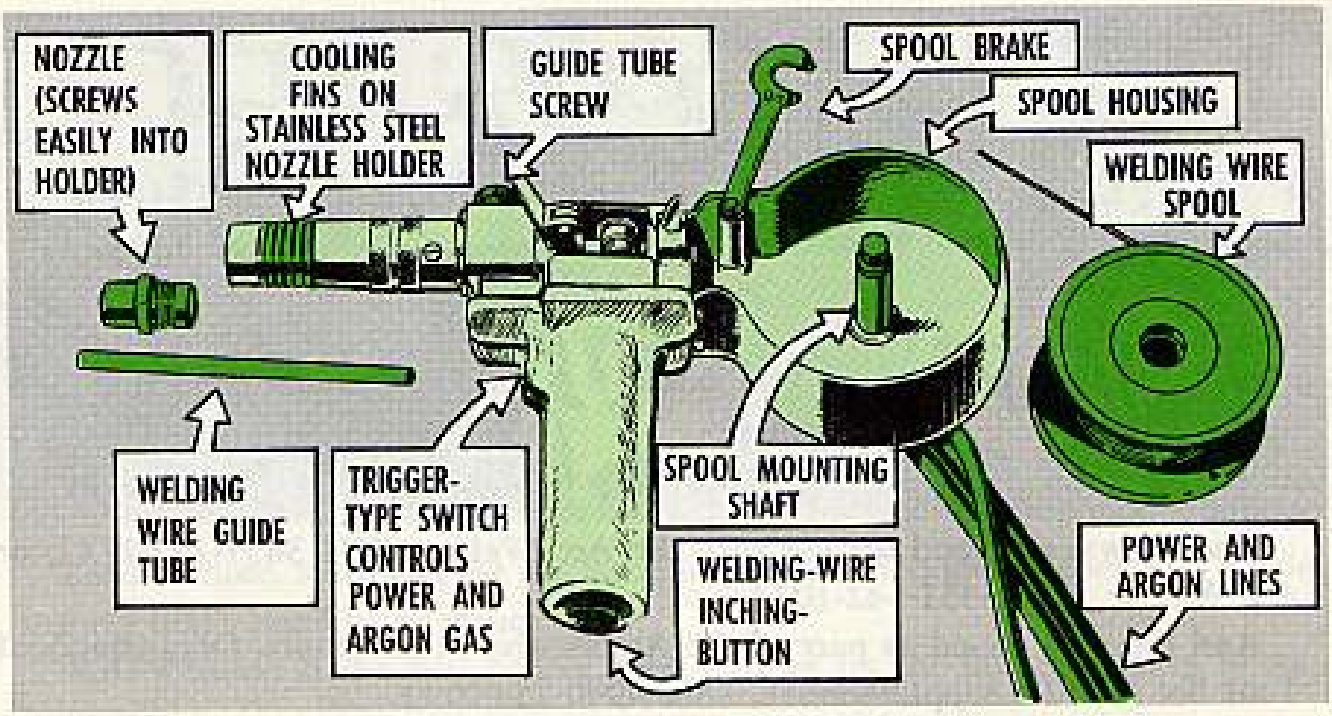
The high heat input of reverse polarity provides a cleaning action, and deeper penetration, on the base welding plate.

If you should forget and leave the generator on straight polarity the wire-feed motor will run in reverse, and the welding wire will burn-back into the guide tube.

There are a couple of other special cautions which we'll talk about later . . . but, right now let's look at a close-up of the MIG gun.



MORE



The MIG torch will handle all wire-feed speeds needed for welding with $\frac{3}{64}$-in aluminum wire (FSN 3439-775-6476), and it'll weld two different thicknesses of aluminum in any position or joint design.

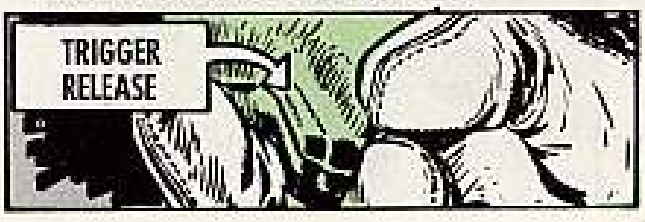
CAREFUL: The torch has a maximum current capacity rating of 200-amps (continuous duty)—so take care your welding amperage never exceeds 200 amps . . . a higher setting on your generator could damage the torch.

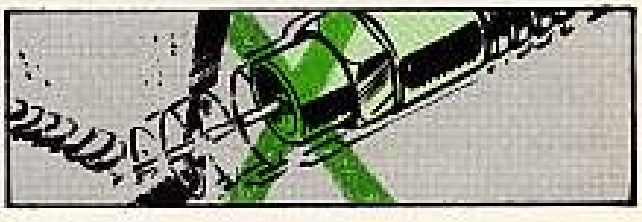
The gun's air-cooled, compact, and well insulated to protect you from its electrically hot wires and components. It's also fairly light-weight (somewhere around three pounds, minus spool and cables), and with its neat size and shape—and its welding wire piggy-back—you can work easier in hard-to-reach places.

GUN OPERATION

You control the welding power with the gun's trigger-type switch. The trigger-switch closes the welding contactor, and also starts the argon flow. You squeeze the trigger to start welding and release the trigger to stop. And, right here's another important MIG-welding caution:

TO STOP WELDING—ALWAYS RELEASE THE GUN'S TRIGGER-SWITCH FIRST. NEVER PULL THE GUN AWAY FROM THE WORK TO STOP WELDING.





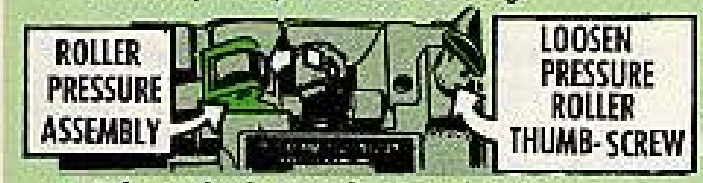
Pulling the gun away from the work while pressing the trigger will throw a voltage over-load on the small motor in the gun's handle, and it'll likely burn up. So watch yourself real close here . . . the price tag on that 24-volt, DC motor, reads something like 100 bucks.

The motor's job is to deliver the wire from the spool to the work. When you're welding, the motor gets its power from the field of electrical current which is generated between the end of the wire and the work plate. The current is picked up by the voltage pick-up cable, sent back through the voltage-control-box, and on to the motor.

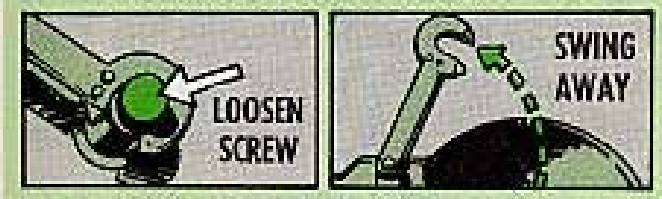
She'll start feeding wire the instant you make contact with the work . . . not when you pull the trigger.

LOADING THE GUN

1. To load, or thread, the gun, loosen the pressure-roller thumb-screw on the side of the gun, and swing the pressure-roller assembly away from the housing.

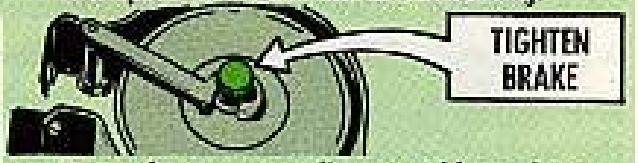


2. Release the friction disc (spool brake) assembly from the spool mounting shaft, and swing it up out of the way.



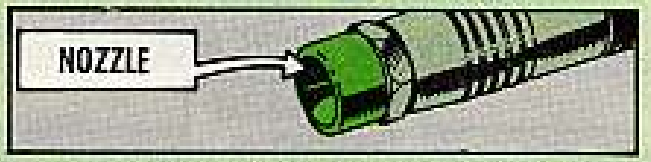
3. Straighten out the end of the wire on a spool (about six inches worth), and push the straight end of the wire into the wire inlet and outlet bushings.

4. Mount the spool on its shaft so the wire feeds from the top, and replace the spool brake. Screw the brake on tight enough so the spool won't unwind in its housing.

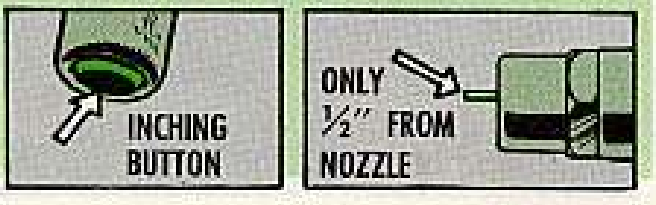


5. Swing the pressure roller assembly in place.

6. Tighten the pressure-roller thumb-screw, and adjust the spool brake, as needed, until the rollers push the wire through the nozzle without any slippage.



7. With the inching-button you can run the wire out past the nozzle to trim or adjust it. Before you start welding (and while you're welding) the wire should be no more than ½ inch beyond the nozzle.



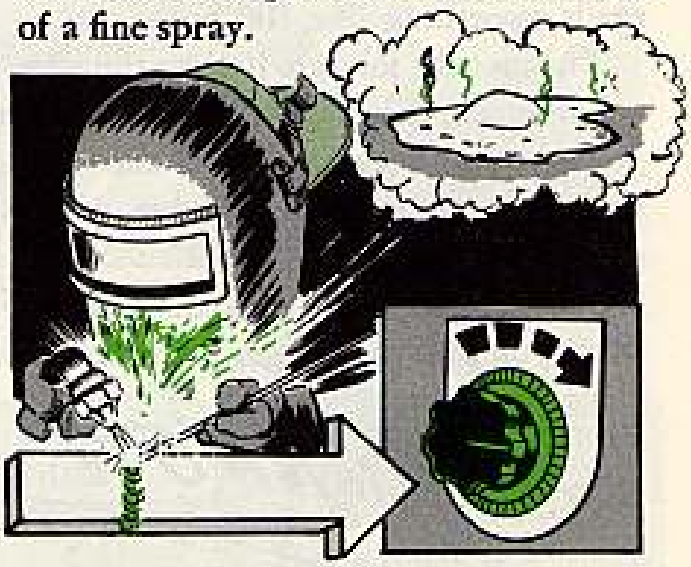
MORE

WIRE SPEED RATE

Wire speed is controlled by the setting you make on the welding voltage-rheostat, on the voltage-control-box. A long arc speeds up the wire, a short arc slows it down. If wire speed is too slow the copper guide-tube will get burned-back (electrode fuses to the tube).

One way to avoid burned-back tubes (when you don't know the best wire speed setting to start out with) is to turn the wire speed knob to maximum speed, and then adjust the speed gradually as you weld.

When you've adjusted the speed just right you'll have a steady frying sound and the wire deposit will be in the form of a fine spray.



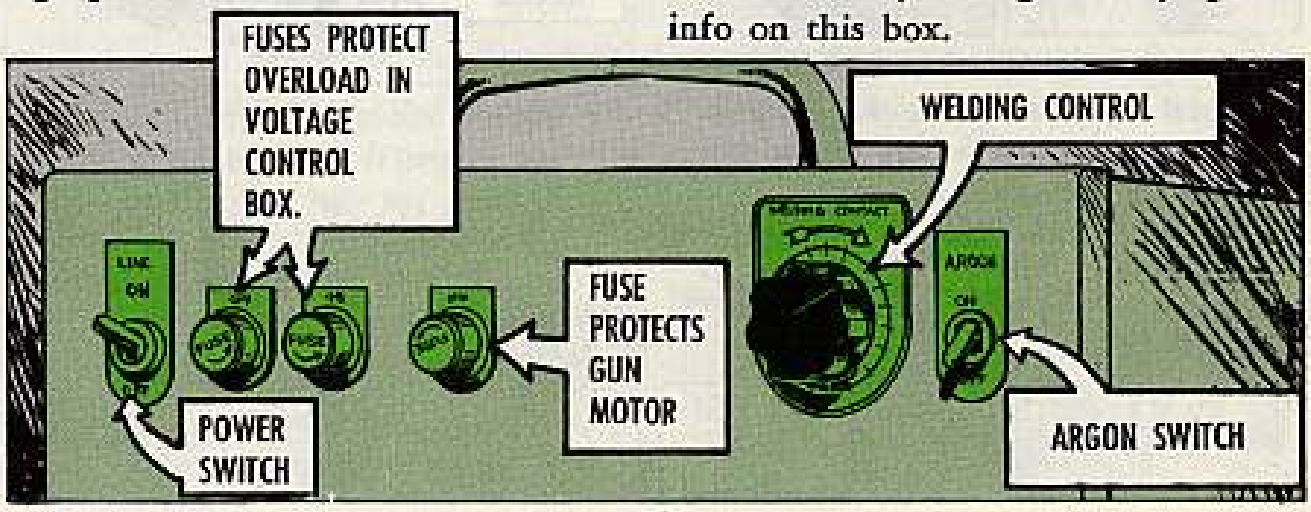
VOLTAGE-CONTROL-BOX

The voltage-control-box controls the wire feed rate and the argon flow. It gives them to you in the proper order. The control also provides the means which let you inch the wire through the gun without welding power . . . when the voltage-control-box switch is ON, and you press the inching-button, the DC output voltage from the control's rectifier will run through the motor's armature, and she'll feed you wire.

Always keep the control box standing up. If it's laid on its back the current relay will close and wire will start feeding prematurely.

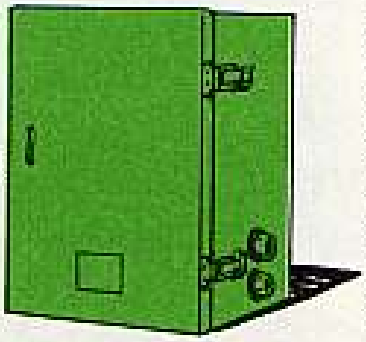
Changing its fuses, as needed, is about all the maintenance business you'll have with the control box.

One more thing . . . when you're using 110 volts AC, don't ground the voltage-control-box to the building . . . the box has an internal ground. Grounding it to the building will create a short that could seriously damage the box. See the operator's and maintenance manual with your rig for any special info on this box.



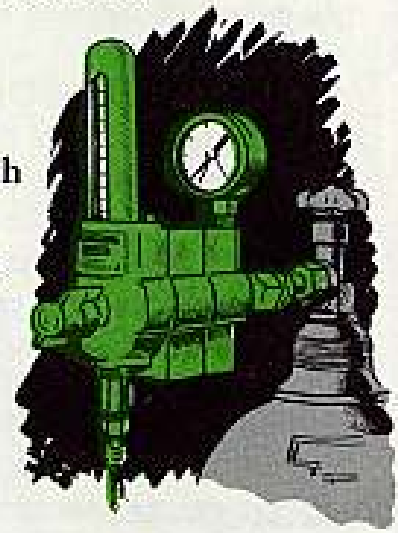
WELDING CONTACTOR

Other than keeping the contactor's connectors tight, keeping the box clean and dry, and checking cables for wear, you'll have little else to do for this switch box.



ARGON CYLINDER REGULATOR

Connect it, adjust it, read it, and keep it clean. Like with any other gas regulator, you don't monkey with this one either.

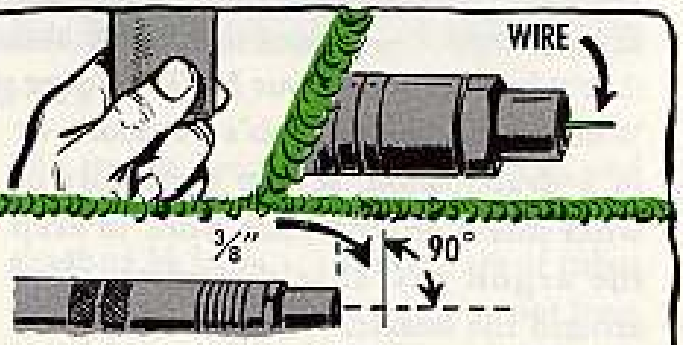


WARM-UP

Are you ready for a few practice passes?

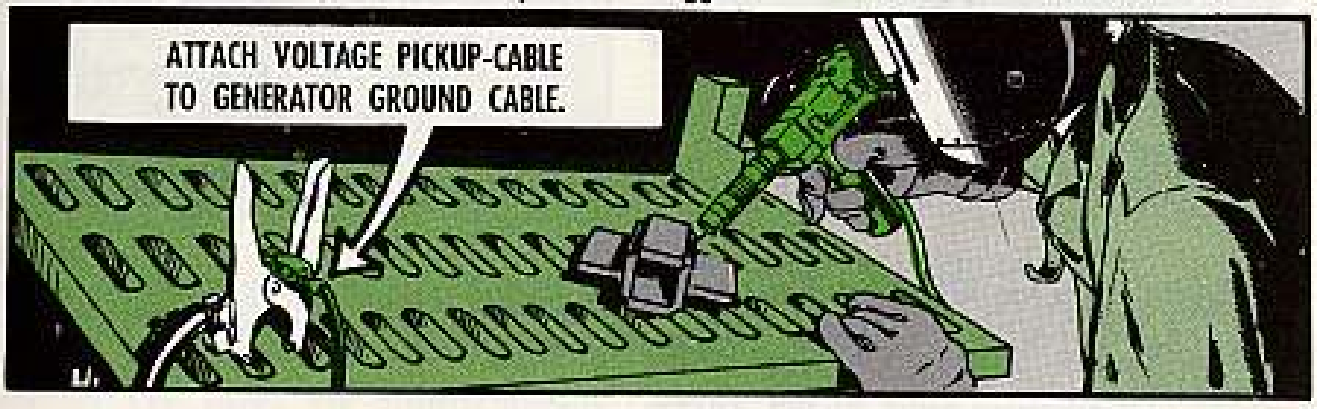
OK, set the generator on reverse polarity, and check your power and argon adjustments. Make sure that the voltage-pickup-cable is attached to the generator-ground-cable, so you'll have the right voltage pickup.

1. With the gun threaded (to feed from the top of the spool) press the inching-button and run the wire ½ inch past the nozzle. Trim the wire if necessary.



2. Take your stand (get yourself in the most comfortable, relaxed position you can find), and hold the gun at a 90° angle to your work, and point it about 10° toward the direction of travel. Keep the nozzle about ⅜ inch above your work at all times. (If you hold the gun too far from your work the molten metal will get contaminated. If you hold it closer, the nozzle will get red-hot).

3. Lower your welding helmet, and squeeze the trigger.



MORE

4. Scratch the work lightly with the wire to start the arc. As the wire touches the work the motor will start, and wire will begin to feed immediately.
(**WATCH IT:** Right about here, on their first few tries, some guys get the urge to pull the gun back a bit, which messes them up, but good. Drawing the gun back feeds out more wire than is needed, and the weld gets contaminated. So be prepared to keep the gun **down** once you get going.)

5. As long as you squeeze the trigger and maintain the arc you'll go on welding.

6. When you release the trigger everything (power, gas and wire) stops.

TO STOP WELDING—ALWAYS RELEASE THE GUN'S TRIGGER-SWITCH FIRST. NEVER PULL THE GUN AWAY FROM THE WORK TO STOP WELDING.

OPERATION NOTES

Never let a fan, or any other strong draft, blow directly on your work when you're welding. The breeze'll blow the argon shield away from the nozzle and that'll be the end of your MIG-welding. When your welding job's outdoors, or in a drafty shop, set up some sort of wind shield around your work to keep the argon gas shield undisturbed around the nozzle.

The welding wire becomes "hot" the instant you pull the trigger, so to avoid accidental arcing, hold the torch safely away from any likely "ground" until you're ready to start welding.

Never press the trigger-switch when you're trimming the wire.

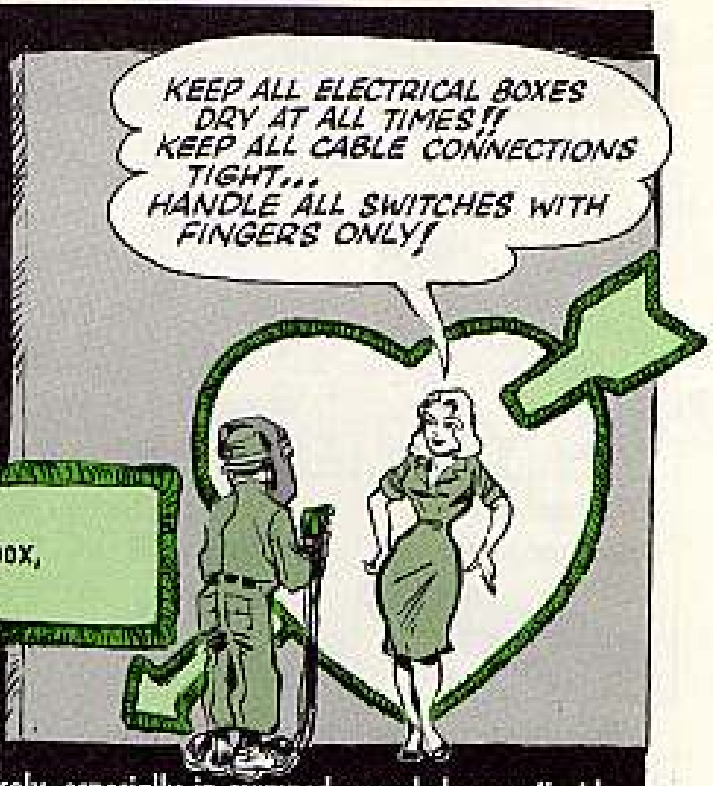
Be sure the torch ground-cable is connected to the ground-terminal on the control box. Also that the control box and your work are connected to a good ground, and the same goes for the 115-volt power outlet cord.

The welding cable connects to the lug on the torch power adapter, after it passes through the current relay — so when you hook-up the welding cable be sure the adapter's jam nut is tight, and that the lug's tight enough so it won't move and touch the screws on the control cabinet.

SAFETY

Safety rules for MIG-welding are similar to safety rules for electric arc welding. (See TM 9-237, Welding Theory and Application pages 38-41, and page 104.):

Wear protective clothing—helmet, gloves, apron, etc. Take care your helmet has the right lens shade. Lens shade No. 10 (FSN 4240-273-8590) when using from 75-to-200-amps, and Lens shade No. 12 (FSN 4240-273-8591) for over 200-amps. These two lens shades are available through supply, and darker shades, No. 13 and No. 14, are available on local purchase from the helmet manufacturer.



Before making any connections be sure the voltage-control switch on the voltage-control-box, and the generator power switch are on OFF.

For the protection of your neighbors work in a shielded area.

Ventilation must be good. Watch yourself closely, especially in cramped, crowded areas (inside vehicles, tanks, tankers, etc.) and in closed buildings. A ten-minute break out of every welding hour will protect you from ozone gas poisoning. (If you're ever smoking in the MIG-welding area and your cigaret suddenly gets to tasting real sweet . . . that's your cue; you're over-due some fresh air.

To make any adjustment at all (on the gun or other equipment) turn off the power supply.

GUN PM TIPS

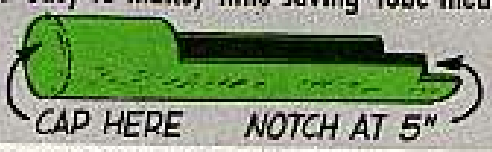
Keep gun wiped clean and dry.

Oil the rollers lightly with 10-weight oil (about twice a year).

Clean nozzle after each operation. Scrape out spatter from inside the nozzle carefully with a scriber, or a file. And take care the spatter you scrape off doesn't drop back into the nozzle holder.

Trim and straighten bugged (burned-back) copper guide tubes with a file or reamer. The tubes are approximately 5⅜ inches long when they're new, and they're still usable after you trim off as much as ⅜ inch . . . but beware of tubes under 5 inches long . . . they're not long enough to guide the wire right all the way out to the work.

Use this easy-to-make, time-saving tube-measure gage.

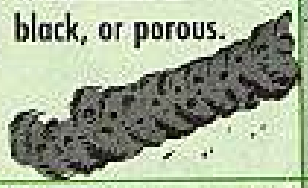


Slice a 5⅜-in length of pipe lengthwise so's to drop tube in easy. Cap one end (so tube won't slip out), notch the other end where it measures exactly 5 inches from the capped end.

Keep hands off damaged power cables and argon line assemblies . . . report 'em to your supervisor.

PS MORE

TROUBLE-SHOOTING THE MIG GUN

WHAT?	HOW COME?	FIX!
Nozzle arcing on work. 	Spatter build-up, or drops of hot metal, inside of nozzle, or nozzle holder, are touching the guide tube which transfers current to the nozzle.	Remove all spatter & balled metal from inside nozzle with a file or scriber.
Nozzle gets red hot. 	1. Wire feed's too slow. 2. Nozzle's being held too close to work.	1. Increase wire feed. 2. Keep nozzle 3/8" above work.
Weld metal is black, or porous. 	Weld metal has become oxidized due to loss of argon shield.	1. Check for drops of metal inside nozzle holder. 2. Check argon supply in cylinder. 3. Check argon hose for holes.
When trigger is squeezed, wire feeds before it touches the work. 	Spark has burned a hole in the power cable shield–grounding the torch-switch cable to the power cable, causing motor to run.	Power shield must be removed, wires retaped and power shield replaced.
Burn-back. 	1. Wire ieed too slow. 2. Wire spool empty. 3. Voltage pickup cable not connected to generator ground cable. 4. Feed assembly contact shoe becomes welded to contact ring on feed roll. 5. Spatter on wire roll keeps wire from feeding. 6. Blown fuse on motor. 7. Wire stops feeding.	1. Increase wire speed. 2. Replace spool. 3. Replace cable clamp or reconnect. 4. Remove name plate on top of gun & free shoe with screw driver. 5. Remove spool, cut off spattered section of wire & reinstall spool. 6. Replace fuse. 7. Check for kinked wire, or worn rollers. Check roller for worn grooves, increase pressure on pressure roller.
Nozzle threads chewed up. 	Nozzle worked loose and allowed spatter to get lodged in threads.	Keep nozzle tight at all times.
Motor won't run when inching-button's pressed. 	1. Blown fuse. 2. Faulty switch. 3. Broken wire in inching-button circuit.	1. Replace fuse. 2. Report faulty switch. 3. Report button failure.
Welding contactor doesn't close when trigger is pressed.	1. Blown fuse. 2. Faulty trigger switch. 3. Damaged contactor coil.	1. Replace fuse. 2. Report faulty switch. 3. Report damaged contactor.
Loss of argon gas. 	1. Holes in argon line. 2. Faulty argon solenoid valve. 3. Cylinder empty.	1. Report damaged hose. 2. Report argon failure. 3. Replace argon cylinder.

END

Connie Rodd's BRIEFS

M125 end curtain

Curtain, vehicular, truck cargo body, FSN 2540-777-5254, found in TM 9-2320-206-20P (Apr 61) fits either front or rear on your M125 10-ton cargo truck. So use this number when a replacement's needed for either end.

Right hookup

Still towing a G675 stake and platform 2-wheel semitrailer? TB 9-2300-219-10 (4 Sep 59) tells you to tow it with the G742-series truck tractors, M48 or M275 . . . instead of the one listed in TM 9-890 (12 Jul 44). Check TB Ord 616 (31 Aug 56) for the adapter needed for the intervehicular electrical hookup.

Next assembly

Sometimes you'll need to order the next higher assembly to get some of the smaller parts for your Ordnance automotive equipment. F'rinstance, to get a bracket, you may need to fabricate it or order the housing it's attached to. To get the nail, maybe you'll need to order the shoe—or even the whole hoss! Costs less to stock one item than 10, y'know.

Engineer engines

Sweat no more when mating Engineer engines with the equipment on which they're used. Coming to the rescue is TB ENG 360 (Aug 61), "Internal Combustion Engine Application." It gives you the scoop on what Engineer engines are used with most engineer rigs. Manufacturer model numbers, part numbers and FSN's of the engines and equipment are included.

Clean your bilge

Mud and silt caked in the bilge pumps of your M113 APC can burn out their motors. The mud gets in when you slop through the goop in cross-country operation. Flushing out the mud before it dries gives you a paid-up life insurance policy for your bilge pumps. So, man the pumps with some clean fresh water before you put your M113 away for the night.

M113 drain plugs

When you drain water from the final drive outer housing on your M113 APC be sure you take out the right plug. There are two plugs pretty close together—on each side of the vehicle. The one closest to the track is removed only if you want to drain the oil out of the final drive. The other plug at the very bottom of the housing is the one you remove to let the water out.

Turn for the better

TB 9-1430-254-34/1/1 (22 Dec 60) is the answer to keep from touching those "hot" terminals on the R2 tach phase adj potentiometer in your Nike-Hercules acquisition antenna's RF coupler. But—in case your support unit has gotten around to turning those terminals up and out of the way as the TB says . . . it's a smart guy who goes along with what it says on page 25 in PS 105: Steer clear of the terminals.

ally by over-
semblies, and
ocks.
ial numbered
thorized only
vices, and is
equ
lons of main-
usually p
maintena

e operations.
zed to facili-
e support at
equate main-
f equipment.
y pushed to-
n service and
ations are an
operational

y will be pro-
nce facilities
n extent con-
rsal require-

supporting
rform on-site
tock of sup-
technical ad-
ort to us

the

nce facilities
te the repair
lities of the
h the overall
; maximum,
d density of

Facilities will
oots to facili-
nd the capa-
its and the
stocks in a

9. Organizational maintenance. *a.* Proper operation and use of equipment and performance of preventive maintenance inspections and services by responsible individuals are basic.

b. In addition to being trained in the proper use of their equipment, operators will be trained
ve
p-
ment manuals (TM), lubrication orders, and
rmy pub-

c. Preventive maintenance will consist of daily operator checks, supervisory inspections, and periodic services.

d. Lubrication will be accomplished as required in accordance with applicable lubrication orders and, if feasible, in conjunction with periodic services.

e. Operator and
ing
will be given under
n of
responsible command
e of
qualified maintenan

f. The operator
d in
servicing equipment
when
personnel and facilities

g. Organizational mec
ics will be required
to inspect and a
reventive main-
tenance pers
by the operators.

h. Operators will assist organizational mechanics in performing repairs on assigned equipment.

i. The echelon of repairs and adjustments performed by each unit or organization will be prescribed in TOE. The specific scope of repairs will be authorized by the Department of the Army equipment manual (TM) for the specific item of equipments, and for communications security equipment by National Security Agency maintenance instructions and Department of the Army equipment bulletins for the item.

j. Each unit and organization will have on hand its prescribed load of repair parts. Units will use parts from their prescribed loads to accomplish authorized repairs and will immediately requisition replacement parts.

k. TOE organizational maintenance shops will not be operationally combined with non-TOE field and depot maintenance shops.

AGO 1276A