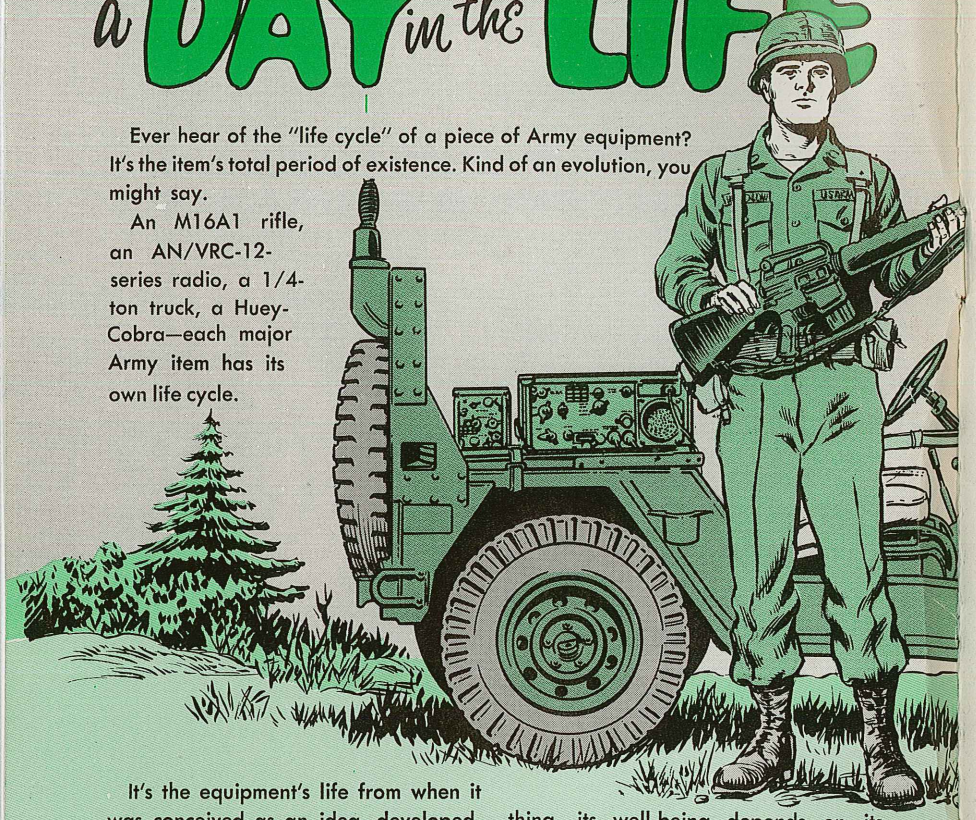

Issue 258
PS
May
1974
THE PREVENTIVE MAINTENANCE MONTHLY
2nd BATTALION ARTILLERY
NOW THAT TH' RAIN'S OVER, LET'S GET UNDER-WAY.
HALP!
ONCE AGAIN, WINGATE FORGOT TO USE HIS TARP TO COVER THE AREA BETWEEN THE ROTOR SHIELD AND THE TURRET.
1st BATTALION ARTILLERY
M109/M109A1
SP HOWITZER
See Page 2
MURPHY ANDERSON

YOUR HEARTFELT CONTRIBUTION . . .

a DAY in the LIFE



Ever hear of the "life cycle" of a piece of Army equipment? It's the item's total period of existence. Kind of an evolution, you might say.

An M16A1 rifle, an AN/VRC-12-series radio, a 1/4-ton truck, a Huey-Cobra—each major Army item has its own life cycle.

It's the equipment's life from when it was conceived as an idea, developed, tested, manufactured and at last put out for your use. The life cycle ends when the gear is finally junked.

"Big deal. Where do I fit in?" you ask.

Right here, ol' buddy. You, the equipment operator or organizational mechanic, are the very heartbeat of that life cycle.

The Army built that piece of equipment around you. And like a living thing, its well-being depends on its heatbeat—you. It could never have been dreamed up in the first place without you in mind. In its development and testing you were given first consideration and full respect.

And now that your equipment is a living part of your Army, you're more important than ever. Its operating life depends on the way you warm up its cold engine, the way you downshift the

DEAR CONNIE OR BONNIE: I would like PS Magazine to run an article about (describe your maintenance problem):

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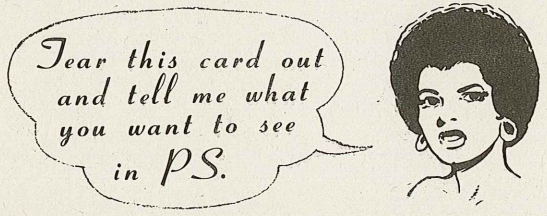

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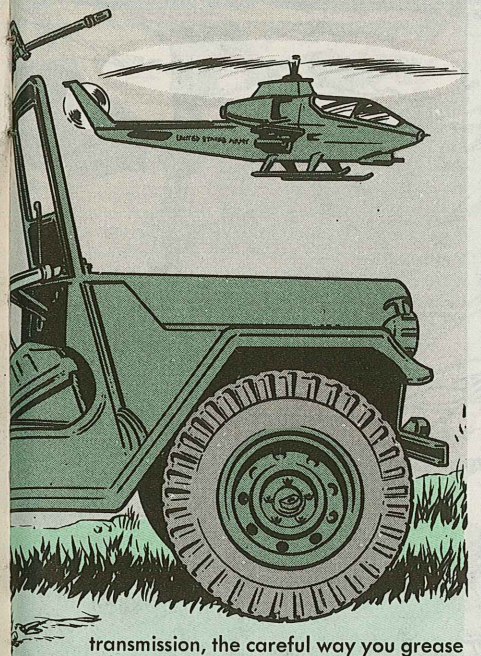
Tear this card out and tell me what you want to see in PS.

(CYCLE)



transmission, the careful way you grease it....

No matter what equipment you work with—your use, your maintenance, your care make all the difference between a long and a short equipment life cycle. Maybe even your life cycle, too.

What if the difference is only one day?

Well, since you're Army and you're proud and you're all heart, it's "a day in the life" to the good. Right?

PS THE **PREVENTIVE MAINTENANCE** MONTHLY

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

M S G Half-Mast
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FIREPOWER

M109/M109A1 SP HOWITZER

All M109's are being "product improved" to M109A1's, but it will take a few years. Meanwhile, this'll help you keep your M109's in shape and give you an advance look at the M109A1.

Since the M109A1 is just an M109 with a bolt-on package added, almost everything you learn about the M109 also helps with the M109A1.

Most of the problems on both the M109 and the M109A1 have the same cause—DIRT.

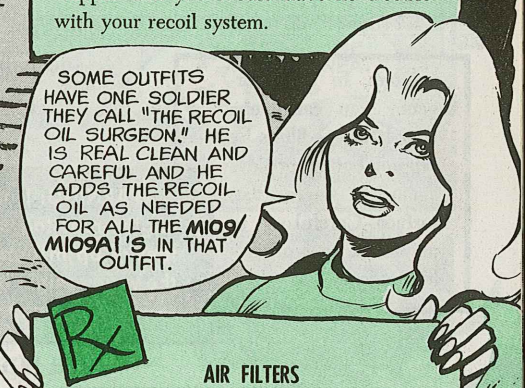
DIRT gets into recoil oil . . . air filters . . . oil filters . . . fuel filters . . . lube . . . commo boxes . . . everything in general.

The real nitty gritty is that there's too much gritty in the nitty.

RECOIL OIL

When you add oil, keep the oil, the M3 fluid gun and the entrance valves and fittings dirt-free. Bleed out any air that gets trapped and you should have no trouble with your recoil system.

KEEP FLUID GUN DIRT-FREE



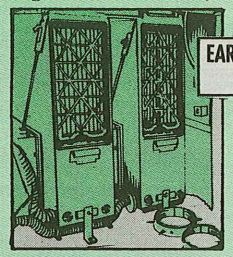
AIR FILTERS

Your TM 9-2350-217-10 says to inspect air cleaner filters every 750 miles and clean them after 1500 miles of vehicle operation.

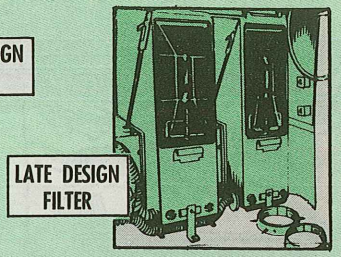
This is just a minimum, so clean 'em more often if they seem to need it. (Loss of engine power and lots of black smoke can be signs of dirty air cleaners.)

Service air cleaners according to their type:

1. Early-design filters—Take 'em apart for cleaning. Wash if necessary.

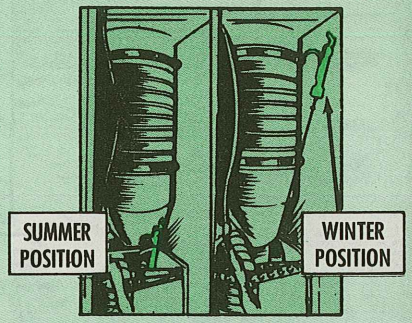


2. Late - design filters — Won't come apart. Take 'em out and clean with compressed air, plain water, or water and non-sudsing detergent.



Early-type air cleaners will fit if you put 'em in backward but they won't work right that way. Make sure the grill faces the air cleaner door.

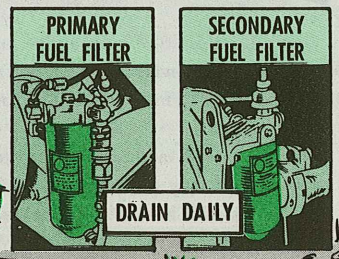
Air cleaner locking handles should be in the proper position for the season (down for summer, up for winter.)



Note: In an emergency you can clean your late-type filters by rapping bottom or sides against a large, flat, surface. Careful not to pound the open or sealing edge.

WARNING: If the handles are down in winter, your engine runs too cold, and the diesel fuel can freeze. If they're up in summer, your engine will overheat, and the valves might burn. Overheating is the most common cause of engine trouble with the M109/M109A1.

FUEL FILTERS



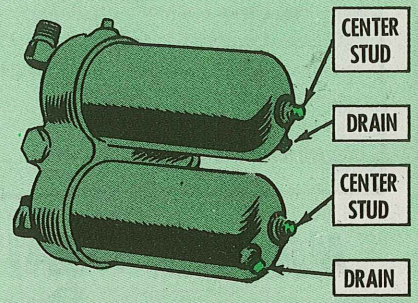
Your primary and secondary fuel filters in the engine compartment are drained daily of any accumulated water and dirt. Do this after operation. When the mechanic puts in a new filter, he'll fill the shell with fuel to keep extra air from entering the fuel system.

OIL FILTERS

The hull mechanic changes 'em every Q-service, 750 miles or 75 hours. If too much oil has been put into the engine crankcase, crewmen can open a drain plug on one of the filters and catch some oil in a clean container. When you decide whether or not the crankcase has too much oil, remember that after standing overnight, oil level may show on the dipstick up to ¾ inch over the FULL mark. This is normal. The crankcase is not too full.

The end of the center stud is sometimes mistaken for the drain plug. Remember, the center stud is exactly in the center, and the drain plug is about an inch away from it.

In draining oil and changing the filter element keep dirt out of the oil system.



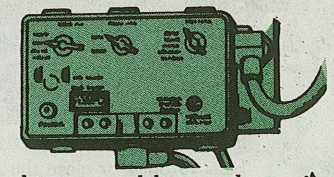
DIRTY LUBE

Your lube is bound to get some dirt in it after it has been applied.

Not much you can do about this. What you can do is keep the lids on the lube containers so you use pure lube and not a mixture of lube and dirt.

COMMUNICATIONS BOXES

CAREFUL WITH WATER



The commo boxes and other commo gear in your M109/M109A1 are supposed to be waterproof. They are in ordinary use. High-pressure water used in cleaning can do 'em in, so go easy. Be specially careful not to get water in the harness of the gunner's selector control box on the M109A1.

EVERYTHING IN GENERAL

Dirt and crud of one kind and another can keep your M109/M109A1 from performing well (or even from performing at all). Spent brass has been known to get into the turret ring mount teeth and bring traversing to a grinding halt.

SOMETHING TO REMEMBER

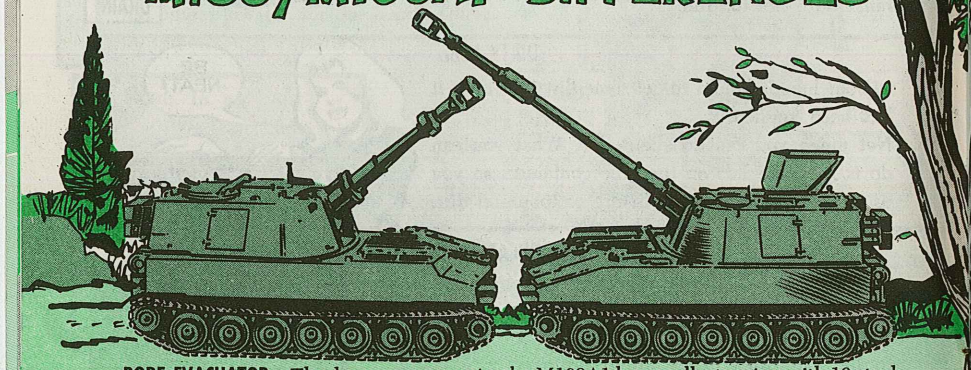
STOW CREW SEATS—On all M109A1's and on all M109's with weapon-mounted rammers, the crew seats have to be stowed before you traverse the vehicle cab.

MUZZLE BRAKE WEAR LIMITS

The M109 and the M109A1 have the same type muzzle brake. It weighs about 350 pounds, and could flatten your curves if it fell on you. So be careful when you put it on or take it off.

Check it carefully at least every 250 rounds. If it has cracks an inch or longer, you need a new muzzle brake. Cracks less than an inch are OK, but if you have several, check the muzzle brake often.

M109/M109A1 DIFFERENCES



BORE EVACUATOR—The bore evacuator in the M109A1 has a collector ring with 10 steel balls to open or close the holes, instead of 6 valves with balls like the M109. (Note: On the M109A1, after unscrewing the evacuator and sliding it forward, you can clean the 10 holes in the valve ring and the 3 metering orifices without taking off the muzzle brake.)

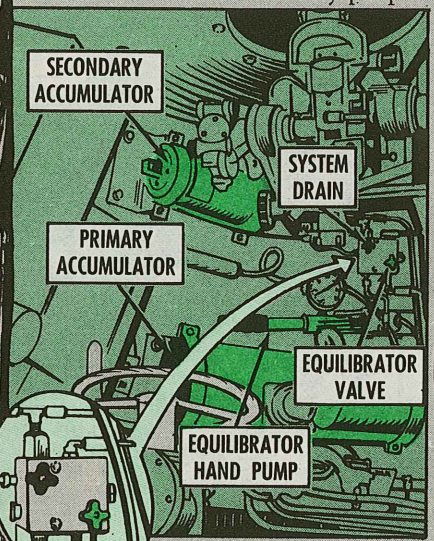
The 10 steel balls for the M109A1 and the 6 steel balls for the M109 are specially hardened. If you lose any of them, you can't replace them with regular ball bearings. The pressure would crack ordinary ball bearings like walnuts.

The ball for the M109A1 is ball, valve, FSN 1025-431-3442 (P/N 11578379), listed on page 436.1 (Fig 153.1) of your TM 9-2350-217-25P/2 (Apr 69) W/ Changes.

The entirely different ball for the M109 is listed on page 436 (Fig 153) of the same TM as ball, bearing, FSN 3110-575-9571 (P/N 11873468).

EQUILIBRATION—On the M109A1, oil for equilibration is drawn from the main hydraulic system. There is no reservoir but there are 2 accumulators instead of one. In adjusting the M109A1 for equilibrator system temperature variation, you use the equilibrator hand pump if the cannon tube is harder to elevate than to depress. ('Course, this is just like the M109.) However, if it's harder to depress the tube, you don't open the globe valve, because there is none. On the M109A1 you reduce pressure by slowly opening the system drain valve on the manifold (distribution block) and draining some of the hydraulic fluid into a clean container. The system drain is the red knob on the left of the manifold, (if it's not already red, paint it that color). The equilibration valve is the white knob on the right. Normal position for both valves is turned as far as they will go to the right—clockwise. This is OFF.

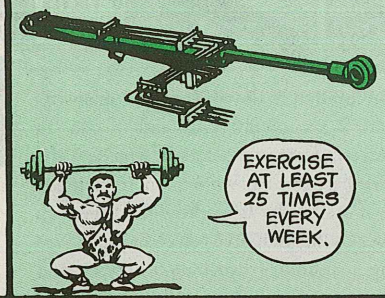
If both the red and white knobs are OPEN (turned as far as they'll go counterclockwise) and you have the master switches and cab power switches both ON, hydraulic fluid will be continuously pumped out until the entire hydraulic system is empty.



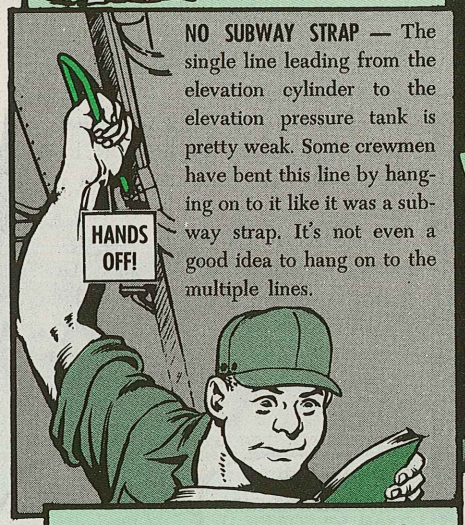
But if you only want to bleed the equilibrator, you turn the red knob ON (counterclockwise) but leave the white knob OFF (as far as it will go clockwise).

You bleed the equilibrator when you find (using the manual elevation/depress hand crank) that it's harder to bring the gun tube down than to get it up.

TORSION BARS—Torsion bars in the M109 and M109A1 are the same except that the left and right first and second position bars in the M109A1 are wound tighter than the bars in the same position on the M109. So it won't do to use the M109 bars. On your M109A1 use 2 each torsion bars FSN 2530-008-8821 (10898191-1), left side, and FSN 2530-008-8822 (10898191-2), right side.



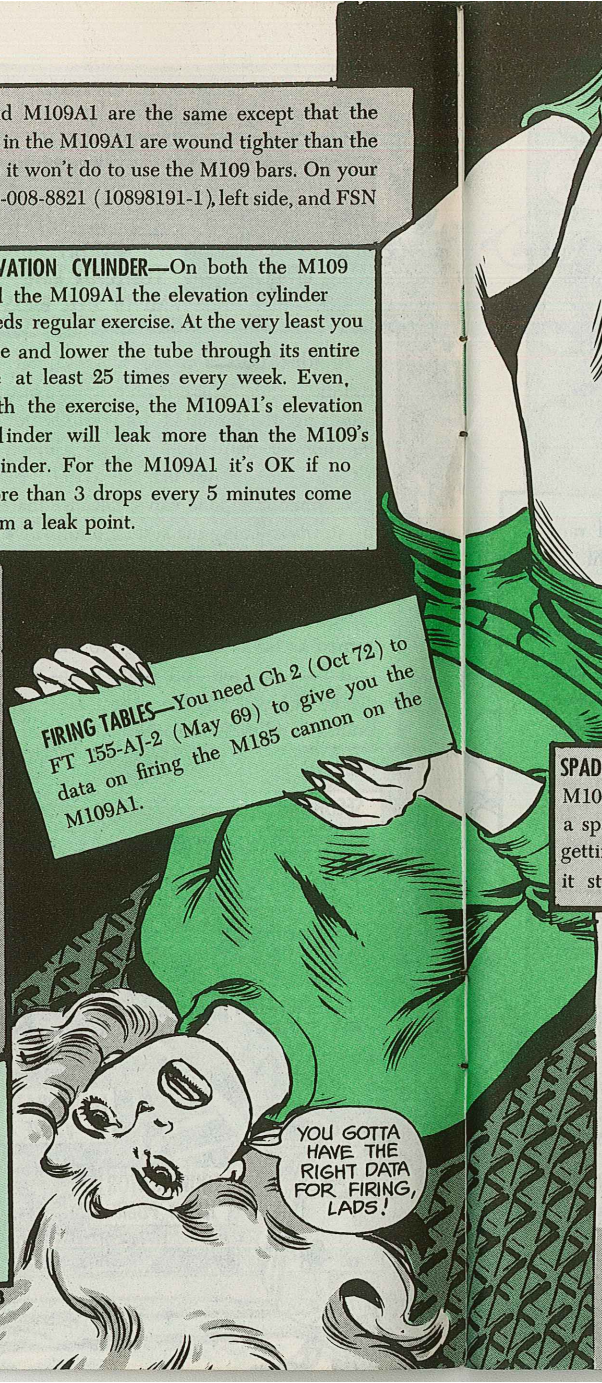
ELEVATION CYLINDER—On both the M109 and the M109A1 the elevation cylinder needs regular exercise. At the very least you raise and lower the tube through its entire arc at least 25 times every week. Even, with the exercise, the M109A1's elevation cylinder will leak more than the M109's cylinder. For the M109A1 it's OK if no more than 3 drops every 5 minutes come from a leak point.



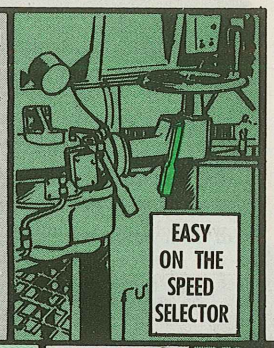
NO SUBWAY STRAP — The single line leading from the elevation cylinder to the elevation pressure tank is pretty weak. Some crewmen have bent this line by hanging on to it like it was a subway strap. It's not even a good idea to hang on to the multiple lines.

RECUPERATOR—The M109 is charged to slightly over 550 PSI. The M109A1 to 700 ± 10 PSI for usual conditions, (ambient temperature 70° to 100°F), but only 600 ± 10 PSI for high ambient temperatures, (close to or over 100°F). Make sure you have it at the right pressure.

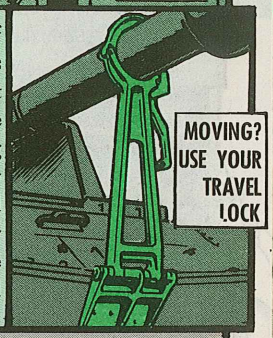
FIRING TABLES—You need Ch 2 (Oct 72) to FT 155-AJ-2 (May 69) to give you the data on firing the M185 cannon on the M109A1.



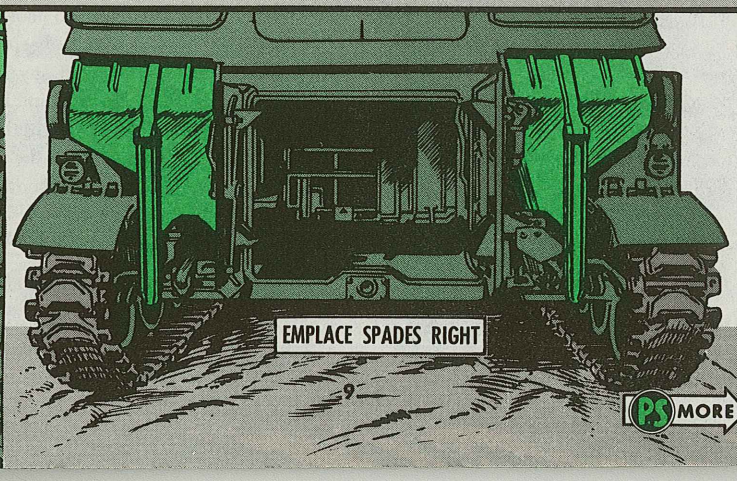
TRAVERSE—The M109A1 has a one-speed manual traverse with power switching between manual and power traverse. The one manual speed is about halfway between the 2 manual speed ranges of the M109. On the M109A1 you still have to keep away from forcing or twisting motions when using selector levers. If selector levers do not engage freely, slowly turn the handwheel in either direction until they do.



TRAVEL LOCK—The travel lock on the M109A1 is, of course, a lot bigger because of the longer tube. This is easy to see. What you may not be able to see right off is that you'll be using the travel lock on the M109A1 a lot more. Because the gun tube is so long and heavy, when you have to move, even if it's only a few feet, put the gun in travel lock. You are 'sposed to do that with the M109 but you could get away with a little cheating. With the M109A1 you have to stay righteous. It's a lot safer using your travel lock.



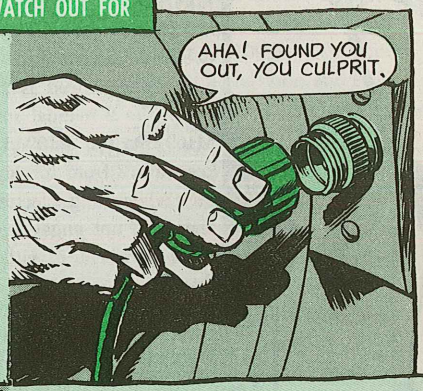
SPADE EMPLACEMENT—With the M109A1, it's even more important than with the M109 that the spades be emplaced right. Never try to turn the vehicle while it's on a spade. This can twist and damage your spades. If you have to make a turn when getting into the field pit, drive the vehicle straight ahead about 10 feet and then back it straight up to the FP and onto the spades.

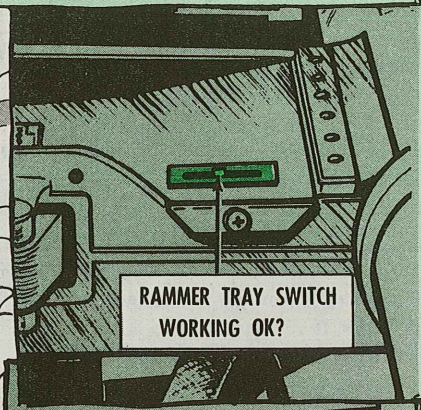


PS MORE

THINGS TO WATCH OUT FOR

CHARGING SYSTEM—You will likely have more problems with the charging system of your M109/M109A1 than with any other system. F'r instance, if your generator sometimes charges and sometimes won't charge, you might think it's broken and replace it. Could be the problem is not in the generator but in the blower motor. One loose wire on a blower motor could short out your entire battery charging system. So make sure all the wires are tight.

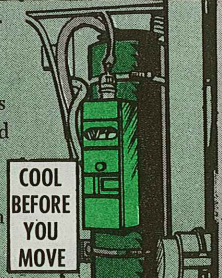




RAMMER—If your weapon-mounted rammer tray switch is not adjusted right, the rammer might quiver a little but not go through its cycle. Get your friendly direct support mechanic to adjust the switch.

Organizational maintenance now times the weapon-mounted rammer on late-model M109's and all M109A1's, as well as the early type cab-mounted rammer. Change 9 to TM 9-2350-217-20 and Change 5 to TM 9-2350-217-10 are the authority for timing the weapon-mounted rammer.

PERSONNEL HEATER—The igniter is the weak point on your personnel heater. It's brittle when hot, and when your vehicle is rolling over rough terrain, vibration can easily break it. So, it's best to turn your personnel heater off and let it cool down before you road march over rough ground.



WATER BUILD UP—There are no floor drains so do everything you can to keep water out. Never wash the inside of any vehicle with high-pressure water or steam. During a rain, water will leak through the gap between the rotor shield and the turret. Use your vehicle tarpaulin to cover this area.

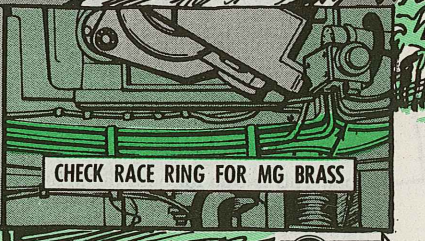
FLOOR MATS—If the inside of your vehicle is too slippery, use floor mats. They're in your TM 9-2350-217-24P/1 (Oct 72). FSN 2540-134-4976 gets you 2 of 'em.

ROAD WHEEL SEALS—Quite a few of these seals have been popping, possibly because of overfilling. Oil level near the center of the sight plug is fine. There's no need to have it above that.

SWISS GROOVE—The M185 tube for the M109A1 is not only longer; it's different. There is a groove about ¼ inch deep along the bottom of the tube. The groove holds in the powder charge when you're cranked up to high elevation. But it also holds water. When you swab out the tube with water after every round, you may have to mop up the water in the groove before you load the next round.

TOW RULES—Because of the extra long tube, the only way you can tow the M109A1 is backward instead of forward like an M109. When you tow either a M109 or M109A1 more than ¼-mile, you first have to disconnect the universal joints. Otherwise, the transmission will be damaged because the oil pump doesn't work when the vehicle is being towed.

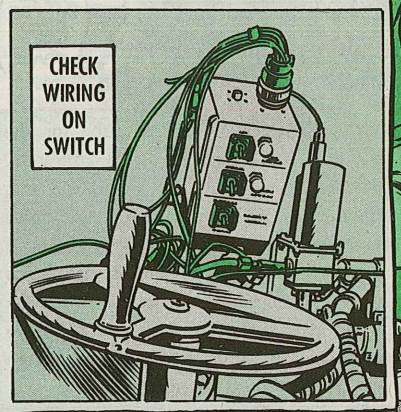
TURRET RACE RING—If you've been banging around with the machine gun, check out your race ring before you traverse. Machine gun brass has a nasty way of filtering down to the ring. A piece of brass caught between race ring teeth can stop your traverse.

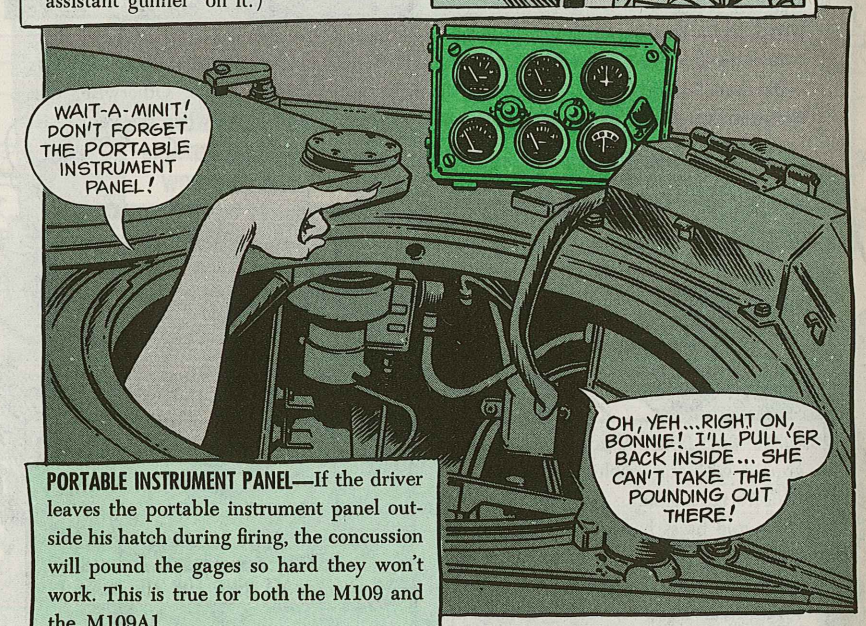


PS MORE

FIRE TELESCOPE—Make sure you have the right one. With the M109 you have the M118C but for the M109A1 you need the M118CA1, which has a different reticle.

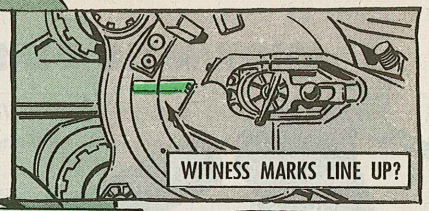
CAB POWER SWITCH BOX—The elevation control switch on your M109A1 switch box may be wired backwards. The gunner has control when the switch is flipped up to the No. 1 Man position, and the No. 1 Man has control when the switch (down) says that the gunner has. This is confusing, so get your friendly direct support to unscramble your switch if necessary. (If you've been trained that the assistant gunner takes over from the gunner, instead of the No. 1 man, you can put a little piece of tape over the No. 1 man sign and write "assistant gunner" on it.)

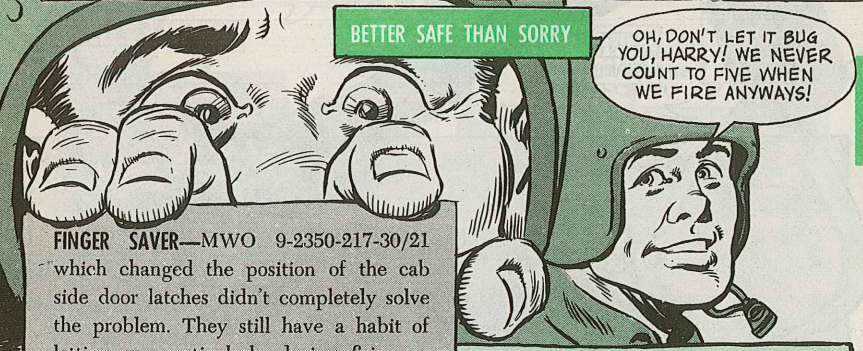




PORTABLE INSTRUMENT PANEL—If the driver leaves the portable instrument panel outside his hatch during firing, the concussion will pound the gages so hard they won't work. This is true for both the M109 and the M109A1.

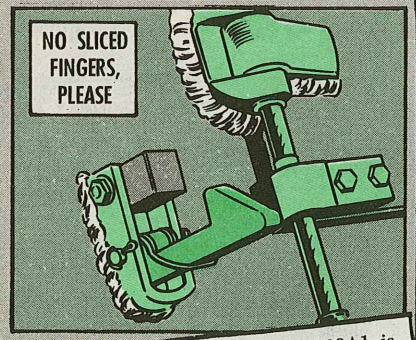
WITNESS MARK—The witness marks on both the M109 and the M109A1 must line up to show the breechblock is completely closed before you try to fire. It is dangerous to try to fire with the witness marks out of phase.

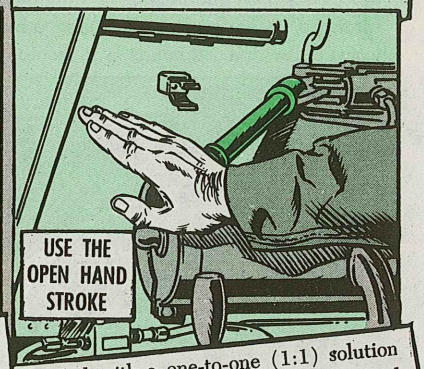




FINGER SAVER—MWO 9-2350-217-30/21 which changed the position of the cab side door latches didn't completely solve the problem. They still have a habit of letting go, particularly during firing or road marches. Check 'em often for wear and spring tension and replace as necessary. The latch is FSN 2540-127-5326. Best of all, play it smart and keep your fingers where they wouldn't get sliced off if the doors should slam shut.

EQUILIBRATOR HAND PUMP—It has been relocated in the M109A1 but this only means you could skin your knuckles on a different bracket. For both the M109 and M109A1 you can keep your skin if you open your hand at the end of each stroke.

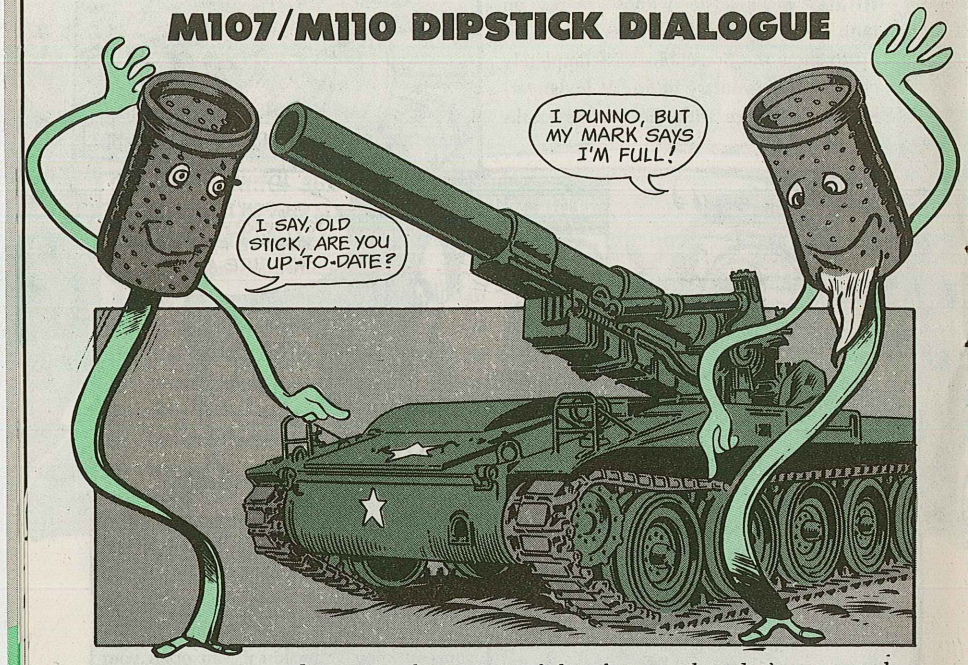




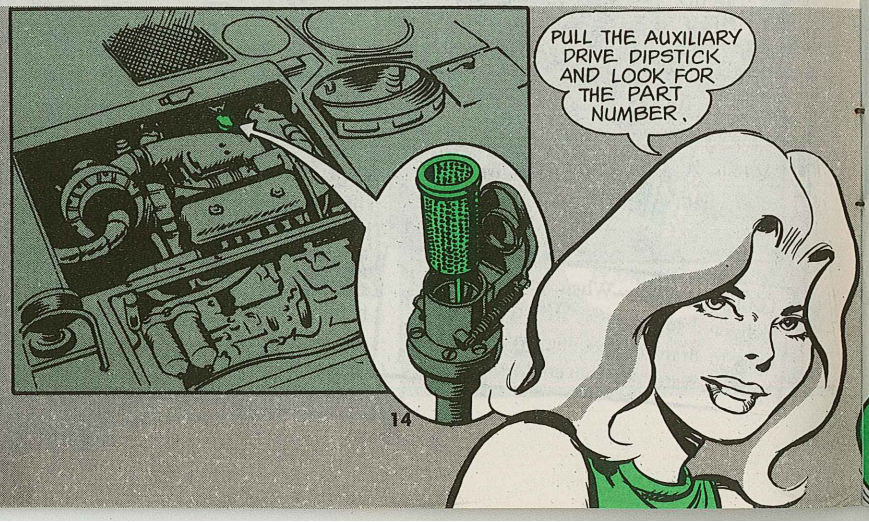
COOLING SYSTEM—When your M109A1 is delivered to you, it is strictly a non-good idea to drain the cooling system and put in fresh water. As delivered, your M109A1 is filled with a one-to-one (1:1) solution of water and ethylene glycol solution and that is better than plain water both in the summer and in the winter.

PS END

M107/M110 DIPSTICK DIALOGUE



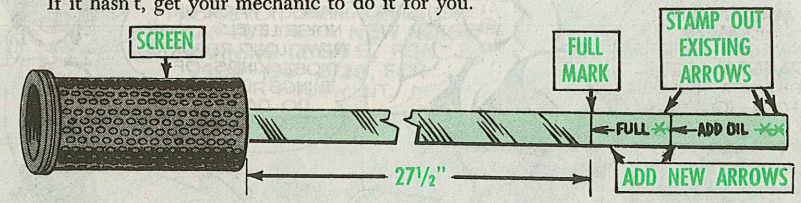
Some generator drive upper bearings are failing because they don't get enough lube. They don't get the lube because the auxiliary drive oil level indicator (dipstick) furnished on early models of these vehicles shows a FULL mark with 3 1/2 quarts instead of with 4 1/2 quarts as it should. So here's what to do . . . .



If the part number is 10906253-1 everything's OK. It's the later model and you can trust it to give you the right reading.

If the part number is 10906253, see if MWO 9-2300-216-20/5 (Aug 65) has been applied, with the old arrows stamped out and the new arrows stamped in. If it has, you have no worries.

If it hasn't, get your mechanic to do it for you.



If you can't read the part number or you aren't sure for any other reason, measure from the end of the screen to the FULL mark. It should be 27 1/2 inches. Have the FULL mark changed if it's at any other distance.

You check the auxiliary drive cold, before you start the engine. If you need to add or drain oil, you do it before you start the engine.

When the engine has been operating, wait 3 to 5 minutes before you make the check.

RIGHT FIT FOR THE FAN

Getting hot under the collar trying to figure out which set of matched cooling fan V-belts you need for your M107, M110 or M578?

Eyeball the DA Form 2408-5 in your log book.

If your M107 or M110 has had MWO 9-2300-216-40/5 applied, the V-belt set you need is FSN 3030-133-5761 (P/N 11062845).

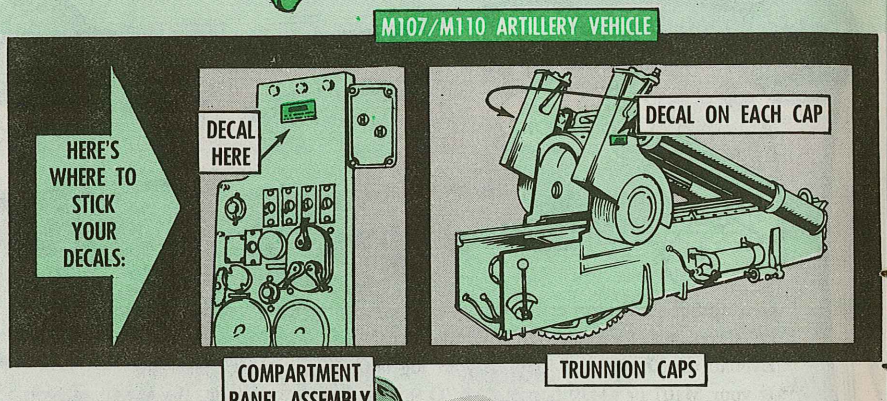
If the MWO has not been applied, use belt set FSN 3030-780-7001(P/N 5703282).

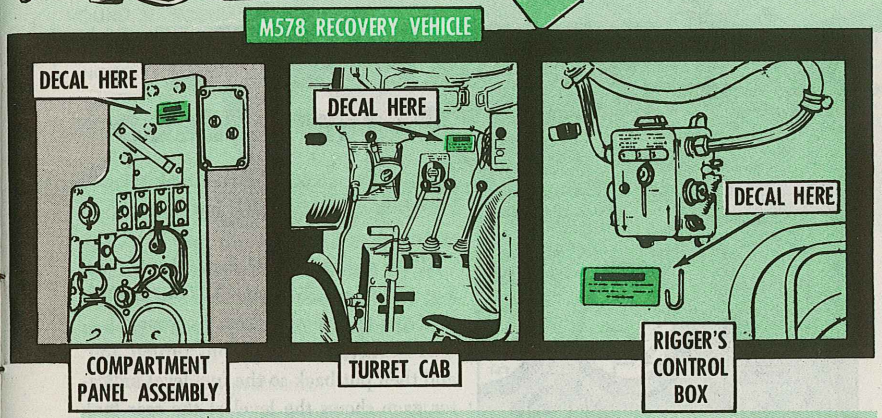
If your M578 has had MWO 9-2350-238-40/1 applied, use belt set FSN 3030-133-5761.

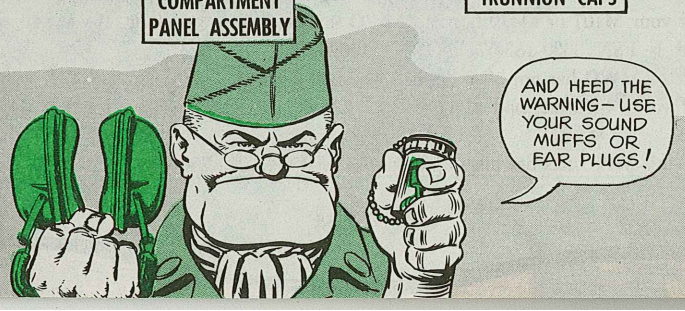
If this MWO has not been applied, use set FSN 3030-780-7001.

BEFORE IT'S TOO LATE . . .

LEND ME YOUR EARS!

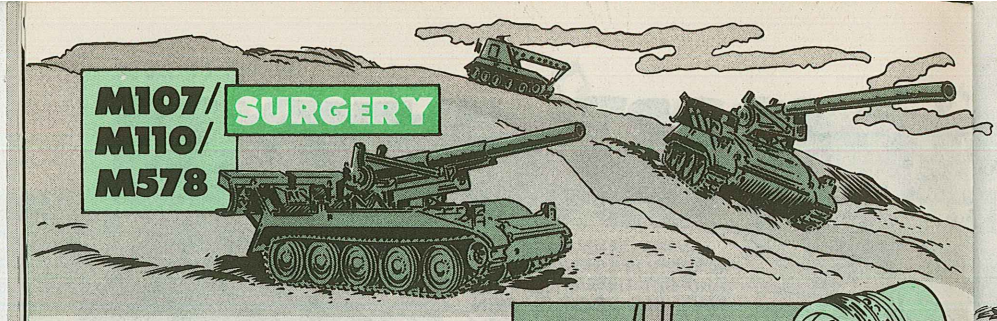






If you work in a noisy area, your hearing may be damaged beyond repair. Check TB MED 251 (Mar 72) for details on noise levels that may be dangerous and personal protective measures to guard against impaired hearing. Para 5 of the TB requires tests, with a meter, to determine noise levels and Para 6 requires that signs be posted in noise-hazardous areas.

M107/ M110/ M578 SURGERY

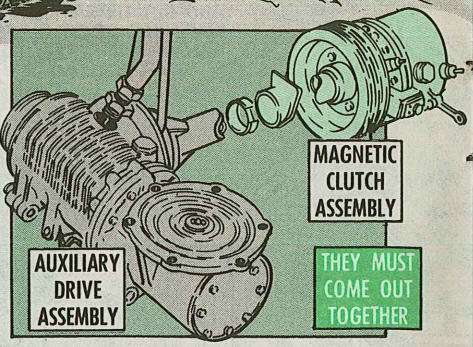


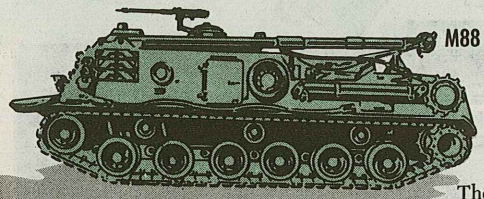
Listen up, you organizational mechanics who do major surgery on M107/M110 artillery or M578 recovery vehicles: When you remove the auxiliary drive assembly, take the magnetic clutch assembly with it.

Reason?

Unless you keep the magnetic clutch with the auxiliary drive it belongs to, you'll wind up with mismatched gear sets.

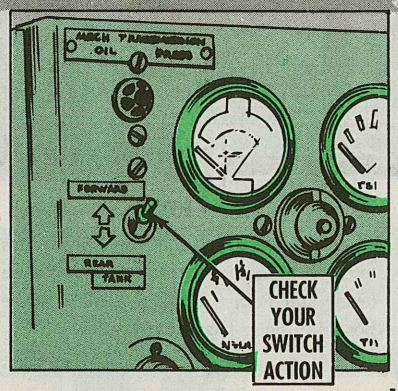
TM 9-2350-238-20 (Mar 72), pages 2-247 thru 2-250, has the dope for the M578. The M107/M110 is handled the same way, except the news will be in a change to TM 9-2300-216-20.





M88 RECOVERY VEHICLE ...

SWITCH SWITCHEROO



There's a chance the fuel tank selector switch in your M88 VTR has been put in wrong.

If the switch "reads" the tanks the way Fig 21 on page 25 of your TM 9-2320-222-10 (Apr 66) shows—then it's wrong.

It needs to be taken out, turned 180° and then put back so the fuel level indicator gage shows the level of the rear tank when the switch is DOWN, and the level of the forward tank when the switch is UP. If the switch is wrong, get your mechanic to change it. If the switch is broken, FSN 5930-577-8841 gets a new one.

M548 CARRIER TIPS

To keep your M548 cargo carrier roaming through the gloaming—or anyplace else you have to drive it:

1. Never (but never) EVER drive it without having the rear door latched.

The rear door has to be in place to keep the sides from buckling. Without the support of the rear door they're too weak for the job.

2. Try not to overload the patient little beastie. The 6,000 pounds the TM calls for as the maximum load is plenty, 'specially when going cross country.

TRACK WHEELS . . .

GET 'EM BACK FOR REBUILD

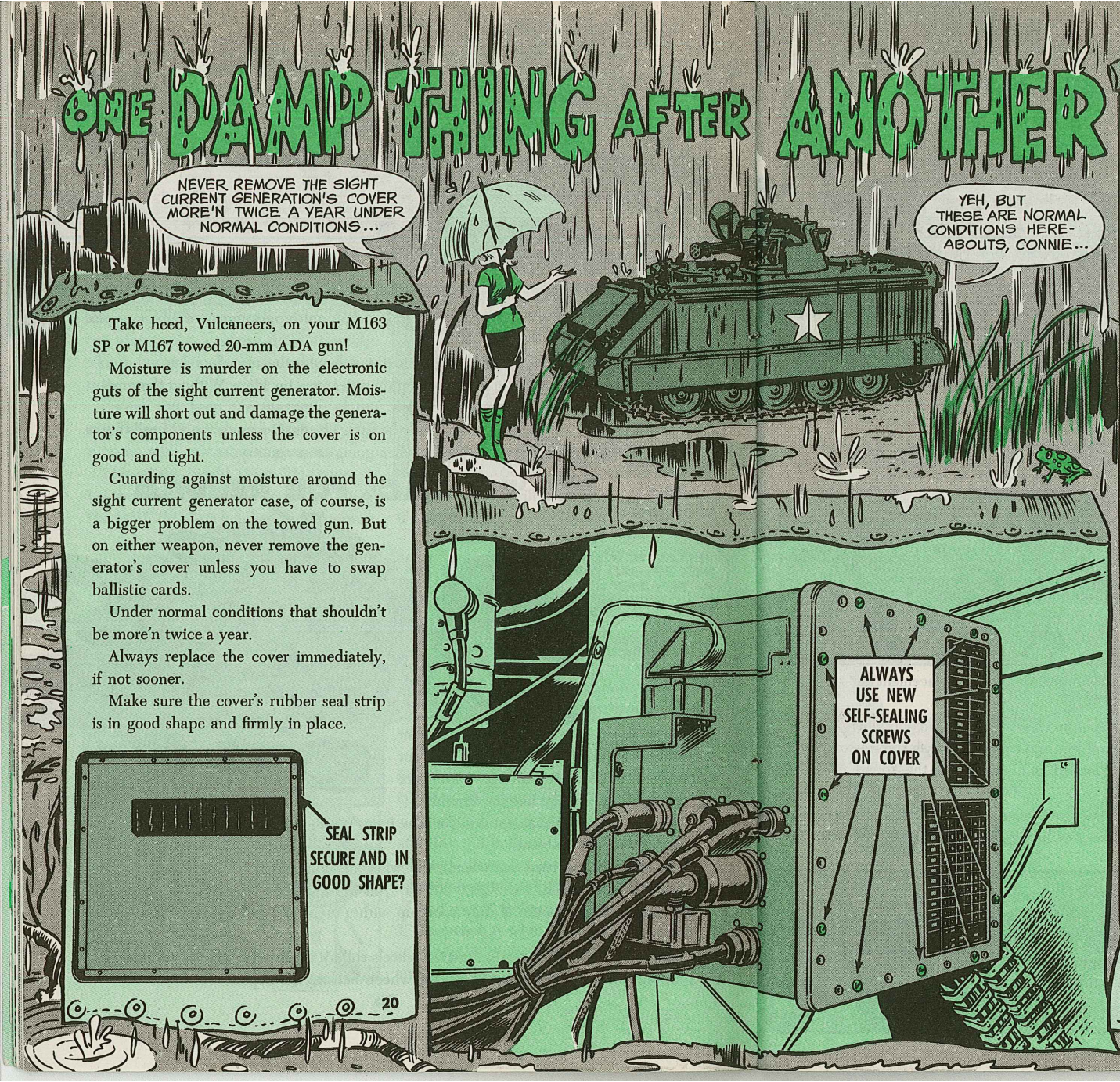
So it is with the used roadwheels, idler wheels and support rollers taken off your tracked vehicles. Not enough of 'em are making it back up the line for rebuild.

Result: High replacement cost for new item. Waste of money, manpower and materials, and supply problems.

So turn in every used roadwheel, idler wheel or support roller to your direct support. They'll use the info in TM 9-2630-200-14 (Jun 72) and Figs 10 thru 25 to determine the status of the wheels. If they come up with a code "F" they're candidates for rebuild.

Remember, it's up to you to start the wheels rollin'—up the line. It's up to your support units to carry the ball and get those wheels back to the depots.

ONE DAMP THING AFTER ANOTHER



Take heed, Vulcaneers, on your M163 SP or M167 towed 20-mm ADA gun!

Moisture is murder on the electronic guts of the sight current generator. Moisture will short out and damage the generator's components unless the cover is on good and tight.

Guarding against moisture around the sight current generator case, of course, is a bigger problem on the towed gun. But on either weapon, never remove the generator's cover unless you have to swap ballistic cards.

Under normal conditions that shouldn't be more'n twice a year.

Always replace the cover immediately, if not sooner.

Make sure the cover's rubber seal strip is in good shape and firmly in place.

If the seal's cut, worn, or otherwise damaged it'll have to be replaced by your DSU (Direct Support Unit).

The moisture seal on the cover's 12

screws must also be in place and OK. Be sure to tighten the screws so the seals compress, but don't force 'em too far. You'll split or squash the tiny seals. And tighten the screws alternately (first side to side, and then top to bottom, or vice versa), so the cover'll have a good solid fit all around.

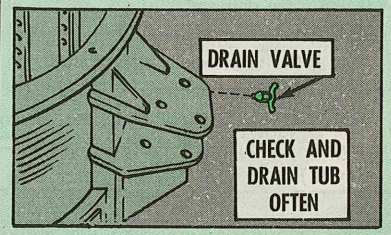
The cover's self-sealing screws come under FSN 5305-142-4794. They're listed on page 39, TM 9-1005-286-20P (Nov 69) for the M167, and on page 3-26, TM 9-2350-300-20P (Jun 71) for the M163.

OTHER MOISTURE CHECKS

Make sure the connector lock rings on the sight current generator cables are tight.

Never use water or steam pressure near the generator. The pressure'll force moisture inside the case.

On the towed weapon be sure the drain valve works OK, and drain the tub often,



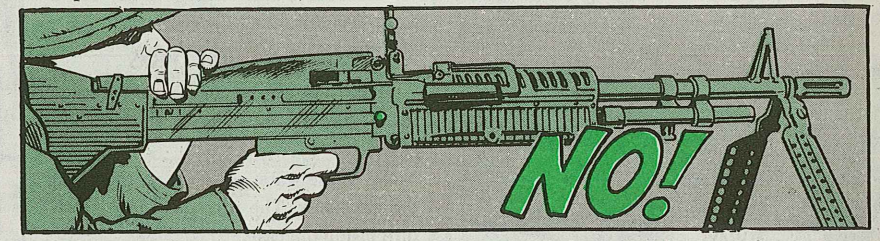
especially after rain, fording or cleaning.

On the M163 keep the vehicle as dry as possible inside, and open the hull drain plugs after fording.

M60 MINI-SECOND PM

Never close the action on your M60 machine gun by pulling the trigger and letting the heavy bolt group—the whole thing—slam forward.

Those sudden stops against the barrel can chip the feed stripping lug, crack or warp the rear of the feed tray, and chip the bolt locking cam in the barrel face.

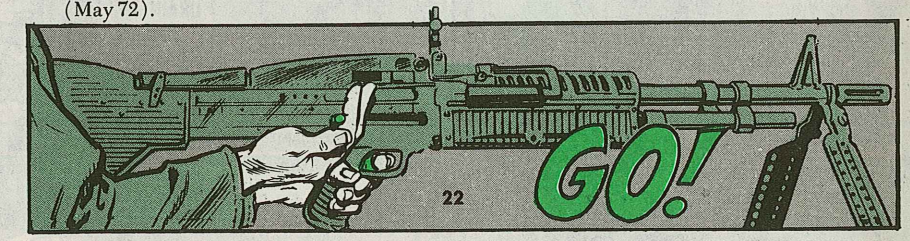


That's a high price to pay in maintenance downtime and parts replacement for not taking 10 seconds to do the job right.

Even more damage is caused by the oddball who closes the M60's action when it's standing on the bipod mount. Like bent or busted legs and a smashed flash suppressor.

And if he overlooked the last round—the UNloaded gun syndrome—the round can spatter, shatter and scatter a bunch of 11B's!

Always close the action like so: As you pull the trigger, hang onto the cocking—charging—handle. Ease the load forward—slow. Just like it says in TM 9-1005-224-10 (May 72).

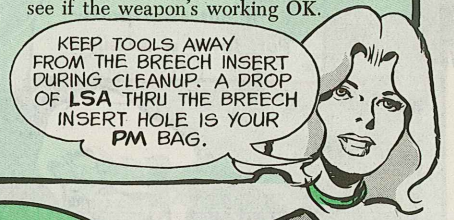


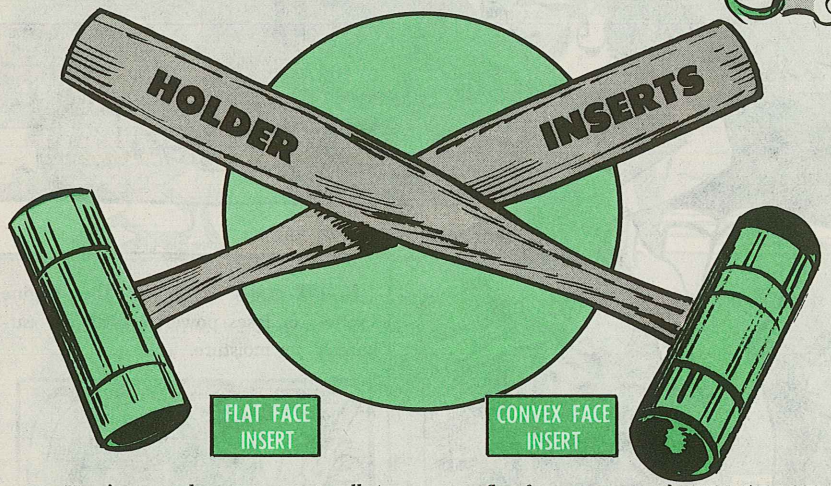
HOLD YOUR FIRE!!

A lot of M203 grenade launchers are being dry-fired much too much.

Unnecessary dry-firing loosens the breech inserts. And that means a DS trip to cure 'em. If they're not fixed quick, the breech face threads'll be stripped. And you could get primer brass in the firing pin recess.

So-o-o-o, Grenadiers, dry-fire your M203 only enough to keep the DI happy, or to see if the weapon's working OK.





Here's an update on your Small Arms Repairman Tool Kit--SC 4933-95-CL-A07 which appeared in PS 248. You can get tough plastic convex face inserts with FSN 5120-596-1072, and the medium plastic flat face inserts with FSN 5120-293-3003. Hammer, hand, FSN 5120-900-7871 has been changed to Holder, insert FSN 5120-903-8545. This last item will be noted in a change or revision to the SC.

HERE'S WHY ON KEEPING IT DRY

HAWK NOTES

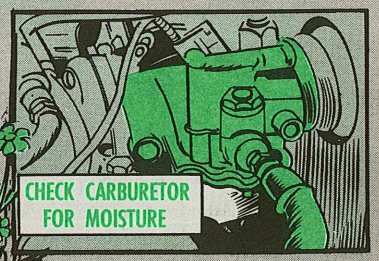
A drop of water can
Drown a man—
Corrode a battery—
Put down a missile.
Too much heat can
Fry you—
Burn out vital parts—
Put down a missile.

THERE YOU HAVE IT. BUT YOU CAN BEAT THAT BAD STUFF WITH TIMELY, ROUTINE MAINTENANCE ON THE COMPONENTS OF YOUR HAWK MISSILE SYSTEM!

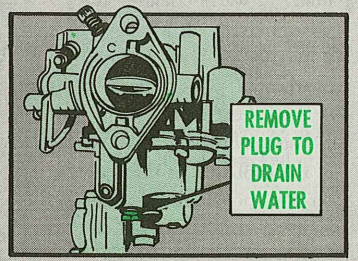
LIKE SO!

US ARMY

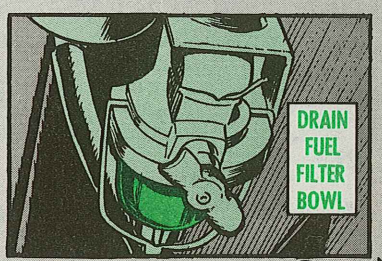
LOADER-TRANSPORTER: If the engine sputters or loses power, eyeball the carburetor for moisture.



First, remove the drain plug in the bottom of the carburetor and get rid of the moisture.



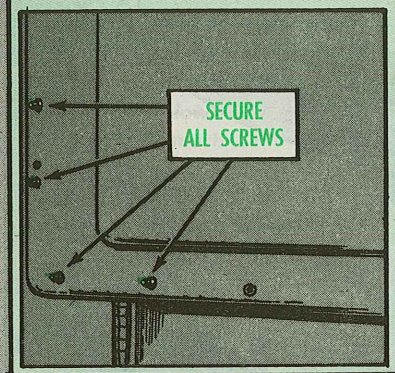
Second, drain the fuel filter bowl. That, too, collects water.

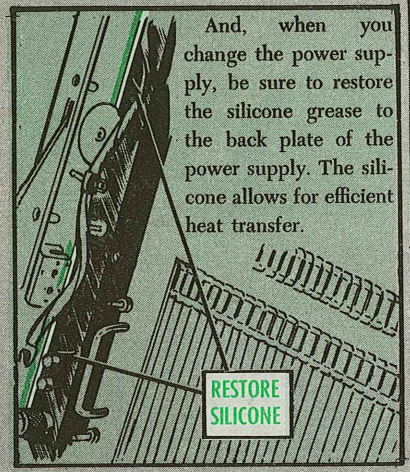


PS MORE

BTE (AN/GSA-77 DATA CONVERTER): Secure all front panel screws on the BTE when you close the panel.

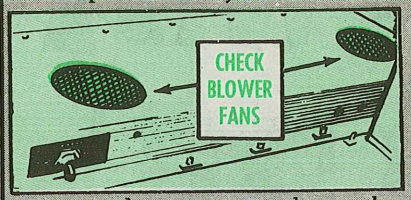
Loose screws allow circulating air to escape . . . which contributes to an overheating problem.





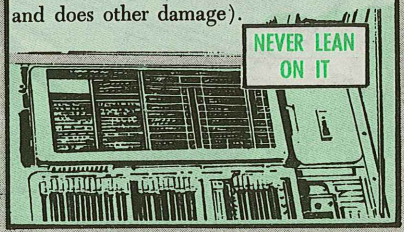
And, when you change the power supply, be sure to restore the silicone grease to the back plate of the power supply. The silicone allows for efficient heat transfer.

Another heat maker to look for is the blower. Some BTE's come with the 2 blower fans installed in the same direction. They should be facing in opposite directions to provide a steady flow of air.



Two good points to remember on the BTE front panel access door:

1-Resist the urge to lean on it when you let it down (the weight stretches cables and does other damage).



2-If the BTE works, keep the door closed. That'll keep you from being tempted to make unnecessary adjustments.

AN/TPQ-21 SIMULATOR: Turning down the air conditioner in warm climates (or warm months) is asking for a warped indicator panel, overheated power supplies, or other heat damage.

You may need a little less of the cool stuff in the shelter, but your simulator needs all the freeze it can get.

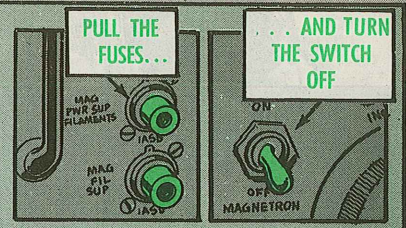
AN/MPQ-34/-48: When you take the CWAR from CW to Standby, pull the magnetron filament and high voltage fuses . . . and set the magnetron switch to OFF.

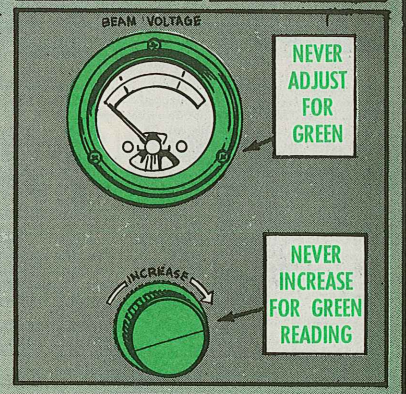
HIPIR: Heed those notes, cautions, and warnings in TM 9-1430-503-12/1 and TM 9- 1430-528-12/1 on how to prevent damage to and lengthen the life of the modulator-oscillator/magnetron.

You, the MPQ-39 operator, do not adjust the CW illuminator beam meter. Your battery maintenance man adjusts it for regulated volts . . . and after that all you do is check the meter for a reading in the green.

Never adjust the power amplifier to put the meter reading in the green, because you apply high voltage which damages various parts.

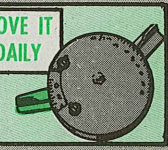
If the meter doesn't read green, call in a maintenance type.





LAUNCHER: During your daily check, move the elevation switch back and forth.

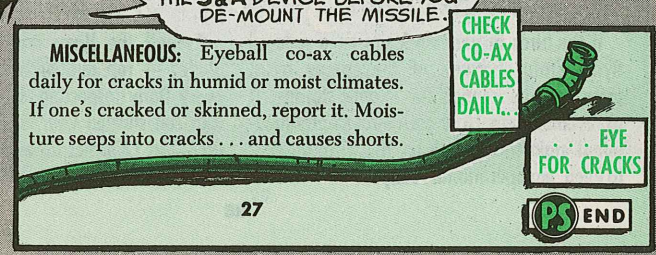
Daily movement keeps it from binding . . . and a little silicone grease on the cylinder adds insurance.



MISSILE: When you dismount the missile from the launcher, use only a 6-point socket in removing the initiator during the de-arming process. Other type wrenches burr the end . . . making for one mean removal job.

When you put the initiator back, dab some silicone grease or graphite on the threads. That'll make it easier to get out the next time.

MISCELLANEOUS: Eyeball co-ax cables daily for cracks in humid or moist climates. If one's cracked or skinned, report it. Moisture seeps into cracks . . . and causes shorts.



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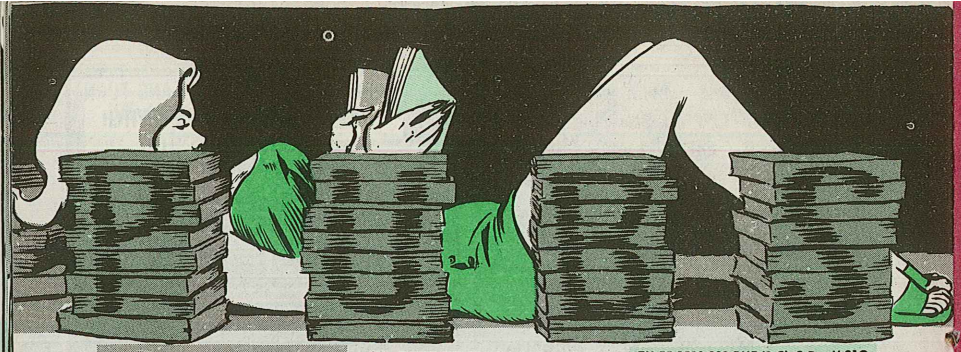


This is a selected list of recent pubs of interest to organizational maintenance personnel. This list is compiled from recent AG Distribution Centers Bulletins. For complete details see DA Pam 310-4 (Jun 72), and CH 4 (Apr 73), TM's TB's, etc.; DA Pam 310-6 (Jul 73), SC's and SM's; and DA Pam (C) 310-9 (Mar 73), COMSEC Pubs.

TECHNICAL MANUALS

TM 3-1040-244-10 Oct Compressor Unit, Recip 3½ CFM, AN-M4B and -M4C
TM 5-1940-201-20P Dec Boat, Bridge Erection, 27 Ft. HP 1-27C
TM 5-4320-272-12 Jan Pump Bulk Transfer, 350 GPM (Peabody Barnes, US37ACG)
TM 5-6115-457-12 Jun Gen set, DED, 100 KW 3 Phase, 4 Wire 120/208 and 240/416 V
TM 9-1015-234-12 Ch 9 Dec M102 Towed Howitzer
TM 9-1300-251-20 Dec Artillery Ammunition
TM 9-1400-500-ESC/1 Jan HAWK (towed)
TM 9-1400-500-ESC/2 Jan HAWK (SP)
TM 9-1425-525-ESC Jan IMPROVED HAWK
TM 9-1450-501-20P Dec Missile Carrier M727
TM 9-1450-585-ESC Ch 1 Dec ESC for Missile Carrier M730
TM 9-2300-297-14 Jan Semitrailer (Milvan) 12-Ton, 2-Wheel
TM 9-2320-209-10 Ch 10 Sep 2½-Ton Truck:
TM 9-2320-212-10 ¾-Ton Trucks
TM 9-2320-218-20 C2 Oct Truck, ¼ Ton M151 M151A1 M151A2 M151A1C M825 M178 M718A1
TM 9-2330-275-14 Ch 7 Jan Dolly Set, Lift,Transportable Shelter: M689 XM840 XM829
TM 9-2350-215-10 Ch 12 Oct M60/ M60A1 Tank
TM 9-2350-217-10 Ch 6 Jan M108/ M109/M109A1 SP Howitzers
TM 9-2350-247-20 Dec M548 Carrier
TM 9-8014 Ch 8 Sep ¼-Ton Truck M38A1 M38A1C, M38A1D M170
TM 10-1670-215-23 Dec Parachutes Cargo Types
TM 10-3930-242-12 Dec Truck Lift Fork, DED RT 6,000 Lb. Models MHG 200-202-222
TM 10-3930-243-20P Jan Truck Fork Lift, Rough Terrain, 10,000-Lb. Model MHE-215
TM 10-7360-204-13 Jan Range Outfit, Field Gasoline Model M59
TM 11-2300-372-14-2 May Installation Kits in M561 Equipment MK-1255 -1256 and -1257
TM 11-5805-247-20P Oct TA-182/U Converter Telgraph-Telephone Signal
TM 11-5820-202-10 Ch 8 Dec AN/GRC-26() radio set
TM 11-5820-800-12 Nov AN/PRC-90 Radio Set
TM 11-5830-340-12 Sep AN/VIC-1(V) Intercommunication Set
TM 11-5855-203-13 Ch 6 Aug AN/PVS-2() night vision sight
TM 11-5965-257-15 Ch 2 Dec Handsets H-138()/U
TM 11-5965-282-15, Ch 2 Dec MK-1039/ G Headset-Microphone Kit
TM 11-5965-283-15 Ch 2 Dec H-182/ PT Headset-Microphone
*TM 32-6625-204-15, Change 1 Feb 74 Oscillograph RO-361 (XT-1)/U
TM 55-1510-201-10/4 Ch 7 Nov U-8D, RU-8D and U-8G
TM 55-1510-201-CL/4 Ch 2 Nov U-8D, U-8G RU-8D
TM 55-1510-201-CL/5 Ch 2 Oct U-8F
TM 55-1510-204-CL/3 Ch 2 Nov OV-1B
TM 55-1510-204-CL/4 Ch 1 Nov OV-1C
TM 55-1510-204-10/2 Ch 4 Nov OV-1A
TM 55-1510-204-10/3 Ch 4 Nov OV-1B
TM 55-1510-204-20-1 Ch 19 Dec OV-1
TM 55-1510-209-CL/3 Ch 3 Oct U-21C and RU-21E
TM 55-1510-209-PMP/3 Ch 3 Dec U-21G and RU-21E
TM 55-1510-209-10/3 Ch 4 Dec U-21C and RU-21E
TM 55-1510-209-20/3 Ch 4 Dec U-21G and RU-21E

*This publication available only from U.S. Army Security Agency, Materiel Support Command, Vint Hill Farms, Warrenton, VA 22186.

TM 55-1520-209-10 Ch 5 Jun CH-47A
TM 55-1520-209-20P-1 Dec CH-47A, CH-47B, CH-47C
TM 55-1520-209-20P-2 Dec CH-47A, CH-47B, CH-47C
TM 55-1520-209-20-2 Ch 2 Nov CH-47A
TM 55-1520-210-CL Ch 3 Oct YUH-ID, UH-1D and UH-1H
TM 55-1520-228-CL Ch 2 Oct OH-58A
TM 55-1520-228-10 Ch 6 Jan OH-58A

MISCELLANEOUS

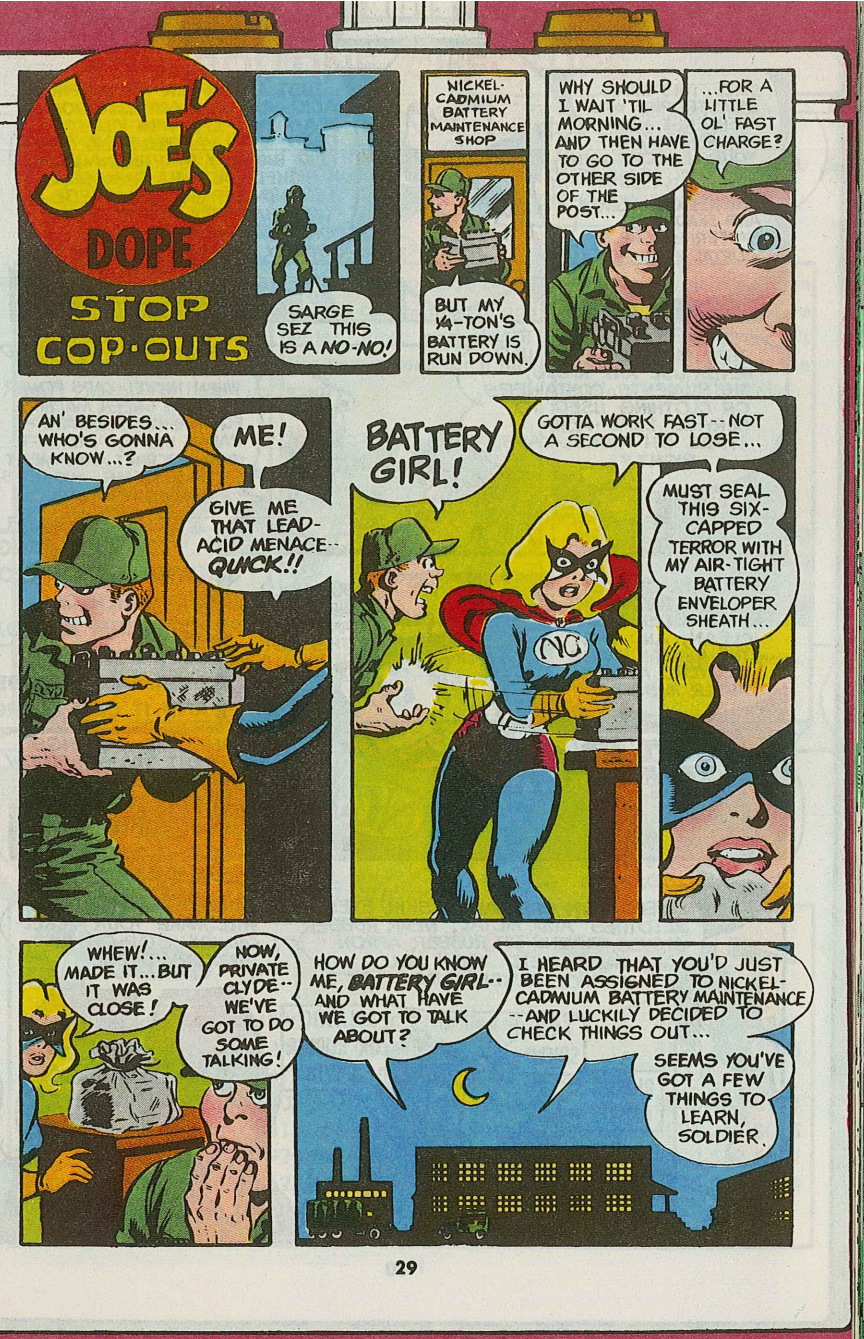
TB 55-1500-307-25 Jan Aircraft Components Req Maint Mgt and Historical Data
TB 55-8100-200-25 Jan Maint of Special Reusable Containers for Aircraft Equip
TB 746-93-2 Ch 4 Nov Painting, Marking Aircraft
TB 750-981-4 Oct Equipment Improvement Report and Maintenance Digest Tank and Automotive Equipment
LO 5-3805-252-12-2 Dec Grader, Road, Motorized: DED (Cat 112F)
LO 5-3805-252-12-3 Dec Grader, DED 12 Ft. (Cat 112F)
LO 9-1430-588-12 Oct Radar AN/MPQ-49
LO 9-1450-501-12 Dec Missile Carrier MX727
LO 9-1450-585-12 Dec Missile Carrier M730
LO 9-2300-257-12 Oct M113A1 Carrier Family
LO 9-2350-247-12 Dec M548 Carrier

The Shortfall

If the birds in your flock are on a reduced flying status because of the energy crisis, some may be headed for flyable storage. If so, eyeball Chap 16 of each aircraft organizational maintenance pub for the word on how to keep 'em operational ready.

It's Your Hide!

Eyeball the Huey and Cobra main rotor blades — top and bottom — for cracks on every Daily inspection, bird types. A cracked spar can shorten your career. Focus in on an area 0 to 12 inches aft of, and parallel to, the blade leading edge from station 90 to 210.



SINCE THIS NEAR CATASTROPHE WAS AVERTED, I MIGHT AS WELL START YOUR LESSONS WITH THIS VITAL WARNING...

NICKEL-CADMIUM AND LEAD-ACID BATTERIES ARE MORTAL ENEMIES!

JUST A SMIDGEN OF SULPHURIC ACID--THE LEAD ACID ELECTROLYTE--IN A NICKEL-CAD WILL KILL IT DEAD. EVEN VAPORS FROM A LEAD-ACID BATTERY DRIFTING ACROSS A NICKEL-CAD WILL DAMAGE IT BEYOND REPAIR... SO THESE TWO BATTERY TYPES MUST ONLY BE WORKED ON IN WIDELY SEPARATED SHOPS OR WORK AREAS.

THAT MEANS YA SHOULD NEVER USE ANY TOOLS, INSTRUMENTS, CONTAINERS OR CLOTHING USED TO SERVICE LEAD-ACID TYPES ON NICKEL-CADS... RIGHT?

RIGHT ON--YOU NEED TO BE REAL CAREFUL WHEN NICKEL-CADS POWER SO MUCH GREEN MACHINE EQUIPMENT THESE DAYS--RADAR UNITS, AIRCRAFT AND AIRCRAFT ARMAMENT SUB-SYSTEMS, MISSILES, VEHICLES--TO ONLY NAME A FEW!

A NICKEL-CAD IS A POWER PACK THAT STARTS ITS JOB CLEAN, AND WITH THE RIGHT CHARGE DELIVERS MISSION AFTER MISSION!

BUT HOLD ONE, PRIVATE--AND NOTE THIS SIGN.

YOU'RE DEALING WITH A DANGEROUS CHEMICAL—POTASSIUM HYDROXIDE (KOH). IT CAN EXPLODE AND IT CAN CORRODE.

ALSO HEED THE WARNINGS IN EQUIPMENT TM'S, BATTERY DECALS AND NICKEL-CAD PUBS:
TM 11-6140-203-15-1.
TM 11-6140-203-15-2.
TM 11-6140-203-15-3.

KEEP KOH OFF HANDS, SKIN, EYES, CLOTHES AND METAL. WEAR RUBBER GLOVES, PLASTIC OR RUBBER APRON AND FACE SHIELD WHEN YOU SERVICE NICKEL-CADS.

THESE PM POINTS WILL MAKE YOUR NICKEL-CAD THE STAR OF THE BATTERY SCENE.

FACE SHIELD

PLASTIC OR RUBBER APRON

RUBBER GLOVES

ROUTINE CHECKUPS

YOUR EQUIPMENT'S TM HAS THE CHECK-YOUR-BATTERY-SCHEDULE... DAILY, WEEKLY, BEFORE/AFTER MISSIONS, ETC.

IF NOTHING'S AMISS, ALL YOU DO IS CLEAN THE CASE AND CELL TOPS, THAT WHITE, POWDERY STUFF IS POTASSIUM CARBONATE. IT'LL COME OFF WITH A CLEAN, DRY CLOTH, PLASTIC OR NYLON BRUSH.

Never use a wire brush to clean the cell tips, terminals and terminal links. A shorted out battery you don't need. Wipe up loosened deposits.

NO WIRE BRUSH!

Clean the outside of the battery case with soap and water. Rinse and dry it. Use compressed air if necessary.

WATER

Any time you check the electrolyte level or remove the battery case cover, it's a good idea to look at the terminal screws or links.

- Replace any broken or bent screws or links—torque 'em by-the-book if loose.
- Replace warped or cracked vent caps. • Reseat loose vent caps.

CHECK DISCOLORED INTER-CELL CONNECTORS FOR LOOSE TERMINAL SCREWS OR BATTERY OVERHEATING.

DS YOUR NICKEL-CAD IF YOU FIND CRACKED CELL TERMINALS, A CRACKED CELL CASE, THE BATTERY CASE PRESSURE RELIEF VALVE PLUGGED OR BROKEN, OR ELECTROLYTE LEAKAGE.

THESE WILL HELP YOU DO A FIRST RATE JOB:

OPERATING TOOLS

Face shield, or	4240-439-3450	Distilled water	6810-682-6867
Goggles	4240-203-0317	Vent-cap wrench	5120-618-5305
Rubber apron, or	8415-082-6108	Corrosion preventive compound	8030-403-0931
Plastic apron	8405-502-2325	Cheesecloth (lintless)	8305-267-3015
Rubber gloves	8415-266-8675	TK 90/G tool kit	5180-542-5812
Nylon brush (no handle)	7920-061-0037	Syringe	6140-376-9635
Multimeter TS-352B/U	6625-553-0142		
Battery Charger	(Use right model)		

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

READY TO CHARGE

MAKE SURE ALL ELECTRICAL CIRCUITS ARE OFF WHEN YOU TAKE THE BATTERY OUT OF ITS POD OR MOUNT.

Be sure the terminal screws and studs are torqued right. Your TM tells you how tight. You don't want to get water in the cell as you clean the battery.

Clean all deposits off vent caps and the outside of the cells. Use distilled water or clean drinking water and a nylon brush.

WIRE BRUSH IS A NO-NO.

THEN DRY THE CELLS.

PLASTIC WRENCH

Use the plastic wrench to unscrew the vent cap from each cell. Give the cap an eagle-eye inspection for damage.

SNORKEL TYPE CAP, USED ON AIRCRAFT BATTERIES

SNORKEL TUBE

If your battery is used on the M18 aircraft armament subsystem, pay extra attention to the epoxy that holds the snorkle tube in place.

EPOXY BREAKING LOOSE?

Put the cap assembly in water until you're ready to put it back on the cell.

MAKE SURE WATER COVERS CAPS

OKAY, PRIVATE, TAKE A BREAK AND WE'LL BE READY FOR CHARGING.

CHARGING

FOLLOW THE BATTERY CHARGING POOP IN YOUR EQUIPMENT'S TM C-A-R-E-F-U-L-L-Y. HERE'RE SOME THINGS TO WATCH FOR!

Make sure the battery has the right hookup to the power source. Positive to positive, negative to negative.

CHARGING POWER SOURCE

+

−

Double check cell tops for wayward tools. Take off your watch, ring and ID bracelet. Any metal object that touches an intercell link of opposite polarity will fuse to it—and you're in for a bad burn.

USE THE RIGHT SIZE WIRE TO CONNECT THE POWER SOURCE TO THE BATTERY. A WRONG SIZE WIRE OR POOR CONNECTION CAN OVERHEAT WIRES, AND THAT'S A REAL FIRE HAZARD.

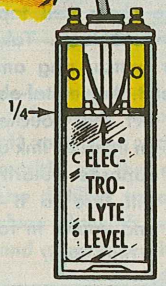
Turn off battery charger before hooking or unhooking it to the battery. This'll stop arcing--another fire hazard.

All connections between cells have to be clean, dry and torqued right. Use the torque wrench and torque 'em like the book says. No guess-torque, please.

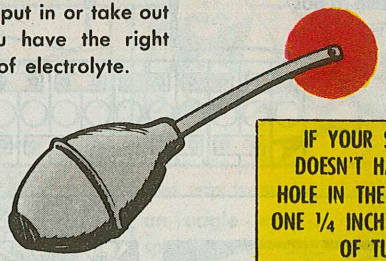
VAPORS FROM KOH CAN BE EXPLOSIVE. SO MAKE SURE YOU'RE WORKING ON A WELL-VENTILATED SHOP. NO SMOKING AND NO OPEN FLAMES ANYWHERE NEAR YOUR BATTERY AREA ARE A MUST.

SIMPLE SQUEEZING

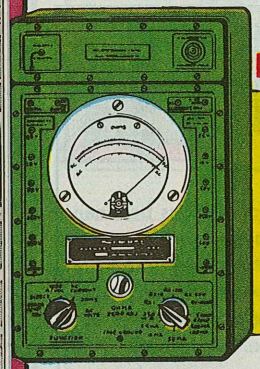
USE A SYRINGE TO WITHDRAW EXCESS ELECTROLYTE--OR ADD DISTILLED WATER. ELECTROLYTE IN EACH CELL SHOULD BE APPROXIMATELY ¼ INCH ABOVE THE CELL PLATES.



The electrolyte levelling syringe has a hole in the tube that's 1/4 inch from the tip. If you rest this tube on the cell plates you can put in or take out until you have the right amount of electrolyte.



IF YOUR SYRINGE DOESN'T HAVE THIS HOLE IN THE TIP, DRILL ONE ¼ INCH FROM END OF TUBE.



ELECTRICAL LEAKAGE CHECK

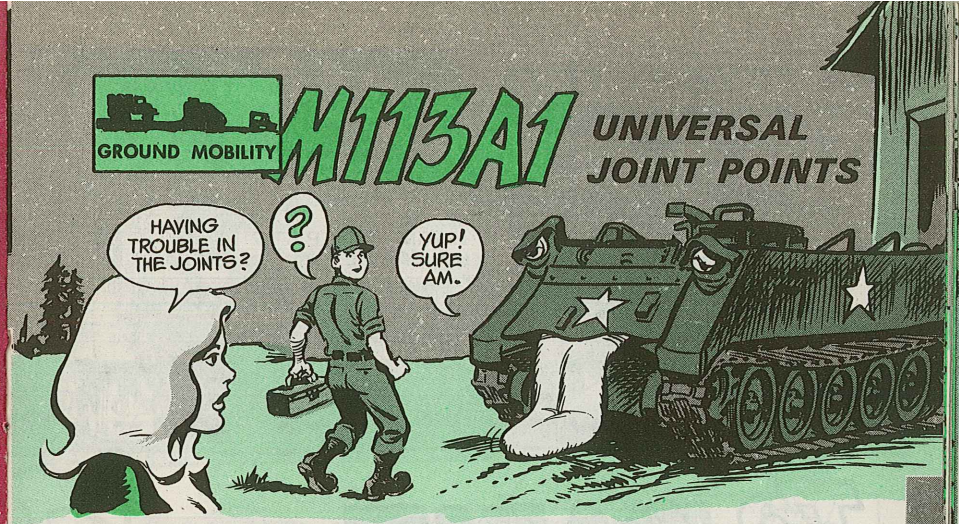
Set multimeter at 0 to 50 volts range—1,000 ohms per volt. Measure the voltage between the positive battery terminal and a clean, paint-free part of the battery case. Do the same thing with the negative terminal.

If the multimeter reads 1 volt or more, reject the battery and turn it in to your DS shop.

If voltage on the multimeter is less than 1 volt, you've done a good job. Put the nickel-cad back to work in the equipment.

GROUND MOBILITY

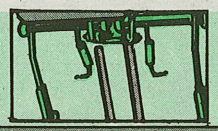
M113A1 UNIVERSAL JOINT POINTS

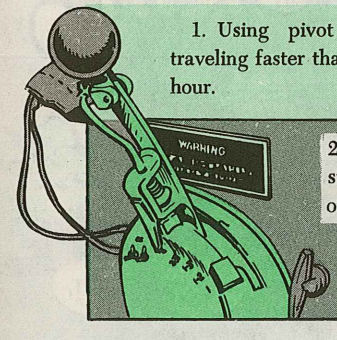


Not your joints—you're not that old yet. Trouble with the universal joints on your M113A1 series vehicle?

Want to know the 3 main causes for universal joints breaking before they should?

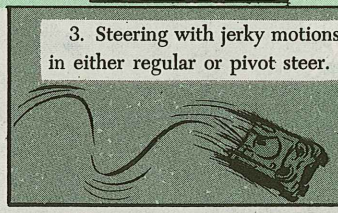
1. Using pivot steer when traveling faster than 15 miles an hour.





2. Using pivot steer in gears other than 1-2.

3. Steering with jerky motions in either regular or pivot steer.

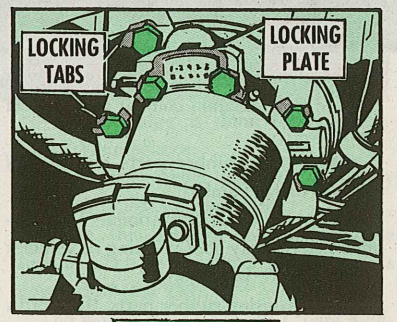


Another thing you can do is eyeball the universal screws every month to see if they're loose.

Make sure the lock plate tabs are intact and in the right position.

So what's a joint like this doing in a nice gal like the Lucky Lady?

Universal joint failure is a problem, and the engineers are working on a solution. But these things you can do now.



CHECK UNIVERSAL SCREWS MONTHLY

Two questions often asked by guys who operate and maintain combat and tactical vehicles—

—What says rubber parts on vehicles are not to be painted?

—What says Organizational Maintenance will do only spot-painting of vehicles (no complete paint jobs)?

About painting rubber parts, the word's in TB 750-260 (Oct 73), Paint Instructions for Operator and Organizational Maintenance Personnel. Paragraph 39d says rubber surfaces are to be left unpainted—unless the TM or other specific instruction for your piece of equipment says different.

Best bet, like the TB says, is to mask off rubber parts before you start painting.

You need TB 750-260 (Oct 73), Paint Instructions for Operator and Organizational Maintenance Personnel.

It's got some new info you won't find in TM 9-213 (Jul 62), Painting Instructions for Field Use.

This TB gives you the poop on taking your sprayer apart and cleaning it.

Watch it. Don't let this TB steer you wrong on maintenance allocation. Just because it's for "Operator And Organizational Maintenance Personnel" does not mean you're authorized to do everything this TB covers. It includes painting instructions for DS-level and above.

You're limited to spot-painting—with either a brush or sprayer.

If you don't have TB 750-260, order it from the St. Louis Publications Center on a DA Form 17.

Then there's no chance of getting paint on the rubber. Same goes for lights, windows, gages, data plates, decals, etc.

How about tires? They're rubber, so the TB makes it clear enough. But the bible on tires, TM 9-2610-200-20 (Nov 72), will nail it down in a change or revision. It'll explain that painting of tires is a waste of paint. And it'll tell you that all your tires need to look good is a soap 'n' water scrubbing when you wash your vehicle.

You have to look hard for the word on spot-painting vs. complete painting of vehicles. One place you'll find it is Ch 3 to TM 9-2320-209-20 (Apr 65)—page 26, paragraph 18—

—Spot-painting is done by Organizational Maintenance.

—Complete vehicle painting is done by Direct Support Maintenance.

Natch, this goes for any other vehicle just as much as for the 2 1/2-ton trucks covered by that TM.

The word's also in AR 746-1, para 4-2d.

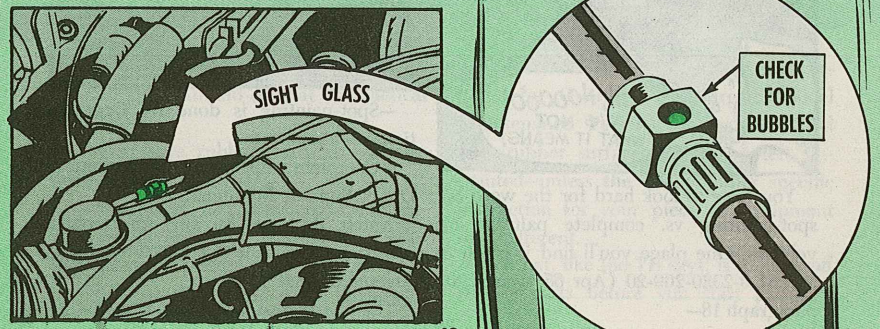
You mechanics gotta care about the air conditioners on commercial design vehicles if you want 'em to pull through the long hot summer without compressor damage.

Get this lowdown on checking refrigerant level. Once a month, during the hot weather season, turn on the air conditioner to any setting and watch the sight glass (under the hood—check the vehicle service manual for the location).

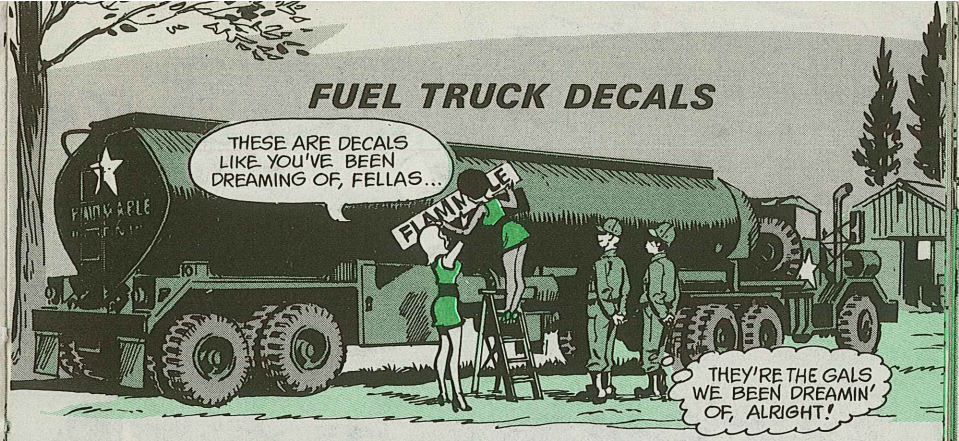
That glass ought to be clear—no bubbles—with cold air coming from the unit. If you see bubbles, the refrigerant is low. If you see a clear glass, but warm air is coming from the unit, shut it off, 'cause that means the refrigerant has leaked out.

The compressor can be damaged if the air conditioner is allowed to run when the refrigerant level is low or there's no refrigerant.

Keep the air conditioner seals from drying out in the cold season by operating the air conditioner for at least 10 minutes once every two weeks. This will prevent seals from leaking when the air conditioner is started up for the summer.



FUEL TRUCK DECALS



Here you go . . . you operators of fuel tankers.

You can now get the reflective red decals for the safety markings thru supply. Order these with RIC S9G:

FLAMMABLE	6-in	FSN 7690-260-7634
NO SMOKING WITHIN 50 FEET	3-in	FSN 7690-260-7635

These decals are gloss red in Color No. 11136 like AR 746-1 (Aug 70) requires. They're especially for fuel tank trucks and semitrailers that travel on public highways. Put 'em on the sides and rear of the tanker. See TB 746-93-1 and check your own command's word on this. With 'em, you won't need special stencils or hand-painted lettering.

A PLUG FOR A PLUG

Some guys are cussin' and fussin' about those 3 plugs in the bottom of their Gama Goat's tractor hull.

They're tearing up the threads where the plug screws into the hull.

They're even losing the plugs.

Let's make it easier on everybody—and easier on your Goat.

Let's start from scratch.

When you get a new Gama Goat, those plugs are not installed in the hull. They're in a package with the stuff that's issued with the Goat.

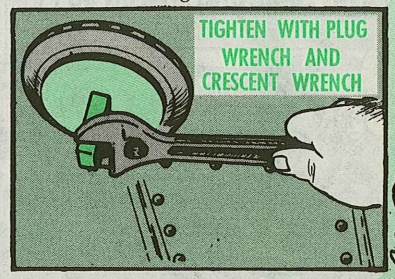
Before you try to install the plugs, go around the threads real good with a stiff wire brush, if they've become corroded. Tough burrs can be removed with a small 3-square type file. Wire brush the threads in the hull hole, too.

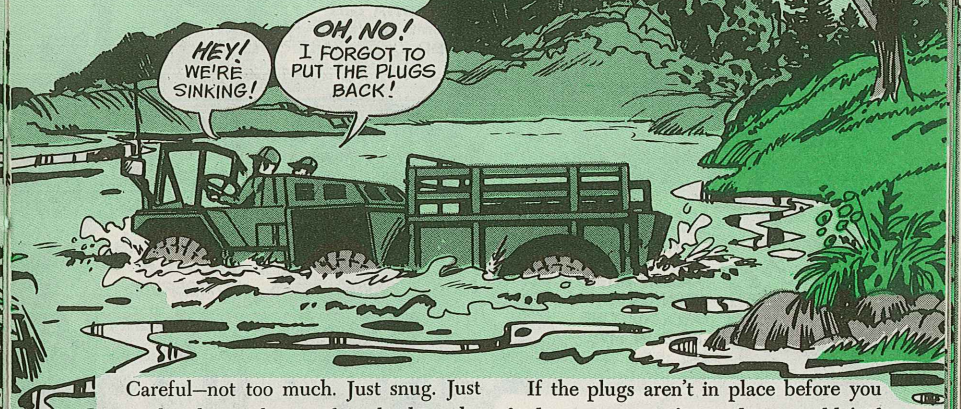
Then smear some anti-seize compound (FSN 8030-753-4953) on the plug threads, like it says in TM 9-2320-242-20 (Aug 70), para 2-220. Now the plug will screw in easier—and will unscrew easier, too.

Use just the tips of your fingers and thumb to get the plug started in the hole.

Slow 'n' easy. If it doesn't screw in smooth, back off and start over. If it goes hard, it's probably cross-threaded. If you force it, you'll bugger up the threads. This makes it hard to get out—and, besides, it'll probably leak when you're swimming your Goat.

After you've got it as tight as you can with your fingers, use a wrench. It's called Wrench, drain plug, straight bar, FSN 5120-935-4654. It's listed in Ch 2 (Jun 72) to your TM 9-2320-242-10. You use your crescent wrench with this plug wrench—like it shows in Fig 2-321 in the -20 TM.

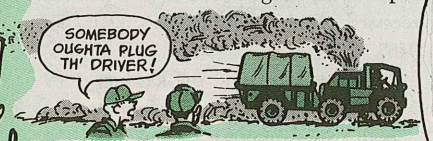




Careful—not too much. Just snug. Just enough to keep vibration from backing the plug out.

You don't want to lose these plugs.

If you operate without your plugs installed, road dirt will be sucked up through the hull holes. Your engine fan will pull

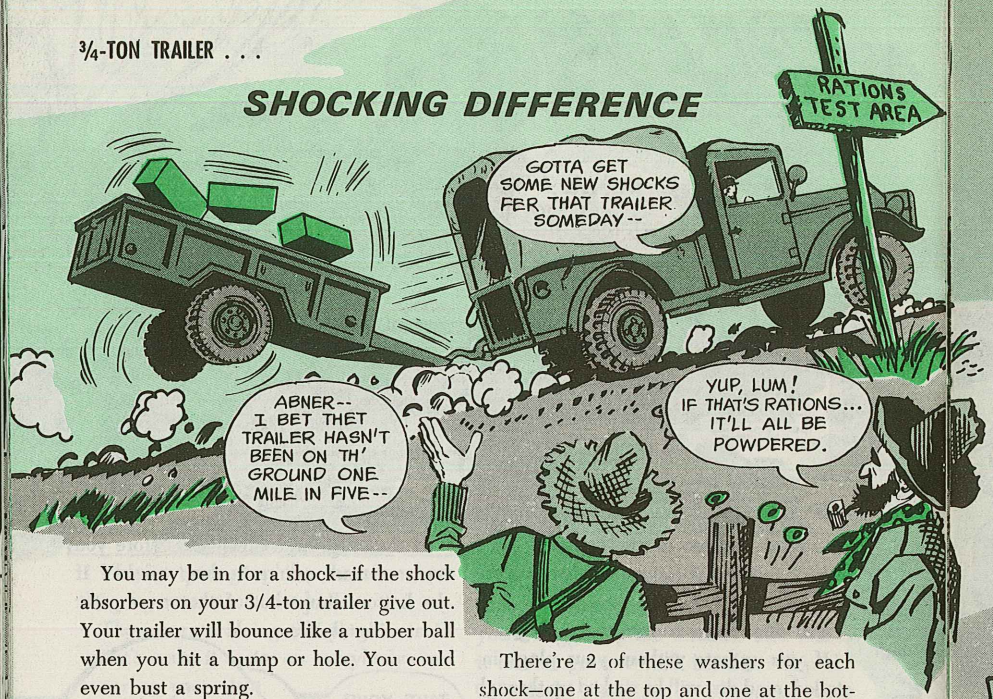


the dirt in. Your transmission, transfer and engine will get coated with dirt. Your radiator will get plugged. Everything will run hot! Bad news!

If the plugs aren't in place before you ford a stream, you're in deep trouble! If the bottom drops out of that creek your Goat will sink like a rock!

You can take out one of the plugs—or all 3 of 'em—when you're washing your Goat. Then any water running down into your engine compartment will run on out.

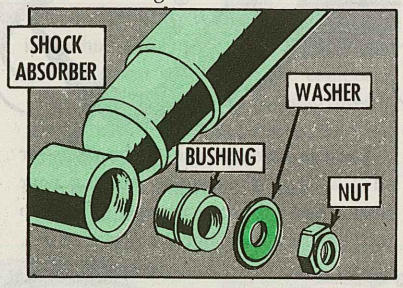
SHOCKING DIFFERENCE



You may be in for a shock—if the shock absorbers on your 3/4-ton trailer give out. Your trailer will bounce like a rubber ball when you hit a bump or hole. You could even bust a spring.

This can happen if the washers at the nut-end of your shock mounts are installed wrong. The strain can bust the loop off the shock. Some new trailers have shown up with the washers installed wrong, so check all of your trailers.

This dish-shaped washer has to be installed with the bulge side in toward the rubber bushing.



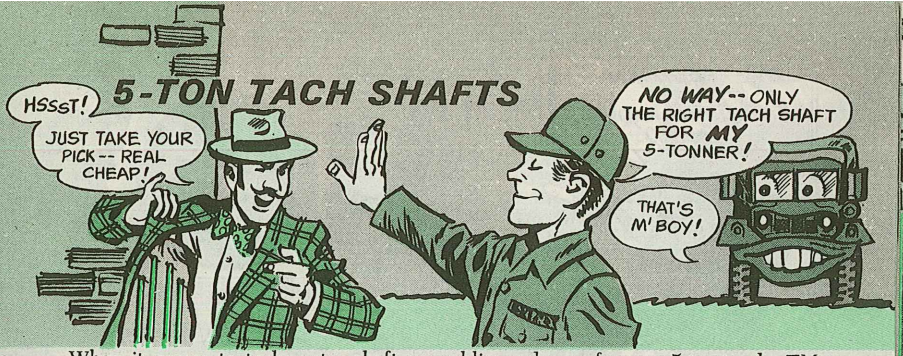
There're 2 of these washers for each shock—one at the top and one at the bottom. So your trailer's got 4 of 'em—Washer, recessed, shock mounting, FSN 5310-733-9465.

And you use Nut, self-locking, FSN 5310-982-6809, in your shock mounts.

Both FSN's are in Ch 2 (Jun 73) to TM 9-2330-202-14P.

This's the setup for M101 and M101A1 cargo trailers and for those M116 and M116A1 chassis trailers that carry different kinds of mounted equipment.

5-TON TACH SHAFTS



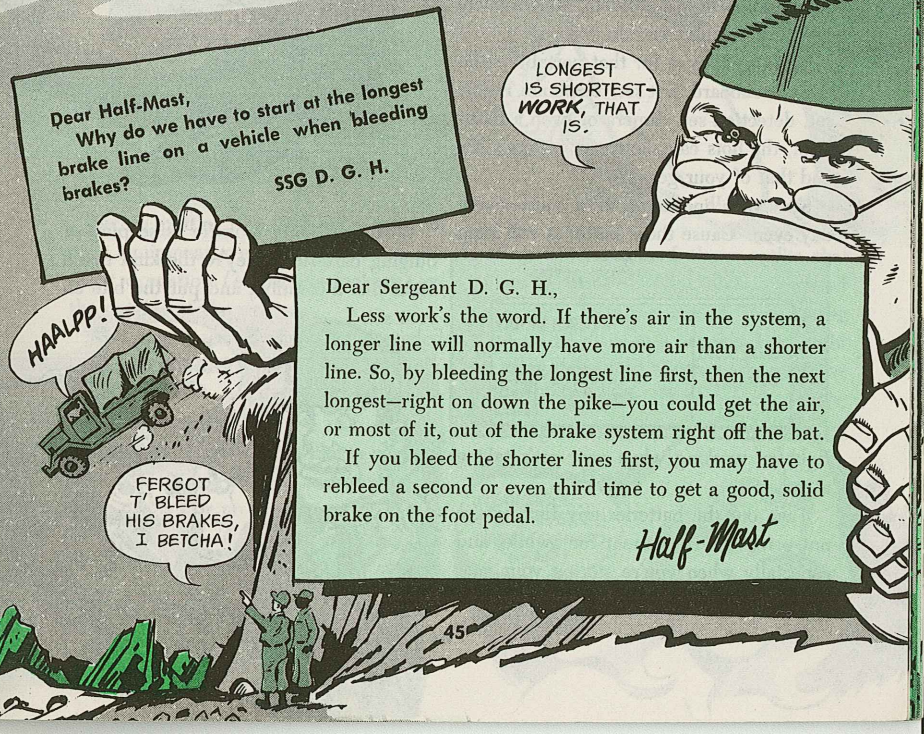
When it comes to tachometer shaft assemblies and cores for your 5-ton trucks, TM 9-2320-211-20P (May 73) can throw you a curve. Here's the straight poop for the different trucks, depending on which engine they've got:

Gasoline—Shaft assy, FSN 6680-882-0966, 55 inches long; Core, FSN 6680-882-0960, 56 5/32 inches long;

Multifuel—Shaft assy, FSN 6680-732-0561, 62 1/2 inches long; Core, FSN 6680-882-0961, 63 21/32 inches long;

Diesel—Shaft assy, FSN 6680-089-2005, 77 1/2 inches long; Core, FSN 6680-741-8491, 78 21/32 inches long.

BRAKELINE BLEEDING TIPS



Dear Sergeant D. G. H.,

Less work's the word. If there's air in the system, a longer line will normally have more air than a shorter line. So, by bleeding the longest line first, then the next longest—right on down the pike—you could get the air, or most of it, out of the brake system right off the bat.

If you bleed the shorter lines first, you may have to rebleed a second or even third time to get a good, solid brake on the foot pedal.

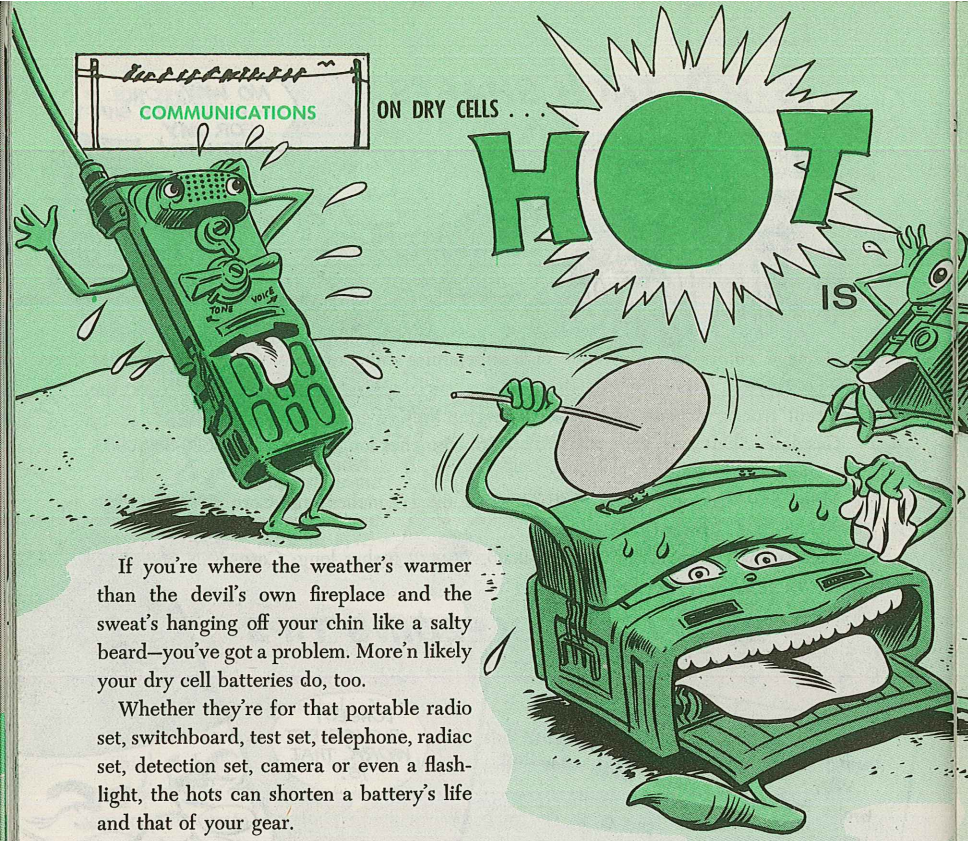
Half-Mast

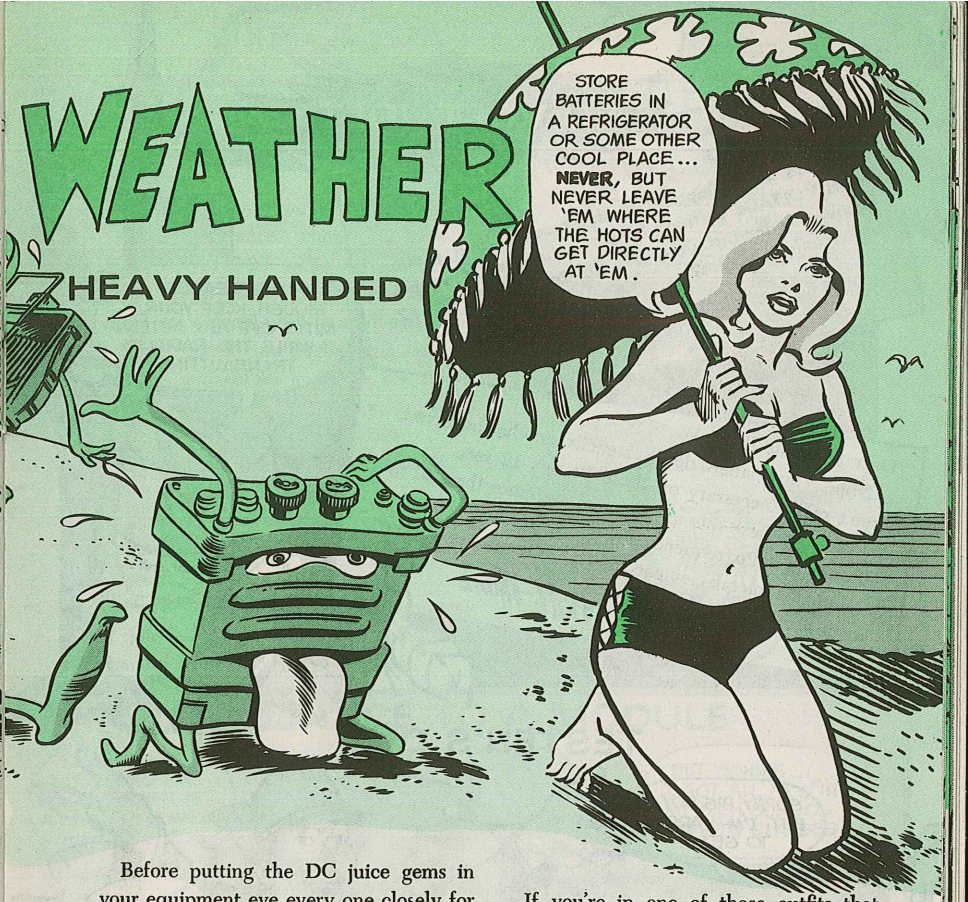
COMMUNICATIONS

ON DRY CELLS . . .

HOT WEATHER

IS HEAVY HANDED

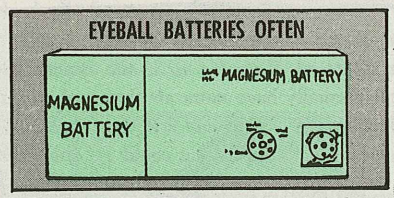




If you're where the weather's warmer than the devil's own fireplace and the sweat's hanging off your chin like a salty beard—you've got a problem. More'n likely your dry cell batteries do, too.

Whether they're for that portable radio set, switchboard, test set, telephone, radiac set, detection set, camera or even a flashlight, the hots can shorten a battery's life and that of your gear.

So, eyeballing often is a must—every day even. 'Cause those batteries will keep



right on working when your set's taking a rest.

Take out the batteries any time you're not using the equipment for awhile, and especially when you're storing your gear or shipping it out for repair.

What you gotta look for is seeping or bulging batteries. They're the kind that'll make like a cannibal and put the bite on your set.

Before putting the DC juice gems in your equipment, eye every one closely for moist exudation (electrolyte leakage) on the outside of the case.

Also, you need to check for corroded terminals or cracked or broken contacts. This'll cut the potential of the power or cut it out completely.

A battery should fit firm-like in your set so it won't jiggle around and give you a lousy contact or no contact at all. Use a piece of cardboard or other material as a wedge between the battery and case to make it snug.

If you're in one of those outfits that moves around a lot and you find yourself and your battery-operated gear going from a cool place to a hot one, keep right on using those cold weather jobs until the power is pooped. Then switch to the regulars.

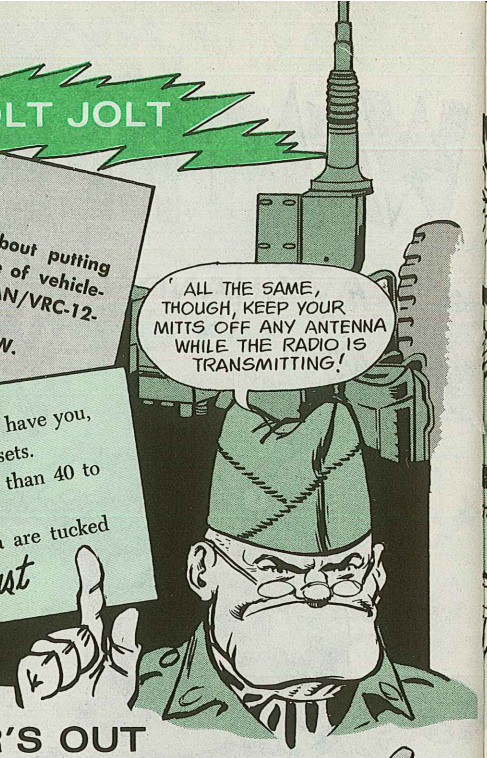
NO VOLT JOLT

Dear Half-Mast,
There's some flapping in the breeze about putting HIGH VOLTAGE warning labels at the base of vehicle-mounted antennas. Does this go for the AN/VRC-12-series radio sets, also?

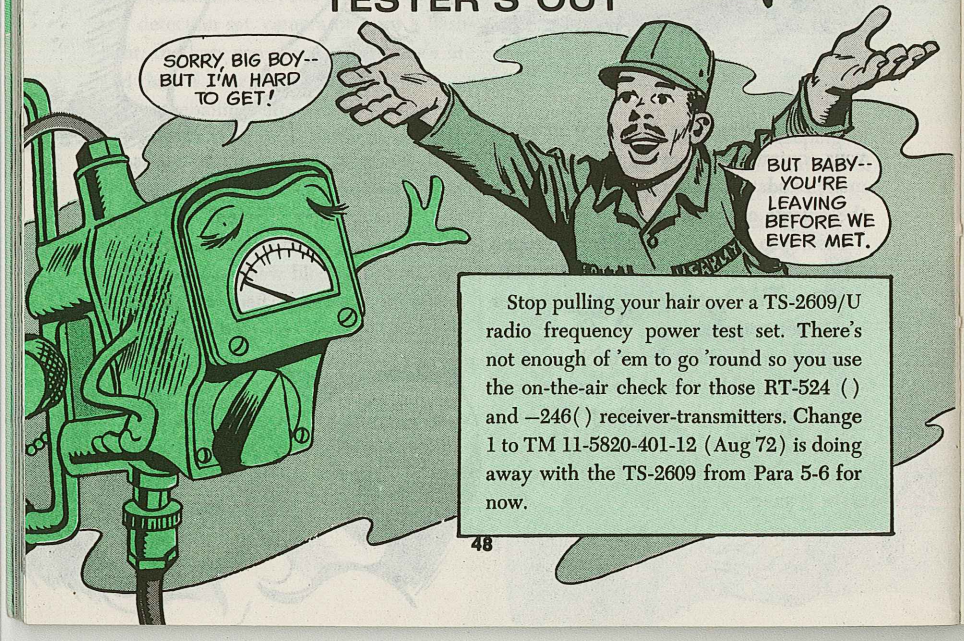
SSG P. E. W.

Dear Sergeant P. E. W.,
Nope. Those labels, decals, stencils, or what have you, aren't really necessary on those Victory-12 sets.
First off, these sets usually pack no more than 40 to 50 watts of radio frequency power.
And, the metal elements of the antenna are tucked inside fiberglass.

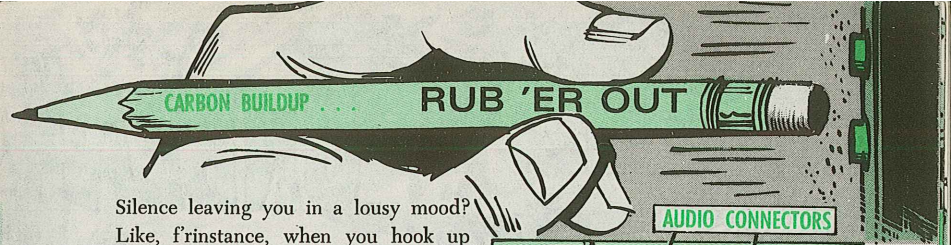
Half-Mast



TESTER'S OUT



Stop pulling your hair over a TS-2609/U radio frequency power test set. There's not enough of 'em to go 'round so you use the on-the-air check for those RT-524 ( ) and –246( ) receiver-transmitters. Change 1 to TM 11-5820-401-12 (Aug 72) is doing away with the TS-2609 from Para 5-6 for now.



Silence leaving you in a lousy mood?

Like, f'rinstance, when you hook up your AN/PRC-25 radio set, AN/PPS-4 radar set or other commo gear and you don't get a peep, beep or a squawk.

Then, focus your eyeballs on the connectors and cables and look for carbon buildup. A thin coat of carbon can sneak in and really sever your circuit.

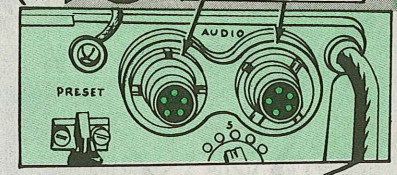
Getting rid of it's a breeze, though.

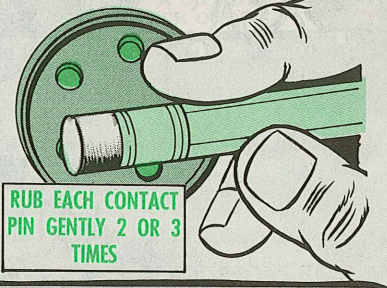
Use a pencil eraser.

With the power off, just gently rub the contact pins a couple or 3 times with the eraser.

Brush or blow the eraser shavings away.

This'll let those contact pins snuggle up and keep your set in business.



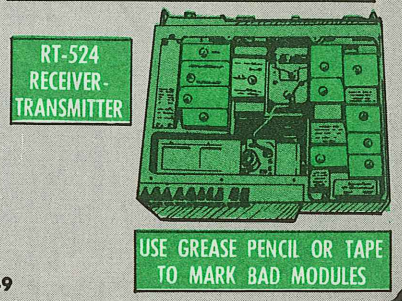


MENACE TO A MODULE

That's right. Engraving or even using a felt-tip pen to write the word "Bad" or the letter "X" on a module cover for your receiver-transmitter or receiver makes the cover a throw-away item at depot level.

When you're replacing a bad module and you're gonna mark it to keep from getting it mixed up with a good one, use a grease pencil or some masking tape.

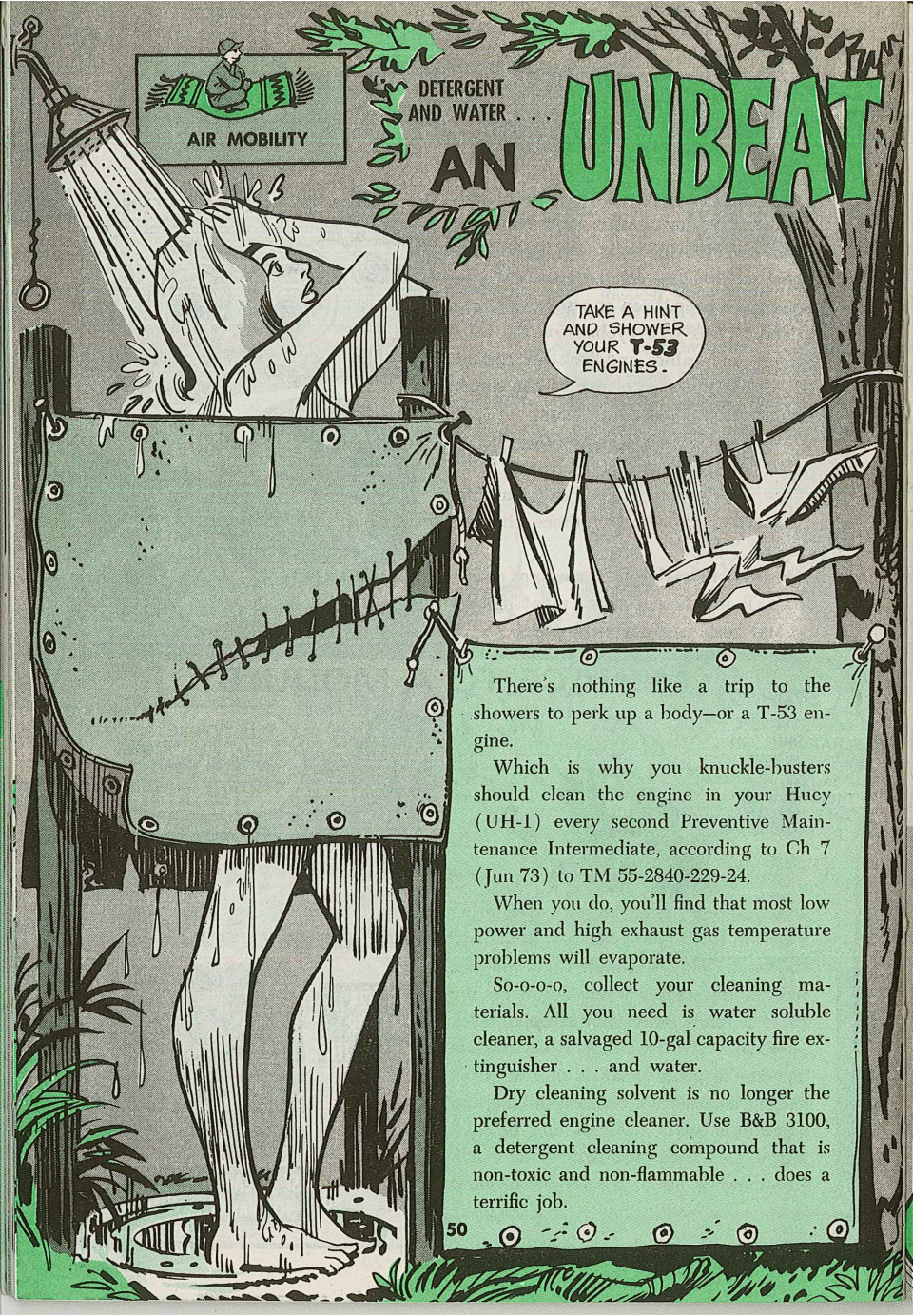
Your best bet's not marking 'em at all. Use a special bin or box for the baddies.



AIR MOBILITY

DETERGENT AND WATER . . .

AN UNBEATABLE COMBINATION



There's nothing like a trip to the showers to perk up a body—or a T-53 engine.

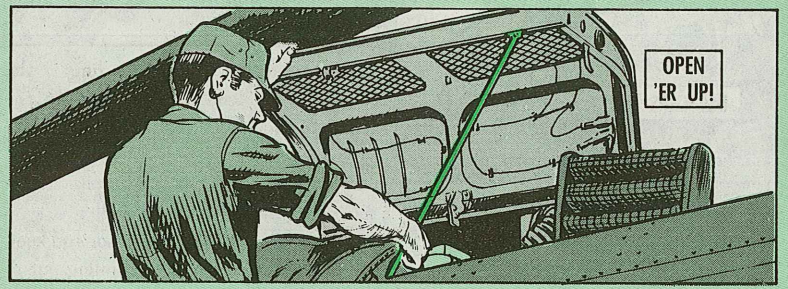
Which is why you knuckle-busters should clean the engine in your Huey (UH-1) every second Preventive Maintenance Intermediate, according to Ch 7 (Jun 73) to TM 55-2840-229-24.

When you do, you'll find that most low power and high exhaust gas temperature problems will evaporate.

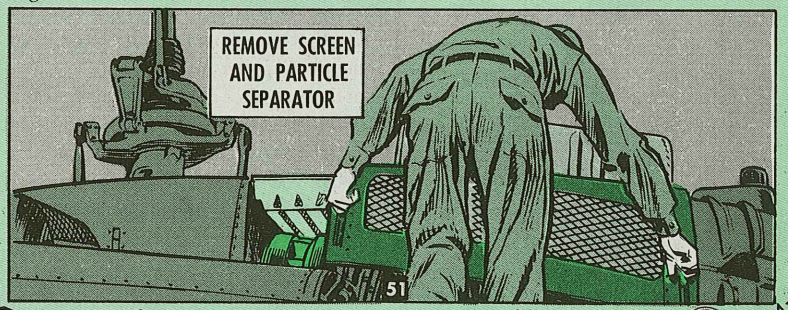
So-o-o-o, collect your cleaning materials. All you need is water soluble cleaner, a salvaged 10-gal capacity fire extinguisher . . . and water.

Dry cleaning solvent is no longer the preferred engine cleaner. Use B&B 3100, a detergent cleaning compound that is non-toxic and non-flammable . . . does a terrific job.

FSN 6850-181-7594 will get you a 5-gal pail of cleaning compound, engine gas path. . . FSN 6850-181-7597, a 55-gal drum.



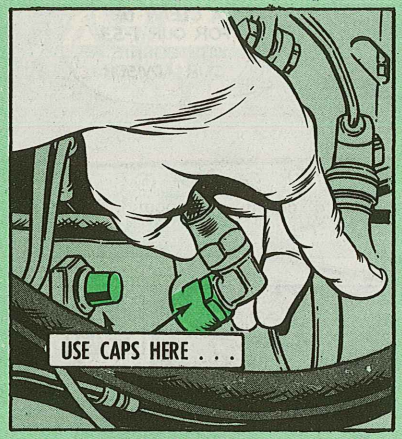
Remove the engine air inlet screen, particle separator and screen so that the engine inlet is clear.



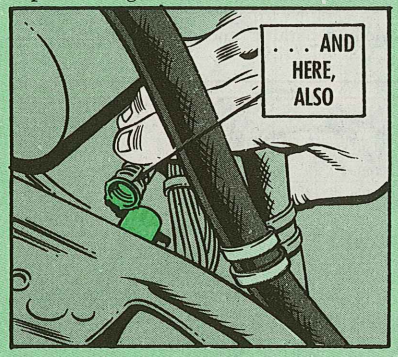
PS MORE

To protect engine components from solvent and water contamination, block off the following lines:

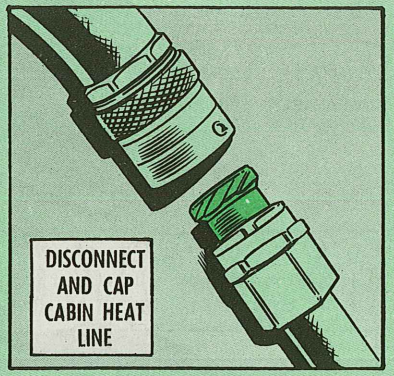
Disconnect the P3 pressure line from the air diffuser to air bleed actuator at the diffuser fitting. Cap the line and port.



Disconnect the P1 pressure-sensing line to the fuel control at the inlet housing and cap the fitting.



Disconnect the air bleed line that goes to the oil cooler blower and cap the connections.



Disconnect the cabin heat line at the customer air bleed adapter and cap the fitting and line.

Position the anti-icing air switch in the cockpit to the CLOSED position.

Closing the bleed band will give you better cleaning of the compressor and keep the cleaning solution from running out of the bleed band ports.

So, if you have 30 to 40 PSI metered air pressure on hand, disconnect the fuel control pressure hose from the bleed band actuator. Cap the fitting and hose. Connect the air source and use the air pressure to close the bled band. Never use more than 60 PSI pressure.

When you don't have metered air pressure, shield the starter-generator from the bleed-band ports with a 6 x 8-inch piece of rubber sheet.

Pull the ignition/start-fuel circuit breaker and make sure that the fuel selector is in the OFF position.

Observing the starter cooling limitations, have your buddy motor over the cold engine with the starter. Better still, plug in an APU and save the battery. Spray 1/2 gallon of the cleaning compound, mixed with 2-gals of water, evenly thru all sections of the inlet.

Then, stop the motoring, let the cleaning compound soak for a few minutes to remove stubborn dirt. The cleaner is so effective no brushing is needed.

Motor the engine with the starter and spray a minimum of 2-1/2 gallons of clean, fresh water into the engine inlet.

Remove the compressed air source if you used it and reconnect the bleed band actuator hose.

Ask the pilot to start the engine and operate it at ground idle for 5 minutes . . . that'll dry 'er out.

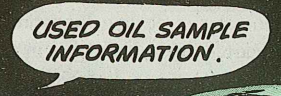
That's just about all there is to it, bird mechs.

Remove all the protective caps from the disconnected lines and ports. Clean the ports and re-connect the lines.

Put back all the engine air inlet components you removed.

You've got it made in the shade and so has your engine.

HOW'S YOUR FORM?



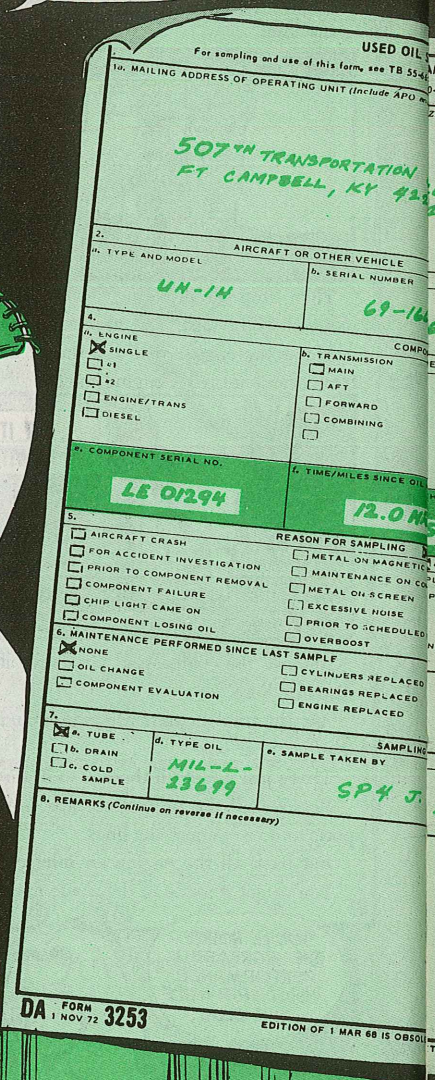
Play by the rules, bird mechs, and you'll get out of the program what you put into it—complete and accurate info.

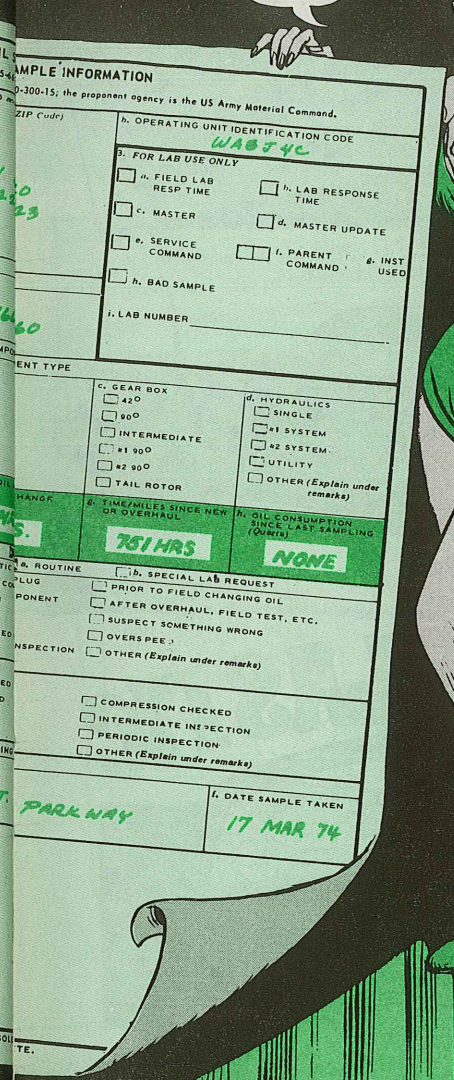
Take block 4f, for example. The lab needs to know aircraft engine, transmission, gear box and hydraulic system time since the last oil change. Remember, the lab types keep a running history of a component on an oil analysis record. An oil change without noting it on the form would give 'em a low wear metal count that wouldn't blend in with the record. The lab might ask for another sample, figuring you sent the wrong one.

By the way, a 12 1/2-hr turbine engine oil sample can be taken between 10-14 hours . . . a 25-hr oil sample between 23-26 hours.

Or, consider block 4g. The lab types need to know, for example, total engine time since new or overhaul. For the hydraulic system, record the airframe time in block 4g. Wear readings are generally higher on break-in or on a high-time engine. They're acceptable unless there is a sharp increase in metal particles.

Oil consumption info in block 4h is also a mighty important factor that the lab technicians consider when making recommendations to you.





Record the airframe time above the top margin of the form, left side. This info will help the lab technician validate hours since new, overhaul and last oil change.

Whether you send a routine or special sample, check *all* the applicable blocks in section 5 of the form.

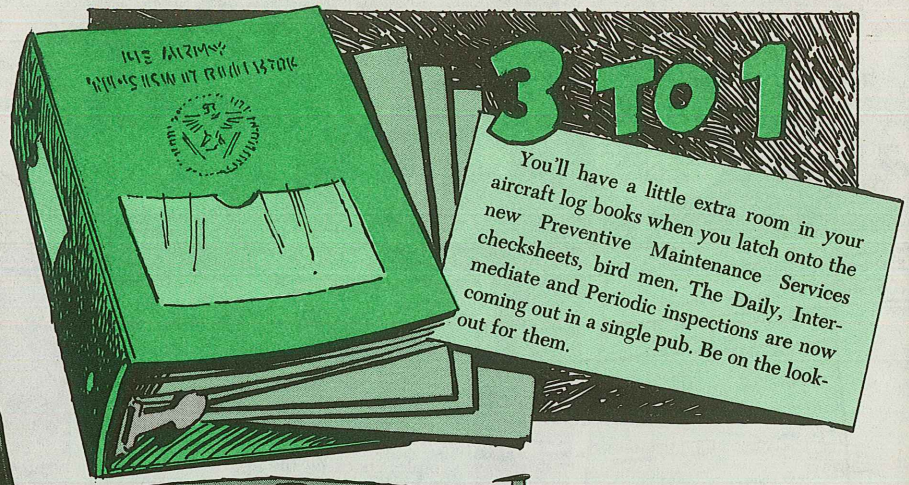
Never overlook section 6 of the form. Check the applicable blocks for maintenance performed on the component. Give with the facts, in section 8 "Remarks," when you check the "Other" block in section 5 or 6.

Fact is, all the blocks on the form give important poop. For a refresher on how to take samples and fill out the form, take a look at TB 55-6650-300-15 (Aug 70), with Ch 3, on the Army Oil Analysis Program.

Focus in on para 5b, for real. Your unit commander appoints a program coordinator with various duties.

If you are tapped for the assignment, edit all the forms for completeness and accuracy *before* they are mailed off with the samples.

When you do, you'll head off a lot of phone calls from the lab asking for missing information. The paperwork load will decrease, and there'll be a lot less static all around



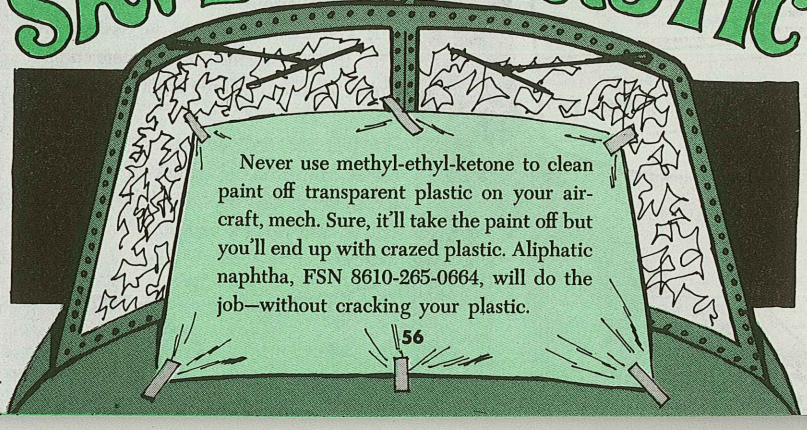
3 TO 1

You'll have a little extra room in your aircraft log books when you latch onto the new Preventive Maintenance Services checksheets, bird men. The Daily, Intermediate and Periodic inspections are now coming out in a single pub. Be on the lookout for them.

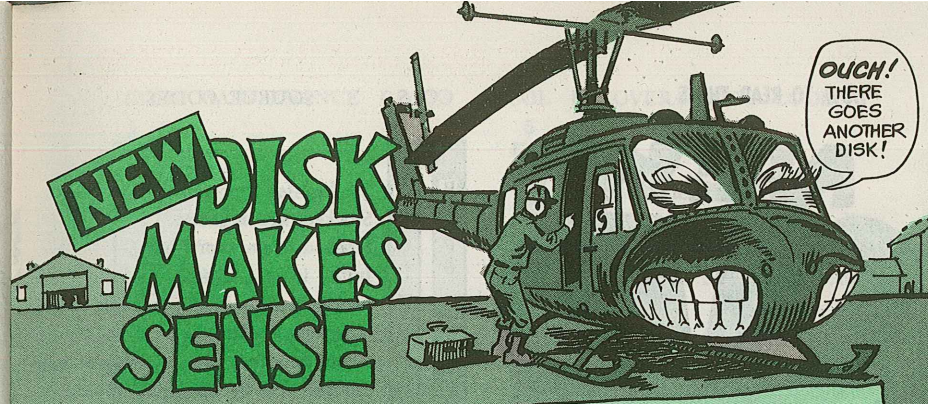
NEW GREASE

If you can't lay your hands on aircraft grease, MIL-G-7711, for your Seminole (U-8) landing gear, no sweat. It's been replaced by MIL-G-81322. FSN 9150-944-8953 will get you a 1-lb can.

SAVES THE PLASTIC



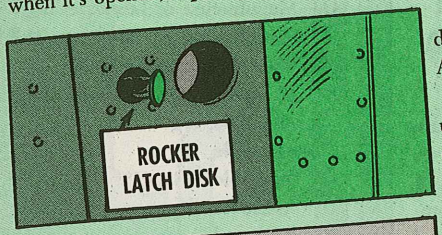
Never use methyl-ethyl-ketone to clean paint off transparent plastic on your aircraft, mech. Sure, it'll take the paint off but you'll end up with crazed plastic. Aliphatic naphtha, FSN 8610-265-0664, will do the job—without cracking your plastic.



NEW DISK MAKES SENSE

Dear Editor,

A lot of latches on the Huey (UH-1) radio, electrical and heater access doors bite the dust when they're accidentally left open. The cargo door rides over the large disk when it's opened, exposing the small disk on the rocker latch.

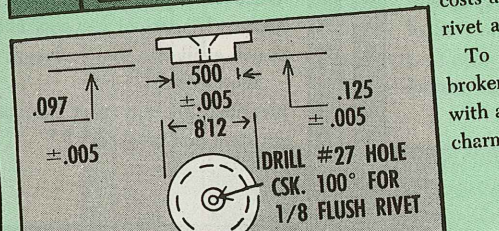


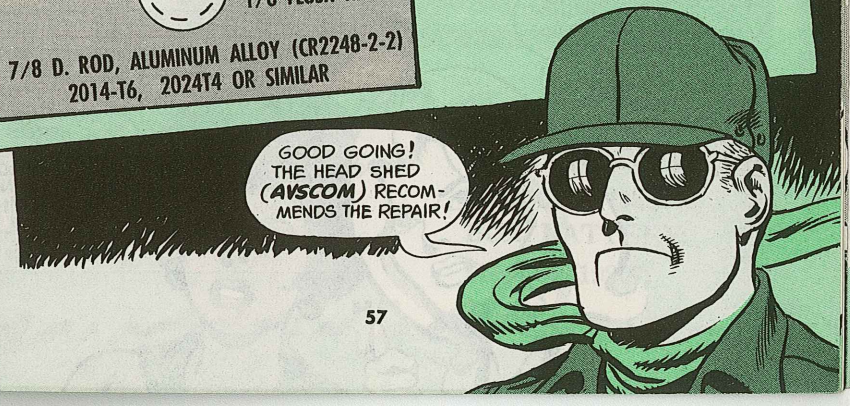
When the cargo door is closed the small disk hangs up on the door and, wham! Another broken latch.

The latches list for $4.41 and that adds up on a large fleet. It's usually the small disk that gets broken so we came up with a handy-dandy disk replacement that costs us only 80 cents to make, including a rivet and dab of paint.

To make the repair we drilled off the broken disk and installed the new disk with a 1/8-in flush rivet . . . worked like a charm.

William L. Dean
Ft Ord, CA





HOW TO READ THOSE . . .

NEW SMR CODES

Your new parts manuals, like -20P's, are showing up with source-maintenance-recoverability (SMR) codes with strings of letters that look like alphabetical spaghetti.

They have at least 5 letters instead of the 3 used in the older codes.

Here're the new codes—and how to read em:

COLS 1	COLS 2	SOURCE CODES
P	A	Stocked for use, general *
P	B	Stocked, contingency
P	C	Stocked, may deteriorate
P	D	Initial issue (support item)
P	E	Initial issue to designated unit (support items)
P	F	Centrally procured only (support item)
P	G	Stocked, hedge against discontinued production
K	D	Item in depot kit
K	F	Item in Org or DS maint kit
K	B	Item in kit (used at either KD or KF
M	O	Manufacture or fabricate, org
M	F	Manufacture or fabricate, DS * *
M	H	Manufacture, or fabricate, GS
M	D	Manufacture or fabricate, depot
A	O	Assemble, org
A	F	Assemble, DS
A	H	Assemble, GS
A	D	Assemble, depot
X	A	Replace by next higher assy only
X	B	If not available from salvage, requisition
X	C	Identified by **mfr part** No. only
X	D	Spt item, not stocked * * *

COLS 3	COLS 4	MAINTENANCE CODES
O		Org replaces
	O	Org repairs
O	O	Org replaces and repairs
F		DS replaces
	F	DS repairs
F	F	DS replaces and repairs
H		GS replaces
	H	GS repairs
H	H	GS replaces and repairs
D		Depot (or spec activity) replaces
	D	Depot (or spec activity) repairs
D	D	Depot (or spec activity) replaces and repairs
	L	Repair only at spec activity
	Z	No repair authorized
	B	Adjust, lubricate—but no repair

COL 5	RECOVERABILITY CODE
Z	Non-repairable
O	Dispose at org if uneconomically repairable
F	Dispose at DS if uneconomically repairable
H	Dispose at GS if uneconomically repairable
D	Return to depot if not repairable at authorized maint. level
L	Neither repair or disposal authorized below depot (or spec activity)
A	Special rules—see applicable directive

* For detailed definitions of the new codes, see introduction of TM that has them.

* * Codes, like MG, that apply to Navy only are not shown.

* * * From MIL-M-63001D, XD item, when required, procured thru normal supply channels.

NOTE: Except for XA, XD, and acft support items restricted by AR 700-42, any source-coded items may be obtained by cannibalization or salvage.

P A O Z A	6140-057-2554	BATTERY, STORAGE: MS35000-3 (96906)
P A O Z Z	2590-753-9504	BOX, BATTERY: 7539504 (19207)

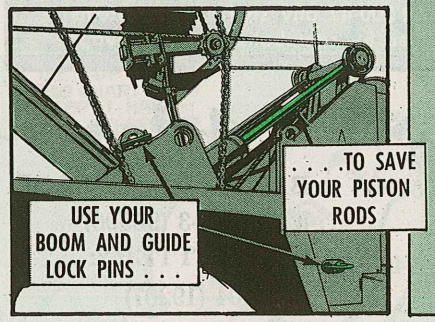
DITCHING MACHINE TRAVEL TIPS . . .

FOR A HAPPY TRIP

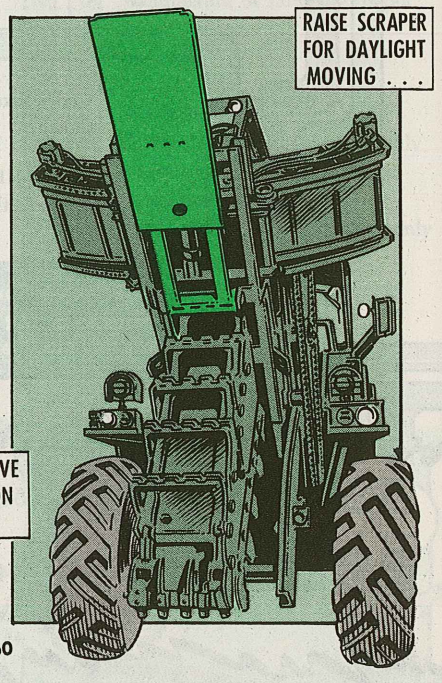
A tight boom lockup before you travel with the Model 624VL ditching machine saves you lots of repairs at the new work site.

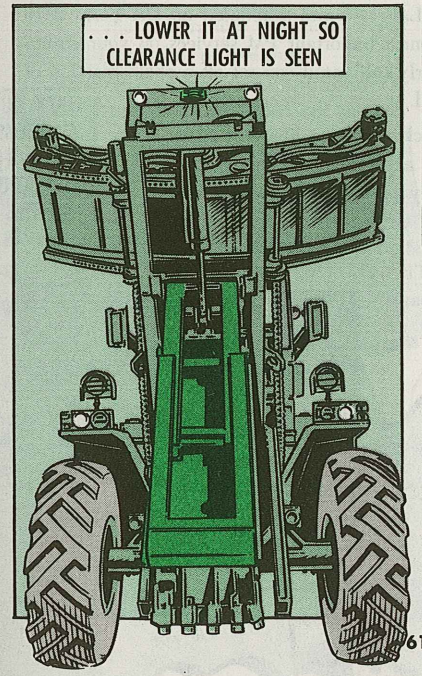
Putting the boom and guide lock pins in place will shift the heavy weight from the cylinders to the frame where it should be. That means no bent cylinder piston rods and no expensive downtime.

If you're making the move in daylight, be sure you also raise the followup scraper. Secure it with the keeper pins. Lower it only if you travel at night so the red clearance light is clearly seen.

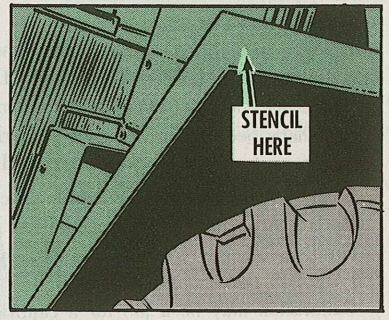


Details on how to follow the straight and safe path are in your TM 5-3805-240-12 (Jun 69). See para 2-6, page 2-7 and Fig 2-3, page 2-6.





If you're going to dig with this machine, you don't want any joyriders on the fenders. These surfaces are for maintenance work only.



Each sloping panel of the rear fenders should have this warning: "STAY OFF FENDER WHILE DIGGING." If it's not there, stencil it on both places yourself. This could save somebody's life.

If you've had doubts about the –20P TM listing for the transmission oil filter element, you're right. It's wrong. You can order the correct element with FSN 4330-443-0015, P/N K25(08832).

WATCH THAT LABEL DATE . . .

CALIBRATE!

When you're using tools, gages, meters and such, keep an eye focused on that neat little form—DA Label 80—attached to 'em. It's about the size of a special-issue postage stamp.

This hug-me-tight decal should be found on any item that requires periodic calibration. And it should show 2 dates—the date the item was calibrated and the date the next calibration is due.

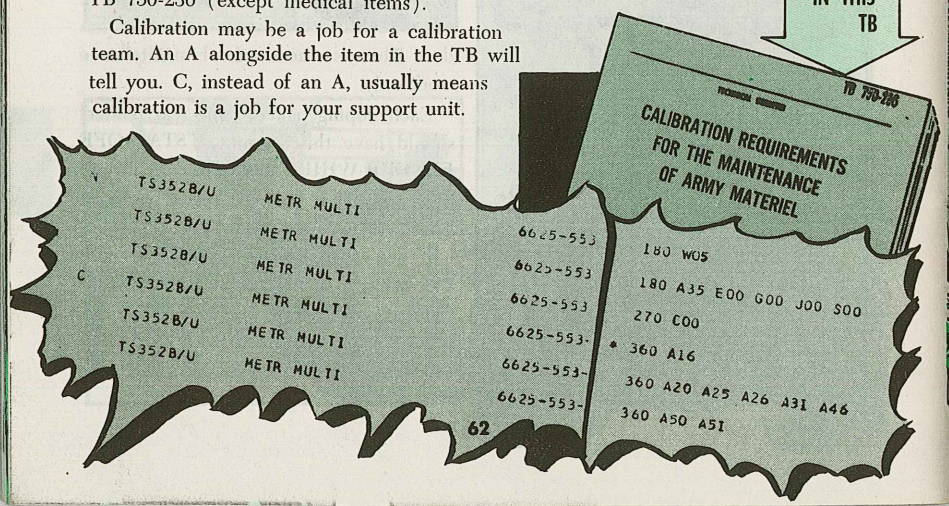
This ties in with a DA Form 2416, which should be on file at your Direct Support (DS) unit. The calibration listed on DA Label 80 and scheduled on DA Form 2416 (or sometimes on DD 314) is one of the most important PM services on your equipment. That's because an item not properly calibrated can set off a chain reaction of maintenance trouble everywhere it's used.

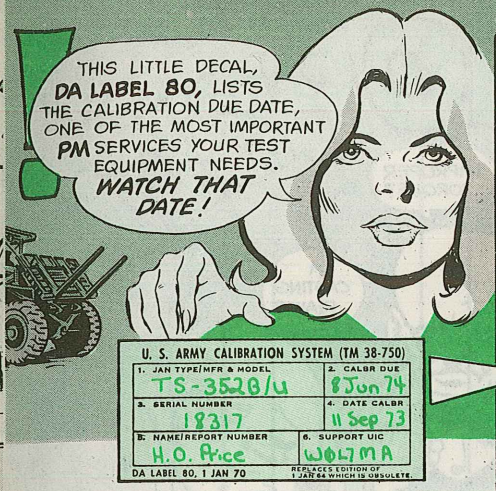
So here's how to check and double check on your calibration needs.

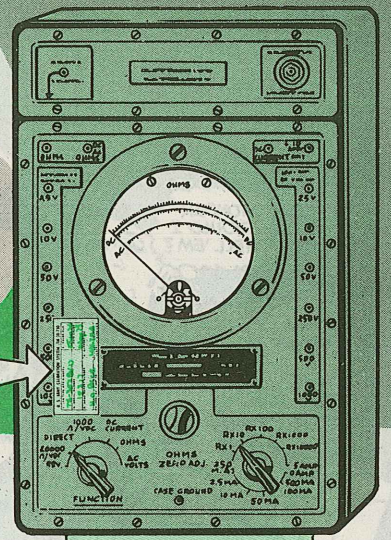
Each Army commodity command has a list of items that require calibration—all now combined in lists by model and item name in TB 750-236 (except medical items).

Calibration may be a job for a calibration team. An A alongside the item in the TB will tell you. C, instead of an A, usually means calibration is a job for your support unit.

CHECK OUT ALL ITEMS THAT NEED CALIBRATION IN THIS TB







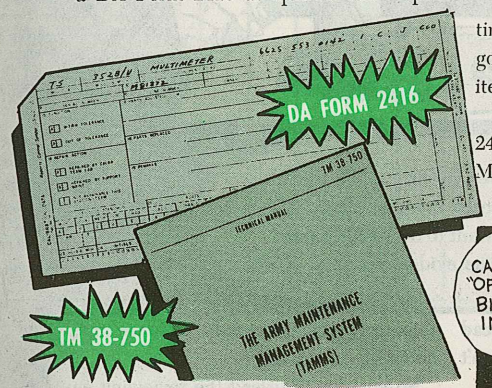
MULTIMETER WITH DA LABEL 80 ATTACHED

If you've got items that are required to be calibrated, check to see—

1. if each has a DA Label 80 properly dated, and . . .

2. if the calibration due date shows calibration is due or overdue.

When there's no label, send your DS a DA Form 2416 as spelled out in para

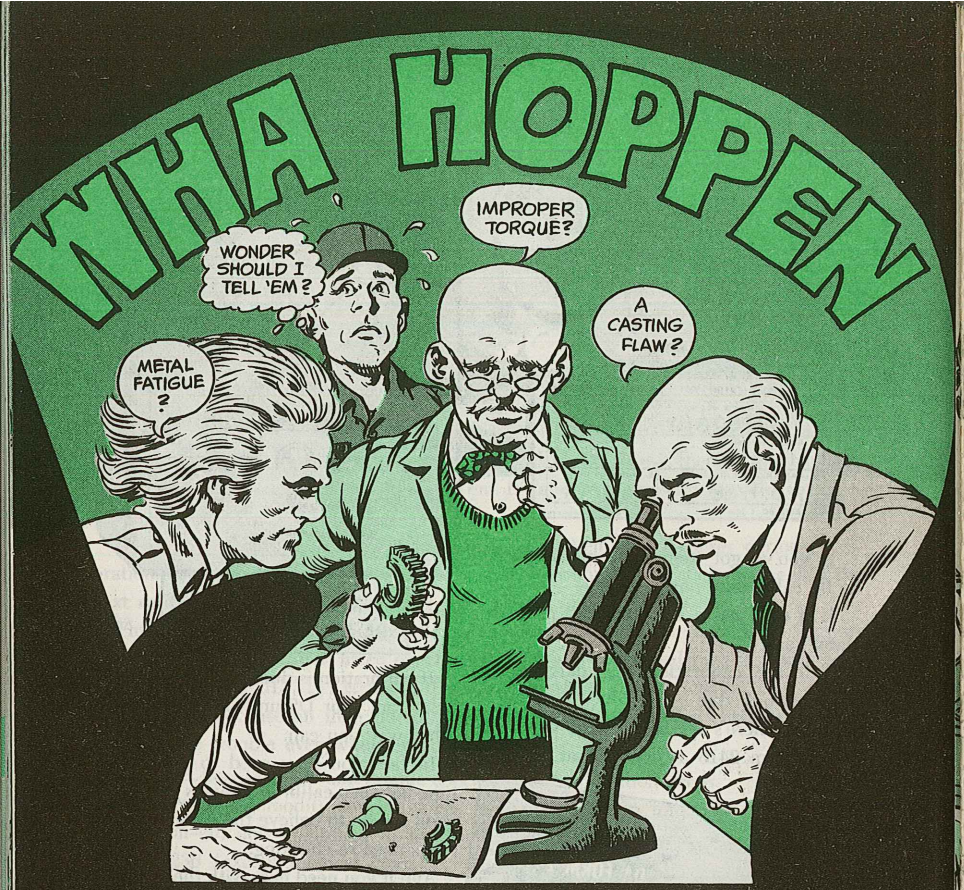


6-4e of TM 38-750 (or a DD 314 as spelled out in para 3-3b if DA Form 2416 is not used).

If calibration is due or overdue, yell for help from your DS unit—by phone or any other way you can.

In fact you may need to do this any time **between calibration dates** if you have good reason to believe the tools and other items need re-checking.

And if you need help with the DA Form 2416, ask your support or your friendly MAIT crew to pitch in.



Never, but **never** try to put the pieces of a broken part back together again. It's a temptation you want to overcome, mech, or you'll destroy the evidence.

Then, when the engineers at the head shed eyeball your EIR exhibit, they won't be able to tell what happened.

Was it a heat treating fault? A casting flaw? Improper torque? Deciding whether the mating parts were damaged during the actual failure, or during handling and shipment, can be strictly a guess, even under the microscope.

So you don't mislead the reviewing engineer, **never** coat exhibit parts with oil or grease. Just wrap each piece individually in your shipment and use plenty of cushioning.

DEAR CONNIE OR BONNIE: I would like PS Magazine to run an article about (describe your maintenance problem):

Want a reply?

Give us your name and address:

Tear this card out and tell me what you want to see in PS.

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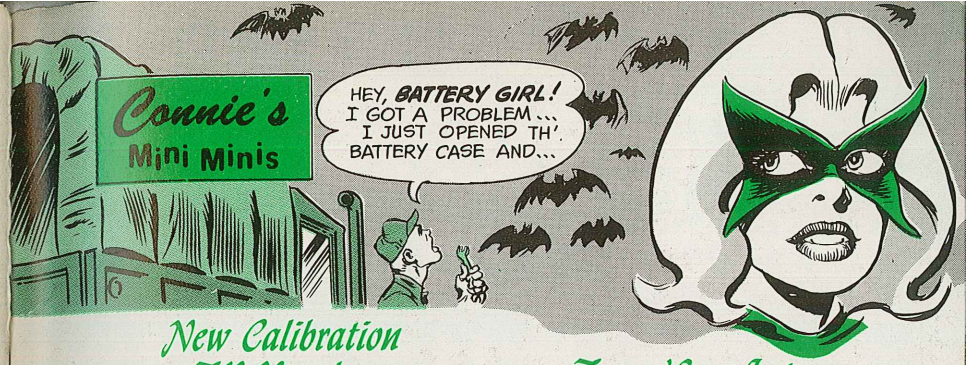

New Calibration TB Number

The newest issue of the Army's Calibration Requirements for the Maintenance of Army Materiel tech bulletin has a new number: TB 43-180 (1 May 74.) It's distributed by pinpoint. If your outfit needs one, order on DA Form 17 from St. Louis pubs center.

M551 Compressor Oil

If you missed the word, your high-pressure air compressors in the M551 Sheridan take Lubricating Oil, air compressor, synthetically prepared, synthetic base, FSN 9150-753-4667. There is no substitute!

PS Index For 1973

The Index for the 1973 issues of PS Magazine should hit your outfit soon. It is distributed to each unit that has a subscription for PS Magazine set up on DA Form 12-5. You get 1 copy of the Index for every 3 copies of the magazine you get each month.

Wide-Angle Mirror

That wide-angle mirror you saw in PS 251, page 14, now comes under FSN 2540-401-8337. The Army Master Data File shows a price of $13.20 for the mirror.

Turn 'Em In!

There is a real shortage of Huey and Cobra T53-L-13 engines at the overhaul shops, air types. So, scout around your area for unserviceables and serviceables that you may not need. Keep the supply pipeline filled with:

T53-L-13 FSN 2840-911-7685
T53-L-13A FSN 2840-102-3969
T53-L-13B FSN 2840-134-4803

Panel Light Lens

Make a note — FSN 6210-337-7345 brings you that light lens for your 2½-ton truck's instrument panel. That's item 20, Figure 33, TM 9-2320-209-20P (Oct 72). You'll find this right FSN in the parts manuals for other vehicles.

Element For Gas Job

No matter what TM 9-2320-211-20P (May 73) seems to say, you can't get the gasoline engine air cleaner element all by itself. You have to order the whole Cleaner, assy, air, gasoline, FSN 2940-740-9304. The TM gives you FSN 2940-134-4657 for the element, but that's the dry-type engine air cleaner element for the M813 and other TM-260-series 5-ton diesel trucks.

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

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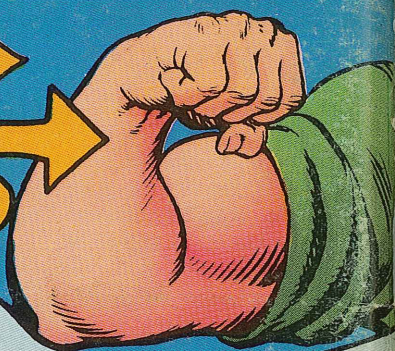

OVER IS AS BAD AS UNDER TORQUE