

Box 164

PS

1961 Summer

THE
PREVENTIVE
MAINTENANCE
MONTHLY



QUOTE...

...The master condition of design lies in a design relationship between condition of the equipment in which and with which they fight. The ability to maintain arms and equipment may well be the difference between defeat and survival.

—P.W. 2.5.7 Chapter 1 (1944)

When it comes to the reason that maintenance is important, it could hardly be said better—

Half-Mast

PS

THE
PREVENTIVE
MAINTENANCE
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How to Use This Magazine
PS Magazine
The Army
The Army

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YOUR M 60 TANK



Your new M60 medium tank with 105-mm gun is a rugged chunk of hardware. It should give you many miles of easy-going operation if you take care of it like the TM says.

Until you get TM 9-2098-11 5-18 on the M60, the steps on these pages will help you and the M60 get acquainted.

Before you drive it, make this quick check:

OUTSIDE THE TANK:



INSIDE THE MGO:

Accelerator pedal and shift lever linkages—operating smoothly?



1. Fuel in the tank? Control panel switches and indicator lights working?



Fertilizing
Bumper OK?



2. Fuel drain valve control lever in CLOSED position? Chimes are left OFF only when vehicle stands overnight.



3. Fire extinguishers filled and ready for use?



STARTING THE M50:

You start the engine—Conventional AFES (Air-cooled, V-type, Diesel, Super-charged), 1796, 2-cylinder diesels....

1. Turn the safety switch to OFF.



2. Make sure your shift lever is in the P (PARK) position and the brakes are set.



3. Flip master switch to ON. The indicator light next to the switch and the engine and transmission fan oil pressure and warning light above the instrument will come on. To help if they don't, have your representative thoroughly check the circuit.



4. Make sure the emergency fuel shut-off valve is in the full forward position. The push-button valve is behind the driver's seat in the lower right. Except for emergency shut-off, it is kept in the full forward position.



5. Set the air cut of the fuel lines and fuel pumps by working the pump pump handle a couple strokes. Don't worry about over-pumping. You won't get over 90 PSI on the low-pressure pump. This doesn't work like the primer pump on the M4's. When you over-charge it is not that all. The pump pump is at the driver's right in front of the fuel shut-off valve control.



6. Late production models have a starter switch on the driver's control panel. When starting the model, push the full forward (PARK) before pushing the starter button.

On earlier production models, which have not yet been modified by an M50C, lift the safety handle and move the shift lever from P (PARK) to the S (START) position.

This'll kick over the engine. These early production units (serial numbers 2 through 54) will all be modified to remove the lower linkage type lever.... In time, really all M50's will have the push-button starter switch.



Don't run the starter more than 30 seconds at a time. Pump down on the accelerator about $\frac{1}{2}$ to $\frac{3}{4}$ of the way while the engine is cranking. If the engine won't start, wait about two minutes and try it again. In very cold weather when the engine is stiff, wait at least five minutes for the starter to cool off before you try it again.

- F. When the engine starts, let it idle while it warms up before you drive off. At temperatures above 32°F a couple minutes at 1,000-1,200 RPM should do it. With temperatures below 32°F, warm up at around 1,000-1,200 RPM.

After you've got your engine warmed up, reduce your engine speed to the normal idle of 700-750 RPM.

In the early production tanks with the lever linkage starter, ease up on the shift lever as soon as the engine starts. Move the lever back to the P (PARK) position and leave the safety valve.

UP! SURELY LATER,
FROM SHUT OFF! WE
WILL RETURN TO
YOUR ENGINE.



UP! SURE,
BACK OFF! WE
WILL RETURN
TO YOUR POSITION
AND LOWER LATER.



- G. Turn the manifold heater valve switch off by pulling down the manifold heater switch in the end of the pump pump handle while you continue to pump.

Don't work the manifold heater unless your engine is being cranked. The reason for this is that the hot manifold heater will get the air that is pulled in by the cranking. If your manifold gets heated with unburned fuel, you might wind up with a hydrostatic lock.

SHUT OFF



If the manifold doesn't get hot enough in the first few seconds for a start, you'll have to keep it from flooding by holding the main engine fuel valve on the manifold panel in the OFF position while you try again.

This fuel valve is spring loaded and usually stays in the OFF position by itself the way the OFF's show it. You have to hold it up with one hand, while you operate the manifold heater button with the other hand and work the starter with your third hand. If you haven't got three hands, use your last engine buddy to help you.



- H. After you have heated up your manifold (if you heated) keep off the main engine fuel switch and it will spring back into the OFF position.

AFTER YOU'RE STARTED...



WARNING LIGHTS

The engine and transmission low oil pressure warning light blinks on when the RPM drops below 1,000.

If the light stays on after 1,000 RPM, something probably is wrong.

It might be contaminated oil or oil that's run light, broken, kinked, clogged lines, or oil loss in the transmission because of bad gaskets or fluid leaks or inspection plugs.

Check the engine oil pressure gauge on the instrument panel. The engine gauge should read about 30 and the transmission gauge about 40.



The high oil temperature warning light for engine and transmission will go on when engine temperature gets between 240° and 250° or when the transmission oil is around 250°-260°.

If this light comes on it usually means something is wrong. Stop your truck as soon but don't turn off the engine. If the oil pressure gauge shows no pressure, shut off the engine.

If it shows pressure, let the engine to run at 1,000-1,200 RPM to heat the oil and check engine components for leaks or wear on the valves or anything else that might cause the overheating.

Course, an engine and transmission can overheat from just a long, hard, pull. Other things that could do it are clogged oil cooler air passages, kinked oil cooler lines or slipping cooling-fan clutches.



SMOKE SIGNALS:

Black smoke means that all the diesel fuel is not getting burned in the engine, either because you're giving it too much throttle or because the turbochargers aren't bringing enough air to the cylinders.

A steady stream of white smoke shows too much engine oil is being burned in the cylinders. This is a real trouble signal for a diesel engine. If you're getting white smoke, see if your turbochargers are leaking oil into the air that goes to the engine.

SLAVE STARTING:



Slave starting the B&B may look a little tough because you've got two jumpstarts and you use two cables, but once you get squared away, there's nothing to it.

You share the B&B with the same type cables you use for other vehicles, FCable, even, rubber covered, 2 conductor stranded, w/female plugs at both ends, AWG No. 1, lgs 30 ft. P/N 4548-474-0135).

First check your cables to make sure the positive (+) and negative (-) prongs on both ends of the cable line up right. (You can get the clips on how to do this in P2-85).

After you get your cables checked, mark 'em some way so you'll know they're OK. That way you won't have to make a check every time you want to use them.

This is the way you share an B&B. (Get a 100 amp for two other vehicles with 100 amp system, and with four batteries, use the dual B&B).



If you run an RWD on the driving vehicle, keep the engine running, but if you run two other vehicles on rollers, turn their engines OFF.

Turn the master vehicles in all vehicles OFF. This is the first matter if the drive is an RWD on the other vehicle. With the RWD the engine will continue running with the master vehicle OFF.



With all master vehicles OFF you hook up your vehicle as a slave. It won't matter whether you plug in the slave or the line back flow, until you make an unconnected vehicle make you plug into first on the RWD you're going to drive.

When you get both rollers hooked up, start the engine in the slave RWD in the road manner with the master vehicle ON.

THIS IS IMPORTANT

When you drive start an RWD with master RWD, be sure the master vehicle of the LWD vehicle is turned OFF before you push the RWD vehicle. If you try to start with the line vehicle master vehicle ON, you can run the line vehicle powerline.



CAREFUL

SAFETY: HOLD THE DRAGGED VEHICLE ON LARGER TIGHT, BE PROUDLY, WAIT AT LEAST TWO MINUTES BEFORE TRYING IT AGAIN. IF YOU DON'T WAIT AT THE FIRST TIME.



As soon as the engine in the slave back runs smoothly without stalling, turn the master vehicles in all vehicles OFF.



Full back cables at the same time from both the stored tank and from the H&H for extra resistance during the slowing. Be a little careful with this because if one of the pins in the cable connector hits the metal around the receptacle it'll cause an arc and damage the cable.



Turn the master cable ON to the stored tank and set the engine at 1,000 RPM to charge the batteries.



You should always use two down cables because of the heavy current load, but in a real emergency you can get by with one cable. If you have to do this, charge the dead vehicle's batteries for at least 30 minutes before cranking and don't crank more than 15 seconds at a time. After, allow at least 5 minutes for things to cool off between cranking attempts.



MOVING OUT:



You can use either LOW or HIGH range. LOW is best for steep grades, or in very soft or rough terrain. This will let you go at maximum speed in LOW.

HIGH is for regular driving conditions and gives you speeds up to 30 MPH.

Get your speed up to 5 to 10 MPH before shifting from LOW to HIGH range. Don't downshift from HIGH into LOW when you're going over 10 MPH.



To shift from REVERSE to a forward range or from forward to REVERSE, come to a complete stop and let up on the accelerator before making the shift.



You can go as fast as 3 MPH in REVERSE.

Bring the tank to a complete halt before shifting into PARK position.

DANGER—WATCH OUT

The 440 has a compressor ignition engine which has a kind built-in advantage and one built-in danger. The danger is that the transmission will drive the engine instead of the other way around. This can happen when you stall going down steep hills and the engine is coast backwards. When this happens, the transmission will drive the engine backwards. The turbochargers then spin in reverse and get damaged. And air goes out of the cylinders, cooling them. The third fix will study...



This can also happen when you're going forward down a steep slope in REVERSE range.

If your engine starts running backward on you, brake the car to a stop, shut off the engine, and after waiting a couple seconds, restart it again.

If you can't brake the engine to a stop, shift into NEUTRAL. You'll lose the engine's braking power, but you'll save the engine itself.

PERFORMANCE TIP8:

Never creep down on the accelerator when you're starting out.

The steering wheel is for steering, not for a hand rest to pull yourself in and out of the driver's seat. Since the car moves in NEUTRAL range, this could be dangerous if you turn the wheel off center. On the production models there's no NEUTRAL, more switch to protect you by breaking the circuit, so don't move that steering wheel unless you mean it.





STEERING:



The **NEUTRAL** steering is self-sensitive, and you've got to be watchful at all times, particularly on hard pavement. Practice braking a few times at different speeds to get the feel of your tank. You can steer in all ranges, including **NEUTRAL**.

NEUTRAL STEER

This gives you a pivot turn. It's hard on the tank, so don't do it unless you have to. **NEUTRAL** steer gives you the most change of direction in the shortest amount of time and space. You turn the steering wheel to full over in the direction you want to turn and you regulate the speed of turning with the accelerator.



To make the tank turn to the right, pull down with your right hand, and up with your left.



Don't make the TANK do any sudden turns. A TYPICAL



Put both hands on the wheel parallel to the floor and as far apart as possible. To make the tank turn to the left, pull down with your left hand, and up with your right.



You can make a sharper turn in **LOW** than in **HIGH**. You also have better control and more pulling power for rough, soft or hilly terrain.

REVERSE & FORWARD

Reversing in reverse is the opposite of forward steering. If you want your back end to go to the right, turn the steering wheel left. To go left, you turn the steering wheel right.



DITCHES & BARRIERS:



In going over the barrier, ease up on the accelerator when the back passes over the barrier point, let the front glide over the barrier before you gas the engine.



Avoid going into deep ditches or barriers that make the gas or rear wheels dig into the ground, but completely in the ditch leaves what's going on as they can get locked.



ON UPGRADE:



To start out an upgrade, speed up your engine as you don't roll backward when you release the service brake. Don't try to hold a steady momentum into an upgrade but keep releasing using your brakes or you'll overtake the transmission.

ON DOWNGRADE:



Still in LOW, keep your engine speed within the governed speed of 1,000 RPM and keep topping leaders off and on.

For long, steep, grades you run, in an emergency, go down in REVERSE. The more you creep on the overdrive, the more braking effect you get. This is hard on the axle so don't do it unless the grade is real steep.

Remember, when you do this your steering is like driving it reverse on the road. Also, this is one of the times when there is a risk that the transmission might run away with the engine, so go from red line.

EXTREME COLD:

Before starting your axle, warm up the engine for at least 15 minutes with shift lever in PARK. After the engine is good and warm, move out in LOW at 15 to 20 MPH. As temperatures drop even to 20 below, go at least a half mile before increasing to normal speed. At 20 to 40 below, make your slow moving leaver's mile.



This slow run is a must to warm up the axle, suspension units and final drives. Even after the warm up period, you have to be careful because operation is never really normal in extreme cold.

When falling for that deep-potail, the lead axle must be lifted immediately after the engine is shut OFF before you're back working in the hole.

Before shutting OFF engine in cold weather, run it for several minutes at 900 to 1,100 RPM and finish off with 2 minutes at 2,000 RPM before letting the engine drop to an idle and shutting OFF the fuel switch.



OTHER THINGS YOU SHOULD KNOW IN CASE EMERGENCIES...

Open the door when to get out of melted snow or ice while you still have engine heat. Once both feet clear... , be sure there's no water left there to freeze. Also drain the R.E. heated line before it'll freeze with the rest of the vehicle.



Put the tank on a heating plank or break up the tank's draft house to the ground when you are parked.

Keep road, snow, and ice from your tank as much as possible after a halt, before they freeze together.



Remove your battery and drive tank to a warm place if you're going to be parked for a long time. The short range and over-night tanks, when the power plant heating bit is going to be used, the warm place should be opened in the warm air can give the battery.

For other steps on cold weather operation see TM 9-207, FM 14-70 and FM 11-71. By the way, there is one FM on the M50, TM 9-2150-215-10 (June 60) in the driver's bible.

TURRET VENTILATOR BLOWER:

Always, but always, keep the turret blower ON when the hatches are closed and you fan the main gun or either of the machine guns. With the blower running, you'll be all right. Without it, a high concentration of carbon monoxide could build up, making everybody in the tank sick or even killing them.

There should be a warning sign in the cupola telling you about this danger. It will read: "Turret ventilator motor must be operating during main-line gun and/or gun camera firing or machine gun fire from turret."



HULL TURRET SEAL:



To the left of the drive is a bicycle-type pump used to blow up an inflatable circular seal between the hull and turret. This is the feeding or leaktight of chemical attack.

Work the pump until the gauge registers 25 PSI for a watertight and air tight hull-turret junction.

You don't pressure the turret with the seal blown up. Before returning open the blowdown and let the air out.



PERSONNEL HEATER:

Works on fuel oil heated oil gasoline. Turn ON with the heater master switch and turn OFF the same way. Will run a few minutes after it is turned OFF while it is purging itself.

In an emergency ONLY you can stop it dead by turning OFF the master heater switch. It isn't good to do this as a regular thing because the heater can't purge itself. There is a guard over the master switch so stupid you can't see it unless you have to.



INTERPHONE BOX:



It's mounted on the right rear corner of the M55. It has two drainage holes to let out moisture that condenses in the box and a rolled steel 6 feet long instead of 30 feet like in the M55A3.

L/I JOE:

You won't have any worries with the L/I Joe on the M55, on account of there is no L/I Joe. The tank has its batteries heated of them for easier starting.



Canada Road's
TRUCK & BUS

Seat belt



Are you kidding? The non-spring-steel bearings on your 2H-ton (K242 and G140-series) and 3-ton (K140-series) trucks?

These bearings are due from GAA every 1000 miles.

It's likely some non-spring-steel bear-

ings are being overlooked by some people because some trucks sport a plug where a grease fitting ought to be. But if you're reading your truck's LO the you ought to pay won't miss this important luber point.



To protect the bearing seals on new trucks, some luber orders called for loosening the screws in the bearing cap and lubing until the GAA showed up on the cap.

But this is needed only on new vehicles. Besides there's some danger when you loosen the screws. The greatest danger the cap may get exposed and cause the luber to leak. And if you loosen too much, there may not be enough pressure to seal the luber into the inner and outer races where it's needed.

So what is easy with this luber job. Luber every 1000 miles until there's GAA shown around the seal on the inner side of the nut . . . like in caps, if necessary, in Note B of LO 9-2320-210-10 (19 Jan 89).



In between luber jobs, check those bearing cap screws to make sure they're tight. And just in case somebody else won't overlook lubing those bearings, check to see that your trucks have been equipped with grease fittings so that their non-spring-steel bearings.

Overloaded and

Before you grow a cross-country truck with the M172 four-bed semi-trailer, learn why a new rating on its rated payload capacity.

THE 9-8122 (22 Dec 51) says it's a 25-ton job, but the Ordnance Corps re-designated it with a 14-ton cross-country rating in 1948. Change 1 (dated 30 Apr 50) to AS 711-040 tells you about this.

The braking and towing capacity of the M172 truck-tractor, the M172's prime mover, was a good part of the reason for the change. Page Three THE 9-8008 (13 Jan 52) tells you the M172's maximum all-highway gross-load is 15 tons.

When you need to handle a heavier load, you'll need the M172A1 semi-trailer and a prime mover with higher rating... such as the M125 truck-tractor. The M172A1's built with a longer greenhouse to stand up with the fifth wheel of the 30-ton prime mover. This unit's also been loaded up in a few other spots to handle the same load.

You can run the M172A1 with the M172 truck-tractor. But when you do, its payload rating drops to the same level as the M172... like so:

For load on	M172 + M172	M172A1 + M172	M172A1 + M125
Highway or cross-country road	25 tons	25 tons	25 tons
United cross-country	15 tons	15 tons	25 tons

To get a full run-down on other tractor-trailer combos, you may want to look into TR 9-1508-219-10 (4 Sept 50). It's one way to keep from getting overloaded.

Just as tight

Now that you put an automatic transmission into one of your G40-series 2½-ton trucks or M19 APC's, watch these modern line drawings.



Too much weight, power or pushing when loading them up can cause the parts, lines or fittings to crack from the strain. When the fittings are snug... stop.

After snugging them up, check to see if they will lock... if not, don't leave them alone. Still backing? Just snug a bit more until the backing stops.

Fuel filter notes

On an AOE 895-1 Fuel injected engine, the engine fuel filter and its filter element, being together like hair and egg.

In short, the word is that you won't operate this engine without the right replacement fuel filter element. ... and that means not never by accident.

If you want to know how to get your replacement, well, just ask for E6, Filter Element, Fluid Pressure, 150A-70A/MT. It includes the filter element, a bowl gasket, an element gasket and a washer for the bowl head.

Never use a replacement fuel filter that's meant for the AOE 895-1 engine. This'll never work.

The AOE 895-1 engine is on the M34A1 110mm self-propelled howitzer, the M34A1 105mm self-propelled gun, M34A1 105mm howitzer, and 76mm gun M34A2 and M34A1 and cargo tractor M34A2... Well said!



I-2 that EMT?



BE PREPARED

That applies to your next scheduled maintenance inspection. And if you will your symbols over Change 6 116 for 611 to 48, 750-6 you'll be better prepared.

This change tells you that you'll no longer have Major and Minor Defenses. Good, you'll get it with Defenses and Shortcomings.

A Deficiency is a "material defect or

operational inadequacy" that makes your equipment so it won't operate or makes it unsafe for you or other guys. Also it could cause further damage to your equipment.

A Shortcoming is a "material defect or operational inadequacy"—other than a deficiency—which you've got to get fixed to keep your equipment in top shape.

Oh right, these new terms apply to all included service equipment.



MORE TO IT

WE GOT A CRACK IN THE HOSE, AND THE PUMP WON'T PUMP. IT'S A BOMB!

Dear Chief-Mon,

It's been going through the daily maintenance routine in our tanks the other day when we ran into a problem in checking our hydraulic power pack's hose found in the M21 SP gun and the M11 LRM.

In checking the system we read where the oil drains and the accumulator oil valves have to be open so that the oil drains into the reservoir so's we get a true level check.

The thing that stumped me is: How do you get the oil that was drained from the accumulators and back into the cylinders put back into the system after making the check?

Sir, C. F. H.

Dear Mr. C. F. H.,

The question is logic.

This lot of left-brained gun guys, along with the oil, back into the system and on the right track.



Assuming you had the gun in several tanks where the oil was drained back into the reservoir for the oil level check, then...



1. Make certain both oil valves in the equalizer portion.



2. Turn on the valve to the tank and...
Wait your 15' (10, or your tank engine, for the indicator you've got the right valve for the electric motor in the hydraulic power pack.



WELL, THE OIL WASN'T IN THE TANK, BUT IT WAS IN THE HOSE. IT'S A BOMB!

1. Turn on the master hydraulic oil pump control valve.



2. Open the accumulators oil valves and accumulator gas valve.



3. Hold the spring loaded accumulator loading valve into "open", "shut-off"...

4. Rotate the lowering power control handle right or left to get the oil pump on-line. That will do the trick of the hydraulic cylinder...



5. Turn on the hydraulic oil pump control valve and open the pump bypass control handle left or right...



While checking the nitrogen pressure gage. Don't use the accumulator loading valve.



7. Release the spring loaded accumulator loading valve and run off the hydraulic oil pump control valve.



10. When you read the nitrogen operating pressure (150 PSI for the M21 and 140 PSI for the M11) it runs off the hydraulic oil pump control valve.

Now, close both the accumulator oil and accumulator gas valves and get the "shut-off" valve in forward position... that's all there is to it.



Half-Mon

THE HONORABLE MR. T. AND
BOB CALL FOR...



Heck, that's accurate.
And don't argue the facts because it doesn't spell anything backward.
One up!

It's just Gossard's way of reminding you to keep your eye peeled for that
mighty important little form with the long, long title: DA Form 1178 "Notice
of Accomplishment of Ordnance Modification Work and Record Order"

The form's been around for some-
times, but some people still don't know it
replaces the old DA Form 881 "Notice
Change Itemization Report."

In case you're not yet squared away
on DA Form 1178, you can learn all
about it in AB 708-000 (27 Sept 54):

Briefly, here's the story: The form's
used to tell Ordnance Corps National
Manufacturing Plans and other support
and design centers how you're making
out with the installation of various types
of modification work orders and special
weapons records orders.

N-O-A-O-O-M-W-A-R-O...



Remember, now, only certain types
of MWO's and RO's call for a 1178
report. You can tell which ones need
reporting easy enough. For one, you'll
find a supply of these forms printed in
the MWO or RO kit, and for sure-
even if no kit is provided—the MWO
or RO itself will tell you so near its
front where it's needed.

In an MWO you get the word under
the paragraph titled "Recording of
Modifications." In an RO the answer
there are given under "Some Easy Re-
quirements."



The form's easy to fill, and its own form is needed when it's sent in. But it does
have a couple of its own copies because they need the file.

1. The original copy goes to the National Manufacturing Plan or agency listed under
reporting instructions in the MWO or RO.
2. One copy goes to the Ordnance office at your unit's command headquarters.
3. One copy stays with you—the outfit which makes out the form.

It might be a good idea to save your
MWO and RO the right now. If your
unit's failed to send in a DA Form
1178 when it was called for ... well,
it's not too late yet.

It's not too late yet.

Then the get copies of the form and the AB from your post, publication
section, or your direct support center can get 'em for you. Get 'em both and keep
'em handy. One is up in the AB.

Last but not least ... make sure you fill in your DA 1178's right. This way
you won't be bothered with letters asking for clarification or more data. Don't
abbreviate or cut your tale short ... give all that the MWO calls for and make
it complete.

TAKE A PEEK AT

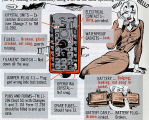
"There is the right and wrong the flesh," was what the oracle said.
A flicker was dead, the wind wasn't spiritul . . . the impact's "Thump!" boomed.
To make sure your handle-balls won't be dead when you and your mouth need
it, give it the same-care right now.

This No-Years-Over-Inspection line will help you pinpoint the trouble spots and let you head 'em off at the pass before an emergency—or an inspection—shows a fire sign.

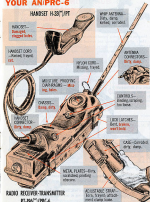
Real service conditions, like those in buildings, should be created before you use the Part 5 scale.

First off, you should use it to store the equipment before, between, and after use and that all users are accounted for and right. Naturally, you always take out the battery when your car is stored or use it to the point for some time. This can allow you better protection.

To test whether your handle width is perceived as the right diameter frequency, test two widths with participants using a set of the same frequency chords.



YOUR ANPRC-6





Imagine a snake going 'round its circles with its tail in its mouth.

That's what the take-up and control belts of Projector Reels AP1/PPP-1 and AP11112 look like when they're joined.

Getting 'em apart—especially those coming down the line (joined—can be a real problem).

But the separation can be made easy if you don't have the chemical 'bobby-fingered' chemin', that is.

All you do is put a finger nail against the female end on field it will while you move the male end.

Body with the tapered ends and are separated by turning the other end counter clockwise.



Never pull the belts in opposite directions while running, because that'll only tighten the joint.



When separating a belt, back up the male end by several turns before screwing it on. That'll keep the belt from twisting.

NO MORE RUB

Dear Editors,

Our unit came up with some FRC-It's that have given us trouble.

Their wolverine-transmitters can rub against both the heavy harness and the screw that holds the harness clamp to the chassis.



So we've found a simple way to correct this.

By simply screwing the clamp underneath the cover plate, (instead of on top like the TM shows), the harness drops out of the way.

This also puts the head of the screw in the second part of the cover where it belongs.

Edg. M. T.



ED NOTE—Thanks for passing along your great deal. Other units can do the same.



TM TALE



Trying to install electronic gear on a vehicle without the right instructions could lead to shortcircuiting—maybe even shortcircuiting—wrecked.

And it does happen that installation instructions get lost, misplaced, chewed up, and sometimes never show up in the installation kit in the first place.

So then what? A check. Since these installation instructions are technically identified as TM's, they've lived in *DM 11-6-7500*, "Books, Maps and Other Publications" dated 18 April 58. Page after page of 'em. Take one if necessary:

"INSTRUCTIONS FOR INSTALLATION OF RADIO SETS AMAGNC

5 to 8, AM/VBC-1 to 3, AM/VBC-7 to 10 and VBC-16 to 18 on TRUCK, 14, TON and UTILITY, and on MCMAL." This job goes under *DM 7630-011-0007*, and is listed in the *DM* by that title under index No. 1304.

Unlike most TM's, though, these instructions are nothing more than a collection of drawings and explanations—coupled together showing how to install the particular equipment on a particular vehicle.

If your unit is harder for some instructions, you might get your support unit to check *DM 11-6-7500* for the one you need.



JOE'S DOPE

The Same Old Story

WELL, ABOUT THE CUSTOMER
LIST OF REPAIRS... I'LL
NEVER GET THEM DONE...
WHY WE ALWAYS GET EVERY
AVAILABLE MAN ON
PROPERTY WORK!



BUT... LOOK AT
YOUR COMBAT
EQUIPMENT... SUCH AS
PRETTY ON THE BUTT...
BUT ONE NOW ROLL
AND FIGHT AT THE
BALLOON SHOULD GO
UP TOMORROW!

ANYWAY
NOT... BUT
WORTH THE
SWEAT??



WE'LL GET
ALL NEW
STUFF
AT THE
PORT!

OH MAN!

I HAVE 3 LEADS
THAT ONE BEFORE!





**YOU'RE not the first soldier
to have doped the deal
this way...**

HOME OF THE
ELEPHANT CORPS
TO THE ORDER

YOU CAN TELL HANIBAL
FOR ONE THAT WE GOT
MORE IMPORTANT THINGS
TO DO THAN MARCHING ELEPHANTS
...BEHIND, WHEN THE BOMB
SOUNDS, WE'LL BE COOLED
ALL NEW DEATHS!

BUT...when the order came...



Joe's

Dope Sheet

If the balloon should go up today,
Are you ready to get under way?
Is your gear sharp or shot?
Can you use what you got?
It may be all you'll have...who can say?

WE HAVE THE WORLD'S BEST EQUIPMENT ...*Take care of it*

for every LAZY soldier there's
always plenty of grapevine
information to lean upon!!



AND...there's always one outfit that
never makes it...





BUT...the enemy didn't wait to be attacked





QUESTION AND ANSWER DEPARTMENT

TWO TANKS = ONE PLUG



Dear Staff-Read,

M1A1 and the M48 tanks share AV-1790 series engines, but the TM's for the two tanks call for different spark plug gaps.

How come?

SFC L. G.

Dear SFC L. G.,

There is an old Army rule that can save you a lot of sweat: "When in doubt, follow the latest order."

TM 9-7812 was accurate when it was written, but TM 9-2110-200-12 is more current, so that is your guide.

When TM 9-7812 was published (30 Aug 44) the correct gap setting for the plug then in the system was .011-.014. The correct gap setting for plugs in the AV-1790 series engines is now .017-.020, like TM 9-2110-200-12 (The 981 says: The spark plug now in the system for AV-1790 engines is Oct Part No. 6668712 and goes by the ESN of 2010-211-4714).

Actually, there is only one current setting—.018.



When you set the gap, use only a .018 gage and try to set it right on the money. If your gap is a little tighter (no .017), or a little wider (no .021), the engine will perform OK, but you can leave out your safety factor.

A good workman likes to get things right, and .018 is the right setting.

Staff-Read



THE RIGHT BUSHING

Dear Half-Mast,

Here in Korea, the going gets so rough sometimes you'll wonder your front end going to fall out. Fast is, our M101's and M113's get shook up so bad the front spring frame buckling gets jarred loose.

When this goes, there's virtually no control over the vehicle's steering.

A check of the JRP's didn't help. 'Cause we couldn't find the bushing we needed to replace the one that got bumped up.

What to do??

CWO G. F. C.

Dear CWO G. F. C.,

The bushing you need is shown on page 55, TM 9-4528-109-10F (aka 976, 176 Bushings Bushings, Overriding bushings), ESN 1426-109-0738.

What shows you off the wear was the non-springing.

When this bushing is failing—whichever way you like to think of it—needs to be replaced, inside the wheel and drive out the old bushing with a scraper. Then install a new bushing with the same concern. Your support can give you the information and answers. TM 9-4528-109-10F tells on page 176 how it's done.

Put that 14-16 in. wide around the bushing on the lower side of the frame. Let the frame roll and roll become wide as it can to weaken it.



WELD AT THIS POINTS AROUND THE BUSHING



When you buckle up the spring shocker (U-bolts) don't forget to put on the nut and washers. The rollers and how the axle get some play and'll help save the bushing from coming out.

You can get the dope on spring shocker in TM 9-4528-109-10F on page 176-178.



START THE PRESSES

[illegible]

The word's what with Del Form (19-22), the historical record for MPE and LPE? The word is it's no longer available through publication channels. Where do we go from here?



www.elsevier.com/locate/jmb

Did Form 1041-B is under review. When you get the revised form, it's OK on locally dependent copies of the 1041-B.



NUMBER OF DAYS

[illegible]

The output I'm with has an *MSL41* 4-man, 4-sided controller clock. The receiving and publication date shows *TAL 9, 2010, 20-19* at the end of the *TAL*. For standard in *D4* Pamphlet 3/10/4 and with my publication system but we can't find that publication found anywhere.

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

1111

POWELL

Here's the story on the TM, Sergio. The one you've been crying to find has been succeeded by TM 9-2336-2344-4. There's also a parts list and you can get it by asking for TM 9-2336-2344-4CF 400-500.

11/11/2019



BALKED MULES



Dear Shell-shock:

You've heard about the horse that stopped because a shoe was thrown because a nail was bent. Well, we've got a pack of *GOAT* Mules that've died, dead because of missing quick-disconnect couplers on the cable controls. It's a thing up with the cars and the animal capabilities, mostly because of arguments about maintenance and our support unit's competency about which tool would do it.

SP, P. 2, M.

Dear Sergeant P. L. M.,

I looked into this whole deal, and I can really see why you're having trouble. Here's the way as good as I can make it out:

There are three different sizes of these couplers, and four places on the Mule.

The smallest is used on the chevron control cable, TM 9-5506-21 5-SEP 126 Apr 69; cable this a high-maintenance organizational maintenance item, and time is as CONNECT, QUICK DISCONNECT; chevron control cable, FM 2100-605-1704, Book is the old approved TM 9-6004-20P 15-Aug 171 it was called CONNECTOR, chevron control cable. You get it from Ordnance. You may have a hard time making anything before this, this, because you can't find it listed neither do I 11-1 or 20 7-1 notes. But, Ordnance is in, and you're needed to it.



The middle one of the three sizes is used on the back end of the steering cable. It's called COUPLING, WIRE ROPE, QUICK DISCONNECT; size 1.4 in. lg of body, FM 4004-604-644, You're really in trouble here because the CONNECT -20P and -20P both fit in for it. The fact that it was in the old TM 9-6004-20P on page 8 of Quick Disconnect, Steady Cable, might help you out. You get this one from the Transportation Corps. ... it's 200 10-0-6000 C for 601 For 1 Alphabetical List, page 12, Index Number 8908.



The largest of these quick-disconnects is used in two places on the Mule: on the clutch and brake cables. But you'll only find it listed as a high-maintenance organizational maintenance item for one application in the current -20P. It's shown there as COUPLING, WIRE ROPE, QUICK DISCONNECT; service brake, FM 4004-604-644. You may have trouble, too, because your Ordnance support boys here it listed in their -20P as a quick-disconnect for the brake cable for organizational level on page 11 and again, but as a quick-disconnect, on page 26 in a field maintenance item. You get this one from the Transportation Corps. They list it in 50 15-1-6000 Part 1 Alphabetical List, page 73, Index Number 8700 as FM 4004-604-644 COUPLING, WIRE ROPE, QUICK DISCONNECT; clutch control cable, 1.80 in. lg of body.

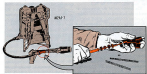


I hope this helps you.

Some people have suggested shilling small holes in these quick-disconnects so you can bolt 'em with a screw pin -60 steel type 'em. One may not of us experiencing difficulties in making one in the time you're got-of you are.

Half-Mule

CHEVRONS ON RIGHT...?



In the PG gun on your M4A-1 portable flame thrower there are chevron packings in the barrel-and-linker body assembly that you've gotta put together right . . . so they'll fit into each other with the opening in the front . . . not backing each other. And the chevroned surface of the packing always faces to the rear.



If you ever put 'em in wrong, they'll work against each other, and you'll be in for trouble. The packings will expand and won't let the needle valve work right . . . it'll get locked in the retracted position. With the needle valve out of operation you'll not be able to fire a second blast . . . you'll lose all

your fuel and pressure.

Change 1 to TM 3-2040-204-10 shows you how to do this thing right. The new path also gives you step-by-step info on how to take apart the gun's valve section and the barrel-and-linker body assembly. Also, how to put them back together.



Brushes are lifeline items in electrical equipment. Working around the clock, they have to hang in there and ride hard on slip rings and commutators that're spinning at a fantastic clip.



Without that solid, smooth brush contact, your equipment wouldn't pull all the power from a piggyback.

This is why you need inspection, cleaning, adjusting and replacing of brushes high on the list of Q services for generators, alternators and motors.

In fact you don't even wait for scheduled service whenever sparking, chattering, or weak voltage output warns you there's trouble brewing in the brushes.

Here're some common causes of brush trouble, and how you can keep 'em from disabling your equipment.

WORN BRUSHES NEED REPLACING



Unless the TSM tells you different, you replace brushes worn down to half their original length. Clean the holder and blow out dirt before putting in the new brush. Never use high air pressure for blowing out dirt—25 or 30 PSI is enough.

NEW BRUSHES NEED FITTING



New brushes are fitted to the commutator surface by sanding with a medium grade sandpaper. Place a strip of 60 grade sandpaper under the brush, with the rough side toward the brush. Then put light pressure on top of the brush with one hand, while pulling the sandpaper through in the direction that the commutator or slip ring runs. Keep sanding in the same direction until

ON BRUSHES



the brush has the same wear. Be sure to shave out all dirt and grit.



SPRING TENSION NOT RIGHT

Test all brushes, even those in touch-to-touch pairs, to be sure each spring is tuned to match your TSM requirements. Use a spring scale hook, and a piece of paper placed between the brush and the commutator. Check the tension on the side where the paper can be easily moved, and adjust the tension until it matches the amount required by the TSM.



BRUSHES NEED A SHAVE

Brushes need enough clearance in the holder to "give" as they ride the commutator. When brushes bind, you clean both brush and holder until the brush slides freely.



CRANK "SIDER"

A commutator, or "sider", is formed by brushes riding on the commutator and slip rings. Too "tight" causes sparking and serious wear on the brushes. Scratches in the "sider" indicate loose spots or high spots, which can be leveled off with a cleaning paddle. You cover the cleaning paddle with coarse or 30 sandpaper—cover with coarse paper—and press lightly a few seconds at a time to clean up scratches.



OIL SNAKE

Oil seeps into the brush, hardens it, and causes friction that runs up the car's face "skins." Oil-hardened brushes have to be replaced. Then you clean the oil snout from the commutator or slip ring, with the cleaning paddle, and check wiper bearings for wear, oil, to prevent more trouble with snouts.

HAT SNAPE, HIGH SNAPE, HIGH NOISE

Some small roughness caused by commutator wear can be smoothed out with hand tools. But resurfacing, sandblasting, and regrounding is better done by support shops with machine tools.

COOPER PICKING ON BRUSH RAY

When the brush picks up bits of copper from the commutator, it cuts through the contact "skin." It's eroding the brush with 60 sandpaper, and cleaning the commutator with a cleaning paddle. If copper still builds up on the brush, you have work for the copper shop.



SHORT-WINDED GENERATORS

Where... choke... grip... swoon... crash.

That could be your 12-0/2F Hot-Gas generator (Model GEN-12AC/2FAC) suffering from an air-locked fuel tank. Which leads directly to a collapsed tank, split seams, or a tank swollen out of shape.

The trouble comes from the standard fuel taps fitted with this equipment. The fuel tanks just can't breathe right—more with the fueling valve in the OPEN position. This sets up a vacuum ... choke ... yolk ... grip ... and the fuel tanks-cry (in).



On the other hand, when the tank warms up from the run, um, the fuel and trapped air expand. Since the air can't get out, something has to give—and it's usually the tank. It wants swelling up.

In either case, you've got a rig on sick call.

So, on air on the situation, try this:

Drill a $\frac{1}{8}$ -in hole in the filler cap from the bottom. You don't drill all the way through the top or much of the cap—just through the lower part.

Then, when 'er up, let 'er run... and let 'er breathe.

NO WOES WITH NEW HOSE



Like the men said when they released him from the operating room: "Well, it won't be long now."

And it won't be long before your hose woes are over with your minute rapping compressor.

Soon's your present stock of rubber-lined high pressure air hose is used up, you can get a new, improved hose. It'll dry down in the right dew point in much less time, it'll last longer, and it's rated as handy up to 6,000 PSI.

Here's what you want from Acme Supply, RSM 4118-767-1655.

With Elvex and Fox, you'll also need one Adapter, RSV 4758-522-1158 (not needed on Fox 8840C2-202 and 8840C3-202), or Clark Ross, Model 1805-4C and 1805-5C).

With Rite, you'll need two Adapters, RSV 4758-122-1158.

And to connect two lengths of the new 25-ft hose, you'll need an Adapter, RSV 4758-125-1158.

Your support unit will replace the one all about from

**WE POWER BATHING TUBS
IN STAINLESS STEEL
COPPER, AND**

HOLD IT... MISSILE-MANI



Be sure to fill the cylinder of your RSC compressed air breathing apparatus according to the info in para 21, Change 2 (1 Sept 59) on TM 5-14B-15.

That is, use a Rite compressor (Model XM 166), or Jay compressors (Model 1441 or 11 8845-405-11 47M 5-1488, TM 5-1411, TM 5-4210-205-104). If you don't have any of these, get local purchase compressed air which is put up especially for breathing apparatus.



For sure, keep the RSC cylinder away from the Emery 8PG-15, 1448-PSI compressor.



And, remember the RSC carbon monoxide detector kit tests air for carbon monoxide contamination only.

UNDER-COVER OPERATION



On your **SEC TEAM** and **TECH** team, there's one undercover job that can let a full-size pump every 10 operating hours. That is, unless you can fit down on a concrete deal with a well-placed drill hole.

This undercover job is pulling the drain plug under the engine clutch, or reading on **SD 1-1010-200-20-2** (20 Feb 65). If you don't drain the clutch housing like it says, you're asking for trouble.



CHARLES JOHN CRIVEN

The full-size pump comes from taking off and putting back the concrete guard extension every time you have to work under your rig to pull the clutch drain plug.

Now here's how you can save time in a two-minute deal.

Here's what you pull the concrete guard extension, which on "C" on the guard on a plastic line below the plug. Then drill that "C" with a 1/8-in hole.

You've got to make these sure on. Every time "C" marks calls for draining the clutch case, it's no reason to open the plug with a 1/8-in drive on, plus 1/8-in extension and.



BELT IT RIGHT!

YMAA
YANBOLA



When a TM gets out something—let your men, but many times in "to-hoo" it's more to mind the message.

Take the 7-0000 to Red playerlock compressor, Princeton.

TM 7-4310-204-11 helps regarding the word about checking drive belt adjustment.

And why is belt tension such a big deal?



1. **Interlocking** the belt and belt 17 17.



2. **Interlocking** drive belt put a link on the crankshaft of the 16. Drive and 16-inch engine that shows the compressor. With a link on the crankshaft, you'll look if it only calls the engine at about 120 PSI. If you're not lucky, the crankshaft will bend and break, taking the main bearing with it on the way.

If there only needs to be a 16-inch adjustment on these 16-inch. And it takes only minutes to learn the best engine running belt and adjust the tension on that it's not too loose or too tight. Make it just enough to keep the belt from slipping on the pulleys.



ARMY AIRCRAFT

LUBE WITH "L" AND "M"

Dear Sgt. Half-Mast,

We've got a snag in TM 1-75-2344-26P (See 68).

On page 141, it lists Lube Oil, Gear, under RSM 2450-234-4130 (MIL-L 2088-A, General P), while the table above in TM 1-75-2344-2 (May 59, WYChgs.) says to use MIL Grade "L" or "M" for turbine gears in our M111Ps.

Primarily, grade "M" is used in the tail rotor gear box and "L" in the central rotor cuffs.

Looks like our -26P's should have two P2P's about don't you think?

One more thing I'd like to know is, how to get the stuff when the -26P's don't show it? Supply says we have to have it listed in the -26P's.

Sgt S. L. W.



Dear Sgt. S. L. W.,

Yep, the -26P's should give with four separate P2P's for the gear oil for your Keros. You'll find the stuff listed in SR 18-3-1, page 28. A further reference don't get you more reading is found there in SR 18-1-2344 (Chgs 201, page 49).

For LUBE OIL, GEARS, aircraft gears, RSM 2450-234-4116 (Q2082) gives you a 1-gal drum; and RSM 2450-234-5417 gives 1-gal can.

RSM 2450-234-4130 gives you a 1-gal can of Grade "M" symbol OQ80, and RSM 2450-240-2117 belongs a 1-pint can of "M" when desired.

"When ordered" the stuff, be sure to include the RSM....make, the type number, the number size, total quantity in applicable unit of measure and other info that'll help identify the item....where used, etc.

Maybe, if this doesn't get your lube and the -26P's are changed, then, maybe' with.



Half-Mast

NO CRACKS, PLEASE



You say you just pulled a pre-flight on your G or H model Stear (H-150)?

And you did it so well that if it had been fixed it would go down in testing as a classic example of on-the-balance?

Congratulations! But, just one more thing . . .

Take another look at the mounting on the AM/AMA-50 Mounting Assembly. While it's a real close look because there may be a fatigue crack that's mighty easy to miss unless you're looking for it. And while you're at it, check the welded brackets and control cable connector holes.

Some of these mountings have cracked from in-flight vibration . . . and you can bet your black book that some more will crack before they're all replaced.

If even the smallest hair-line shows up, get the mountings replaced. And keep an eagle eye on it all the time. Otherwise your big gas bird may end up with its man in the shop.



NO OIL IN ENGINE

Army aviation types do not immediately rain clouds engines by running down without oil. But some do get nervous about pre-oiling. You get the same effect either way.

Take the \$11,000 Cessna 441B, for example. The rules on pre-oiling are printed in black and white.... just 1-9 page 291 in Ttl 1-114-14-2 (Apr 66). Just as a reminder, though, there're three conditions when pre-oiling is a must:

1. before starting a newly installed engine after an engine change. (Always must be done within two hours after pre-oiling.)
2. after the engine has the 12 hours "break in" time.
3. though it's best allowing the engine's oil level first.

It's not likely a good Cessna mechanic would mess up on the "what" part of this maintenance. Most of the bigger trouble comes from not knowing *all* of the...

The 1-2 pre-oiling procedure seems simple enough to follow, but it *is* easy to get it confused like:

1. fill all oil.
2. take out the main spark plugs.

3. Remove the 1/2 in pipe plug from the pre-oil fitting—left side of oil pump.

4. Remove the magnetic drain plug from the supercharger air housing.
5. Remove the magnetic drain plug from the fuel pump.



Now just hold on a minute and carefully say I believe you got it. There's more to one common pipe plug in this area. Pull the wrong one and the rest of the operation's wasted.

Now you take out the 1/2 in pipe plug from the other pre-oil fitting—in the housing forward of the oil system drain valve. This is the fitting you start with by unscrewing up the pre-oiler hose.



Then equal all the air from the pre-oiler and to run the engine oil (MIL-8082, grade 1000) is heated up between 100° to 175°F (or 30° to 75°C). Also, check the engine gauge that the ignition switch is OFF and the mixture control is in IDLE/CUT OFF.



After all this careful preparation, it'll be a shame to turn on the master by pulling the operation. So, another reminder—crank the engine for no more than the limit spelled out in your aircraft's handbook, with plenty of time for cool-down between starter engagements. Also, if your aircraft has two engines, don't flip back switches to engage the engine and engage separately.

Ready? Pre-oil! Turn the pre-oiler and crank the engine with the master until you get close oil—with no oil bubbles—coming out of the pre-oil connection on the oil pump body. Then disconnect the pre-oiler from the housing down under and get ready to stick it into the oil pump hole operator.

MORE...



Before you do that, though, put the pipe plug back in the distributor housing and safety it. Then expel all the air from the pre-oiler again and recheck the oil level.

With the pre-oiler connected to the oil pump body, pump out as many gallons of oil into the engine and start cranking as soon as the oil-pressure gauge shows a rise. Stop about two or three gallons are in the engine. Pull out the pre-oiler, then put back and safety the return pipe plug and both magnetic drain plugs. Replace the rear spark plugs and you're finished.

This —if procedure, along with the first creation seen noted in, is the

only way to be sure you install your E1820-814 in any other engine the right way. Ignoring the book is a sure way to encourage engine failures that lose you time instead of saving it. The know-it-all-by-heart mechanic is a bird's nest away.



SWITCH YOUR TRANSFORMER

Your Mitchell Runway T11 100W Light Co. FSN 6130-011-0717, shows you all the light you need to keep your aircraft on the beam.

However, the 100-watt runway lighting transformer in this set gives off enough voltage to put a guy into the middle of next week. The open circuit voltage on the secondary goes as high as 1000 volts.

No need for you and the other guys in your outfit to fly with a wooden



crucifix when you can get a standard 100-watt transformer that's been checked out for safe operation to take the place of the present one. At the same time, you'll also need a new lamp in the glimmer-light to go along with the new transformer.

Show your requisition for the 100-watt G-574-0 lamp-transformer through regular general engineer supply channels. It has been set up under FSN 6130-011-0148.

You'll have to get the newly designed lamp through local purchase under FSN 6130-011-0211, Part No. 1164401, G-5A/T1115P.



KEEP IT UNDER A SECOND



Dear Half-Mack,

We are a little puzzled concerning the amount of time an aircraft can be flown over the scheduled periodic inspection time. TB AFM 5, page 7, says "These inspection intervals should never be exceeded." Which seems clear enough.

But some people say the aircraft can be flown 10 percent over. Some say 15 percent over only if the aircraft is on a flight when the PE comes due. Could you please give us the word?

Also, how much leeway does the aviation or maintenance officer have to authorize periodic inspections to be pulled early or late? If not specific regulations cover this?

Dear August C.C.D.,

You've almost answered the question yourself, August. Just as the TB puts it: "These inspection intervals should never be exceeded." There's no such deal as a 10 percent over—under any circumstances. Operation type shouldn't put you in a bind with your inspection by scheduling a mission that'll put an aircraft over its next PE.

The only—repeat only—exception is an order to evacuate all flying aircraft due to an alert or incursion. That 10 percent figure somebody found in the rule books could come from only one place—TB AFM 13-10. It allows a 10 percent extension on aircraft components, not PEs.

Then come para 7 on page 9 of TB AFM 5 also makes it pretty clear that

aviation and maintenance officers can authorize pulling periodic early only. It says they can increase the frequency but can't exceed the intervals, August.

The reason behind this attitude is simple enough. Instead of the proverb about "give a man an inch and he'll take a mile," substitute "give a man an hour over and he'll take 10 or 20". In other words, if the inspection let you, you'd be tempted to destroy the safety factor which the manufacturer built into his aircraft. That's why TB AFM 5 says these intervals are the maximum recommended by the manufacturer.

In a good rule of thumb is—if you think it's absolutely necessary to stretch a PE, keep it under a second!

LOANED, LOST OR MOONLIGHTED



No matter how you say it—"loaned", "lost", or just plain "moonlighted"—fire extinguishers have a habit of disappearing from Army aircraft. The result during emergencies is self-evident.

A recent case in point involved a Sioux (H-130) which hit the ground, rolled over and started leaking gasoline. Pilot and passengers escaped without injury.

Seconds later the leaking fuel was ignited by a gas fire caused by the engine exhaust. When the pilot reached for the fire extinguisher, guess what?

It wasn't there. The Sioux just kept on smoking.

Now everybody knows a fire guard can't possibly follow every landing during field operations. Given that caveat by choppers during normal landings, due to full gross wt., pilots run the need for that extinguisher to be in his/her car at all times.

Your boss has no say "pre-flight" or "tidy" is to check and see that the extinguisher is in its place.



You might also check for dead when items of safety equipment that sometimes gets misplaced—the first aid kit.



When ordering your replacement fire extinguisher listed in the 100 manual you may not find the latest F29. The type A-28 is being replaced by the CE 342 Fire Extinguisher, FSN 4310-115-6803. This is a new mono-hydrant-air-flow-mechanism extinguisher, based by the Corps of Engineers and is the one you should order.

A new extinguisher costs a lot less than a new pilot. Hang on to one, and it'll help you keep the other.

THE M-1937 FIELD RANGE



Napoleon (or was it Josephine?) said no army marches on its stomach. Maybe so. Anyway, there's no monoopole like an M-1937 field range on the list. Least the whole world with an empty feeling.

But there's a sure-fire recipe for a lifelong success and a sure way. Check your equipment against this list. The major trouble spots—those in **bold type**—are the ones that make your range work or waste it. Get 'em taken care of right off. The others you might fix yourself before they cause trouble.

You gotta get this point clear: Your **importance** was double when he symbolically say, kind of more equipment—the health of the equipment and the health of the character. Each of characters (junior class, that is) and safety (like, sharp edges, etc.) are worth major gigs every day.

TOOLS & ACCESSORIES

TOOLS & ACCESSORIES — Your parts, tools, wiring, brakes, baby, called **wire** **tool**. (Regular wiring does not count.)

Don't get excited the right tool... the ones that come with your range. Flare, fire, and, are more or less of collecting tool. Don't they'll stop up the best things.



CONNECTIONS—Grained, dirty, vapor tubes plugged. Throttle cracked, loose. Submarine line tight, too loose, threaded.

If the generator's OK, you'll find two spots where under-the-hood "leak" of air, pushed the burner out all the way out and remove the spacers from the rear. But don't forget to replace the spacers on the air side of the run. **THE FUEL VALVE** will quit for you. Another thing: before you use engine generator, make sure the vapor tubes are clean.

THE FIRE UNIT

FUEL VALVE ASSEMBLY—Steam and packing glands loose, worn, set wrong. Throttle worn, flat, bent.

STEAMER HEAD AND ASSEMBLY—Steam is right on mixing blade for the burner, work tappet bracket, but not both need help. Burner arm clipped with carbon at dist. badly rusted.

Always use a valve brush and not cleaner to do a good job.

STEAM VALVE ASSEMBLY—Valve stem and packing glands loose, worn, set wrong. Throttle worn, flat, bent.

FUEL TANK FILLER CAP—Loose, cracked, plug missing. (Never use it, will be the burner's going to take all water for it.)

STEERING CHAIRS—CRACKS, cracked, too low. Tube doesn't fit right in bottom cap.

FIRE EXTINGUISHER—Bad broken, needs compressed, never used. Wrong type, other equipment needed, get a 2-1/2 lb. **CO2** type, and repair/brush it. **PSY 210** CO-2-100-100-1.

NO TURE VALVE ASSEMBLY—Fuel valve and packing glands loose, worn, set wrong. Throttle worn, bent.

One thing about the steam valve stem and the fuel valve stem—they may look the same, but they're not interchangeable. So make it don't get 'em mixed up for that matter, but that wouldn't get the right look on the right side.

FUEL VALVE ASSEMBLY—Steam, broken, won't work right. Valve stem and pack big glands loose, set wrong, need jet dirty, suggest try valve work, flat, bent.



FUEL VALVE ASSEMBLY—Steam, cracked, valve stem and packing glands loose, set wrong, fuel jet dirty, plugged, threads worn, flat, bent.

STEAM VALVE ASSEMBLY—Steam, cracked, dirty, bent, won't work.

AIR SHUTTER—Loose set on M 111 tight against the panel. Handle bent, broken, spring loose, doesn't work.



AIR PUMP—Fittings loose, dirty, pointer not wiring in bright light from cracked, missing, not wiring, clamp in.



FIRE UNIT FRAME—Bent, bent, cracked.

BURNER CONSOLE AND—Fuel, clean.

AIR OUTLET—Bent, dirty, loose.

FUELING—Bent, cracked, cannot turn loose, dirty.

Keep these! Don't get the one that hold the others in the main one. (Things are right, and especially the connection that holds the generator valve. Don't wind up changing the valve and threads a cracking the tubing, don't use the tube. If you'll bend the hot vapor tube and get the generator on the tank.

AIR TANK—Should dirty, loose. Last, bent, dirty, bent.

There's a good reason for keeping these things up in a public place. All your operating instructions are printed on them. And you make them there in structure everything before you light up the engine.

FIRE TANK—Control, dirty, loose. Should dirty.

THE CABINET

CRACKING APPEARANCE—Keep dirty, broken wheels, dents, ruts, badly pulled down or missing rivets, screws, nut and nut standing level, not firmly anchored in it, rivets.

CABINET RAILS—Loose, bent, bent into kinks, sharp edges, badly rusted, worn.

BOARDS (Top, Front, Free Unit) — Bales, 1/4 inch or bigger, dents, bumps, frames and other bent, badly rusted, sharp edges, very dirty.

CRACKS—Missing, loose, badly rusted.

LIFTING HANDLE—Loose, bent, rivets missing, gross.

WHEELS—Missing, broken, bent.

WHEELS—Cracked, very rusty, worn, not work.

DOOR STAY—Loose, bent, badly rusted.

UTENSILS & ACCESSORIES

DOUBLE CHECK THE STUFF YOU HAVE AGAINST WHAT YOU NEED'S HERE ACCORDING TO THE 1944-45 JULY 30 AND THE 1945-46 FEB 1946 FOR ONLY ONE.

RANGE OVEN—Components missing, bent, broken. Pots and pans dirty, rusted, pitted, Cook pot cracks, rusted, badly rusted.



DOGS W' BROS

That's for sure. You just can't afford any leaks in your tank. Keep looking for 'em all the time. Here's a good way to check:

1. Check the air pressure gauge in the air pump and pump the pressure up to at least 10 pounds. The gauge should show that the inflator goes up with each stroke and that the pressure holds for at least 1 minute.
2. Put soap with around all valves and connections, if holding pressure on any gauge, you know where the leaks are.





Take Note — You gotta be careful where you use what lube on these ranges. Some parts take graphite, some take general lubricating oil. Your TMI'll run you on this. IFM 8158-312-4175 will get you a 4-oz can of oil and IFM 8058-343-1185 will get you a 1-lb can of molybdenum compound, petroleum and graphite, from Orlinco.

And, hold on, get that used oil sorted

first! First off, it's not a laboratory second, it has got to be that'll run up the next. Some gas for burner and shortening. They've had food-food for your range's digestion.

One more thing: when you shut the unit off, never turn any fan the fuel valve in the upper right corner off tight. Leave the air and flame valves partly open. The reason: if you turn the air and flame valves tight while the burner's hot, those valves are gonna "frown" up on you.

PAID IN STORAGE

Y'know, a fuel range is a monstrous thing. Sometimes you use it makes an odd. Sometimes it just stands there.

But, whether you're using it or not, this baby needs care. Matter of fact, the care you give it when it's killing time in the supply room can be life or death to your M. P.C.

Here're a few tips to go along with the dope on storage you'll find in Chapter 2 of TMI 80-78.



Inspect It. Going in and out of storage... and once a week while it's in temporary storage. Inspect every part of it, too. Especially be on the lookout for rust and moisture. (Of course, you know about storing the range itself and the necessary tools separately.)



Clean It. Get rid of dirt, grease, oil and rust from every part and every

component. After you drain the fuel from the tank, use the siphon with stick to make sure it's all gone. Take an 8-10-inch piece of canvas rope and shove one end down to the bottom of the tank, leaving the other end hanging out. This'll speed up evaporation of the remaining fuel.



Preserve It. Stuff the enclosed box the air and fuel tank with preservative oil. Coat threads and flanged connections and fittings and put a thin coating of rust preservative on all tanks and undrained surfaces. Also, use water-repellent, primer-inhibitive tape on the oil gauge face. And don't forget to tie that the fan vapor plug on the generator wire to prevent it.

CONTRIBUTIONS

HIGHPOCKET HAULER

Dear Editor,

As this Nike site, we use the Federal MC 18 crane to haul our Derry RKC-11 air-compressor.

This is a ladder-based hookup, with the Derry derrick strapped up at about a 45-degree angle to the MC 18 plate. With this hookup, it doesn't take much of a bump to knock the beam wild on the Derry tracks—and a short time later up the Derry's front end.



Our support mechanics gave us a hand with this problem by helping us cut down the derrick angle, and hooking up the Derry front end.



First, we took the second pin off the tail end of our Derry and **boltd** from the lower edge of the MC 18 rear bumper. This tie cut down the derrick angle and made the drive.



Then to haul up the Derry front end, we hoisted the trunnion with a section of 3-in angle iron.

The standing side of this 3-in angle iron is drilled to slip over the trunnion shaft behind the nut. The other side of the angle iron is fastened to the frame gun with a pair of 1/4-in holes. This job is done when the hydraulic is pulled for maintenance.

Now, taking in down and away on rough ground—and no short turns—it's no dream to haul our Derry with the MC 18.

Edward W. Hooper
Niagara Falls, N.Y.



TAKE A LITTLE BITE



Dear Editor,

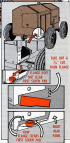
Here's a five-minute fix that makes it much easier to pull the right side panel on the Dewey RFG-11 compressor, when you have to get in there under the control panel.

First, when you pull that right side panel, you have to open the whole right-side housing and slide it forward until it clears the flange on the rear-end panel.

Once you get it off, you just take about a 1/2 in. out of the bottom of the flange on the rear-end panel. That's all you need to clear the first screw pull on the side panel, so you can pull the rear side panel straight out next time you have to remove it.

Saves lots of maintenance time.

Ben Merrill
St. Davids, Miss.



(GUY NOTES—Nice going. It sure makes it easier to pull maintenance.)

Connie Rodd's BRIEFS



Read it?

Has getting F&F OA not getting enough copies? Get in your request to publications support . . . they order an OA Form 12-4. Remember, FS is not issued on a distribution formula . . . only on an "as-needed" basis. Also . . . if you've got extra copies after your FS library is up to date, send the extras to Sgt. Matt Sharp. Immediately after receipt.

Stop . . . look!

If you're doing maintenance on a Quartermaster equipment, you'll be interested in taking a gander at DA 10-124 (2 Sep-80) with Change 1. It gives the scoop on items being phased out of the Army supply system that don't get any more maintenance at all or get only to be maintained by organizational and field maintenance.

Follow close

Get an APM-1 flying helmet? Then you want to get a carrying case for it. Just ask Ben Cook, Flying Helmet and Oxygen Mask . . . FSA 6415743.2801 (24). It's got a slide fastener closure, a pocket and two strap-type handles.

Arrest that spark!

You highballer? A diesel electric locomotive these days? Then look up to a copy of MWD 13.2300.301.2811 (24) 875. It gives you the dope on the fabrication of spark arrestors for most of the models of locomotives.

Paper maintenance

Certain kinds of paper are good for certain kinds of things. Like the moisture-proof paper your dry-pack batteries are shipped in. That paper is a natural for making temporary housing suitable for AM/PMC's or 4-13-71 Handlets. For example. But be sure your support unit replaces them with the standardized stuff as soon as possible.

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

**NEED A
MAINTENANCE
TRAINING
AID?**



See U.S. Pamphlet 100-5 (June 1961) It gives you a list and shows pictures of the graphic training aids you can get from your Training Aids Center.

100

1. **Introduction**
 2. **Background**
 3. **Methodology**
 4. **Results**
 5. **Conclusion**

100