

# PS

## THE PREVENTIVE MAINTENANCE MONTHLY

Issue 19

1954 Series

# BEFORE OPERATION SERV



**1.** CHECK OIL, WATER  
TIRES, BATTERIES,  
LOOSE, GLASS  
LAMP BULBS &  
LUBRICANTS  
CHECK FOR LEAKS  
UNDER TRANS  
IGNITION, COILS &

### LUBRICATION TRUCK, IS-TOP

TRUCK TO CHECK OIL LEVELS  
CHECK TIRE PRESSURE  
CHECK BATTERY CHARGE

Illustration of a truck engine with various parts labeled with letters A through J.



AT THE COST OF ONLY MINUTES A DAY



PEACE  
**WAR**

Admission

PEACE

### WAR—IN PEACE

These members sit, and so it does, more and more of the old tank who did the fighting in World War II and Korea are holding their tongues and leaving the Army.

The training program does its best to give the newcomers some idea of what they may be up against if the shoe goes on the other foot. But it's very hard to get across the fact that equipment must be kept in top condition at all times during the cold peacetime you'll be ready to roll when someone shows the wheels and you have to go into combat.

It is the tankie who entered the nation with a tank he viewed like a baby all in the who comes out alive. The "secondary types" and the guys who target about cars and changing lanes the roads divided again them.

It's all a matter of habit and hours of mind. If you always think of each tank you handle as the best tank you'll ever get, and always try to be just as close to the old girl as you possibly can have, is wrong you won't be likely to find yourself sitting inside a broken-down tankie while the other team sweeps the lanes.



When the situation deteriorates—as the guys who don't think like so call keep thinking you go without lubrication, cleaning and adjustment for a surprisingly long time, and will keep fighting. You can afford to be sure and forget the tank for long enough to fight through the nation in a split split again. Your tank can take more than the other guy's, anyhow.

But, the little tricks that give you trouble when you are safe at home on the training course will tear up your tank just as fast as when the shoe are down. Only breakdowns in battle don't you don't get off with a chewing—why don't get off at all.

No, let's study our tanks and learn to avoid all the little abuses in our driving which can break us down. Runaway at too high a speed, the tankie, will lead a transmission under fire just as fast as it will on the hot Korean driving ranges.

Now, if you'll only remember to treat your present tank right, when you have to fight with one, you'll have a good chance of getting back to make a part of yourself in the PX line-up.

"Now, is that war?"

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1954 Edition

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1947 1/2 Tonne Fuel Battery

1947 1/2 Tonne Fuel Battery

# 24 - VOLT WATERPROOF

There's the wisdom on the new 24-volt 'Waterproof' Electrical Systems you have been crapping on the new vehicles. This is one of a series of articles which will start with basic principles and run through to on-the-vehicle tests and troubleshooting.

## IT'S AMAZING!

Some of the smartest men in the Army work in water pools. For they do, in spite of what the water sergeant says. They're the men who understand the insistent plumbing of a submarine, the same like of a four-cycle engine over the casual behavior of the hydraulic lines.

But when it comes to the electrical system of the truck or tank there comes men who dog down in a mass of superstition, rumor and plain black magic. To avert Electrical trouble develops a host of other vehicles, but some of these same smart men shy off an electrical job like a cat does off the dog-pound.

This is plain foolish, for it's so easy to understand your electrical system as any other part of your vehicle. With the new vehicles of you do it but read engine manuals, either 'OH' manuals, you will understand a job if you understand what goes on inside the battery, what they do for you and how they do it.

Let's hit the high spots, once over lightly, to give you the minimum understanding you should have for unit water pool work. If you want the whole ball of goods, start with TM 71-444 and go from there to bits E-1011A, B, and C, which pretty well cover the subject.



# ELECTRICAL SYSTEMS

## PART 1

WHATEVER YOUR WOE—ONE MISERABLE MORNING IT'LL COME IN WANDY TO—

## KNOW YOUR BATTERY

Perhaps the most abused and discarded part of your whole electrical system is the battery. This is probably because it is misunderstood, even by those who have a pretty good idea of what goes on in their generator and regulator.

To begin with, the name "Storage battery" implies a storehouse for some electricity. This is misleading, for except in special and limited cases, electricity cannot be stored. Any electrical current must be used at the same instant it is generated. There is no way to put it up in a battery until it is needed. On the other hand, as you all know, we apply a charging current to a vehicle battery today, and tomorrow we get current from the same battery tomorrow morning when we want to start our truck. Confused? Read on—

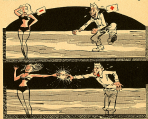


## BATTERY CURRENT

What actually happens is this: While you cannot store electricity, there are some chemical conditions which will produce electricity. In general, two different metals in an acid or an alkali solution will have an electrical-current set up between them. Some other materials (such as carbon) will have the same effect. Naturally, some of these materials will produce a greater flow of current for a longer time than others, but in every case, the production of the current is dependent on actual chemical changes within the cell.

In your flashlight battery or the larger dry cells used in radios, the current is produced by the action of ammonium sulphate on the zinc which forms the cell's outer shell. This zinc is gradually consumed by the chemical action, and as you have no doubt seen, if the battery is left in the flashlight too long, it starts to leak all over the inside of the case.

It would be possible to run a vehicle on this type of dry battery. The trouble would be the size of battery needed and the cost of replacing the zinc elements every few starts, for this type of battery reaction is not reversible; therefore, the battery cannot be recharged.



## STORAGE BATTERY

Fortunately, there is one type of battery reaction that has the advantages of being reversible, and/or the reverse flow unobjectionably common and reasonably cheap materials. This is the lead-acid battery, or the common automotive storage battery.

You've probably seen broken batteries. You may have taken them apart, if only to salvage the lead in them for fishing sinkers. In any case, these batteries are made up of alternate plates of sponge lead and lead peroxide. These plates are separated by thin porous plates, generally made either of wood or (in military and some other heavy-duty batteries) of micro-porous rubber or fiber glass.

A bank of these alternate plates and separators is suspended in a hard rubber case and makes up one cell of the battery. The case is then filled with a mixture of sulphuric acid and water, originally about 29% acid to 60% water (Specific Gravity 1.290 at 68°F.)

Taking the chemistry over slowly, you have negative plates of sponge lead, positive plates of lead peroxide—this is a compound of lead and oxygen—separated by non-conducting but porous separators in a solution of dilute sulphuric acid. All the negative plates are connected to each other, but not to the positive plates; while at the other end of the cell, all the positive plates are connected to each other, but not to the negative plates.



Now, if you connect a voltmeter from the positive terminal of the cell to the negative, it will indicate a potential of roughly two volts. If you connect a two-volt lamp, it will light. Now watch what happens. As the current is drawn from the cell, some of the "sulphate radical" ( $\text{SO}_4$ ) of the sulphuric acid combines with the lead of the lead peroxide in the positive plate, while some more of it combines with the pure lead in the negative plate. At the same time, the oxygen ( $\text{O}_2$ ) from the lead peroxide in the positive plate combines with the free hydrogen ( $\text{H}_2$ ) left in the electrolyte to form water.

As you can see, the action is precisely reversing both the positive and the negative plates into lead sulphate. Now remember that only different metals (or compounds of metals) in a solution will produce current, so when the plates turn into the same metal compound, the current falls off and finally stops.



BY ELMER FINE, ILLUSTRATED AND CAPTIONED BY ALVIN TAYLOR FOR MCM, NEW YORK, N.Y.



Actually, this reaction will not go all the way to completion, since the electrolyte is being diluted all the time by the water made in the reaction. The  $\text{SO}_4$  is also being withdrawn. Also, the lead sulphate forms as crystals that settle on the plates, and finally prevent sulphuric acid from reaching the plates. But when the reaction has gone as far as it will go, the battery is said to be completely discharged. A long slow discharge will get a lot more out of a battery than a fast discharge, which is why your battery will often fire your ignition long after it refuses to crank your engine.



Now if this were a zinc-acid dry-cell flashlight battery, that would be the end of it, and a new battery would have to be put in its place. But this is a reversible reaction, and you can put things back like they were by running a current from some other source (generator or battery charger) back through the battery.

The lead sulphate on both plates is split up by the changing current into lead and "sulphate radical" while water is split up into hydrogen and oxygen. The sulphate radical leaves the plates and combines with the hydrogen to form sulphuric acid. At the same time, the

oxygen combines with the lead of the positive plate to form lead peroxide. Notice that water actually takes part in the chemistry of this battery.

**Note:** This is a simplified explanation of the reaction—for a complete run-down, see battery TM 9-28175.

Since sulphuric acid weighs more than water, the amount of acid in the cell can be measured by taking the specific gravity of the solution with an ordinary battery hydrometer. Notice that as the cell is discharged, the specific gravity falls off for two reasons: Sulphuric acid is being transferred to the plates, and new water is being made. This water is formed at the positive plates, and since it mixes slowly, these plates are most likely to be damaged by freezing after a real heavy discharge. Remember this for later when you are considering maintenance battery care.





## HYDROMETER READINGS

When the battery is charged, the specific gravity rises for two reasons. The reverse of those above: The water is used up, and the sulphuric acid is formed. This acid also mixes slowly, and sometimes the specific gravity of the solution (up at the cell top where your hydrometer gets hold of it) will seem to rise for some time after charging is stopped. Actually, you are not getting any more acid into the solution, you are just waiting while it mixes all around.

Another thing can fool you: If you take a reading while the solution or electrolyte is full of gas (it forms while charging), you will get a false low reading. So take your final readings after the battery has been off charge for an hour or two.

As you know, the 6-volt car batteries have three cells connected in series. The 24-volt military trucks have two 12-volt batteries of six cells each, also in series, to produce

the desired 24 volts. Since all the cells in any one battery are made exactly alike, made at the same time, get their first charge at the factory together, and work together all the time—it follows that they should be in the same condition of charge at all times. Which means that they should have the same specific gravity at all times.

One of the first signs of trouble in a battery is any measurable variation between cells in that battery. Many things can cause variations between cells, but they all mean trouble, whether a short circuit between the plates, a failure of the separator, loss of acid by spilling or overboiling addition of too much water to one cell, or whatever. So whenever your battery shows a variation of more than twenty-five gravity points between cells, get it out of your truck and put in good batteries. You never want to be crawling around with a doubtful battery.

## TEMPERATURE vs. CHARGE

Your hydrometer will also tell you the state-of-charge your battery is in, but there is a pitfall in the dock. You must know the temperature of the battery solution in order to get real useful information from the specific-gravity reading (see chart). When your electrolyte cools down it contracts and becomes denser. Therefore, a cold solution will give a higher reading

than a warm one, although the actual percentage of acid is just the same. But, since the percentage of free acid in the cell is what tells the state-of-charge of the cell, you should allow for the temperature before you can learn much about the state-of-charge.

If you have a way of telling the temperature of your solution, or if you know the temperature of the air in which the battery has been standing for a long time (all night or longer) without being either

## BATTERY CHECKS



DO NOT SUCK  
IN TOO MUCH  
ELECTROLYTE

TAKE READING  
AT EYE LEVEL

### APPROXIMATE STATE-OF-CHARGE

- 1.260-1.280=fully-charged (winter)
- 1.250-1.260=three-fourths-charged
- 1.240-1.250=one-half-charged
- 1.230-1.240=one-quarter-charged
- 1.220-1.230=fairly empty
- 1.210-1.220=completely discharged

# HYDROMETER METHOD



charged or discharged, here's how to correct for temperature:

For every ten degrees below 80°F you subtract 4 gravity points from your reading. For example, a battery of 87°F might read 1.234, a reading which would indicate about half-charged at 80°F. But when you subtract the 30 points (4x3=12) to correct for temperature you find it is actually a 1.260 battery, or barely 1/4-charged.

On the other hand, you add 4 gravity points for every ten degrees above 80°F. On a real hot day in the desert, say 120°F, a bat-

ttery which reads 1.248 (148-18) would actually be at 1.260, or fully charged.

You can see that in field conditions this problem is going to be hard to lick, but you don't really have to lick it. All you need to do, if you don't have a real good way of checking cell temperatures, is to check your reading carefully for radiation between cells. No matter how hot or cold the battery is, if the cells show more than twenty-five hydrometer points difference, get it off your track because trouble is coming.

Dear Alf Host;

I am here at our base



at base  
but after  
ating  
money  
idea

inable  
living -  
about  
a just!!  
of get  
- have  
a boy  
Diana

**JOE H—AND MARY**

Come sleep late, fix or visit  
on Frowning (Mortenson?) then,  
get it done and send it off to PE  
Magazine, Alameda Frowning  
Ground, Maryland. It'll be  
passed along to other guys for  
benefit, but there is on your merits  
of good maintenance.

## BATTERY CHECKS



## VOLTMETER METHOD

Now, to see if your battery is near enough charged to run your truck, get a voltmeter that goes to at least 30 volts and hook it from the positive post of your battery to ground. Leave your switch off, and crank your engine with the starter. If you have at least 18 volts while the starter is cranking, you have enough for ignition. And if the starter turns your engine reasonably fast, you have enough capacity to start.

The joy of this particular test is that you make the temperature work for you. On a real cold day you need a better battery than on a warm day, and on a cold day your

starter takes more out of the battery to crank your cold engine. Therefore, if your battery will crank the engine at about normal cranking speed, and still have 18 volts left for the ignition, it is good enough to start that engine on that day—which is what you wanted to know in the first place.

Of course, the battery which passes this test on the Fourth of July in Georgia may not pass on Christmas in Wisconsin, but for where you are when you're there, if she cranks OK and has 18 volts showing, she is safe to take out on a run. If she won't pass the test, get a good one.

## COLD WEATHER TIPS



Cold weather also cuts down the output of a battery, even when it's in good condition and fully charged. In extreme cold, way below zero, you may find that you can't start, no matter how good your battery is, or it may happen that you can't get a good battery to replace your poor one.

If you have one of the slave kits or other portable heaters, you will, of course, heat the entire engine and the battery before trying to start. But if you have nothing but a heated maintenance tent (or any warm place, no matter what) take your battery inside, and warm it up. Keep the battery a safe distance from stoves or explosives and open fires and avoid heating it too fast. A good rule is not to let the battery get any warmer than will let you comfortably hold it in your bare hands. See TSB One 280 for steps on using slave kit (2840) to heat batteries.

When you get the battery back in the truck she will probably start. However, do not be fooled! If she does start—it will very possibly not start again after the battery gets

cold. So don't kill your engine until you see back again to where you ran without the battery if necessary.

If heating the battery is not enough to start the engine, remember that in trying to start, you have formed new water at the positive plates and so made the battery much more liable to damage by freezing. You'll have to take it out of the truck and back into the warm place until it can be fully charged again. (Normally, in a 24-volt vehicle you give both batteries the same treatment.)

And speaking of the same treatment, never replace one battery out of a pair, change one bolt, and let the battery man who changes 'em test 'em fully and set up matched pairs for use together. If you couple a new battery with an old, believe it that the old one is not going to last long. Even though the batteries only need charging and watering, it must be done by a competent battery man who has a warm place to work, and can make both hydrometer and capacity tests to find out matched pairs of batteries that will work together. 

## ON-VEHICLE CARE

### TOO MUCH WATER IS AS BAD AS TOO STRAIT



There are a few things you can do for your battery during the daily servicing of your vehicle which will keep it in the best of shape and really save you walking back some stormy night.

First of all, keep the top of your battery clean—and this means really clean. Of course, you know enough to keep the water level up in your cells, but remember also that too much water is as bad as too little. If your batteries use more than about one ounce of water per cell in a week, you better talk to the shop electrician about checking your generator regulator setting; might be too tight.

The final decision on what water to use in a battery will depend on what you can get. Distilled water is best, of course. If you don't have it, the cleanest water you can get will do. If you have to use tap

water, let it run until the water which has been standing in the pipe is gone. The fresh water will have less mineral salts in it. Always remember that ANY water is better than NO water.

One other thing, since the heaviest demand for current in your truck, the starting load, goes from the battery through the heavy cables, be sure the cables are clean, tight and free of broken strands. After washing the battery is a fine time to take hold of each cable and test its tightness. And the good time to be crank your engine for 15 seconds with the switch off, and have someone tap hands on the cable ends while you do it. If they are loose or corroded they will get hot under the load.

Keep these ideas in mind and you won't have any trouble with the battery part of your system.

# TANK CARBURETORS ARE INTERCHANGEABLE

## BUT...

STAY  
DOWN



Thoughts play it cool and get the right type carb for your particular truck-wagon, Man. Otherwise, you'll find that Continental engine won't run worth a continental dime.

Some joes get the idea that the carburetors are all interchangeable between all these Continental engines. But that just won't get it.

There are two different types but four different carburetors. From the outside they look a lot alike. But one type (two different carbs) works right on the 400-883-2 engine only; the other type (also two carbs) on the 400-883-4 and all AV-1798 series. Give one of these engines the wrong juice-pot and it'll spit 'n' splutter 'n' drag 'n' fizzle.



You'll find this carburetor on engines fitted with the 400-883-2, 400-883-4 and 400-883-5 engines only.

This carburetor will fit on carburetors fitted with the 400-883-4 and 400-883-5 engines only.

All four carbs carry nameplates which identify them as Model MA-Y5G3 (see figure on page 879). And this might fool ya, if ya didn't look any further. But a closer gander'll show that the nameplate is also stamped with the engine model on which that particular jug should be used. Now, that's the dope that steers ya straight—not just the carb model number.

Also, you oughtta know that there's been a slight change affecting both types of carbs. On earlier engines they both used 1/2" studs for mounting the air-intake elbow. On those coming out now they take 5/16" studs. The chart shows you which is which. (Depends on serial number of your engine.)

Now you're about to ask: if two jugs made for the same engine model—but using different size studs—are interchangeable. Right? Right! They are.

Just make sure the type of jug is right for your particular engine. Of course, you may have to get bigger studs or get Guidance to drill and tap the holes, depending on which carb (stud size, that is) your acquisition brings.

But whenever you need a jug for a tank with a Continental power plant, this chart will pick you up on the right stud number to use. Just check your engine model and serial number and order the carb as indicated. You either get it (if it's available) or see that'll wait.

FOR THESE VEHICLES	441, 442A*, 443, 444, 445, 447-450 C	441B*, 441 (74111), 441A1 (74112), 7491, 7492
WITH ENGINE MODEL	40-875-4 and all 40-1770 Series	400-875-3
*USE CARBURETOR STOCK NO.	0244-701189 (Use 1/2" studs for mounting air-intake elbow. 1770 Series after Engine Serial No. 4948; 40-875-4 after Engine Serial No. 7492)	0224-724883 (Use 1/2" studs for mounting air-intake elbow. See Guidance No. 7492.)
	0263-740109 (Use 5/16" studs for mounting air-intake elbow. 1770 Series after Engine Serial No. 4948; 40-875-4 after Engine Serial No. 7492)	0250-741011 (Use 5/16" studs for mounting air-intake elbow after Engine Serial No. 7492.)

\*When in case none of you read can, have your other eye on FR 624 113 (28 Apr 55) which was speaking in this column on the subject—don't fooler ya. The FR is being revised.

# LITTLE CRAZY MIXED UP CLUTCHES



Check before you try. The bad trucks can be mislabeled. And you yourself can give them the proper treatment that'll make them stop back and do right. The best part of it is you don't get the prescription while lying on your back. Just follow these red-ink reminders and there won't be any chance of your clutch going down the drain.

**1st MWQ**—The grease fitting on the clutch release bearing sleeve must come out (see Fig. 1). In place of this fitting put a 1/2" pipe plug (H186-014-9851) and thereafter keep grease outta this sleeve. Make a note on your LO sheet that this sleeve will get its share of grease at time of rebuild or overhaul. **2nd**—That lets you see.

**3rd**... is release operation—The transmission level. It must be kept as outlined in MWQ Det 6244-74. Now here's where we're going off the leader path a little. That MWQ provides a transmission oil-level indicator—hole so the oil will be at the right level. But remember here is that some people have misinterpreted the MWQ



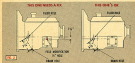
and un-drilling the inspection hole in all their 2-inches.

They've got the wrong impression. The MWQ applies only to the early model trucks which have the transmission filter and inspection hole located above the power-takeoff plate. Before you drill, measure the distance between the center of the drain plug and the center of the filter plug. If it's 6 1/2", then it's a late model truck so which the MWQ does not ap-

ply. But if the measurement is 7 1/2", then do as the MWQ says (Fig. 2).

No matter where the inspection hole is, the right amount of oil in your transmission is 27 pints with PTD and 23 pints without the PTD.

Now for the last of the cues... remove the drain plug from the flywheel housing and keep it in your map compartment. It's to be used for sealing purposes only.



## Comic Radd's "BOSS 'N SHIT DIRT"



### *Are you watering the starter?*

Be careful with the use of water or steam when cleaning your new GMC M115, M111, M115, M117, M121 and M122 trucks.

It's possible for water to enter the flywheel housing thru the vent system and get into the starter. Water getting into the starter not up rust and corrosion which can destroy the starter dash housing and cause the starter drive gear teeth to wear extensively, especially if the truck is idle for any length of time after a good rainstorm.

DeLorean also has added two gaskets to help stop this trouble. They're Flywheel Housing Cover Gasket (Stock No. G7-49-8117563) and Housing Mo-



**HOWLON'T TELL ME YOU'RE GONNA GET OVERHEAT ABOUT WASHING A TRUCK**

tor to Flywheel Housing Cover (Stock No. G7-49-8117564).

They're factory installed on vehicles after 10/11/67. On vehicles before that, they'll be put on in the field.

## *Rattle rattle*

Some 1968-71's are finding their engine head's cross-member banged up by the engine's lifting-ring after the engine's been taken out once or twice.

Lifting the engine can scratch the ring, so it's a good idea to check its clearance every time it's reinstalled. The sides knocking a hole in the cross-member, the ring's close contact with it gives out a terrific rattle.

To save your cross-member and get

that quiet ride, check the engine's and lifting-ring's mount bolts to see that they're in and snug. And check the nuts at the lifting-ring's feet—a broken one could make it tip. If everything's tight and in place, and you're still having trouble, loosen the lifting-ring a little. If that's right, take off and hammer the ring back to its original shape. And when you see that hammer, up rather than swing.

## *Air cleaners... keep clean*

*(Both bottom AND top)*



When operating your M-10 tanks in extremely dusty conditions (Greece, for instance), it'll pay you to check and clean the **tops** of your air cleaners as well as the **interiors**.



Saw a tank at Camp Lewis which had been returned to Columbia for lack of power on the main unit. Oil reservoirs were clean as a whistle, but the air doors up on top of the cleaners were packed with the red dusts dust.

The crew dumped the oil cans and put them back on to catch the dust, which was then scraped and washed off the upper surface. Emptying the dust out of the oil cans and cleaning and refilling them was all it took to return the tank to action. You shouldn't trust the grease the shop officer provided to the crew!



These ideas won't hurt a bit on any tank you may be driving.



## *You, too, can avoid damaged digits*



On your M-10 the radiator cap is doubly latched by some sharp edges of the fan shroud. As you may have already learned the hard way, this can easily lead to finger- or finger-phantom, chest pumps and head injuries.



Once at Berlin Arsenal find an easy way to cover holes and hot breath is to get a piece of old inner tube about 4" x 3" with a 2 1/2" center hole, and fit it over the filter neck, under the cap, in about fifteen



*Connie Sez...*

DUMP YOUR

**M51**

TROUBLES

PERFORMANCE HAS THE ANSWERS!

### *Dump-body hinge-bracket*

Make the following checks often or you might be dumping more than your load, on your M51.

The dump-body hinge bracket is bolted to a strong, longitudinal piece of mild-steel steel placed at the rear and under the dump body (Fig. 1). This longitudinal piece is welded to a crosswise, thrust-plate in front of it.

You've got to keep those bolts tight and keep a check on that weld. It means that when the dump body starts to go up there's a real close check on the hinge and the piece it's attached to. And if the weld starts to crack, it'll crack all the way and maybe shear the bolts.



If the bolts are loose it'll put a strain or strain on the longitudinal piece that'll crack the weld every time.

These checks will cover body, cage and all.

A fit is on the way to reinforce the hinges and strengthen the section that the hinges are attached to. Till then—keep a watchful eye on it.

### *Control valve adjustment*

Can troubles with your M51 dump-crank hydraulic hoist? If so—handle your chassis over to Chalmers to check the hoist's control valve.

That valve is a sensitive little buggie. It has a little ball inside somewhat like a file ball on a pin-ball machine, so if you don't know the ones you'll loose things up but good. Let the experts do the necessary fiddling whenever it comes to the hoist linkage and controls. If they aren't familiar with the adjustment procedure, they can always put their finger on TM 5-1802E, page 15, and get the exact steps.

**JOE  
DOPE**

**SAFETY  
PRECAUTIONS  
FOR TANKS**

WHILE YOU  
ARE PICKING  
UP THE SPECIES  
...LET ME TELL  
YOU HOW TO  
AVOID ANOTHER  
...MISTAKE!



**SET PARKING BRAKE  
BEFORE STARTING**

REMEMBER YOU CAN'T  
START THE ENGINE  
TILL THE TRANSMISSION  
SELECTOR LEVER IS IN  
THE NEUTRAL POSITION.



**DO NOT OVER-DOME ENGINE WHEN STARTING.**

.... NEVER ENGAGE A STARTER FOR PERIODS LONGER THAN 30 SECONDS.



**IF OIL PRESSURE GAGE INDICATES NO OIL PRESSURE, OR IF OIL PRESSURE WARNING LIGHTS FALL TO GO OUT WHEN ENGINE IS OPERATING... STOP ENGINE AT ONCE!**

NEVER MOVE A TANK IN A NARROW PASS OR A CONFINED SPACE WITHOUT A GROUND GUIDE.



**GROUND GUIDES WILL NEVER STAND BETWEEN THE TANK AND A WALL, TREE, BOLLARD, OR ANOTHER TANK. A GUIDE MUST FREQUENTLY BLANCE TO HIS REAR TO AVOID TRIPPING OR STEPPING IN A HOLE....**

WHEN FOLLOWING A GUIDE AT NIGHT, **STOP** IF HIS LIGHT CANNOT NO LONGER BE SEEN....





**W**HEN BEING SHIPPED, NEVER LET THE TANK GET CLOSER THAN TEN YARDS FROM THE BRIDGE, AND USE ONLY FIRST OR REVERSE GEAR.

**D**O NOT MOVE A TANK WITHOUT RECEIVING AN ORDER FROM TANK COMMANDER ... (THE GROUND BEHIND IS THE TANK'S COMMANDER... REGARDLESS OF GEAR.)



## STARTING



## STOPPING



**ALWAYS** WARM UP A VEHICLE PROPERLY BEFORE STARTING TO MOVE OUT...AND COOL IT PROPERLY BEFORE STOPPING THE ENGINE.

**ALWAYS** MOUNT AND DISMOUNT OVER FRONT SLOPE PLATE, SO THE DRIVER CAN SEE YOU NEVER DISMOUNT OVER THE TRACKS.



**K**EEP HIPS BELOW RIM OF THE HATCH OF THE CUPOLA... BE SURE HATCHES ARE LOCKED EITHER OPEN OR CLOSED.

JOE'S

# Dope Sheet

KEEP  
WELL DOWN  
IN THE  
TURRET... AND  
KEEP WATCHES  
LOCKED—  
EITHER OPEN  
OR CLOSED!

**F**or tankmen who live by sheer pluck,  
Here's advice not dependent on luck.  
It's a four letter word  
And one that you've heard.  
Play **SAFE** or you're a dead duck.

YOUR GROUND  
BLADE IS TOP-GUN...  
HE ALWAYS HANDS...  
DON'T OPERATE IN A  
FRANK WITHOUT HIM!

NEVER  
SHOVE  
WITHIN  
50 FEET  
OF YOUR  
TANK!

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

NEVER LEAVE LOOSE TOOLS OR EQUIPMENT IN A TANK.



ALWAYS DRIVE FORWARD THROUGH A WOODS - DON'T PICK UP - AND KEEP YOUR HEAD INSIDE THE HULL.

STAND CLEAR OF A CABLE WHEN IT UNDER STRAIN.



STOP



STOP

ORDER. (WHEN IN DOUBT) STOP.  
COMMANDER. (WHEN IN DOUBT) ORDER DOWN TO STOP.

SHIFT INTO LOW GEAR WHEN YOU START UP OR DOWN HILLS.



NEVER SHIFT INTO NEUTRAL OR CUT OFF IGNITION DOWN HILLS.

BE CAREFUL INTO AND OUT OF HOLES.



ALWAYS COME TO A COMPLETE STOP BEFORE SHIFTING INTO REVERSE.



**S**LOW DOWN WHEN PASSING  
TRUCKS OR OTHER VEHICLES.  
... A BROKEN TRACK CAN  
CAUSE A LOT OF HURD.



**G**ET PERMISSION TO PASS  
IN COLUMN.

**REMEMBER...** YOUR FIXED-GEAR  
EXTRADUSHERS PROTECT THE  
ENGINE COMPARTMENT **ONLY**. DON'T  
GET SLOPPY ABOUT FIRE PRECAUTIONS.



**W**HILE REFUELING, SHUT OFF THE  
ENGINE... AND MAKE SURE A  
CREW MEMBER IS ON THE BACK  
DECK WITH A PORTABLE FIRE  
EXTRADUSHER... AT READY!

**FGMSAPS** DON'T USE GASOLINE  
FOR CLEANING !!!



**I**T'S MURDER TO RUN A TANK  
THROUGH INDIVIDUALS UNLESS THE  
PLACE IS VENTILATED.

**NEVER** SLEEP UNDER A TANK  
... IT MAY MOVE !!!



... PLEASE DON'T  
WAST OUR ABOVE  
PRICE OF ADHESIVE  
TAPE.....

AND, PLEASE ALL, NO  
HORSEPLAY, PLS. IF  
YOU MIGHT GET HURT.....



NOW  
PULL YOUR  
SELF TOGETHER,  
POORHONEY!



BEH!  
CARELESS  
AROUND  
TAPES  
IS SUICIDE,  
POG.

YOU'RE  
TAPING  
ME?



CARE SAVES WEAR ON YOU AND YOUR EQUIPMENT





## IS WITH THE NEW

Dear Half-Mast,

We've got an M47 which uses M4801 joints like a sealed shell bearing, and the larger starter. It looks like it came from production that way. Is there any transition model?

For E. J. Ryan.

Dear For E. J. Ryan,

No, there's no special M38 transition model, and no finish-up either. Those parts you mention were added while the '38's were still coming down the assembly line. The sealed system was first used in one-hundred and two of the vehicles (Serial Nos. 11887 through 11909). Then standard units were used again. But it wasn't until Serial No. 54162 that the sealed shell

took over on all M-cars through the present M38A's. So you'll have some early M38 models that won't have the same features as later models.

*Half-Mast*

## DEPENDS ON THE CHANGES YOU GOT, HA!



## WHITE IS THE COLOR

Dear Half-Mast,

For unable to locate information and authority at this post for painting the inside of a turret on a tank white. Can you give me a clue where to look?

Major L. J. W.



Dear Major L. J. W.,

The basic authority you're looking for is MIL-Y-1127 (General Requirements For Military Specifications For Vehicles, Combat, Self-Propelled and Towed) which is usually for manufacturers and related people.

As for repainting, the basic specifications will apply because all you're doing is bringing the tank up to the same spec. It's like when you break a window. Authority isn't needed to put in a new one—just replace it with a similar type.

When doing a repaint or touchup job, be sure you're using the correct "white" paint. Use only Enamel, synthetic, gloss (TT-4-495), Engineer Stock No. 12-B-4002-198 will get you a quart and 12-B-4012-198 a gallon.

*Half-Mast*

## BUFFING SOLUTION

Dear Half-Mast,

It should be possible to buff the BF11's spare tire from hole (long run by the transfer case's forward U-joint, like TT 2-R124-12 says, is correct. But how about another where the rear U-joint sits in oil? The stuff lands on the spare and is needed to dry the tire surface. Another thing to fit the tire's shape could work it.

Pat J. D. M.

Dear Pat J. D. M.,

Too many buffing can be buffing. The better solution may be to cut out the flanging by using the right amount of grease and wiping off any excess. That way the rear U-joint should keep its life to itself. It's usually the grease-happy guy who gets up the works.

*Half-Mast*



## PAINT ON RUBBER-COVERED CABLES

Dear Mac's Man:

Maybe you can help me. Electric cables on your overalls and other type overalls are made (usually) always on dry wire? normal when a joint job is done on the cables. The overalls get on them and after a time and a few paint jobs, these cables are painted too. It's inspection practice to mark this obligatory but remember and maintain this are always asking me for the identity for it. Is there any witness word that says cables must be free of paint?

WYONG M. A. G.

Dear WYONG M. A. G.:

Might it well stop your search . . . out as we can figure it, there's never been anything published that says you have to keep paint off cables as you get gipped. Just like there was being a witness law that you've gotta pull your windows down when it rains . . . just good common sense. TM 9-2811 does say to mark anything that shouldn't be painted but says nothing specific to the present cables. It's good practice not to let all these paints get on rubber at any time . . . likely to cause it to crack.

## SOME GOOD COVER-UPS FOR NEAT SPRAY-PAINTING



AN OLD OVER TUBE



ORIGINAL SHEET



OR IMPROVED  
MASKING TAPE



BEST IDEA OF ALL ... BE CAREFUL

## USE WHATEVER IS MOST HANDY . . .

So . . . try it anyway you like but it looks as if you're just going to have to keep along without painted wood and working to back it up but just good old-fashioned sense. Some design engineers have

said it's OK to paint if it doesn't bother function. That's all we can tell you but still of course you know how to keep it all.

*Mac's Man*

# DIRECTIVES

## Recheck That Hack, Jack...



Time rolls on...and the '86, '87, '88—and what have you read in. Hard to keep up with? Maybe. But they keep the wheels rolling—which is what gets you here and back.

In PS #13 a lot of class was whipped together as a guide to the best sources of info for getting the most from your rolling stock. Dig out your copy of #13 and take on the following list, and your guide will be up to date.

(And don't forget to check the Perpetual Index of each issue, page 26, to keep yourself on the ball with PS articles.)



### 1988 and 1987, STUFF. 1-then 4 or 4 WHEELS HELP

1988 4-Door 3-Door

1988 4-Door 1-Door

1988 4-Door 3-Door

1988 4-Door

1988 4-Door

1988 4-Door

1988 4-Door

1988 4-Door

1988 4-Door

1988 4-Door

1988 4-Door 3-Door

1988 4-Door 3-Door

The Pressure

The Pressure

Winterize '88

Prep for Winter (See About

24-Valve Perpetual Header

Wasserman Service

Van's Auto Club

Washburn's Motor

Yamaha-Coupling Suspension

Engine Head Headed

800's Car's Assembly

Front-End Oil Tank





www.dodge.com

### MEET Dodge, 4x4 DODGE (CARGO) TRUCK

TR F8001-2

Power Train

TR Cnd 442

Fuel Tank Pressure

TR Cnd 499

Stop Light Switches

TR Cnd 556

24-inch Perennial Washer

TR F8001-3

Battery-pack Insulation

TR F8001-4

Battery Cable Assembly

TR F8001-5

Control Panel Mounting

TR F8001-7

Steering Push Rod

TR F8001-8

Brake Line

TR F8001-9

Radio Mount & Fuel Tank

TR F8001-11

Backbone Support Bracket

TR F8001-7

Handicap Chassis Kit

RWD Cnd D741-W3

Air Cleaner Element



### MEET Dodge, 4x4 DODGE (CARGO) TRUCK (BIG & TUCKER) TRUCK

TR F8111-Long 2

Spring Seats

TR Cnd 3381-Box 12

Minimization of B4

TR Cnd 444-F

Fuel Stop-Set No. 1

TR Cnd 443

Fuel Tank Pressure

TR Cnd 476

Grounding & Post-Valve Air's

TR Cnd 493

Fuel Pressure

TR Cnd 499

Stop Light Switches

TR Cnd 556

Welded Toward Side

TR Cnd 571

Leaf Springs

TR Cnd 590

Battery Filter Caps

TR Cnd 636

24-inch Perennial Washer

TR Cnd 642

Minimize Replacement

TR F801-11

Radio Receiver

TR F801-7

Wash Motor Pin

TR F801-8

Wiper Motor (Control)

TR F801-11

Food Safety Dish

TR F801-12

R/T Motor Mounting Hardware

TR F801-14

Fuel Tank Filter Cap

TR F801-15

Minimize Storage

TR F801-17

Air Filter Support Clamp

TR F-101-25-2

Mounting Bracket Stop Screw

TR F-101-26-2

Front Axle Oil Seal

TR F-1000-10

Handicap Chassis Kit



MWD Cnd 444-478  
 MWD Cnd 474-479 chng 1  
 MWD Cnd 474-479 chng 1  
 MWD Cnd 474-479 chng 2  
 MWD Cnd 474-479  
 MWD Cnd 474-479  
 MWD Cnd 474-479  
 MWD Cnd 474-479  
 MWD Cnd 474-479

Modify Truck Mount  
 Battery Hold-down Frame  
 Brakes Cab Assembly  
 Oil Draining Chock  
 Brake Cam Creation Plate  
 Heater Kit Refurbisher  
 Replace Fuel Filter  
 Cargo Body Straps  
 Brake Shoe Guide Pin



**MODEL 3 Features with CARGO TRUCK (MWC)**

Cnd 4 444-478 Sec 42  
 Cnd 4 444-478 chng 2  
 Cnd 4 444-478 chng 2

15 Cnd 478  
 15 Cnd 478  
 15 Cnd 478  
 15 Cnd 478  
 15 Cnd 478  
 15 Cnd 478

15 P-480-11  
 15 P-480-12  
 15 P-480-13  
 15 P-480-14  
 15 P-480-15  
 15 P-480-16  
 15 P-480-17  
 15 P-480-18  
 15 P-480-19  
 15 P-480-20  
 15 P-480-21  
 15 P-480-22  
 15 P-480-23  
 15 P-480-24  
 15 P-480-25  
 15 P-480-26  
 15 P-480-27

MWD Cnd 474-479  
 MWD Cnd 474-479  
 MWD Cnd 474-479  
 MWD Cnd 474-479  
 MWD Cnd 474-479

**Special Tool Sets**

Two Features  
 Top Light Switches  
 Battery Filter Caps  
 Exhaust Porting Plates  
 Flywheels, Torque Converters  
 Motor Oil Replacement

Current Generator  
 Tie Down S-locks  
 Heater Fuel Mounting  
 Starter Fuel Lines  
 Hood-latch Releaser  
 Taper Specifications  
 Replace Storage Battery  
 Spare Tire Mount  
 Upper Tail Pipe Clutch  
 Grease Lubrication  
 Remount Heater Kit  
 Power Plant Heater Kit  
 Handing Chock Kit

Trans Oil Filter Tube  
 Regulator Valve Spring  
 Wheel Caster Plate  
 Front Clutch, Cover  
 Trans Actuating Lever





### **D63, 6x4, 4-wheeled TRUCK TRACTOR (DIAMOND-T)**

TR Dnd 300

TR Dnd 324

TR P-637-3

6WD Dnd 3744-70

6WD Dnd 3744-74

Welded Forward Ends  
24-inch Reinforced Rectors

Reinforced Front Fenders

Work Baller, Forward  
Oil Level Hole



### **M11, 6x4, 4-wheeled CARGO TRUCK 4x4 (HC)**

### **M11, 6x4, 4-wheeled DUMP TRUCK 4x4 (HC)**

TR Dnd 300-9021

TR Dnd 328

TR Dnd 330

TR P-637-3

TR P-637-3

TR P-2665-10

Welded Forward Ends  
24-inch Reinforced Rectors  
Steering Supplement

Integrate Wing-Door Truck  
Reinforced Front Fenders  
Hand-top Closure Kit

6WD Dnd 3744-70

6WD Dnd 3744-74

6WD Dnd 3744-70

Work Baller, Forward  
Oil Level Hole  
Dump Body Front Mount



### **LIGHT TANK M19, 75mm GDM**

TR Dnd 324

TR P-2650-11

TR P-2650-12

24-inch Reinforced Rectors

Reinforced Hatcher Kit

Power Plant Hatcher Kit



### MEDIUM TRAKE M462, 71mm GUN HO & HO

TB Ord 200

24 volt Personal Heater

TB 4-2885-10

Personal Heater Kit

TB 4-2885-14

Power Heat Heater Kit



### MEDIUM TRAKE M46 & M46A1, 70mm GUN HO&C

TB Ord 491

Control Box Lubrication

TB Ord 492

Magnetic Testing Procedure

TB Ord 493

Brush Clean Lubrication

TB Ord 494

Insulate Box Leaking

TB Ord 500

Trans Oil Pressure Gauge

TB Ord 502

Oil-Pressure Light

TB Ord 510

Trans Control Valve

TB Ord 514

Hydro Bearings

TB Ord 524

24 volt Personal Heater

TB Ord 526

TB 4-738-1

Trans Oil-Pressure Plug

TB 4-738-10

Range Oil Control

MWD Ord 0244-PCP

Replace Fuel Line

MWD Ord 0244-PCB

New Insulate Starfield

MWD Ord 0244-PCP

Oil Cooler Line Clamp

MWD Ord 0244-PCB

Obstruct Shifter Lever

MWD Ord 0244-PCB

New Engine Fuel Shutoff

MWD Ord 0244-PCB

Potential Light

MWD Ord 0244-PCB

New Standard Pin

MWD Ord 0244-PCB

Replace Relief Valve

MWD Ord 0244-PCB

Replace Drive Lever Shaft



### MEDIUM TRAKE M47, 70mm GUN TTYM1

Training Circular No. 33

Fuel Quantity M47

TB Ord 490

Fuel-Output Gauge Unit

TB Ord 491

Control Box Lubrication

TB Ord 494

Brush Clean Lubrication

TB Ord 498

Insulate Box Leaking

TB Ord 500

Trans Oil Pressure Gauge





TR-2nd 818  
TR-2nd 819  
TR-2nd 820  
TR-2nd 821

TR-478A-7  
TR-478A-8  
TR-478B-1

WFO-2nd 01-190P  
WFO-2nd 01-190B  
WFO-2nd 01-190P  
WFO-2nd 0200-10T  
WFO-2nd 0200-10C (Mag. 1)  
WFO-2nd 0200-10C  
WFO-2nd 0200-10T  
WFO-2nd 0200-10B

Low-Altitude Light  
Turret Control Motor  
Hydro Bearings  
Manual Personnel Hoists

Turret Elevation Gear  
Turret Performance Requirements  
Turret Troubleshooting Kit

Reaction Fuel Lines  
New Intake Scoopout  
New Oil Cooler Line Clamp  
Fuel Drive Output Seal  
Reaction Motor Control  
Ballast & Relay Jumper  
Correcting Speedometer  
Fuel Valve Lever Seal



## CIRCULATION DEPARTMENT



Does your unit get enough copies of PM? Would your copies in the Library Mess/Kitchen Repair Squadron like to get it? If you have any questions concerning who gets PM and how many, see the distribution formula printed on page 84T. If your outfit isn't included, check your AG publications officer or section.

They can tell him that the official

circulation representative for PM Magazine is the Adjutant General's Office. There is a definite formula for distribution of PM to nearly all military units through normal channels, and AGI can help you.

For you who still need back issues or that special issue, PM # 14 (on the light tank series), PM's supply you as long as they hold out.

## ARMAMENT & AMMUNITION

**.30 and**

**.50 Caliber**

## SLUG SPITTERS

**YOU CAN'T GET MORE—**

*(They're Doing All They're Capable)*

When you're spraying with your .30 cal. machine gun, it throws out about 30 slugs a second. Pretty fast, eh?

Some hot-heads think it's kind of slow and get the idea she needs a stiffener in the buffer-tube. They think that this stiffening will make 'er kick out more than 300 rounds a minute.

They're wrong, but they try sticking some shims or maybe a peep between the buffer disks in the buffer-tubing.

By doing this, they're taking away the cushion provided for the metal-to-metal contact of the bolt and the buffer-plate. Taking away that cushion is like entering a jeep into a stone wall—no give—plenty of bounce—no jeep.

When the bolt slams back it strikes the buffer-plate. A lot of little fiber cushions called buffer disks are behind the plate.

Some machine guns have 22 buffer disks, some 13 and some 8, plus a spring case, to absorb the shock. These disks have to be in good condition and free of oil.

There's a screw in the buffer tube to adjust the amount of cushioning given by the disks. The set adjustment is not more than one full thread of the screw sticking out of the buffer tube. The screw can't be in the tube any more than that one thread either. The set adjustment is to keep you from packing the disks too tight and ruining their cushioning power.

These disks and their adjustment give you a gun that'll fire as fast as she can and keep on firing.

You wouldn't sell your gun for a penny. Why ruin it with one?

### MAKE THOSE DISKS STICK

Like we were telling you back in PX #13, if you have one of the .30 cal. heavy barrel machine guns that have been modified, you gotta

make sure it has a warning decal—concrete on the receiver top plate. That's to give everybody and his cousin the clue that the correct way to adjust headspace is told in Change 4 to FM 23-63. (These guns were modified under MWD Ord A39-W13 and MWD Ord A38-W1.)



A new decal label is now available through your normal publications supply channels. It is DA Label No. 19 (1 Oct 53). It replaces the label of the same number dated 1 Feb 53. The new label includes the reference to Change 4 to FM 23-63, which is just where you'll find how to adjust the headspace. (You can also see it in PS #33 beginning on page 373.)

There's a catch in the deal, though. Lots of guys made a fool about these other labels. Claimed they couldn't make 'em stick to the receiver top plate.

Well, there's a good chance they did have trouble. Big in a little closer while we tell you the secret.

The reason it won't stick too good is that your receiver top plate probably has been given an oil-slicked phosphate finish. The way

to get around it is simple—clean the surface with solvent and let dry—then apply a coat of thin lacquer to the spot you want. After that, your decal should stick with you like a girl's kid brother.

The one you want is DA Label No. 19 (1 Oct 53). Your authorization for it is DA Circular 133 (9 Nov 52).

### ALL-BEANS PLUGS GET HOT

Spritzer' slugs from your .30 cal. water-cooled machine gun makes not water hot, and the front and rear water-jacket plugs get "hotter-than-the-hinges."

Fiber insulation is placed to these plugs to keep you from getting' hot fingers if you have to take the plugs out.

Sometimes the insulation breaks off. If you can't get a replacement plug (Stock No. A005-4017556), file the plug down and use the all-beans plug.

Have a pair of pliers handy—you'll need 'em. With no insulation, that all-beans plug's gona' to be all-hot hot if you try to take it out with bare fingers.



# CARBINE CURE



When it comes to checking your .30 cal. carbine you've better than a one-armed paper hanger with the job.

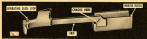
You know that some day it could be your life insurance—no game killing here.

You eagle-eye the operating slide for cracks around the operating-

ears where the inertia block and the arcs come together (Fig. 1). At the same time you check for breaks around the hole for the operating-spring stop.

Peel your eye on the bolt for cracks around the right hand locking lug (Fig. 2).

No stress—you're not the guy to gamble. If these parts are cracked or broken, run 'em into supply for new ones.



# DIRTY HEADS CAUSE TROUBLE



It's all in the head—keep it clean.

After you've used a grenade-launcher, take a look-over for dirt or carbon under the gas-splender lock-screw head of your M1 rifle. That head is a part of a valve in the lock-screw (Fig. 1). It seats itself like the valve in the head of an engine.



Fig. 1—Here's a head that's into a bit of getting muddied to make sure it's clean.

When you stick a grenade-launcher on your rifle, a stud on the launcher opens the valve in the lock-screw. This lets some of the gas escape from the front of the rifle when a grenade is fired.

Part of the gas escapes from the front of the rifle and prevents full recoil of the operating rod and gives you a single-shot weapon for grenade-launching. It also prevents parts slamming back too hard to recoil and damaging them when you launch a grenade. But it does give dirt and carbon a chance to get under the valve-head.

Dirt or carbon under the head (Fig. 2) will distort the head and mask it. That's got a lotta gas pressure in there. Improper seating or cracks will give you a single-shot when you need a semi-automatic rifle.

To get at the head, stick the screw-driver end of your combination tool in the open end of the lock-screw and push against the valve stem. Then give it a going over with your old tooth brush and a little bore cleaner.



Fig. 2—A head head muddied with rifle bore cleaner will never quit from the head.

# ENGINEERS

CALL  
DOZER



## DOZER DO'S

### THE ROCKY ROAD

Dozer drivers who take over big rocks, usually give their blades, and lifts, tracks and rollers an awful walloping. You'd best plow 'em out first. If your dozer can't get 'em out, use a roller or blast powder, and you'll soon have those rocks small enough for the dozer's diggings.

Unless it's bed rock that's stopping you in the form, of course. For that kind of stuff, push a dirt fill over the granite until you've finished raising material over its top.

And here's something else to think about on rocky ground. When you keep your throttle wide open

and blow a cloud of smoke, you cut down your tractor's push power. But if the throttle's cut down, you'll be able to shove more stuff at a time—especially on a rock pile.



## DOWN, BOB, DOWN

The easiest foul-play is getting rid of somebody's handoff the fast way. This can happen should you leave your door with its blade hanging in the air. Then, while one of your buddies is looking under the blade, some smart may decide to hang his coat on the control lever, releasing the blade with a bang. Don't take heart, your buddy could be lucky enough to only get his foot in it. Ooof!

Whenever you leave your door, lower the blade to the ground. A good idea is to rest the blade on a piece of wood or a small stone so that if the ground is rocky and the weather cold, you won't find your blade frozen solid when you get back.

**KEEP MOVEMENT  
UNDER 1 INCH**



**MOVE MORE THAN 1 INCH**



**UNDER 1 INCH**



## ON THE LEVEL

When you level off a field, and raise or lower the blade more than 1" at a time, you'll likely have an uneven surface. Then the uneven wheelbarrow effect will roller-coaster the tractor up and down as it crawls forward, cutting out more and more uneven layers of dirt. Keep this up long enough, and you'll get a field that looks like Josephine's hair-do after she's had a permanent wave. It's wise to keep the blade's up and down movements to less than an inch.

## ANOTHER TIP

Should you try to crack through the top layer of frozen earth with the blade in its regular position, it could feel like you were trying to slice through a brick street. And the blade can't take much of that. It's better to take the easier way to get your cut.

Just lay a smooth log, plank, or railroad tie in front of one of the dozer's tracks the long way, and ride the dozer back and forth over it. This sets the tractor and its blade at an angle so that you'll cut with only the blade's pointed corner and soon tear through the frozen top soil.

Once you've done that, it's easy to break up the surrounding area by turning the tractor and hitting the cut straight-ahead. Bring the blade up under the frozen surface and hold with the dozer bowl.



## THE ROOT OF THINGS

And finally, here's one that'll save your neck as well as your tractor. When you're using a dozer to push over trees, lay off when the tree begins to fall. Otherwise you're liable to find yourself and the tractor 30 ft. off the ground as the tree's roots. To save your all, shift into reverse and move out of reach when the call is—"Timber!"



# AVOID HOT TIMES BY KNOWING ALL THE COLD FACTS



The man who uses "what's on hand," instead of what's called for in repairing refrigerant lines, could make those cold things hot for him—well if he doesn't watch.

It may be easier at times to get a plumber's or automotive mechanic's part instead of one especially designed for the cold line, but it's usually not a good idea to use it. Why? Lead us over and we'll tell you.

Take galvanized or cast iron fittings, for instance. The coating on a galvanized fitting dissolves when it's used in easy Freon. Freon is the most common gas used in cold boxes. And cast iron fittings are almost as leaky as a rusty tin roof—at least when carrying the stuff under pressure.

For Freon, use only copper, brass, or steel fittings. But if you're repairing ammonia, use only steel. Ammonia breaks back out of copper and brass when it's around moisture—a little steam you have plenty of with cooling systems.

Another reason for sticking to special refrigerant fittings is that

they're usually closer machined than the others. Refrigerant gases will seep through smaller cracks easier than will water, oil or most anything else that's piped.

A common goof is in the use of flare nuts. When water gets under the long flank of the kind used for other purposes, it's usually OK. But where you're making cold, that water'll freeze and crush the tubing or crack the nut and you'll lose your gas. The flare nuts issued specially for refrigeration purposes are freezeproof. That's why you need them.

All of which adds up to the fact that special refrigerant fittings give you real cool service, man. Need more to talk?



# CONTRIBUTIONS



## PINNED-DOWN LEVERS

Dear Editor,

The MG's weaker's manual-control-lever and transfer lever sometimes stick or freeze together on their common pin. Then when you move the transfer lever you engage the winch lever. While the safety lever at the winch should hold it, and ought to be locked in before the vehicle is operated, that lever could slip out—or could be somebody locked it up or forgot to lock it. A loose winch can swing, or at least damage the front end.

To be sure the levers work independently of each other, remove cab floor manual and put a  $\frac{1}{2}$  inch  $\text{Ø}$  grease fitting in each lever at the pin (Fig. 1). Use the

two fittings on the lever's right side and fasten them upward so you can grease them



Fig. 1. Use  $\frac{1}{2}$  inch grease fitting on each lever to keep the wheel off the transfer lever's back.

and replace floor control. Getting there after will be accomplished once a year or every 12,000 miles.

**Ernest Fahn**  
**Ronald E. Tipton**  
**APC, Maryland**

*(Old Note—Ordinary support for the tools for this job. Slipping it to them and sending through a CDF are the best way to help the mission. Sometimes, how about using both hands—could one leave when moving the other. And, to protect yourself from a wandering vehicle, double-check the vehicle's safety lever each time before you get in the cab.*

*Another idea you might like even better, that the experts are working on, is to design "HOLD-ON" with a slot on one side, covered to the floor-board, to lock the vehicle in place when it's not in use (Fig. 1). Then when you want to use it, all you gotta do is lift up the design. An added advantage to this set-up is that you won't be able to move the wheel should you push it by mistake when you reach for the transfer lever.)*



## UP-LIFTING IDEA

*Dear Editors,*

We had a bit of trouble with the MIBAN's spare tire carrier breaking on the top, forward weld. With the hoisting around it goes to those hills, it's a wonder the welds last as long as they do. We reinforced it with a heavier and longer lead but found these welds better too.

The gimmick we hit on that's doing the trick is a lower tie-support we got from a WW II jeep that's been in last days. Welded on the 'A's rear cross-member, it works fine (Fig. 2).

**Majr George Ford**  
**APC, San Francisco**

*(Old Note—It seems the up-lift is a small idea but it may be enough getting an old jeep tire support in the field. How about welding a front set of two pieces of scrap metal? The upper just doesn't have to fit the tire's shape exactly as long as it gives it something to sit on. This can be done on approval by the Ordnance officer or a major command, or a field for under AR 17-62.)*



## Conroe Rodd's BRIEFS



### Two Parts Needed

When you requisition the overhauling clutch assembly for the MG1 Run 2 Fly, be sure you order it by this number . . . Q742-807447! This is a new kit complete with lay and washers. This way you don't get a spring assembly from a few yards. Dig out your MH and jot down the new number.

### Exchanged Windshield Bumpers

While poring through the motor pool the other day, I saw a neat trick for the MG1 jeep. Someone had nailed short split sections of old hose onto the head's windshield bumpers. They were painted O/C, of course.

### Dope On Generators

So you've been looking for some dope on those Hubert Generators? Look no more. For the 28-lw 600 cycle, you may now get TM 3-3872, LG 3-3872 and TB 3-3872-1. For the 30-lw 60 cycle, there's TM 3-3879, LG 3-3879 and TB 3-3879-1. See your nearest publication center. You can't tell the players without a program.

### M41 Tank Cables

Just a word to the wise. When replacing the left air cleaner on your M41 Tank, be careful not to join the bottom-air cable between the air cleaner and the clear rod. After checking the cleaner into place, shake the tank cable to be sure it's free. You don't want a cable linked or bound. Some guys seem to think that it's okay to be able to steer the tank, you know.

### Breaking your spiders?

If the transmission-to-transfer U-joint on your 3-ton M41-series has been giving you a bit headache, try the new spider for that location as a cure. 8K, repair, universal joint, QF44-8112612 is what you should be using to shatter the transmission-to-transfer U-joint. The transfer-to-front axle and transfer-to-pillock block U-joints take 8K, repair, U-joint, QF44-7288612.

### Light Trackers Keep Go

M41 sets in T1E1, M41A1 sets in T1E2. This is for all the grids. The T1E is now dead.

# PERPETUAL INDEX

This monthly reference guide is an essential  
feature of the first 100 issues of the magazine

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TECHNICAL  
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BUCKET LAUNCHERS  
100 AND 1001

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# NEW NUMBERS FOR TECHNICAL MANUALS

## HERE'S HOW IT'LL BE:

- The old "100-series" manuals will be even-numbered.  
(For 1st and 2nd echelons)
- The old "1000-series" manuals will be odd-numbered.  
(For higher echelons)

*Just as simple as that.*

On the new manuals you'll see the old number in smaller type just below the new number. Helps you to keep 'em straight.