

PS

THE
PREVENTIVE
MAINTENANCE
MONTHLY

NUMBER 10

NOVEMBER 1952



PREVENTIVE MAINTENANCE . . .

"Success in Preventive Maintenance as in all other military fields springs from the personal interest and enthusiasm of the commander—be that commander a corporal or a general.

"The skilled gunner whose ignorance of standing and labor-order procedures results in an inaccurate or stand-fired gun is of little value to the fighting team.

"Aptitude skills are obtained by experience and training. Proving time must be provided for Preventive Maintenance.

"... Command interest and responsibility, supply procedures and backlogs, availability of spare, specialists and experience—how can we tie all these into a unified Preventive Maintenance team? How can we guarantee the availability of spare parts and tools we require?"

"It says in a simple manner . . . it is 'Command Responsibility and Dependence.' "

Major General L. B. White
Commanding General, 10th Corps

SHARE YOUR

Letter from an unqualified stream engineer to FS as follows: "Your FS Magazine is received at this base, but our headquarters must think it's a comic book or something because it never makes an effort in the 220000 that read it."

Comic Book, indeed! Let us perish that thought aborning. Or in other words, right here and now.

FS is not a comic book. It only looks like one . . . because it's easier to read that way. Besides—the real reason stream missed the last couple issues is because ANAC certainly didn't get through in time.

So here's about 8 Army—what can we doozy owe to the nearest major goal with our already read copies of FS in our hand, and offer that blessed stream a chance to distribute all that wealth around his shop and diving departments.

Good idea? This is what is known as passing the buck.

A COMMAND RESPONSIBILITY



WEALTH



NOVEMBER 1962

IN THIS ISSUE

TRUCK/AUTOMOTIVE

Transportation Filter Caps	412
The New MCM-1	414
How To Load Trucks	416
Prime-Prime Piv	420
M4 Tank Transmission	422
Oil Engine Switches	424
M4 Tanker Electricals	427
Utility Framework	431
Remoney Vehicle	431

ARMAMENT & AMMUNITION

Armament Station	432
Operation Box	433
Container Link Assembly	434

FIELD COOKING

Making Your Meal	435
M44 Relay Team	436
Iron Cook	437

ARMY AIRCRAFT

Card Protection Safety Lock	438
Play-A-Talk	439
Oil Pressure Relief Valve	440

SUPPLY

Scrubbing Parts	440
Oil Spacers	440
Oil Tin Storage	441
Paint Identification Board	441
The Right Equipment	442

DEPARTMENTS

Editorial	36
Command Maintenance	40
Command Report	41
Command Responsibility	42
Our Open Column	43
High Seas	47
Wanda's Wonders	48
Contributions	49
Commander's Brief	50

It is the policy of the Department of Defense to provide equal opportunity for all persons in the military service, without regard to race, color, religion, sex, or national origin. This policy is intended to ensure that all persons are treated equally and that no person is discriminated against on the basis of race, color, religion, sex, or national origin. This policy is intended to ensure that all persons are treated equally and that no person is discriminated against on the basis of race, color, religion, sex, or national origin.

FORGING AT ZERO

Dear Editor,

PS is a great aid to getting the idea of good PM habits over to the average driver. I found, in many cases, that they either didn't know, or never had any chance to find out.

Like a kid in my outfit . . . had frozen brakes and didn't know it. This kid in his Jeep—you'll laugh—made a trip to the forward loading position about twice a day (and it was cold, about -15° during the day). Just to the rear of the position he had to load a stream—not too deep, up a foot or 18 inches. This went on about 5 days before it came to my attention. On the form of a squawk that he hadn't use brakes.

That Jeep was solid ice from the edge of the doorway down. The wheels were solid ice disks. The ice underneath had a little break at the drum in the rear, and at the CV joint in the front. And so help me, he thought it looked small Oh boy! "Ripple disc."

I sat down with him and explained that the brakes got wet and froze. Then, and him out to drive up the road a few hundred yards with his left foot on the brake pedal continuously . . . stop and smoke a cigarette, and then turn around and do the same thing on the way back. He got back safely and seemed to understand he had to warm his brakes on the ice would melt and the springs dry out. I also told him to apply his brakes a little after crossing water in any climate so the brakes would be dry and workable when needed. He never had any more trouble.

The point is, he was a boy from the south who never had been in snow, or severe cold areas in his life. He just didn't know. When a driver reads PS for a while, he begins to watch his own vehicle a bit closer. I know it sounds like a lot of honey but I've seen it work, so kidding.

Bob B. Curran
Barrow

Combat Maintenance Stories

MUD, DIRT AND WATER

Dear Editor,

Found September PS—the first one I've seen since I've been in Korea. We truckmasters could learn a lot from PS and maybe help some others through PS.

Here in Korea mud, dirt and water on the rough washboard roads play hell with every type vehicle. Tighten up body bolts, make a 30-mile run, then when you get back they're all loose again. Bolts! The problem comes—just get on an extra nut, whenever there was time. Check rivets, to lock up what was already there, worked real good.

We need other folks' ideas and suggestions too, so let's keep getting that PS every month. How's about it?

Sgt Frank Archer, Jr.
APO-961, San Francisco



BIDDIN' DOWN YOUR TRAIL SPADES

Dear Editor,

I read with interest M Sgt. C. B. Hobbler's letter from Korea titled, "Both Sides for Trail Spades," in PSM #7. His experience with locating trail spades in rocky and frozen ground has always been an Ordnance officer's reason for getting white hair at an early age. I know. During the "Battle of the Bulge" I had two battalions in my division with all bombards out of action at the same time owing to conditions similar to those in Korea.

The Sergeant recommends "blowing out" to furnish soft footing. Instead of using this method, which no sign could give away to the enemy the position just occupied, we solved the problem by using good old sweat, combined with pick and shovel, to dig trail holes—plus wood from sawed boxes and small trees as flags, to take up the shock from the trail spades. No more breaking of trail spades.

Col Edwin A. Smith
New York Ordnance District



leave filler caps open—hachao-oo, no transmission



There's a story traveling around about people "cutter" up their MHT machines from guards to keep grill covers from breaking transmission fillings.

This is to be frowned on sure's if you'd see someone take the splint off a man's clutch. Is it not the answer to transmission filler cap leakage.

The cap gets clogged by the grill only when forgetfully left open after a check or a fill, and coming away moved as the cap'll flop down out of the way in flying right in the face of human nature.

The same forgetter that leaves the

cap propped up will leave the cap flopped down when the guard's gone.

Then you get real trouble.

With the closed grill holding the open filler, nobody'll give a thought to the fact the transmission's cooling bearing sleeves don't get too hot to pass through the machinery before it gets to the filter if it ever does. And you know what happens next . . . no transmission.

The best thing I can think to tell you for now, instead of cutting away any metal, is to add a small piece. One small hardware blade will do the trick if you'll rig it to the filler neck with a hose clamp like those pictures from Pt. #4 suggested back in September 1971.



Fig. 1: Attach the spring from an 8" piece of hardware blade, heated and bent to a ninety degree angle 1" from the rounded end.



Fig. 2: Clamp blade to fill pipe with a 3-1/2" hose clamp so it's about 1/2" above filler cap when cap is closed position.

come see

the new M38A1

The best 4WD checklist of the assembly line only in July 1981, with the A1 coming hopefully right in its tracks. This latest edition of the Army's favorite part-time is now hitting the road fast—before the doors. With a good idea what the '81 is like, let's compare it with the new arrival.



Many of the older model's parts will fit the new Jeep, and you'll find some of the new parts usable on the old vehicle, but there are enough changes to keep you alert to parts-supply problems. Read on.

When you see your first M38A1, you'll first notice its generally slicker features. The longer, curved front fenders cover a wider tire area to keep mud from being flung into you and your windshield. And if you've travelled the wet road in the straight-fendered '78, you'll love three times faster.

Secondly, the '81 has straight sides with nothing sticking out—no door protruding bars over the gas-tank cap and headlights. The engine hood is slightly rounded with straps underneath for your planet shovel. The axle gets strapped to the right rear-wheel housing. Nothing new to snag you climbing in and out.

Compared to the M38's 133-12/16", the '81 is 138-5/8" long. The tailgate's no longer there. And without the tailgate, there's no problem of its anchor-socket breaking loose.

Come up closer and you'll see both batteries nestled together on top of the cowl. This leaves more wench-swinging room under the hood, and should get you to check both batteries every time. Instead of only the one lying next to the engine. Many a battery on the cowl of the M38 dies an early death because it's left unattended while the other is given kindly care because it's easy to get at. Crossing at the position of one by the position of the other is often a mistake.

ALL NEW WINDSHIELD

The windshield's been changed too. The '81 has a two-paneled windshield, while the '78 has only one



What makes the difference?





time-saving half a glass on every repair job. And while the windshield of the '38 is often removed in combat by unhooking the side hinges, to take it off the new vehicle you bend it forward and slip the hinges apart; this is quicker protection against shattering glass. The windshield can also be tilted forward at the base of the frame and tied down to a metal bracket in the center of the hood. The bracket on top of the windshield lets it rest firmly on the hood instead of the wooden-block seats with rubber padding that kept the M3's window from breaking. In some cases the tie-down strap of the '41 is put on backwards. Set the strap right and belt it tight.

Defroster vents and ducts are built into the new vehicle, all set for the personal heater that goes under the hood on the left side instead of sticking up on top. The windshield wipers now swing from the top of the frame rather than the bottom which keeps them away

from the built-in defroster vents.

DETACHABLE PARTS

The vehicle-hood and radiator-grille have the same type hinge as the windshield so you can slip them out by tilting to about a 45° angle. After the first 5,000 or so M3's, a safety latch was added to the front center of the hood as an extra precaution. Early models are supposed to get modified.

To keep the hood raised with-out taking it off, there's a hook on the windshield's front-top-center that latches to a bracket on the hood. If this doesn't hold, the bracket on the hood is being abused and may need tack welds to keep the hood from slamming down on your head. The M3 doesn't have these difficulties—but neither can you take off the hood, car is there a catch to keep it up.

Like on other newer vehicles, the slave receptacle and primer pump are missing—but are available in kit form as winterization

equipment only. Blazing, too, is the main exception and its cable assembly that can also be repositioned in kit form by those who read these. A circular depression on the cowf's right side will hold the slave receptacle and keep it below the side's surface if you're in mud, etc.

SAFETY FEATURES

Now look around the inside of the cab. You'll notice the map compartment's been enlarged and moved to the left side, handy to the driver. On the right where the compartment used to be, sits a hold-on bar for the "co-pilot" so he can stay put when the ride gets real rough.

The problem of speedometer cables getting tangled, when the M38's instrument cluster is replaced in the panel, is partly over-

come on the 'A1 by the larger and wider space under the cowf. Still, the cable should be guided back through the fire wall to make sure it's not right.

The foot-brake pedal is spaced farther from both the clutch and accelerator pedals on the 'A1 to avoid the close-pedals trouble some men have on the M38, slowing their reactions and catching the soles of their shoes under the brake and clutch pedals' sides.

The hand-brake is moved from the dash to the floor between the front seats and is controlled by direct linkage, while in the older vehicle it's cable controlled.

As part of the bigger and better, the gas tank under the driver's seat holds 17 gallons to the M38's 14 gallons. That the one-inch gap next to the panel in which the tank sits will collect damaging debris



Fig. 1—There's a lot more room in one of those quarters than you'll ever need on off-roadwork. Keep an eye on weight, too, guys.



Fig. 2—Even if you been driving on M38 all day every day you'll be smart to have your reactions to the A1's new levers and pedals.

unless you stuff it with a wrap of rubber or something.

The diameter of the new axled tube is 2-1/2" instead of the 2-1/3" it replaces, giving your engine easier breathing when set for loading. The loading valves are vertical now and should open easier when the handle's pushed in. But like with the horizontal valves of the earlier vehicle, you'd better check, mate, under the hood to be sure the valves stay open while you're a landlubber.

NEW SUSPENSION

Getting down and underneath, look first at the springs. To give

you an easier ride, which you've been longing for, find to match the longer wheel base of the bigger vehicle, the springs have been made longer and are spaced a little farther apart than on the '88. This in turn means more jounce-squirt—the new springs for the wheels and axle house equal in a bigger area under the vehicle.

With the jounce-squirt enlarged, the shock absorbers are longer and have more travel, but the travel is not of restricted and not spungy. Otherwise you'd occasionally fly out on your ear and leave the vehicle driverless. The change in the jounce that set the bell-mech higher above the steering knuckle called for new linkage that will not interchange with the M38.

The steering ratio is increased from 14 to 1 on the M38 to 18 to 1 on the '91. This means less tendency to wander and you'll have to turn the steering wheel more to turn the wheels. A change in front axle steering linkage lets you turn in a smaller space too. The new minimum turning radius is 194" right against the old 20' for right turns, but left radius is still 22'.

There's all this and a lot more in store to help when you on this kamacite before you drive it out of the showroom, but you'll have to wait for PD #11 for the rest... watch for it at your favorite public-relations-supply store.

(This is the first of two
introductory articles.)

ALERT TIMING MARKS



When you look down from the front of your Jeep, you may see marks like the above, like in the list, or none at all. Any that are there will do to do your timing, if you see none at all, the marks are likely hiding under paint or other camouflage. Clean it away the best way you can, but if other all your best efforts, there's no mark to be found, you've nothing left to do but PDG a 1991.

HERE'S
HOW TO

LOAD DRUMS

WITHOUT SPECIAL EQUIPMENT



Wood has been going around that corner of us are treating the back of our trucks pretty rough when loading barrels. Seems that some who are lucky enough to have fancy loading equipment aren't even using it right.

When you load these barrels over the side or over the tailgate, let 'em down easy—some give but when you're rolling them off a platform or ramp—they 'em down.

But there's going to be a time when you'll have to load your barrels in trucks without special equipment. It's created around and found an old bush-bucker's method that can be used for loading barrels without special equipment. Here's how to go about it.

You'll need about 50' of string rope and some rough or milled lumber (1x4's and 4x4's). Before starting to load, tie the ends of the rope securely to the iron pins that support the backboard of the truck. This is the rope you'll use to pull the barrel up the ramp. Be sure to keep the rope inside the ramp so it won't slip off the barrel.

Use the 4x4's over two 12' sections for

the ramp. Make the ramp wide enough so that the outside edges of the timbers are about 8" from the ends of the barrel, and keep the timbers from spreading by nailing on two or three crosspieces. Use the 4x4's or empty beams to build one or two supports for the ramp, depending on the load. It's a good idea to use a short timber between the top of the ramp and the truck to the barrel will roll instead of slip on the truck.

A few words of caution: the reason you don't set your ramp on the tailgate of the truck is a good one. You might fall flat on your face when the gate drops—which has happened.

When you're loading a barrel up the ramp, the men pushing it will prefer to be *outside* the timbers to ease somebody gets tired and lowers the barrel.

A good idea is to start loading them from the front of the truck and work back, to get an even distribution of the load. Lay a crosspiece after each row of barrels and jam 'em tight against the rear of the truck. This'll keep 'em from jerky bouncing all over your side cargo racks, ramp ends, and tailgate.

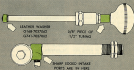
WHY THE PRIMER DOESN'T PUMP

It's a gullotine and not a scissor that's been putting track vehicles (and some of your wheeled vehicles) primer pumps on the blink. The gullotine is the razor-edged intake port (or ports) near the bottom of the pump-cylinder that take a slice out of the leather piston every time the washer passes by, and eventually loose up its sealing action. Thus, much pumping, no gases.

First thing to do is unscrew the collar from the pump cylinder, pull out the plunger and inspect the

leather piston's washer at the end. If its sealing lip is nicked-to-shreds, draw another washer—listed in SML's as "Plunger, hand rod, (leather) 0741-705708 2"; or "Plunger, pump rod, (leather)" or "Cup, primer, plunger stem"; or "Plunger, engine primer", all under Number 0168-7037082.

Now to prevent this new washer from being locked to death, screw off the plunger knob, and on the rod just below the knob threads, solder a 3/8" piece of 1/2" tubing. This will shorten the pump stroke enough to keep the washer away from the sharp-edged fuel ports, but will not affect the fuel supply to the engine w/le your'd notice it. 1/2" tube about two-and-one-half strokes when it took four before.



On pumps like this that are now coming out of production you'll not need the above fix because the ports' sharp edges have been smoothed. . . Thanks to the gentleman who did this gapping on a UBR.

Connie Rodd's "SHORT 'N' SWEET DEPT"



Double-check for water

Confusion is good for the soul—in let me tell you about yesterday. I checked a 240-cc filter for water; removed the rubber cap, took a peek, saw water, and said, "OK."

Friend & co-blogger me said, "Yeah." And proceeded to add water. Two gallons of water! I wanted to die.

The trouble was that I saw just a pool of water trapped in the filter sock. If the filter sock were straight, like on late production models, this wouldn't happen; all the water would drain into the radiator case. But, you'll notice that the filter sock on most the late and Granddaddy 240-cc had it at an angle—down in the case. Which is why the filter sock can hold a little pool of water while the radiator will never gather more.

These radiators ought to be filled while the engine's at normal operating temperatures; they'll hold 20 quarts, and you should see the water trickling out of the

level stick in the filter sock, when you drop the head side panel, which is the way you're supposed to do it anyway (see TM 9007). Just make it a new check. It's no hair peaking—it might get you a cracked head.

Slave receptacle and primer now critical

Couple of years since that the touring transport vehicles have been sold' around us a full time team have been put in the "just-in-case" class. According to recent engineering change orders the slave receptacle, and also the primer pump, and parts, are no longer being installed on production (temporary) vehicles. From now on the items will be furnished by Ordnance, in kit form and mounted only when required. In the holes where they used to be, you'll see flat plugs.

For those vehicles in the field, slave receptacle and primer pumps should say

put-but you'd best keep hands off the pump or your engine will be run ground-up to know what it's doing.

3/4-ton brake lines

How about squaring behind that 3/4-ton Dodge (MPC series) and inspecting the brake line that runs along the rear axle? You'll probably find the attaching screws in the frame-mounted axle-bracket have been bending back out of the brake line. This happens during maximum coil-spring-compression.

Getting the hydraulic lines out from under the hump of the axle-bracket screws will take some of your line, but not much else. Loosen their retaining nuts and temporarily fix the two end hold-down clamps, after you've unclamped the brake line; then clamp the clamps back over the line—and you'll stay out of trouble (Fig. 1). Yes, the line will fit

enough to let you bang the clamp upside-down. Or leave the brake line as is and reverse the direction of the frame-mounted axle-bracket bolts like they are doing on the later MPC.

And, of course, if the lines are already damaged, you don't have to be told to replace them, do you?

Fractured fenders

Welding alone won't stop those cracks that you find creeping up the outside flange of the driver fenders of M11 dump trucks and M10 truck crossovers. So while you've got the truck out you'll do well to put in a brace.

You can be real generous and weld a long piece of flat steel (1/2" thick) to the outside edge of the fenders to give you solid support from fender to cross.

Or just weld short lengths of 3/4" steel bar at all the sharp corners and over



the small nonchoking area at the rear of the loader (Fig. 2). Will the fuel inside the loader just behind the tip, or at the point of fracture.

These lines will eliminate new breaks when your Seasoner starts sweeping over rough roads, and they'll also keep old breaks in check.

In the future, all 1-ton, but (Max Series) tractors will roll out of production with stronger, heavier shafts with complete spring-mounted support instead of the present partial spring, and rigid bush mounting.



Fig. 3.—Cracked shaft-horn loaders can be remedied by retensioning them — this will also tend to decrease further cracking.

Transmission oil splash — hot or cold

Oil still on a background of bright metal leaves plenty of room for guesswork when you take a reading on your M155 Hydraulic transmission oil-level dipstick. But a couple of little holes drilled in the dipstick will pick up a film of oil that lets you see right where it is. Or isn't.

Take your dipstick out of the oil filler tube. Hold it with its flat side up and drill a 3/16" hole close to, entering the drill on the COLD FULL mark (Fig. 4). Repeat the drill by entering the drill on

the HOT FULL mark. All you've got to remember now is that a hole's not just a hole, it's got a purpose.



Fig. 4.—By drilling two holes in dipstick, you make a sure thing of transmission oil-level.

When a fella needs a brake

Just read a report that said a fella stacked up a back because he didn't have brakes when he needed 'em. He had a bad left wheel cylinder inlet connection—and all his brake fluid had leaked out of the system.

Make sure power-hydraulic line connections are right all the time... all the time... all the time....

Air compressor tubing

If the engine-labeled Bendix-Westinghouse air compressor in your new vehicle goes temperamental on you, with stick-slip, unlabeled valves or just an other unlabeled mechanism gone, here's what you can do to ease your back in action.

Remove the air compressor dust cover and give the entire unlabeled mechanism a liberal coat of Oil 30.

Actually, this air compressor isn't misbehaving without cause. A recent field survey of new vehicles in storage, tells me the condition is encouraged when new vehicles are put in storage before

the new engine's new enough action to follow them with its job of sweeping them into the subassembly-rotation parts bin, as the new vehicle waits its turn to hit the road, these parts sit there rotting, and at the mercy of moisture that's chiseled around 'em by the air compressor dust-cover . . . See?

In the future, this air compressor'll get a shot of extra lube in production so it can ward off damaging rust while a vehicle's in storage.

Silicone oil-seal treatment



In case you haven't yet wind-up to the muscle feelings of those silicone oil-seals used in CD-950 transmissions . . . this is to tell you they really don't need extra pampering.

Just lube 'em.

I have talks that some tech people discuss the life span of silicone oil-seals by substituting Diesel oil for special transmission lubricants, then wonder why their tech doesn't stick and stuff as it's supposed to. Here's why:

Diesel oil, kerosene, mineral spirits, and other aromatic lubricants or solvents, are no match for the rubber's of these seals. Contact with the silicone shows weakened items make rubber swell, break, and jam plain go blither and then they can't do the work they're supposed to do.

The same weakening holds when cleaning the seal during a transmission tear-

down—can only Oil it if it, plus keep them clear of all abrasives, because they can only.

So, Pro's-ans, if you see anyone cutting their transmission oil with aromatic solvents for easier starting, or using any other transmission lube than Oil it if it, pass along the good word, will ya?

Less commutation time

About all that can be done when the commutation bus strikes or breaks loose in a generator is to get a new generator. Once they loosen it isn't long before the magnets run out of their bed and give the brushes a rough ride. The probable cause is overheating in that part of the armature circuit.

When a widely fluctuating generator signals trouble and the voltmeter poles in the generator, that sub-assembly should be exchanged and turned in for overhauling.

How the pressure

A lower than optimum is all high-temperature diesel oil August 1941 clean up the dimensions of chains and master chains about the walkways wearing and topping of 2000 1100 x 20 mm. The new specs, based on inputs at average temperatures, call for 70 psi highway pressure and 1/8 to 3/16 in.

Please to see your vehicles to their new figures by tomorrow at the latest.

KEEPIN' M4 TANKS IN THE GREEN

Dear Editor,

After a rough time with blown head gaskets, burned valves, and general failures of the GAA Ford engine in our M4 tanks we came to one conclusion...they've lasted mostly from lugging engine under load, idling for long periods at torque as RPM, and in some cases excessive speed.

In other words, our M4 drivers were not keeping an eye on the tachometer and not using the correct engine speeds when operating their tanks.

We marked their bad habits by painting a colored band 1/4" wide around the tachometer of every M4 tank. The colors of the band correspond with the correct engine speeds and give the driver a quick reference.

Since we've adopted the procedure above, engine failures dropped off almost to none. Since the idea helped us perhaps other M4 tank units may benefit by the system.

M. E. Wharton
Fort Hood, Texas

HOW TO USE THE COLOR-BANDED TACHOMETER.

1000 (100 to 1200-rpm)

This is the idling zone. Although the tachometer goes zero like a 0-30 scale, the engine should be held steady at 1000-rpm (avg. idl.).

800 (0 to 800-rpm)

Lower speeds better than idling during idling RPM's may drop into this zone... get back above 1000-rpm as quickly as possible.



0-30 (0 to 3000-rpm)
LEADING COLORS
0-30. Maximum speed with load (idling).

0-30 (0-3000 to 4000-rpm)
Never operate in the 0-30. Maximum speed without load (idling) may exceed speed.

Half-Mast answers two old,
familiar questions about

OIL, ENGINE

Dear Half-Mast,

Does motor oil wear out? If oil could be kept free of sludge and foreign matter, would it still do the job? Is a gallon of kerosene worth a pound of sand?

PFC F. E. D.

Dear PFC F. E. D.,

In the strictest sense of the word oil does not wear out. Well, it's almost impossible to keep motor oil pure. Once oil gets thick with sludge it's no good as a motor lubricant—no, we say with the usual ease.

Real dirt, engine wear and similar foreign matter that doesn't dissolve in oil, can be filtered out mechanically. But filters can't trap other impurities that do dissolve in motor oil. For example, the acid impurities oil collects from fuel combustion. If you allow them to increase and thicken the oil, you'll soon have corrosion eating away at your metal parts.

Some oil-bleeding systems will remove both solid and soluble particles, but they also rob the oil of valuable additives put in by the manufacturer to get a desired level of engine performance, and to break down the initial qualities of the oil.

Dear Half-Mast,

Water found near or inside engine oil distribution is not 100-ten. Last MAF truck. Engine oil shows a marked grey color after about 200 miles of operation. Is this normal, and suggests slippage in oil collect on metal parts. Does this coloring affect the lubricating qualities of the oil?

N. H. P., OCT

Dear OCT N. H. P.,

Wet-oil distribution is quite common. Probable cause: Condensation (as mixed with the particles of foreign matter that cause the discoloration are held suspended by detergent additives); short runs of the vehicle or slow speed operation in which engine temperatures don't get high enough to evaporate water vapor in the crankcase or a clogged crankcase ventilating system. The crankcase ventilator valve, the line to the valve-chamber cover and the screen inside the cover should be checked. Storage of a vehicle in a damp place (or a stalled engine) results in water condensation and oil metal reaction. A leaky cylinder-head gasket, a bad hole or a crack in the cylinder block or cylinder head might cause discoloration.

The lubricating properties of engine oil aren't affected by discoloration. As long as the cooling system functions in working order and the engine temperature doesn't dip below 140° F., the oil is good for the prescribed limit (normally 7-8,000 miles).

Half-Mast



**OIL LEVEL
ON JOHN
DEERE
TRACTORS**

Dear Mr. H.,

The way to check the transmission and differential oil level on the 80, 94A, 94AHC and 94C High Speed Tractors is a subject of much confusion. The (JD 575) says: "Operate vehicle a short distance then check oil level and add lubricant to bring level to 'half' mark." The questions are: should level be checked two minutes after operation, immediately after or while motor is still running, and if running, should it be at idle speed, 500 rpm or what? Could you also give us the right procedure for checking torque-converter oil level?

These questions are not unrelated—slightly different results are obtained when level is checked under various conditions. How or what oil would cause further differences.

If you could run down the proper procedure it would avoid much confusion and probably save a few transmissions.

E. M. H., OCT

Dear Mr. E. M. H.,

We bundled some of our best heads together to get you these answers:

check daily!

**Oil Level in Transmission
and Differential**

Change every 180 hours. Drain only after operating (while oil is hot), if vehicle has been standing, operate vehicle (see note) for a minimum of five minutes, stop engine and drain. Fill with 24 qts of oil, then check level.

*check
daily!*

Check daily. Check immediately after operation with engine stopped and while oil is at its normal operating temperature. Check must be made within two minutes after stopping engine. If vehicle has been standing, or after refilling, operate vehicle (see note) for a minimum of five minutes to bring oil to normal operating temperature before checking. Add lubricant to bring level to full mark on gauge.

*check
daily!*

*2 min
Convin.*

Oil Level in Torque Converter

Change every 180 hours. Drain after operation (while oil is hot), through the torque converter drain plug and remove draincock. After the system has been completely drained, fill fluid compartment with Oil, Fuel, Diesel—then start and run engine at half-throttle (1500 rpm), engage motor clutch to operate torque converter then add oil until 24 qts are measured. (Over-all capacity is 34-1/2 qts, using less will pre-

*check
hot!*

*check
hot!*

Continued on page 494

JOE DOPE

LARCENY IN SPARE PARTS

It is night . . . the autumnal rains pelt the window of the demolition worker's room . . . Sergeant Daniel O'Kaneville prepares the shipping orders for B Battery . . . They focus on the wings of dawn . . . for a forward pass.





But what he "needed" depleted stock **WASTEFULLY!**



Here's his chance, he thinks, to back for a promotion . . . He begins to "MAINTAIN" like the doctors . . . by clearing.



Only those parts that are ship-
now remain. The rest go.



Nothing escapes his careful scrutiny . . . His major compo-
nent or part thereof is spared
a step.



Naturally his post's require-
ing is very considerable . . .



And so... as the dawn's golden fingers touch the hills... a Battery rolls out of the battalion area... the hum of their motors is morning song on the still air... Let us look (for a fleeting moment) into their supply truck...





Dope Sheet

WHY SERGEANT
OFFICER, ARE YOU LOW
...WHEN WITHOUT
REAL RADIO HE MUST GO ?



WE HAVE THE WORLD'S BEST EC

OF HOUSE PARTS I'M SURE,
CAUSE THE GUY WHO JUST LEFT
IS THAT NOTORIOUS HOOPER NAMED JOE

BOY,
I'LL GO
GET A
COLLECTOR'S
EDITION
OVER THERE.



EQUIPMENT.. *Take care of it*

SHIFTY FOOTWORK



Lots of people are meeting heavy three-shift transmissions for the first time in the cab of a military truck. Progress is wonderful, but even the Synchro-Mesh transmission with steering-column shift-lever and the new automatic transmissions have become standard for pleasure cars, many of us have had no chance to learn the little tricks required to shift a big transmission quietly and effectively.

The old Standards will now take five, while the rest of us talk about what makes a "Dodge and a half" growl at you when you shift low gears.

To be sure we all understand what a transmission does for a truck, let's just for example take a look at the Preventable Road Speeds plate in a GMC's 3-1/2-ton for a minute. We see that with a maximum engine-speed of 3700-rpm, we are allowed 45-mph in seventh but only 6-mph in first.

*Shifting in this article applies in any way to the GMC Hydramatic 4032 type.

Obviously, the gears are so made that a fixed engine-speed will give us a different road-speed in each gear—the other side of this coin is that a fixed road-speed will require different engine-speeds for each gear.

Simple, isn't it? But right there is the secret of good gear-shifting. With a fixed road-speed, each gear calls for a different engine-speed. Let's explore the inside of a transmission and see why.

In the transmission, we find a number of gears, each with a different number of teeth, revolving on shafts. The gear-shaft lever slides first one set of gears and then another into mesh. What we have set the speeds of these gears so that the same number of teeth per second are passing a given point, they will slip together noise and easy. But, if we have less of teeth on one gear trying to go by, while only a few go by on the other, we get a roar of agony from the transmission—called by a roar of agony from the Motor Regiment who has to find a replacement. So we use our throttle and our clutch to synchronize the teeth on the gears before they mesh. On our pleasure cars the Synchro-Mesh thinks for us, but truck transmissions depend on the driver using his organs.

Let's run through the gears now: Starting out, we accelerate our engine and ease our clutch out to take off (generally in second unless we are on a hill or heavy-

loaded). As our speed approaches the posted limit for the gear we are using, we depress the clutch pedal, shift to neutral, engage the clutch briefly with our foot **off** the accelerator, depress the clutch again, shift to the next higher gear, and engage the clutch once more, opening the foot throttle as we do so. The purpose of the "double-clutch" on an up-shift is to use the engine drag to slow down the drive gears in the transmission; therefore, we do **not** hit the gas between shifts. It is possible to up-shift quietly without double-clutching by waiting for the gears to slow down by themselves, but it is slow, and wastes lots of the forward speed of the truck. Doing it the smart way, we go up through the gears, double-clutching, and proceed on our errand.



When we come to an upgrade, particularly if running in over-drive or top gear, we feel our speed fall off and see the speedometer hand fall back. Now we all know it's bad for an engine to lug it down, so as soon as our speed has fallen a little **below** the posted top-speed for the next lower gear, we down-shift to that gear.

Down-shifting is done in the

same manner as up-shifting, with one vital difference: We want to synchronize the gears by **speeding up** the drive-gears in the transmission. Are you ready? We depress our clutch, shift to neutral,



engage the clutch, and then hit the accelerator to bring the engine and drive-gear speed up for a quiet shift. (We've all heard that little burst of exhaust when a good tractor shifts a big track to a hill.) Remember that for the same road-speed, a lower gear rate calls for a higher engine-speed. We then depress the clutch again and finish our down-shift to the next lower gear, releasing our clutch and opening the foot throttle as before to continue up the hill.

On paper, that's all there is to it. On the road, you'll find that practice and lots of it is required to be able to make a smooth, quiet shift every time—up or down—and to make it at the right time to get the most from your track.

A couple of additional hints may help. First, insofar as good safe driving allows, keep the speed on your track. Approach your hills at a good clip, and shift soon enough and often enough to keep your engine turning in the top half of

its speed range. You gotta have RPM's if you want horsepower. Logging down too far in any gear may require extra and unnecessary shifting to still lower gears. Just as soon as Betty falls below the posted tagwood for the next lower gear, get down into it. It is poor driving, and downright embarrassing to have to stop dead in the middle of a hill—dangerous, too.

When you've found the gear that'll take you over the hill, don't be too eager to shift back up. It is better to stick off on your throttle a little—to prevent stalling your engine—and wait till you're over the crest, before shifting, then to shift too soon and have to shift back down again. If you don't revvies rise just right the first try, you can snap your clutch out while still in neutral to give your gears more speed if needed. You can also wait for them to slow down to matching speed, feeling them out by way of the gear-shift lever. Gears is gears.



Let's don't give a mighty horse and have them in—you'll lose your teeth.

When approaching a down-hill, slow down at the top and make a

down-shift *before* entering the grade. Go down two or three gears if heavy loaded. Then you can use your brakes lightly and intermittently, which will get you down to the bottom without using your engine and without overheating your brakes. (You get the familiar feeling, sicklike, if you run out of brakes before you run out of hill.)



A driver who uses such necessary shift of gears as a chance to practice a smooth professional shift will soon find he is darn good, and he won't miss a shift sometimes when it counts heavy. The most common error in double-clutch driving is hitting the gas between the shifts when shifting up. This is a sure sign that the driver doesn't understand why he should use this kind of shift, or what he is trying to do.

When you are given one of the new vehicles, say the M34 2-172-ton Ram, you'll find that it has a Synchro-Shift transmission. However, if you continue to use old-fashioned double-clutch technique, that new transmission will last longer that if you make the heavier speaker rizing-rings do your thinking.



OBSCURE DIRECTIVE

Dear Half-Mast,

Remember back there in the old days they used to go up there and there was a TM that gave adjustments on the 14 days fuel carburetor mixing rod. I'm not including the adjustment was made right along with the carb. rod plug, etc., at 1000 mile check. I've forgotten the rating and can't find it in any publications or hand. What was that old TM?

Also, there was a floor plan in the TM for a 3-1/2-ton dash for setting up a shop with complete wild super-structure (this was about 1941 to 1944).

WFO P. M. D.

Dear WO P. M. D.,

Lots of things happened in "the old army" that has to disappear... among them, obscure directives. Among your 14 days fuel rod is a Willys-Overland or

Ford GPW Jeep, TM 9-803, Feb 44, mentions an RPM spec for carburetor adjustment except for the mixture which should be 100 revolutions (RPM). No other carburetor adjustments are made in the 1000 mile check. When mixture adjustments are needed, the defective carburetor is replaced and the old one sent to a special shop to be rebuilt.

TR 2413-2 and the TR ORD 444 series shows layouts for installing organizational maintenance set #2 in the 3-1/2-ton, dash, 3014 truck. People are using these layouts as a guide and including second editions set #7 (super-structure) and mounting both on the GMC CCKW-353 6-cyl cargo truck. This is new steps for the new equipment. Most things go far back to 1941-1944 are obsolete.

Half-Mast

AFTER-WHEEL LUBING

Dear Half-Nut,

The Fawcett mechanic at every base I've been stationed argues with me about the amount of grease that goes on the flywheel of track-motors (any make or model). I say that a thin film of lubricant on the cable proper, and a heavier coat on the sprocket is all that's needed. Mechanics disagree. Our tracks come back from preventive-maintenance with the flywheels heavily greased fore and aft, abraded and abraded. The few tracks that's backed under low-track gear splashing all over the rear deck—in the air boxes and on the light cables.

Seems to me that the upper flywheel plate on the trailer gets enough grease to make up for any excess (just on the lower plate).

Can you settle this debate?

Sgt E. E. H.

Dear Sgt E. E. H.,

There ain't nothin' to debate, Sarge, you are so right, so right. Tell those mechanics to read my TM—they'll hold 'em.

Half-Nut

MILITARY vs BATTERY

Dear Half-Nut,

When checking the engine oil in our M1Ps, the dipstick contacts the positive battery terminal (Fig. 1). It's not only a fire hazard but it has caused some damned good damage on the felloes doing the checking. We solved the problem by slipping a piece of windshield wiper down the dipstick over the handle.

M. M. P., GCT

Dear Mr. H. E. P.,

You've got an idea, but try this hot idea. As was said in PM 117, page 185, you'll notice a slight crack in the dipstick guide-tube and a locknut where the tube enters the pump housing the locknut and turn the tube so the crack is facing the front of the engine, tightens the locknut. This will insure the dipstick in the other direction and away from your battery (Fig. 2). If you still don't have enough clearance you can bend or arc (any does it) the guide tube toward the front of the engine. Changing the position of the distributor body may be necessary in some cases.

Half-Nut



Position in life is everything—making it the difference in the M1P's dipstick guide-tube.

COMPRESSION TUBE TROUBLE

Dear Half-Nut,

Wife's having a lot of trouble with the M1P compression tube and would appreciate

side it if you'd advise as whether or not you've encountered any difficulty with the device not making good contact (both from the water pump and the air compressor fittings).

Lt Col G. W.

Dear Colonel, Sir,

You're not alone in the trouble you're having with the M4 compressor unit. We've had other worried reports of the bearing nuts cracking, and two reasons have been suggested.

Maybe these nuts are being tightened too much. The fittings on these compressors are a flexibility to reduce the effects of vibration and you don't have to apply excessive torque to get a good seal. When the nuts are tightened too much and are loosened, the nuts will split. Or possibly the ball drive clips have worked loose, bending the tubes upward. Even though the tube passes through the clip, it will require a slight expansion upon vibration.

Half Mast

LOADING YOUR MOTOR

Dear Half-Mast,

I disagree with your OK on PWC (P) 80 like to use, N, P, W of your practice to build up the base contact end of the rotor. Unlike is pretty soft and I don't believe it would take the heat. Coming right down to it, I believe that a hard-of policy would be a better PM procedure.

ASgt L. L. F.

Dear Sgt L. L. F.,

You're right, hands off policy is good PM procedure for motors . . . hands off cleaning them with a file or more (but not used lightly). Rotor

got shortened from misalignment, they don't wear short. But if some minor formed you filed your rotor to a nick, and the lack of a new one you're forced to use a makeshift method to build it up, unlike will do the trick. As for the base, this is a secondary circuit and the best is negligible. So in a pinch, change the roller method, as an expedient, will work.

Half Mast

WHY TWO SCREWDRIVERS

Dear Half-Mast,

I am the acting motor sergeant for the 1st Ambulance Company, 111 Medical Battalion, Wanda, Japan, and I got a lot of helpful letters for my job from PM Magazine. Here's a good 'ol one to pass along.

It seems to me that the General Machinery Tool for is making a very important contribution. The short jump from the 3.10" electrical to the 30" screwdriver screwdriver. I believe use either one of them, but I sure don't know where that's in between these two sizes. Say usually have more of the normal or Phillips-type screwdrivers than a man can use, so I give 'em the Phillips if I've made the mistake, and most needed one in my kit.

Cpl D. M. T.

Dear Cpl D. M. T.,

Please take another tip from PM and leave the whittling to your buddies in the clinic. Being forced to whittle your Phillips 20 to get the size screwdriver you need, makes me wonder if maybe you have an incomplete (or perhaps wrong) mechanic's tool kit.

If the right screwdriver is in the Gen-

and Michael's Test Set (Ded. 4, 1981, J-R, section 4, page 5) don't cover your requirements and you can show need for skilled welders—your CD can explain what you lack. And also, do you know that untrained, unskilled weld can be trained in through supply channels?

Half-Heart

NEW TYPE CHROME FINISH

Dear Half-Heart,

Last month you wrote a guy about getting rust off chrome. Wouldn't it be better to keep it off? And shouldn't it be said there are chrome and chrome? Some chrome are in this case anything will scratch them and you couldn't give a buddy a post—the chrome would strip off the bumper.

A. B. C.

Dear J. B. C.,

You're way right about one thing—chrome ain't what it used to be. The new type chrome finish on administrative vehicles is not only thinner, but is sprayed right over the copper and then protected with a coat of varnish. The chrome's not the glue of the olden days that used to be put on the copper before applying the chrome. If you have the slightest suspicion that most of your vehicles have the new type chrome, don't take any chrome with it. Get yourself a copy of the new TB ORD 444. TB you get the TB, you can follow those new rules for safety—avoid anything even slightly abrasive on the new chrome and keep it waxed with care.

Half-Heart

THE WOUNDS

Dear Half-Heart,

I don't know if anyone else has been having trouble with ORD 7 1981, G-505 (August 74) but I did and I have found out that you'll have to go back to the old G-505 to get what you need.

For instance group 0001, line 4, G-505-714002, another w/grade master key for GCRF 70, also item w/grade/levelled more like a hot water boiler.

Also, in group 1200, line 4, G-505-707002, paint, drain, w/locking key. I later found by using manufacturer's part number from ORD 7 1981, G-505, this item is for the GRC model AFAPX-111.

Could you tell me if there has been something left out by the printer or should I get myself a new pair of glasses?

WCCO C. F. C.

Dear WCCO C. F. C.,

On the first item, line 4 in group 0011 is just as you described it and you should have received G-505-707002, another w/grade master key for GRC GCRF 70. Anything could have happened to cause a physical mix-up. Did you try requisitioning a second time?

As for the second item, perhaps the new glasses would be in order—or at least a few sheets of 16 P 14000 (ORD 1 1981, K-1). You did slip a cog, you did not. Line 4 in group 1200 in the new ORD 7 1981, G-505 (August 1981) is not the broken parts you described at all. You were wanting line 3. So maybe it's just a matter of getting used to the new 1981, and by now you've had time to get better acquainted.

Half-Heart



You Might Be The Next One

To Chase A...

RUNAWAY VEHICLE

For a vehicle whose parking brakes were rightly set, this runaway water tanker did a pretty good job of crawling into those dunes and splashing them all to you know what. Which only goes to show, children, that the handbrake is not a simple safeguard when parking your vehicle. No, the good old reliable handbrake offers at least two possibilities for slipping. At the drum, or at the post-and-axle.

Ask the insurance companies—they pay out plenty of moneys each year because of civilian vehicles peeling without drivers. And almost all the run-arays that witnesses checked promptly either had their handbrakes set, or apparently had had them set before some mechanical failure or accident allowed them to slip off.

But whether gonna do it if you can't trust your handbrake? Here's a little guess for you: when he leaves his truck parked at the **top** of a hill that he won't maybe find it down at the **bottom** of the hill, when he comes back?

Well, for one thing, the driver's manual says not to choose a steep grade for a

parking place unless it's absolutely necessary. But if you have to, and you've braked downhill, turn the wheels toward, but not in direct contact with, the curb (if there is a curb); if the vehicle is braked uphill, turn the front wheels away from the curb, in the **rear** part of the drum wheels is toward the curb, but not in direct contact. Even then, we all know that a steep bump can sometimes outweigh a cramped wheel and start the vehicle on its unhappy way downhill.

The book doesn't recommend leaving a parked vehicle in gear because of the chance of mechanical change in case it's bumped, but it's far wiser to drop it into a low gear after the parking brake is set than to leave it still away while you're gathering rocks to check the wheels.

When there's enough space at the side of the road it may be practicable to park the vehicle at a right angle to the grade. But, of course, not if the grade is steep enough to strain or even overturn the vehicle.

All else failing—you'll just have to sit still, and keep your foot on the brake!

ARMAMENT & AMMUNITION

Faulty Ammo... T No!



999 are MISBLAMED MISFIRES

From the hills and dikes and mounds and valleys—from the cruddy slabs and cruddy pits—in fact from any old place where men miss mortar and mortar misfire comes the little cry of misfiring mortar men: “**Faulty ammunition.**”

But the guys who know and know these started rifle sports report: “Out of a thousand shells that plug into a tube and just sit, 999 of ‘em misfired for other reasons than faulty ammo.”

The best of these “other reasons” is an **unsatisfactory firing pin**. All ammo, good or bad, needs a pinpoint of encouragement before it’ll go anywhere, and a pin that’s not up to the job is either **loosely**, **loosely** **severed** into the base plug or it **backs off**, or worse still it can’t rise above its bushing. A good check for pin failure if you don’t have a gage (or can’t make one like it says in TM 9-1360), is to get a stick with putty or wax on the end (or just a plain soft wood) and press it down on the pin. If it’s good you’ll get a smooth dent, about 1/32” deep (by now you’ve seen enough of these things to re-

quire a satisfactory dent.) A dinky dent or a jagged one means you need a new pin or a pin cleaning.

The big heel of these maintenance boys is mortar tubes that have collected more trash than a hat chest. Dirt, oil and water will crumple up the inside of your tube, and the shell slides too sluggishly to explode even if it does hit the pin. You could even have left-over fuel or primers in the tube.

If you misfire anyway, **Stop**... **Back** (away from the tube)... and **blow** (for at least a minute or more) to make sure that shell isn’t just taking a nosedive. Then grab your favorite FM and follow the directions for removing the shell. This last is an uncomfortable bit of business, and it’s sure the hard way to find out you should’ve checked and serviced regularly.

Course it could happen that you’ll misfire because of faulty ammunition—but it’s not likely. There’s no denying your girl thinks you’re one in a million, but when it comes to misfiring mortars, the odds are 999 against you even being that one in a thousand.

OPERATION BUST

FOR BOMBS WITH A HOLE IN THEIR BARRELS



The kid who plugged up the hole in the barrel with his finger had the right idea...for a minute. Acting like a bathtub stopper he kept and saved Holland

from an annoying flood of moisture and humidity which could have suffocated the whole crew.

But if Holland had been a tunnel (of the same name) with only one opening, things would've been different. For one—the kid would have needed a bigger finger. For two—he wouldn't have kept the

tunnel dry, or even stuffed it. He would've invented it up...and sweat means rust...and rust is bad.

For three—if a rat that was burrowing gas came shooting down that clogged up tunnel, the whole thing would've been a bust. No place for the rat to go, means less the gas. And the light in the little bear's eyes would have been gas light.

Enough with the bad hole stories! This is what happens in your gun when you shoot it with obstructions in the barrel! Don't let the stuff [fingers, cleaning patches, dirt or whatever] get in there, fool!

CONTACTOR LATCH ASSEMBLY STANDARDIZED

It may be a contact wire to a racket, but in many a gambler it's a stick in the back—or the chest—or wherever its unpredictable flight might take it when it whips around after the rocket is fired. Now, according to the latest juice from the grapevine, this little problem is scheduled to be eliminated.

The Contactor Latch Assembly for the 2.5 inch M20 and M20B1 Rocket Launchers has been standardized. With the addition of the Contactor latch assembly, the M20 and M20B1 Launchers are designated the M20A1 and M20A1B1

Launchers, respectively. The latch allows loading of the rocket in a definite stop—makes contact when the lever is engaged, and opens the circuit automatically after the rocket is fired. With the new latch mechanism there'll be faster loading and firing, and the launcher-man will be able to place aimed shots on the target.

Whiz's have started handing to get the Contactor Latch Assembly in production, and there'll be field modifications available for all existing launchers, which PS hopes to tell you all about later.

FIRE CONTROL



MAKING ENDS MEET

Most of the time a unit's returned into an assembly and shipped to storage with part of its connecting ends left hanging on the main assembly. Not knowing what goes with what, is the usual reason for the oversight. But what happens? The units are returned with the parts missing and there's a run on spare parts hard to get, or you try making them locally and find it an expensive and highly technical proposition. Here's a few tips on the off-ends that shouldn't be overlooked if the supplier is to be a winner.

If it's a Periscope Mount you're taking off a vehicle, take the cone assembly off first, then the upper and lower connector assemblies, connector link, headrest assembly, and in some cases, the locking mechanism. When you've got those off, put them back on the dismantled mount when the parts can be machined or selected for it.

The link assembly on Telescope

Mount, M44, should go with the mount when it's taken off the vehicle. A mounting bracket is bolted to the right side of the barrel/turner and is the mount's support. Some men are separating the mount from the bracket by removing the outer pin and nut, leaving the bracket attached to the vehicle. It's an important part of the mount and may be taken with the mount by removing four screws and two dowel pins.

Telescope Mounts M55, M56, M57, M58, and MT2, have a headrest assembly physically separate from the mount but considered part of it. Take the headrest with you when relocating the mount and bundle 'em together for future use.

As may see in Figure 1 is Telescope Mount, M55. There's a "front mounting bracket" way up in the front part of the turner and it's part of the mount. It's often forgotten when the main part of the mount's stored away.

M33 RELAY TESTS

To make a test case out of a couple of relays that may be fouling up your M33, use Hickok Model 336 or WECO Model KR-5737 which you'll find listed in ORD 6, Test Equipment, for Fire Control Systems, AA, M33 and T18. The relays you're sporting this time are No. BA-718423, Stock No. F342-1901828 (a tube relay that's normally closed and used in the Acquisition Modulator Meter Panel on early M33 Systems 3 Para 133), and No. BA-761727, Stock No. F342-7660040 (also a tube relay but normally open and used in the Track R. P. Unit of later M33's from 133 up).

When you're testing the earlier models, first throw the power switch to "OFF" and set up your tester. Plug the line end of the tube socket into the 110-volt 60-cycle outlet, set your selector switcher to BT-5890-0, and turn the filament switch to 3 volts and the short switch to No. 4. Now put the tube in the socket and throw the power switch to "ON". If the neon short-indicator lamp glows for about two seconds the relay should be OK.

The later models get the same treatment except that the filament switch should be on 1.7 volts, and you'll find the indicator lamp will glow continuously after about 3 seconds if the relay's working fine.

LENS CARE

With the walloping sun striking down on your instruments, it isn't long before the optical lenses begin to get messy. Most lenses are of multiple-type-often where two or more are cemented together for special effect, and heat from the sun's rays can cause the cement to break. This is particularly true of lenses cemented with Canada Balsam—a common adhesive that's often used.

To the sun's direct force, the lenses themselves add to the problem by concentrating the heat as the rays go through. It's a fact that instruments should be in a shaded place

between use, and in fact cover all lens.

As for dirt—think twice before taking an instrument apart to clean the lenses. Take lubricators, for instance—you'd never get them back together again, it takes some know-how, and a tugging-up target to set the calibration—unless you've got luck, you're on a limb. Anyway, you can't always be sure where the dirt is—you might think it's on the objective lens when it's really on the eyepiece, or when your inexperienced could be a small job into a big one. So pour the luck, and let the Ordnance engineers clean them for you.

ARMY AIRCRAFT



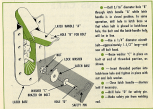
COWL FASTENER SAFETY-LOCK

Sometimes pilots are claiming that low altitude over swampy areas is not a good place for L-19 cowlings to flap around like a board's ears. Which sounds reasonable.

Sketches below in a little show the boys at the TAD. And the are putting on their L-19 cowling latches to take care of the complaint. The

engineers are not convinced that it's necessary, but agree that it can do no harm—and if nothing else, it'll prove the latch is closed correctly.

So if your cowlings are rattling in the breeze, try this. One on each side, front or rear, ought to be enough.



—Cut 1/2" diameter "T" through both heads "X" while both heads is in closed position. In open position, cut hole in both heads so that when hole is placed in both heads hole, the hole and the fastener hole, all in a line.

—Use a 1/2" diameter closed hole—approximately 1.1/2" long—cut out of both head.

—Place washer "Y" in place on both end of threaded portion, in closed.

—Insert threaded portion into both-head hole and tighten in place with nut and lock washer.

—One both heads—insert half "T" assembly.

—Install hole "Z" for safety pin.

—Install safety pin from existing nut.

Because it **CAN** happen—

PLAY IT SAFE

Ground check controls. We know that no smart pilot ever takes off without checking his controls at least by moving them. The smart boys also look to see that the control surfaces move freely. Now comes proof that the real smart boys take the extra second needed to be sure that the controls actually move in the right directions as well as moving freely. One chance in a million, but it *can* happen: A ship got into the air with controls wrongly connected after a major refuel. Pilot found himself

in the same position as a kid trying to ride a bike with his arms crossed in front of him. Operations officer found himself short one aircraft (complete w/ pilot).

Check the fuel. Like it did in Major Light's story (PS 89), there has been a good deal of trouble lately from contaminated fuel—single engines in fact. Watch it like a hawk, and if you find lake teeth and broken thunderbugs in your fuel filters, go a step beyond cleaning out the tank—have a look at the servicing tanks too.

How to control your **30**

Oil Pressure Relief-Valve

To get the valve you need when you need it, define the following parts numbers from *Air Force TO 8M 00A-408A-4* (12 Jun 52):

Spring, oil pressure relief valve, P/N 330443

Plunger, oil pressure relief valve, P/N 330297

Insert, oil pressure relief valve, adjusting, P/N 332470

(now shown as 33470 in the TO)

The parts numbers for the 3-47B-11 engine oil pressure relief valve are:

Spring, oil pressure relief valve, inner, P/N 332181

Spring, oil pressure relief valve, outer, P/N 330186

Insert, oil pressure relief valve, adjusting, P/N 332186

Plunger, oil pressure relief valve, P/N 330166

Shims, oil pressure relief valve, P/N 330184

Windy's Windstorms

ALL ABOUT THE L-19A

GOOD STOPS

Those of you who have the new type slow stop on your L-19A's (the clip with two rubber bumpers mounted on the strut stop strap) will be happy to know that rubber foot bumpers, which you can get from the motor pack, will fit into these holes. These automotive bumpers will not only serve as replacements but being larger and thicker with flat ends, they will do a better job.

FUEL TANKS

Lots of leaking fuel tanks have been reported. Inspect yours, with particular attention to the fast-and-ah hold-down straps (take the tank cover off) and replace any broken or bent parts, tighten loose nuts, etc. Keep an eye on these tanks.

OIL FILTER CAPS

Oil filter caps are still getting away, sometimes resulting in loss of oil. Replace with great care when servicing the ship. A new cap with positive safety features is in the mill.



OIL CONSUMPTION

Excessive oil consumption is reported on lots of L-19A's, mostly from F300M. There is UN's on these. And as Windy said last month, keep your air filters clean and oiled.

WEE WEE

There has been some confusion as to the wedges on the L-19A landing gear. See TD 81-1150AA-2, Par. 4219-A to 4219-D for the correct info.

WING HEAVENLY

At least one of the mysterious cases of wing-looseness has finally been shut down. A slight bend in the rubber was found to be causing all the trouble. Rubber trim ink was enough to correct it. (How do youm look?)

CHUTE HARNESSES

Pilots flying L-19A's can save the crew chief a lot of grief if they make a habit of fastening their safety belt and chute harness be-

ture during the drive. When deploying, be sure the left half of the safety-belt and the chest-leg straps are on the seat before sliding the door. Friends catching them in the door and springing it. (An air-spring door will keep you warmer on cold days, too.)

TRAYWHEEL BOLTS

Traywheel spring attaching bolts are now supposed to be torqued to 140-190 inch pounds on the L-104's. Thought everybody knew that.

FLAP HAPPY?

Flaps on these aircraft have been giving trouble. Flaps are warned not to lower flaps at speeds above 100 miles per hour. If you have any troubles with your flaps fill out a DR, and give speed, temperature, etc. to help locate the trouble. These flaps are now being stalled in hopes of correcting the difficulty.

MAT MOORING-HOOK

If you are operating off a perforated-mat runway, or are mooring your ship on such a mat, the hook shown below will prove handy.



Slip the hook through two adjacent holes in the mat and then run the 1/2" plate-keeper down over the end of it. Tie mooring rope to the eye, or apply it as.



GOT TROUBLES, BUD?

Windy can't solve all your problems, but by far an aircraft trouble. He's an authority on anything that flies, but he can't help you with any problem unless you tell him what's on your mind. If you get a gripe, glitch, feld fix, or even just a wild idea about Army aircraft—don't forget it. Drop a line to Major Windy Winchuk, c/o AF Magazine, Aberdeen Proving Ground, Maryland.

SUPPLY & DIRECTIVES



SWITCHABLE PARTS

The story on finding out new retailer parts interchangeability is much the same as it's been for all vehicles—only you'll have to use the new cross-reference lists (Ord 3-4 and 3-5 series) that are just rolling off the press and will show the new vehicle parts.

For the benefit of those who haven't had a tune-up or two with the GM 3-4 and 3-5 series, you have to have one of 3 numbers to start with. If you have the manufacturer's number in the drawing number (your supply man can help you with this one) you can look in your Ord 3-4 series for the stock number. Under the stock number, the Ord 3-5 series will list the Supply Catalogs the part appears in—this way you'll know which vehicles use the part.

Of course, if you have the stock number to start with, you're ahead of the game—you'll only need your Ord 3-5.

PM REPORTS

PM Reports have other uses than to create an impression for IG inspection purposes.

Latest cross-issue official has it that these preventive maintenance services are too often of the pencil-and-paper variety, and that the vehicle doesn't always follow them as the report.

PS has pointed out the mechanical points of filling out the forms (Ord form 48 and WD 500 figs 460)—it's been suggested that the using units spot check their own vehicles against the reports to be sure they reflect what's on paper.

Time studies could be made, too, on the basis of the info in these reports, and used by your unit to plan your workload. Also, by reviewing the parts used over a period of time, say one month, you can estimate the parts required and start getting them in a week or two before you need them, based on scheduled maintenance.

NO TIRE SHORTAGE

It just looks that way when it takes so long for your repaired fender tires to be shipped. The present general depots won't "fill" small tires, so your repair shop waits till there's a cartload of something coming your way.

Soon as the new "farm depots" are set up to stock these fast-moving tires, and the "back-up depots" to stock the slower-moving things, much time will be saved between asking and getting—stocks will be closer to you, less paperwork will be involved. In the meantime, look ahead to your needs—especially on fast-moving items.

In the case of tires—don't expect them all to be lowering you because they'll probably be a mixture of new, retreads, and good used ones. The test you can do (in the

21) is to be sure they're checked before they go on your vehicle. These tires with 88% or more tread left on them have to be used—not because there's a shortage, but for the sake of economy. However, they could cause more damage than the savings involved if care isn't taken to make sure the same amount of tread remains on those being used together.

TM-31-506, Pneumatic Tires and Rubber Treads, tells exactly how to match tires. If you don't get tires within an inch (at most) of the same circumference (measured at the center of the tread, you're in trouble. Not only will you be scuffing tires every inch of a mile, but your differential won't take the extra wear—its isn't built for it. Lacking the prescribed tools to do the measuring is no excuse. A piece of string will do the job—plus a head.

IDENTIFICATION BOARD FOR COMMON PARTS



All of you stock men are now here cooperating in what someone named me in your door with his fingers held like a collar and says, "This is a little hell about the log?"

The author is happy coming the parts and of the stock men at the New Field Automobile Shop, New Haven, Conn. He is a well-known. Outside his stock room he has a big board, on which is displayed one each of every bolt, nut,

screw, and washer piece of hardware he carries. From the rolling bridge and so on one item. In when a man needs a part for which he doesn't know the exact description or the part number, he looks on the board and finds it. Once found, he notes the number placed under it as a handy new part rolled up alongside the board, and then goes to the window to deliver it. This system saves no end of time and being long around, keeps "downers" out of the stock room and makes everyone happy. Could be copied all better and include gaskets and so on.

THE RIGHT EQUIPMENT FOR THE JOB

Some jobs like to live dangerously; they always go around testing Safety Margins. They don't actually know that's what they're doing. Usually it's just a case of being too lazy to get the right piece of equipment for the job at hand, so they use what's handy at the time. No one is really surprised when something snaps or unseals, as a result, and the same jokers usually ask . . . "What happens?"

Like this, for instance: A white back Ordinance had to go out and bring in an M3 trailer that had

headed for the cornfields. They also had to unwrap the towing track from a telephone pole and try to straighten up the pole, too. So what happened??? One of the margin-testers we mentioned above had loaded the 2-ton trailer with a 3-1/2-ton load, and then pulled it with a 1-1/2-ton truck.

The fact that the hitch snapped and let the loaded trailer take to the timber is an understatement. You or I could have told him it would happen. The next time he shouldn't have to be told.

They had no safety chains.
They had no trailer-brake control.
What did they have?
The wrong equipment.



CONTRIBUTIONS



CIRCUIT-BREAKER FIX

Dear Editor,

Before we saw your M38 circuit breaker fix on page 43, of PS No. 3, we had solved the same problem for our selves in a little different way. We simply ran a strip of sheet metal from the bottom of the dashboard to the firewall so that it was between the circuit breaker and the big box. Our sheet metal never held it.

Mr. F. H. George
Edmond, Maryland

HOOK FOR LOCK WASHERS

Dear Editor,

Here's a little gadget for getting off the lock washers between the two nuts holding in the wheel bearings on Jeeps, 1/4-ton and 3/4-ton jobs.

Make it from an old shock cable or shock cable (Fig. 1).

Just cut the cable off about six inches from the hook and bend it out the end so there's a little hook. You can then reach in and flip the washer right out. Save it a time and work over.

PHIL J. A. GULLPIONE
APO 305, San Francisco



Fig. 1—You get big ones? Use all the rest! Then let this hook snag your lock washers.

BRAKE-SPRING GUIDE

Dear Editor,

I find our brake spring plates are obsolete for the M37 3/4-ton truck because the hooded linkages have no rivet hole to anchor the plates while removing the brake reassembling. Without an added tool, the linkage would be all chewed up.

To save the lining and still do the job, cut a piece of 18 gage sheetmetal 3-1/4" wide and 1" long. Cut out one end cut a groove width 1/2" wide and 1" long and bend this as shown (Fig. 2). Then bend the other end in the opposite direction to form a 1/4" hook at about a 90° angle. Hook the big bend to the bottom of the brake shoe and anchor the piece back of the 1/4" hook when you take hold of the spring. Guide the spring down there.

Capt. E. J. Rufe
APO-48, New York



Fig. 2—Leaf spring with groove cut across it you anchor piece to the axle.

(Ed Note—Looks like a mighty fine idea. But if you have an M11 around, and the last axle has nuts that go with it, the one shown on page 73 of TAM, M11 Item E (700000), will also do the trick. Stick the handle with the spring on it into the spring-hole and let it slide, if you're putting it on, or the reverse if you're taking it out.)

PACKING BRACE INCHES

Dear Editor,

We've had some trouble with the M4 parking brake with close footing on the pins (700,000). To fix this, I took to chiseling and tapping them for grease fittings. The lower shoe calls for a 1/8" fitting and the next one wants a 1/4" fitting. As you know, the grease fittings go into 1/8" NPT holes.

The mainline fitting may be put in the shoe before assembly, but the most fitting must be the last thing installed.

SFC W. A. Gussner
Camp Buckner, Alabama

(Ed Note—Good grease fitting here is fine, but go easy on the grease or keep it off the brake shoes.)

MUFFLE MENDING

Dear Editor,

At our motor pool when we can't get a replacement for a burned muffler we use a piece of sheet metal and burnish it across to patch the old one (Fig. 3). This mending has solved our problem many times.

SFC G. Dickerson
Fresno APO, Cal.



Fig. 3—This is one way to patch a good but fast muffler till a replacement comes thru.

(Ed Note—won't take the place of a new muffler, large, but if you can't get a new one out of supply, about any point will do as a pinch. Our favorite field repair for damaged mufflers is to wrap the muffler in asbestos paper—if we have it—and in any case put a sleeve of flexible metal (aluminum will work, will do) around it. The sleeve is held together with heavy wire and is joint kept away from the heat in the muffler as shown below Fig. 4.)



Fig. 4—Metal will be a good muffler, but here's another patch that'll work in a pinch.

TRANSMISSION JACK

Dear Editor,

Here's how we made ourselves a transmission jack for use in the field, when we couldn't get a regulation one. You take a piece of metal, 8" x 7" and 1/4" thick, and drill holes in each corner, large enough for 1/2" nuts and bolts (Fig. 5). Weld nuts in the metal holes and grind the point of the bolts in ball shape, about 1/4" from the end

(this is for a steady fit on the transmission). Saw the threads on the bolts so you can adjust them to the transmission. Then weld a regular 60 jack to the corner of the plate. The jack can still be used in the shop.

For 48, *Woods*
WFO 30, San Francisco



Fig. 5—Here's the solution, if you've been without a jack—try this on your transmission.

(Ed Note—Good idea, but you could probably get more use out of your jack if you made the plate removable. This could be done by welding a short piece of pipe, about 1' long, to the plate. To be successful, this pipe would have to fit snugly over the top of the jack. For added security you might also weld a plate to the base of the jack.)

LEARN WHEEL-BEARINGS

Dear Editor,

On a recent inspection we found loose wheel-bearing on some M1's. The

reason was that the lock, although any wrench entered in any one of the holes by the dowel pin of No. 1, did not bearing, as per (center).

Upon removing the No. 1 adjustment, hub bearing (center), we found that the dowel pin was not properly located, so we used a new one and everything was OK.

Wggt Richard B. Magan
Maryland National Guard

BOAT STORAGE

Dear Editor,

I solved where and how to store my outboard for the Marine truck, MTC. With a pair of brackets, mounted on top of the cargo seat backrest, a little past the second low-pocket (Fig. 4) we got an easy and neat resting place for the boat.

RFC Salvatore J. D'Andrea
APO 4, San Francisco

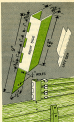


Fig. 4—Mounting guide lines appear to be a headache where you mount a couple of brackets on behind your cargo seat backrest with no chains.

Continued from page 427
rent over-filling in case some oil wasn't drained.) Continue to run engine until normal pressure gage shows normal (40-45 lbs) without the needle fluctuating and until oil temperature rises, then reduce engine speed to 2000-2500, now add or drain oil until level is the normal reserve amount at the full mark on the dipstick.

Check daily. Check after operation (while oil is hot), if vehicle has been standing, start engine, engage water pump (check to operate water pump correctly and

run few minutes to bring oil to its normal operating temperature. With engine running at idle (800-900), water pump engaged and oil temperature at normal, check oil level on lowest gage. Add or drain oil to bring level even with full mark.

Final Drives

Change every 100 hours. Drain while the oil is hot. Fill (150-200) until oil is level with plug hole.

Check daily. This check is to make sure oil is level with plug hole.

Frank J. Magan



Connie Rodd's BRIEFS

Tire inflation

To make it easier on your life and keep you around like on a magic carpet, there are two new tire inflation options for your 7.00 x 14, P. S. HDCE tires. Your M38, M38A1, the new 134000 combination, and the M100 134000 trailer, use these tires as standard equipment. The following figures will tell you when to pump up your tires.

How to pump

Highway	20 psi
Cross Country	25 psi
Sand, Mud, Snow	30 psi

Battery lighter

Guess it went in one eye and out the other—that M27 and M38 battery light pictured in PS #8, page 211, will match 3004 and most GM batteries. The GM's have handles on their ends that solve the problem.

Reservoir cap

You'd better grade with many fingers when you're fiddling around for sediment at the bottom of the air cleaner reservoir on your 2-1/2 ton Bays or Stakeholders. There's a sharp

lower edge on the all-weather handle that can do a job like a razor.

Low voltage tester

One type of low voltage circuit tester in the supply system (ORD 7-45, Stock No. 17-T-3173-50) does not look like PS #8 showed when describing how to use adapters with the tester for testing 24 volt equipment. What's more, if you have low voltage Circuit Tester, Stock No. 17-T-3173-58, you won't be able to make tests B and F like PS said. So, now, if your meter has no field rheostat, you'll have to make your voltage regulator and circuit relay tests a two man operation. Have someone use the accelerator pedal as a substitute for the field rheostat and see the engine up and down while you take the readings.

Where's that gun hook?

That "getta' away" if it didn't, the Handcar gun hook, is being put in its place—and kept there—by entreating gamblers at Fort Benning, Georgia. A slip in the right box does the trick by holding the leg hook securely in place. So long as the right box is there, the leg hook will be, too.

DEADLINE BEGINS AT HOME



TENANCE SUPPORTS SUPPLY SUPPORTS MAINTENANCE
LY SUPPORTS MAINTENANCE SUPPORTS SUPPLY
TENANCE SUPPORTS SUPPLY SUPPORTS MAINTENANCE