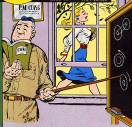


PS

THE PREVENTIVE MAINTENANCE MONTHLY

Issue 18 1984 series



"...Observe steering action or looseness... note any excessive pull or shimmy... and when chronic failure results from subjection to extreme conditions, report of such chronic failures should be made on DA Form 468...."



For The Love Of A Gal...

When you see a gal...

Just look, quietly, calmly, before you ride—

Remember that someone placed a bet.

So it was easy then:

Keep your head strong, your spine pointed, and your
loins well fixed.

Like the stars above the soil rising from the horizon and

like the stars you feel from the horse and into you.

In moments when you stand steady, like the horse you love.

Today's work is not so simple.

You have tools and gear and plans and methods
and equipment so complicated that you sometimes wonder
what makes it tick.

With all this, sometimes situations can become even more
complex for the making of better.

The work and the work that will, and the gear
that does—do every subtle transition every other
second so you can go about the world.

To keep 'em rolling, maintaining it everybody's job.
EVERYBODY—has that again, and repeat.

Forward—yes, YES—definitely.

Backward—well, yes, backward—yes, no.

Oblique—right, straight—forward.

Over Calm and Control—flexibly.

Everybody else everybody has a hand in keeping 'em rolling
and starting, all these people like yourself, and that every
thing is done just so.

To show 'em rolling over back to the right side.

Or keeping it steady.

Or adjusting the work back.

Or clearing the gut.

Or doing all the things you've got to do to keep
your equipment ready for action.

So look ahead of it all, some gears, the right
equipment . . . a better fit.

Just make the right gear, adjusting, growing, tightening . . .
make sure it goes (and what's more, you're after.)



A Bottle Was Lost



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Price 50c

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Cover's Spotted Mail



THE M135'S TEMPORARY PARKING BRAKE WASN'T MEANT FOR PLAY

You want to know why I'm all hopped up and spinnin' mad? It's those lousy brain jobbers who ride in the M135 truck cab along with the driver and flip the temporary parking brake switch to the OFF position when the driver's not looking.

You know what happens? The next time the driver leans on the brake pedal, there's a good chance of all the wheels locking tight.

This isn't funny because if that M135 is slipping along, somebody'll go sailing thru the windshield, and if there's a human cargo aboard, they'll get stacked up like matches dumped out of a box.

That's what may happen if you're hunky-hunky out to be going around a curve. If you are, then you and your truck'll do some wilds.

That temporary parking brake switch is to be used only when the hand-operated parking brake can't be used. You see, with a hydraulic transmission you don't have gears that can be set to hold the truck while you get out and check

the wheels. You'll need the temporary parking brake only once in a cow's age.

If you have to use that temporary brake, make it short, because if it's left on for a long time you'll get a dead battery, the fuel'll run low, and you'll have a runaway truck.



Before starting out with your M135 each drive, and make sure that switch is OFF. And make sure those jokers keep their pants off of it.

STUMPY

CLANCEY LOWERED THE BOOM

Dear Half-Mast,

Just received your new M21 answer... sorry, nothing worked for that and there had to be a revised. What would happen if the crane operator continuously raised the end on the attachment-like boom-travel when the boom was up and then, eventually, the boom got lowered?

Are psychological and physiological reasons for boom-stow operators that the name "Stumpy" would like to see some sort of protection device attached. Do you have any suggestions?

Clarence Gung

Dear Gung,

Fig. 1... we've just come up with the gadget you're looking for... It's a safety shield attached to the boom (Fig. 1). Here's how it's made—let's get yourself a sheet of Magnesium Alloy (M21) or one end drill holes as in Fig. 2. Then screw it to the boom as in Fig. 3. To do that you'll need three India 114-2000-2x1/2" lock washers and of course the holes in the boom that line up with the holes in the plate.

Half-Mast



How to level-up

HEAVY TRAILERS



Dear Hal-Allen,

We had trouble leveling our tractor up to the combination, Union, Standard, Cargo, 3117. If the trailer is loaded, or we set it on sandy ground, the supports don't hold the trailer up far enough to back the tractor under it. We took a 2x4 end board and nailed it to the bottom of the supports (Fig. 1) which gave us enough rise and also kept the trailer level on uneven ground.

We also had trouble with the tailgates being torn up faster than we could repair them. The gates sag in the middle and the holes are split, due, as you say, also they can get so-py them out. The jacking from the bottom board is perfect. We took 3/4" angle iron, long enough to go all the way across the bot-

tom of the gate, and nailed it to the metal supports to give a strong jacking surface and save the gates.

L. B. R. III.



Fig. 1—A long board keeps sagging bogged-down support from making supports wobble.

Dear L. B. R. III,

Well, Sir, it sounds like you're keeping your trailer on the level and saving tailgates. But, as for that plank stretched

across the bottom of your landing supports as a permanent fixture, I'm afraid you'll run into trouble. It would be like a road-scraper when the going's rough

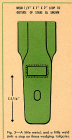
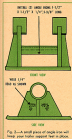
and you have enough worry about clearing the supports with another on their bottom. Best make it a removable piece, so it can be stowed when traveling.

If, on any of your E-tube trailers, you're having trouble with the landing support feet protruding right out from under the supports when you load 'em on rough, hard terrain, here's a production for you to try.

Take four pieces of angle iron $1\frac{1}{2}$ " x $1\frac{1}{2}$ " x $1\frac{1}{2}$ " long, and weld one to the front and back of each foot, directly under and against the tubular section of

the landing support (Fig. 2). These bases will keep the feet/bases they pivot for enough to stabilize the supports.

For another production for on the tailgates, here about you welding steps on the gate posts so they're less likely to wiggle in their sockets (Fig. 3). The steps would also give you prying surfaces if you need it. Looks like it would be easier than running angle iron along the bottom board of each gate—and that's a lot of leg too.



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



Capacitors only

If you've been using heated-air capacitors-with-leads over your left shoulder while your right hand searches for the necessary replacement, now's the time to change the habit. It'll be very dry now that your replacement gets you capacitors only. No more leads attached.



When the capacitor comes out, nothing happens to the wire, anyway. Just strip

the lead close to the capacitor, just back a little insulation, and wrap or solder a terminal on the bare end. If there isn't a terminal available, wind the naked wire around the same in the new capacitor.

As a matter of fact, the capacitor you think is a special deal probably has a good substitute in a standard item—what you're waiting for in replacement is maybe right in your own backyard.

The first capacitor to go, this economy pick happens to be used with the famous control-box on MVA medium tanks—but tomorrow it might be another capacitor and another location and an other vehicle. This business of substituting, made me capacitors-with-leads and replacing them with a standard foot-capacitor is being done wherever possible. Be careful yourself, though, and check your bulk supply of lead wire and terminals.

Mixed gears

If you can't tell which hole from a hole in the ground, you might have trouble in identifying gears as shown in TB-Ged 134 dealing with servicing standards for auto drive gears.

Somebody's gears were mixed as the pic are included. The descriptions under illustrations #1 and #2 should be exchanged. Correctly, #1 is spiral bevel gear and #2 is spur gear.

Confused? Not me anymore!



Change the clips

Sometimes along the line a bunch of retaining clips that are on the wood spacers under the surge body of your M15, M16, etc., don't work. They get changed often.

These spacers are the two wood ribs which are lengthwise under the surge body on top of the truck's main frame. When you crawl under you'll see that four retaining clips have been welded to the surge body above each spacer but may not have been held down. They're there to keep the spacers from slipping.



If the spacer hasn't shifted, do your self a favor and top the retaining clips down with a hammer before they do. They'll hold fine (Fig. 1).

But if the spacer have shifted, you'll have to loosen the hold-down bolts, jack the body up and shove the spacers back in place. Then bolt 'em down tight and level down the clips.

If a spacer comes out, even so only one end, it'll probably cause ripples in your body's undulatory. The spacers are in there to cushion the body against the main frame in rough going. Along with the springs on the hold-down bolts, they let the surge body roll with road-bed jounces.

Wood cradle plate

Here's more for the boys who replace down the truck with safety-belted adjusting bolts till the frame is better.

Ordinance is installing a cradle plate on the wind-trailer-tan cover of some trucks about here right to save the body.

So, if you have a truck without a cradle plate on its wind, see if Ordinance can put the plate on for you.

Just water—not acid

The only drink your batteries need is water.

Some people have been tipping the apple cart by giving them a twig of acid, but it isn't according to Hays, because batteries that you get have already had their dose. The only time acid is added to a battery is when it's received from the depot dry-charged or when a battery expert decides it needs more. Calsonic takes care of that for you. If you happen to add more sulphuric acid you're upsetting the chemical balance of the cells, and it's bound to go floppy long before its time.

In case there's a jug of sulphuric acid around your motor pool or shop, to keep some jokers from killing good batteries, put a small sticker on it that says

SULPHURIC ACID

CAUTION

not to be added to
batteries

Hydraulic lube

How pouring over what kind of oil goes in the hydraulic system of your M41 Dump? The higher octane TBM 5-447D (Jan 55) says it's hydraulic oil, petroleum base (OIL).

But, if you try to get petroleum base oil and find yourself up the creek, use mineral grade Oil. Some that's given is the BMC 20-ton dump EO—it'll save your hyd.

How much... it takes 50 gals. When you're filling or checking, take a good reading on the reservoir, oil-level-gage and get the levels at the proper marks (Fig. 1) to be sure you're safe.



Overfilling builds up about a 20 lb excess pressure that has nowhere to go because the system isn't vented. But it does a place to go when you remove the filler cap—which can be dangerous. So remove the filler cap slowly to allow gradual escape of any excess pressure.

Point need a boot?

You been wondering why a rubber boot was added to the bolt control valve spool on the M41 dump?

Yep—just like a Band-Aid keeps dirt out of a cut finger, this boot was put there to keep dirt and corrosion from the exposed control valve shaft—especially when operating in dirty or sandy country.

You'll find these boots on M41's with serial No. 98788 or 100000 inclusive and on 'em all after serial No. 100764.

If you're picking up and dumping your load in the dusty, sandy country, better check on one of your vehicle needs this rubber liner (Part No. G141-43200-0) to keep things clean.

Truck ticket holder

Could some heads in the 1st Army find this one. Whenever a driver gets the key to an administrative vehicle from the dispatcher, he gets a little plastic and fabric envelope chained right to it (Fig. 2). This envelope is about the right size to hold the trip ticket folded over, and keeps it from getting lost or messed up on the trip, and saves confusion when all the drivers come in for their regular run at work cell.

The plastic face lets everyone read off the vehicle number and the driver's name without taking the ticket out of the envelope, and if an Oil Pan wrap is needed, it too is put where it can be seen through the bottom.

These envelopes can be run up in a few minutes by the military shops, from wrap materials. The answer is the same as is used for wrap overlays.



Fig. 2

How angled creases

Some army genius in the First British Ordnance shops got tired of using a conventional crease under the lighter military vehicles. He had no hold his head up to see, but didn't have room to sit up. So he made a gauge that turned his head about 30° and had a piece of sheet metal to give him a back rest. He made it so it can be removed when not needed. Looks like (Fig. 3).



Fig. 3

Weight correction

The road weights for the G-100, M37, shown on page 9, in 8-544, are really "curb weights" in round figures, because they include full equipment, personnel, and extra empty payload. The Vehicle Weight and Dimension Data Plate has the correct figures for road weights (which, of course, does not include weight of personnel).

WV Weigh

| | | |
|---------------|------|-----|
| Empty | 2917 | Rs. |
| Cross-Country | 7417 | Rs. |
| Highway | 2917 | Rs. |

WHD Weigh

| | | |
|---------------|------|-----|
| Empty | 3607 | Rs. |
| Cross-Country | 7107 | Rs. |
| Highway | 3607 | Rs. |

Distinguished Driver's Award?

IT'S IN THE BOOK



Every now and then, faint, plaintive cries are heard from the back country to the effect that everybody gets to wear a measly badge, but the driver, and that poor guy who does all the hard, day-in, day-out work to keep 'em

rolling, the motor mechanic. The insurance guy gets his long rifle, the combat medic gets his wreathed stretcher... so how can a top-flight truck-jockey or wreath-juggler show that he knows his stuff?

Simple, friends. Just take a long look at page 24, Sec. III, AM 500-75. There's the whole thing spelled for the driver or mechanic who's



proved he knows what he's doing. It's in the book, so you motor officers who want to show that hard work really does pay off, here's your cue. And you first-class drivers and mechanics... maybe your motor officers have

been too busy doing their jobs to have climbed through their regulations. You could reward them. And don't make the mistake of under-rating the Master Vehicle Driver's (and/or Mechanic's) Badge. To wear one, you've got to be plenty good, because the qualifications are high and grades aren't used at all.

WHAT'S THAT KNOCKING IN MY ENGINE?



Joyride Joey can spot a knock in an engine a mile away. When he hears a knock from one of the company pups, he yells something about "This '55!?" "Aw, yeah!"

What Joey doesn't know is that gas-line probably isn't the trouble. Several other things can make an engine knock. Some of them you can't control, when you can.

You can't do anything about these:

Flexibility—Did you ever notice how much quieter your Old Chevy runs in a rain than in dry weather?

Temperature—You are more likely to get a knock in hot weather than in cooler, due to higher engine temperatures.

Flexion—Some gaslines will take you through the mountains nice and smoothly, but down at the seashore will make your engine sound like a jackhammer.



You can do something about these:

Engine temperature—Knock can come from an engine that gets too hot because of a clogged radiator, faulty thermostat, bad pump or loose fan-belt.

Carbon—An engine that's bushed-up with carbon may give a knock.

Carbon—If it's run for too long a distance, you may get a knock.

Overhaul timing—Knock can come from a spark that's advanced too far. And you'll also lose power. Too—the advance mechanism may be out of kilter.

Driver habits—The driver who scoot-ers with the gas pedal jammed to the floorboard is asking for trouble. Also, the lug who lugs the engine down to its maximum-lug gap before shifting gears will hear pounding in his head—he should have pounding on his head.

Kind of driving—Excessively slow speed driving on the job or in town is likely to cause accumulation of carbon deposits which may help to develop knock.

Man—What can you do about it?

Get yourself an engine check, including the carburetor, distributor, plugs and cooling system. When that's nailed up the rest is up to you. Avoid long engine idle periods. They cause carbon formation in the combustion chambers. The main thing is to watch your driving habits. Avoid jerky starts. Take the right gear for your load and speed. Watch the tachometer (if you have one).

The right kind of driving will knock most engine knock's right out of your head.



TRASH THE PRESSURE

Dear Half-Mast,

It's on the morning end of these questions:

Why are the tire pressures unequal on the truck, 45 psi M18 and the trailer, 35 psi M20? The tires are the same and it is required that the spare be used for either. How would you set the jay spares on the trailer with its 25 psi? Do you know the answers?

Maj. A. F. D.

Dear Maj. A. F. D.,

Well, Sir, they don't call me the Answer-Man for nothing. The 25 psi prescribed for the M20 in TM 9-804 has been changed to 35 psi by Change 5 (30 Apr 54) to the TM. And Change 1 (1 Apr 54) to TM 9-874 sets the tire pressure for the M18 trailer at the same figure—35 psi. So let me state this and you'll stop all the questions.

This 35 psi pressure fits its 400 truck and trailer tires applied to both highway and cross-country operation. You reduce it by 10 psi when you're rolling in mud, sand, or snow.

Half-Mast

STIRRING AROUND

Dear Half-Mast,

What is the story on the loading in the steering roller arm on our M1's and other Dodge vehicles? It's interesting and quite a lot of them, and can't find any listing in our Ord 7, SMC, G-741. It's back the matter up with our Field Maintenance Card, and they couldn't get it either, but did give us a whole new arm. It seems silly to replace the whole arm when the loading is all around.

FOAC

Dear Mr. McC.,

You did just right when you had the whole steering roller arm on your M1's replaced. You could have done this yourself, because it's right there on page 68 of your Ord 7, SMC, G-741. Only \$10. "ARM, STEER, W/ROLLS and BRAKING, any (changed) ISN 1041-71705." You don't save any work on this, but you can get it when you need it. After all, a loose bushing gives less of warning before it is completely unworkable.

I looked back to see just where the bushing for this arm did show up, and

it's on the Depot track. The idea is this, the man you replace is not staying away. It's just back to the Depot where they have the tools to do a precision repair job.

The Chevrolet you
are using is
the **REPAIR** car.



By the way, you want to be sure to get the "REPAIR, later use," GM-717066 which is the last item on page 70 of the Oct 7, 1961, D-701 or replace it the same time, as your new one will last longer.

Half-Mast

SEAN HURDON

Dear Half-Mast,

It's nice one takes as much as 150 miles a day in a good sized metropolitan area with numerous freeways, one way streets and highways, some of which are up to six lanes wide, without the aid of outside rear-view mirrors. Crossing lanes without mirrors is nerve-racking and hazardous because of blind spots.

The boys who drive our system feel they should have outside rear-view mirrors to prevent any possible accidents, but we can't seem to find any

direction that indicates as is required, the mirrors. Can you help us on this?

Sgt G. J. D.

Dear Sgt. G. J. D.,

Times it's a tough nut . . . outside rear view mirrors are classified as accessories, and 58-713-118-58 gives all instructions on how to get accessories on local purchase.

But here's the rough part—an order has gone out to Class I manufacturers saying that non-essential accessories such as grill guards, outside rear-view mirrors, wind deflector wipers, back-up light and emergency brake warning light are not authorized for procurement.

The order goes on to say, "a non-essential accessory is one that is not important to the highest degree and not indispensable to the mobility and safety of human beings and/or proper operation of the vehicle in question."

In short, if you can survive your old state that **power** mirrors are essential, maybe he'll be able to get them authorized by writing to the depot and



quoting Mercedes letter (OCD) 35013, dated 1 Dec 48, that says "an adequate field of view to the rear, provided by rear view mirrors is a safety requirement." Do you think you could buy them yourself?

Half-Mont

FE VERSUS OE 15

Dear Half-Mont,

There is considerable discussion here as to the compatibility of OE Engine Oil 15, Spec. MIL-0-2204 and Engine Oil Protective (PE), Spec. OE Army 2-1281.



This has come up because the new Allison cone-drive transmissions that we get in our tanks have PE 15 in them and we are in doubt as to whether it's better to flush the PE from the transmission before refilling with OE 15 or if it's sufficient to drain and refill?

Can you straighten us out on this?

Ms. W. A. M.

Dear Ms. W. A. M.,

Sureman . . . shows two oils are compatible because basically they are the same. PE is just OE 15 into which a preservative formula has been added.

As the flushing procedure will flush your new Allison transmissions, it isn't necessary because the amount of PE that remains in the centers, lines and transmission will do no harm when they're washed. If you did flush out the transmission, the flushing compound might get in the torque converter and it's impossible to drain the torque converter without completely disassembling. So don't flush — just drain 'n refill.

Half-Mont

SPINNING WHEELS

Dear Sgt Half-Mont,

Could you tell me why my 1946 truck's front wheels have a tendency to continue turning when I lock it up? Does it have any detrimental effects on the vehicle?

Sgt R. L. D.

Dear Sgt R. L. D.,

Sounds like your front axle drive is engaged at the wrong time. This could damage the drive mechanism—especially if the gears and bearings—so it's certainly no effect on the tires.

When the drum drive is used on hard surfaces under normal conditions, torque builds up in the power train, and when the vehicle is lifted across the wheels so none is lost. This wind-up isn't as likely over rough roads be-



more torque is relieved when you're lurching over that kind of terrain.

Like it says on page 18 of TM 9-406: "This device should be used only in off-the-road operation, slippery roads, steep grades, or starting hard pulling and deep water fording."

Half-Meat

3-CYCLE OR 4-CYCLE

Dear Half-Meat,

I was taught that the 300 tank has a four-stroke two-cycle engine. The manual calls it a four-cycle engine. The people I talked to around here say it's just considered a four-cycle engine but actually it has only four strokes and two cycles.

Can you set me straight on this?

Sgt T. S. H.

Dear Sgt. T. S. H.,

Just one . . . that engine in the 300 tank is an air-cooled L-type engine. You're confusing cycles and revolutions. An Otto 4-cycle engine (named for the guy who invented it) is one more common engine. It's the one that

has four strokes—two revolutions—for each explosion. You know, intake, compression, power, and exhaust.

The L-type engine does every two cycles, or one revolution. This is done by having no valves and pushing the new charge in at the bottom of the piston bowl. The exhaust is driven out the other side of the cylinder at the same time. So—the up-stroke provides compression, and the spark sets off the power stroke near top dead-center.

Almost the only L-type engines you'll find today are in outboard motors, some little motorcycles and power lawn mowers. In general, if you have to mix the oil and the gasoline, you're dealing with a L-type job. If the oil goes into a canister, it's a 4-cycle job. For more dope on automotive principles dig out TM 9-1708. It covers the subject well.

Large, with no your manual. It's your best bet for basic info.



SUPPLY & DIRECTIVES



**SEND AN
EAR**



**HERE'S HOW
TO GET**



**NEW
SHOP SETS
FOR
FIELD
STORAGE** **OF
SPARE
PARTS**



If you've had trouble getting Shop Sets 21 and 22 for field storage of spare parts, hold an ear. Here's the latest news.

The Supply File in *Revised Ordnance Depot* say that three shop sets are being new. They replace Sets "21" and "22", Stock No. 41-G-4800 and Stock No. 41-G-4900 respectively. The old jobs listed in Parts 2 and 3 of Ord 6, 296, 2-71, have been deleted obsolete and canceled.

Instead of Ordnance Maintenance Set "21", you now order Shop Set, Field Maintenance, Spare Parts Storage, Set No. 1, Stock No. 41-G-2990-500.

The replacement for the "22" set is Shop Set, Field Maintenance, Spare Parts Storage, Set No. 2, Stock No. 41-G-2998-312.

If you want to know what these sets contain, look at the tables printed opposite. Remember—the Ordnance Corps is responsible for the initial issue of this set, including the components which are items from other technical services, like those hand lamps, flashlight. For replacements within the set, requisitions should go to the technical service concerned—in the case of the handlamp, to the Engineers.

Either set can be mounted on any 2½-ton 504 truck with a flat cargo bed. The truck, of course, is your regular TDML vehicle.



S OF

ARMY SUPPLY MANUAL GROUPS



Get acquainted with your *DoD* letter and number groups and you won't have to guess what to find when you need when you want it.

UTILITY GROUPS

A Group—

Automatic guns (including automatic rifles, machine and submachine guns); small machine guns and machine (up to 40mm); mortars (up to 4.2"); all land vehicle equipment; automatic anti-aircraft material (up to and including 40mm).

B Group—

Small arms, hand arms, semi-automatic rifles, gyroscopic projectors, grenades and rocket launchers, lighted, launch tubes; arm chests, lockers and racks.



C Group—

Light and medium field artillery (including guns and howitzers from 57mm up to and including 155mm howitzers); aircraft cannon (over 40mm); park artillery (including howitzers and carriages); park land accessories, machine mounts; aircraft artillery (including guns and airplane mounts); airborne artillery (including guns, howitzers and carriages).

D Group—

Heavy field artillery (beginning with 155mm guns and 75mm anti-aircraft guns).

E Group—

Scout artillery power plants.

F Group—

Sighting and fire-control equipment, sighting devices, time interval meters, and watches.

G Group—

Automotive control.



H Group—

Standard common items including hardware, strips and leather piece material; electrical fittings and piece material; pipes, tubing, hoses and fittings; miscellaneous piece material (wires, ropes, threads, glass); ferrous and nonferrous metals (tools, bars, plates, strips, sheets and shapes); anti-friction bearings; oil seals; tires, tubes and repairing materials; batteries; lubricating fittings, oil filters, and elements.

J Group → Cotton, tools and machines.

K Group → Cleaning, preserving, lubricating and welding materials.

L Group → Targets and target material.

N Group → Ord and ord tool, load and supply guides (not otherwise classified). N Group SNLs pertaining to TYM&E units will be cancelled when the current information has been transferred to J Group SNLs.

P Group → Ammunition, fuses and primers for medium and major caliber artillery, anti-aircraft artillery, and heavy field artillery.

R Group → Ammunition, fuses and primers for rifle and machine caliber field artillery and mortars, land mines, and demolition materials.

S Group → Bombs, mines, and torpedoes for aircraft, grenades, pyrotechnics, guided missiles and rockets including fuses and primers.

T Group → Small arms ammunition.

U Group → Army aircraft.

V Group → Guided missiles.

Z Group → Captured foreign material.

Obsolete Group → Obsolete general supplies.



ORDERS GROUPS

ORD 1—Introduction (order is now being processed in DA S-25-29)

ORD 3—Set of current items transferred to back for reprocessing.

ORD 5—Ord of all items (Stock and Ordnance Reference List and Obsolete General Supplies).

ORD 6—Gas, kits and outfits.

ORD 7—Organizational and material allowances.

ORD 8—Field and depot maintenance allowance.

ORD 9—Roll of all service points.

ORD 10—Ord ord tool, load and supply guides.

ORD 11—Ammunition (which is being converted to Ord 3 and Ord 5 manuals without changing the information on the Group letter and number.)

ORD 12—Obsolete General Supplies.

ORD 14—Interchangeability list.

ORD 15—Ordnance Reference List.

ORD 16—Captured foreign material.

PM BY MILES



Is your one of those on-the-go males with a batch of wheeled vehicles that need their 1000-mile service long before 90 days are up? Or with track jobs that do more than 100 miles every month? Are you having a rough time scheduling these babies for their PM needs? Well, fret no more because TM # 2000 (Oct. '83) gives a handy-dandy of a way to keep yourself posted on these specific gallopers. Here's how it's done:

Take the right hand page of PM cover WD 400 460 and unspine a mileage chart. Just line out the numbers across the top of the page and put miles instead—from 100 to 1100, allowing two spaces for every 100 miles, and down along the left numbered column for the last three digits of the vehicle's number. (If by chance you have more numbers that are alike, no flame, put in the full number). The idea is to run a line out from the vehicle column and record its mileage.

As mileage is accumulated for

each vehicle, draw a heavy line to the right. (Might error your marking mileage for each vehicle in the 100 column if you start.) As the line crosses within the 900-mile mark, then you can make your plans to call in the wheeled vehicles for their 1000-mile service. Like in the sample, wheeled vehicle on line #1 is entering the 900-mile zone—time to schedule even if the 60 days aren't up yet. And the one on line 3 is overdue. Plotting in advance makes for a balanced work load and cuts down the gray hair.

This chart can be tacked up on the wall for quick reference; furthermore, sheets can be resealed to go for the 6000-mile service if you want, then you can plan the PM services when the vehicle passes the 5700-mile mark.

Incidentally . . . when making these mileage inspections, you should be filing in the new DA 460 or 461 forms. BK 790-123-0 and FS # 30 give a good rundown on how they're to be used.



**JOE
DOPE**

**IN THE
SPRING
A TUNE-UP**

Now the sun...
 ...dawning, closer
from the far edge of our orbit
 ...warms sweet breath on the land
Here a bird trills...
 ...There a coplet glistens
Now the winter hard soil
 ...yields to man

Over at mead hall 3
 ...a bud peeps
An insect hums
And the moss egg
his heart abarot
with gladness
 ...clings.





1. ANTI-FREEZE



5. COOL IT AND STORE IT IN THE COLD. DRIVING YOU GET FROM QM!



2. CLEAN & FLUSH COOLING SYSTEM



WHAT IF THE VEHICLE HAS BEEN WINTERED AND IS EQUIPPED WITH A POWER HEATER?



THEN DO THE FOLLOWING...



FIRST...

CLOSE SHUT-OFF COCK CONTROLLING CIRCULATION OF COOLANT THROUGH BATTERY HEATER PAD AND ENGINE HEATER.

DO THIS AFTER ENGINE HAS BEEN RUNNING.



THEN...

DISCONNECT ONE END OF THE TWO COOLANT HOSES.



...AND TIE IT FIRMLY NEARBY SO IT'LL BE READY FOR NEXT WINTER.



3. GIVE IT A WASHING



AND WHILE YOU'RE DOING THAT, I'LL TAKE UP THE POWER.

Joe's

Dope Sheet

EVERYBODY
KNOWS WE ONLY
DO A GREASE JOB
EVERY 1000 MILES.

WE HAVE THE WORLD'S BEST EQUIPMENT

PRODUCED UNDER SPECIAL LICENSE TO U. S. DEPT. OF COMMERCE BY THE GENERAL MOTORS CORPORATION

The army can give you the tools
Fine machines and plenty of tools
But you gotta pay heed
To the use of your steel
Use your head like they teach you in the schools.



... BUT JOE, WE
JUST BEEN OVER SANDY
TERRAIN... THRU TWO
DUST STORMS... I CAN
HEAR THE JOINTS
GRINDING... THAT'S
WHY WE GOTTA GIVE
IT SPECIAL ATTENTION
LIKE IT SAYS IN THE
SMALL PRINT OF
THE LG...

EQUIPMENT... Take care of it

NOTE: IF YOU'VE
FINISHED READING,
WELL, PROCEED.



4. LUBRICATE



FROM END TO END
JOB... LIKE THE
LUBE OILS!

5. RUST SPOTS



CLEAN 'EM OFF
WITH FINE SANDPAPER
AND PAINT.

6. ELECTRICAL



CRACKED
LEADS OR
CABLES?

7. BRAKES



CRACKED BRAKE
HOSES. AAAAA!

8. TIRES



THE WORN
PIECES PUT THESE
SCREWS AND LOCK
FOR TIGHT AND
TACKLE.

IF YOU'VE
NOT CHANGED
BATTERIES
CHECK WITH
YOUR BOMB
AND SEE
IF YOU
NEED THEM
OR TURN
EM IN TOO.

9. STEERING



LOOKS 7 HARD LUBE 7
HOW ABOUT BRINDING 77

10. HEADLIGHTS



BOTH BEAM THE
GOOD TIGHT 7
CHECKED.

11. BATTERIES



IN THE 50 50
IN BELOW 12 24
GET THE BATTERY
OUT AND RECHARGE IT
IN THE BOMB
THEN CLEAN IT.





JEEP CRANKSHAFT PULLEY

Take a look at that double-Y crankshaft pulley on the 400 and 401ci 5-cyl. If the two dies are pulling apart, it means that the pulley has broken at the welds and you'll need a new one.

If you need to fix faster than you can get supplied with a new pulley, look around for someone with the time, tools, and training for the tricky job and a big, worn heat treat Ordinance support unit. Otherwise, there's a production change that can be used in the field to make the best

disc available again—they're now being welded and drilled.

Here's how they do it:

Take off the pulley and bore three 3/4" holes through the disc (Fig. 1). The holes have to be spaced just so or your pulley'll be taken out of business. Space the first hole 30° off the layaway, and make sure all three holes are in a 7 1/2" diameter circle.

Put the disc together with three 7/32" x 1 1/4" flathead bolts (Fig. 2). Tight 'em down and you've got 'em for good.



Fig. 1



Fig. 2

CONTRIBUTIONS



TORQUE WRENCH ADAPTS

Dear Editor,

Considerable trouble from blow or locking mandible gauges as well as cracked mandibles is being experienced on the MTC in the field. Most of it is caused by improper or excess torque of the mandible steel nuts.

Here's a tool (Fig. 1) adaptable to the torque wrench which can be used to get the proper torque of 20 to 25 foot pounds on these mandible steel nuts. It can be made in an Ordnance machine and welding shop.

Harwood E. Gray, OGT
H. Leonard Wood, Missouri

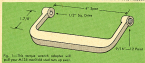


Fig. 1—This torque wrench adapter will pull your MTC mandible steel nuts up even.

CLAMMED-UP DINNERS TWITCH

Dear Editor,

Some of the boys are getting a whole heck in service now and then by waiting out the dinner twitch in cleaning uniforms. If the only thing wrong with it is excess grease and dirt in the plumbing, this will sometimes put it back in service for awhile.

Ed Isaac Harding
APO 319, New York

(Ed Note—Several gas, A-10s, & such very likely to try before experimenting a new twitch.)

TORTEN STAKE BODY HITS

Dear Editor,

Could be that the nuts on the carriage bolts that hold the body side rods and tramp seat them together on the GMC 26,000 (M20-M21) under haven't been pulled tight enough and properly sealed. It's always good to give these retaining nuts a check for tightness and make them fit place. If you don't, you might find yourself heading down the road with your stake down and your seat being pumpled apart.

For Dan R. Hagan
APO, Maryland



(Ed Note—It's good PM to check any nuts like this and with these that get a good longer around, it's some better.)

THE TWINKING LIGHTS

Dear Editor,

From being out in the weather, the message has latches on the M47 radio usually rust and stick so tight it's hard to get them to work. When people pound them with a hammer . . . more often they snap off before they give.



Fig. 1—The above shows the spot to drill for latch locking hole should be drilled.

To remedy this calamity, drill a 1/4" hole through the side of the handle directly above the spindle (Fig. 1); do this on every latch handle. This'll give you an opening for lubing the spindle and will stop the rusting and seizing. Then at your regular PM services give them a shot of oil.

If there are already frozen latches on your message boxes, after drilling the hole, blow out the metal chips, squirt in some light penetrating oil, knock No. 14-G-2815-992, let it set awhile then tap it with a hammer until it moves freely. Blow them on out loop it lubed.

L. E. Moyer
P. Box, Kentucky

Take a close look at that

57_{mm}

Recoilless rifle

(Before you take it out your backdoor)

ARMAMENT



Don't lose your head. You might if you don't read any farther. Yeah, we're talking you about an open invitation to a big blowout.

Before you pull the trigger again on your favorite M56A1 57mm Recoilless Rifle, take a closer look at the trigger's leading edge. Check those three retaining screws. Look closely to see if they are tight and haven't let the leading edge forward.

Sometimes how the force of the firing pin eventually causes the retaining shoulder of the leading edge to break off. Specially when you do a bit of dry-firing.

You can't tell this has happened unless you check things real close. When it does break, this is what happens—the leading starts to move forward—each trigger squeeze moves it forward a little more—then, 10 or 15 rounds after the break—Pow! Right in the knee.

If the leading slides forward far enough, you'll get a premature fire

as you close the breechblock.

The only sure medicine for this ailment is to check those screws every day—twice a day if you're firing a lot. If the leading rubs out of the breechblock when the screws are tight, pull for help from Ordnance.

Or you might get a successful, if not satisfying, you didn't bargain for.

here's HOW with

CONVERTING THE WORD

One day back in Ordinance Department headquarters, we were by accident made the M16A1 when we meant all your M16s. However, if you're using the manual and when he gets done working it over, it'll be an M16A1 because you said so. We'll be doing what M16A1 Ord. PART NO. 200-22 tells him to do, so he can't be too.

In the Field-B-Till-Er-Ree (and AAA)

KNOW—

**DON'T BLOW—
YOUR STACKS**

Drop your tail-gate by the stove, island, and let's swap tall-tales about short people and long guns. Things these here Old Soldiers know and don't like to give away.

Small additions, and a lot of young fellows, too, will give you some surprising information when it comes to what makes gun life



accurately. You might not have realized it, but one place where firing accuracy begins is with the guy who piles the ammo in the ready stacks.

Frumpy, unhesitating no-target military fire is not possible if you don't work what you're doing in preparing the ready stacks. Ammo must be sorted according to lots and area weights if you want quick, accurate fire.

Look out for mixed stacks. If you disregard area weights and add area weights in sorting ready stacks, you have passed up a good opportunity to minimize the difference between consecutive rounds. (That goes for you AAA throwers, too.)

the HOWITZERS

QIVE YOUR 120 THE AIR.

Don't come of your alleged military-mat when you're getting down the 120-caliber fire on your 120-howitzer when you're doing "work." Don't let any other part of an air-column, it'll get full of water from condensation and run up or down. Just use that wet or stick fire had to last it to get it off.

CARE AND FEEDING **90mm Ack Ack**



Let's face some sharp-eyed boys in the field bring to our attention some "icks" and some "otors" in Ord 7 SML D-28 covering organizational maintenance alterations for M4s, M2A1, and M2A2 all on the M1 mount.

Seeing as how organizational troops are not allowed to make adjustments of the equilibrator, both the equilibrator wrench and the equilibrator wrench guide should not be listed in the SML; so, you won't be able to get it.

The M4s lifting jack was supposed to have been in Ord 6 SML J-30, Section 5, but somehow got left out. The jack is authorized, even though it's not in the book. It's listed under Stock No. 41-J-129-32.

The piston retainer wrench and the chain terminal and operating cranks will not be author-

ized in the next revision of Ord 7 SML D-28 and Ord 7 SML D-28. You can't get universal gear taper cast, T3 or T6, either.

In the way of oils and lubricants—you'll see that oil, engine preservative (PE) is called for in LQ 9-272, even though it's not listed in the SML. Its stock numbers are: Grade 1 (SAS 100—5-gal. drum, 14-O-2370-A, 55-gal. drum, 14-O-2372-55; Grade 2 (SAS 200—5-gal. drum, 14-O-2372-A, 55-gal. drum, 14-O-2372-55.

For the hydraulic jack and recoil mechanism, oil, hydraulic, petroleum base (MIL-O-2486) is what the doctors order. For any recoil mechanism not checked after filling with the new-type oil, you check-fire it when you have Ordnance folks around to see how she works. If necessary, check-firing can be done without Ordnance folks present.



BAR

men

Control Your Gas
with the
New Improved Plug

You can now plug up your gas-cylinder troubles on the breeching Automatic Rifle with a new kind of gas-cylinder lock, or plug.

It's a new-type plug that makes adjustment a snap, without tools—even in the dark.

What's with this new jaw-dandy gadget? This improved plug has a positive spring and sliding notches that not only line-up the different gas ports but hold the plug tight when you want it.



It's simpler than the old plug, with a big, knurled turning knob that works fine in the dark or when you're wearing gloves. Since the gas-cylinder tube hasn't been changed, the plugs are interchangeable. The new assembly gives a choice of three gas ports, and these are lined up with a spring pin.

Just like other things, though—when operation becomes more automatic, care and cleaning become more important. Because of that, you have to be more careful in removing this gadget for cleaning.

A pointed-up rifle will be all you'll get if you try removing the entire assembly without taking the regulator out first—that's the piece with the knob that turns inside the body. Remember that it has to come out by itself. So turn the page and read on.

HERE'S HOW THE NEW GADGET WORKS INSTALLED



Now, first, drive out the body tank pin. This is a special little pin, one of which you're looking and look where you're there. Some have been that this is a heavy and gets almost completely disappeared from those "Flying Saucers."



After you get the pin out, the regulator assembly is taken out by turning it and pulling downward. It is placed in the middle of the tank because of certain diameter but it has tops with a rubber seal. (You can't see it) placed between it. If you haven't got a rubber, use a wooden object to make it work at several "hold-up" jobs and use that.



After you have the regulator assembly out, drive out the body tank from the tank to the gas cylinder valve and body of the gas cylinder. Your combination tool and the need to screw the body out of the tank.

THE PARTS LOOK LIKE THIS WHEN YOU FINISH



With that done, you're ready to clean the body with your gas cylinder tool and you also can get at the valve. A word of caution though: The regulator assembly, that got you took out first, is to be left together. Characters who insist on taking it apart will find themselves in the tool-boxes sling.

To get things back together, just reverse the steps you took to get them apart—make sure first thing that after the body is screwed in tight, it's backed off until the key notch lines up with the notch of the tube, directly under the bal-

ast. These D.A.R.'s can be as touchy as a Saturday night date, so this clearing business is needed to keep them in the right mood.

There is a chance, tho' that doing it too often will hurt some little parts, specially when you have to drive that tight-fitting pin in and out. Do it often enough to keep things working right, but don't do it for fun or it'll wear out.

This new stuff is made of stainless steel, so you shouldn't have too much trouble with corrosion and carbon until you fire a considerable number of rounds.

STOCK NUMBERS

For those of you who like the name, mark, and serial number, look no more. We have them right here.

Enter Data Gas Cylinder Assembly, Stock No. 7162249.

PARTS

Gas Cylinder Body
Body Key
Regulator Assembly
Body Leak Pin

STOCK NO.

7062293
7062294
7062295
7062291

SMALL ARMS DE

EASY ON THE MJO DRINK

You've got a couple choices in your 30.06-42" mortar that you should go easy with. One of them's the electric crank and the other's for cranking it. On some models they're attached—later ones have steel cranks.

If you take it easy, they'll hold up and do you a good fare but—trust, it's rough, and maybe you won't know when or just mortar's up, down, or cranked. You gotta remember—that the firing crank has to be folded in the way on the traversing wheel before you can't taking your mortar apart.

SHOOTING AN MJO MORTAR

For gods sake, kids, don't let a 42" mortar's not a saw-bull charge. Its base plate can't stand bouncing directly on logs or field drainage any more than your car.

When you put it down on soft or swampy ground and see logs of drainage for a foundation, put a layer of dirt or sand bags between the base plate and logs for a cushion effect. You'll be surprised at how many more rounds its foot-crank'll be good for.

HOW TO BE A HIT

Before you open the cover assembly on your MJO1044 or MJO1046 .20 cal. machine gun, be sure you raise the front sight. If you don't do it, it'll still draw a bead when you need it.

When the front sight in MJO is in the down position, the blade end of the sight sticks over the ridge end of the cover and the cover hits the sight blade. In addition to your big sights, a spring helps to move the cover back and hold it there. With the force of both, the cover hits the sight. It can break off the sight blade.

So don't go far. Better to be a hit than a miss. Why gamble?



LIVERS THE GOODS

BETTER THAN A TWO-DOLLAR REPEL

That old faithful hand-held pyrotechnic projector, the M6, costs more than any two bucks, but when used with the M74 Flash and Sound signal, she can be better than the proverbial \$2 pistol.

Some commands are acting to stop use of the M6 with explosive type signals, for if you're called on to fire that M74 sound-flash, check the local ground rules. A nice safe bet, if one is available, is the Pistol, Pyrotechnic, AN-566.

BLOWING YOUR SOUVENIR

After using your rifle or gas state gun, be sure to wipe excess oil from the barrel and chamber. Too much oil in either place can blow up the gun—and maybe you.

Excess oil in the chamber or barrel will raise the barrel pressure to a dangerous point, with the gas burning, it could blow the bolt, ruin your gun, and send pieces flying in your face.

A gun that's too oily also picks up grit which not only wears the barrel out of moving parts but can cause a stoppage or malfunction.

HOW'S YOUR STOCK?

Limed up? What you need to keep your rifle stock in condition. You can get new limed oil under Cat Stock No. 57-0-725.

Every time you use your rifle, wipe dampness, dirt and perspiration off the stock with a dry cloth. Once a month you might apply new limed oil. Where you apply the oil wipe off the excess and polish the stock with a clean dry cloth or the palm of your hand.

Be careful to keep the oil away from the moving parts of the rifle because it will harden and mess up the mating parts. And, if you've got a rifle with a varnished stock just wipe it clean and forget about re-liming it.

WITH SUBMACHINE GUNS WHY HAVE A BARREL THAT'S LIMP, WEAK AND WOBBLY?



You think Daim with the submachine gun—did you ever go to get your gun and find everything out there! The barrel, that is. Some PM readers have. Others have had the inspector find loose barrels for them.

If the matter interests you, and you figure loose barrel rubber springs might cause you some trouble, head on over to the first most likely cause of such an ailment.

First, the notches and ridges on the face of the rubber spring may be worn down. On the other hand, maybe the same thing has happened to the notches and ridges on the barrel collar.

If that doesn't cause the trouble, look for a rubber spring that's been bent away from the barrel collar with a wrench held the barrel tight. In a few cases, check the whole rubber spring assembly for looseness.

What generally happens is this: As time in the street gets longer or worse, letting up the rubber spring's hold on the barrel. In any case, the rubber spring doesn't do the job it was supposed to do—hold the barrel in place.

Almost all you can do about it is bend the rubber spring (Fig. 1) toward the barrel (take the barrel out for this) if it is bent in the wrong direction. Careful—just enough to make it hold tight.

If the rubber spring or barrel collar is worn or if the rubber spring is loose at the street, it's a job for Ordnance. Then the weapons crew is there for a new rubber spring or barrel or for rightening the street. They have the tools to do the job properly.

Take a spin at these if you spinners. You may catch nobody when somebody else will jump you for something. Like the old saying, "A stitch in time."

M3 .45 CAL MACHINE GUN



FIRE CONTROL



HOW'S YOUR FLOOR POINT?

Some of you Fire Control techs—especially those of us who have been leaving around positions in the good old air—have screamed here lately about point peeling on the antenna equipment. Seems as how regular paint fancies the fix, and if you don't paint, working starts and you get pretty poor detection.

Never fear, kids. If your electronic bobbies have started peeling, here's the dope you need:

To make sure to interfere with the signal, a non-metallic paint is in order, no matter. Non-metallic paint, air drying, olive drab semi-gloss synthetic enamel, No. 2420, PE TT-C200, 1 gal. can, Spec MIL-E-11851, Class A. This paint is available through supply channels from the Corps of Engineers, Stock No. 33-3475.017-100.

It's useless to use this non-metallic paint if you foul it up with just any thicker—right one is: Thinner, synthetic, enamel, TT-T-306, Stock No. 33-3-443.

Level surfaces lightly, use oil priming coat and allow plenty of time between first and second coats. This paint is special stuff, remember, so allow 18 hours after the second coat before you handle it, if you can.

On other metallic surfaces of the M13 Acquisition Antenna and to the complete T13 Acquisition Antenna, the correct paint is listed in the correct Ord T SMI-F-341. It's Kanthal PE TT-E-485, Type IV, Stock No. 33-3423.702-800. It's also handy for touching up the trailer and van body.

IF YOU GUESS RIGHT

You've a new colored light bulb coming to you for your M74 light mount for your IF-200 or other rifle. It's a new bulb for use with a new ammunition mount. With the new light bulb in place the light mount will be the M74C, M74C Ord F220-971 (Exp 53) spec. It's urgent. Your Ordnance Inventory equipment needs the job.

Stadia line articles

A RANGE-FINDING PEEPHOLE FOR SHARP-EYED SHOOTERS



PS was telling you back in #14 (on page 282) just how the reticle markings would be changed in your telescope—the one on your 37mm noseless rifle—when it's changed from the M80C Telescope to the M80F.

It was a pretty good job of showing the changes—how the stadia lines were added, but seems as how a little more explanation is in order, though, on just how you use them for more hits.

It all boils down to this—the only reason those stadia lines are in there is to give you a pretty good indication of the distance from you to your target. Look at 'em. The longer the range—the shorter the distance between the stadia lines.

The lines are spaced the way they are for this reason—the longer the distance from you to your target, the smaller the target will look. This spacing of the stadia lines is figured for a 32" target which is the average length of a tank. Half of that, or 16", is the average width of a tank.

Figures 1 thru 4 show how you

use the stadia lines to get your range.

Simple? Sure, 'cause all you gotta do is remember those three types of targets. Then you'll have the right range every time.

Wait a minute. Come back here—that's not all. Remember that what you've just done won't give you the right sight-picture for aiming. Once you get your range you must know how to figure your leads when you're aiming.

First, get your range with the stadia lines. Generally, the estimated target speed will tell you if you have to lead it and how much (2 leads for SLOW, 4 leads for MEDIUM, 6 leads for FARTY). Last, lay the correct range line (or estimated one if it is between) right along the top of the track, use the target all center the correct amount if you need it, and—*Wham! Right in the guts.*

You've got more firepower on your shoulder than a lot of the world's artillery crew carry around on carts. Use that telescope right and you can drop 'em in their back pockets.

LAY IT LIKE THIS

INCH-GRAD TARGET

If a mark is coming directly across your line of sight (parallel to you) you can avoid an it taking pretty close to 20° away. Catch it in your muzzle and drop her down that "V" of the skull line until both ends of the mark are just making an inch line. Then you can read the correct angle—like the skull mark shown at right.



HEAD-ON TARGET

If a mark is coming straight at you (ie. going straight across from you) it's pretty close to 10° wide. When you get it in your muzzle, hold it between the center-line and the skull line on your side—drifting it down one side of the "V" until one edge of the target is resting on the center-line and the other edge is on your skull line. Then read the correct angle—like the 100 yards shown at the left.



CIRCLE TARGET

There's a possibility of two different kinds of oblique, or slant, targets—those are targets coming at you at an angle from you on straight rifle zero of them like this.

If the angle appears greater than the skull, read it like a head-on target and let it touch both skull lines—like you shown at right.



If the skull seems more than the target when you look at it, read it like a head-on target. Center the leading edges of the mark between the center line and the skull line on one side—like the mark shown at left.

*DOWN through to line
*DOWN to line
*DOWN to line

ENGINEERS



DIRT-STAY CLINIC



BULL DOZER DUG UP
ALL THE

DIESEL DIRT

There's No Fuel Like Clean Fuel...
Valves and Pumps Like It.

It's no secret—a diesel will take a lotta punishment without any back talk, but one thing it can't stomach is a sliver of dirt and water in its fuel injection system.

Every operator or mechanic who's been through the mill knows that the fuel injection system is the heart of a diesel engine. Like your own ticker, it's delicate, precision stuff and it's gotta be handled with kid gloves.

The fuel injection system con-

sists mainly of a fuel pump and a fuel injection valve, or nozzle. Both have parts machined to tolerances so small that you can't even "color" them, and that's calling 'em real close—over smaller than a goat's whisker.

That's why a little dirt or water in the pump or valve can cook a diesel out faster's you can lose a buck in a crap game. So, you've gotta remember: Keep diesel fuel free of dirt and water.

DRUM BEATS

You've got a protected storage pump? Here's a simple check to check it.

| Step | What to do | What to look for |
|-----------------------------------|--|---|
| 1. Hold valve | Hold your drum in front—back and higher than front | See that valve works in the fuel grade. With enough water the valve can stay for 24 hours (Fig. 1). |
| 2. Holding drum under water | Handle drum with care | Or you'll let water leak into the fuel. |
| 3. Keep caps and things | Before you open them | See if they leak or get stuck. Use a clean rag. They are hard to keep clean, smaller and harder to see. |
| | When they're closed | Turn the caps tight—especially in the traps where water's a big menace. |
| 4. Check the bucket, pan and case | Are you're done? | Clear what you're not. It could be any kind of water. |

TRAP AND DRAIN

That sage learner who spends his time tearing a tractor apart to find out why his engine has had knocks, heavy black exhaust and misfiring, without first checking his fuel injection system, can make a lotta extra work for himself. If he's done his job, that's the first thing he'd suspect, and it's surprising how often he'd be right. And the root of the trouble, in all probability, is contaminated fuel.



Fig. 1. Fuel traps store water and dirt. It doesn't run and it burns fuel in there.

Remember those close tolerances we were talking about? Now, when foreign matter in the fuel gets into the fuel injection pumps and valves, it'll grind away on those very hard-ground surfaces. And, it won't be long before you have irregular engine operation—like hard starting, knocks, misfiring, loss of power and heavy black exhaust.

Water in the fuel causes corrosion of these precision parts and you get pretty much the same effect as dirt on pumps and valves. Most diesel fuel injection systems are made so they'll stop a lot of the water and dirt before it gets into pumps and valves.

Under the fuel tank you'll find either a sump trap or sediment bowl which you ought to drain daily before the machine's started. Be sure to do it after it's been idle for some time—to give the sedi-

ment a chance to work. If dirt and water get by this point, they can be eliminated farther along the fuel system by draining your filter and replacing them—when necessary.

If you think the fuel's contaminated, the best thing to do is to drain the sump trap or sediment bowl first—until the fuel runs clear. Then close the trap or bowl and turn over the main engine with the starting engine (if you've got one) and open the filter drain. By holding your hand under the drain and letting the fuel drip into it, you can usually tell when the fuel is running clean.

But, when too much water gets into the fuel, or if the trap and filter aren't drained regularly, they'll fill up and the water'll get into the fuel injection pumps and valves. You can tell when you've reached this fuel-up because, once fired out of her, the engine will stop running. Then—you're stuck. About all you can do is drain the whole fuel system, from the tank to the engine, including the fuel

filters, to get rid of the water.

In bearing weather, water in the fuel injection pumps and valves may freeze and block 'em up. Ice can damage the injection system.

VALVES AND PUMP

After you do everything to keep the fuel and the fuel system clean, and the engine still spits 'n sputters, you better run a suspicious eye over the fuel injection pumps and valves. Take a gander at their fuel-line connections. Loose connections or leaks in the line will cause poor cylinder firing.

When you install a new fuel-line, be sure to use the right replacement line for each cylinder, since each line has a different shape. The shape has a lot to do with the way the cylinder works. If you take a line designed for one cylinder and try to shape it to fit another, you'll wind up with a misfired engine. Like trying to make a jeep do the work of a 2½-ton truck.

Pump and valve connections OK? Then try this simple test: Run the engine at its worst (when you get the heaviest knocking, most smoke or least power). Cut off each cylinder's fuel supply by loosening the fuel-line nut or stop-plug (something like you find the firing on a gasoline engine by starting out the spark plugs).

If loosening the fuel-line makes no difference in how the engine



runs, it means either the injection valve or the fuel injection pump for that cylinder is not up to snuff—that is, if the engine's mechanically OK otherwise (Fig. 2).

Now the big question is: How do you tell whether it's the valve or the pump?

Here's how: If your diesel has a fuel injection system with injection valves as separate units (they get high-pressure fuel through a line from a separate fuel injection pump), make this test. Take loose the fuel-line from the injection valve and take the valve from the cylinder. Then reconnect the valve



to the fuel-line, crank the engine at low engine-starting speed and open the throttle. If the injection valve is in good condition, it will give a fine, even spray.

Be careful not to heat fuel lines out of shape when testing...and brush off dirt around the valve before taking it out.



If this test shows that the injection valve is in good condition, the valve and fuel injection pump are probably OK, and the trouble lies elsewhere. But if the injection valve gives an uneven or irregular spray, or if it drips, you can bet the valve is bad.

Replace this suspected valve with a new or reconditioned valve and repeat the test. If the spray from the new valve is the same as the spray from the old one, then the fuel injection pump is likely bad. Replacing and servicing the pumps is real complicated. So, look that job to higher echelons for repair.

If you have a fuel injection system where this injection valve spray test can't be made, try replacing a suspected valve with a new valve. If the cylinder is still bad when other valve is used, the pump's likely at fault.

In any case, whether it's the valve or pump, it's the higher echelon boys who have the savvy and equipment to do the job right.

Conrad Rodd's BRIEFS



Hydraulic Transmission MTC's

Your GMC 2½-ton 26-series truck will get relief from some of her automatic transmission troubles from Onbman support. MTC's Cud Q219-M3, M3, M4, M5, M12, and M13 will be used to pack up her shift. And before this happens, maybe you should check to see if you've done all you could to help—MTC Cud Q219-M4 is March 53 and M3 Q March 53 may be just what the doctor ordered for your trouble.

Tain's gears

Some fellows will try anything—even try to get out a screw that's been broken in a weapon. If you come across a screw that has the hood "cut" to the place with a punch or chisel blow, keep

hands off, because that part of the strip goes to Onbman maintenance people.

Plastic's tough, but—

If you're using the plastic handle of your hammer for a hammer or maybe playing mandibary-pug with it, take it easy—you might break that handle. Some guys go for the plastic handle. When you're sportin' one, watch how you hit—you could get splinters.

Flying prop shafts

Be sure to check the propeller shaft. Bangablocks on all your new 1961 26-series transport vehicles. So far there's some around with bolts only finger tight—better tighten 'em before a shaft comes flying up into the cab.

Perc's how it is... about army aircraft

Let army work in the main Army, M. Higgins has to know—to know you with "technical, preventive maintenance information on all items of Onbman and Engine equipment." That's what it says and that's what it means. So... M. Higgins will be the first of the army it's got for Onbman or Engine equipment. He'll be the first of the army it's got for Onbman or Engine equipment. He'll be the first of the army it's got for Onbman or Engine equipment. He'll be the first of the army it's got for Onbman or Engine equipment.

That's all that's to be done, and that's what M. Higgins will be the first of the army it's got for Onbman or Engine equipment. He'll be the first of the army it's got for Onbman or Engine equipment. He'll be the first of the army it's got for Onbman or Engine equipment. He'll be the first of the army it's got for Onbman or Engine equipment.

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