

ARMY MOTORS

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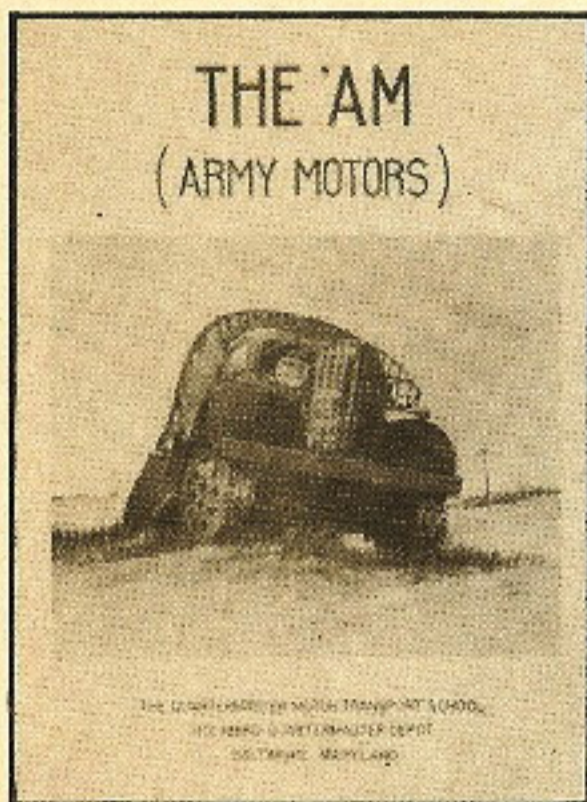


W. H. Sherman

It's Our Birthday—But You Take the Cake

Have a look at a museum piece—the cover of Volume 1, Number 1, of ARMY MOTORS magazine.

When that first issue was published, only a handful of us had ever tackled a maintenance job on an Army vehicle. The duck and the weasel were



Vol. 1, No. 1: 400 copies
Vol. 6, No. 1: 200,000 plus

just a couple of characters in America's wildlife. The jeep was a gleam in some engineers' eyes. The few trucks and tanks and self-propelled guns we did have were strictly pre-war.

April 1940 was still the pre-war era, far as we were concerned. The draft was half a year in the future. Pearl Harbor was twenty months away.

But the Germans were already warming up their transport planes for the invasion of Norway, and the Wehrmacht was primed for its whirlwind campaign in the West. Dunkerque was only eight weeks off. The Luftwaffe was soon to blitz the U. K.

Torrents of history and hell have gone over the dam since Volume 1, Number 1, of ARMY MOTORS was put in the mailbags at Holabird.

The fighting vehicles we needed have been designed and delivered. We (millions of us) have driven and maintained them through the training camps and maneuvers—through North Africa, Italy, and Iran—through France and Belgium and Holland—deep into gutted Germany itself.

We've rolled them out of the LST's onto a string of Pacific beaches, right up to the Japs' front yard.

We've preached and practiced preventive maintenance every rugged mile of the way. For in no other way could our vehicles have brought us so far and so fast toward our final objectives.

As lower-echelon mechanics of world security—performing the preventive maintenance of peace—may we all do as well.

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ARMY MOTORS MAGAZINE is printed monthly with the approval of the Bureau of the Budget, Executive Office of the President. It is published in the interest of organizational maintenance by the Preventive Maintenance Branch, Maintenance Division, Office, Chief of Ordnance-Detroit.

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New Lightweight Radio Antennas

antennas are to replace your present antennas on a **maintenance basis only**—like when the mast base on your M8 armored car gets broken. Then you go ahead and order the whole new antenna system for the job. You've got to install the **whole** new system—parts of the new can't be used with parts of the present system. That is, the old and new systems are interchangeable in whole, but not in part. They use the same $2\frac{1}{8}$ "-diameter hole in the vehicle for mounting.

There isn't room to print all the dope in the bulletin here—so pass the word to your nearest SC officer and get it from him. Ask for SB 11-52 (19 Jan. 45).

As you go gallivanting up and down the terrain in your radio-equipped vehicle, do you find that whipping action plays hell with your antenna? Do you suspect that the present antenna could be built a lot smaller and lighter? And have you been looking around for a really good way to waterproof the antenna so water won't come trickling down over the mast base and onto the radio set?

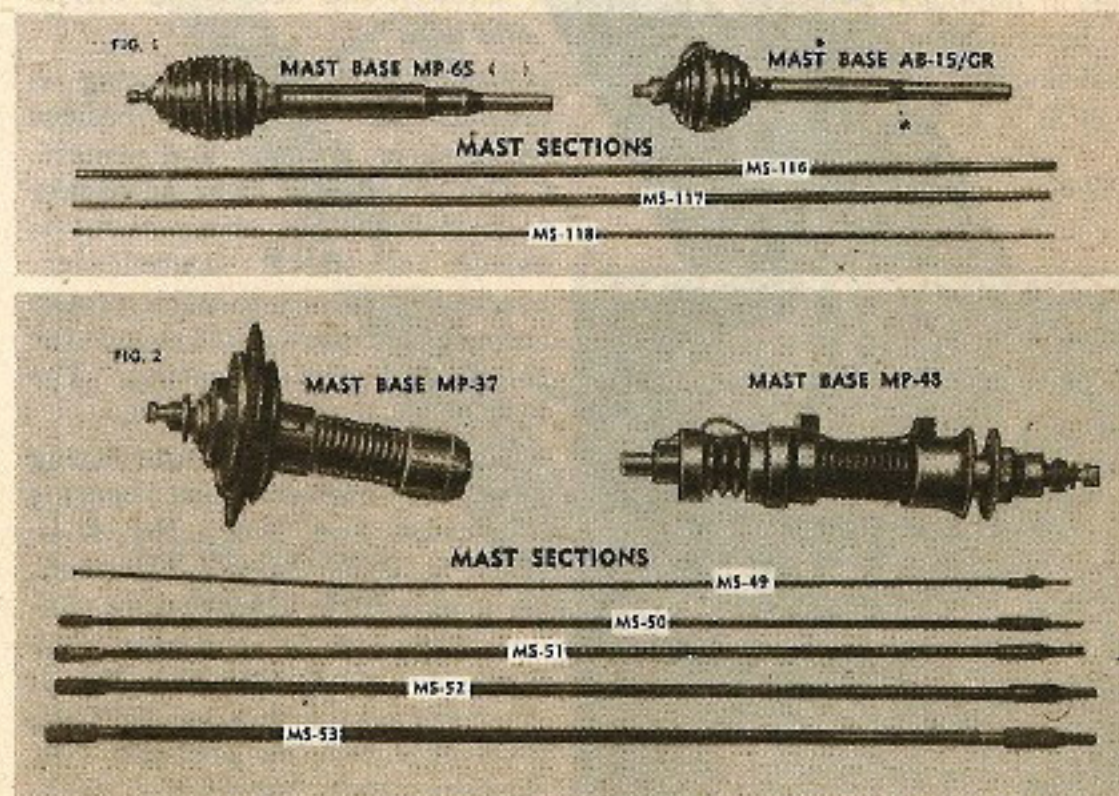
All these problems, and a couple of others you can add at your leisure, bid fair to be solved by a new Signal Corps Supply Bulletin, SB 11-52, which offers "Lightweight Antenna Systems for Vehicular Radio Sets."

These new antenna systems are now available for practically every vehicle radio set you can think of and a few that you can't. They are designed to be waterproof—there's a rubber grommet where the base fastens to the vehicle. They are shakeproof—the shaft just above the porcelain on the base consists of strands and windings of piano wire which gives plenty of flex. Finally, the new base and mast sections are a lot smaller and lighter than the present antenna components.

The new mast bases are **MP-65**

and **AB-15/GR**, using mast sections **MS-116, 117, and 118** (Fig. 1). **MP-65** replaces the present **MP-37** and **57** on your vehicles; **AB-15/GR** replaces **MP-48**. The new, lighter mast sections, **MS-116, 117, and 118**, replace the present **MS-49 through 53** (Fig. 2).

Caution: This bulletin is not the ticket for you to rush out and order new antenna systems for every vehicle you "own." The



The old (below) and the new streamlined jobs (above).

2
HEEYAR! . . . GETCHA NIZE FRESH

2nd-Echelon Bearing Packer

KEEPS YOUR BEARINGS
GREASED RIGHT—AND
YOUR HANDS LILY-WHITE

Most mechanics will agree that once you use a bearing-packer you'll never be happy with hand-packing again.

But some 2nd-echeloners have been going along getting their mittens all greasy with hand-packing, blissfully ignorant that ORD 6, SNL G-27 entitles them to a jim-dandy little bearing packer (Fig. 1) plus a low-pressure lubricating gun to use with it.

Any bearing packer salesman will tell you (and this time it happens to be a fact) that you can't

Fig. 2

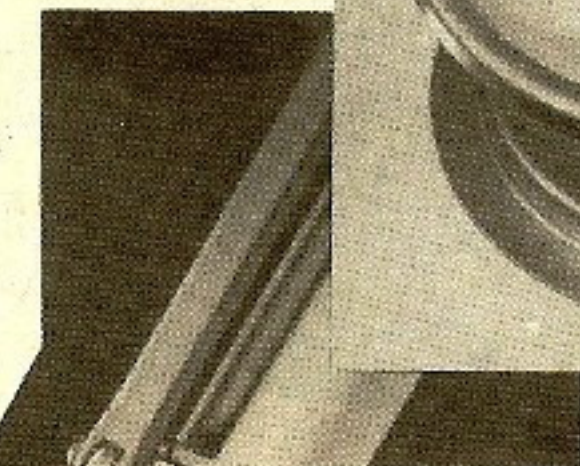
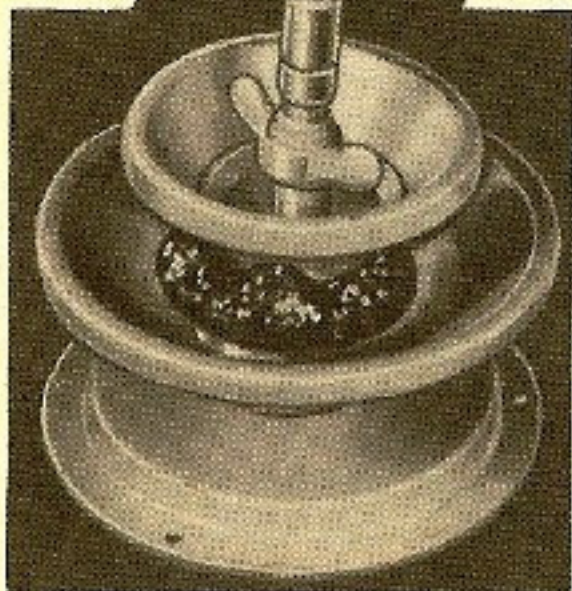


Fig. 1

really do a job of cleaning the dirt and old grease out of a bearing—and repacking it—with only the use of your nekkid hand. Some dirt will lurk in the far corners of the bearing and come out after dark to scratch and score the rollers and balls.

Furthermore, hand-packing is old-fashioned—a packer, besides being surer, is faster and neater.

This particular bearing-packer we're licking our chops about is called for short: "Lubricator, bearing, portable, to pack proper amount of lubricant around the rollers and balls of bearing." The Fed. Stock No. is 41-L-1620.

The low-pressure lubricating gun "for use w/wheel bearing lubricator, Fed. Stock No. 41-L-1620," is Gun, lubricating, hand-lever-operated, low-pressure volume type, 15 oz. capacity, Fed. Stock No. 41-G-1330-65. (Or, if you can't get this gun, ask for Gun, lever-operated, low pressure, 1-lb. capacity, Fed. Stock No. 41-G-1330-75.)

Both pieces of equipment are listed in ORD 6, SNL G-27, Section 2, under the 2nd-Echelon Tool Set No. 1. They also come in 2nd-Echelon Set No. 2, although it doesn't say so in G-27 (correction will be made in the next revision of same. The alternate gun is listed in ORD 5, SNL K-3).

Incidentally, these photos don't show the same packer as is shown in the pictures in G-27. What you see here's the latest model.

Fig. 2 shows how the bearing packer is used. Don't be alarmed, when you get yours, because the upper cup is shaky on the threads. It was designed that way so that it automatically aligns any bearing you put into the packer. Also note the grease fitting on top of the thumbscrew. As you can see, that's how the grease is forced in.

The packer is easily cleaned with a little solvent, and as you can guess by the little holes in the bottom flange, it can be screwed onto a convenient place on the shop truck with wood screws.

Might add that you can also use the regular high-pressure lever-type grease gun (in vehicle tool sets) with the packer. Only this is, it takes a lot more strokes of the gun.

A NEW HIGHER-TYPE GMC Clutch-Pedal Floorboard Bumper

When your 2½-ton GMC clutch-diaphragm spring breaks, you can generally hang it on too much pedal travel and wrong free-travel adjustment. Free travel (measured by hand from the footpad to where the clutch starts to disengage, as shown in Fig. 1) should, of course, be set at 2½" until the adjusting nut reaches the end of the adjusting-link threads. After this, you can still operate the clutch until free travel is down to 1", when it's time to install a clutch-driven assembly with new facings.

But here's the joker. Even if you're sure the adjustment is right, it still might be wrong. What can fool you is the clutch-pedal bumper under the floorboard (put there to stop the pedal from hitting the floor from below). The clutch pedal can slip off this bumper when your vehicle's steeplechasing over rugged country. Besides, it wears away (if made of felt) or gets knocked off. Any of these things'll let the pedal extend farther above the floorboard than it should. The way this clutch works, the farther the pedal travels, the more the spring is bent. As a result, this increased pedal travel overworks the spring and it cracks. Ordinarily, the bumper limits pedal travel by ⅝". When it doesn't, the pedal free-travel is thrown out of its proper position, which'll overflex the spring, too. (Incidentally, another way to protect that clutch spring is to watch the pull-back spring attached to the release fork, and replace it if it weakens. Because if this spring doesn't have enough tension to hold the pedal on the bumper, it'll also affect the adjustment.)

Anyhow, the way it looks now, the amount of pedal travel might be more than this spring can take even when the bumper's in good shape. So in order to cut this

Clutch springs are breaking because the old bumper sometimes lets the pedal travel too far. Replace it with this better one.

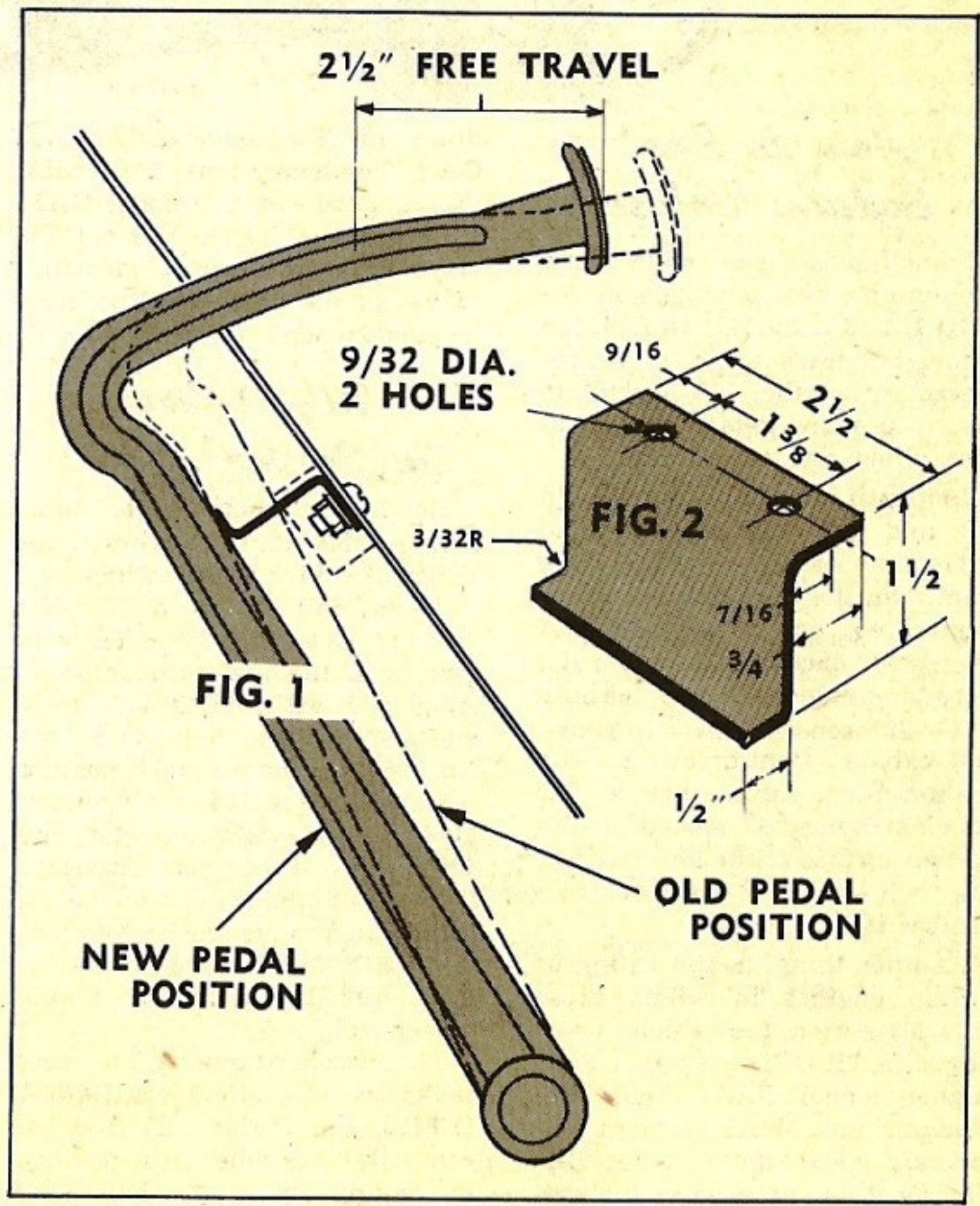
travel, a new-type steel bumper, 1½" high (the old one is ⅝"), is being installed at the factory. You people should make this same change on all your CCKW-GMC's, too. Replace the old bumper with the new type as soon as possible (TB ORD 250, 3 Feb. 45, blesses this modification).

It'll be stocked under the following parts numbers:

	Official Stock No.	Mfr's Part No.
Floorboard Bumper	3500-2205546	GM-2205546
2 Bolts	H101-01-91879	GM-191879
2 Nuts	H001-41-35761	GM-142247

Meanwhile, if you can't get hold of this bumper, don't wait around—because you can easily make your own. It's in the shape of a bracket 2½" long x 1½" high (see Fig. 2). The manufacturers are

(Continued on page 28)



Connie Rodd's Bulletin Board



How to Spot Sodium Valves

Something's been added and something's been changed in TB ORD 134 (3 Aug. 44). In fact, the whole bulletin's about to be replaced by another TB—partly to give you more details about sodium-filled exhaust valves.

In identifying the valves, the old TB told you that sodium-filled valves have a much larger valve stem than the ones that aren't sodium-filled, but didn't add that there's an exception to the rule: Ford tank-engine valves have only .001" difference between intake and exhaust stem-diameter. The sodium-filled valve, though, has an identifying "S" etched on the curved surface at the lower end of the stem—so you'll know it when you see it.

Another thing, in the listing of in-line engines in which these valves are used, the vehicles mentioned in TB ORD 134 under Ford engine, model GAA, should be: Medium tank M4A3 and gun motor carriages M10A1 and M36B1. The Ford engine used in the me-

dium tank T23 is model GAN, not GAF. The heavy tank, T26-series, uses a Ford engine, model GAF.

Everything else in the old TB stays the same—you still toss the valves in the briny blue or bury 'em deep when they're done for.

What's New In Tank Clutches

How's your memory for numbers on M4 tank clutches? Not so good? Why worry when you can find most of 'em in TB ORD 213 (12 Oct. 44). This TB also gives you the lowdown on servicing and adjusting the new master-clutch assembly (Ord. Part No. 7067270) for your M4 medium tank, your M4 w/105-mm howitzer, M4A1, M4A1 w/76-mm gun, and 105-mm howitzer motor carriage M7. This clutch will soon be installed in production on all Continental R975-C1 and R975-C4 engines needing a clutch in the power train.

The clutches now used in these tanks carry Ord. Part Nos. D47534, D78123, and 7067347. D47534 becomes D78123 when it's modified by adding ventilation holes and

coaxial release-bearings. A few of the D78123's were even further modified by positive plate-separators—shown on page 4 of the TB—and they'll carry Ord. Part No. 7067347 (still with me, audience?). As long as spare parts are still around for the build-up of any tear-down, you can keep on using these clutches. But when the parts run out, you'll have to requisition master clutch 7067270, which can be interchanged with your old one as a complete assembly. Don't requisition yet, though—they aren't available. Watch for further word in ARMY MOTORS.

The TB also gives you the dope on removing and replacing the aforesaid clutch.

Zenith Carburetor Idling Fix

If the carburetor on your vehicle is a model 29 Zenith and the engine gives out with some peculiar idling, it could be the carburetor's fault. But don't rattle it off and throw it out until you've first given the engine a preliminary once-over.

Take a look at your distributor ignition-points and spark-plug gaps to see if they need cleaning and adjusting (if the points are in bad shape, replace them). How's your ignition timing? Are all the manifold and carburetor flange-nuts tight? Also, make sure the manifold-heat-control-valve setting is adjusted for the climate you're in.

Now, if your engine's idling is still off the beat, check the compression on all cylinders by removing the spark plugs and cranking the engine with the starter when the engine's hot and the throttle's wide open. Then measure your valve-tappet clearance—all this according to your vehicle's TM (or TB ORD 205—see the January ARMY MOTORS). If you can shanghai somebody with an ignition-circuit tester, have him check your coil and condenser.

If you haven't put your finger on that idling trouble by this time, you can probably blame it on the carburetor. Hand it over to the higher-echelon boys who can carry on from here—like this: Uneven idling often comes from a too-high carburetor-float setting. Test it with a float-setting gage (Fed. Stock No. 41-G-194-800) to see whether it's absolutely accurate. Then, while the bowl cover's off, remove the vacuum-piston-rod-pump assembly. If there are deep scratches, nicks, or grooves on the vacuum piston, or if the plug in the top of the piston is loose, replace this assembly if you can. Either a damaged piston or loose plug'll allow air to bypass the piston into the manifold, resulting in lean mixtures. Then you'll get spitting and snarling in the carburetor when you speed up, together with bad idling. If you can't locate another vacuum-piston-rod-pump assembly, and your trouble is due only to a loose piston plug, it can be easily repaired (according to TB 9-1826C-1, 27 Dec. 44). Press the loose plug $\frac{1}{8}$ " into the piston head (Fig. 1). No farther, though, because it mustn't touch the pump connecting-rod. Then solder the plug in this position. So you don't stop up passage "A" (Fig. 1 again) while

you're doing this, stick something like a toothpick in this passage. If you do accidentally plug it up, it can be opened with a .039" drill. Another thing—before replacing the bowl cover, see that the bowl-to-cover gasket holes and the bowl-cover holes are exactly the same size and fit together perfectly.

After finishing the job, you should find that all this loving care has persuaded your engine to idle with a steady, even purr.

Afterthought on Sprocket Tightening

In February I told you a neat way to tighten final-drive sprockets on M4-series medium tanks by taking a chisel and pounding a groove right around the sprocket, $\frac{1}{4}$ " from the hub. But I forgot to say it ought to be done with a long-handled **blunt-nosed** chisel—that makes the best kind of groove for this trick. Besides that, it's definitely a good idea to put a board or piece of metal underneath the sprocket before you do any swaging with the chisel. Otherwise, the impact from the hammering will be taken up by the capscrews and there mightn't be any threads left on 'em when you get through. See?

Wet and Dry Stowage

People keep asking me what's the meaning of "wet" and "dry," the way you see it in vehicle nomenclature sometimes.

Both terms are used to describe the way ammunition (usually

75 and 76-mm) is tucked into tanks. "Wet" means that the shells are stowed in a rack surrounded by sealed containers filled with non-inflammable fluid. The stowed shells don't come in direct contact with the fluid—which is called Ammudamp, by the way. It's a special solution that keeps fire from spreading in the ammunition rack by dousing it almost before it gets started. There are several types of "wet" stowage racks, usually rigged up under the tank's floorboards right behind the driver and assistant driver.

"Dry" simply means that the shells are loaded into racks not protected by any "fire-fighting" liquid. These racks are usually stuck up in the right or left front-ponson, where the heavier metal hull shields them from enemy action.

P. S. on Lube Orders

Right now there are two places to shop for Ordnance-materiel lube orders—Fort Wayne Ordnance Depot for the old type, and the AG depots for the new card and decalomania type. What you want determines where you go for it. The latest lube order available (the one with the latest date) is what you want, of course, and that's listed in the Lube Order Department of the latest FM 21-6.

AG depots have their first batch of the new type, and they'll be getting a lot more in the next thirty days. You can pick the AG editions by their numbering system. Like we said back in February, their numbers are based on the TM numbers for the vehicles

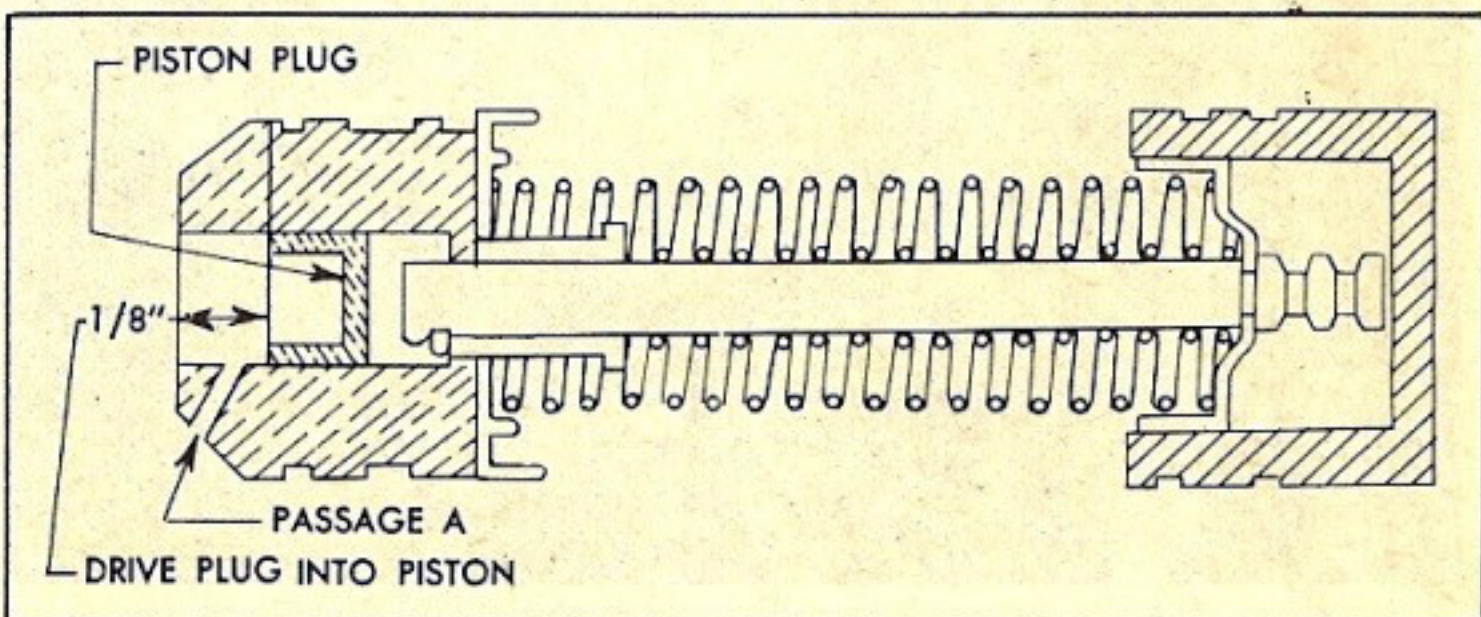


Fig. 1—A loose Zenith carburetor piston-plug can be repaired with a little solder—so little you don't stop up passage "A."

or whatnot. For example, you look in the latest FM 21-6 under Lubrication Orders to find what's what on the ¼-ton 4x4, and you find LO 9-803 (30 Jan. 44). That's the baby the AGO has got, and if you haven't got it, don't be bashful about requisitioning same. Distribution of the new type is automatic from the AGO, but the one ear-marked for you **could** get lost in the mail or the shuffle. When it comes, fold it up to fit into your copy of TM 9-803—and don't forget it's there, 'cause instructions in the LO are mandatory.

Fort Wayne has the situation well in hand to take care of your needs until the new type is available—if you'll let them know what you need. Until the new-type cards are available in AG depots, they'll supply Ordnance-material lube orders (numbers 1 to 1000 not preceded by "LO 9-"). Old-style lube orders **aren't** issued automatically, and you'll have to requisition those you need. So if you find a number like "106" listed in FM 21-6 for the 105-mm howitzer motor carriage M7, **that's** what you ask Fort Wayne for—and use it till you see LO 9-731E (number for new-type LO for this vehicle) listed in FM 21-6. Then ask the AGO for that one, if they

haven't already sent it to you.

If you're on the ball, you'll take a quick look at FM 21-6 each month when it comes in, to see whether you've got the latest available lube orders for your vehicles and equipment. What you haven't got, you'll order and use—and when it's worn out, ask for another (the new card-type is expendable).

ARMY MOTORS will keep on listing the newest lube orders for vehicles and vehicular equipment in "The Month's Directives"—but there are lots of things besides vehicles that crave grease and oil.

Tank Fuel-Filter Shut-Off Valve

If the fuel shut-off valve on your M4A3 medium tank and M36B1 90-mm gun motor carriage won't shut off like it should and dirt and rust have accumulated in the fuel tank, there's no time like now to do something about it. Better had, too, in case you have to remove the fuel-filter bowl for cleaning during a blackout. If you can't be sure the fuel's completely shut off, you might suddenly discover there's no longer a blackout on account of the fire started in

your engine compartment.

TB ORD FE29 authorizes you to install your own shut-off valve on the fuel filter. Requisition: Valve, siphon type, ½" (Item Stock No. G104-1827110), and Close Nipple, ½" (Item Stock No. H0000270020).

Take off the fuel filter and remove the brass 90° elbow (Item Stock No. G104-03-02037). Pulling off the elbow is tough to do, because it's stuck to the filter with sealing compound—but it'll give you a chance to exercise those manly muscles. If you put the filter in a vise you'll be able to get a better grip on the elbow with your wrench.

This done, insert the close nipple in the filter (Fig. 2). Then screw on the valve. (You can save the nut and rings that came with it, because you'll use the same nut and fitting that came off the fuel line.) Then reinstall the filter in your tank. Tighten everything up and you're all through.

In an M10A1 3-in. and M36 90-mm gun motor carriage, the job's even easier—you don't have to take out the filter. Just remove the brass elbow and install the valve and nipple.

Slippery Thin-Film

SOP in the Pacific right now is to give further protection to amphibious vehicles by slapping a coat of Compound, rust-preventive, thin-film (Fed. Stock No. 14-C-507-10; 5-gal. can) right over the paint on the bottom (outside only) of the hull. Does a great job of corrosion preventing.

It's not advisable to give this same treatment to the upper parts of the hull because the thin-film preservative stays soft in hot weather and is pretty slippery. I'm just mentioning this so's you don't get over-enthusiastic and start slapping thin-film all over the works. Matter of fact, to make the upper or walking parts of the hull even less slippery, you can use the non-skid paint they're now putting on the duck. This is Enamel, non-skid, olive drab lusterless (Fed. Stock No. 52-E-5750; 1-gal. can).

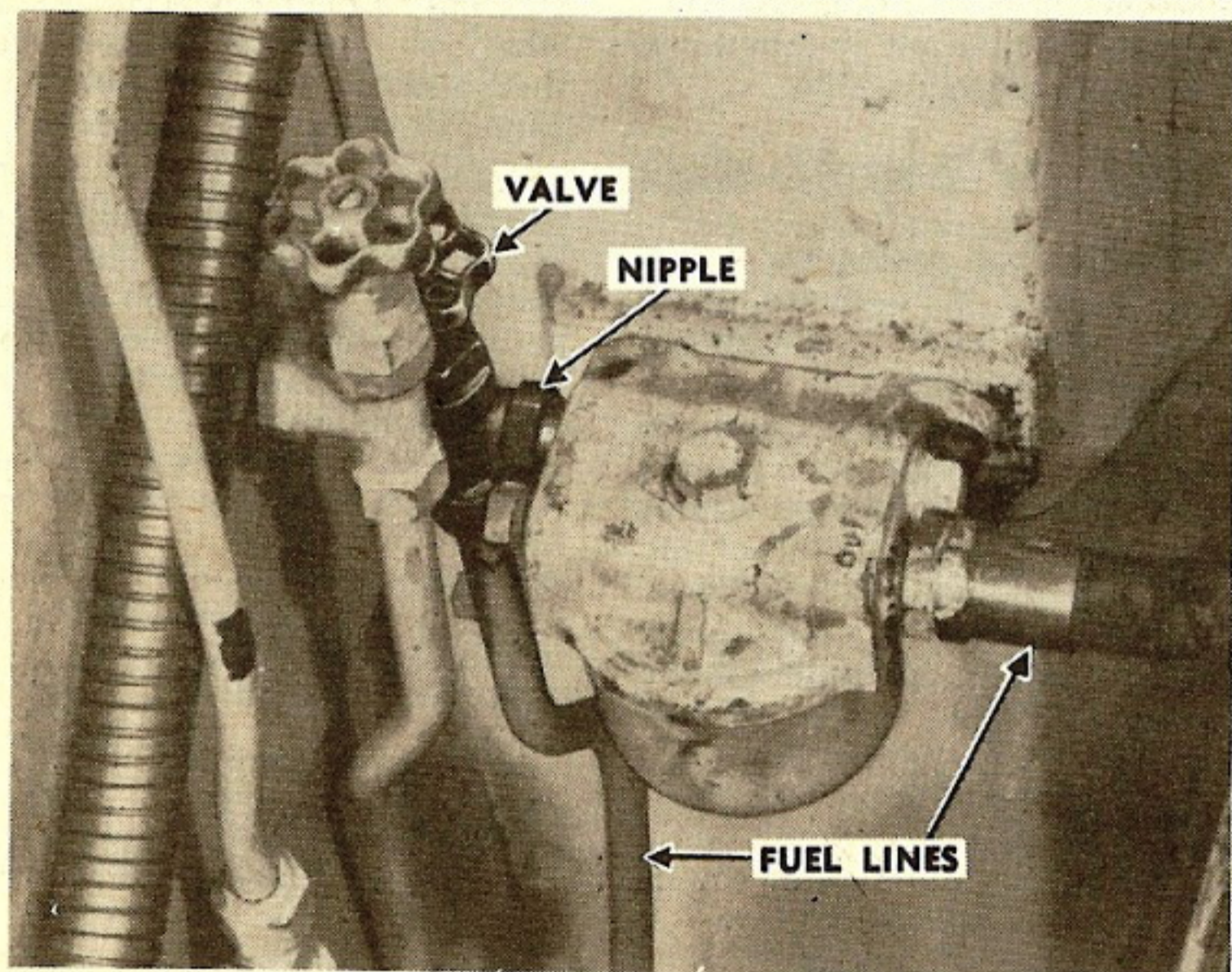


Fig. 2—Fuel-filter shut-off valve. Fuel line at left leads to the multiple valve and line at right leads to the fuel pump.

THERE ARE 2 KINDS OF M4 TRACTOR

Torque-Converter Leaks

One you can stop and one's gotta go off to Ordnance. Do this to find out which.

Any man who knows and loves his M4 high-speed tractor can tell when her torque converter has sprung a leak. The Diesel fuel in her converter goes down—and where it goes is into her transmission or out through her torque-converter pump. But any man who knows and loves his leisure won't fling the converter up on his shoulder and go paddling right off to Ordnance for help—not if he can help it. And in most cases, he can.

What usually happens is that a tiny grain of sand or crumb of dirt gets lodged between the ground surfaces around the hard-carbon seals, or behind the lip of the seal retainers, and holds them open enough to let the fluid gush forth. To find out whether that's your trouble—and to fix it if it is—the following procedure is strongly recommended:

Disconnect seal-drain line "B" (Fig. 1) at the tee below the torque converter, and raise it along the fluid-reserve tank so its open end is higher than the fluid level in the tank. Wire it up like that (Fig. 2).

Disconnect seal-drain line "A" (Fig. 1) at the tee likewise, and let it drop down into a clean can or similar receptacle (Fig. 2).

Disconnect nipple "D" (Fig. 1) from the torque converter. In its place, insert another seal-drain line ("C" in Fig. 2) which you've borrowed or found somewhere—and let that one hang down into another clean can. Better fasten both cans with wire to hold them in place during what follows.

What follows is that you lock the M4's brakes in the applied

position and put the tractor in high gear. Then, with the driver in there to watch the brakes and gages, run the engine at 1600 rpm's until the temperature hits about 230° (the torque-converter pressure should be 45 lbs.). Keep

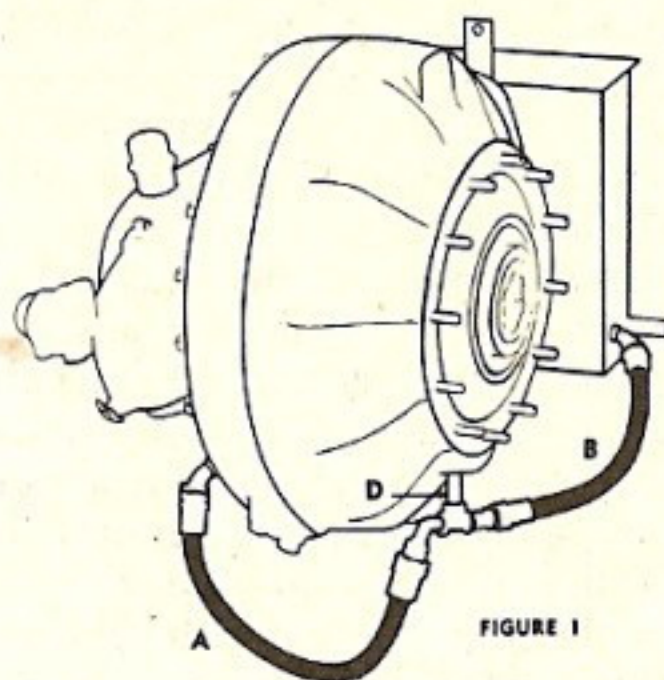


FIGURE 1

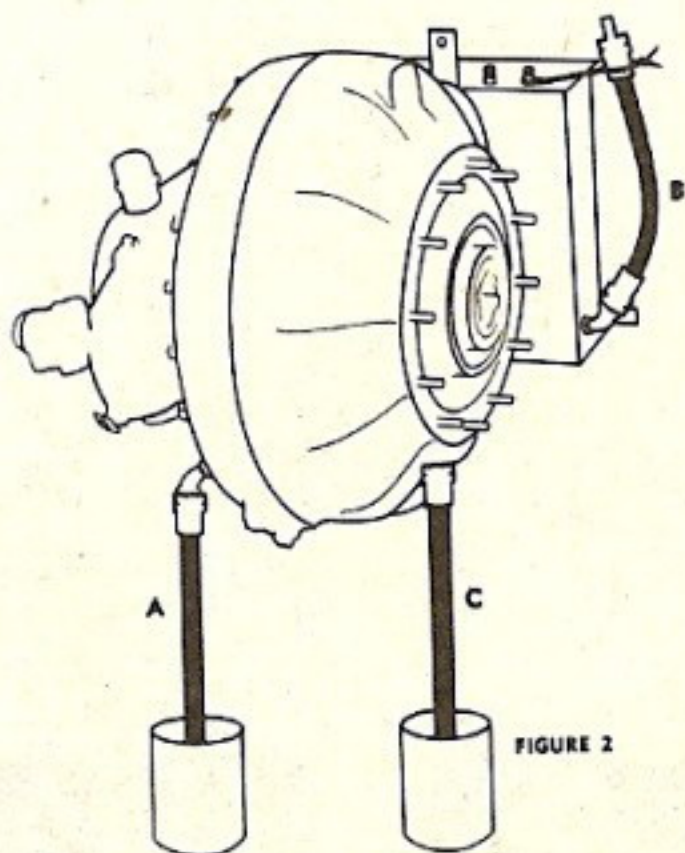


FIGURE 2

her going this way for 10 minutes, then cut down to an idle—enough to turn over the torque converter—for another 5 minutes. Then shut her off.

If your leak was a higher-echelon headache, you'll sure know it by now. Chances are that the leaking suddenly stopped soon after you started the test—because this operation should force out any dirt or sand around the seals

and plump them firmly in place. You can't make 'em leak after that.

Just to be doubly sure of yourself, drain and refill the torque-converter system, empty the cans (if they've caught some fluid), and leave the seal-drain lines hanging in the cans overnight. You won't hate yourself in the morning—because by repeating the above engine-running test at that time, you'll know positively that your leak was a pushover. If you find less than a teaspoonful of fluid in each can, it's been cured.

After the second test, remove the extra seal-drain line ("C" in Fig. 2), clean out the other two and the tee (for two), reassemble as in Fig. 1—and your M4 has ceased to be a drip.

Another thing you better do is drain and refill the transmission or the torque-converter pump, whichever has had Diesel fuel leaking into it and diluting the lube.

To keep all this from happening again, your best bet is to watch out for dirt every time you fill the torque converter. Wipe your container and the filler opening spotless before you begin. Also, as ARMY MOTORS mentioned in March, keep checking your pressure-relief valve and the fluid filter in the radiator-overflow return-line. See that the pressure-relief-valve piston has at least .005" clearance (TB ORD FE27), and that there's no debris clogging it or the fluid-filter element.

If you ever do have to yank out your tractor's torque converter and bestow it upon Ordnance, make it a point to seal up every opening—large and small—with masking tape or the like. Too many converters have been winding up on the scrap heap because sand and/or water got inside whilst they were awaiting repairs.

8 TWO TIPS TO END ALL U-Joint Aggravation

GIVE THE UNIVERSAL JOINTS ON YOUR
2½-TON A LONG LIFE AND A MERRY ONE
—WITH MORE GREASE AND LESS MUSCLE

There are just two things that ruin 99-44/100 per cent of all propeller-shaft U-joints on 2½-ton 6x6 trucks. If you know what they are and correct them, most of your U-joint troubles are over.

The first thing is that grease does not get out to the bearings on the ends of the U-joint cross. The second thing is that the U-bolt nuts are easily and often overtightened.

Grease not getting out to the bearings is now taken care of by the new high-pressure relief valve which was advertised loudly in December. These new valves replace the original low-pressure relief valves in the middle of the propeller-shaft U-joint cross on all 2½-tons.

To get a true-to-life picture of

this trouble—and how completely it can be cured—take a gander at the Fig. "A" in the Fig. shows a U-joint which was lubricated with the original low-pressure relief valve in the middle of the cross. Grease never got out to two of the bearings on the ends of the cross—they're bone-dry and full of rust. Furthermore, the needles are cocked and have worn grooves in the ends of the trunnions (more about this in a minute).

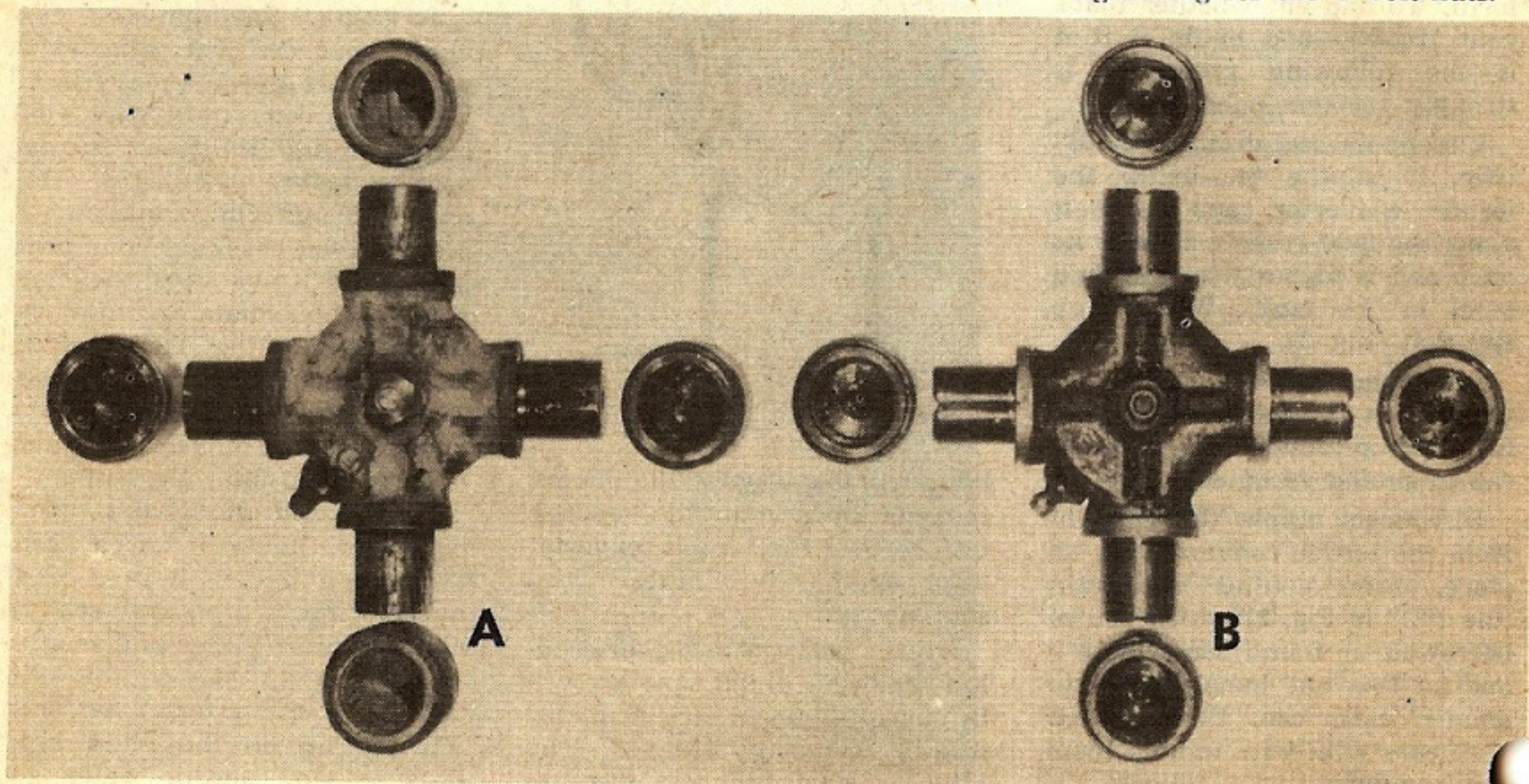
On the other hand, look at "B" in the Fig. Note the bright and shining face of the bearings and trunnions. The new high-pressure relief valve used in this joint stayed closed till enough grease got out to the ends of the cross and soaked the bearings.

The name, rank, and serial

number of the new valve are: Valve, lubricating, pressure-relief, 1500 lbs., 1/8", 27 NPT male, short, Fed. Stock No. 45-V-18129-3. It's listed in ORD 5, SNL K-3.

The second big cause of trouble—overtightening of the U-bolt nuts of the U-joint—is something that'll happen every time a man, who doesn't know a little secret, goes to tighten these nuts. The little secret is that 20 to 25 ft.-lbs. torque is right for tightening these U-bolt nuts. A little more muscle—10 or so ft.-lbs. more—and the U-joint is on the way to ruin. What happens is that a greater bind is put on the lower part of the bearing where the U-bolt hugs it—which gives the lower part of the bearing a tighter little circle to run around in, while the upper part is running around looser in a larger circle. You can see the result in "A" below: The needles are cocked—being cocked, they can't roll—so they just stand there and pound diagonal grooves in the ends of the trunnions.

Two things are all you have to do to end your propeller-shaft U-joint troubles: One, get those high-pressure relief valves in there. Two, spread it around that 20 to 25 ft.-lbs. torque is the right tightening for the U-bolt nuts.



"A"—Old relief valve and over-tightening produce rusty, bone-dry, distorted prop-shaft U-joint bearings. "B"—New valve and proper tightening keep the joint bright and healthy.

WHAT THE 3rd ARMY LEARNED ABOUT



M25 Tank Transporters

The 66th Ordnance Battalion numbers among its favorite step-children the 40-ton tank transporter M25, consisting of the tractor M26 and the semitrailer M15. There are only a few (thousand) things in life they'd rather do than maintain these hulks. In pursuit of such happiness, the 66th has been chasing M25 transporters all over the 3rd Army's chunk of Europe and has piled up more experience with these monsters than you've got hair on your head.

A good deal of this experience has been set down in the form of "technical notes," which were spirited to us by **Capt. Maxwell M. Morrow** and which we are happy to pass on, to coin a phrase, for the information and guidance of all concerned.

Before plunging headlong into the "notes," it will cheer the cockles of your heart to learn that a giant modification to the transporter's M15 semitrailer is on the way over, which will enable it to handle vehicles it never handled before—the T26-series heavy tank, for example. MWO ORD G160-W1 (2 Mar. 45) will offer the following: (1) a set of four large wheel ramps which fit over the rear wheels of the trailer and allow tanks to walk right up over them; and (2) outriggers to widen and strengthen the trailer. The outriggers are added width of floor for tanks to sit on, and they do away with the stowage compartments that you now have along

LITTLE PIMPLES ON THE TAIL OF PROGRESS WITH THESE MONSTERS—AND SOME GOOD WAYS TO HEAL THEM

the sides of the trailer. There's also a "drum box" for raising and lowering the ramps.

But this is for the near future. Today, the 66th Ordnance Battalion is faced with such things as the problem of the transporter's wheel-ring studs.

WHEEL-RING STUDS

The wheel-ring studs have the curious habit of shearing off at odd times and places and there's nothing quite so funny as watching an M25 toting a medium tank down the road when a few of the studs suddenly let go, and you can see the tube creep out like a blister and suddenly explode. It's really very hoomerous—especially when you've got the job of changing those little (14.00-24) tires.

As we News Flashed in the March issue, a new replacement stud and nut have been perfected for the wheels of the transporter and are expected to blossom forth in great quantity with the flowers in May or thereabouts.

The new stud will be a $\frac{7}{8}$ " bolt of high-grade steel—the holes in webs of the wheel will be reamed out to take the bolt and large enough so that they don't interfere with it. Until the arrival of the new stud, the 66th has collected a list of substitute studs of, they say, greater or less reliability and

availability. These are: (1) The hub bolt and nut from the $1\frac{1}{2}$ -ton 6x6 Dodge—pretty good, but the supply, they reveal, is limited. One edge of the head must be shaved down to make it fit against the rim of the wheel. (2) The $\frac{3}{4}$ -ton Dodge hub stud and nut are stronger than the original stud and have proved satisfactory. The head must also be shaved. (3) Hub stud-bolts from the $2\frac{1}{2}$ -ton 6x6 GMC have been used. To use Stud (RH and LH) GM-285369 or 285379, shave off one end of the bolt head as above to make it fit against wheel rim; to use Stud (RH and LH) GM-2140131 or 2140132, shave bolt head and extend threads $\frac{3}{8}$ " on bolt; to use Bolt (RH and LH) GM-3660003 or 3660004, cut off one edge of head and extend threads 1" on the bolt.

The DUKW combat-wheel rim bolt is identically the same as the original stud on the transporter.

Getting right down to it, a good part of the trouble is with the way the studs have to be installed in the wheel. They have to pass through holes in the web of the wheel and usually have to be slightly cocked to fit through the hole in the hub and wheel ring. This sits them in an awkward position and subjects them to too much shear. In addition, they're often found unevenly tightened—

the tight ones carry the load of the loose ones, and first thing you know, pop.

Be this as it may, it goes without saying (or does it?) that any nut and bolt you use must be properly tightened. Tighten these to 275 ft.-lbs. torque.

The 66th recommends tightening every 2500 miles and advises that the tires be deflated when the bolts are tightened. "If this is attempted with tires inflated," they say, "the rim bolts will shear before they are fully drawn up . . . some transporter crews report no failures in 3000 miles of service once the operation is performed in this manner. Check the tightness daily."

PINION BEARING

Most crews, according to the 66th, have never been properly introduced to the filler plug on top of the differential pinion-bearing housing. They go along blissfully believing that the pinion bearing is lubricated by splash in the differential assembly. Poor, blind fools!—the pinion bearing is lubricated separately from the rest of the differential. Failure to keep the oil up to the level at this point soon burns the bearing out—of which many cases have been reported.

MUFFLER HEAT

An undesirable next-door neighbor to the auxiliary transmission is the muffler. The muffler throws off heat like a blast furnace and we have seen oil in auxiliary

transmissions so carbonized by the heat that it solidified to hard, sooty ash. Because the oil makes an ash of itself (haw!), the assembly suffers from lack of lubrication and burns out.

To beat the heat, the 66th has designed a heat baffle (Fig. 1). It's designed so that it's easy to install, and the clamp on the baffle is an exact fit for the bolts on the clamps holding the muffler to the frame. Using the two bolts, the baffle is mounted between the frame and the muffler, thus shielding the auxiliary transmission. The side of the baffle with the ventilating holes is placed facing the muffler—the radiated heat enters the baffle and is wafted out by the air current through the baffle.

Realizing that damage may already be done, the transmission, auxiliary transmission, transfer case, and power take-off units should be inspected for carbonized gear lubricant. The presence of same calls for complete dismantling and cleaning.

SPRING CENTER-BOLTS

Steering failures on three transporters serviced by the 66th were traced to sheared spring center-bolts. Sheared spring center-bolts were traced to loose U-bolts which allowed the springs to shift. According to the 66th, oil on the springs also caused "excessive flexing of the springs which in turn caused looseness of the U-bolts."

Keep U-bolts tight and keep oil off springs.

JUMPY SPEEDOMETER

Reports of speedometer needles jumping like goosed canaries have come to the 66th. These were traced to looseness of the cable where it connects to the transfer case. Tighten the connection and the needle stops jumping.

STARTER DRIVE-GEARS

A number of cases of teeth broken out of cranking-motor drive-gears have been reported. This can be blamed directly on the loosening of the capscrews holding the cranking motor to the reduction-gear case and the reduction-gear case to the flywheel housing.

If these capscrews are kept tight, the trouble practically disappears.

GEAR-CASE BEARINGS

The failures of bearings in just about any gear case you care to name on the transporter can be laid to loose propeller-shaft companion-flanges. As observed by the 66th, these failures happen in two ways. First, there's the whipping and vibration of the propeller shaft. You can bet dollars to doughnuts this is the fault of drivers who declutch to fly downhill on the wings of the wind. This turns the propeller shafts up 'way beyond the rpm's they were built to stand, and strains the connections to the breaking point.

Second reason for gear-case bearing failures is worn seals which result from worn bearings. Simply tightening companion flanges is not enough—if the transporter has been running around with whipping shafts, and the bearings have been worn, the oil seals soon go to hell. This lets the lubricant trickle out, and spells finish for gears and bearings.

Spot worn seals and bearings by checking gear cases for leakage.

TIRES

The giant-size tires used so lavishly around the M25 can't be found in every corner drugstore. They're hard to make and they're hard to get—but like any tire,

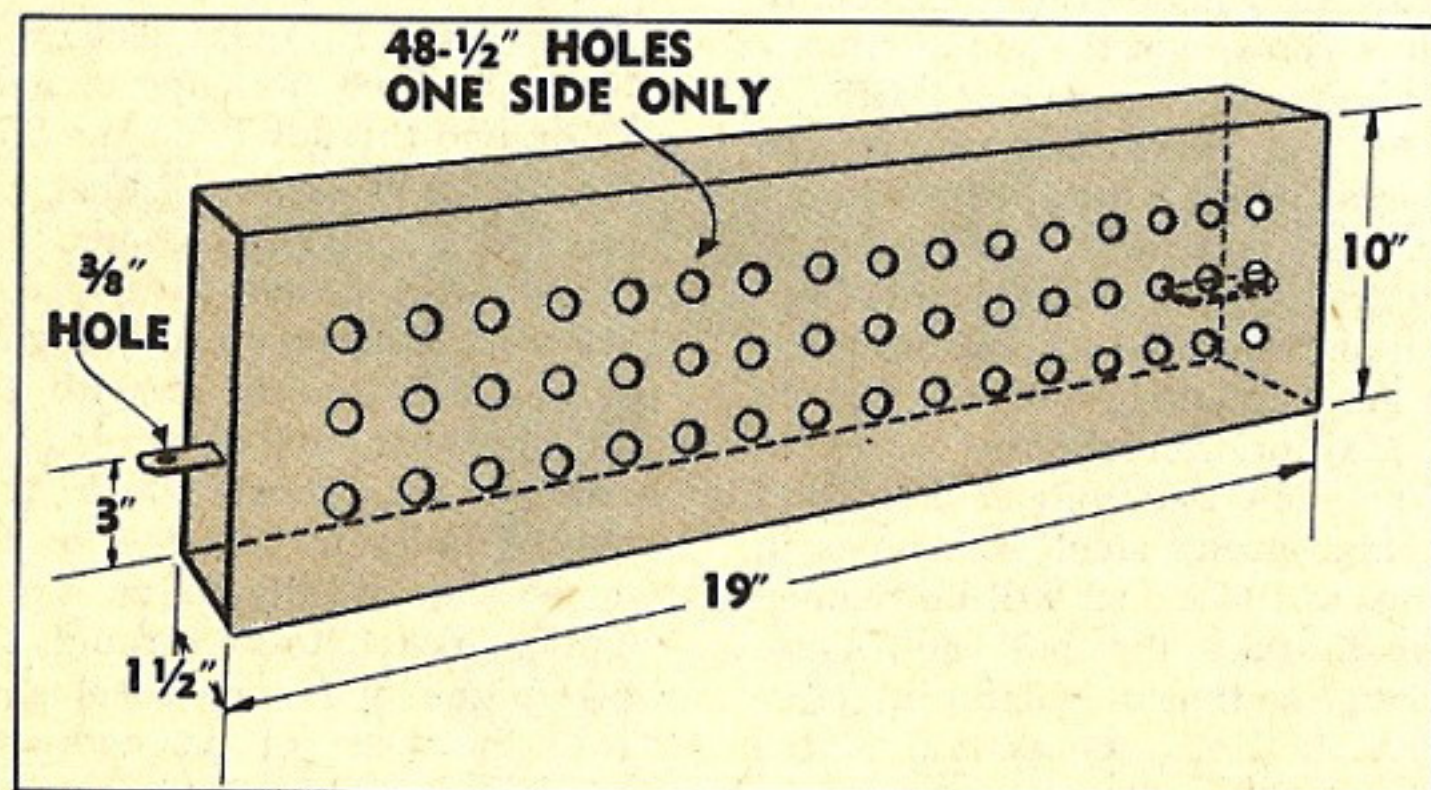


Fig. 1—The 66th Ord. Bn. keeps muffler heat away from the M26 tractor's auxiliary transmission with this baffle.

they're easy to damage. Running over Bailey bridges has been damaging these tires—caused by the outside set of tires running on the rib band of the bridge. To prevent this, the 66th has laid down the following laws governing bridge crossing: (1) Speed limit—one mile an hour; (2) the wheels on the semitrailer must be retracted to the width of the wheels on the tractor; (3) the assistant proceeds *au foot* to guide the driver; and (4) the Corps of Engineers will be respectfully requested to remove their hotdamn rib band off the bridge if more than one transporter is to cross.

PM INSPECTIONS

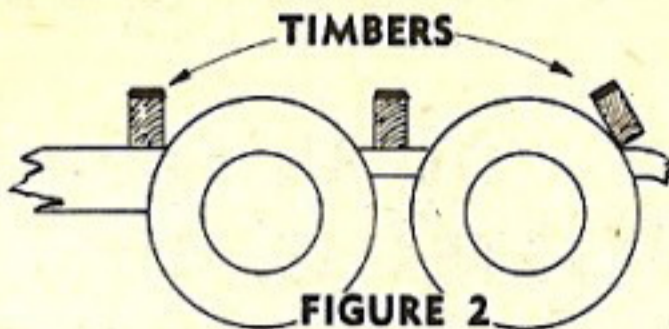
Normal PM schedules are okay for the usual run of vehicles—but the M25 transporter is a hoss of a different color. As a matter of fact, it's closer to being a locomotive than a hoss. For this reason, and because of the work it does, the 66th has put its transporters on a tighter PM servicing schedule: "monthly" inspections are held after every trip, "semi-annual" inspections after every 2500-3000 miles. This has been found to be "sufficient but not excessive."

LOADING OF LVT'S

Nobody paid much attention to LVT's when the transporter was first designed. Since that time, however, the 3rd Army has found it necessary to piggy-back these boats on the M25—and the width of the LVT raises the problem of getting the outer wheels of the trailer out of the way. The new ramps which are part of the coming modification of the M15 semitrailer will allow LVT's and other wide vehicles to ride on a bridge right over the wheels. But what to do now? What to do now is what the 66th does. They simply run the inside tires of the trailer up on a plank; this throws the outer wheels down and away from the trailer. A timber placed over the space thus created allows the LVT to go up on the trailer smoothly and safely. The wheels must be at their extreme outer position and the loading ramps must be removed and fixed to give

their maximum width.

A faster way of doing the same job, and even better in muddy terrain, requires three timbers, 13' x 12" x 6". Place these across the trailer before, between, and behind the rear tires (Fig. 2). The



LVT is then winched or driven over the tires and does not chew the rubber. Pad the timbers with old tire casings to protect them.

DIFFERENTIAL BOLTS

Another condition that has been turning the nightmares of the 66th into *boltmares*, involves the differential-carrier bolts. There's enough vibration at this point to work these bolts loose—the lubricant spills out and the differential may fail. After discovering six of these failures, the 66th took steps—they drilled holes in the heads of the bolts and safety-wired them in pairs. That was that.

WALKING BEAMS

While the corn is as high as an elephant's eye, the M15 semitrailer is as wide as an elephant's . . . well, never mind, but it has caused accidents. Thirteen of these accidents, brought to the attention of the 66th, resulted in walking-beam axles bent or completely broken.

Here's SOP by the 66th in these cases: If the walking beam has suffered a minor bend—one that affects the tracking ability of the forward and rear tires less than two inches—they straighten it, without removing the beam from the trailer, by the use of hydraulic jacks, chains, and blocks.

In the case of two unserviceable walking beams, to save the undamaged trunnion shaft of each, they weld them together to form one serviceable walking beam.

DOWNHILL

An M25 transporter, a heavy load, and a driver that does not

know whereof he is at—all going downhill—is a good recipe for trouble. To avoid same, here's fatherly advice:

When the hill's unfamiliar, shift into low range in the auxiliary transmission and low speed in the main transmission before going down. If the hill is well-known to the driver, he may shift in the next-lower-gear-which-would-be-used-to-come-up-the-same-hill-with-the-same-load. Use the air brakes to keep the vehicle under full control. Lay off the hand brake—it's for parking only. Drivers who haven't heeded this advice have found themselves running hell-bent-for-election on the lip of a landslide—it's practically impossible to shift to a lower range once the transporter has rolled up a reading of 2100 rpm's on the tachometer.

Never coast the transporter downhill with the transmission in neutral, the clutch disengaged, or the engine shut off. This may poop out the steering-system hydraulic booster—making steering tough or even impossible if curves suddenly appear in the road. It also asks too much of the brakes or may result in a loss of air pressure in the braking system and lead to complete loss of control of the vehicle.

RADIUS RODS

The radius rods, which are part of the rear-axle tandem unit on the tractor truck M26, have frequently required a laying-on of hands. Since what the 66th reports on the radius rods is a result of practical field experience and differs somewhat from what is inscribed in the holy writ, we will give you the dope as they have give it to us:

(1) They found, on many of the tractors, that the slot on top of the radius rods was not wide enough to permit proper tightening. So they widened the slots and tightened the clamp bolts. Dirt found in the slots of several radius rods also prevented proper tightening.

(2) The most important adjustment on the radius-rod adjusting-screw is seeing that the ball

HERE'S THAT PAN AGAIN—THE GMC Crankcase-Ventilating System

Poor fellow. Buck over there was once a normal guy. A guy who liked his beer dark—his women often—and his trucks running smooth and regular. But lately, his 2½-ton 6x6 GMC jobs started acting spooky, like something from Horror Stories Quarterly. They'd throw quarts of oil out the crankcase breather and slop it all over the side of the engine. They'd stop dead, right in the middle of Somewhere, then start up a few moments later as though nothing had happened. Buck's struggles to dope out the reasons for those failures started the medic measuring him for an olive-drab straight-jacket.

Buck's mistake was that he kept looking for a big and important reason for the engine acting up. The trouble was so serious, he figured it had to be something like a carburetor, or a distributor. Nothing simple. Nope, nothing so obvious as that hunk of plumbing coming out the valve cover on

IF YOU'RE STILL SWEATING OUT ITS MYSTERIES, CHANCES ARE YOU NEVER SAW THIS EXPLANATION IN DEC. 43

the 2½-ton 6x6, or the crankcase breather (Fig. 1). He didn't give the crankcase-ventilating system a second thought. It's clear our friend didn't know why Army trucks have the ventilating system, or how it works. Once you do, you'll know that if the system isn't treated kindly, it can cause these troubles.

Ever since the crankcase-ventilating system was put on, the picture inside the engine has become less gruesome. The system does the job of drawing off the water vapor before it can condense. Fig. 2 shows you how. It's sucked out of the crankcase up to the valve chamber, through the ventilator valve, and over into the intake manifold. Cool, sweet air pours

into the crankcase through the breather and replaces the vapors vented out. That's the only way air is supposed to get in, so it's cleaned by a filter on the filler pipe before mixing with the moving parts. Air sneaking in through leaks in the valve cover, valve push-rod covers, or other places in the crankcase, comes in loaded with dust and other corruption. Leaks in the system are bad for another reason—the ventilating system pulls in air through them instead of pulling out the vapors from the crankcase. You can see that the ventilating system can't do a good job unless the engine's sealed as tight as a Jap's future.

How good a job the system does also depends on that little ventilator valve on the side of the manifold. The valve controls the amount of blow-by that will be pulled out of the crankcase when the engine's running. This valve in turn is controlled by the vacuum in the manifold.

When the engine's idling and the vacuum in the manifold is **strongest**, the valve stays **closed**. Just a fine sliver of air from the crankcase is pulled through the valve into the manifold. There isn't much ventilating to be done anyway when the engine's idling—not much blow-by is coming down past the rings into the crankcase. It's another story when the engine is at **full throttle**. Then the vacuum in the manifold is at its **weakest**, and the crankcase is stuffed full of blow-by. That's when the ventilating valve opens widest to take out as much of blow-by as it can. So the ventilating system gives you a sweet

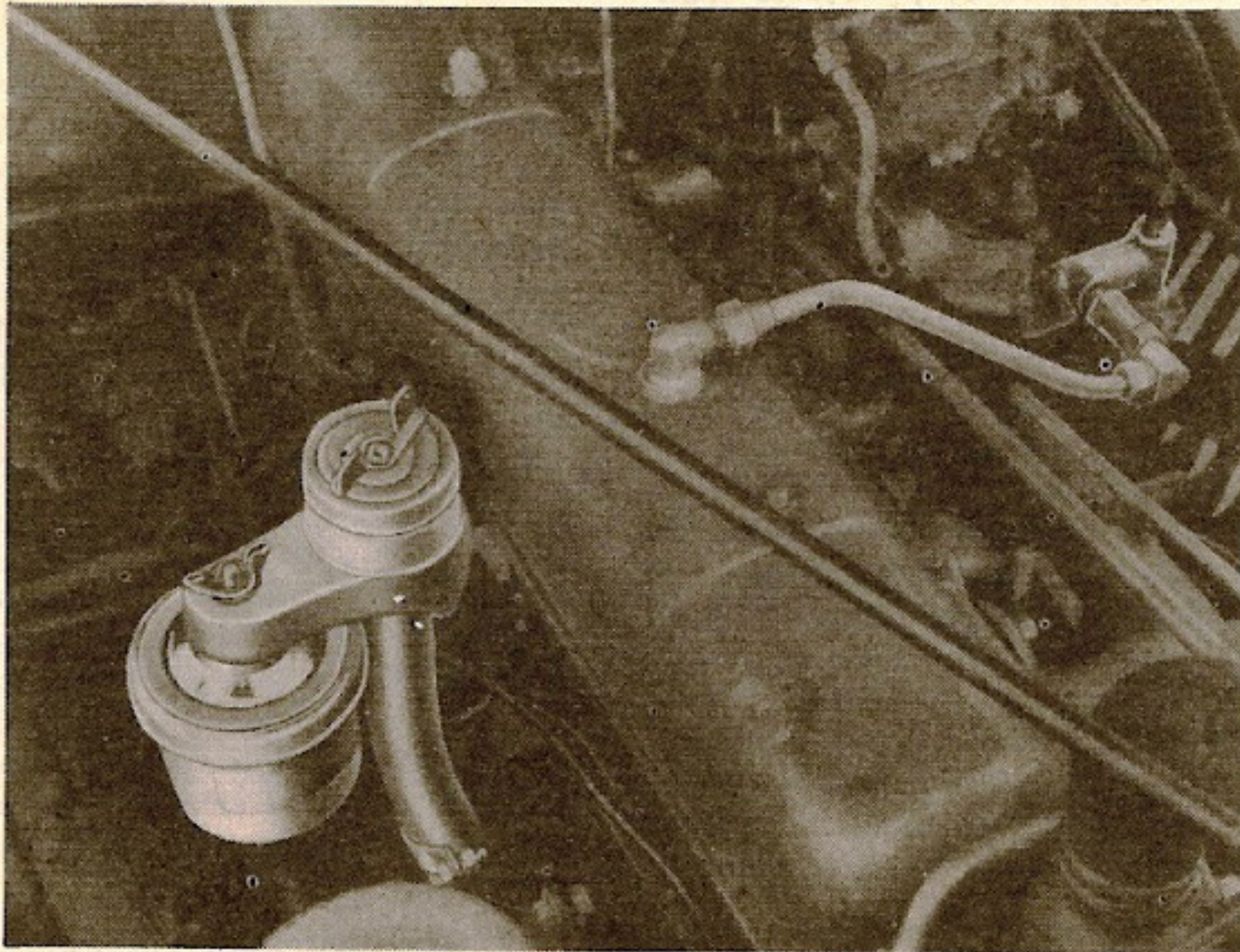


Fig. 1—(Right) Ventilator valve and tube from manifold to valve cover. (Left) Crankcase breather and filler pipe.

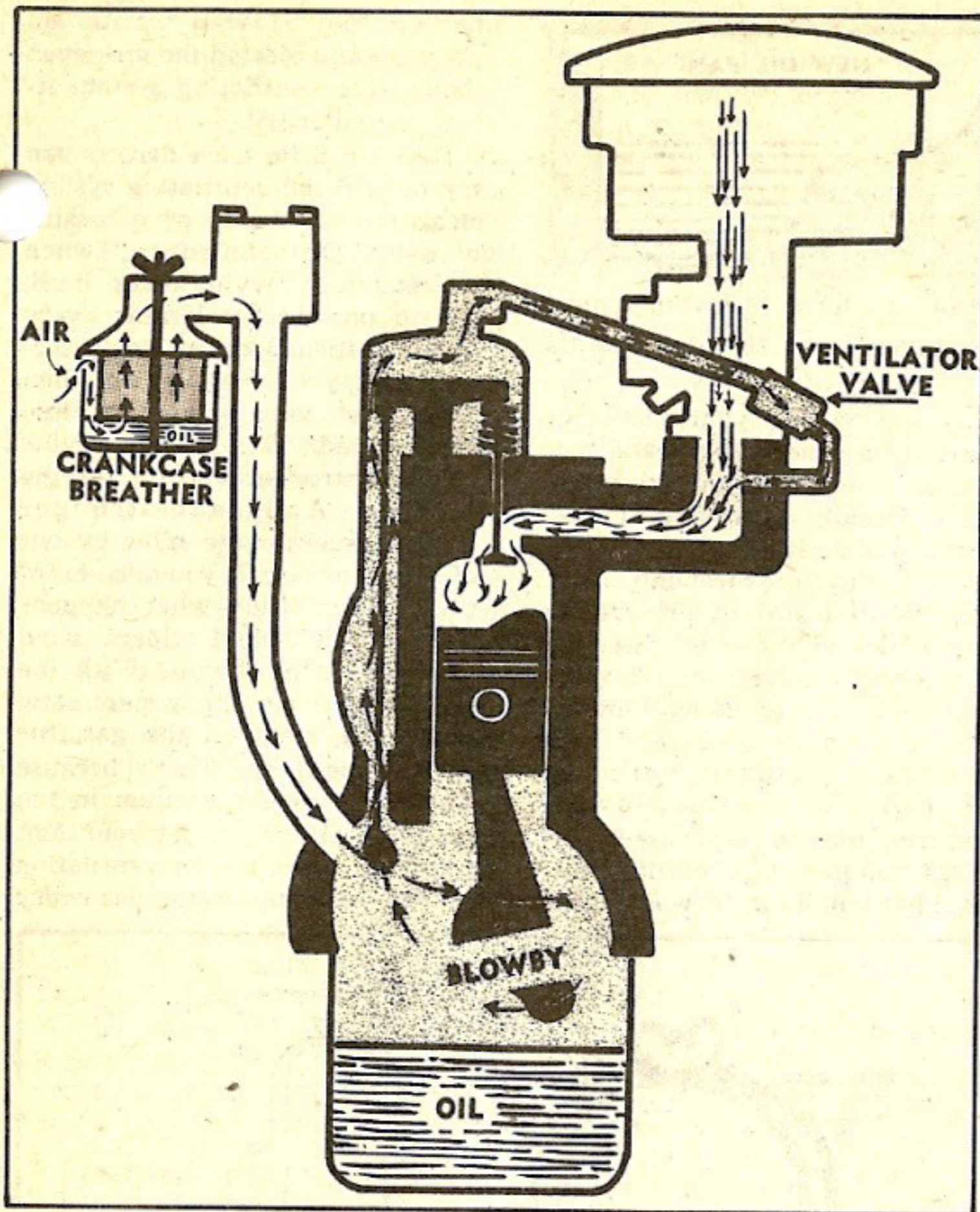


Fig. 2—Blow-by drawn from crankcase through vent tube and valve into manifold. Filtered air enters through breather.

crankcase—and that spells a healthier engine.

It's only when something goes wrong with the crankcase-ventilating system that the truck gets sick and starts to vomit oil out the breather, or to sputter and die out. Take the first one:

ENGINE THROWS OIL

It usually shows up when the truck's been on a tough pull, like up a cliff. The engine's in low and revving for all she's worth. You inch up to the top of the hill—whoosh, you're over and flying down the other side. Your foot eases off the gas. Just then you begin to see streams of oil trickle under the hood onto the top of the cowl. A couple quarts have let go out the crankcase breather.

Any one of four things (or a combination) could cause the flying oil: (1) Ventilator valve troubles, like a clogged valve or an incorrect spring tension; (2) overfilling the crankcase; (3) over-speeding; (4) excessive blow-by.

(1) A clogged ventilator valve shows up best on a tough pull. It really shines. There's plenty of blow-by and plenty of work for the ventilating valve. All during the hard pull the valve **should** be wide open. If it's clogged, the blow-by doesn't get pulled out by the system. It stays in the crankcase and builds up pressure. When you release your foot from the gas—look out! The pressure in the crankcase can't get out—remember that the valve closes when you take your foot off the

gas and let the engine idle. So the blow-by pressure takes the other way out—up through the breather—tearing pints of oil out along with it.

Servicing the valve can save you from this fate. The vehicle TM's call for taking the valve apart, dunking the parts in solvent, and blowing out the dirt with an air hose every 6000 miles. That's the official rule of thumb. You may find the valve gets clogged up sooner—say at 3000 miles. Hop to it. If after dunking, etc., you can't see through the valve—it's still clogged. Get a 1/16" drill. Hold it between your thumb and forefinger and twirl it around in the passage.

Even some clean valves can cause trouble. Especially when one of our inventin' mechanics gets to fooling around with the spring. He'll try s-t-r-e-t-c-h-ing it, or snipping off a few coils to get more draw or less draw from the system. But that spring's been engineered for a specific job. Changing it won't let the valve open at just the right time or close at just the right time. You won't get the best ventilating efficiency. The spring that came from the factory is okay—you can trust it.

(2) Overfilling the crankcase is a good way to get the oil whooped out. Normally there's lots of circulation and agitation of the oil as the truck drives. Too much oil invites too much agitation. So when you get an extra dose of blow-by in the crankcase and the pressure starts to go out the breather, it's more tempted to take the foam and whipped oil out with it. The remedy is to fill your crankcase **exactly** FULL. Even an 1/8" over the FULL mark is overfilling. Park your truck on level ground and give the oil a chance to run down for 10 minutes or so before you take a reading on the dipstick (or check the level before operation). That's the accurate way. You may notice that the oil pan has a new profile on the more recent GMC 2½-ton trucks. It's a deeper pan (Fig. 3).

This newer pan when FULL has an oil level nearly as low as the old oil pan did when EMPTY.

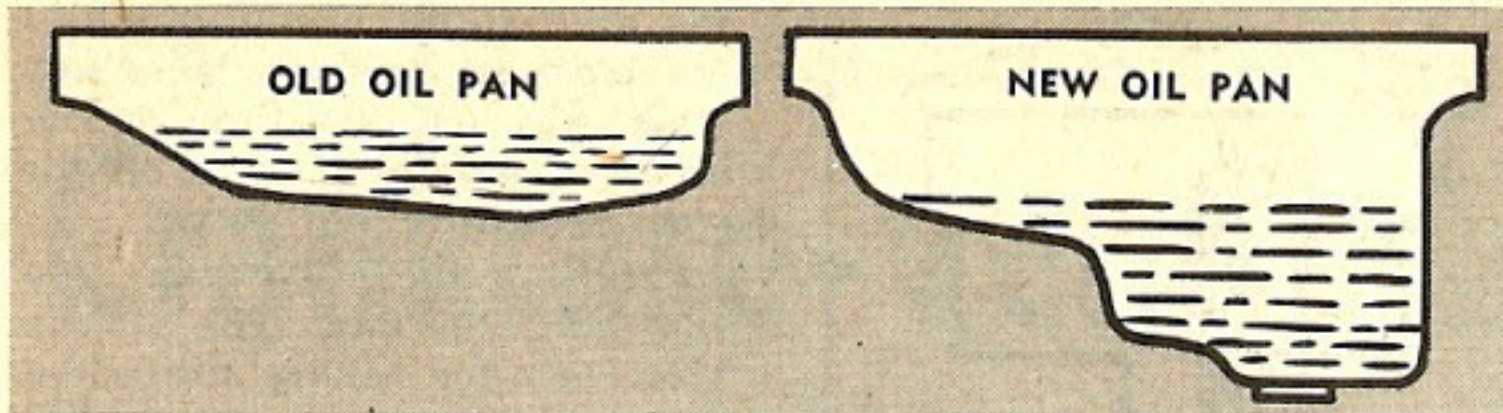


Fig. 3—Not so much splash in the pan with the new model. It's deeper, keeping the oil farther away from the crankshaft.

Notice the extra space between the crankshaft and the oil. And so—less agitation, and less chance of the oil whipping out. But the new pan was put on in production only. About the best you can do with the old pan is keep an extra close watch on the oil level. Fill it exactly to the FULL mark and not an eye-dropper over.

(3) Overspeeding has the same effect as overfilling. Even though the oil's no higher than the FULL mark, when you run the vehicle faster than the road-speed plate says, you're setting up a violent agitation in the crankcase. All it takes then is a little blow-by pressure in the crankcase, and blooie! the oil heaves. Go only as fast as the road-speed plate tells you for each gear. On level ground you shouldn't be able to go any faster than that—the governor won't let you. But on downgrades, it's a different story. Here the weight of the 2½-ton truck grabs hold and starts to roll the truck ahead. The governor steps out of the picture because the engine isn't controlling the speed any more. The wheels are driving the engine faster and faster. The rpm's go up till the engine's overspeeding. Things like this start to happen—the bearings go, they can't stand up under the super speed—the oil in the crankcase gets whipped into a frenzy and may go shooting out the crankcase breather. A little sense will stop this from happening to you. Follow this: Use the same gear **going down** a hill that you'd pick out to **climb** that same hill. The gear you select should hold the truck down to the figures on the road-speed plate for the gear you're in, when helped a little by applying the brakes off and on. That's the

easy way to keep your truck running till a ripe old age—and with the oil snug inside the crankcase.

(4) Usually doing one of those three will break your 2½-ton of its uncanny oil-throwing habit. But we've heard of drivers and mechanics who tried all three, yet the job still tossed oil. It was a serious case of too much blow-by. The engines were old and worn and the cylinders were egg-shaped. So the blow-by got pumped into the crankcase in such large volumes, the ventilator just couldn't handle it. It was a losing

battle. The blow-by built up pressure and ejected the oil—even though the ventilating system itself was all right.

Here's a little trick drivers can try to help the ventilating system clear the crankcase of excessive blow-by. On a tough pull when the engine's revving over hard, let up on the accelerator every now and then. Just for a split second, ease your foot up and then down—not long enough to lose much speed. This lets the engine cause a stronger vacuum in the manifold. And that stronger vacuum sucks more blow-by out of the crankcase. If you need extra convincing, watch what happens to your windshield wipers when you're on a hard pull. With the gas pedal down the wipers slow down. Ease up on the gas, the wipers speed up. That's because there's a stronger vacuum in the manifold when you let your foot up. Apply this to the ventilating system—ease up on the gas every

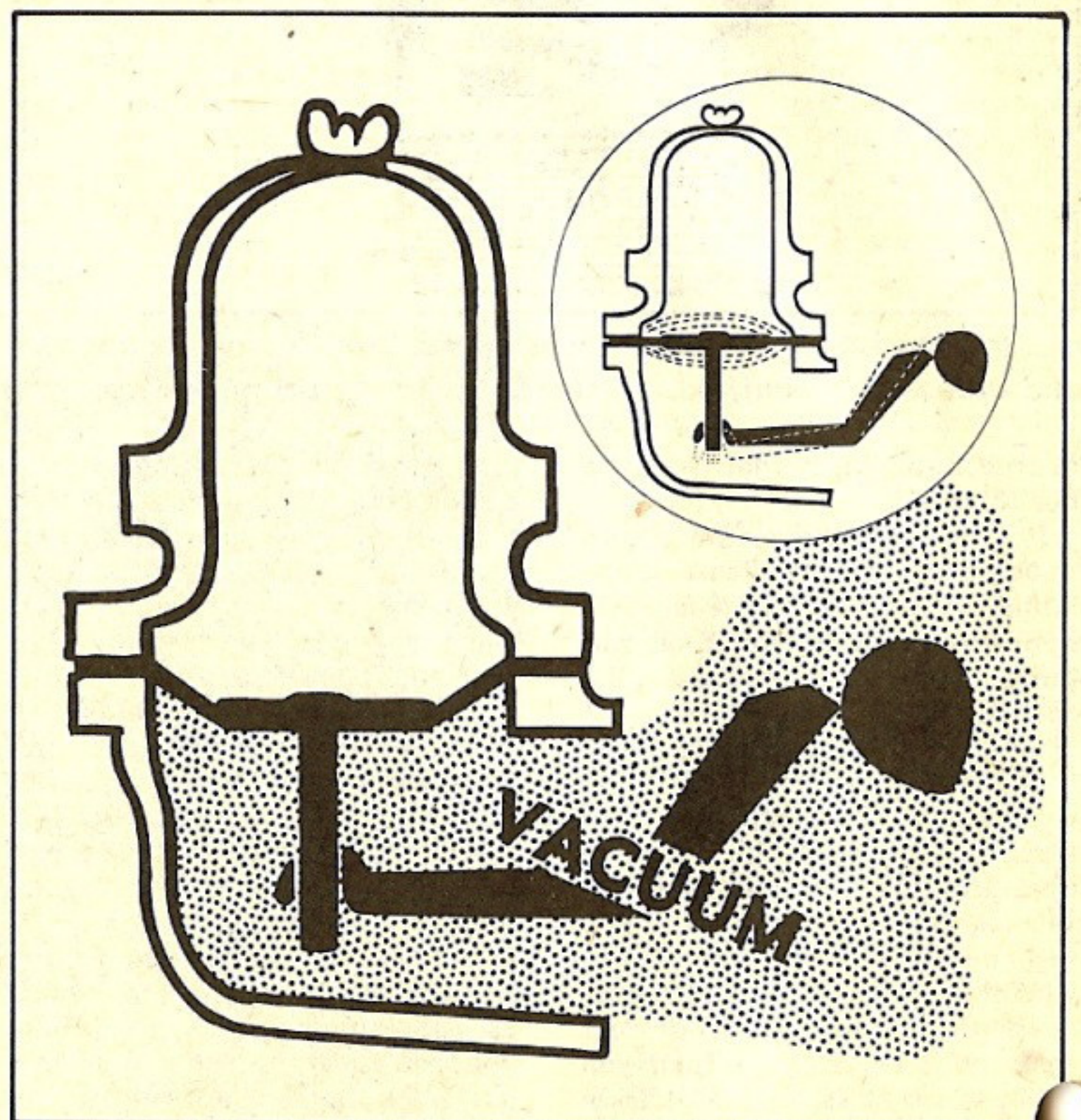


Fig. 4—You CAN keep a good fuel-pump diaphragm down by leaving out the crankcase-breather air-filter. See Fig. 5.

now and then on a hard pull, and keep your crankcase free.

There's only one other remedy, except for a higher-echelon overhaul, when excessive blow-by's the reason for blowing oil. It's a larger ventilating valve (ARMY MOTORS, Apr. 44). If you've tried the cures just mentioned and your truck still blows oil like a whale, take a compression test. If it shows abnormal blow-by, then order the larger ventilating valve, GM Part No. 1543341, through your regular supply channels.

That winds up the story of correcting the problem of over-enthusiastic oil. These angles will usually lick it, if followed by mechanics: Clean the ventilator valve, oftener than 6000 miles (or semiannually) if necessary; leave the ventilator-valve spring alone—don't cut or stretch its golden coils; test to see if the engine's rolling in excessive blow-by. Drivers can do their share by (1) not overfilling the crankcase; (2) not overspeeding; and (3) easing up on the gas for a split-second every now and then on a hard pull.

Then the only other headache you're liable to get, from the crankcase-ventilating system on the 2½-ton 6x6, is this:

ENGINE DIES ON YOU

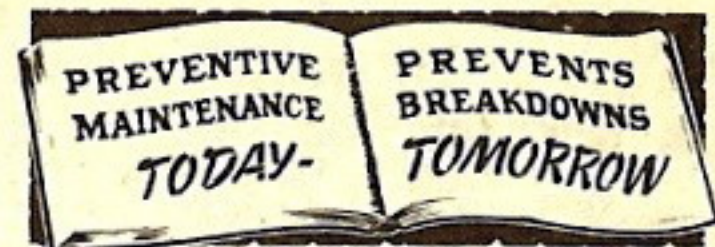
mysteriously, but after a few seconds, you can start it up. It'll have the same old vigor, too. Drivers tell those ghost stories about the truck slowing itself down. They hear a sucking sound, a wheeze, then a tired pftshshsss. The engine dies cold. Just as the driver starts to sweat, he tries the starter, just for the hell of it. Spooks. The engine starts. Then that little routine happens all the way back—the truck stops and starts and stops.

Scotland Yard reports that the trouble is in the crankcase breather—or closer still, it's with the drivers or mechanics who've been servicing the breather on the 2½-ton truck. According to the vehicle TM, the element in the breather should be taken out and lunked and blown dry and put back in every 1000 miles (or sooner under dusty conditions). That last part—putting the ele-

ment **back in**—is where the trouble begins. If the element's left out, or lost, or forgotten, or just plain not put in, you get a sealed crankcase. The element holds the shell of the breather away from the top and leaves a small space for the air to get into the crankcase. Leave the element out and the shell screws up and seats itself comfortably on the gasket in the top of the breather. That makes a nice airtight fitting—just as effectively as if you'd put your hand down over the filler pipe.

We watched a mechanic try his hand on the filler pipe the other day. He took off the entire breather assembly and started up the engine. Then the mechanic pressed his palm flat against the top of the filler pipe. The engine ran okay. After a few minutes, though, it suffocated and stopped. Of course, the mechanic took a piece of wire and fished down in the crankcase for the hunks of flesh that came off his palm. There's a mean cyclone going through the crankcase when it's working right.

The vacuum in the crankcase is what stopped the engine. When the air can't get in the breather, the vacuum in the manifold keeps emptying air out of the crankcase. A stronger and stronger vacuum builds up. Finally, the vacuum gets enough muscle to hold down the diaphragm of the fuel pump (Fig. 4). The pumping stops, no fuel goes into the carburetor, and the engine dies of undernourishment. Later, as soon as enough air seeps back in to fill the crankcase and let that diaphragm pump gas again, you're able to start the engine.



Next time the engine pulls this stopping stunt, take a close look at the crankcase breather. It's easy to tell if the element's been left out. With the element **in**, there are only a few threads sticking out beyond the wingnut on the top of the breather (Fig. 5). With the element **out**, notice how high the threads stick out. Scout around and find the lost element. Or requisition a new one. But don't go driving along without the element—unless you like to be stalled when everybody else is moving forward.

'Course Buck wouldn't mind. He's too far gone. Just remember he got that way from a little thing like refusing to maintain the system. Stay 'way from his bad example. Operate your 2½-ton truck according to regulations and service your ventilating system. And you'll keep your crankcase from getting cranky.

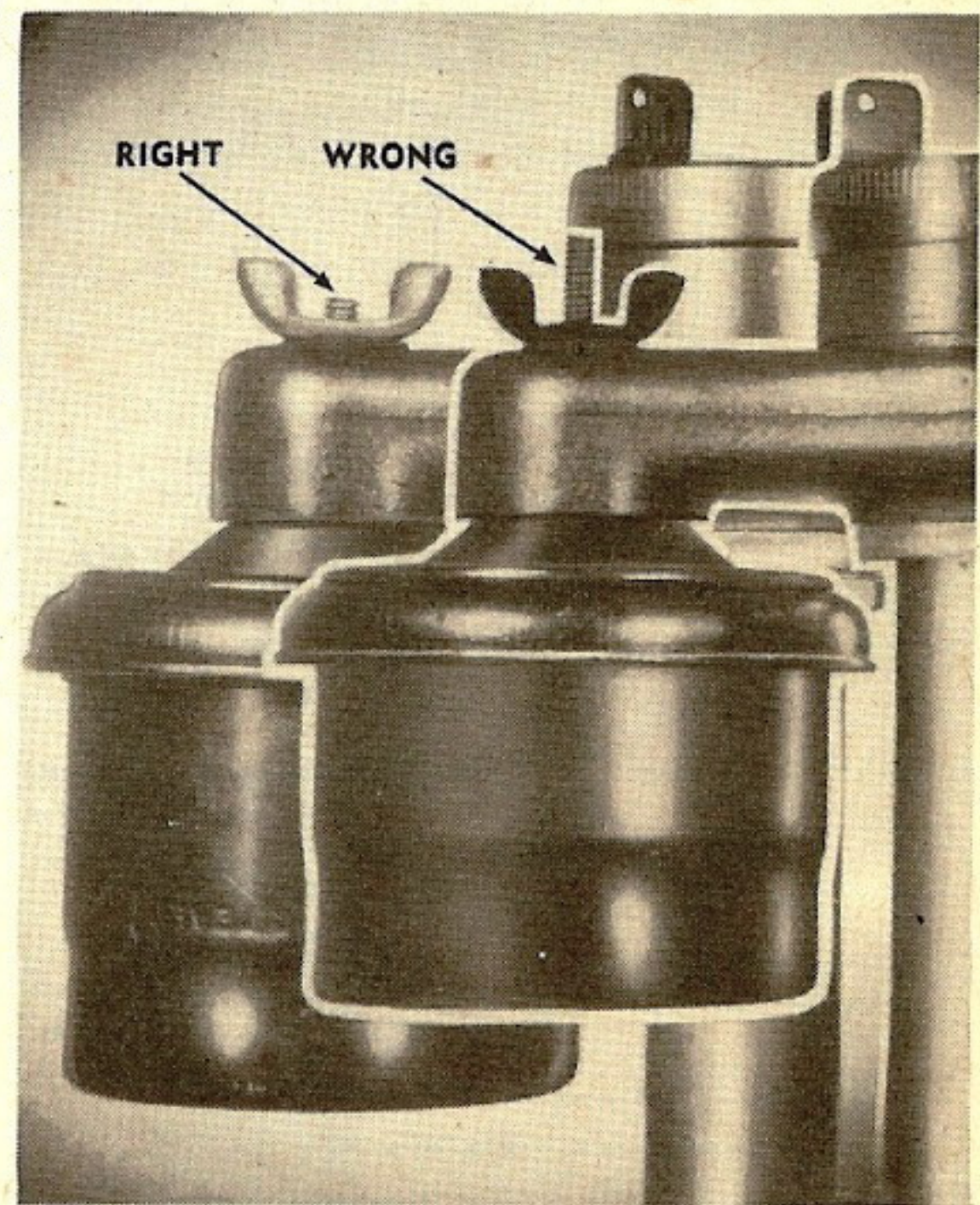


Fig. 5—Wanta stop your truck without using brakes? Just leave out the filter element.

GRASS CUTTER FOR YOUR

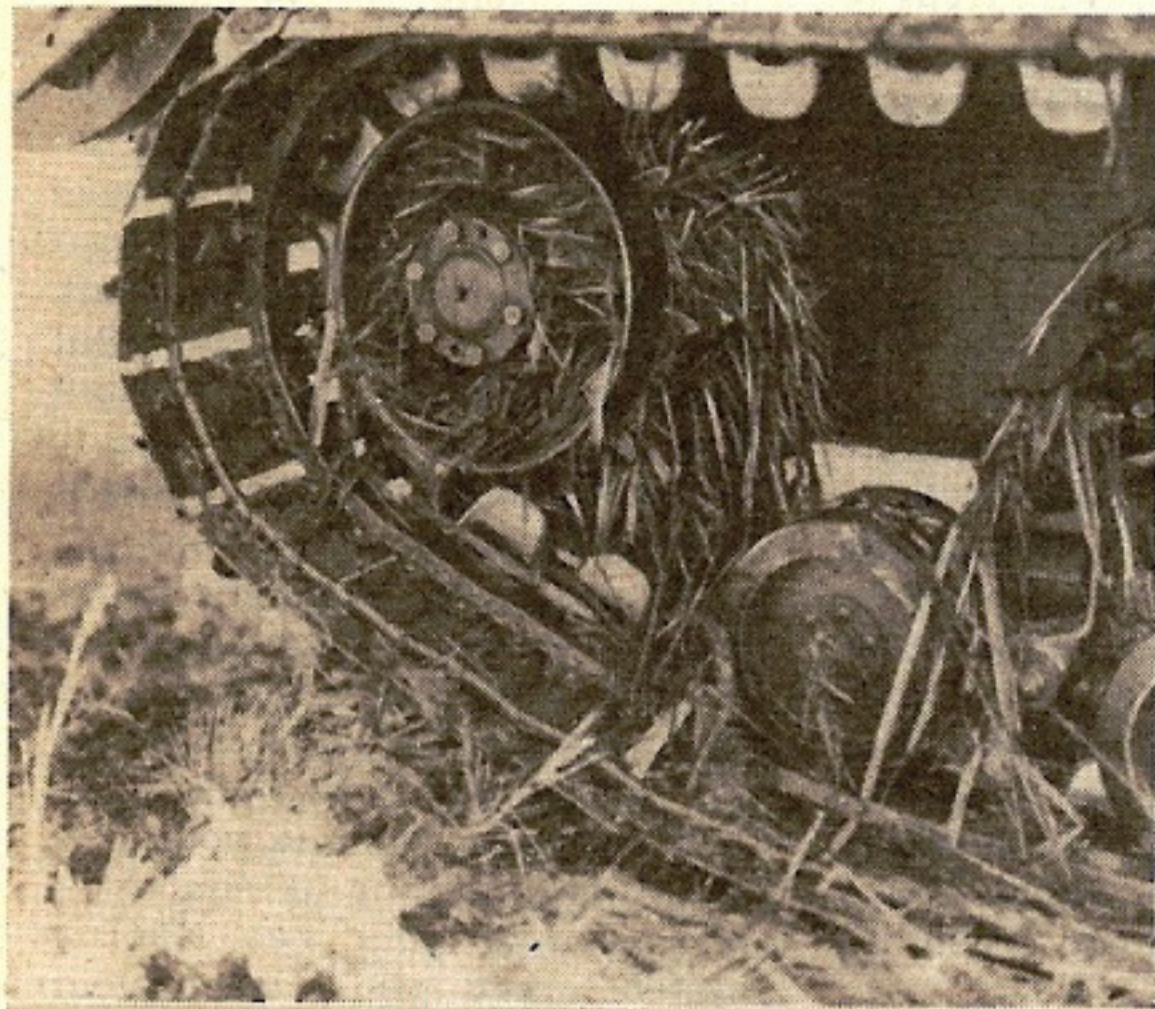


Fig. 2—Graphic view of how the Weasel drive sprocket collects weeds and other crap.

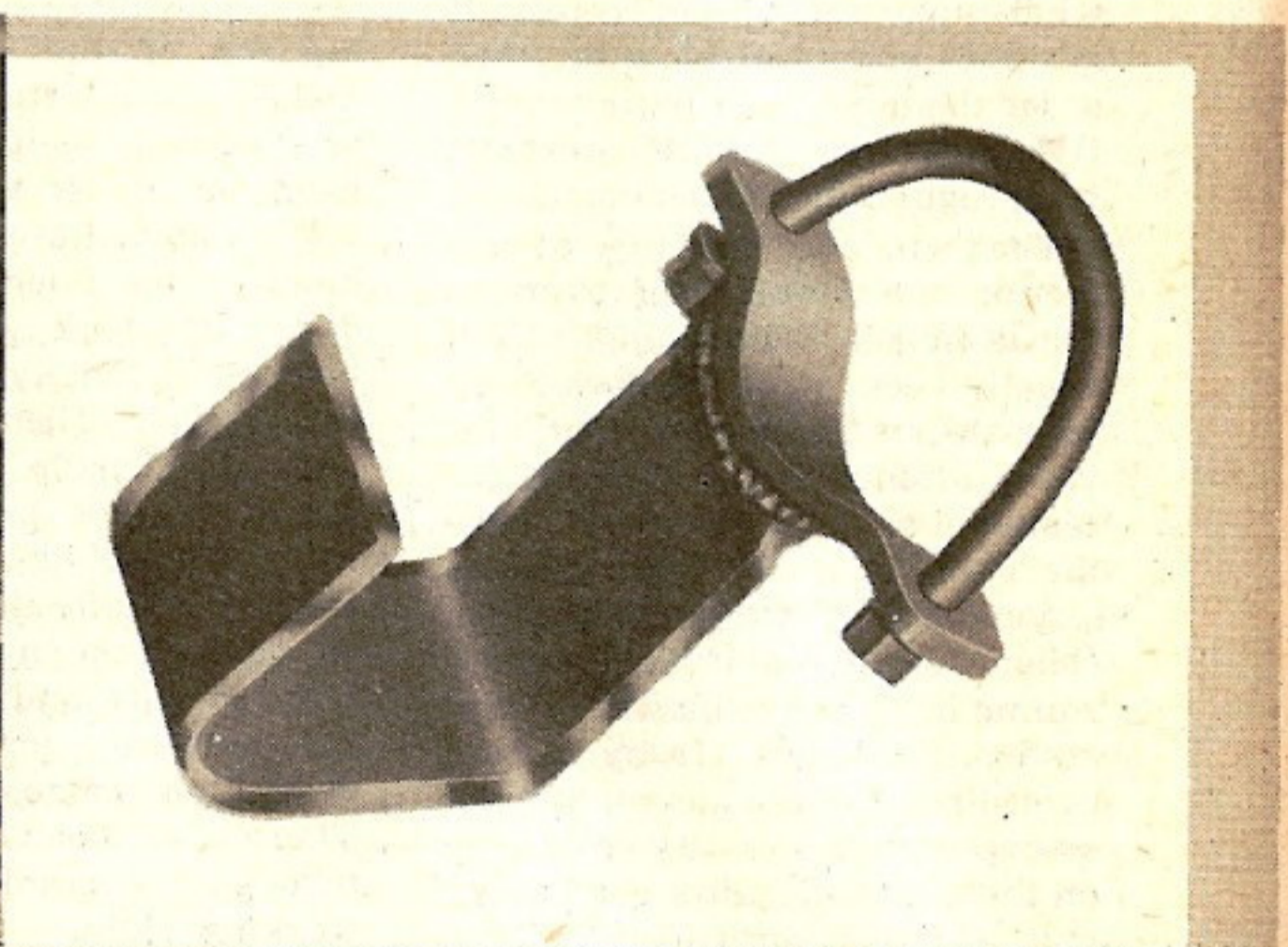


Fig. 3—The knife looks like this. The only maintenance it needs is keep it sharp and tight.

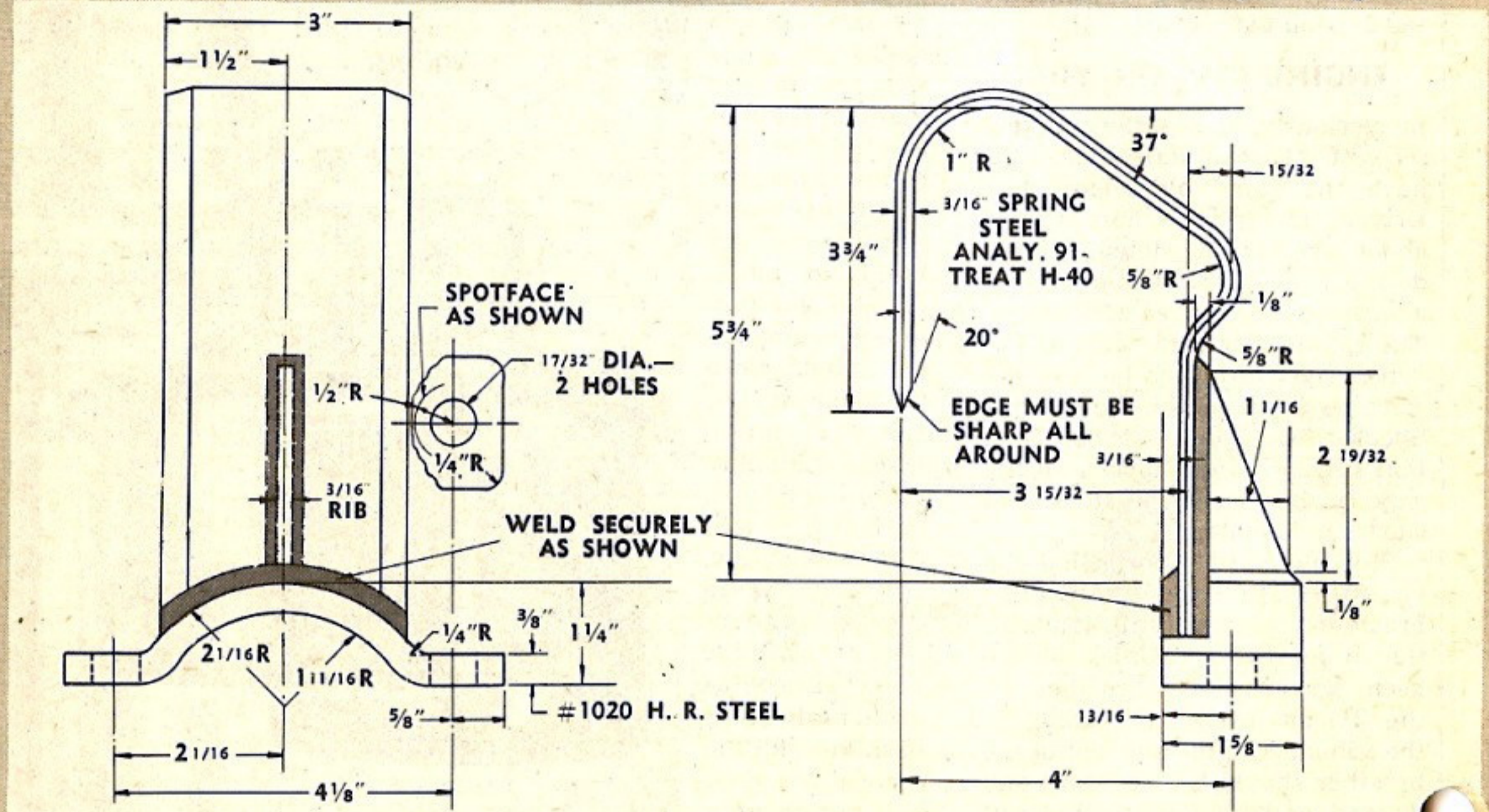


Fig. 4

WEASEL

Among the many torturous types of terrain that the cargo carrier M29 and M29C has met and mastered are jungle swampland and weedy marshes. But in many cases, it's been found that the tall weeds and growth of the swamps are quickly picked up by the tracks and wound around the drive sprocket (Fig. 2). First thing you know, the whole center of the sprocket is clogged with weeds—the track guides can't enter the sprocket—and the next thing you know, the unguided track has run off and out from under you.



Fig. 1

To keep grass out of the drive sprocket (the drive sprocket only—not the idler), Studebaker has devised a knife (Fig. 1) which is anchored to the drive-sprocket carrier, runs around the sprocket, and fits down into the center of the sprocket wheel. As quickly as the weeds arrive at the sprocket wheel and try to wind around, the knife cuts them into cole slaw.

As it is installed at the factory, the knife is built with certain little refinements. But there is a simple version of the same knife that can be easily made in the field and does the job just as well (Fig. 3). As you can see by the picture, it's clipped around the carrier. The drawings (Figs. 4 and 5) show you how to make the knife.

All you permanent-in-grade Pfc's, rush this idea up to your CO—it ought to be good for at least a T/5, or maybe KP three days running for bothering the old man when he's busy.

CORRECTION

This has nothing to do with cutting grass, but it has plenty to do with cutting a hole to take the heat off your feet when you're driving the Weasel. In the March ARMY MOTORS, Fig. 6 on page 355 showed you just where to cut that hole—in the panel at the driver's **right**. Trouble is that the story said "at left of the driver's feet." Do that and you'll have fish in your lap in no time. As you probably guessed from the start, **right** is right.

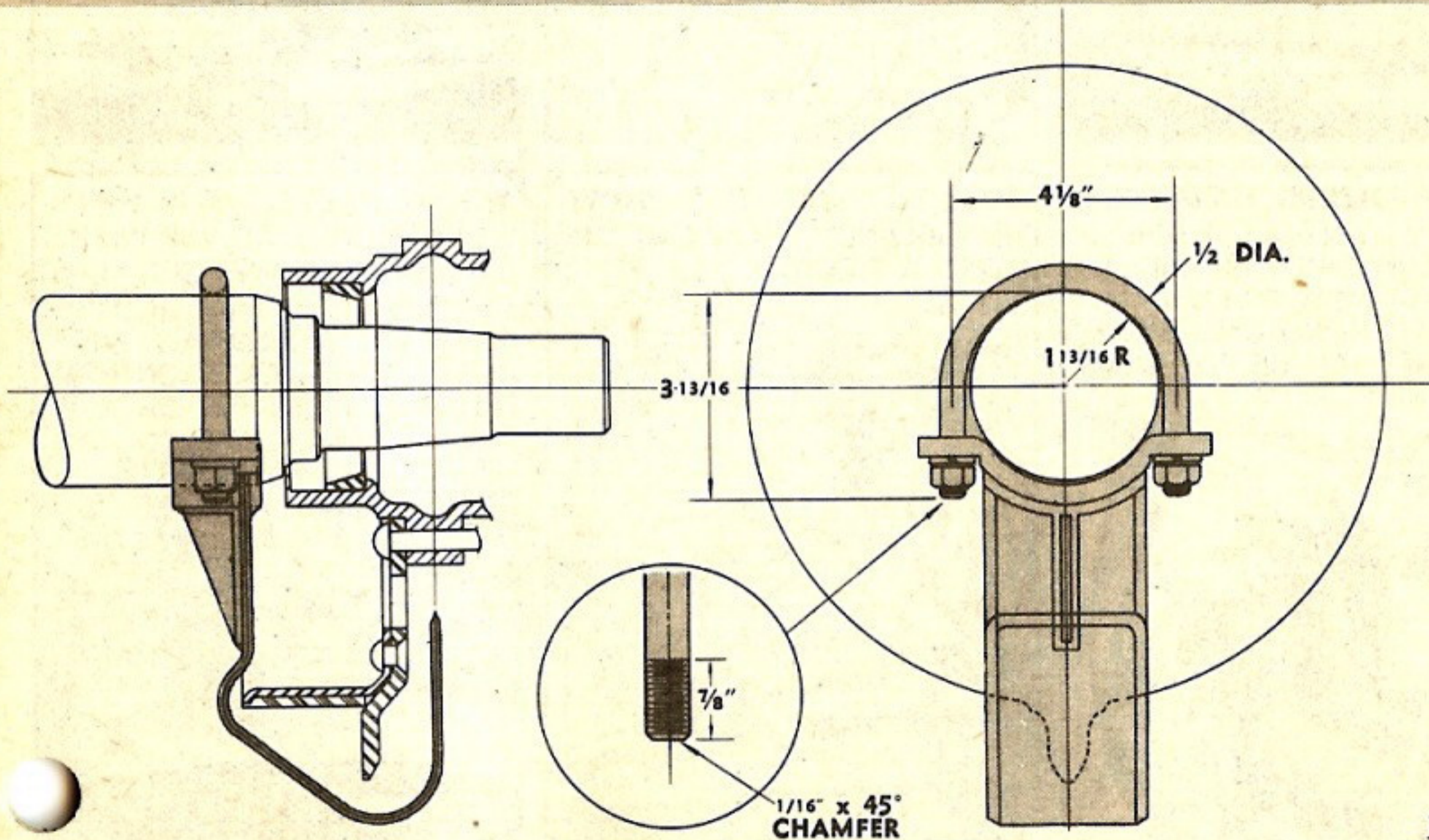
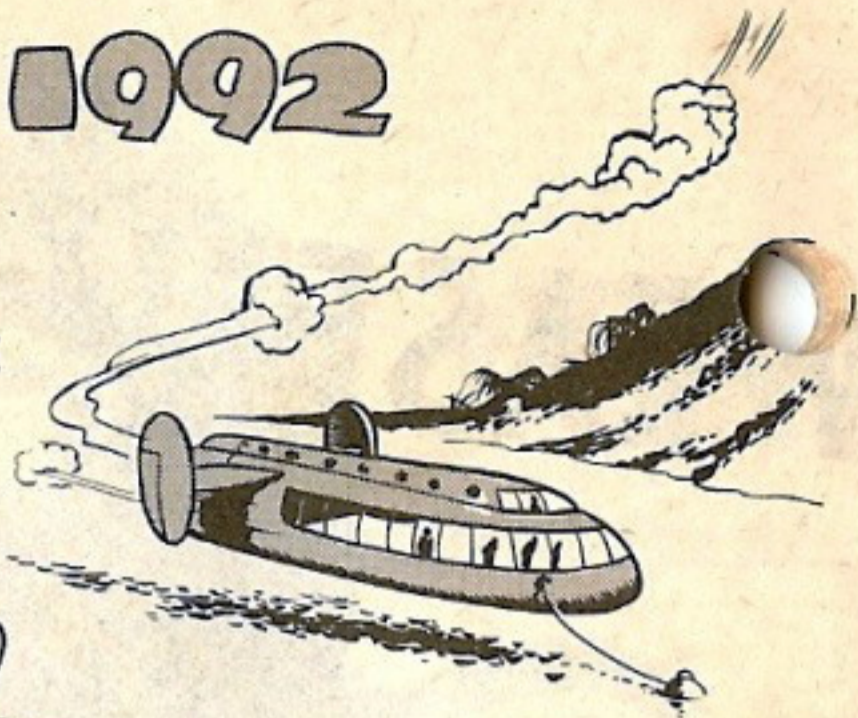


Fig. 5

IT IS THE YEAR 1992

WORLD WAR II HAS LONG SINCE PASSED INTO HISTORY AND THE WORLD IS NOW ENJOYING ITS WELL-EARNED PEACE!

ONE SUNNY DAY, THE LUXURIOUS TRANSPACIFIC ROCKET CRUISELINER DESCENDS FROM THE STRATOSPHERE AND, JAMMING ON ITS DE-GRAVITATORS, BEGINS TO HOVER ABOVE THE TINY ISLAND OF 'HEEBI JEEBI'.



.. AND NOW FOLKS, IF YOUSE'LL STEP OVAH HERE I'LL PERNT OUT D'MORE EJACASHINULL SIGHTS ONDIS HERE NOW ISLE ... OBSOIVE THE TROPICAL FAWNA AND FLORA TREW YER GLASSES!

... DIS IS D' ISLE OF **HEEBI JEEBI**, ONCE RULED BY THE JAPANESE BUT TAKEN DURIN' D'WAR BY US!..

HEY, LOOK! SOMEONE'S ON IT !!

AN OLD MAN .. A HERMIT .. **BOY** DOES HE LOOK SAD!

DAT IS **COLONEL BIRDFOOD**, THE ONEY LIVIN'SOUL ALLOWED TO REMAIN ON THE ISLAND... AND NOW FOLKS, IF YOUSE'LL HANG ON WE'LL PERCEED TO THE ALEUTIAN CHAIN UP NORT!

JOVE, I'LL WAGER THAT ISLAND HIDES A TERRIBLE SECRET!

I KNOW WHAT IT IS

TELL US THE STORY, OL' TIMER!

WELL, IT WAS BACK IN 1945 WHILE WE WERE STILL AT WAR WITH JAPAN - THE ARMY FORMED A DARING PLAN THAT, HAD IT COME OFF, WOULD HAVE ENDED JAPAN RIGHT THERE - ON **D-DAY H-HOUR**, THE SECRET GROUP ON HEEBI JEEBI WAS TO DISPATCH A MAN IN THEIR **ONLY DUKW** WITH THE VITAL DATA ... IT WAS ALL TIMED!

THE DRIVER HAD TO BE A FEARLESS DAREDEVIL—AN EAGLE IN EMERGENCIES, AN ACE IN ACTION... THE C.O. COL. BIRDFOOD CHOSE **JOE DOPE**



YOU'RE THE ONLY MAN WE CAN AFFORD TO LOSE... I'LL SEND YOU!

THANK SIR

THE NEXT DAWN FOUND **PRIVATE DOPE** POISED FOR THE BIG ADVENTURE!



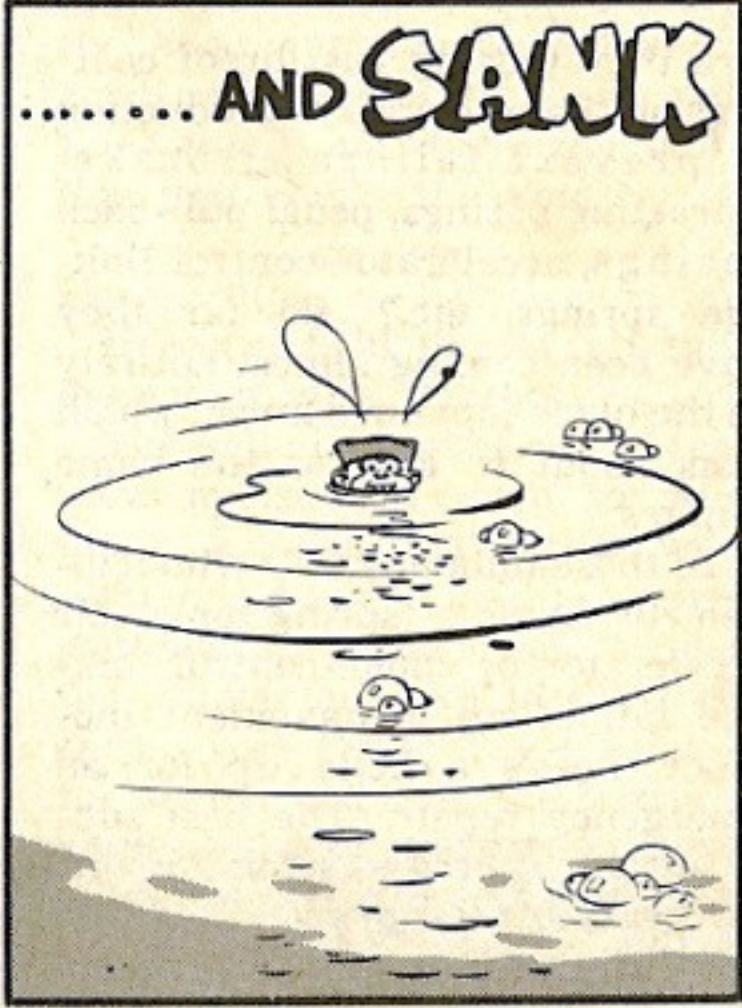
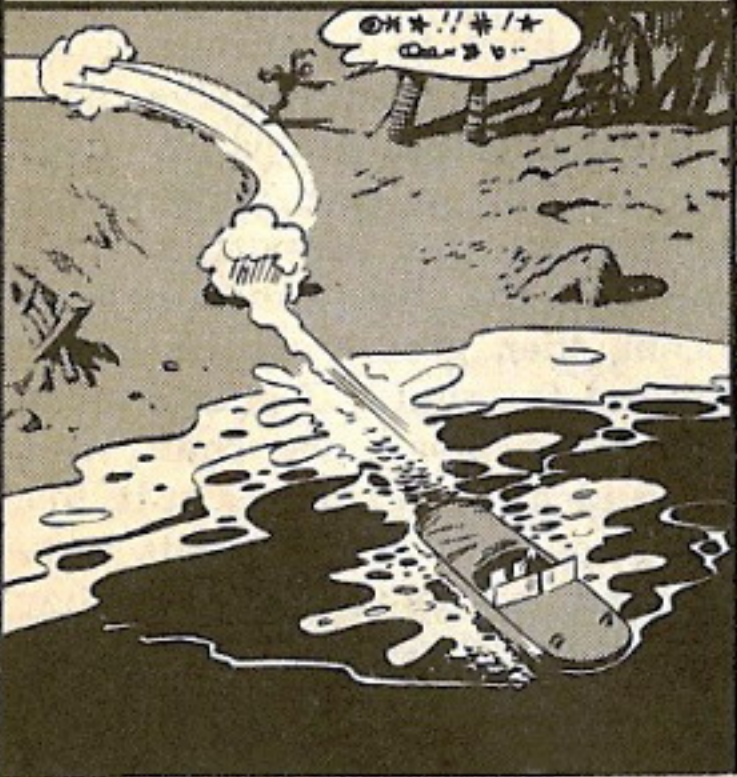
WITH A SOUL-STIRRING BATTLE CRY, THIS INTREPID TROOPER DASHED EAGERLY TOWARD HIS DESTINY!



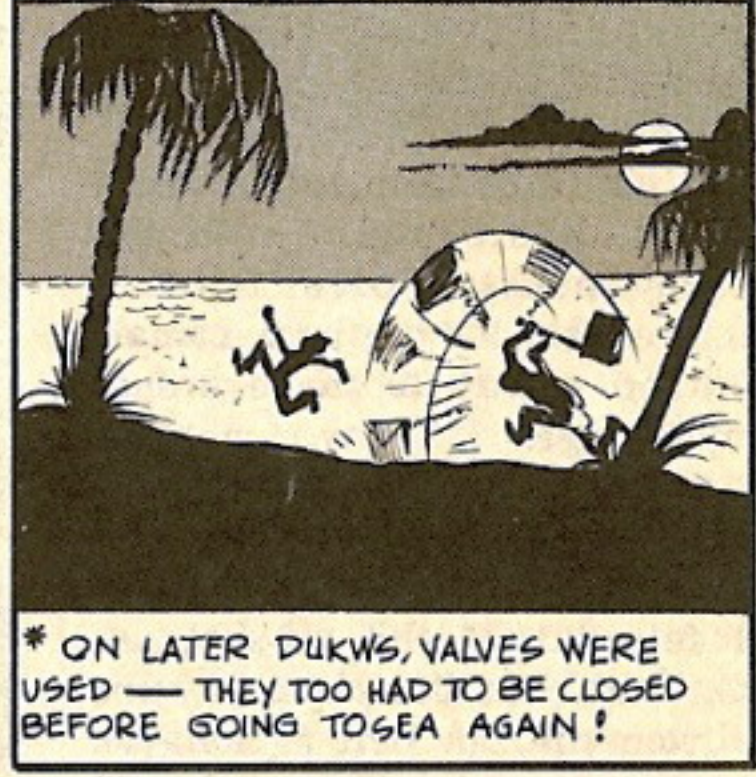
VAULTED LITHELY INTO HIS TRUSTY AMPHIBIAN THAT HE LOVED SO WELL...



AND AMID THE CHEERS OF THE MEN, TORE DOWN THE BEACH, SWUNG SEAWARD, SWAM THE DUKW ACROSS THE WAVES...

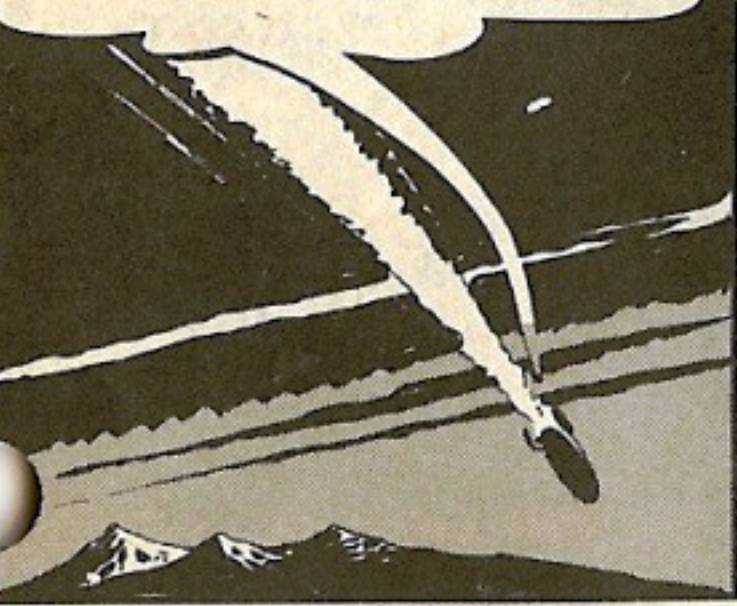


JOE DOPE HAD FORGOTTEN TO REPLACE THE **DRAIN PLUGS** THAT ARE REMOVED AFTER AMPHIBIOUS VEHICLES ARE USED *



* ON LATER DUKWS, VALVES WERE USED — THEY TOO HAD TO BE CLOSED BEFORE GOING TO SEA AGAIN!

NATURALLY THE BIG OPERATION NEVER CAME OFF.... **COLONEL BIRDFOOD** WENT BEZERK AND THE ARMY MERCIFULLY ALLOWED HIM TO SPEND THE REST OF HIS BROKEN LIFE ON HEEBI JEEBI.....



WHAT HAPPENED TO **JOE DOPE, OL' TIMER?**



OH, HE CONTINUED TO GOOF-OFF... AND AFTER THE DURATION-AND-SIX WAS NEVER HEARD OF AGAIN



down on the contact plate and contact studs. A piece of flint-paper (00 grit) and some carbon tetrachloride will make the switch almost as good as new. The same goes for the starter switch on the jeep, though here it's wise to use a file and keep the contacts as level and parallel as possible.

T/4 Edwin D. Meisner
APO 758

Ed. Note—Fine, except for the carbon tet. WD Circular 36 (30 Jan. 45) says nix on using that precious stuff for cleaning automotive parts, among other things. Use dry-cleaning solvent, instead.

Dear Editor,

In the past, due to incorrect installation of the noise filter mounted on the distributor housing of our 2½-ton GMC's, we have had several vehicles deadlined. This filter on the distributor has been breaking the connection on the fuel filter which is mounted on the frame—the rocking motion of the motor is responsible.

I've found that by removing the filter from the clamp, turning the clamp upside down, then replacing the filter, it raises the noise filter out of the danger position and broken fuel connections cease.

This condition was true a year ago and it still exists today; a truck passing our camp in a convoy had to drop out for this reason. By sheer luck, we happened to have an extra fuel filter with the fuel-line connection to replace the one that had been broken. Otherwise, the truck would have had to wait until who-knows-when before it could be repaired.

We instructed the driver to tell all the others in his convoy to change that distributor noise-filter on their trucks as soon as possible, because fuel-line connections don't grow on trees out here.

Sgt. D. A. Harris
APO 629

Ed. Note—Good for you. But next time, tell the drivers to remove the troublesome suppressor filter. The original authority was TB 801-4 (24 Jun. 43) and the information is now on page 190 of TM 9-801 (24 Apr. 44). Thus: "Some early vehicles were equip-

ped with a radio-interference suppressor-filter on the distributor. This filter may strike and break the fuel line. If a filter is found, remove and discard it."

Dear Editor,

I have a little stunt that'll keep the sun out of staff-car drivers' eyes. As you know, the sun-visor brackets on Plymouths are made of die-cast metal and break very easily.

I made a small plate of heavy sheet steel the same size and shape as the bracket flange, then cut a hole in the center, the shape of the raised section of the bracket. Drill three small holes for mounting and the plate's finished.

Another thing, if you need a replacement gearshift-lever knob for a jeep, find an old GMC wheel-cylinder piston to use as a mold. Melt old lead pipe and scraps of solder in the cavity of the piston. Remove the casting, drill a hole in the flat side, and tap to fit the shift lever.

Ivison W. Rhodes
Automotive Advisor

Dear Editor,

Upon inspecting the jeeps of this outfit, we find that a lot of the drivers are failing to grease the brake and clutch bushings. Why? Due to the ground. You have to dig a hole to get under and at them.

We have done something about that by removing the original straight fitting and putting on a

45° or 90° angle fitting. This has cut down our complaints on slipping clutches and sticking brakes. Now all the driver gets is a sore back and not a broken one.

Capt. Russel J. McWade
APO

Dear Editor,

Anyone else having as much trouble as I've had finding an oil seal for the inner end of the trunnion socket for the M1 wrecker (or 6-ton White cargo truck) may be glad to know that a GMC pillow-block seal will do the job—after alteration.

When the regular seal (WIS A-1805-X-128) couldn't be had, we found that GM-2068106 was okay, except that it was too thick. We removed the small raised portion inclosing the leather part of the seal by grinding the edge, taking out the leather seal, and hammering down the remaining part of the raised portion. The seal fitted perfectly. It's much easier to leave the tie rod connected and remove the bolts on the axle housing (after pulling out the axle), then swing the complete assembly and trunnion out in the clear. It's a good idea to block up the tie rod while doing this.

The 6-ton 6x6 White uses the same trunnion assembly as the M1 wrecker.

Capt. D. M. Googins
APO 654

Ed. Note—Your idea's handy in a pinch. But it'll save time and trouble if you rake the countryside for the right seal, first.

Keep Your Dome Fires Burning

When you've got something hot in your head, give it here and give it air. Especially if a maintenance stew is what's cookin'. If it saves time or sweat or precious parts—if it gets you and your vehicle out of a spot—it'll do as much for hundreds of thousands of others. We'll not only publish your deal if it's good, but also reward you handsomely with a one-year **personal** subscription. Tell all to ARMY MOTORS MAGAZINE, Office, Chief of Ordnance, Detroit 32, Michigan.

Dear Half-Mast,

I'd like to know why they eliminated the bearing inserts in the connecting rods on small air compressors. We never had any trouble with the ones we had in the ones that had the bearing inserts in the rods. Now we have a compressor without the inserts and it's laid up without the connecting rod—and we can't requisition a new one because there aren't any to be had. The drivers have to lubricate by hand and that's no fun.

Another thing—on the split-type housing on a 2½-ton GMC: It has two caps, one to check grease and the other for filling it up. Well, when the driver checks the grease he goes wrong by checking the filler cap instead. Why can't the filler cap be eliminated and just use the other for both checking and filling?

Sarge, in replacing rubber retainers on our ¼-ton jeeps, such as on tie rods and the bell crank, I use a piece of hose cut to the size of the retainer and it sure is doing a swell job.

Sgt. J. G. S.

Dear Sergeant,

Bearing inserts haven't been eliminated from portable air compressors—we've had both kinds of connecting rods right along. You must have worked with the insert-type first. Maybe you can rig up a jig and re-babbit your worn rod. Or, a piece of leather will make an okay bearing that'll last for a little while. Both types of rods are still GI.

I think you're a little mixed up on those GMC axle housings. The split-type has only **one** hole for filling and checking the lube level. On the banjo-type housing, use the **lower** hole for both filling and checking.

Sharp idea, using rubber hose (when you can get it) to make retainers for ¼-ton tie rods and bell cranks.

Half-Mast

Dear Half-Mast,

You asked for criticisms on the M24 light tank, so here goes.

SGT. HALF-MAST McCANICK'S



CRYSTAL BALL DEPARTMENT

Why doesn't the tank have a fuel filter? It's the only Army vehicle I know of that doesn't have one. We've had trouble with hydrostatic lock when the tank is in motion—that's sure one for the books. The TM says the gas tanks should be drained a little to allow dirt and water to get out. We did this and still had trouble.

One more thing, why don't they put a petcock on the gas tank? Would make it much easier to drain.

Cpl. E. B. P.

Dear Corporal,

The reason they didn't put a fuel filter on the M24 in the first place was this: The engineers figured the screen on the electric fuel-pump would do the job. But some cases of hydrostatic lock, like the one you reported, have turned up—so a small disc-type filter has been added to each carburetor in recent production. I hear that these filters will also be authorized for M24's in the field. Watch our list of "The Month's Directives."

Say, one possible cause of that hydrostatic lock could be dirt under the carburetor-float valve. My gal Connie says to read her Bulletin Board in the February ARMY MOTORS. She had some good tips on that there trouble.

On your second question, there just ain't room enough between the bottom of the gas tank and the hull floor in the M24 to put in a petcock. Couldn't let it stick below the hull floor, either—too easy to bash up or knock off.

Half-Mast

Dear Half-Mast,

On the 2½-ton 6x6 GMC's which we have here, the rear bogie axles have been going bad—probably due to overload and operation in muddy sections. But it's my belief that the manufacturers are shorting us on the deal. After we had three go out in one week, I took it on myself to find out why. It seems that the gears on the spider of the differential are breaking up and tearing the other parts to pieces. Upon further investigation it was noted that instead of having four of these gears on the spider as the book calls for, there are only three. I would like to know if this is the cause—and if so, why only three gears instead of the usual four? If not, then what is the trouble? I know that the gear lubricant is correct and at the proper level, so that's out. Overload, maybe—but I can't see it, because we never have operated

with more than five tons on any of our vehicles and directives say it's safe to overload 100%.

Lt. E. K. G.

Dear Lieutenant,

If you found only three gears instead of the proper four, somebody must have made a quick fix on the differential and shoved it back together with only three pinions. The manufacturer makes a stiff check on all differential assemblies installed in vehicles or shipped as service parts—so it's a pretty safe bet the fourth gear got left out somewhere in the field.

You didn't go into much detail on what you found in the rear axles that went bad. But that missing pinion **could** have raised plenty of hell. The thrust from the propeller shaft is divided equally among the four pinions. When one's missing, you get an out-of-balance that tends to bend the spider and is kinda rough on differential bearings.

That's not the only trouble, though. You're right—WD Circular 212 (44) did authorize 100% overloads for cargo trucks rated up to 2½ tons. But **only** on hard-surface roads. Doesn't say you can lug that kind of load over rough country. If you ever do, watch out for "extreme bogie action". That's when your forward rear wheels hit a sharp rise which jams the axle up near the frame while your rearward rear wheels are hanging free over the hole you've just climbed out of. When that happens, the forward rear axle has to take the full driving load for a second or two—a load way over what it's built for.

Half-Mast

Dear Half-Mast,

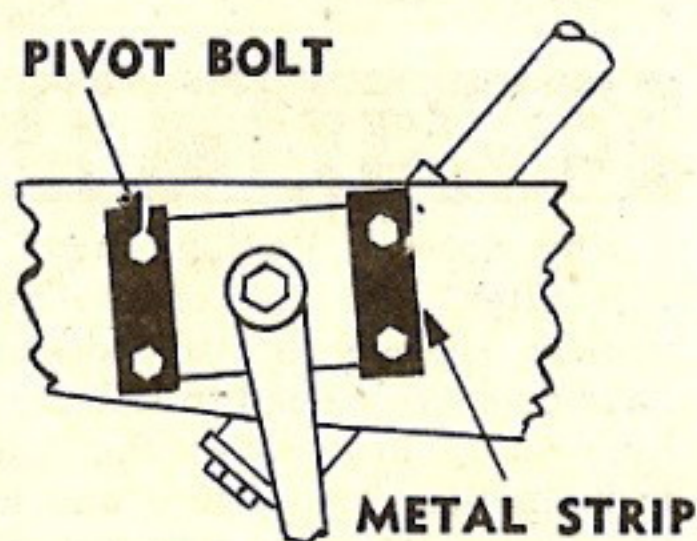
On our Dodge trucks and command cars, the bolts fastening the steering column to the frame always come loose. I think putting metal strips across the bolts (see Fig.) would keep them from pulling loose. Do you have any better suggestions?

Sgt. E. R.

Dear Sergeant,

Wish you'd let me know which

Dodge jobs are bothered by those loose steering-post bolts, 'cause there are several different sizes used on different models. The ½-ton 4x4 T-202 and the 1½-ton 4x4 T-203 have ¾" steering-gear-to-frame attaching bolts; on the ½-ton 4x4 T-207, T-211, and T-215, the bolts are ½". The ¾-ton 4x4 and 1½-ton 6x6 have ⅝" cap-screws. If you find that the ¾" bolt is to blame, try enlarging the frame slots and bolt holes for ½" SAE bolts. If they're kept properly tightened, you shouldn't have any trouble. But if they do loosen and ain't tightened soon enough, the threads may be so shot that you can't keep the parts tight any more.



If you're running over really rough ground, might use longer bolts and two nuts to make a double-nut lock.

Your suggestion for fastening down the bolts with metal strips is okay if nothing else helps.

Half-Mast

Dear Half-Mast,

On gasoline-driven air compressors, portable or otherwise, the gasoline first goes into the tank, then through a shut-off valve, next through a filter with glass bowl, and finally into the carburetor. Evidently someone had illusions that the filter would stop dirt and water before they reached the carburetor. In practice, some water may collect in the glass bowl, but the dirt stops in the shut-off valve. Then begins the little game of blowing the dirt back into the tank, and waiting for it to collect in the shut-off valve again. Finally, matters get so bad that somebody takes the

tank off and cleans the valve thoroughly.

Why not make the filter go to work, either by eliminating the shut-off valve or by using a wide open-straight variety of valve?

T/5 S. M.

Dear Corporal,

Eliminating the shut-off valve or replacing it with a straight-through type ain't the answer to your trouble. In the first place, this valve is needed to shut off the fuel tank when you're cleaning the filter or carburetor. And the Army don't like the straight-through type of valve for gasoline because it's pretty hard to keep it from leaking, which makes a nifty fire hazard.

Seems to me the root of your trouble is dirty gasoline. If it's so dirty that it plugs the valve, I'd strain it before putting it in the tank. And besides, I'd take a look at the fuel tank to see if that's clean, too. But you know your own situation, Corporal—maybe, straining the gas is easier said than done.

Half-Mast

Dear Half-Mast,

We're having some trouble removing brake drums on the ¾-ton Dodge, when screwing bolts into the threaded holes and applying pressure to force the drum from the hub. On drums that are rusted or frozen to the hub flange, the reinforcing plate on the drum (which is spot-welded to the brake drum proper) separates from the drum or gets badly bent, bending the part under the reinforcing plate, too. A metal-stripping action also takes place when the reinforcing plate bends before the drum loosens from the hub (since the reinforcing plate is then in a cocked position in relation to the studs in the hub and that part of the hub to which the driving flange is attached). This increases even more the pressure necessary to remove the drum.

I've found no way of taking frozen drums except by removing the drum and hub as a unit which exposes the wheel bearings

to plenty of dirt and dust on a windy day.

T/3 L. F. W.

Dear Sergeant,

Smear some penetrating oil in the puller screw-holes and between the hub and brake drum. (If there ain't no penetrating oil around, use a substitute—like oil, lubricating, preservative, special or light; Diesel fuel; or rifle-bore cleaner). If the drum hasn't been removed for quite a while, try using three $\frac{3}{8}$ " standard cap-screws, instead of the attaching screws. Tighten all the screws evenly and shock each screw with a hammer as it's tightened. This shocking will let you remove that stubborn drum and at the same time prevent stripping of the puller screw-holes. It'll also let you remove the drum without distorting the reinforcement plate.

Half-Mast

Dear Half-Mast,

A lot of people around here have been asking me what an ambulance KD is. I had to admit I never heard of it—and so did all the people I asked.

Somebody took that simple line in our T/O & E which said "Ambulance, $\frac{3}{4}$ -ton" and changed it to "Truck, $\frac{3}{4}$ -Ton, 4x4, Ambulance KD." I'd like to know why they changed the nomenclature and what in hell KD means.

Lt. A. R. R.

Dear Lieutenant,

That mysterious "KD" stands for "Knock-Down."

The Ambulance KD is a factory-modified $\frac{3}{4}$ -ton Dodge weapons carrier. It has a collapsible ambulance body that's completely knocked down for shipment—to save shipping space. The nomenclature's been changed and the KD tacked on 'cause it amounts to a new type of vehicle.

Half-Mast

Dear Half-Mast,

We are having trouble with an Autocar tractor-truck, model U-4-T, leaking oil around the generator. Seems the oil slinger doesn't do the job sufficiently to stop the leaks. Can you give us

some help in this respect?

E. L.

Dear Mr. L.,

You can blame oil leaks around that generator on several things. There's a cork seal in the crankcase, put there to stop oil from leaking between the barrel-end of the generator and the crankcase hole. If this seal gets damaged when it's installed, oil is liable to leak. (When inserting the seal, try lubricating the generator's barrel-end with engine oil.) A loose oil slinger'll cause leakage, too—the slinger gets bent and rubs against the generator casting, and oil pumps through into the armature housing.

Has your vehicle got positive crankcase ventilation? If it ain't working right—maybe due to a gummy intake valve—you're pretty sure to have this trouble. If you don't have crankcase ventilation, a clogged breather'll cause too much crankcase pressure, and this'll push the oil out, too.

Half-Mast

Dear Half-Mast,

In spite of good winch maintenance, the present shift-yoke handle of the 2 $\frac{1}{2}$ -ton GMC winch assembly becomes unwieldy and requires the use of a screwdriver or hammer in engaging and disengaging. Don't you think adding 2" to the handle would fix it?

Capt. W. G. L.

Dear Captain,

You could drill an oil hole in the upper part of the winch-yoke handle and squirt a little oil on the poppet now and then—that'll make shifting easier. But adding

2" to the yoke handle would extend the handle out onto the bumper and would take some changes in design to make it workable. Could be there's some binding of the spring bolt, due to damage. Better check the tension spring to see if it's seated properly and not catching on the bolt threads.

Half-Mast

Dear Half-Mast,

We have found that some 1st-echelon "mechanics" are trying to adjust voltage regulators when the ammeter shows no charge. I've found that in some instances the battery was fully charged and the regulator was just cutting the current flow down to prevent battery overcharge. Of course, this is needless labor and should be eliminated. That seal on the regulator should mean something, right?

T/3 C. P. M.

Dear Sergeant,

With some guys, a seal is just an obstacle to be overcome—evidently, as you say, they think that because the ammeter needle ain't bending itself against the charge end of the dial face, they gotta rip the seal and fix (?) the regulator. When they break that seal, they're breaking all the rules.

I thought everybody knew that the regulator adjusts the charging rate to the needs of the battery. Fully-charged battery, low ammeter reading—run-down battery, high reading.

Half-Mast

Gray Cells, Why Are You Blue?

Are there a coupla maintenance brainbusters foggin' up the operation? A coupla problems you can't beat? Where you are, the answers ain't. Where Half-Mast is, the answers are—Half-Mast can spit in any direction and hit a truck or tank manufacturer, or an Ordnance engineer—and often does. Send your unsolved chestnuts to "Dear Half-Mast," ARMY MOTORS MAGAZINE, Office, Chief of Ordnance, Detroit 32, Michigan. You'll get a personal subscription **by direct mail** if your question's published.

The Month's Directives

Your monthly check-list of War Department AGO and Ordnance publications affecting 1st and 2nd-echelon motor maintenance—and how to get them

WAR DEPARTMENT AGO PUBLICATIONS

AR—Army Regulations
FM—Field Manual
TM—Technical Manual
TB—Technical Bulletin
LO—Lubrication Order

MWO—Modification Work Order
TC—Training Circular
WDC—War Department Circular
SB—Supply Bulletin

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ORDNANCE DEPARTMENT PUBLICATIONS

ASF Catalog, Ordnance Supply Catalog:
ORD 2, Index.
ORD 3, List of items for issue to troops, posts, camps, and stations.
ORD 5, Standard hardware, common tools, cleaning and preserving materials, misc. common items.

ORD 6, Tools and tool sets.
ORD 7, Organizational spare parts and equipment.
ORD 8, Higher-echelon spare parts and equipment.
ORD 9, List of all parts.
ORD 13, Parts common to two or more major items.

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ARMORED CARS

CAR, ARMORED, LIGHT, M8
ORD 7, 8, 9, SNL G-136, G-176, C6 (15 Feb. 45).

CAR, ARMORED, UTILITY, M20
ORD 7, 8, 9, SNL G-136, G-176, C6 (15 Feb. 45).

GUN MOTOR CARRIAGES

CARRIAGE, MOTOR, 105-MM
HOWITZER, M7

TB ORD 222, Tightening exhaust-collector ring-clamps.

CARRIAGE, MOTOR, 105-MM
HOWITZER, M7B1

ORD 7, 8, 9, SNL G-199, C1 (15 Feb. 45).

CARRIAGE, MOTOR, GUN,
155-MM, M12

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ORD 7, 8, 9, SNL G-210, C2 (25 Jan. 45).

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LO 9-772 (23 Sep. 44).

CARRIER, CARGO, M29C
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ORD 7, 8, 9, SNL G-103, Vol. 2, 8, C4 (15 Feb. 45).

TANK, LIGHT, M5A1
ORD 7, SNL G-103, Vol. 8 (31 Jan. 45)

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TB 9-729-3, Equipment list.

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TB ORD 243, Towing procedure.

TANK, MEDIUM, M4, 75-MM
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TB ORD 222, Tightening exhaust-col-
lector ring-clamps.
ORD 7, SNL G-104, Vol. 6 (2 Dec. 44).
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TANK, MEDIUM, M4, 105-MM
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TB ORD 222, Tightening exhaust-col-
lector ring-clamps.
ORD 7, SNL G-104, Vol. 14 (2 Dec. 44).
ORD 7, 8, 9, SNL G-104, Vol. 6, 11, 14,
C4 (10 Feb. 45.)

TANK, MEDIUM, M4A1, 75-MM
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TB ORD 222, Tightening exhaust-col-
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C4 (10 Feb. 45).

TANK, MEDIUM, M4A1, 75-MM
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TB ORD 222, Tightening exhaust-col-
lector ring-clamps.

TANK, MEDIUM, M4A1, 76-MM
GUN, WET

TB ORD 222, Tightening exhaust-Col-
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Feb. 45).

TANK, MEDIUM, M4A3, 75-MM
GUN, WET

ORD 7, 8, SNL G-204, C2 (25 Jan. 45).

TANK, MEDIUM, M4A3, 76-MM
GUN, WET

ORD 7, 8, 9, SNL G-104, Vol. 15, G-205,
C2 (10 Feb. 45).

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ORD 7, SNL G-104, Vol. 15 (31 Jan. 45).
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Feb. 45).

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TM 9-735, Operation and maintenance
(15 Jan. 45).
ORD 7, SNL G-226 (6 Jan. 45).

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TRUCK, 1/4-TON, 4x4 (WILLYS,
RD)

ORD 7, SNL G-503, C1 (19 Jan. 45).
SE 9-44, Canvas conservation (22 Jan.
45).
LO 9-803 (30 Dec. 44).

TRUCK, 3/4-TON, 4x4 (DODGE
T214)

TB 9-808-6, Equipment list.
ORD 7, 8, 9, SNL G-502, C1 (20 Jan. 45).
ORD 7, 8, 9, SNL G-502, C2 (15 Feb. 45).

TRUCK, 1 1/2-TON, 4x2 (FORD)

TB 9-806-1, Equipment list.
ORD 7, 8, 9, SNL G-540, C1 (15 Feb. 45).

TRUCK, 1 1/2-TON, 4x4 (CHEV-
ROLET)

TB 9-805-1, Equipment list.
ORD 7, 8, 9, SNL G-85, Vol. 4, G-506, C5
(20 Jan. 45).

TRUCK, BOMB SERVICE, M6
(CHEVROLET)

TB 9-765-2, Equipment list.
ORD 7, SNL G-85, Vol. 4 (3 Dec. 44).
ORD 7, 8, 9, SNL G-85, Vol. 4, G-506, C5
(20 Jan. 45).

**BE A GOOD
NEIGHBOR**

Know any outfits in your
neighborhood that could use
ARMY MOTORS—and aren't
getting it? Be a good neighbor
and give them our address, so
they can send in their request
and T/O & E number.

ARMY MOTORS is distrib-
uted on this basis:

- 1 for each Motor Officer
- 1 for each Motor Sergeant
- 1 for each O14 Mechanic
or equivalent

—to be passed around, of
course, to all concerned.

TRUCK, 2 1/2-TON, 4x2 (FED-
ERAL 2G, 3G)

TB 9-821-1, Equipment list.

TRUCK, 2 1/2-TON, 6x4 (GMC
CCW-353)

TB ORD FE21, Brake and clutch-pedal-
shaft lubricating fitting.
ORD 7, 8, 9, SNL G-508, C2 (29 Jan. 45).

TRUCK, 2 1/2-TON, 6x6 (GMC)

TB ORD FE21, Brake and clutch-pedal-
shaft lubricating fitting.
TB ORD 231, Equipment list.

ORD 7, 8, 9, SNL G-508, C2 (29 Jan. 45).

TRUCK, BOMB SERVICE, M27

ORD 7, 8, 9, SNL G-508, C2 (29 Jan. 45).

TRUCK, 2 1/2-TON, 6x6, SMALL
ARMS REPAIR, SIGNAL
CORPS, M7

ORD 7, SNL G-229 (6 Jan. 45).
ORD 7, SNL G-229, C1 (29 Jan. 45).

TRUCK, 2 1/2-TON, 6x6, SIGNAL
CORPS REPAIR, M30

ORD 7, SNL G-235 (11 Jan. 45).

TRUCK, 2 1/2-TON, 6x6, SIGNAL
CORPS GENERAL REPAIR,
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ORD 7, SNL G-229 (6 Jan. 45).
ORD 7, SNL G-229, C1 (29 Jan. 45).

TRUCK, 2 1/2-TON, 6x6 AND 6x4
(STUDEBAKER, REO)

TB 9-807-5, Equipment list.

TRUCK, 4-TON, 4x4, CARGO
(FWD HAR-1)

TB 9-815-1, Equipment list.

TRUCK, 4-TON, 6x6 W/WINCH
(DIAMOND T)

TB 9-811-2 Equipment list.
ORD 9, SNL G-509 (28 Dec. 44).

TRUCK, TRACTOR, 4-5 TON,
4x4, C.O.E. (FEDERAL 94x43C)

TB 9-820-1, Equipment list.

TRUCK, TRACTOR, 5-TON, 4x2
(IHC H-542-9, H-542-11, MAR-
MON-HERRINGTON H-542-11,
KENWORTH H-542-11)

TB 9-812-3, Equipment list.

TRUCK, TRACTOR, 5-6 TON, 4x4
PONTON (AUTOCAR
U-8144-T)

TB 9-817-1, Equipment list.

TRUCK, 6-TON, 6x6, BRIDGE
ERECTING (WHITE)

TB 813-3, Equipment list.

TRUCK, 10-TON, 6x4 (MACK
NR)

TB 9-818-3, Equipment list.

TRUCK, WRECKING, HEAVY,
M1

TB 9-795-4, Equipment list.

TRUCK, TRACTOR, M26, M26A1,
AND SEMITRAILER, M15

ORD 7, 8, 9, SNL G-160, C1 (5 Feb. 45.)

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TRAILER, 1/4-TON PAYLOAD,
2W, CARGO (WILLYS MB-T,
AMERICAN BANTAM T-3)

ORD 7, 8, 9, SNL G-529, C3 (20 Feb. 45).

TRAILER, 1-TON PAYLOAD,
2W, WATER TANK, 250-GAL.

ORD 7, 8, 9, SNL G-527, C3 (15 Feb. 45).

SEMITRAILER, 7-TON, 4W, VAN,
W/DOLLY, M26

LO 9-884 (17 Jan. 45).

TRAILER, GENERATOR, M7,
M18

TM 9-881, Operation and maintenance
(22 Dec. 44).

ORD 9, SNL G-217, G-221 (15 Nov. 44).

TRAILER, DIRECTOR, M13, M14,
M22

TM 9-881, Operation and maintenance
(22 Dec. 44).

ORD 9, SNL G-217, G-221 (15 Nov. 44).

TRAILER, MOUNT, M17

TM 9-881, Operation and maintenance
(22 Dec. 44).

CARRIAGE, MULTIPLE CAL. .50
MACHINE GUN, M51

ORD 9, SNL G-217, G-221 (15 Nov. 44).

TRAILER, BOMB, 1-TON, 4W,
T53

ORD 9, SNL G-224 (15 Jan. 45).

LANDING VEHICLES

VEHICLE, LANDING, TRACKED, ARMORED, MK I

ORD 9, SNL G-214 (10 Jan. 45).

VEHICLE, LANDING, TRACKED, MK II

ORD 7, 8, 9, SNL G-167, G-168, C4 (30 Nov. 44).

ORD 7, 8, 9, SNL G-167, G-168, C5 (19 Jan. 45).

VEHICLE, LANDING, TRACKED, ARMORED, MK II

ORD 7, 8, 9, SNL G-167, G-168, C4 (30 Nov. 44).

ORD 7, 8, 9, SNL G-167, G-168, C5 (19 Jan. 45).

VEHICLE, LANDING, TRACKED, ARMORED, MK IV

ORD 9, SNL G-214 (10 Jan. 45).

EQUIPMENT

CHARGER, BATTERY, PORTABLE, AIR COOLED, GASOLINE-ENGINE-DRIVEN, 12 V., 2000 WATTS (Onan 33-B) COMPLETE (17-C-9635)

ORD 7, SNL J-457 (8 Jan. 45).

GENERAL

AR 1-10, List of current and suspended pamphlets (1 Jan. 45).

AR 850-5, Marking of clothing, equipment, vehicles and property (15 Feb. 45).

AR 850-15, C8, Motor vehicles (27 Jan. 45).

WDC 33, Materials handling equipment, maintenance, procurement, storage and issue (27 Jan. 45).

WDC 36, Carbon tetrachloride; motor vehicle scheduled preventive maintenance; preventive maintenance roster change (30 Jan. 45).

WDC 43, Unserviceable major unit assemblies (5 Feb. 45).

FM 17-33, Tank battalion (Dec. 44).

FM 17-40, Armored Infantry Co. (Nov. 44).

FM 17-69; C2, Armored Command crew drill (24 Jan. 45).

FM 21-6, Training publications (20 Jan. 45).

WD Pamphlet 12-6, Administrative and supply publications index (1 Jan. 45).

TM 21-301, Driver selection, training, and supervision, half-track and full-track vehicles (Oct. 44).

TM 21-302, Operator selection and training, materials handling equipment (Feb. 45).

TM 21-305, Driver's manual (Nov. 44).

TM 37-250, Basic maintenance manual (Nov. 44).

TB ORD 224, Paints and painting.

TB ORD 230, Continental R975-C1 Ordnance spare engines.

TB ORD 232, General and special purpose vehicles, special equipment, crankcase drain intervals.

TB ORD 234, All Ordnance wheeled vehicles, electric brake controls.

TB ORD 235, All vehicles using Continental R975-C1 and R975-C4 engines, carburetor identification.

TB ORD 239, Identification, inspection, classification, reconditioning, and dis-

position of synthetic inner tubes. TB ORD 242, Ordnance vehicles, protection of electrical equipment against corrosion and rust.

SB 9-1, Ordnance major items and combinations, pertinent publications (1 Feb. 45).

SB 9-5, Disposition of excess and unserviceable Ordnance general supplies (25 Jan. 45).

SB 9-41, Transfer of vehicles (5 Jan. 45).

SB 9-43, Storage and shipment of rubber tires, tubes and camelback (26 Dec. 44).

SB 10-139, Liquid fuels, lubricants, hydraulic fluids (28 Dec. 44).

SB 38-1-9, Repair of critical, excess, and obsolete items (23 Dec. 44).

ORD 2, Index, C1 (1 Feb. 45).

ORD 3, SNL G-1, Suppl. 1, Data chart, vehicular armament and mounts (6 Jan. 45).

ORD 13, SNL G-9, Pt. 1, Group G common items (15 Jan. 45).

ORD 6, SNL G-27, Sec. 2, Automotive and semi-automotive maintenance tools (1 Jan. 45).

ORD 5, SNL H-10, Ferrous metals (19 Jan. 45).

ORD 5, SNL H-14, C1, Tires, tubes, tire valve and patches (28 Nov. 44).

ORD 5, SNL J-1, Sec. 1, Abrasion and compression tools (3 Feb. 45).

ORD 7, SNL J-5, Lifting, holding, and forming tools (13 Jan. 45).

ORD 5, SNL J-6, Percussion, digging, and wrecking tools (3 Feb. 45).

ORD 5, SNL J-7, Sec. 1, Welding, forging, soldering, and brazing equipment (3 Feb. 45).

ORD 5, SNL J-9, Sec. 1, Measuring and testing instruments (3 Feb. 45).

ORD 13, SNL M-5, Items common to two or more groups (12 Jan. 45).

GMC CLUTCH-PEDAL BUMPER

(Continued from page 3)

using hot-rolled steel (band iron) .089" or .083" thick. Make it out of this material if you've got it on hand. Otherwise, you can use 1/4" strap iron or something similar. First, cut out a piece of metal 2 1/2" wide and 2 3/4" long. Then make a 3/32"-radius bend 1/2" from the right edge of the 2 3/4" length. Make the same radius bend 1 1/2" from the first one, only facing the other way. All you've got to do now to finish your bumper is drill two 9/32"-dia. bolt holes, located as shown (Fig. 2). And you're ready to attach it under the floorboard. After removing the old bumper, mount the new one in the same place (Fig. 1), using the original holes and the same nuts and bolts. If you find the metal raised up around these holes, hammer the surface flat so the bumper'll sit tight. If by doing this you decrease the size of the holes, you may have to re-drill them to their original size.

After you've attached the higher

bumper, be sure to change the pedal free-travel to what it was before. That is, keep it at 2 1/2" until the adjusting nut is at the end of the adjusting-link threads, where you can leave it until free travel works down to 1".

This bumper'll cut the total pedal travel by 7/8". But you don't have to worry about a full clutch release because you'll still get it with a 3/4" leeway when the foot pad touches the floorboard, even with the tightest possible combination—the higher bumper, a new clutch, and 2 1/2" free travel. The reason for this cut in pedal travel is, of course, to cut some of that wear on the spring.

M25 TANK TRANSPORTERS

(Continued from page 11)

fits snugly into the ball socket on the axle—under the stabilizer beam—without end play. End play sets up a hammering of the adjusting screw, resulting in breakage or loosening. Adjust by removing shims.

(3) Experience has shown that if the adjustment on the radius

rod is done as per TM 9-767 (23 Feb. 44), it often leaves the wheels out of adjustment. To get around this, instead of adjusting the radius rods until the proper deflection of the chains is obtained, measure the distance from the axle to a stationary part of the vehicle. A slight variation of deflections in the chains won't hurt anything, but if the wheels are not parallel, it wears the devil out of the tires. When adjustment of the drive chains is necessary and can't be made with the adjusting screws the same length, the only possible way to get the correct adjustment is to add or subtract some links.

With the radius-rod screw-ball in correct adjustment and the slot clear and wide enough to allow proper tightening, trouble with loose adjusting screws should disappear. Just keep checking the clamp bolts for looseness. Once the correct adjustment is accomplished, crews should be warned to resist the temptation (a terrible temptation) to tamper around the tandem. Just check the clamp bolts for tightness.

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This is a happy-medium index. It's more complete and helpful than the Perpetual Index you've been seeing right along, but it doesn't give the exact subjects of articles and items the way our annual indexes used to do (the space shortage is the reason).

The breakdown is simple enough: Types of vehicles, general references to those types, then specific vehicles or makes, and finer points under those. Start off with the vehicle concerned and track down the item you're hunting from there.

The Perpetual Index has been discontinued. From now on, there'll be a quarterly index published in the JULY, OCTOBER, and JANUARY issues, with an annual index in APRIL. That way, you'll never have more than three mags to thumb through without an index to guide you.

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Where There's a Wheel, There's a Way

Like a lot of other people, maybe you're confused about how to requisition hubs and drums for your 2½-ton GMC's and 1½-ton Chevies. Used to be that you simply ordered a complete hub-and-drum assembly (the old non-demountable type)—but those days are gone forever. There's no part number covering the demountable hub and drum as a complete assembly. You order the separate parts that go to make them up.

2½-Ton 6x6 GMC

Rear Demountable Hub and Drum (Banjo type only)

Part	Mfr's No.	Item Stock No.
Hub, rear	2197671	G501-7001995
Drum	2197670	G501-7001996
Deflector, oil	3678656	G501-7001992
Screws (drum attaching)	114663	H1-1023149
Bolts (left rear)	3665389	G85-3524289
Bolts (right rear)	3665390	G85-3524322
Ring, bearing retainer	594324	G85-3111760
Cup, bearing, inner	127631	H12-0708608
Cup, bearing, outer	127627	H12-0708620

Front Demountable Hub and Drum (Banjo type only)

Part	Mfr's No.	Item Stock No.
Hub, front	2197668	G501-7002242
Drum	2197669	G501-7001994
Cup, inner bearing	186573	H12-6225100
Cup, outer bearing	142224	H12-6202450
Screws (drum attaching)	114663	H1-1023149
Bolts (left front)	3665385	G85-3524320
Bolts (right front)	3665386	G85-3524321

If you still have the old non-demountable hub and drum, bring your truck up to snuff by latching onto TB ORD FE22 (26 Jan. 45). That'll tell you how to use the demountable drum with the old-type hub. If you need both hub and drum, there's no modification necessary—just off with the old and on with the new.

These numbers replace the old hub-and-drum assemblies 605787, 605788, 3660095, and 3660096:

1½-Ton 4x4 Chevrolet

Rear Demountable Hub and Drum

Part	Mfr's No.	Item Stock No.
Hub, rear	3665388	G85-3521028
Bolts (left rear)	3665389	G85-3524289
Bolts (right rear)	3665390	G85-3524322
Drum	608800	G85-3557464
Deflector, oil	3678656	G501-7001992
Bolt, anchor plate	181671	H1-5457041
Screws (drum attaching)	114663	H1-1023149
Bearing, inner assy.	144527	H12-0707609
Bearing, outer assy.	144525	H12-0707694
Ring, bearing retainer	594324	G85-3111760

Front Demountable Hub and Drum

Part	Mfr's No.	Item Stock No.
Hub, front	3675980	G85-3621030
Bolts (left front)	3665385	G85-3524320
Bolts (right front)	3665386	G85-3524321
Drum	608799	G85-3557463
Screw (drum attaching)	114663	H1-1023149
Cup, inner bearing	186573	H12-6225100
Cup, outer bearing	142224	H12-6202450

• • NEWS FLASHES • •

The items on this page include latest news, revisions, and corrections verified after the publication deadline

The **Driver's Manual** you've seen advertised for the past two months is now yours for the asking' (**TM 21-305**, Nov. 44). It's high time to toss out your old **TM 10-460**, and tuck this new manual in your handiest pocket.

* * *

15 Aug. 45 is the deadline for changing your vehicle registration numbers from blue to white. The new **AR 850-5** (15 Feb. 45)—superseding the one dated Aug. 42 and all its 10 changes—says, "Registration markings will be applied with approved white lusterless, stenciling, synthetic enamel," and gives you six months from its publication date to get the white markings on your vehicles. Then it goes on with details, such as size of marking, style, etc. Specifications for all other vehicle markings—national symbol, unit identification, tactical markings, weight-class markings (formerly published in **TC's**), headquarters identification plates, and special markings are in this **AR**, too. It's the law on "Marking of Clothing, Equipment, Vehicles, and Property" and rates careful checking.

* * *

Time to get acquainted with **WD Pamphlet 12-6**, twin sister of **FM 21-6**—and a session with the Introduction Section to the 1 Jan. 45 edition is a good way to break the ice. You'll come out knowing what's listed there, how it's indexed, and so on.

From now on, **WD Pamphlet 12-6** will carry listings of new **AR's**, changes to and revisions of old ones; **WD Circulars**, **General Orders**, and **Bulletins**; **T/O&E's**, **T/A's**, and **T/BA's**; and **Blank Forms**—in addition to the publications listed in the earlier edition: **Mobilization Regulations**, **MWO's**, **Pamphlets**, **Readjustment Regulations**, and **SB's**. The 1 Jan. 45 edition washes out all unnumbered lists and indexes of War Department publications, as well as **WD Pamphlets 12-3** (**List of Forms Stocked by AG Depots**), so you'll even use it to get the lowdown on blank forms.

* * *

Because spare **Continental R975-C1** engines have been shipped with different accessories by different manufacturers under different part numbers, **TB ORD 230** (13 Dec. 44) jumps in and straightens things out. All new and rebuilt spare **Continental R975-C1** engines are now being supplied under **Ord. Part No. 7002017**, Item **Stock No. G104-7002017**. The **Ord. Part No.** will be marked on the box along with the name of the vehicle the engine's supposed to go into.

These spares will all fit all vehicles powered by this engine except the 76-mm gun motor carriage **M18**, armored utility vehicle **M39** (**T41** and **T41E1**), 155-mm gun motor carriage **M12**, and cargo carrier **M30**. And they're okay for either early or late-type medium-tank hulls.

Shipping boxes will include all necessary fittings except generator and generator clamps. If the particular vehicle needs an engine-driven generator and the one on the replaced engine is serviceable, you use it. Otherwise you requisition one.

Then there are four or five more pages telling you what to do with the spares when you get 'em. Better snag a copy of the **TB**.

* * *

Fresh off the press is **TM 21-300** (Feb. 45), "Driver Selection, Training, and Supervision; Wheeled Vehicles," to supersede the one dated 10 Nov. 42 and **Change 1**. Its companion piece, **TM 21-301** (18 Oct. 44), "Driver Selection, Training, and Supervision; Half-Track and Full-Track Vehicles," hit the field a little earlier. Picking and training operators for materials-handling equipment gets attention, too—in **TM 21-302** (Feb. 45). With this trio, your 1st-echelon oughta be a 1st-class crew.

* * *

SB 9-44 (22 Jan. 45) rings down the canvas curtains, also the tops, on 1/4-ton jeeps, **M2** and **M2A1** half-tracks, and **M3** and **M3A1** half-track personnel carriers.

So we'll have enough tentage duck for higher-priority uses, no more canvas will be bought for tops and curtains for these vehicles. Where tops and curtains are still on hand, they may be issued as usual.

The **SB** adds that all bows, rods, and webbed straps on these vehicles should be removed and returned to the nearest storage depot when your present curtains and tops wear out, or before issuing a vehicle without 'em. If and when more canvas is available for tops and curtains, you can go ridin' around in the rain again.

* * *

There's a lot of dope about paints and painting in **TB ORD 224** (27 Nov. 44). Tells you what paints, primers, enamels, lacquers, and thinners you can get to preserve your Ordnance materiel—what you use 'em for—how to handle 'em safely—and how to prepare surfaces for painting. It's the same type of info you once got out of **MTTSB Z-9**, which we hear is about to be officially rescinded.

Snowball in hell

That about sums up the chances of the new tire that just went by.

Its road to glory is paved with jagged rubble and splintered glass—with flying lead and steel thrown in for good measure.

The real reason for the tire shortage is simple: There's a war on.

The most we can do about the shortage is keep it from getting any worse—by giving our tires still more of that ever-lovin' care.

That's also the **least** we can do.