



ARMY MOTORS

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Tankmen Get a Break . . .

It's no news that driving a tank is a tough job. Even being in one is tough.

Foul air, cramped quarters, hide-scraping gadgets...all these make the tankman's life anything but a bed of roses.

Despite these hindrances, our tanks are out-fighting and outshooting anything the enemy throws at us. This alone would make it the easiest thing in the world for the War Department to sit back on its well-deserved laurels and figure their job was done to everybody's satisfaction...except the tankmen's.

But we don't operate this way over here.

Now that the tanks have proved they could do well the only thing they were designed to do — FIGHT — the big-wigs have turned their attention to making things a little more tolerable for the fighting crews of these fighting tanks.

A tank driver, better than anyone else, knows that disengaging the clutch 100 or more times a day makes him feel like he's got a wooden leg... and with good reason. To prevent this fatigue, a modification is in the works to provide an "over-center-spring booster" to relieve the driver of the wearying clutch-spring pressure.

Another modification planned will prevent the tankmen from losing their heads. A more secure lock will hold the hatches open. Present locks allow the hatch to close while the tank is bouncing along...occasionally cracking a skull.

And while the engineers were on the subject of hatches, they planned a counterbalancing device for the driver's hatch, which will make it easier to open and close the hatch from both the inside and the outside.

They took pity on the extra tall and extra short drivers too. The vertical adjustment of drivers' seats is going to be increased.

The highly combustible latex crash padding is being changed for fire-resistant cattle-hair pads. This may not have anything to do with comfort, but it makes things a lot safer.

Also, the ventilating system in the fighting

compartment is being improved to remove those overpowering gun fumes. This should also get rid of the heated air more quickly, thus making a tank cooler when operating with the hatches closed.

These aren't all of the modifications...more are planned. Some have already been made, others you won't see for several months.

Some people may wonder why these improvements weren't made when the tanks were first designed. The answer is: There just wasn't time. When the orders came through to design a tank that could stand the gaff of modern warfare, only three things could be considered — firepower, mobility, and armor. Safety, comfort, and appearance had been pigeonholed.

But now that the bugs are about ironed out of the mechanical side of the tank, the designers are turning to improving the safety and comfort of the crew.

Again, the powers-that-be are leaving no stone unturned to make the American army the best equipped army in the world.

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ARMY MOTORS is published monthly in the interest of Preventive Maintenance by the Preventive Maintenance Unit, Tank-Automotive Center, at the Holabird Ordnance Depot, Baltimore, Maryland. Your contributions of ideas, articles and illustrations are welcome. Address all correspondence to the Editor, at the above address.

Are You a Tank Destroyer?

If you've got to bust tanks, break up those Nazi Mark VI's -- not your own M4's

It's great for a man's ego. It makes him feel invincible. Sit him behind the controls of a 30-ton tank and he's sure to feel powerful. 'Yah! nothing can stop me.' Jam it in gear. Push that accelerator down to the floor. Drop out the clutch. Feel the lurch of the tank as the tracks bite. Give it hell. Pick out the roughest, toughest obstacles. Ram right into or over them. 'Nothing can hurt this vehicle -- it's a tank.'

Yes, it's a tank. And because it's a tank, it's subject to more mistreatment than any vehicle in the Army. It's mistreated because lots of men don't realize that a tank is made up of the same type gears, pistons, and bushings as those in any other vehicle -- and need the same care.

From the toughest proving ground in the world come reports that our American tanks are as good as anything our enemy has -- or better. In Libya and on the Russian front they proved that they could stand up under the worst conditions nature could provide. But even the best materials and engineering can't stand up under the murderous treatment of a careless tank driver.

You may have your own ideas on how to destroy a tank but here are a few samples of how some greenguards destroy tanks and then blame it on the materials or design.

STARTING RADIAL ENGINES

Just crawl into the first radial-powered tank you see

and start it up -- that's all. If the tank's been sitting still for 12 or more hours it's possible for you to break the engine up as effectively as a German 88 could.

Radial engines have a number of cylinders pointing down (Fig. 1); the combustion chamber in each of these cylinders is *under* the piston (Fig. 2). While the engine isn't running, oil and gas may drain from the crankcase

into the lower combustion chambers. If the engine is started *without* removing the liquids from the combustion chambers, the pistons are forced to compress the liquids just like air. But, you know that liquids can't be compressed. Wham, when the piston hits the oil and gas, something has to give -- and it's usually the piston or the cylinder head.

To prevent this tank-busting, a seasoned tank driver will crank the engine by turning the hand crank over 50 times before starting it (if the tank has not been run overnight). Cranking the engine

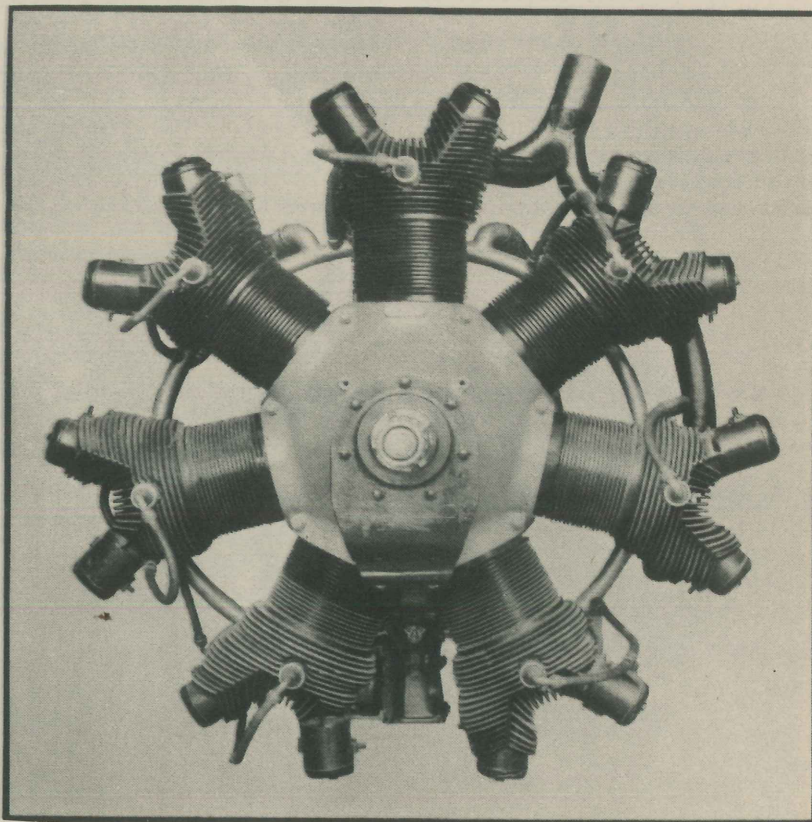


Fig. 1 - It's easy to see by this light-tank radial-engine that 4 of these cylinders are pointing down.

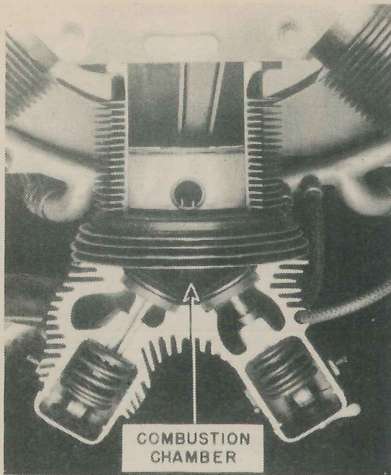


Fig. 2 - Cut-away view of an upside-down cylinder.

forces the pistons to go through the exhaust strokes which pumps the liquids out of the combustion chambers. If you have trouble cranking, you may have to remove the spark plugs so the liquid will have a means of escaping.

If you're ever in doubt as to whether the tank has been cranked over or not, don't take a chance — crank it.

IDLING SPEEDS

Blowing cylinder heads apart and breaking pistons is an effective but crude way of destroying tanks. Some GI's

with a more delicate touch have developed more subtle methods — idling speeds for example.

These boys stop their tanks and allow the engine to idle at 400 to 500 rpm's while they're eating their field rations or calling up Mabel. Somebody said that the smooth ticking of the engine aids their digestion. But this fine, smooth idling of the engine is the calm before the storm. Prolonged low idling speeds on radial engines cause extremely high temperatures in the cylinder walls and low temperatures in the spark plugs. Also, there's very little oil circulation. First thing you'll notice is mis-firing and smoking, caused by fouled plugs. Later as the oil on the moving parts burns off — pistons and cylinders score, bearings wear and in general the engine gets shot.

Radial engines should never be idled at less than 800 rpm. When you have to idle an engine, set the hand throttle to run the engine at 800 rpm. The low idle speed (400 rpm) controlled by the carburetor is only to be used for shifting gears.

Diesel engines are also damaged by low idling speeds.

If you have to idle them, set the hand throttles to idle both engines over 600 rpm.

And while we're on the subject of engine speeds another way to finish off a good engine is to 'lug' it. Lugging a tank means to continue driving it in a high gear after the speed of the engine has slowed down. This generally happens when you're driving in a high gear over smooth terrain and suddenly go into heavy mud or up an abrupt hill. Some greenguards do the same thing by slowing the engine speed in order to slow the tank speed. When the engine rpm's drop, the engine can't develop enough torque (twisting force) to keep the tank moving. The engine loses speed rapidly. You can almost hear each cylinder firing individually. During this time the engine is knocking itself apart, the pistons vibrate in the cylinders, power is applied in jerks, the tank shivers, shakes and gasps. Plenty of parts are being ruined while all this is going on.

A good driver never allows the terrain or tank speed to slow up the engine rpm's. He shifts to a lower gear as soon as the tank slows up or if he wants to reduce the tank speed.

Radial engines, especially, are mutilated by low engine speeds. These engines were designed to run for long periods between 1800 and 2200 rpm. For short periods, they can be run at 1500 rpm. When operated at these speeds they'll give very little trouble. But lug a radial-powered tank along in 3rd, 4th or 5th gear at 1200 or 1300 rpm, and you'll have to change engines at 50 hours.

A good thing to remember is this: whenever you're in a gear higher than 2nd, no matter how slow the tank has to travel, your engine speed must be kept above 1500 rpm. If this causes the tank to travel too fast, shift to a lower gear. Don't ease up on the throttle!



Fig. 3 - This guy defied the laws of gravity - but he broke his rear idler housing doing it.

Gunning a tank too much is bad business too. Every tank has a top governed engine speed, which is the greatest number of rpm's it can stand in prolonged operation. For short runs it can take a little more, but not much. See your manual for details.

We won't go into the methods of getting the rpm's to exceed the legal limit, but we've seen it happen, and you probably have too. Some guy roars his engine like a bat out of Hell — then it starts to cough and sputter, won't run smoothly. It's suffering from 'valve surge,' which means the valves can't keep in step with the rapid cam action and therefore go into a fluttering motion of their own. At first there's no permanent harm, but after a while the valve lock washers give up all hope of controlling the crazy valve action; they break and drop the valves into the cylinders. After a piston has beat on a valve a couple of times, you'll have a cylinder full of first-class scrap.

If this doesn't happen first, chances are the engine will overheat, and you know what that means — the lube film in the engine breaks down, and you get scored pistons or bearing failure.

Overspeeding is especially apt to happen when going downhill. Don't forget you have brakes to take a load off your engine. Maybe it would be a good idea to dig out the June ARMY MOTORS from the bottom of that pile of *Breezy Stories* and read the article on 'Give Your Tank a Brake.'

CLIMBING HILLS

Even our tanks have limitations and a good tank driver learns them. While watching a tankman putting his medium tank through its paces, we saw a rear idler housing sheared off neatly as if it were done with a cutting torch.

All this driver did was to try to climb the tank over an abrupt hill. But not knowing

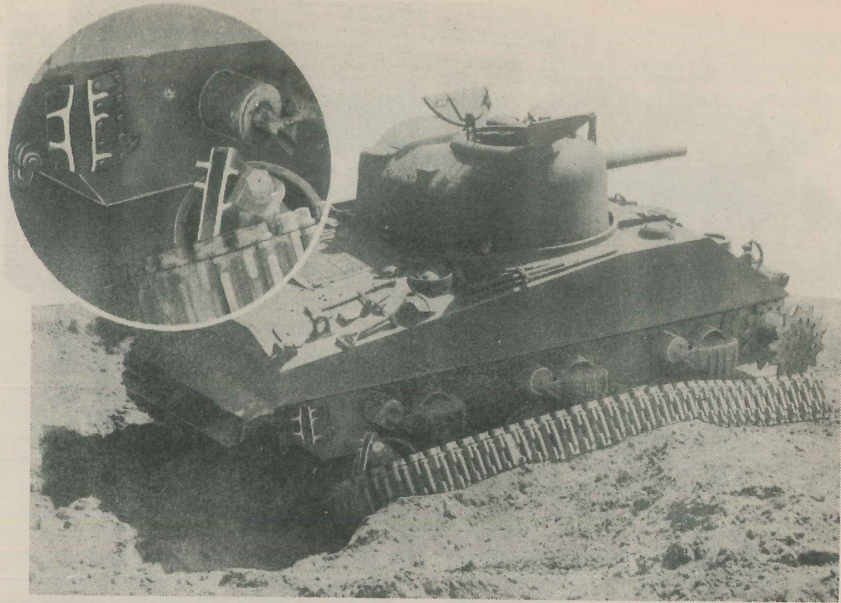


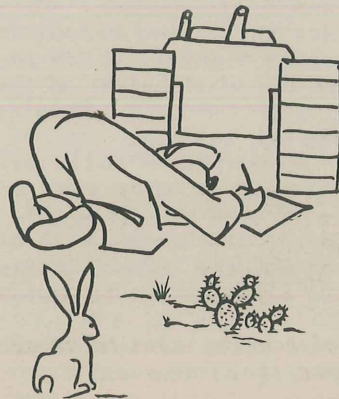
Fig. 4 - This tank could lick a dozen Nazi tanks - but one careless driver put it out of action.

the right way to handle such a hill, he didn't get over it — but he did put his tank out of operation.

Here's how:

He approached the hill at a sharp angle with the tank transmission in third gear. When the tank hit the soft stuff at the base of the hill it lost speed. By the time the nose of the tank found its way up on the hill (Fig. 3), there was too much load on the engine. It stalled.

Next, the driver started the engine, shifted to creeper gear (1st gear), braked the left track to straighten up and gave her the gun.



Here's what happened:

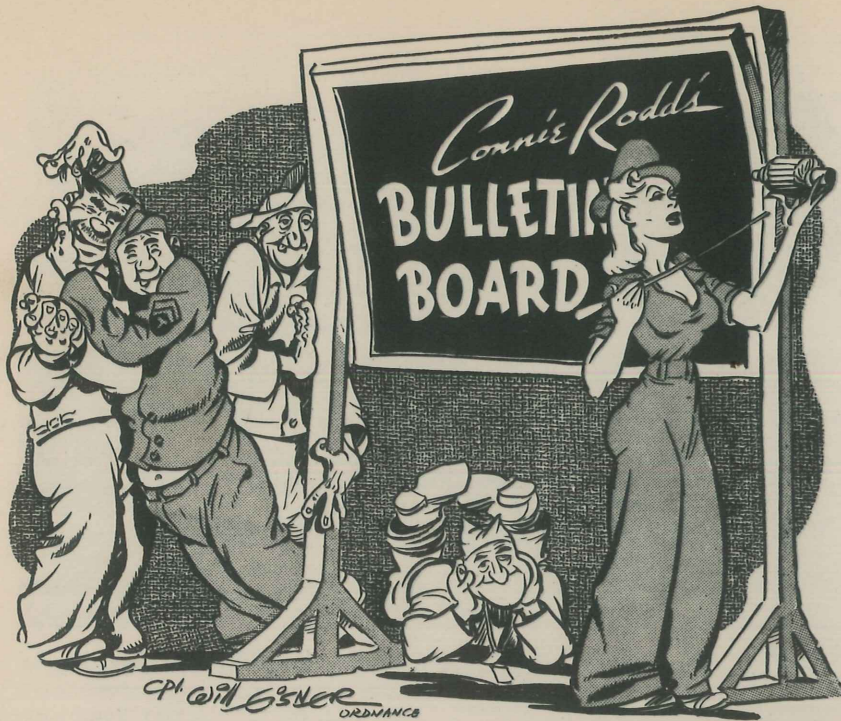
In trying to run the tank up the hill at an angle the driver was forcing the right track to do all the work. The engine itself develops enough torque in 1st gear to pull the tank up such a hill, but in this case the torque is not applied equally to both tracks. It's being applied mostly to the right track.

Naturally, this pull centered on the right idler housing, and because the housing was never designed to take all the torque necessary to pull 30 tons up a steep grade — it broke (Fig. 4).

Had the driver known his tank thoroughly, he would have charged up the hill at an angle which would allow both his tracks to take part of the load. But, if by chance he found himself in the position shown in Figure 3, a good tank driver would have backed the tank down and changed direction before trying to go over the hill.

A tank is big, all right — and it weighs plenty — and you can knock over a house with one. Just remember, though, that it needs loving care and lots of it.

Baby yours.



Half-Track "U" Bolts

If you tell me that you've broken a front spring or center bolt on your half-track, I'd bet my pet girdle that you didn't keep the spring U-bolts tight.

You might have tightened the U-bolts — once. You may have checked them with a half-hearted tug on a wrench. But unless you *tighten* them often, the U-bolts are not likely to hold the spring snug to the axle. As a result of the looseness between the axle and spring, the full driving torque and braking torque is transmitted from the axle to the spring through the center bolt, instead of through the U-bolts. Snap — the center bolt breaks, the axle shifts, the propeller shaft buckles, and from here on, anything can happen.

According to a TB in preparation, here's what you do to prevent this. When your half-track is new, or has recently had a new spring

installed, tighten the U-bolts every 15 miles during cross-country operation. Continue doing this until the U-bolts show no signs of loosening. This will mean the springs are *seated* on the front axle. As you know, the leaves of a new spring are not perfectly smooth, nor is the curvature of all the leaves exactly the same. Therefore, there are high spots and gaps between the leaves that prevent the spring from being completely compressed against the axle. After the spring has been flexed and has carried the weight of the vehicle, these high spots wear off, and the shape of the leaves changes to match each other. This causes the spring leaves to compress tighter, which reduces the total height of the spring at the axle. This is known as *seating*.

Unless the U-bolts are tightened at this time to take up the clearance developed, the spring will be loose on the axle. A few miles of operation like this will result in a broken center bolt, or spring and shifting of the axle.

After the seating takes place, check the tightness of the U-bolts with a wrench after every 8 hours of operation.

Hydrostatic Lock

Just in case you didn't know it, before tanks are shipped from the factory the engine cylinders (the part of the cylinder above the pistons) are filled with oil to prevent rust. If the engine is started with the oil in the cylinders, it's going to cause hydrostatic lock — which means the piston or cylinder heads are going to break.

So, before starting a new tank, take out the spark plugs and crank the engine over until the oil is pumped out of the combustion chambers.

Sealing of Joints

Vehicles with tank-type hulls (tanks, armored cars, special purpose vehicles) have shown a great fondness for many leaks in their bolted or riveted joints. These leaks are caused by inadequate sealing of hull joints at the time of assembly, or when parts are replaced.

Next time you have to replace an exterior part of a tank-type hull, spread a waterproof, non-hardening, sealing compound (A312249) evenly over the surfaces to be riveted or bolted together, and under the heads of bolts, if you're using bolts.

Use enough of this compound to guarantee you a complete sealing of all joints within fording depth, such as 1) differential housing, 2) final drive housing, 3) drain valves on hull floor, 4) inspection plates on hull floor or sponson, 5) all bolts extending through the sides of the hull, including track rollers and suspension units, and 6) all dead axles, including the

extension flanges.

Turret Lock

Speaking of new tanks, when you ship them by rail be sure the turret traveling lock is seated securely in the ring. Otherwise, the turret may swing around during shipment. In one case I know of, the turret on a tank being shipped by flat car swung around and derailed several cars of a passing freight.

Upside-Down Shock Absorbers

Strangely enough, a number of Chevrolet M6 Bomb Service trucks in the field have had their rear shock absorbers installed in error at the factory. The error was the switching of the right and left hand rear shock absorbers; naturally the shock absorber assemblies are upside down.

You can recognize the mistake two ways; first, the curve in the arm points upward instead of downward when viewed from the side, and second, the filler plug in the shock absorber body is located at the bottom of the shock absorber assembly instead of at the top.

When you run across this upside-down business, remove and properly reinstall the assemblies — but before you do reinstall, make sure the action is OK and that no damage has resulted from the inverted position it's been operating in.

M6 bomb service trucks with the manufacturer's serial number starting with the figure '3' should be checked carefully — because not *all* the trucks with this first serial number are mixed-up. You can't tell without looking.

Tire School

I'll be seeing you at tire school.

In all 9 of the Service

Commands, Ordnance Service Command Shops are holding schools of four days, more or less, to demonstrate the maintenance and conservation of tires and tubes. These classes are open to enlisted men and civilians in all organizations of the Army Ground, Air, and Service Forces, including Ordnance Plants and Depots. Unit Commanders should make application for the men they wish to send (probably not more than 4 from a unit), to the Commanding Officer of the Ordnance Service Command Shop serving their organization.

If the shop happens to be one of the few that are not conducting tire schools, it can at least tell you where the nearest school is being held.

Gear-Box Vent Plugs

Do you know the best way to blow grease seals on differentials, transmissions, and transfer cases? Just let the vent plugs get clogged, that's all. Excessive pressure will build up inside the gear case, and goodbye grease seals. Just pay a little attention to the vent plugs, fellows, and you won't have to worry about blown seals.

Rivet Failure

From the fighting front, comes word that the front-spring rear hanger rivets (where the front spring rear hanger attaches to the frame) on the 1 1/2-ton 4x4 Chevrolet dump truck have been shearing all over the lot. Blame it on extreme operating conditions.

If you're having these rivets shear, replace them with alloy steel bolts. Use axle flange bolt (Chev. piece mark 3653927), lock washer (Chev. piece mark 123174), and nut (Chev. piece mark 123078). These bolts will be slightly larger than the holes in the hanger and frame. So you'll

have to ream them. But only ream them enough to allow for a drive fit. This will prevent any free play between the hanger and frame. TB 10-1557-1 will soon bring you this information officially.

In production, this hanger has been widened on the vertical flange and two more rivets are being installed.

Wait for F.S.M.W.O.'s

Quite often I give you some advance dope on a new Fizmo (Field Service Modification Work Order), just because I'm bursting to get it off my chest. In my enthusiasm, I often forget the most important point: **DON'T REQUISITION PARTS UNTIL YOU RECEIVE THE PRINTED COPY OF THE FSMWO THROUGH REGULAR ORDNANCE DISTRIBUTION.** The parts are not available until you officially receive the Fizmo.

While I'm on the subject of printed matter, you men can get something off your chests, too. I'm anxious to hear how you feel about Ordnance publications in general. Ask yourself the following questions about vehicle SNL's, TM's, FSMWO's, TB's, etc. Are they right, are they adequate, and **DO YOU GET THEM?** Fire your answers at me. You don't have to hedge men. I'll keep your confidences well. And that's a promise.

One last point. Don't write to the Tank-Automotive Center for publications. Write to the nearest Ordnance Publications Depot (see OFSB 1-8).

Crankcase Ventilating Valve

If you're having idling troubles on the GMC (equipped with crankcase ventilating system) don't tear your hair out, until you check the

ventilating valve spring.

When the ventilating system kits were first sent out, the valve spring was too strong. It would not fully close at idling speed which would allow air bleed into the intake manifold. Result - rough idling.

Later, the spring was weakened in manufacture to permit the valve to close at 13" to 14" of mercury instead of 16" to 17" as it was originally designed.

To fix this, exchange the whole valve assembly for one with a weaker spring. If you can't get a new assembly or a weaker spring, then cut off one-half coil of the spring you have. This will weaken it enough to close at idling speed.

Hoist Pump on Dump Trucks

They tell me that the hoist pump on dump trucks with hydraulically operated bodies is being operated while the trucks are moving. This causes excessive heating and expansion of the pump parts, with the result that working clearances are taken up. When this happens the pump 'freezes', which breaks the pump shaft, gears, and case.

The solution is simplicity itself: don't drive the truck while the hoist pump is engaged. (See TB 800-15.)

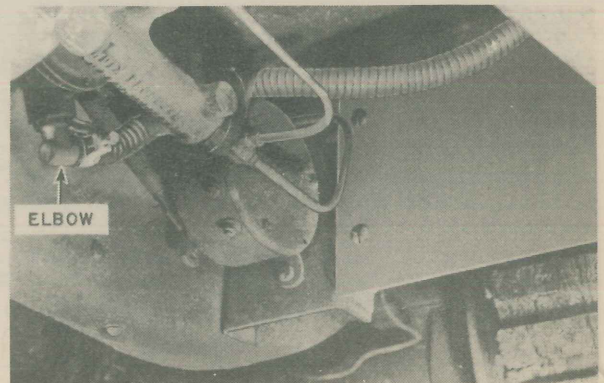
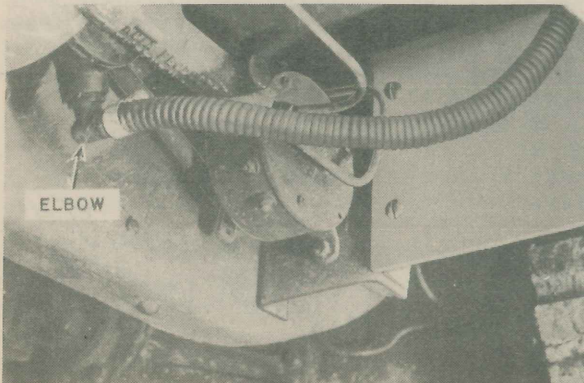


Fig. 1 - This air tube is asking to be snagged. Fig. 2 - Run the air tube over the hydrovac unit.

Winch Trouble on Diamond-T

I've been told by Diamond-T that some of you men are using the winch on their 4-ton wreckers with the transmission in 1st gear. And with a light load, too.

I'm surprised at you. You know this results in excessively high engine rpm's to get satisfactory cable speed. No engine should exceed 1000 rpm when winching.

If you're winching a light load place the transmission in 3rd or 4th gear. If you're working on a heavy load, of course you can shift to a lower gear. But always select a gear high enough to give you the proper cable speed, without having to rev up the engine.

This same procedure for operating the winch under load holds true for all winch-equipped vehicles - not just for the Diamond-T alone. The important thing to remember is to use the highest gear possible and not to race the engine to speed up the winch.

Still More on Differentials

Back in February, I innocently ran a little item on preventing further damage to an already injured front axle. In the May issue, a note from one of my fans added that it

would be necessary to remove the front propeller shaft.

My friend, Mr. W. L. Aiker of Autocar, writes in to say that if all the pulling power generated in low range, (with the front axles out and the propeller shaft off) is put through the rear axle only, you'd probably wind up with two damaged axles instead of one. And I agree with him.

Anybody else got any ideas on the subject?

Half-Track Hydrovac Hose

The flexible air tube between the brake system air cleaner and the hydrovac unit on the International Harvester M5 half-track is easily ripped off by underbrush, when the vehicle is sent scampering through hill and dale.

The air tube, in its present location, (Fig. 1) is just asking to be snagged. To keep it from snagging, remove the air tube at the hydrovac end of the line and give the elbow a 1/4-turn to the right. Then run the air tube over the hydrovac unit (Fig. 2) instead of under. Tape the tube to the hydrovac unit to prevent wear from rubbing.

Warning! If the brass elbow turns hard, *don't force it*. The walls are very thin and you're likely to split the elbow. Just remove it, clean and lubricate the threads, then tighten it carefully.

We hear that some pintle hooks on Light and Medium Tanks and tank-like Gun Motor Carriages are collapsing like the Duce. Well, brother, it ain't the pintle's fault, it's the driver's. Those pintles are designed for towing a 5-ton load - like an ammunition trailer, for instance - which is child's play compared with towing a tank. If you want to tow something heavier than 5 tons, hitch it to the towing shackles on each side of the tank's rear end; they can take it.

* * *

A new automotive-type generator, driven from the propeller shaft, will soon replace the engine-connected aircraft-engine generator on the M4A1 Medium Tank.

Bigger and Better OFSB 1-1

Hardly was the ink dry with which we cheered the new OFSB 1-1 in last month's "Army Motors", when an even better 1-1 arrived. This new edition, dated 1 July 1943, adds two new high-class features - (1) a list of all 10-series vehicle TM's, including maintenance manuals and parts lists for transport vehicles, and (2) a complete list of FSMWO's, arranged according to the SNL number of the vehicle to which they apply.

So now you need only two booklets to provide a complete index to publications on Ordnance materiel; namely, the latest OFSB 1-1 and the latest OPSI. And there's a story going around that even these two will soon be combined. Incidentally, there will be a new OFSB 1-1 every two months from now on.

Your Ordnance Officer can get it for you from the regional Ordnance Publications Depot.



On all medium tanks of the M4 series, your troubles with the turret traverse switch will soon be over. A new toggle-type switch is on its way.

* * *

Don't be surprised when you find synthetic insulation instead of rubber on automotive wiring. New Army specs permit it.

* * *

We've heard that on some new engine blocks being installed in the GMC, 6x6, Models CCKW 352 and 353, the identification plate located on the lower left side has been left off. The four drilled holes used to install this plate are left open, causing an oil leak.

Take a look at your engine block.

* * *

You tankmen who've been getting hot pants sitting next to the transmission on M4 medium tanks will welcome the news that the Engineering Branch at the Tank-Automotive Center is working night and day to insulate the transmission and lower its operating temperature.

* * *

Here's one for the book.

We've just heard of a driver who came up with a broken baffle plate on his 2 1/2-ton GMC oil pan. It turned out that his vehicle was toting six quarts of oil over the FULL mark! His explanation was that a "reliable

mechanic" had told him oil evaporated rapidly. So, to avoid running low, he just added a quart every other day. He figured if he took care of 'evaporation' that way, it wouldn't be necessary to bother checking the oil.

Moral: don't guess — check that oil!

* * *

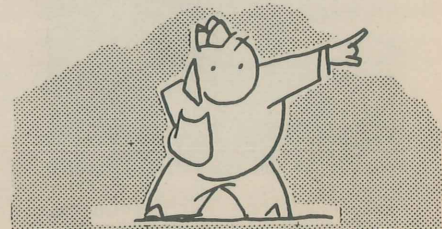
To decrease the probability of fires inside medium tanks caused by gasoline fumes, a new filler neck with a grommet has gone into production that will keep gasoline from being spilled into the engine compartment. A dust-proof filler-cap vent will eliminate a lot of engine stopping, too.

* * *

You can be expecting some changes in the instruments on tanks in the future. The trend is to eliminate gadgets on the instrument panel and instruments that are 'nice to have' and keep only the ones that are essential to tank operation.

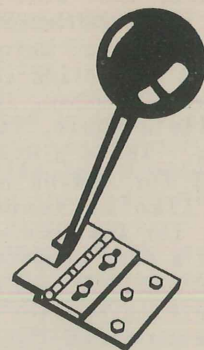
* * *

The length of the winch cable on all 4-ton, 6x6, Diamond T's in production will be changed from 300 ft. to 250 ft.



Has Your Winch-Control Lever Got the Jitters?

If your M5 half-track cries 'Yes' — here's how to shut its big mouth



This modification is officially authorized by the Chief of Ordnance and should be made by using troops. No Field Service Modification Work Order or Technical Bulletin will be issued on it.

If you hear a strange buzzing while jockeying your M5 half-track over ditches and small cliffs, it might mean that your kidneys need attention. But it's more likely to be the clash of the winch power-take-off gears.

While galloping over rough terrain, the half-track floor plate moves slightly forward or backward because of the terrific twists and strains put on the frame. This slight movement causes the hinged latch on the floor plate to contact the winch lever (or power-take-off lever, if you like that name better), and move it enough to make the power-take-off gears clash.

If you're having this trouble, you'd better tell your organizational mechanic

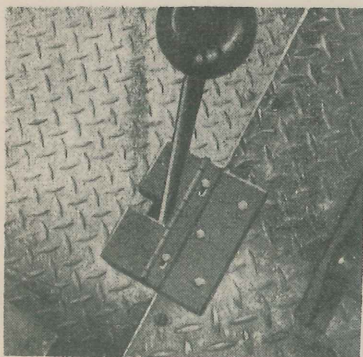


Fig. 1 - Hinge-latch mounted on transmission tunnel.

so he can make the modification.

This modification means moving the hinge latch from the floor plate and mounting it on the top of the propeller shaft tunnel (Fig. 1).

With the hinge latch in this new position, it will not move enough to cause the winch lever to engage the gears. The higher the hinge plate is mounted, the more movement it takes to move the winch lever far enough to engage the gears. Even under extreme twists and strains the shaft tunnel plate won't move this much.

Before the hinge latch can

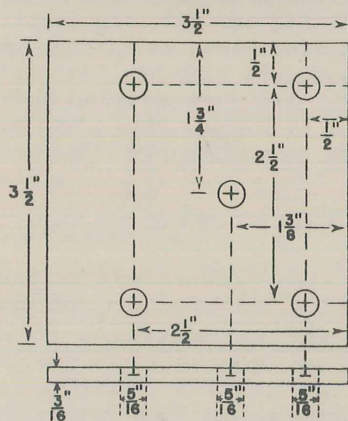


Fig. 2 - Plan for making the extension plate.

be mounted on the tunnel floor plate you have to make an extension plate which will fit between the tunnel and hinge latch. If the hinge latch is bolted directly to the tunnel it would not be long enough to reach the winch lever.

The extension plate is made out of a piece of 3/16"-thick steel, which you'll probably be able to get from salvage. Cut it to measure

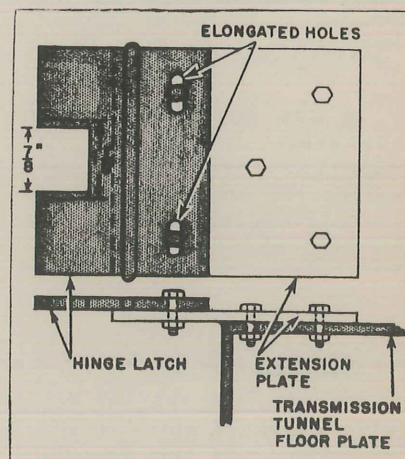


Fig. 3 - Hinge-latch mounted on the extension plate.

3-1/2" on all four sides and drill the holes as indicated in Fig. 2.

Then remove the hinge latch from its original position on the floor board and file its two mounting holes to look like those in Fig. 3. This allows you to adjust the position of the hinge latch after it is mounted on the extension plate. Also file 1/8" from either side of the slot in the hinge plate. Bolt the hinged latch to the extension plate with 1/4" x 3/4" capscrews and nuts. The two plates bolted together can now be used to locate the three holes which will be used to fasten the extension plate to the tunnel. To do this, place the winch lever in neutral, and hold the extension plate on the tunnel floor in a position that centers the lever in the hinge latch slot. Then

(Continued on page 160)

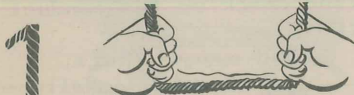
On your tank, it's a towing cable. On your truck or half-track, it's a winch cable. But no matter what you call it — including those unprintable names — it's still wire rope. And it still demands a certain amount of respect, or you'll be sorry.

A winch or towing cable is no stronger than its weakest kink

You could probably wrap the Army's wire rope around the world, if you went in for that sort of thing. And if the wire rope were all in one piece. But all you're really expected to do is keep *your* little piece in one piece. How? With preventive maintenance, that's how.

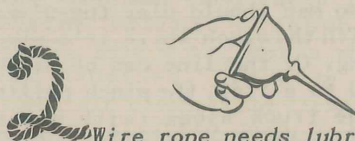
A tank's towing cable is a cinch. Keep it properly hooked up on the hull. Keep a sharp eye out for signs of loosened strands, or weakened end connections (the point of greatest wear is where the cable meets the load). Keep the cable free of rust and corrosion by occasional cleaning and lubrication with used engine oil. And that does it.

Your winch cable, on a truck or half-track, is a much longer story. It's a much longer cable, to begin with — roughly ten times as long. And its use is at least ten times as complicated. Proper care must be pushed if you want that cable to pull. Remember — no matter how seldom you use your winch cable, it's got to be *right* when you need it. And it can't be right if you handle it wrong. Step up for your set of seven basic pointers:



1 New wire rope should be 'broken in'. A brand-new winch cable should always be limbered up on a few light loads, to help it adjust itself to the kind of work it must do. Wire rope will live longer that way — so it's worth the trouble.

THE CARE AND FEEDING OF Wire Rope



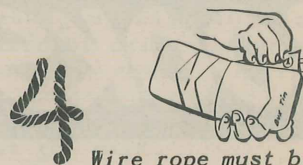
2 Wire rope needs lubrication. As a protection against rust, corrosion, and excessive wear, a winch cable must be dunked in oil at regular intervals. Recommended lubricants are OE #10 (at temperatures of 32°F or lower) and OE #30 (above 32°). As ARMY MOTORS has said before, used oil from your crankcase will do the job — and save that much new oil in the bargain.* Before lubricating the cable, it's a good idea to clean it with a wire brush, using kerosene (or solvent) to remove accumulated dirt, oil or grease. Dry the cable with absorbent cloth. Then run it slowly through a trough of oil, swabbing off the excess as the cable comes out. (In case you're fresh out of oil troughs, a rag dipped in a

*Our repeated recommendation to lubricate winch cables with crankcase drainings is a field expedient based on the realities of supply. Under ideal conditions, seldom encountered in the field, we'd recommend a special rust-preventing oil or fresh engine oil, in that order. Third choice then, would be crankcase drainings. The point is this: Lubrication with used OE is infinitely better than no lubrication at all. Used OE is always available. That's why we say with such assurance, "Use it!"

bucket of oil and applied tastefully to the cable will do the job almost as well. Wipe off any excess oil.) Keep this in mind, too: If bright spots appear on the cable, it's a sign of faulty lubrication. Make sure it isn't *your* fault.



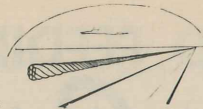
3 Wire rope needs frequent inspection. Be on the watch for splayed strands, broken wires, loose clamps or connections. Look for rust and corrosion, too — though you're not likely to find any if your lubrication is up to par. If the cable looks unhealthy, for any reason — don't use it. Report it.



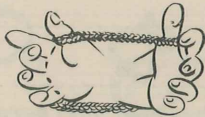
4 Wire rope must be paid out with care. The usual method is to disengage the sliding-jaw clutch and unreel the winch cable by hand. The drag brake on the drum flange automatically prevents the drum from spinning and the cable from unwinding too fast. (Check the drag-brake lining to see that it's in good condition, secure, and correctly adjusted to stop the drum.) Keep the cable taut and straight as it comes off the winch. Kinks are wire rope's worst enemy.

Another thing: Never unwind the cable completely from the drum. That puts a strain on the ferrule and forms a reverse bend in the rope, weakening its point of attachment.

5



Wire rope needs a clear path for pulling. When there's a load on your cable, make sure it's pulling in the clear — not rubbing against any part of your vehicle, dragging against rocks or through gravel. Chafing can weaken wire rope in a hurry. So can sudden stresses. If loads are applied to the cable with a quick jerk, the stress may equal many times the actual load being pulled or lifted. Result: Sudden breakage or serious loss of cable strength. Steady pulls are best — and certainly safest.



Wire rope must be skillfully rewound. The way you wind the cable back onto the winch is all-important. Only constant care at this point will keep out kinks and

WIRE ROPE

prevent uneven winding — and you've got to do both to keep that rope in trim. Rewind your cable as soon as possible after use. Rewind it under enough tension to insure tight layers on the drum. At least two men should play tug-o'-war with the winch while it's winding. Or the line can be hitched to a tree, the winch pulling the truck along. (with brakes on lightly) as it winds. Guide the first layer on the drum most carefully (with a pry bar or the like), so that each row of rope is tight against the next one — all the way across. Use a hammer, on a wood block, to tap each row and layer into place as the winding proceeds. Don't ever let the cable slip down between rows of the layer beneath.



Wire rope can be dangerous. With improper handling or insufficient care, wire rope can become a deadly weapon. If a winch cable snaps under load, all hell breaks loose — and with lightning speed. You won't have time to duck. So keep your distance from a loaded line. Of course, if your shear pin hasn't been replaced with something stronger — and if your cable's condition is what it should be — there's little danger of a break. The shear pin gives way under strains of not more than 10% above the rated capacity of the winch. The tensile strength of a healthy cable is considerably higher. So we might put it this way: Care for your cable — and spare your own neck. As a further precaution, wear heavy gloves when handling wire rope. It's full of tiny metal splinters that might mess up your manicure.

TRAINING FRONT NEWS

BOOKS

INSTRUMENTS ON YOUR TANK

Until recently, vehicle manuals on light tanks and medium tanks have kept you in the dark about periscopes, telescopes, reticle patterns, and gunner's quadrants.

Now the Ordnance Dept's loose ends branch has issued changes to the vehicle Tm's to cover Sighting and Fire Control Equipment. On light tanks, it's Change 1 to Tm 9-726C, 9-727, 9-727C, and 9-732; and Change 2 to Tm 9-726. On medium tanks M4 and M7 series, it's Change 1 to Tm 9-731A, 9-731B, 9-754, and 9-759.

These changes go into detail about the equipment... what makes it work, how to operate and adjust it. Under 'Care and Preservation' you get information on how to apply that Mother's loving care... how to handle the equipment so it won't black out on you, how to prevent fogging of lenses and windows, and how to lubricate and clean the instruments. Regional Adjutant General Depots have these changes. Just scream out on a W.D., A.G.O. Form No. 17.

ARMY INSTRUCTION (TM 21-250)

'The ideal officer is not afraid of anything - not even of a new idea,' says Tm 21-250, quoting from the words of Undersecretary of War Robert P. Patterson. And, with this challenging beginning, it proceeds to advance a few

ideas on Army instruction. For instance:

Preview your film strip presentations. See that they are closely linked to the lesson.

A discussion may confuse students if it is not summarized.

A test may be used to teach, as well as evaluate.

When grading problems and reports, an instructor should read several before marking any.

The more frequently each officer is observed, the better the officer in charge can keep check on the conduct of training.

And many others.

It's an exceptionally well illustrated book, which obeys its own directive that a plan of attack is as necessary for training as for a tactical operation. Good stuff for motor officers.

This one is distributed by Regional A.G. Depots.

Tank Idling Mixture

A new type air-cleaner filter element will eliminate "engine roll" on your M5 series light tanks

If your light tank (M5 series) engine is rolling at idling speed due to an over-rich mixture, and the roll can't be taken out by adjusting the carburetor, cast a suspicious eye on the oil-bath air cleaner.

According to TB 700-18, there are two things that can be causing the rich mixture: (1) The oil level can be too high, or (2) the air passages in the cleaner can be clogged with dirt. Either of these conditions will restrict the flow of air into the carburetor which results in too much fuel and not enough air in the mixture.

The first thing to do when you suspect the air cleaner, is check its oil level. If someone has put in too much oil, remove the excess; but, if you find the oil at the

correct level, remove enough to drop the level about 1/4 to 1/2 inch and then check the engine idling. Probably she'll idle O.K. Here's what had happened. In some of these air cleaners the cleaning element sits too deep in the reservoir and displaces more oil than it should. So, when you put the proper amount of oil in the cleaner — the element raises the level higher than it should be. Result — an overrich mixture.

The best remedy for this trouble, as explained in TB 732-19, is to install a new-type filter element. Unlike the old one, it has a stop plate that prevents it from being pushed too far into the cleaner, and a heavy square handle that keeps it from settling too far in the oil reservoir. Therefore it

can't raise your oil level too high. And that's not all. The new element also has a centering bead which eliminates the possibility of air sneaking around the filter instead of going through it. You'll have to identify the new filter by looks alone (see Fig. 1), because its item stock number is the same as the number of the old one (G103-15-69175), and so are the Ordnance and manufacturer's numbers. It's available at Fort Wayne Ordnance Depot, Fort Wayne, Michigan.

If for some reason you can't get one of the new-type elements, you can still get the same results, with a little elbow grease, by welding a 1/4" to 1/2" spacer to the handle of the old-style element (Fig. 1). The spacer will prevent the element from settling too deep in the reservoir, and thus raising the oil level. Same effect in the long run as if you had used the new-type element. This little trick was authorized in TB 700-18 before the new elements were available.

The second reason for a rich mixture mentioned in TB 700-18, dirt in the air passages (Fig. 2), can be fixed by using the good old armstrong method. No tricks, no gadgets — just get in there with a screwdriver and scrape out the dirt.

There's also a chance that an excessively dirty element can cause the trouble — but you know what to do about that.

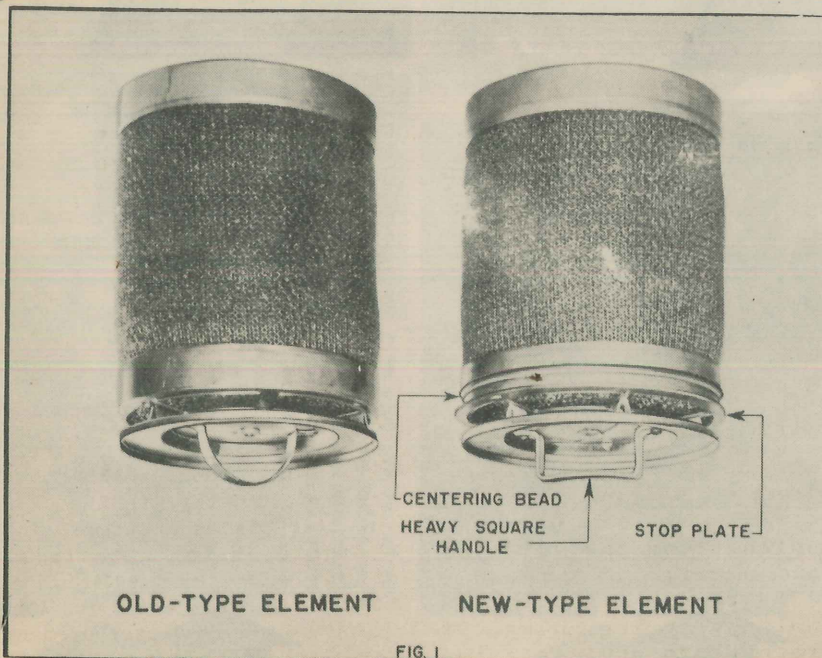


FIG. 1

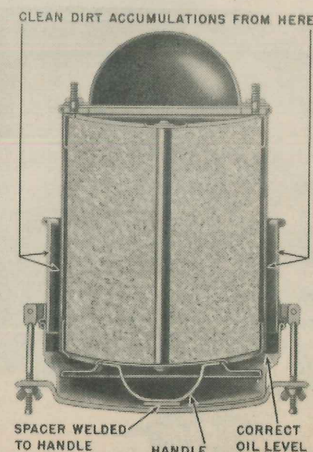


FIG. 2

WLA Primary-Drive-Chain Adjustment

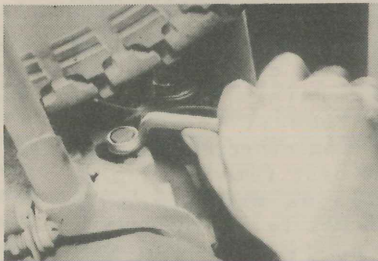
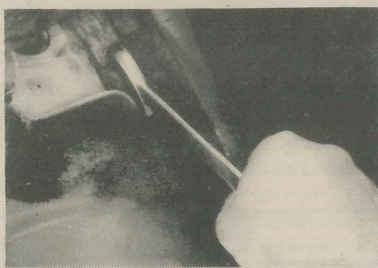
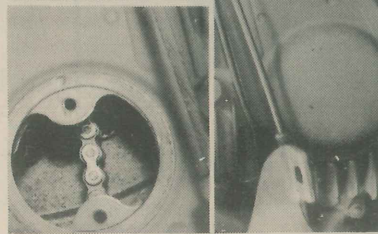
Lots of Harley-Davidson Motorcycles are handed to higher echelons for major overhaul because their riders are alarmed by loud, scraping noises in the left-hand side of the engine. More often than not, the repair echelons find that major repair is unnecessary — a simple, primary-drive-chain adjustment is all that's needed to stop the clatter.

Normal operation eventually loosens the chain and if it's

not kept adjusted it will rub the chain guard and make the familiar loud, scraping noise.

So let's examine the primary-drive chain every 1,000 miles and stop the trouble before it starts. Let's let the higher echelon boys waste their time on something more important than making adjustments we can make ourselves. In cases where the chain is already rubbing the guard, follow the picture story to set things right again.

Primary Chain



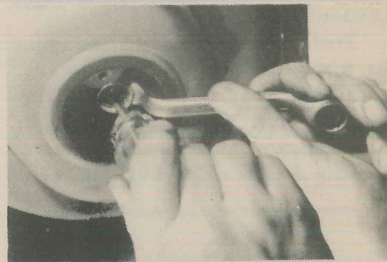
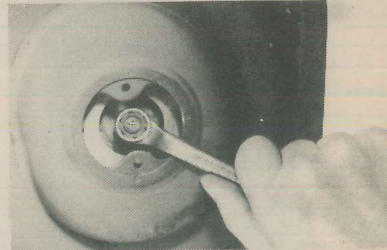
1. Remove primary-drive-chain-inspection-hole-cover and if chain has more than 1/2" slack, it's too loose.

2. Loosen the three transmission-hold-down studs, and turn the screw clockwise...

3. ...until the chain will deflect only 1/2". Then retighten the hold-down studs and replace the inspection-hole cover.

The primary drive chain is now properly adjusted, but the operation has disturbed the clutch control adjustment, gear shifter controls, the rear chain, and the rear-wheel brake. So let's re-adjust the clutch control.

Clutch

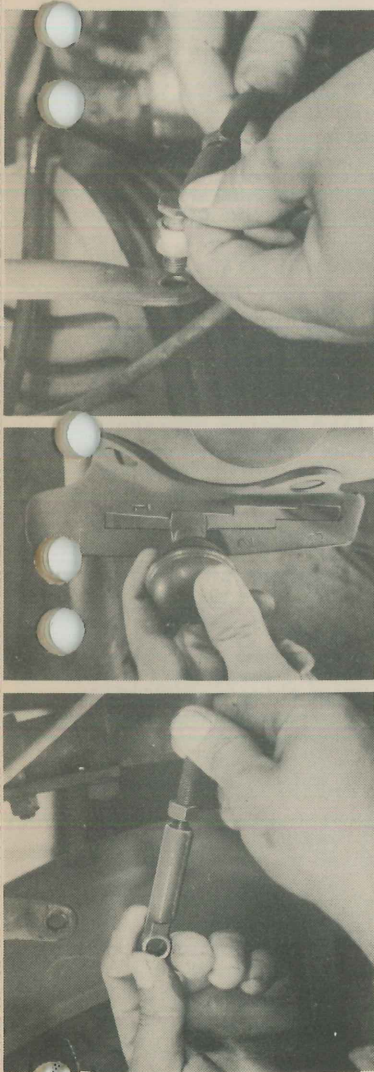


4. Remove the clutch-adjustment cover. Then loosen the push-rod adjusting screw...

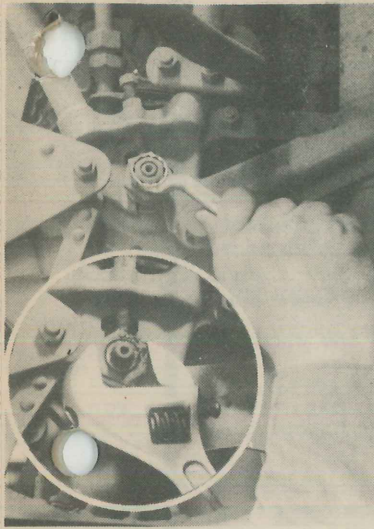
5. ...there is 1/8" to 1/4" free play at the junction of the cable and the throw-out lever. Tighten the lock nut and replace cover.

The clutch adjustment finished, the next step is to re-align the gear shift linkage, which we do in two stages.

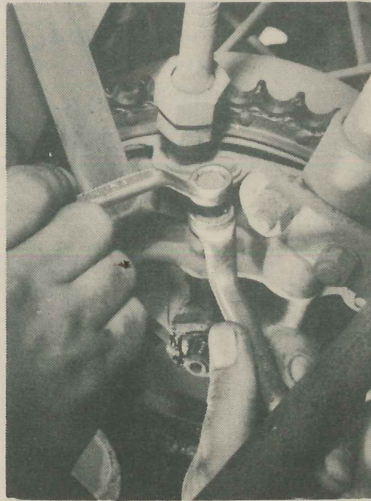
Transmission



6.7.8. First, set the hand lever in exact neutral and disconnect the shifter rod from the hand lever and with back and forth movement, "feel" the transmission lever to seat the shifter cam-spring-plunger (inside transmission) in its locating notch. Second, turn the clevis to align its end hole with the hand-lever hole. Insert the bolt and tighten lock nut.



9.9a. Remove rear-axle nut, sleeve-nut lock washer, and loosen brake sleeve nut. Rotate rear wheel to locate position of least chain slack.



10. Then loosen the rear-wheel-adjusting-stud lock nut and turn the adjusting stud clockwise until...



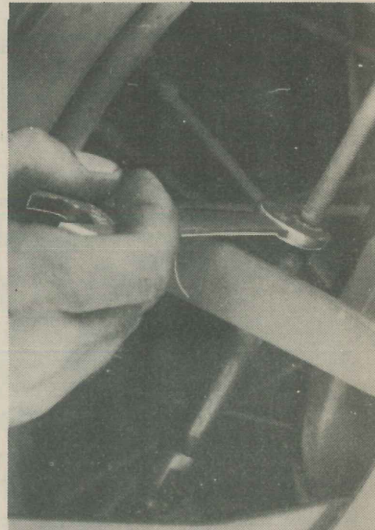
11. ...the chain deflects 1/2" * midway between the sprockets. Tighten the brake-sleeve nut and replace the washer and axle nut.



12. Go around the cycle and loosen the other lock nut. Adjust stud to contact the axle. Retighten lock nuts. Recheck chain adjustment.

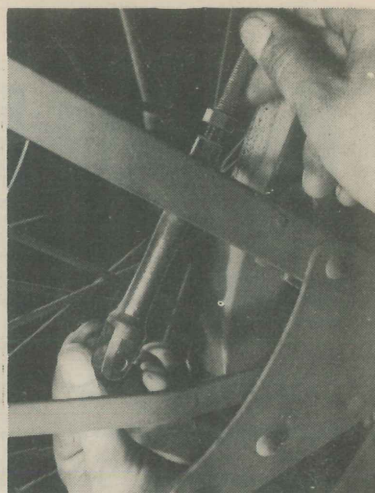


13. If the brake pedal moves freely thru one-quarter of its complete stroke, the rear-wheel-brake adjustment is O.K.



14. But if you feel it resist before it travels one-quarter of its stroke, loosen the lock nut and remove the clevis pin.

* total up-and-down play



15. Then turn the clevis counter-clockwise until you get the required 1/4-stroke free travel. Replace the pin and tighten lock.

Harris Lets His Hair Down

It's just like old times, having something by Gene Harris in ARMY MOTORS.

Gene was our Technical Editor before claustrophobia got him and the wanderlust took him to the wide open spaces of the Southwest. He's now getting a huge kick out of being a Civilian Automotive Advisor at an Army air base. We think you'll find his letter as 'on the ball' as we did.

The Editors



Dear Editor:

Remember when we used to get those letters from Private Joe Fletcher, Mechanic, and Sergeant Bill Hansen, Motor Sergeant, and 2nd Lieutenant Francis Flemin, Jr., Motor Officer? We didn't know those boys, nor any of their buddies, who in varying degrees of vehemence told us the same story:

Those stone-hearted, lame-brained inspectors had nailed some of their vehicles for a spot-check, and even though the writer of the letter and all the men in his company had worked their fingers to the hang-nails trying to keep their vehicles in top shape, these denizens-of-the-undersides-of-rocks had found the following

things wrong with said vehicles — and so on.

We got just as sore as they did, and burned those inspectors plenty when they failed to allow for lubricant expansion on a hot gear box and gipped the driver for too much lubricant in the transfer case.

Yesterday I was dragged from the cloistral walls of the driver's school where I was trying to teach the difference between a transfer case and a transfer deed, and was sent out to head up a spot-check crew at a temporary bomber field where the boys were living under battle conditions.

'These boys are hot,' said the officer. 'They need several groups like theirs overseas and we have to whip them into shape in a hurry. We're pulling all their surplus rolling stock, and they're operating just as they will on a similar field God-knows-where.'

'Then why heckle them with a spot-check? you don't let 'em go to town. They have to bathe in their helmets and live in tents under that broiling sun without a tree in sight,' I replied.

The old boy gave me that familiar who-let-these-damned-civilians-in-an-army-camp look, and stalked off.

My delicate mental process sensed that the conversation must be nearing an end, so I hopped in the waiting jeep with the spot-check crew and bounded off over the rutted prairie trail.

The camp looked so much like those overseas camps in the newsreels, I started scanning the skies for enemy planes. We found the Motor Sergeant in a tent with field phone in hand, telling the Motor Officer that those 'stinking spotters' hadn't arrived yet, and it was already two minutes after two, when the grapevine had told him they should be there. He glanced up into our innocent faces and said, 'Here they are now,' and hung up.

We accompanied him past a line of prepared vehicles — and sicked our crew on a jeep that was apparently unprepared, for it had just rolled up with its trailer full of supplies. The dirt on this jeep we overlooked, for ours was even dirtier from making the same trip.

But we did confront him with the air cleaner which had a full quart of dirt in its reservoir, and while explaining to him — with the unit in my hand — that it would have to be changed more often, a bomber took off from the field behind us. When the sand from its prop-wash subsided and we again opened our eyes, there was another quart of sand in the oil — so I shut up. He said the unit was changed 12 hours ago — and now I believed him.

I'm wandering away from the subject, for what I wanted to say was that during the spot-check we turned up any number of little items that our victims had never known about. The propeller-shaft center bearings, Hydrovac cleaners, and a number of other units had been neglected only because the men had not been instructed enough in their servicing, or in the consequences of neglect of such units. These men were attentive listeners, and I'll wager my next paycheck that these units will hereafter be in as good condition as the units we found they understood — which were in perfect repair.

We passed on the information a couple of advisors from headquarters had given us the day before. Told them about plugging the vent in their Gar Wood winches with a rivet through the name plate, so the next fellow would know it had been done. (There was water in their winches, too, even out on these sand dunes — probably the only water in miles.) Told them the 1/2-inch-below-plug-level was too low on the jeep front axle, and why. Told them that one advisor had found the wrong wheel cylinder on a jeep front axle, causing it to swerve on quick stops, and a few other things like the possibility of removing the wheel from one side of one axle on the bogie — and tying up the axle to the body sill — to bring her in when a wheel bearing failed.

They hadn't heard of the manifold warpage trouble if the heat control valves weren't set properly for the season, or that notching the end of the U-joint trunnions would do away with joints burning out on just one bearing for lack of lubrication.

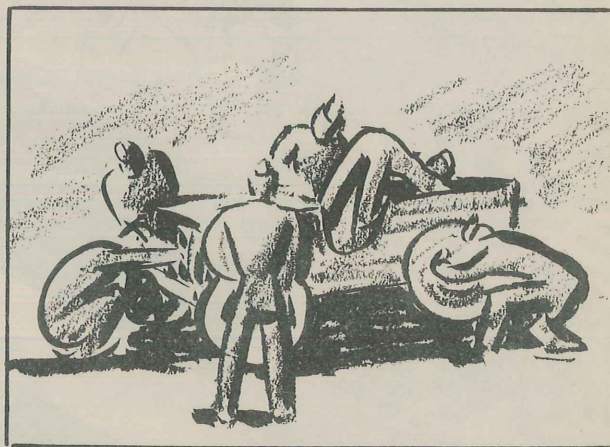
Before we were through, the Sergeant had called his Motor Officer, and we weren't introduced as those 'dirty spotters' this time. They had a lot of problems, tough ones we never dreamed of at Holabird. We helped them where we could, and learned a lot of things from them that will help others later on. They even asked for a copy of the 'gig sheet', so they would know better how to check their vehicles themselves.

All the time we were working, in the back of my mind I saw this same little group in a

similarly dispersed field a long way from here. The men would be searching the skies unconsciously, instead of the grass tufts for snakes as they were today. They'd be wearing their helmets and carrying their gas masks just as now, but it wouldn't be merely because of an order — it would be life-or-death.

In the tanned, ruddy faces of these boys of all races and complexions, I saw counterparts of my own sons, of those of my friends and neighbors. And here they were setting out on a job greater than any I had ever tackled — and with so few weeks of training in the tricks of the trade.

Had I forgotten to give them just one little piece of information that would bring their ambulance through, with maybe four of these kids swung up on the litters? Would that cargo truck fail them, because of something I was so familiar with, I had forgotten to pass it on?



Pretty soon I was wondering if maybe I couldn't go along with them.

Many was the time I had told a young hopeful in my civilian shop that I couldn't make a mechanic out of him in less than 3 or 4 years — and these boys just hadn't any time like that to learn the ins and outs of trouble-shooting. The whole situation got in my hair so completely that I almost forgot to duck when the sergeant driving our jeep spit tobacco juice into the windstream as we jounced along toward the base.

And I couldn't get full enjoyment out of the gig sheet we found clamped in our map panel door when we got into our jeep to start home. The boys had been spot-checking our vehicle while we were busy checking theirs. Such guys. They can call me anything they like, and I'll still love 'em.

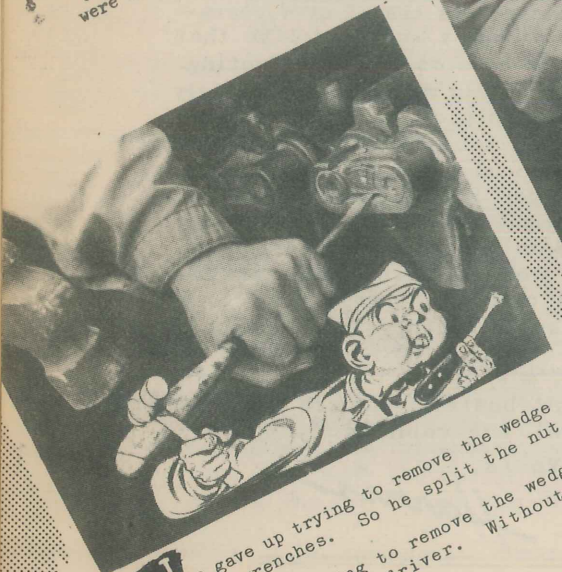
And I'll bet I'm speaking for all the rest of the civilian nut-busters who are haunting Army camps all over the country.

Yours,

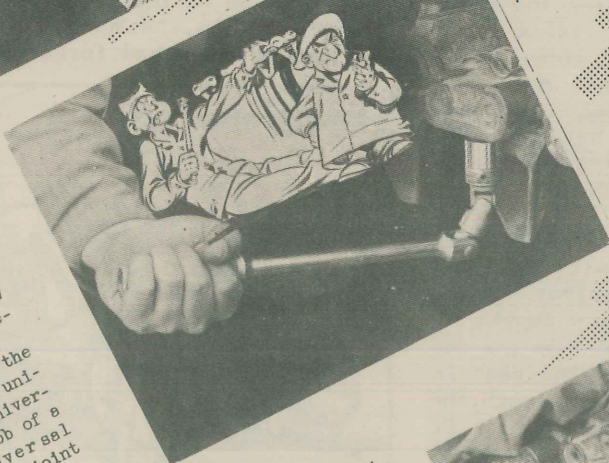
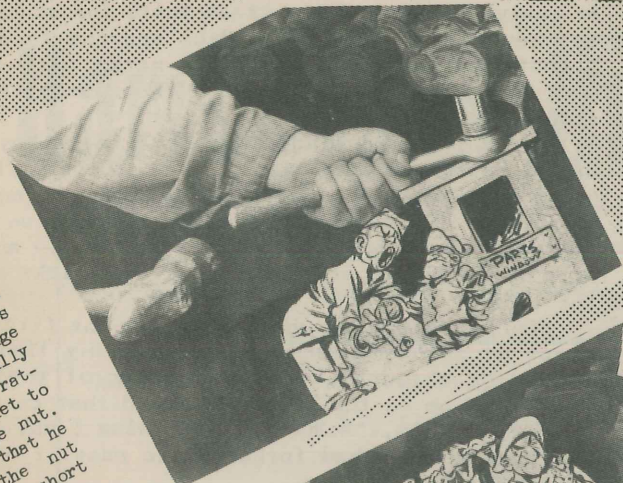
Harris

Use LEVERAGE to 'break' or tighten balky nuts.

Joe has discovered a bottomed track wedge. So to prove himself a good tankman, he's going to change it. Thoughtfully he selects a ratchet and socket to remove the wedge nut. But finding that he can't turn the nut loose with the short ratchet handle, he proceeds to beat the ratchet handle with a small 2 lb. hammer. The third blow did the trick...so Joe thought. The nut didn't break loose....the innards of the ratchet broke. A ratchet is not designed for loosening tight bolts or nuts. It's intended only to run them off after they've been broken loose. So, Joe threw his ratchet aside, muttering something about bum materials. Here you see Joe attacking the same nut with his flex bar universal joint. Joe figures the universal joint can easily do the job of a short extension. Wham, the universal joint splits in two! The ears on the joint were never designed for tough pulling.



Joe gave up trying to remove the wedge nut with wrenches. So he split the nut with a chisel. Now he's trying to remove the wedge itself with a screwdriver. Without a



moment's hesitation he jammed the screwdriver between the wedge and track connector and started beating on it. He had an astonished look on his face when the screwdriver tip broke off. Little does Joe realize that screwdrivers are designed for screwing only. They can't be used as pry bars or chisels and still keep their original shape. A screwdriver blade, when tempered properly, is too hard for prying and too soft for chiseling.

When you have to 'drive', ... use a BRASS drift.



Since he couldn't pry the track wedge out with a screwdriver, Joe decided to drive it out. Thinking that his 1/2" drift he starts to wham the daylight out of it. The fact that the end of the extension was beating on started to flare, he attributed to soft material. Poor Joe never learned that extensions are tempered to stand a lot of twisting action, but they are too soft to stand even a few blows with a hammer.

To hell with cheap tools, Joe thought as he beat the wedge out with a hammer. course, if he had wanted to use the right tool, he'd have discovered that the wedge would be N.G. Joe finally got the track and put a new one on. Now you're making sure the nut is good and get extra leverage Joe put a new extension bar and slipped it on the bar. When the socket broke, he was wondering how to replace it. He lost off his knuckle and jammed it into the track.

JOE DOES IT



E gles h ANKS!

Tiring of crude jobs on the suspension system, Joe thought it would be easier to do a more technical job inside the engine compartment. So, here you see him in the process of removing the gasoline filter.

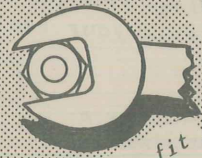
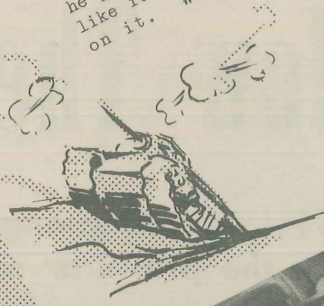
Grabbing his pliers, which he likes because they seem to fit everything, Joe used his vise-like grip to remove the bolt. But strangely enough all he does is round the grooves on the pliers as well as the bolt. It never occurred to him that they put flat sides on a bolt or nut for the specific purpose of using a wrench on them.

He figures his pliers are getting old and he'll have to remember to trade them with some other guy when the other guy's not looking. Joe remembered something about using open end wrenches on hexagon nuts. So he picked up the first one that looked like it should fit and started to pull on it. When the jaws spread, Joe

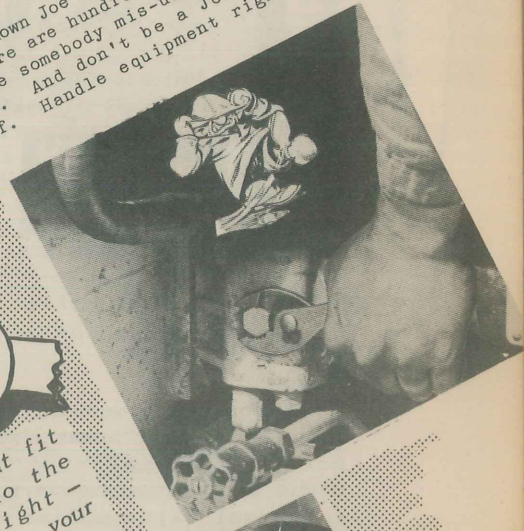
realized the bolt must have been too small for the wrench. You see, Joe has good reasoning powers. Nothing like doing things in the old fashioned way, figures Joe, as he hammers on a screwdriver split and the handle on the screwdriver and Joe forgot about the gas filter and the whole tank while picking splinters out of his hands.

We've shown Joe in 10 tool-busting poses; there are hundreds of others. If you see somebody mis-using tools, stop him. And don't be a Joe Dope yourself. Handle equipment right!

inkmen, beware! Joe Dope has infiltrated your ranks. Our photographer caught him murdering his tools doing some 1st echelon jobs on a tank. Take a look at these pictures and then look at your eyes open. If you see him... beat him sharply over the noggin with a short-handled hammer.



The right fit will do the job right - and save your wrenches.



The right tool gives enough leverage - makeshifts are dangerous.



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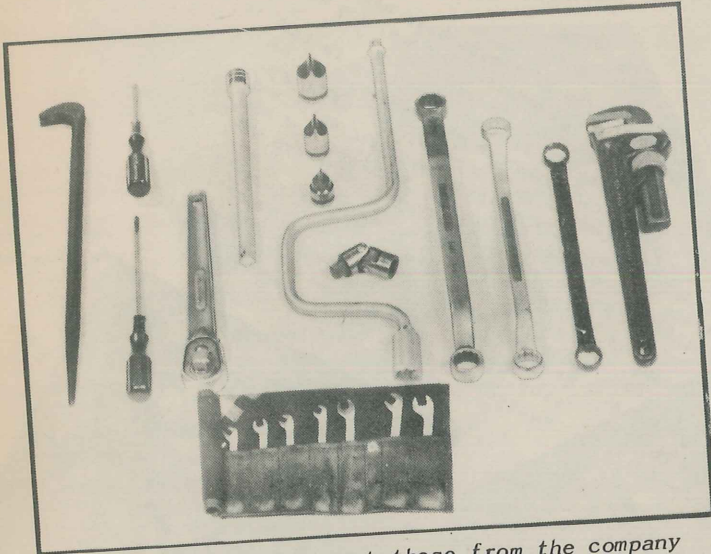


Fig. 1a - You used to get these from the company truck; now they should be in your tool box.

Maybe every mechanic is a Rube Goldberg at heart when it comes to inventing tools. Maybe even if you gave him a universal 3-jaw puller that would remove *anything*, he'd still stay at camp on Saturday night trying to invent a fancy home-made puller for jeep hub caps.

But we don't think so. Judging from our mail, a lot of guys are building home-made tools simply because they don't know GI tools are available for the job, or can't get them.

That's bad, because the official 2nd-echelon tool sets authorized by Standard Nomenclature List (SNL) N-19 contain no less than *three hundred* changes from the pre-war sets that used to be prescribed in OQMG Circular 4.

The present sets first appeared in the 5 October 1942 edition of SNL N-19, and are now re-published in the 20 April 1943 version of this popular and fascinating little book, with no changes except an additional coil of rope in Set #2 and a slight difference in welding equipment in Set #5.

Every company, troop, and battery is entitled to a copy of N-19. If your Ordnance Officer hasn't provided your

organization with one yet, ask him about it; he can get all he needs from the nearest Ordnance Publications Depot.

As for the tools themselves, all are supposed to be in stock now. If you're short, requisition your 3rd-echelon Ordnance light or medium maintenance company.

These wartime sets for 2nd echelon are, first and foremost, preventive maintenance sets. They have what it takes to handle the all-important preventive maintenance jobs prescribed on the new 2nd-echelon worksheets (see our plushlined announcement in the April ARMY MOTORS).

They are not repair-and-overhaul tools. The Master Minds Department has decided that if you do a good PM job in the 2nd-echelon, you'll keep more vehicles out of the Ordnance shops than if you spend the same time overhauling

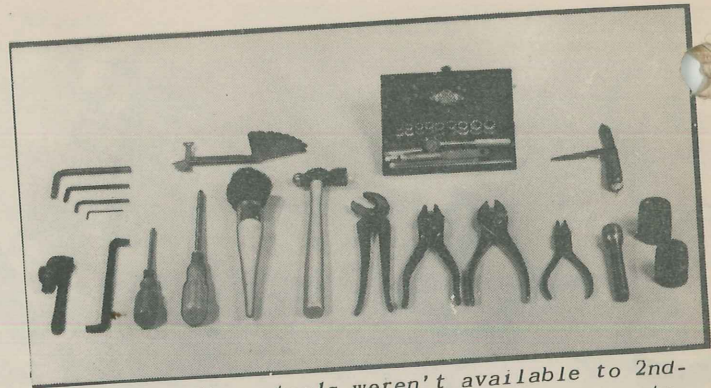


Fig. 1b - These tools weren't available to 2nd-echelon mechanics at all in the pre-war sets.

Tool Sets And How They Grew

SNL N-19 lists 300 changes in 2nd-echelon tools since the pre-war sets... Got 'em all?

piston-and-connecting rod assemblies.

So if you have any unauthorized milling machines, lathes, electric razors, or waffle irons in your set, now's the time to turn them in. When you get shipped overseas, you can't take them with you anyhow....unless they change SNL N-19 by that time.

MOTOR VEHICLE MECHANICS' TOOL SET

If you're a general automotive mechanic, you've probably griped plenty about having to run back to the company truck every time you struck an unusual size or shape of nut or bolt. Well, if you have the complete wartime tool kit for Motor Vehicle Mechanics, you'll find a mess of sizes and shapes not formerly available, making it a lot easier to tighten in tight places. In fact, 13 tools that you

formerly had to borrow from the company truck are now supposed to be in your tool box, along with 20 others that you never had any chance to use at all.

Check over your socket set. It ought to include a couple of extension bars (5- and 10-inch), a set of drag link bits, a reversible ratchet-type handle, a speeder handle, a universal joint, a 1 1/16-inch wrench, and a 1 1/8-inch wrench. Along with these goes a 1/4-inch square-drive midget socket set.

Count your pliers. You should have 5 pairs instead of the 2 that used to be provided. The new ones are a 6-inch round-nose, an 8-inch flat-nose side-cutting, and a water-pump model. Also, the old 6-inch wire cutters have been swapped for 8-inch wire cutters.

In addition to the 5 screwdrivers you had all along, you should now have an offset screwdriver, a couple with shockproof handles, and two for Phillips-type screws.

Add 3 more box wrenches, a pipe wrench, 4 safety-screw wrenches, a pry bar, a tool brush, a spark plug and ignition feeler gage, a 4-ounce hammer, and a knife, and you have all the tools added to your set in the past year or two. For the complete list, see N-19.

2nd ECHELON UNIT EQUIPMENT SET #1

Preventive maintenance is going to be a lot more efficient (and maybe a little easier as well), if you have all the equipment on your Company 3/4-ton maintenance truck that N-19 authorizes for 2nd-echelon Unit Equipment Set #1.

Take lubrication, for instance. If you have your authorized portable air compressor and high-pressure lubricating gun, grease jobs should be a pleasure. Add to these a bucket-type pump gun, 2 lever-type high-pressure guns, a universal grease-fitting tool, flexible-spout measures, a drain pan, and a trigger-type oiler, and you can shoot

the lube wherever it's needed.

For taking care of those all essential tires, you should now have a vulcanizer, 3 valve-stem repair tools, 6 deflating caps, a 7-ton hydraulic jack, a few tire irons, an air hose to connect to the compressor, and a new and better precision-type air-pressure gage...not to mention a new shock-type wheel-lug wrench which replaces your old 4-way rim-nut wrench.

For tightening and adjusting, be sure you have the torque wrench that tells you 'how tight is tight.'

Other PM tools authorized in N-19 are additional battery

and anti-freeze hydrometers, a toe-in gage, battery and hydraulic brake fillers, a neon timing light, and an assortment of gages and testers that you will put to use.

You'll also want the authorized breast drill with all sizes of twist-drill bits from 1/8" to 1/2" diameter; the bench grinder, and the universal 3-jaw puller.

In fact, you'll want 81 types of tools not formerly provided in this set. And, in return, you should turn-in 29 tools no longer authorized if you have not already done so.

(Continued on next page)

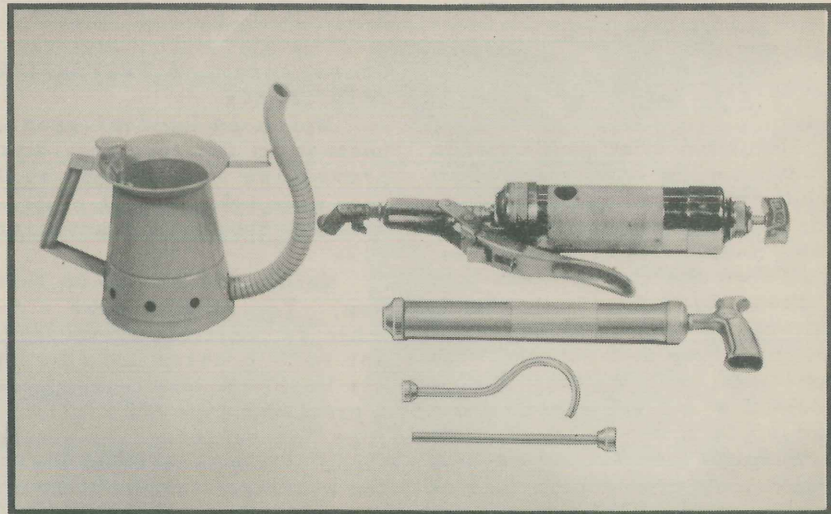


Fig. 2a - This is what the pre-war version of 2nd-echelon Set #1 (the company set) authorized for lubrication.

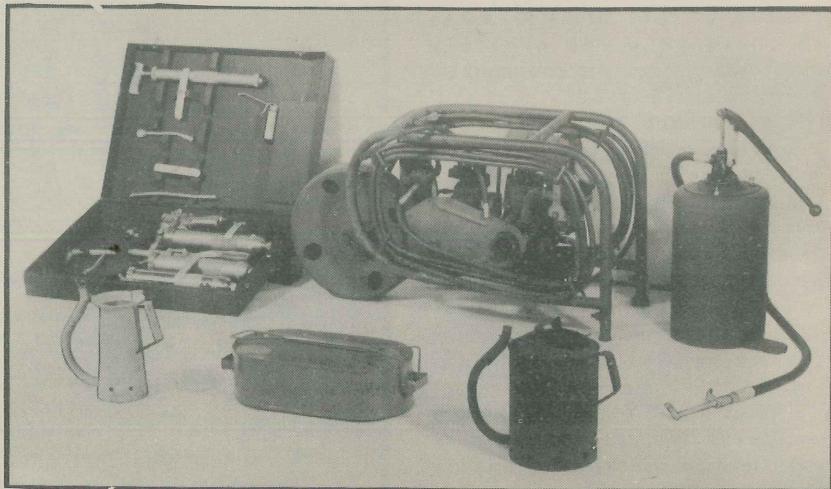


Fig. 2b - But now the lube equipment in 2nd-echelon Set #1 has increased to this.

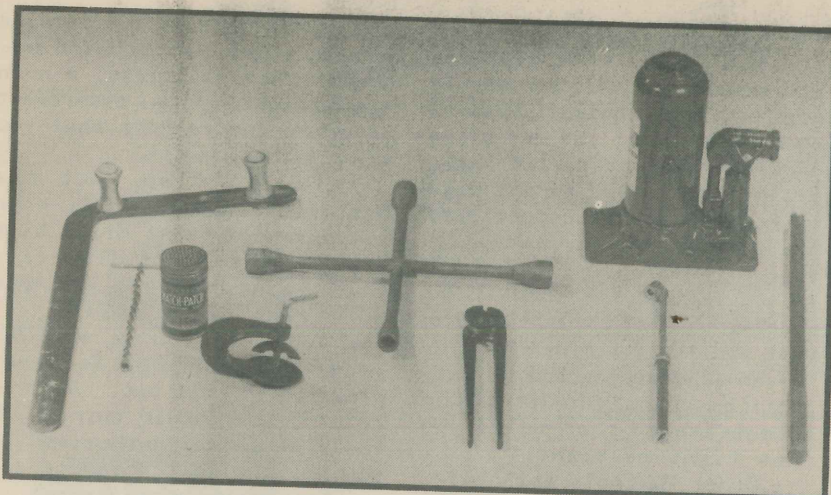


Fig. 3a - Here's what you used to get in 2nd-echelon Set #2 (the battalion and regimental set) for tire care and maintenance.

2nd ECHELON UNIT EQUIPMENT SET #2

A rumor got around once that some 2nd-echelon battalion and regimental outfits were using heavy equipment which the books didn't authorize.

When the give-it-back-boys asked why, they learned 1) that the bootleg equipment made better 2nd-echelon work possible, and 2) that it made some 3rd- and 4th-echelon work possible too.

Well, even the give-it-back Dept. couldn't object to letting a 2nd-echelon mechanic turn a generator commutator if it was absolutely necessary and he had plenty of time. The trouble is that if he does his PM thoroughly, he probably won't have time for overhauling even a small unit.

Therefore they made up a 2 1/2-ton truckload of 2nd-echelon equipment for the battalion and regimental mechanics. Almost all of it is PM or trouble-shooting equipment. You won't find any lathes, valve grinders, brake relines, shapers, or calipers, because the set is streamlined for the job it's supposed to do.

You will find the right equipment for scientific tire maintenance and repair, battery charging, spark-plug cleaning and testing, vehicle lubrication, brake adjustment, and

other forms of PREVENTIVE MAINTENANCE.

Which is kind of smart, because in the long run, good preventive maintenance will keep more vehicles out of 3rd-echelon shops than anything else.

Mainly, it shapes up this way. You should have a 6-cubic ft. portable air compressor with 5 extra lengths of air hose. A chuck-gage, and a precision-type 'fiddlestick' gage for perfect tire inflation. Along with it go two 7-ton hydraulic jacks, a handful

of tire irons, a lock-ring remover and replacer, a valve and-tube vulcanizer, a foot-operated spreader (instead of the vest-pocket edition formerly supplied), a shock-type wheel lug wrench, and an assortment of deflating caps, valve converting tools, valve core tools, and valve stem tools.

For greasing, you've got approximately the same equipment as the company 2nd-echelon outfits, plus the water pump gun and transmission-and-differential gun that you had along.

For engine tune-up, there's a spark-plug cleaner and tester, a new friction-clutch valve lifter, a new circuit tester, and a neon timing light.

We might also mention the hydraulic brake bleeder and filler tools, the bolt clipper, the headlight screen, the tire-chain repair tool, the soldering equipment, and the hydrometers; also the blacksmith equipment for those who like to roll their own tools and parts. But you'll discover them for yourself when you study SNL N-19.

OTHER 2nd-ECHELON SETS

The other 2nd-echelon unit
(Continued on page 160)

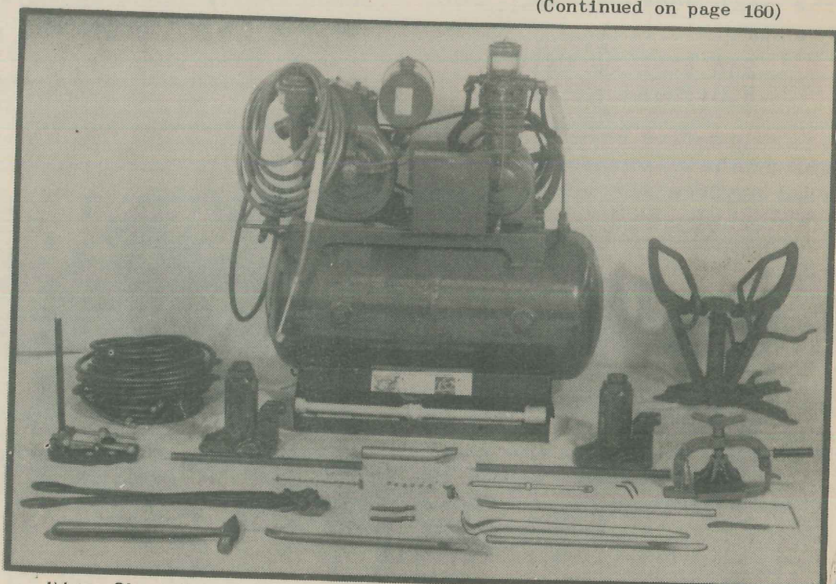


Fig. 3b - Now your tire equipment in 2nd-echelon Set #2 has reached this all-time high.

STICKING

Shift - Lever On 1/4-Tons

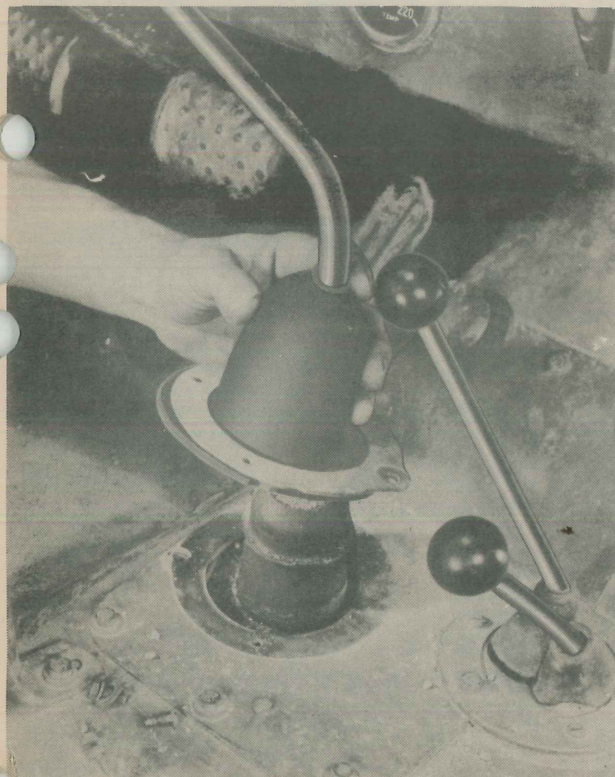
Lots of men have been crying the blues to us about how hard it is to shift gears on the 1/4-ton 4x4 after it has been run under extreme dusty or muddy conditions.

In some cases, they tell us it's almost impossible to engage the gears in any position. Dirt settles on the transmission control housing ball socket and cap washer and causes the ball on the shifter to freeze or seize to the control housing and cap.

This condition sneaks up on the transmission and the driver doesn't notice it until the transmission fails to stay in gear, or to enter the gears properly, because these parts are covered by the boot.

A sticking shift-lever is the least of the troubles that can result from dirt - eventually the gears themselves can be completely ruined by improper meshing.

Just follow the pictures carefully - and you'll go a long way toward protecting the gears and eliminating a sticking shifter control.



1. Remove 4 screws which hold shift lever boot to floor.



2. Take off shift lever boot and brush away all loose dirt.



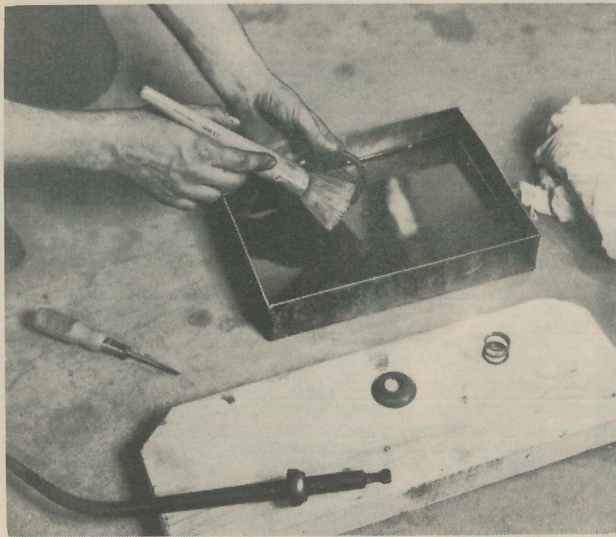
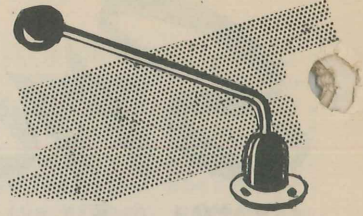
3. Loosen and remove transmission control housing cap.

4. Gently lift out the transmission control lever assembly.

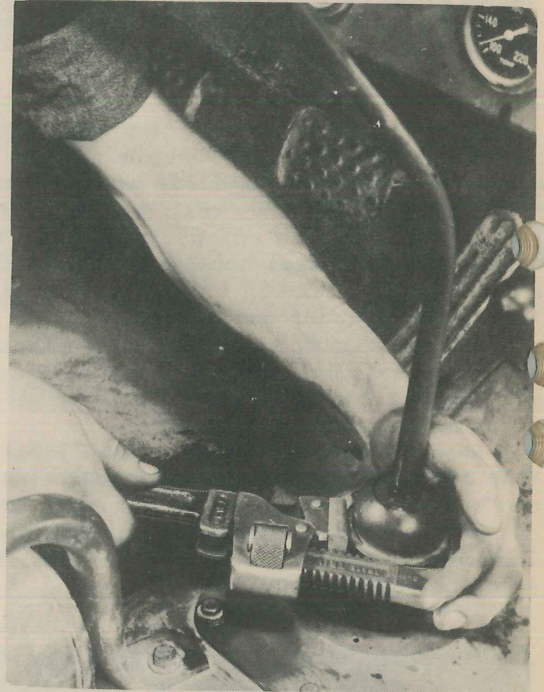


Important:

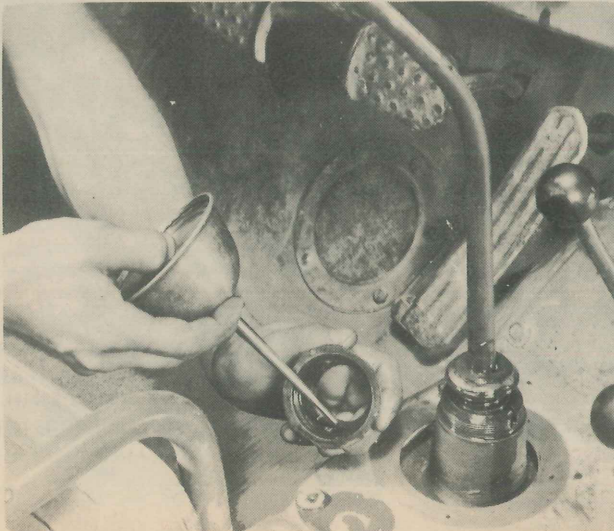
5. Wipe dirt away from housing ball socket.



- 6. Wash all parts thoroughly in solvent (Fed. Spec. P-S-661a).
- 7. Reassemble. Lubricate ball socket cap and washer with OE.



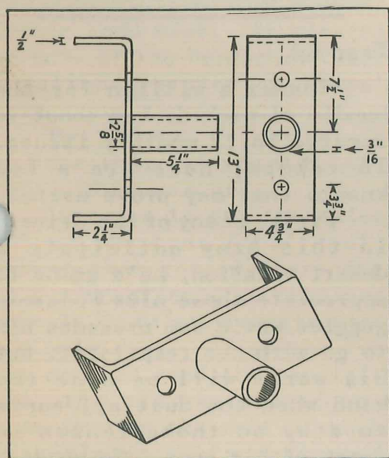
- 8. Run the cap down on housing and tighten it securely.
- 9. Slide boot over control lever assembly, tighten capscrew. If the boot is cracked or torn it should be replaced.



Dear Editor,

Here are some improvements, we think, on the Diamond T 4-ton 6x6 wrecker. Since arriving in California, we've had plenty of opportunity to use our wrecker, since it's the only one within 100 miles of this station. We've had to use it in some tight places, such as pulling a 2½-ton GMC off the edge of a cliff, as well as for long-distance hauls.

One of our greatest difficulties has been with the bumper claws on the Y-bar (more commonly known as the V tow-bar - Ed.). These claws were evidently made for civilian vehicles with the standard-type bumper, and served the purpose on these vehicles excellently. However, on heavy Army trucks with their broad springless bumper, these claws broke off and bent. I asked one of my metal workers to work out a piece from a drawing of mine (see Fig. below) to see how it



worked. This claw is made of heavy semi-soft steel. It will fit even a Diamond T bumper and will stand a tremendous amount of abuse. The two holes are there to allow the chain fasteners to be used on bumpers of smaller sizes and still remain tight, having no play. We retained the old claws for use on light vehicles, such as staff cars and those with conventional bumpers, since it is very easy to make the change-over.

Here is a suggestion in the use of the Y-bar (V-bar. -

CONTRIBUTIONS

Got a good idea? Invented something lately? Got a gripe? Shoot it along to us. Maybe you've solved a problem everybody else is worrying about. Pass it to us, and we'll buck it to the rest of the boys in the field. You'll get a personal subscription if we like your idea - you lucky thing.



Ed.) that many don't know about. The chain fasteners that hold the bar tightly to the bumpers should never be tightened beyond the amount necessary to hold the bar in place, until the vehicle has been hoisted to the proper height for towing. The reason is that, in hoisting, a strain of sufficient force to break the tightening lever is caused by the change of position. I know, because I broke it twice before I found the cause. We brazed the parts and they are holding. By the way, do you have a parts list for such accessories? (The V tow-bar is listed in TM 10-1606, 10-1334 and 10-1296, Parts Lists for various Diamond T wrecker models. The manufacturer's part number is VB45. - Ed.)

One other improvement that has proved more than satisfactory is a cable guide on the side winches. This is in the form of a swinging arm, pivoted off a piece of angle iron run across the uprights on which the winches are mounted. This insures even winding of the cable, especially under heavy strains. The guides were only a few hours' work, simple to make and to operate.

In the August (1942) ARMY MOTORS, page 154, I noticed a contribution on removing the wheel from the wrecker floor

and placing it with the other spare on the brace members of the winch. I don't know how it was done by that outfit, but we took a piece of angle iron, slightly heavier than the one on the vehicle, and mounted it a few inches higher on the braces. We raised the first spare to this, so the spare from the floor wouldn't touch the brace members when placed on the first spare. We then made a light but sturdy spacer to keep the two tires from rubbing. And that was that.

Lt. Lawson F. Reichard
710th Ord. Co. MM (Avn)(Q)

There have been a number of failures of the top bronze cone type bearing on the new 3/4-ton Dodges. Most of the failures that we have inspected have the appearance of wear due to the lack of proper lubrication.

In our outfit, failure of these bearings has been kept to a minimum because of preventive maintenance and smoothing off the sharp edge on the special square-shaped groove that distributes the grease around the cone bearing surface; and adjusting the bearings as recommended in the factory manual.

This top steering knuckle bearing is a plane sliding surface type that requires lubrication more often than roller bearings. It's my opinion that grease from the driver's grease gun should be added every 500 miles to furnish additional lubrication to that recommended by the Dodge manual. Two or three shots from the grease gun would be plenty; taking care to avoid over-lubrication of the universal drive joint.

In the manufacture of this alloy cone-shaped bearing, the tool used to cut the square spiral grooves leaves a sharp edge on the surface of the bearing. After assembly on the vehicle this sharp edge causes the grease to be cut off of the bearing surface. With this lack of lubrication, the bearings would wear rapidly.

On the 1000-mile inspections or the first time the vehicle went into the 2nd echelon shops, this sharp edge on the bearing would be rounded off or just dulled by dragging a file or scraper over the edges; just once or twice is plenty to take the razor-edge off the spiral. Be sure the material that is removed is not allowed to remain in the groove or on the bearing surface. To allow for grease space, it's important to put a coat of grease on the surface before assembling and adjusting the drag on the steering knuckle housing.

Major John P. Derks
18th F. A. Brig.

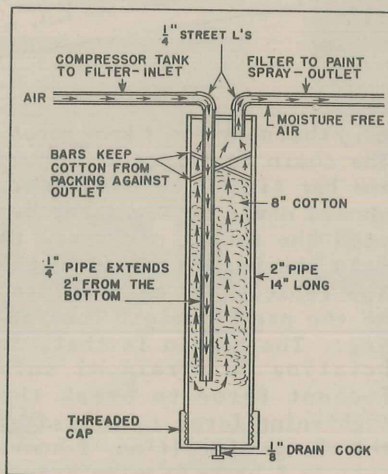
(Ed. Note — We don't think it's necessary to remove the 'sharp edge' on the surface of the groove on the steering knuckle top bearing cone to allow for ample lubrication. Just grease them as often as the manual calls for and you should have no difficulty with this bearing except for periodical maintenance adjustments. The truth is that lubrication at this point has been neglected because greaseballs don't want to go to the trouble of removing the trunnion socket grease plug and installing the

grease fitting to lubricate this bearing.)

Dear Editor,

Since moving to the tropics, our painter has been annoyed by water mixing with his paint due to moisture in the air getting into the air-compressor. To remedy the situation, we have devised an inexpensive, easy-to-make moisture trap, using cotton (or similar absorbent material) as the trapping agent.

The attached sketch tells the story (see Fig. below).



We welded the complete assembly to the compressor tank and directed the hot exhaust gases from the compressor motor to hit the trap assembly, which keeps it warm and dry, thus further increasing its efficiency.

This device has served us so well that we think it's worth writing home about.

S/Sgt. Richard H. Stevens
516th Sig. AW Regt.

Dear Editor,

Vehicles in this Brigade operate in very wet and muddy conditions. About six months ago we started the procedure of painting the inside of the brake drum, with the exception of the coefficient of friction area, and the brake backing plate with metal primer. This was performed during the 6000-mile

inspection and makes the operation a little longer but pays off by eliminating the rust. Will last indefinitely if it is touched up every 6,000 miles, during the inspection.

In case there is doubt as to the muddy conditions in California, I might add that the Chamber of Commerce is a wonderful institution.

W/O R. L. Akers
37th Brigade Motor School

(Ed. Note - The idea is sound providing all rust is removed before the paint is applied)

From Automotive Advisor, Mr. Earl L. Cook, comes the good suggestion that emphasis be placed on making sure that the winch shear pins are in the trucks when they are needed. The only way to make sure is to inspect the dash compartment for the shear pins daily.

Dear Ed,

Thanks a million for the bundle of orchids I am about to receive in 12 monthly issues. In return, here are a few knacks that may prove useful.

First, if any of the driver in this Army anticipate a desert vacation, he's going to appreciate those nice Polaroid goggles Uncle Sam presents him to go with his respirator. But his words will be none too kind when the dust all wants to stay on those lenses in front of his eyes. So up goes his arm to slide the sleeve of his fatigues across the soft surface and removes some of the dust. But the buttons have a habit of leaving scratches. Here's a help to save our hero. Borrow one of Connie Rodd's fluffy powder-puffs. Sew one part of a snap fastener on the back of this piece of feminine camouflage equipment and sew the other part on your jacket-sleeve. You can keep the puff in your glove compartment, so whenever you go on a GI joyride, you merely snap the gadget on your

sleeve and proceed to remove the dust from your goggles.

You may stop me if I'm late about this, but if you intend to put oil or grease on your windshield so adhering sand will cut down reflection, please remove the wiper blades. Rubber and oil were never on speaking terms.

Pvt. Jerome Winkler,
36th Ord. Mtnce Battalion

(Ed. Note — Oil on the windshield is not harmful to the glass — it's only when sand is added that the abrasive effect gives the glass a permanent haze. The rubber angle is also important, and if the oil and sand are used, the windshield wipers should be removed.)

Dear Editor,

You had some swell ideas on gas cans in Feb. ARMY MOTORS, Connie Rodd Dept. It cleared up some of the headaches those 5-gallon 'service stations' have been causing us.

By the by, we cooked up an idea that, if you O.K. it, you might pass on.

In order to get the water out of the cans (that small amount that got in there due to condensation), we obtained some 2" by 6" s and constructed a simple rack. After the can was emptied, and the cap left off, the can was placed upside-down on the rack at such an angle so as to drain out any water which may have been in it.

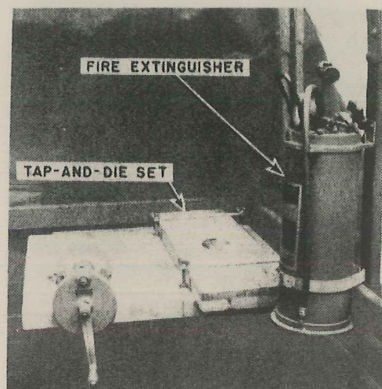
This simple little system has saved us plenty of carburetor trouble, and no foolin'.

Sgt. O. K. Maltbie,
R. Hq. Co. 185 Inf.

A couple of new slants on the 2nd-echelon #2 tool-set layout for the 2½-ton truck pictured in our April issue come from the fertile minds of Lt. R. C. Donlevy and Corp. Fred Space, of the 3007th Ord.

Base Depot Co. (formerly of the 316th Ord. MT Supply Co.).

(1) The tap-and-die sets can be mounted, one each, on the tops of the tool cabinets. All this takes is four through-bolts with wing nuts, and connecting metal straps for each cabinet. (See Fig. 1 below).



(2) The fire extinguisher can be mounted on a front bow, handy for fighting fires in the shop part of the truck. After all, the truck has a vehicle fire extinguisher in the driver's compartment anyhow. (Fig. 1 again).

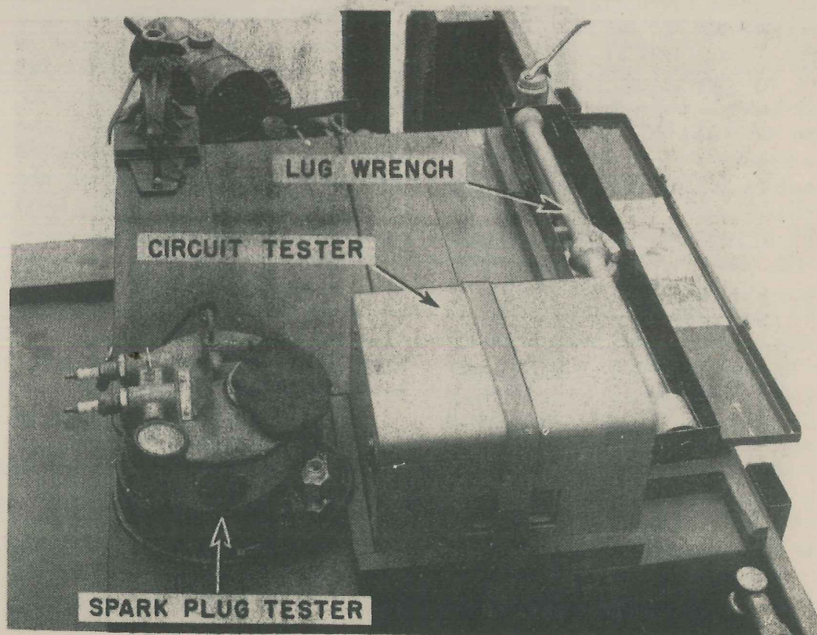
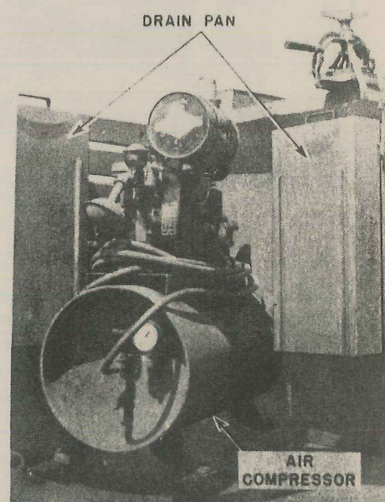
(3) There's just room enough for the low voltage

Fig. 2 (below).

Fig. 3 (at right).

circuit tester between the spark-plug tester and the shock-type lug wrench. (Fig. 2).

(4) In case your air compressor is cranked from the back (like Lt. Donlevy's) instead of the front (like the one we pictured in April), it can be turned catty-cornered for convenience. That leaves room for you to hang an oil drain pan near it on the side of the truck and another on the side of the cabinet. (See Fig. 3 below).





What Half-Mast doesn't know you could put in a gnat's ear and, by the same token, what a gnat doesn't know you could put in Half-Mast's ear. Half-Mast is the answer man, he'll answer all those questions — technical, procurement, procedure — that have you up a tree. Write 'Dear Half-Mast.' Preventive Maintenance Unit, Holabird Ordnance Depot, Baltimore, Maryland.

Dear Half-Mast,

The transfer case on our 1 1/2-ton 1942 Chevrolet 4x4 disengaged from high range on a steady pull. We removed the unit, inspected it, and found that by changing the sliding gear into a more forward position to just clear the drive gear when in neutral, the trouble of disengaging was eliminated. We did this by relocating the shifting fork on the shift rail. A new lock notch was machined in the rail in order to move the gear forward approximately 3/8".

Of course, all the normal methods of eliminating this trouble were tried before the above changes were made.

What do you think of it?

Lt. E. N. H.

Dear Lieutenant,

I don't think it's such a good idea. Reslotting the shifting rail as a cure for

high gear hop-out will cause a rubbing condition of the gears in high or low gear when the case is in neutral.

Instead, I'd suggest the following to cure this trouble in the split shaft type 4x4 Chevrolet transfer cases:

1) Check to make sure the shifting rod clevis is adjusted to obtain enough travel of the shifter fork to allow the ball to drop into the slot in the shaft.

2) Check and increase the tension on the detent spring if necessary. Normal free length is 2", but it may be lengthened to 2-1/4".

3) Loosen the set screws holding rear bearing lock-sleeve. Also loosen main shaft front and rear bearing retainer capscrews.

4) Drive the vehicle in high range of transfer case for a short distance to allow the bearings and caps to seek

their own position.

5) Then retighten the front and rear bearing retainer capscrews.

If this don't correct the trouble, have a higher echelon shop replace the present main-shaft with part #591279, which will reduce the tendency of the sliding gear to slip out of engagement. This new main-shaft went into production 9 September 1941 and can be identified by a groove 1/16" wide and 1/32" deep across the face of the outer, or threaded, end of the shaft, on which the transmission drive flange is mounted.

Half-Mast

Dear Half-Mast,

How do you crank a 4-ton Diamond-T front-mounted winch 6x6? Do you have to take the winch off?

Cpl. W. B. M.

Dear Corporal,

To crank a 4-ton Diamond-T front-mounted winch 6x6, the first thing you do is to disengage the winch sliding clutch. Then pull enough cable off the drum to let the crank fit into the guide. Turn the crank bracket (mounted on the bumper) to an up position, slip in the crank, and start to grind.

That's all there is to it, and you don't have to take the winch off.

Half-Mast

Dear Half-Mast,

I have experimented with a brake drum shield to reduce constant maintenance on the brakes of our 1 1/2-ton Chevrolet and 2 1/2-ton GMC trucks. Tests and results show that installation of this shield on all our Chevrolets and GMC's would eliminate all brake maintenance and repair previously caused by mud forced into the brake drum when these trucks operate on poor muddy roads.

(Ed. Note — A description of the shield, and a photograph of it accompanied this letter.)

I believe my invention will practically eliminate

these troubles, thereby saving the Army a considerable amount of money as well as a large number of man-hours.

Motor Sgt. W. B. H., Jr.

Dear Sergeant,

I wish your invention would eliminate brake troubles. But it don't. Your solution is one of the best I've gotten - and I've gotten dozens of them.

But the fact remains that any brake design which includes running clearance between the drum and flange plate will let in water and mud if that clearance space is *submerged*. And you've got to have clearance space, because the general design depends on air circulation to carry away the heat built up during brake application.

If it'll make you guys feel any better, I'll tell you that the wheel hubs and brake drums on the Chevrolet and GMC vehicles are being revised so that the drums can be removed without removing the hubs, similar to the present arrangement on the 3/4-ton Dodge. This change will speed up the removal of drums for cleaning mud, etc., out of the brake assemblies.

Half-Mast

Dear Half-Mast,

We just got 4 M-1, 10-ton wreckers manufactured by the Kenworth Motor Truck Corporation. Their unloading instructions tell us that the tires are inflated to 90 lbs. for shipment and should be reduced to 80 lbs. before placing vehicles in service. The tire size is 11.00 x 20, 12 ply.

We're following pressure specifications laid out in Circular 384 for this size tire, which is 70 lbs. However, the manufacturer's instructions cause a little confusion and misunderstanding.

Can you straighten us out?

Lt. T.A.K.

Dear Lieutenant,

You're right - 70 lbs. is

the correct pressure for those wrecker tires of yours.

Pay no attention to the manufacturer's figure when it disagrees with War Department Circular No. 384 and the new TM 31-200, both of which specify 70 lbs. for this size tire.

Half-Mast

Dear Half-Mast,

At this time we are having a great deal of trouble with pillow block oil seals. I understand that on the 1 1/2-ton Dodge 6x6, the pillow bearing will be filled with 1 1/2 pounds of chassis #2 grease. Is that correct?

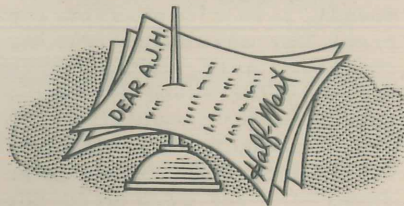
Is there any objection to filling 2 1/2-ton GMC pillow blocks with #2 chassis grease?

Also, can you give me information on 1 1/2-ton Dodge parts that are going to be interchangeable?

Also, I am told that the fan belts will have cable centers to avoid stretching.

A.N.B.

Automotive Advisor



Dear A. N. B.,

No. 2 chassis grease is all right for the 1 1/2-ton Dodge 6x6, but the capacity of the bearing is 4 to 6 OUNCES - not a pound and a half! No wonder you've had trouble with the oil seals.

No. 2 chassis grease is OK for the GMC.

If there is any interchangeability between Dodge and GMC parts, I don't know about it.

However, about 800 parts (including parts common) are interchangeable between the Dodge 1 1/2-ton and 3/4-ton. You can locate these in the SNL Service Parts Catalogs for these two vehicles. Interchangeable parts will have the same Item Stock Numbers in

both books.

Whoever told you that fan belts on the Dodge will have a steel core, is giving you straight dope - it's expected to increase the belt life.

Half-Mast

Dear Half-Mast,

On a recent convoy, my vehicles were involved in an accident which pushed the front end of seven vehicles back about six inches, necessitating, of course, the loss of time and 3rd-echelon repair. This could have been eliminated by the modification of the front bumper. The front bumper on these particular vehicles is approximately 2 1/2 inches too low. If raised this much it would, on level road, hit squarely on the bumperettes in the rear of other 2 1/2-ton 6x4 or 6x6 GMC's.

I'm sure this modification wouldn't take much time or material. What do you think?

Lt. H. V. R.

Dear Lieutenant,

Tank-Automotive Center has been playing with your idea and thinks maybe the bumper *should* be raised. They aren't ready to say for sure 'til they've completed tests, but you may be seeing an official directive sometime soon as a result of your contribution.

Half-Mast

Dear Half-Mast,

We have here at our 2nd-echelon shop a problem with some new 3/4-ton Dodges which we have just received.

Our main trouble with them is that the carburetor likes to flood up when idling at operating temperature, and has a tendency to die. Also, when going at slow speeds over rough terrain, they don't respond when you want power, and just about throw a person out, when they start acting up. If you look it up, you'll find it has the latest type of Zenith Carburetor Model Number or series 29. We have checked all over

them, and can't seem to locate our trouble. We have checked the float level, jets, and air passages. But all seem to be perfect. They all have a flat spot when accelerated suddenly and just flood and conk out. We know that the accelerator pump circuit is operated by vacuum. Could this be the cause of our trouble, or is it something else that we have missed?

T/5 F. N.

Dear Corporal,

I can't give you an honest answer, because too many different factors are involved. But I can, and have, arranged for the Fargo Field Service Engineer in your territory to check with you on his next trip to your camp. You may see him before you see this in print, even.

Anyhow, Fargo is now working on a new carburetor repair and rebuilding procedure which will be released to the field 'in the near future,' as they put it. The Field Service Engineer will have some of this advance dope with him.

Half-Mast

Dear Half-Mast,

About the Ford jeeps that sometimes refuse to be driven around in anything but low gear — on these jobs, the shift fork guide (which is riveted to the gear shift housing assembly), becomes loose, which makes it difficult to shift from low into second gear.

To correct it, we re-peened the rivets and spot-welded the plate on the sides, to the housing.

How's about welding these plates right on at the factory, instead of bringing 'em to us poor, old, overworked (?) 3rd-echelon guys?

T/Sgt. F. W. D.

Dear Sarge,

Your re-peening process is the right cure for this trouble, you poor, old, over-

worked dear. Ford is now making sure that the plate is securely riveted in production.

I wouldn't weld the plate to the housing, though, because it ain't practical to weld a *steel stamping* to the housing, which is a *casting*.

Half-Mast

Dear Half-Mast,

As instructed in M.T.T.S.B. G-2, dated 1 September 1942, we requisitioned 'Torque Reaction Spring Installation Field Kit', Part #A-6157-D for Willys and Ford 1/4-ton trucks.

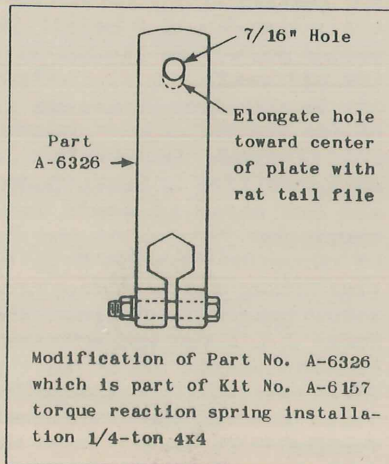
We now find that Part #AE-6326-D of the kit does not fit the Ford. Would like to know if correct part is available or if part #AE-6326-D should be modified.

Thanks in advance for all information.

Lt. R. E.

Dear Lieutenant,

Some time ago, the front spring hanger brackets on both the Ford and Willys were moved forward 1/8" to avoid the possibility of the starting crank nut assembly striking the front axle. This change actually increased the wheel base from 80" to 80-1/8". In order to take care of both the 80" and 80-1/8" wheel base chassis, Ford elongated the 7/16" hole in the spring shackle bolt lock assembly 1/8". Willys followed suit — but sometime later. The part you've got came out before



Willys made the change.

You can modify part #AE-6326-D to fit; in fact, there an FSMWO in the works which will direct you to do it. However, since no parts are involved that you haven't already got, we're giving you a sketch which demonstrates how to elongate the hole with a rat-tail file. Remember, though, that some of the parts fit all right; so if you get any more, be sure to check the spacing of the holes before you start filing.

Half-Mast

Dear Half-Mast,

The propeller shaft universal joint corks are blown by extreme pressure during lubrication. And I find that there is no lube in the opposite cross. Where does the air that's in there go?

Please put me straight on this, will you?

Sgt. R. H.

Dear Sergeant,

You're right, the universal joint cork seals can be damaged by using a high pressure gun to lubricate them. The newer joints (except on the 1/4-, 3/4-, and 1 1/2-ton vehicles) have a relief valve to relieve pressures that would otherwise damage the cork seal to escape. But even with this extra precaution, use only the hand gun for lube operations on U-joints.

Any air that may be trapped in the grease passages will be forced out of the relief valve by the incoming lubricant, if the cork seals are in good condition.

But if the seals are bad, the lube will pass out past the seals before enough pressure can be built up in the joint proper to open the relief valve. It's possible for the lube passages to get plugged with dirt, dried grease, or foreign matter which would prevent the lube from reaching the needle bearings. Dismantle the joint and clean out the passages, if

(Continued on page 160)

Did you get all the directives this month?

Here is your monthly checklist of recent official directives of interest to the 1st and 2nd-echelons of maintenance. As we said last month, ARMY MOTORS is moving its publication deadline forward. And as we promised then, this issue will contain only Ordnance Publications...next month we plan to bring you both Adjutant General Publications and Ordnance Publications.

The directives listed below are distributed by your regional Ordnance Publications Depots (OFS distribution) and come through your Ordnance Officer. Ask him about it if you were missed; don't write to Holabird or the Tank-Automotive Center for any of these publications.

ABBREVIATIONS

AR - Army Regulations	°OSPE - Organizational Spare Parts and Equipment, SNL
C - Change	°SNL - Standard Nomenclature List
*FM - Field Manual	°SPC - Service Parts Catalog, SNL
*FSMWO - Field Service Modification Work Order	°TB - Ordnance Field Service Technical Bulletin
*OFBS - Ordnance Field Service Bulletin	*TC - Training Circular
*OFSC - Ordnance Field Service Circular	*TM - Technical Manual
*OPSI - Ordnance Publications for Supply, Index	*WDC - War Department Circular
	*AGO Distribution
	*OFS Distribution

ARMORED CARS

CAR, LIGHT, ARMORED, M2
SNL G-136, OSPE.

SCOUT CARS

CAR, SCOUT, M3A1
SNL G-67, Sec. 15 to 24, List of all parts.
SNL G-67, OSPE.
TB 700-54, Tire repair kit.

GUN CARRIAGES

CARRIAGE, MOTOR, 37-MM GUN, M6
SNL G-121, C1, Parts and equipment.
SNL G-121, Temp. C1.
FSMWO G121-W1, Lubrication instructions on instruction plate, canceled by C1.
TB 750A-1, Publications number plate.

CARRIAGE, MOTOR, 75-MM GUN, M3
SNL G-102, Sec. 1A, Parts change directory.
SNL G-102, Sec. 10, Generator and starter.
SNL G-102, Sec. 13, Engine group.
SNL G-102, Sec. 22, Steering group.
SNL G-102, Sec. 26, Piece mark conversion list.
OFBS 6-G-102B, Lubrication instructions.
FSMWO G102-W23, Bogie volute spring (red).
TB 700-54, Tire repair kit.

CARRIAGE, MOTOR, 75-MM GUN, M3A1
SNL G-102, Sec. 1A, Parts change directory.
SNL G-102, Sec. 13, Engine group.
SNL G-102, Sec. 22, Steering group.
SNL G-102, Sec. 26, Piece mark conversion list.
TB 700-54, Tire repair kit.

CARRIAGE, MOTOR, 81-MM MORTAR, M4
SNL G-102, Sec. 1A, Parts change directory.
SNL G-102, Sec. 10, Generator and starter.
SNL G-102, Sec. 13, Engine group.
SNL G-102, Sec. 22, Steering group.
SNL G-102, Sec. 26, Piece mark conversion list.
FSMWO G102-W23, Bogie volute spring (red).
TB 700-54, Tire repair kit.

CARRIAGE, MOTOR, 81-MM MORTAR, M4A1
TB 700-54, Tire repair kit.

CARRIAGE, MOTOR, 3-INCH GUN, M5
SNL G-120, Temp. C1, List of spare parts.

CARRIAGE, MOTOR, MULTIPLE GUN, M13
SNL G-102, Sec. 1A, Parts change directory.
SNL G-102, Sec. 13, Engine group.
SNL G-102, Sec. 22, Steering group.
SNL G-102, Sec. 26, Piece mark conversion list.
TB 700-54, Tire repair kit.

CARRIAGE, MOTOR, MULTIPLE GUN, M15
SNL G-102, Sec. 13, Engine group.
SNL G-102, Sec. 22, Steering group.
SNL G-102, Sec. 26, Piece mark conversion list.
TB 700-54, Tire repair kit.

CARRIAGE, MOTOR, MULTIPLE GUN, M16
TB 700-54, Tire repair kit.

CARRIAGE, MOTOR, 105MM HOWITZER, M7
TB 700-52, New type cam assembly.
TB 700-53, Magneto timing change.
TB 731A-6, Interchanging master clutch.
TB 731B-4, Change rear door strap.

FSMWO G128-W11, Ventilated clutch (red).
SNL G-128, Vol. 1, Temp. C1.

CARRIAGE, MOTOR, 75-MM HOWITZER, M8
FSMWO G127-W1, Air cleaner system (red).
SNL G-127, Temp. C1.

CARRIAGE, MOTOR, 3-INCH GUN, M10
FSMWO G130-W11, Fan-drive gear (red).
SNL G-130, Temp. C1.

CARRIAGE, MOTOR, 3-INCH GUN, M10A1
SNL G-170, OSPE.

CARRIAGE, MOTOR, 155-MM GUN, M12
OFBS 6-G-158, Lubrication instructions.
FSMWO G158-W3, Ventilated clutch (red).
TB 700-52, New type cam assembly.
TB 700-53, Magneto timing change.

CARRIAGE, MOTOR, 105-MM HOWITZER, T19
SNL G-102, Sec. 1A, Parts change directory.
SNL G-102, Sec. 13, Engine group.
SNL G-102, Sec. 22, Steering group.
SNL G-102, Sec. 26, Piece mark conversion list.
FSMWO G102-W23, Bogie volute spring (red).
TB 700-54, Tire repair kit.

CARRIAGE, MOTOR, 75-MM HOWITZER, T30
SNL G102, Sec. 1A, Parts change directory.
SNL G-102, Sec. 13, Engine group.
SNL G-102, Sec. 22, Steering group.
SNL G-102, Sec. 26, Piece mark conversion list.
FSMWO G102-W23, Bogie volute spring (red).
TB 700-54, Tire repair kit.

HALF-TRACK VEHICLES
FSMWO G102-W10, C2.

CARRIERS

CARRIER, CARGO, T14
FSMWO G158-W3, Ventilated clutch (red).
OFBS 6-G-158, Lubrication instructions.
TB 700-52, New type cam assembly.
TB 700-53, Magneto timing change.

CAR, HALF-TRACK, M2 AND CARRIER, PERSONNEL, HALF-TRACK, M5
FSMWO G102-W1, Drag link assembly, canceled by C2.
FSMWO G102-W23, Bogie volute spring (red).
SNL G-102, Sec. 1A, Parts change directory.
SNL G-102, Sec. 10, Generator and starter.
SNL G-102, Sec. 13, Engine group.
SNL G-102, Sec. 22, Steering group.
SNL G-102, Sec. 26, Piece mark conversion list.
TB 700-54, Tire repair kit.

HALF-TRACK VEHICLES
FSMWO G102-W10, C2.

TANKS

TANK, T9E1
SNL G-148, Temp. C1.

TANK, LIGHT, M3A1
SNL G-103, Vol. 5, Sec. 12, Ch. 2, Turret traversing mechanism.
SNL G-103, Vol. 5, Temp. C1.

TB 726C-1, Turret traversing mechanism.

TANK, LIGHT, M3A3

TB 726C-1, Turret traversing mechanism.

TANK, LIGHT, M5

SNL G-103, Part 2, Vol. 2 & 8 (pp 1-355), Service parts catalog.
SNL G-103, Part 2, Vol. 2 & 8 (pp 355-723), Service parts catalog.
TB 732-19, Air cleaner filter element.

TANK, LIGHT, T7E2

SNL G-137, Temp. C1.

TANK, MEDIUM, M3

SNL G-104, Vol. 1, Temp. C1.
OFSB 6-G-104A, Lubrication instructions.
TB 700-52, New type cam assembly.
TB 700-53, Magneto timing change.
TB 731A-6, Interchanging master clutch.

TANK, MEDIUM, M3A1

OFSB 6-G-104A, Lubrication instructions.
TB 700-52, New type cam assembly.
TB 700-53, Magneto timing change.
TB 731A-6, Interchanging master clutch.

TANK, MEDIUM, M3A2

OFSB 6-G-104A, Lubrication instructions.
TB 700-52, New type cam assembly.
TB 700-53, Magneto timing change.

TANK, MEDIUM, M4A

SNL G-104, Vol. 3, Temp. C1.

TANK, MEDIUM, M3A3 & M3A5

FSMWO G104-W58, Eliminate clutch failure and shim removal (green).
FSMWO G104-W66, Fan drive gear (red).
SNL G-104, Vol. 5 - Vol. 10, Temp. C1.

TANK, MEDIUM, M4 & M4A1

SNL G-104, Vol. 6, C2, OSPE.
SNL G-104, Vol. 7, Sec. 23, C3, Turret traversing mechanism.
TB 700-52, New type cam assembly.
TB 700-53, Magneto timing change.
TB 731A-6, Interchanging master clutch.

TB 731A-7, Oil level gage.

TANK, MEDIUM, M4A2

FSMWO G104-W58, Eliminate clutch failure and shim removal (green).
FSMWO G104-W66, Fan drive gear (red).
SNL G-104, Vol. 7, Sec. 23, C3, Turret traversing mechanism.

TANK, MEDIUM, M4A3

SNL G-104, Vol. 7, Sec. 23, C3, Turret traversing mechanism.
SNL G-104, Vol. 8, OSPE.
SNL G-104, Vol. 8, Temp. C1, Engine.

TANK, MEDIUM, M4A4

SNL G-104, Vol. 7, Sec. 23, C3, Turret traversing mechanism.
SNL G-104, Vol. 9, Temp. C1.
SNL G-104, Vol. 9, Sec. 1, C1, List of all parts.
SNL G-104, Vol. 9, Sec. 6, Cooling system.
SNL G-104, Vol. 9, Sec. 21, Transmission.
SNL G-104, Vol. 9, Sec. 22, Turret.
FSMWO G104-W60, Ventilated clutch and fan (red).

VEHICLE, TANK RECOVERY, T2 (DIESEL)

FSMWO G169-W3, Fan-drive gear (red)

AMPHIBIAN TRUCKS

TRUCK, AMPHIBIAN, 1/4-TON, 4X4 (FORD)

FSMWO G504-W5, Voltage regulator and static noise filter (red).
FSMWO G504-W6, Transmission and transfer case (red).
FSMWO G504-W7, Rear deck, motor, motor compartment, instrument panel, rear seat, hull and coaming, muffler, motor cover, rear compartment, fuel line (red).
FSMWO G504-W10, Power-take-off (red).

TRUCK, AMPHIBIAN, 2 1/2-TON, 6X6 (GMC)

FSMWO G501-W9, Bilge pump strainer (red)
FSMWO G501-W15, Pump impeller (red).

TRUCKS

GENERAL PURPOSE VEHICLES

OFSB 4-21, Gun mounts.

TRUCK, WRECKING, HEAVY, M1 (CORBITT)

FSMWO G63-W2, Tow bar, canceled by C1.

TRUCK, WRECKING, HEAVY, M1 (WARD LA FRANCE)

FSMWO G116-W1, Lubrication chart holder, canceled by C1.
FSMWO G116-W2, C1.

TRUCK, 2 1/2-TON, 6X6 (GMC)

TB 801-2, Types of oil pens for "270" engines.
OFSB 6-G-508, Lubrication instructions.

TRUCK, 2 1/2-TON, 6X6 (MACHINE SHOP)

SNL G-146, Vol. 1, OSPE.

TRUCK, 2 1/2-TON, 6X4 (STUDEBAKER)

SNL G-630, OSPE.

TRUCK, 2 1/2-TON, 6X6 (STUDEBAKER)

SNL G-630, OSPE.

TRUCK, 7 1/2-TON, 6X6, PRIME MOVER (MACK)

SNL G-532, OSPE.

TRUCK, BOMB SERVICE, M1 (DIAMOND T)

OFSB 6-G-110, Lubrication instructions.

TRUCK, BOMB SERVICE, M1 (GMC)

OFSB 6-G-85, Lubrication instructions.

TRUCK, BOMB SERVICE, M6 (CHEVROLET)

OFSB 6-G-115, Lubrication instructions.

TRUCK, TRAILER, 45-TON, TANK TRANSPORTER, M19

SNL G-159, OSPE.

TRUCK, LIFT, M22 (WEAVER)

SNL G-161, OSPE.
OFSB 6-G-161, Lubrication instructions.

TRUCK TRACTORS

GENERAL PURPOSE VEHICLES

OFSB 4-21, Gun mounts.

TRACTORS

TRACTOR, LIGHT, M2 (CAT. R-2)

OFSB 6-G-68, Lubrication instructions.

TRACTOR, LIGHT, M2 (CLE. AG)

OFSB 6-G-96, Lubrication instructions.

TRACTOR, HEAVY, M1 (CAT. D7)

OFSB 6-G-89, Lubrication instructions.

TRACTOR, CRANE, 1-TON, M1 (INT. T-6)
FSMWO G108-W1, Lubrication chart holder, canceled by C1.

SEMITRAILERS

SEMITRAILER, 6-TON GROSS, 2W (2at)
SNL G-569, OSPE.

TRAILERS

TRAILER, ARMORED, M8

SNL G-157, List of all Parts.
SNL G-157, OSPE.

TRAILER, BOMB, M5

SNL G-74, OSPE.
OFSB 6-G-74, Lubrication instructions.

TRAILER, 1-TON PAYLOAD, 2W, WATER TANK

SNL G-527, OSPE.

TRAILER, 1-TON, 2W CARGO (BEN-HUR-KWT)

SNL G-518, Vol. 1, C1, OSPE.

TRAILER, 1-TON, 2W, CARGO & 250 GALLON WATER TANK

TB 883A-1, Steel landing wheel assembly.

MOTORCYCLES

MOTORCYCLE, SHAFT-DRIVE, SOLO (HARLEY-DAVIDSON)

SNL G-585, OSPE.

BICYCLES

BICYCLE, MOTOR (SERVICYCLE - SIMPLEX G-A-1)

SNL G-611, OSPE.

MAINTENANCE

OFSB 6-G-2, C1, Lubricating oil requirements for diesel engines.
TB 850-10, Addition of gum solvents in lubricants and motor fuels forbidden.

STORAGE SHIPMENT AND ISSUE

OFSI (1 July 43), Ordnance Publications for Supply Index.
SNL OGS-7-1, Obsolete Group C materiel.
SNL OGS-7-1, C1, Obsolete Group G materiel.
OFSB 2-15, Depot Supply of Ordnance parts and tools.
OFSB 2-16, C1, Storage and shipment of rubber tires, tubes and camelback.
OFSB 2-19, Shipments damaged in hands of carriers.
OFSB 2-20, Deletion of "Y" symbol in SNL's.

TRAINING

OFSI (1 July 43), Ordnance Publications for Supply Index.
OFSB 1-1, Index of Technical Publications for Ordnanceman.

TOOLS

SNL G-27, Tools, Maintenance, for repair of automotive vehicles.
SNL N-19, (20 April 43), Tool sets, motor transport.
OFSB 2-15, Depot supply of ordnance parts and tools.

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PERPETUAL INDEX

Your monthly reference guide to all subjects covered in the last 12 issues of ARMY MOTORS

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PRESERVATIVES	103						285	273, 284		30			
PROCUREMENT	107, 30	92		22, 32, 30		323, 331			236, 237	30			
PUBLICATIONS	103, 125, 127, 30	68, 93, 95, 30	40, 45, 53, 30	13, 15, 16, 30	356, 362, 378, 30	345, 30	291, 312, 315	255, 261, 289, 40	238, 251	20, 200, 40	192, 30	142	
RADIO	101, 124		39	30	30	30				199	190, 40		
RECLAMATION									30			154	
SAVAGE								30	30	30			
SOLVENTS	123, 30		39							30	30		
STEERING	122		37	23	361, 371	339	311	274		210, 220		134	
STORAGE					364	323, 339, 344	285, 290	260	230		178	160	
SUPPLY	107	92	30		361	330	287		260, 30			155	
TIRES	102, 128, 30	77, 88, 95	39, 48	32	354, 372	341, 344	290, 299, 312	274, 275	231, 247, 30	201	175, 192	137, 143, 149, 150, 154, 156	
TOOLS		84, 30	58, 60, 30	7, 8, 20	354, 368, 374	317, 323, 340, 341, 343	291, 306, 308, 309, 310	273, 275, 276, 277, 30	225, 242, 248	215, 222	166, 170, 173, 184	153	
TRACK	101, 102, 30	69, 72, 96	36, 30	30									
TRAILERS	120		57	21, 30	367, 30	329, 30	300	253, 279	236, 242	201		130, 156, 30	
TRAINING	111				378	323, 326, 345, 30	305	20, 274, 283	20	216	171	30	
TRANSFER CASE	104, 106	67, 82			360	318	286	258, 278	230, 243	217	166, 185, 187, 188	134, 139, 158, 30	
TRANSMISSION	102	90	57	18	359	318	286, 312, 316	277	246	219	187	156, 30	
TURRET			30										
VEHICLES			46										
WHEELS			57		353, 358, 361, 372	336, 343	299	261, 276	245	208	215	184, 188	143
WINCH			60	22	353, 367			275		217			

WINCH-CONTROL LEVER

(Continued from page 136)

center punch the tunnel floor plate through the three exposed holes in the extension plate. Drill the three holes at the punch marks and bolt the extension plate to the tunnel floor plate with 1/4" x 3/4" capscrews and nuts.

Your job is done now except for testing. Latch the winch lever in neutral, and with the engine running, gently move the lever forward and backward to determine if the gears will contact. Remember, we said gently. If the gears contact, then remove the 3/8" pin in the lower end of the winch lever (under the floor plate) and install a 5/16" pin with two 5/16" spacer washers in its place. This pin will require the winch lever to move farther before the gears will contact. Then unlatch the winch lever and make sure you can engage the gears fully before the lever contacts the end of the slot in the floor plate when shifted into either the forward or reverse position. If you can't, then file the slot in the floor plate enough to provide clearance.

DIRECTIVES

(Continued from page 156)

ADMINISTRATION

- SNL OGS 7-1, Obsolete Group G material.
- SNL OGS 7-1, C1, Obsolete Group G material.
- OFBS 1-1, Index of Technical Publications for Ordnancemen.
- OFBS 2-19, Shipments damaged in hands of carriers.
- OFSC 27, Ordnance technical vehicles

SCRAMBLED ABC'S

If you have your copy of TM 31-200, "Maintenance and Care of Pneumatic Tires and Rubber Treads" handy (the 1 April 1943 edition), turn to par. 73 and make a correction. Where the text reads *Track guides "A"*, write *Track guides "B"*. Where it reads *Broken guides "B"*, write *Broken guides "A"*. Then Fig. 212 will make sense.

ARMY MOTORS IS EAGER TO FOLLOW YOU WHEREVER YOU GO. BUT FIRST, YOU'VE GOT TO TELL US WHERE YOU'VE GONE. PLEASE REMEMBER...

NOTIFY US PROMPTLY OF CHANGE OF ADDRESS

...AND INCLUDE BOTH YOUR OLD AND NEW ADDRESS WHEN YOU WRITE.

TOOL SET STORY

(Continued from page 148)

equipment sets, which are sometimes authorized by the Table of Equipment in addition to Set #1 or Set #2, haven't changed much. They are:

- #3 - Air equipment (lube and tires).
- #4 - Block and tackle.
- #5 - Oxy-acetylene welding equipment.
- #6 - Electric generator.
- #7 - Superstructure, hoist, and tow bar.
- #8 - (False alarm; there's no #8 set).
- #9 - Anchor stake set.

You'll find all these in N-19 too.

HALF-MAST

(Continued from page 156)

this case.

If cleaning doesn't open up the cross for lubrication, you can grind a groove 3/32" wide and 1/16" deep in the end, as authorized in TB 700-84 (now on its way to you through channels). This will let the lube into the needle bearing. This change is being made in production by many manufacturers.

Half-Mast

Dear Half-Mast,

We've just received a 3/4-ton, 4x4 Dodge Carryall as organizational equipment for our company.

The Carryall has a 12-volt electrical system set up for

supply power for radio apparatus. This system is too powerful for the 6-volt defroster and, consequently, tends to burn it out.

We are stationed in the cooler regions of the country, so we have drawn defrosters for our vehicles. Would two defrosters hooked in series remedy the situation or do you have another method?

Lt. R.C.R., Jr.

Dear Lieutenant,

Two 6-volt defrosters hooked in series will serve the purpose, but I'd suggest you requisition the 12-volt defroster for use on all your 12-volt systems. The Federal Stock No. is 8-D-550. Incidentally, the official directive on defrosters (AG 451.9 15 November 1941) tells you who is entitled to them. Here's the list: "All passenger cars and on all closed cab motor trucks operating in Alaska, Newfoundland, Greenland, and Iceland, and in the Continental United States as follows: entire First Service Command, entire Second Service Command, entire Third Service Command, (except Maryland and Virginia), Ohio and Indiana only in the Fifth Service Command, the entire Sixth Service Command, the entire Seventh Service Command (except Arkansas), Colorado only in the Eighth Service Command, entire Ninth Service Command (except California and portions of Oregon and Washington west of the 120th Meridian)."

Half-Mast

From now on, unless you're in an Air Service Command unit, you'll get your Automotive Disability Report Forms (W.D., I.G.D., forms 5-G, 5-C, 5-T, and 5-A) from the Adjutant General Depot in your service command. Air Service Command, however, will distribute the forms to its own units.

• • NEWS FLASHES • •

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

The use of all-steel trailing idler wheels (D34910) on light tanks of the M3 and M5 series, and on 75 mm Howitzer Motor Carriages M8, is being gradually discontinued. FSMWO G103-W20, which told you to reinforce this wheel, has been canceled, and hereafter when the steel wheel becomes unserviceable you'll install in its place a rubber-tired trailing idler wheel (C107939). Ordinarily, you won't remove any serviceable steel wheels for replacement; you'll let 'em ride till they need changing. However, as the rubber wheels should be installed in pairs, you may have to do a little switching around if only one steel wheel gives out at a time.

* * *

On the rear of all M4 series Medium Tanks (and some gun motor carriages on medium tank chassis) there's an exhaust deflector which is put there to keep you from blowing up too much dust. This deflector is hinged and can be closed to keep the engine warm when starting in sub-zero temperatures. *At all other times, however, this deflector should be open.* Otherwise, the engine will overheat and fail ahead of its time.

* * *

Incidentally, on the M4A3's and M10A1's watch out for your head when fooling around that exhaust deflector. If the engine compartment rear door is closed, there's nothing to keep the deflector from conking you.

* * *

A new TB on its way to you will announce that lubrication instructions for the spindle ball and roller bearings of the master clutch are incorrect in TB 1700-21 (par. 7b), TB 731A-6, TB 731E-3, and TB 750-12 (par. 6h). Instead of the lubricant directed in those bulletins, you should use Grease, Ball and Roller Bearing, K001-10-34835 (in 1-lb. cans), or K001-10-34838 (the same in 25-lb. pails). This applies to Medium Tanks M4, M4A1, and M4A4; 105 mm. Howitzer Motor Carriages M7, 155 mm. Gun Motor Carriages M12, and Cargo Carriers T14.

* * *

Here's a clarification of TB 700-66, which tells you not to remove radial or in-line engines from light or medium tanks when performing the 100-hour inspection. It lists several TM's and tells you to do the work required in those TM's at the 100-hour period unless that work would require removal of the engines. Well, some more TM's have popped up. So we're officially informed that you're supposed to do all the 100-hour inspection required in *any* TM, except those parts of the work which would require engine removal. Also, bear in mind that this TB applies also to Gun Motor Carriages built on tank chassis.

* * *

Been having trouble filling your fuel tanks on your newest medium tanks and tank-like gun motor carriages? Hard job getting that last 2½ inches filled up? Well, you can relax. A TB now in preparation explains that you're not supposed to fill it that far. The filler neck is especially designed with a solid wall in the top 2½ inches instead of a strainer as below, so as to allow that much space for expansion of the fuel when it gets hot. With a 30-degree rise in temperature, gasoline or diesel fuel will rise as much as 1½ inches in the tank, and the new filler neck (which has a tiny air vent at the top) guarantees that it can expand *inside* the tank instead of overflowing. FSMWO G104-W63, now on its way to you, will direct you to install a similar filler neck in older vehicles.

* * *

The transmission oil-pressure warning light on the Light Tank M3A3 is likely to cross you up, in case you hadn't noticed. Sometimes it lights even when the oil pump is working perfectly. Therefore, a forthcoming TB will direct you to remove the bulb. To check the oil pressure, you'll open the petcock on the top rear of the transmission after warming up the vehicle, but before driving it. If oil flows from this petcock when opened, with engine running and clutch engaged, you'll know the pump is O.K.

* * *

Keep Our Armor in Action!



MAJOR GENERAL A. C. GILLEM, JR.
Commanding General
of the Armored Command

The stoutest armor is no protection against neglect. Preventive maintenance must be as relentless as our tanks in combat.....as skillful and determined as their crews.

General Gillem's words are urgent. Translate them into action...now!



HEADQUARTERS ARMORED COMMAND
OFFICE OF THE COMMANDING GENERAL
FORT KNOX, KENTUCKY

The military value of an armored element is directly dependent upon its ability to utilize its inherent speed, mobility, protective covering and heavy firepower. Therefore, it is obvious that preventive maintenance in every unit must be brought to a high degree of excellence. The preservation of this principle will result in maximum availability of equipment in the supreme test of combat.

Maintenance is a factor which all commanders must consider at all times. Where you find excessive breakage, you find faulty leadership. Our firepower, mobility and personal comfort is affected, for better or worse, in direct proportion to the energy with which the maintenance problem is attacked in training and in combat.

The driver of each vehicle is the first echelon of maintenance. He must be fully trained and qualified to perform his maintenance duties promptly and intelligently. A failure on the field of battle usually results in needless risk of life and equipment. It may likewise jeopardize the attainment of an important objective.

We have learned from every battlefield that recovery, repair and replacement, under fire or completely unfavorable conditions, not only is important, but is essential to victory.

A. C. GILLEM, JR.,
Major General, U. S. A.
Commanding.

