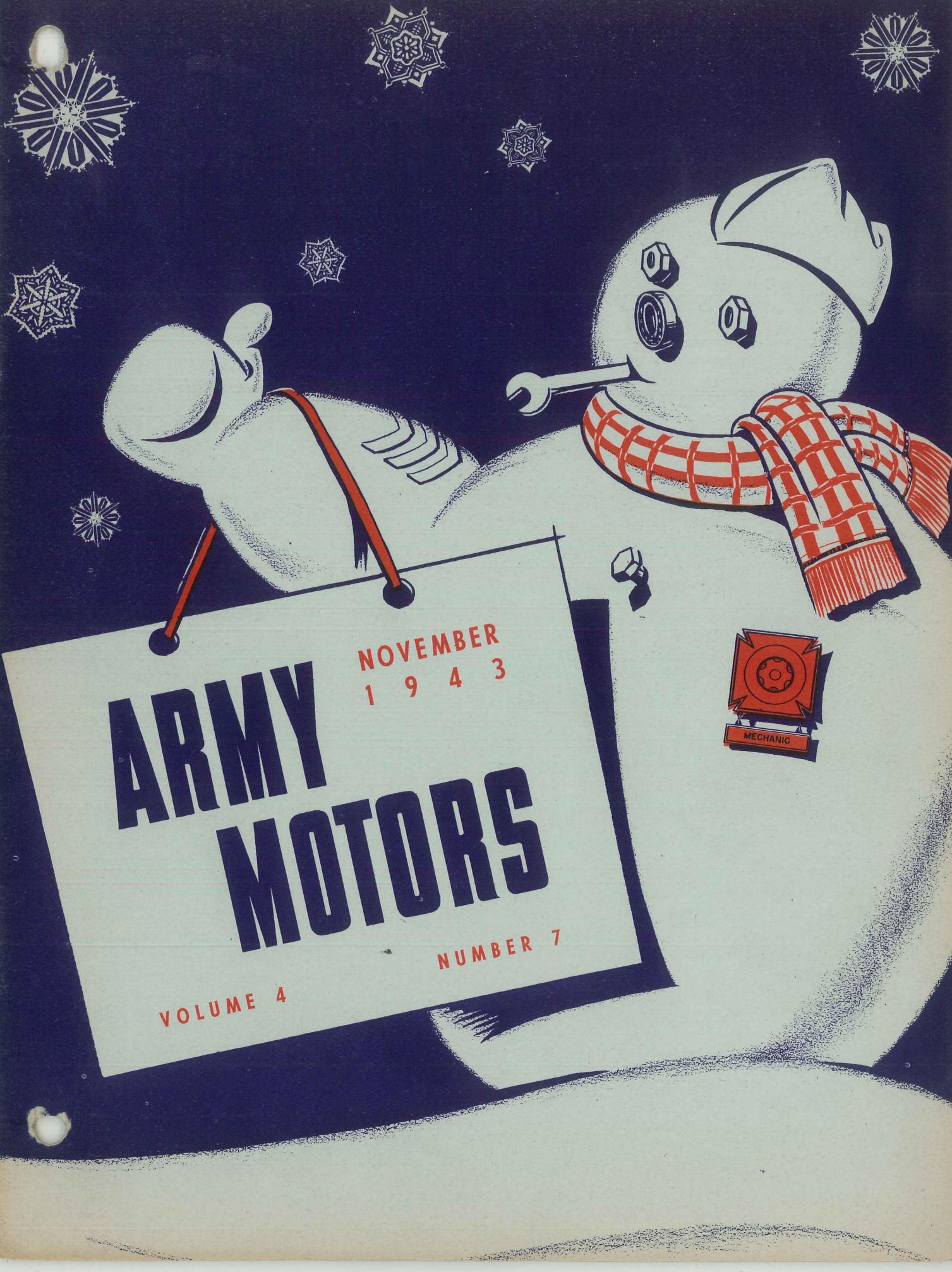


# ARMY MOTORS

NOVEMBER  
1 9 4 3

VOLUME 4

NUMBER 7





## The New AR 850-15

Like a dentist at work on a neglected mouth, General George C. Marshall has just put a few new teeth into the maintenance regulations and filled some cavities in the old ones. His signature on the new AR 850-15\* sets up all the channels you need to educate the Joes who make your life one long disability report.



Unlike a dentist, the CofS has filed sharp points on some of the teeth as fast as they were fitted. Among them are regulations that:

- ★ AUTHORIZE YOU TO STABLE A VEHICLE THAT NEEDS MAINTENANCE WHEN CONTINUED OPERATION MIGHT CAUSE FURTHER DAMAGE.—Par. 15a (10).
- ★ INSTRUCT SHOPS TO REPORT NEGLIGENCE BY LOWER ECHELONS TO THE CO-OF THE OUTFIT THAT OWNS THE VEHICLE.—Par. 15b.
- ★ LET YOU STEP DOWN TO THE NEXT LOWER ECHELON AND GIVE THEM TECHNICAL ADVICE THROUGH CHANNELS WHEN THEY NEED IT.—Table III.
- ★ MAKE ORGANIZATION COMMANDERS RESPONSIBLE FOR GETTING MAINTENANCE DONE IN TIME TO AVOID BREAKDOWNS.—Par. 27.

To all PM-conscious soldiers, the AR's punch-line is in paragraph 27; it says for all to see, "MOBILITY DEPENDS ON PREVENTIVE MAINTENANCE SERVICE." The new 850-15 ought to be in your mail pouch any day now—watch for it. Then read it, eat it, sleep it, and preach it.



## Cut the Comedy

For a long time, we've been lecturing the Motor Officer on this page.

Now we've got a serious word for the enlisted man.

It concerns shop horse-play.

We know that a lot of kibitzing goes on in shops—we know because we've been guilty of it ourselves.



Don't get us wrong—we don't maintain that every mechanic should go around with a long frozen face—hell, no. The work is tough enough as it is.

But we do know that a lot of guys get hurt and that a lot of time is lost through practical joking. Tricks with air guns, for instance. There are enough sharp edges, enough slippery places, enough loose tools lying around to make air gunplay anything but fun. And air guns aren't the only weapons. Some guys are more vulnerable than others.

The one word we dislike to use in this magazine, more than any other, is the word "don't". But we've got to say it: Don't—please don't—endanger yourself or your buddies, just for a laugh.

No laugh is worth a painful injury.

\*Dated 28 August 1943.

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★ ★

ARMY MOTORS is published monthly in the interest of organizational maintenance by the Preventive Maintenance Section, Maintenance Branch, Tank-Automotive Center, Detroit, Michigan. ARMY MOTORS is glad to get your ideas for articles or illustrations, and is glad to answer your questions. When you write, use this address: ARMY MOTORS MAGAZINE, Tank-Automotive Center, Detroit 26, Michigan.



# SLUDGE

## When winter comes, can sludge be far behind

**S-L-U-D-G-E.** It's an unpretty name for a sorry mess of soft, oozy muck that collects in crankcases, valve chambers, timing-gear housings, and plugs up oil screens. Piston pins and pistons have been badly corroded because of the water in this black, grey or brown monster called sludge.

Sludge does its dirty work in the wintertime. You run many of your vehicles on short errands and park them. The bitter cold cools the hot engines quickly, and just like the sweat that grows on cold pipes running through hot rooms, the little drops of water spring up all over the inner surfaces of the engine, then run down and mingle with the oil in the crankcase. It's just plain condensation. Long runs make the engine hot enough to evaporate it; short runs pile it up. In no time at all, the condensed water mixes with the oil and you've got—sludge.

You want to know how this affects your winter driving and maintenance. You want to know a little of the background on sludge and crankcase dilution and a lot on what you can do about it in the future. Let's start with the principal ingredients that go to make up sludge—water, oil, and an assortment of dirt, soot, lead and iron.

### WHY WATER IN THE CRANKCASE?

It's pretty obvious that if cylinder heads aren't tight, water will leak into the cylinders. While most of it goes out the exhaust, some sneaks down into the crank-

case, because there's always a certain amount of blowby. If the leak isn't big and the engine is run hot (and the breather and crankcase ventilator are clean), the water evaporates and goes out as fast as it comes in. But if you find water, something's wrong—and don't blame the oil.

Get after the cylinder-head bolts with a torque wrench. They're supposed to be tightened after 500 miles on any new vehicle, and there's no regulation which says you can't check them any time. If antifreeze seeps into cylinders and the crankcase, you may find yourself with a badly gummed-up engine.

Suppose, though, that the heads are tight and you *still* get water and sludge. How come the water? Well, for every pound of gasoline burned, a little over one pound of water is formed right in the cylinders. Gasoline is composed of hydrogen and carbon, and when it's burned the hydrogen unites with the oxygen to form water. On a cold day, you can see the water coming out of the exhaust in a white cloud. But not all the water goes out the exhaust—if the cylinder walls are cold (as they always are when an engine is first started), some of the steam in the hot burning gases condenses, leaving a film of water to be swept away by the piston rings. Some of it is carried down into the crankcase, either by direct blowby or by getting mixed with the oil film which is swept back and forth by the rings. Maybe only an ounce of water gets past the rings for each gallon of fuel

consumed—but there it is, and more coming from the same place.

If the crankcase ventilators are clean so air can get through them, they get rid of a lot of water. But cold air doesn't pick up moisture very well—in cold weather crankcase ventilation alone usually won't do the trick, and some of the water stays in the crankcase.

When an engine runs so cold that water (steam) from combustion condenses on the cylinder walls and gets down into the crankcase—cylinders, rings, and pistons start to wear in a hurry. This wear is caused by rapid rusting or corroding in the presence of water and the products of incomplete fuel combustion. In some cases, corrosion and pitting of aluminum pistons and steel piston pins follows. Valve-springs, too, have their lives shortened by accumulations of water-oil sludge.

Door-to-door-delivery trucks suffer in civilian life—in the Army, vehicles that are idled, started and stopped frequently or used on short runs are the usual offenders.

### SLUDGE AND MAYONNAISE

Shake water and oil together and they soon separate. But mayonnaise, which is salad oil and water (in the form of vinegar) has eggs, flour and cream to hold them together. The soot, lead, iron and dust do the same for water and oil—hold them together, and the egg-beater action of the crankshaft and oil pump forms sludge in your engine. If you're



wondering where the soot comes from, it comes from incomplete combustion of the fuel in a cold engine. As long as the choke is in use, you'll get plenty of soot.

### WHAT SLUDGE DOES

Generally speaking, sludge is a symptom of trouble rather than a cause of failure. In some cases, sludge clogs oil screens and shuts off oil circulation with disastrous results to bearings. Low oil pressure, or no oil pressure at all is a warning-light for this kind of trouble. Water-oil sludges quickly clog filters for the simple reason that none of the mixture of oil, water and dirt will go through the filter, and the amount of it is very large compared with the amount of dirt that is ordinarily stopped by the filter.

### CRANKCASE OIL DILUTION

You know that a cold engine must be choked to start it, but do you know why? Of course you do. Gasoline doesn't have a single fixed boiling-point like water, alcohol, ethylene glycol, or the first sergeant. It contains (the gasoline, not the first) low boiling-point particles that vaporize easily to give quick starts; moderate boiling-point substances for fast warm-up, and good acceleration; high boiling-point material for power and economy.

When an engine is started stone cold, only the light fractions evaporate. An extra supply of gasoline must be provided to make up for the heavy fractions which go into the cylinders as liquid, for liquids don't burn—only vaporized liquids burn. So, until the engine warms up and the choke isn't used any more, a lot of heavy high-boiling-point liquid gets into the cylinders. It mixes with the oil film on the cylinder walls, gets down past the rings and mixes with the oil. It's the same as if 5% or 10% or 20% of gasoline were mixed with the lubricating oil before it was put into the crankcase; the oil just gets thinned out. And it's not the oil's fault.

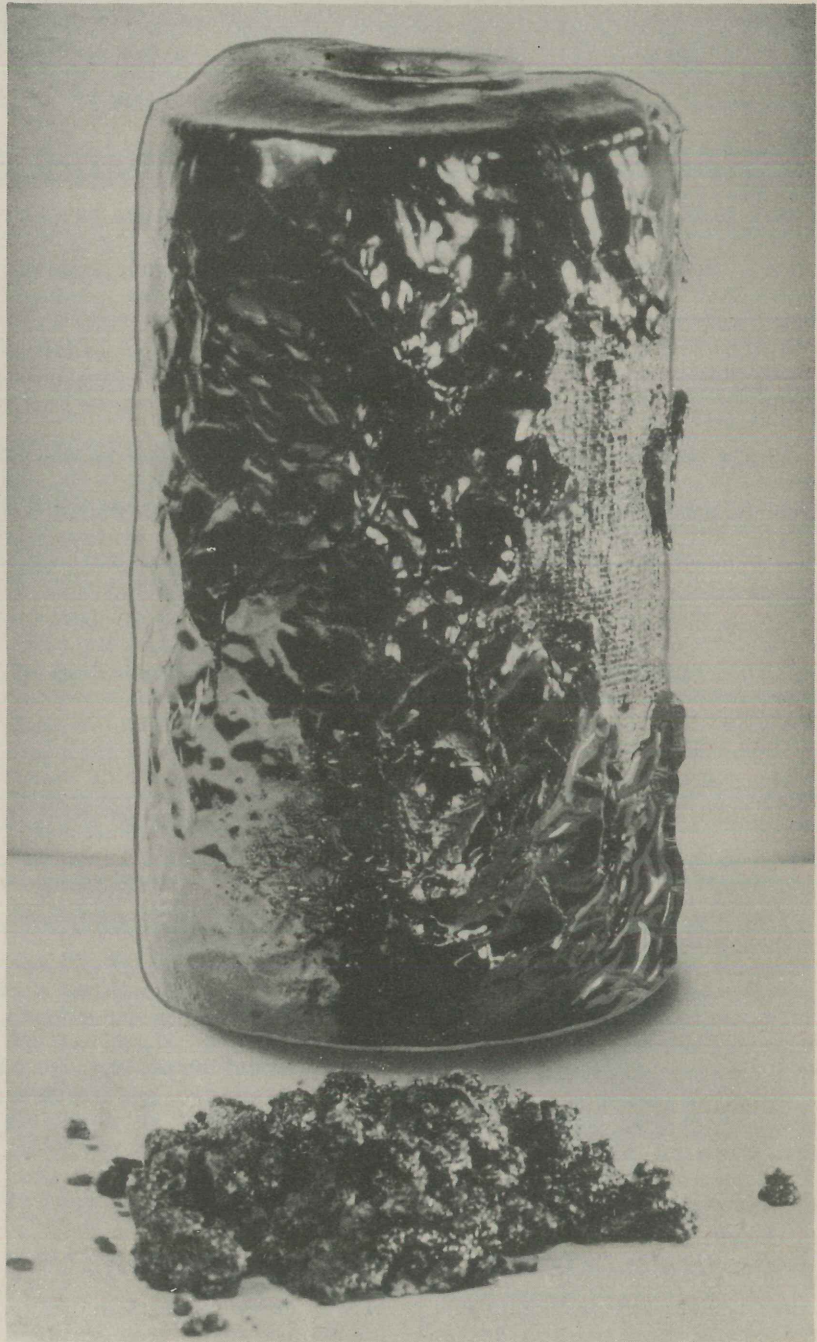
Forgetting to push the choke back after the engine warms up

is a good way to cause crankcase dilution.

Ordinarily, dilution takes place only during the warm-up period. For as soon as the engine and oil reach normal operating temperature, the heavy fuel fractions are vaporized in the crankcase and

pass out through the ventilator. But, if the engine is allowed to run cold, this won't happen, and the oil will be very badly thinned.

In a cold-running engine, dilution is not necessarily harmful. In fact, dilution of the oil is recommended and practiced in ex-



*Soot, carbon, and oxidized oil clogged this filter so no oil could pass through the element.*



treme cold operation to assure easy starting. BUT if abrasive dirt is swimming around in badly-diluted oil it'll cause greater wear than if it were mixed with oil of normal body or viscosity. Besides, the diluted oil gives less protection against rusting and corrosion.

In general, dilution, like sludge, indicates that something is wrong with the engine operation.

### WHAT CAN YOU DO ABOUT IT?

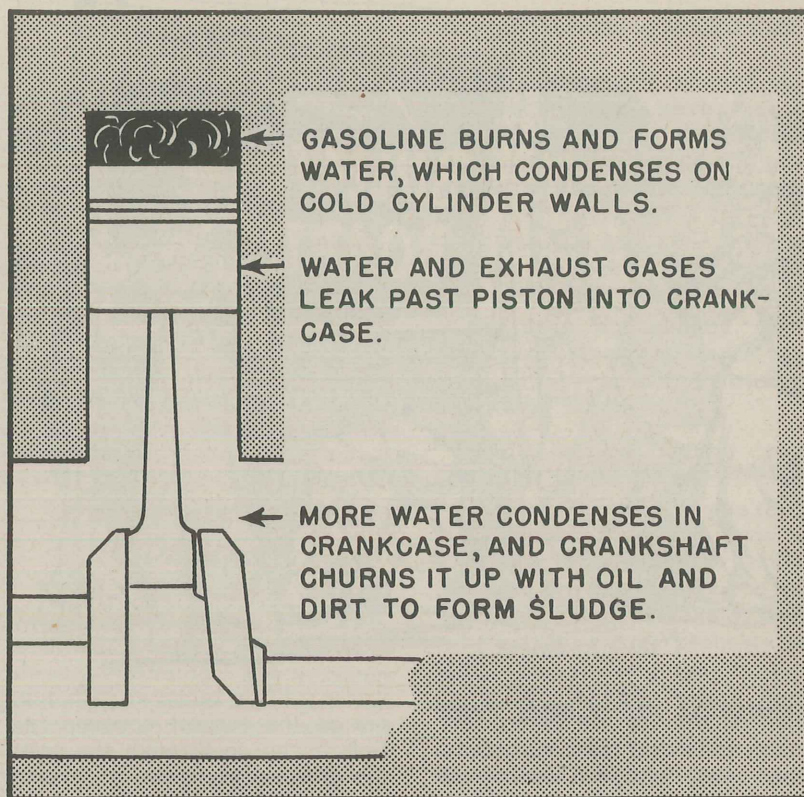
The most important thing you can do is to prevent condensation as much as possible. See what you think of these steps in that direction:

*Inspect and test cooling system thermostats.* Sometimes they're taken out in hot weather and forgotten when winter comes around. Put them in water to see that they open fully and close tightly at the specified temperatures. Thermostats are supposed to keep the coolant from circulating until the engine is warm. If they open too soon, they'll overcool the engine.

*Cover the radiator.* In freezing weather, a partly covered radiator that keeps engines at normal temperatures helps keep cold winds from chilling the engine.

*Close hood louvers.* If the radiator is well covered, covered hood louvers will keep plenty of warm air inside.

*Don't slow-idle a cold engine.* Many engines can't be warmed up by slow idling, no matter how long they run, especially if the engine isn't covered. Many thermostats allow some water to pass through vent holes, even when closed, and if the radiator is stone cold, the engine won't heat up.



Idling the engine under such conditions is wasting fuel, inviting water and sludge, and hastening wear. If the oil pressure is normal, it's safe to run the engine under load.

*(Ed. Note—A soon-to-be-issued Technical Bulletin will give you the exact idling speeds for proper warm up. Separate rpm specifications will be listed for each different make and model of engine and you'll be told how to set the throttle adjustment for a good all-around minimum idle.)*

*Clean the crankcase breather and ventilator.* If these are clogged by dirt, there isn't much chance of air circulating through

the crankcase. Therefore whatever water or gasoline does get into the oil, doesn't have much chance to evaporate. An open breather and a covered radiator means there'll be warm air in the crankcase to fight condensation.

*Drain the crankcase oil.* Oil changes may be necessary more often than usual when engines are run cold and so exposed to condensation. If you find the oil is thin and smells like gasoline—drain it, and drain it hot, regardless of the mileage. Draining the oil filters is important, too—that's often the first place water collects.

That about does it. For cold-weather operation, get your engine warm in a hurry—and keep it that way.

That goes for you, too.

*(Ed. Note—The latest complete story on winterization is the new OFSB 6-11. It supersedes the one dated 15 December 1942 and you'll find it a good refresher on seasonal changeover. If it hasn't gotten around to your bivouac yet, hunt up the Ordnance Officer and use his file copy.)*







### Removal of Lock Nut

If you discover your half-tracks (the ones equipped with the double-coil spring-loaded idler), coming back from the 3rd echelon shop, minus the lock nut (A293925) on the idler adjusting rod (B184568) don't start calling the Ordnance boys nasty names. Third echelon has received definite instructions in a new TB to leave the lock nuts off whenever they get a repair or overhaul job on the double-coil spring-loaded idler.

It was discovered by a very dear friend of mine that the double coil adjusting nut would remain tight even *without* the lock nut. He said something about the tension of the double coil spring being enough to hold a dozen nuts tight. But anyhow, if the lock nuts are left off, it will make it a lot easier for you to adjust the band track tension.

### Rubber Tracks for M3's and M5's

You probably don't love the steel tracks on your M3 and M5 series light tanks. I thought so. That's why I'm telling you about this new anti-steel Technical Bulletin (700-96). It says, "Steel

tracks will be replaced with rubber at the earliest opportunity." Before you go through the nasty job of removing them, see if your supply sergeant has the rubber tracks on hand. If he doesn't, needle him into requisitioning rubber tracks. You might mention to him that any steel tracks in supply stocks are not to be turned in anywhere. Just hold them. Also hold this between your ears: no more steel tracks on M3 and M5's.

### Spark Plug Inserts

A lot of M4A3 medium tank and M10A1 gun motor carriage spark plug inserts are being damaged by some strong-arm guys while they are tightening the spark plugs. What these brawny boys don't realize is, the outside threads of the inserts and inside threads of the cylinder head are both left hand. So if you keep on tightening the spark plugs (which have right-hand threads), instead of stopping when they're snug enough, you'll twist the insert loose and beat it up so bad it can't be used again. It's true there's a dowel holding the insert to the head, but both the head and the insert are much softer metal than the dowel, and are easily torn when you put too much brawn

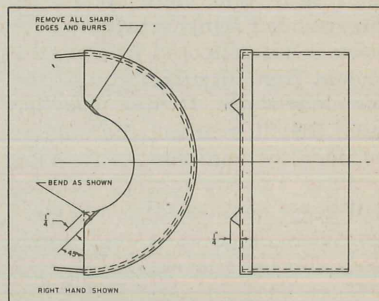
on the plugs. If the vehicle goes out in this condition, it's possible for the spark plug and insert to be blown out of the cylinder head.

The next time you get one of these jobs make sure you've got good gaskets on the spark plugs and tighten them to only 25-30 ft.-lbs. If you do this you'll have no trouble with ripped threads or loose or leaking spark plugs.

### Steering Knuckle Boot Guard

If you've been keeping on your toes and have installed the steering knuckle boot guard on your half-tracks, like fizzmo G102-W18 says, you may discover that an edge of the boot guard is cutting the boot itself.

If this happens, calmly bend the corners of the guard as shown in the figure below:



This will prevent the sharp edge of the guard from digging into the boot.

Incidentally, if the boot guard is cut open, change it immediately. Otherwise it'll become a snug haven for mud, sand, old bottle caps, and other things that'll knock the daylights out of your front end.

### Oil Seals

When installing an oil seal, treat it like you would the colonel's chinaware. In order for a seal to prevent lubricant leakage, it's got to seat perfectly all the way around the shaft with very little eccentricity. If the leather is distorted or pulled out of shape while installing the seal—you may as well forget about installing it—the lubricant will leak.

Leather type seals should be



dunked and soaked in oil for at least 24 hours before installing them. It's an even better idea to keep your reserve stock of seals in jars of oil all the time. This softens them up and provides lubrication until the regular lubricant reaches the seals. If after the leather is soaked, it doesn't become soft and pliable you better not install it—probably it would leak anyway.

Some city bumpkins are ready to condemn an oil seal when it permits a slight seepage of oil to get by. It's O. K. to have high maintenance standards, but these guys should remember that nearly all seals allow a little oil seepage, especially during its initial run. During this time, the seal is seating itself to the shaft and will allow more seepage than usual.

Oil seals can last a long time if they're given a little care.

### *Lube Seal for Half-Tracks*

Driving the half-track (M9, M9A1, M5, M14) when it has a leaner on may cause you a little brake failure. After the vehicle is driving along a slope for a while, the rear differential gear lube works its way along the jack shaft, around and down into the wheel-bearings and over into the brake compartment—and trouble, as you can see by Figure 1. Just then you look around for a soft tree to stop against. A new Red

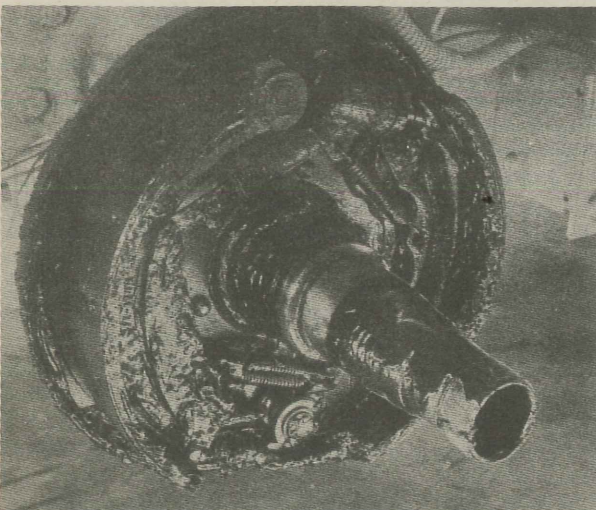


Figure 1

group FSMWO has a way to correct the grease leaks. It's a new jack-shaft bearing adjusting nut with a seal fitted into the recess (Figure 2). Order it by Kit No. G147-W3 from Fort Wayne Ordnance Depot, Detroit, Michigan.

Don't get excited just because you have a half-track. The modification is for the M9, M9A1, M5, and M14's only (IHC). When you get the new nut and seal, notice that the retainer and seal can be removed from the recess in the nut. When the seal needs replacing you order just that—not the whole deal.

### *Auxiliary Fuel Pumps*

When your medium M4 and M4A1 tanks will run O. K. without the electric pumps, *leave them switched off*. The auxiliary pumps don't make the engine run any better and they *can* cause the engine to catch fire.

When the engine is stopped, the electric pumps will continue pushing fuel through the lines if the carburetor float valve is not properly seated. In many cases this will cause the carburetor to flood, with a lot of gas running into the carburetor air horn. If the engine backfires the next time it starts, you'll have a blaze on your hands.

Of course, some guys say that they always remember to switch the electric pumps off when stopping the engine, but I say why

have them running at all if they're not needed.

I remember the reasons those auxiliary pumps were first installed. The boys were griping about vapor lock. So the engineers put the extra pumps in the fuel line to stop both the vapor lock and the griping. The extra pumps also came in handy when the mechanical pump gave out.

So, keep the electric pumps switched off, unless you're troubled with vapor lock or mechanical-pump failure.

### *Dirt-Packed Clutch*

If you discover that you're not able to push the clutch pedal all the way down in the radial-powered medium tanks, or gun carriages (or if the gears clash when shifting), it's probably not a sign that you're getting hardening of the arteries. More likely it's caused by an accumulation of dirt and dust inside the clutch. If you force the clutch pedal down, you'll pack the dirt solid and will eventually bend the clutch linkage. So, when you run across such conditions, *don't force the clutch pedal*.

Instead, while the engine is idling, work the pedal up and down, being careful not to push it past the blocked position. This will work the dirt free and the motion of the flywheel will tend to throw the dirt out.

If you're lucky enough to have

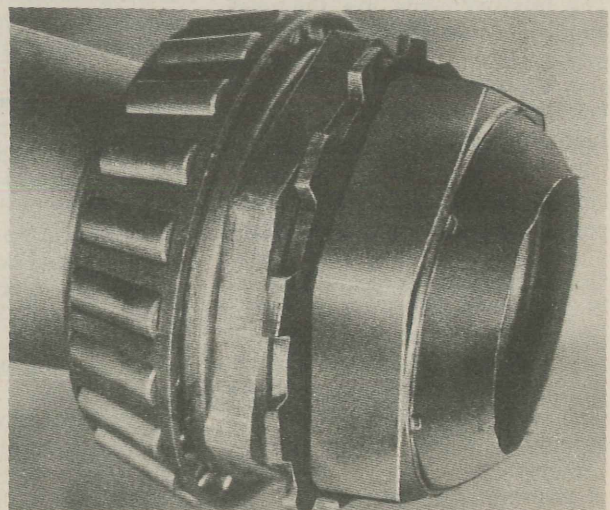


Figure 2 Photos by Signal Section, Hqs. Armored Command



compressed air around, blow the clutch out at regular intervals—say, once a day in dusty country.

When you do all this and the clutch still won't work freely, you'll have to pull the engine, disassemble and clean the clutch.

## Standard Military Motor Vehicles

Crammed with 15,000 facts about 300 military motor vehicles, that popular little Who's Who, TM 9-2800, or "Standard Military Motor Vehicles" has been published in a new revision, dated 1 September 1943.

It's a bigger book. It contains approximately half again as many vehicles as the edition of 6 March 1943, what with all the new ones added (such as administrative and amphibians). On account of the special super-de-luxe thin paper used however, the new book isn't a great deal thicker than the old one.

The pages are easier to read, too. Instead of the double column of small type used in the old TM, you'll now find a redesigned data sheet which brings you all the same information in a single column of larger print. Incidentally, the pages will stay open wherever you want them, on account of a new (no extra charge) sewed binding.

It's your book, this new TM. The improvements are the ones you suggested in answer to the invitation on page 2 of the old one. On page 3 of the new issue, you'll find an invitation to suggest further improvements.

In the back is an index to special-equipment, special-purpose, and general-purpose vehicles used by the Signal Corps, Quartermaster Corps, Chemical Warfare Service, Medical Corps, Corps of Engineers, Ordnance Department, and Army Air Forces. In chart form, this index shows who is responsible for parts procurement, higher-echelon maintenance, and storage and issue of each vehicle listed.

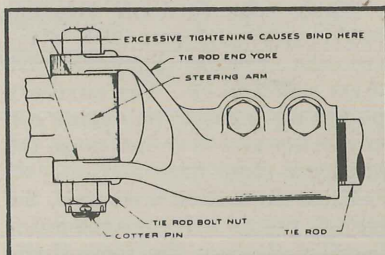
Distribution provides a copy

for every company in the Army. Watch for yours.

## Half-Track Steering

I'm told that drivers of the M5, M9A1 and M14 half-tracks are getting swollen biceps from trying to steer these vehicles. Though the steering design has been cussed at a bit, the trouble is really with the mechanics who love to tighten the tie-rod-bolt nut *extra tight*. This causes the tie-rod end yoke to clamp down on the steering arm, which causes binding on turns.

These tie-rod-bolt nuts should not be tightened, but adjusted instead. Draw the nut up till it's snug, back it off two castellations, then cotter it up.



## Shutter and Deflector Door on Medium Tanks

While taking my usual Sunday drive in a medium tank, I noticed the engine was overheating something terrible. My friend *Half-Mast* soon discovered that I was driving along with the shutter and deflector door on the engine compartment air outlet in the closed position.

The shutter and deflector door (on M4, M4A1 medium tanks and M7 carriage) is made to be set in two positions—open and closed. The closed position is used *only for warming up the engine before driving the tank*. Profit by my experience—never drive with the shutter closed. You'll burn up the whole shebang if you do. In the open position the deflector and shutter allows plenty of cooling air to flow through the engine compartment. It also prevents the windstorm of exhaust gases and cooling air leaving the tank from creating a small duststorm be-

hind each tank (by deflecting the gases straight back).

## TM's on 1st and 2nd-Echelon PM

Still waiting for detailed instructions on how to perform the 1st and 2nd-echelon preventive maintenance services prescribed on the new Trip Ticket and the new Work Sheets? Hm-mm?

Changes #3 to AR 850-15, which directed you to use these forms, announced that you'd find complete instructions in TM 9-2810, "Motor Vehicle Inspections and Preventive Maintenance Servicing." But you don't have TM 9-2810, because it isn't published yet.

However, the newest TM's for individual vehicles (in the TM 9-700 and 9-800 series) are carrying the same dope, specially tailored for the vehicle. Each of them specifically refers to WD Form 48 (Trip Ticket) and to the Work Sheets, WD Form 461, 462, or 463 (whichever applies), listing the items number by number.

These are now available:

TM 9-707, Basic Half-track Vehicles, 21 May 1943.

TM 9-739, Tank Recovery Vehicle, T2, 11 August 1943.

TM 9-762, Bomb Lift Truck, M22, 31 May 1943.

TM 9-802, GMC 2½-ton 6x6 Amphibian Truck, DUKW-353, 1 September 1943.

TM 9-808, Dodge ¾-ton 4x4 Truck, 12 May 1943.

TM 9-809, GMC 2½-ton 6x6 COE Truck, 27 May 1943.

TM 9-882, 7-ton Semitrailer, 11 June 1943.

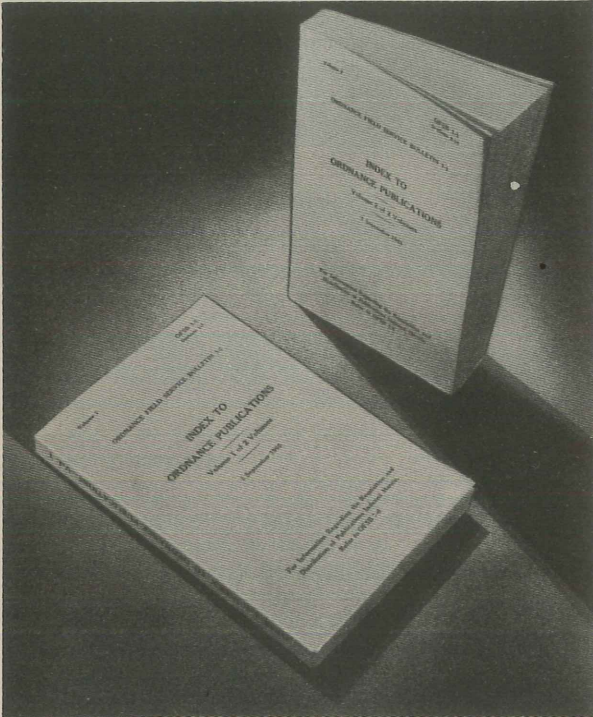
TM 9-883, 1-ton 2 wheel Trailer, 27 August 1943.

Incidentally, don't get high blood pressure over the fact that the vehicle manuals don't include *every* item on the work sheets. The work sheets are written to fit all types of vehicles, and therefore include all items serviced on vehicles. If an item doesn't require servicing on a specific vehicle, that item is omitted from the manual. For instance, Item #12 (air-brake system leaks) wouldn't appear in any manual covering a vehicle that had hydraulic brakes only.



At last! It knows all—tells all—

# The New Index To Ordnance Publications



What do you want to know? The SNL number for a quarter-ton jeep? The Lubrication OFSB for an M5 light tank? What modifications have been made on the Duck? Just hit us with a question . . . or better still, get a copy of the *NEW* OFSB 1-1 and read the answer for yourself.

Ever since the Army started growing in size and in types of materiel, GI's have been wishing for a single publication that would tell them how to find all the published information on any Ordnance equipment.

Now they've got it. It's the Index to Ordnance Publications, known as OFSB 1-1, and (beginning with the issue of 1 September 1943) published in a new revision every two months.

Way back last March we tried to help ARMY MOTORS readers with an article on Ordnance publications. "Be sure you have all the *indexes*," we said. "They will tell you what else you need. You should have the OPSI; TB 1-10; OFSB 1-1, 1-2, 1-8, and 1-20; OFSC No. 1; OEC Subject Index; and FSMWO Subject Index. And don't forget the changes."

In the July issue we were able to announce something that made us very happy. Seven publications were lumped into one, and OFSB 1-1 suddenly grew from a skimpy leaflet into a pretty important little

book (dated 1 April 1943) indexing everything except the publications already covered in the OPSI and the FSMWO index. "Now," we gleefully exclaimed, "if the Publications experts could only melt these 3 indexes into ONE, and arrange that one alphabetically by subjects, the beer would be on us."

The beer is on us.

The next OFSB 1-1 (dated 1 July 1943) absorbed the FSMWO index, and *then* came the Index to Ordnance Publications.

It not only indexes *all* the Ordnance Field Service publications, but also includes those War Department AGO publications which refer particularly to Ordnance materiel ("shootin' Ordnance" as well as automotive).

It also includes the Introduction to the Ordnance Catalog (IOC) and the Ordnance Provision System Regulations (OPSR).

All in a single book? Well, yes, in a way. Officially, it's a single book; it has a single title, and is distributed as a single publication, but it's published in 2 volumes, because it adds up to 672 pages, and that's too much for one volume.

We predict that the most-used part of OFSB 1-1 will be a brand-new feature, which occupies almost half of Volume II. This is a complete *subject* index. You look up a vehicle . . . any vehicle . . . say, the  $\frac{3}{4}$ -ton Dodge, and you find a listing of all the current official publications referring to it:

TRUCK, $\frac{3}{4}$ -ton, 4 x 4, 1942-43 (Dodge T214)	
Model WC-51, weapon carrier	
Model WC-52, weapon carrier, w/winch	
Model WC-53, carryall	
Model WC-54, ambulance	
Model WC-56, command reconn.	
Model WC-57, command reconn., w/winch	
Model WC-58, radio	
Model WC-59, 61, telephone maint.	
Model WC-60, emergency repair chassis	
emergency repair chassis, w/winch	
Modification	
Cooling system	FSMWO G502-W3
Lever and driver, carburetor throttle, assembly	FSMWO G502-W1
Line, fuel	FSMWO G502-W5
Pad, rear axle drive gear thrust pin, differential case cap (front and rear axle)	FSMWO G502-W6
Seats, bucket	FSMWO G502-W2.
	C1
Operation	TM 9-808
Ordnance Field Service Bulletins	
Lubrication instructions	OFSB 6-G-502
Ordnance Field Service Technical Bulletins	
Front axle and transfer case	TB 10-1000-2
	800-4
Ignition distributor assembly	TB 808-2
Standard Nomenclature List	SNL G-502

(Continued on page 224)



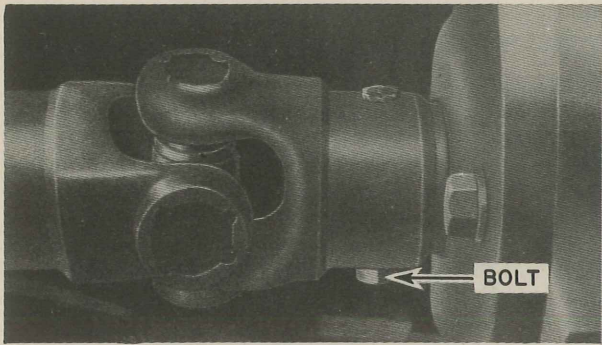


Figure 1

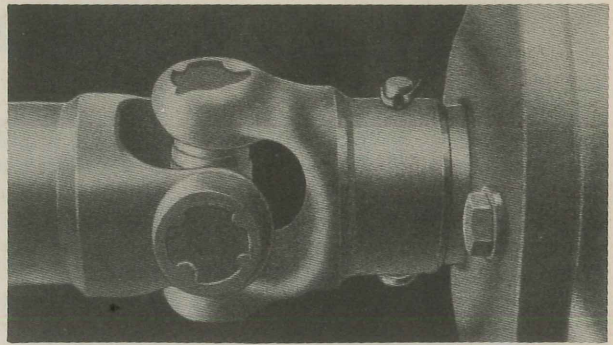


Figure 3

# Winch Shear Pin

It's the weak link in the winch power system—keep it weak

If you ever see a guy jamming a bolt in the winch-propeller-shaft universal joint (Fig. 1) instead of using a shear pin, clout him sharply behind the ears. Because he's the same sort of guy who ties down the safety valve on a steam boiler, then spends the remaining hours of his life heaving coal on the fire. Maybe he'll break his neck when the broken winch cable winds around it, and maybe he won't, but it's a sure bet a perfectly good winch will be shot to hell.

In either case this maniac is

writing the death warrant of the winch he's operating, because he's preventing the safety valve from protecting the winch from an overload. Maybe you've never thought of the winch shear pin as a safety-valve, but that's all it is. It's purposely designed as the weakest link between the power take-off and the winch drum. It's weaker than the power-take-off propeller shaft, worm and gear, drum shaft, or the cable (Fig. 2). Still, it's strong enough to stand any pull up to the capacity of the winch. If an

overload is put on the winch, then the shear pin breaks instead of one of the other parts. This makes sense, because it's a lot easier to replace a shear pin than it is to install a new cable, worm-gear or something else.

When a bolt or a punch or anything other than a shear pin is used, then the connection between the universal joint and the worm shaft is no longer a weak link. It becomes as strong or stronger than the rest of the parts. It's a toss-up which part will break first.

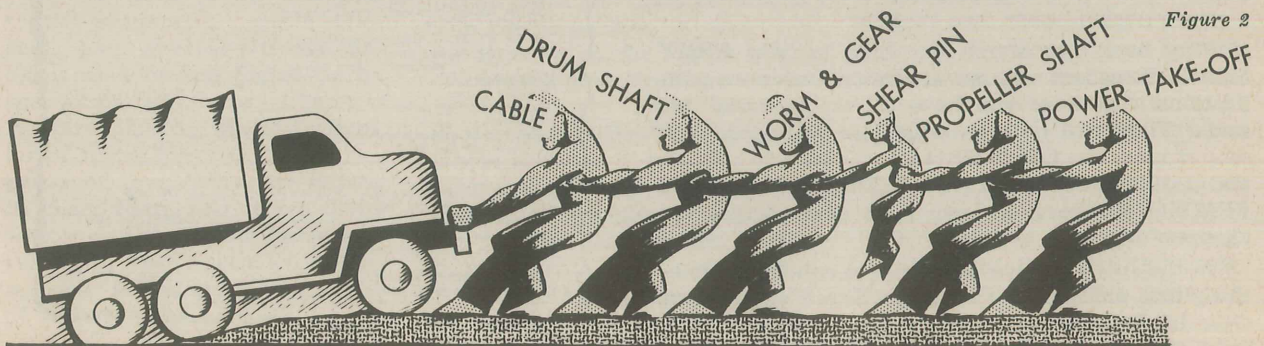


Figure 2



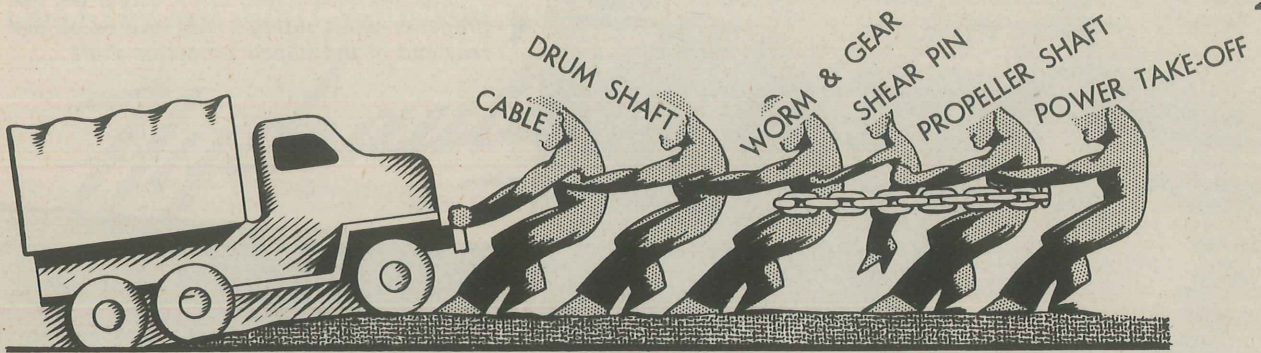


Figure 4

So to make sure the *safety valve* on your winch is operating, inspect the shear pin before winching. All you've got to do is knock off the mud and look at it (Fig. 3). Keep one or two spare shear pins in the dash compartment; if they're handy when one breaks, you won't be tempted to substitute something else.

A runner-up way to wreck a winch is to allow the joint between the propeller-shaft and worm shaft to rust or corrode. For the shear pin to shear when

the winch is overloaded, the full torque must be carried by the pin itself. If the sliding fit of the universal joint and the worm shaft become frozen because of rust, then the *torque* is carried *by the rust instead of by the pin* (Fig. 4). This is the same as if the two parts were welded together—the shear pin would be no protection at all.

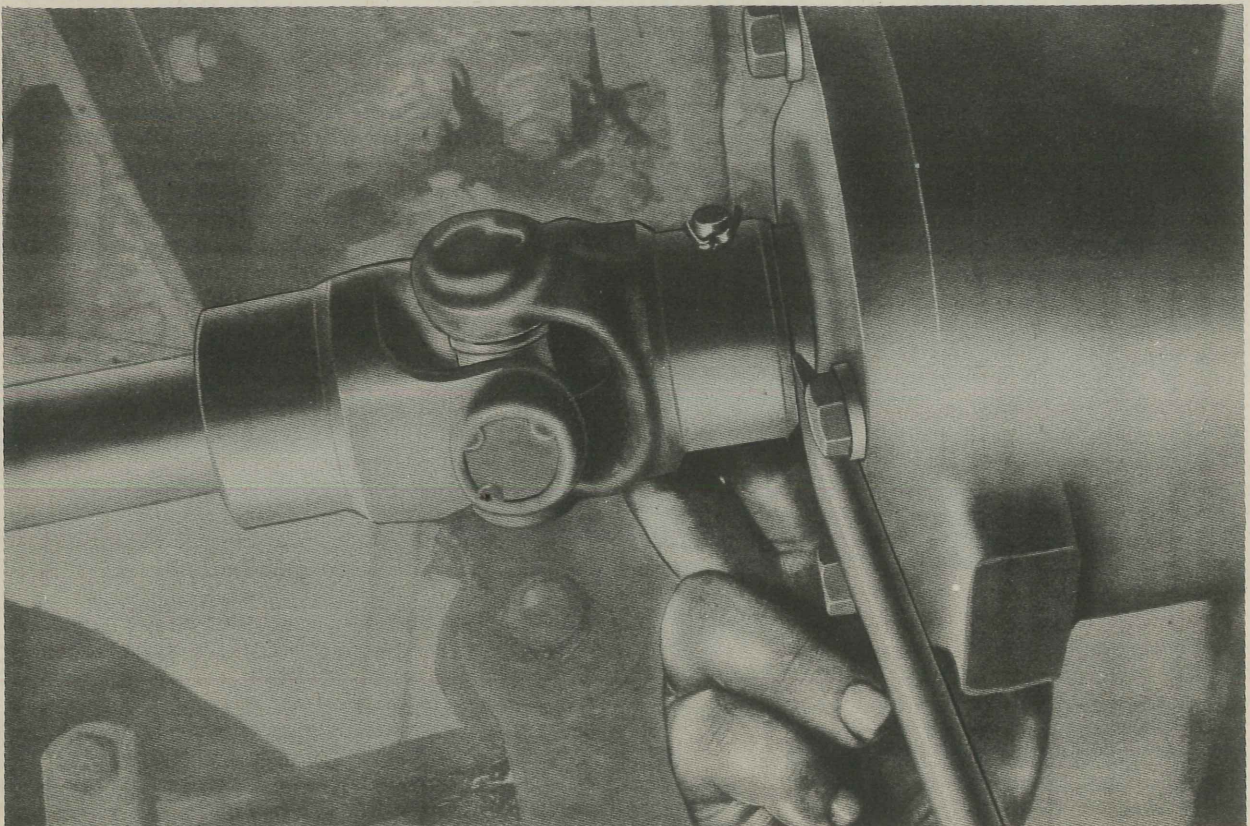
This doesn't happen very often but it does happen often enough to make an inspection, cleaning,

and lubrication of the worm-shaft-universal-joint fit desirable every 6,000 miles.

During the 1000-mile inspection it's a good idea to look for a frozen universal-joint and worm-shaft by checking the play between the universal yoke and the worm-shaft (Fig. 5). If you feel no end play, better pull off the universal-joint and clean it up pronto.

In case you haven't had one off recently, the pictures on the next page might help you do the job.

Figure 5





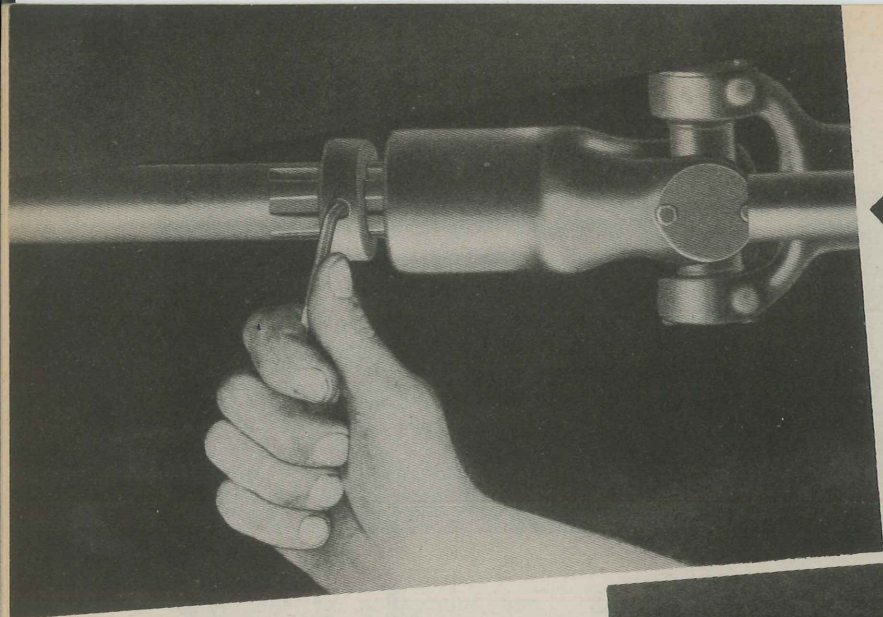


Fig. 6—Loosen the allen screw on the propeller-shaft safety collar located on the rear end of the winch propeller shaft...

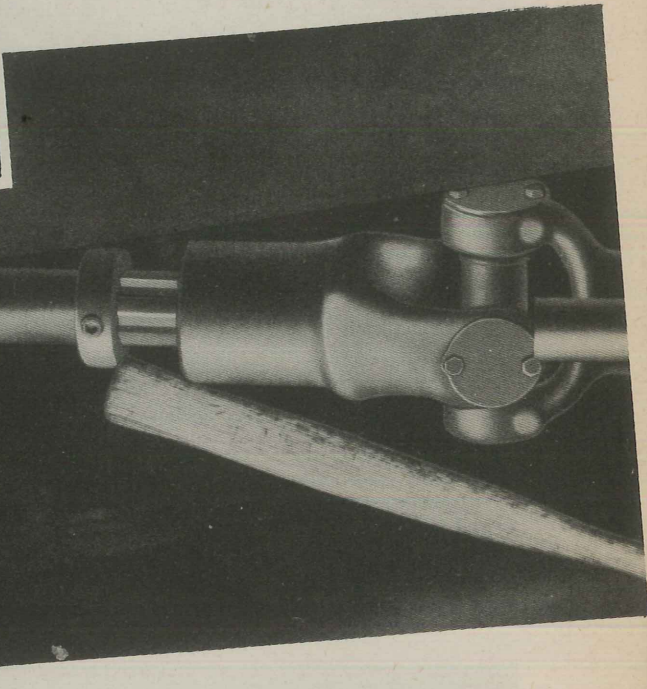
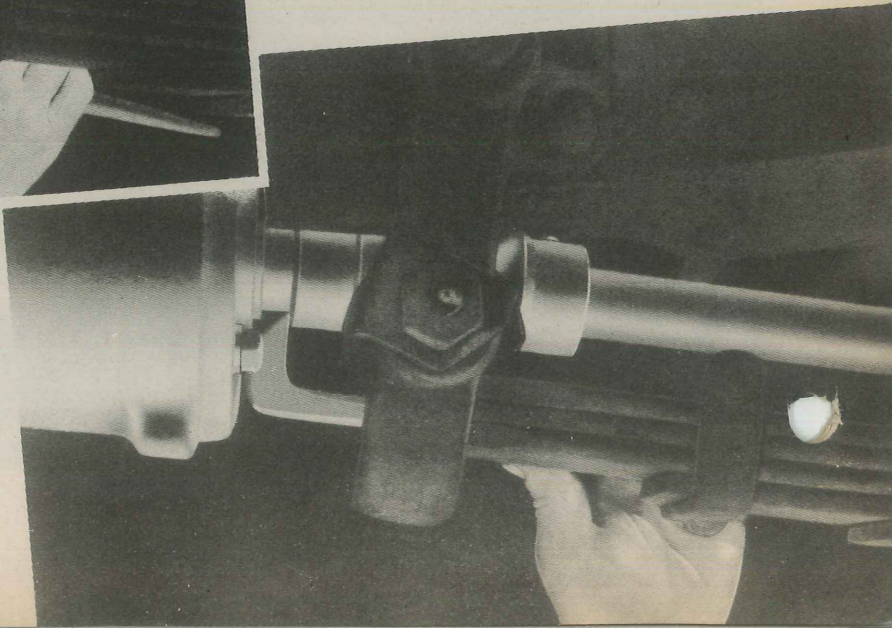


Fig. 7—... then push the safety collar as far back as the splines permit.



Fig. 8—Remove the shear pin and then insert a drift pin in the shear pin hole about a 1/4" deep. Place the head of your pry bar (Federal Stock No. 41-B-292) behind the punch and force the whole propeller-shaft-assembly away from the winch gear-case. This will allow you to...

Fig. 9—... pry directly on the shoulder of the universal-joint itself. Then remove the joint from the worm shaft. After cleaning the outside surface of the worm shaft and the inside surface of the universal-joint, smear some Grease General Purpose No. 2 (WB-2) on both before re-installing.





Don't say we didn't warn you about

# Hydraulic Fluids



**B**rake systems like their liquor straight. So do most other hydraulic mechanisms. In fact, one of the surest ways we know to give your vehicle the DT's (Deadline Troubles) is to give it a cocktail mixed up from a couple of completely different poisons such as *FLUID, Brake, Hydraulic* and *FLUID, Shock Absorber, Light*. Toss in a jigger of *OIL, Hydraulic* or *FLUID, Shock Absorber, Heavy*, and the hangover will be just so much worse.

The Army buys 4 different hydraulic fluids for motor vehicles, and gives each of them a Specification number. Each spec is designed to meet a certain purpose, and using the wrong fluid causes troubles like swollen and rotted rubber connections, collapsed springs, broken shock-absorber arms, and stuck hydraulic machinery.

Simple, you say. Put brake fluid in the brakes and shock-absorber fluid in the shocks. And you're right as far as you go. However, some of the fluids aren't labeled with the Specification numbers, and a few of them are running around without any labels at all.

To keep straight on this business, become thoroughly familiar with the characteristics of each fluid, and use only what you're sure of. If there's any doubt about a fluid, swap it for good stuff at your regular point of supply; the depot can have it tested in accordance with instructions they've already received.

Here's the list:

*FLUID, Brake, hydraulic* (U. S. A. Spec. 2-111A, Ord. symbol HB) has two special characteristics. First, it's watery thin, so it will apply the brakes at the touch of your foot, even in the coldest weather when heavier fluids

would become too viscous to operate. Second, it won't harm rubber.

This brake fluid is listed under many stock numbers. SNL K-1 (Cleaning, Preserving and Lubricating Materials) has 4 different Item Stock Numbers for 1-gallon cans: K001-10-28365, K001-10-28367, K001-10-28369, and K001-10-28370. The Parts Common Manual gives Federal Stock Numbers 51-H-156-40 for pints, 51-H-156-50 for quarts, 51-H-157 for gallons, and 51-H-158 for 5-gallon cans.

All these stock numbers mean the same thing—*FLUID, brake, hydraulic* (U. S. A. Spec. 2-111A). The label may have this information on it, or it may have a brand name only. It doesn't matter what the brand name is, if the fluid meets Spec. 2-111A, as all fluids bought under this spec are miscible (which is the technician's way of saying they can be mixed with any other fluids bought under the same spec).

In case you have a brake fluid that doesn't bear the magic numbers 2-111A, you can check the brand name. All of the following have been approved by the Chief of Ordnance, and they are all miscible.

Manufacturer	Production Code Number
Bell Co., Chicago, Ill.	1377
Ford Motor Co., Dearborn, Mich.	M-4777-A M-4777-B
R. M. Hollingshead Co., Camden, N. J.	50-8886 (1-gal. domestic) 50-8887 (5-gal. domestic) 55-8886 (1-gal. export) 55-8887 (5-gal. export) 70319-C
General Motors Corp., Dayton, Ohio	Delco Super 10
Puritan Co., Rochester, N. Y.	5
Service Supply Co., Denver, Colo.	200
Wagner Electric Co., St. Louis, Mo.	21-11

But don't order by brand name. Give 1) the Item Stock Number or Federal Stock Number, 2) the nomenclature "*FLUID, brake hydraulic,*" and 3) the U. S. A. spec. number. That is all.

*FLUID, Shock Absorber, Heavy* (U. S. A. Spec. 2-112, type II; Ordnance symbol SA) is the Houdaille-type fluid, and it's especially designed for Houdaille-type shock absorbers. It's a vegetable-base fluid, and like brake fluid won't attack rubber, but unlike brake fluid, "SA Heavy" is so thick it's almost like syrup. (In 1-gallon cans, the Item Stock Number is K001-10-28390. Federal Stock Numbers are 51-S-726 for pint cans, 51-S-727 for quarts, 51-S-728 for gallons, and 51-S-729 for 5-gallon lots.)

*FLUID, Shock Absorber, Light* (U.S.A. Spec. 2-112, type I; Ordnance symbol SA) is the Delco-type fluid, a light mineral-base liquid which flows freely through the tiny openings in Delco-type shocks and lubricates them as well. (Item Stock Number, K001-10-28395, in gallon containers. Federal Stock Number, 51-S-718 for pints; 51-S-719 for quarts; 51-S-720 for gallons, and 51-S-721 for 5-gallon cans).

*OIL, Hydraulic* (U. S. A. Spec. 2-79A; Ordnance symbol OH) is a mineral-base oil, similar to OE 10, which lubricates machinery as well as transmitting hydraulic pressure. This makes it ideal for turret-traversing mechanisms, gun stabilizers, dump-truck hoists, and similar hydraulic machinery. For these, its viscosity is just right. (Item Stock Numbers K001-10-74746 for quarts and K001-10-74748 for gallons).

Four fluids, all different.

*The wrong fluid in brakes. SA Heavy will clog them and give you no brake action. SA Light* (Continued on page 224)



# The New Exchange Tag in Action

... several acts in 3 scenes

Up until now, direct exchange of assemblies, sub-assemblies, parts, vehicles and tools in the field has been going on to the tune of Tally Sheets, In; Tally Sheets, Out; Requisitions: locally improvised forms; racing forms; and Maiden Forms. Now—just as forecast by Change No. 3 to AR 850-15—a dandy new “Exchange Part or Unit Identification Tag” (W.D., O.O. Form No. 7370) is coming off the presses, ready for distribution.

The Exchange Tag has been cleverly designed to make direct swapping of parts, etc., much less troublesome for you in the 2nd-echelon. Just this one Tag and the old part should get you a new one. NO REQUISITION when you're trading parts. (If you have no parts to swap, of course you'll requisition by the method explained in July ARMY MOTORS, page 107.)

By less troublesome, we mean this:

It's a snap to fill out the Exchange Tag. No certifications, no fancy stuff, no quadruplicate (or more) copies.

You'll get the right part in exchange. The tag is tied to the old part and can't get lost.

If you get prompt delivery, you'll get a stub back as a convenient record of what you received.

If third-echelon has to back-order, you'll get a stub anyhow—to use as a claim check—and 3rd-echelon will keep another stub as a reminder of who gets the part when it comes in. No resubmitting of requisitions!

Third-echelon rides along on these benefits also. They can check with their Stock Record Cards and count up the Exchange Tag Stubs

No. 2 to see 1) how many parts they owe the lower echelons, and 2) how many parts they have on hand to exchange with the 4th-echelon.

Watch the sample Tag here for a few minutes and you'll see how the system works.

While you're still enthusiastic, order the Tags now, before rationing sets in. W.D., O.O. Form No. 7370, “Exchange Part or Unit Identification Tag,” is available through your Adjutant. He requisitions them on W.D., A.G.O. Form No. 17 (Requisition for Blank Forms and Publications) from the Adjutant General Depot serving that area. Overseas units requisition from the Commanding Officer, Port of Embarkation.

## SECOND ECHELON SWAPS PARTS

**EXCHANGE PART OR UNIT IDENTIFICATION TAG**

1. Vehicle make and model *Dodge 3/4 T 4X4*
2. U. S. registration No. *W-2019245*
3. Part No. *G 121-01-52000*
4. Item *Distributor Assembly*
5. Organization *1011st Service Co 3*
6. Job order No. \_\_\_\_\_
7. Repair. Rebuild. Reclaim \_\_\_\_\_
8. Final disposition \_\_\_\_\_
9. Inspector \_\_\_\_\_
10. Vehicle make and model *Dodge 3/4 T 4X4*
11. U. S. registration No. *W-2019245*
12. Part No. *G 121-01-52000*
13. Item *Distributor Assembly*
14. Date exchanged \_\_\_\_\_
15. Back order No. \_\_\_\_\_
16. Filled by \_\_\_\_\_
17. Vehicle make and model *Dodge 3/4 T 4X4*
18. U. S. registration No. *W-2019245*
19. Part No. *G 121-01-52000*
20. Item *Distributor Assembly*
21. Date exchanged \_\_\_\_\_
22. Back order No. \_\_\_\_\_

W. D., O. O. 7370 12 July 1943  
See AR 850-15, C3

16-00000-1 (Over)

*The unit mechanic walks up to the Supply Section (2nd-echelon) with an unserviceable distributor he has just removed from a 3/4-ton Dodge. He exchanges the old for a new distributor. Then the stock clerk fills in the tag and ties it on the old assembly with a neat bow. (On combat vehicles, “Make” would be “Medium Tank, M4A2,” for example.) “Part No.” is the item stock number from the SNL, if available; otherwise the manufacturer’s number. “Item” is the item. The Supply Section later bundles up the unserviceable parts and bucks them all to the Ord. LM Co., Supply Platoon, for the next trade-in to replenish second-echelon stocks.*



### THIRD ECHELON . . .

**EXCHANGE PART OR UNIT IDENTIFICATION TAG**

1. Vehicle make and model *Dodge 34T 4X4*
2. U. S. registration No. *W-2019245*
3. Part No. *G121-01-52000*
4. Item *Distributor Assembly*
5. Organization *1011<sup>1/2</sup> Service Co. 3*
6. Job order No. \_\_\_\_\_
7. Repair  Rebuild  Reclaim
8. Final disposition \_\_\_\_\_
9. Inspector \_\_\_\_\_

10. Vehicle make and model *Dodge 34T 4X4*
11. U. S. Registration No. *W-2019245*
12. Part No. *G121-01-52000*
13. Item *Distributor Assembly 2*
14. Date exchanged *21 Oct., 1943*
15. Back order No. *179*
16. Filled by *J. M. Burkhart*

17. Vehicle make and model *Dodge 34T 4X4*
18. U. S. registration No. *W-2019245*
19. Part No. *G121-01-52000*
20. Item *Distributor Assembly*
21. Date exchanged *21 Oct., 1943*
22. Back order No. *179*

W. D., O. O. 7370 12 July 1943 See AIR 850-15, C3 (Over)  
16-00000-1

*If the LM Co. doesn't have the part: The old distributor is turned in anyway. The clerk fills in Stubs 1 and 2. He gives Stub 1 to the second echelon as an IOU (so they can needle him), and keeps Stub 2 to remind him that he owes the second echelon a distributor.*

*If the LM Co. has the part: The second echelon gets back a usable distributor when it turns in a tagged one. The clerk in the LM Co. fills out Stubs 1 and 2. There's no Back Order, so the line is scratched out. Stub 1 is given out with the usable distributor. Stub 2 goes into the LM Co. files.*

### FOURTH ECHELON REBUILDS

**EXCHANGE PART OR UNIT IDENTIFICATION TAG**

1. Vehicle make and model *Dodge 34T 4X4*
2. U. S. registration No. *W-2019245*
3. Part No. *G121-01-52000*
4. Item *Distributor Assembly*
5. Organization *1011<sup>1/2</sup> Service Co. 3*
6. Job order No. \_\_\_\_\_
7. Repair  Rebuild  Reclaim
8. Final disposition *Back in stock*
9. Inspector *A. R. McNeill*

The Ord. LM Co. finds the unserviceable distributor needs rebuilding, so they toddle it off to the fourth-echelon shop. The exchange system works again. Stub 3 remains with the distributor from then on as identification until it is rebuilt and put back in stock.

*Back Orders  
or  
... Delivers  
Immediately*

10. Vehicle make and model *Dodge 34T 4X4*
11. U. S. Registration No. *W-2019245*
12. Part No. *G121-01-52000*
13. Item *Distributor Assembly 2*
14. Date exchanged *21 Oct. 1943*
15. Back order No. \_\_\_\_\_
16. Filled by *J. M. Burkhart*

17. Vehicle make and model *Dodge 34T 4X4*
18. U. S. registration No. *W-2019245*
19. Part No. *G121-01-52000*
20. Item *Distributor Assembly 1*
21. Date exchanged *21, Oct., 1943*
22. Back order No. \_\_\_\_\_

W. D., O. O. 7370 12 July 1943 See AIR 850-15, C3 (Over)  
16-00000-1



NOTE.—Section 3 of this tag to be attached to part or unit until final disposition.

EACH PART OR UNIT TO BEAR A SEPARATE TAG

*Dist. bushings worn*

ORGANIZATION *1011<sup>th</sup> Service Co.*  
*Fort Henry, Aldrich, Md.*

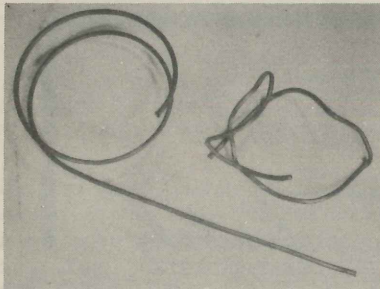
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*Dist. bushings worn*

ORGANIZATION *1011<sup>th</sup> Service Co.*  
*Fort Henry, Aldrich, Md.*

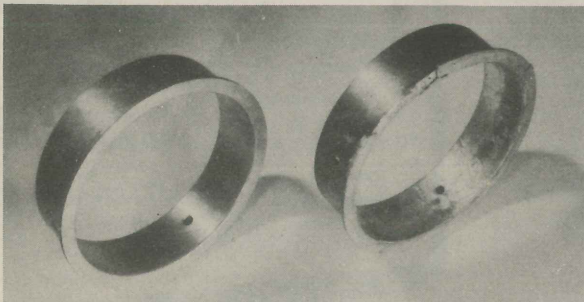
OPD 16-00000-1

REVERSE SIDE OF TAG—  
Description of unserviceability  
should be jotted in above name  
of organization.



The kinks can be taken out of copper tubing, and it's good as new.

The handle was O.K.—so Reclamation put a new point on the soldering iron.



Don't throw away a burned-out bushing. Reclamation can build it up with sprayed metal.

# Don't Throw That Part Away

There's a good reason for parts exchange and the exchange tag, entirely aside from accountability.

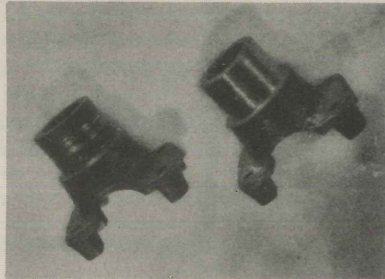
The old, beat-up parts you'd no longer dare use in your vehicles still have reclamation value. Often a few relatively simple operations by Reclamation in the Ordnance shop will restore a junky-looking piece of iron to a good and usable part. The pictures on this page prove it.

That means less critical material wasted, therefore more parts manufactured.

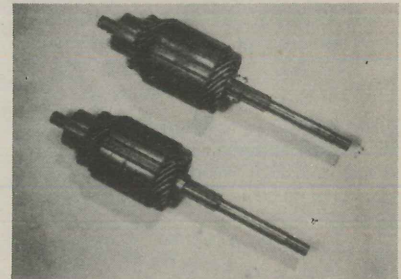
Particularly, it means more spare parts that you can draw on. When the parts you turn in are reclaimed, they'll probably go into a depot that serves you.

Either way, you profit.

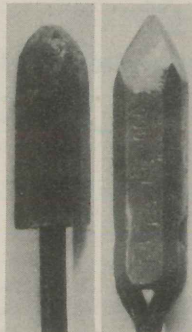
You can't maintain your vehicles without parts. Help keep a guaranteed supply of parts by swapping in all old parts, properly tagged.



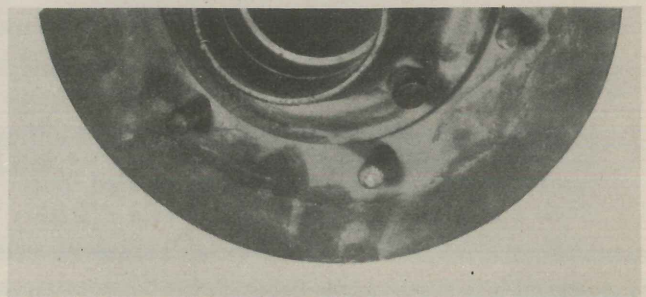
Reclamation can revive a propeller-shaft flange by spraying liquid metal or by resleeving.



1935 Dodge starter armature (below) was n.g. Machined in 3 places, it now fits a 1943 Chev.



Even this chewed-up bogie wheel was reclaimable, by trimming the ragged edge and welding on a new ring.







Straight from the ¼-ton jeep's mouth—Sgt. Half-Mast gets the goods on replacing the

# Front Axle Tracta Joint

**L**ook who's on furlough! . . . and to Toledo. I walked up the long marble steps of the Willys factory last week—dignified like—carrying a duffle full of questions on the Tracta joint. It's new stuff . . . and because it's new, some of the boys have been getting slight hemorrhages when they've had to remove the joint from the ¼-ton jeep.

Now don't go getting the idea it's OK for everybody to be taking the front axle off. In those cases where Echelon No. 2 is given

fancy permission to put in the new front axle, they begin to perspire. And when they see the gallstone-shaped hunks of iron come out of the front-steering knuckle—they faint! The boys forget—and think they're working on the Bendix-Weiss or Rzeppa universals. Then with the joint half out, they look around frantically for those silver balls. But the Tracta, like the fly on the wall, just ain't got any! In fact it's quite different from other front-axle universals.

Case the joints in Figure 1. Those are the three types used in ¼-ton jeeps. All the complicated races, balls, center pins, cages, and

pilots don't mess up the Tracta. It's more like a Chinese Puzzle. It seems tough when you don't have the know-how. When you do, it practically falls apart and together. There's just the two axle shafts—the inner and the outer, and two cleverly designed globs of iron between the shafts. That's all. And the Tracta joint does the same work as the other universals—allows the same degree of turning radius, gives constant velocity speed, and requires the same lubrication. Besides, it's interchangeable. You can wear a Tracta on the right side and a Bendix or Rzeppa on the left and no one will know the difference. *Caution*—each slotted and spigoted half of the Tracta has a matching number—1, 2, 3 or 4. The parts from one joint are interchangeable with another joint *only when the numbers match*.

Whenever you receive a front axle for replacement, if it's a Tracta, look for a bronze bushing dangling along with it. That bushing (Axle-shaft Bushing) goes in, and the neoprene oil seal (Oil Seal, Wheel End) is yanked out (Figure 2). I've sliced open a steering knuckle to show how the bushing goes in (Figure 3). When it's all set, remember to prick-punch it about four places to keep the bushing in. Don't feel sorry for the oil seal you took out; it was only a luxury anyway. Any lubricant leaking past that seal couldn't escape far. The *inboard* oil seal stops the oil before it gets to the differential. In the second place, not enough oil can leak past the seal to seriously lower the level of the lube in the steering knuckle.

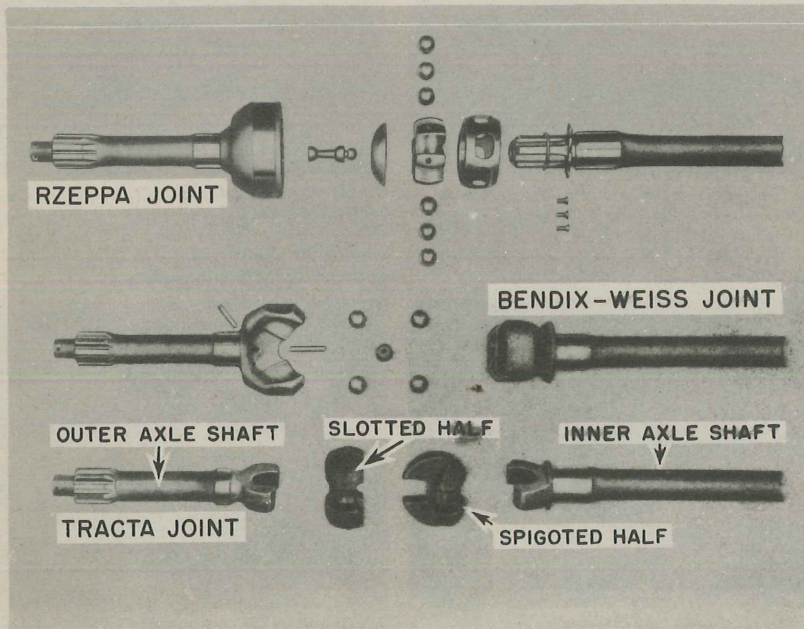


Figure 1—Three of a kind. Learn to know them when you see them. Quarter-ton jeeps may have any of these in the front axle.



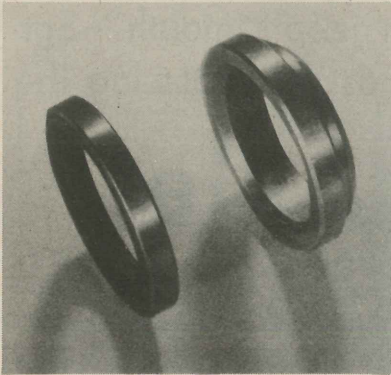


Figure 2—When your vehicle has a Tracta joint, it should have the axle shaft bushing (right), instead of the oil seal (left).

Some of my fan mail tells me the boys think this oil seal has something to do with grease getting on the brakes. Now I ask you, ain't that the most ridiculous thing you ever heard!

There's a good reason for that bronze bushing going in. Back in the days when the Tracta was only a gleam in an English engineer's eye, the ¼-ton had only one thrust-washer to take care of thrust from the Bendix and

Rzeppa joints. Then the Tracta came along with a small flange. It went right through the thrust-washer (Figure 2). The engineers got together around a tremendous table and came up with a prescription for this bushing to take the Tracta thrust. Now your quarter-tons have the thrust washer and the axle-shaft bushing.

Vehicles coming off the production lines these days have both of those parts already installed—the washer and the bushing. This simplifies matters when you go to replace the front axle. No matter which joint you put in—the Bendix-Weiss, the Rzeppa, or the Tracta—the thrust is taken care of.

But there are still lots of earlier-model jeeps running around with the oil seal in the knuckle instead of the bushing. What about those vehicles when you've got a front axle to put in? That depends. If you're putting in a Tracta joint, you remove the oil seal and replace it with the axle-shaft bushing. If you're putting in a Bendix-Weiss or Rzeppa joint, you leave in the oil seal. Just straighten the seal out if it's a little battered.

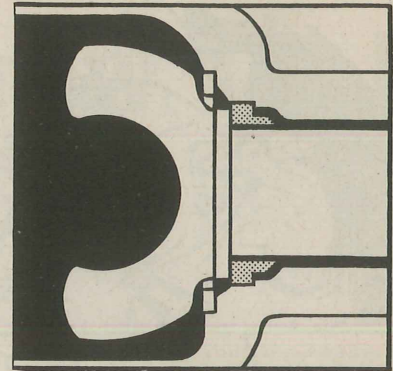
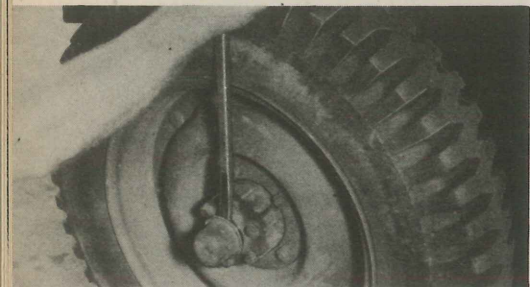


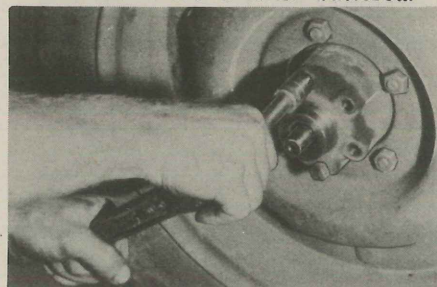
Figure 3—Here's where the axle shaft bushing goes—snug against the housing. The bushing's loose against the axle.

It's still needed as an axle centering guide. But don't let me catch anyone putting a jeep on the deadline just because that seal's slightly egg-headed, or chewed up, or even missing!

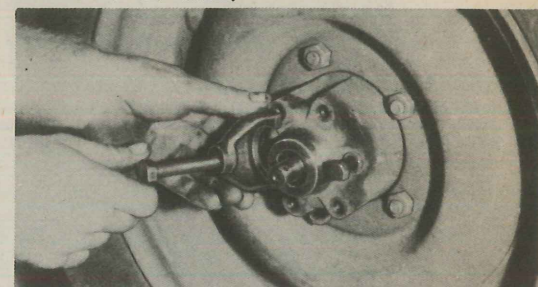
Now we'll peel open the front end for you. They've just rolled in the silver-plated ¼-ton. Wait till I roll up the sleeves of my fatigues and get comfortable—I want to watch this factory mechanic do his stuff.



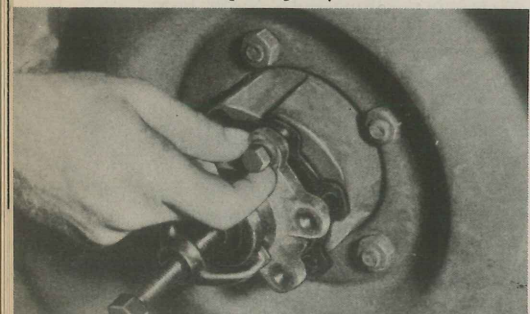
1. Looks to me like he's starting by removing the hub cap. Next the axle-nut cotter pin, and the nut. This photo, like most of the first few, is no doubt duck-soup to you fellows.



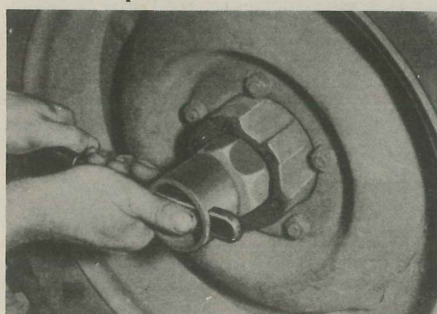
2. Now he's busy on the drive-flange bolts. Leave the last bolt in by about two or three turns. This will keep the flange from turning when we pull it in the next picture.



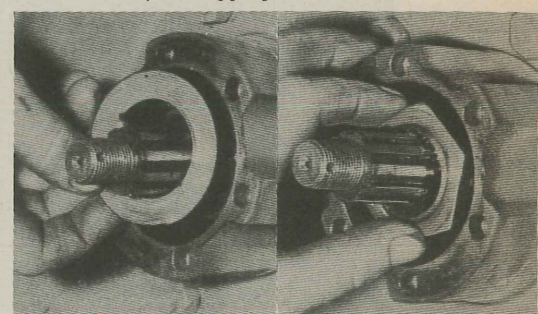
3. He rummaged around in the jeep's tool compartment and came up with this wheel-hub puller. Then like a good mechanic, he put a few drops of oil on the puller bolt before slipping on the tool.



4. Here the drive flange is almost off. Remove the last bolt—thumb and fore-finger, and it's done. It sure was a pleasure for me to watch somebody else do a nice job.



5. Behind the outside wheel-bearing nut is a lockwasher. He just finished bending the ear on the washer to un-lock the nut. The hands are now removing the nut.

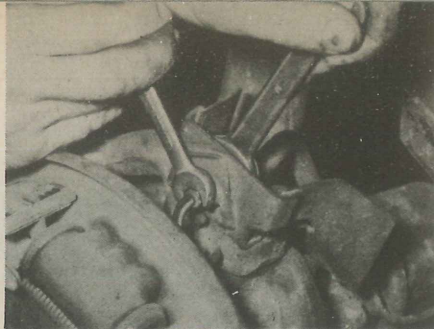


6. Out with the lockwasher and wheel-bearing nut. (Reassembling: Tighten the inside wheel-bearing nut till there's a slight drag on the bearings when the wheel's turned. Back the nut off 1/8-turn.

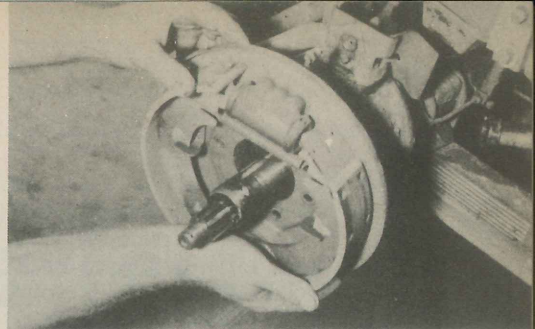




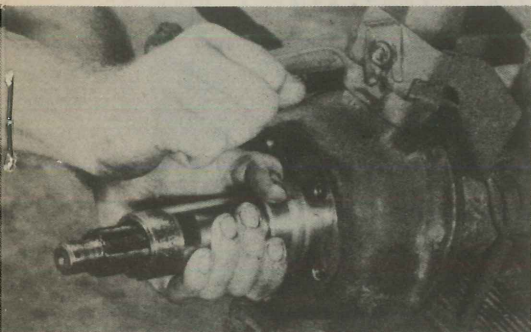
7. Jiggle the wheel lightly to bring the wheel bearing out. Watch it—don't drop the bearing on the ground. Dirt and bits of junk don't mix well with bearings. Now take the wheel off.



8. Disconnect the brake tubing. That wrench in the back is the one to watch. He's holding the inside nut. If he doesn't, he'll twist and break the tubing when he tries to remove the outside nut.



9. While I wasn't looking, he removed all the brake-backing-plate screws. The brake backing-plate comes off easy now. And he's all ready to start work on the spindle.



10. Watch how he breaks the spindle loose from the knuckle. It takes a little technique. Wrap one hand around the spindle to support it. Give the spindle a hefty sock with the fleshy part of the hand, enough to "break" it free.



11. Ah-ha, he changed hands. The idea is to reach in and grab the outer axle shaft. If you don't hold on to the axle, it may come tumbling out with half of the Tracta, right into the sand. Now remove the spindle.



12. There's the complete Tracta joint—unmasked. The outer axle shaft he's holding has the slotted end of the joint still on it. The inner axle and the spigoted half of the Tracta are about to be pulled out of the knuckle.

## PUTTING IN THE TRACTA JOINT . . .

IS JUST A MATTER of back-tracking through the steps I've just showed you. Before you start, better get down and squint at the inside of the steering knuckle. See if the bronze axle-shaft bushing is in there (Figures 2 and 3). If not, you'll have to put one in.

Next, put in the Tracta. Follow either Step 12 or Figure 1 when you put the Tracta joint together and you won't go wrong. Just remember that the spigoted half fits on the inner axle and faces toward the wheel. Next, bolt the wheel-bearing spindle in place (Step 11), and keep following the steps back through 5. When you finish all those steps, meet me here.

\* \* \*

Let's see now—you've assembled everything, down to the axle flange. Before tightening the rest of the axle in place, you've got to check the clearance in the Tracta. Right here some yardbird mechanics get lazy. They don't see why that checking business is necessary. 'Course if you always drove with the wheels straight ahead, you wouldn't have to be

so particular with play in the Tracta. Because in the straight ahead position, the joint just revolves. There's more action, though, when you turn the wheel. Those slotted and spigoted halves are brought closer together on one side all during the time they're revolving.

Unless they have enough room to move more freely, the Tracta is apt to grind itself into a fine powder—much quicker than it takes to adjust the joint.

You adjust the clearance in the Tracta by putting the shim pack between the axle hub and drive flange. More shims there means more clearance between the halves of the joint. The test is to find *how much* of a shim pack is needed. It varies with each vehicle. First, cramp the wheels full left (or right) against the turning-radius stop. Put on the drive flange *WITHOUT SHIMS*. Two drive-flange bolts screwed in loose-like, by hand (Step 5A), hold the flange on snug. Tighten the axle-shaft nut. Revolve the wheel enough to bring the punch mark on the axle end to a top or bottom

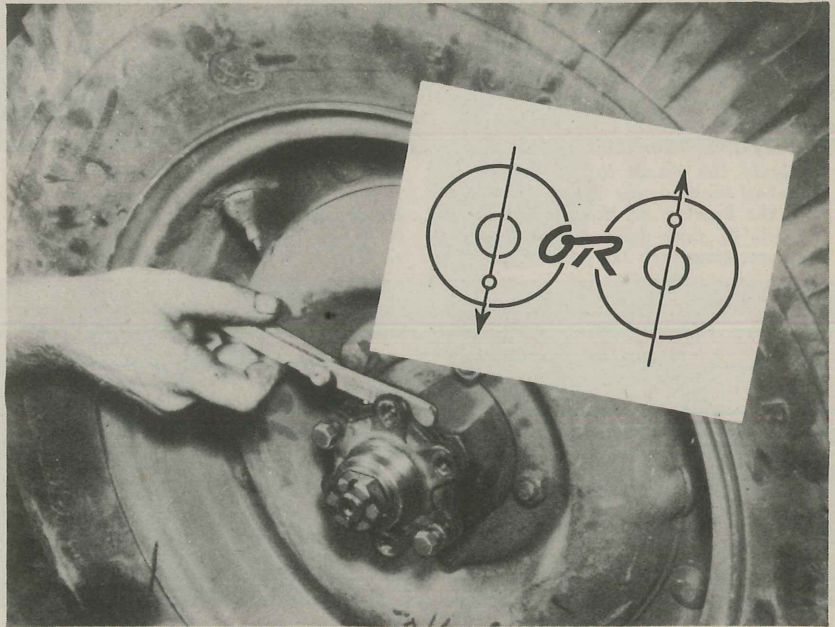
center position. Measure the distance between the drive flange and the hub—the way he's doing in Step 5A. This gage happened to show .010". Your maintenance manual says to put in .015" to .035" shims *in addition* to the reading you got between the drive flange and the hub. That's the shim pack you need to give your Tracta clearance enough for all turns. His first reading was .010", so he put in a .010" shim, and then a .020" shim in addition. (As I wet my thumb to turn a page in the manual, I noticed this: "If no clearance is had between the drive flange and the hub, install a .010" shim.") Go ahead and put back the drive flange with the right amount of shim pack and all the drive-flange bolts, the axle shaft nut washer, and nut. Draw everything up tight. Wipe your hands on a greasy rag and you've put in a new Tracta joint—ALMOST. Almost except for a final check.

Like all good mechanics, the fellow who loaned me his hands for these pix-chewers is a careful guy. There's a chance to make a few slip-ups when he made the



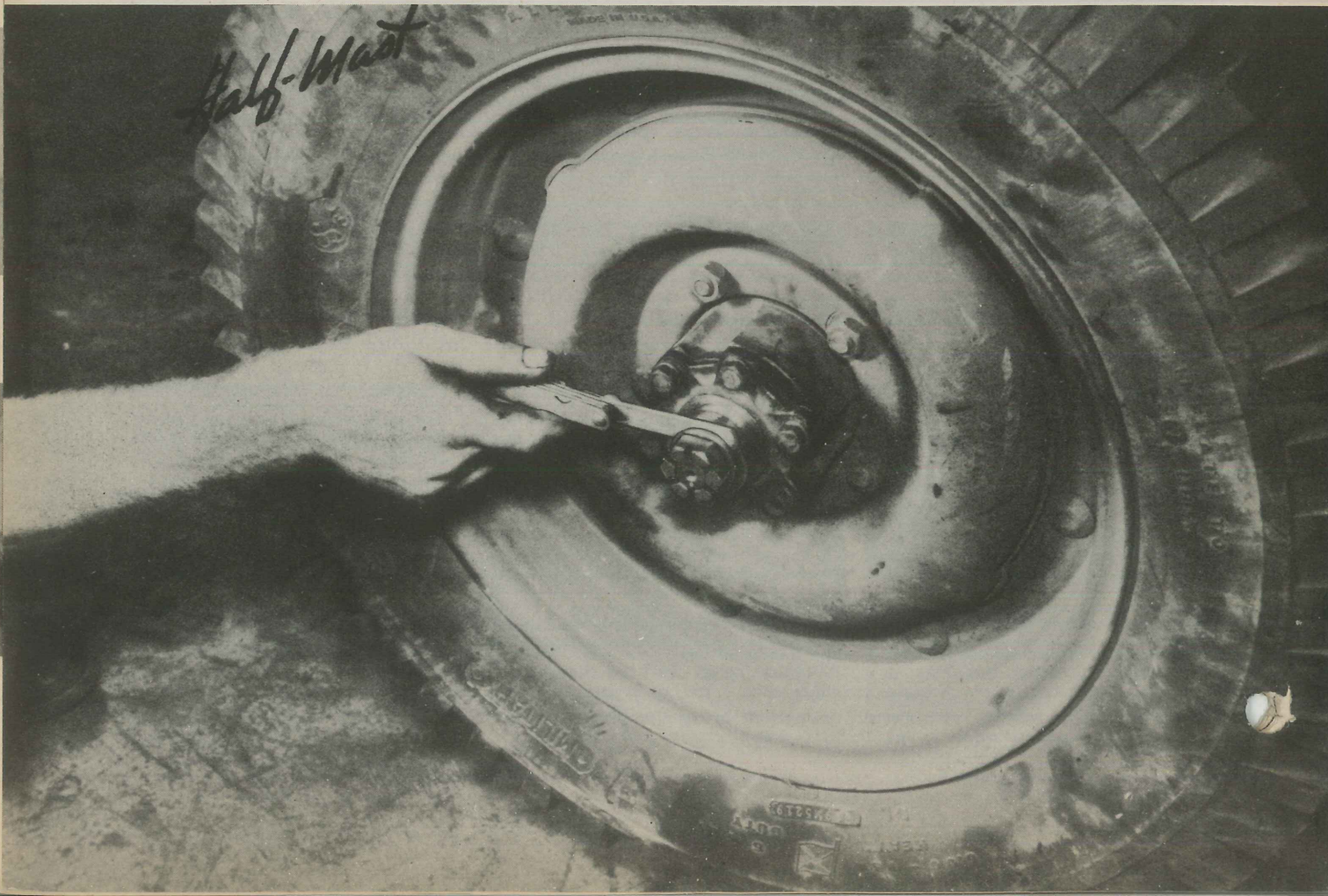
first adjustment. So he made an extra check to keep from having nightmares of the Tracta wearing itself down to two stumps. Back off the axle-shaft nut till your feeler gage shows .050" between the nut and the flange. Then tap on the end of the axle with a hammer. Don't hit the hammer directly against the axle—put a block of wood against the axle and hit the wood. A few taps and you'll feel the axle jump in. Measure how much space is now left between the nut and the flange. (That's what is going on in Step 5B.) If the measurement's anywhere between .015" and .035", you can throw out your chest. You've put in the shim pack that allows enough play in the Tracta. And, that's a good job. Tighten the axle-shaft nut again, install the cotter pin, and put back the hub cap.

Don't mess up your job now by forgetting these important odds and ends: bleed the brakes, fill the steering knuckle with lube (up to the filler plug), and check the toe-in of your front wheels.



*Step 5A—He's measuring the distance between the flange and the hub. (Inset shows correct position for punch mark on axle, when doing the measuring.)*

*Step 5B—The double check. Before I snapped the shot, he had backed the nut off and tapped the end of the shaft. The gage will show if he's done a good job of installing the axle.*





# Current\* Affairs Test

\*And we do mean BATTERY current. The question is:  
Do you know all the answers?



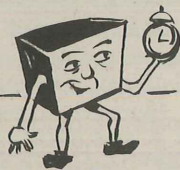
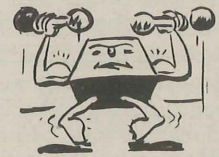
1. When should a battery be removed from a vehicle for recharging?

6. Why does the electrolyte sometimes turn a dark chocolate color during charging?



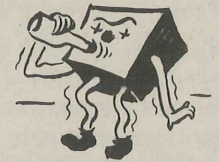
2. At what rate should a battery be charged?

7. How can you tell when a battery has reached its full charge?



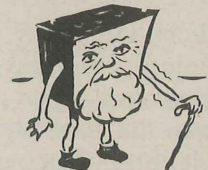
3. After a battery is placed on charge, how soon should the first inspection be made?

8. Should anything but distilled water be added to a battery?



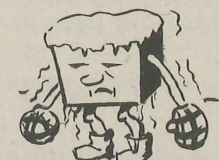
4. Why does a battery generate gas while charging?

9. Must the electrolyte specific gravity be adjusted as a battery grows older?



5. What causes a sudden rise in specific gravity reading toward the end of the charging period?

10. How low must the temperature go to freeze a fully-charged battery?



Pss! When Teacher leaves the room for a short beer, turn this page quick for the answers. Then follow Teacher.



# Right Answers to Battery Servicing Questions on the preceding page

**1.** When its hydrometer reading has dropped to 1.225 or lower. At that reading, a battery is just about half-charged. So you'd better pull out the battery and put it on charge. Also, if separate cell readings vary more than 20 or 30 points, your battery may be going berserk—so that's another cue to remove it from the vehicle for inspection and test. Remember this, too—no battery should be left sitting around in a pooped-out condition. Sulphation—always produced during discharge—can damage the plates if it isn't promptly reduced or removed by recharging.

**2.** Any rate is okay—provided it doesn't heat up the electrolyte above 110°F. Too much heat, cooked up by charging, has a very unhealthy effect on plates and separators. One way to prevent overheating—and overcharging—is to reduce the charging rate as the battery approaches full charge.

**3.** About three hours after the battery is put on the line, take a gander to make sure it's not overheating—or gassing so hard that the electrolyte is bubbling over. If that's happening, or if the inter-cell connectors feel hot to your hand, either slow down the rate of charge or take the battery off charge for a while to give it a chance to cool.

**4.** The bubbling gases are hydrogen (at the negative plate) and oxygen (at the positive). They're released when the charging current breaks down the electrolyte water (H<sub>2</sub>O) into its component parts. Just plain chemistry, that's all. And it's just plain self-preservation to keep lighted cigarettes away from batteries on charge. Those gases have been known to explode.

**5.** In the early stages of battery-charging, the charging current usually produces concentrated sulphuric acid which settles to the bottom of the cell—because it's heavier than the rest of the electrolyte. As the battery nears full charge, the gassing action stirs up this acid and mixes the

electrolyte thoroughly. Result: a rapid rise in specific gravity—and your first **true** hydrometer reading.

**6.** You're more likely to notice this dark chocolate color in old batteries that are on their last legs. It's caused by stirred-up sediment or active material that's been loosened from the positive plates. In any case, don't pass your cup—it isn't cocoa.

**7.** This is too easy. Your battery is fully-charged when it's gassing freely and when three separate hydrometer readings—taken one hour apart—show no further rise in specific gravity (it should be between 1.270 and 1.285).

**8.** Not if you can help it. But if there's not a drop of distilled water in sight, use any clear drinking water rather than let your battery run dry.

**9.** Practically never. A battery's full-charge s.g. decreases very little with age. It's not likely to require any adjusting at all—unless you've lost some electrolyte through spilling or leaking, or something new (in the form of acid) has been added. (Aside to 3rd-echelon: If you **must** add acid solution, be sure the s.g. is no higher than 1.400—or it will injure the plates and separators.)

**10.** All the way down to 85° below zero F.—or well below the freezing point of brass monkeys. A fully **discharged** battery, on the other hand, will freeze at around 32° **above** zero—since its electrolyte is mostly water. In cold weather, the gravity of your situation depends—inversely—on the gravity of your electrolyte.

**NOTE:** The above answers apply to storage batteries whose full-charge specific gravity is between 1.270 and 1.285, at a normal electrolyte temperature of 80°F. In other words, healthy batteries in temperate climes. In the tropics, the s.g. should be considerably lower—about 1.200 (at 80°F.) when fully charged.

**Any other questions on battery servicing? Shoot 'em in—for our positive or negative replies.**



Dear Editor,

It's practically impossible for the drivers to read the pressure indications on the tire pressure gage in a blackout, without some sort of light.

May I suggest that the indicating bar be slightly notched with a three-cornered file at each five-pound marking, on the side of the bar, so that the driver need only to count these notches by using his thumb nail along the side.

**Bruce G. Freeman**  
Civilian Automotive Advisor

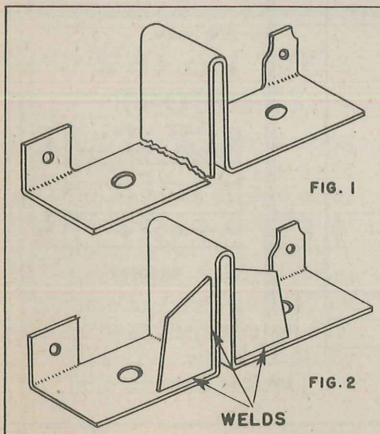
(Ed. Note — If you must check tires during blackouts, and you do notch the indicating bar, be sure to file it clean and leave no burrs. Not that we're worried about your fingernail being scratched, but the burrs might damage the workings of the gage.)

Dear Ed,

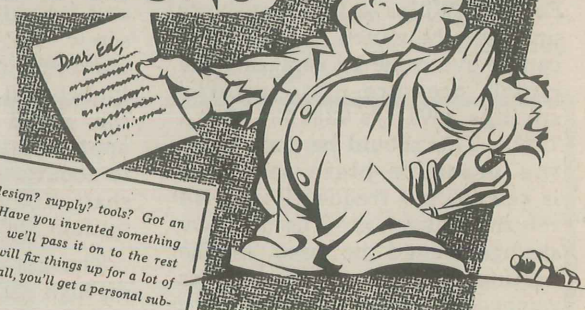
Enclosed is a sketch of a brush holder from the 12-volt generator on the ¼-ton amphibians.

Figure 1 shows a broken brush holder, which we've found on many of the generators on these vehicles. We think that vibration is causing failure of the holder as well as broken brushes.

Figure 2 shows our way of curing this trouble. The insulated brush holder is removed and a piece of 1/16 strap iron is welded on the brush holder. The strap iron acts as a brace and prevents the bottom of the brush holder from vibrating and finally breaking. The brush holder is easily replaced with small bolts instead of rivets which originally held it in place.



## CONTRIBUTIONS



Got any pet gripes with vehicle design? supply? tools? Got an idea that'll make maintenance easier? Have you invented something lately? Shoot it to us and if it's O.K., we'll pass it on to the rest of the boys. Maybe your gripe or idea will fix things up for a lot of other guys in the field. If you're on the ball, you'll get a personal subscription to ARMY MOTORS.

Don't know whether other outfits are having this trouble or not, but if they are, we hope it helps them.

**Maintenance Mechanics**  
**140th Infantry**

Dear Ed,

Crankcase ventilating kits have been installed on many of our 2½-ton GMC trucks. Here and there trouble has arisen, most of which has been minor and easily remedied. However, one serious bit of trouble has cropped up and great difficulty has been experienced in curing it. Yet the solution is simple.

If you are having trouble with oil and gaskets blowing out on the crankcase air cleaner, just remove the ventilating valve on the intake manifold and clean it out. If the ventilating valve and vacuum line are plugged with dirt, the pressure built up will fling oil from the air cleaner and blow gaskets in the process.

In our section we've handled this problem through cold and hot weather, through swamp and desert, and have found the above remedy will work 100%.

**Sgt. L. C. Howell**  
**Service Co. — 305th Inf.**

(Ed. Note—When you clean the ventilating valve and tube, be sure you stick to the procedure outlined in Par. 61, TM 9-801.)

Dear Sir,

On our light tank M3 and M3A1, the driver turned in a report

stating that the clutch slips. So the Maintenance Section checked the free travel adjustment.

The free travel was O. K. but they found the clutch release linkage at the rear of the tunnel frozen. So they removed the shaft on which the clutch release lever is mounted and polished it. To prevent the linkage from rusting again, two 7/32" holes were drilled through the bosses on the lever. This allowed the driver to oil the shaft.

Since this was done, we've had no more reports of clutches slipping before their time.

**Maintenance Section**  
**Troop E, 104th Cavalry**

From one of the hundreds of Civilian Automotive Advisors who take delight in beating the Army's head and ears on better maintenance, we hear a contribution. **Mr. George G. Hailey** tells that on some of his vehicles the hydrovac air cleaner isn't a cleaner—especially when air sucked through the cleaner draws off the oil in the element. Then dirt sneaks through to the hydrovac and engine. His contribution suggests a more efficient air cleaner. Good. Many Army technicians and engineers have wrinkled their brows over that problem. They've decided to move the air cleaner to a place where there's less dirt . . . maybe in the cab, maybe by attaching the air intake line to the carburetor air cleaner. Those are production changes. In the



field we can only say clean the hydrovac air cleaner more often. Every hour on the hour, if needed.

Dear Editor,

The irritating rattle in the Ford and Willys ¼-ton that shows up when the clutch is disengaged can be overcome by replacing the clutch pressure-plate return-springs. (Willys 638153) (Ford 7590). This should be done when the pressure-plate assembly is rebuilt, but frequently the old return-springs are used. New springs should be used as the heating up of the assembly has removed the temper. Precautions should be taken to see that the return springs are properly positioned under the clutch adjusting screw washers.

**Kenneth A. Heagle**  
Civilian Automotive Advisor

Dear Editor,

A suggested guard to prevent sticks and branches from puncturing the rubber boot on the front propeller shaft of ¼-ton amphibians is shown in the attached drawings (Figs. 1 & 2). We have constructed and installed this type of guard on our amphibian vehicles and find that they are effective in preventing damage to the boot.

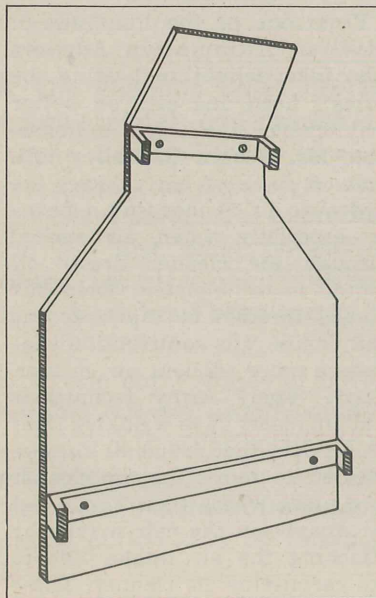


Figure 1

The guard consists of 1/8" sheet metal cut to the size of the propeller-shaft tunnel and held in place by means of two 1/4" strap-iron brackets, spotwelded to the interior of the propeller-shaft tunnel. These brackets are drilled and tapped for a 5/16" USS cap-screw. The guard extends 1/2" to the rear of the propeller shaft tunnel seal. The forward part of the guard is bent upward at approximately a 45-degree angle to about one inch of the propeller shaft. The guard is held in place by four capscrews (5/16" USS).

The guard also acts as a skid on high centers, preventing rocks and dirt from jamming the bottom of the hull.

W/O (J. G.) Clarence E. Bringle

(Ed. Note—This sounds like a swell idea to us, though maybe it would be better to use a longer piece of strap iron than Mr. Bringle suggests, and weld all around the joint, horizontally and vertically, instead of spot-welding. Incidentally, the Ford

man to whom we showed this idea says to be sure the material is strong enough so that, if struck, the guard itself won't damage the boot.)

Dear Editor,

For some time our organization has been using a very simple method for measuring and comparing the over-all circumferences of various truck tires. With no more equipment than a piece of chalk the average truck driver can properly measure and mate mixed brands of tires on his vehicle. This system is used as follows:

- a. Find a level surface on which the tires can be rolled.
- b. Draw a line on the ground and stand the tire vertically at this point.
- c. With chalk or any other material available make a mark on the shoulder of the tire at the point where it touches the line on the ground.
- d. Roll the tire (be sure it is

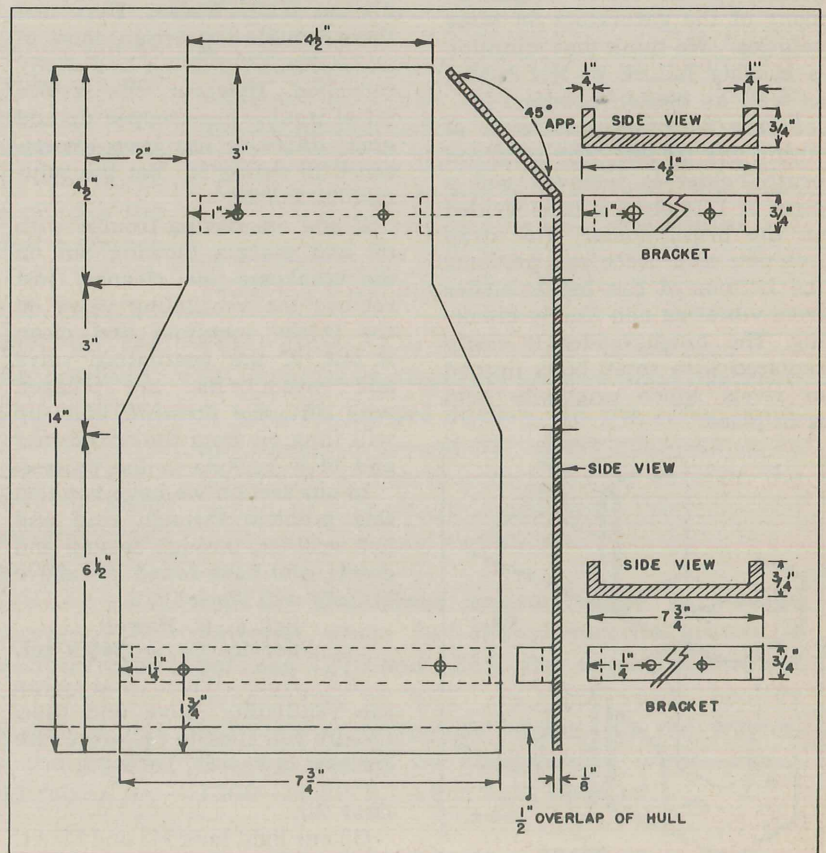


Figure 2



vertical) toward fixed point until the marked point on the tire again touches the ground, denoting one complete revolution.

e. Mark this point clearly on the ground and repeat the same operation with the other tires.

f. After all the tires have been measured in this manner, they should be mounted so that tires closest in outside circumferences are mounted together.

This method, although simple, has been found to be far superior to most other methods of tire measurement. It has been found to be much more accurate than the usual system of placing two tires side by side to compare diameters, and even better than the recommended method of using a steel tape.

**Lt. Charles S. Schaevitz**  
**Motor Training Division**

(Ed. Note—This should be done after tires are mounted on the wheels and properly inflated.)

Dear Editor,

A combination lug wrench for removing outer lug nuts from the inner lug nuts and for tightening the inner lug nuts has been designed by **Mr. N. H. Biggers**, Principal Tire Advisor of the Ordnance Service Command Shop No. 7.

This wrench is made by cutting off the hexagon end of a lug wrench and welding it to a pipe. The remaining part of the lug wrench is placed into the pipe and bushed in at the top, and the necessary length of 1-inch rod is welded on this wrench to give enough clearance to the handles.

A 1-inch hole is bored near the top of the rod for the upper handles. The lower handles are welded into the top part of the pipe.

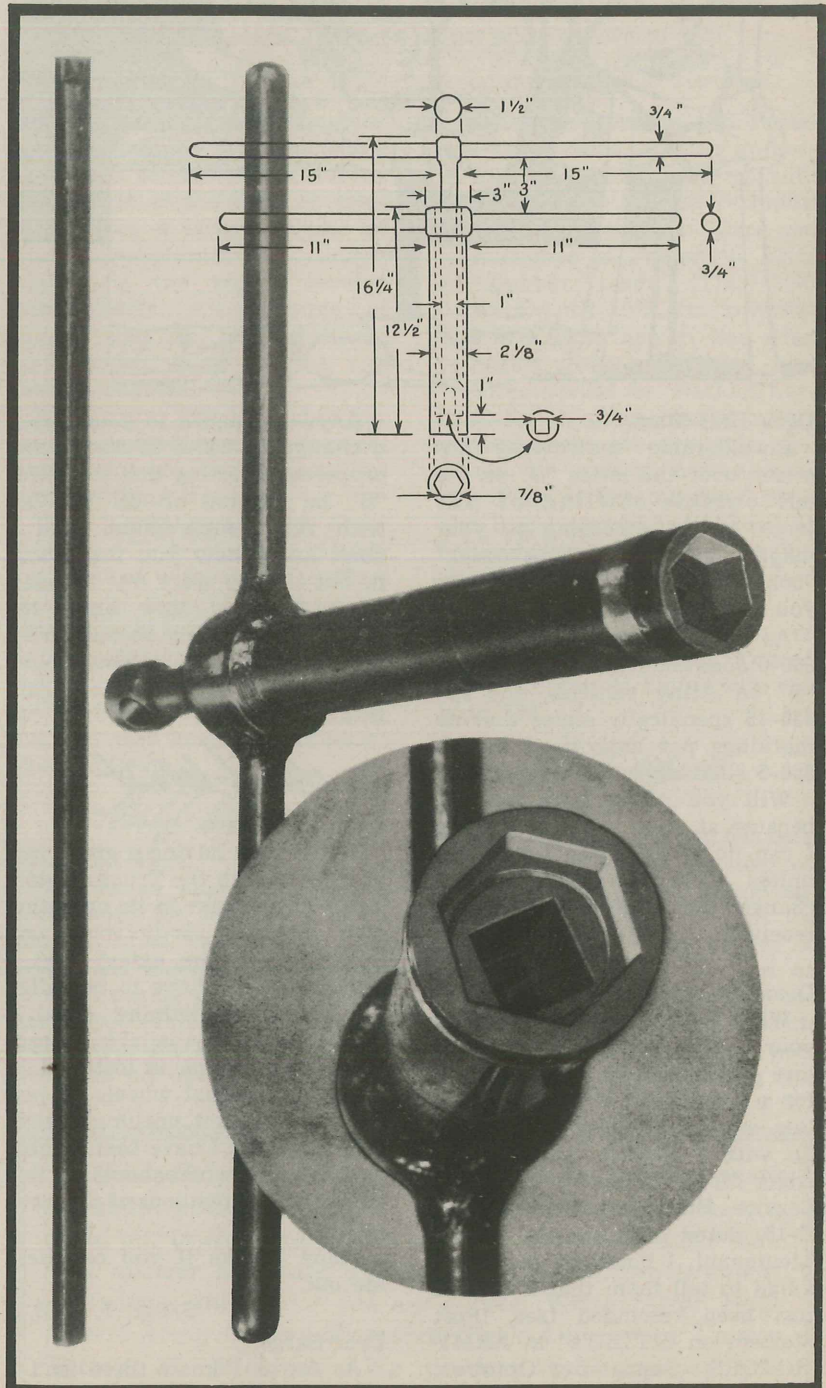
The materials needed for this combination lug wrench are:

- 1—Standard Lug Wrench
- 1—2" pipe, 12½" long
- 2—11" pieces ¾" rod
- 1—30" piece ¾" rod } handles

1—2½" brass bushing with 1" arbor

We believe that the use of the combination wrench will save many outer lug nuts and that it could be used to advantage in 2nd-echelon shops.

**Lt. James C. Layden**  
**Ordnance Service Command**  
**Shop No. 7.**



**T/O and T/E TROUBLE?**

If you've been having trouble understanding the changes to Tables of Organization and Equipment, which the War Department issues from time to time, take a look at War Department Circular 225, which explains how to read them.



# Sgt. "HALF-MAST" McCANICK'S Question Dept.



Dear Half-Mast,

Considerable controversy has arisen over the letter "S" on the left outside-cowling of our jeeps which, according to your magazine, means "suppressed," "bonded," "shielded," or what have you.

As far as I can determine, AR 850-5 does not authorize the letter "S" on Army vehicles, and AR 850-15 specifically states that no markings not authorized in AR 850-5 shall appear on vehicles.

Will you please help me out, because at present the only thing I can do is paint the letter out, unless there has been an AR change this organization hasn't received.

Lt. F. T. R., Jr.

Dear Lieutenant,

What you started! Upon reading your letter, our best legal minds tore the bookcases apart looking for a regulation or directive on this subject. Finally they came up with a slightly worn-at-the-edges Motor Transport Technical Service Bulletin called MTTSB Z-15, dated 1 May 1942. Well, Lieutenant, I hated to do it, but I had to tell them that Z-15 had just been rescinded (see "Post Mortem on MTTSB's" in ARMY MOTORS, September-October, 1943.)

Anyway, thanks to your letter, a change to 850-5 is now being proposed, directing that the letter "S" be painted on all vehicles with radio suppression. And I don't know how you feel about it, but if they were my vehicles, I'd be kind of slow about removing that letter, because from here it looks like it would have to be painted right back on again in a little while.

## Half-Mast

Dear Half-Mast,

We've been having a great deal of trouble with the Truck, 40-ton, Tank Transporter in its operation over soft and sandy roads and sometimes to the extent that a wrecker would have to be called out to give a helping hand. I believe there is available a traction device which is installed in place of the dual wheels or just fits over present pneumatic tires on trucks, but I have been unable to learn the whereabouts of this equipment or methods of procurement.

Many thanks if you can help me out.

S/Sgt. J. E. B.

Dear Sarge,

As far as I know there isn't a special traction device for the

tank transporter. The only traction device I could find available is the regular vehicle tire chains.

I'm told that if you load the body with 4 to 5 tons of gravel or sand, the transporter will pull like a Missouri mule.

## Half-Mast

Dear Half-Mast,

We are over here in the Southwest Pacific Area. A problem has confronted us and we haven't been able to find a solution for it. The drums of the GMC 2½-ton and ¼-ton jeeps are the sore spots. We have been operating in soft mud and water and the mud packs on the inside of the drum and around the brake shoes.

Now, we tried painting the inside of the drum, and brake-shoe-spring with red lead. That keeps down corrosion, but does not help the mud conditions in the drums. Could you tell us if there is a way to seal the openings between the outside part of the drum and shoe without injury to the drum or shoe?

Pvt. W. H.

Q. M. Truck Regt.

Dear Private,

Your solution of sealing the openings between the outside part of the drum is kinda like my typewriter. I fix one thing—then something happens at the other extreme. You'd have no trouble with mud and water any more, but instead, overheating of the brake shoes and drums would cause other failures. As you know, the openings are in the drum as an aid to cooling the brake shoes. About the best you can do is to give the brakes a double dose of preventive maintenance. The vehicle TM's say every 6000-miles. But with mud and water, you'll be a smart boy for doing it more often. If it makes you feel any better, I'll tell you that manufacturers and Army maintenance men have tried to find a seal to prevent mud from entering. None have been successful. So they did the next best thing. They called for a production change on the 2½-ton GMC, on ¾ and 1½-ton Dodges, and on 1½-ton



Chevrolets, to install demountable drums. They make cleaning a snap for the lucky stiffs who get the later vehicles. You and I will have to struggle along with the old-type equipment—meantime giving it extra care.

*Half-Mast*

Dear Half-Mast,

There seems to be a lot of misunderstanding about whether to remove factory grease from vehicle wheel bearings or leave it in until the 6000-mile inspection. If this grease is no good, why doesn't the factory put in the proper grade and weight at time of assembly? We have read and understand MTTSB Z-13 and TC 32, but are still confused.

F. L. S.

Dear F. L. S.,

If you're still going by MTTSB Z-13 and TC 32 you have a good reason for a misunderstanding. Both these publications have been washed out. TC 32 was rescinded by TC 103, 18 August 1943. MTTSB Z-13 has been superseded by OFSB 2-17.

According to the newest instructions, you don't have to clean and repack the wheel bearings when the vehicles are received from the factory. Of course, the bearings get their regular servicing at the 6000-mile mark or 6-months period.

I don't know where you get the idea that the grease used in assembling the vehicles is no good. The manufacturers have to meet certain specifications on the grease just as they have to do on the rest of the vehicle.

*Half-Mast*

Dear Half-Mast,

Are mufflers really necessary in the operation of a motor vehicle (outside the safety factor and quieting the exhaust)? Will it really harm an engine if it's operated without back pressure? Some of my men think that the back pressure created by the muffler helps in operating the valves. If the muffler was left off, the valves would be damaged, they argue.

We'll be looking for your decision.

Sgt. R. M.

Dear Sergeant,

I've never heard of an engine being harmed by operating without a muffler, though I've seen a lot of men gigged because their vehicles are running around with their muffler's entrails dragging.

According to everything I call authority, the faster the exhaust gases are driven out of the combustion chamber, the cooler the engine valves are going to operate. The trick is, the fresh incoming gases tend to cool off the valves. Getting rid of the exhaust gases also allows a larger volume of fresh gases to enter the cylinder, which lets the engine develop more power. An example of engines that run O. K. without mufflers are many marine and aircraft engines.

So, it seems that instead of our engines depending on back pressure to operate, they'll run a lot better without it.

This doesn't mean that Army vehicles will develop appreciably more power without the mufflers than with them. The engineers have done a good job on muffler design. Our mufflers not only reduce noise and prevent live sparks from leaving the exhaust, but they also keep back pressure at a minimum.

*Half-Mast*

Dear Half-Mast,

Here is an appeal for just a little help for the boys down yonder. Just why can't you people get together in reference to the stacking of tires? I quote Air Corps Technical Order No. 04-5-2, Paragraph 1: "Tires will be stored in an upright position to

prevent damage resulting from storage in stacks." Then when I look at Ordnance Field Service Bulletin No. 2-16, Paragraph 17, dated 28 December 1942—I am baffled. I quote Par. 17: "Tires should not be stored in vertical or upright position."

Ordnance inspector says "Stack them horizontal", Air Corps inspector says, "Stack vertical." Just what are we to do?

S/Sgt. F. J. W.

Dear Sergeant,

Since those Orders and Bulletins were issued, another authority has popped its head up with a good answer. It's the Technical Manual specifically on "Care and Maintenance of Pneumatic Tires and Rubber Treads," (TM31-200) dated 1 April 1943. Its information is a little newer. See what you think of this quote:

"Tires should be stacked horizontally in piles, except where vertical racks are available, and should be grouped according to size. Piles of tires of size 7.50-20 and larger should not exceed 12 feet in height, and piles of smaller size tires should not exceed 7 feet. Lower stacks are preferable."

There's a whole section on "Storage of Tires and Tubes." Try curling up at nights with this good TM.

*Half-Mast*

Dear Half-Mast,

After the adjusting nut has been run back as far as possible on the half-track single coil spring-loaded idler, there is still too much tension on the spring to allow the track to be put on without loss of religion. Why not thread the bolt on the end opposite the adjustment? This would hold the tension when removing and

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," Army Motors Magazine, Tank-Automotive Center, Detroit 26, Michigan. We promise he'll answer you.



replacing the tracks and also capture spring tension in the event the tracks would break.

E. P. W.

Dear Mr. W.,

Your theory is as right as *Connie Rodd*. In actual practice though, you'd discover the threads on the idler-adjusting screw would be worn to a frazzle. As the coil spring compresses and expands (while traveling over rough terrain), the idler screw moves back and forth through the spring bracket like a piston in a cylinder. If there were threads on the adjusting screw, the ones rubbing against the spring bracket wouldn't last very long. Besides, each time the spring would expand the adjusting nut would slam against the spring bracket with the force of a 155. You know what would happen.

The trouble you describe is caused by improper location of the bracket that holds the forward end of the single-coil spring. According to FSMWO G-102-W14, which gives the instructions for installing the single coil spring, two dimensions are given to locate the spring bracket B-86023. The first dimension was 22- $\frac{3}{4}$ " from the center of the idler shackle (B-86020). This dimension was to be used on vehicles equipped with No. 1 volute bogie springs B-86011. For the volute springs that came later—No. 2 and No. 3 volute springs—the bracket should have been mounted 24- $\frac{3}{4}$ " from the idler shackle. If the vehicles you're referring to are either the half-track M2, gun motor carriage M3, howitzer motor carriage T30, howitzer motor carriage T19, mortar carrier M4, or personnel carrier M3, and you find you have No. 1 or No. 2 volute springs in them, you should get the No. 3

springs installed according to FSMWO G-102-W23. When this is done, change the bracket adjustment as I've described above.

*Half-Mast*

Dear Half-Mast,

Is there any objection to painting truck tire-chains with lusterless olive drab paint and storing them in this manner?

SGT. A. F. R.

Dear Sergeant,

I don't know if there are any objections to doing the job this way, but I know a better and recommended way.

Clean the tire-chains thoroughly with Phosphoric Metal Conditioner (Federal Stock Nos. 51-A-1302, 1-gal., and 51-A-1303, 5-gal.). Let them dry. Take Gloss, Clear Varnish (Federal Stock Nos. 52-V-2770, 1-gal., and 52-V-2780, 5-gal.) and cut it in half with Thinner (Federal Stock Nos. 52-T-445, 1-gal., and 52-T-450, 5-gal.). Dip your chains in the thinned varnish—and that's all there is to it. Be careful, though, not to varnish the clips; varnish will keep them from opening and closing.

It takes about a week for the varnish to be thoroughly dry and hard.

Try my way, Sergeant.

*Half-Mast*

Dear Half-Mast,

I would like your opinion as to the need of winch covers. Is there a regulation requiring the use of winch covers? and do you think they are needed? This question has been discussed pro and con by the automotive advisors of this Brigade and we would like your opinion.

If a winch is not used, how

often do you think it should be reeled out to check for rust and lubrication? Your article in a previous ARMY MOTORS on cleaning and servicing the winch settled lots of questions on how it should be done, but it is still hard to get some of them to quit putting chassis lubrication on the cable.

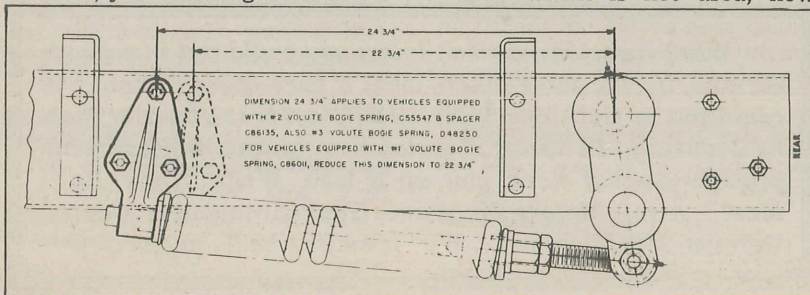
Automotive Advisor D. H. H.

Dear Mr. H.,

You're really on your toes. Your suggestions and contributions come so fast, I have to keep a staff of one busy on just your letters.

In my opinion, winch covers are in a class with hand-painted spittoons, cut-glass flyswatters, and other doo-dads. Regulations are on my side . . . good ole regulations. None of them specify winch covers should be used. If the winch line is coiled properly on the drum, very little moisture will seep through. A few blasts of sunshine quickly dry out the moisture. All you get is a little harmless surface rust. With an embroidered winch cover though, any water that does get in stays in considerably longer. Lubricating your winch line depends entirely on the climate and condition the vehicle's operating under. In desert camps, don't reel out the cable except when using it. That's inviting sand and other dirt to cling to the oiled cable. In camps near salt water, the line should be checked every 60 days. I don't have to tell you the hell this stuff plays with all exposed metal. For the same reason, tell the men to check the line when they get overseas. When a new vehicle's received the winch-line should be gone over. If not, then one dark day the vehicle may get stuck. The driver frantically calls on the winch line. After uncoiling it he finds the cable in three separate pieces. If he checks the line when the vehicle's received, he'll know that with PM from time to time, the winch will be as dependable as my set of off-center ivories.

*Half-Mast*





# Which Tool List?

A round-up of SNL'S . . . six different kinds carry tool information

Every afternoon our office boy rushes in with a little white pamphlet, tosses it on our desk, and screams, "Latest tool list, Jackson."

And every afternoon we throw the latest tool list whizzing past his left ear, to a mounting pile of latest tool lists we keep in the northeast corner of the office.

This morning we decided to sort out the pile. We found not one, not two, but *six* different kinds of tool lists, all published in SNL's. And you in the 1st and 2nd-echelons are supposed to be using at least two kinds, maybe three or four.

Some of them cover *common* tools (that is, tools you can use on most all vehicles), and some cover *special* tools (designed for one vehicle, but maybe interchangeable on a few others).

Some are used as a *basis of issue* (mention 'em and you can have anything that's legal), and others aren't. For those that aren't, the Table of Organization and Equipment (T/O&E) is very often the basis of issue.

These are what we found:

1) *Organizational Spare Parts and Equipment (OSPE)*. These are individual pamphlets for each make and model of vehicle. They tell what tools the vehicle itself carries (first-echelon tools), and what special tools the second echelon will need to maintain it. OSPE's are used as a basis of issue.

2) *Tool Sets, Motor Transport (SNL N-19)*. This one has a tool-by-tool listing, with pictures, of everything in the second-echelon unit equipment sets (including the Armored Comand sets), plus the hand-tool kits of general automotive mechanics and automotive specialists. It's good only for identifying the tools in the sets;

the basis for requisitioning sets is the company's T/O&E.

3) *Special Tools for Combat Vehicles (SNL G-175)*. Here's where you find an ABC list of all tools used by any or all echelons for maintenance of *combat* vehicles. It has pictures, tells the stock numbers, piece-mark or drawing numbers, and SNL numbers for each and every tool. It is not a basis for issue (use the OSPE instead). Sorry, but there's no publication like it for transport vehicles at present.



4) *Interchangeability Chart of Organizational Special Tools for Combat Vehicles (SNL G-19)*. This baby tells you how to save weight in your 2nd-echelon tool load, and at the same time help to avoid tool waste. It's a cross-reference to special tools that can be used on more than one vehicle. For instance, if you already have an idler-wheel puller (41-P-2940-800) for maintaining the M12 Gun Motor Carriage, this SNL tells you the same tool will fit 15 other motorbuggies. Like G-175, this one is for combat vehicles, and is published for information only. It is not to be used as a basis of requisitioning.

5) *Tools, Maintenance, for Re-*

*pair of Automotive Vehicles (SNL G-27)* is a 3rd and 4th-echelon publication, for Ordnance outfits only. It lists their unit-equipment sets, their special tools for component parts of vehicles (such as voltage regulators, brakes, etc.), their special tools for specific makes and models of vehicles, and a few additional kinds of special equipment. This publication is a basis for requisitioning and issue of all special tool sets allowed to Ordnance organizations for maintenance of combat vehicles.

6) *Shop SNL's*. These give complete tool lists for certain types of shops—all of them Ordnance shops, with the exception of SNL N-23, which covers unit equipment for posts, camps, and stations.

So you see, gentlemen, this is what you will need:

*First echelon:*

For your vehicle tool set—the OSPE for your vehicle. It provides a basis for requisition, and identifies the tools with stock numbers and pictures.

*Second echelon:*

If you have transport vehicles only, you'll need your organizational T/O&E (as basis for requisitioning unit sets of common tools), SNL N-19 (for details of the tool sets), and each vehicle's OSPE (as basis for requisitioning special tools).

If you service combat vehicles also, you'll need in addition to the above, SNL G-175, which gives pictures and full identification of special tools for combat vehicles; and SNL G-19, which gives you the dope on interchangeability.

*Ordnance shops:*

Ordnance shops will get most of their information from SNL G-27, including the basis of issue for special tools. Basis of issue for unit equipment sets of 3rd and 4th-echelon tools is contained in the organization's T/O&E, but details of the sets are published in G-27. In addition, you can find pictures of special tools in SNL G-175.

If your outfit is covered by a shop SNL (and they're rare—but consult the new OFSB 1-1 for the list), that will be your Bible, of course.



# The Month's Directives

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

## WAR DEPARTMENT AGO PUBLICATIONS

AR—Army Regulations  
FM—Field Manual  
TC—Training Circular  
TM—Technical Manual

T/O & E—Table of Organization and Equipment  
WDC—War Department Circular

Distributed through Post Adjutants by AGO Depots in each Service Command:

594-596 Commonwealth Avenue, Boston, Mass.  
641 Washington Street, New York, N. Y.  
601 South Haven Street, Baltimore, Md.  
Glenn Street and Murphy Avenue, S. W., Atlanta, Ga.  
Buckingham and Grant Streets, Columbus, Ohio.  
111 North Canal Street, Chicago, Ill.  
1113 North 13th Street, Omaha, Nebr.  
c/o San Antonio QM Depot, Fort Sam Houston, Texas.  
2325 Wall Avenue, Ogden, Utah.

Distributed outside Continental United States by:

The Adjutant General, War Department, Washington, D. C.

## ORDNANCE FIELD SERVICE PUBLICATIONS

FSMWO—Field Service Modification Work Order

OFSE—Ordnance Field Service Bulletin

OFSC—Ordnance Field Service Circular

OPSI—Ordnance Publications for Supply, Index

SNL—Standard Nomenclature List.

List of All Parts (LAP)

Organizational Spare Parts and Equipment (OSPE)

Service Parts Catalog (SPC)

TB—Ordnance Field Service Technical Bulletin

Distributed through Ordnance Officers by regional Ordnance Distribution Depots:

Eastern Ordnance Publications Depot, 985 Broad Street, Newark, N. J.  
Southeastern Ordnance Publications Depot, Glenn Street and Murphy Avenue, S. W., Atlanta, Ga.  
Central Ordnance Publications Depot, 111 North Canal Street, Chicago, Ill.  
Southern Ordnance Publications Depot, c/o San Antonio QM Depot, Fort Sam Houston, Texas.  
Western Ordnance Publications Depot, P. O. Box 1031, 2325 Wall Avenue, Ogden, Utah.

Overseas units requisition on depot serving their P. O. E.

## SCOUT CARS

CAR, SCOUT, M3A1

SNL G-67, OSPE.  
OFSE 6-G-67, Lubrication.  
TB 700-64, Door stop angle.  
TB 705-12, Removal of restrictor plate.

## GUN CARRIAGES

CARRIAGE, MOTOR, 75-MM

GUN M3

TB 700-64, Improvement of door stop angle.

CARRIAGE, MOTOR,

105-MM HOWITZER, M7

FSMWO G1-W4, Insulate accelerator pedal.  
FSMWO G1-W7, New towing shackle pin.  
FSMWO G128-W20, Gunner's hand grip.  
TB 700-51, Flame detector.  
TB 700-72, Bogie wheel bearings and seal.

CARRIAGE, MOTOR,

3-IN. GUN, M10

SNL G-130, OSPE.  
FSMWO G1-W4, Insulate accelerator pedal.  
FSMWO G1-W7, New towing shackle pin.  
FSMWO G130-W13, Heavier turret traversing lock.  
FSMWO G130-W17, Pads on turret plates.  
TB 700-51, Flame detector.  
TB 700-72, Bogie wheel bearings and seal.  
TB 731B-2, Crankcase breather elbow.

CARRIAGE, MOTOR,

3-IN. GUN, M10A1

SNL G-170, OSPE, C1  
FSMWO G1-W4, Insulate accelerator pedal.  
FSMWO G1-W7, New towing shackle pin.  
FSMWO G170-W4, Heavier turret traversing locks.  
FSMWO G170-W5, Generator, regulator and filter.

FSMWO G170-W7, Oil trough assembly.  
FSMWO G170-W9, Pads on turret plates.  
FSMWO G170-W10, Over-center clutch spring.  
OFSE 6-G-170, Lubrication.  
TB 700-51, Flame detector.  
TB 700-72, Bogie wheel bearings and seal.  
TB 731G-4 Rear engine compartment door bolts.  
TB 731G-5, Cylinder head gasket.

CARRIAGE, MOTOR,

155-MM GUN, M12

FSMWO G1-W4, Insulate accelerator pedal.  
FSMWO G1-W7, Towing shackle pin.  
TB 700-51, Flame detector.  
TB 700-72, Bogie wheel bearings and seal.  
TB 751-1, Caution sign.  
SNL G-158, OSPE (with C1).

CARRIAGE, MOTOR,

MULTIPLE GUN, M15

OFSE 6-G-102C, Lubrication.  
TB 700-51, Flame detector.  
TB 700-64, Door stop angle.

## CARRIERS

CAR, HALF-TRACK, M2

SNL G102, Vol. 1, OSPE.  
FSMWO G102-W30, Gun mount.  
FSMWO G102-W37, Fuel tank filler cap.  
FSMWO G102-W38, Idler post brace.  
FSMWO G102-W40, Idler post and shackle.  
TB 700-64, Door stop angle.  
TB 700-75, Removal of governor.  
TB 710A-20, Radio mounting.

CARRIER, PERSONNEL

HALF-TRACK, M3

SNL G-102, Vol. 3, OSPE (with C1).  
FSMWO G102-W37, Fuel tank filler cap.  
FSMWO G102-W38, Idler post brace.  
FSMWO G102-W40, Idler post and shackle.  
TB 700-64, Door stop angle.  
TB 700-75, Removal of governor.

CARRIER, HALF-TRACK, M4

SNL G-102, Vol. 5, OSPE.  
FSMWO G102-W29, Modification to conform to M4A1.  
FSMWO G102-W37, Fuel tank filler cap.  
FSMWO G102-W38, Idler post brace.  
FSMWO G102-W40, Idler post and shackle.  
TB 700-64, Door stop angle.  
TB 700-75, Removal of governor.

CARRIER, HALF-TRACK, M4A1

SNL G-102, Vol. 6, OSPE.  
FSMWO G102-W40, Idler post and shackle.  
TB 700-75, Removal of governor.

CARRIER, PERSONNEL,

HALF-TRACK, M5

SNL G-147, Vol. 3, OSPE.  
FSMWO G102-W40, Idler post and shackle.  
OFSE 6-G-147, Lubrication.  
TB 700-75, Removal of governor.  
TB 707-1, Transmission gear shift lever.

CAR, HALF-TRACK, M9

FSMWO G102-W40, Idler post and shackle.  
TB 700-75, Removal of governor.

CAR, HALF-TRACK, M9A1

SNL G-147, Vol. 2, OSPE.



FSMWO G102-W40, Idler post and shackle.  
OFSB 6-G-147, Lubrication.  
TB 700-75, Removal of governor.  
TB 707-1, Transmission gear shift lever.

### CARRIER, PERSONNEL, HALF-TRACK, M5A1

OFSB 6-G-147, Lubrication.  
TB 700-75, Removal of governor.

## TANKS

### TANK, LIGHT, M3

TB 700-51, Flame detector.  
TB 700-62, New type bogie wheel lift.  
TB 700-81, Reversing track end connectors.

### TANK, LIGHT, M3A1

SNL G-103, Vol. 5, OSPE, C1.  
TB 700-51, Flame detector.  
TB 700-62, New type bogie wheel lift.  
TB 700-81, Reversing track end connectors.

### TANK, LIGHT, M3A3

SNL G-103, Vol. 7, OSPE, C1.  
TB 700-51, Flame detector.  
TB 700-62, New type bogie wheel lift.  
TB 700-81, Reversing track end connectors.  
TB 727C-2, Transmission oil pressure warning light.

### TANK, LIGHT, M5

FM 17-68, Crew drill.  
SNL G-103, Vol. 2, OSPE.  
SNL G-103, Vol. 2 & 8, Part 2—SPC.  
TB 700-51, Flame detector.  
TB 700-62, New type bogie wheel lift.  
TB 700-81, Reversing track end connectors.  
TB 727C-8, Ignition timing.  
TB 727C-9, Transmission throttle lever.  
TB 727C-10 Fuel tank outlet screw.

### TANK, LIGHT, M5A1

FM 17-68, Crew drill.  
SNL G-103, Vol. 2 & 8, Part 2—SPC.  
SNL G103, Vol. 8, OSPE.  
FSMWO G104-W55, Control cam, hydraulic turret traversing mechanism.  
TB 700 - 51, Flame detector.  
TB 700 - 62, New type bogie wheel lift.  
TB 700-81, Reversing track end connectors.  
TB 727C - 7, Piston improvement.  
TB 727C - 8, Ignition timing.  
TB 727C - 9, Transmission throttle lever.  
TB 727C-10, Fuel tank outlet screw.

### TANK, MEDIUM, M3

SNL G-104, Vol. 1, OSPE.  
TB 700-51, Flame detector.  
TB 700-72, Bogie wheel bearings and seal.  
TB 700-81, Reversing track end connectors.

### TANK, MEDIUM, M3A1

SNL G-104, Vol. 12, OSPE.  
TB 700-51, Flame detector.  
TB 700-72, Installation bogie wheel bearings and seal.  
TB 700-81, Reversing track end connectors.

### TANK, MEDIUM, M3A2

SNL G-104, Vol. 12, OSPE.  
TB 700-51, Flame detector.  
TB 700-72, Bogie wheel bearings and seal.  
TB 700-81, Reversing track end connectors.

### TANK, MEDIUM, M3A3

SNL G-104, Vol. 5, OSPE.  
TB 700-51, Flame detector.  
TB 700-72, Bogie wheel bearings and seal.  
TB 700-81, Reversing tracks and connectors.  
TB 731B-2, Crankcase breather elbow.

### TANK, MEDIUM, M3A4

SNL G-104, Vol. 3, OSPE.  
SNL G-104, Vol. 3, OSPE C1  
TB 700-51, Flame detector.  
TB 700-72, Bogie wheel bearings and seal.  
TB 700-81, Reversing track end connectors.

### TANK, MEDIUM, M3A5

SNL G-104, Vol. 10, OSPE.  
TB 700-51, Flame detector.  
TB 700-72, Bogie wheel bearings and seal.  
TB 700-81, Reversing track end connectors.  
TB 731B-2, Crankcase breather elbow.

### TANK, MEDIUM, M4

FM 17-67, Crew drill and service of the piece.  
SNL G-104, Vol. 6, OSPE (with C1, C2).  
FSMWO G1-W4, Insulate accelerator pedal.  
FSMWO G1-W7, Towing shackle pin.  
FSMWO G104-W55, Control cam, hydraulic turret traversing mechanism.  
FSMWO G104-W69, Driver's compass.  
FSMWO G104-W81, Turret basket.

## ARE YOU BEING

# Followed?

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

**NOTIFY US PROMPTLY OF CHANGE OF ADDRESS**

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

FSMWO G104-W85, Over-center clutch spring.  
FSMWO G104-W94, Vane sight.  
FSMWO G104-W96, Foot rest for foot firing switch.  
TB 700-51, Flame detector.  
TB 700-72, Bogie wheel bearings and seal.  
TB 700-81, Reversing track end connectors.

### TANK, MEDIUM, M4A1

SNL G-104, Vol. 11, OSPE, C1  
SNL G-104, Vol. 11 Sec. 11, LAP — Gasoline Engine.  
FSMWO G1-W4, Insulate accelerator pedal.  
FSMWO G1-W7, Towing shackle pin.  
FSMWO G104-W55, Control cam, hydraulic turret traversing mechanism.  
FSMWO G104-W69, Driver's compass.  
FSMWO G104-W81, Turret basket.

FSMWO G104-W85, Over-center clutch spring.  
FSMWO G104-W94, Vane sight.  
FSMWO G104-W96, Foot rest for foot firing switch.  
TB 700-51, Flame detector.  
TB 700-72, Bogie wheel bearings and seal.  
TB 700-81, Reversing track end connectors.

### TANK, MEDIUM, M4A2

SNL G-104, Vol. 7, OSPE, C1 and C2.  
FSMWO G1-W4, Insulate accelerator pedal.  
FSMWO G1-W7, Towing shackle pin.  
FSMWO G104-W55, Control cam, hydraulic turret traversing mechanism.  
FSMWO G104-W69, Driver's compass.  
FSMWO G104-W81, Turret basket.  
FSMWO G104-W94, Vane sight.  
FSMWO G104-W96, Foot rest for foot firing switch.  
TB 700-51, Flame detector.  
TB 700-72, Bogie wheel bearings and seal.  
TB 700-81, Reversing track end connectors.  
TB 731B-2, Crankcase breather elbow.

### TANK, MEDIUM, M4A3

SNL G-104, Vol. 8, OSPE, C1, C2.  
FSMWO G1-W4, Insulate accelerator pedal.  
FSMWO G1-W7, Towing shackle pin.  
FSMWO G104-W55, Control cam, hydraulic turret traversing mechanism.  
FSMWO G104-W69, Driver's compass.  
FSMWO G104-W79, Generator, regulator and filter.  
FSMWO G104-W80, Lubrication magneto drive.  
FSMWO G104-W81, Turret basket.  
FSMWO G104-W85, Over-center clutch spring.  
FSMWO G104-W94, Vane sight.  
FSMWO G104-W96, Foot rest for foot firing switch.  
TB 700-51, Flame detector.  
TB 700-72, Bogie wheel bearings and seal.  
TB 700-81, Reversing track end connectors.  
TB 731G-5, Cylinder-head gasket.

### VEHICLE, TANK RECOVERY T2

SNL G-169, OSPE.  
FSMWO G169-W4, Transfer-case, drain and filler plugs.  
OFSB 6-G-169, Lubrication.  
TB 700-72, Bogie wheel bearings and seal.

## TRUCKS

TRUCK, AMPHIBIAN, ¼ TON, 4x4

TB 10-1263-5, Spare wheel.

TRUCK, BOMB SERVICE, M1

SNL G-85, Vol. 2, C3.  
SNL G-85, Vol. 3, Sec. 2, C3.

TRUCKS, DUMP

TB 800-15, Hydraulic pump.

TRUCK, LIFT, M22

SNL G-161, OSPE.

TRUCK, WRECKING, HEAVY, M1 (CORBITT)

SNL G-63, OSPE.

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

TB 795-3, Synchronizing dual ignition.



TRUCK, ¼-TON, 4x4 (FORD)  
TB 803-3, Alinement of carburetor air-cleaner tube.

TRUCK, ¾-TON, 4x4 (DODGE)  
TB 801-3, 2nd echelon tool sets.

TRUCK, 1½-TON, 4x4,  
(CHEVROLET)

TB 10-1557-1, Front spring rear hanger.  
TB 800-16, Brake pedal shaft.

TRUCK, 1½-TON, 6x6, (DODGE)  
SNL G-507, OSPE.

TRUCK, 1½-TON, 4x2 (FORD)  
FSMWO G540-W1, Oil filler pipe brace.

TRUCK, 1½-3-TON, 4x4, (GMC)  
SNL G-553, OSPE.

TRUCK, 2½-TON, 4x2,  
(INTERNATIONAL)

SNL G-541, OSPE.

TRUCK, 2½-TON, 6x6, (GMC)

OFBS 6-G-508, Lubrication.  
TB 10-1000-20, Clutch pedal adjustment.  
TB 801-3, 2nd echelon tool sets.  
TB 801-4, Removal of distributor suppression.  
TB 801-6, Prevention of interference between body channel and rear tires in vehicles having U-shaped cross numbers.

TRUCK, 2½-TON, 6x6,  
(STUDEBAKER)

OFBS 6-G-508A, C1.  
OFBS 6-G-630, Lubrication.

TRUCK, 4-TON, 6x6,  
(DIAMOND T)

OFBS 6-G-509, Lubrication.

TRUCK, 5-TON, 4x4 (C. O. E.)  
MACK

SNL G-639, OSPE.

TRUCK, 7½-TON, 6x6,  
PRIME MOVER, MACK

OFBS 6-G-532, Lubrication.

## TRACTORS

TRACTOR, MEDIUM

SNL G-151, OSPE (Caterpillar D-4)

TRACTOR, MEDIUM, M1

SNL G-69, OSPE. (Caterpillar RD-6).  
SNL G-99, OSPE. (International T-9, TD-9).  
SNL G-125, OSPE. (Allis-Chalmers HD-7W).  
SNL G-132, OSPE. (International TD-14 w/crane).  
OFBS 6-G-125, Lubrication instructions.

TRACTOR, MEDIUM, M4

SNL G-150, OSPE. (Allis-Chalmers).

TRACTOR, MEDIUM, M5

SNL G-162, OSPE.

TRACTOR, HEAVY, (Caterpillar D-8)

SNL G-153, OSPE.

TRACTOR, HEAVY, M1

SNL G-98, OSPE. (Allis-Chalmers HD-10W)  
SNL G-98, Sec. 10, LAP, Brake system.  
FSMWO G98-W3, Engine mounting brackets.

TRACTOR, HEAVY CRANE  
6-TON, M4

SNL G-126, OSPE. (Caterpillar D-7).

TRAILER, TRACTOR,  
CRANE, M6 & M12

SNL G-117, OSPE.

TRACTOR, LIGHT WHEELED,  
INDUSTRIAL TYPE  
(ALLIS-CHALMERS)

OFBS 6-G-94, Lubrication.

## No Can Do!

Please don't write to ARMY MOTORS for copies of Ordnance and AGO publications. We keep getting such requests—and we have to keep answering, over and over, "Alas, no can do."

We're tickled pink to supply the names and numbers of any publications you're puzzled about—but to get actual copies, your best bet is to follow the procedure outlined on page 220.

ARMY MOTORS has its hands full distributing just one publication. This is it.

## TRAILERS & SEMITRAILERS

TRAILER, ARMORED, M8

SNL G-157, OSPE.

SEMITRAILER, 3½ TON PAY-  
LOAD (BLACK DIAMOND)

SNL G-530, LAP, C1.

SEMITRAILER, 6-TON GROSS  
(GERSTENLAGER)

SNL G-569, OSPE, C1.

## MOTORCYCLES

MOTORCYCLE (HARLEY-  
DAVIDSON)

SNL G-523, OSPE, C1.

## BICYCLES

BICYCLES (ALL TYPES)

SNL G-519, OSPE.

## MAINTENANCE

WDC 198, Container markings — Petroleum products.  
WDC 202, Rescinding Circular WDC 384 (1942 series), on conservation of tires.  
WDC 211, Publications covering lubrication of Ordnance materiel.  
TM 5-267, Camouflage, Supplement 3.  
SNL H-1, C1, Standard hardware.  
SNL M-1, Electrical apparatus units and parts.  
OFBS 4-5, Modification of Ordnance materiel.  
OFBS 4-16, C1, Recoverable automotive items.  
OFBS 4-17, C3, Serviceability standards.  
OFSC 28, Bearings, ball, and roller: instruction charts.  
TB 700-56, Correcting windshield defroster—switch short circuit.  
TB 700-58, Mounting decontaminating apparatus, M2.  
TB 700-71, Sealing of bolted and riveted joints.  
TB 700-73, Combat vehicles: Engine crankcase drain periods.  
TB 700-76, Engines, gasoline and diesel: Oil-filter replacement elements.  
TB 801-3, 2nd echelon tool sets.

## STORAGE SHIPMENT AND ISSUE

WDC-177, Local purchase.  
WDC-182, Discrepancies in shipment.  
WDC-192, Obsolete SNL'S.  
WDC 198, Container markings—petroleum products.  
WDC-209, Local purchase.  
WDC-215, Local purchase.  
WDC-220, Supply of overseas commands.  
SNL M8, Chests, kits, racks, and tool rolls.  
SNL N-19, C2, Tool sets, motor transport.  
OFBS 2-2, Shipping tickets.

## TOOLS

SNL G-19, Interchangeability Chart of Organizational Special Tools for Combat vehicles.  
SNL M-8, Miscellaneous chests, kits, racks & tool rolls.  
SNL N-19, C2, Tool sets, motor transport.  
TB 801-3, Installation of 2nd Echelon tool sets.

## ADMINISTRATION

AR 850-15, Motor vehicles (revised 28 August 1943).  
WDC 180, Chart of responsibilities under AR 850-15.  
WDC 189, Movement of units within the Continental U. S.  
WDC 207, Motor transport responsibilities.  
WDC 210, Motor transport responsibilities.  
WDC 225, Changes to Tables of Equipment.  
WDC 230, Chart of responsibilities under AR 850-15.  
AGO Form 432, Tank and combat vehicle status report.  
OFSC 4 C1, Chevrolet Field Representatives.

## TRAINING

TC 104, List of publications.  
TB 106, List of films.  
WDC 177, Exemption of training films and film strips from property accountability.

## OPERATION

TC 107, Employment of mechanized cavalry units.  
WDC 189, Movement of units within the Continental U. S.



# PERPETUAL INDEX

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

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2C-Inside Front Cover, 3C-Inside Back Cover 4C-Outside Back Cover.



## Corrections on Last Month's T2 Story

Gear oils are O. K. for wheeled vehicles but tanks don't use the stuff. So, when we told you to use GO 90 for the winch power-take-off and the winch itself, in the T2 Battlefield Recovery Unit story (Sept.-Oct. issue), we were wrong. The correct lubricant for these two gear cases is OE 50 (plus 32° F and above) and OE 30 (plus 32° to 0° F). They should be drained and refilled every 6 months.

According to the T2 maintenance manual which just crossed our desk, you can get away with lubing the winch propeller-shaft universal joints monthly instead of weekly as we told you in the story.

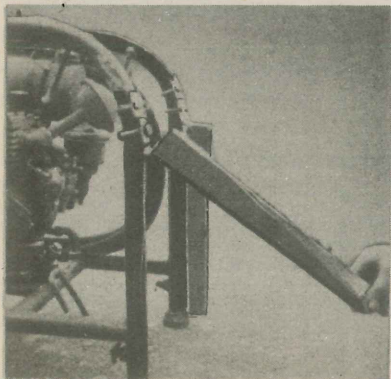
Incidentally, Figure 4 in the same article indicates no cover for the roller chain—well, there is one.

## THE NEW OFSB 1-1

(Continued from page 199)

If your outfit doesn't get one, though, it should ask the Ordnance Officer for it. He can get all he wants by requisitioning the regional Ordnance Publications Depot which regularly supplies him.

The latest Index to Ordnance Publications is being shipped every two months to Ordnance Officers everywhere. No organization which uses motor vehicles or weapons should be without it.



## HYDRAULIC FLUIDS

(Continued from Page 203)

and again you'll soon have no brake action. OH will clog the lines and rot the connections.

*The wrong fluid in Houdaille-type shocks:* None of the other three is heavy enough, neither SA Light nor HB nor OH. Any of these will flow too freely, fail to check the rebound, and will break a spring as easily as if you had no shocks at all.

*The wrong fluid in Delco-type shocks:* SA Heavy would clog the mechanism . . . the shock-absorber arm, trying to force it through, would fail and break. HB wouldn't lubricate them adequately.

*The wrong fluid in turret-traverses, dump-truck hoists, etc.:* Again, HB wouldn't provide adequate lubrication, and besides (like SA Light) it's a little thin for transmitting hydraulic power in this type of machinery. SA Heavy is out of the question; it'll gum up the works.

Order the right fluid by Item Stock Number or Federal Stock Number—and nomenclature, and you can't go wrong.

## DECONTAMINATOR MOUNTINGS

What, you didn't see TB 700-58? 'Way back last winter, ARMY MOTORS announced that a bulletin on the mounting of the Decontaminating Apparatus M2 on motor vehicles would be distributed to the field, and come spring, it was distributed.

However, judging from letters we've received, some of you missed it.

Full information on decontaminator brackets and how to mount them is published in TB 700-58, dated 28 May 1943. Your Ordnance Officer can get you one from the regional Ordnance Publications Depot serving him.

Up pops Sgt. Robert H. Fortin, of the 5th Infantry Regiment, our ever-contributing contributor, with another one. In his own words, 'this one was evolved after bruising our shins pushing around the air-compressor.'

'The purpose of the folding handles is for compactness (see Figs.), as when the air-compressor is loaded in a truck. Hinges are attached to the air-compressor frame, which is also the tank, by means of U-bolts. At the free end of the hinges, wooden handles are attached with stove bolts.'

## Connie Rodd Changes Her Mind

In our July issue, page 100, Connie Rodd breezily remarked that "you're not to perform the 100-hour service (on inline engines of light and medium tanks) after 100 hours of operation—perform it after 200 hours of operation."

Well, a gal's got a right to change her mind. TB 700-66, her alleged source of information, turns out to say nothing of the sort (as pointed out by T/Sgt. Lester M. Albertson, 101st Cavalry). Blushing prettily, our Connie takes it all back: "100-hour servicing means just what it says, boys. Do it at 100-hour intervals—not 200. And forgive me, just this once."

## Superseded "Lists of All Parts"

"Lists of All Parts" for the following motor vehicles have now been superseded by "Service Parts Catalogs" and you should be sure to have the listed SPC on your shelf of parts books if you maintain these vehicles. The vehicles are: Tanks, light, M5 and M5A1 (SNL G-103, Vols. II and VIII); Tank, medium, M4 (SNL G-104, Vol. VI); Truck, bomb service, M6 (SNL G-85, Vol. IV), and Carriage, motor 75-MM Howitzer, M8, (SNL G-127).

Incidentally, whenever you find a "G" Group SNL for the same vehicle as a TM 10-Series Parts Book, you can be sure the SNL has superseded the Parts Book even though you don't find any specific directions to that effect.





# • • NEWS FLASHES • •

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

Army Service Forces units should not act surprised if they receive new 1½-ton, 6x6, trucks even though their Tables of Organization and Equipment, or Tables of Allowances, specifically call for the 2½-ton, 6x6, cargo trucks. There's a directive just down from Headquarters of ASF authorizing this substitution, provided the 1½-ton, 6x6, can do the unit's work satisfactorily.

\* \* \*

Some of the GI dandies have been doing a complete repaint job on their vehicles too often, according to a recent report by the Deputy Director of Operations, HQ, ASF. There are only two reasons for having paint on the vehicles. 1) As a protective coating for the metal, wood, or fabric; and 2) for camouflage purposes. So rather than completely repainting vehicles, a touch up of exposed surfaces from time to time should be sufficient to protect the surfaces and restore the camouflage. The condition of the vehicle has to be damn serious before a complete repaint job becomes necessary.

\* \* \*

The freeze has been applied to another critical item—rubber tracks for medium tanks. They're not to be issued for continental U. S. The only way to get these tracks for domestic use is to send a request showing why they're needed, through channels to Headquarters, Army Service Forces.

\* \* \*

Out of the maze of different kinds of stock numbers, drawing numbers, piece mark numbers, and manufacturers' numbers that automotive spare parts have been known by in the past, comes a brand new number, the **Official Ordnance Parts Number**, a 7-figure symbol that will eventually put all the rest out of business. In addition to the advantage of giving you only one number by which to call a part, instead of

the former 5 or 6, it will automatically provide interchangeability in storage and issue, the experts tell us. They'll start appearing in SNL's within a couple of months, we hear.

\* \* \*

That "No Local Purchase" rule for automotive spare parts, equipment, and tools, is a little less strict, as a result of WD Circular No. 209, dated 13 September 1943. Now you can buy locally in a few rare cases, provided you meet these requirements:

1) Find a vendor who has the material you need **on his shelves**, ready for immediate delivery.

2) Prove to your Service Command Supply Point, Ordnance Depot, or Port of Embarkation, that the local purchase will release urgently-needed equipment from the deadline, or that it is essential for movement overseas or into a theater of operations. The Supply Point, Depot, or POE will either make the purchase for you, or give you authorization to do it. Without such authorization, you're stuck. Better dig out W.D. Circular 209 if you need more details.

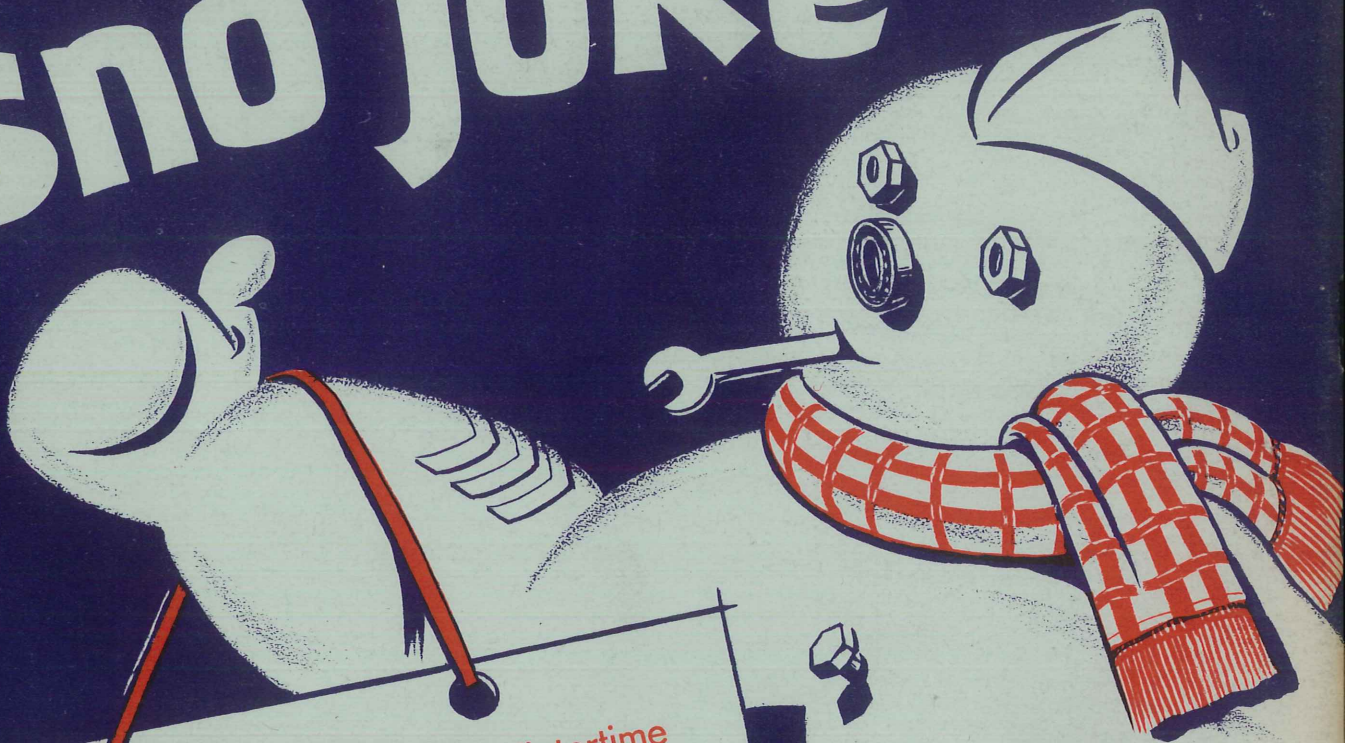
\* \* \*


Automotive Disability Reports are now submitted on a simplified form (W.D., I.G.D. Form No. 6) instead of the various forms formerly authorized. Instead of submitting them direct to the Inspector General, using organizations now send their reports to their Station or Depot Commander for consolidation. (AAF units under the jurisdiction of the air service command also submit a copy of each report to the area air service command under which they function.) Trailers are no longer included in the reports.


For details, see War Department Circular 231 (1943 series).




# 'sno joke



 Maintaining mobility in Wintertime can be pretty tough sledding. Sub-zero temperatures, snow and ice put the clammy whammy on everything that makes wheels and tracks turn.

 But there's one way to ease the freeze. Put the heat on PREVENTIVE MAINTENANCE - do it more carefully, more thoroughly, more frequently than usual.

 Don't let Winter stop you cold!

