

# ARMY MOTORS



## PREVENTIVE MAINTENANCE SERVICE AND TECHNICAL INSPECTION WORK SHEET WHEELED AND TRACK VEHICLES

Vehicle Nomenclature (MAKE)  
Special Instructions: See TM 9-2810, for details.  
Legend for marking:  
 -INSPECT & CORRECT,  
 6000-MILE MAINTENANCE  
 OR TECHNICAL INSPECTION  
 -Satisfactory



- 33 MANIFOLDS & HEAT EXCHANGERS (GASKETS) (SEASONAL SETTING)
- 34 AIR CLEANERS (DIESEL) (AIR CLEANER)
- 35 BREATHER CAPS & VENTILATORS
- 36 CARBURETOR (CHOKE) (THROTTLE LINEAGE) (GOVERNOR)
- 37 FUEL FILTERS, SCREEN & LINES
- 38 FUEL PUMP (VACUUM & PRESSURE)
- 39 STARTER (ACTION) (NOISE) (SPEED)
- 40 LEAKS (ENGINE OIL) (FUEL) (WATER)
- 41 IGNITION TIMING (ADVANCE)
- 42 ENGINE IDLE & VACUUM TEST
- 43 REGULATOR UNIT (CONNECTIONS) (VOLTAGE) (CURRENT) (CUT-OUT)
- 44 POWER TIRTS (DRIVE) (LUBRICATION)
- 45 NOZZLES & LINES
- 46 BODY ATTACHMENTS
- 47 TIRES & RIMS (VALVE STEEL) (CONDITION) (DIRECT) (MATCHING) (SPARE CARRIAGE)
- 48 HALF-TRACKS DO-100 (DRIVE) (SUSPENSION) (WHEELS) (SHOCKS) (BUSHINGS)
- 49 REAR BRAKES (DRIVE) (CYLINDERS) (CONE) (MAGNETS) (TEMPERATURE)

## New Words For Old

Some words have life and meaning, some words are dead. Say NICE JUICY GIRL to Joseph Dope - the eyes light up like a pinball machine, the tongue rolls out of the mouth and rattles loosely on the ground.

But say CHECK your gear cases, say CHECK your oil-bath air cleaner - the lacklustre eyes remain dull, the mouth hangs open like a trap for flies and the words echo hollowly against deaf ears.

For the word CHECK is a dead word and means little or nothing.

What's it supposed to mean? In *checking* the gear cases is the greaseball supposed to look and see if they're still there? Is he supposed to make sure that they haven't developed warts?

The trouble is that if the word CHECK ever did have a meaning, it has lost it.

So we say down with the word *check* - forget it, don't use it.

Instead, we say, start off the new Work Sheet program with a bang - let's use a new term: INSPECT AND SERVICE. And, lest this term too loses its meaning, we say define it, show exactly what it stands for.

What does it stand for?

The term INSPECT AND SERVICE stands for five little terms which a driver or a mechanic uses as a measuring stick in inspecting and servicing. These terms are: 'In Good Condition,' 'Correctly Assembled,' 'Secure,' 'Excessively Worn,' and 'Unusual Noises.'

But what do these mean?

A combination of showing and telling, makes their meaning clear:

**IN GOOD CONDITION** - Having once been shown what good condition of the particular part is, your man inspects to be sure it's not...bent or twisted...chafed or burned...broken or cracked...bare or frayed...dented or collapsed...torn or cut...or deteriorated.

**CORRECTLY ASSEMBLED** - Again, having been taught what the particular part looks like when correctly assembled, your man inspects to see that it hasn't been put together upside down or inside out. For instance, somebody might have installed the tie rod wrong side up - it might work all right in straight-ahead driving, but would interfere in backing up at an angle. A thrust washer might be grooved on one side for distribution of lubrication - the grooved side must be where the grooved side belongs.

**SECURE** - Hand-feel, testing with a pry-bar or wrench will tell your man whether locknuts, locking wires and washers, cotter pins, etc., are properly tight.

**EXCESSIVELY WORN** - You'll have to teach your man what excessive wear is - which is more or less hard, depending on the part. He'll have to recognize when a part is worn close-to or beyond the danger line and likely to fail in short order.

**UNUSUAL NOISES** - When into the natural noises of a vehicle creeps a strange and interesting boogie beat, the time has come to investigate - something's out of order. A driver is naturally familiar with the characteristic purr of his vehicle, urge him to report notes of discord immediately.

These are the five formulae gathered together under the meaningful term INSPECT AND SERVICE - they are the definition. Together with the specific servicing directions on the new Work Sheets and TM 9-2810 'Motor Vehicle Inspections and PM Servicing,' (you'll be getting it soon) they tell a man what he's looking for when he's looking for it.

Let's get away from the weasel-word CHECK.

### In This Issue . . .

May 1943

New Grease Fitting	33
Duty Rosters	34
Connie Rodd	36
Rumors	39
Standard Nomenclature Lists	40
Vesicant Detective	46
Time to Retire	48
The Month's Directives	53
Contributions	56
Half-Mast	59
Carburetor Plugs	62
News Flashes	Inside Back Cover



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# Ordnance Announces A ----

## New Grease Fitting

*Standard Fitting To Replace All Others in Future Production.*

**A** new, improved type of grease fitting, known as the 'Ordnance Lubricating Fitting,' has been developed and approved by the Ordnance Department. It will replace all other types of grease fittings on future production of Ordnance materiel.

The new, standard fitting is an improved modification of the regular 'hydraulic' or 'push-type' fitting now widely used on Ordnance equipment. It is interchangeable with the standard hydraulic type and can be serviced with the same hydraulic couplers currently provided on grease guns and lubricating equipment in the field. However, in order to provide a freer flow of lubricant, all future production couplers will have a  $3/32$ " outlet instead of the  $1/16$ " outlet now in use.

The figures below show the improvements in the new-style fitting and coupler (fig. 1) as compared with the old style (fig. 2). The lubricant inlet port, formerly  $1/16$ ", has been opened up to  $3/32$ ", which allows a freer and faster lubricant flow. The ball check is mounted flush with the head of the fitting preventing the entrance of dirt which, in the old-type fitting, could lodge in the passage from the head of the fitting down to the ball check.

In the new standard fitting, a special, non-clogging, non-collapsible type of spring is used to hold the ball in place. In addition to this, the new fitting body and head are much more sturdy than formerly, making the fitting less susceptible to damage. The rounded shoulder on the new fitting makes it easier to clean than the old type, and cleaner coupler-to-fitting contact is guaranteed by a slight shoulder on the head of the new fitting which permits a more positive grip by the fingers of the coupler.

$45^\circ$  and  $90^\circ$  angle bodies in the new fitting will provide angularity. The thread size of the new fitting will be  $1/8$ " P.T. in all cases - except for motorcycles which require a special thread,  $5/16-32$  N.F.T.; and universal joints, tie rods, etc. which require  $1/4$ " N.F.T. Since these last two are special cases and do not use fittings in great quantity, they will continue to be furnished the old-type fitting.

Although you won't be required to replace the old-type fittings now on your vehicles, with the new Ordnance Lubricating Fitting (since, as we mentioned before, the new fitting is scheduled for future-production materiel) you will be required to change over from the *button-head* and *pin-type* fittings. Instructions will be issued shortly directing you to make the change on these latter two types.

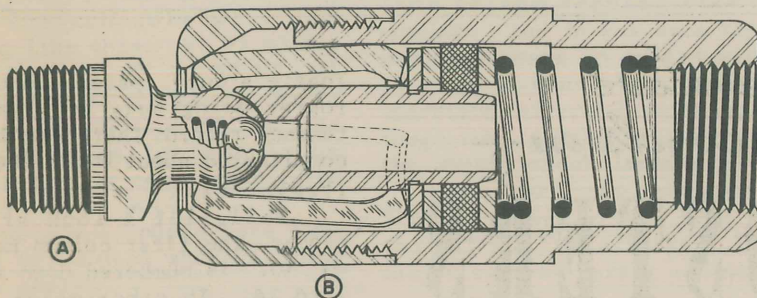


Fig. 1 - New Standard Ordnance Grease Fitting (A), Coupler (B)

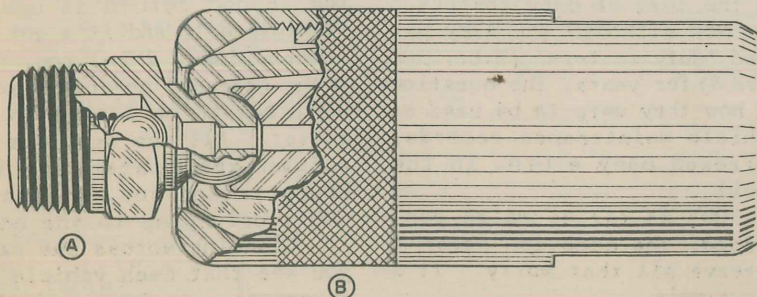


Fig. 2 - Old-type fitting (A), coupler (B) will be replaced in future production by new fitting above.

*Now that the new Work Sheets*—describing in detail the preventive-maintenance servicing to be performed by all echelons - have been made official and mandatory (by Change 3, AR 850-15, dated April 20, 1943, announced in the April ARMY MOTORS) a bright spotlight is thrown on the Duty Roster, W.D. A.G.O. Form 6.

For it is on Duty Roster Forms that you are required to keep a record of the preventive-maintenance operations detailed on the Work Sheets.

For this reason and because of requests for thousands of reprints, we herewith present a repeat performance of our October article, 'How to keep Preventive Maintenance Records on DUTY ROSTERS.'

Besides serving as a record of Work Sheet operations, Change 3 suggests that lubrication records also be kept on the Duty Roster form. There are two schools of thought on this subject: some people in the War Dep't say it's not necessary to keep a record of lubrications because lubrications depend too much on operating conditions and cannot be closely scheduled: after a run through a creek, you lubricate the assemblies affected by water no matter how recently those assem-

lies were lubricated.

In other words, all assemblies must be kept in the proper state of lubrication at all times.

The second school of thought says you've got to keep some kind of a record because some assemblies and vehicles are hardly ever - if ever - subjected to extreme operating conditions. Lubrication in this case will then depend on mileage covered or hours run. The only dependable way then to keep track of the miles or hours, is to put the

figures down on paper.

A convenient piece of paper is the Duty Roster.

So if you hold with the second school of thought that says keep a lubrication record, we suggest that you assign two lines of your Duty Roster to each individual vehicle: use one line to record the Work Sheet servicings, use the second line to record lubrication (fig. 2).

Now because you are the guy who's going to use the Duty Roster form for the purposes described above, you ought to have a chance to state your opinion.

Do you think the Duty Roster form is sufficient to handle the job? If not, why not? Can you think of a better form? Can you design a simpler one?

The War Dep't is all ears - shoot your letters in here to the ARMY MOTORS Magazine, and we'll see that it gets to the proper people.

## *How to keep Preventive Maintenance Records on...*

# DUTY ROSTERS

**O**n July 10, 1942, War Dep't Circular 223 came out with the announcement that Motor Vehicle Service Record Books were discontinued. You weren't going to get them any more, you weren't going to use them any more.

And, lest the primates among us be deluded into thinking that the announcement meant the end of regular, scheduled, preventive-maintenance operations, the Circular went on to say that necessary main-

tenance records would 'be kept in the form of duty rosters.'

Now although the Army has used 'duty rosters' (W.D., AGO Form 6) for years, the question of how they were to be used as vehicle maintenance records, furrowed many a brow in the field.

But as far as we're concerned, the question doesn't deserve all that worry. It's too simple.

Look at the little chart on the opposite page (fig. 1).

That's a duty roster - a duty roster doing duty as a maintenance record. There's nothing complicated about it, is there? (Yes).

Well, let's look at it closer. The first column headed 'No.' is numbered down from 1 to 14. In other words, 14 vehicles will be listed on this particular duty roster. The second column is headed 'Vehicle #W', and it's got the subhead 'GMC, 2 1/2-ton, 6x6' - the make and nomenclature of vehicles to be listed on the roster. All the way down the column are listed the USA Registration Nos. of the 14 GMC's belonging to the unit.

Glancing across the card, you see that each vehicle has 31 spaces - or days - allotted to it. In these spaces will be noted the preventive-main-

VEHICLE #	MOTOR VEHICLE P M S ROSTER. MONTH <i>May</i> YEAR <i>1943</i>																															No.				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					
G.M.C. 2 1/2 t 6x6 1 434561																																				
2 435531																																				
3 436521																																				
4 437231																																				
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8 433291																																				
9 437421																																				
10 439241																																				
11 437651																																				
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13 438765																																				
14 437672																																				

The Duty Roster used to record 'Work Sheet' inspections and services.

aintenance operations performed on the particular vehicle: 'W' (weekly), 'M' (monthly or 1000 mile), 'S' (semi-annual or 6000 mile). A numeral - 1, 2, or 3 after the W or M - notes whether it's the first, second or third weekly or monthly operation: Thus 'W1' means it's the first weekly operation since the preceding monthly operation; 'M2', the second monthly operation. For tank records on hourly basis, 'F' for 50 and 'H' for 100.

The schedule will run along like this: W1 W2 W3 M1, W1 W2 W3 M2, W1 W2 W3 M3, W1 W2 W3 M4, W1 W2 W3 M5, W1 W2 W3 S. The mileage at the time of the operation should be entered after each symbol: for instance, M2 3014.

Now with these keys in hand, the duty roster ought to read as pleasantly as a letter from home.

Of course, you've got to remember that one preventive maintenance operation doesn't cancel out the others. For instance, if a truck is getting the monthly checkup, there's no reason why the driver shouldn't at the same time give it the regular weekly checkup. And in the same way, you don't have to wait a week to give a truck the weekly operation. After a particularly tough run, a truck should get the weekly check immediately.

And that explains the little circles around some of the "W2's," "M1's," etc. The little circles merely indicate

that the particular servicing was performed out of turn. Of course, after performing one servicing out of turn, you don't go back to your schedule as originally set up - you carry on from the out-of-turn servicing as though it weren't out of turn at all.

Anyway that's the story of duty rosters. Don't be afraid of them. They're just a convenient form to keep your maintenance records on. One glance at the proper roster tells you which vehicles are due for what operation.

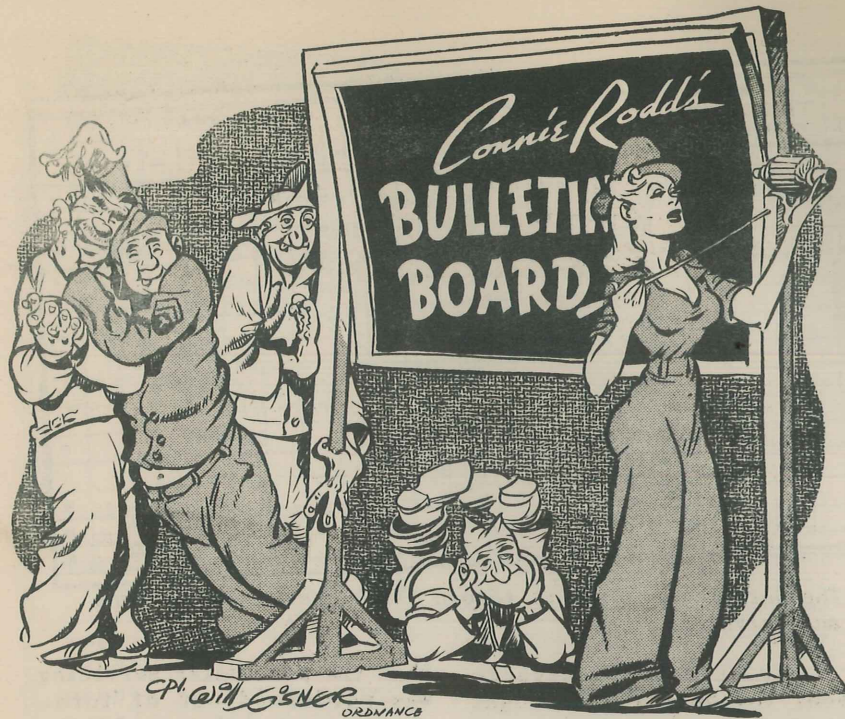
Here's a couple more symbols to be used whenever they apply:

- P - Deadlined for lack of parts
- A - Deadlined because of an accident
- O - Deadlined in an Ordnance shop

If you're going to use the Duty Roster as a lubricating record, as well as a 'PM Record,' give each vehicle two lines.

VEHICLE #	MOTOR VEHICLE P M S ROSTER. MONTH <i>May</i> YEAR <i>1943</i>																															No.				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31					
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## Heat Control

To avoid those cracked and warped exhaust manifolds so many of you ran into last year, get busy and set your manifold heat-control valves to the summer position (I'm talking to you guys in the temperate zones where summer is just a comin' in).

Your 3/4-ton Dodges (Motor Gun Carriage, M6), 2½-ton GMC's, etc. have manually operated heat controls which must be set by hand. Certain other of your vehicles like the 1½-ton Chevy, 1/4-jeep, etc., have a thermostatic heat control which, being automatic, doesn't require hand setting. Whether manual or automatic, set 'em - now!

## Bogie Rollers

Talking about rubber, you half-track men will be interested to hear what a new OFS Technical Bulletin has to say about the 'limit of service for bogie rollers.'

In order to get the most service out of the bogie rollers and still catch them

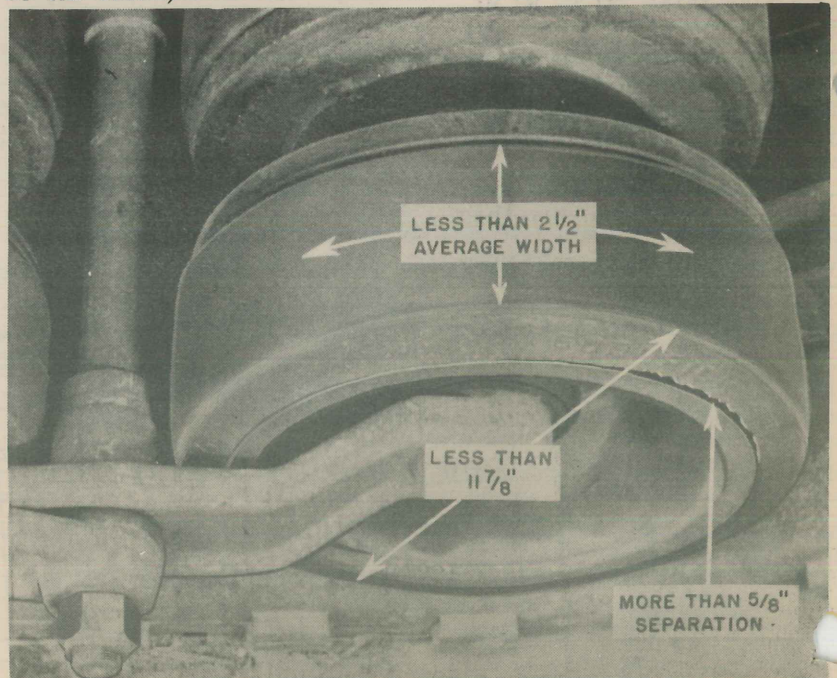
before they're too far gone for reclaiming, keep your bogie rollers in service until one or more of the following conditions show up - then change the bogie:

1) When the average overall width of the rubber tread (all around the circumference of the tread) is less than 2½",

change the bogie. To find the average overall width, measure the width of the rubber tread at six equally spaced points around the circumference of the tread - if the average width is less than 2½", change the bogie; 2) change the bogie when the average outside diameter of the tread is less than 11 7/8" (measured from the top of the bogie to the bottom, and measured at a couple of equally spaced points to find the average); 3) change the bogie if the rubber tread has pulled away from the metal base for a distance of 5/8 of an inch or more (measuring in and under the separation). Sand and grit lodging in separation, plus the action the bogies, will cause the rubber to be chewed up beyond repair.

When the tread is new and has its full width, wear is comparatively slow. But as the tread gets smaller, it exposes a smaller surface to carry the load and the rate of wear rises fast. So, after a certain point has been reached (2½" width, 11 7/8" diameter), the rate of wear is so fast the rubber disappears before you know it.

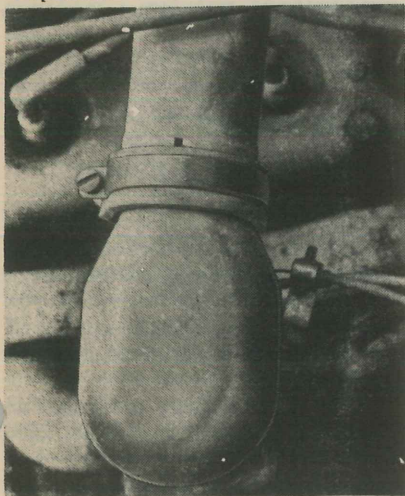
Don't waste materials by



changing your bogies before the above-mentioned happens; don't ruin them for reclaiming by neglecting to change them as soon as it happens.

## *1/4-Ton Air Hose*

That Fabre what's-goin' on-inside-the-engine analysis has discovered too much dirt, sand, and bits of hose in the crankcase oil of the 1/4-ton jeeps. The bits of hose are from the wide, flexible hose nearest the air cleaner - this hose when in bad condition, sheds and allows the sheddings to be drawn on down into the engine. Remedy: examine these hoses - especially on the inside - and if in bad shape, replace.



Dirt and sand is finding its way into the engine from the other side of the air pipe - at the connection between the two metal pipes (see fig.) nearest the carburetor. This connection is supposed to be sealed and held tight by the piece of rubber hose and a metal clamp.

However, the piece of rubber hose now doing the job is not wide enough to cover the slots in the metal pipe (the slots are in the longer, metal air-cleaner pipe to give it a little spring action and make the connection tight. The pancake air horn fits into it). The result is that a little

bit of the slot (or slots) may be exposed - thus serving as an entrance for dirt and sand.

**Remedy:** Shorten these slots in the metal air-cleaner pipe by brazing. Remove the metal clamp and rubber hose, clean off any paint or rust from around the edges of the air-cleaner pipe, fit the air horn into the air-cleaner pipe. Now the edges of the air horn will cover part of the slots in the pipe. You can see the trouble clearly - a section of the slot is exposed, permitting dirt and sand to enter. Close up as much of these slots as are exposed, by brazing.

Put the hose and clamp back on - check finally to make sure the slots are sufficiently closed.

Your authority for making this slight modification is a TB which will be out shortly - in the meantime you can go ahead with the job and save yourself some engine wear.

## *More on Saving Differentials*

Lieutenant Eugene A. Ehrlich, Co. H. 128 Ord. M.S. and E. Reg't, Atlanta Ordnance Depot, adds a footnote to my little February article on preventing further damage to an already injured front axle.

Mulling over what I said about keeping the front differential from turning by removing the drive flanges and disengaging it in the transfer case, Lt. Ehrlich points out that I did not say, remove the

front propellor shaft. "This is all well and good in normal operation," says Lt. Ehrlich, "however, should it become necessary to use low range, it will be impossible to shift into low range without first engaging the front-wheel drive. To keep the front-axle differential from working then, it will be necessary to remove the front propellor shaft."

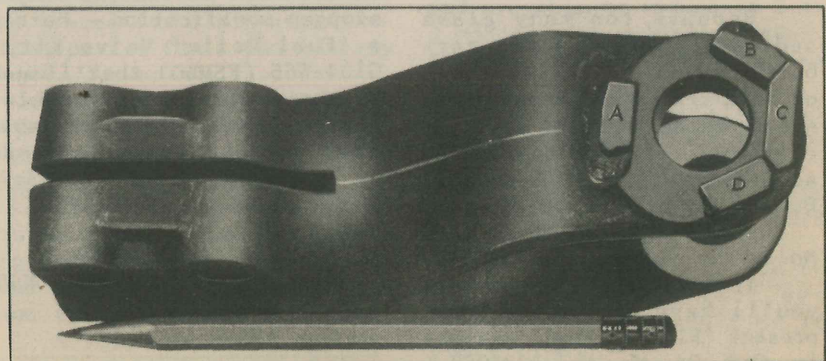
Right, Lieutenant, and to keep your eyes just as sharp as they are now, I am forwarding a special art-photo of me in the nude. (I am curled up cozily on a velvet pillow and the photo was taken of me when I was four months old.)

## *Saving Tie-Rod Ends*

From Fort Shafter, Hawaii, by way of the Tank-Automotive Center, comes a four-star idea for improving the tie-rod ends of the 2½-ton GMC and 1½-ton Chevrolet.

The tie-rod end on these trucks has a small lug at the point marked (A) in figure 1. A flat surface is machined on this lug which is adjacent to the tie-rod bolt hole, for the purpose of preventing the hex-headed bolt from rotating in the hole, thus preventing wear on the forging itself. In rough operation, however, the bolt binds in the tie-rod bushing and shears this small lug from the forging.

To do the job of the small lug and do it better, Staff Sergeant Carl D. Standard and



Private Charles Ryan, Motor Maintenance Shop, 15th C.A., arc-welded four pieces of 1/4" key stock at points A, B, C and D (see fig.) to fit against the four sides of the bolt head to prevent rotation.

The TAC recommends it highly and says you can go ahead and make this modification without a formal Field Service Modification Work Order.

## Driver - Mechanics Award

I finally got my pretty claws on the Federal Stock Nos. of the Drivers' and Mechanics' Award (authorized by War Dep't Circ. 248, July 28, 1942) which I've been beating my gums about so long (page 346, February ARMY MOTORS). Here's the nomenclature and Nos. of the badge and the bars:

'BADGE, Qualification,  
Motor-Vehicle Driver, Mechanic,  
71-B-197-50

BARS, Qualification,  
Driver-W.....71-B-1212  
Driver-T.....71-B-1213  
Driver-M.....71-B-1214  
Mechanic.....71-B-1229

The awards were supposed to be ready for delivery to the depots back in February, so if you request them through your local QM officer, you'll probably get them without much trouble.

## Sediment Bowl

Because too many glass sediment bowls (in the carburetor fuel-filter assembly of half-tracks and scout cars) are breaking, a metal sediment bowl has been made available, according to an OFS Technical Bulletin to be issued soon.

The Ordnance Piece Mark No. of the old bowl is A214577.

To make the changeover, you'll have to remove your present 'Filter, Fuel, Assembly, Ord. Pc. Mk. No. A225980,'

and install 'Filter, Assembly-Gasoline, Ord. Pc. Mk. A226202.' (In other words, to make the changeover to the glass bowl, you have to change the entire filter assembly which includes the bowl.)

Be careful to properly seal and tighten all connections to avoid leakage at the joints.

By the way, in searching through SNL G-67 (Scout Cars, M3A1), I find that the new metal sediment bowl is already standard equipment on this vehicle - however, you may have an earlier model with a glass bowl; make the changeover as per above.

## Fuel Relief Valve

In March, we told you (on page 379) about a strainer screen that you were to add (by FSMWO G 104-49) to the fuel relief valve of the Continental radial engines in your medium tanks (M3, M3A1, M4, M4A1) and motor carriages (T14, M12, M7).

The strainer screen, we told you, was a temporary expedient to prevent pieces of metal that broke off of the fuel relief guide (because of vibration) from passing on into the Romec fuel pump and busting it up.

The question that no doubt entered your mind was: how about something that'll keep the fuel relief guide from breaking in the first place?

That's what we have now - the strainer screen was only a stopgap modification - here's a 'Fuel Relief Valve Kit,' G104-W65 (FSMWO) that'll get to the root of your trouble. The kit which is now available from the Ft. Wayne Ordnance

Depot, Detroit, Michigan, includes the following parts (see fig.):

1 Fuel Relief Gasket	B155785D
1 Fuel Relief Guide	B155785B
1 Fuel Relief Spring	B155785E
1 Fuel Relief Stem	B155785C

Remove the old parts and install the new.

**Caution:** The new installation requires a different fuel pressure from the old. The new pressure is to be set at 4½ lbs. at 1000 rpm with full fuel tanks.

Because somebody else may not be able to tell whether the job was done, paint the fuel-relief-valve cap red to serve as a 'be it known to all men....'

P.S. If by this time you haven't installed the strainer screen of our previous story, forget it, you don't need it. If you have installed it, also forget it.

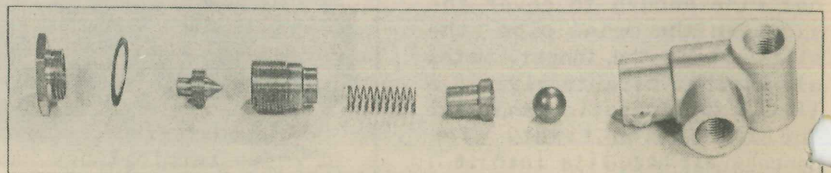
## Medium Tank Dipstick

Here's an additional word from an OFS Technical Bulletin on my March item warning you about the incorrect scale of some of the medium-tank dipsticks.

It seems that the Medium Tanks, M4, M4A1 were manufactured with three different types of engine oil tanks. On the first type of tank, the oil-level gage was threaded into the top of the oil tank; on the second type, a 6-1/4-inch filler pipe was added to the oil tank; and on the third type, a 13-1/4-inch filler pipe was added to the oil tank.

On this last type - with the 13-1/4-inch filler pipe - the oil-level gage B200157 was,

(Continued on page 64)





The Daily Activity Report of the Maintenance Branch, Washington, D. C., reports that action to have electric brakes removed from 105 mm Howitzer Carriages is being taken at request of AGF. Decision reached is that power brakes will not be required on towed vehicles of less than 5000 pounds. Limit formerly was 3000 pounds. An FSMWO is being prepared to effect removal of brakes from carriages in the field and efforts will be made to use interchangeable parts and assemblies on brake mechanisms of larger guns. Publications Sect., Exec. Br., is being requested to change SNL's and technical manuals to conform with the brake removal.

\* \* \*

We hear that certain solvents for 'tuning up sluggish engines', and for 'protection against rust and gum in motors and fuel systems of vehicles stored or seldom used', have been locally purchased and are being used in the field. Because we don't want to slander any of the commercial solvents, we won't give you a list of names — but if you have any commercial preparation supposed to be added to crankcase oil for purposes of 'cutting sludge and engine deposits, don't use it. As you well know, the engine oil we are now using is detergent-type oil which takes care of 'cutting' engine deposits and sludge formation. It's strictly against the law (by TC 32, May 22, 1942, among other directives) to use patent additives in Army engine oil. Don't! Put those bootleg additives back on the shelf.

\* \* \*

Here's news of production changes that's come our way:

Ford is galvanizing the tire bead locks on the 1/4-ton combat wheels to discourage rust and ease tire-changing.

The cab of the Ford 1 1/2-ton 4x2, is being reinforced to overcome floor-pan breakage and damage to the under-seat fuel tank. Also on the ton-and-a-half, spare tire-carrier



stops are being eliminated to save the carrier from punishment when the wheel is removed.

To save steel and improve ground clearance on the Dodge 3/4-ton weapons carrier, the panel skirt across the front of the body and on the sides ahead of the rear wheels is being shortened several inches.

GMC 2 1/2-ton's are getting the new Spare Parts kit (in production). The kit, by the way, includes such handy little gadgets as tire-valve caps and cores, assorted cotter pins, shear pins, friction tape, lamp bulbs, iron wire, fan belt, spark plug, and spark plug gasket.

Willys 1/4-ton's, scheduled for subzero operations, are being equipped with improved cold-starting field kits. Changes, based on tests in the frozen North, include relocation of the stove and modification of its chimney.

Willys-Overland Corp. has been equipping its 1/4-ton's with a crankcase ventilation system since February (with some exceptions). Information we have so far is that a crankcase ventilation kit will not be issued for field installation on 1/4-ton's you already have.

Willys has also been using synthetic tire casings on 1/4-ton trailers since early April or thereabouts.

These little windshield bumpers on the hood of both Ford and Willys 1/4-ton have for some time now been wood and fabric instead of rubber.

A radio terminal box has been supplied on all Willys

Model MB's since March except MB-NOM-12 (Marine jobs with 12-volt auxiliary generator). One end of cable, says Willys, attaches to the live side of the starter switch and the other goes to the outlet box. The box contains a condenser to ground noise.

To make the ring gears on the 3/4-ton Dodge and the new 1 1/2-ton, 6x6 Dodge interchangeable (expect to have a story on the new 1 1/2-ton, 6x6 Dodge soon), the size of the ring gear on the 3/4-ton has been increased.

As for motorcycles — they are conserving metals like mad. Don't be surprised at anything you find on them.

\* \* \*

Here's a letter from Lt. R.P. Seaman, Ft. Lawton, Wash. opening an old wound.

Dear Editor:

This may be an old subject to you but it's new to me. Many Army drivers are 'Shifting Down' each time they stop a vehicle (other than a passenger car) on level or sloping roads. Drivers go through successively lower gear ratios and are able to reduce to 2 or 3 mph without using the brakes. Reasons have been given to me as follows:

1) 'Brake pedals, oil line fittings, cylinders, linings, and drums are conserved.'

2) 'I was taught to stop that way each time, at drivers school.'

3) 'I was taught how to 'Shift Down' and will get rusty at it if I don't do it every time.'

(Continued on page 64)



# Standard Nomenclature Lists

**They give you Parts Lists, Allowances, Parts Common, Stock Nos., Tool Lists — are you sure you're getting full benefit from the system?**

Back in the early days, somebody in Ordnance suddenly realized that maybe everybody better start calling a trigger a trigger instead of, say, a spade or some other stupid nomenclature.

So Standard Nomenclature Lists were born.

Standard Nomenclature Lists were a list of all the parts used in a particular piece of equipment and each part was called by its official name.

Thus when you ordered a 'Trigger, knurled-grip, alloy steel, #30987,' you got a 'Trigger, knurled-grip, alloy steel, #30987,' and not a 'Chamberpot M1, Safety-type, quart, #34532.'

Since that time, the complexity and variety of Ordnance materiel has grown, the character of war has changed, and the whole maintenance picture has blown up to giant proportions.

The SNL's changed and grew too. From a small beginning as a simple parts listing, they grew to include a variety of statistics and controls. Today, your SNL may tell you anything from how many spare parts a company needs to maintain 'X' number of vehicles for a 12-month stretch in the field, to what to do with captured enemy materiel.

Although it's hard to pin a label on anything as variously useful as the SNL system, Ordnance Field Service Bulletin 1-8 says SNL's are 'primarily lists of parts and equipment for use in the requisitioning, supply, and procurement of

Ordnance materiel.' Those of you who have been used to dealing with maintenance manuals and parts lists, will more easily grasp what SNL's are if we say: *SNL's are parts lists with military characteristics.* Anything like vehicles, tools, guns, ammunition, etc. that requires a listing and/or a breakdown of parts, gets an SNL.

The SNL's are supplementary to the Tables of Organization, Tables of Equipment, Tables of Allowances, and Tables of Basic Allowances. They give the *details* of allowances not shown in these tables.

The 'military characteristics' nature of SNL's is: 1) the fact that they are broken down into books for convenient handling by the different echelons — that is, the second echelon gets only the chunk of the particular SNL it needs to work with (the breakdown of a complete SNL is shown on the opposite page); and 2) each book of the SNL contains many useful and vital statistics such as:

Proper identification of all parts — including nomenclature, piece marks, and drawing (blue-print) numbers.

Pictures of parts and the complete major item or items.

Prices.

Lists of equipment and parts issued to the using arm (organizational spare parts, organizational equipment, etc.)

Addenda showing how many

parts and what equipment will be needed by the various echelons to maintain a stated number of major items or assemblies in a theater of operations over a given period of time.

Special notes concerning specific items and parts.

How is the SNL system organized? Aside from the convenient breakdown into books, shown on page 2, what is the meaning of all those letters and numbers you see, like 'SNL G-104, Volume VII, Section 1, 2, 3, 4,' etc.?

Basically, the SNL organization is alphabetical. All Ordnance materiel is classified (by SNL's) into 19 'groups' — each group designated by a letter. Following are the materiel groups and designating letter:

- A. Automatic guns, cannon smaller than 57-mm, 60- and 81-mm mortars.
- B. Small arms (not automatic), hand arms, etc.
- C. Light and medium field artillery (57-mm guns through 155-mm howitzers).
- D. Heavy field artillery (155-mm guns and up); heavy anti-aircraft artillery (3-inch and up).
- E. Railway and permanently emplaced (seacoast) artillery.
- F. Sighting and fire-control equipment.
- G. Motor vehicles (tanks, tractors, trucks, etc.).
- H. Standard hardware, etc.
- J. Standard tools, etc.

(Continued on page 42)



- K. Cleaners, lubricants, welding supplies, etc.
- L. Targets and target materials.
- M. Electrical apparatus, miscellaneous kits, etc.
- N. Sets of special-use equipment (e.g., tool sets for Ordnance maintenance companies). All items are cross-referenced to other groups.
- P, R, S, T. All types of ammunition, including bombs.
- Z. Captured enemy materiel.
- 008. Obsolete general supplies.

Wheeled and track men will of course, be especially interested in Group 'G' (motor vehicles) - also Group 'H' (standard hardware); 'J' (standard tools); 'K' (cleaners, lubricants, welding supplies, etc.); and 'N' (sets of special-use equipment. Group N, by the way, contains the 'Motor Transport Tool Sets', by echelons, and the specialists' tool sets).

Understanding the significance of the letters, SNL 'G', the numbers that follow the letters will begin to make sense; each piece of equipment in a group has its own number SNL G-1, SNL G-2, etc. The SNL group and number for Medium Tanks of the M3 and M4 series, for example, is SNL G-104.

The question enters your mind, "What about the different variations of M3 and M4?" How, for instance, do you find the M4A2?

For the different models of Medium tank, there are 'volumes' within SNL G-104: Volume I, II, III, etc. Thus SNL G-104 *Volume VII*, takes care of the Medium tank M4A2. Same with different models of other pieces of equipment.

Just as the Technical Manual is broken down into 'Engine' 'Clutch,' 'Fuel System,' etc., the 'Volume' that takes care of your particular model of vehicle, is also broken down into 'Sections' for easy reference: Section 1, 2, 3, 4, etc. 'Section 1' of SNL G-104, Volume VII, covers 'Ammunition Storage, Tool and Equipment Boxes;' 'Section 2 covers Auxiliary Generator,' etc.

The first book of an SNL usually carries an index to the sections - showing which deals with what.

What at first appeared to be an elaborate system of man-traps and booby busters, should now begin to make sense. The SNL system is ingenious and easily understood once its basic principles are explained - it's a system that has grown to fit man's growing needs.

Another key to the SNL system which tells you exactly what vehicles are covered by what SNL's, is the 'Ordnance Publications for Supply Index' (OPSI). OPSI lists all the SNL's or portions of SNL's now in existence or in preparation - including Changes - and indicates by an asterisk whether an SNL is distributed to all arms and services or whether it is limited to Ordnance personnel (no asterisk). Look in OPSI under 'Truck, 2½-ton, 6x6, (GMC),' and you find that the 2½-ton GMC is covered by SNL G-508. SNL G-508, then, is the SNL for the 2½-ton, 6x6, GMC.

However, looking closer, you find that only the 'Organizational Spare Parts and Equipment Book,' published Jan. 11, 1943, of SNL G-508 is available. The fact that the other books are not yet available is shown by the lack of a publication date.

This raises another question: How come only the 'Spare Parts and Equipment' section of the SNL for the 2½-ton GMC has been published? What about the rest of the SNL for this vehicle - the 'List of All Parts,' the 'Service Parts Catalog,' and the 'Addendum?'

The answer is that it takes a long time to prepare a complete and accurate SNL - and since the old QM vehicles were taken over by Ordnance at one fell swoop (with a giant-sized fell-swooper built especially for the occasion), it has, of course, been impossible to prepare complete SNL's for each of these vehicles.

However, the more urgently needed portions of the SNL's

are being rushed on both the former QM vehicles and also on new vehicles being developed by Ordnance. As it stands now, the 'Service Parts Catalog' \* is usually the first book of the SNL written on new vehicles to enable you to identify parts used for maintenance. On the ex-QM vehicles, since the Parts Lists ('10-series' TM's) will serve as 'service parts catalogs,' priority is being given to the 'Organizational Spare Parts and Equipment,' and the 'Addendum.'

Incidentally, the revised OPSI now in production (superceding the Feb. 1 edition) will carry SNL numbers of all the former QM transport vehicles.

The way we see it, there's a distinct possibility that some portions of some SNL's will never be issued. The 'List of All Parts,' for instance, is such a tremendous job and has such comparatively limited use, that for many vehicles, it will never see the light of day. But we're only guessing.

The question of who gets what portions of the SNL's is answered in detail on page 41: arms and services responsible for 1st- and 2nd-echelon maintenance of Ordnance materiel usually need the 'Service Parts Catalog,' and the 'Organizational Spare Parts and Equipment' covering their particular vehicles and equipment; Ordnance organizations responsible for 3rd- and 4th-echelon maintenance need the 'List of All Parts,' and the 'Addendum' - *providing, of course, that these portions of the SNL have been prepared and are available.*

Follows a brief picture of what each of the four books of the SNL are, what juicy information they contain, and what they can do for you:

#### LIST OF ALL PARTS

The 'List of All Parts' is a very bulky publication indeed.

\* A comparative newcomer to the S family, Service Parts catalogs will be issued with all future vehicles and similar equipment instead of Parts Lists.

NOTE SYMBOL	ITEM STOCK NO	FIGURE NO	PIECE MARKS OR DRAWING NUMBER	NOMENCLATURE	QUANT PER UNIT ASSY	UNIT PRICE
	CV-3659563 CV-3660103	2-1		ARM, front axle steering knuckle ARM, front axle steering knuckle, w/TRUCKION, assembly (Composed of: 1 CV-3659963 ARM 1 CV-3659685 TRUCKION)	1	(1)
	CV-3659725			AXLE, front, w/wheel HUB, assembly (Composed of: Y 1 CV-3660103 ARM, assembly Y 1 CV-3659776 BALL 4 TDM-41286 BEARING, assembly 2 TDM-398-A BEARING, assembly 2 TDM-33275 BEARING, assembly 15 CV-3659927 BOLT 2 CV-3659776 BOLT Y 1 CV-3659907 BRAKE, L.H., assembly Y 1 CV-3659908 BRAKE, R.H., assembly 1 CV-3661199 CARRIER, assembly Y 1 CV-3662020 CLIP Y 1 CV-3661853 COVER, assembly Y 2 CV-3659267 DEFLECTOR Y 1 CV-3660790 DRUM, assembly Y 2 CV-119512 FITTING 2 CV-3659930 FLANGE, assembly 2 CV-3659733 WASHER 1 CV-3652245 GASKET Y 1 CV-3659746 HOUSING, assembly Y 1 CV-3664376 HUB and DRUM, w/COIL and SPAL, group assembly	(1)	(1)

Fig. 2 - A page from a 'List of All Parts.'

For vehicles, it is broken down into separately-bound sections, each covering a group of related assemblies and each giving every part, down to the most insignificant nut, bolt, and gasket. It identifies them completely - by name, number and illustration.

For instance, you'll find, (in fig. 2) a sample page from Section 2 (the front-axle booklet) of the List of All Parts, SNL G-85, 'Truck, Bomb Service, M6 (Chevrolet).' This is one of 20 separate booklets comprising the List of All Parts for this vehicle.

Notice the column arrangement. Reading from left to right, we have, in Column 1 - 'Note Symbol:' any special notes or information pertaining to the part are indicated in this column and are explained at the end of the Section.

The 'Item Stock Nos.' in Column 2 were not available at the time this particular List of All Parts was prepared. The 'Item Stock No.' is of four-star importance because it's to be used in preference to any other number in requisitioning parts. In this case, the omission isn't

disastrous - the Item Stock No. can be found in the portion of the SNL we'll examine next - the 'Service Parts Catalog.'

Note that the Item Stock No., when available, is derived from the SNL designation 'G' and the SNL 'No.'; the number under 'Sect.' is the bin section number which tells the depot where the part is stocked; and finally, 'the Item No.' is the individual number given to the item.

The item stock number SNL 'G' number designation is derived from the first SNL in which the part was coded. It does NOT mean that the part is used ONLY in that SNL. Every other time the part is used, no matter what vehicles, it will be given this same item stock number with the same original SNL 'G' designation.

'Figure No.' in Column 3, refers you to a picture of the part which is shown

on another page of the List of All Parts.

'Piece Marks or Drawing Number' - divided into 'Ordnance,' Column 4, and 'Manufacturer,' Column 5 - simply means that there's a blueprint of the part in either the manufacturer's or Ordnance's files (depending on whose number is given). The 'CV' in Column 5 stands for Chevrolet. An explanation of such letters is usually carried in the back of the Section together with the Notes mentioned above.

Column 6 contains the name of the assembly - the official name. The assemblies are also broken down into sub-assemblies and parts in this column, with manufacturer's and unit manufacturer's numbers given. (The footnote '1' explains, at the bottom of the page, that more information on this assembly is provided in Section 5).

Column 7, shows the 'Quantity Per Unit Assembly,' and Column 8 gives the 'Unit Price,' (due to fluctuations, prices have sometimes been omitted recently. For purposes of accountability, you'll simply have to estimate.)

GROUP 10 - FRONT AXLE						1000-1002	
Fig No	Item Stock No.	PART NUMBER		DESCRIPTION	Quant Per Unit Assy	Unit Price	Weight Pounds
		Ordnance	Mfg.				
	GNS-31-00140		3659725	1000-FRONT AXLE ASSEMBLY Front Axle and Wheel Hub Assy.	1	621.00	
	GNS-31-00100 GNS-31-00100 GNS-31-00100		341830 3652256 604143	1001-FRONT AXLE HOUSING Gasket, Axle Filter Plug Gasket, Axle Housing Cover Gasket, U-Joint, Steering Knuckle	2 4 1	.00 .01	
10-2				(Composed of the following items not listed for service separability): 1-3659608 Axle Housing Outer End Seal 1-3659641 Axle Housing Outer End Seal Retainer Gasket 1-3661407 Axle Housing Outer End Dust Seal 1-3661608 Axle Housing Outer End Dust Seal Spring 1-3659644 Steering Knuckle Sprocket Gasket			
	GNS-31-00960		3602231	1002-DIFFERENTIAL AND CARRIER ASSEMBLY Bearing Assy., Differential Sub-Car (By R.V.11928.2) Carrier and Cap Assy., Differential Carrier Assy., Differential (Complete) Lockwasher (2) Screw, Hex. Hd. (1/2" x 20 x 1 1/2") Screw, Hex. Hd. (1/2" x 20 x 1 1/2") (Note: Use only stock on hand of 10/19/53 before being 3651199)	1 2 1 1 10 10 6		162.70
10-1	GNS-31-00720		3652274	Dowel, Differential Carrier Bearing Cap	1		.09
10-1	GNS-31-00800		3602230	Gasket, Differential Carrier	1		.01
10-1	GNS-31-00720 G122-1-21422 G122-1-21422	HEXCU	315672 121367 190475	Lockwasher, Adjusting Nut Lockwasher (2) Nut, Differential Adjusting	1 1 2		.07
10-1	GNS-31-00800 GNS-31-15611 GNS-31-12230	DCAXAH	375665 3602254 131106 3602254	Screw, Hex. Hd. (1/2" x 18 x 3/4) Screw, Differential Adjusting Screw, Hypoid Drive Gear Thrust Pad Screw, Differential Carrier Bearing Cap Lockwasher (1 Heavy)	1 1 1 1		.79
10-1	GNS-31-12230 G122-1-01662 GNS-31-13000	HECKM	123174 094435	Screw, Differential and King Gear Lockwasher (17 Heavy) Nut, Differential Gear, Spider and Thrust Washer (Composed of the following items not listed for service except those designated by #) 1-3602254 Differential Spider 1-065550 Differential Sub-Car and Carrier Assy. #2-3651125 Differential Sub-Car Thrust Washer #1-3699926 Differential Pinion Thrust Washer Differential Pinion Thrust Washer Differential Sub-Car Thrust Washer	1 1 1 1 1 1 1 1 1 1 1 1		2.13 11
10-1	GNS-31-13000 GNS-31-13000		3602254 3651125	Differential Pinion Thrust Washer Differential Sub-Car Thrust Washer	1 1		.01

Fig. 3 - A page from a 'Service Parts Catalog.'

The List of All Parts is a wonderful thing to behold, but its greatest asset (completeness) is its greatest drawback for field use. It's just too bulky for easy handling. A complete List of All Parts for one vehicle adds up to a couple-dozen booklets in fine print. Therefore it seldom gets farther afield than the Ordnance heavy maintenance, base shop, or depot organizations.

**SERVICE PARTS CATALOG**

Hence we have the second book of the SNL: the 'Service Parts Catalog.' This is a short form of the List of All Parts, and includes only serviceable parts whether or not they are purchased - the 'unit replacement' parts as opposed to 'repair and overhaul' parts. Aside from that, the Service Parts Catalog is very much like the List of All Parts.

Compare the Service Parts Catalog page (Fig. 3) - from a book that resembles an ordinary vehicle Parts List - with the page taken from the List of All Parts (Fig. 2).

The column arrangement is somewhat the same except for the last column which gives you the weight of the unit.

**MAINTENANCE PARTS FOR 100 CARS, SCOUT, M3A1 (Cont'd)**

NOTE SYMBOL Col. 1	ITEM STOCK NO. Col. 2	PIECE MARK OR DRAWING NUMBER		NOMENCLATURE Col. 5	12 MOS. FIELD MAINTENANCE Col. 6	MAJOR OVERHAUL AND DISTRIBUTION Col. 7	UNIT WEIGHT (LB) Col. 8
		ORDNANCE Col. 3	MANUFACTURER Col. 4				
				<b>SECTION 01. ENGINE GROUP (Cont'd)</b>			
				<b>GROUP 0101. CRANK CASE, CYLINDER BLOCK AND HEAD (Cont'd)</b>			
				<b>COVERS AND GASKETS (Cont'd)</b>			
	G067	12	01127 A163217	WI-96429			
	G067	12	01150 A229781	WI-373822			
				SCREW, valve plate cover	12		28
				SEAL, timing gear cover, assembly	32		68
				<b>CYLINDER AND CRANKCASE ASSEMBLY</b>			
	G067	01	01155 A171657	WI-96329			
	G067	12	00270 E2863	WI-373830			
	G102	01	02688 A215134	WFA1827X			
	G102	02	04666 A226018	WI-A16094X			
	G067	12	00865 A144587	WI-61530			
	G067	12	00895 A144588	WI-26473			
	G102	01	02685 A167563	WI-A1622X			
				<b>CYLINDER HEAD</b>			
	G067	12	00500 C68991	WI-326035			
	G067	12	00650 D38036	WI-352046			
	G067	12	00110 A144647	WI-41454			
				GASKET, cylinder head	68		132
				HEAD, cylinder	4		4
				SCREW (cylinder head)	36		68
				<b>GROUP 0102. CRANKSHAFT AND BEARINGS</b>			
				<b>CRANKSHAFT</b>			
	G067	12	00350 D36775	WI-321169			
				CRANKSHAFT, assembly	4		8

Fig. 5 - A page from an 'Addendum.'

(Don't let that 'Item Code No.' fool you, it's just the 'Item Stock No.' by another name.)

But the big difference is that instead of taking up space with the complete breakdown of axle parts, the Service Parts Catalog lists only the axle assembly and a few minor, easily-replaced parts - which is all you need, since you re-

place axles as a unit in field maintenance - you don't rebuild them.

Look long at the numbers in the second column - these are the Item Stock Nos., the numbers that guarantee that you'll get the kind of axle you request when you send in a requisition.

The Item Stock Number is used in preference to all other numbers when ordering parts under the Ordnance system of supply. When the Item Stock Number is available, it is even used instead of the Federal Stock Number or manufacturer's number that was required for parts identification when motor transport supply was a Quartermaster function.

Of course when the Item Stock No. is not available, use whatever number is available - manufacturer's number, Ordnance number, etc.

As noted before, the first section of the number (G85) identifies the part as itemized in SNL G-85. The second (31) locates the bin section number for the convenience of the depot. The final section (00480) is the individual item number.

Except when rushed out preliminary form, the Service

**ORGANIZATIONAL SPARE PARTS**

PIECE MARK OR DRAWING NUMBER Col. 1	NOMENCLATURE Col. 3	UNIT WEIGHT, POUNDS Col. 4	NUMBER OF SPARE PARTS CARRIED														
			COMPANY						REGIMENT OR SEPARATE BATTALION								
			No. OF VEHICLES		No. OF VEHICLES		No. OF VEHICLES		No. OF VEHICLES		No. OF VEHICLES		No. OF VEHICLES				
Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14	Col. 15	Col. 16						
	Ammeter, 25 amperes	0.50															
	Ammeter, 40 amperes	0.50															
	Braker point set, Dist.	0.07															
	Battery	22.00	1	2	3	2	3										
	Belt, fan	0.80															
	Bolt, cylinder head to block	0.20															
	Breaker, assembly, fuel gage circuit	0.10															
	Bearing cup, front wheel, inner, Timken # 33472 Banjo and Split type axles	2.00															
	Bearing cup (rear wheel inner), (front wheel outer) Timken # 394A	1.50															
	Banjo and split type axles	1.50															
	Bearing cone, front wheel inner, banjo and split type axles, Timken # 33275	1.50															
	Bearing cone, front wheel outer, banjo and split type axles, Timken # 399A	1.50															
	Bearing cup, rear wheel outer, split type axle, Timken # 382	2.00															
	Bearing cone, rear wheel inner, split type axle, Timken # 395	2.00															
	Bearing cone, rear wheel outer, split type axle, Timken # 387	2.00															
	Bearing cone, rear wheel inner, banjo and split type axle, Hyatt # 12051-Z	2.00															

Fig. 4 - A page from 'Organizational Spare Parts and Equipment.'

Parts Catalog usually includes pictures of the parts.

#### ORGANIZATIONAL SPARE PARTS AND EQUIPMENT

Settling the doubts of those who say there are no SNL's for the ex-QM vehicles, we present a sample page (Fig. 4) from the SNL (G-508) for the 2½-ton GMC Cargo Truck to illustrate the third book of the SNL - 'Organizational Spare Parts and Equipment.'

The interesting part here is the right half of the page under the heading 'Number of Spare Parts Carried.' In these columns, spare-parts allowances are made up into sets, calculated according to the type of maintenance the organization is required to do (company maintenance or battalion-and-regimental maintenance), and the number of vehicles to be maintained.

The page doesn't require much explaining. You can see for yourself the number of parts allotted for each set, and appreciate the neatness and dispatch with which your 'parts allowances' problem is settled.

Organizational Spare Parts and Equipment books generally also specify the parts and tools carried on the vehicle, and list any special-service tools for the particular make of vehicle, which organizational maintenance requires.

#### ADDENDUM

Although the title of the fourth book of the SNL, 'Addendum,' sounds like a lot of nothin' - it was intended to mean only P.S. However, the information this book contains is clear, meaty, and useful enough for any Ordnance Shop. This little book tells you how many of each maintenance part is required for 12 months' maintenance of 100 vehicles of the type concerned. By a little simple arithmetic, which is explained on the first page of the Addendum, you can easily convert this figure to cover the number of vehicles to be maintained by

any given organization for any given length of time.

Figure 5 is a page from the Addendum for SNL G-67, which covers the Scout Car, M3A1. Notice columns 6 and 7. Column 6 gives the maximum number of parts to be stocked by light and medium maintenance - and usually heavy maintenance - organizations (organizations not doing major unit overhaul). Column 7 is for organizations performing major overhaul jobs (base shops and a few semi-mobile heavy-maintenance units).

\* \* \*

Curt, clear, and reasonably complete, that's the story of the four books that go to make up an SNL for a vehicle, gun or similar piece of equipment.

Remember, it won't always be four books - we happened to select an SNL with four books for purposes of illustration. Sometimes it'll only be three books, sometimes two, sometimes one (depending on what is considered necessary, and on the time and trouble involved). Also, for any number of reasons, you'll run across SNL's that don't follow our description in every particular.

But following what we've said, you'll get a broad picture of what's going on - see the forest in spite of the trees.

To polish you off in fine style, we'd like to give you a little information on: 1) the SNL's that deal with tools, and 2) a couple of SNL's that cover materials that you formerly consulted your Parts Common Manual about.

Although we've pointed out that the 'Organizational Spare Parts and Equipment' book lists the tools that accompany the individual vehicle, a great many more tools are, of course, required throughout all echelons for maintenance of all vehicles.

Tools are listed in the 'J' series SNL's and the 'N' series SNL's. First, don't be upset because the tool SNL's are not broken down into books like the vehicle SNL's - it's

not necessary. Second, the 'J' series are merely a listing - but not by sets - of all the tools used by Ordnance: SNL J-10 lists all the 'Hand Tools,' SNL J-11 lists all the 'Machine Tools,' etc.

The 'N' series, on the other hand, gives you all the tool sets - 1st, 2nd, 3rd, and 4th-echelon tool sets, specialists' tool sets, etc. Specifically, SNL N-11 itemizes Tools for a Depot Company; SNL N-23 gives you Post, Camp and Station Tools; N-19 lists 'Motor Transport Tools.' (SNL N-19 which supersedes the old OQMG Circular 4, gives all the 2nd, 3rd, and 4th-echelon unit equipment sets; the specialists' tool kits; and special tools for certain types of motor-transport equipment.)

#### 'PARTS COMMON' MATERIALS

The SNL'S that list certain materials formerly the strict business of the OQMG Parts Common Manual, are SNL K-1 and SNL K-2.

SNL K-1 lists 'Cleaning, Preserving, and Lubricating Materials; Recoil Fluids, Special Oils, and Miscellaneous Related Items.' SNL K-2 lists 'Soldering, Welding and Brazing Materials, Gases and Related Items.'

These materials are available in Ordnance Depots - consult SNL K-1 and K-2 for the Item Stock Nos. and methods of requisitioning. For a full explanation of the characteristics and use of the materials listed in K-1 and K-2, see TM 9-850.

## Index to AR's

Yes, there is an index to Army Regulations, a complete alphabetical index to all subjects covered in the AR's. It is issued yearly and the current edition covers all subjects from January 1, 1943 on back.

It is "AR 1-5: Index to Army Regulations," a classy 548-page volume full of gray type.

It's available from the AG Depot in your service command - order it and find what you're looking for.

# HOW TO BE A Vesicant Detective

**Chemical Warfare Service has been passing out detecto-sets for uncovering hidden poison gas. Here's how to use them.**

Once upon a time it was enough to say, "If you smell geraniums and don't see any flowers, go, brother, go - it's Lewisite. If you smell garlic and don't see any pastrami - it's mustard gas...also go."

But today sniffing isn't enough - poison gas comes both scented and unscented.

For this reason, the Chemical Warfare Service is now supplying three materials for determining whether a vehicle has been poison-gassed or whether decontamination of a poisoned vehicle is complete:

(1) *Liquid vesicant detector paint, M5*; (2) *liquid vesicant detector paper, M6*; (3) *HS vapor detector kit, M4 (for mustard gas only)*.

These three types of detectors reach you from the Chemical Warfare Service through regular QM channels. HS vapor detector kits, M4, are issued, usually one to a company, as specified in Tables of Equipment, Tables of Allowances, or Tables of Basic Allowances. The paint and paper are issued according to requirements - perhaps some to each vehicle.

Notice that the paint and

paper are satisfactory for detecting either Lewisite or mustard, but only in liquid form. The detector kit will detect mustard gas as a vapor, but will not detect Lewisite.

Taken together, these materials should be sufficient to handle your problem of detecting vesicants - which incidentally, may be in the form of tiny droplets on your truck or vapor in the air. Keen detective work is necessary because Lewisite lingers in the air from one to three days in summertime and a week or more in winter; mustard pollutes the atmosphere from four days to a week in summer, and several weeks in winter.

Thus seeing, it is imperative - and even advisable - that you learn and understand the use of the vesicant detectors before all-of-a-sudden you are rendered horse de combat:

## PAINT, LIQUID-VEVICANT DETECTOR, M5

This paint, which is olive drab in color, is brushed or sprayed on fenders and hoods of motor vehicles, forming

part of the camouflage pattern. (For camouflage patterns, see FM 5-21, 'Camouflage Painting of Vehicles and Equipment'.)

War Dep't TC 51, dated April 19, 1943 also recommends that the paint be applied in a camouflage pattern on *helmets* as well as vehicles (and on both it should constitute one-half of the entire camouflage pattern).

When drops of poison gas are sprayed on your vehicle or helmet, or carried thereon by bursting shells or contaminated vegetation, the paint turns red immediately at those spots where the liquid has touched it.

Now here's a touchy point: When poison gas strikes it, the vesicant-detector paint turns red; under severe conditions of heat and sun, the vesicant-detector paint also turns red. But remember this - there's a distinct difference in the reds. The red color of the paint that results from heat and sun, is a *dull all-over red*. The red color that results when poison gas strikes the paint, is a brilliant, scarlet, splotchy red.

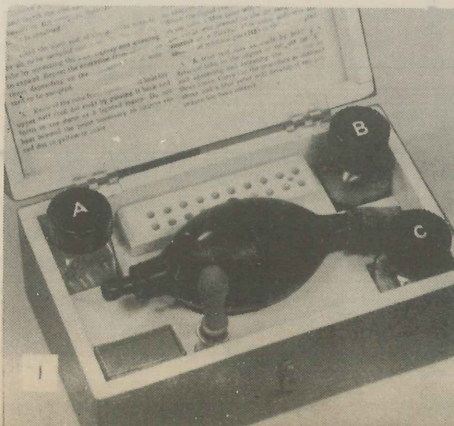
Another thing to remember is that the paint's good while it lasts, but it's vesicant-detecting life is short - especially under a hot sun. Therefore, if you happen to be operating in hot climates, you'll have to renew the paint every week. In milder climates, once every few months is often enough.

This is especially true when the paint is wet. To protect it against the sun as long as possible, the Chemical Warfare Service recommends

(Continued on page 64)

① *The HS Vapor Detector Kit - better than a nose for detecting poison gases. Here's how it works (start below):*

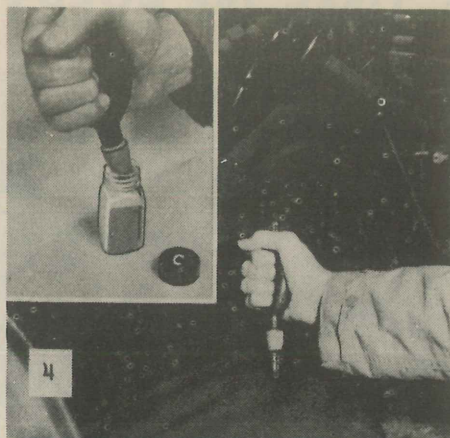
② *Remove one glass detector tube from Bottle 'A'. A straightened paper clip is a convenient tool when the bottle is full.*







3



4

③ Insert the end opposite the red dot in the holder on the sampling bulb. Be sure it fits tightly.

④ Hold the open end of the detector tube against the object to be sampled and draw air through the tube by squeezing and unsqueezing the bulb (from one to ten times depending on concentration of mustard gas present). INSET - For practice, draw a sample from Bottle 'C' which contains a substance which reacts on the tube like mustard gas.

⑤ Remove the tube from the bulb and heat the upper half (red dot end) by passing it back and forth in the flame of a lighted match. Heat only 'til the red dot turns yellow.

⑥ Allow tube to cool for a minute and wipe off the deposit of carbon.



5



6



7



8

⑦ Remove (with the handy paper clip) the cotton plug from the end you've heated.

⑧ Take some solution from Bottle 'B' with the medicine dropper.

⑨ Add one drop of the solution at the open end of the tube.

⑩ When the liquid hits the sensitive substance in the tube, a blue color will develop if mustard gas (HS) was present in the air sampled.

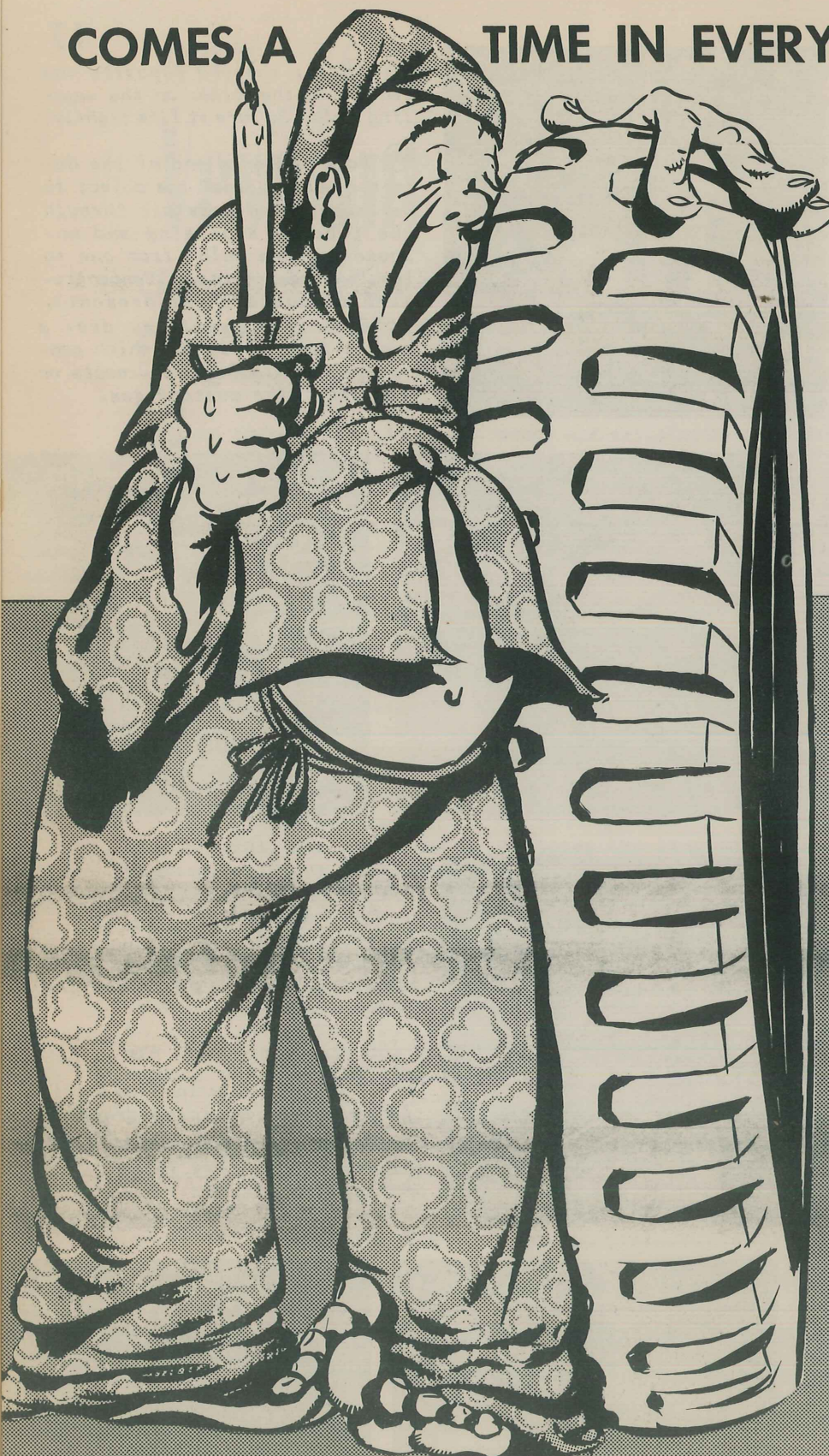


9



10

COMES A TIME IN EVERY TRUCK'S LIFE WHEN



# Time

The big question is, *wh*  
Tires,' Nov. 27, 1942) says,  
tion of the cause will be m  
responsible, corrections wil

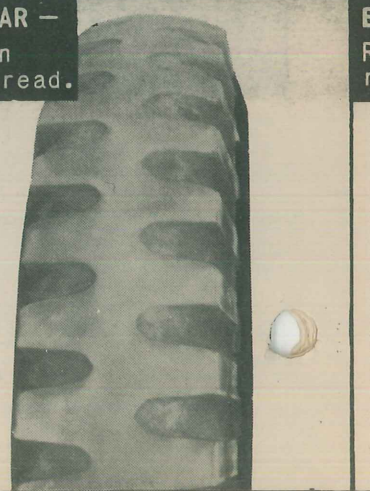
But can you read the we  
condition responsible?

Can you tell what bad h  
the tread and sidewalls?

Tell you what we're gon  
Skunkface, that's you. Just  
gonna teach you how to read t  
we have pictures of tire sho  
under certain condition. f u

Scrutinize the pictures  
rubber man entitled (by AR 850  
your commanding officer 'Snoo

**EVEN WEAR —**  
Too soon  
for retread.



WHEN IT'S...

# Time to Retire!

When? War Dep't Circular 384 ('Conservation of Rubber  
When irregular wear develops on a tire, an investiga-  
tion should be made and if a mechanical condition of the vehicle is  
found, it should be made."

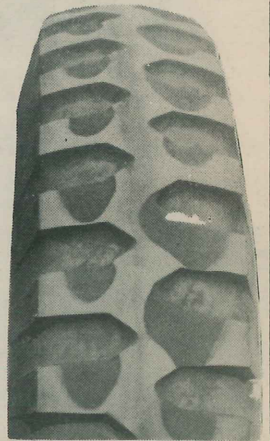
Check for marks on a tire and put your finger on the mechanical

bad habits your drivers have developed by the condition of

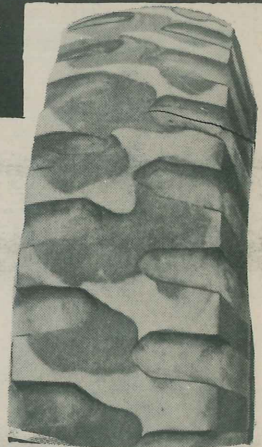
What can you do: we're gonna make you an Indian. Little Chief  
is like an Indian reads the marks in the woodland, we're  
reading the marks on a tire. On this and the following pages,  
we're showing you exactly what happens to the tread and sidewalls,  
and how to use them to avoid abuse.

Check closely and before you know it, you'll be an Indian  
with a 50-00 Change 8(1)(a) to wear an upsweep hairdo, and call  
him a 'hokie.'

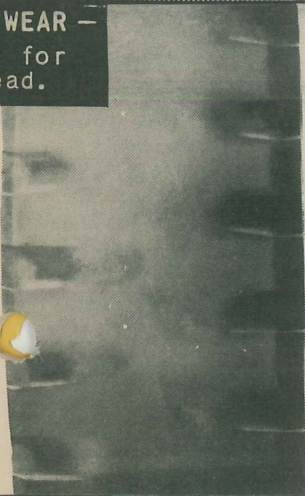
**UNEVEN WEAR —**  
Too soon  
for retread.



**UNEVEN WEAR —**  
Ready for  
retread.



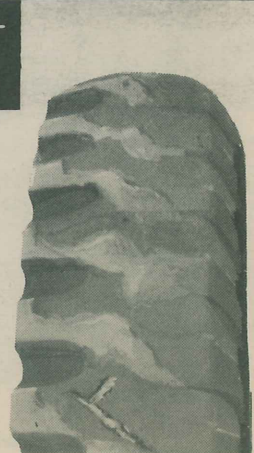
**EVEN WEAR —**  
Ready for  
retread.

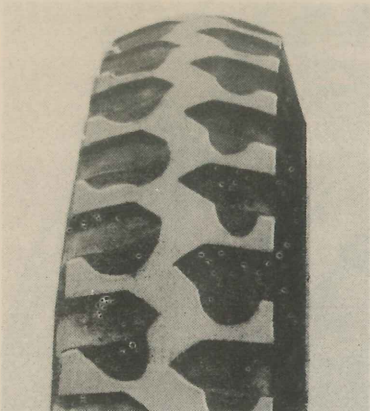


**EVEN WEAR —**  
Worn too far  
before removal.



**UNEVEN WEAR —**  
Tire  
destroyed.

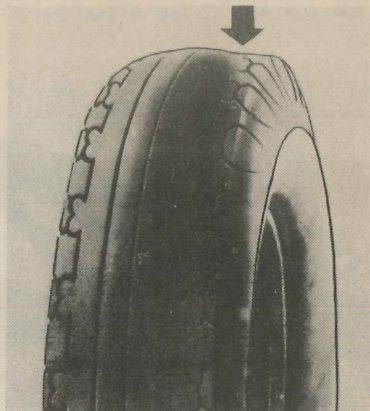




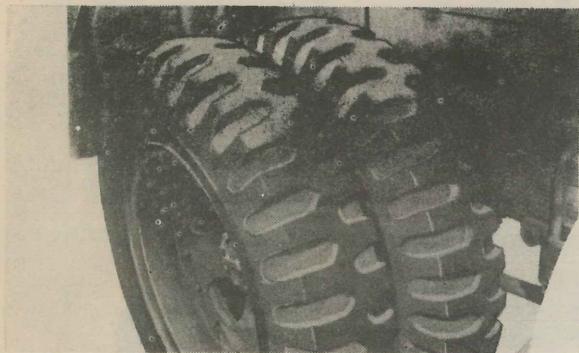
**MECHANICAL IRREGULARITY** or operating conditions caused this irregular wear.



**A GRABBY BRAKE** is responsible for this condition - it's too late for anything.



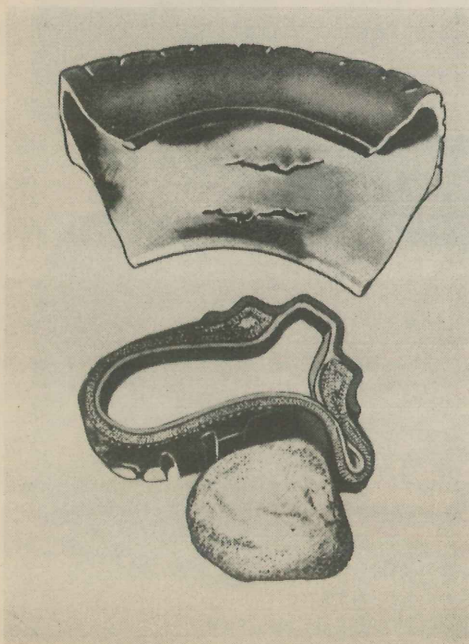
**IMPROPER CAMBER** of front wheel did this; switch tire to a rear wheel.



*THESE DUALS* are properly matched - the same type tread, wear, and circumference.



*NO...THESE DUALS* are mismatched. Blow-up shows what happens to tires on inside.



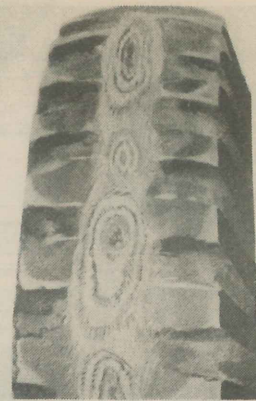
**ROCKS AND BUMPS** do this to the inside of your tires... you can't see it, either.



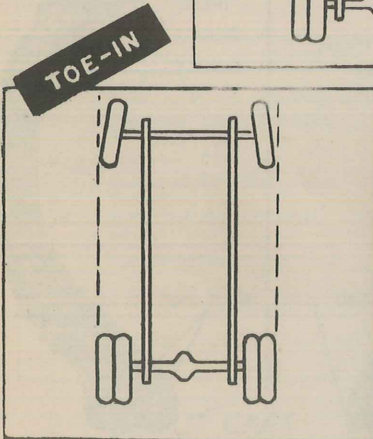
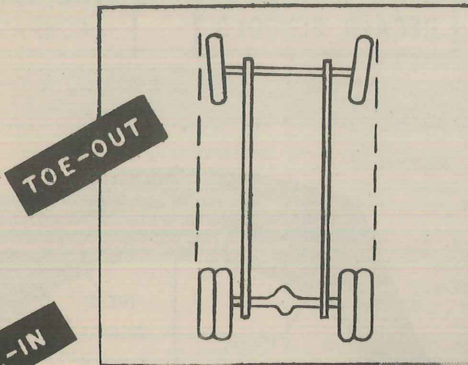
**IMPROPER CASTER** is responsible...time to turn it in for a full retreading job.



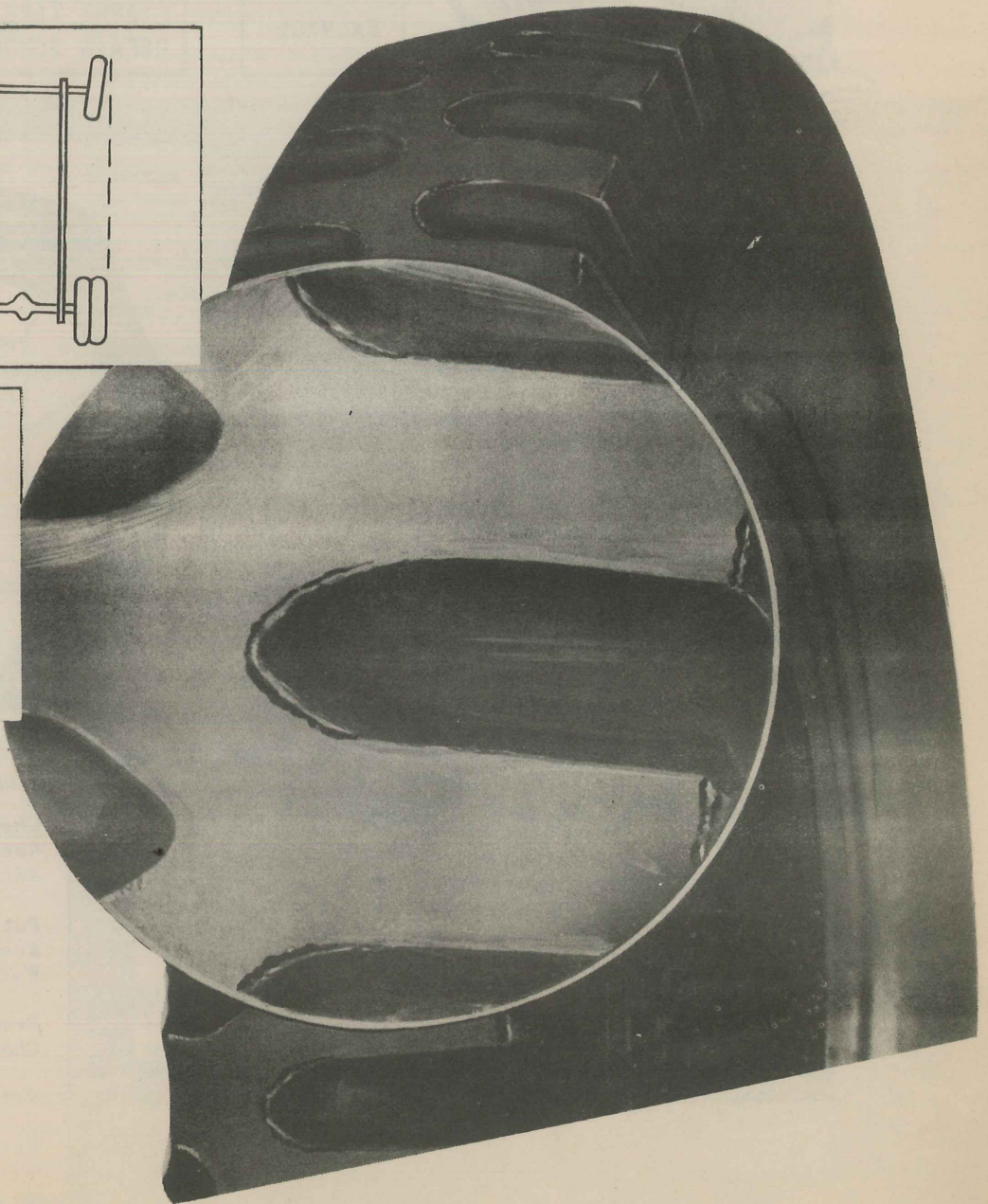
**SHARP POINT OF HOOKS** on chains were improperly turned toward tire, instead of away.



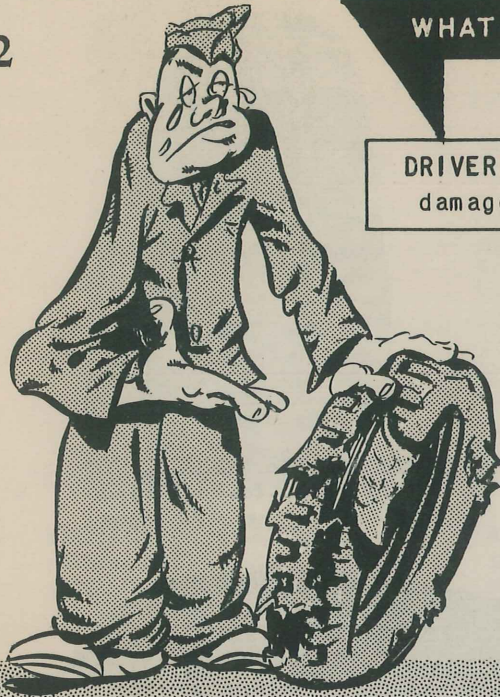
**READY FOR THE SALVAGE HEAP** is this shot-to-hell-tire. Catch'em before cord shows.



**TOO MUCH TOE-IN** and its partner in tire wear, **TOO MUCH TOE-OUT**, produce the results on the right. A wheel out of alignment  $1/2^\circ$  will drag the tire 87 feet sidewise in one mile! The feather-edge shown in the insert points out too much toe-in or toe-out.



WHAT HAPPENS TO TIRES TURNED IN FOR RETREADING?



DRIVER OR 2ND-ECHELON MECHANIC removes damaged tire and turns it in to the

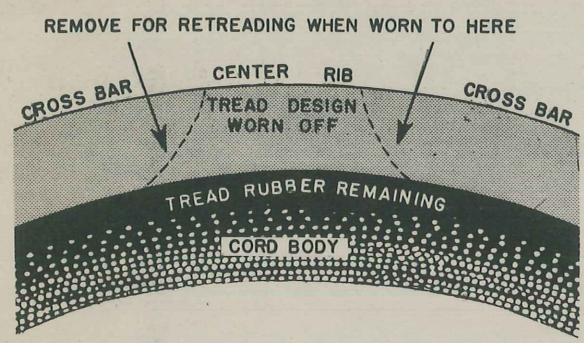
REGULAR SUPPLY ORGANIZATION OF THE UNIT who sends it to the proper

MOTOR TRANSPORT DISTRICT Who, in turn, sends it to 1 of these 3 places

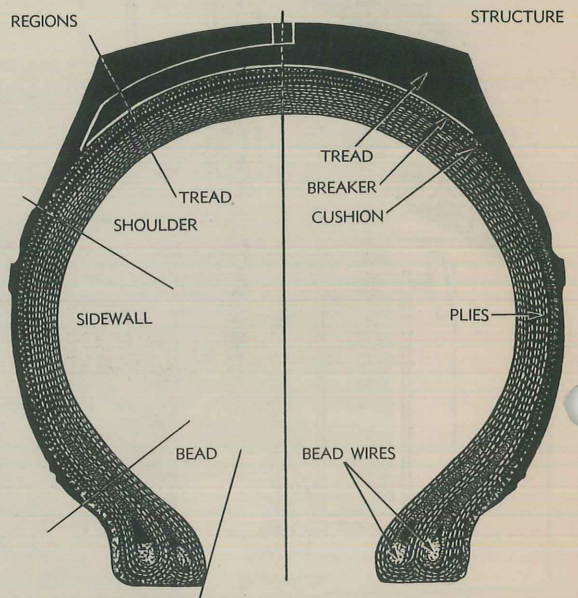
SALVAGE

ARMY TIRE REPAIR SCHOOLS

COMMERCIAL TIRE RETREAD COMPANY



This drawing shows you when to remove tires for retreading.



Worm's-eye view of tire structure, showing all the lurid details.



10 WAYS TO MAKE TIRES LAST LONGER

- Check air pressure
- Keep valve caps on
- Match duals according to circumference or diameter
- Put valves in correct position
- Keep the spare in use
- Watch tires for evidence of wheel misalignment
- Promptly repair injured tires
- Change wheel position at first sign of irregular wear
- Retread tires worn smooth in center
- Use proper rotation on directional tires

# Did you get all the directives this month?

In keeping with ARMY MOTORS' new policy of featuring 1st and 2nd-echelon maintenance, the month's list of official directives from the War Department includes only publications that line organizations will be interested in. We're no longer listing all of the higher-echelon TM's, TB's, and SNL's. We're using the space to give a fuller listing of new T/O's and T/E's for companies and similar units performing 2nd-echelon maintenance.

Check your publications against our list, and if you've been skipped on a couple you should have, see your distributing agent or agency: the local Ordnance Officer for Ordnance publications (he gets them from Ordnance regional depots), and your post or division HQ for AGO publications (which are now coming from the local AGO depot in each service command).

Do not write to Holabird or to the Tank-Automotive Center for any of the publications listed.

## ABBREVIATIONS

*AR	- Army Regulations
C	- Change
Ch.	- Chapter
*FM	- Field Manual
*FSMWO	- Field Service Modification Work Order
*OEC	- Ordnance Equipment Chart
*OFSB	- Ordnance Field Service Bulletin
*OFSC	- Ordnance Field Service Circular
*OFSI	- Ordnance Publications for Supply, Index
*OPSR	- Ordnance Provision System Regulations
*OSPE	- Organizational Spare Parts Parts and Equipment, SNL
*OSSC	- Ordnance Storage and Ship-ment Chart
Sec.	- Section
*SNL	- Standard Nomenclature List
*S of SR	- Schedule of Stores Re-ports
*SPC	- Service Parts Catalog, SNL
*TB	- Ordnance Field Service Technical Bulletin
*TC	- Training Circular
*T/E	- Table of Equipment
*TM	- Technical Manual
*T/O	- Table of Organization
Vol.	- Volume
*WDC	- War Department Circular
*Adjutant General Depot Distribu-tion	
*Ordnance Field Service Distribu-tion	

## SCOUT CARS

### CAR, SCOUT, M3A1

FSMWO G67-W11 (including C1), Surge tank (red group).  
FSMWO G67-W18 (including C1), Chassis front springs (red group).  
FSMWO G67-W19, Oil filter (red group).

## GUN CARRIAGES

### CARRIAGE, MOTOR, 81-MM MORTAR M4

SNL G-102, OSPE.  
FSMWO G102-W20, Blackout driving light (red group).  
FSMWO G102-W22, Hand rails (red group).

### CARRIAGE, MOTOR, 37-MM GUN, M6

FSMWO G121-W2, drive-gear thrust-pad (red group).

FSMWO G121-W5, Carburetor-throttle lever and driver (red group).

FSMWO G121-W6, Bucket seats moved back (green group).

### CARRIAGE, MOTOR 105-MM, HOWITZER, M7

TM 9-731E, Organizational maintenance.

TC 47 (1943) and TB 700-41 Bogie-wheel grease leaks.

FSMWO G128-W3, Fuel-relief-valve screen (red group).

FSMWO G128-W5, Magneto (green group).

FSMWO G128-W6, Bucket seats moved back (green group).

TB 700-39, Radial engine.

### CARRIAGE, MOTOR, 75-MM, HOWITZER, M8

TC 44 (1943) and TB 727C-3, Final drive installation.

TB 732B-1, Sighting equipment.

### CARRIAGE, MOTOR, 3-INCH GUN, M10

TC 47 (1943) and TB 700-41, Bogie-wheel grease leaks.

TC 54 (1943) and TB 731G-2, Importance of locking turret.

FSMWO G130-W2, Throttle (red group).

FSMWO G130-W6, Rifle bracket (red group).

FSMWO G130-W8, Panoramic sight box (red group).

TB 753-2, Fuel-pump tube failure.

### CARRIAGE, MOTOR 3-INCH GUN, M10A1

TC 47 (1943) and TB 700-41, Bogie-wheel grease leaks.

TC 54 (1943) and TB 731G-2, Importance of locking turret.

FSMWO G170-W1, Canceled by C1.

### CARRIAGE, MOTOR, 155-MM GUN, M12

TC 47 (1943) and TB 700-41, Bogie-wheel grease leaks.

FSMWO G158-W1, Fuel-relief-valve screen (red group).

TB 700-39, Radial engine.

### CARRIAGE, MOTOR, MULTIPLE GUN, M15

TM 9-708, Organizational maintenance.

FSMWO G102-W20, Blackout driving light (red group).

## CARRIERS

### CAR, HALF-TRACK, M2

FSMWO G102-W20, Blackout driving light (red group).

FSMWO G102-W22, Hand rails (red group).

### CARRIER, PERSONNEL, HALF-TRACK, M3

FSMWO G102-W20, Blackout driving light (red group).

FSMWO G102-W22, Hand rails (red group).

CARRIER, PERSONNEL, HALF-TRACK, M5  
SNL G-147, OSPE.

## TANKS

### TANK, LIGHT, M3

SNL G-103, Vol. 1, OSPE.

FSMWO G103-W22, Removal of machine-gun mounts (red group).

FSMWO G103-W27, Compass (red group).  
TB 700-40, Ceramic spark plugs.

### TANK, LIGHT, M3A1

FSMWO G103-W27, Compass (red group).  
TB 700-40, Ceramic spark plugs.

### TANK, LIGHT, M3A3

TB 700-40, Ceramic spark plugs.

### TANK, LIGHT, M5

TC 44 (1943) and TB 727C-3 Final drive installation.

TB 727C-4, Lower front hull plate.  
TB 732-11, Hydramatic-transmission lubricant.

### TANK, LIGHT, M5A1

TC 44 (1943), Inspection procedure.  
TC 44 (1943) and TB 727C-3, Final drive installation.

SNL G-103, Vol. 8, OSPE.

### TANK, MEDIUM, M3

TC 47 (1943) and TB 700-41, Bogie-wheel grease leaks.

FSMWO G104-W31, Magneto (green group).

FSMWO G104-W32, Magneto and carburetor (green group).

FSMWO G104-W33, Engine valve mechanism (red group).

FSMWO G104-W48, Oil-tank breather (red group).

FSMWO G104-W49, Fuel-relief-valve screen (red group).

TB 700-46, Cast track-support roller.

TB 700-39, Radial engine.

### TANK, MEDIUM, M3A1

TC 47 (1943) and TB 700-41 Bogie-wheel grease leaks.

FSMWO G104-W31, Magneto (green group).

FSMWO G104-W32, Magneto and carburetor (green group).

FSMWO G104-W33, Engine valve mechanism (red group).

FSMWO G104-W48, Oil-tank breather (red group).

FSMWO G104-W49, Fuel-relief-valve screen (red group).

TB 700-46, Cast track-support roller.

TB 700-39, Radial engine.

### TANK, MEDIUM, M3A2

TC 47 (1943) and TB 700-41, Bogie-wheel grease leaks.

FSMWO G104-W31, Magneto (green group).

FSMWO G104-W32, Magneto and carburetor (green group).

FSMWO G104-W33, Engine valve mechanism (red group).

FSMWO G104-W48, Oil-tank breather (red group).

TB 700-46, Cast track-support roller.

TB 700-39, Radial engine.

TANK, MEDIUM, M3A3  
TC 47 (1943) and TB 700-41, Bogie-wheel grease leaks.  
FSMWO G104-W42, Throttle (red group).  
TB 700-46, Cast track-support roller.  
TB 753-2, Fuel-pump tube failure.

TANK, MEDIUM, M3A4  
TC 47 (1943) and TB 700-41, Bogie-wheel grease leaks.  
TB 700-46, Cast track-support roller.

TANK, MEDIUM, M3A5  
TC 47 (1943) and TB 700-41, Bogie-wheel grease leaks.  
FSMWO G104-W42, Throttle (red group).  
TB 700-46, Cast track-support roller.  
TB 753-2, Fuel-pump tube failure.

TANK, MEDIUM, M4  
TC 47 (1943) and TB 700-41, Bogie-wheel grease leaks.  
FSMWO G104-W31, Magneto (green group).  
FSMWO G104-W32, Magneto and carburetor (green group).  
FSMWO G104-W33, Engine valve mechanism (red group).  
FSMWO G104-W48, Oil-tank breather (red group).  
FSMWO G104-W49, Fuel-relief-valve screen (red group).  
TB 700-35, Differences between M4 and M4A1.  
TB 700-36, Circuit-breaker reset button.  
TB 700-46, Cast track-support roller.  
TB 700-39, Radial engine.

TANK, MEDIUM, M4A1  
TC 47 (1943) and TB 700-41, Bogie-wheel grease leaks.  
FSMWO G104-W31, Magneto (green group).  
FSMWO G104-W32, Magneto and carburetor (green group).  
FSMWO G104-W33, Engine valve mechanism (red group).  
FSMWO G104-W48, Oil-tank breather (red group).  
FSMWO G104-W49, Fuel-relief-valve screen (red group).  
TB 700-35, Differences between M4 and M4A1.  
TB 700-36, Circuit-breaker reset button.  
TB 700-46, Cast track-support roller.  
TB 731A-5, Removal of weld from final-drive sprocket screws.  
TB 700-39, Radial engine.

TANK, MEDIUM, M4A2  
TM 9-731B, Organizational maintenance.  
TC 44 (1943) and TB 700-41, Bogie-wheel grease leaks.  
FSMWO G104-W42, Throttle (red group).  
TB 700-36, Circuit-breaker reset button.  
TB 700-46, Cast track-support roller.  
TB 753-2, Fuel-pump tube failure.

TANK, MEDIUM, M4A3  
TC 47 (1943) and TB 700-41, Bogie-wheel grease leaks.

TB 700-36, Circuit-breaker reset button.  
TB 700-46, Cast track-support roller.

TANK, MEDIUM, M4A4  
TM 9-754, Organizational maintenance.  
TC 44 (1943) and TB 754-3, Differences in fuel pumps.  
TC 44 (1943) and TB 700-41, Bogie-wheel grease leaks.  
TB 700-36, Circuit-breaker reset button.  
TB 700-46, Cast track-support roller.  
TB 754-2, Adjustment of oil-pressure gage sending unit.

TANK, MEDIUM, M7  
TC 47 (1943) and TB 700-41, Bogie-wheel grease leaks.  
OFSB 6-G-137, Lubrication.  
TB 700-46, Cast track-support roller.  
TB 732A-1, Cylinder-head baffle adjustment.  
TB 732A-2, Fluid for torque converter.  
TB 700-39, Radial engine.

TANK, HEAVY, M6  
SNL G-118, Vol. 1, OSPE.

TANK, HEAVY, M6A1  
SNL G-118, Vol. 2, OSPE.

## AMPHIBIAN TRUCKS

TRUCK, AMPHIBIAN,  $\frac{1}{2}$ -TON 4X4 (FORD)  
TC 47 (1943), Sealing threaded fuel-line connections.

TRUCK, AMPHIBIAN,  $2\frac{1}{2}$ -TON 6X6 (GMC)  
TC 55 (1943) and TB 802-1, Hull drainage, ventilation, and care.  
FSMWO G501-W2, Canceled by C1.  
FSMWO G501-W3, Pump assembly (red group).  
FSMWO G501-W4, Tire tube (red group).  
OFSB 6-G-501, Lubrication.

## TRUCKS

TRUCK, BOMB SERVICE, M1 (YELLOW)  
FSMWO G85-W2, Canceled by C2.

TRUCK, EMERGENCY REPAIR, M1  
FSMWO G61-W1, Lubrication chart holder (red group).

TRUCK, SMALL ARMS REPAIR, M7  
SNL G-138, Vol. 1, OSPE.  
SNL G-138, Vol. 2, OSPE. (Signal Corps models).

TRUCK, SPARE PARTS, M14  
SNL G-144, Vol. 1, OSPE. Load A.  
SNL G-144, Vol. 2, OSPE. Load B1.  
TRUCK, 1/4-TON, 4X4 (FORD & WILLYS)  
SNL G-503, OSPE.

TRUCK, 3/4-TON, 4X4 (DODGE)  
FSMWO G502-W4, Ambulance litter bracket (C1).  
FSMWO G502-W6, Rear-axle drive-gear thrust pad (red group).  
TB 808-2, Distributor.

TRUCK,  $2\frac{1}{2}$ -TON 6X6 (GMC)  
TB 801-1, Water in winch worm housing.

TRUCK, 4-TON, 6X6 (DIAMOND T)  
SNL G-509, C1, OSPE.  
FSMWO G509-W2, Governor housing (red group).

## TRUCK TRACTORS

TRUCK TRACTOR, 4-5-TON, 4X4, COE (AUTOCAR)  
TM 10-1568, Parts list.  
TM 10-1569, Maintenance manual.

## TRACTORS

TRACTOR, CRANE, 1-TON, M1  
SNL G-108, OSPE.

TRACTOR, LIGHT, WHEELED IND. TYPE (ALLIS-CHALMERS "B")  
OFSB 6-G-94, Lubrication.

TRACTOR, MEDIUM, M1 (INTERNATIONAL TD-14)  
SNL G-132, OSPE.

TRACTOR, HEAVY, M1 (ALLIS-CHALMERS)  
SNL G-98, OSPE.

## TRAILERS AND SEMITRAILERS

SEMITRAILER, 6-TON, STERILIZATION & BATH, MODEL MSB  
TM 10-641, Operation and spare parts.

TRAILER, 1/4-TON, 2-WHEEL (BANTAM)  
TM 10-1281, Parts and maintenance.

## MOTORCYCLES

MOTORCYCLE, SOLO, SHAFT-DRIVE HARLEY-DAVIDSON  
SNL G-523, OSPE.

## ORGANIZATION & EQUIPMENT

T/O & T/E 2-27, Recon. Tr. (Co.), Mech. (Armored), March 1, 1943.  
T/O & T/E 5-16, Hq. & Hq. & Service Co. Eng. Combat Bn., March 1, 1943.  
T/O & T/E 5-17, Eng. Combat Co. (Tr.), March 1, 1943.  
T/O & T/E 5-397, Eng. Gas Generating Unit, Feb. 22, 1943.  
T/O & T/E 6-10-1, Hq. & Hq. Btry., Artillery, Inf. Or Mtz. Div., March 1, 1943.  
T/O & T/E 6-26, Hq. & Hq. & Service Btry., Mtz. F.A. Bn., March 4, 1943.  
T/O & T/E 6-27, F.A. Btry., Mtzd., 105-mm How., Truck-drawn, March 4, 1943.  
T/O & T/E 6-37, F.A. Btry., Mtzd., 155-mm How., Truck-drawn, March 4, 1943.  
T/O & T/E 7-12, Hq. & Hq. Co., Inf. Regt., March 4, 1943.  
T/O & T/E 7-13, Service Co., Inf. Regt., March 4, 1943.  
T/O & T/E 7-16, Hq. & Hq. Co., Inf. Bn., March 4, 1943.  
T/O & T/E 7-18, Inf., Heavy Weapons Co., March 4, 1943.  
T/O & T/E 7-117, Inf. Antitank Co., March 4, 1943.  
T/O 8-447, Med. Air Evacuation Transportation Squadron, Feb. 15, 1943.



OEC 5-35 (tent.), Eng. Bn.  
 OEC 5-95, Eng. Camouflage Bn. Aviation.  
 OEC 5-115 (tent.), Eng. Squadron.  
 OEC 5-125, C1, Eng. Ry. Oper. Bn.  
 OEC 5-215, C1 (tent.), Armored Eng. Bn.  
 OEC 5-235, C1 (tent.), Eng. Mountain Bn.  
 OEC 5-251 (tent.), Eng. Special Service Regt.  
 OEC 5-510 (tent.), Eng. Amph. Brig.  
 OEC 5-511 (tent.), including C1, C2), Eng. Boat Regt.  
 OEC 5-521 (tent.), including C1), Eng. Shore Regt.  
 OEC 6-200 (tent.), Div. Artillery, Airborne.  
 OEC 7-11, Inf. Regt.  
 OEC 7-51, Inf. Glider Regt.  
 OEC 7-415 (inc. C2), Air Base Security Bn.  
 OEC 8, C1 (tent.), Med. units.  
 OEC 8-195, C1, Med. Bn., Eng. Amph. Brig.  
 OEC 10 (tent.) QM units, including Series 6-7.  
 OEC 10-115, C1 (tent.), QM Squadron Av. Div.  
 OEC 10-275, QM Bn., Eng. Amph Brig.  
 OEC 11, C1, Signal Units.  
 OEC 11-15, C1, Signal Bn.  
 OEC 12-327, AG Machine Records Unit  
 OEC 71, Inf. Airborne Div.

T/O & T/E 11-7, Sig. Co., Inf., Div., March 1, 1943.  
 T/O & T/E 19-7, MP Plat., Inf., Div., March 1, 1943.  
 T/O & T/E 44-26 Hq. & Hq. Btry., Antiaircraft Artillery, Automatic Weapons Bn., Mobile, Feb. 27, 1943.  
 T/O & T/E 44-27 Antiaircraft Artillery, Automatic Weapons Btry., Mobile, Feb. 27, 1943.  
 T/O & T/E 44-126 Hq. & Hq. Btry., Antiaircraft Artillery, Automatic Weapons Battalion, Semimobile, Feb. 27, 1943.  
 T/O & T/E 44-136 Hq. & Hq. Btry., Antiaircraft Artillery, Searchlight Battalion, Semimobile, Feb. 27, 1943.

T/O & T/E 44-138 Antiaircraft Artillery, Searchlight Btry., Semimobile, Feb. 27, 1943.  
 T/E 6-36 Hq. & Hq. & Service Btry., Mtzd., F.A. Bn., Medium, Truck-drawn, Mar. 1, 1943.  
 T/E 11-287 Sig. Depot Co., Aviation Mar. 1, 1943.  
 T/E 20-42 Hq. & Hq. Co., Replacement Depot, Feb. 18, 1943.  
 OEC 3, C1 (tent.), CWS units.  
 OEC 4-275, Antiaircraft Bn., Airborne Div.  
 OEC 5 (tent.), Eng. units.

SNL K-1, C2, Cleaning, preserving & lubricating materials.  
 SNL M-3, Miscellaneous accessory units and parts.

**TRAINING**

TM 31-200 (revised), Maintenance and care of pneumatic tires and rubber treads.  
 TC 39 (1943) Film strips and bullet-ins.  
 OFSB 1-8, Publications for the Ordnancemen.  
 OFSC 1 (1943) C2, List of OFSC's  
 TB 10, Index to TB's.

**MAINTENANCE**

TM 31-200 (revised). Maintenance and care of pneumatic tires and rubber treads.  
 TC 45 (1943) Spark test for location of field wire insulation faults.  
 TC 54 (1943) and TB 700-36, Placing of caution tags in drivers' compartments.  
 TB 700-42, Steering-knuckle-arm ball failure.  
 SNL M-3, Miscellaneous accessory units and parts.

**TOOLS**

SNL J-2, C2, Cutting, boring, and tweezer tools.  
 SNL N-19, C1, Tool sets, motor transport.  
 SNL N-23, (including C1), Tool sets, unit equipment, for posts, camps, and stations.

**SALVAGE AND RECLAMATION**

OFSB 4-19, Maintenance reclamation of automotive materiel.  
 OFSC 24 (1943), Disposition of scrap rubber.

**ADMINISTRATION**

AR 25-40 Claims for damage to or loss or destruction of property incident to the training, practice, operation, or maintenance of the Army.  
 WDC 98 (1943), Responsibility for procurement, maintenance, storage, & issue of gasoline nozzles.

**STORAGE SHIPMENT AND ISSUE**

AR 35-6560, Receipt, shipment, and issue of property.  
 WDC 98 (1943), Responsibility for gasoline nozzles.  
 WDC 101 (1943), Simplified inventory adjustment procedure.  
 WDC 108 (1943), Revised procedure for distribution of shipping tickets.  
 OFSB 6-2, Product guide.

**OPERATION**

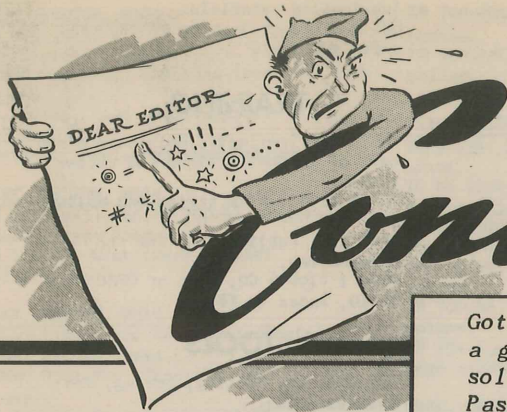
WDC 102 (1943) Movement of troops within continental U.S. (motor, rail, and air).  
 TC 54 (1943) and TB 700-36, Placing of caution tags in drivers' compartments.  
 TB 700-38, Descending steep grades in tank or full-track gun carriage.  
 TC 51 (1943) Use of paint, liquid vesicant detector, M5, on helmets and vehicles.

**Know Your Tanks**

You can't tell one tank from another without a score card. Here's a score card listing the light, medium, and heavy tanks. Use it as a ready reference to show you hull construction, engine type, and location of largest gun on any particular tank you're reading or thinking about.

<b>LIGHT TANKS (APPROX. 15 TONS)</b>			
Number	Hull Construction	Engine Type	Largest Gun Location
M3	Riveted	Radial-Gas	Turret
M3	Riveted	Radial-Diesel	Turret
M3A1	Riveted	Radial-Gas	Sponson
M3A1	Riveted	Radial-Diesel	Turret
M3A3	Welded	Radial-Gas	Turret
M5	Welded	V-Gas	Turret
M5A1	Welded	V-Gas	Turret
<b>HEAVY TANKS (APPROX. 50 TONS)</b>			
M6	Cast	Radial-Gas	Turret

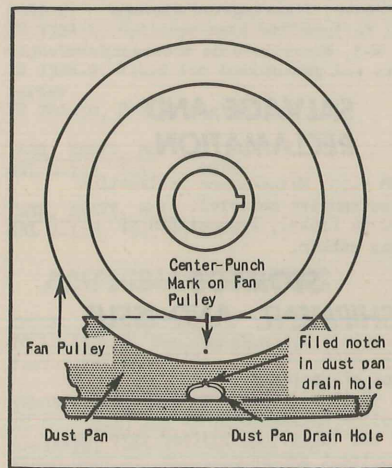
<b>MEDIUM TANKS (APPROX. 30 TONS)</b>			
Number	Hull Construction	Engine Type	Largest Gun Location
M3	Riveted	Radial-Gas	Sponson
M3A1	Cast	Radial-Gas	Sponson
M3A2	Welded	Radial-Gas	Sponson
M3A3	Welded	In-line Diesel	Sponson
M3A4	Riveted	Multi-Bank Gas	Sponson
M3A5	Riveted	In-line Diesel	Sponson
M4	Welded	Radial-Gas	Turret
M4A1	Cast	Radial-Gas	Turret
M4A2	Welded	In-line Diesel	Turret
M4A3	Welded	V-Gas	Turret
M4A4	Welded	Multi-Bank Gas	Turret
M7	Welded	Radial-Gas	Turret



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

H. M. Johnson, Automotive Advisor, 78th Signal Co., Camp Butner, N. C., complains, as many another mechanic before him has complained, that the location of the inspection hole on the 1/4-ton truck, makes it very hard to observe the correct position of the timing marks.

Constructively, Mr. Johnson comes forth with an idea on 'relocating' the timing marks which will make checking the timing marks a thing of beauty and a joy forever. Since the fan pulley turns as the fly-



wheel turns, Mr. Johnson center-punches a mark on the pulley and uses that mark, which can be more easily seen than the one in the inspection hole, as a timing mark.

Here's the idea in three easy steps:

1) Remove the inspection-hole cover and line up the IGN mark on the flywheel with the mark on the flywheel housing.

2) Proceed to the small dust pan directly beneath the fan pulley. There's a small drain hole in the bottom of this dust pan. Take a three-cornered file and notch this drain hole as shown (see fig.). This notch will serve as a stationary timing mark.

3) Now make a center-punch mark on the fan pulley directly above the mark on the small drain hole - being careful not to let the engine turn.

This center-punch mark and the mark on the drain hole now exactly 'reflect' the correct position of the marks on the flywheel and flywheel housing, if you have transferred them exactly.

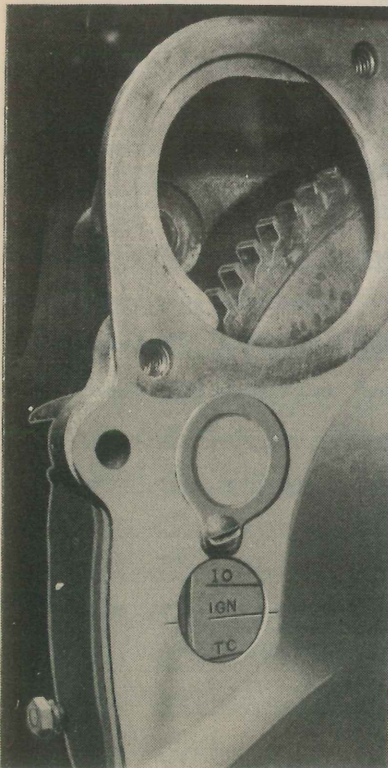
We can't stress too strongly that you've got to transpose the marks faithfully - otherwise, you'll be setting the timing by screwy marks and consequently, your timing will be off.

Joseph R. Avilies, Foreman, C and I Dep't of the Holabird Shop throws out a warning to persons attempting to make the customary growler test on the GDJ 2065F armature in the Model GDJ-4808, Generator (12 volts, 50 amps, and used on the 3/4-ton radio-equipped Dodges).

Seems that the growler hacksaw-blade test does not tell a true story on this armature - good armatures register 'bad'. This is due to the windings of this armature which differ from the windings of the two-brush jobs.

The only legitimate test of this armature is the draw test described in the maintenance manual.

Of course, as Mr. Avilies says, the manual does not mention that a growler test is to be made on this armature. But on the other hand, it does not say that the growler test is not to be made. The ordinary greaseball, not knowing from nothing, goes ahead, makes the



customary test and gets fooled.

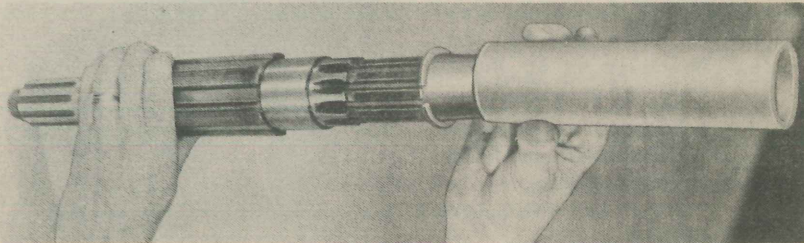
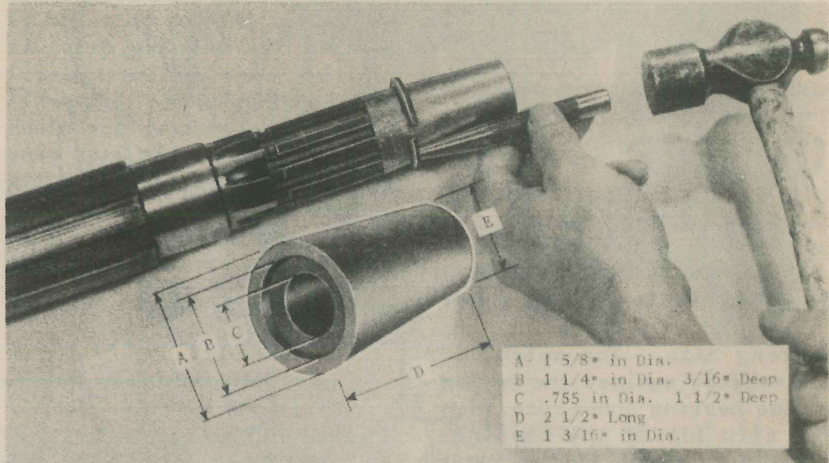
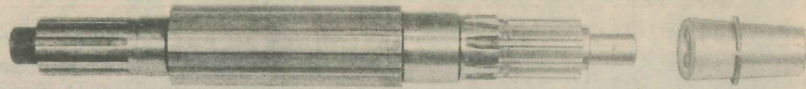
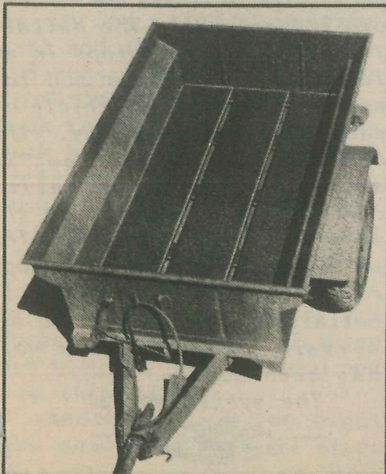
Fair warning from Mr. Avilies.

Dear Ed,

We've designed and built wooden floors to protect the floors of our 1/4-ton trailers. The entire floor of the trailer was designed to support the payload, but if you put a barrel or some other heavy object in it, the full payload may be carried in a small area, denting and bending the floor - perhaps busting it through thus seriously destroying the trailer's seaworthiness. Why not equip all 1/4-ton trailers with removable wooden floors?

Stanley M. Brewster  
1st Lt., Air Corps  
Transportation Officer  
7th Tow Target Squadron  
March Field, California

(Ed. note - The Tank-Automotive Center declared a half-holiday and all the chittlins' you could eat, upon viewing Lt. Brewster's idea. Said the TAC, "a slatted framework, should be used to allow air circulation between the two floors to prevent rusting. The wood floor should not be held to the steel floor by bolts, etc., otherwise the water-tightness of the body will be impaired. Clips welded to the steel body could be used - if it is felt that the floor must be secured down at all.")



Installing the snap ring that holds the fifth-speed gear on the transmission main shaft of the 2 1/2-ton GMC is a job to make strong men weep. Even if you do succeed in prying the ring on with a screwdriver, etc., chances are you'll spring the ring and take the snap out of it.

Confronted with this aggravation, George Plitt, Principal Instructor, Chassis Units, Holabird Ordnance Automotive School, cut himself a persuader - a tapered sleeve (see figs.) that fits on the main shaft and acts as a ramp up which the snap ring may be driven.

Driving the ring up the tapered sleeve may be done with a hammer and punch or more simply by using a length of pipe. The length of pipe faces squarely on the snap ring - hammering the other end of the pipe drives the ring quickly and easily into position.

Dear Ed,

I run into a lot of hot arguments regarding the fit of wheel bearings to both steering knuckle (at the front wheels) and main-tube housings (at the rear wheels). The arguments start when a wheel hub and bearings are removed disclosing scorched surfaces on the inside of the inner-bearing races and on the underside of the steering knuckle or main-tube housings.

The manufacturer states that the bearing to knuckle shall be a slip fit (easy press fit) and the knuckle is machined to provide the necessary clearance for this. Furthermore, when reassembling these bearings, the inner race to knuckle should also be lubricated.

However, most mechanics when assembling bearings, fail to lubricate between the inner bearing race and knuckle. What's more, they center-punch

all around the knuckle or housing in an attempt to stake the bearing and prevent any movement of the inner race.

This, of course, is a mistake - what they've done is stopped the inner race from turning and have permanently put the load on one spot at the bottom of the bearing ... leading to shortened bearing life.

The bearing inner race was designed to creep on the knuckle or main tube so that the load would be distributed over the whole of the inner roller cup thus promoting long bearing life. The weight of the vehicle against the bottom of the bearing inner race, plus the slip fit of the bearing, resists movement of the inner race until the roller-to-inner-and-outer-race friction overcomes it - then the bearing creeps. Which is as it should be.

Lewis A. Frick  
Automotive Advisor  
518th M.P. and Hq.  
First Army  
Fort Jay, New York

(Ed. Note - Right! Stationary shaft applications, as at the wheels, require a loose-fitted cone to allow the cone to creep in service.

Proper cone-fitting practice, as shown in *Tinken service manual for the U. S. Armed Forces*, prescribes a cone fit of .0002" loose to .0012" loose on stationary wheel-bearing shafts up to 2½" bore, and from .0002" loose to .0022" loose on stationary shafts from 2½" to 12" bore.

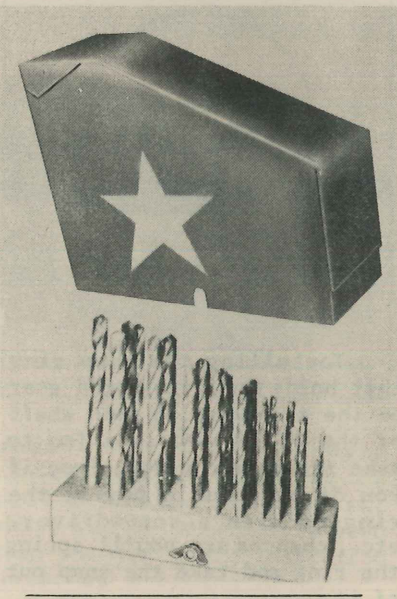
About lubricating between the inner bearing cones and axle tubes, we don't believe that any specific recommendation is required covering this point, because when the bearings are properly packed with lubricant and the wells in the wheel hubs are packed to the level of the outer races, the bearing bores and axle tube or spindle will get enough lubricant to keep them from rusting or gaulding, as described above.)

Dear Editor:

Here's an easy way to keep drills in the maintenance truck. One of my men, T/4 Turner, concocted this brainchild and says, 'All you gotta do is take a block of wood, drill it full of holes and mark drill sizes on the holes. Now drill another hole through the block of wood for a bolt and wing nut. Next, make a cover outta a piece of tin and paint it.'

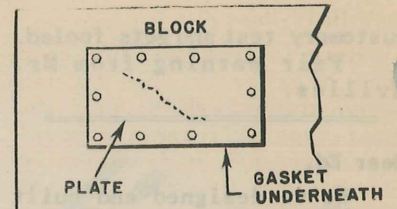
The star is optional. Turner has the artistic turn of mind.

Clemens Berzowski  
1st Lt., MAC  
36th Med. Amb. Bn.  
Camp Forrest, Tenn.



Sgt. Raymond H. Gorman, 3446th Ordnance A.M. Co., State Armory, Red Bank, N. J., comes through with a couple of oldies that've been kicking around for years. They might save somebody's vehicles out there where the lines of supply are thin. (Of course, where available, you'd requisition new assemblies.)

'To repair a crack in a cylinder-block water jacket, make a plate of heavy sheet metal, drill and tap for 3/16 or 1/8 by 1/2 inch round-head stud screw bolts. Put a gasket under the plate and screw the plate over the crack in



the block. (Of course, the crack must be in a place that'll take the plate and screw bolts.)

'Sand holes (defects) have been known to appear in even the best-inspected gear cases - differential, transmission, or transfer cases. Patch them up by drilling them out large enough to obliterate the sand hole, then tap, and screw in a pipe plug with a little permatex smeared on the threads (or a hunk of string wound around the threads) to prevent oil leakage.'

1st Lt. Charles W. Converse, Hq. Co., 27th Signal Construction Battalion, believes that a motor officer's best position is horizontal - under a vehicle looking for loose bolts, leaking seals, etc. Take advantage of the *Civilian Automotive Advisors*, you ribbon clerks turned motor officers, urges Lt. Converse. Go over the vehicle with him, spot checking to beat hell, read your maintenance manuals until you know what this motor business is all about.

Our system (we're a separate battalion with over 100 vehicles) is to have the company motor officers make their own inspections. The battalion motor officer drops in at least once each week and inspects at least one vehicle of each type in the company. The original spot-check sheet is submitted to the battalion commander who sends it to the proper company commander for immediate action. Carbon copy is for future reference of battalion motor officer to ascertain that necessary work has been done.

The system works!



Dear Half-Mast,

Here is an appeal for help from overseas. Due to bad roads, the 6x6 GMC's, with the split-type differential housing, are quite frequently brought into the shop with the spring hold-down studs on the right side of the front axle broken. We have tried installing lock washers under the nut, but this seems to hold for a short while and they break again in about a week. On the 'banjo-type' housing we have no trouble because they use U-bolts. My question is, is it possible to make U-bolts for the split-type housing?

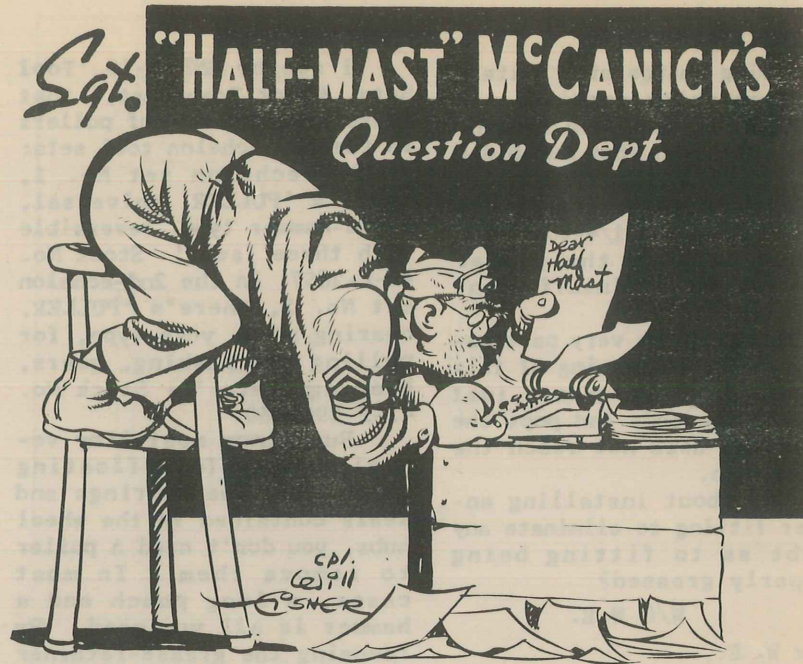
Our other problem concerns brake drums. Mud gets in between the drum and backing plate. Of course, this is raising particular hell with the linings, wheel cylinders, and so on. Can you tell me if the GMC people have devised anything to beat this?

T/Sgt. J.W.G.C.

Dear Sarge,

About the spring hold-down studs: rivet heads on the axle housing are in the way of installing U-bolts. Analyzing the condition, any movement of the spring is transmitted to the studs, tending to bend the stud and break it. For this reason, and the stud being what it is, it's necessary to tighten it properly and keep it tight. Proper tightening in this case means putting a full load on the truck so as to take all the camber out of the spring (spring pressed flat) and then tightening the stud nuts. Even after proper tightening, you've got to recheck the stud nuts after the truck has been in operation a little while (about 1000 miles) because the 'high spots' on the spring leaves wear off and allow some looseness to creep in. It's looseness that puts excess strain on the studs and causes them to break. Tighten them with the truck loaded and keep them tight.

Another thing you might make sure of is that the studs are properly bottomed in their



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

sockets. Any dirt down in the socket (I don't know why you should have any down there) will cause the stud to ride high — you won't be able to tighten it down all the way, and again you have looseness that leads to breakage. At any rate, Sarge, and from what you say I think tightening the nuts with a load on the truck will solve your problem.

About dirt getting into brake drums: everybody I know is experimenting like mad to find some way of keeping the dirt out of the drums (it generally flows in as mud), but so far no solution is in sight. Closing up the space between the backing plate and the drum wouldn't keep the mud out — it would just prevent the dirt from centrifusing or spinning out again.

Dear Half-Mast,

The gasoline-solvent paint turned out to be not even waterproof. Where do we go from here?

Also, in painting unit-identification numbers on vehicles, it is my contention that where AR 850-5 calls for a star in the first group (as it does in Air Force designations) it is not necessary to have another star in the center of the bumper. Right?

A.P.R.  
2nd Lt., Ord.

Dear Lieutenant,

Right about the star. About the gasoline-solvent paint — I hear that an improved specification is already being drawn up. All you can do now, if the paint washes off, is repaint it.

Half-Mast

Half-Mast

Dear Half-Mast,

Having charge of a Battalion Shop which services all vehicles, it has been brought to my attention that the spider universal joint (Part No. 18397 - Knuckle and Spider Assembly) on the 1/4-ton Ford, is not getting the proper greasing due to insufficient fittings.

We have been very particular about the greasing of this fitting but the grease just reaches two ends and pops the valve and does not reach the other two.

How about installing another fitting to eliminate any doubt as to fitting being properly greased?

W/O W.E.

Dear W. E.,

It seems to me I've heard that song before - grease not reaching the bearing in the universal joints. But the reason is not 'insufficient fittings.' The reason is plugged passages. The only answer is to disassemble the joint and clean out the passages where the lubricant has hardened and blocked the openings.

Grease General Purpose No. 1 is the recommended lubricant for the universals. However, if anybody else has anything to say about plugged passages in the universals, let's hear from you. I'd like to hear how many of your vehicles (name the make and model) this plugging has occurred, and at what mileages. For the sake of the record, state what lube you're using, how you apply it, and how often.

*Half-Mast*

Dear Half-Mast,

Too many wheel bearings are being damaged during removal for repacking. The reason is the lack of wheel-bearing pullers in the 2nd-echelon tool sets. How about this?

W.P. W/O (j.g.)

Dear W.P.,

I see by SNL N-19 'Tool Sets, Motor Transport,' that there are a couple of pullers in the 2nd-echelon tool sets: in 2nd-echelon set No. 1, there's 'PULLER, universal, slide-hammer type, reversible with three jaws,' Stock No. 41-P-2657; in the 2nd-echelon set No. 2, there's 'PULLER, bearing race, yoke type, for pulling and pushing, gears, bearings, etc.' - Stock No. 41-P-2905-60.

But since most Army vehicles have full-floating axles with the bearings and seals contained in the wheel hubs, you don't need a puller to remove them. In most cases, a long punch and a hammer is all you need. By removing the grease-retainer lock ring, and tapping evenly and lightly on the bearing - being careful not to let the punch slip between the rollers or rest on the roller retaining cage - they can be removed without damage. (And remember, you don't have to remove the inner-bearing outer race to pack the wheel bearings.)

P.S. They tell me that eventually, demountable drums will be in production so you can more easily take them off for cleaning without getting into wheel-bearing trouble.

*Half-Mast*

Dear Half-Mast,

We'd like to know the proper location of white stars on Ford 1/4-ton, 4x4 Amphibians.

Capt. H.F.L.

Dear Captain,

As far as I can learn, AR 850-5 is still the latest word on the position of the white stars on the 1/4-ton amphibians. It doesn't mention the amphibian, but it does say, 'Special vehicles of the types enumerated will be marked so as to conform as closely as practicable to the marking prescribed for the type to which

they belong." Since I feel that the amphibian is essentially a jeep, that would make it the reconnaissance type, and so would be painted like the jeep: a white star on the front deck (corresponds to the outer surface of the hood), and a star on each side, near the rear of the vehicle. Until something more official comes along, I'll stick to this.

*Half-Mast*

Dear Half-Mast,

We've been having considerable argument concerning the covering of winch cables at this base. I feel sure that there is a regulation, bulletin or circular dealing with this subject, however so far we have been unable to find it. Please send the information to me so we can put an end to the argument.

S/Sgt. N.F.B.

Dear Sarge,

I've never seen a regulation on the covering of winch cables. If anybody has, I'd like to hear from them.

But there's two sides of a winch cable that need protecting: the outside and the inside (there's a hemp core on the inside). Ordnance has 'oil, lubricating, preservative medium,' K 001-10-74780, 82 and 84, which takes care of both sides. However, to avoid a supply problem, I like crank-case drainings. It does the job inside and out.

*Half-Mast*

Dear Half-Mast,

On our M3A1 scout cars, the vacuum pump on the Zenith carburetor isn't working right. The pump works OK for a while then has to be overhauled. We think it's the brass piston working in the cast cylinder. The piston corrodes and carbon forms on the upper piston keeping it from operating. We've been shining the pistons

with brass-polishing-material - they work for a while after this treatment but since it's only temporary, won't you please send a permanent cure?

Sgt. W. L. H.  
Somewhere in Africa

Dear Sergeant,

The corrosion on the piston tells me that there are probably impurities in the gasoline you are using which is causing the piston to gum up. First, check the condition and functioning of the little fuel filters in the carburetor and, second, check the condition and source of your gasoline. If the gasoline appears too watery or dirty to you, scare up a chamois cloth somewhere and filter the gasoline through it. (Use a couple folds of cloth if you can't find a chamois.)

The carbon on the piston tells me that your engine is backfiring through the carburetor. And this again may be caused by poor gasoline. Of course, certain mechanical conditions like poor timing cause backfiring but I assume that all such conditions have been eliminated. I blame it on the gasoline - check it and service your filters more often.

*Half-Mast*

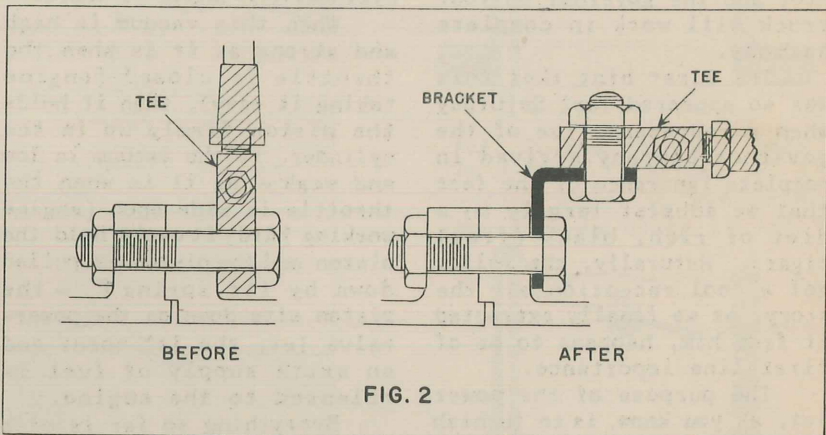
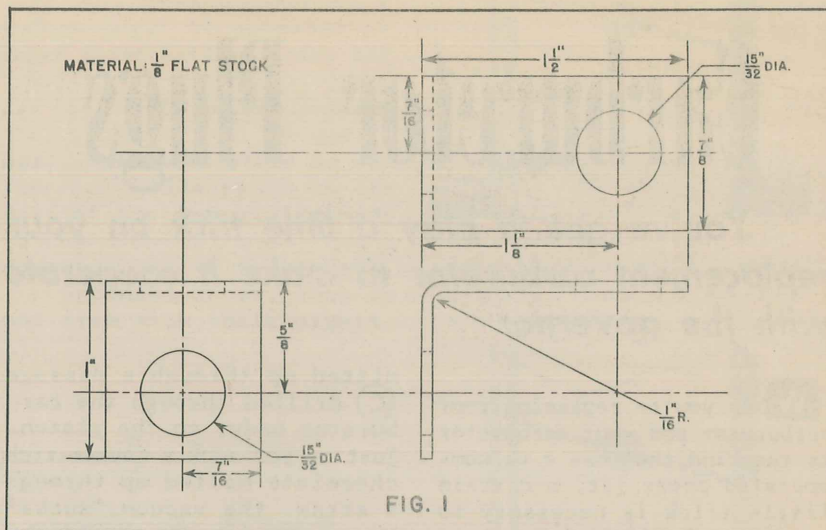
Dear Half-Mast,

On the Scout Car M3A1, the brake hose is mounted on top of the differential housing pointing straight up toward the body. The first big bump - or series of bumps - you hit, bang, down comes the body and breaks off the brake hose. Result: No brakes and maybe an accident. I am making some temporary changes to try to relieve this condition on the vehicles we have, but thought you could help us with an authorized modification. What shall we do?

I. W. B.

Dear I. W. B.,

You shall follow the sketches and directions I am



about to give you which are from an FSMWO (G67W20) now in preparation - advance notice of which was obtained by me from confidential sources in the Tank-Automotive Center named Crazy-Mamie Hooligan. The purpose of the forthcoming FSMWO is to relocate the rear-axle brake-line tee and to provide a bracket to hold the tee in position thereby moving the brake hose out of harm's way. Since many vehicles may be damaged before the FSMWO and materials needed get out, TAC has suggested that I give you a temporary expedient and show you how to build the materials needed from scrap.

Obtain a piece of 1/8" stock of the dimensions shown in Figure 1 (above). Bend the stock 90° and drill a 15/32" hole in each side as also shown

in Figure 1. Take the tee fitting off its present mounting and install the bracket as shown in Figure 2: bolt the long side of the bracket to the axle housing and bolt the tee fitting to the short side of the bracket, using a 7/16" capscrew. Before tightening this capscrew, turn the bracket slightly forward of the center line of the rear axle - the rear-wheel brake lines will then enter the tee fitting from the same general direction as formerly, but the flexible brake line will enter the tee from the side rather than looping in from above. Thus relocated, the brake hose is beyond the reach of the bouncing body.

*Half-Mast*

# Carburetor Plugs

*You've got to play a little trick on your replacement carburetor to make it cooperate with the governor.*

**W**hen you're replacing your carburetor and your carburetor is the kind that has a vacuum-operated power jet, a certain little trick is necessary to guarantee that both the carburetor and the governor on your truck will work in complete harmony.

The first hint that this was so appeared last Saturday when a representative of the governor company arrived in complete ignorance of the fact that we subsist largely on a diet of rich, black (free) cigars. Naturally, the fellow got a cool reception but the story, as we finally extracted it from him, happens to be of first-line importance.

The purpose of the power jet, as you know, is to furnish an extra burst of power when the engine is laboring under load. The mechanics of the vacuum-operated power jet system are this: There's a piston (A) in Figure 1 (next page) in a cylinder - if the piston drops down and sits on the power-valve jet (B) an extra supply of fuel is released to the metering well and the engine gets the extra burst of power mentioned above.

**Question:** What determines when the piston shall sit down upon the little power-valve jet?

**Answer:** The piston is held off the power jet by a vacuum (or released by a lack of vacuum). The vacuum 'comes from' the inlet manifold. On carburetors without a governor, a little hole just below the carburetor butterfly valve, picks up the vacuum and the effect of the vacuum is trans-

mitted up through a passage (C) drilled through the carburetor body, to the piston. Just as you suck a double-rich chocolate malted up through a straw, the vacuum 'sucks' the piston up the top of the cylinder and holds it there. \*

When this vacuum is high and strong as it is when the throttle is closed (engine taking it easy), then it holds the piston firmly up in the cylinder. If the vacuum is low and weak - as it is when the throttle is wide open (engine working hard) it can't hold the piston and the piston is pulled down by its spring † - the piston sits down on the power-valve jet, the jet opens and an extra supply of fuel is released to the engine.

Everything so far is milk and honey (or whiskey and soda, if you prefer), but what happens when you install a governor on your carburetor? In this case the drilled vacuum passage is extended down through the

\* Just to satisfy the guys who always write in here to tell us that vacuum never sucks anything, we'd just like to say that what actually happens is that a low-pressure area is set up in the vacuum passage and the higher atmospheric pressure on the other side of the piston forces it up to the top of the cylinder.

† By the way, Tank-Automotive Center reminds us that this spring is calibrated to a certain tension - which varies in different makes of carburetor. So, the echelons overhauling carburetors must 1) be sure in replacing this spring that it's the right one for the particular carburetor; and 2) replace the spring yearly.

governor body and ends in an opening just below the governor butterfly valve. It will be the business of this new opening in the governor to pick up the vacuum from the intake manifold.

In which case, the old opening upstairs below the carburetor butterfly valve must be plugged up. Otherwise, it will act as an entrance for atmospheric pressure and break the vacuum in the drilled passage. *It must be plugged up.*

Plugging up the old hole is the little trick necessary to guarantee harmony between the governor and the replacement carburetor.

To plug the hole up, the governor people offer three separate and distinct plugs:

1) A short, stubby plug for carburetors where the old vacuum hole is on the inside of the carburetor base flange at an angle (Figure 2).

2) A hollow screw for cases where the old hole is drilled 'straight in' and is hard to get at (Figure 3). In this case, you're simply inserting the screw into the vacuum line itself - the side of the screw blocks the old hole off, and since the screw is hollow, the vacuum 'passes' through it.

3) The hollow screw mentioned above also does duty on carburetors with two passages in the base (Figure 4). The hollow screw is installed in the inner of the two passages in the same manner as in the case of Figure 3. Concerning the outer or 'angled' passage, don't worry about it - the correct gasket used between the carburetor and governor flanges, will block that off.

By the way, this outer passage may have a plug in it - ignore it.

4) A final condition is where the hole is on the inside of the carburetor base flange but the passage, although drilled on through to the bottom of the base (Figure 5), is plugged up. In this case, in addition to plugging up the 'inside' opening, the passage will have to be drilled out



(with delicacy and a small drill) to open at the bottom of the base flange.

All the above information, if the governor company representative is to be believed, is common knowledge and practice at the vehicle assembly plants. In the field, it is less well known and less well practiced.

And so, when you receive a governor and find a small bag containing three plugs attached

to it, don't shrug your shoulders and pass it off as a sudden burst of generosity. Those three little screws are fraught with significance and are the key to harmony between the carburetor and the governor. The extra plugs do not represent philanthropy on the part of the governor company which - very probably, has a governor on its pocketbook. Goodness knows, they're not free with their cigars.

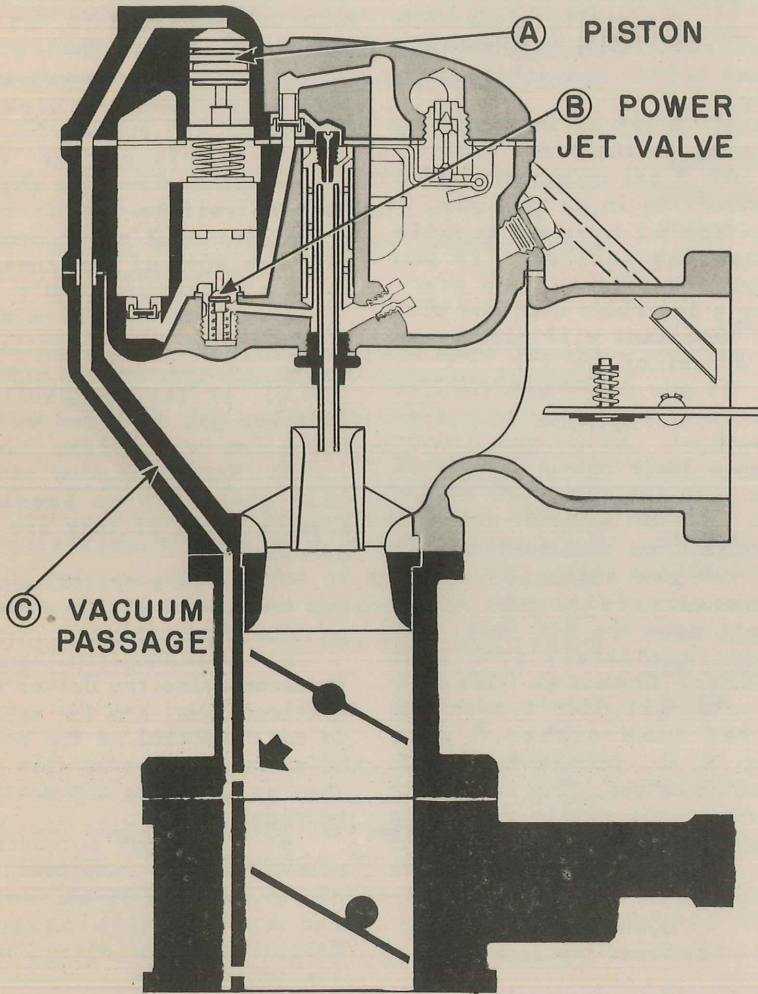


Fig. 1 - Nowhere in the world will you see a carburetor quite like the one above. It's strictly a doctored-up job to show you how the vacuum-operated power jet works - also to convince you that the 'old' hole under the carburetor butterfly valve (arrow) must be plugged up when a governor is used with this type of carburetor. The reason: so that the vacuum may be picked up from nowhere else but the opening below the governor butterfly.

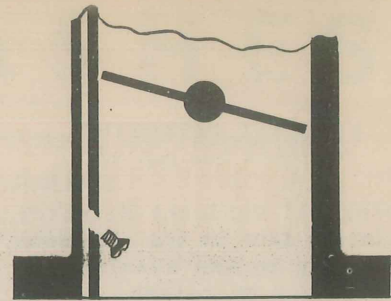
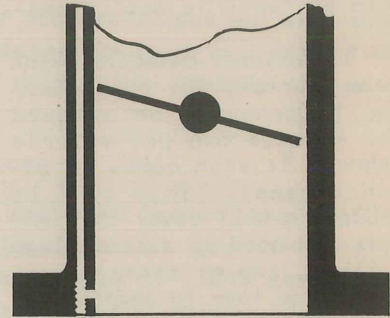


Fig. 2 - Where the 'old' hole is at an angle, a short stubby plug is easily screwed in.



HOLLOW SCREW

Fig. 3 - When the 'old' hole is drilled 'straight in' a hollow screw is run into the line to block it off.

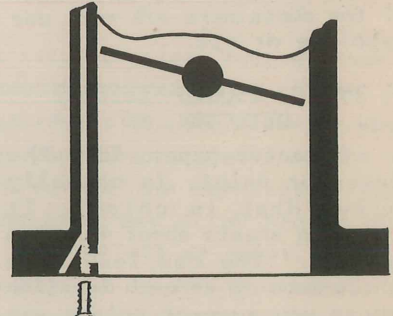


Fig. 4 - Don't be afraid of a double outlet to the flange - just screw in a hollow screw as above (the gasket will block off the angled outlet).

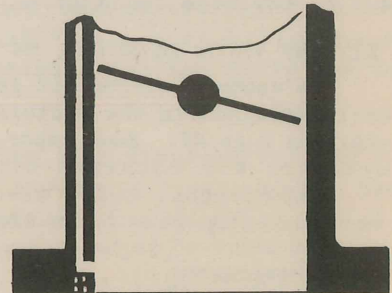


Fig. 5 - The opening to the bottom of the flange may be plugged. Drill the plug out.

## VESICANT DETECTIVE

(Continued from page 47)

doing all vesicant-detector painting late in the afternoon or early in the evening, so it can dry overnight.

Abrasion is another enemy of detector paint. Rough handling, sand in the air, or contact with jungle foliage will help to 'wear it out' chemically.

If vesicant-detector paint is authorized for your unit, you'll probably be allowed one 4-ounce can per vehicle (though it also comes in 32-ounce cans). This will be enough to half-cover the fenders and hood in a camouflage pattern, two or three times.

If you have to abandon the paint, don't leave it for the enemy to make use of — pour it on the ground. If you have to dispose of a lot of it, stack the containers and burn them with the help of grenades. If the containers are wet, use gasoline or oil.

## PAPER, LIQUID-VESICANT DETECTOR, M6

Detector paper, like the detector paint, is normally olive drab in color. It comes in sheets about 4 inches square. You can leave one sheet face-up at each location where you suspect poison gas may be used; or you can press the sheet face-down where you suspect that gas has already been used. In either case, the paper will turn red wherever droplets of liquid mustard gas or Lewisite touch it.

## KIT, HS VAPOR DETECTOR, M4

The vapor detector kit is best explained in the picture story on page 47. Each vapor-detector kit consists of:

1) A rubber bulb, used for drawing gas from the article believed to be poison-gas contaminated.

2) A bottle of glass tubes (bottle 'A') which are attached to the bulb and into which the contents of the bulb are squeezed. Each tube con-

tains a material which reacts chemically to mustard gas.

3) A box of matches for heating the tubes.

4) A bottle of liquid (bottle 'B') which develops the tell-tale color in the tubes if mustard has been drawn off the article sampled.

5) A medicine dropper for inserting liquid 'B' in the tubes.

6) A test bottle (bottle 'C') which gives the characteristic mustard reaction.

7) A sampling block with numbered holes for holding tubes before and after sampling.

8) A set of instructions mounted in the lid.

9) A set of more detailed instruction in an envelope.

You'll have no trouble detecting vesicants if you study the pictures and practice a few times with the kit.

Rehearsal will also serve as a test of the kit.

If you don't get results the first time, don't be discouraged. Maybe you didn't draw a large enough sample of gas into the tube...or heated the tube too long...or not long enough...or the test bottle 'C' has gone stale. If, after several trials, you still can't make the kit work, get help immediately from your nearest Chemical Officer.

"My kit didn't work the first time either," says Mrs. R. C., housewife of Bedpan, Oklahoma, "but now I can produce the tattle-tale blue every time. Hee hee hee he!"

Go back and study the pictures.

## CONNIE RODD

(Continued from page 38)

as I said in my previous article, scaled wrong: the graduated scale was started 8-19/32 inches from the bottom of the gage. The correct starting point is 1-19/32 inches from the bottom of the gage.

Do as I said before: fill in the present marks with solder and, on the other side of the stick, file the correct scale, starting 1-19/32 inches

from the bottom of the gage.

Check all your Medium Tanks, M4, M4A1, having an engine oil tank with a 13-1/4 inch filler pipe, for the incorrect gage — and modify as above.

## RUMORS

(Continued from page 39)

4) 'Commercial truck drivers do it that way.'

5) 'The engine is turning over faster and therefore gets more lubrication' (a master sgt. gave me this one).

6) 'The brakes won't stop a truck without the braking effect of the engine.'

7) 'It is easier and quicker to replace the engine than to relieve the brakes.'

As far as I'm concerned, here are some of the reasons for not 'shifting down':

1) It causes extra wear in the entire vehicle, particularly to the power train.

2) It wastes gasoline. It takes gas to speed up the motor for each shift.

3) Brakes on Army trucks will stop them on level or sloping roads if they are not overloaded.

4) Braking systems should not be spared at the expense of the power plant.

5) It is dangerous because it preoccupies the driver at a critical time, and the vehicle is out of control at the moment of shifting (this is also true when accelerating but can't be helped).

6) It is not authorized, according to my interpretation of par. 43, FM 25-10, and as far as I know this is the present official directive on the subject.

I'd appreciate your comments.

Lt. R.P. Seaman,  
Ord. Dept.

No comment, Lt. Seaman, you said a mouthful.

P.S. TM 21-300, 'Driver Selection and Training,' the very latest directive, doesn't and never will, authorize this practice either.

# NEWS FLASHES

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

Half-track fans should be on the lookout for completely revised SNL G-102, covering the M2 car, M3 personnel carrier, M4 mortar carrier, M3 and M3A1 gun motor carriages, and similar vehicles.

\* \* \*

If you're still having trouble with cracked rear-body panels on 1/4-ton jeeps, even after bracing and reinforcing the panels as directed in April ARMY MOTORS quoting TB 803-1, the cause may be improper loading. Except for the spare gasoline can and bracket, and the spare tire and rack, *nothing* should overhang the rear panel, according to Army Ground Forces weekly directive No. 15.

\* \* \*

Using organizations don't have to use requisitions when exchanging defective Ordnance parts for new ones. New "Stock Control Manual" (TM 38-220) says, "Insofar as possible, spare parts will be supplied by direct exchange of unserviceable for serviceable items without requisition." Change 3 of AR 850-15, also just out, authorizes use of an identification tag for exchange parts (W.D., O.O. Form No. 7370), but doesn't require it. More about this later.

\* \* \*

If you value your skull, fasten both of the turret traversing locks securely on the M10 and M10A1 gun motor carriages when you're traveling. It's possible for the traversing mechanism to break when the locks are not engaged, allowing the gun tube to swing around and whack you into the middle of next Tuesday.

\* \* \*

Latest news on tools is a revised Armored Force set (SNL N-19, Change 1), and a Posts, Camps, and Stations set (SNL N-23). As usual, your Ordnance Officer is the man to see about it.

\* \* \*

You'd better wear non-sparking shoes (no metal plates, hob nails, calks, or exposed nail heads) when handling gasoline in a closed or otherwise draftless place, says AR 850-20, Change 1. If you don't, you may suddenly find yourself hoisted by your own petard as the sparks from your shoes explode the gasoline vapors.

\* \* \*

Grease leaks on bogie wheels of medium tanks and the tank-like gun motor carriages are, according to TC 47 (1943 series) and TB 700-41, caused by excessive clearances on Timken tapered roller bearings. These publications recommend removing the bearing #A244898 and installing double-row ball bearing #CABX3AL in its place.

\* \* \*

Vehicles without water, oil, or some other operating necessity, must be tagged *in the driver's compartment* (on the steering wheel or in some other conspicuous place) so the driver will be sure to see the warnings. Hiding a tag under the hood may allow him to operate the vehicle without oil or water. So say TC 54 (1943 series) and TB 700-37. (Rumors Dept., April, gave you the tip-off on this.)

\* \* \*

The illustration in Figure 9 of TB 700-16, "Tanks, Differences among Models," which shows a medium tank with a cast hull, is wrongly labeled "Medium tank M4 and M4A1." Actually, only the M4A1 has a cast hull; the M4 is welded. Otherwise the two tanks are alike.

\* \* \*

When medium tank track rollers don't hold up under the strain of steel tracks, the old rollers (B168339) are to be replaced with cast-type B207814 rollers, according to TB 700-46 ("Cast track support roller").

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# NEWS FLASHES



# GENERAL ARNOLD

## *on preventive maintenance*

WAR DEPARTMENT  
HEADQUARTERS OF THE ARMY AIR FORCES  
WASHINGTON

MEN AND WOMEN OF THE ARMY OF THE UNITED STATES:

Americans are fighting a war on wings and wheels in every part of the world. To keep our global Army at peak performance, we need the men and machines of motor transport as never before.

Truck wheels are rolling up the world's last frontiers.

In 1918, motor transport was crude, but its only maintenance problem was the mud of French battlefields. Today, mechanized giants must blast new Overland Trails through jungles, cross high mountain ranges, and haul food, bombs and fuel across blistering deserts, in order that our fighters can attack the enemy by land and air.

The details of preventive maintenance have been prescribed to you. Any additional information you may need is available for the asking. For success in every theater, we must depend upon trucks and must have responsible men to keep them rolling. That is your stake in victory.

*H. H. Arnold*  
H. H. ARNOLD,  
General, U. S. Army,  
Commanding General, Army Air Forces.



If the men at the top turn away for a moment from the colossal switchboard of war to dictate a message to us of the wheeled-and-track-vehicle forces, our wisdom is to listen. These are the voices of the helmsmen—seeing the war as a global thing, they tell us our place lest, lost in routine, we forget.

*We are the wheels and the tracks of the thunder and lightning moving to victory.*