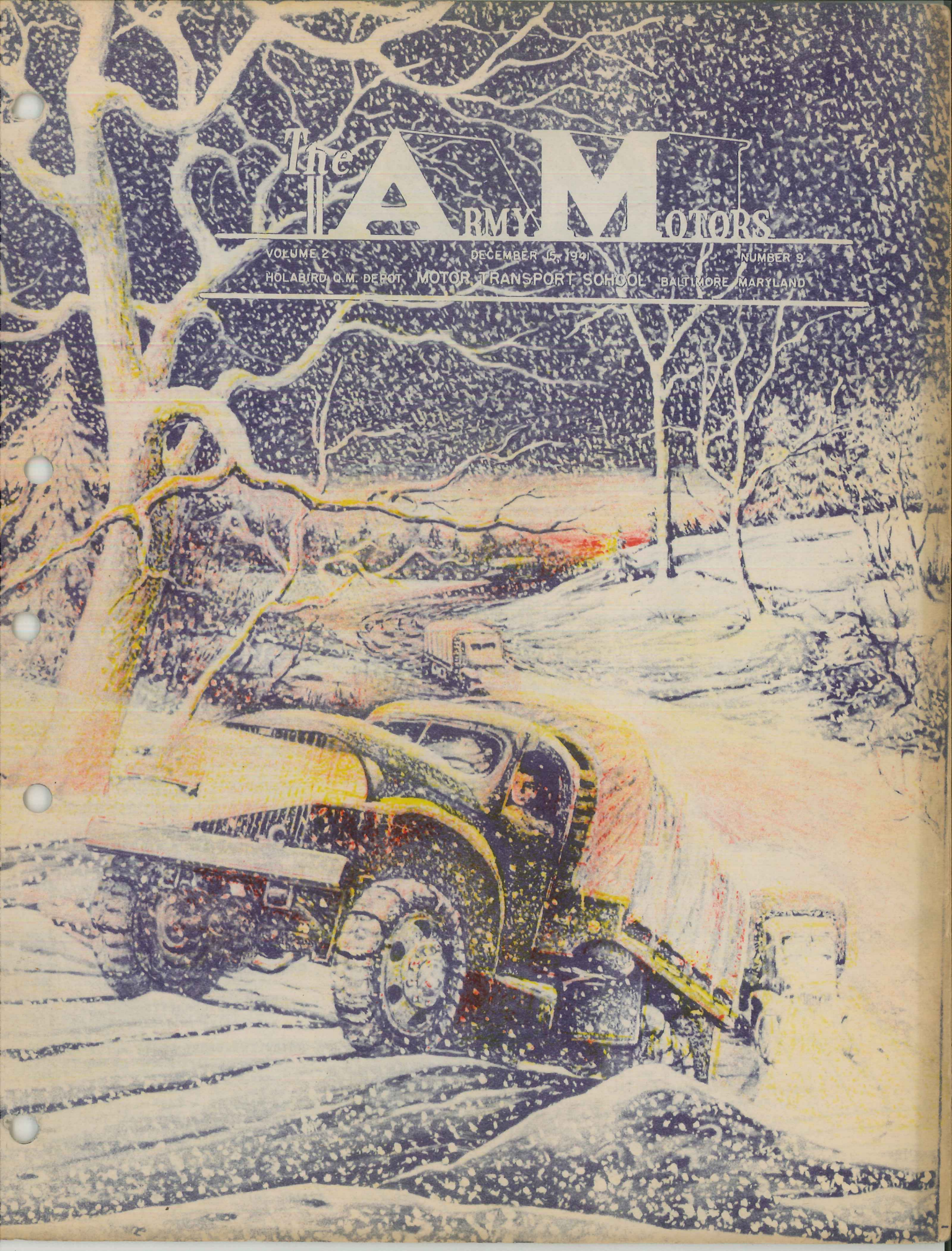

VOLUME 2 DECEMBER 15, 1941 NUMBER 9
HOLABIRD Q.M. DEPOT MOTOR TRANSPORT SCHOOL BALTIMORE MARYLAND

THE Steering Wheel

ARMY MOTORS

We're beginning to feel a little sad about ever having run that Editorial in the November 'AM about one driver's ignorance of the Echelon System of Maintenance. At the time we thought we had uncovered an isolated or at most, a localized condition.

We were astonished to find that ignorance of the Echelon System -- the very heart and soul of Motor Transport -- is widespread enough to frighten, even terrify.

Men who had been in Motor Transport six months, ten months, a year, had hardly heard about the Echelon system -- let alone knew the vital inner workings of the program.

We recall the day, not long ago, when we were talking to a group of officers about Motor Transport. Just out of curiosity we polled them on the meaning of "unit replacement". Eighty out of one hundred Motor Transport officers questioned, didn't know or knew hazily, the meaning of the term "unit replacement".

* * * * *

At the risk of being fatuous, we're going to follow our policy of broadcasting educational information and throw out a brief resume of just what the Echelon System of Maintenance is.

Mind if we go back to the beginning?

The Echelon System of Maintenance is what Keeps 'EM Rolling - or should. What the Army tries to do is catch the trouble before it starts by constantly inspecting and checking to see that everything is lubricated, inflated, clean, full or what have you, and kept well groomed.

If preventive maintenance fails (and confidentially, it's in pretty bad shape at the moment) and trouble does start, cure it quick. Repair the unit on the spot; or if it's easier and quicker, try unit replacement: Replace a faulty unit with a good one instead of trying to repair it. The faulty unit is repaired later and held ready for immediate issue.

Preventive and curative maintenance is in the hands of:

ORGANIZATIONAL MAINTENANCE

The first echelon, the drivers, who keep the truck lubed, gassed and contented; and check, check, check, check, then report anything wrong.

The second echelon, mechanics who check the servicing of the first echelon, do limited unit replacement and catch and repair mistakes of a minor nature.

SERVICE MAINTENANCE

The third echelon, trained parts men who supply parts, and trained mechanics who do repairs the second can't do, and shoot vehicles they can't repair to ....

The fourth echelon, who supply parts to the other echelons and do repairs beyond the ability of other echelons.

* * * * *

Here's something we learned too late to put into our lead article on Interchangeability: in future, parts lists will have a column showing the unit manufacturer's name and part number for any parts not made by the vehicle manufacturer. That'll be a help in telling what's interchangeable with what when the interchangeability charts aren't handy.

* * * * *

The people who put those Interchangeability charts together would like to hear what you think of them -- good or bad. Why not drop 'em a line?

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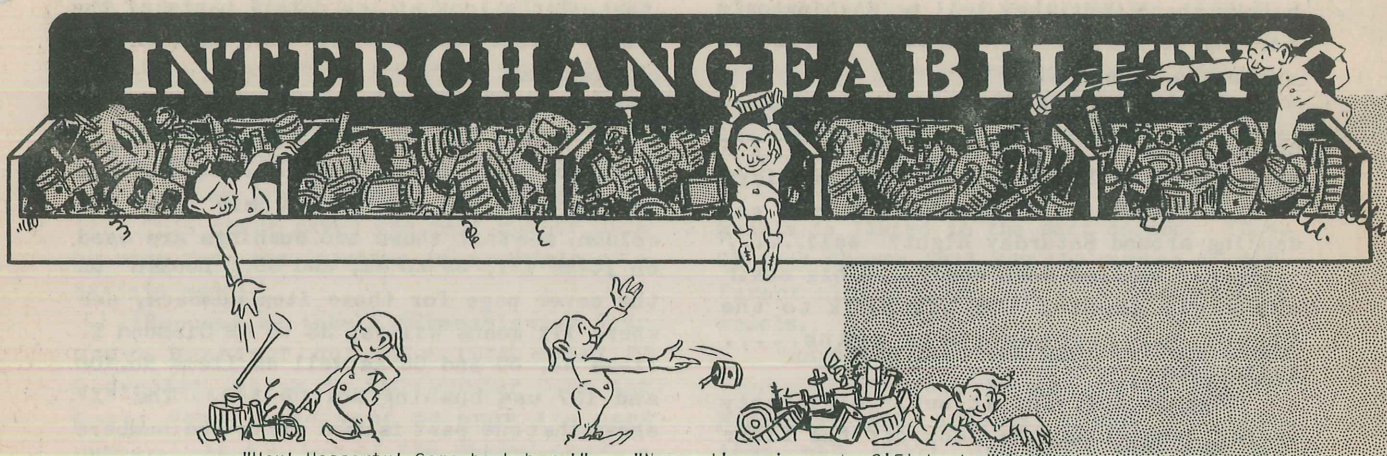
INTERCHANGEABILITY



"Hey! Haggerty! Come back here!" "Nope, I'm going out, O'Flaherty, and you ain't keeping me here to learn me that big book - I don't know nothing about interchangeability and I don't care." "Come here." "Aw, Sarge, have a heart. I got a date with ....."

"Me, you zombie, and that new Interchangeability Chart. Like the other dopes, Haggerty, you're willing to spend twice as much time getting out of learning something that will save you half the time you'd waste doing a job in four times the hours it should take. This Interchangeability Chart," O'Flaherty pulled a big book across the desk and forced it under Haggerty's chin, "was made in Washington to save doughheads like you a lot of effort in ordering and finding parts. It'll keep trucks off the deadline. Swallow the dope in it and them stripes is yours, plus the cash that goes with them. Sure, you got to learn how to use it - you gotta learn how to drive a car, but ain't it worth it in the long run?"

"O.K., O.K., you win," Haggerty sighed and opened the big book. "Hey, they already got instructions how to use it on the second page," he objected, "why you gotta tell me how to use the instructions? Why don't they put the straight dope in the book in the first place, instead of needin' instructions on how to use the instructions?"

"Look, Jughaid," O'Flaherty snarled, "like I say, anybody else who wants to know how to use the book will have enough brains to figger it out .... but you .... oh well, I'll tell you."

"In the first place, this book gives you interchangeability of parts between trucks made by the same company, as well as interchangeability of parts between trucks made by different people. Got that straight? O.K., now here comes the secret: you get the interchangeability between different parts by using the *unit* maker's number - the truck manufacturer's part number ain't got nothin' to do with it. Take an axle, f'r'instance. Jones makes it. GMC calls it number 5, Dodge calls it number 13. But it's the same axle, see? If you call it by the unit manufacturer's number, that is, Jones's number, 25, then everybody knows just what it is whether you need it for a Dodge or a GMC. Once you get that through your block, the rest is easy. Got it? O.K., now let's start from the beginning of the book."

"Why", Haggerty asked plaintively, "don't they stop finagling around with truck part numbers and unit part numbers and sub-unit part numbers and make 'em all use the same number in all the parts lists - wouldn't have to lug this book around then. Why do they always have to make it tough for the soldiers?"

"Sometimes, Haggerty," O'Flaherty admitted, "you talk wise and other times you just talk. As I said before, if I knew the answers I wouldn't be sittin' here. Somebody had a darn good reason for writing the book this way, and you gotta learn to use the book the way *they* made it. Now look: here's an index, first page

in the book. It gives all the assemblies in a truck. Yea, I know, there's lots of blanks there, but they tell me Washington's working to fill 'em in. A baby starts off small too, don't it?

"Talkin' about babies.....and interchangeability," Haggerty broke in, "You know that little blonde trick that dizzy tech sergeant over in Chassis Bay was dancing around Saturday night? Well.....," Haggerty nestled down cozily in his chair and slyly shunted the big book to the floor, ".....seems she's twins..... well....."

"Cut it out, cut it out," O'Flaherty warned, snatching the book off the floor and dumping it in Haggerty's lap, "Start reading!"

"The next page tells you how to use the book. Shut up!" O'Flaherty warned again, "no more cracks about instructions on how to use instructions. Sit there and read 'em and then we'll go on. In the meantime, I'm havin' a smoke."

There was silence for a while as Haggerty inched his way down the page. "I don't get it," he said suddenly.

"I thought you wouldn't," O'Flaherty grunted. "That's why I'm telling you. Let's go on.

"In the front of each Interchangeability Chart is what they call a cover sheet, that gives all the trucks in the QMC and gives them all an *item* number."

"Why do they gotta call a truck an item? Why don't they call it a truck number," Haggerty wanted to know.

"Trucks," O'Flaherty paid no attention, "keep the same item number all through the book. No. 1 is always the Bantam jeep, No. 68 the Ford jeep and No. 171 the Willys jeep. The rest of the cover page gives all the dope about a vehicle, the year, model, capacity and such.

"Let's take a F'r'instance, and see how this thing works. Start with Distributors.

"On the cover sheet it sez the unit manufacturer is Auto-Lite and that their distributor assembly number is IGW-4156. Now let's turn to the Chart headed "Distributors Auto-Lite." Let's look for Item 1, (Bantam) and that's on the 12th line from the top of the page. This *complete* distributor doesn't interchange with another vehicle because no other item (vehicle) numbers are in the same box. So, not findin' that, let's look at the detail parts of the distributor and see if they are interchangeable.

"At the top of the Interchangeability Chart you'll see that insulating bushings, Part No. IGW-38 and Part No. CB-140 are used in this distributor. Comin' down the column, see that these two bushings are used on Items 171, 39 to 42, and 38. Lookin' on the cover page for those item numbers, see where 171 means Willys; 38 to 42 Diamond T. Items No. 55 and 58 as well as Items No. 106 and 107 use bushing No. CB-140. The "X" shows that one part is used while the numbers mean that that many are used. You can trace the distributor caps and other detail parts just the same way.

"Serves you right. Go dozing again and I'll give you another crack. Get awake and stay awake, because the lesson ain't finished.

"Let's move to another part of the book and see what the Bearing interchangeability looks like."

"Why don't they put 'Bearings' on the cover sheet?" Haggerty wanted to know.

"Because they got too many bearings in a truck to get 'em on one page, or a couple pages. See? Anyhow, let's take Item No. 9, the third line reading from the top down. You can get a list of all the New Departure Bearings used on Number 9 by layin' a rule on the Chart and reading from left to right across the page.

"The first "X" is New Departure Bearing No. CT-22. The next is a "2" showin' that two Parts Number 0114 are used. The next "X" is New Departure Bearing No. 3203, which looks as though it's used on plenty of trucks, as even you can see by following the "X" down the page. See what that means? No, I didn't think you did, you dope. It means that this New Departure Bearing No. 3203 can be carried in one bin to fit plenty of trucks by one number, instead of in ten or twelve bins by vehicle manufacturer's numbers. Swell idea, eh?

"Now let's turn over to the second New Departure Chart. What's that?" O'Flaherty was exasperated, "how can you tell when you have to turn to the second chart? The book doesn't tell you? Well, you just *gotta know*, that's all. Look here. The first chart

shows all the bearings used in trucks listed by number, so if you know the bearing number you can tell which truck it's used on, and how many are used. The second, Model Application Chart, shows you *where* the bearing is in a truck. See? So, the first column at the top of the second chart "Transmission" shows the "Vehicle or Model Application." Don't ask me how I knew it - I hadda guess it. This chart gives the part number of a bearing from its location in a vehicle of a certain model.

"Suppose we take a "Transmission Gear Drive Bearing" out of a 1940 Model KB Chevrolet, which is item number 9 on the Cover Sheet, and want to know its part number. At the top of the second chart - no, it ain't got a name," O'Flaherty bellowed - " we find the heading "Transmission Gear Drive Bearing" and in the second column down we find item number 9. Following that line across the page we come to an "X" and then reading up we find that the "Transmission Gear Drive Bearing" has a part number 43207. Snap, eh? The other numbers alongside 9 in the item number column, 10, 11, 12, 16, 17, and 21 indicate that certain bearings are interchangeable on these models. Take another assembly, Haggerty, and play around with the chart. Anybody else who does it will get the right answer every time.

"The Chassis Unit Sheets give the specs of the complete vehicle, and give information on the engine, make, number of cylinders, bore and stroke, piston displacement, etc. The Chassis Unit Charts show Interchangeability of the major units. For example, on page 7 under clutch is listed Chevrolet, Item 9 through 22. Clutch assemblies Part Nos. 838954 and 838953 are the clutch cover assemblies for this entire list of Chevrolets.

"The clutch disc for each of these models is listed in the next column. These Chassis Sheets tell you the number of different clutch discs you need to cover all models.

"Anything more you want to know about these here Interchangeability Charts, Haggerty? No? It's all bright 'n' clear, then, eh? WHAT! You don't know what the cover sheets are for? You don't care....? Come back here, Haggerty - Come back you mungo-eyed ape...."

The Interchangeability Charts are distributed direct to Corps Areas, Commanding Officers of Divisions, Heavy and Light Maintenance Companies, Quartermasters and to all Posts, Camps and Stations. The mailing list is kept up to date and any changes of address should be reported to the Parts Standardization Section of the Quartermaster General's Office. The correct address is necessary because supplements are sent out regularly to keep the Parts Standardization Charts up to date.

D'ya know, Zeke, that...

A current regulator is used to protect the generator.

A voltage regulator is used to protect the battery.

A Cut-Out Relay is used to complete the circuit between the generator and battery.

When taking current and voltage readings regulator cover should be in place.

A current regulator should operate only when generator is putting out maximum current.

A voltage regulator will not operate on a discharged battery.

A regulator does not increase the available output of a generator.

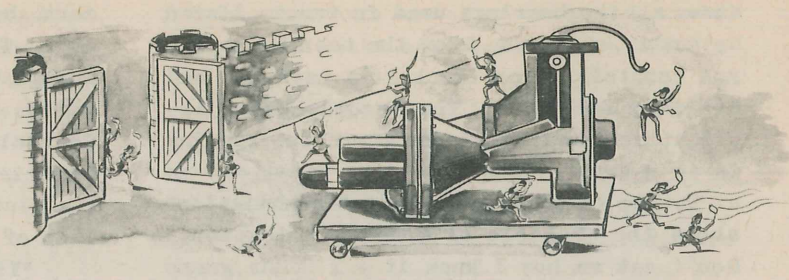
A fixed resistance can be used in place of a battery in setting a vibrating type voltage regulator.

The difference between Battery Voltage and Generator Voltage should never be greater than 3/4 volts with 20 amperes flowing.

A fully charged battery and a low charging rate indicates the generator and regulator are functioning normally.

A fully charged battery and a high charging rate indicates the regulator is not reducing the charge rate as it should.

TROUBLES FROM WITHIN

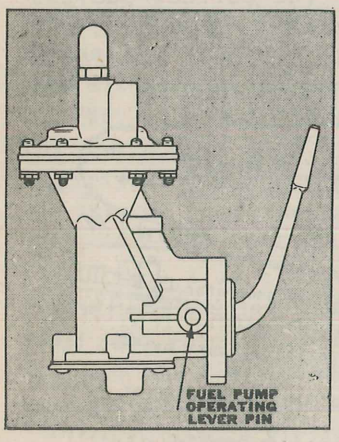


And so, while the unsuspecting Trojans snored peacefully, the wily Greek warriors crept out of a secret door and quietly opened the gates of the impregnable city.

Thus, on the night of Epeios' glory* the first Trojan said, "Things ain't always what they seem." All of which is very good reading if you have the time. Or maybe you want someday to be a great strategist like old Epeios.

But neither of these is the reason we bring up this time honored old bit of military lore. We just think it's a darn good example of how people can get taken in by a set of circumstances when they don't take the trouble to scratch below the surface. According to the newest batch of reports from the field the latest transport headache is a flock of vibrated-loose fuel pumps.

Seems that when the fuel pump comes a bit loose where it's mounted on the block, a slight oil seepage gets blown all over the place by the air blast from the fan. Instead of cleaning things up a bit and tracing the seepage back to its source, the boys have been going all around Robin Hood's barn looking for some serious trouble. They've diagnosed it as everything from a loose pan gasket to burned out rear main bearings.

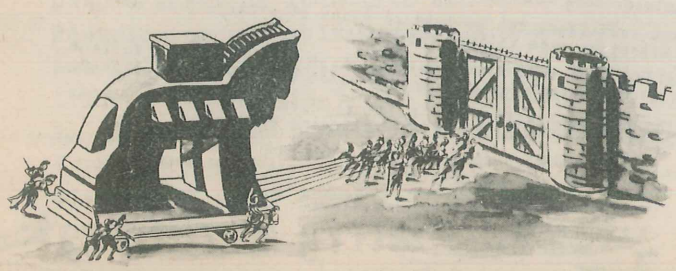


So take heed men, if those buggies start coming in to your shop with a bad case of oily block, steam 'em off and then trace the trouble back to its source. If you find the fuel pump has come loose, take it off altogether, replace the gasket (it's sure to be damaged) and screw the assembly on again good and tight.

However, if you find the oil leaking from around the shaft of the fuel pump operating lever, turn the pump in for a new one. When oil starts seeping out at that point it's a sure sign the pump has done its duty and is ready for the salvage pile.

The next step is to get a good old fashioned double wrist lock on the first echelon jockey who pilots the crate, show him the agony you went through to get things back in running order. Try to get him on your side so he'll do right by his little Nell. Show him the importance of keeping things clean and in good order. Tell him what his screwdriver and wrench are for other than to pick his teeth with and drive in loose hobnails. Make him understand (without using a maul if possible) that if he just keeps after things a little bit, his truck will keep him rolling about 99% of the time instead of putting him out in a ditch somewhere when the rest of the convoy is settling down for hot coffee and chow.

Send him away impressed so he'll be just as wary of an unkempt truck as we would be of the aforementioned Greeks bearing gifts. Keep 'em clean and keep 'em tight and they'll keep you rolling.



*He built the horse.

KEEP ME ROLLING

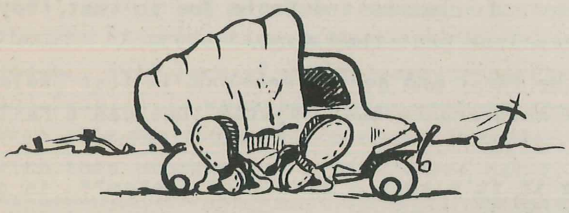
Some time ago a fellow named Jerome Weidman wrote a story about a horse that could whistle "Dixie".

Well, talking about horses that could whistle "Dixie", they have a reconnaissance car out at Cochrane Field, Georgia, that goes around all day making an *earnest request.*

You'd think that an automobile with the remarkable power of making earnest requests would go around spouting all kinds of wisdom - but this car says just one thing. Anytime anybody looks at it - be it Private or General - it looks him straight in the eye and says, "Keep *Me* Rolling."

Well, for Mike's sake, you say, what is this, a gag?

No, it's not a gag - it's like the trained seal who could play anything on the nosepipes, just so long as it was "America." Well, same way with this reconnaissance car - it can articulate, it can say anything, just so long as it's "Keep *Me* Rolling."



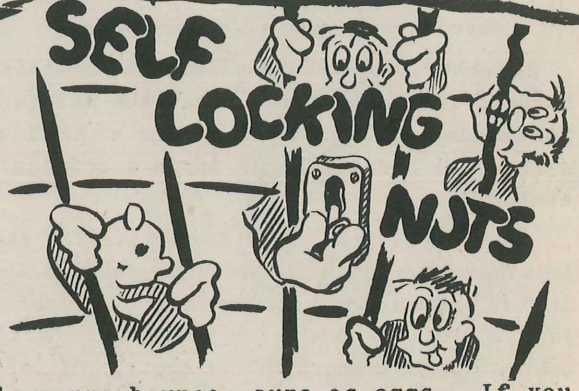
Believe it or not. The way we see it is: here's this lonely little car lost in the sound and fury of "Keep 'Em Flying!", "Keep 'Em Rolling!", "Keep 'Em Hopping!". Great slogans all - even olympian - but lacking in warmth, tenderness, individual appeal. Then this little car wistfully rebelling, giving tongue to its plaintive plea, "Keep *Me* rolling." A last desperate cry for air in its tires, oil and grease for its moving parts, "preventive maintenance, *please,* kind sir."

It all started the other day out at Cochran Field, when they handed Private Paul Postle a "Keep 'Em Rolling!" sticker for his windshield. Whether it was the gear shift lever that tugged longingly at his sleeve, or the steering wheel that whispered something in his ear, he'll never know. All he'll know is that at the moment of pasting it on, the "e" and the "m" in the sticker were suddenly reversed and "Keep Me Rolling" was born.

Well, what are you going to call it: coincidence, black magic...that the little car should suddenly find a voice for its plea?

Let's call it a gentle hint....let's check the tires, look to the lube, and see what that little leak under the hood is all about. *What are we waiting for?*

SELF LOCKING NUTS



You're going to find a new self-locking nut on the con rods of GMC 228 to 270 engines. It looks like the standard castle nut, but the slots are too narrow for a cotter pin, and the contact face of the nut is dished.

As you screw the nut down, the outer rim of the contact face hits first, and as you keep on tightening the dished face is pressed down, which brings the slots together and locks the nut. No cotter pins needed. Nice, eh?

BUT, you gotta use a torque indicating wrench for these nuts, and keep within 40 to 50 foot-pounds. If you don't, that job is gonna bounce, sure as eggs. If you stick to the maintenance manual specifications, you can use the con rod bolts and the self-locking nuts over and over again.

Merry Christmas

UNCLE JOE'S SYSTEM

...reported several instances of governor tampering ... the top plate of the governor is removed and a stone or stick wedged in between the side of the housing and the operating mechanism." "Returned to ---- with ---- and together we inspected warehouse where parts are received from the ----. This inspection was made after the writer had reported the deplorable manner of handling parts during the talley in procedure and ---- witnessed the throwing of waterpump assemblies in among connecting rods and the packing of door hinges on top of condensors...

...Uncle Joe had been a farmer all his life — farming the most run-down farm in six counties. Never could stop doing four things long enough to do one of them properly. We used to tease him about it, and he'd always answer, "Son, I know it. Things are in pretty bad shape. But I got a system, son, and if I could find time to use it, things would go fine. Just ain't got time to work the system."

Uncle Joe used to kid himself about that system. Sometimes he half believed that maybe come tomorrow he might start using his system, and that it would work if he could only get time to use it.

The only *similarity* between the first and second echelons and Uncle Joe is that they both have systems and they're both kidding themselves that they work.

The only *difference* between Uncle Joe and the first and second echelons is that Uncle Joe's system never existed, whereas preventive maintenance has a system that can't fail if it's carried out.

"Why isn't preventive maintenance working if it's such a darn good system?" is a logical question, and the Air Corps has a logical answer*.

Here's what they think about it:

"Recent observation within the 3rd Air Force .... has indicated that the maintenance and operation of motor vehicles within the 3rd Air Force is in a critical state....

....that of all the Camps I have visited the lack of interest shown in servicing all vehicles at this point is most outstanding. Their motor pool is full of dead-line vehicles. These vehicles have been robbed of parts, and left standing out in the rain with hoods off and no protection whatever from the weather. They have been standing there for a considerable length of time — covered with mud — and in general in a deplorable condition....

...It is imperative, therefore, that this condition be remedied at once... Some of the reasons responsible for faulty maintenance are noted below:

"*Failure of Commanding Officers to assume responsibility* for maintenance and operation of their transportation. This is the underlying cause and all other deficiencies can be traced to this fault...

...A spot check of this vehicle was made under

Circular Letter, Hq., 3rd Air Force, Tampa, Florida, Oct. 24, 1941, sent to THE 'AM by Captain W. M. Tisdale, Q.M.C.

the writer's supervision and the front and rear axle lubricant was found to be low--- Heat manifold control valve improperly adjusted, intake and exhaust manifold nuts loose, oil filter cap dirty, leak at puralator top gasket, battery low on water, Zenith gasoline filter dirty, right front fender loose. Since this vehicle is assigned to the----- Company, operating as a light maintenance unit, the condition of the vehicle did not speak well for the operation of this Company on Maintenance...

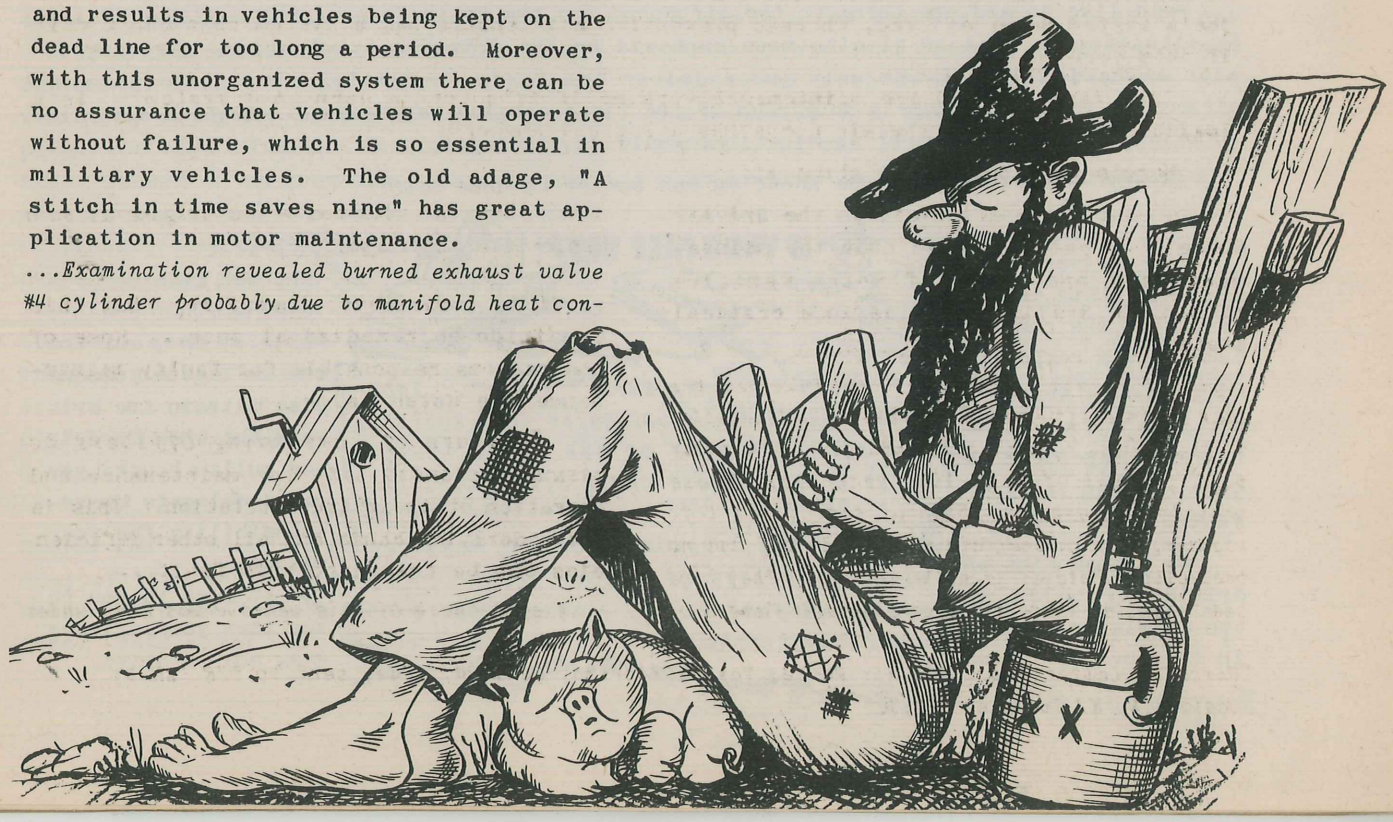
...*"No Unit Motor Transport Officer is assigned* in many organizations. Those that are assigned are subject to frequent changes and are not permitted to continue on their job sufficiently long to make their influence felt. Moreover, Motor Transport Officers are, in most cases, assigned a multitude of additional duties which prohibit them from giving essential time to this important job. Many officers are assigned who are not suited basically for this type of work, and in some cases, officers who have been especially schooled at the Motor Transport School at Fort Wayne have not been assigned to motor transport duties.

"*No systematic preventive maintenance* schedules are followed. Vehicles are run until something happens to them, with no thought of preventing failures before they occur. This lack of maintenance is costly and results in vehicles being kept on the dead line for too long a period. Moreover, with this unorganized system there can be no assurance that vehicles will operate without failure, which is so essential in military vehicles. The old adage, "A stitch in time saves nine" has great application in motor maintenance.

...*Examination revealed burned exhaust valve #4 cylinder probably due to manifold heat control valve set in winter position and valve stuck in this position. Carburetor governor blocked wide open with stone inserted between operating mechanism and body of governor. Zenith gasoline filter had been removed and line connected up direct. Filter was located in glove compartment of truck and filter element solid with sand. Chain case oil seal leaking badly...*

DRIVERS NOT PERMANENTLY ASSIGNED.

"Drivers and assistant drivers of motor vehicles in most cases are not permanently assigned nor properly trained. They are not given the assigned grade or rating for their work, and in some cases are even given arduous driving duty as a form of punishment. This system can only result in slipshod driving, driver's neglect, accidents, lack of 1st echelon maintenance and a corresponding breakdown of the vehicle. Remember that careful vehicle operation by a well trained driver who consistently executes the 1st echelon of maintenance on his vehicle is the broad foundation upon which the whole system of Army Maintenance is established. If the foundation is permitted to crumble, the whole structure will break down. Lack of the elementary drivers' maintenance prescribed for the 1st echelon and lack of lubrication are accounting for about 90%



of all vehicle failures in this Air Force. *...all vehicles are suffering from neglect and abuse, especially in the 1st and 2nd echelons. Premature motor failures due to abrasives in oiling systems are evident. That could be reduced materially if breathers and air cleaners were frequently attended to. I am making every effort to contact as many 2nd echelons as possible to urge the importance of air cleaner attention DAILY. Hoping that this motor wear can be materially reduced...*

"With a view to correcting these discrepancies the following steps will immediately be undertaken by Organization Commanders at all Air Bases:

SOLUTION TO THE PROBLEM.

"Responsible trained officer of suitable background will be permanently assigned the duty of Motor Transport Officer in each unit, and will be relieved of all other duties which might interfere with this duty. An effort will be made to place those officers now being schooled at Fort Wayne, Michigan, or Holabird QM Depot, Baltimore, Maryland, in these positions. No officer should be sent to the Motor School at Fort Wayne or Holabird unless it is intended that his permanent assignment will be to motor duties on his return. Motor Transport officers of groups or similar units will conduct Motor Schools for officers and key non-commissioned officers in that unit. These schools will use Field Manual 25-10 for a textbook and will emphasize that portion which deals with operation and maintenance of vehicles.

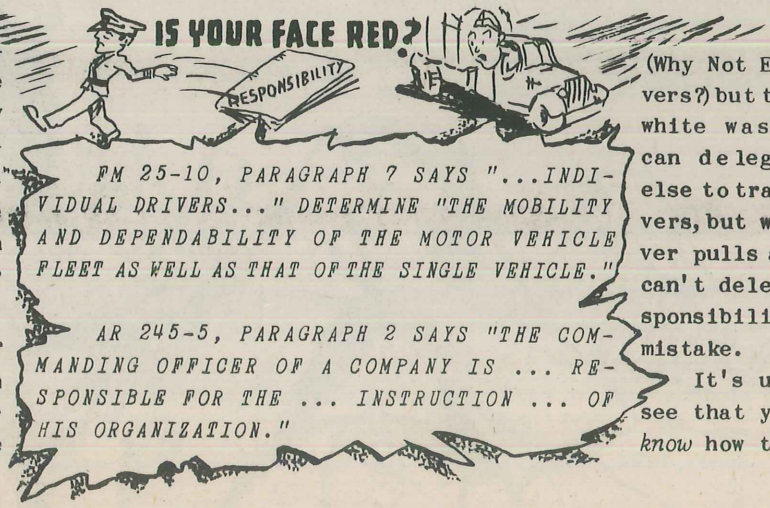
"A system of preventive maintenance will immediately be instituted, based upon Field Manual 25-10.

"Every effort will be made to permanently assign regular drivers and assistant drivers. These persons should be delegated full responsibility of operating their vehicle and performing drivers' maintenance thereon, and should be held strictly accountable for deficiencies. Suitable grades and ratings as laid down in T/O will be given drivers and satisfactory acknowledgement will be made to the drivers concerned for outstanding performance of their duty. In this connection, the system of competitive driving within the unit, will be found to be helpful. A crusade for improved driver training and prevention of motor accidents will start at once."

A good many of us are like Uncle Joe. We got a system, but we just ain't got time to use it. We spend so much time swearing at preventive maintenance, or thinking up new and better systems, that half of us have never tried to carry the present preventive maintenance system through to the end. It's condemned before it's used.

We'd like to add one thing to the Air Corps and the Field Inspectors' analyses of the PM situation — that of placing more emphasis on the driver's examination. Driving is most emphatically *not* the only job a driver has to do, and it's up to the examining officer to test the driver's knowledge of the first echelon maintenance. Maybe a definite official system of drivers' examinations would do the trick.

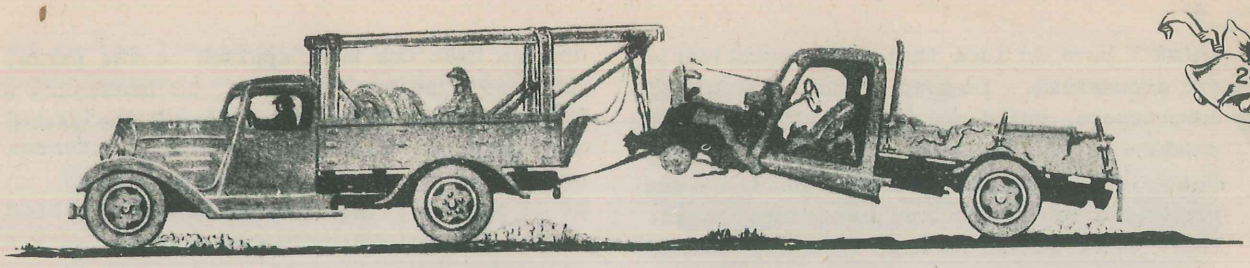
Anyway — whatever is done about PM had better be done *soon*!



The driver's responsibility is the truck, and the company commander's responsibility is the driver — so the next time there's an accident in your company, it's your fault.

We pinned a lot of driving troubles on the examining officer in the November issue (Why Not Examine Drivers?) but that doesn't white wash you. You can delegate someone else to train the drivers, but when the driver pulls a boner, you can't delegate the responsibility for your mistake.

It's up to you to see that your drivers *know* how to drive.



HELP !

Helpful Henry

To the Editor
Holabird Quartermaster Depot
Baltimore, Maryland

Dear Sir:

I find your magazine very interesting and a good source for information. I thoroughly enjoy reading every column and they are as good, if not better than a lot of the trade magazines.

You asked for ideas, so I thought I'd send some along to you.

When a vehicle won't start because of a wet distributor cap, a small amount of carbon tetrachloride sprayed on it, will remedy the trouble. Unlike kerosene, it has no ill effect on the wires.

EDITOR'S COMMENT: An excellent idea, and it's up to smart drivers to keep a small bottle of carbon tet in their tool kit.

If a head puller isn't available, damage on removal of the cylinder head can be prevented by using the casing of an old spark plug, the same diameter as the spark plug hole, welded to an iron bar. This is then screwed tight into the head. A great deal of pressure can be exerted, and it is often necessary to transfer this lifter from the front spark plug hole to the last one, so that the head will not bind on the studs. The iron bar is T shaped, to provide handles.

EDITOR'S COMMENT: Why not make two spark plug pullers? Otherwise a sound scheme and a big help.

After a master cylinder has been overhauled and is ready to be replaced, a great deal of time may be saved by bleeding the master cylinder instead of the wheel cylinders. This works most of the time, but it isn't perfect if air has already entered the lines. When the master cylinder has been bolted into place, screw the hydraulic line on a few turns, then have a man press the brake pedal down and up a couple of times, and then hold it down. While the pedal is down, quickly tighten the nut on the few remaining turns, and when it is tight, have the man pump the brake a few times. If the brake pedal is low, or has a spongey feeling, the wheel cylinders will have to be bled.

EDITOR'S COMMENT: This doesn't sound so good. You'll lose a lot of time bleeding the master cylinder and then finding that the wheel cylinders need bleeding anyway. Brakes are too important to take any chances with.

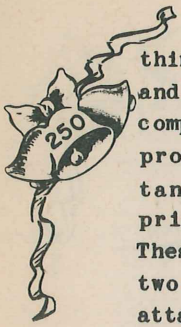
When an oil pump screen cannot be cleaned by ordinary means, and no solder is used in its construction, there is an easy way to clean it. Dip it into gasoline, let it drain a few moments, then carry it *out* of the garage to a cleared, safe place, and ignite it with a match. After it has burned, give it a chance to cool, then blow out the burned oil and carbon. This may also be used to clean certain types of air cleaners.

EDITOR'S COMMENT: You'll probably wind up with a clean screen, but gasoline is a tricky thing to fool with. We'd rather not recommend this one from a safety angle.

When replacing exhaust flange and manifold nuts, be sure they are brass. This will make them easy to remove, even after the threads of the bolt become choked with rust and scale.

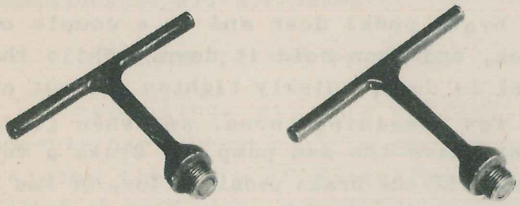
EDITOR'S COMMENT: O.K. if you can get the brass nuts. Most of them are steel.

You seem to be having a great deal of trouble obtaining air for tires, well, I



think I have an idea that seems practicable and economical. Instead of having a lot of compressors, build one that will be able to produce a high pressure to push air into tanks that are constructed on the same principal as oxygen and acetylene tanks. These tanks can be handled by either one or two men. Suitable gauges and lines can be attached, to aid in filling truck tires.

EDITOR'S COMMENT: This may be the prize idea of the lot. We like it. Anybody got objections? Maybe Private Henry would like to send us a sketch of how he thinks it would work.



It's no trouble at all to lift a stubborn head off with this pair of home made spark plug wrenches.

In case a truck should stop because of a bad fuel pump, it can be kept running until it can be repaired, if an old gas cap with a valve out of a discarded inner tube is welded to it. This cap can be put on the tank, and air can be pumped into it with a tire pump. This will force gas to flow to the carburetor. This idea may also be used to repair gas tanks that have dents in them.

EDITOR'S COMMENT: This sounds more complicated than unit replacement or repairing the pump. It might be dangerous if an air line were used instead of a hand pump.

An easy and safe way to patch a hole in a gas tank is as follows, without removing the tank, measure and cut out a piece of copper covering a larger area than the damaged part of the tank. Make sure that the parts are clean, and use plenty of acid, to make doubly sure. Drop a line of solder on the edges of the piece, then place it over the damaged area, and use a stick, or a piece of metal to hold it in place. Get the soldering iron very hot and apply it to the patch, starting at the center and working out. When most of the heat of the iron has been dissipated, use a second hot iron, and follow the same procedure. When enough heat has been applied to the parts, they will be well bonded. If necessary a thin line may be soldered around the patch, but this is often unnecessary.

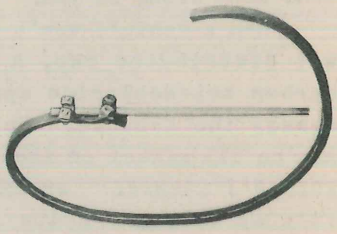
(Signed) Thomas Henry,
Hq. 2nd Bn. 96th CA AA
Camp Davis, N. Car.

EDITOR'S COMMENT: Sounds all right, but Don't forget to: First, drain the tank thoroughly, and second, blow it out with compressed air. The soldering iron should not be red hot, or it may ignite any explosive mixture left in the tank. Gas tank repairing is a tricky job - don't fool with it unless you're an expert, and then don't take chances.

Thanks very much, Private Henry for your brain waves and let's hear from you again.

Gripper

If you've had trouble loosening the nut on the generator that holds the pulley to the armature, give ear. You'll be interest-



Yes...this is not to be used as a bull whip! Its an old piece of fan belt hooked on to a 3/8" bar. Use it instead...

...of a vise which usually damages the commutator. When you want to take the pulley nut off, just whip the belt part around the pulley and start wrenching. The rubber belt gives a friction grip on the pulley that is even better than the metal to metal contact in a vise.

ed in the little gadget that Staff Sgt. James Hornor, Co. C of the 53rd QM Regiment picked up at the Auto-Lite school this summer.

Up to now, a lot of fellows have been holding the pulley still by clamping it in a vise or taking the armature out and clamping it in a vise. Clamping the pulley itself in a vise, crushes it and probably ruins it forever; clamping the armature in a vise, crushes the laminated core.

Sgt. Hornor's gadget makes it a simple trick to hold the pulley while you get a good grip on the nut - which like as not is rusty as an old beer can. The gripper holds the pulley firmly, without possible chance of damaging it.

The gadget is an old fan belt cut apart and fastened to a piece of 3/8 inch stock with a couple of U-bolts. Looks just like a bull whip.

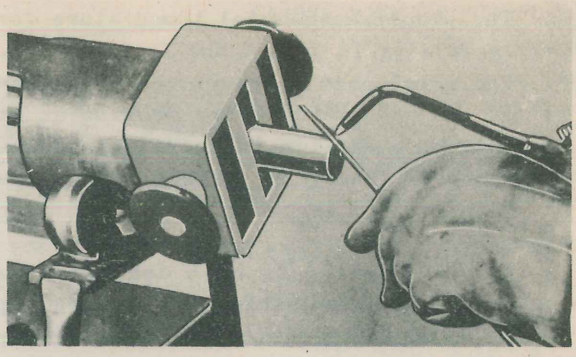
All you have to do is wind the whip end of the gadget around the pulley - it'll hold tight come hell or high water - and apply a wrench with all the force necessary to get even the rustiest nut off.

Safe Ending Tools

LINDE AIR PRODUCTS CORP.

After whanging a mushroom on the top of your tools, what do you do with them? Cut the mushroom off and whang away until you get another one, and cut that off and so on until you've worn the tool down to the point? Or maybe you just mushroom the ends and then throw the tools away. Seems to us we heard someone yelling about TOOL SHORTAGE a while back....

Why not try *safe-ending* your tools - not only to keep the ends from mushrooming but to cut the danger from flying chips? Safe-ended chisels have lasted three times



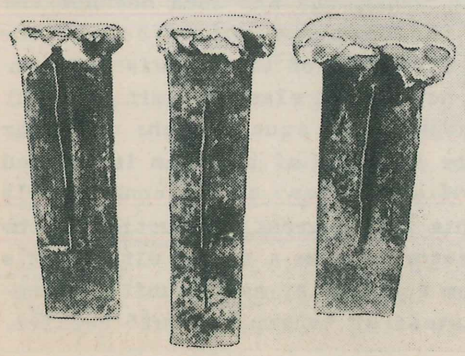
Here's a tool being safe-ended in a special rotating jig, designed for the job.

as long as untreated chisels, and they don't mushroom, crack or spall. Safe-ending is easy. All you do is cut the struck end of the tool down to sound metal if it's already ruined, or rebuild - that is, add new metal - by welding if the tool can't be shortened. Then file or grind the end to prepare it for a *bronze band* that does the safe-ending. A final grinding to smoothen things finishes the job.

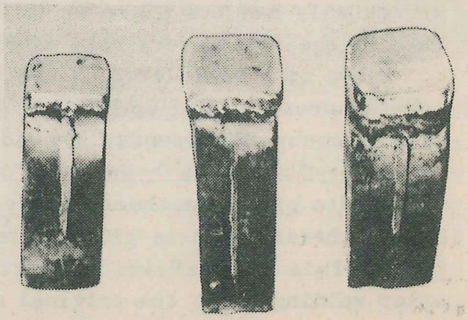
There's one catch, though: You have to know your bronze welding. Safe-ending will be successful and will produce no change in the hardness of the tool only when the proper bronze-welding technique is employed.

BRONZE WELDING TECHNIQUE

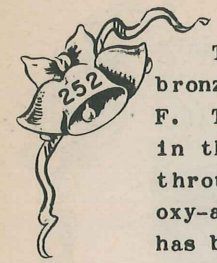
The success of bronze-welding depends on properly cleaning and heating the steel surface you're welding. When bronze is put on a dirty surface, the molten bronze tends to gather in drops. However, when a piece of steel has been properly heated and fluxed and is chemically clean, the bronze will spread out in a thin film. This is called "tinning" and it is this tinning action that allows a strong bond between the bronze weld metal and the base metal.



Hurry! Hurry! Hurry! The show's about to begin. Right here on your left is a trio of the most dangerous mushrooms a mechanic has ever put to steel. Now shift your gaze to the same set of chisels. You see them again on the right, transformed by a new bronze welding trick called "Safe Ending."



Merry Christmas



The proper base-metal temperature for bronze-welding is from 1,600 to 1,700 deg. F. The metal gets a bright red when seen in the dark; but if you're looking at it through dark glasses in the light of the oxy-acetylene flame, the correct temperature has been reached as soon as a red coloring appears.

Bronze-welding is best done with as small a flame as possible, and by speeding up the welding operation as it nears the finish. In welding around the end of a tool, heat builds up, so as you near the finish, less heat must be supplied to the base metal to allow complete tinning.

IF HARDNESS IS CHANGED MARKEDLY

There should be neither a marked increase nor decrease in the hardness of the safe-ended tool. Originally tools are given the hardness that is best suited to the work done with them. If the tool has increased in hardness after safe-ending, because too much heat has been used during the bronze-welding, it can be reduced by heating the end of the tool with the oxy-acetylene flame until it turns a barely visible red color - then allowing it to cool slowly to room temperature in still air. If, on the other hand, the struck end has been softened, it can be rehardened by heating it to a cherry red and quenching it in air or water.

Framework

From an original article by
A. C. LIDDY, Senior Instructor
6th Corps Area MT School
Fort Sheridan, Illinois.

The development of welding has progressed so rapidly that many service men think it can be successfully applied to almost any sort of a job. While welding undoubtedly has its place it is a big mistake to use it in every case of breakage.

Parts of a vehicle which are subject to severe stresses, and upon which the safety of the occupant depends, should never be welded. They have been carefully heat-treated to give them the necessary strength. Part of the strength is given by heat treatment. This part of its strength is lost after welding. Both the original metal part that has been melted and the added weld metal are cast steel, which does not have the strength of forged or rolled steel. In order to be as strong as the parent metal, the welded joint must usually be "reinforced," that is, built up to a larger cross section than the original.

Cold straightening does not ordinarily weaken a part. On the contrary, it strengthens the part since cold working is one of the methods of increasing the strength of metal. However, if the ductility of the metal is exceeded, cracks which do impair its strength will soon appear. These cracks may be too small to be seen. Therefore, cold straightening is not recommended for badly bent parts and never for important members, upon which safety depends.

The front axle "I" beam of the average light car has a tensile strength of about 100,000 pounds per square inch and an elastic limit of about 70,000 pounds per square inch. This means that stresses up to approximately 70,000 pounds per square inch can be put on the axle "I" beam, which will bend, but when the load is released or taken off, the axle will return to its original shape. Stresses over 70,000 pounds per square inch will curve the axle "I" beam and give it a permanent bend. A stress of 100,000 pounds per square inch will break the beam. The tensile strength and elastic limit on a light front axle give a factor of safety of about six to one.

Frequently vehicles are in accidents and the "I" beam is bent. Therefore the load on the "I" beam in the accident stressed it over the 70,000 pounds per square inch limit. If the shop decides to straighten the "I" beam, the mechanics think it's easier to straighten the part when hot, so a blow torch or forge fire is called into use. Without the most exacting scientific equipment nobody has any idea how hot the fire or the beam get and of course the internal structure of the beam is changed. The beam now has an elastic limit of about 40,000 pounds per square inch; in other words, the strength of the beam is reduced 40% to 50% and in many cases, considerably more. This is too great a reduction in the safety factor to take a chance with. Let's "Keep them Rolling" by making unit replacements instead of "cheap way out" repairs.

WAR DECLARED

The army and 36 northern police chiefs have declared war on General Winter and his army of maniacs.

"Winter driving hazards are an immediate salient on the public safety front", the declaration read, and the fight will go on until the hordes of savage wrecks and useless deaths that fight with General Winter and his Army, have been driven from the United States. No invader has ever successfully maintained a foot on American soil, and the legions of Army drivers are being enlisted to drive this latest menace from the highways of the Union.

The National Safety Council's Committee on Winter Driving Hazards have issued the following list of fifth columnists that are known to be acting under direct orders of General Winter and his staff. These hazards must be killed on sight:

BAD HEADLIGHTS

A scoundrel with a black patch over one eye and a frightening squint in the other. You can't judge where he is on a dark night, and neither can he. Very easy to hit.

NO CHAINS

A barefooted demon that walks on slippery places. Absolutely no control over his direction of travel.

DIRTY WINDSHIELDS

An ominous looking creature, wearing dark glasses, who can't see where he's going. Constantly running into things.

DOZER

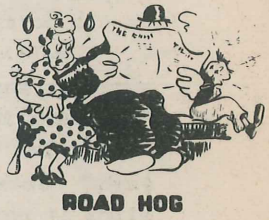
Characterized by a dopey look due to driving with the window closed. Carbon monoxide, his side kick, loves closed garages and cabs. Especially dangerous pair who strike without warning.

BAD BRAKES

This enemy can be identified by a decided limp and by the unmistakably cockeyed way he comes to a stop.

JACK RABBIT

An epileptic who zooms away and stops on a dime. He attacks from front and rear without warning.



ROAD HOG

Like the fat man in the street car who uses two seats, this enemy takes up the whole road, forcing you off the highway. Exceedingly dangerous.

HIGH SPEED

Easily spotted by a large, leaden foot that never allows the accelerator to leave the floorboard. Probably the most dangerous of General Winter's forces. Absolutely uncontrollable.

We don't talk about "salvage" anymore - the War cry now is...

RECLAMATION!

By Major A. A. Kleiber, Q.M.C.

"What the hell happened to that?" The sergeant rubbed his open palm over his mouth and stared aghast. The vehicle that had just been dragged in was a practically-new, 1941 Chevrolet panel truck. The whole back end of it above the axle looked as though somebody had gone over it with an axe. Top, sides, back and fenders up to the cab were a hash of torn and twisted metal.

"It got in a accident with a airplane," a soldier said shyly. The sergeant snorted in indignation, "What!! Whaddye talking about - accident with a nairaplane! Don't tell me he was flying this truck!"

"No sir," the soldier said, "He was over to the flying field on business and when he went to back up and turn around, he backed up into a airaplane propeller."

When the dust had settled, the sergeant returned to his desk swearing under his breath. A airaplane!....brand new vehicle.....$900 to buy a new body for it..... .....aaaaaa sugar! Junk it.....tear it down, recover some parts and throw the rest on the scrap pile.

A soldier broke in, "Whoa, Sarge, wait a minute, what about that Chevvy panel truck that came in last week with it's front end busted in? You know the one we were gonna junk? Sure, take the body off of it and stick it onto the chassis of this one."

And that's the way it was done. Two ruined ones together made a perfect one, and the extra parts went back into stock. Of course, one vehicle disappeared but it was better than two being junked. Ordinarily the cost of repairing each of these vehicles would have been out of the question - both might have been junked - but repairing one with the parts of the other, kept at least one truck rolling.

That's the way "Reclamation" works. We don't talk about "salvage" anymore - at least not so freely. In the old days - last year, two years ago - there was a great temptation to take a broken up or obsolete vehicle and mark it "To Be Sold Accountability." That is, sell the vehicle to commercial buyers for use as a vehicle. But today, we either fix a vehicle up for our own re-use, give other departments of the government a chance to use it, let Motor Transport Schools knock it down for instructional purposes, or else tear out all good parts, chop up the rest of it and sell it to commercial buyers as junk.

In this day of shortages, the big feature is "Reclamation," recovering materials and repairing vehicles and parts that would otherwise be junked.

The regular salvage procedure goes this way: a truck comes in pretty well beaten up. The question is whether it's worth the cost of parts, labor and so forth to repair it. The fourth echelon whistles for an inspector who looks it over and decides either that it pays to fix it or certifies that it's beyond economical repair.

In deciding to fix it, the inspector keeps in mind Circular 1-10. This sets the approximate limit of repair costs.

If, however, the Inspector decides the truck is ready for the boneyard, he fills out Form 260 and shoots it through channels to the Corps Area or Department Commander.

For the sake of brevity, let's say

this officer gives the high sign for an "I and I" form (Inspections and Inventory) to be filled out. Then an inspections officer comes forward, casts his glims over the vehicle, and fills out the "I and I" form - which becomes the death warrant for the vehicle.

The fourth echelon, which has been hovering hungrily in the background, now swoops down on the truck like a bunch of vultures and picks it clean of all recoverable parts - then makes a goulash of the remaining metal so that it can never again be used as a motor vehicle. The scrap metal is sold to commercial junk houses, the recovered parts (which are repaired if need be) go back into stock.

Unserviceable units - fuel pumps, generators etc. - taken off vehicles in the ordinary course of repair, are shipped to third or fourth echelon shops for cleaning, major or minor repairs - or for reclamation of usable parts.

All this, as we say, is the regular procedure for reclaiming and disposing of worn out and broken trucks and parts. *But*, it's no trick to follow a plan that's all laid out for you - the real trick is in using your own initiative, your own brains to figure out ways and means of helping to save vital parts and vehicles.

Think of this man's Army - Motor Transport - as something that belongs to you and you're a part of it - you're a stockholder. From now on, you're the 1st vice-president in charge of saving vehicles and parts for the company. It's up to you to see that only absolutely necessary spare parts and accessories are requisitioned, that all excess parts are returned. You're to see that all parts are handled and stored carefully.

As a mechanic, you're going to figure out ways of repairing units so that they can go back into service. Remember we're a bunch of guys riding trucks down a dark and troubled road. When our distributor goes on the blink, we can't just take a new one off the shelf, we've got to fix the one we've got. A little welding, a little brazing fills in that part, builds up this part.

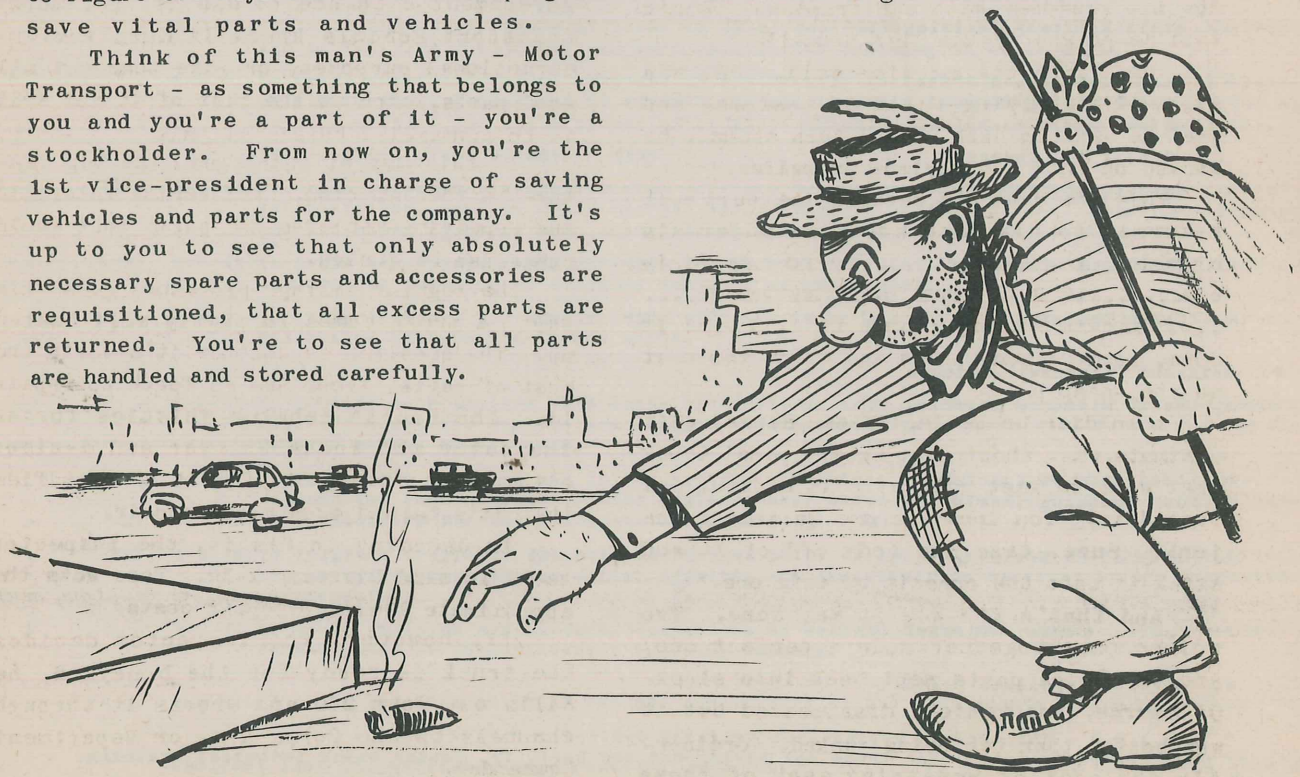
See that worn bushing over there? Let's replace it before the shaft wears the hole cockeyed. Oh, the hole is already cockeyed - well, let's throw a sleeve into it to straighten it out. The broken thread on that shaft, put a new thread on it by chasing it with an undersized thread.

Keep an eye on those bearings. They don't grow on trees anymore.

Any squarehead can be a parts changer - but it takes a wise guy to fix a part so it can be used a second and a third time.

Hey Hiram - where you going with that tire? Oh, it's got a cut in it and you're going to toss it on the junk heap. Bring it back, Hiram, we're repairing and retreading tires now. "Reclamation" is the war cry.

It's time to get the lead out.



Merry Christmas

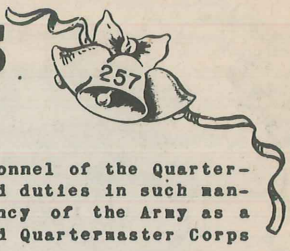
SCHEDULE OF QUARTERMASTE

CLASSIFICATION — TRAINING CENTERS - UNITS - SCHOOLS AND OTHER INSTAL

TYPES OF TRAINING	QMC REPLACEMENT CENTERS	TROOP SCHOOLS (TABS A & D)*	THE QM SCHOOL	THE QM M.T. SCHOOL	C.A. MOTOR TRANSPORT SCHOOLS	C. A. B & C SCHOOLS	CIVILIAN TRADE SCHOOLS	OTHER ARMS & SERVICE SCHOOLS	ARMY INDUST. COLLEGE	C G SC
A. UNIT										
1. Basic Military Training	(X) or	(X)	-	-	-	-	-	-	-	-
2. Basic Technical Training	(X) or	(X)	-	-	(X)	-	-	-	-	-
3. Basic Tactical Training	-	(X)	-	-	-	-	-	-	-	-
4. Field Exercises	-	(X)	-	-	-	-	-	-	-	-
B. INDIVIDUAL										
1. Officers: **										
a. Basic Military Training	-	(X)	-	-	-	-	-	-	-	-
b. Company Officer Training	-	-	(X)	(X)	-	-	-	-	-	
c. Advanced Training	-	-	-	-	-	-	-	-	(X)	(X
d. Specialist Training	-	-	-	(X)	-	(X)	(X)	-	(X)	(X
e. Instructor Training	-	-	(X)	(X)	-	(X)	-	-	-	(X
f. Cadre Training	(X)	-	(X)	(X)	-	-	-	-	-	-
2. Non-commissioned Officers										
a. Basic Military Training	(X) or	(X)	-	-	-	-	-	-	-	-
b. Non-commissioned Officer Training (Practical basic technical)	(X) or	(X)	-	-	-	-	-	-	-	-
School NCO Course	-	-	(X1)	(X2)	-	-	-	-	-	-
c. Specialist Training	-	-	-	(X)	(X)	(X)	(X)	-	-	-
d. Instructor Training	-	-	(X)	(X)	-	(X)	(X)	(X)	-	-
e. Cadre Training	(X)	-	(X)	(X)	-	(X)	-	-	-	-
3. Enlisted Personnel - Others										
a. Basic Military Training	(X) or	(X)	-	-	-	-	-	-	-	-
b. Occupational Specialist Training (Basic technical)	(X) or	(X)	-	-	(X)**	(X)	(X)	(X)	-	-
c. Specialist Training	-	-	-	(X)	(X)	(X)	(X)	(X)	-	-
d. Cadre - (Cooks - Clerks)	(X)	-	-	-	-	-	-	-	-	-
e. Officer Candidate Training (W.O's. & E.M.)	-	-	(X)	-	-	-	-	-	-	-

* Tabs A & D - Not through Replacement Training Centers.
** Basic mechanic school for those not having had QMC Repl. Tr. Center basic technical training.
*** Regular Army, National Guard, Reserve, and R.O.T.C. Graduates

CORPS TRAINING FACILITIES



ONS

ARMY WAR COLLEGE	CIVILIAN EDUCATION INSTITUTIONS	ARMY MANEUVERS	TRAINING MISSIONS
			GENERAL TRAINING MISSION:- To train the officer and enlisted personnel of the Quartermaster Corps to carry out their assigned duties in such manner as to increase the combat efficiency of the Army as a whole, by producing competently trained Quartermaster Corps units for assigned duties.
			SPECIFIC TRAINING MISSIONS:
-	-	-	A-1. To train each QM unit to efficiently maintain its own military administrative protection, subsistence, clothing, transportation and discipline.
-	-	-	A-2. To train each QM unit to efficiently carry on the technical operations which are assigned it.
-	-	(X)	A-3 To train each QM unit to function efficiently as a part of a tactical organization.
-	-	(X)	A-4 To train each QM unit by the use of practical field exercises to take their place and function efficiently in the next higher organization.
-	-	-	B-1-a. To train each newly appointed officer to discharge all duties appropriate to his grade and to supervise and direct the training of the individual enlisted men under him.
-	-	-	B-1-b. To give each officer a thorough knowledge of the duties of a company officer, both within the company and within the different units of a QM detachment or regiment by providing training based on actual experience, notes, charts and records.
-	(X)	-	B-1-c. To instruct the selected officers in the technical supply administrative functions and logistics of the Quartermaster Corps service, operating with or for Other Arms and Services.
-	(X)	(X)	B-1-d. To train selected officers for the operation of QM specialities.
-	(X)	(X)	B-1-e. To qualify selected officers as instructors in the several Quartermaster Schools.
-	-	-	B-1-f. To train cadre officers to effect a rapid and efficient preparation of all units and installations for active operations.
-	-	-	B-2-a. To train non-commissioned officers to be more efficient in the basic military subjects, and to fit them for higher and more specialized training in their units.
-	-	-	B-2-b. To train non-commissioned officers to efficiently perform the responsibilities appropriate to their grades and to conduct all the required instruction of their units, as well as prepare for their promotion to first three grades non-commissioned officers.
-	-	-	(X1) supply. (X2) Motor.
-	-	(X)	B-2-c. To train selected non-commissioned officers for assignment to key occupational specialist positions, such as chief clerks, specialists in units, offices, shops, and depots, and all other agencies and installations operated by the Quartermaster Corps.
-	-	-	B-2-d. To train non-commissioned officers in the most efficient methods of imparting instruction in the teaching of assigned subjects in their units.
-	-	-	B-2-e. To train selected non-commissioned officers to be practiced in the duties of their mobilization assignments in new units.
-	-	-	B-3-a. To provide each trainee with basic instruction, such as The Articles of War, camp orders, military courtesy, hygiene and uniform regulations, etc., so he will function as an efficient member of his unit.
-	-	-	B-3-b. To train each enlisted man in the various operations, based on civilian trade classifications and requirements of loss replacements, under the title and classification numbers necessary for the operation of QM units.
-	-	(X)	B-3-c. To instruct trainees, who have sufficient skill as specialists in civilian life, to qualify as specialists in the units, agencies and installations operated by the Quartermaster Corps.
-	-	-	B-3-d. To train enlisted men in such occupations as bakers, cooks and clerks, for the newly formed units at QM Replacement Training Centers.
-	-	-	B-3-e. To train selected enlisted men for appointment as 2nd Lieutenants in the Quartermaster Corps.

* *

The fact that Quartermaster organizations have routine duties to perform in connection with the supply and transportation of the Army must not be permitted to interfere with the carrying out of a definite training program. A certain part of every working day must be set aside for training.

Staff Sergeant Lester Phillips and Tech. Sergeant Edwin Hall were standing in the sun near the door of the Motorcycle Shop at Holabird. Sgt. Phillips had a hangdog expression on his face and Sgt. Hall, just back from the maneuver area, was down in the mouth.

Both boys were in fine shape.

"Say," suddenly popped Sgt. Phillips, "what's that you got in your hand?"

"Oh these," said Sgt. Hall, "these are pistons that got ruined by ignorant m'cycle drivers whose name are legion."

"That's a funny name for ignorant m'cycle drivers," puzzled Sgt. Phillips, "I can think of a couple of choicer names. But pray tell, how come those pistons in your hand are so eaten, beaten and chewed? Was it lack of oil in the engine?

"No," said Sgt. Hall, "it was a loose nut—sitting in the saddle. There was plenty of oil in the engine. 'Twas something else."

"'Twas?"

"Yeah," said Sgt. Hall, "these pistons got ruined by drivers who didn't know enough to snap off the throttle every mile or so when riding *long distances* at high speed.

As you and I know, the oiling system on a m'cycle is different from a truck or an auto. M'cycle crankcases are airtight and full of vacuum and vaporized oil that's being flung about by the flywheel. When the piston goes up, it makes a stiffer vacuum at the top and the vaporized oil rushes up and soaks the skirts of the piston and the cylinder."

"But.....?" prompted Sgt. Phillips.

"But," continued Sgt. Hall, "at high speeds there is a lot of pressure in the combustion chamber on top of the piston—and some of this blows by. Blows by and kills some of the vacuum in the crankcase—which prevents the oil from being drawn up around the piston and cylinder walls. This is one of the reasons why the pistons and rings run dry and dash themselves to pieces."

"Murder," agreed Sgt. Phillips, "and to think all a driver had to do is cut off his throttle for a second every mile or so, especially these guys on the open highway in convoy."

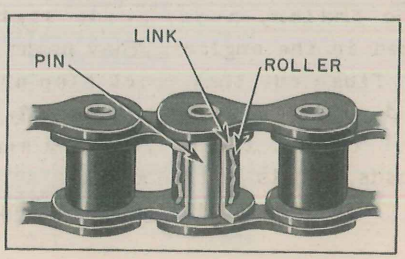
"You said it," said Sgt. Hall sadly, "and if you think that's bad, you ought to see what's happening to the rear drive chains."

"You don't have to tell me," said Sgt. Phillips, "a couple of characters came tearing in here the other day with drive chains that had been run through dirt, sand, mud, water and whatnot. Well, I got mad. I get these characters by the lapels and say, "Ever think of cleaning and lubricating those drive chains?" They gimme the old raised eyebrows, 'Clean drive chains? Why?'

"I grabs up a piece of roller chain and they both duck. 'Wait a minute, 'I says, 'see those rollers? Inside each and every roller is two bearing surfaces which need lubrication and cleaning.'

"The less gruesome of the two characters seems interested and asks how. 'Easy,' I says, 'all you have to do is take off the chain, brush it with a brush—brush it again in clean kerosene, hang it up and let it dry.'

'As for lubrication, just remember that the lube to use is either #10 motor



The grease-hungry innards of the roller chain.

oil or a heavy motor oil heated. Let the chain soak in this—then hang it up and let it dry. The motor oil cools down inside the rollers and stays in under tough riding. Do this every week and you won't have any trouble.'

"As they start edging toward the door, I give them one last word, "Don't forget to put the chain back on to run in the same direction as before—to save wear.' But by that time they were out of sight. If they'd stuck around a minute I could've saved them a lot of trouble in replacing their chain by telling them to run an old chain on in line with their dirty chain—so when they went to put the clean chain back on, they wouldn't have to go crazy tickling it around with their fingers."

"By the way," said Sgt. Hall, "have you heard what some of these chuckleheads are using to lubricate m'cycle transmissions?"

".....", said Sgt. Phillips.

"No," said Sgt. Hall, "but you're close. They're using 600W and even hypoid differential grease—stuff so thick they must be cutting chunks of it off with a scissors and ramming it down into the transmissions. Why, the stuff's like taffy!"

"And they're using it to lubricate those close-fitting little needle bearings in the Harley Davidson transmission? Why some of those parts are no bigger than fountain pen parts."

"True, Oh King," mourned Sgt. Phillips, "in any case they should never use anything heavier than SAE 60 motor oil. Anything over SAE 60, just won't penetrate down into the innards. Might just as well not lubricate."

"The futility of it all," groaned Sgt. Hall, "They don't have much to remember. They don't have *anything* to remember. The name plate tells them what lubes to use in what temperatures. At most, all they've got to remember is that in the Harley, the same motor oil is used in the transmission and the engine. In the Indian, a one grade lighter oil is used in the engine! They ought to remember to flush out that thick slop with kerosene and refill with the right oil."

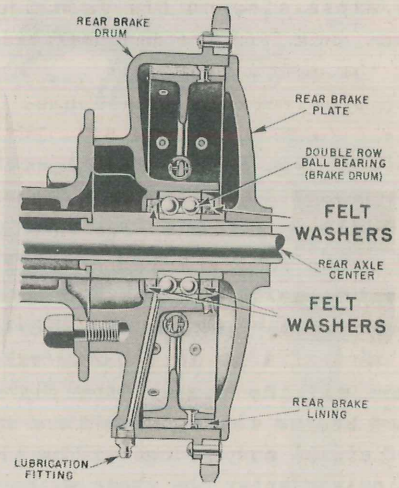
"Aaaah, the only memory some of these toads got is for food."

"Say," said Sgt. Hall, "Heard anything more about that Zerk fitting on the wheel hubs?"

"You mean the one the grease monkeys have been using a pressure gun on and shooting full of chassis grease?"

"Yeah. The one without a relief valve to let them see the excess grease coming out—the one they just keep pumping full of grease until it busts through the felt washers and pours over the brake linings and ruins them."

"No," said Sgt. Phillips, "I haven't heard a thing. *I just keep my grease monkeys away from that fitting.* Every



5000 miles, I take the wheel off and hand pack the bearings with a good wheel bearing grease and forget about it for a year."

"Cripes," said Sgt. Hall, "After seeing the treatment some of those m'cycles got out in the maneuver area, I'd like to get away and forget about everything for a year."

"Now," said Sgt. Phillips sadly, fingering a ruined piston, "You're cooking with gas."

Here's a parts common tip on General Motors vehicles. Any part number in the 100,000 series is a parts common - that is, a part you can buy in a hardware store. F'rinstance, take a wing nut, part number 120,240. Being in the 100,000 series, it's in the nut and bolt section of the parts common list. An ordinary plug, water jacket, 1-5/8" diameter looks like a part common. But the part number is 838,538 - it's not in the 100,000 series so it's not part common. Probably made of special steel.

Merry Christmas

PISTON PINS

WHAT HAPPENS TO THE PISTON PINS SHOULDN'T HAPPEN TO A DOG!

Out at the Smith house, everybody figured *Johnny* to be the bad one so they coddled him along and kept him on the straight and narrow. Then one day *Willy* went out and played the horses.

Same way with the pistons. Everybody thinks of the rings as trouble makers -- then one day the piston pins up and go blooey. If you think about it a minute, it's not at all surprising. After all, the pin not only carries the shock as the piston is forced downward by the burning fuel but it also resists inertia at the end of each stroke. These sudden changes of direction carry as much jolt as the stuff Grandmaw used to keep in the brown jug under her bed.

The pin must be small to fit into the space made for it, and therefore must carry a heavy load for its size. Because the piston moves up and down and not sideways, the wear takes place at the top and bottom of the bosses or bushings, making them oval. The bit of room left for the connecting rod to get a start, lets it slam the pin into the piston, making the oval wear faster.

All in all, what happens to the piston pins shouldn't happen to a dog.

A mechanic goes to work and does a ring job to correct oil pumping and blow-by. When he's all finished and washed up, the engine starts making a dull knock. "Condemn it", he hollers, "it never rains but it pours!"

TROUBLES ARE RELATED

That dull knocking is a first cousin to the ring job he's just done, not a different bellyache. It's the piston pins. The new ring job gives better compression, the piston pins get a bigger load - and any loose pins sound like a mine exploding. The same thing happens when the crankpin bearing is serviced and its knock removed; the quieter pin knock becomes more noticeable.

The thing to remember is that the piston pins and their bearings go bad as well as rings and crankpin bearings. You'll save yourself a tear down by checking the pins whenever you're doing either of these jobs.

Loose pin fit is usually due to: (1) a worn pin; or (2) a worn bushing. Whatever the cause, the result is the same: A nasty noise and another job for Joe Mechanic.

Spotting loose pins is easy. Bushings

or pins that are very worn can easily be seen when the engine is down. Sometimes, looseness can be heard by listening closely for piston pin rattle. Accelerate and decelerate the engine quickly. Listen for "pin thrash". With an idling engine, a loose pin generally makes a noise something like a rod bearing knock. The noise may become less when the spark is retarded. As a rule, when the cylinder is shorted out, a change in tone occurs. Sometimes, unless the wear is excessive, you can't hear the noise when the exhaust valve is held open.

A fairly tight fit makes it more difficult to detect trouble. At speeds up to 40 mph with the engine under load, the noise will not be noticeable, but if there's excess looseness, the engine will be noisy when quickly decelerated from this speed. At speeds above 40, the light tapping noise will increase as the car speed is increased - but will be more noticeable at any time upon deceleration. The engine should be well warmed before making these tests.

INSTALLING NEW PINS

In any case, it's always good practice when you're replacing pins to take a look at the bushings and change them if necessary - and vice versa. Generally speaking, you can replace pins up to .008 -- that is, they come in that much oversize -- without replacing the bushings. It's a simple matter of reaming out the bushings to size.

Keep two things in mind when installing new pins: too loose a pin fit will cause noise and eventual breakdown; too tight a fit may fracture the piston pin bosses, cause distortion and misalign the piston.

As for replacement, remember that in some cases, aluminum pistons must be heated so the pin can be inserted by hand. To be on the safe side, follow the manufacturer's specification carefully. Anything more than a push fit makes it too tight. Check fit by trying to fit it in the boss with the palm of your hand when the piston is cold. If you can, the fit is too loose. Also, check pin for misalignment - misalignment reduces clearance and makes it appear that the pin is fitted tightly enough.

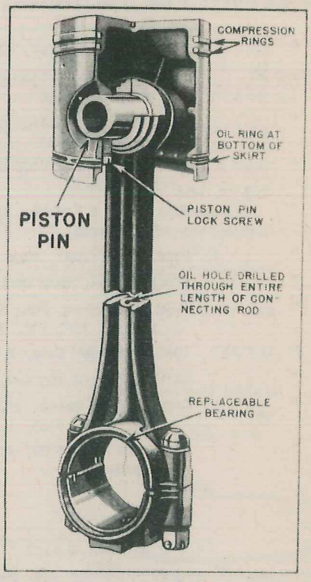
Usually, alignment can best be checked by fitting the pin in each boss separately and then in both bosses together. As a first precaution, check pins for out-of-round with micrometer. Never fit the pins tighter than specified -- they will seize when expanded by engine heat.

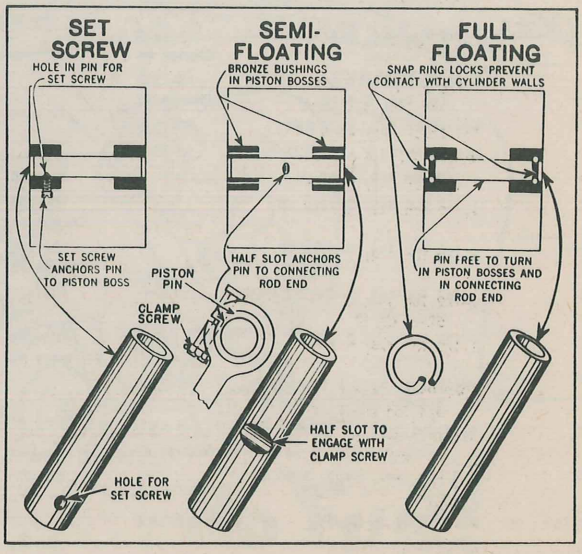
Some more precautions: be sure the clamp bolt is tightened properly when the pin is clamped in the upper end of rod; bushing should be tight before being finished to size; oil holes must be in alignment.

One last thing deserves special mention: the alignment of the piston and connecting rod assembly. Check this when the piston and rod are assembled and double-check before the assembly is placed in the cylinder.

You've just done a good day's work, don't plant the seeds of the old trouble all over again. You'll get old before your time that way - so will your truck.

The picture on the right shows a piston and the parts that go with it in cut-away view. This ties the whole piston assembly together. The picture below shows three ways of securing the piston pin inside the piston or connecting rod.





Merry Christmas

LATEST TECHNICAL MANUALS

Here is a list of the latest available vehicle technical manuals (maintenance and parts), plus some Ordnance technical manuals that might interest QM units, and a few corrections of TM numbers in the latest FM 21-6 List Of Publications For Training, September 1, 1941.

MANUFACTURER	MODEL NO.	PARTS LIST T.M. NUMBER	MAINT. MAN. T.M. NUMBER
Autocar	5 Ton 4x4 COE, U-5044	10-1160	10-1160
"	5-6 Ton 4x4 Ponton Tr. Truck, U-8144-T	10-1118	
"	5-6 Ton 4x4 Ponton Tr. Truck, U-8144-T		10-1119
"	4-5 Ton 4x4 Tr. Truck, U-7144-T	10-1116	
Bantam	1/4 Ton 4x4, BRC	10-1204	
"	1/4 Ton 4x4, BRC		10-1205
Ben Hur	1 Ton, 2 Wh. Trailers, 41-120	10-1318	
"	1 Ton Cargo Trailer, 41-33	10-1324	
Chevrolet	1-1/2 Ton 4x4, G-7105-06-16-07-17-13-27	10-1126	
"	1-1/2 Ton 4x4, G-7105-06-07-13-16-17-27-33		10-1127
"	1-1/2 Ton 4x4, G-4105-13-52-62-63-65-74	10-1430	
"	Pass. Cars & Trucks, 1941, Shop Manual		10-1301
"	Pass. Cars, 1941, Shop Manual		10-1303
"	Trucks, 1941, Shop Manual		10-1305
"	1942 L.H. Drive, Four Door Sedans, 73K, 73L, 73M.	10-1132	
"	1942 Passenger Cars, B.G.		10-1133
"	Carry-all, 1/2 Ton 4x2, 3101	10-1306	
"	Cargo & Tel. Maint. 1/2 Ton 4x2, 3116, 3103, & 3101	10-1308	
"	1-1/2 Ton 4x2, 4109, 4103, & 4409	10-1310	
		10-1310 Change #1	
"	1-1/2 Ton 4x4, G-4112	10-1202	
"	C.O.E. 1-1/2 Ton 4x4, G-4103	10-1202 Change #1	
"	1-1/2 Ton 4x4, G-4112	10-1202 Change #4	
"	Telephone Maintenance, 1-1/2 Ton 4x4, G-4112	10-1202 Change #2	
"	Tr. Truck 4x2, 4103-SAR	10-1316	
"	Master Parts P.L., 1929-1941	10-1312	
"	1-1/2 Ton 4x4, G-4112		10-1203
"	1-1/2 Ton 4x4, G-4112 YP		10-1203 Change #1
"	1-1/2 Ton 4x4, G-4112 YP		10-1203 Change #3
"	1-1/2 Ton 4x4, G-4105-13-52-62-63-65-74		10-1431
"	1-1/2 Ton 4x4, G-4103		10-1203 Change #2
"	1942 Pass. Cars & Trucks, BL 3/4 Ton, MR 1-1/2 Ton	10-1166	
"	Airfield Service Trucks 1941 1-1/2 Ton 4x4, G-4112	10-1202 Change #3	
"	1/2 Ton, 4x2, 3103, 3104 & 3116		10-1251
Corbitt	6 Ton 6x6, 50-SD-6	10-1158	
"	6 Ton 6x6, 50-SD-6		10-1159
"	Prime Mover 6 Ton 6x6, 50-SD-6	10-1108	

MANUFACTURER	MODEL NO.	PARTS LIST T.M. NUMBER	MAINT. MAN. T.M. NUMBER
Diamond T	4 Ton 6x6, 967	10-1602	
"	4 Ton 6x6, 967		10-1603
"	4 Ton 6x6, 968, 969, 970		10-1605
"	4 Ton 6x6, 968A, 969A, 970A		10-1607
"	4 Ton 6x6, 968, 969, 970	10-1604	
Dodge	1-1/2 Ton 4x4, VF-401-402-403		10-1193
"	1-1/2 Ton 4x4, VF-404-405-406-407	10-1178	
"	1-1/2 Ton 4x4, VF-404-405-406-407		10-1179
"	1/2 Ton 4x4, WC-1 thru WC-10	10-1122	
"	1/2 Ton 4x4, WC-1 thru WC-10	10-1122 Change #1	
"	1/2 Ton 4x4, WC-1,3,4,5, 6,7,8,9, 10, 11		10-1123
"	1/2 Ton 4x4, VC-1,2.3,4,5	10-1210	
"	1/2 Ton 4x4, VC-1,2,3,4,5		10-1211
"	1/2 Ton 4x4, WC-1,3,4,5,6, 7,8,9, 10, 11	10-1120	
"	1/2 Ton 4x4, WC-12 thru WC-20	10-1200	
"	1/2 Ton 4x4, WC-4,6,7,8,9, 10, 11, and WC-12-20		10-1201
"	1/2 Ton 4x4, WC-4,6,7,8,9, 10, 11	10-1198	
"	1-1/2 Ton 4x4, VF-401-2-3	10-1192	
"	1/2 Ton 4x4, WC-4, & 6-20		10-1201 Change #1
"	1/2 Ton 4x4, WC-21 to 27, 40 & 41		10-1153
"	1/2 Ton 4x4, WC-1 thru WC-11		10-1123 Change #1
"	1/2 Ton 4x4, VC-1 & VC-5		10-1195
"	1/2 Ton 4x4, VC-1 & VC-5	10-1194	
Federal	4-5 Ton 4x4 C.O.E., 94x43		10-1107
"	4-5 Ton 4x4 C.O.E., 94x43	10-1106	
Ford	1/4 Ton 4x4, G.P.		10-1101
"	1/4 Ton 4x4, G.P.	10-1100	
G.M.C.	2-1/2 Ton 6x6, CCKWX-353	10-1104	
"	2-1/2 Ton 6x6, CCKWX-353		10-1105
"	1-1/2-3 Ton 4x4 COE, AFKX-352		10-1401
"	2-1/2 Ton 6x6, CCKW-352-353	10-1500	
"	2-1/2 Ton 6x6, CCKW-352-353		10-1501
"	2-1/2 Ton 6x6, CCKWX-353	10-1104 Change #1	
"	1-1/2-3 Ton 4x4 COE, AFKX-352	10-1136	10-1136
"	1-1/2 Ton 4x4 COE, AFKX-352	10-1226	
"	2-1/2 Ton 6x6, ACKWX-353		10-1233
"	2-1/2 Ton 6x6, ACKWX-353	10-1232	
"	2-1/2 Ton 6x6, ACKWX-353		10-1241
"	1-1/2 Ton 4x2 COE, CF-35		10-1703
	1-1/2-3 Ton 4x4, CCK-353		10-1265
"	1-1/2-3 Ton 4x4 COE, AFKX-352		10-1231
"	2-1/2 Ton 6x4 COE, AFWX-354	10-1262	
"	2-1/2 Ton 4x4, AFKX-502		10-1239
"	2-1/2 Ton 4x2, AC-723-AC-725		10-1261 Change #1

MANUFACTURER	MODEL NO.	PARTS LIST T.M. NUMBER	MAINT. MAN. T.M. NUMBER
"	1939-40, AC & AF-500-550-600-650-700-800-850	10-1260	
"	2-1/2 Ton 6x6, ACKWX-353	10-1232 Change #1	
"	1-1/2-3 Ton 4x4, AFKX-352	10-1400	
"	1-1/2 Ton 4x2, AC-AF-100 to 450	10-1258	
"	2-1/2 Ton 4x4, AFKX-502	10-1238	
"	1-1/2 Ton 4x2, AC & AF 100 to 450		10-1259
"	4 Ton 4x4 COE, AFKX-804	10-1700	
"	4 Ton 4x4 COE, AFKX-804		10-1701
"	2-1/2 Ton 6x6, CCKW-352-353		10-1147
"	2-1/2 Ton 4x2, AC & AF 500-850		10-1261
"	2-1/2 Ton 6x6, CCKW-352-353	10-1146	
International	2-1/2 Ton 4x2, K-7	10-1140	
"	2-1/2 Ton 4x2, K-7		10-1141
"	2-1/2 Ton 6x6, M-5-6		10-1505
"	2-1/2 Ton 4x2, K-7	10-1114	
"	2-1/2 Ton 4x2, K-7		10-1115
"	5 Ton 4x2, KR-11		10-1145
"	2-1/2 Ton 4x2, K-7		10-1173
"	5-Ton 4x2, KR-11	10-1144	
"	2-1/2 Ton 6x6, M-5-6	10-1504	
ndian	1940, Military Model 340		10-1283
"	1940, Military Model 340	10-1282	
"	2nd Edition 1941, Military Model 45-640B	10-1280	
"	1941, Military Model 45-640B	10-1276	
"	1941, Military Model 640		10-1279
Mack	1940-2-1/2 Ton 6x4, NB	10-1188	
"	1940-2-1/2 Ton 6x4, NB		10-1189
"	1940 Prime Mover 6x6, NM 8 D		10-1183
"	1940 Prime Mover 6x6, NM	10-1182	
"	5-6 Ton 4x4 COE, NJU-1 & NJU-2 Tractor Trucks		10-1705
"	2-1/2 Ton 4x2, EES	10-1190	
"	2-1/2 Ton 4x2, EES		10-1191
Nash-Kelvinator	2 Wheel 1-Ton, "A" Trailer	10-1370	10-1370
Plymouth	Sedan, P-11	10-1148	
"	Sedan, P-11		10-1149
"	Passenger Cars, P-11	10-1150	
Studebaker	2-1/2 Ton 6x6, US-6	10-1502	
"	2-1/2 Ton 6x6, US-6		10-1503
"	2-1/2 Ton 6x6, US-6	10-1502 Change #1	
Willys	1/4 Ton 4x4, MA	10-1102	
"	1/4 Ton 4x4, MA		10-1103
Reo	2-1/2 Ton 4x2, 21 BHHS & 21 XHHS		10-1271
"	2-1/2 Ton 4x2, 21 BHHS & 21 XHHS	10-1270	

Here are some Ordnance Technical Manuals we took from the last issue of THE ORDNANCE SERGEANT. They may be of use to QM outfits.

PUBLISHED: TM 9-705, cars, scout, M3, M3A1, 4.2 mortar motor carriage, M2

TO BE RELEASED

SHORTLY: TM 9-776, Truck, wrecking, heavy, M1
TM 9-789, Truck, emergency repair (Fargo)
TM 9-790, Truck, emergency repair, M1 (Ford)
TM 9-791, Maintenance trucks, including: artillery, automotive, instrument and small arms repair; machine shop, spare parts, tanks maintenance tools, tool bench, and welding.
TM 9-850, Cleaning, preserving, lubricating and welding materials and similar items issued by the Ordnance Department.

Captain T.H. McCalla, 3rd., Co. B, 57th. QM Regt. (HM) noticed that some of the Technical Manuals listed in FM 21-6 "List of Publications for Training" didn't jibe with some of those in the October ARMY MOTORS. Here are the incorrect listings with the correct ones.

FM 21-6	CORRECT
TM 10-1102 2-1/2 Ton (LC) 6x6, GMC Model CCKWX-353	TM 10-1104
TM 10-1103 2-1/2 Ton (LC) 6x6, GMC Model CCKWX-353	TM 10-1105
TM 10-1104 1/4 Ton 4x4 Willys, MA	TM 10-1102
TM 10-1105 1/4 Ton 4x4 Willys, MA	TM 10-1103
TM 10-1202 and 10-1203 Parts List and Maintenance Manuals, Chevrolet Telephone Maintenance	TM 10-1202 and 10-203 Chevrolet 1-1/2 Ton 4x4 Special Change #1, COE Change #2, Telephone Maintenance Change #3, Air Field Service Change #4, Tractor Trucks
TM 10-1430, Chevrolet, 1-1/2 Ton 4x4 Model G-4112	Should include models G-4105, 4113, 4152, 4162, 4163, 4165, and 4174.

Experimental

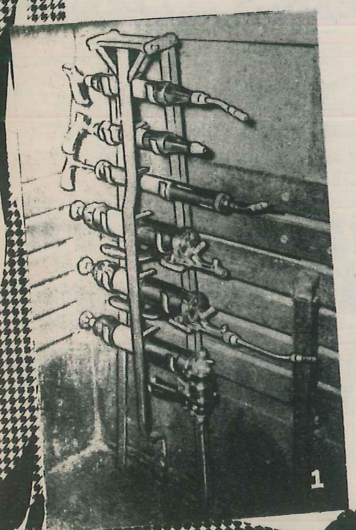
GREASE GUNS

JOSEPH G. GROSCH,
2nd. LT., SIGNAL CORPS.

The rack illustrated is designed to hold the six grease guns which are included in Second Echelon sets Nos. 2 and 3. It combines several functions; storage, safe keeping, almost instant accessibility and ease in use of guns.

The method of mounting in repair truck is shown in Fig. 1. The rack is supported and held in the truck at two points. The first point is between the second and third guns where a hook bolted to the top board of the back rest in the truck engages the SUPPORT BAR of the rack. The second point is near the bottom of the rack where a heavy STAPLE bolted or welded to the truck body goes through the LOCKING HOLES of both the MAIN ASSEMBLY RACK and LOCKING BAR. The lock put into the STAPLE locks the guns in the rack and the rack in the truck. The LOCKING FINGERS on the LOCKING BAR keep and lock the guns in place on the hooks.

To use the guns the LOCKING BAR may be lifted up and kept up by means of a catch while the rack is in the truck, or the rack may be taken bodily out of the truck and set up as shown in Fig. 2 and 3. The LOCKING BAR lifted up and swung down in back provides support to prop up the rack.



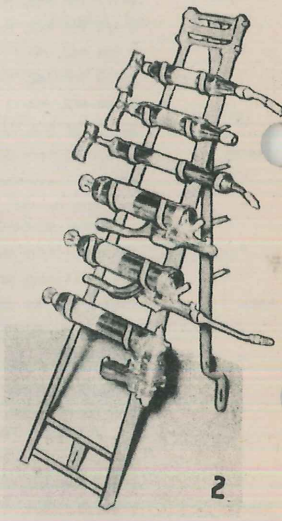
1

The LOCKING BAR LINK is shown in detail in Fig. 4 and is very important. Rigid construction is required in that the LOCKING BAR will be kept in line with the rack proper when the bar is used as a prop.

Drawings complete with parts list give the necessary dimensional details. The designer believes that the rack is as well proportioned as possible and no parts should be made weaker if maximum safety and strength is desired. The welded construction throughout makes the rack exceedingly rigid. The hooks should be made so the guns fit snugly. Safety against theft of guns is not absolute but it is felt that no trouble will be experienced if common sense and precaution are used.

The rack is mounted in a corner of the 2nd echelon truck facing working space in which no other load is put, making the guns as available as the tools in the drawers of the cabinets facing the same working space. The exposure to dust is no worse than the exposure to dust of other tools in the truck.

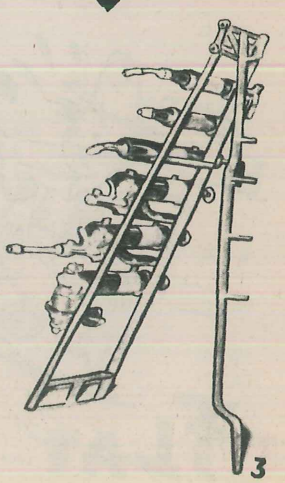
We have used the rack at the base and in the field for three



2

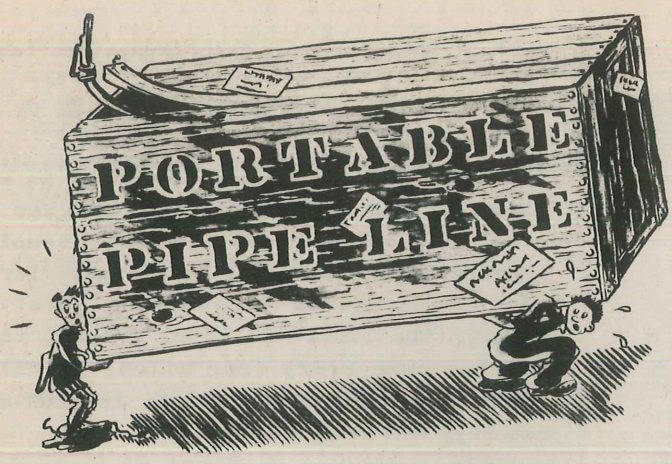
Rack set up: no fumbling for guns.

Locking device serves as support.



3

(Turn to page 267)



I can still remember the first time somebody told me about how they were getting crude oil and finished gasoline cross-country from the West to the Atlantic seaboard. Of course, it's nothing remarkable anymore - after the flurry about gas shortages and all - but all the time, I thought I was being kidded.

We were driving past Marcus Hook, Pennsylvania when my friend jerked his thumb at the acres and acres of refining machinery there and asked, "Know how they get oil up here?"

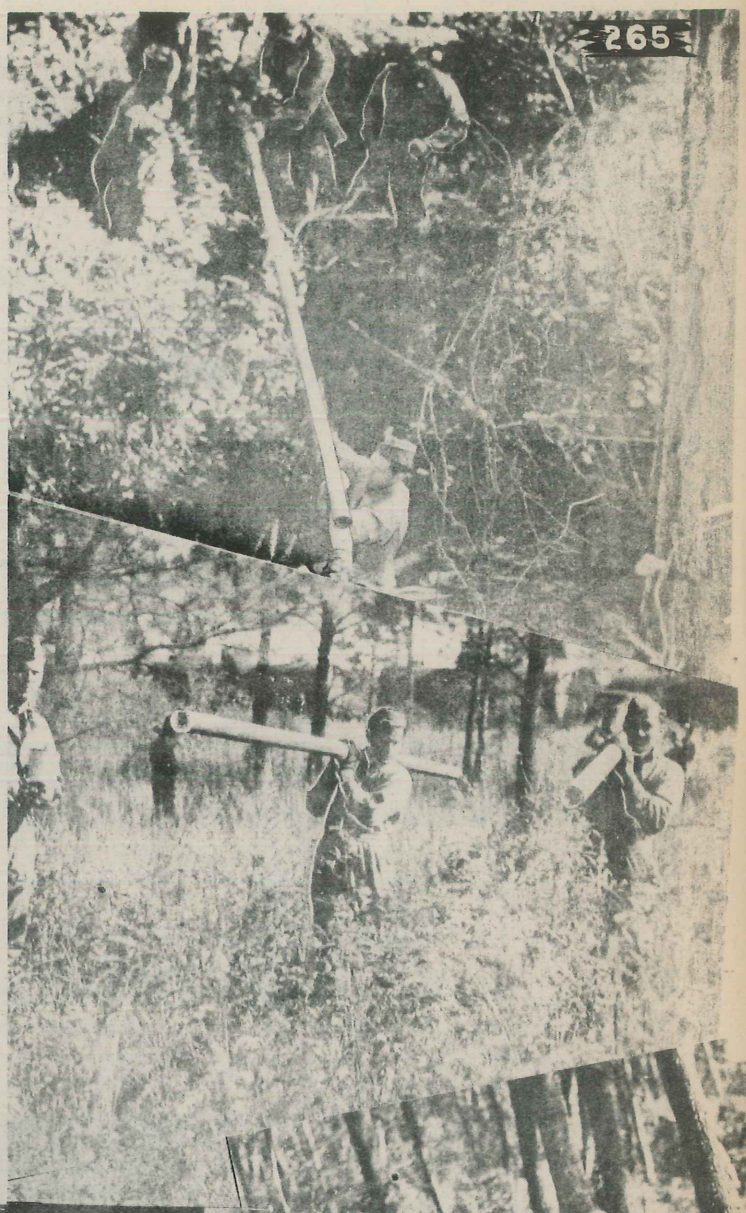
I murmured something about railroad tank cars, sea-going tankers.....

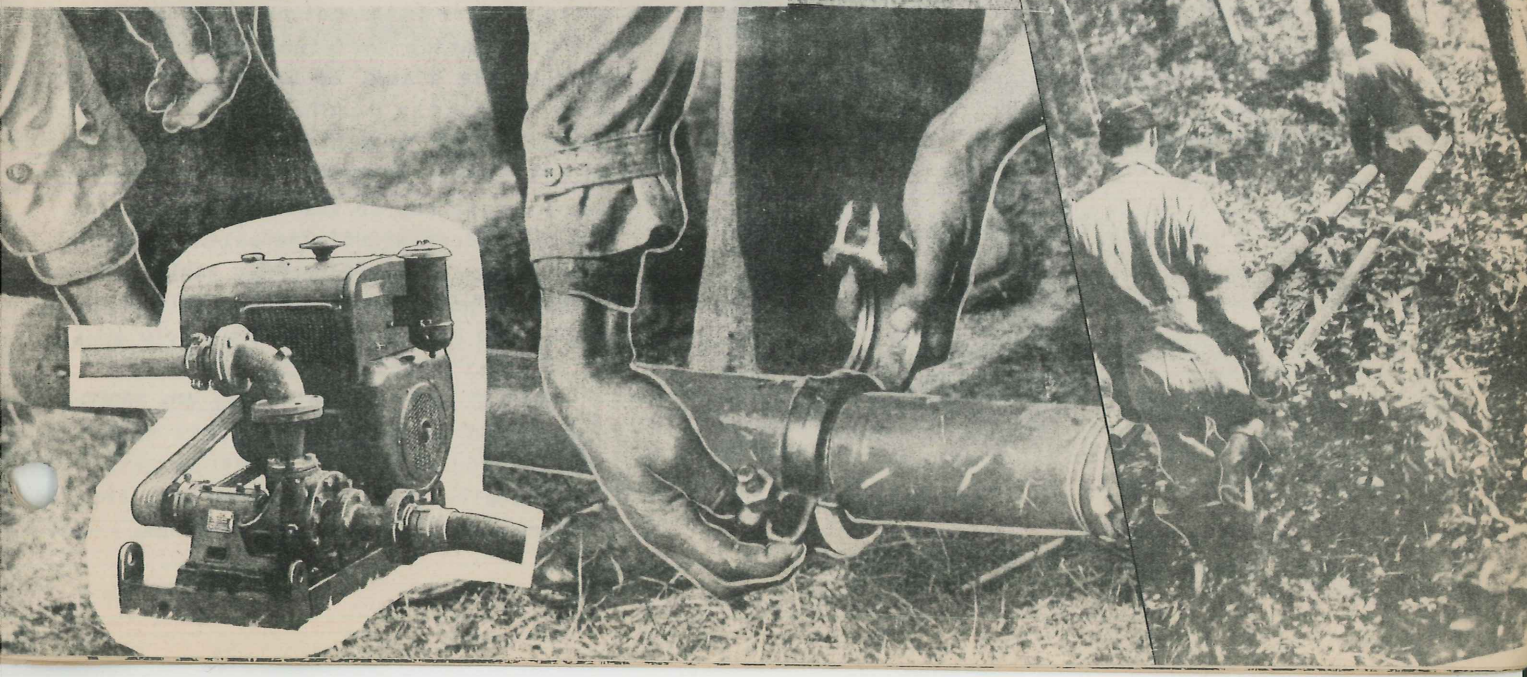
"No," he said, "They've got continuous pipe lines running up from way out in places like Texas."

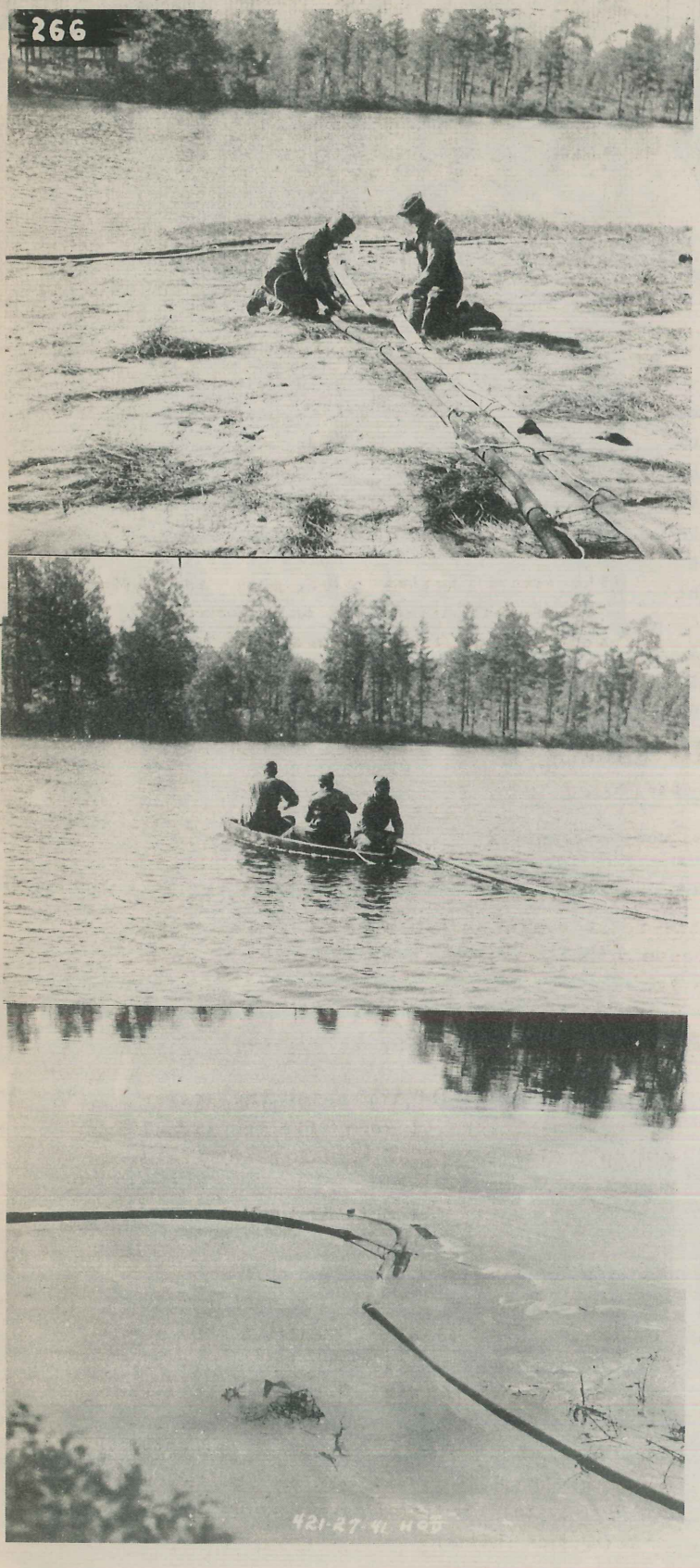
"Cut it out," I said.

It took my friend about ten minutes to convince me.

As I say, this was pretty long ago - so the other day, when I went out to take a







look at the Army's new experimental portab pipe line, I was pretty blasé. After al what was it? After Buck Rogers and Flash Gordon.....

Well, I went out and looked at it and there it was - fifteen foot lengths of steel pipe the size of firehose, coupled together with leakproof couplings. Large aircooled engines to pump the gasoline through the line. On level ground, they put one pump every four miles; in hilly country, one every two miles; in mountain country, one every half mile.

Valves strung along the line - eight or ten to 1/2 mile - are used to cut off the flow.

One important function of these valves was being explained to a group of onlookers by a short, swarthy man. He was pointin to a thing which he called a "milker" - kind of supply valve with three ordinary gasoline hoses attached. "This milker," he said, "Can be cut into the pipeline at any coupling to get gasoline for them as needs it. The idea is to turn off the flow at the nearest valve, uncouple the pipeline and set in the milker. Then three men - on on each of the three hoses - can go to work and fill cans."

There were a couple of photographers aiming a camera out over a hedge that bordered a creek nearby. I sauntered over and discovered the pipeline again. This time it was afloat on the deep, supported by a fifty foot length of hose-like "ponton." The ponton had a valve by means of which had been filled with air to give it buoyancy.

An officer in the neighborhood explained that by floating the pipeline this way, it would enable a ship or barge standing off shore to easily discharge its cargo of gasoline. Not to mention that inevitably the line would have to cross streams and rivers on its way to its destination.

The officer proudly revealed the carrying capacity of the line, "Say you're standing at one point on the line. In one single minute, 220 gallons of gas goes by - speaking of level ground, of course."

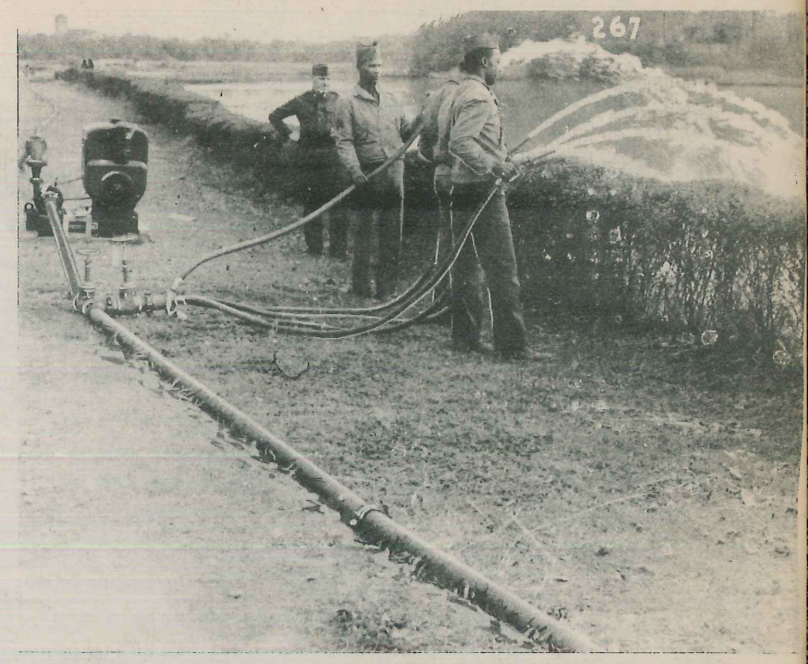
Under further stimulation, the officer pooh-poohed the romantic notion that the pipeline would stretch right up into the front line refueling the tanks and trucks hustling about the fields of combat. "The

main use of it," he declared, keeping his feet on the ground," is to break up the concentration of men, trucks, and fuel containers at base sources of supply. The line will make it easy to establish fuel dumps and keep them well supplied. That's the main use of it."

A visiting engineer strolled up with a slight retinue buzzing about his ears and the officer went into a technical song and dance about the pipeline."....a half mile section of the line would be carried in a semi-trailer.....a crew of fifteen could lay a mile of the line in 45 minutes and pick it up again in fifteen minutes..... a leak detector is being developed..... communication from one end of the line to the other by field telephone or walkee-talkee radio.....six degree deflection at each coupling allows the steel pipe line to meander up hill and down dale....."

When the officer had run out of information, someone made a funny crack and everybody laughed. Then a tall man in the group said,"That reminds me of the time...."

At that point I went home.



The line in action: pipe, pump, and milker. (The latest milker has only 3 hoses.) The soldiers in the picture aren't shooting away good gasoline--water is being used for test purposes.

GREASE GUN RACK

(Started on page 264)

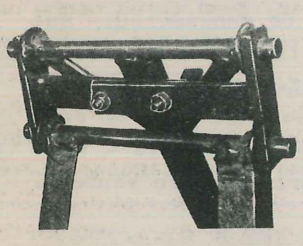


Fig. 4.- The Top of the Rack.

months and it has proved very successful.

EDITOR'S COMMENT:-

Lieutenant Grosch seems to have a good idea by the tail here.

But in the meanwhile we understand that Holabird is working on a metal case for grease guns. As soon as we can get the dope for you, we'll publish it.

Complete specifications for building this rack can be had from The Editor, Holabird Quartermaster Depot, Baltimore, Maryland.

Editor, Army Motors, Dear Sir,

In a bull session in my room, another two soldiers and myself spent a half hour asking each other why in the name of common sense didn't they install a filler neck on both sides of the 35 gallon gas tanks on the 2-1/2 ton G.M.C. Then when you pull off of a narrow road to re-gas, you can reach the filler neck or when you're in the field you can form the trucks in two columns and go down the center with a service truck and gas both sides at once. Maybe I'm all wet, but if so, I'd like to hear your argument against it. If you print the answer in the Army Motors, I sure will see it. I wouldn't miss a copy of that for any Field Manual printed.

Mr Sgt. R. Urbano
Camp Forrest, Tenn.

Editor's Comment:- Here's another one, Sergeant, about those same GMC's. When you pull off the road on to a steep shoulder, the truck leans to the right. You can't get more than about 20 gallons of gas in the tank in this case. Anything more runs out. Maybe a filler neck on the right would solve the problem. There's always danger of being hit by other traffic on the left of the truck, and possibly more chance of being side swiped.

Camoufl

Concealing trucks from aeroplanes is a job. A house or a gun emplacement stays in one place, which makes camouflage fairly easy, but a truck can be in green fields one minute and in a sand patch the next. Lusterless paint (page 136, August 'AM) helps a lot, but it doesn't solve the problem. We dug around in our files to see what we could find on the subject of vehicle camouflage and discovered a "Canadian Army Training Memorandum" that had some fairly sound stuff in it.

PAINT CAMOUFLAGE

Apparently the Canadians are using a lusterless paint also, but in addition, their trucks are painted "in two or more suitable colours in a bold, irregular, curved pattern. This is called disruptive patterning." The top of a vehicle is subject to more light than the side surfaces, so the top should be painted with darker paint, because light paint naturally reflects more light. The shadow cast under the fenders and body can be camouflaged to some extent by blending it with the vehicle paint, that is, by using darker paint in irregular patterns on the body and fenders of the vehicle.

In addition to paint camouflage, every truck is equipped with a camouflage net. Here are the instructions the Canadian Army gives for using them.

CAMOUFLAGE NETS

"Nets are not magic cloaks of invisibility. A net merely hung over the top of a lorry (truck) will not make it disappear, as the rectangular shape and shadow still remain. Shade, shadow, and of course, tracks give a lorry away from the air. The net must be used as a curtain. The top of the net should be tied to some handy support above the vehicle - a tree, telephone pole, etc. Then the skirt of the net should be pulled away from the vehicle and pegged to the ground with wire pins. In this way there will be a better chance of remaining undetected. An observer will have the same difficulty as seeing into a room through a lace curtain, from outside.

"If parked under a tree in full leaf, only the side view and possibly the cast shadow of a lorry need be considered. But leafless trees hide nothing." Therefore, when parking under winter trees, concealment from an aerial view must also be considered. "Hence the general rule - nets vertical in summer and horizontal in winter".

CARE OF NET

"Nothing will hide a moving vehicle on the road. When on the move, the net should be carefully folded and placed under shelter in the vehicle. If it gets wet, the first opportunity should be taken to spread it out to dry."

Of course, our vehicles aren't supplied with nets, but a good many of the following general tips on camouflage will come in useful.

PARKING PLACES AND TECHNIQUE

"There are no set rules for the choice of good parking places. There are, however,

ge

a few simple and important general principles that should be used every time a vehicle or column is halted. In the final result, concealment is an *individual responsibility* and *drivers* must be made to realize this. The following notes will help drivers to help themselves.

"Consider from what you are hiding. The answer is AIRCRAFT.

"Therefore, place yourself where you will be least noticeable to an aerial observer. Consider (1) what there is about a vehicle which gives it away to the air observer, (2) what the whole pattern of the landscape looks like to the air observer.

"Vehicles are conspicuous from the air because of their rectangular shape, their shadow and the tracks they make.

"The air observer sees a vast jig-saw of fences, grass fields, ploughed land, copses, houses, both isolated and in groups, and the crowded rows of city streets and buildings, and he sees it in patches and lines of light and dark rather than in terms of colours.

"The driver's problem is to attach his vehicle sensibly to that pattern, never forgetting the tracks made in doing so. Good concealment of a vehicle may be spoiled by carelessly made and unconcealed tracks.

"Pick a sensible spot under cover from air view if possible or where the vehicle will fit into the general pattern as seen from the air. If an open field is all that is available, do not give up and park your vehicle in the centre. Your nets will not hide you, for not only will the unusual object in the otherwise smooth field attract the attention of the air observer, but your tracks will point like an arrow to your hiding place. Park along one of the boundaries with the shadow of your vehicle in a clump of bushes, a hedge or a ditch. Choose a spot where your nets, properly rigged, will have a sporting chance.

"If buildings are near, attach your vehicle to them in such a manner that you

carry out the existing pattern. Lorries parked close to a barn with nets properly erected will pass for a lean-to addition to the building.

"Do not hesitate to pool your nets with other drivers when a group of vehicles is parking together. Excellent results have been achieved in this way.

"Remember the sun moves round during the day," so change your camouflage to match the changing shadows.

"If visible tracks must be made, make them sensibly. Do not cut across a field to get to your parking place. Follow the fence or hedge. A lorry driven over soft ground leaves a track startlingly visible for a long time.

"Do not gather in groups about well parked lorries, and look at enemy aircraft. A group of upturned faces has disclosed many well concealed vehicles.

"Keep vehicle curtains down when parked, and when possible, on the move. With rolled curtains the shadowed interior of the vehicle is plainly visible from the air."

The only thing THE 'AM has to add to these very sensible suggestions is the scheme sent us by Lieutenant Edwin P. Arnold on windshield camouflage, which we published in the May issue. Here it is again:

"Friends in the Air Corps revealed a very interesting point ... trucks parked in foliage and under trees --- could be observed by the sun reflecting on the slanting windshields ...

"To overcome this slight but important giveaway we have taken salvage canvas and cut it up the size of a truck windshield, leaving a six inch margin overlap. We then took olive drab and brown paint and camouflaged the windshield cover. The rigidity caused by a heavy coat of paint sprayed on the canvas, plus the pressure of the wiper blades (placed vertically) will keep it in place. If the wind is severe, the windshield may be opened out and each corner of the canvas shield folded back and under the windshield frame. Close the windshield, but don't force it shut too tight."

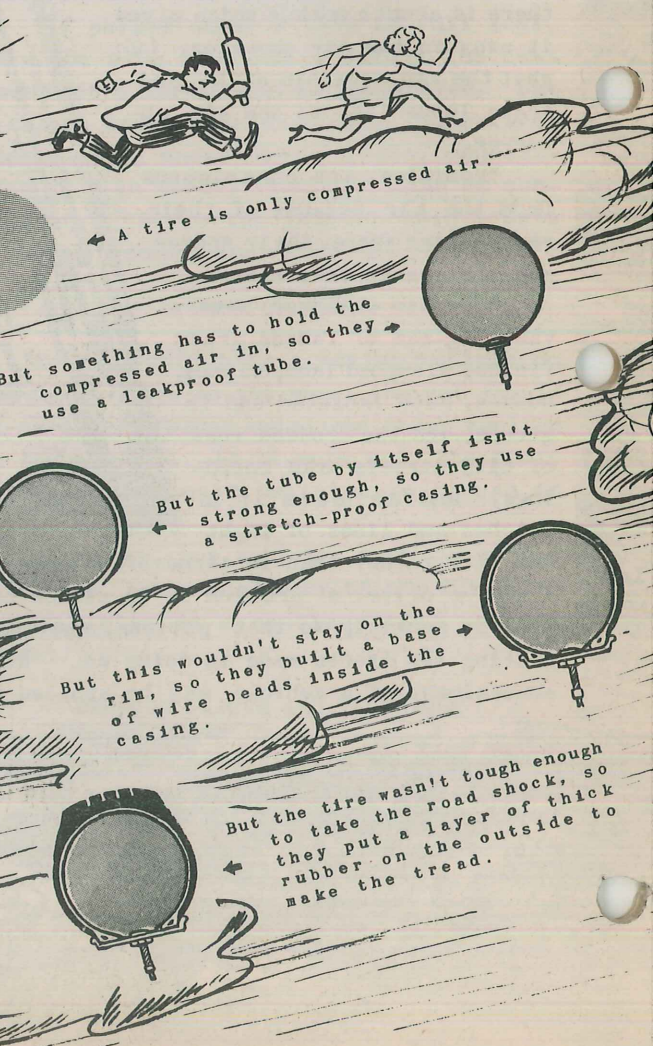
Tires
ARE LIKE WIVES

CONTRIBUTED BY THE GENERAL TIRE COMPANY.

Like the little woman *they* take the beating when *you* make a fool of yourself - they take the hammering from ditches and boulders and curbs that would soon blast the truck, without their protection, into a junk heap.

Tires are made of what ? Rubber? You're only a third right - two thirds of a tire is fabric. Rubber bends and stretches plenty, but fabric doesn't - and that, bud, is why tires are so easily ruined. The rubber in a tire is simply the binder that holds the fabric together, that keeps the air in. That keeps the air in - that's the important thing: Keeping the air in.

Manufacturers can build everything into a tire except the air. You have to supply that. If you forget the air, the fabric and rubber have to take over the job that the air is supposed to do. Just like you doing two other fellow's KP.



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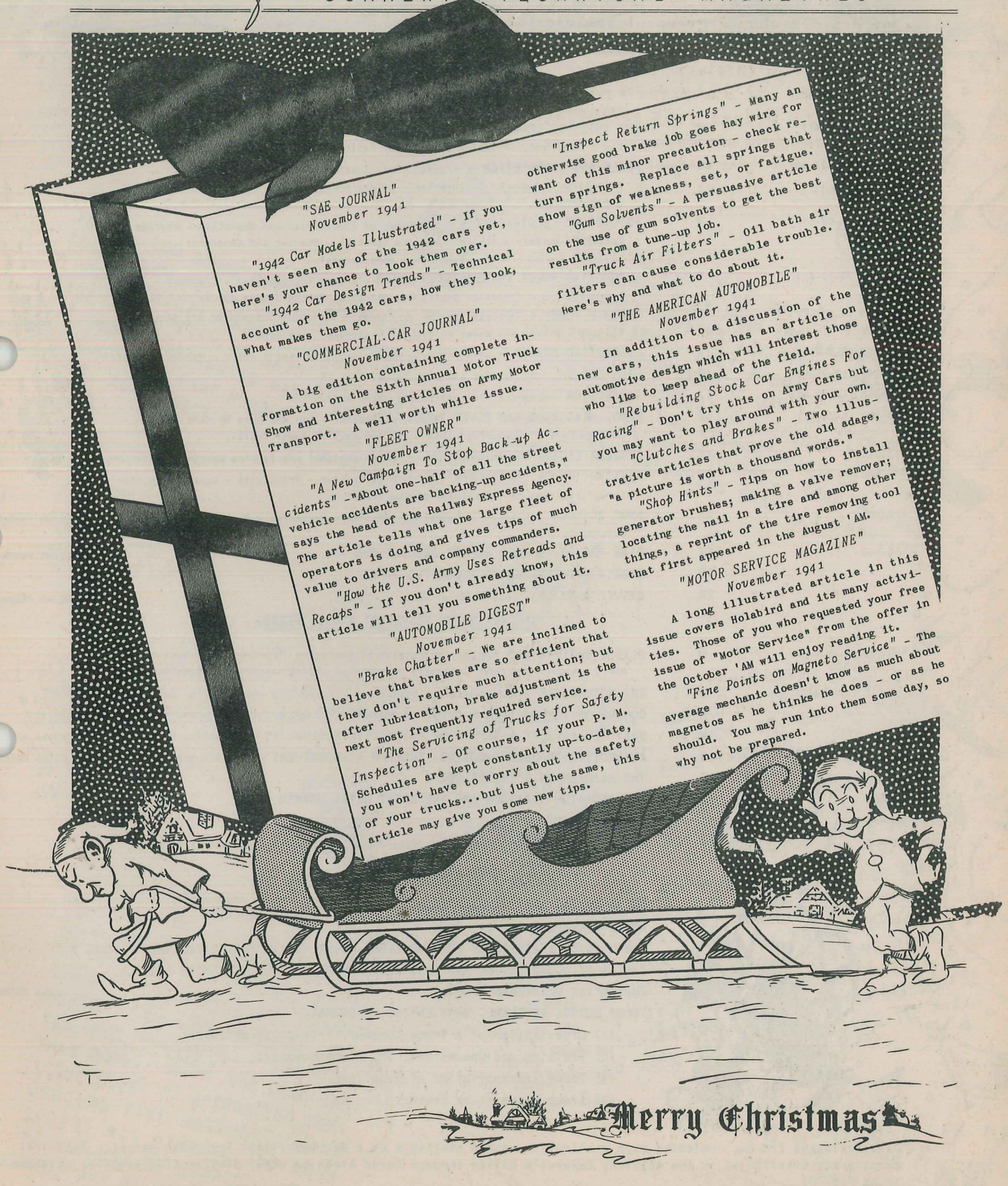
of CURRENT TECHNICAL MAGAZINES



"SAE JOURNAL"
November 1941

"1942 Car Models Illustrated" - If you haven't seen any of the 1942 cars yet, here's your chance to look them over. "1942 Car Design Trends" - Technical account of the 1942 cars, how they look, what makes them go.

"COMMERCIAL-CAR JOURNAL"
November 1941

A big edition containing complete information on the Sixth Annual Motor Truck Show and interesting articles on Army Motor Transport. A well worth while issue.

"FLEET OWNER"
November 1941

"A New Campaign To Stop Back-up Accidents" -"About one-half of all the street vehicle accidents are backing-up accidents," says the head of the Railway Express Agency. The article tells what one large fleet of operators is doing and gives tips of much value to drivers and company commanders. "How the U.S. Army Uses Retreads and Recaps" - If you don't already know, this article will tell you something about it.

"AUTOMOBILE DIGEST"
November 1941

"Brake Chatter" - We are inclined to believe that brakes are so efficient that they don't require much attention; but after lubrication, brake adjustment is the next most frequently required service. "The Servicing of Trucks for Safety Inspection" - Of course, if your P. M. Schedules are kept constantly up-to-date, you won't have to worry about the safety of your trucks...but just the same, this article may give you some new tips. "Inspect Return Springs" - Many an otherwise good brake job goes hay wire for want of this minor precaution - check return springs. Replace all springs that show sign of weakness, set, or fatigue. "Gum Solvents" - A persuasive article on the use of gum solvents to get the best results from a tune-up job. "Truck Air Filters" - Oil bath air filters can cause considerable trouble. Here's why and what to do about it.

"THE AMERICAN AUTOMOBILE"
November 1941

In addition to a discussion of the new cars, this issue has an article on automotive design which will interest those who like to keep ahead of the field. "Rebuilding Stock Car Engines For Racing" - Don't try this on Army Cars but you may want to play around with your own. "Clutches and Brakes" - Two illustrative articles that prove the old adage, "a picture is worth a thousand words." "Shop Hints" - Tips on how to install generator brushes; making a valve remover; locating the nail in a tire and among other things, a reprint of the tire removing tool that first appeared in the August 'AM.

"MOTOR SERVICE MAGAZINE"
November 1941

A long illustrated article in this issue covers Holabird and its many activities. Those of you who requested your free issue of "Motor Service" from the offer in the October 'AM will enjoy reading it. "Fine Points on Magneto Service" - The average mechanic doesn't know as much about magnetos as he thinks he does - or as he should. You may run into them some day, so why not be prepared.

Merry Christmas

BASIC MOTOR TRANSPORT SCHOOL TEXTS

T/M NUMBER	M.T.S. TEXT NO.		REMARKS
*10-510 (10-1-40)	1	THE MOTOR VEHICLE - (Automotive Nomenclature - Terminology Military Motor Vehicles - Vehicle Units and Assemblies)	
*10-570 (2-4-41)	2	THE INTERNAL COMBUSTION ENGINE - (Principles of Operation - Types - Parts and their Functions, including Engine Lubrication and Cooling).	
*10-550 (12-27-40)	3	FUELS AND CARBURETION - (Fuels - Fuel Systems - Physics of Carburetion - Principles - Types of Carburetion - Intake and Exhaust Systems - Super-chargers and Governors).	
*10-580 (1-29-41)	4	AUTOMOTIVE ELECTRICITY - (Principles of Electricity and Magnetism - Storage Battery - Battery Ignition - Magneto Ignition - Starter and Generator - Lighting System - Horn - Electrical Accessories).	
*10-585 (4-10-41)	5	AUTOMOTIVE POWER TRANSMISSION UNITS - (Power Transmission - Clutches - Transmissions - Propeller Shafts and Universal Joints - Rear Axles).	
*10-560 (5-20-41)	6	CHASSIS, BODY & TRAILER UNITS - (Frames - Springs - Suspension and Steering Systems - Wheels and Wheel Alignment, Bodies and Trailers)	
*10-565 (3-8-41)	7	AUTOMOTIVE BRAKES - (Principles - Mechanical - Hydraulic - Air - Vacuum - Electric)	
*10-540 (12-26-40)	10	LUBRICATION - (Principles and Practices).	
*10-545 (12-30-40)	11	INSPECTION - (Command, Preventive and Technical).	
*10-590 (5-26-41)	12	HAND, MEASURING AND POWER TOOLS - (General - Use and Care of Hand Tools - Use and Care of Measuring Tools - Use and Care of Power Tools).	
10-525	15	ECHELON SYSTEM OF MAINTENANCE - (Organizational and Service Maintenance).	
10-505	16	MILITARY MOTOR TRANSPORTATION - (Organization - Principles - Supply & Maintenance). Section on "Principles of Operation"	
10-555	21	SHOP SCIENCE - (Algebra - Geometry - Physics - Mechanics - Blue Print Reading - Metallurgy).	BEING PREPARED
10-360	22	FIRE PREVENTION AND SAFETY PRECAUTIONS -	BEING PREPARED
	23	CARE & MAINTENANCE OF PNEUMATIC TIRES	
	24	DRIVER'S GUIDE - (Operation of Motor Vehicles).	BEING PREPARED

SPECIAL MOTOR TRANSPORT SCHOOL TEXTS

*10-575 (7-25-41)	8	DIESEL ENGINES AND FUELS - Principles of Operation - Types, including Semi-Diesel - Parts & their Functions, including Lubrication and Cooling-Fuels & Fuel System).	
*10-515 (12-13-40)	9	THE MOTORCYCLE - (Nomenclature - Operations - Inspections - Maintenance - Driver Training).	
		COURSE OF INSTRUCTION & GUIDE IN MOTORCYCLE OPERATION - (Supplement to Text No.9).	
10-520	14	UNIT REPLACEMENT & REPAIR OF AUTOMOTIVE ASSEMBLIES - (All Units & Assemblies).	BEING PREPARED
10-530	13	AUTOMOTIVE TROUBLE SHOOTING, TUNE-UP & ADJUSTMENT - (Trouble Shooting).	BEING PREPARED
*10-440 (6-16-41)	17	THE BLACKSMITH & THE WELDER	
10-450	18	THE RADIATOR REPAIRER AND THE SHEET METAL WORKER	
10-445	19	THE MACHINIST	
10-455	20	THE BODY FINISHER - (Woodworker, Upholsterer, Painter, Glassworker) *REVISED*	

SUPPLEMENTARY INSTRUCTIONAL MATERIAL

MOTOR REPAIR SHOP MANUAL, OQMG

MOTOR TRANSPORT SUPPLY, OQMG

TENT. GUIDE & REFERENCE FOR QMC LIGHT MAINT. UNITS (MOTOR TRANSPORT) OQMG

TABLES OF ORGANIZATION AND FUNCTIONAL CHARTS, MOTOR TRANSPORT SERVICE

10-522 PREVENTIVE MAINTENANCE GUIDE — BEING PREPARED

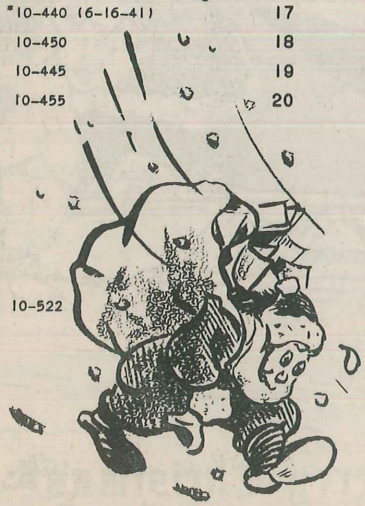
TROOP SCHOOL PROBLEMS, ARMY EXTENSION COURSE:-

(1) Organization of a Truck Company, Triangular Division;

(2) Training and Operations, QMC Truck Company;

(3) Truck Transportation of Supplies;

(4) Troop Movement by Truck.



*Date following T/M No. indicates when publication became available as a War Department Technical Manual. Technical manuals are distributed by the Adjutant General's Office through Corps Areas or other distributing agencies as enumerated in AR 310-200.

Holabird Quartermaster Depot, Baltimore, Maryland
November 15, 1941

HOT OFF THE WIRE

TM 10-1200 DODGE TRUCK PARTS LIST, DODGE FORM NO. D-10034, CONTAINS A TYPOGRAPHICAL ERROR. PLATE 25, PAGE 10-2, ITEM 39 SAYS THAT THE OIL SEAL RETAINER IS PARTS NUMBER 915090. THIS PART NUMBER SHOULD BE 915086, AS CORRECTLY STATED ON PAGE 10-7.

Z-5'S ARE STILL COMING INTO HOLABIRD WITHOUT THE NAME AND ADDRESS OF THE ORGANIZATION. DO YOU WANT SOME ACTION ON YOUR TRUCKS WHEN THINGS GO WRONG? GET TO WORK THEN AND GIVE US ALL THE DOPE.

ALL FIRE TRUCKS ARE NOW BEING FURNISHED IN OD WITH NO BRIGHT WORK. IF YOU HAVE TO PAINT ANY OF THE OLD RED TRUCKS, PAINT THEM OD AND COVER THE CHROME PLATE. SEE OQMG CIRCULAR LETTER 302, NOVEMBER 17 FOR FURTHER DOPE. UNTIL THE OQMG CAN ISSUE A LIST OF AUTHORIZED COMMERCIAL TIRE RECONDITIONING SHOPS, ALL DAMAGED AND WORN TIRES MUST BE STORED. DON'T SCRAP ANY OF THEM.

WE TOLD YOU ONCE BEFORE TO GET THOSE INSIGNIAS AWAY FROM THE RADIATOR. THEY DECREASE COOLING EFFICIENCY ENORMOUSLY. JUST LEARNED THAT A SMALL INCREASE IN RADIATOR TEMPERATURE CAN INCREASE CRANKCASE OIL TEMPERATURES ENOUGH TO CHANGE THE LUBRICATING CHARACTERISTICS OF THE OIL. IF YOU WANT TO WRECK YOUR ENGINE, KEEP THOSE INSIGNIAS SMACK IN FRONT OF THE RADIATOR.

EIGHTY SEVEN DODGE 1/2 TON TRUCKS HAVING A 230 CU. IN. ENGINE INSTEAD OF THE 217 CU. IN. WERE DELIVERED WITH 217 CU. IN. ENGINE PARTS LISTS AND MAINTENANCE MANUALS. THE DODGE SERIAL NUMBERS OF THESE VEHICLES RUN FROM 8,680,778 THROUGH 8,680,854; 8,685,452 AND 53; AND 8,691,821 THROUGH 828. (THESE ARE NOT U.S.REG.NOS.) THE PARTS LISTS FOR THESE TRUCKS ARE TM 10-1368, DODGE FORM NO. D-10187; AND THE MAINTENANCE MANUAL IS TM 10-1209, DODGE FORM NO. D-10113. TM NUMBERS ARE GIVEN FOR YOUR INFORMATION IN MAKING FUTURE REQUESTS. HOWEVER, AT PRESENT THESE BOOKS ARE IDENTIFIED ON THE COVER ONLY BY THE DODGE FORM NO. AND NOMENCLATURE. KEEP YOUR EYE OPEN FOR THESE TRUCKS AND SERVICE THEM ACCORDING TO THESE MANUALS.