

The 'I A M' RMY MOTORS

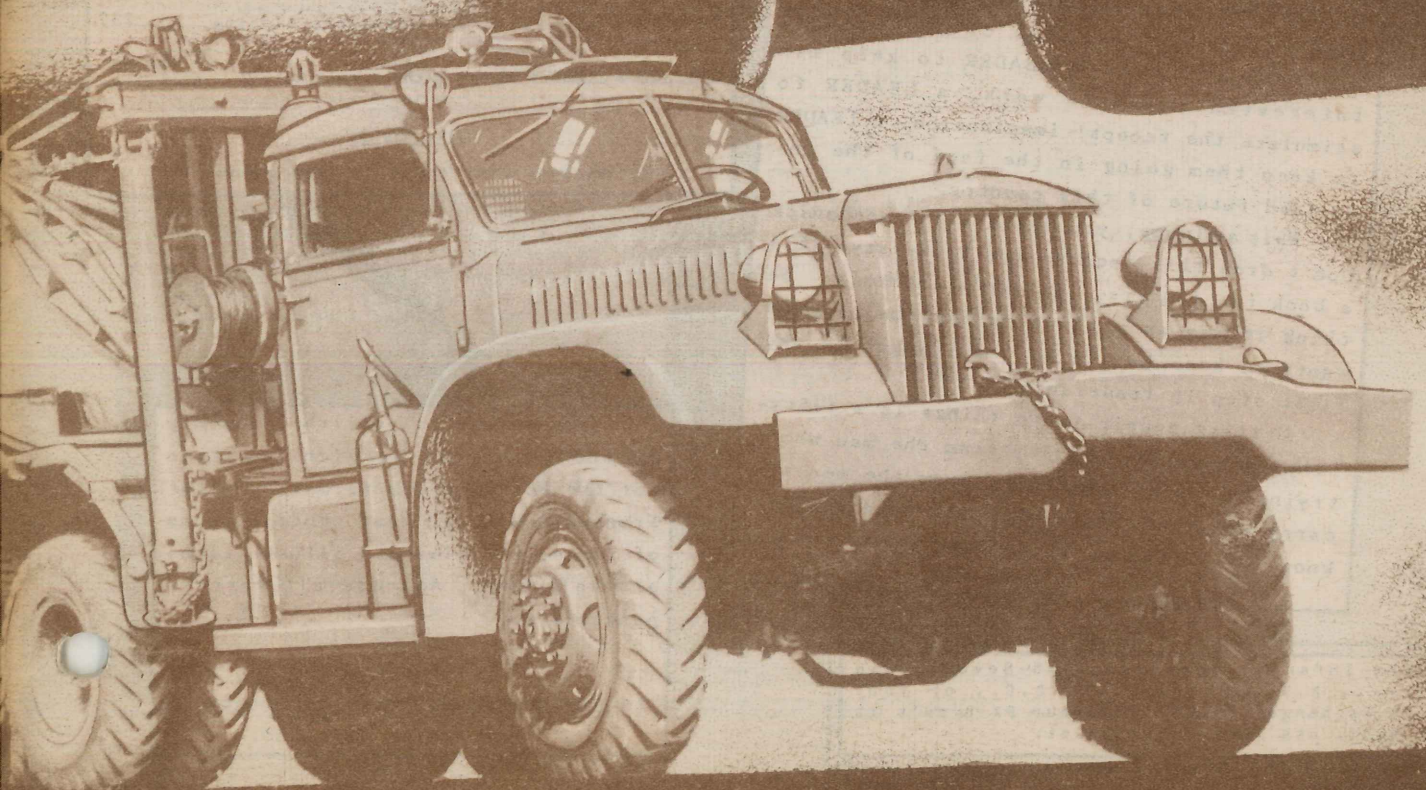
VOLUME 2

NOVEMBER 15 1941

NUMBER 8

THE HOLABIRD Q.M. DEPOT MOTOR TRANSPORT SCHOOL BALTIMORE, MARYLAND.

PREVENTIVE MAINTENANCE



The 'AM Reviews

A BOOK



THE 'AM has withheld the opening of its book review for some outstanding work. Hundreds of automotive technical works - books, magazines and pamphlets - come our way every year. Frankly, half of them are written in such high flung technical language that they look like gibberish to us - we don't see how the average motor sergeant, mechanic and driver would find them very useful. We don't, half the time.

We have never felt the need of praising anything that wouldn't help motor transport. We still don't feel the need. We never will. But now comes 'LEADERSHIP For American Army Leaders' by Major E.L. Munson, Jr., Infantry.*

Well, what's 'Leadership, etc., by Major somebody' got to do with motor transport? It won't tell you how to drive, or tear down a carburetor or blow a gas line free. But motor transport couldn't run without it.

Leadership at the moment is more vital to the American Army than supplies and equipment - in the face of the present shortage it takes a LEADER to keep men interested in their work, a LEADER to stimulate the troops! imagination, a LEADER to keep them going in the face of the undecided future of this country.

Wait a minute, you drivers and mechanics! Don't drop this because the title says it's a book for leaders. It isn't entirely. We think it has as much value for the man who wants to know how to be *led*, (which is the first step in leadership).

Getting people to do things is a fifty-fifty proposition. Fifty from the man who's trying to lead, and fifty from the men who carry out the orders. If you as a soldier know the headaches of your officers you are
(TURN TO PAGE 238)

* The Infantry Journal, 1115 Seventeenth Street, N.W., Washington, D.C., or your Post Exchange, \$1.00. If your PX hasn't it on hand, ask them to order it.


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THE COVER

A weak link endangers the chain



Army Motors is published monthly by the Technical Service Division for the Holabird Quartermaster Motor Transport School. Your contributions of ideas, articles and illustrations are welcomed. Address all correspondence to:

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THE 'AM

VOLUME 2

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WHAT'S ALL THIS ECHELON STUFF?

THAT ROVING REPORTER OF OURS IS A HOODOO. EVERY TIME WE SEND HIM OUT HE COMES BACK WITH BAD NEWS. HE NEVER SEES A DRIVER CHECKING HIS TIRE INFLATION BEFORE STARTING OUT OR LOOKING AT HIS AIR CLEANER AFTER DRIVING IN A SANDSTORM OR EDGING OVER TO THE MIDDLE OF THE ROAD FOR A LEFT TURN — YOU KNOW, THE THINGS BY WHICH DRIVERS ARE JUDGED. OUR REPORTER SEZ YOU CAN JUDGE 'EM ALL RIGHT, BUT YOU CAN'T SENTENCE 'EM, AND AFTER ALL HE'S SEEN, HE'S ITCHING TO SENTENCE SOMEBODY.

HE WAS RIDING ALONG AS NICE AS YOU PLEASE THE OTHER DAY, CHATTING TO THE DRIVER ABOUT LIFE, AND THE WEATHER AND BLONDES AND OTHER THINGS MEN TALK ABOUT. SO ALL IN ALL THEY GOT REAL PALLY. THEN THE CONVERSATION SHIFTED TO THE PROBLEMS OF FIRST ECHELONS AND SECOND ECHELONS AND THIRD AND FOURTH ECHELONS. THROUGH ALL THIS THE DRIVER TOOK IT ALL IN — BUT FINALLY, WHILE WAITING FOR A LIGHT TO CHANGE, HE LEANED OVER TO OUR ROVING REPORTER, AND IN A CONFIDENTIAL WHISPER, INQUIRED: "PARDON ME, SIR, BUT...WELL, I'M ONLY NEW IN THE ARMY — ONLY BEEN DRIVING TEN MONTHS — MAYBE YOU CAN TELL ME: WHAT *IS* ALL THIS ECHELON STUFF THEY TALK ABOUT? WHAT'S IT *DO*?"

A LITTLE SIMPLE FIRST AID BROUGHT OUR REPORTER OUT OF HIS FAINT. HE'S STILL WHITE AROUND THE GILLS, THOUGH. *WHAT'S THIS ECHELON STUFF THEY TALK ABOUT — ONLY BEEN DRIVING TEN MONTHS. ENOUGH TO FLOOR ANYONE.*

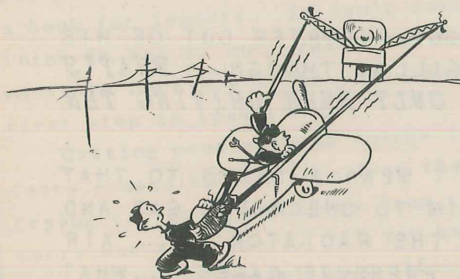
FIRST ECHELON OF MAINTENANCE DIDN'T MEAN A THING TO THAT DRIVER. THE MOTOR SERGEANT HAD TOLD HIM TO CHECK THE GAS AND OIL — BUT HE'D NEVER BEEN TOLD ABOUT THE RADIATOR AIR CLEANERS ...LEAKS ...ANTI-FREEZE ...OIL PRESSURE GAGES ...WHAT THE AMMETER SAID WHEN IT WENT WHICH WAY ...TIGHTENING BODY BOLTS ...FAN BELT TENSION ...USING CHAINS ...AIR PRESSURE GAGE ...LOST PARTS ...LOOSE BOLTS AND NUTS ...FRAYED WIRES ...NEVER BEEN TOLD NOTHIN' IN FACT ...TEN MONTHS A DRIVER AND HE'S ASKING ...*WHAT'S THIS ECHELON STUFF THEY TALK ABOUT...*



We're inclined to think Haggerty wasn't sufficiently appreciative of O'Flaherty's ideas on aerial supply in the October 'AM. Particularly when you read "The Case For An Army Air Arm" in the October INFANTRY JOURNAL and "Fly it Away" in the October FIELD ARTILLERY JOURNAL, both of which stress the multiple uses of the much neglected light plane. The article in THE FIELD ARTILLERY JOURNAL discusses an actual production plane that the author learned to fly in an hour. But more about that later. Let's say O'Flaherty's flying jeep is an actuality.

All we have to do now is use it for aerial supply. How? Well, bearing in mind what O'Flaherty said about it, let's add some more points as we think of them.

The September-October CAVALRY JOURNAL reports the successful use of radio-equipped bantams for reconnaissance, so there seems



little reason why radio equipped transport vehicles wouldn't be possible. A call for parts from a stranded convoy or from a caught-short maintenance crew could be answered almost immediately. The supply

plane would spot the trucks by panels laid out on the ground by the convoy crew, well away from the maintenance set-up to deceive enemy aviation. These canvas panels could be folded and slipped under the seats when not in use, so they would present no storage problems.

Knowing that parts are almost instantly available will probably prevent a great deal of hoarding. When parts are difficult to get, the natural inclination is to lay hands on everything, whether they're needed now or tomorrow, or next month. Sometimes useless parts are hoarded on the off chance of being able to trade them for something usable. Aerial supply will save hauling around low mortality parts for fear one might go west, and prevent stocking large quantities of high mortality parts because spares will be available at all times. Advantage 1: no hoarding, smaller quantity of spares.

The danger of attack from enemy aviation should be negligible. High powered combat planes are incapable of ducking around as close to the ground as these jeeps can, and sensible camouflage would make the low flying supply plane difficult to spot. Besides - any enemy aviation fooling around the Communication Zone at low altitudes is looking for trouble from AA crews. Advantage 2: Relative security from enemy aviation.

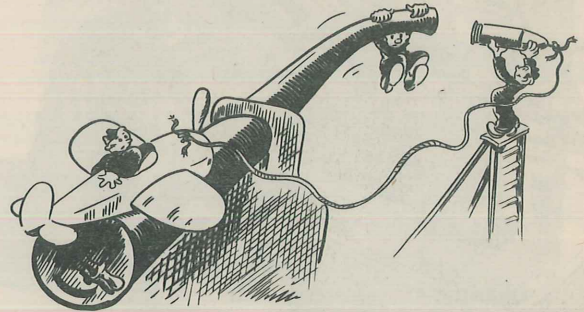
There are thousands of light private aeroplanes instantly available for this

type of work, and heaven knows how many pilots that haven't a chance of qualifying for combat service but who could fly parts wonderfully well. Pilots could be trained in not more than a week, and maintenance could be undertaken by existing motor transport facilities. Advantage 3: Availability of trained men and usable planes.

Dropping supplies by parachute is now a commonplace operation. Crates of eggs and bottled goods have been landed without damage. What's the difficulty of hitting the bulls eye with an assortment of timing gears, brake linings, distributors, water pumps - and maybe a packet o' cigarettes? None at all. Advantage 4: Keep 'em rolling!

The map shows the existing supply depots with circles of 200 mile radius drawn around them. Within the radius of any circle you can probably depend on 24 hour service by rail or truck for parts. Without the radius of any circle you can't depend on any definite service. Look at those wide, empty spaces throughout the middle and far west and in the south. Think of a maintenance crew anywhere in those holes depending on rail or truck transportation for some vital supplies. Doesn't look so good, does it?

Then think of those jeep planes hedge-hopping along in four or five hundred mile jumps, refueling at motor parks or gasoline

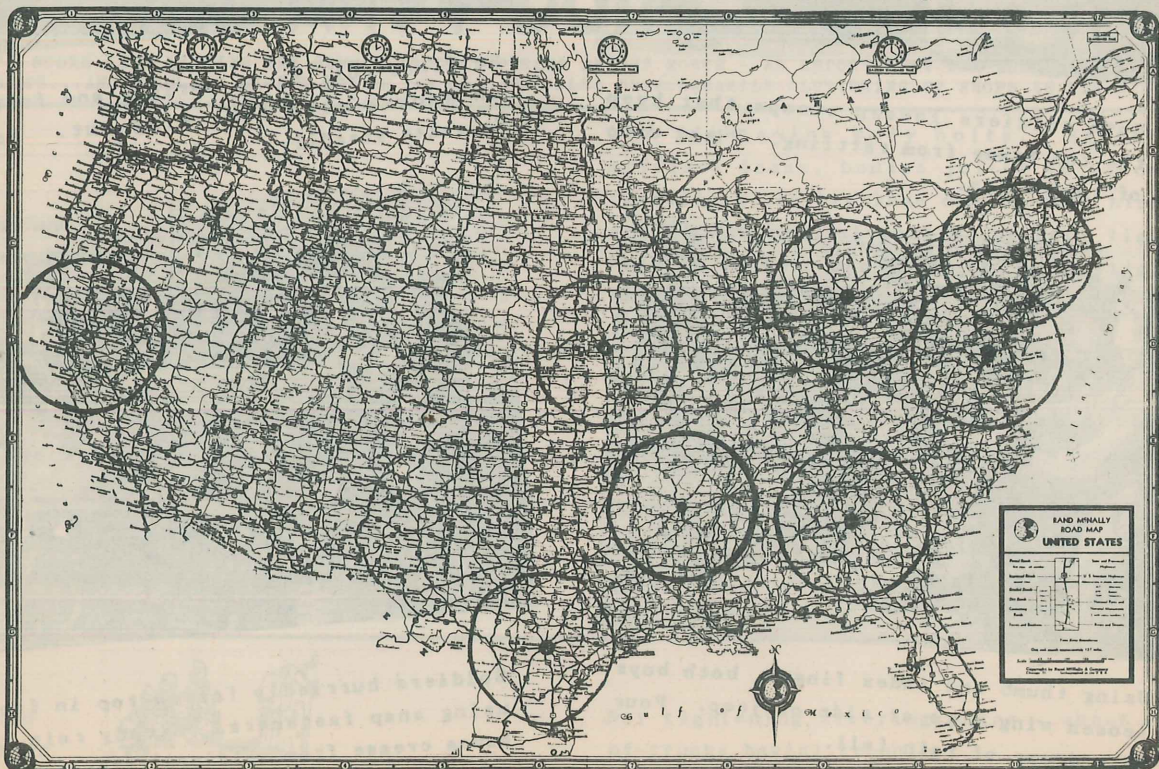


dumps, delivering supplies *anywhere* in from minutes to 15 hours at most. Looks good doesn't it? Advantage 5: Immediate supply of vital, light parts.

When do you need parts most desperately? When the fighting is on? Yes! And isn't that just when the roads are most crowded and impassable, just when it's hardest to get parts when you most need them? What's the answer to relieve road congestion and get the parts instanter? Flying jeeps! Advantage 6: Increase mobility by clearing the roads and by getting parts faster you can *get there*.

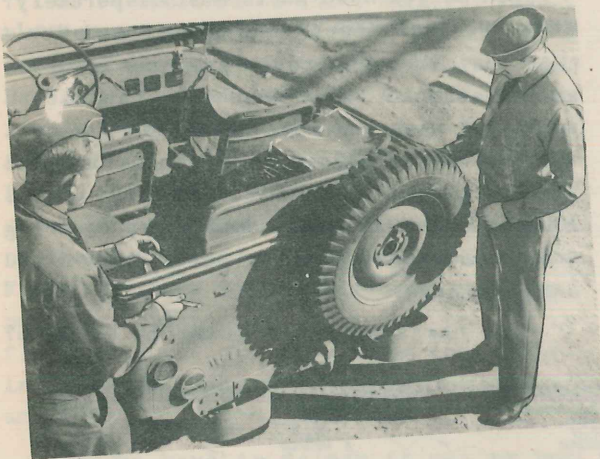
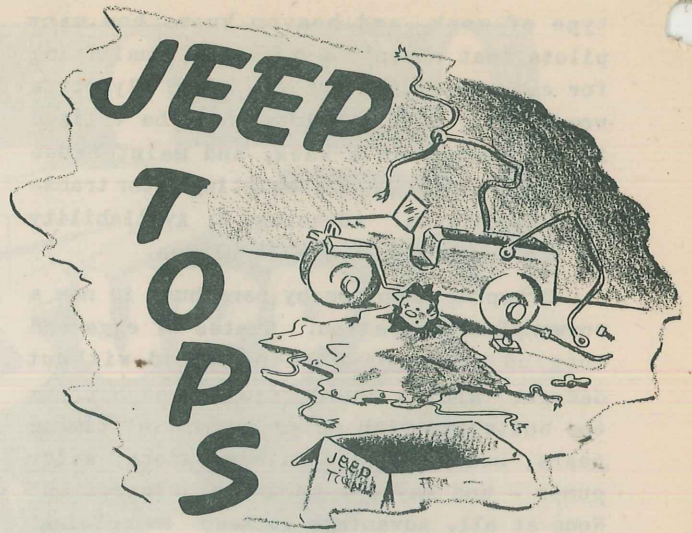
And how's all this going to be done?

More On Page 240





First soldier pulls top from under seat. Second soldier dreams of Jeannie with the light, brown hair.



Both soldiers loosen straps that keep the top frame from rattling. First drop of rain falls.



Soldiers pull frame upright and fasten in socket with same wing nut. Rain drizzles steadily.



Using thumb and index finger, both boys loosen wing nuts at side of jeep. Four more drops of rain fall.



Soldiers hurriedly fasten top in front using snap fasteners. Steady rain removes crease from soldiers' trousers.



Frenziedly, soldier whips top over frame. Rain beats down heavily.



In torrential down-pour, soldiers make back of top fast with straps.



Drenched to the skin, soldier fastens side protectors. Rain stops and sun comes out.

WHO AIN'T DOIN' WHAT?

*A SCORE CARD LISTING THE COMMON TRUCK TROUBLES OF THE MONTH - AS REPORTED BY THE HOLABIRD REPAIR SHOPS...AND WHICH MAY OR MAY NOT BE THE SAME TROUBLES UNNECESSARILY CLUTTERING UP SHOPS IN THE FIELD.

First and Second Echelon



Not tightening body bolts. Results: mufflers loose, bodies jolted to pieces, terrific glass breakage due to door hinges and window channels not being kept tight. Nuts on exhaust manifolds not being tight, exhaust manifolds warp and have to be re-faced.

Grease Monkeys



Overlubricating units, not allowing for grease expansion - brakes are getting soaked and ruined.

Company Commanders

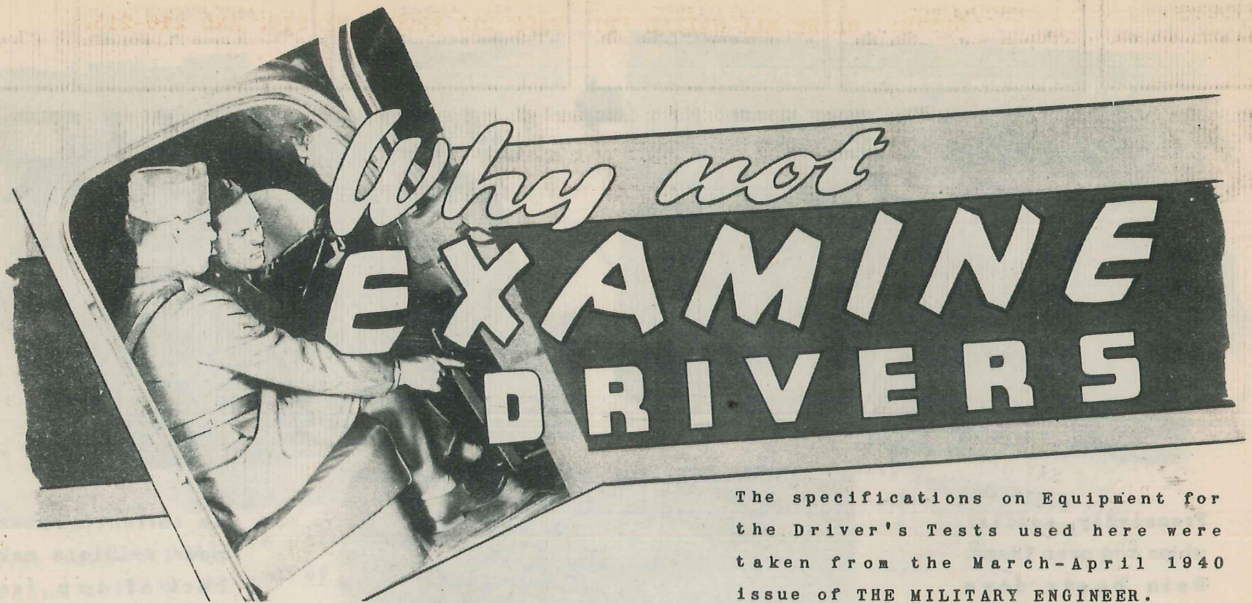


Not getting vehicle markings on. Nobody knows who owns trucks left in repair shop.

Second Echelon



Not tightening steering gears - about 80% of trucks having trouble.



The specifications on Equipment for the Driver's Tests used here were taken from the March-April 1940 issue of THE MILITARY ENGINEER.

We're still stumped. Remember the Dipsy Doodle story, page 175 in the September 'AM? That told of a driver who didn't know what the transfer case was for and who'd never heard of or used the front driving axle. All through October we worried about this, wondering whether the unit commander should be shot for having a dope like that in his outfit, or whether the examining officer should be hung for passing a driver like that. Finally our conscience drove us to check all the Field Manuals, Regulations, Circular Letters and everything dealing with motor transport. All the references say that the driver will not be given a permit until he has "satisfactorily passed an examination conducted by a qualified commissioned officer."

But: None of them says what kind of an examination, or what kinds of questions should be asked, whether they should be oral or written, tough or easy, or what. So, of course, the examining officers don't know what kind of examination to give and our Dipsy Doodle drivers get their permits and go merrily along ruining truck after truck.

That's a fine state of affairs, sez we, and having a conscience, THE 'AM sat ourselves down and wrote a driver's examination, and by gosh, we'd like to see anyone try and get a permit out of us without getting at least 85% correct!

NOMENCLATURE AND MECHANICS

If a driver doesn't know what makes the

wheels go 'round, he won't know how to drive. He may be able to *steer*, but that's all. Since the Army wants drivers, not steerers, it's up to you to see they get them. Here are some sample questions that might be used. We suggest you make half of them oral and half written. Scrounge around and persuade someone to run off mimeographed copies for you. Give the oral ones outside and make the driver point to the exact location of the units as you question him on it.

1. Q. Before you can drive a vehicle, you must be able to control it. What are the controls of a vehicle?

A. The choke, the throttle (hand and foot); the ignition switch; the gear-shift lever; the front wheel drive lever; the transfer case shift lever; the clutch; the steering wheel; and the hand and foot brakes. The following, while not exactly controls, affect the control of a truck and could be included; Light switches; horn; rear-view mirror; tachometer; windshield wiper; winch controls; speedometer; stop lights; air pressure gage.

2. Q. How does the engine work?

A. An air-fuel mixture is drawn into the engine from the carburetor and lighted by an electric spark. The burning gases expand and push a piston down. The piston is connected to the crankshaft which revolves and turns the gears that run the wheels through the power transmission system.

3. Q. Is the differential in the front or rear or middle of the vehicle?

BONER: WE'RE ALL BALLED UP! PAGE 215 SHOULD BE 216, AND 216-215.

three people and a cow. Make him fill out his accident report. Pretend the gas line is blocked and see if he can tell you how to clear it. Have him take a spark plug out and tell you if it needs to be cleaned. Be a human being - not a question-asking machine. When you come back have him fill out a trip ticket.

REACTIONS

There's nothing in regulations about testing a man's reactions - but since these are vital, it's up to the examining officer to make sure a man can react within normal time to emergency situations.

Most men can be trained to become competent, if not expert, truck drivers. However, there are a few men with such slow physical and mental reactions that no amount of training will qualify them as drivers. This is no reflection on them since they may become much better mechanics, for example, than the most expert drivers.

In order to find out who is fitted to drive and who is not, here are some tips on testing.

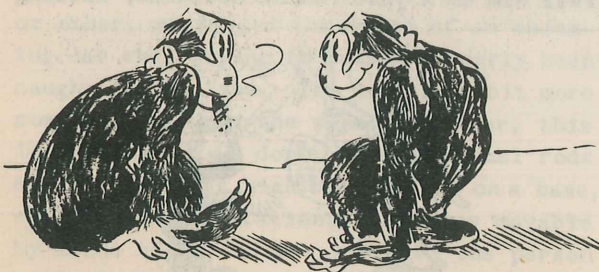
There are five usual tests which cover the most important points of driver ability:

- 1. Clearness of Vision
- 2. Field of Vision
- 3. Stability
- 4. Depth of Perception
- 5. Reaction Time and Reaction Distance

The last is something you can't test without some elaborate equipment. You can rig it up yourself, so if anyone's interested, drop us a line and we'll shoot you the dope.

CLEARNESS OF VISION

Clearness of vision actually means the ability to see, and is the one test that is

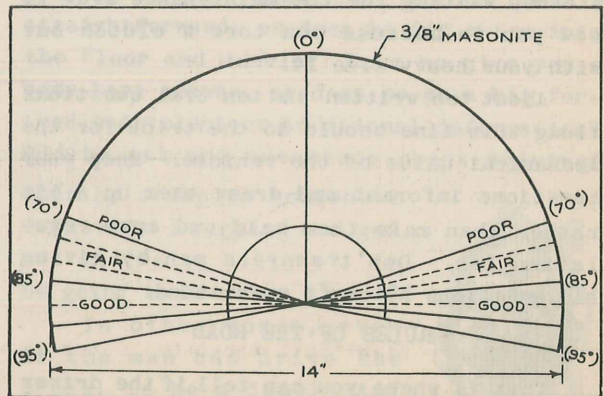


GAWSH-HE WOULDN'T GIVE ME A PERMIT!

usually given to anyone applying for an operator's permit - if you can't see you can't drive, and that's all there is to it. The local commissioner of motor vehicles will give you a vision chart and tell you how to use it.

FIELD OF VISION

Field of Vision is something that is not considered nearly as often as Clearness of Vision, perhaps because it is not as obvious in spite of the fact that it is almost as important. It means the ability to look out of the corner of your eye - the thing teacher used to be so good at when you were trying to pull a fast one back in grammar school. It's important, this field of vision is, because upon it depends your ability to spot vehicles as they come alongside you from behind, or as they pop out at you from side roads. It's easy to give a rough test on this: A twelve-inch ruler will do, though a fourteen-inch one would be better. Rest the center of it on the bridge of the man's nose close to his forehead and if he can see both ends, he has a field of vision of about 180°, which is just about as good as you can hope for. This test is not accurate, so if he can just not see the ends it isn't serious, but if he's a long way from making it, say two inches from each end, it wouldn't be a bad idea to have him checked by a doctor. A very narrow field of vision, anything less than 70° from the straight ahead position, is called "Tunnel Vision" because the people that have it might just as well be looking down a tunnel for all the territory they can see out of the corners of their eyes.



HERE'S ANOTHER DEVICE FOR TESTING "TUNNEL VISION". CENTER IT ON THE BRIDGE OF A MAN'S NOSE.....

A. It is in the rear in a rear-wheel drive vehicle, and in all live axle assemblies in multiple wheel drives.

4. Q. What does a generator generate, and where does the thing it generates go?

A. A generator generates electricity for charging the battery and for operating the various electrical units of the vehicle.

5. Q. What are universal joints in multiple wheel drive vehicles used for?

A. To connect moving parts which are not constantly in alignment.

6. Q. How can you use the engine as a brake?

A. By taking my foot off the accelerator with the gears engaged and letting the truck drive the engine; that is, using engine compression to slow a vehicle down.

7. Q. What is the principle of clutch operation and why should you engage the clutch gently?

A. a. The clutch is like two plates that are covered with a friction material. One plate is connected to the engine and one to the transmission. These plates are pushed together when you engage the clutch and power is transferred down the drive-shaft to turn the wheels.

b. It should be engaged gently because sudden shocks are very likely to break an axle or a gear or a universal joint.

Then, if this were an oral question, you might drive the point home by telling the driver about the time you spent six, miserable, shivering hours in a sub-zero weather, huddled in your cab over a can of Sterno, waiting for the maintenance crew to tow you in because you tore a clutch out with your heavy size 14.

About ten written and ten oral questions along this line should do the trick for the mechanical units of the vehicle. Keep your questions informal and dress them up a bit rather than make them bald and army regulation-ish. Don't scare a man by giving him questions he can't understand.

RULES OF THE ROAD

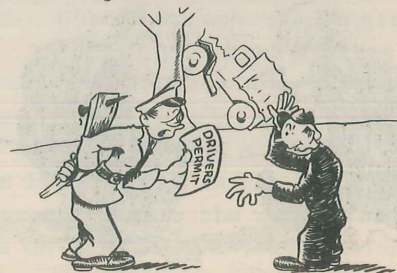
This is where you can tell if the driver really knows his stuff. Nine times out of ten he'll hop right into the cab. Catch'im

and ask 'im reproachfully if he's never heard of first echelon maintenance (like the driver in "What's This Echelon Stuff" in the editorial). Make him go through the regular first echelon "before operation" check: tires, water, gas, oil, everything mentioned in paragraphs 17 to 21 of FM 25-10. See that he tests his brakes shortly after starting out. Make him stop in the middle of driving and go through the "during operation" inspection. See that he knows how to put the chains on and take them off. Make him use the transfer case and the front wheel drive. Have him double clutch up and down the whole range of gears. Run him through a mud hole. Lay out a course like that given in paragraph 27, FM 25-10. Put him through *all* the ropes. Get out of the cab and give him the arm signals for "start engine", "open out," and the rest given in paragraph 29 FM 25-10. As you're talking, ask him the rules of the road and general questions about driving.

Sure, it's going to be work. Yes, we know, the unit commander should have taken care of his training - but how do you know he has unless you test the man on everything? Every incompetent driver in the army can be traced to an incompetent examining officer. Them's fighting words, but we mean it. Flunk a man every time you think he can't do the job. It's not your job to teach him - but it's up to you to see that the man is taught before you pass him.

During the actual driving test tell the driver to park near a fire hydrant or at a corner. If he obeys, explain why he's wrong and from here lead into a verbal examination on traffic regulations and safety precautions. Give him reasons for everything you tell him - he's much more apt to obey if he understands.

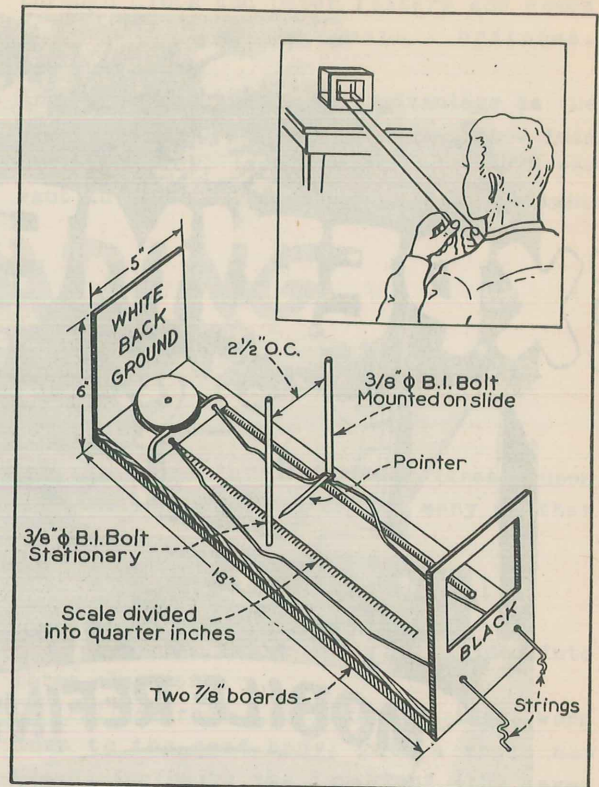
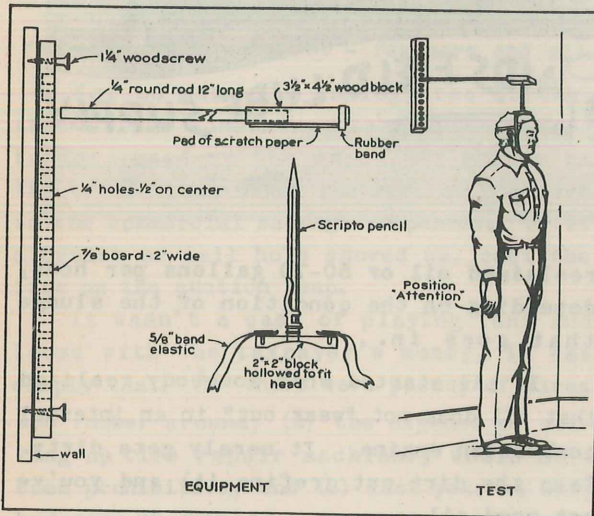
Make a game out of the examination. Tell him he's just had an accident, killing



GO AHEAD, REACH FOR IT!

STABILITY AND CONTROL

Stability, the third test, in this case doesn't mean walking the chalk line with your feet, but rather drawing the chalk line with your head. Lack of a good sense of balance, which comes from steady nerves and controlled muscles, is a serious deficiency. An ingenious method of testing stability consists of a pencil, fastened upright on the head of the man being tested, and a small pad of paper supported on a bracket so that it can be suspended over the pencil. Stand the man at attention and adjust the pad support so the tip of the pencil on the man's head just touches it. If he has good balance and well developed nerves, the variations or sway back and forth should not be over 1-1/4 inches.



required to adjust the movable rod until it is exactly opposite the fixed rod. The average accuracy in inches and fractions is computed from the results of five trials. An average deviation of over 1 inch indicates a deficiency in ability to judge depth and relative distance.

PERSONALITY

There's also nothing in regulations about examining a driver's personality, but his general demeanour and attitude toward driving can tell you a lot. Are his answers straightforward, or does he dig a toe into the floor and mumble? Does he give you a bone-bare answer, or does he go a bit further and volunteer additional information? Did he ask any questions about driving?

When he crumples someone's fender is he going to get out and raise billy-o? Is he going to be a horn blower?

In other words, even if the man can drive the truck, is he a dope? And if he is, think twice about giving him a permit.



IF HE'S A DOPE ...

DEPTH OF PERCEPTION

The fourth test, Depth of Perception, judges the ability of a driver to safely overtake or pass a vehicle, and to cut in and out of the traffic stream. Obviously it is an important test, because there aren't many of us who haven't, at one time or other, misjudged the speed of an oncoming car when trying to pass and nearly been caught out of line. The test is a bit more complicated than the rest. However, this is the way it is done: Two vertical rods about six inches high are mounted on a base, so that one is stationary and one movable by means of an endless string. The person being tested stands 20 feet from the apparatus and by pulling on the string he is

EXPERIMENTAL



You can eat your cake and have it too with the new oil "reclaiming" unit now being tested by Holabird Engineers.

The story is that all the old crankcase sludge you've been pouring down the drain, can now be re-refined and made as good as new.

Imagine yourself stuck away on an island somewhere with about forty-nine trucks. The only oil you've got is in your hair. What do you do? Why you get the guys together and whip up a hot game of cribbage—because Brother you ain't going nowhere.

On the other hand, say you've got an Oil Refining Unit. Then all you do is empty the old sludge from the crankcase of the trucks, pour it into the Reclaimer and before you can say, "Jack Rob..." —you've got fresh clean oil for your trucks, a couple of slightly mildewed drinks of water, and a little light machine oil that've been distilled out in the process.

Honest. Working an eight hour day with one Reclaimer, you can get 400 gallons of

reclaimed oil or 50-70 gallons per hour, depending on the condition of the sludge that goes in.

It all started when somebody realized that oil does not "wear out" in an internal combustion engine. It merely gets dirty. Take the dirt out (refine it) and you've got good oil.

WORKS LIKE THIS

That's just what the new unit does. This is the way it does it:

You take all that old oil that's been lying around the post, pour it into the "mixing tank" adding half a pound of fuller's earth for every gallon of old oil. (The fuller's earth gives all the sludge and impurities in the oil a base to cling to.)

After being mixed thoroughly in the mixing tank, the oil and fuller's earth solution is sucked up into a heating tower or retort. Here it is heated to 600 degrees under constant vacuum which distills out a few by-products: light machine

oil, a little water and some gasoline.

The main body of oil is next dropped down into a "contact tank" where it is cooled to 400 degrees.

Finally, the oil is pumped through a "filter press", that is, it's squeezed

through cloth and paper filters and comes out clean as the sergeant's britches. Cleaner.

And of course the biggest advantage is the comparative compactness of the unit - load it on a truck, (see picture) go where you want to go and everything will be oil right.

RETREADING



There once was a king who would dine off nothing 'but pheasants' tongues. His greatest delight was to tear out this delicious morsel and throw the rest of the bird to the dogs.

Until one time, besieged in his castle for months, he ate crow - feathers and all.

Not to make the analogy too strong, that's like something the Army once used to do: used up the succulent rubber of the tread, then threw the rest of the tire to the commercial salvage companies. Or if a bruise or nail hole showed up, cast the tire on the auction heap.

It wasn't a case of playing fast and loose with the taxpayer's money, it was simply that: (1) there were plenty of tires and rubber around; (2) the expense of setting up tire repair machinery would have been prohibitive; and (3) last year we only had some 20,000 trucks while this year we've got about 300,000. (Are you listening Adolph Shicklegruber?)

But now, with rubber scarce as the conga in the old ladies home, the Army has looked upon Tire Repair and Retreading and found it fair. As a matter of fact, the invitation to bid went out to commercial retread houses October 15.

Well, what is Retreading? What is Recapping? And how about Repairing?

Retreading is a process that makes old tires young. It takes a tire that has grown old gracefully and gives it a new lease on life. Given a tire that is bald but still strong of bead, sidewalls and body, Retread-

ing puts a new layer of rubber (tread) upon it, and sends it out to run many another mile.

THREE KINDS OF RETREADING

Technically, Retreading is divided into three classes:

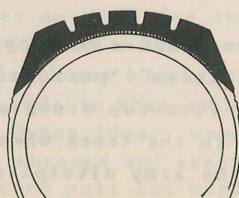
Full Retread - in which the tire, worn down to the cord body, gets a whole new tread, including the "cushion" (the layer of rubber beneath the tread design) cemented onto it from shoulder to shoulder.

Full Recap - in which a tire that has lost only its tread design, gets a new design which includes the shoulders but does not include the cushion. This will probably be the process most used in the Army, because tires caught at this stage have already given long mileage and can be expected to give maximum retread mileage.

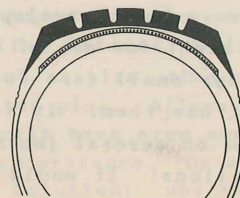
Top Cap - the tire gets only a new tread design - in other words, a slice of rubber as wide and as deep as the old tread design.

THREE KINDS OF REPAIRING

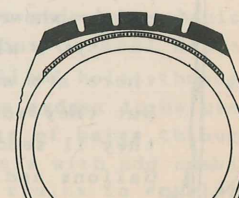
Repairing - which will probably constitute about 75% of the new tire work for the first six months - is also divided into three classes:



RETREADING



FULL RECAPPING



TOP-CAPPING

Sectional Repair - long cuts (3 to 4 inches), diagonal and "X" breaks, extending all the way or almost all the way through the tire, are mended with patches.

Reinforcement Repair - same as Sectional Repair except that the injury is not as large and does not extend all the way through the tire.

Spot Repair - small cuts, short breaks or nail holes which can be filled in with gum.

All this does not mean, however, that some beetlebrain will be permitted to drag in a handful of fabric with a wisp of rubber, and get it retreaded just like new. Tires to be rehabilitated will be thoroughly inspected and only those with a minimum of damage or wear will be rejuvenated. The table shows those injuries that will exclude tires from reconditioning.

Radial cracks
Injured bead
Worn to the cord body
Aged or cracked sidewalls
Ply separation
Loose cords in the inside ply
Tires which in the opinion of the inspectors cannot be satisfactorily retreaded for various other reasons

The success of retreading depends upon what tires are retreaded and whether they are given the new tread at the right time, that is, before the conditions in the table set in. Tires are not to be run to the

bone - the cords in a "thin" tire receive all the shocks the tread should take, and won't be in any shape for retreading.

The money to be saved on new tire bills is considerable. The cost of Retreading is not more than 50% of the cost of a new tire. Retreading gives at least 80% of new tire mileage. So you see the Army stands to save some 30% of its new tire bill.

With three million dollars to be spent the first year on the reconditioning of 600,000 tires, the saving comes to a cool million. Which is definitely not broccoli.

Although all of today's and tomorrow's retreading and repair will be done by commercial houses, it is not hard to visualize Army retread shops of the future. As a matter of fact, mobile repair shops for spot repair seem to be a "must." It hardly seems practical to take tires that have been slightly injured in the field and junk them - or hold up the works until The Eureka Tire Retreading Company gets around to spreading a little gum on them.

In this connection, the first obstacle to the tire reconditioning program was the inability of the commercial field to handle the Army's work. The military mud and snow tread requires new equipment - new molds and matrices. But now after much talk, things seem to be shaping favorably. Things *will* shape favorably if the man in the field gets to understand that the Army is not looking for new retread business. All the admonitions about tire care still go.

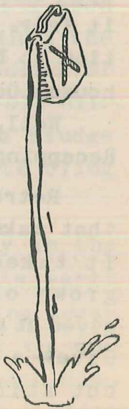
You know we've got a whole warehouse full of bandages - but we're not straining at the leash to use them. Comprenny voo?

WHY NOT THINK ABOUT IT DEPT

From The London (England) New Statesman and Nation

I fell into conversation with an army lorry driver the other day. 'They tell us,' he said, 'that they've stopped waste of gasoline in the army now. Well, I know better. How many gallons do you think I have to waste in a week? They send me with a five-ton truck to deliver a package like that,' and he showed me a bulky envelope.

'It's all right for me, of course, but a motorcycle could take it, and there are always small cars for officers' 'personal use' standing round. But they won't use them. It's the five-ton truck every time. Sometimes they'll send me on several journeys in the truck when one would do. Waste! Gallons and gallons! It would not be army discipline for me to tell them that sailors die to bring it here.'



4-WHEEL STEER JEEP

There's a strange new jeep out in the field. Not very many of them but the minute you see one hopping across a meadow, you'll know it's something new under the sun.

It'll be tearing along a perfectly straight course, when suddenly at a flick of the driver's wrist, it'll make a right angle turn that'll make you blink your eyes and look again. At cruising speed it will do an "about face" smartly as a bee stung donkey.

You'll rush right home and throw the bottle out the window.

But you're all right - you've just been watching the amazing performance of the jeep with the four-wheel-steer.

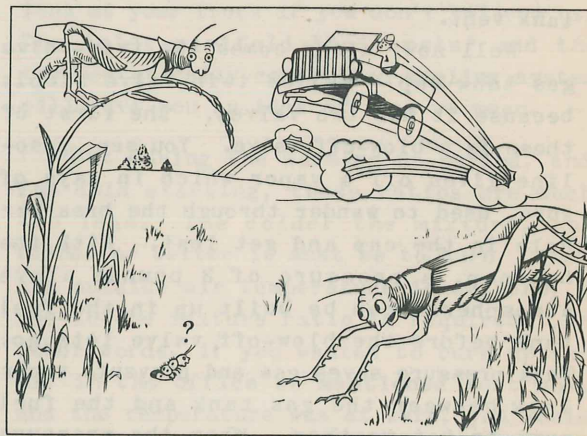
The four-wheel-steer is another step toward making the 1/4 ton reconnaissance a right, tight little car fully able to scoot out promptly from under the bright face of danger and fly away home. It has no arms (so far) and it has no armor - so it's got to have git-up-and-go.

The idea is not new - back in the last World War, many a driver gasped and turned pale as the terrifying quad beneath him responded too quickly and too much to the slightest touch on the wheel. Imagine threading delicately in and out of traffic with a truck that answered the wheel like a crazy grasshopper!

But today's four-wheel-steer has a delayed action on the rear wheels that permits the driver to make all those delicate

curves and turns without the rear wheels coming into play. Perhaps an even better device is the declutching arrangement that allows the driver to throw out his back wheel steering.

This is not to say that driving today's four-wheel-steer jeep is a cinch. It still has keg of dynamite characteristics. It's the closest thing on the ground to piloting an airplane. That's why every Tom, Dick and Harry won't be driving one - that's why, in the final analysis, the four-wheel-steer may not even be accepted.



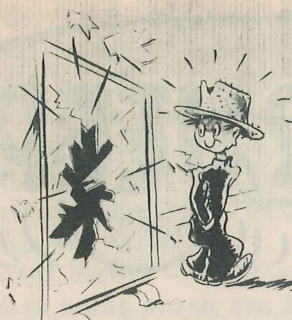
Look out Maw, here he comes again!

But if it is, you'll see some artful dodging that'll make lubricated lightning look like Grandma Pettibone doing the big apple.



CALLING MAJOR C. ELFORD SMITH

Two improvements on your tire tool (August 'AM) have been made by mechanics under Colonel A. B. Warfield, Commanding Officer, Columbus General Depot. Instead of resting tool on four loose blocks of wood on tire, they drilled holes through the blocks and held the metal rods in them with cotter pins. Allows the gadget to be used by one man without trouble. Other idea: some wheels have even number of holes through rim, which allows chain to go through and exert even pressure. On wheels with odd number of holes, one chain gives uneven pull and binds. Solution: use two chains to equalize pressure, prevent binding.



THE NEW GAS TANK AND RADIATOR CAPS (THEY'RE CORKERS)



The old grey radiator cap ain't what she used to be - and the same goes for the gas tank cap. They've grown up to be intricate, little precision units.

Take the gas tank cap. For a long while we've known about the gasoline loss by evaporation through the breather hole in the cap. Not to mention the gas that spilled out of full gas tanks as vehicles were parked or driven up or down steep grades, jounced over rough terrain, or simply sat in the sun so that heat expanded the gasoline and forced it out of the gas tank vent.

Well now, along comes the twin-valve gas tank cap - called twin-valve simply because it has two valves. The first of these is a blow-off valve. You see, gasoline gives off a vapor which in days of yore, used to wander through the breather hole in the cap and get lost. With the new cap, a pressure of 3 pounds above atmospheric can be built up in the fuel tank before the blow-off valve lets go. This pressure saves gas and prevents vapor lock between the gas tank and the fuel pump in hot weather. When the pressure rises above the three pound limit in the

tank, the valve lets go and the dangerous pressure phtttttts.

ABHORS A VACUUM

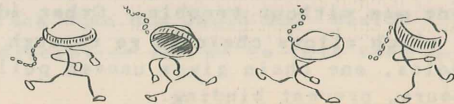
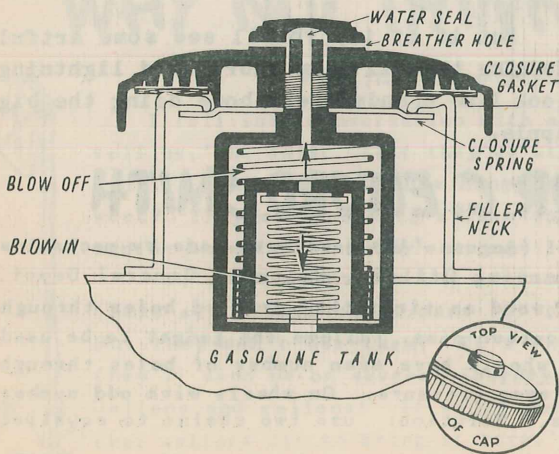
The second valve guards against vacuum in the gas tank. On a cool day as gasoline is drawn into the engine, vaporization in the tank is not rapid enough and a vacuum occurs. Ever throw your lip around a bottle of pop and try to suck the drink out? Same thing happens in the gas tank - just as it did when chewing gum was plastered over the breather hole in the old fashioned cap. Vacuum means no flow of gas through the lines. No flow - no go. But here the second valve steps in. As soon as the pressure inside the tank falls below atmospheric pressure, the little spring of the valve gives in. It's like knocking the props out from under - atmospheric pressure pours in.

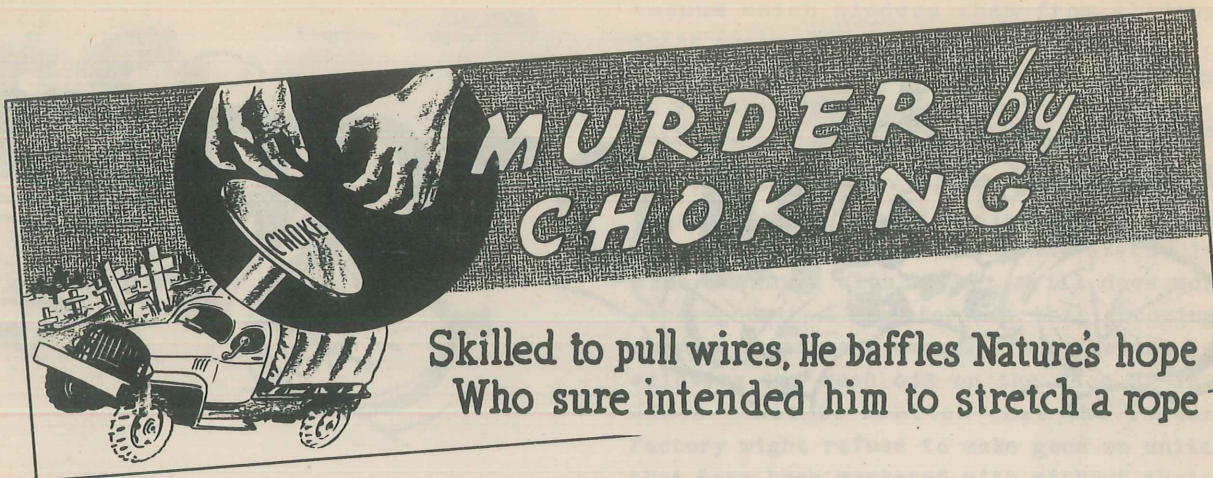
RADIATOR CAPS

The same principle of "twin valves" operates the new radiator caps. A one-way valve allows a free flow of air into the radiator and checks the evaporation or accidental spilling of water or expensive anti-freeze. Another one-way valve relieves excess pressure from within the radiator.

While we're on the subject of caps, we might mention the new anti-theft, anti-loss anchor for gasoline, radiator and oil filter caps. This is simply a chain attached to the cap with a ring or some such anchor that fits down in the filler neck.

Great stuff for just before inspection - when all the tank caps used to pick themselves up and go for a walk.





Of all the toys provided (unintentionally) by a well-meaning manufacturer for a driver to play with, the choke takes the prize. A rookie loves to pull a knob out - especially if he can choose a time when by all the rules it should be pushed in and left in.

The choke is provided to make it easy for you to start a cold engine. Your maintenance manual tells you to push it in again as soon as possible. Your sergeant tells you to push it in again as soon as possible. Everybody tells you the same thing. Common sense *should* tell you - but maybe it isn't as common as we thought.

Let us explain what the choke does and why it has to be used intelligently.

A gasoline engine operates by burning a mixture of gasoline and air. The mixture is compounded in the carburetor and measured by weight.

Just a minute, we can hear you saying, air doesn't weigh anything. Are you telling us, or are we telling you? The office in which this is being written is twenty feet square and twenty-four feet high. If it were possible to cram all the air from it into a sack, do you think you could carry it? Come up and try it some time. It weighs just over 700 lbs. or so, as near as maybe, a third of a ton.

But that is by the way. For full throttle performance, the mixture should consist of about 13 parts of air (by weight) to one part of fuel. For part throttle performance, in an efficiently

designed carburetor, the ratio can be thinned out to 16 or 17 parts of air (by weight) to one part of fuel.

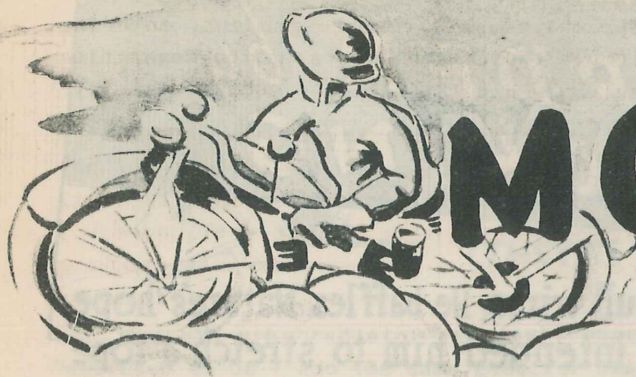
These mixture ratios are satisfactory after an engine is warmed up. That is why manufacturers make use of various devices to shorten the warming up period. Take a look at your truck if you don't believe us. The inlet manifold "hot spots" and the thermostatically controlled cooling system will give you an idea of what we mean.

But during the warming up period, and for cold starting, these ratios are much too lean. The colder the mixture, the richer or wetter it must be to burn. When the outside air temperature is at zero, a one-to-one mixture ratio is required. In other words, if you wanted to burn up the air in the office we mentioned just now, and the temperature was at zero, you would need 700 lbs. of gas.

Talk about being wet, that's wet with a vengeance. All the same, if you mean to start an engine at this temperature, you must have a one-to-one ratio. Only for an instant, of course, but you must have it - and you can get it with the choke. Most trucks make it possible for you to carry on running with this wet mixture by a device which automatically changes the ratio and makes it much leaner as soon as the engine starts to run. If it didn't, the engine would peter out almost immediately, anyway.

The leaner mixture thus automatically provided while the choke is still pulled

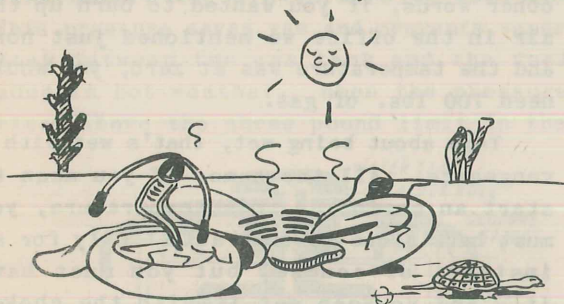
More On Page 240



These Indian motorcycles are highly developed little beasts. They can run up to the speed of sixty miles per hour, (with a suicidal driver, up to 100 m.p.h.) will roll over at the command of their master, leap and dodge about in a manner amazing, and because of their small size and extreme mobility, rush in where fools and angels fear to tread.

Organically, motorcycles are astonishingly hardy - but compared to camels and tortoises they are frightfully feeble. For a camel can struggle along without water for weeks at a time, and tortoises have been known to go without lubrication for months on a stretch.

But motorcycles without gas, oil, and grease wane and die like mayflies in June.



Among habitual motorcyclists, these are facts well-known. But not so well known are certain other physical shortcomings. "Wet sumping", for instance. Wet sumping - or "bicycle bellyache" - occurs frequently and is simply too much oil in the crankcase.

DRY SUMPING

Before getting too technical, let's

look at the oiling system of the motorcycle. The system is called "dry sump". This is not a dirty name, it simply means that the oil is not stored in the bottom of the crankcase as is usually the case in trucks and such. Motorcycle oil is stored in a tank at the top of the engine.

From the tank it flows (by gravity) to an inlet pump which shoots it to the right places. From these places, it drops to the bottom of the crankcase. And here our story begins:

A motorcycle in fine fettle, in perfect physical condition, has a "sump valve" (if it'll help you any, "sump" simply means drainage) with a little tube attached, to draw off the oil from the crankcase. This sump valve is operated by a vacuum (furnished by a thing called a "return pump.") In short, the vacuum (from the return pump) enables the sump valve to draw off the oil from the crankcase through the little tube, and send it back upstairs to the oil tank.

The trouble begins when something goes wrong with the sump valve - for then oil congregates in the crankcase, is picked up by the flywheel and showered helter-skelter all over the innards. Gums up the works.

CURING FAULTY SUMP VALVE

Well, let's enumerate the things that go wrong with the sump valve.

First of all, the pick-up tube of the sump valve is often installed so that the opening at the end of the tube is too

(MORE ON PAGE 236)



Dear Sir

A letter from the field the other day, alleged that the clutch on the Indian motorcycle fails to disengage properly. The Indian company, our correspondent went on to say, recognizes this difficulty with clutches and recommends a light grade of oil. However, says our correspondent, in hot weather under tough going, it would be hard to retain a light grade of oil. (This we can't see inasmuch as the clutch is a "wet" one encased in a housing. The only way we think it could lose oil, is if the housing is loose.)

Well, what with one thing and another, our correspondent suggests grooving the Raybestos discs of the clutch.

Now this, as you can imagine, is a pretty touchy subject. But as our correspondent seemed to know whereof he spoke, we gave ear.

GROOVING CLUTCH DISCS

The grooving of the discs, he said, would allow oil to enter between the steel plates and the Raybestos discs and set up a separating action. That would help the clutch disengage. As you know, the clutch on the motorcycle consists of a lot of plain steel discs alternated with a lot of Raybestos lined steel discs - the whole being tough enough, they tell us, to handle a ten-ton truck (necessary to smooth out the rough action of a two cylinder motorcycle engine.) Tough but oh so gentle!

These discs when engaged, squeeze tightly together and set up a partial

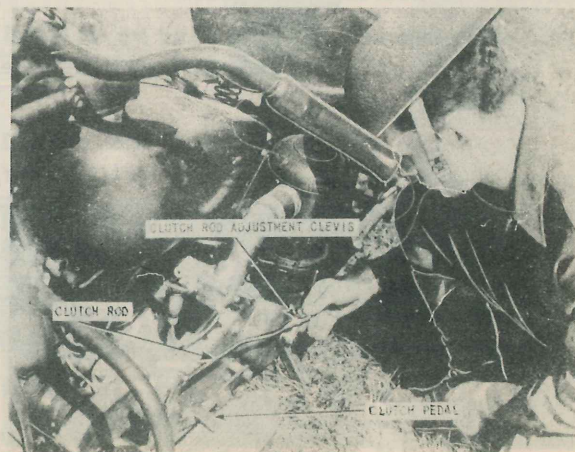
vacuum which hinders them from sliding apart again when the clutch is disengaged. The oil, says our correspondent, entering in via the grooves, sets up the separating action - and the clutch disengages easily.

Now this grooving of the discs is a fairly ancient practice - ancient but not honorable. The Indian company itself is experimenting with it but still does *not* recommend it. The story is that grooving weakens the discs, causes sloppy action by allowing too much oil on the face of the discs - not to mention that the Indian factory might refuse to make good on units that have been monkeyed with without their recommendations.



So keeping our nose clean, we turned our back on disc grooving and looked further afield. Further afield we met Staff Sergeant Phillips, Motor Transport School Detachment at Holabird, who said that the most likely cause of clutches not disengaging properly, was the linkage not being adjusted to give the greatest amount of throw on the worm lever. In other words, when you step on the clutch pedal, the clutch rod doesn't allow the clutch to fully disengage. The clutch, then, is slightly engaged even with your foot off

(MORE ON PAGE 239)



OVERCOOLING -

Overheating we all know about - or should. But overcooling is an angle of winter operation that's not very often considered. The problem is particularly important in vehicles that do a great deal of idling and operate under light loads because their engines are apt to operate at lower temperatures.

The thermostat largely controls the temperature of the engine. When starting on a cold day it cuts out the radiator and bypasses the water around the cylinder blocks until the engine reaches operating temperature. If rust and sediment prop a thermostat open, if it's incorrectly installed or broken, the cold water will flow through the radiator and get colder instead of warming up, keeping the engine below its correct operating temperature. This decreases the efficiency of the crankcase ventilating system and allows water to condense in the case.

The water mixes with oil and forms a thick sludge which clogs filters, screens, and oil lines, affecting oil circulation. The sludge also hardens on valves and pistons making them stick. Faulty lubrication always ruins an engine. When the engine is stopped this water can freeze and damage the oil pump shaft or the oil strainer. Ice crystals may block the flow of oil, and the first thing you know a couple of bearings are gone.

The crankcase oil can also be diluted by unvaporized gasoline forced past the piston ring.

Carbon dioxide, one of the normal products of combustion, combines with water

vapor to form carbonic acid. This acid can etch the engine metal and eventually damage it.

These are only some of the headaches that a cold running engine can give you. The following suggestions may help lick this bugaboo.

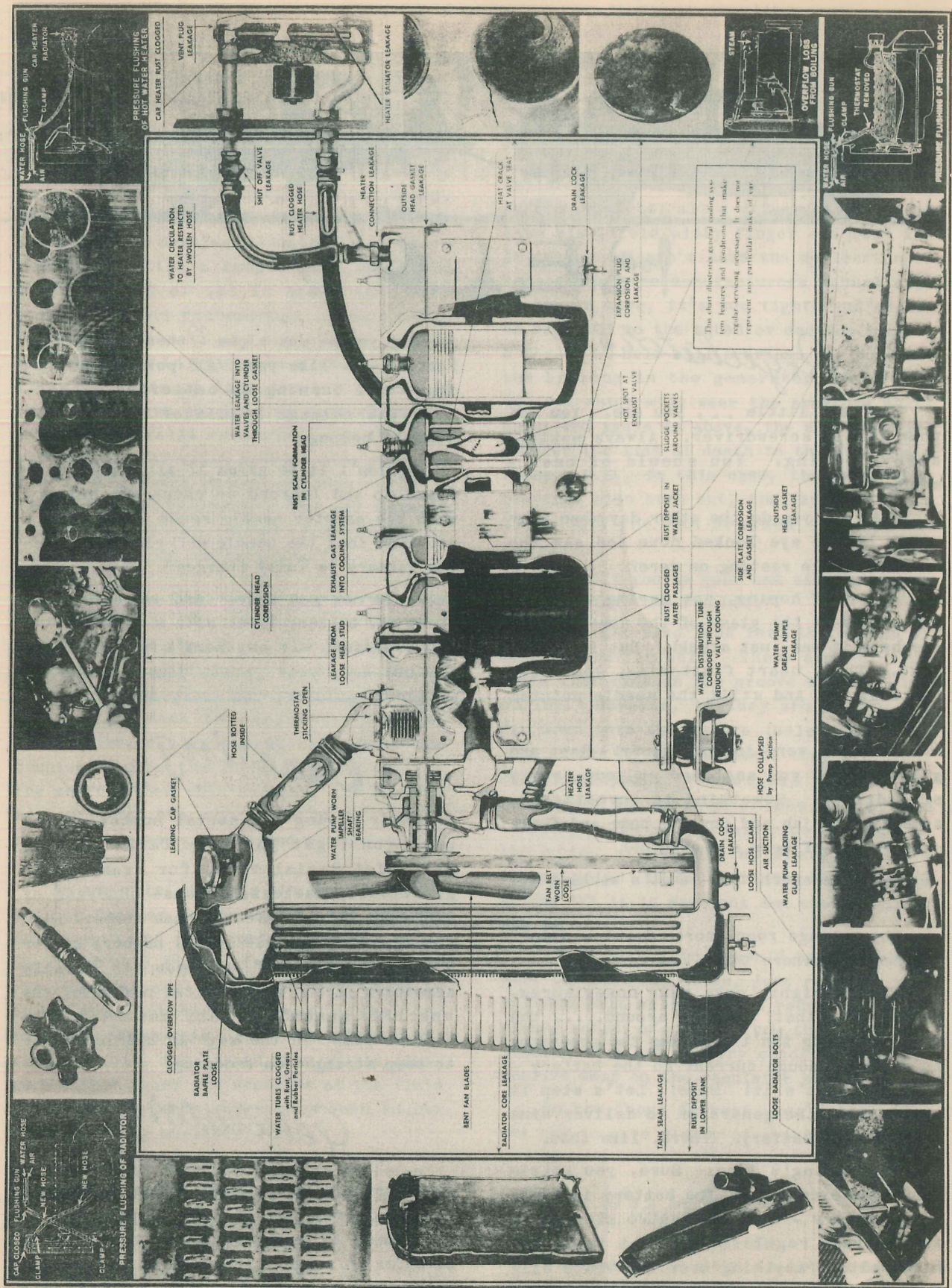
See that the thermostat is correctly installed and in proper operating condition. Your vehicle maintenance manual tells you the whole story - read it.

A radiator hood can advantageously be used in temperatures below 32 degrees F. These hoods are not part of the vehicle equipment, and regulations don't tell you to use them, nor do they forbid using them, so it's up to the company commander to scrounge around and find some substitute. Cardboard or a leatherette cover will do the trick.

In below zero weather some insulation over the crankcase may help - try asbestos sheeting or even cardboard. The oil filter can also be insulated.

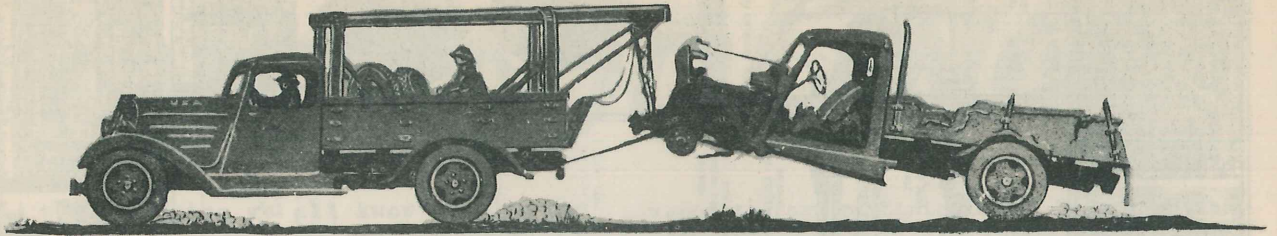
For the rest of the story on winter cooling system maintenance, see "Keep Cool" on page 150 of the September 'AM, and for specific recommendations on ordering Prestone anti-freeze, read Circular Letter 237, OQMG, September 19, 1941. This brand of anti-freeze is stored at all Motor Supply Depots for issue on approved requisitions, without reimbursement from funds in an allotted status. The Prestone was bought for the Depots with money appropriated for buying gasoline and lubricants. So if you hoard or waste the Prestone, you'll find the next allotment for buying gasoline and lubes correspondingly cut. You'll need the table in the Circular Letter to calculate your requisition, so if it hasn't come your way, better check with Corps Area for a copy. The "Cooling" section of the maintenance manual belonging to each vehicle usually gives recommendations for all common types of anti-freeze. Read it and keep warm.

**OVERCOOLING
FREEZES ENGINES -
BURNS SERGEANTS**



This chart illustrates general cooling system features and conditions that make regular servicing necessary. It does not represent any particular make of car.

A TYPICAL AUTOMOBILE COOLING SYSTEM
Showing points where trouble may result from neglect of cooling system service



HELP!

Regulators

You're a little . . ., you are. You and your little screwdriver. Always poking, always prying. You should of been a mechanic.

What did you do the other day when your quick little eye looked down and saw the ammeter needle resting on zero?

Ah, half hoping, not daring to hope, you tapped at the glass of the ammeter dial (perhaps it was just stuck). But it didn't move. Then, heart fluttering, you raced the engine. And still the needle pointed to zero.

Then you were in your glory! Rapt and glassy-eyed, you snatched up your trusty screwdriver. Something to investigate, something to jab and pry and poke and feel! (You *should* of been a mechanic!)

The generator! No - that's working all right.

The voltage regulator! Sure! - didn't you hear somewhere that.....

That's right, poke your nose screwdriver into that! Monkey around..... the darn old thing isn't allowing the generator to deliver enough current to the battery - I'll bet that's it! Sure! Let's step it up to allow the generator to deliver nine volts to the battery. There, like that.

Everything's fine. Sure, you little . . ., fine except that the battery is a six volt battery - and now you've stepped up the voltage regulator so that it'll get nine volts. Anything over 7.5 volts will ruin the battery. You're cute, you are. Now the battery plates will buckle and the whole darn thing'll burn up.

Oh, you're not alone - there are plenty little . . . like you. All poking and prying - all burning up batteries by setting the voltage regulator up where it doesn't belong.

Wouldn't it be grand if all youse . . . wised up and learned to check the battery when the ammeter needle reads zero? Don't you know that the needle will read zero when the battery is fully charged?

Well now you know. And the next time check the battery first with a voltmeter or a hydrometer. If anything's wrong report it, but *keep your grisly paws offen that voltage regulator, you hairy ape.*

Ordering

and only giving the serial number of the part won't get you very far. Quoting Chevrolet Serial 4000, for example, is practically useless, because hundreds of different trucks have the same number. Give the W number, vehicle serial number, bid or contract number if you know it (usually somewhere in the cab) and the number of the specific assembly. Why not read "The Numbers Game" in the May 'AM and learn how to keep straight on ordering?

Generators

There's been too much generator trouble reported from the field. Generators in sore need of repair are piling up like potatoes in a bin. The trouble is entirely needless, because it takes only thirty seconds of a driver's time to save the repairman endless hours.

A driver has to double check two things. First, the lubrication of the generator at the commutator end plate; second, the deflection of the fan belt.

First, let's look at the lubrication. In most generators, lubrication is accomplished by means of a wick. The wick in the generator carries oil up to the armature shaft just like a lamp wick. Well, you squirt a bit of oil in there (as often and as much as recommended in your manufacturer's manual) and the oil settles to the reservoir in which the wick is bathed. The wick leads up from the oil reservoir and is cut into the bushing upon which the armature shaft is revolving. In the same way that a beer stain spreads over your new tie (a professor friend of ours calls it "capillary attraction") the oil spreads or travels up the cotton wick and lubricates the speedy armature shaft.

Of course, if you have neglected to squirt oil into the reservoir, there won't be anything to travel up the wick except perhaps a few microbes. These won't oil the armature shaft. Without oil, the wick burns up and must be replaced. Without lubrication, the armature shaft wears the bushing or else the bushing "freezes" on the shaft. When this happens, the bushing revolves with the shaft until finally a nice hole is worn in the end plate.

At any rate, whether the bushing wears out, or freezes on the shaft, the hole is made larger and the armature drops down on the field pole shoes. The clearance between the armature and the field pole shoes is only some 30/1000 of an inch anyway, so when the armature drops down even the slightest bit, the jagged face of the armature either tears and wrenches at the field pole shoes or else wears them down to the point of being useless.

When this finally happens you can't just fix it with a piece of old chewing gum and piano wire. The armature, the field pole shoes and the commutator end plate all have to be replaced. In a man, this would be comparable to replacing the medulla oblongata and parts of the brain, not to mention the izzard and the gizzard.

So you see it's a big job - a big job that could be no job at all if you'd only lend an ear to manufacturer's recommendation on oiling the generator.

As to the second cause of generator failure, which is simply that the fan belt is on too tight, all a driver has to do is take his little pinky finger and test it. If the belt doesn't have the deflection or "give" that the manufacturers manual says it should have, it's too tight, and should be reported to the squad or section leader. A too-tight-belt will overload and burn out the bearing in the generator driver end cover - which will wear the armature shaft hole; and again as above, the armature will deliver the kiss of death to the field pole shoes. P.S., in this case, the water pump bearings also burn out, the fan belt falls apart and the fan crashes through the radiator.

Now will you be good and oil the generator and test the fan belt?

You might also look into the extent of wear on the fan belt. These are "V" type belts that ride in the groove of the drive pulley. However, if they are riding too far down into the groove (below the outer edge of the pulley) it means they are probably "bottoming" - that is, the belt is riding on the bottom of the pulley and slipping. The belt should ride or cling to the sides of the pulley where it has a firmer grip. If it is riding at the base of the "V" it is worn out and should be replaced.

If, however, you should be tempted to make the belt too loose, just remember that a loose belt will cause a reduced and unsteady output of current from the generator; leading to a low battery condition and excessive wear on the regulator points.

So how 'bout it boys, let's take time out now to save plenty of grief later?

Orphan

The maneuvers down in Louisiana uncovered another orphan - the trailer landing wheel. The side wheels of the one-ton trailer are being kept properly inflated,

but the landing wheel is being neglected - until it has about as much air in it as my uncle Morris's right lung (one level teaspoonful).

So when the time comes for it to be used, it bumps along with the vitality of wet spaghetti, and finally hops right off the rim when it hits the first rough spot.

Somebody ought to remember that the trailer landing wheel has a pneumatic tire just like any other tire. Shoot the $30 \text{ N}_2 + 10 \text{ O}_2 + \text{CO}_2$ to 'em, John boy.

Circ. 1-10

Tables are useful, but in many cases they encourage snap judgements. Like the table in paragraph 12 of Circular 1-10 which some people seem to think tells who repairs what in which echelon. Glance down the column and you'll see "Oil pump, replace" and an "x" in the third echelon column.

But doggone, man, if a desperately wanted truck needs an oil pump and you have one and you send the truck along to the third echelon because you think Circular 1-10 says you don't have to do the job - well, you ought to be shot, because it shows you haven't read 1-10.

Go back and check on that paragraph 12. "The ...table shows the lowest echelon ... in which a repair job should normally be performed. The table is *not* to be considered as arbitrarily placing a maintenance operation in *any particular* echelon. The personnel, equipment and supplies available ...determine the ...work to be performed."

And that means to us: If you have the time, the capable men, the tools and the material, go ahead and do the job and keep 'em rolling!

*Ventilators
and Such*

Crankcase ventilators are a big help in engine cooling. They prevent dilution of engine oil with water, gasoline and acid by allowing them to pass off in the form of

vapors. If ventilator passages are obstructed the ventilator can't work. And what happens? They eventually get so diluted that rings stick, pistons and cylinders score and bearings burn out.

Another thing these ventilators do is relieve the variable pressure in the crankcase caused by the pistons pumping up and down, by the combustion gases that blow by the piston rings, or by the vapor pressure from the heated oil in the crankcase. If the ventilator is obstructed so that pressure builds up in the crankcase, the engine oil is forced out through the front or rear bearings. Goodbye oil seals and bearings! Drivers have been known to stuff rags in the breather pipe to prevent engine vapors "messing up" the nice, clean engine. Make 'em keep the engine clean the hard way! See that the breather cap and filter is cleaned right along with the air cleaner, blown out dry with air and dipped in light engine oil to trap dust.

MANIFOLD HEAT CONTROLS

The manifold heat control mechanism controls the intake manifold heat within limits as close as five degrees of the temperature known to be the best for engine and fuel efficiency. An overheated manifold will warp and crack and gaskets will blow. If the intake manifold is too cold it may cause hard starting, even when the engine is warm, poor fuel economy, and lowered engine efficiency.

ENGINE SUPPORTS

Loose engine supports are the cause of many driver complaints of chattering clutch and engine noises, especially when engines are mounted in live-rubber or other flexible supports. If these supports are too tight the engine will feel rough when operated, and they may even cause a cracked clutch and flywheel housing.

All vehicle manufacturer's manuals have instructions for the proper adjustment of engine supports.

STRAINER SCREENS

Strainer screens in carburetors, and screens and sediment bowls of fuel pumps

should be cleaned regularly according to preventive maintenance schedules. If they're not, you'll have clogged lines or carburetor jets and a long wait on the road while things are blown clean.

In replacing strainer bowls, do not attempt to stop leaks by using a pair of pliers on the nut in the bail that holds the bowl. Too much pressure distorts the top part of the sediment bowl cover and increases the leak. Many fuel pumps are ruined because the housing has been cracked in an attempt to stop leaks around top of sediment bowl by tightening with pliers. If bowl leaks, the usual cure is to replace the gasket.

NOISY VALVE LIFTERS

Never Attempt To Quiet Noisy Valve Tappets By Setting Them Closer Than Manufacturer's Specifications.

When valve tappets are adjusted to proper setting and are still noisy, the trouble *must* be assumed to be sticking valves, valve springs too strong, valve springs too weak, worn guides, worn stems, worn lifters and guides, and rounded valve stem ends or hollowed tappets. Freeing-up sticking valves with penetrating or gum dissolving oils sometimes stops the noise. Most cases of valve failure (burning and pitting) can be traced to setting tappets too close.

Checking valve clearance with engine running may not be accurate if valves are sticking.

Valves should not usually be checked or adjusted until engine is at normal operating temperature.

Slight noises in valves and lifters are usually not serious if due to normal wear, and need no correction until the vehicle is due for a semi-annual inspection.

A scraping noise in the valve mechanism may indicate scored cams and mushrooms and demands immediate attention.

AXLE SHAFTS

Most broken axle shafts and worn axle drive flanges can be traced to failure to

keep the axle shaft nut or flange nuts properly tightened. Any play at this point puts a shock load on shafts and flanges every time the vehicle is started and stopped. A few minutes time devoted to this item each 1000 miles, or sooner if noticed, will save axles and flanges and prevent road failures.

Mess Trucks

Here is a comment on Mess-Trucks from Capt, Harry Andrews, Jr., 26 Ordnance Co. (MM), Fort Bliss, Texas. "The canvas cover on the 6x6 - 2½ Ton Cargo Truck is too low to allow cooks to stand erect when cooking with the field range on the march. We have removed the bows and dropped down into the body slots a piece of wood 12" long with the cross sectional dimensions of the bows. The bows and cover are then replaced. This provides the additional head room without an unauthorized modification as the wood fillers can easily be removed. What are your comments on this?"

That's what we call hoss sense, Captain, and more power to you. Maybe some other outfit will take a tip from this.

U-Quints

The Rzeppa Universal Drive Assembly is interchangeable with the Bendix-Weiss Drive Assembly except for the adjustments. Since there is no thrust button on the inner end of the Rzeppa Drive Shaft, install .052" in shims between the Front Axle Drive Flange and the Wheel Hub to put the Drive Assembly in the correct operating position.



FOR want of some oil, a bearing was lost;
 For want of a bearing, an engine was lost;
 For want of an engine, a truck was lost;
 For want of a truck, a battle was lost;
 For want of a battle, a democracy was lost—
 And all for the want of a film of oil.

THE MISSING LINK

IN VEHICLE SPACING

Suggested by an article in POPULAR SCIENCE, May 1940.

No plan for vehicle spacing will work efficiently as long as it depends on the driver's ability to *guess* how far he is behind the next truck.

This year, some 300,000 greenhorn selectees will pilot 300,000 vehicles through crowded city streets, over broad highways made narrow by reckless drivers, across country on who-knows-what kind of terrain.

Their officers' heads will be abuzz with theories on convoy control: vehicle spacing....intervehicular headway....infiltration....intracolumn interference....speedometer multiplies....time-vehicle ratios...

Abracadabras for controlling a convoy as a whole, *but* what of the little man who's got to be there? The guy that runs the convoy--the driver.

Well, like the elastic in the duchess' corsets, it all depends on him. That benighted, bedeviled creature - it all depends on him. He's got to know, got to be able to judge, how far behind the other vehicle he is.

WRECKS CLUTTER SHOPS

And if he doesn't....well, the sky won't fall upon us - but we will continue to see convoys pile up on themselves like caterpillars with a jag on. Take the convoy carrying a full division that went flying through the third corps area like a windstorm last week - leaving eight disabled vehicles in its wake.

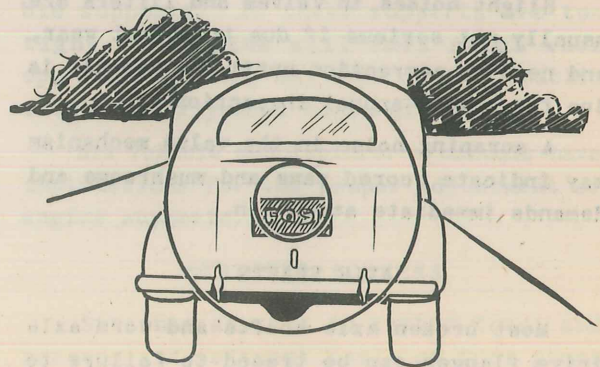
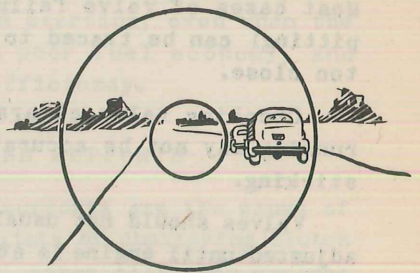
Or if you don't like them onions, jog down to our repair shop where the proof of the pudding is: 90 out of every 100 vehicles dragged in for repair had been in ac-

cidents! Read the Job Orders: "repair rear sill, apron and floor....straighten front bumper and brush guard, check front end of frame for distortion....straighten right front fender and braces...." On and on and on.

All of which is why we say, look to the driver - the lowest, common, most important denominator in any convoy. Teach him to judge the distance between his own and the vehicle up ahead - give him a tool or a device.

Now this is where we come in. A few weeks ago, we stumbled across just such a tool, or rather, device. We don't know whether it'll work or if it's any good. All we know is that it's interesting. We present it for your critical judgement:

If you were glancing through the danger meter in Figure 1 at the right you'd know it was safe to pass, while the view in Figure 2 warns you that you're following too close behind the next car. Illustrations on the next page show the danger meter adapted to convoy use.



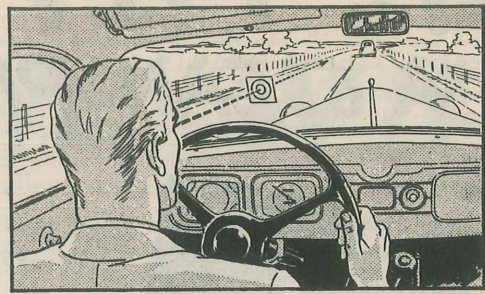
It's a little gadget we ran across in an old copy of Popular Science Magazine. Of course their use of it was to give the passenger car driver a mechanical device to show him when it's safe to pass, Figures 1 and 2. As you can see in the accompanying drawings, the little concentric circles don't obscure vision although they give you a precise picture of your chances to complete a road maneuver safely.

THE DANGER METER

Applied to military needs the danger meter, as it is aptly named, would have slightly different characteristics. As shown by figures 4, 5, and 6, the circles would indicate safe following distances at typical speeds of 10, 20, and 40 miles per hour.

Based on a speedometer multiple of three*, when the truck ahead is within the largest circle, you're following him at thirty yards; when you see all of it in the center circle your distance is sixty yards, and when the vehicle next in front of you fits neatly in the smallest circle, he's one hundred twenty yards out of the way of your front bumper.

Now that's simple enough, isn't it? Why don't you dash over to the nearest draftsman, get an ink compass, and scribe yourself three little circles on a piece of cellophane. Then all you have to do is stick it on the windshield. Look through it and you know exactly where you are. The table will give you some idea of the size to make the circles although you can plot your own if you care to, to conform to your own idea of the most frequently used spacings and size of vehicle used. Rear silhouettes vary between the lowly jeep and the pompous 6x6.



This picture gives you an 'over-your-own-shoulder' view of the meter in use.

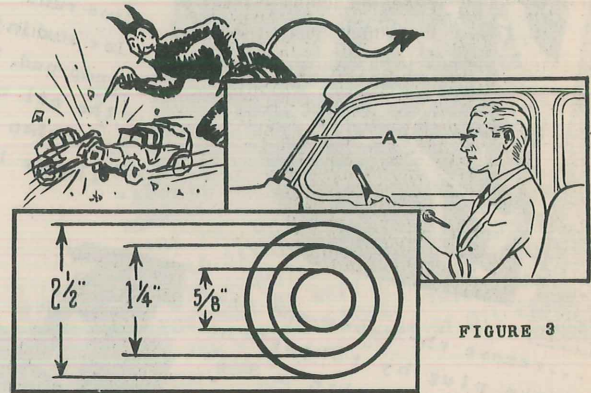


FIGURE 3

Dimensions above are calculated for distances of 30, 60 and 120 yards based on an eye-to-windshield distance of approximately 23 inches.

Well there it is. We give it to you at its face value, hoping it starts you thinking. Perhaps you can try it out on a couple of your own vehicles. If it stinks, maybe you have a better idea. And if you do, we are certainly anxious to hear about it, and we mean quick. At least in time to dish it out to the field before the lines of wrecks start overtaking the lines of assembly.

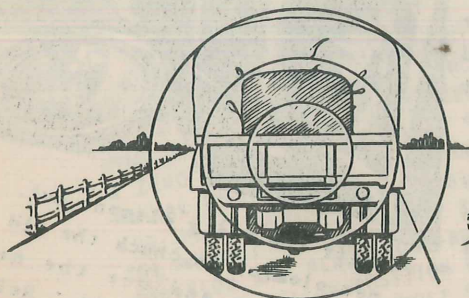


FIGURE 4

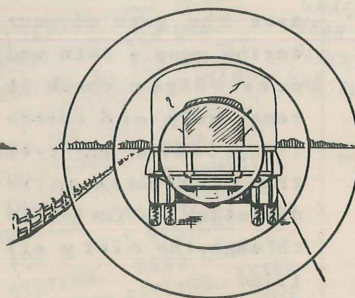


FIGURE 5

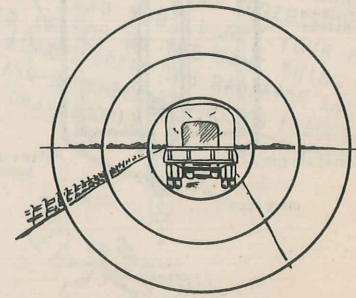


FIGURE 6

Translate the dimensions in Figure 3 into little circles and this is what you'd see if the same truck were thirty, sixty and a hundred twenty yards away.

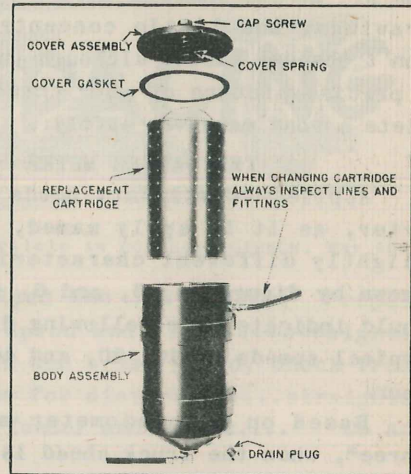
*Three times your speedometer speed in yards, that is: 20 MPH calls for a distance of 60 yards.

OIL FILTERS

A CLEAN PICTURE STORY

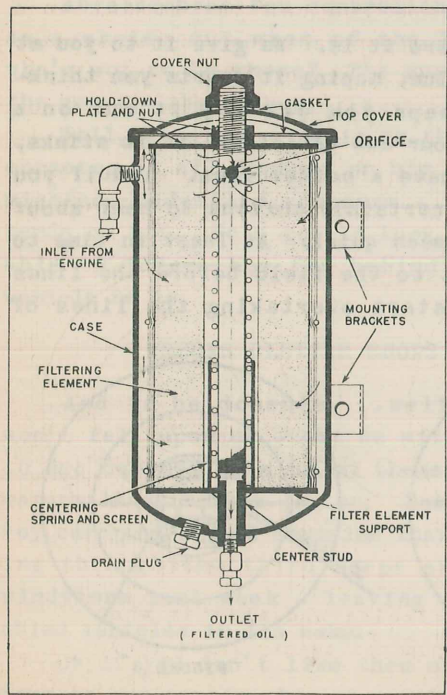


This is a typical installation of a Military Standard Filter. A tee in the rocker arm takes the line for the inlet, and the return line runs to a hollow stud in the fuel pump pad. You check the oil every day, and when it becomes sludgy looking...



This is an exploded view of a strap or bracket mounted oil filter. The base mounted filter has the same cover assembly, gasket and cartridge.

...remove the cover and the drain plug by taking the capscrew off with a 3/4" open face hex or crescent wrench. Drain the sludge. Install the plug and...



Here's how the gadget works. Looks simple, and it is - but it'll save the guts of your engine many a pain and ache if you check it constantly and change the element whenever the etch mark on the dip stick is invisible through the dirty oil film.



...lift the dirty element out. Slip a new element in, chuck the old cover gasket away and use the new one packed with each element. Reinstall the cover, start the engine and check all connections for leaks.

HOT OFF THE WIRE

NEWS FLASH ON TECHNICAL MANUALS IN OCTOBER DIDN'T SAY THROW ALL MAINTENANCE MANUALS AND PARTS LISTS OUT THE WINDOW. IT SAID TO SCRAP ONLY THOSE WITHOUT TM NUMBERS THAT DUPLICATED THOSE WITH TM NUMBERS. AND FOR GOSSAKE DON'T SCRAP ANYTHING UNTIL YOU KNOW YOU CAN GET A REPLACEMENT.

SPEC. 680 WILL REPLACE ALL QM PAINT SPECS NOW IN USE. ALL PAINTS AND SURFACE COATINGS ARE COVERED IN THIS ONE SPECIFICATION.



TWO CORRECTIONS FOR YOUR DELCO-REMY U.S. GOVERNMENT VEHICLE ELECTRICAL EQUIPMENT HANDBOOK, D-R 900: PAGE 16, COLUMN 1, LINE 10, SHOULD READ: "ARMATURE" AND "FIELD" TERMINALS MOMEN-" PAGE 17, COLUMN 1, PARAGRAPH 5, SHOULD SAY THAT THE OIL RESERVOIR IN THE COMMUTATOR END OF THE GENERATOR MUST BE KEPT FILLED WITH OIL TO THE OVERFLOW HOLE. THIS USUALLY REQUIRES 8 TO 10 DROPS OF OIL EVERY 1000 MILES.

THOSE USING THE NEW PORTABLE GREASE DISPENSERS IN THE FIELD ARE URGENTLY REQUESTED TO FILL OUT THE QUESTIONNAIRE IN THE BACK OF THE DISPENSER MANUAL AND SUBMIT TO HOLABIRD QM DEPOT AT THE END OF MANEUVERS.

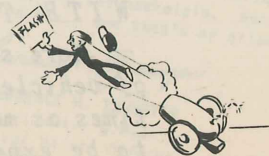
FUTURE CONTRACTS ON TIRES WILL STIPULATE NON-DIRECTIONAL MUD AND SNOW TREAD WHENEVER POSSIBLE.

TO REMOVE ALL AIR FROM THE HYDRAULIC BRAKE SYSTEM ON CHEVROLET 1-1/2 TON TRUCKS, AFTER BLEEDING BRAKE SYSTEM AS DESCRIBED IN THE MANUAL, START ENGINE AND OPERATE HYDROVAC BY DEPRESSING BRAKE PEDAL. STOP ENGINE AND RE-OPEN #3 BLEEDER VALVE (SEE MANUAL) ON THE SLAVE CYLINDER UNTIL ADDITIONAL AIR IS BLED FROM SYSTEM. THIS IS IN ADDITION TO REGULAR PROCEDURE FOR BLEEDING THE HYDRAULIC SYSTEM AS OUTLINED IN TM-10-1431, SUPPLEMENT, PAGE 5-3 AND TM-10-1127, PAGE 5-12.



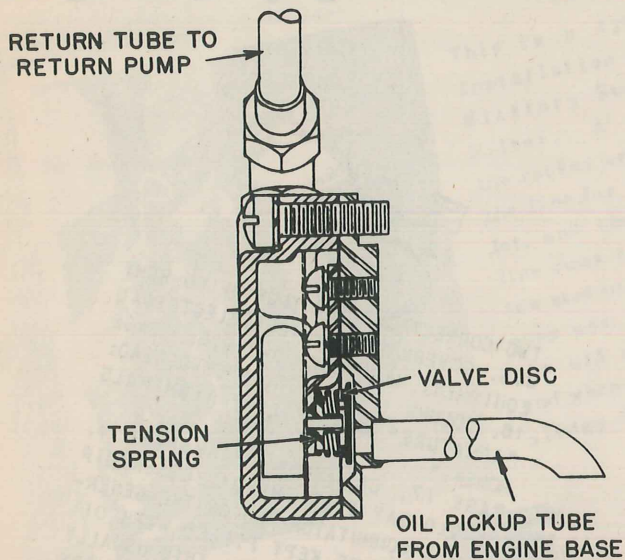
REMEMBER LAST YEAR SOME BRIGHT BIRDS DRAINED RADIATORS BEFORE PUTTING VEHICLES IN STORAGE, BUT FORGOT TO DRAIN THE BLOCK? ABOUT 40 BLOCKS FROZE STIFF AND CRACKED - AND YOU'LL GET YOUR BLOCK CRACKED IF YOU DO THE SAME THING THIS YEAR. ALWAYS DRAIN THE RADIATOR AND THE BLOCK - AND REMEMBER THE BLOCK FREQUENTLY HAS TWO DRAIN COCKS.

IN USING LOW VOLTAGE CIRCUIT TESTER (QMC MODEL 1-41) TO PERFORM THE "OPEN CIRCUIT TEST FOR DELCO-REMY REGULATOR #5628" UNDER TEST NO. 5, YOU'LL GET A ZERO READING EVERY TIME, FOLLOWING OPERATING MANUAL INSTRUCTIONS. TO PERFORM THE TEST CORRECTLY, ADD THE FOLLOWING TO THE INSTRUCTIONS ON PAGE 6 OF THE MANUAL: PLACE UTILITY SWITCH IN VOLT-AMMETER POSITION AND PLACE VOLT-AMMETER SCALE SELECTOR SWITCH AT YELLOW POSITION FOR 6 VOLT SYSTEMS AND RED POSITION FOR 12 VOLT SYSTEMS. READ CORRESPONDING SCALE ON METER FOR REGULATOR SETTING. AFTER THE READING HAS BEEN MADE AND REGULATOR SET, MOVE UTILITY SWITCH BACK TO "REGULATOR TESTS" POSITION FOR REMAINDER OF TESTS.



MOTORCYCLE SUMP VALVE

(Continued from Page 224)



close to the bottom of the crankcase. In other words, the mouth of the tube is shut up by being pressed too close to the bottom of the crankcase. Naturally, then, it can't drink in the oil.

There is nothing really complicated about correcting this - all you, and that you means motorcycle mechanics *only* - have to do is remove the oil level screw which is at the left half of the crankcase, and pry around with a skinny screwdriver or bent instrument, until you have lifted the mouth of the pick-up tube 1/8 or 3/16 off the floor of the crankcase. Or if you can't raise the tube sufficiently this way, you'll have to take down the sump valve and cut off a portion of the tube to give it a full opening.

At any rate, you've got to give the tube its full opening - otherwise the engine is sure to overload at speeds around 50 miles per hour

In some cases, it has been found that the end of the tube inside the *sump housing* is too long. This will also restrict the flow of oil through the sump valve. If there is not a 3/16 inch clearance between this end of the tube inside the housing, and the bottom of the housing itself - some careful cutting is in order.

A more subtle trouble sometimes occurs. The little disc, which serves as the trap-door through which the oil passes out of the sump valve, is sometimes slightly ajar. It may be caused by some obstruction, or an uneven surface (caused by wear) may prevent the disc from seating correctly against the back plate of the sump valve.

In this case you'll have to smooth out this little disc by regrinding it with fine valve grinding compound. Simply sprinkle a bit of the grinding compound on some plate glass or a surface plate and revolve the disc with your index finger until it has a smooth surface.

To check the sump valve before sticking it back on the engine, assemble it and apply oil pressure to the return nipple opening. If the valve is sitting right, it should hold 8 to 10 pounds of pressure.

One other thing you might check before calling it a day, is whether the connecting pipes between the return pump and the sump valve are tight. If they aren't, the vacuum from the return pump to the sump valve won't be complete - and the oil won't be sucked up as it should be. If you find that these unions are not tight, take them apart and paint the threads with aluminum paint. Aluminum paint has enough body to act as gasket cement.

COLLISION HAZARDS QUADRUPLE

WITH THE SQUARE OF TRAFFIC VOLUME!

More simply stated, this means: when the number of vehicles on a given highway area is doubled, four times as many accidents involving two or more cars is to be expected. You can help your post beat this average by driving with a little more care.

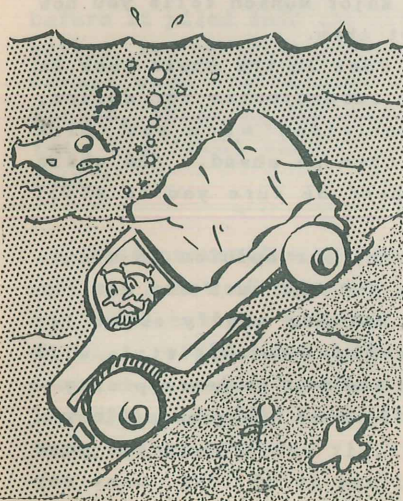
This 'n That

CONVOY TO CANADA

The Canadian Government has authorized U.S. military vehicles to cross Canadian territory from Detroit to Buffalo if no dutiable goods are carried and if drivers carry written authority showing they are traveling on official duty.

Chevrolet

Chevrolet has been receiving parts requests that give only the Series Number, like Chevrolet 4000 Series. This means nothing at all because many different vehicles are built under the 4000 Series. If you want to get the part - and if you don't want it, why order it? - give the W. number, vehicle serial number, and the bid or contract number found on the name plate on the glove compartment door. In addition, of course, give any other information necessary to identify a part.



Are you sure he said turn left?

TIRE TALES

Here's the report on tires made by manufacturer's representatives:

"...There is need for a standard policy on tire rotation to take full advantage of usable tire life..."

"...Too many slightly injured tires are being discarded and disposed of through salvage. Many could be reused after slight repair..."

"...About 25% of the tires in use have
(Turn the Page)

Gripe

The Editor
Army Motors
Holabird, Md.

Dear Sir:

I have a gripe! At first I thought of writing my congressman or the president of the United States but saner judgement caused me to write you direct without going through channels.

This all started when the army sent me to Holabird for the Short Officers' Course. Well, I didn't know a spark plug from a tire lock when I arrived. In the entrance exam they asked 20 questions--I only answered two and only one of those was right. The first question I answered was about a "bogie" and my guess about it being a man who haunted houses was wrong. Then the second question wanted to know how many wheels there were on a car and I said I didn't know. That was right--I didn't. I guess that was good enough for the powers there for they admitted me to the school.

Then began a hectic period of classes, lectures, laboratories, demonstrations, and convoys and later some more of the same stuff all over again. This finally terminated in the school giving me a diploma to get rid of me. Said they "We couldn't teach you all there is to know in so short a space but we did give you the seeds of information and how far you go when you get out depends upon yourselves."

Now there is where my gripe is. They couldn't teach us all there is to know so now I sit up late nights boning over all my old text books; I jilt my best girl to buy new texts on motors; I'm forever getting my fingers rapped with a hammer or a wrench in the head for sticking my nose in a motor that is ripped apart. All because I want to see what is going on and they didn't teach me that at Holabird.

The other night I saw Col. Lawes in the movies and I stood up and cheered and everyone wanted to know where the flag was so I sat down again. Then today I saw an item by Col. Greaves about accidents and remember his opening lecture to our class; "Gentlemen, I welcome you to Holabird--but accidents don't happen--they are caused--so if you want to stay here see that you don't have an accident."

Now I'm a Holabird grad. I've developed a motor for a heart with oil lines for blood vessels, a distributor for a brain and ignition wires for nerves. I've tried Lydia Pinkhams Remedy and Castoria to cure the nostalgia. But, in spite of myself, you've made me a transportation man. And that's my gripe about Holabird--GOD BLESS HER!

Lawrence M. Zaumeier

LAWRENCE M. ZAUMEIER
2nd Lieut., Q.M.C.
Motor Maint. Officer

no valve caps. It is not generally realized by many people that valve cores are not a positive seal, but only a check valve. Caps are necessary to protect the cores and minimize pressure losses..."

"...Reversing directional tires on the front wheels greatly improves resistance to cupping and uneven wear..."

"...It is estimated that 25% of the trucks are using front wheel drive in high-way operation..."

"...Company K of the 23 and K of the 7 QM battalions maintained tire pressures to within 4 pounds - a better showing than many commercial fleets. Other units had one third of their tires 10 pounds under-inflated. There is a general tendency in all companies to neglect the spare when inflating. Many drivers didn't know what correct tire pressure meant or that they could increase their tire life an estimated 60% by simply maintaining proper pressure..."

"...Tire pressure gages varied anywhere from 3 to 10 when compared with an accurate master gage..."

Read, mark, learn and inwardly digest.

Battery Water

Distilled water has ruined more batter-

LEADERSHIP FOR AMERICAN ARMY LEADERS

(Started on inside front cover)

in a grand position to help yourself by helping them. Reasonable, isn't it? You don't get something for nothing, and unless you give, the best leader in the world is useless and everything goes wrong. Your unit drops behind the others, the company commander jumps all over you, and your outfit smells in your own opinion and in the opinion of others. That fine situation gets everyone exactly nowhere.

Sure, a buck is a lot of dough out of army pay, but this book's well worth it - as Ben Franklin said, 'If you don't hang together, you'll all hang separately.'

Take the apparently simple thing of language. Major Munson says 'What particular good does it do to speak of 'weapons-carriers' if they are known to every man as 'jeeps'?' No good at all - so why do it?

ies than polluted water!

Nuts! sez you. Sure 'nuff, say we. Your battery goes dry and you haven't distilled water. What do you do? Just let it stay dry because somewhere you read that *only* distilled water should be added to batteries. So the battery gets ruined and you can blame the distilled water for it.

"Well, what am I supposed to do if I run out of distilled water?" Use tap water, stream water, any water that's clean and hasn't got old socks and tin cans and sand floating around in it. Use anything rather than let a battery go dry - which will ruin it quicker than impure water.

Here's the dope: Distilled water should be used when available. Any water you can drink can be put in your battery.

Ordinary water will not affect the electrical characteristics of the battery, and even under extreme conditions it won't affect battery life more than 5 to 10% - which is a darn sight better than ruining the whole battery for lack of water.

Heavily chlorinated water will not seriously harm a battery.

Evaporation drives off only the water and leaves the impurities behind. So the initial filling of a dry battery must be with distilled water. After that, the possible accumulation of impurities from ordinary water is negligible.

There are hundreds of other things that are no good at all; Major Munson tells you how and why to forget them.

The guiding idea in the whole book is, 'Depend on your subordinates for advice, make your own decisions when you think you're right - then go ahead. And while you're going ahead be sure you're *still* right.'

So, gentlemen, our opinion in a nutshell is: Fork out the buck and get the book. There's nothing stuffy about it; its light, friendly, readable style will carry you along and you'll learn plenty - painlessly. It'll make the good officer a superior officer, it should make the poor one a good one, and it'll lift 'most any man out of the Private, Buck, class to as far as he can go. Nuff sed, eh?

MOTORCYCLE - CLUTCH

(Started on Page 225)

it, which ruins the facings in a short while.

Our correspondent touched on this in his letter.

SHORTEN

The remedy for this is to shorten up the linkage - and this is done by pulling the clutch adjusting arm up until the clutch is fully engaged, then adjusting the linkage by means of the clutch rod clevis adjustment. If this doesn't do the trick, put the clutch control rod in the next lower hole on the clutch foot pedal. You

should get full engagement of the clutch (discs) when the heel plate of the clutch pedal is all the way down.

Another thing you might look into next time you've got your clutch down, is whether the Raybestos discs slide freely on the pins of the clutch sprocket. If they don't, use a round file to cut the notches - being careful not to give the discs sideways play on the pins.

While on the subject of pins, kindly remember never to use them as a lever for tools - you'll bend them out of shape that way.

SABOTAGE

It had been raining a little, not enough to wash the accumulation of dust and grease off the road, but just enough to mix it into a slick, skiddy goo that lay treacherously on the surface. The reconnaissance car was heading the convoy. On one of those sharp New England bends a truck suddenly boomed into sight on the wrong side of the road.

The driver of the reconnaissance car slammed on the brakes and swung out. With a squeal of tires, the driver desperately fighting for control, the car went into a tail spin and then head over heels just before it piled into the cliff. One soldier killed, two officers seriously injured. The report said "The brakes on three wheels locked, throwing the reconnaissance car into its fatal skid on the treacherous road."

Most preventive maintenance is a nuisance. A lot of rigamarole thought up by the brass hats to keep you busy. Do this, do that - before operation, after operation, every week, every month, during operation, last thing at night, every six months. One thing after another.

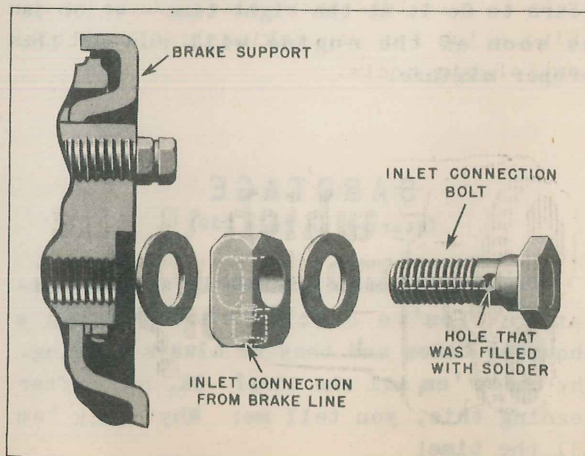
They hauled the wreck into the shops and made a routine inspection.

Routine until they found the hydraulic brake inlet connection to the right rear wheel carefully filled with solder and filed smooth. "The brakes on three wheels locked ... fatal skid ..." The French had a word for it - sabotage.

Most preventive maintenance is a nuisance. "Do you remember the one that says "Check brake action shortly after starting out?"

If the driver of the reconnaissance car had remembered it he'd be alive now. If the second echelon had remembered it on the weekly inspection the driver would be alive now.

(MORE ON PAGE 240)



AERIAL SUPPLY

(Started On Page 210)

What planes are going to be used? Let's hark back to the October FIELD ARTILLERY JOURNAL and the light plane mentioned there.

The Civil Aeronautics Authority says the plane is "characteristically incapable of spinning". It actually has fewer controls than a motor car, and all you have to do is pull the steering wheel toward you to go up, and away from you to go down, and to the right or left for any desired degree of turn. That's about all you have to know to fly it.

The engine is probably less complicated than a truck engine. With a little training any competent third and fourth echelon mechanic could maintain the fuselage and wings. The plane can be towed by a 1-1/2

ton truck (the wings are carried inside) and the whole thing only weighs 850 pounds. The tank holds 20 gallons of gas and at 20 miles to the gallon, the plane can cruise 400 miles. The plane can land in a hundred yards, which means it could drop into a motor park for refueling. Its speed range is 45 to 100 m.p.h. and it climbs 550 feet per minute.

In a test given it by the Field Artillery, the plane was unlimbered from the towing trucks, lifted across a ditch by six soldiers, put together and sent into the air in ten minutes.

All in all, the flying supply jeeps would seem to answer a lot of questions.

MURDER BY CHOKING

(Started On Page 223)

out is about 4 or 5 to one. And that is still very wet. So in most trucks, when you push the choke half-way in, the ratio thins out a bit more - this time to about 8 or 9 to one.

So far so good, but even with a mixture of 8 or 9 to one, cylinder bore wear is excessive because the fuel washes oil away, and we dare not leave the choke in the half-way position longer than necessary. This, unfortunately - we've said it now and we won't go back on it - this unfortunately, is where we have to rely on you. You have to push the choke in - right in - with your own fair hand. And if you mean to graduate from the "greenhorn" class, you'll learn to do it at the right time - which is as soon as the engine will run on the proper mixture.

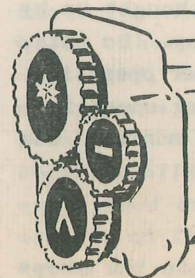
Remember, with the choke half out, the mixture ratio is 8 to 1 for full throttle and 9 to 1 for part throttle. With the choke pushed in, it is 13 to 1 for full throttle and 17 to 1 for part throttle. There's a lot of difference, as the absent-minded professor said when he took hold of the wrong end of the poker. And the result of that difference, if you misuse the choke, is to increase engine wear by between two and three hundred per cent—to say nothing of the gas you pour down into the crankcase.

The moral is, don't experiment with the choke control. If you can't stop playing with it, ask the sergeant to hand your vehicle over to someone else. Maybe he can find a job for you making little pebbles out of big rocks.

SABOTAGE

(Started on Page 239)

Preventive maintenance is a darn nuisance. You've checked those brakes a thousand times and they're always working. Why check 'em all the time? OK, bud, after reading this, you tell me: Why check 'em all the time!



which is the
most important
Gear?

digests-comments

CURRENT TECHNICAL MAGAZINES

"MOTOR SERVICE MAGAZINE"

October 1941

"Watch Out For Winter" - An exhaustive article on winter tune-up, from the front bumper to the tail pipe.

"Fuel Injection" - With this system, air only is drawn into the cylinder. Then, at the right moment, while the intake valve is open, a spray of gasoline is injected into the air stream. It's being used on airplanes now, but you can never tell when trucks will be using it.

"Shop Kinks" - Preventing Piston Seizure; Stoppers For Drainage Holes; To Save Gas; and Removing Broken Taps.

"Shop Ventilation" - A simple shop ventilating system that can be made by any good mechanic - and something that's needed in many shops.

"FIELD ARTILLERY JOURNAL"

October 1941

"The New Motorized Division" - How it will be used.

"Motor Vehicle Identification" - A straight from the shoulder plea for sensible vehicle marking, with a plan that looks good to us.

"Fly It Away" - The tale of a jeep plane

the Field Artillery are experimenting with, of the type THE 'AM suggests for aerial supply.

"MOTOR AGE"

October 1941

"Tune-up For Oil Economy" - How to treat rings, bearings and cylinders to get maximum oil economy.

"Generator Trouble Shooting" - Another in the series of articles on the fundamentals of the electrical system.

"Winter Cooling System Tune-up" - Why to do what and when.

"MOTOR"

September 1941

"Breaker Points Can Take It" - for 50 or 75 thousand miles - if you take care of them. This article tells you how.

"Generator Service" - How to test, inspect and overhaul third brush and Shunt Generators.

"MOTOR"

Annual Issue

A great big issue crammed with dope on the new cars and trucks and containing a fine section on Uncle's automotive army. Fine as a reference and a copy to mull over.



MAINTENANCE

The Vital Chain

REPAIR - OVERHAUL

