

The **ARMY** **MOJORS**

VOLUME 2

MAY 15 1941

NUMBER 2

W. HOLABIRD QUARTERMASTER DEPOT

MOTOR TRANSPORT SCHOOL

BALTIMORE MD.

Putts



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THERE IS NO CHARGE FOR THE 'AM—

Requests for subscriptions should bear the signature of the Commanding Officer of the organization desiring them. If you receive the 'AM regularly and should move or be transferred, please notify the Editor of your new address before the first day of the month of the copy you want forwarded.

ORIGINAL ARTICLES ARE WELCOMED

Address all correspondence to "The Editor, Holabird Quartermaster Depot, Baltimore, Maryland". Please sign your name as author or give detailed information as to the source of the material submitted. Anonymous contributions cannot be accepted, but your name will be withheld if desired.



THE 'AM

VOLUME 2 MAY 15, 1941 NUMBER 2

START THE NEW MAN OFF ON THE RIGHT FOOT - KNOW THAT HE KNOWS

AS THE ARMY GIRDS ITSELF TO THE STEPPED-UP TEMPO OF THE DEFENSE PROGRAM, ALL TYPES OF MEN - SKILLED AND UNSKILLED, EXPERIENCED AND INEXPERIENCED - ARE BEING RECRUITED. THIS HODGE-PODGE OF HUMAN MATERIAL MUST BE MOLDED INTO SMOOTH-WORKING TEAMS THAT WILL TURN OUT WORK QUICKLY, EFFICIENTLY AND WITHOUT ACCIDENTS - MEETING THIS RESPONSIBILITY SUCCESSFULLY BOILS DOWN TO A TEACHING JOB - A PATIENT, INTELLIGENT TEACHING JOB. A RECENT SPEECH BY THE MANAGING DIRECTOR OF THE NATIONAL SAFETY COUNCIL SAID IN PART:

MOST FOREMEN AGREE THAT WITH NEW, INEXPERIENCED EMPLOYEES, SUPERVISION MUST START FROM SCRATCH, TAKING THE WORKER THROUGH THE ROUTINE OF HIS JOB STEP BY STEP. SHOWING PATIENCE WITH HIS EARLY MISTAKES, EXPLAINING PRODUCTION AND SAFETY RULES, CORRECTING THE NEW MAN UNTIL HE BECOMES ADJUSTED.

BUT WITH SKILLED OR EXPERIENCED MEN, NEWLY EMPLOYED, IT'S APT TO BE A DIFFERENT STORY. THE FOREMAN IS APT TO FEEL: 'THIS FELLOW IS A SKILLED WORKMAN. HE'S HAD A LOT OF EXPERIENCE. HE KNOWS HIS TRADE. HE DOESN'T NEED A LOT OF TEACHING'.

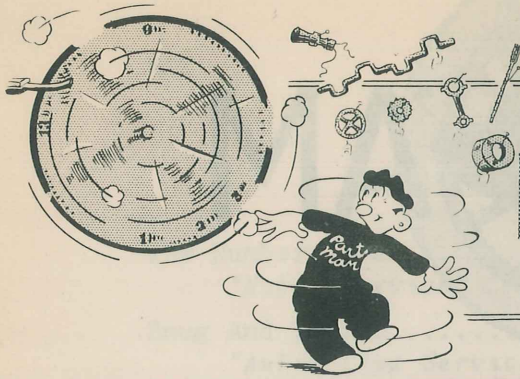
NUMEROUS ACCIDENTS DEMONSTRATE THAT ALTHOUGH A MAN MAY BE AN EXPERIENCED WORKER IN HIS PARTICULAR TRADE, HE SHOULD NOT BE PUT ON THE JOB UNTIL HE HAS RECEIVED CAREFUL INSTRUCTIONS ON HOW THAT SPECIFIC JOB IS TO BE DONE SAFELY AND EFFICIENTLY. OF COURSE, IN THE CASE OF A NEW OR INEXPERIENCED MAN, SUCH TRAINING IS OF EVEN GREATER IMPORTANCE, PARTICULARLY FOR THOSE JUST ENTERING THE ARMY. EVERYTHING IS DIFFERENT THERE, AND AN OLD JOB TAKES ON ENTIRELY NEW ASPECTS. SOME OF THE REGULATIONS SEEM SILLY, AND SMACK OF REGIMENTATION, BUT THEY'RE MADE SO THAT VITAL WORK CAN BE DONE QUICKLY AND SAFELY BY MANY MORE MEN THAN ARE EMPLOYED BY ANY ONE COMPANY.

HERE ARE SEVEN RULES TO FOLLOW IN TRAINING NEW MEN:

1. EXPLAIN THE JOB TO THE MAN.
2. TELL HIM WHY IT HAS TO BE DONE IN A CERTAIN WAY.
3. HAVE HIM TELL YOU WHY IT SHOULD BE DONE THIS WAY.
4. DEMONSTRATE.
5. HAVE THE MAN DEMONSTRATE TO YOU.
6. WATCH HIS DEMONSTRATION CAREFULLY FOR UNSAFE PRACTICES.
7. CHECK! CHECK! CHECK!

WHILE YOU'RE TEACHING HIM, DON'T TREAT THE MAN LIKE A KINDERGARTEN PUPIL. DO IT IN A FRIENDLY WAY THAT WILL MAKE HIM REALIZE THAT YOU ARE SIMPLY TRYING TO GET HIM STARTED ON THE RIGHT FOOT.

START THE NEW MAN RIGHT AND HE'LL KEEP RIGHT - START HIM WRONG AND THINGS WILL GO WRONG ALL ALONG THE LINE, CREATING PERPETUAL HEADACHES.



THE NUMBERS GAME

"Hell's Bells", groaned the Transportation Officer as he slumped in his chair, "a 12th indorsement on the basic communication asking for truck parts, and I finally get the serial number. And what do I find -- it's not a truck at all, but a trailer".

That prompted your editor to check further and he was startled to learn of the number of delays in handling requisitions, extra checking of reports, letters delayed, unnecessary correspondence, mechanic's complaints that the depot was not cooperating with them, etc., that could be attributed to a single cause. Why? Simply because the requisition contained insufficient information.

For this reason always give the year and model of the vehicle and by saying "model", we don't mean the year of the vehicle, as is so often the answer given to this question. The name plate on every vehicle dash gives all the dope.

DIFFERENCE BETWEEN YEAR AND MODEL

Let's take, for example, the 1940 Blank. Most of you fellows know that there are six series in the Blank line for that year: the 40, 50, 60, 70, 80 and 90. It so happens that the first two use the same pistons, timing chain, etc.; in fact, they have the same engine, while the last four mentioned also have the same engine. However, on checking into the tie rods, tie rod ends, and several other parts, we find that the 80 and 90 series are alike, while the 60 and 70 series use the same as

the 40 and 50. There is only one unit common to these six series and that's the muffler. When taking a look at the tailpipe though, you will see how easy it would be to have the muffler coming out of the wrong end of the car if you used a 60 tailpipe on a 90 chassis.

NO BLINDFOLD ORDERS

The more information the better, but above all, give the manufacturer's name, model number, serial number and type of truck or unit. The goods are on the name plate and the time spent double checking it may save days in filling the requisition, not to mention wear and tear on the nerves of all concerned. It's easy to jot down the U. S. registration number of the truck, too. You can't miss it even on a cloudy day — not those large block numbers that appear on the hood and the tail gate. You can pick them off over your shoulder as you're dashing back to have that req. OK'ed.

We've kept harping on that elusive little scrap of metal called a name plate — where do they keep it? Your guess is as good as ours in a good many cases, but they're generally found in the following places.

GENERAL MOTORS TRUCK	
NOMENCLATURE	2½ TON 6X6
SUPPLY ARM OR SERVICE MAINTAINING VEHICLE	
— QUARTERMASTER CORPS—	
MODEL-C6KW-353	SERIAL NO
DEL DATE	GROSS WT
MAX PAYLOAD	5,000 LBS.
MAX TRAILED LOAD	4,500 LBS.
ENGINE LUBRICANT	RECOMMENDED
SUMMER	SAE 20
WINTER	20W OR 10W
GASOLINE OCTANE RATING-68	
YELLOW TRUCK & COACH MFG. CO	
PONTIAC, MICH.	

VEHICLE NAME PLATE

This plate, also called "Chassis Plate" or "Nomenclature Plate" is usually on the instrument panel or dash and gives the model number, payload capacities, lubrication and gasoline data, etc. The name plate is really the "table of contents" of the truck. Transfer the info on this to the requisition and you can't help getting what you ask for. This plate may give the serial (chassis) number, but this is frequently given on

THE CHASSIS SERIAL NUMBER

plate, which will probably be on the engine side of the dash panel or fire wall.



THE ENGINE NUMBER

This plate is usually on the side of the engine block, and gives you the engine number, firing order and other information. Sometimes this information is stamped on the engine block rather than being on a plate. The only sure way of locating the plates is to see the manufacturer's manual. Some of the required information may be only given in the manual.

OTHER PLATES

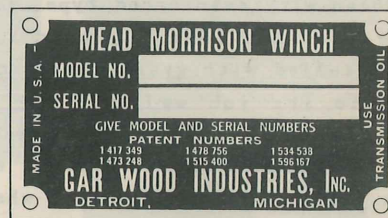
Most of the sub-assemblies, like generators, starters, carburetors and the like can be positively identified by their individual name plates or stamped numbers. This is necessary because many units may be produced by a company other than the truck manufacturer. For example: the winch on your Diamond T truck is manufactured by Gar Wood Industries, Inc., under the name of Mead Morrison Winch. The name plate pops up on the top of the gear box on the winch, and there you are, serial number, model number and all.

SUB-ASSEMBLIES

On many trucks there are different distributors used in one year, especially when delivered on different contracts. As most of you probably know, every distributor, generator and starter has the part or model number stamped on a little metal tag which is fastened to the unit and easily located if you will take the time to wipe off some of the grease and dirt that shouldn't be there anyway.

In one recent model of a standard commercial truck, for example, during one year there were two optional and two standard generators, all four of which were apparently used with no definite favoritism. This means that four distinct types of brushes, armatures, field coils and plates and such had to be kept on hand, and the parts man must know definitely just which one is being asked for. It is easy to get what you want if only you will remember to copy down the model number of the generator, starter, or distributor. This little effort on your part will save you a lot of time and probably a lot of grief when you try to get the wrong part on the right unit.

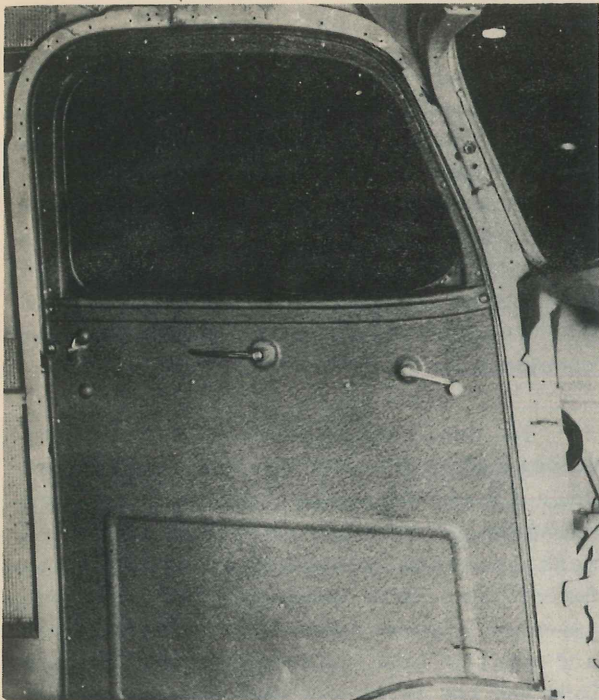
Remember this and you'll find that your work is being completed with a minimum of lost time, and you'll feel better at the end of the day because you didn't have to jump all over that "dumb parts man" for giving you the wrong parts. Think it over, will you?



WINCH PLATE

Located on top of gear box on winch.

The good ol' summertime means that about eight million bicycles will be rolling along the highways and byways of the United States. And the bicycle season means, too, that motorists will have to watch out for bike riders. Boys and girls sometimes forget to be careful. It's up to you to protect them as much as possible.



Shows cab door properly prepared for an installation of weather proofing air seal.

Efforts to make the modern truck or car interior as comfortable as the fireside in the old homestead, naturally means the addition of all sorts of new fangled mouldings, trims, foamy seats, and what-nots, to the already complex motor vehicle.

One of the newest of these aids to better living, and probably one of the most desirable from the point of view of the all weather driver, is latex sponge weather stripping.

The woven wire reinforced type, (which has many advantages and has been approved for Army use). must be installed with great care and precision if it is to do its job well. This is obviously necessary if you really want to keep out wintry blasts. The weatherstrip, or it may be called wind lace, must make snug contact where doors meet frames on the truck cab or car body.

The accompanying illustrations show the correct method and steps to follow in installing air seals properly.

Holding the lace properly at the starting point. Use care in striking fasteners so as not to cut the rubber seal.

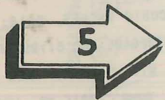


Tinners shears are used to cut the inner seal only after it has been fastened all the way around the door frame.



Kerfing the wired flange so that stripping follows the contour of the door frame without buckling.

Ceiling and side panels are set in place and fastened so they are flush with the tubular portion of the air seal.



Job is now finished in the approved professional manner. Note how the wedge illustrates tight fit of a properly installed air seal.



Placing metal trim which covers poorly fitting joints and decorates interior.





DISTRIBUTOR SHAFTS ON THE 1/4 TON 4 x 4 FORD "GEEPS" ARE BINDING OR SEIZING IN DISTRIBUTOR HOUSING DUE TO APPARENT LACK OF LUBRICATION. THIS IS DUE TO THE NO-12141 OILER FELT INSERTED IN THE B-10141 OILER ASSEMBLY IN BASE OF THE GP-12124 DISTRIBUTOR HOUSING NOT ALLOWING SUFFICIENT LUBRICANT TO SEEP THROUGH TO KEEP DISTRIBUTOR SHAFT PROPERLY LUBRICATED. IT IS ESSENTIAL TO REMOVE THIS OILER FELT IMMEDIATELY. TAKE A LONG POINTED NEEDLE OR ANY POINTED PIECE OF THIN WIRE AND BEND A VERY SMALL HOOK AT A 90° ANGLE AT THE POINTED END AND "FISH" OUT THE FELT IN THE OILER PASSAGEWAY. AFTER OILER FELT IS REMOVED, OILER SHOULD BE FILLED WITH OIL.

IF A GEEP IS A SMALL BUT POWERFUL ARMY CAR AND A JALOPY IS ANY OLD CRATE THAT WILL JUST BARELY RUN, A GEEP THAT IS GETTING OLD MUST BE A GEEPLY.

PARTS LISTS AND MAINTENANCE MANUALS FOR THE 1941, 1/4 TON, 4 x 4 FORD "GEEP" HAVE BEEN ISSUED AS TM 1100 AND TM 1101. THESE SHOULD READ TM 10-1100 AND TM 10-1101. CORRECT YOUR COPIES AND REFER TO THEM AS TM 10-1100 AND TM 10-1101 IN ALL CORRESPONDENCE.

THERE HAVE BEEN ENOUGH ARTICLES IN THE 'AM ON LUBRICATION (SEE THE INDEX, PAGE 333, MARCH 1941, IF YOU WANT THE DOPE) TO INDICATE THAT IT'S A HIGHLY TICKLISH SUBJECT ON WHICH YOUR GUESS IS ALMOST AS GOOD AS THE NEXT MAN'S. HOWEVER, THERE'S ONE RAY OF LIGHT ON THE CLOUDY HORIZON AND THAT IS THE NEW UNIVERSAL GEAR LUBE THAT DOES AWAY WITH THE ASSORTMENT OF EXTREME PRESSURE AND HYPOID LUBES THAT USED TO DRIVE AND RECOMMENDED FOR ALL FULLY ENCLOSED GEARS — HYPOID OR OTHERS — SUCH AS DRIVING AXLES, TRANSMISSIONS, TRANSFER CASES AND DIFFERENTIALS OF ALL QUARTERMASTER CORPS VEHICLES. THE GREASE FALLS INTO THREE CLASSES: CLASS 1 — FOR CONTINUED USE BELOW 0° F. (SUB-ZERO) IN AUTO-MOTIVE EQUIPMENT WHEN LUBRICANT OF LOW VISCOSITY IS REQUIRED. TO BE USED WHEN THE VEHICLE MANUFACTURER RECOMMENDS SAE NO. 80. CLASS 2 — FOR GENERAL USE IN AUTOMOTIVE EQUIPMENT AT ALL ATMOSPHERIC TEMPERATURES ABOVE ZERO REQUIRING A LUBRICANT OF MEDIUM VISCOSITY. TO BE USED WHEN THE VEHICLE MANUFACTURER RECOMMENDS SAE NO. 120 OR A HEAVIER LUBRICANT. THE PROCUREMENT DIVISION, TREASURY DEPARTMENT, HAS ENTERED INTO A CONTRACT FOR A UNIVERSAL GEAR LUBRICANT (EXTREME PRESSURE) IN ACCORDANCE WITH A "PROPOSED FEDERAL SPECIFICATION VV-L-701, DATED OCTOBER 1, 1940". PERIODIC NOTICES BY CIRCULAR LETTER WILL BE PUBLISHED GIVING PERTINENT INFORMATION CONCERNING EACH SUCCEEDING CONTRACT. BRANDS OR TRADE NAMES OF LUBRICANTS COMPLYING WITH AND PURCHASED UNDER THIS SPECIFICATION BY THE PROCUREMENT DIVISION CAN BE MIXED. ANY BRAND OR TRADE NAME OF GEAR LUBRICANT WHICH IS NOT PURCHASED UNDER THIS SPECIFICATION SHALL NOT BE MIXED WITH THIS UNIVERSAL GEAR LUBRICANT. FOR FURTHER INFORMATION ON THIS LUBRICANT, SEE MOTOR TRANSPORT TECHNICAL SERVICE BULLETIN B-5, OR CIRCULAR LETTER NO. 5, OQMG, JANUARY 15, 1941.

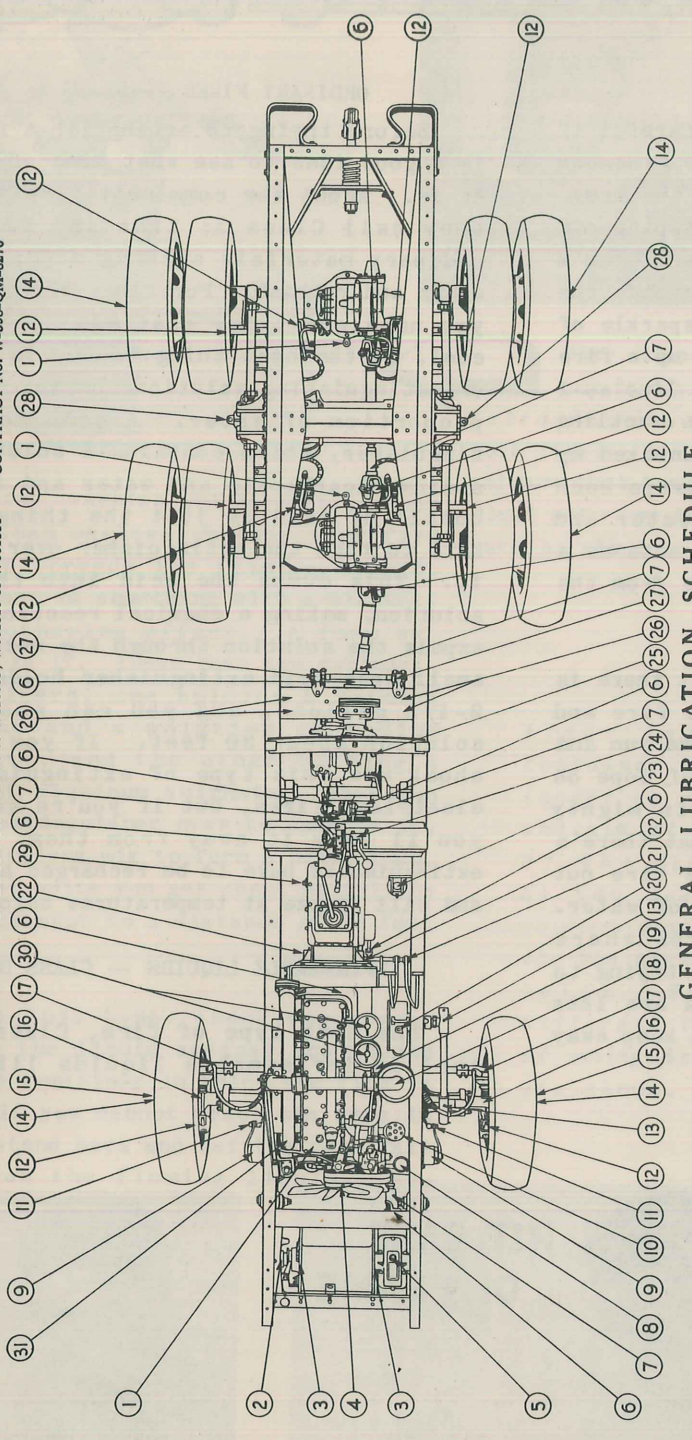
MOTORCYCLE OIL BATH TYPE AIR CLEANERS, MENTIONED ON PAGE 291 OF THE FEBRUARY 'AM, WILL BE READY FOR ISSUE FROM THE QUARTERMASTER MOTOR SUPPLY DEPOT, FORT WAYNE, MICHIGAN, ABOUT MAY 15, 1941. SUBMIT CONSOLIDATED REQUISITION FOR 1940 MOTORCYCLES AS FOLLOWS: PART NUMBER 611844 FOR 1940 HARLEY, 45 CUBIC INCHES, SOLO; 611840 FOR 1941 HARLEY WITH SIDECAR; AND 611983 FOR 1940 INDIAN, 74 CUBIC INCH, WITH SIDECAR. FOR DETAILS SEE CIRCULAR LETTER 70, OQMG, APRIL 23, 1941.

YOU MAY HAVE HAD SOME TROUBLE WITH THE OIL PUMP STRAINER ON THE 2-1/2 TON 8 x 8 GMC TRUCKS. IT SEEMS, WHEN YOU OVERFILL THE CRANKCASE OR GO UP AND DOWN STEEP GRADES WITH A FULL CRANKCASE, THAT THE STRAINER IS FORCED UPWARD BY THE OIL UNTIL IT MEETS THE CRANKSHAFT — AND YOU CAN IMAGINE WHAT HAPPENS FROM THEN ON. THE SERIAL NUMBERS OF THE TRUCKS WITH THESE DEFECTIVE "FLOTO" OIL PUMP FLOATS HAVE BEEN SENT TO THE FIELD WITH INSTRUCTIONS TO REQUISITION AN IMPROVED ONE. YOU'RE NOT MEANT TO WAIT UNTIL THE TROUBLE STARTS, SO EVEN IF YOU HAVEN'T NOTICED ANY TROUBLE, GET YOUR NEW FLOATS IMMEDIATELY AND SAVE PLENTY OF HEADACHES ON THE ROAD. THE TRUCKS MAY RUN ALL RIGHT NOW, BUT THEY CAN GO GALLEY WEST QUICKER THAN A FLASH IF THE STRAINER MEETS THE CRANKSHAFT.

CIRCULAR 74, WD, GIVES THE LATEST CHANGES ON MARKING VEHICLES WITH U.S.A. REGISTRATION, REGIMENTAL, ETC., INSIGNIAS AND NUMBERS. HOPE TO HAVE SOME ILLUSTRATIONS FOR YOU IN THE JUNE 'AM.

A TYPICAL LUBRICATION CHART FOR A 6X6 TRUCK SHOWING TREND IN AUTOMOTIVE LUBRICATION

SERIAL Nos. 9670001-9670998 U. S. ARMY Nos. W417678 to W418655; W001310 to W001331 CONTRACT No. W-398-QM-8270



GENERAL LUBRICATION SCHEDULE

Ref. No.	Description	Type	No. of Fittings	Capacity	Lubricant	Grade		Mileage	Remarks
						Summer	Winter		
1.	Acid (Bifluorid)	Plug	3	6 piz. oz.	Gas Oil	S.A.E. 140	5000	Check oil level every 1000 miles and add as required.	
2.	Winch Chucks	Zerk	3	5 piz. oz.	Fibre Grease	S.A.E. 90	10000		
3.	Winch Drum Spindles	Zerk	3	5 piz. oz.	Fibre Grease	No. 2	1000	Check every 2000 miles and add as required.	
4.	Fan Hub	Zerk	1	5 piz. oz.	Fibre Grease	No. 2	1000		
5.	Winch Gear Case	Plug	1	3 1/2 Pts.	Gear Oil	S.A.E. 140	5000	Check daily and keep between 2 1/4 and 4 1/4 on gauge.	
6.	Slip Joints	Zerk	10	2 drops	Engine Oil	S.A.E. 90	5000		
7.	Slip Joints	Zerk	5	2 drops	Engine Oil	S.A.E. 140	5000	Check each month. Fill to level. Do not use substitute fluid.	
8.	Engine Crankcase	Filler	1	16 qts.	Engine Oil	S.A.E. 90	500		
9.	Shock Absorber Body	Plug	2	1/2 oz.	Fluid #1404	No. 2	1000	Wipe only a small quantity of grease on cam.	
10.	Tractionster Adapter	Cup	1	1/2 oz.	Fibre Grease	S.A.E. 90	1000		
11.	Shock Absorber Link	Other	1	2 drops	Petrolatum	S.A.E. 20	5000	Inspect every 2500 miles.	
12.	Brake Camshafts	Zerk	4	4 oz.	Fibre Grease	No. 2	1000		
13.	Drag Link	Zerk	2	2 oz.	Fibre Grease	No. 2	1000	Do not fail to inspect and lubricate this joint.	
14.	Wheel Bearings	Zerk	2	3 lbs.	Fibre Grease	No. 2	5000		
15.	Front Axle Univ. Joint	Plug	2	2 lbs.	Fibre Grease	No. 2	1000	Change oil with each crankcase change.	
16.	King Pin	Zerk	2	2 oz.	Fibre Grease	No. 2	1000		
17.	Tie Rod	Zerk	2	3 Pints	Water	S.A.E. 20	500	Turn down grease cups alkidity from time to time. Under extreme conditions lubricate oftener. Do not use grease.	
18.	Air Cleaner	Cup	2	1 oz.	Pump Grease	S.A.E. 140	100		
19.	Water Pump Housing	Zerk	1	1/2 oz.	Fibre Grease	No. 2	1000	Under extreme conditions lubricate oftener. Do not use grease.	
20.	Water Pump	Zerk	1	1/2 oz.	Fibre Grease	No. 2	1000		
21.	Ball Support	Zerk	1	1/2 oz.	Fibre Grease	No. 2	1000		

Ref. No.	Description	Type	No. of Fittings	Capacity	Lubricant	Grade		Mileage	Remarks
						Summer	Winter		
22.	Clutch Release Shaft	Zerk	2	1 oz.	Fibre Grease	No. 2	1000	Check level every 1000 miles and add as needed.	
23.	Brake Valve	Zerk	5	2 oz.	Fibre Grease	No. 2	1000		
24.	Operating Levers	Plug	1	5 pints	Gear Oil	S.A.E. 140	5000	Do not fail to lubricate.	
25.	Transfer Case	Plug	1	5 pints	Gear Oil	S.A.E. 140	5000		
26.	Front Drive Shaft	Zerk	5	2 oz.	Fibre Grease	No. 2	1000	Check level every 1000 miles and add as required.	
27.	Hand Brake Shaft	Zerk	5	2 oz.	Fibre Grease	No. 2	1000		
28.	Rear Axle Rocker Beam	Plug	1	24 piz.	Engine Oil	S.A.E. 90	5000	Check level every 1000 miles and add as required.	
29.	Transmission	Plug	1	24 piz.	Engine Oil	S.A.E. 140	5000		
30.	Oil Filters	Other	2	5 drops	Engine Oil	S.A.E. 90	5000	Renew cartridge when oil becomes dirty.	
31.	Generator	Other	2	5 drops	Engine Oil	S.A.E. 90	5000		
32.	Accelerator Shaft	Other	2	2 drops	Engine Oil	S.A.E. 90	1000		
33.	Throttle Rod	Other	2	2 drops	Engine Oil	S.A.E. 90	1000		

TABLE I (P. & C. FORM) REVISED 4/11/40

Automotive Greases:		Concentrated Lubricants, Fibre Type	
Grade	Penetration, A.S.T.M. (Unworked)	No. 3 (Milsim)	No. 1 (Goff)
Grade	Penetration, A.S.T.M. (Unworked)	No. 3 (Milsim)	No. 1 (Goff)
Soap Content, % Total	19-250	240-340	340-440
Temp. of Soap (Max.)	6-14	15-4	15-4
Melting Point, F. (A.S.T.M. (Min.))	Soda (I)	Soda (I)	Soda (I)
Corrosion, A.S.T.M.	1	1	1
Free Sulfur, Acid or Alkali, % Mfr.	NI	NI	NI
Mineral Oil Content, % Mfr.	0.4	0.4	0.4
Foreign Matter, % Mfr.	120	120	120
(1) Sodium or Sodium and Aluminum.	0.1	0.1	0.1





EASY AS

ABC.

ORDINARY FIRES -- CLASS A

Yep, it's easy to Always Be Careful if you know what you're doing. I remember the first fire I came across in the Army. One of those southwest gales whipping off the Chesapeake knocked a branch from a tree onto an electric line outside the barracks, sending it down in a sparkle of blue flame and smoke. I picked up a fire bucket and doused as much of the line as I could see. The wire kept right on crackling and I got a shock that almost knocked my shoes off. Since then I've Always Been Careful and remembered that water and electricity do not mix — water acts as a conductor and carries the charge from the electrical equipment to you.

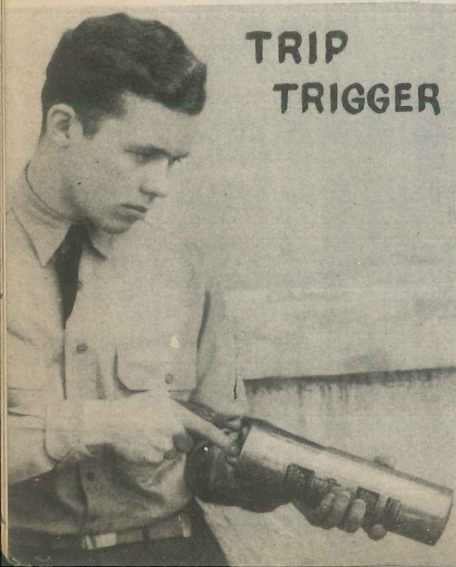
From that day I've found that there is as much difference between one fire and another as there is between a home run and a bunt. I've picked up a lot of dope on fire fighting that has come in mighty useful to me and I've learned that there's a darn sight more to putting a fire out than using the nearest bucket of water. In fact, there are lots of fires where using water is almost as bad as trying to douse it with gasoline. Fires are lots fun to go to but good things to keep away from.

Before trying to extinguish a fire it is a good idea to see what kind of a fire it is. About the commonest fire is what they call Class A; that is, fires in ordinary materials such as wood, paper, cloth and rubbish. For fires of this type you need something that will quench or cool, so the best thing to use is water, or extinguishing solutions having a large proportion of water. A soda acid extinguisher, which contains a solution of sodium bicarbonate and water and a small bottle of acid is just the thing. You have to turn the extinguisher over to use it. This dumps the acid into the soda solution, making a chemical reaction which expels the solution through the nozzle. A small soda acid extinguisher holds about 2-1/2 gallons, and you can shoot the solution about 30 feet. If you want a shock use this type of extinguisher on electrical fires, but if you're sensible you'll keep it away from them. These extinguishers have to be recharged annually and will freeze at temperatures below 40°F.

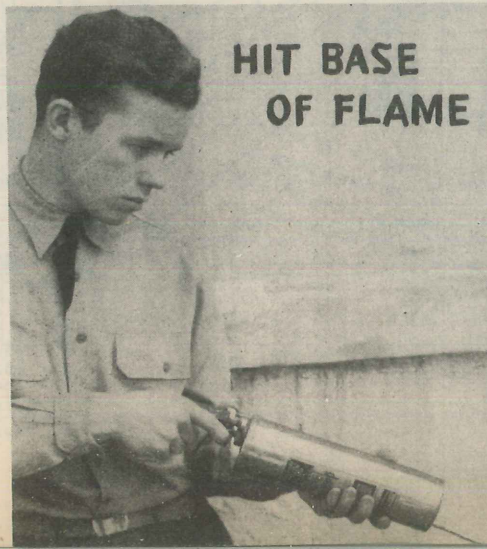
INFLAMMABLE LIQUIDS — CLASS B

The next type of fire, Class B, is that in inflammable liquids like oil,

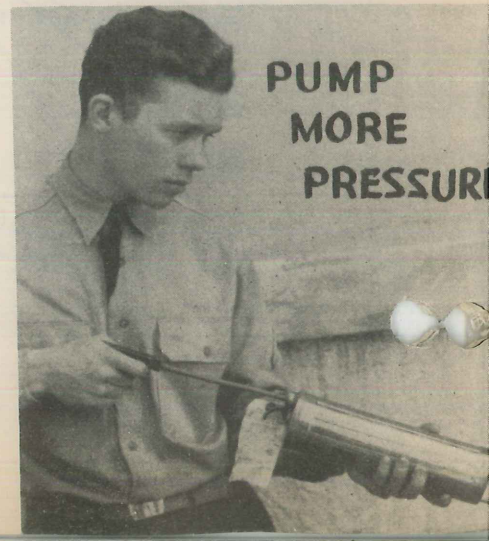
**TRIP
TRIGGER**



**HIT BASE
OF FLAME**

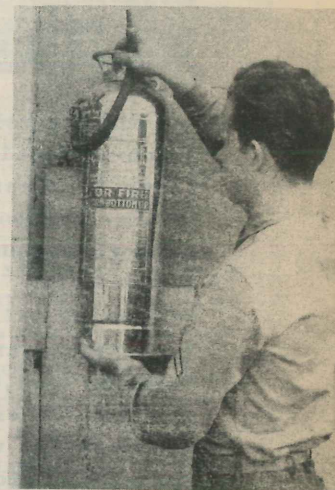


**PUMP
MORE
PRESSURE**





← **WRONG!** hose should be gripped firmly before soda acid extinguisher is removed from hanger. Picture below shows **RIGHT** way. ↓

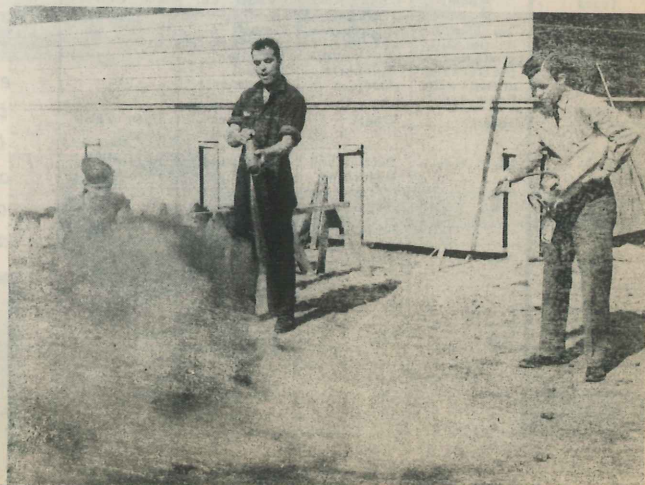


← This illustration shows proper way to use a one gallon carbon tetrachloride extinguisher. Grip hose firmly, point at base of flame and turn black handle which releases fluid under one hundred pounds pressure as shown on the gauge.

grease, paint, varnish and lacquer. Water is worse than useless on this type fire because it spreads the flaming liquid. What you want is something with a blanketing or smothering effect. A foam extinguisher is IT. These have two cylindrical containers, one holding a foaming ingredient and a solution of sodium bicarbonate, and the other holding a solution of aluminum sulphate. When you turn this extinguisher over to operate it, the two solutions mix to form a heavy foam. In the small units you get about 20 gallons which can be shot to a distance of 30 feet or more.

To use this type, shoot the stream just above the liquid against the inside wall of the container in which the fire is burning. If you cannot reach the fire in this way, stand back and let the foam fall directly on the flaming liquid. Ex-

After taking container down, invert as shown and aim at base of the flames as you see the soldiers doing in the two pictures below. Three different types of extinguishers are shown.



tinguishers of this type can be used for Class A, as well as fires in inflammable liquids. Don't use it on electrical fires or in motor vehicles because it contains water which conducts electricity. Like the soda acid extinguishers, they have to be recharged annually and kept above a temperature of minus 40°F.

ELECTRICAL FIRES — CLASS C

Fires in electrical equipment require a non-conducting extinguisher. The best thing is a carbon dioxide extinguisher because carbon dioxide will not burn nor support combustion and doesn't conduct electricity. When the gas is compressed within the extinguisher, most of it turns to a liquid and builds up a pressure of from 750 to 1,000 pounds per square inch, so treat the extinguisher carefully. When you open the valve of the extinguisher, the carbon dioxide shoots out so rapidly that the expanding gases have a cooling effect and the discharge looks like a jet of steam. Actually, the stream has a temperature of about 109°F. below zero. Extinguishers of this type are not good on ordinary Class A fires but they are excellent for Class B fires (inflammable liquids) and electrical fires. The cylinder should be weighed about every six months to see that it is not leaking. Ten percent loss in weight indicates that it needs recharging. This gas will not freeze.

MOTOR VEHICLE FIRES — CLASS D

The last type of fire is what they call Class D, fires in motor vehicles, and

for this you want to use a carbon tetrachloride extinguisher. The extinguishers are light and compact and since they are sealed they do not evaporate or deteriorate under normal conditions and they won't freeze above minus 50°F. You can get 150 gallons of extinguishing vapor from one quart of liquid.

DRY POWDER EXTINGUISHER

There is one kind of extinguisher that you probably won't come across very often. This is dry powder tied up in little packages which you throw into the fire. They can be used on any type of fire, including electrical equipment because the sodium bicarbonate compound they contain is a non-conductor.

SOME TIPS

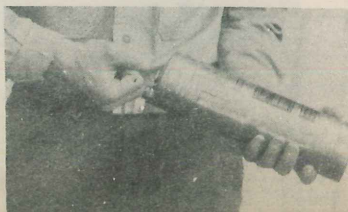
I have also picked up some tips on fire fighting which might be useful; for example, be careful in directing the extinguisher on burning liquids because you may splatter liquid out of the container and start other fires. This article is only a brief summary, but your local fire department officials are in a position to give you more detailed, invaluable information.

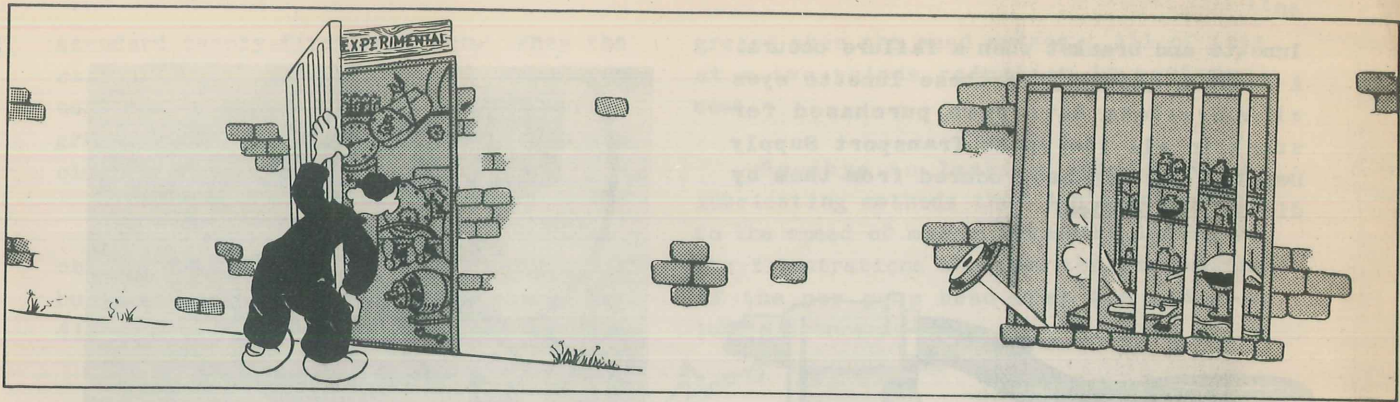
Using the chart shown here as a quick check and reference will pay plenty of dividends. But don't wait until the fire starts before reading what's in it. Fire's a wonderful friend, but a terrible enemy — keep on the right side of it.

FIRE EXTINGUISHER CHART

Types		Foam	Soda-Acid	Vapor. Lq.	Car. Dioxide
Chemical (Obtain Charges from Manufacturer)		Sol. of Aluminum Sulphate and Bicarbonate of Soda with Foam Agent	Bicarbonate of Soda Solution and Sulphuric Acid	Carbon Tetrachloride with Important Components	Carbon Dioxide
Operating Method		Invert	Invert	Pump, or Open Valve	Open Valve
Extinguishing Effect		Blanketing	Cooling and Quenching	Blanketing	Blanketing
Protection from Freezing Required		Yes	Yes	No	No
Use on Class "A" Fires	Wood, Rubbish, Textiles, etc.	Yes	Yes	No—but has some value on small fires	No—but has some value on small fires
Class "B" Fires	Oils, Greases, Paints	Yes	No	Yes Blanketing	Yes
Class "C" Fires	Live Electrical Equipment	No	No	Yes	Yes

Picture at right shows use of carbon dioxide extinguisher on a gasoline engine. Note that this vapor is aimed above the engine. View below shows carbon tetrachloride extinguisher which is operated by turning handle and then pumping fluid at base of flame. This type has no trigger and no compressed air chamber.





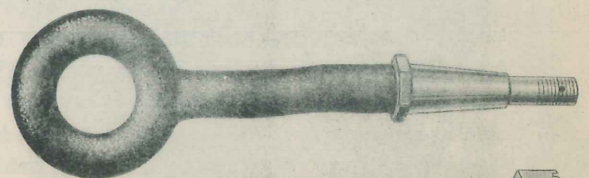
The shelter uses a standard storage tent, less flies, which fits over the framework of light gauge, square section nickel steel. The framework has socket type fittings at the corners and joints and is demountable. It weighs approximately 285 pounds and measures 245" x 204" with 62" side walls and 156" ridge. Removable uprights can be used at each end during bad weather.

Here's some more light on a covered subject -- the new field maintenance shelters mentioned on page 329 of the March 'AM. The picture practically tells the whole story -- but not quite. The first pilot model took an awful beating from Old Man Blizzard, but held up until it was carrying 3,000 pounds of snow and leaning against 5,000 pounds of wind. Then it collapsed, and so would you. Another model is now being tested.

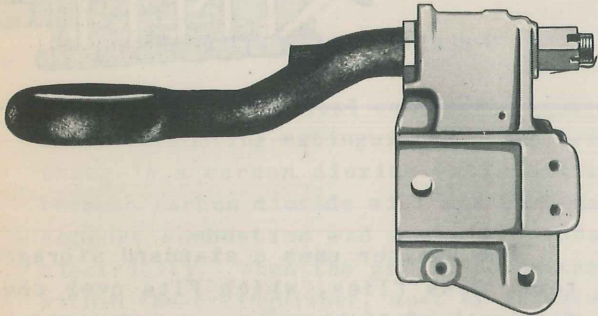


A NEW LUNETTE

The latest 1-ton 2-wheel trailers are being improved by increasing the size and strength of the lunette eye shank from 1-1/8 to 1-3/4 inches and changing it from straight to tapered. Trailers now in operation should be serviced with the new



lunette and bracket when a failure occurs. A limited quantity of these lunette eyes with brackets have been purchased for stock in all the Motor Transport Supply Depots, and can be procured from them by direct requisition.



SAFETY CHAINS have been developed for these trailers which will hold the tractor-trailer combinations together if the



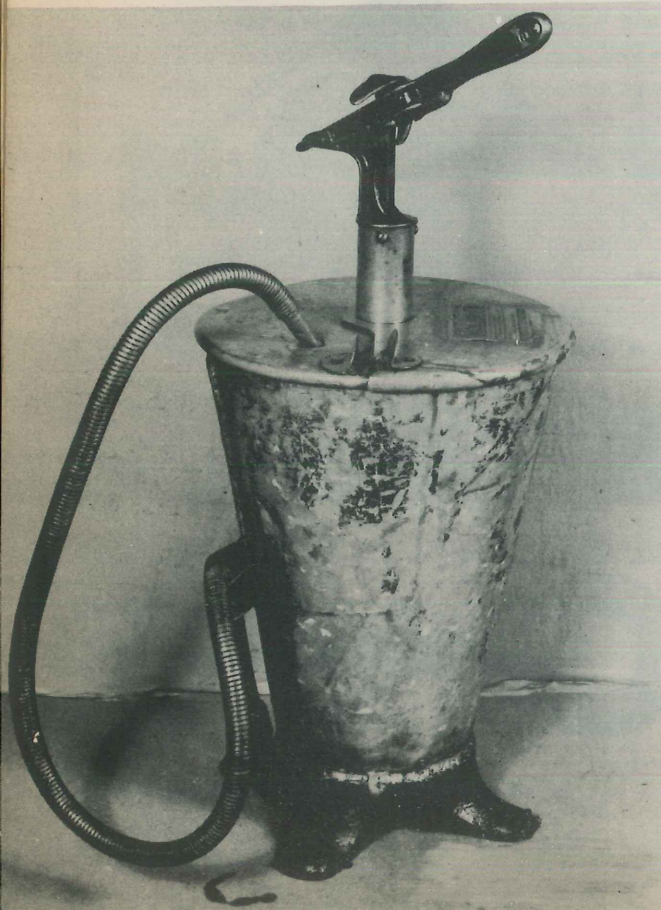
lunette eye breaks. All trailers now being purchased will be supplied with these chains and "eye" bolts, but we can't give you the dope on how to get them for trailers now in use until next month — if it comes through by then.

SOME NEW PUMPS

... FOR HYPOID

Stationary hypoid pumps that are now in use have served their purpose reasonably well. However, modern engines whose finely machined parts have a horror of even tiny particles of dirt or foreign matter call for tidier greasing methods.

This demand is being met by a new hypoid pump head that fits right on any



standard twenty-five pound can. When the can is empty, you just put the same pump head on a new can, instead of transferring grease from the shipping container to the old type dispenser.

You will soon be using this light, compact hand pumped lube head which can build up a ton and a half of pressure, yet dispense a teaspoonful of wheel bearing

grease when the need arises. All of this at a two-thirds reduction in equipment cost.

Goodbye to leaking, dirty, bulky lubricating methods that don't measure up to the speed of modern transport standards. The illustrations show you the improvement of the new pump head over the old hand lube dispensers.

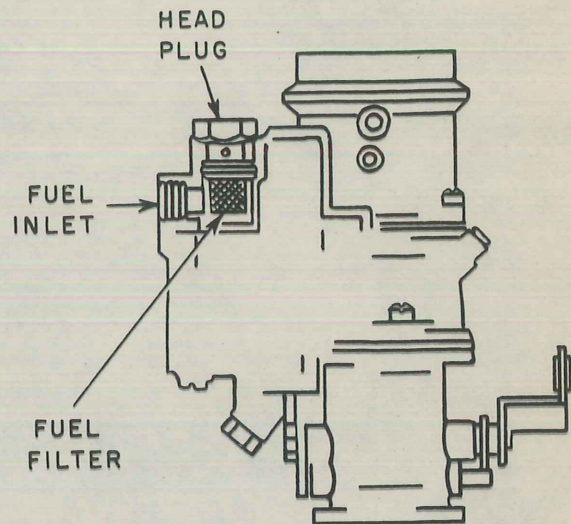


CARBURETOR FILTERS

All GMC 6x6 units (models CCKWX-353) are equipped with a special fuel filter mounted on the frame side rail between the fuel tank and fuel pump. This filter is constructed so that it will remove any dirt particles large enough to hinder carburetor operation and assures clean fuel at all times. This filter eliminates the need for the small filter which is in the carburetor and was designed to remove very small particles. When this small filter is stopped up, the vehicle cannot operate because gasoline cannot reach the engine. For this reason, trucks built after serial number CCKWX-353-7000 have the small filter removed at time of assembly.

All trucks are equipped with two filters, therefore, the carburetor filter on all chassis under numbers CCKWX-353-7000 may be removed and discarded.

The filter screws to the inside of the large hexagon plug in the top of the



SECTIONAL VIEW OF CARBURETOR SHOWING FILTER TO BE REMOVED

carburetor where the fuel line enters the carburetor. Remove this plug — unscrew filter and replace plug (see sketch). Make sure that the fiber gasket under the plug is in good condition when the plug is replaced.

CANVAS CAMOUFLAGE

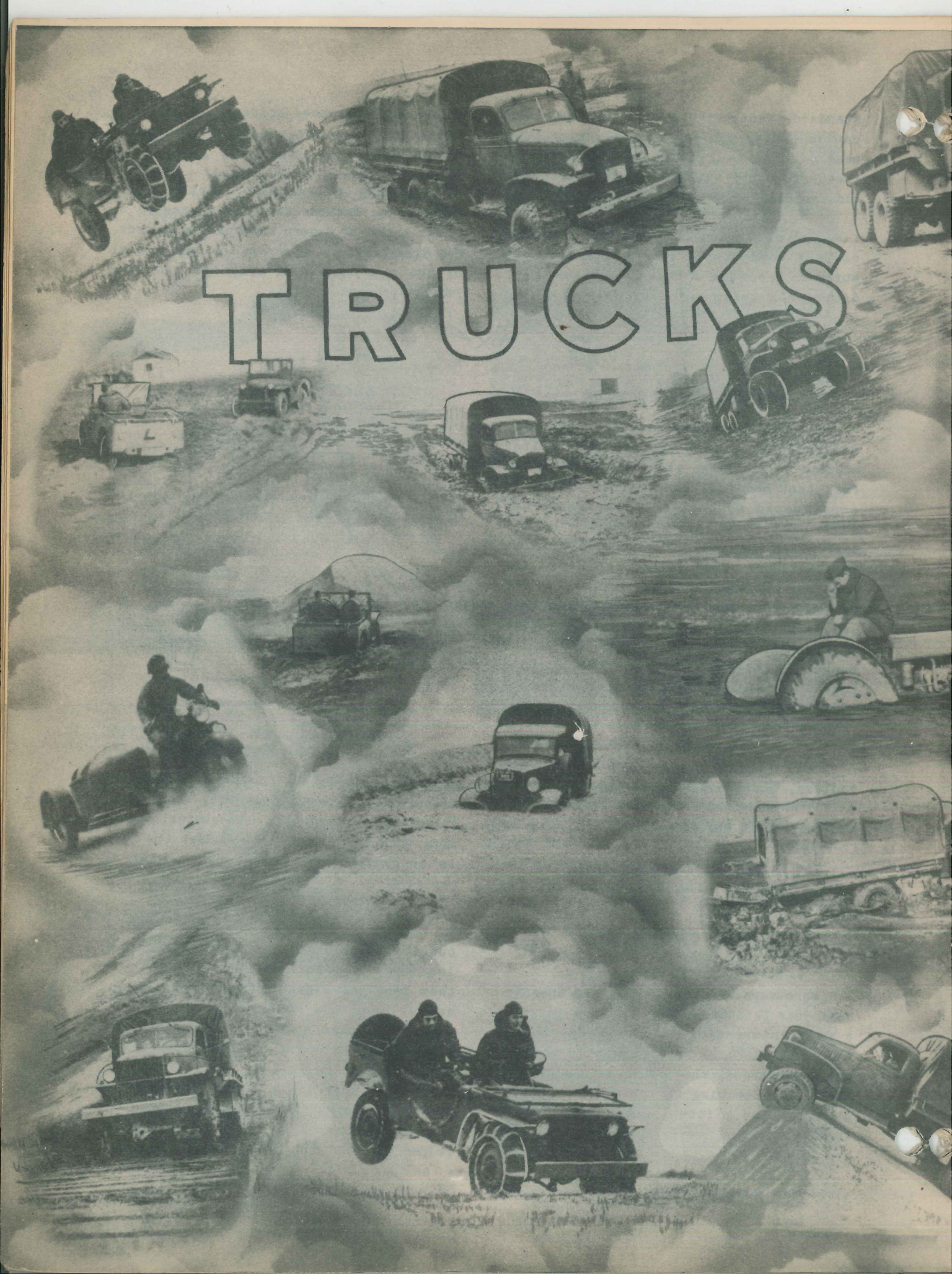
By EDWIN P. ARNOLD, 2nd Lt., Q.M.C.

Maneuvers for this year start shortly. Last year friends in the Air Corps revealed a very interesting point. They claimed that while trucks were parked in foliage and under trees, they could be observed by the sun reflecting on the slanting windshields, and glistening back up through the branches and leaves to the pilot.

To overcome this slight but important give away we have taken salvage canvas and

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

TRUCKS



TODAY





Generator test



There was a time, and not so long ago either, when it was enough to know that a generator would charge ten or fifteen amperes at about 2000 R.P.M., but, believe me, that isn't true on today's vehicles.

WISE GUYS AREN'T WISE

The modern voltage and current regulated generator does a swell job of keeping the battery in good condition if the electrical system is properly adjusted to start with. Regulation must be extremely accurate, and don't let any "wise guy" tell you different. Too many of that breed are going around tinkering with voltage and current regulators with a bent screwdriver. There are enough of them, in fact, to keep a good number of capable men busy repairing the damage done to armatures, fields, and batteries.

An efficient generator must put out enough current to keep the battery well charged -- no more, no less. Adjusting these high speed generators correctly requires no guesswork or obsolete equipment. You have to know your stuff and have the correct tools.

ADJUSTING AND TESTING

must be done according to the conditions under which the vehicle is used. One manufacturer suggests that generators be tested at a speed of 100 R.P.M. for each mile of car speed. This means that a vehicle driven at 45 miles an hour should have the generator tested up to 4500 R.P.M.

If all generators had the same characteristics, adjusting them would be simple, but maximum output speeds are reached anywhere from 750 R.P.M. to 5500 R.P.M., or thereabouts.

Generators should be tested up to their top speed for two reasons; one mechanical; the other, electrical.

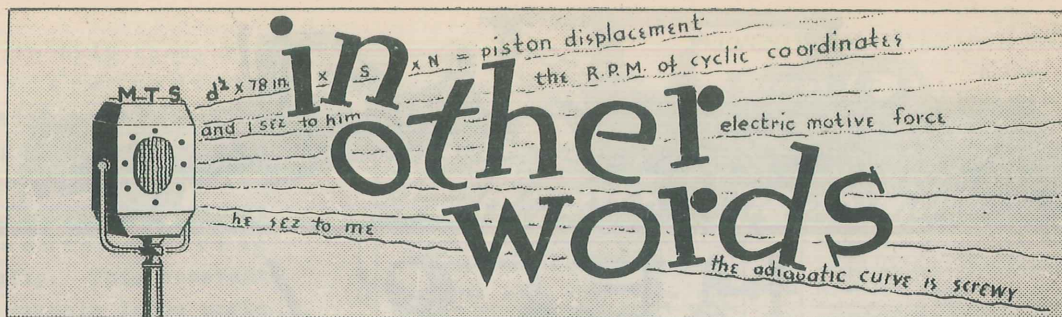
It is well to know that the generator will not overcharge at high speeds. It is also important to know that commutator bars or armature leads are not going to pop out; that bearings are tight enough to prevent whip, and that commutators are true enough to keep the brushes steady at high speed.

GENERATOR TEST BENCHES

Few of the old style generator test benches have a top speed of more than 3000 R.P.M. Trying to test a new high speed generator on an old style bench is like taking an Indianapolis racer and roadtesting it at thirty miles an hour, and then trying to put it up to one hundred miles per hour on Memorial Day. Nearly all the old style benches use a direct drive between the electric motor and the generator under test. This was all right for the old timers, because their limits were about in line with the characteristics of alternating current electric motors as far as speed and power requirements were concerned.

BELT AND PULLEY DRIVE

They work fair at about 2000 R.P.M., but above or below that the regulation was poor and the power factor tapered off fast. After plenty of experimenting, test bench manufacturers discovered that no type of electric motor was suitable for testing both low-speed high-output generators and the high speed types by direct drive. They decided that an all around generator test bench could only be designed by using a belt drive between motor and generator. The belt drive allowed the motor to be operated at an efficient speed and, by means of various size pulleys, to run the generator at the rate of speed indicated by its type. The heavy-duty, slow-speed generator can be stepped down to a speed less than the driving motor, and the high speed job can be operated far beyond the speed range of the electric motor.



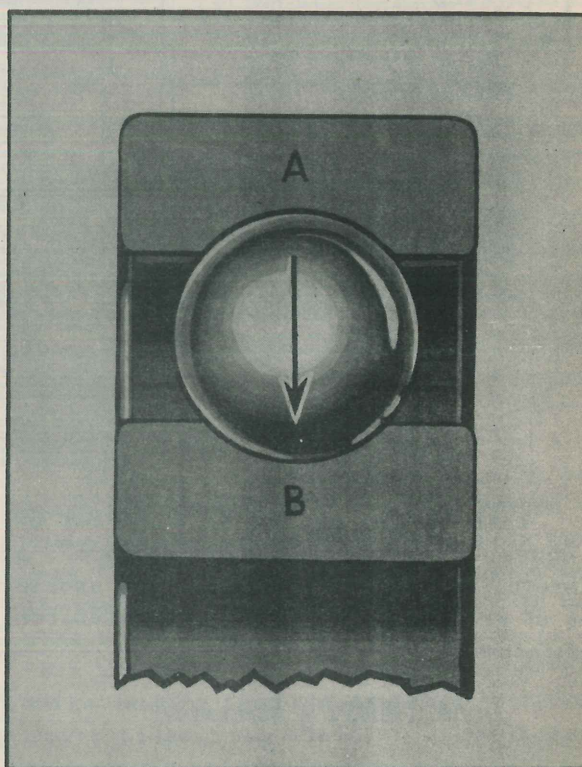
BABBITT.— WEBSTER SAYS: *Babbitt metal, a soft white antifriction metal of varying composition as of 4 parts of copper, 8 of antimony, and 24 or 96 of tin.*

In other words, babbitt metal is an alloy or combination of metals mainly copper and tin. When this alloy rubs against other surfaces it does not heat up as much as other metals do, so we say it is an alloy with low friction properties. Babbitt metal is used in some bearings. The metal may be cast directly in the hole surrounding the journal or it may be cast in a separate bronze or steel backing and inserted in the bearing housing. Some-time graphite is cast with the metals to give the babbitt a self lubricating quality.

BEARING.— WEBSTER SAYS: *A part in which a journal, gudgeon, pivot, pin, or the like, turns or revolves.*

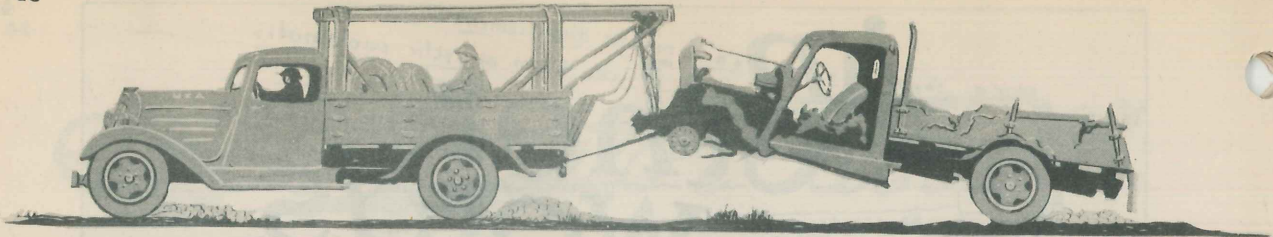
In other words, bearings are vital parts in every motor vehicle. Their chief use, as the name suggests, is to support moving loads. They must do this with a minimum of friction generated heat. Friction is caused by the rubbing together of two surfaces and bearings offer the least resistance to motion and suffer less wear than other surfaces. The bearing then has a triple purpose: 1. to support a moving load without getting too hot; 2. not to wear out rapidly; and 3. not to hinder or slow the motion too much.

For example, take the ball bearing. The rolling ball has the smallest contact with another surface. In the illustration the load meets the rolling ball at A and it is transferred through the ball to B, where the load is transferred to a point on the race. In this way friction is reduced to its lowest point. Of course, not all bearings are ball bearings. There are many other kinds, such as: sliding rolling face bearings, thrust bearings, etc.



DO YOU HONK DURING UNAVOIDABLE DELAYS? — — —

If you do, you're an impatient driver . . . A fellow who can't wait . . . A guy who tries to pass another car on a hill, who tries to beat the red light, who always has to be the leader of the pack. Do you forget that it's better to lose a second than to lose a life?



**PREVENTIVE MAINTENANCE WORK SHEET
GASOLINE TRUCK AND TRACTOR "B" SERVICE**

OWNER _____
 ADDRESS _____ MILEAGE _____ R. A. No. _____
 (✓) O. K. (X) ADJUSTMENTS MADE (O) REPAIRS NEEDED

- | | |
|--|---|
| <p>1. Clean and adjust spark plugs. (See Instruction Manual for Gap Spacing.) Report On: (Visual Inspection) Ignition wires—</p> <p>2. DISTRIBUTOR: (Includes: clean and adjust Points—Adjust Timing—Synchronize—Clean Rotor and Cap—Oil Dist. Wick Grease—Clean Distributor Cap—Remove Oil from Points—Clean when open—Clean Distributor—Clean Ignition Wires—Adjust Points when closed—Points. (Should be zero.) Shaft—Cam—Automatic Advance—Primary Wiring—Ignition Switch—)</p> <p>3. COIL: Test Coil—Amperes draw should be 1½ at approximately 15 m. p. h. Spark Gap—mm. Amperes draw—Amperes draw—Amperes.</p> <p>4. FUEL PUMP: Clean filter bowl and strainers—Test pump output—Pressure—Should not exceed 3½ to 4 pounds—see manual for details—Clean fuel pump—6 psi—minimum—Test the connections—Remove and clean the case gasket—</p> <p>5. STARTER: Includes: Tighten cable connections at starter—Oil Starter—Report on: Commutator—Brushes—Drive—Switch—</p> <p>6. GENERATOR: Includes: Adjusting charging rate if necessary—Adjusting fan belt—Tighten Ammeter connections—Oil generator—Report on: Commutator—Brushes—Ammeter charging rate—Amps, Cut-out Relay—</p> <p>7. CRANKCASE VENTILATOR: Includes: Remove, Clean and install—</p> <p>8. OILING SYSTEM: Includes: Clean or replace Oil Filter—Tighten oil line connections— Report on: Oil pressure—lb. Oil level in oil pan—</p> <p>9. COOLING SYSTEM: Includes: Tighten Water Pump gland nut or grease pump—Tighten hose connections—Tighten radiator hold down bolts—Tighten radiator tie rods—Report on: Radiator—Hose—Anti-Freeze—Pump Packing—Pump shaft—Fan—Fan Belts—</p> <p>10. VALVES: Tighten head bolts—Adjust valves according to Maintenance Manual—Includes: Report on Springs—Clean overhead oil passages—Clean dipsticks—</p> <p>11. CARBURETOR: Includes: Clean air cleaner—Check Choke adjustment—Tighten Manifold—Carburetor Flange—Exhaust pipe flange—Governor flange—Oil Choke and Throttle linkage—Adjust Carburetor with Vacuum Gauge.</p> <p>12. WHEELS: Includes: Remove and install wheels—Replace Grease retainers if necessary—Oil Brake linkage—Adjust wheel bearings—Tighten axle shaft or flange nuts—Tighten Wheel nuts—Report on: Linking—Drums—Wheel Cylinder Boots—Leaks—Shoes—Linkage—Inflate Tires, R.F. _____ lbs.; R.R. _____ lbs.; L.F. _____ lbs.; L.R. _____ lbs.</p> | <p>13. BRAKES: Includes: Adjust—Tighten all fluid line connections—Filling of Master Cylinder if necessary—Report on: Cables—Rods—Cross Shafts—Hose—Lines—Booster Cylinder—Booster alignment—Booster operating valve—Booster Boot—Master Cylinder boot—Master Cylinder—</p> <p>14. DRIVE SHAFTS: Tighten differential carrier bolts—Tighten cover bolts—Tighten U bolts—Report on: Lubricant level—Springs arched—Flat—Spring alignment—Shackle Bolts—Auxiliary spring pads—Gaskets—Leaks—Radius Rods—</p> <p>15. FRONT AXLE: Includes: Tighten and adjust all steering connections—Align front wheels—Tighten U Bolts—Report on: Caster—Knuccle Bushings—Axle 1 Beam—Springs arched—Flat—Spring Alignment—Shackle Bolts—Adjust pedal—Adjust hand brake—Replace pull back spring if necessary—Report on: Lubricant level—Leaks—</p> <p>16. UNIVERSAL JOINTS: Includes: Tighten Joints and Flanges—Report on: Condition—Hanger Brg.—</p> <p>17. LUBRICATION: Lubricate chassis according to lubrication chart—
 (a) Oil and inspect all brake linkage, pedal controls, choke, carburetor linkage, door hinges and locks. Oil Booster both ends—(2 oz. each end of cold test oil. Four test at least 30 degrees below zero.)</p> <p>18. BATTERY: Includes: Test gravity 1-2-3—should be 1275. Clean cells—Tighten connections—Tighten generator straps—Tighten battery case—Report on: Open Voltage—volts. Battery Box—Cables—Connections—</p> <p>19. LIGHTING SYSTEM: Report on: Horn operation—Wiring—Headlamps—Dim Lamps—Side Lamps—Dash Lamp—Tail Lamps—Stop Lamp—Spot Lamp—Lighting Switch—Clearance Lamps—Road Lamps—Stop Lamp switch—Trailer Wiring Plug—Rectifier—Dimmer switch—</p> <p>20. FENDERS: Report on: Condition of Fenders—Running Boards—Apron—Top Covering—General condition—</p> <p>21. BODY: Includes: Clean glass—Remove all grease and finger marks—Clean inside of cab with air—Report on: Glass—Door Locks—Handles—Window regulators—Wiper Blade—Hose—Gas Gauge—Air Gauge—Body pads—Springs—</p> <p>22. MISCELLANEOUS: Includes: Road test vehicle. Report on: Clutch, Good—Grease—Slips—Brakes—Operation of transmission, Noisy—Quiet—Gear Shift—Speedometer—Differential, Noisy—Quiet—Muffler—Heat Indicator—</p> |
|--|---|

This is the second in a series of guides on preventive maintenance. A careful study of the entire group should be of great help in planning maintenance procedure.

WHY INSPECT A GENERATOR?

It's sad but true that too few people check up on generators until the ammeter shows there is trouble. Then it is often too late to make economical repairs. Generators have inspection covers which can be easily removed to check the condition of the brushes and the commutator.

Preventive maintenance calls for timely inspection of these important items. Brushes should always be replaced before they are completely worn away; failure to do this can cause short circuits and ruin commutators by allowing brush holders to cut them. The coils may overheat and burn out from operation after charging has ceased. You must admit it's good sense to replace brushes at about 45¢ a set, instead of complete generators which cost from \$15.00 to \$50.00 apiece, depending upon their size and type.

WHY CLEAN A CRANKCASE VENTILATOR?

Gasoline and water vapors accumulate in the crankcase under all operating conditions and unless expelled, they will form acids which damage the fine metal surfaces of bearings, cylinder walls and pistons. Therefore, crankcase ventilators must be cleaned periodically to assure a constant change of air.

WHY CHECK THE DRIVE LINE?

The U-joints and propeller shaft of the vehicle are often entirely neglected as long as they operate satisfactorily.

Again in this case, repairs are usually expensive. In addition to regular inspection, tighten all universal joint flanges and inspect the center bearing carefully. This constant check reveals loose parts which lead to excessive vibration, and eventual failures in the power transmission system. Such failures, in addition to being dangerous, often mean costly damage to the other parts of the vehicle.

WHY REMOVE WHEELS?

It is recommended that wheels be removed periodically for complete internal inspection. If signs of grease leaks are found, replace the seals, or the brakes will soon fail. Inspect brake linings and drums instead of waiting for the lining to wear out. If you do wait, you can expect plenty of trouble from scored drums and burned up shoes. However, safety alone should justify proper brake inspection to any conscientious maintenance man.

Tire mileage can be increased considerably by rotating the wheel and tire assemblies around the truck in conjunction with each inspection requiring wheel removal. This procedure is explained in detail on Page 290 of THE 'AM for February 1941.

WHY ARBITRARY PART REPLACEMENT?

Distributor points open and close between 150 million and 200 million times on the average truck in the course of 15,000 miles of operation. They become worn and pitted if left in service too long.

The condenser, for example, also

OWNER	PREVENTIVE MAINTENANCE WORK SHEET		
ADDRESS	MILEAGE	R. A. No.	
(√) O. K.	(X) ADJUSTMENTS MADE	(O) REPAIRS NEEDED	
1. MOTOR: Includes: Grind Valves—Replace valve springs—Clean overhead mechanism thoroughly—Clean rib-plates and block—Replace spark plugs. (See Instruction Manual for Gap Spacing)—Adjust valves (See Instruction Manual for clearance).		12. BRAKES: Includes: Adjust—Tighten all fluid line connections—Fill master cylinder—Report on: Cables—Rods—Cross shafts—Hose—Lines—Booster Cylinder—Booster Alignment—Quitting valve—Booster Boot—Master cylinder.	
2. OILING SYSTEM, PAN and OIL COOLER: Includes: Remove, clean and install Oil Pan—Oil Pump—Lines—Cooler—Outside oil lines—Tighten all motor support bolts—Clean or replace filter—Report on: Oil pressure—lbs.—Leaks—		13. FRONT AXLE: Includes: Tighten and adjust all steering connections—Align front wheels—Tighten U Bolts—Report on: Caster—Camber—Knuckle Bushings—Tie rod ends—Axle I Beam—Springs arched—Flat—Spring alignment—Broken Leaves—Shackle Bolts—	
3. DISTRIBUTOR: Includes: Replace Condenser; Replace points—(See Instruction Manual for Point Spacing)—Replace rotor—Synchronize—Oil Distributor wick—Grease can—Fill grease cup—Replace high tension wires—Report on: Voltage at points when open—Vts. (Should be same as battery). Voltage at points when closed—Vts. (Should be zero). Shaft—Cam—Automatic advance—Primary wiring—Ignition switch—		14. TRANSMISSION & CLUTCH: Includes: Adjust pedal—Adjust hand brake—Remove clutch inspection plate and inspect springs, etc. Includes adjustment on shim type plate (Lipe). Drain transmission lubricant, flush and refill—Report on: Leaks—	
4. FUEL PUMP: Overhaul or install reconditioned fuel pump using new gasket—Test pump outlet pressure—(See Instruction Manual for Pump Pressures)—Test pump vacuum pressure—(6 inches minimum).		15. UNIVERSAL JOINTS: Includes: Tighten all U joints to shafts—Report on Condition—Hanger bearing—	
5. STARTER: Includes: Tighten cable connections at starter—Clean commutator—Oil starter—Report on: Commutator—Brushes—Drive—Switch—		16. LUBRICATION: Lubricate chassis according to lubrication chart— (a) Oil and inspect pedal controls, choke, carburetor linkage, door hinges and locks. Oil Body—Four test	
6. GENERATOR: Includes: Replace brushes—Clean commutator—Turn down commutator—Clean and tighten primary connections.		17. BATTERY: Includes: Test gravity 1—2—3—should be 1.275. Fill with distilled water—Clean—Tighten Connections—Replace ground strap—Tighten battery in case—Report on: Open voltage—volts. Battery Box—General Condition.	
7. CRANKCASE VENTILATOR: Includes: Remove, Clean and install—		18. LIGHTING SYSTEM: Includes: Tighten all lighting connections—Replace bulbs as necessary—Report on: Horn operation—Dinner switch—Road lamps—Clearance lamps or reflectors—Trailer wiring plug—Receptacle—Stop lamp switch.	
8. COIL: Test Coil—Ampere draw should be 140 amps. at 15 m. p. h. at 1000 r.p.m. engine speed.		19. FENDERS, ETC.: Includes: Tightening of fenders—Running boards—Aprons—Bumper—Report on: General condition—	
9. COOLING SYSTEM: Includes: Replace or Grease Pump—Tighten hose connections—Replace hose if necessary—Tighten radiator hold down bolts—Tie rods—Flush radiator—Replace belts—Report on: Anti-Freeze—Pump shaft—Leaks—		20. BODY: Includes: Clean glass—Remove all grease and finger marks—Clean inside of cab with air—Tighten rear cab bolts—Body bolts—Change wiper blade and hose if necessary—Report on: Glass—Door locks—Handles—Window regulators—Gas gauge—Air gauge—Cab mountings—Springs.	
10. CARBURETOR: Includes: Remove, Clean, replace Jets and install—Clean air cleaner—Tighten manifold nuts—Governor flange—Exhaust pipe flange—Oil Choke and throttle linkage—Adjust with vacuum gauge.		21. MISCELLANEOUS: Includes: Road test vehicle—Report on: Clutch—Good—Grabs—Slips—Brakes—Transmission, Noisy—Quiet—Gear Shift—Speedometer—Differential—Noisy—Quiet—Muffler—Heat Indicator.	
11. WHEELS: Includes: Remove and install wheels—Replace Grease retainers—Oil brake linkage—Adjust wheel bearing—Tighten axle shaft or flange nuts—Tighten wheel nuts—Report on: Lining—Drums—Wheel cylinder boots—Leaks—Shoes—Inflate tires, R.F. lbs.; R.R. lbs.; L.F. lbs.; L.R. lbs.		22.	

Why arbitrary Parts Replacements?

Why exchange the Fuel Filters?

Why overhaul a carburetor?

charges and discharges several million times in 15,000 miles, and due to accumulation of oil and moisture, has a tendency to discharge a small amount of current prior to the normal firing period. Therefore, it does not deliver the complete hot spark that is required for maximum efficiency.

Likewise, the rotor carries this hot spark and discharges it the same number of times to the electrodes. These in turn pass the spark on to the individual plugs through the high tension wires. In due time the extreme heat which accompanies this action swells the insulation on the wires leading from the distributor to the spark plugs. In addition, they become thoroughly saturated with oil, grit and moisture which destroy their protective covering. Current leaks at the point of least resistance, and the current which reaches the spark plug is not strong enough for correct ignition.

(turn to page 52)



FACTS FROM FORMULAS

WE'LL BEAT YOU TO THE DRAW BY ADMITTING THAT THESE TWO PAGES LOOK LIKE A LOT OF DRY-AS-DUST FIGURES THAT SOMEBODY THOUGHT UP IN THE MIDDLE OF A NIGHTMARE. BUT AS THE OLD FOLKS SAY, 'LOOKS IS DECEIVIN', AND YOU'LL SOON DISCOVER THAT THERE'S A LOT OF REAL DOPE THAT IS ONE HUNDRED PERCENT USABLE IN EVERY MAINTENANCE MAN'S DAILY WORK.

IF YOU'VE BEEN GETTING THE 'AM SINCE LAST MAY, YOU'LL REMEMBER AN ARTICLE CALLED RUBBER CYLINDERS, ON PAGE 24. IT GAVE ALL TENSION SPECIFICATIONS AVAILABLE AT THAT TIME AND IN ADDITION HAS A TABLE FOR CONVERTING WRENCH READINGS INTO POUND FEET. YOU WILL WANT TO REFER BACK TO IT IF YOUR WRENCH IS NOT MARKED IN POUND FEET.

VEHICLE SPEED

$$\text{MPH} = \frac{\text{RPM} \times \text{R}}{168 \times \text{FGR}}$$

MPH = Miles Per Hour
RPM = Engine Revolutions per Minute
R = Rolling Radius
FGR = Final Gear Ratio
168 = A constant comprising the conversion of rolling radius in inches to wheel circumference in feet; wheel revolutions per minute to wheel revolutions per hour; feet per hour to miles per hour

ENGINE SPEED

$$\text{RPM} = \frac{\text{MPH} \times 168 \times \text{FGR}}{\text{R}}$$

See above for abbreviations

GRADE ABILITY

$$\text{GA} = \frac{\text{TE}}{\text{GVW}} \text{ minus } .012$$

GA = Grade Ability
TE = Tractive Effort
GVW = Gross Vehicle Weight
.012 = 12 lb. per 1000 lb., rolling resistance on hard-surfaced roads

TRACTIVE EFFORT

$$\text{TE} = \frac{\text{lb. in. Torque} \times \text{FGR} \times .90}{\text{R}}$$

R = Rolling Radius in Inches
FGR = Final Gear Ratio
lb. in. Torque = 12 times Torque in lb. ft.
.90 = Efficiency for all rear axles except worm, then .85

DRAWBAR PULL

$$\text{DP} = \frac{.90 \times \text{lb. in. Torque} \times \text{FGR}}{\text{R}} \text{ minus } .012 \text{ GVW}$$

DP = Drawbar Pull
R = Rolling Radius in Inches
FGR = Final Gear Ratio
GVW = Gross Vehicle Weight
.90 = Efficiency for all rear axles except worm, then .85
lb. in. Torque = 12 times Torque in lb. ft.
.012 = 12 lb. per 1000 lb. Rolling Resistance

MAXIMUM NET ENGINE TORQUE

Torque in lb. ft. = $.70 \times \text{cu. in. Piston Displacement}$. (This is approximate and should be used only when actual torque is not known.)
.70 = Average figure based on analysis of a number of torque curves

TORQUE AT PEAK HORSEPOWER

$$\text{Torque at Peak HP} = \frac{\text{HP} \times 5252}{\text{RPM}}$$

5252 = Constant resulting from the conversion of torque and RPM into horsepower
HP = Maximum net horsepower (See Horsepower below)
Peak HP = Maximum useful horsepower

MAXIMUM NET TORQUE

$$\text{Max. Net Torque} = \frac{\text{Torque at Peak HP} \times 5}{4}$$

(This is approximate and should be used only when actual net torque is not known.)

5 and 4 = Figures based on an analysis of a number of torque curves

PISTON DISPLACEMENT

$$\text{Piston Displacement in cu. in.} = \text{B} \times \text{B} \times \text{S} \times .7854 \times \text{No. of Cylinders}$$

B = Bore
S = Stroke
.7854 = Constant comprising the conversion of the area of a square to the area of a circle of the same dimensions

FINAL GEAR RATIO

$$\text{FGR} = \frac{\text{R} \times \text{GVW} \times (\text{GA} + .012)}{\text{lb. in. Torque} \times .90}$$

GA = Grade Ability
GVW = Gross Vehicle Weight
lb. in. Torque = 12 × lb. ft. Torque
R = Rolling Radius in Inches
.90 = Efficiency for all rear axles except worm, then .85
.012 = Rolling resistance on hard-surfaced roads

AMA HORSEPOWER

(For License Purposes Only)

$$\text{AMA HP} = \frac{\text{B} \times \text{B} \times \text{No. of Cyl.}}{2.5}$$

B = Cylinder Bore
2.5 = Constant based on average engine in 1908

HORSEPOWER

Maximum Net Horsepower (maximum gross horsepower less power consumed by engine accessories) is the only horsepower that should be used in transportation engineering formulas, and can be determined only by using a dynamometer

TIRE CAPACITIES

Tire and Rim Association Sizes, Loads and Pressures

Tire Size	No. of Plies	Lb. Pressure for Max. Load	Maximum Load Capacity (Lb.)
6.00-17	6	50	1250
6.20-20	6	50	1400
6.50-17	6	50	1500
6.50-18	6	50	1575
6.50-20	6	50	1700
7.00-17	8	55	1725
7.00-18	8	55	1800
7.00-20	8	55	1950
7.50-15	8	55	1825
7.50-17	8	55	2000
7.50-18	8	55	2100
7.50-20	8	55	2250
7.50-24	8	55	2250
8.25-15	10	60	2275
8.25-18	10	60	2550
8.25-20	10	60	2750
8.25-22	10	60	2950
8.25-24	10	60	3125
9.00-15	10	65	2875
9.00-18	10	65	3225
9.00-20	10	65	3450
9.00-22	10	65	3675
9.00-24	10	65	3925
10.00-15	12	70	3375
10.00-18	12	70	3775
10.00-20	12	70	4000
10.00-22	12	70	4275
10.00-24	12	70	4550
11.00-18	12	70	4200
11.00-20	12	70	4500
11.00-22	12	70	4750
11.00-24	12	70	5000
12.00-18	14	80	5125
12.00-20	14	80	5475
12.00-22	14	80	5800
12.00-24	14	80	6150
13.00-20	16	85	6750
13.00-24	16	85	7575
14.00-20	16	90	8200
14.00-24	16	90	9150

EXTRA PLY AND DUAL-MARKED TIRES

6.00-18/30x5	8	70	1700
6.00-24/34x5	8	70	1950
6.50-20/32x6	8	65	1950
7.00-20/32x6	10	70	2250
7.00-24/36x6	10	70	2575
7.50-15	10	75	2225
7.50-18/32x7	10	75	2500
7.50-20/34x7	10	75	2700
7.50-24/38x7	10	75	3100
8.25-15	12	75	2600
8.25-18	12	75	2925
8.25-20	12	75	3150
8.25-24	12	75	3600
9.00-15	12	80	3200
9.00-18	12	80	3600
9.00-20/36x8	12	80	3850
9.00-20/40x8	12	80	4375

SPECIFICATIONS

FOR USE WITH TENSION WRENCHES

LISTED BY ENGINE MAKES, COVERING CYLINDER HEADS, MAIN AND CONNECTING ROD BEARINGS

Engine Make	Cylinder Head	Main Bearings	Connecting Rod Bearings	Engine Make	Cylinder Head	Main Bearings	Connecting Rod Bearings	Engine Make	Cylinder Head	Main Bearings	Connecting Rod Bearings
AUTOCAR A, UA, B, UB, C10, C10T, U10, 10T, C20, C20T, U20, U20T All Others	50-55 80-85	60-70 130-140	55-60 85-90	GEN. MOTORS (Cont.) 239, 257, 286 331, 400, 450 479, 529, 707 228, 236, 248, 256, 270 278, 308 361, 426, 451, 477 Diesel: 3-71, 4-71, 6-71 (Note 3)	60-70 65-75 100-120 60 70 65-75 65-75	90-100 90-100 100-120 70-80 75 85 90-100	65-75 90-100 100-120 40 50 65 75 90-100	REO S140, S209 S228, S3-268, S3L268, S5-309, GC228, GC245, GC288, GC310,	60-61 83 1/2-100	87-98 67-75	49-52 1/2 71-75
CHEVROLET (1938) (Note 1) (1939) (1940-41)	67 78 75-80	106 100-110	..... ..... 40-45	HERCULES IX NX ZX OO QX	42 60 42 60 60	77 77 77 105 60	42 52 25 53 39	STUDEBAKER J5, J10, J15, J15M, J15B, K5, K10, K15, K15M, K15B, L5 (Note 7) Coupe Express, Standard (1941) Heavy Duty (1941)	83 50 83	92 92	54 54 54
CONTINENTAL A6244 (Note 4) B6371, B6405 (Note 6) E600, E601, E602, E603, (Note 5) F4124, F4140, F4162 (Note 4) F6170, F6199, F6209, F6218, F6226 (Note 4)	70-75 70-75	100-110 100-110	35-40 100-110	JX WX YX, RX RXL	60 60 60 74	**70 **70 **105 **123	56 105 105 175	WAUKESHA 6BL, 6BM, 6BK, 6BKH, 6MS, 6ML, 6MK, 6MZ, 6MZR, 6-110 6SR, 6SRL, 6SRK, 6SRLR, 6SRKR, 6-125 6RB, 6RBR 6GAL, 6GAK, 6D140, 6DA140 6D100, 6DA100 130GS, 130GL, 130HS, 130HL 140GS, 140GK, 140HS, 140HK 145GS, 145GK, 145HS, 145HK 6WAL, 6WAK, 6WALH, 6WAKH	65-80	65-80	45-55 65-80 90-110 90-110 45-55 65-80 90-110 100-120 100-120 90-110 90-110 90-110 100-120 100-120 100-120
M6271, M6290, M6330, M6253 (Note 6) 20R, 21R, 22R (Note 5)	70-75	100-110 100-110	70-75	HX DIX DOO DJX DWX DRX DHX DFX	60 60 60 158 158 158 158 158 11 11 11 11	**70 **70 **105 **123 175 193 **210 *77 *95 *77 *95 175 175 *193 *210 260	56 53 56 140 140 140 158 168 263 263 263 56 67 93 93	WHITE All Models	83 50 83	92 92	54 54 54
DODGE (1938-40)	Nuts 53-57 1/2 Plain head cap screws 65-70 Cupped head cap screws 67 1/2-72 1/2 80-85	75-80	45-50	INTERN'L HARVESTER GRD Engines	158 158 158 158 158 158 11 11 11 11	**210 *77 *95 *77 *95 175 175 *193 *210 260	140 140 140 158 168 263 263 263 56 67 93 93	WILLYS 48, 440 (1939-41) Note 7	75-80	65-70	50-55
GEN. MOTORS (1936-40) 216, 223, 230	60-70	75-85	40-50	LYCOMING AFE, AEF ASE, BF	52 1/2-56 49-52 1/2	..... .....	..... .....	WHITE All Models	83 50 83	92 92	54 54 54
FORD (1938-40) (Note 2)	85 h.p. alumi- num-40 60 h.p. alumi- num-30 All iron-50 85 h.p. cast iron-50			LYCOMING AFE, AEF ASE, BF	52 1/2-56 49-52 1/2	..... .....	..... .....	WHITE All Models	83 50 83	92 92	54 54 54
(1941)				LYCOMING AFE, AEF ASE, BF	52 1/2-56 49-52 1/2	..... .....	..... .....	WHITE All Models	83 50 83	92 92	54 54 54

ABBREVIATIONS:
 * Center and Rear. ** Front and Intermediate.
 *** Connecting Rod 1/2 in. † Babbitt.
 Note 1-Rocker Arm Support 29 (1938), 27 1/2 (1939).
 Note 2-Spark Plug Tensions:
 3/8"-18, cast iron head-34-38

18mm. cast iron head-28-32
 18mm. aluminum head-24-28
 14mm. cast iron head-24-28
 14mm. aluminum head-20-24
 Note 3-Injector crab nut 11.
 Note 4-All 18 mm. plugs 33-42.

Note 5-Manifold 100-110.
 Note 6-Manifold 70-75.
 Note 7-Sparkplug.
 Iron head-28-30.
 Aluminum head-26-28.

1940 ACCIDENT DATA

DIRECTION OF TRAVEL

	Persons Killed	Per Cent	Persons Injured	Per Cent
Going straight	29,200	83.4	992,660	75.2
Turning right	450	1.3	30,360	2.3
Turning left	1,330	3.8	91,080	6.9
Backing	320	.9	21,120	1.6
Skidding	2,070	5.9	59,400	4.5
Car parked or standing still	910	2.6	62,400	4.7
Slowing down or stopping	520	1.5	59,400	4.5
Miscellaneous	200	.6	3,940	.3
Total	35,000	100.0	1,320,000	100.0

ROAD LOCATION OF ACCIDENTS

	Persons Killed	Per Cent	Persons Injured	Per Cent
Between intersections	10,150	29.0	477,160	36.1
Rural intersections	1,300	3.7	33,000	2.5
Highway	9,930	28.4	163,680	12.4
Driveway	390	1.1	22,440	1.7
Curve	3,320	9.5	50,160	3.8
Street intersections	7,140	20.4	548,520	41.6
Railroad crossing	2,070	5.9	7,880	.6
Bridge	700	2.0	17,160	1.3
Total	35,000	100.0	1,320,000	100.0

WEATHER CONDITIONS PREVAILING

	Fatal Accidents	Per Cent	Non-Fatal Accidents	Per Cent
Clear	26,940	85.8	748,520	82.6
Fog	660	2.1	13,590	1.5
Rain	3,050	9.7	111,470	12.3
Snow	750	2.4	32,620	3.6
Total	31,400	100.0	906,200	100.0

DAYS OF OCCURRENCE OF ACCIDENTS-1940

	Persons Killed	Per Cent	Persons Injured	Per Cent
Sunday	7,140	20.4	237,600	18.0
Monday	4,480	12.8	171,600	13.0
Tuesday	3,780	10.8	153,120	11.6
Wednesday	4,060	11.6	163,680	12.4
Thursday	4,130	11.8	170,280	12.9
Friday	4,690	13.4	182,160	13.8
Saturday	6,720	19.2	241,560	18.3
Total	35,000	100.0	1,320,000	100.0

ROAD CONDITIONS PREVAILING

	Fatal Accidents	Per Cent	Non-Fatal Accidents	Per Cent
Dry	24,400	77.7	643,400	71.0
Wet	4,840	15.4	161,300	17.8
Snowy	810	2.6	30,810	3.4
Icy	1,350	4.3	70,690	7.8
Total	31,400	100.0	906,200	100.0



GIVE AXLES A BREAK

NOT A

BUST

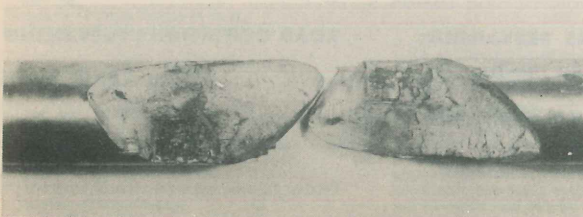
If a broken axle shaft is replaced without discovering the basic cause of the failure, further trouble will occur.

The axle shaft is the connecting link between the final drive and the wheels. It transfers the engine torque to the wheels and through them drives the vehicle.

Practically all truck axles are full floating. The inner end of the axle shaft extends into the differential side gear and the outer end is usually rigidly attached to the wheel hub by a flange and studs.

When the bearings and the axle housing are correctly adjusted and aligned, the only stress to which the full floating axle is subjected is that of twisting or torsion. This stress occurs in one direction when the vehicle is driven forward and in the opposite direction when the vehicle is in reverse. The axle shaft is designed to withstand this type of stress only.

You couldn't expect a cardboard container to hold melted lead because it's not built for the job. So why expect an axle shaft to take stresses it wasn't intended or built to take?



FATIGUE FAILURES

Most axle shaft failures are commonly termed "fatigue failures". Steel is composed of crystals very tightly cemented together. When steel is bent or twisted there is a tendency to crush some of these crystals together, pull them apart, or make them slide over one another. If the stress on the steel is very light, the crystals are not moved and when the stress is removed the steel resumes its original shape. However, if the deforming force is heavy enough, the crystals are disarranged and if the stress is repeatedly applied, a microscopic crack will develop at the point where the crystals have been disturbed. At the start, this crack is so small that it can hardly be detected even under the microscope, but as the stress is repeatedly applied, it becomes deeper wider and longer until at last a definite fracture occurs.

Obviously as the fatigue cracks deepen, even progressively lighter loads will carry them still deeper. Consequently, it very often happens that the final fracture occurs under practically no load at all.

AVOID BENDING STRESSES

We said before that a full floating axle was designed to carry only torsional stresses. However, if the axle housing or housing sleeve is bent, due to

excessive loading, an accident, or a severe impact from traveling rapidly over a very rough road, then the axle shaft is also subjected to bending stresses.

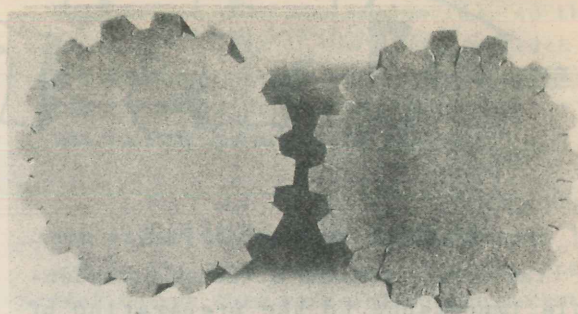
FAILURE DUE TO BENDING

Failure in an axle shaft due to bending can occur at almost any point, but the majority of such failures are at the flange end. The broken surfaces are usually flat and show parallel lines of failure over a considerable section of the shaft. To avoid bending failure, keep the wheel bearings correctly adjusted, avoid overloading, keep your speed down on very rough roads, and periodically check the axle housing for alignment. If you replace a broken shaft and the new shaft has a tendency to bind when it is put into place, it's strong evidence of a bent housing.

TORSION FAILURES

Torsion failures seldom occur, except as a result of fatigue — a repeated application of high torsional loads. These failures may be caused by moving excessive loads in low or reverse, by a grabbing clutch, by abusive use of the clutch, (catching a vehicle on a grade after it has started to roll backward) or the erratic use of the propeller shaft brake to stop the vehicle.

Torsion failures usually occur at the splined end of the shaft near the side gear, or in the body of the shaft. Fatigue cracks generally start at the base of the



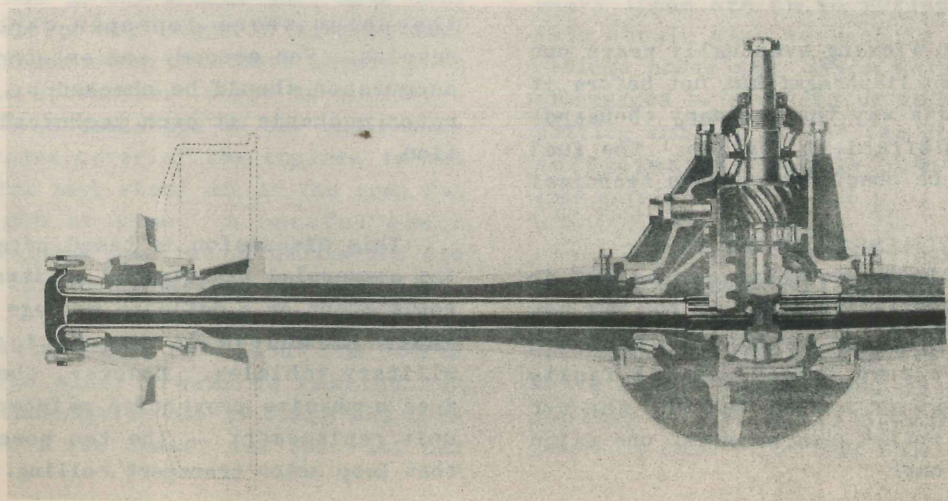
spline and progress toward the center of the shaft body. The final fracture is usually cone shaped.

The illustrations used here are typical, and are given only as a guide in diagnosing axle shaft failures. The type of fracture, however, should not be entirely depended upon in analyzing such failures. A careful check of every possible contributing factor should be made to discover all other evidences before a definite decision is made.

PREVENTING FAILURE

In preventing axle shaft failure, the most important precaution is to avoid the first overstress that starts the deadly chain of fatigue. Once the metal has been weakened, it's only a matter of time until complete failure occurs.

Don't forget that you can reduce shaft life to one eighth of its normal expectancy merely by doubling the stress it is designed to carry safely.



== This 'n That ==

GERMAN FUEL SUPPLY

The German command attaches considerable importance to the preparation of speedy transportation of fuel from the deep rear to the front lines, over railroads and highways. Freight trains in many cases attain a speed of 65 miles per hour. Mechanical equipment is installed at railroad stations to speed up the loading and unloading of war supplies. The German war plan, which provides for the building of 4,295 miles of super-highways, 25 yards wide, has been largely completed.

Transportation of fuel over dirt roads is carefully considered. Kulemeyer carts

are used for this purpose. A specially adapted 20 ton railroad tank car is reloaded to such a cart, which is then drawn by a 100 h.p. motor at a speed of 9 to 12 miles per hour, for delivery directly to front-line units. Six to eight such loads insure the supply for an entire division.

The day of long fuel trains is past, and this apparently is realized by Allied attack and bombing aircraft. Transportation of fuel in 3 to 5 ton containers and tank trucks is now practiced.

A net of well concealed small filling stations has been established on roads. More than 60,000 such stations have been



"HELP" CONTINUED

The total replacement cost of all of these items averages only about .00016 cents per mile on a 15,000 mile replacement basis. Obviously it is ridiculous to believe that there is any saving in attempting further operation with inefficient parts.

WHY EXCHANGE THE FUEL PUMP?

Constant flexing eventually wears out the fuel pump diaphragm; but not before it has pumped its way through many thousands of miles of efficient service. The fuel pump should be checked with each technical inspection.

A new diaphragm alone can be put in and give satisfactory service, but why not go all the way and avoid the grief and expense of a road failure due to faulty valve springs or spring seats? Why not replace the entire pump whenever one major part goes wrong?

WHY OVERHAUL THE CARBURETOR?

The old fable about the drop of water which eventually wore away the big stone gives us a moral which applies to the flow of gallon after gallon of gasoline through the tiny jets of a carburetor. The high velocity at which the fuel flows through the jets wears away the metal to the point where improper carburetion results. For economy and smoothness, the carburetor should be checked by a carburetor mechanic at each technical inspection.

This discussion is based primarily on the commercial practice of arbitrary parts replacement on a definite mileage basis — which of course is impracticable for military vehicles. However, the article does emphasize preventive maintenance and unit replacement — the two power plants that keep motor transport rolling.

established. Field fuel supply centers are carefully camouflaged in forests (at Sedan, for instance).

Allied aviation, unable to wrest control of the air from the Germans, is incapable of destroying their system of fuel supply.

SMART VEHICLE STORAGE

THE 'AM, last February 1941, on page 302, gave you a tip on storing vehicles in the open so that the universal joints on front drive steering would't rust and cut the oil seals when the truck was operated.

Here's another tip along the same line taken from a letter we received recently about the rocker arms and overhead valve mechanism of an "I-head" motor. Apparently the trouble has been causing plenty of headaches in the field.

"The rocker arms of the engine in this truck had rusted so that they could hardly be moved. The lifters had rusted into the block at the guides so that it was necessary to drive them out, and the push rods were bent out of shape; the rocker arm bearings were completely imbedded with an abrasive that apparently was rust. I removed the oil filter elements myself, and found them to be in as bad shape as any I have ever seen; there also was considerable water in the bottom of the oil filter case.

"On all of the trucks that have been in service for any length of time I found one condition which I believe should have immediate attention: there is considerable rust accumulation on the under side of the valve cover of the engines in the trucks that have stood out in the open for any length of time. A careful check showed that the most recent deliveries did not have this accumulation.

".....issued an order that the covers on all the older trucks be removed and cleaned thoroughly; one of these had been run while I was there, and the rust had

been softened by the engine oil, so there is no doubt that if the truck had been run any distance at any rate of speed at all, the rust would have been carried to all the working parts of the engine.

"I feel sure that this condition would not exist if the engines of trucks left out in the open were run at least once a week to get them warm and to get a certain amount of oil washing in the valve cover."

This letter doesn't seem to need much comment — it tells the whole sad story in a few words.

SHIFTING FRONT AXLE

Present Maintenance Manuals and other instructions pertaining to use of front axle as a driving unit contain certain rules which should be followed. Proper use of the driving front axle can best be described under two types of operation, on-the-road and off-the-road service.

ON-THE-ROAD OPERATION

The nameplate fastened in the truck cabs reads: disengage front axle drive when operating on dry hard surfaced roads. This rule generally holds true because in most cases the pulling ability of the two rear axles is sufficient. However, if steep grades are encountered, or if the vehicle is called upon to help move an additional load, the front axle drive should be engaged in order to use the pulling ability of all three axles. If heavy loads are to be pulled, the front axle should also be used in getting the vehicle under way, after which it may be disengaged — provided of course that the pulling ability of the two rear axles is sufficient to handle the additional load safely.

OFF-THE-ROAD OPERATION

The foregoing applies when the vehicle is operating on ordinary roads, but in all off-the-road operations the front axle drive should be engaged, as the pulling ability of all three driving axles is generally needed for this type of work.

digest

C U R R E N T

"AUTOMOBILE DIGEST" April 1941

"Plan to Simplify Lubrication" — In trying to simplify the hodge-podge of lubrication requirements, the American Petroleum Institute has prepared a list of 22 lubricants that just about covers every need.

"Curing That Flat Spot" — There is nothing mysterious about a flat spot in acceleration if the engine fuel requirements are understood. This article tells you why it happens and what to do about it.

"Spray Pattern" — Simple patterns show how to obtain the best spray results.

"Good Surfacing" — You can't get a good surface unless you make it absolutely smooth after each operation. This article tells you how to go about it.

"Pull A Wheel" — Adjusting brakes without knowing their condition is like prescribing medicine for a sick man without studying the symptoms. Pull a wheel and do your brake job properly.

"COMMERCIAL CAR JOURNAL" April 1941

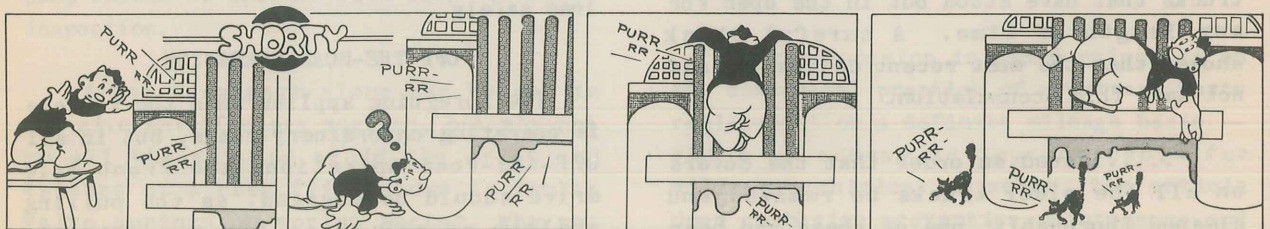
This issue is called the "Fleet Operator's Reference Manual". It contains a lot of invaluable stuff, some of which we are republishing in this month's 'AM. It's a handy issue to have around.

"FLEET OWNER" April 1941

"Marker and Clearance Lights" — This survey doesn't concern Army vehicles too much, but it covers very thoroughly the pros and cons of various types of vehicle markers.

"Better Oils and Clean Engines" — A general, not too technical, discussion on the constantly changing picture of automotive engine lubrication.

"Clutch Service" — "Out-of-service" time is as damaging to efficiency as enemy action. Clutches are too often taken for granted, but clutch maintenance is just as important as any other maintenance operation.



Comments

T E C H N I C A L M A G A Z I N E S

"Truck Tire Lock Rings" — Many serious injuries, and some fatalities have been caused by truck tire lockings blowing off and striking mechanics. Here is a good article telling how to handle them in order to keep out of trouble.

"MOTOR"
April 1941

"Keep It Looking New" — To the casual observer the outside of a truck tells the story about its driver. Don't allow your truck to let you down.

"MOTOR AGE"
April 1941

"Check List For Spring Tune-up" — An adequately illustrated article describing 24 separate operations and instructions necessary to put vehicles in first-class condition after the ravages of winter.

"MOTOR SERVICE"
April 1941

Spring tune-up seems to be in the air and Motor Service gives three or four complete articles on tune-up for different types of engines.

"Shop Kinks" — Some hints on bearing trouble; painting; leaks in Plymouth water pumps; soldering; holding nuts for starting.

"Spring Radiator Work" — It is just as important to get the radiator in shape for spring as it is to flush and tighten it for winter operation. A good article on the subject.

"Tune-up Manual" — The greater part of this issue is given to very complete details and invaluable hints on service and tune-up procedure for passenger cars.

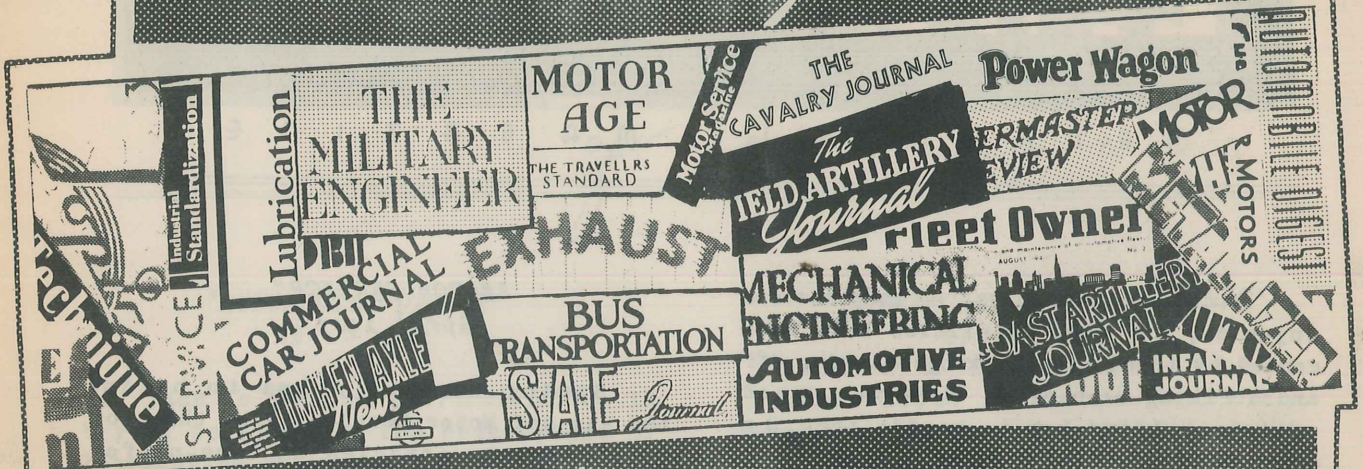


"YOU DON'T DRIVE MULES, BUT—

Remember the mule-driver who saw a speed limit sign for the first time and said, "Mules, we'll have to go across country, we can't travel that fast!"? Remember that the signs indicate the maximum safe speed, not that you've got to drive that fast. Keep well within the speed limit while driving. You'll get there just as soon and all in one piece.

MAY

Acknowledgments



The editors wish to thank the following publishers for their courtesy in allowing The 'AM to make use of articles and illustrations from their publications. There were many articles that could not be used, but it is hoped that those published here will stimulate interest in the source material.

"Snug And Trim", page 32, was illustrated with prints furnished by Bridgeport Fabrics, and suggested by "Snug And Trim", AUTOMOTIVE SERVICE, January 1941. Slocum Publishing Company, Inc., 2751 Jefferson Avenue, Detroit, Michigan. \$1.00 per year.

"Trucks Today", pages 42 and 43, was compiled in part with pictures lent THE 'AM by General Motors Folks.

"Generator Test", page 44, was revised from "Modern High Speed Generators", AUTOMOBILE DIGEST, February 1941. Automobile Digest Publishing Company, 22 E. 12th Street, Cincinnati, Ohio.

The material in the "Help" section was produced from data provided by the Research Department of General Motors Corporation.

"Facts From Formulas", page 48, was reproduced from COMMERCIAL CAR JOURNAL, April 1941. Commercial Car Journal, 100 E. 42nd Street, New York. \$3.00 per year.

"Give Axles A Break — Not A Bust", page 50, was based on maintenance material in TIMKEN AXLE NEWS, a house organ of the Timken-Detroit Axle Company.

The warning on the back cover was taken from "Watch Out For The Sodium Filled Exhaust Valve" in MOTOR SERVICE, March 1941. All safety cautions used in this issue were adapted from slogans issued weekly by the Virginia State Police.

Editorial, "Start The New Man Right", was suggested by bulletins from the Standard Oil Company, and the National Safety Council.

"The Numbers Game", page 30, was suggested by "Consider Your Parts Man", in MOTOR SERVICE, December 1940.

"German Fuel Supply", page 45, was taken from THE MILITARY REVIEW, March 1941, Command and General Staff School, Fort Leavenworth, Kansas. \$1.00 per year.

CARELESSNESS PUTS TWO STRIKES ON YOU!

Pending their issue as War Department Technical Manuals, the publications below can be obtained from The Editor, THE 'AM, Holabird Quartermaster Depot, Baltimore, Maryland, as follows:

T/M NUMBER	M.T.S. TEXT NO.		REMARKS
<u>BASIC MOTOR TRANSPORT SCHOOL TEXTS</u>			
*10-510 (10/1/40)	1	THE MOTOR VEHICLE- (Automotive Nomenclature - Terminology Military Motor Vehicles - Vehicle Units and Assemblies).	1/1/41
*10-570 (2/4/41)	2	THE INTERNAL COMBUSTION ENGINE- (Principles of Operation - Types - Parts and their Functions, including Engine Lubrication and Cooling).	1/1/41
*10-550 (12/27/40)	3	FUELS AND CARBURETION- (Fuels - Fuel Systems - Physics of Carburetion - Principles - Types of carburetion - Intake and Exhaust Systems - Superchargers and Governors.	8/31/40
*10-580 (1/29/41)	4	AUTOMOTIVE ELECTRICITY - Principles of Electricity and Magnetism - Storage Battery - Battery Ignition - Magneto Ignition - Starter and Generator - Lighting System - Horn - Electrical Accessories).	1/1/41
10-585	5	AUTOMOTIVE POWER TRANSMISSION UNITS - (Power Transmission - Clutches - Transmissions - Propeller Shafts and Universal Joints - Rear Axles).	1/1/41
10-560	6	CHASSIS, BODY AND TRAILER UNITS - Frames - Springs - Front Axles - Steering Gear - Wheel Alignment - Wheels, Rims and Tires).	2/15/41
*10-565 (3/8/41)	7	AUTOMOTIVE BRAKES- (Principles - Mechanical - Hydraulic - Air - Vacuum - Electric).	1/1/41
*10-540 (12/26/40)	10	LUBRICATION - (Principles and Practices).	9/30/40
*10-545 (12/30/40)	11	INSPECTION - (Command, Preventive and Technical).	9/30/40
10-590	12	HAND, MEASURING AND POWER TOOLS	2/1/41
10-530	13 #	TUNE-UP AND ADJUSTMENT - (Trouble Shooting).	To be revised.
10-525	15	ECHELON SYSTEM OF MAINTENANCE - (Organizational and Service Maintenance).	2/1/41
10-505	16	MILITARY MOTOR TRANSPORTATION - (Organization - Principles - Supply & Maintenance). Section on "Principles of Operation"	Being revised. 9/30/40
10-555	21	SHOP SCIENCE - Arithmetic - Algebra - Geometry - Physics - Mechanics - Blue Print Reading - Metallurgy). <i>REVISED</i>	To be published about 6/30/41
10-360	22 #	FIRE PREVENTION, SAFETY PRECAUTIONS, ACCIDENTS	To be published about 6/30/41
<u>SPECIAL MOTOR TRANSPORT SCHOOL TEXTS</u>			
10-575	8 #	DIESEL ENGINES AND FUELS - Principles of Operation - Types, including Semi-Diesel - Parts & their functions, including Lubrication and Cooling-Fuels & Fuel Systems).	To be published about 6/30/41
*10-515 (12/13/40)	9	THE MOTORCYCLE - (Nomenclature - Operations - Inspection - Maintenance - Driver Training) COURSE OF INSTRUCTION AND GUIDE IN MOTORCYCLE OPERATION (Supplement to Text No. 9)	Revised 9/30/40 Published 6/1/41
10-520	14 #	MAINTENANCE AND REPAIR - All Units and Assemblies of the Motor Vehicle)	To be revised
10-440	17	THE BLACKSMITH AND THE WELDER <i>REVISED</i>	To be published about 6/30/41
10-450	18	THE RADIATOR REPAIRER AND THE SHEET METAL WORKER	Being revised
10-445	19	THE MACHINIST <i>REVISED</i>	To be published about 6/30/41
10-455	20	THE BODY FINISHER - (Carpenter - Upholsterer - Painter).	Being revised
<u>SUPPLEMENTARY INSTRUCTIONAL MATERIAL</u>			
		MOTOR REPAIR SHOP MANUAL, OQMG	2/1/41
		MOTOR TRANSPORT SUPPLY, OQMG	3/25/41
		TENTATIVE GUIDE AND REFERENCE FOR QMC LIGHT MAINT. UNITS (MOTOR TRANSPORT) OQMG	1/1/41
		TABLES OF ORGANIZATION AND FUNCTIONAL CHARTS, MOTOR TRANSPORT SERVICE	3/15/41
		TROOP SCHOOL PROBLEMS, ARMY EXTENSION COURSE:-	1/1/41
		(1) Organization of a Truck Company, Triangular Division;	
		(2) Training and Operations, QMC Truck Company;	
		(3) Truck Transportation of Supplies	
		(4) Troop Movement by Truck.	

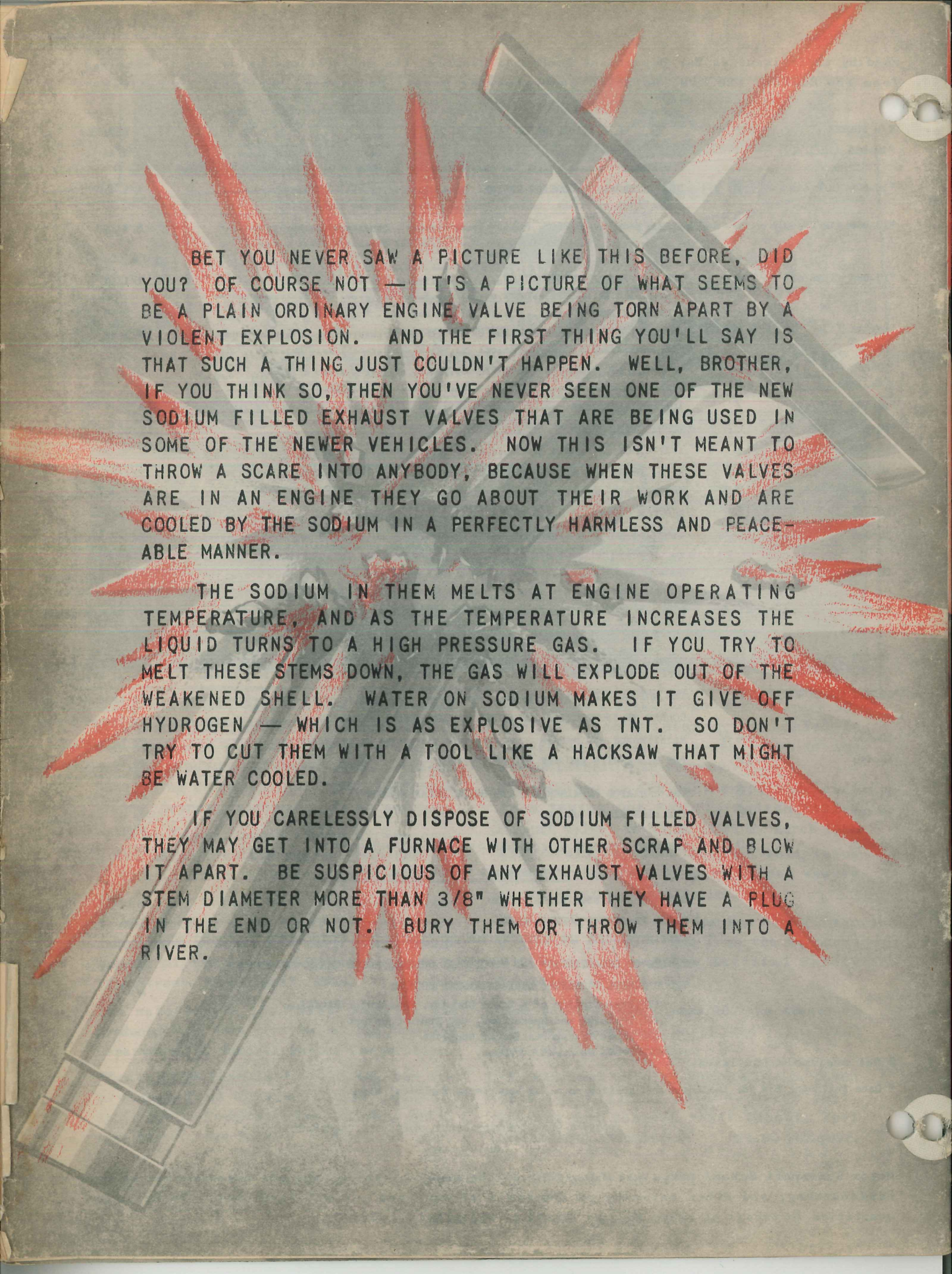
Not available for issue.

* Date following T/M No. indicates publication as a War Department Technical Manual.

Holabird Quartermaster Depot, Baltimore, Maryland

May 15, 1941

Motor Transport School texts are furnished on the basis of three sets per organization or per headquarters; and other material on the basis of one each per military unit. Requests for quantities in excess of these amounts should be explained in detail.

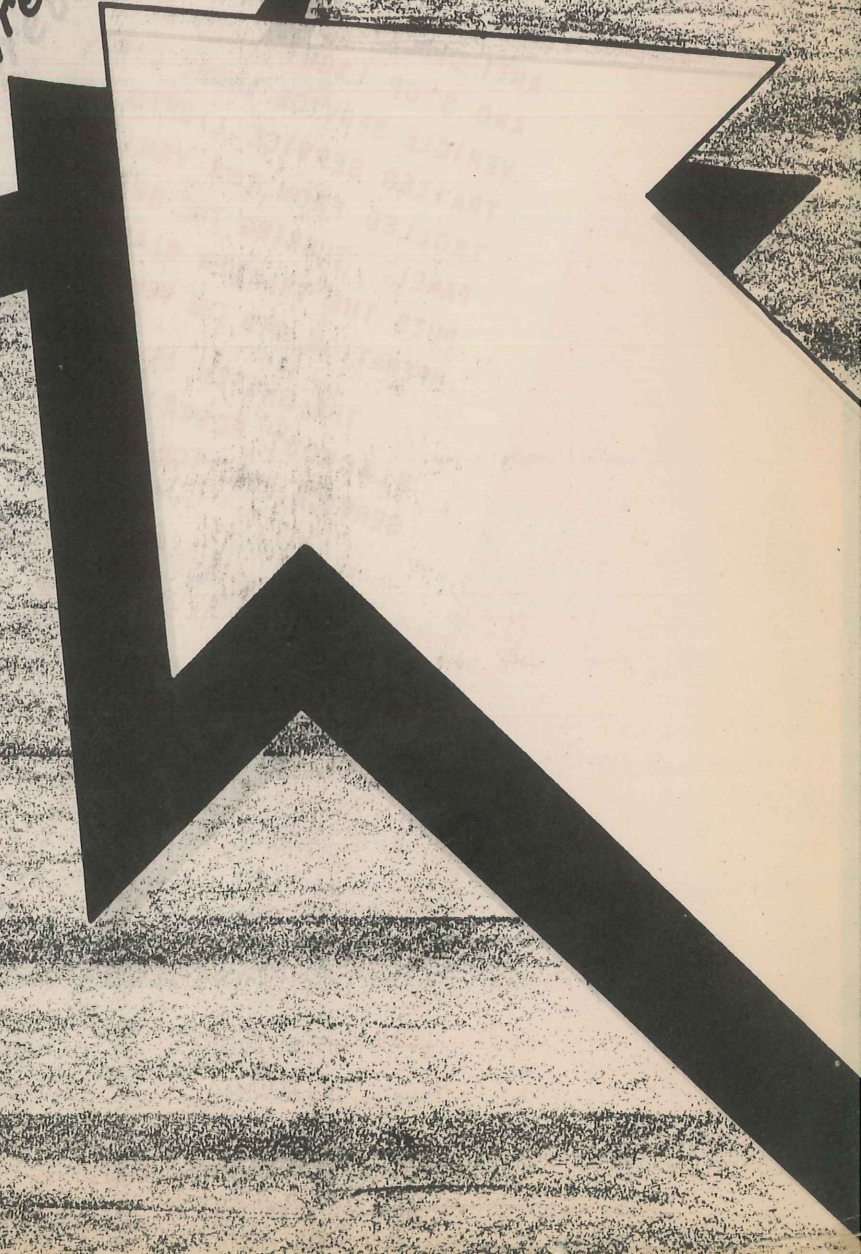


BET YOU NEVER SAW A PICTURE LIKE THIS BEFORE, DID YOU? OF COURSE NOT — IT'S A PICTURE OF WHAT SEEMS TO BE A PLAIN ORDINARY ENGINE VALVE BEING TORN APART BY A VIOLENT EXPLOSION. AND THE FIRST THING YOU'LL SAY IS THAT SUCH A THING JUST COULDN'T HAPPEN. WELL, BROTHER, IF YOU THINK SO, THEN YOU'VE NEVER SEEN ONE OF THE NEW SODIUM FILLED EXHAUST VALVES THAT ARE BEING USED IN SOME OF THE NEWER VEHICLES. NOW THIS ISN'T MEANT TO THROW A SCARE INTO ANYBODY, BECAUSE WHEN THESE VALVES ARE IN AN ENGINE THEY GO ABOUT THEIR WORK AND ARE COOLED BY THE SODIUM IN A PERFECTLY HARMLESS AND PEACE-ABLE MANNER.

THE SODIUM IN THEM MELTS AT ENGINE OPERATING TEMPERATURE, AND AS THE TEMPERATURE INCREASES THE LIQUID TURNS TO A HIGH PRESSURE GAS. IF YOU TRY TO MELT THESE STEMS DOWN, THE GAS WILL EXPLODE OUT OF THE WEAKENED SHELL. WATER ON SODIUM MAKES IT GIVE OFF HYDROGEN — WHICH IS AS EXPLOSIVE AS TNT. SO DON'T TRY TO CUT THEM WITH A TOOL LIKE A HACKSAW THAT MIGHT BE WATER COOLED.

IF YOU CARELESSLY DISPOSE OF SODIUM FILLED VALVES, THEY MAY GET INTO A FURNACE WITH OTHER SCRAP AND BLOW IT APART. BE SUSPICIOUS OF ANY EXHAUST VALVES WITH A STEM DIAMETER MORE THAN 3/8" WHETHER THEY HAVE A PLUG IN THE END OR NOT. BURY THEM OR THROW THEM INTO A RIVER.

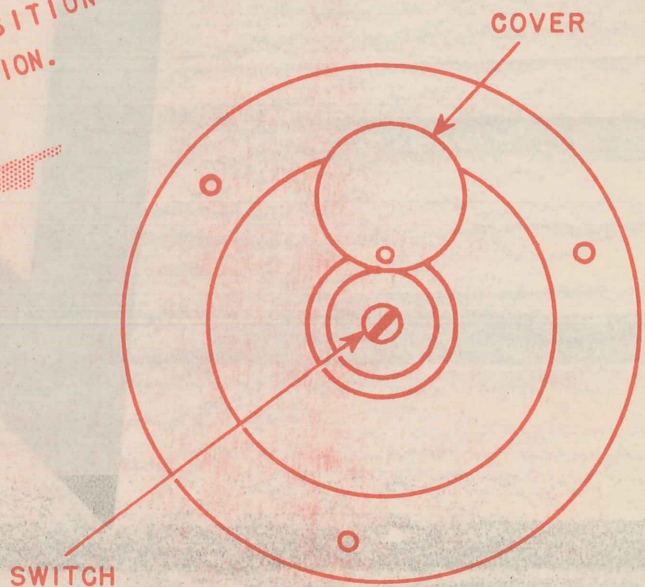
You may have some trouble with oil leaking past the oil seals on all 1941 Chevrolet trucks. New seals are being developed, but until they are ready for issue, use no. 3 grease, even though maintenance manuals recommend no. 2 grease ---



TO MEET THE NEW REQUIREMENTS FOR BOTH SERVICE AND BLACKOUT TAIL AND STOP LIGHTS ON TRAILER UNITS, A TRAILER BLACKOUT SWITCH HAS BEEN DEVELOPED AS SHOWN BELOW. SOME TRAILER UNITS NOW BEING DELIVERED ARE PROVIDED WITH THIS SWITCH AND IT WILL BE SUPPLIED ON OTHER UNITS JUST AS SOON AS IT CAN BE PLACED IN PRODUCTION. THE SWITCH HAS A SLOT IN THE END OF THE SHAFT AND IT CAN BE OPERATED EITHER BY A COIN OR A SCREW-DRIVER. TURNING THE SWITCH TO THE LEFT, ANTI-CLOCKWISE, THROWS THE SERVICE TAIL AND STOP LIGHT INTO SERIES WITH THE VEHICLE SERVICE LIGHT CIRCUIT, AND THE TRAILER SERVICE LIGHTS ARE THEN CONTROLLED FROM THE VEHICLE INSTRUMENT PANEL. TURNING THE SWITCH TO THE RIGHT PUTS THE TRAILER BLACKOUT LIGHTS INTO OPERATION WITH THE VEHICLE BLACKOUT LIGHTS.

THE SWITCH IS MARKED "BO" FOR THE BLACKOUT POSITION AND "S" FOR THE SERVICE POSITION.

SPECIAL FLASH ON TRAILER LIGHTS



SERVICE AND BLACKOUT
LIGHT SWITCH FOR TRAILERS