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ARMY MOTORS

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NUMBER 8



Ray L. Forman

A NEW KIND OF Grease Fitting

THAT KNOWS WHEN IT'S HAD ENOUGH

DOES GREASE GUM UP THE DRUMS AND BRAKES OF YOUR AIRBRAKE TRUCKS AND TRAILERS? HERE'S A SURE CURE FOR YOUR TROUBLE

Here's a headline story for everybody with trucks and trailers equipped with airbrakes. If you've been close to these vehicles, if you've ever poked a grease gun onto the little fitting that greases the brake-operating camshaft (see Figs. below) down at the wheels, or squirted grease into the fittings that lubricate the two anchor pins (Figs.) in each wheel, you'll really warm up to the news we've got for you.

As they are now, a lot of these airbrake jobs have the ordinary Ordnance standard grease fitting on the brake-operating camshaft and at the anchor pins. When you go to pump in grease there's no way to tell whether you've pumped in too much or too little. Usually, the man with the gun works away at it, and unbeknownst to him, a thick blob of grease wells up on the inside of the wheel and flops down on the drum—to be greasily distributed all over the linings and drums when the truck starts to roll.

Now we have for you a brand-

new kind of grease fitting, a grease fitting that says "when" (Fig. 1). This fitting, called a "Pressure-vent relief fitting," allows you to pump only the exact amount of grease into the unit being lubricated—no more, no less. There's a little "calibrating tube" inside the body of the fitting which is set with a certain specified clearance between the tube and body. When the unit being greased has had enough, a back pressure is set up that forces all surplus grease out the vent holes in the body of the fitting. The man with the gun can work away till he's blue in the face—surplus grease will squeeze out of the vents instead of loading up inside the wheel.

To some of you, pressure-vent relief fittings may be an old story—some of your airbrake jobs already have them. But, as we mentioned, other of your airbrake jobs do not. Furthermore, your supply channels do not provide pressure-vent relief fitting replacements. The fittings already installed on some of your trucks are

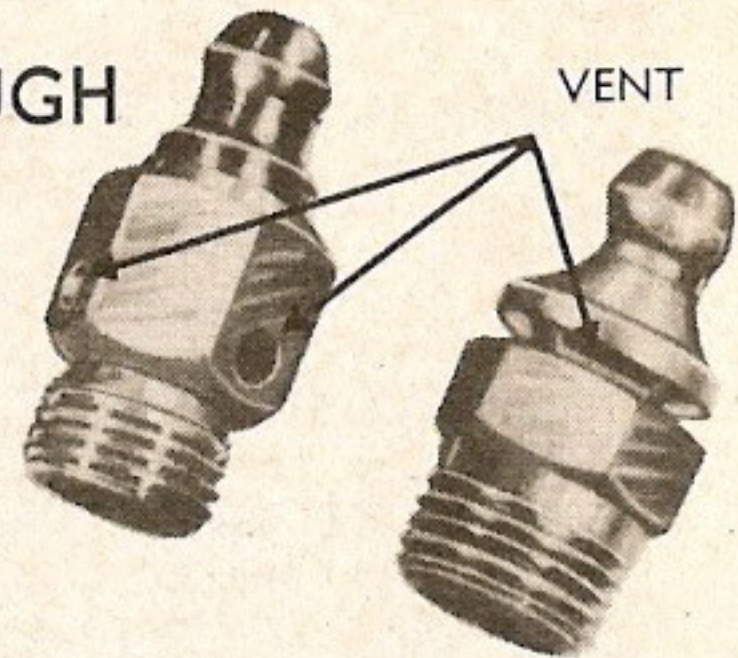


Figure 1

all you have. Break one or lose one, and you can't replace it.

Now, as this story goes to press, a large initial purchase of these special fittings is being made. Delivery to your favorite depot should be made about the beginning of December.

Get ready to requisition. You'll need three fittings for each airbraked wheel of your airbrake trucks and trailers: one fitting for the brake-operating camshaft, one fitting for each of the brake anchor-pins.

Requisition **Fitting, Lubricating, Pressure-Vent Relief, 14-15 lb. relief pressure, 1/8-27 NPT, Male, Fed. Stock No. 45-F-479-985.** Go over all your airbrake jobs and find which don't have the pressure-vent relief fittings. Order enough to take care of them and a reasonable number of replacements.

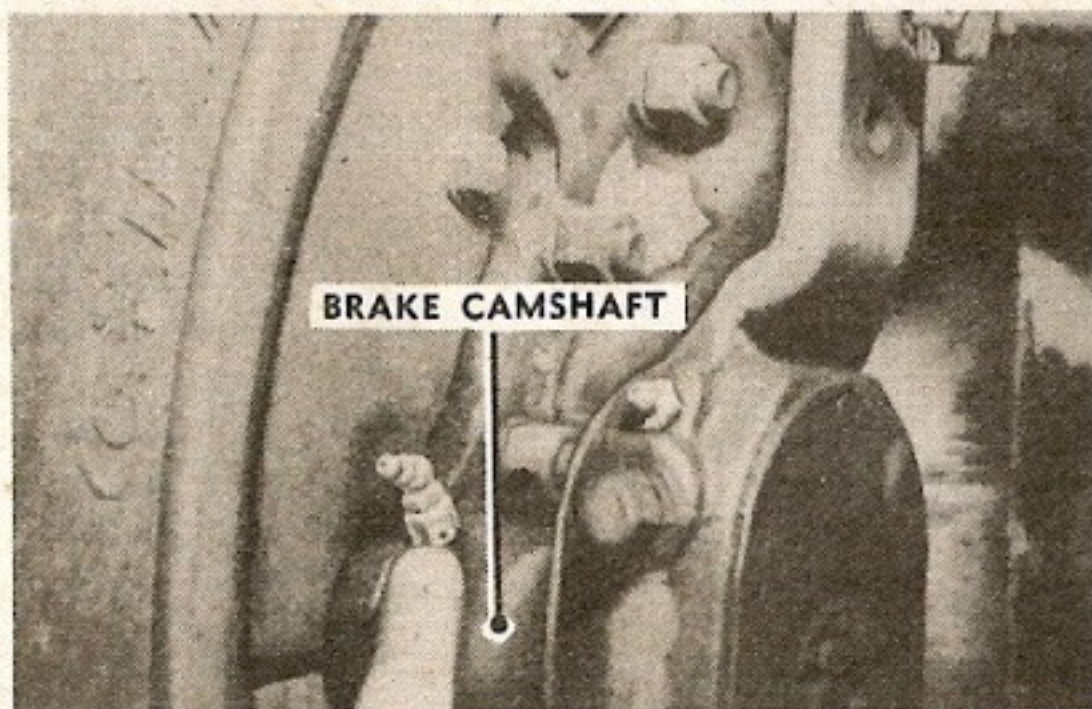


Fig. 2—The fitting at the brake camshaft.

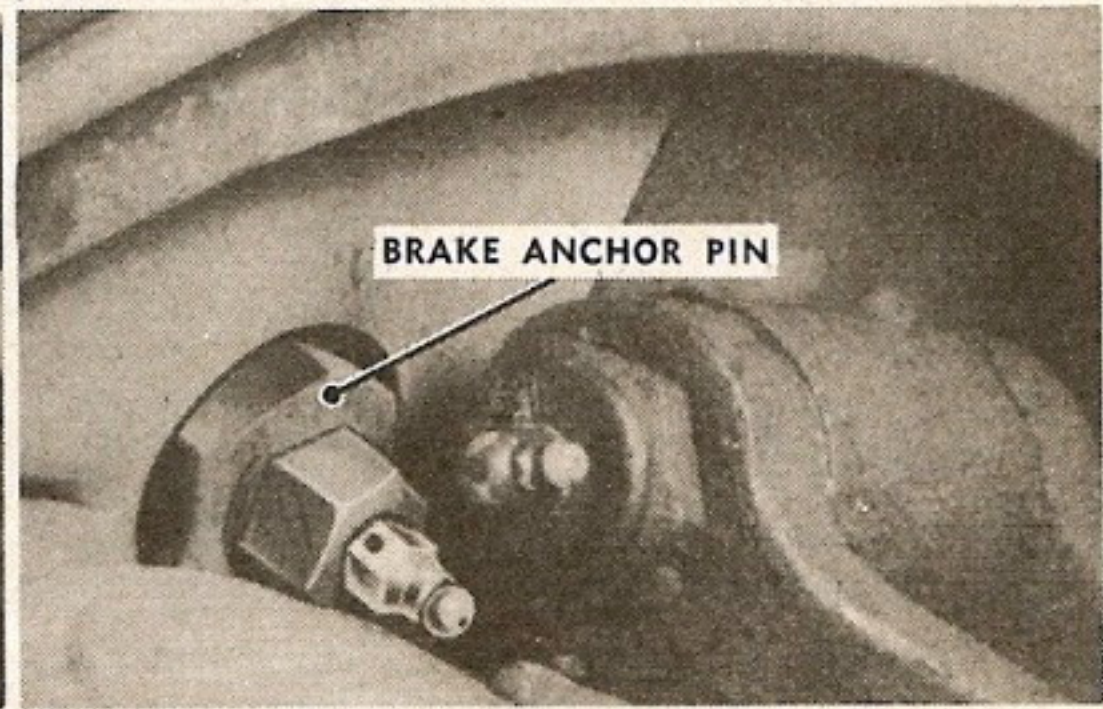


Fig. 3—The fitting at the brake anchor-pin.

Mum Ain't the Word

A cloud of dust rose from the rear of an M4A3 medium tank and almost filled the corner of the shop. A T/4, holding a long thin extension pipe rigged up on the end of an air chuck, was blowing away at the radiator.

"What's cookin' up there?" we asked.



The Tech Sergeant explained, "Oh, that's a little thing we have to do to keep from burning up some of our early M4A3 tank engines. We burnt up a couple before we found out a funny thing about the radiator cores.

"The core looks like a solid core, but if you take up the strip of metal that runs all along the top of the radiator, you can see where it's split longways down the middle. There's only about a 1/4" space between the front half of the core and the back half, but hunks of weeds, dirt and all kinda stuff packs down in there. Then the fans can't pull the air through the core and the engines heat up. We blow 'em out with that long thin extension on the end of an air chuck every 100 hours."

"Looks like a damn good idea. Did you write in a Form 468 on it?"

"Well, I've been kinda busy, but . . ."

In another shop a man said, "We had trouble with the M5 bomb service trailer. Get towing a load of bombs across a cement ramp, and even at low speed the trailer starts to shimmy and throw bombs overboard. We fixed it by putting set screws on the swivel yoke on the front-axle caster unit to keep it from dancing in the dampener shoe."

"Sounds good," we said. "Report it on a Form 468?"

"Wal, we've been a little rushed lately, and . . ."

The story to be drawn from these two little dramas is not how do you blow weeds and dust out of a tank radiator core, or how do you modify a trailer to keep it from scattering bombs. The story is that here are two good ideas—both having been applied locally—that now lie gathering fly-specks in the corner of somebody's skull.

"Dose are the conditions what prevail" wherever we go. Little men, living in little worlds of their own, solve their own problems in their own little way. Which is okay. But why all the hush-hush?

Out at an airbase, a man can't get the linkage to operate the power take-off on his oil-servicing truck. He rigs up a lever which comes right up through the cab floor and works directly off the transmission—short-cutting the need for linkage. A truck rolls off the deadline and a couple thousand dollars worth of equipment goes back to work. At too many other bases, the same truck lies fallow, because the same bright idea hasn't occurred to or been passed on to the people in charge.

You begin to get the point now. Because these local expedients are such closely guarded secrets—because somebody was too busy or lazy to send in an "Unsatisfactory Equipment Report" and drop a line to ARMY MOTORS—these great and good ideas, as the poet says, "waste their fragrantz on the desert air."

You got an idea? Let's take a look at it. If it's good, we'll make your name a household word. If it's bad, we'll tell you what you can do with it.

But don't keep it a secret.



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ARMY MOTORS MAGAZINE is printed monthly with the approval of the Bureau of the Budget, Executive Office of the President. It is published in the interest of organizational maintenance by the Preventive Maintenance Branch, Maintenance Division, Office, Chief of Ordnance-Detroit.

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SHOOT TROUBLE THREE WAYS ON YOUR M5 High-Speed Tractor

Do you wake up screaming—chew your nails—tear your hair, because your M5 high-speed tractor is deadlined for burned pistons, loose fenders, or clutch failure? Here's how to keep that tractor working at its job full-time.

CLUTCH

If you can't put your finger on what's causing clutch failure in your M5, try this trouble-shooting. Look through the inspection plate hole in the clutch housing at the clutch-release-bearing grease-tube. If it's damaged or broken, hike your vehicle to the shop for a replacement, pronto.

Some M5's came out with metal grease-tubes that break like tooth-

picks. Result: the clutch-release bearing doesn't get lubricated, runs dry, and burns out. But replacement tubes are now made of neoprene—they're flexible and won't break like the others did. There is no change in part numbers.

Your clutch-release bearing is in constant operation on the M5, so be sure to lubricate it every 16 hours like the Lube Order says. That goes for the clutch linkage, too. Don't neglect them.

FENDER SIDE-SHEETS

Maybe you're rattling around the country with the right and left fender side-sheets banging loose or coming off because the cap-screws connecting the sheets to

the final drive have been shearing. The answer to that is a larger bolt (see Fig.) that'll stand the strain. Make the switch this way:

- (1) Remove the eight ½" cap-screws from the right and left side-sheet.
- (2) Drill and tap holes in the gear case, using a ⅝" 18-NF-2 bottom tap. Be careful not to drill through the gear casing because you'll get cuttings down in the gear case or start gear oil seepage.
- (3) Make the holes already in the side-sheets and cap-screw locks bigger (by drilling) so you can use ⅝" bolts (Official Stock No. H1-116338).
- (4) Install the bolts and secure them by bending over the ends of the cap-screw locks. Don't forget to re-tighten the bolts for the first couple days until they set permanently.

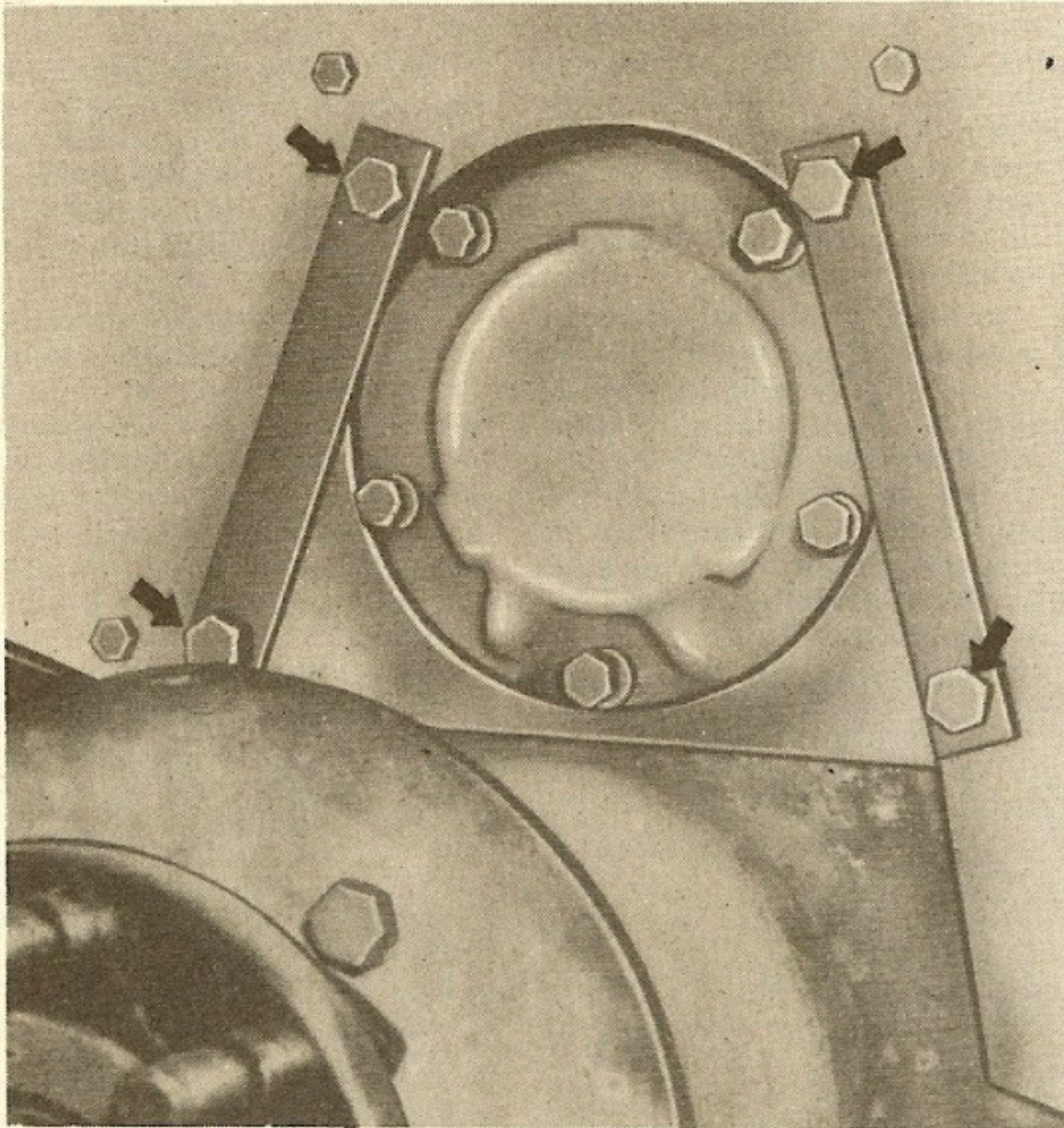
PISTONS

Some outfits have reported trouble with a lot of burned pistons. One thing that's most likely causing it is improper ignition timing for the type of fuel used.

Timing the engine is an old story to you mechanics, but you have to be extra careful on the M5 engine to set the ignition timing at top dead-center for the fuels used in the States. For the 80 octane fuel used overseas, the 10° advance may be used, but that's only when you're sure you have 80 octane fuel in the tank. TM 9-785 tells you exactly how to check the timing, so do it before your engine starts giving trouble.

Another reason for piston burning could be improper clutch operation. Because you can shift range when the vehicle is in motion by tromping on the clutch till it hits the floorboards, it's easy to lug or overspeed the engine, and that sure won't do the pistons or the engine any good. When you go from low range to high, slow down the engine speed. Going from high to low range, increase the engine speed. In both cases watch the tachometer and synchronize the engine speed with the vehicle speed. If you don't do it right, you'll not only lug the engine but you'll have passengers

(Continued on opposite page)



Use ⅝" bolts and bend over the ends of the cap-screw locks to secure the bolts in place. This makes a neat fender-mender.

M10A1 DOOR Admits Bootleg Air

Here's a tip on the 3-inch gun motor carriage, M10A1, and the 90mm gun motor carriage, M36 (and M36B1): Some of the boys have found that the splash shield on the engine-compartment door (Fig. 1) butts up against the air-intake carburetor-connecting manifold (arrow). This action sometimes knocks away the air-cleaner hose altogether or creates a gap between hose and manifold. In either case, air can be sucked into the engine without first being laundered in the air cleaner. Needless to say, this is hardly cricket.

To prevent the wholesale rush of dirty air into the engine, eliminate the door-to-manifold interference (as prescribed by TB ORD FE 14) by banging down the sore spot on the door's splash shield. In the following manner: (1) Open one door at a time, peering under the closed door to observe the point of interference. Mark the point of interference on the splash shield. (2) Heat the interfering area cherry red with a flame torch (Fig. 2). (3) With a sledge hammer or suitable blunt instrument, beat down on the splash shield until you get at least $\frac{3}{4}$ " clearance. (4) Finish by repainting the spot where the torch burnt off the paint.

Do likewise with the other door.

M5 TRACTOR (continued)

sailing out the back end or over the windshield.

You're a sharp driver if you're also careful to select the proper gear for the terrain you run on. You can be in low range and still lug the engine if you're in the wrong gear.

Don't go away yet, there's one more thing that'll help keep the pistons in shape. The next time you have the cylinder head off, round any sharp edges in the combustion chamber (don't file off more than $\frac{1}{32}$ "). Those edges heat quickly when they're sharp and cause pre-ignition.

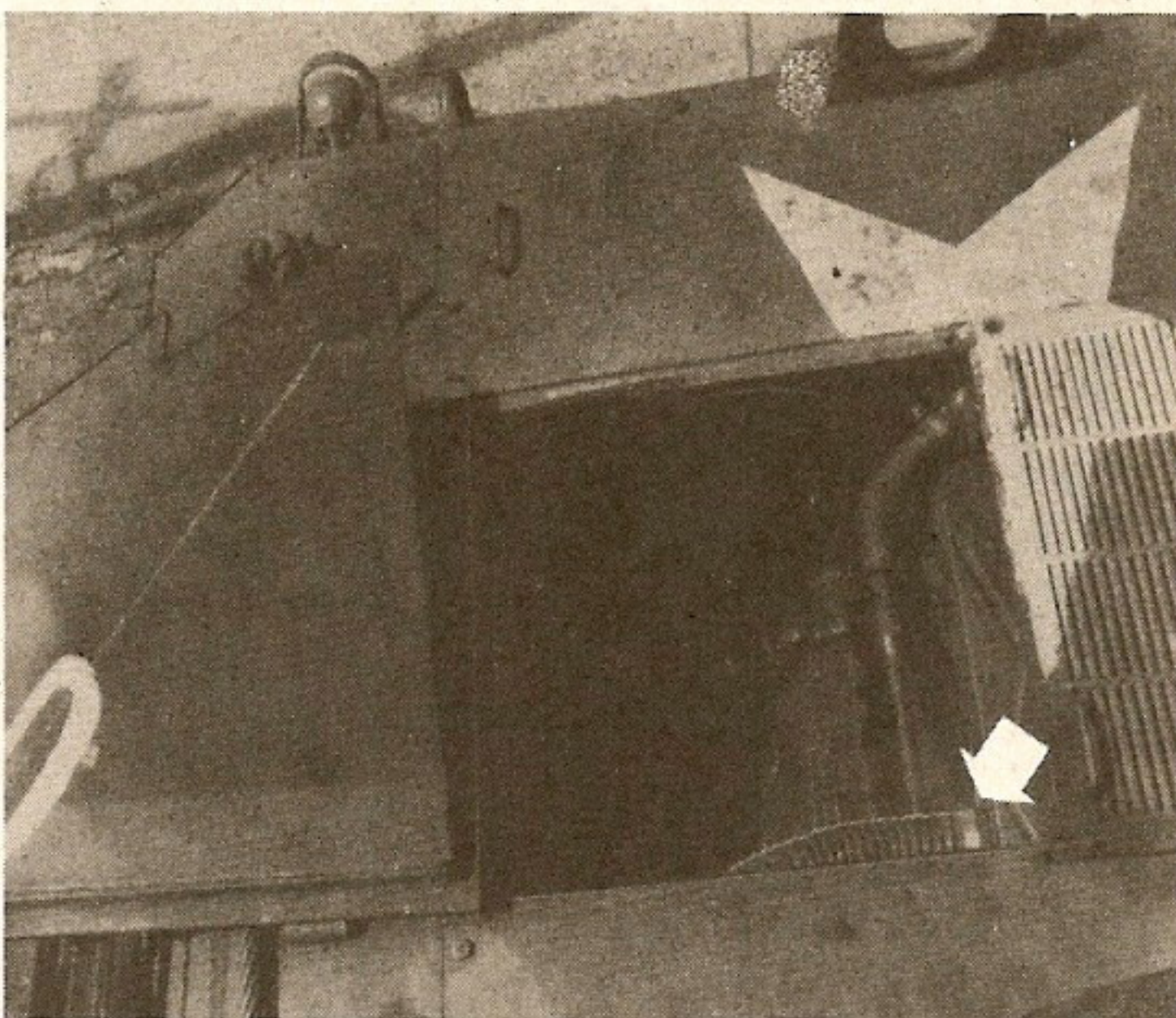


Fig. 1—Down comes the splash shield (under the engine door) and knocks away the air-cleaner hose. Air—dusty air—is sucked directly into the manifold and thence into the engine.

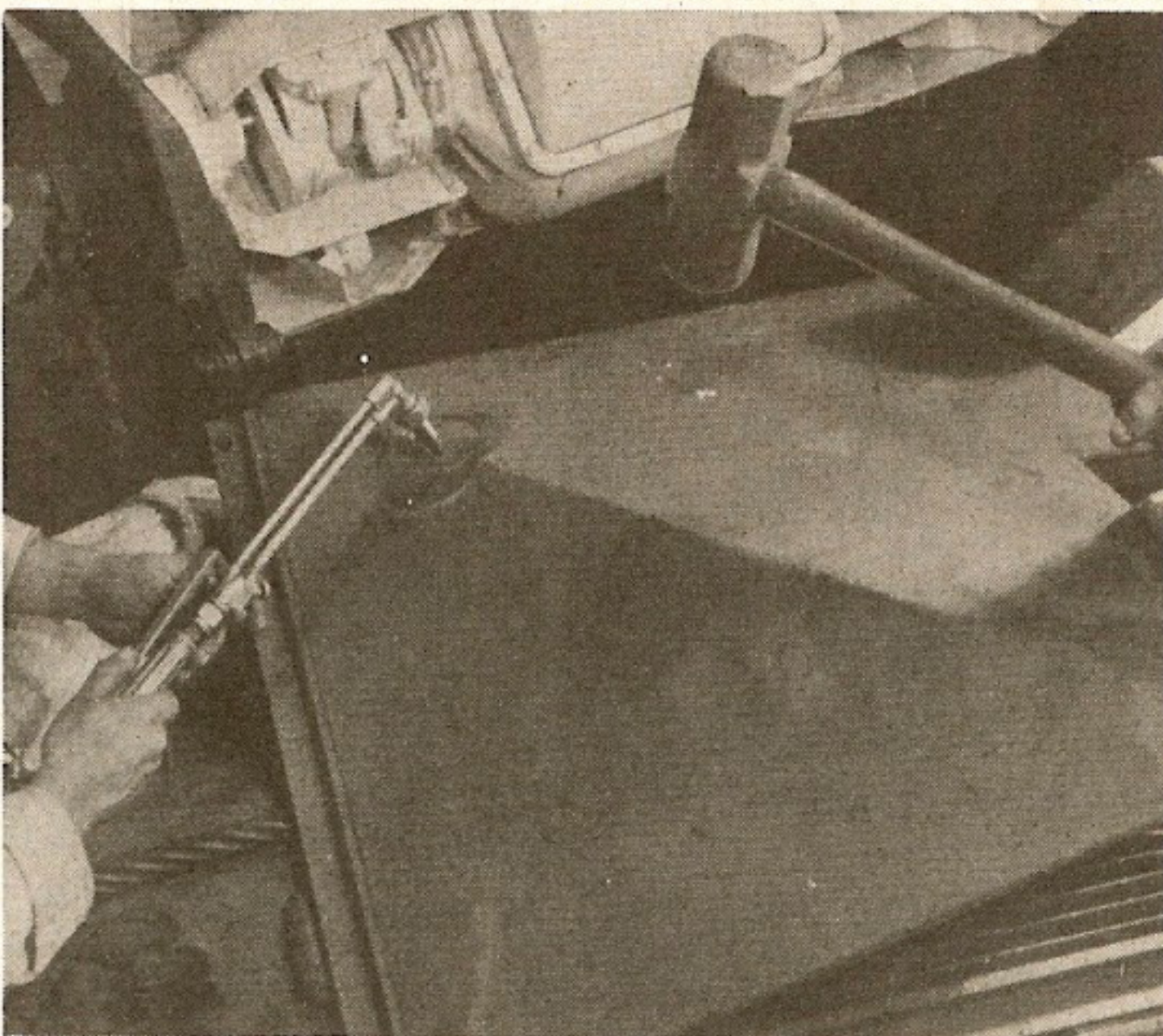
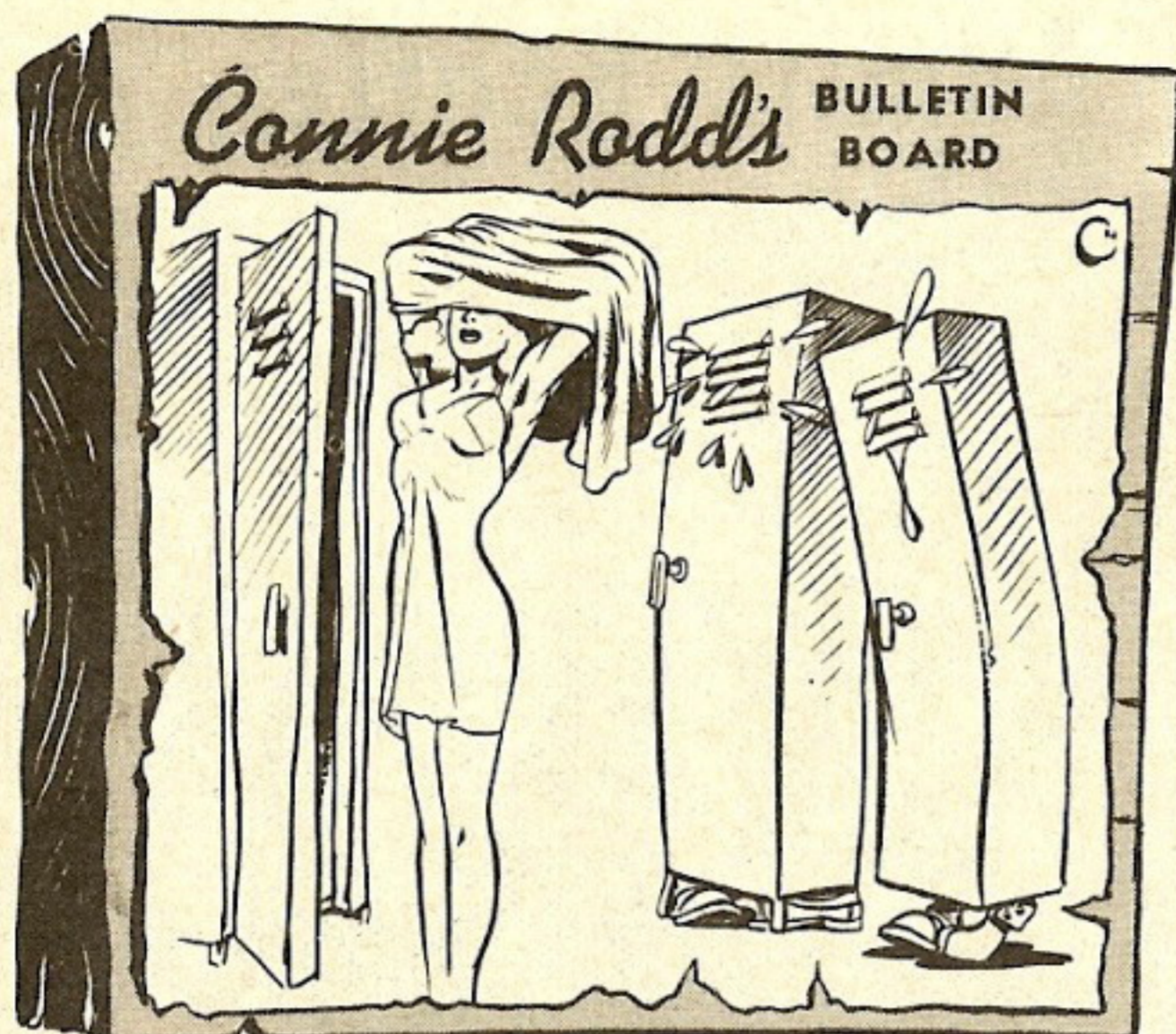


Fig. 2—Remedy: heat the interferin' area of the splash shield cherry red and beat it down with a sledge about $\frac{3}{4}$ -inch deep.



New Ordnance Dolly

Fewer maintenance and parts problems, easier handling, more versatility than any other dolly—that's the new Ordnance dolly the Army's issuing to the Transportation Corps for converting semi-trailers into full trailers.

The dolly's bound to be a favorite because (1) its long drawbar can be used with towing vehicles that have pintles mounted at different heights; (2) it won't tip when it's not attached to a

prime mover; (3) it's built without the auxiliary wheel or link some hinged-drawbar-type dollies had (you won't have the extra wheel to mire in the mud when you connect the dolly and semi-trailer on a rainy day).

As for connecting it to the semi-trailer—simply attach the eye to the prime mover, tilt the dolly to the rear (see Fig. below), line it up so the semi-trailer king-pin falls into the V-guide opening of the dolly fifth-wheel, back it into place, and the fifth wheel of the

dolly will slip neatly up against the trailer upper-fifth-wheel.

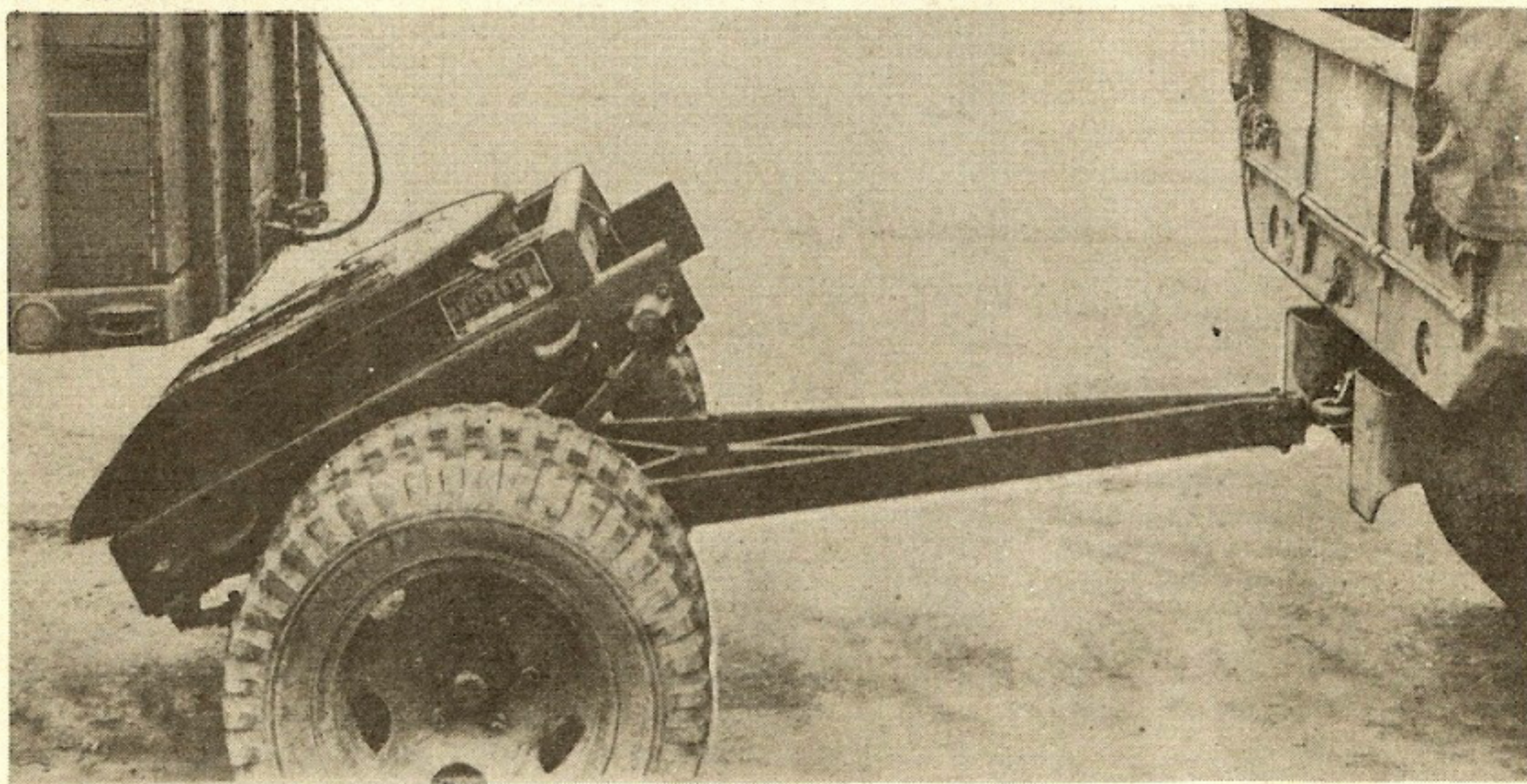
Since the dolly's made up of standard parts used in other military vehicles, and the A-frame is held together by bolts, maintenance and replacement of parts (tires, springs, fifth wheels, etc.) is a simpler matter than with the older dollies.

The dolly now comes in only one size—with 7.50x20 dual tires for use with standard 3-ton van or 3½-ton stake and platform semi-trailers (or any other semi-trailers using 7.50x20 tires). Later on, there'll be other sizes for use with other semi's.

Constant-Velocity Joints

Down in the Texas panhandle recently, I drifted into a couple of shops where the secret of where the hell all our wheelbearing grease goes to, was slightly solved. The boys down there pack it into their constant-velocity universal joints. They claim the heat in Texas causes chassis grease—which the lube order specifies for the CV joint—to leak out too fast. Leaks out past the wiping seal, they claim.

Well, all I know is what I see out at the proving grounds, and what the reports from overseas say and don't say. Out at the prov-



ing grounds, they ran a herd of trucks for 14 months with all kinds of grease in the CV joints and as far as they're concerned, chassis grease is right for the job. There are a couple million trucks pounding all the world's roads with CG in their CV joints, and we don't hear any squawks.

Now I've got an open mind on the subject, and if anybody's got some good reasons for using anything but CG in the CV joints, I'd welcome hearing about it.

I can think of a couple good reasons for **not** using wheelbearing grease in the CV joints. First place, although it hasn't been found that the wheelbearing grease does any harm to the balls and races in the CV joint, a good question is: Does the stiffer wheelbearing grease seep out enough to cover the ball housing with the necessary film of lubricant? If it doesn't, you know, the ball housing will rust up and really rip hell out of the seal as it wipes back and forth across the ball housing.

Then again, what if the hot-weather brethren transfer out to a cold climate? It's doubtful whether wheelbearing grease would ever thaw out enough in the cold to really lubricate the CV joints—not to mention that steering would become hard work.

But probably the biggest thing overlooked by the users of wheelbearing grease in the CV joints, is the lubrication of the steering-knuckle bearings. I mean the roller bearing or bronze bearing or whatever it happens to be on your truck, located directly above the CV joint. Since the boys tell me they simply pack the CV joint with wheelbearing grease every 6000 miles and don't bother to lubricate between packings, how is the steering-knuckle bearing supposed to get a drink of grease? On $\frac{3}{4}$ -ton, $1\frac{1}{2}$ -ton, some $2\frac{1}{2}$ -tons, 6-ton, M8 and M20 armored cars, half-tracks, etc., there's either a fitting or plug on top of the steering-knuckle housing (see Figs. below). Through this fitting or plug passes the most beautiful grease

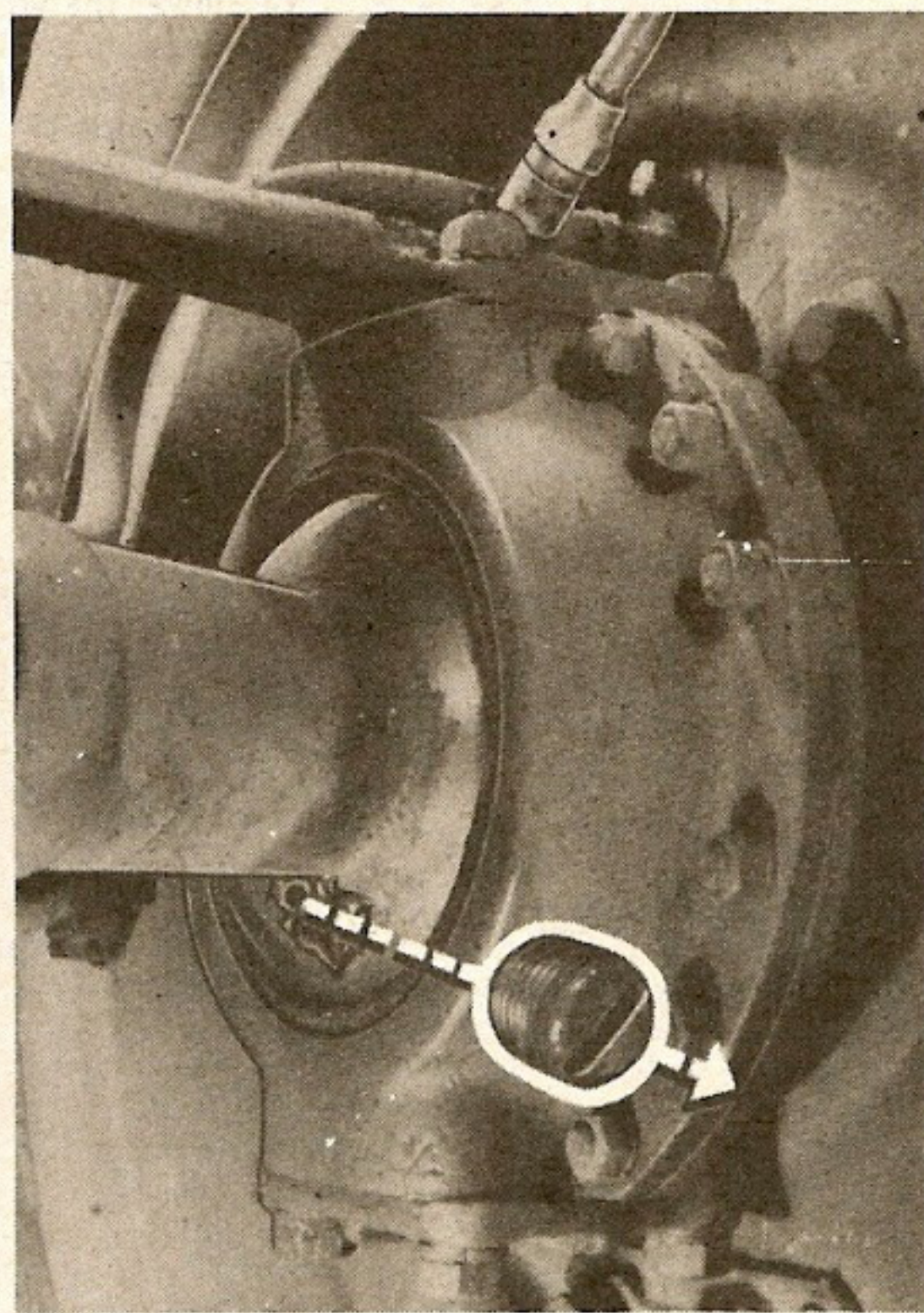
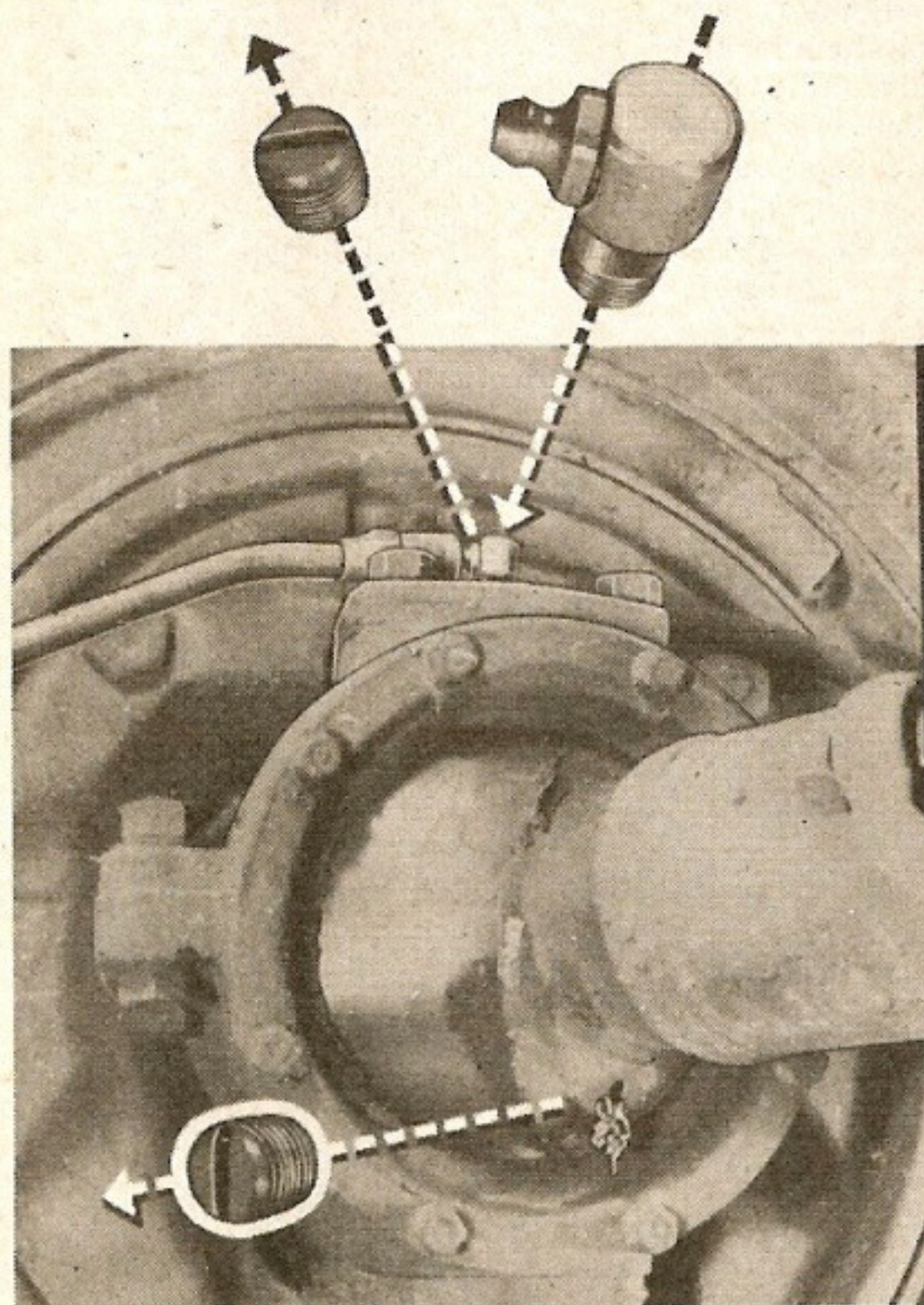
in the world. It lubricates the steering-knuckle bearing and flows on down to the CV joint to lubricate it (follow lube order instructions about removing the plug when pumping grease through the fitting).

But if you've been packing the CV joint with wheelbearing grease, your steering-knuckle bearing's been neglected. And don't tell me the grease from the CV joint works up around the bearing well enough. It doesn't, not on our trucks.

Well, there it stands. Of course, maybe I'm just beatin' my gums, maybe somewhere, somebody's got his reasons. If so, I'd sure like to hear them. Until then, the good word is: Chassis Grease in the Constant Velocity Universal Joints.

HOLDERS for WD Lubrication Orders

All your questions about where to mount War Department Lubrication Orders and how to mount



them on your particular vehicle are answered by TB ORD 117 (3 Jul. 44).

The TB gives directions for making the holders and it lists 16 different locations for mounting them. For vehicles not mentioned in the TB, the holders should be installed in the positions shown for a vehicle of similar characteristics—size, shape, and what-not.

The GMC, 2½-ton, 6x6 amphibian takes a canvas holder that you'll requisition instead of making yourself. The canvas holder (GMC Part No. 2205304) requisitions should read "For the Amphibian" and should be addressed to: Commanding Officer, Fort Wayne Ordnance Depot, Detroit 32, Michigan, ATTN: SPOMW-B. The holder goes on the back panel of the driver's seat and it should carry 2 WD Lubrication Orders No. 505; 2 Driver's Daily PM Services Form No. 48 PM; and 1 Technical Manual 9-802.

But get yourself a copy of TB ORD 117 and find out all there is to know about the holders.

Tachometer Drive on M4 Transmissions

If you have a vehicle with a medium tank, M4 transmission, and if you've had trouble with the tachometer-flexible-shaft or angle-adaptor-drive, you'll be glad to see TB ORD FE 5 (10 Jun. 44). The TB provides for installation of the tachometer drive on the transmission instead of on the engine. New vehicles already have the tachometer driven from the transmission, so you shouldn't have any trouble with them.

New W/S Wipers for Jeeps

Windshield wipers with tension arms for your jeep—isn't that what you've always wanted? That's what you can get if you need a new wiper.

Instead of requisitioning a tandem set (Ford Part No. FM-GPW-17500 or Willys Part No. WO-A-11433) when the old blades get

tired wringing the windshield dry, requisition Windshield wiper assembly, hand, single (Item Stock No. G503-5700002). You'll need two wiper assemblies for a tandem installation and one Connector, windshield wiper, hand (Item Stock No. G503-5700003).

When you hook up the new wipers, use the holes in the windshield where the old wipers come out. As for the connector, the windshield-wiper cranks have a hole ready and waiting to fit the screw attached to the connector . . . you're really just replacing one set of wipers with another.

The tension screw in the windshield-wiper arm (see Fig. at right) is set at the factory for correct pressure under average conditions. If you find it's gotta be reset, turn it **right** to increase pressure and **left** to decrease pressure.

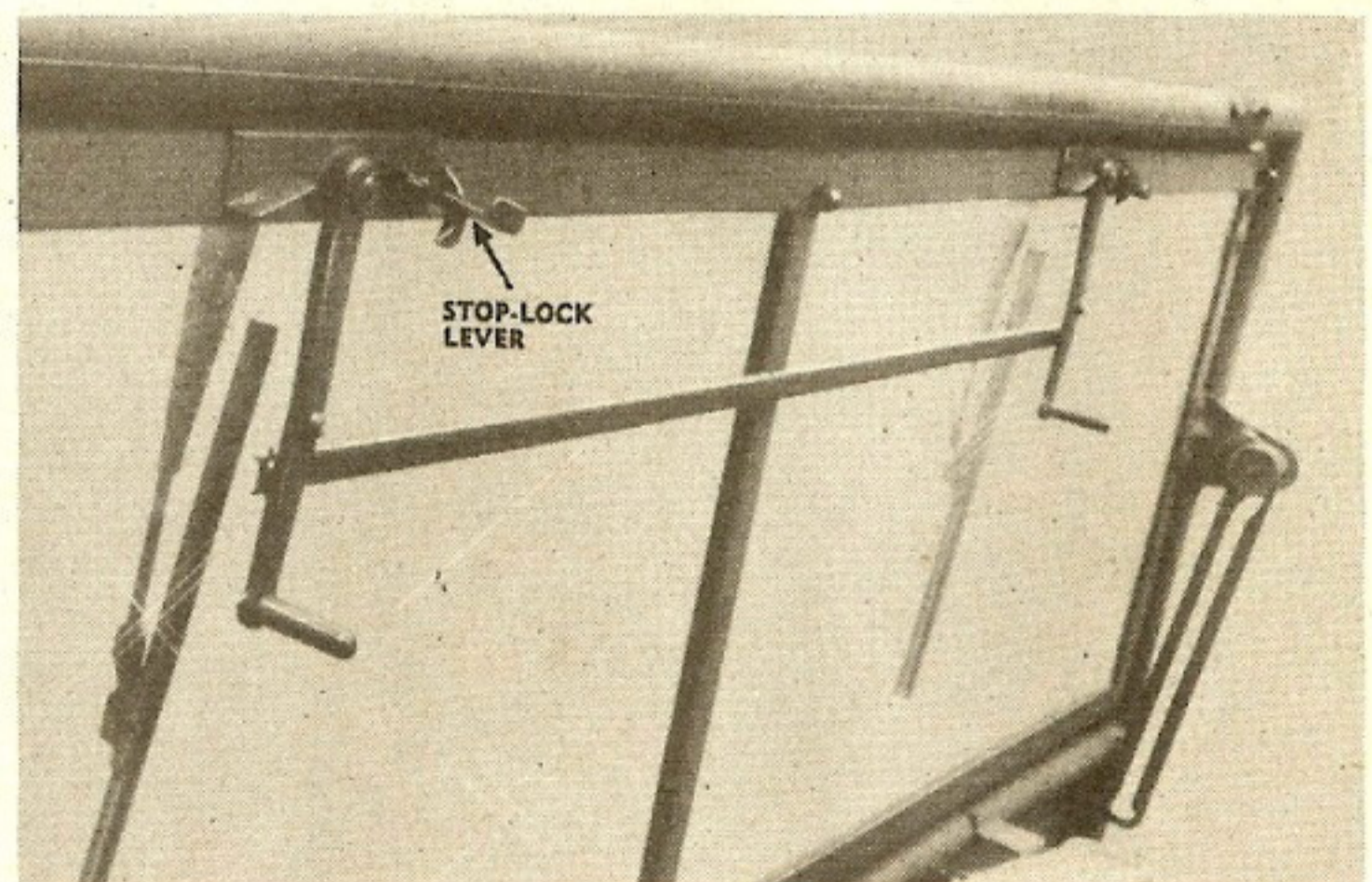
The stop-lock levers (see Fig. below) are there to lock the wiper blades outside your line of vision when the windshield is up. **Before you lower the windshield**, release the levers by pushing them in, and get the wiper blades in a protected position, which is straight up and down—vertical to you.

Do Connie a favor, though, and don't requisition the new blades just to keep your jeep in style. But if you do need them, if your old blades are plain worn out and broken down, then you can get the new wipers with my blessings.

Crowbar Installation on Medium Tanks

They tell me that the size and shape of the brackets that hold the crowbars on medium tanks makes it tough to tell which is the proper way to stow the bar.

The **right** way to stow the crowbar is: place the heavy end of the crowbar in the boot (A348043) toward the rear of the vehicle, on the right side, then drop the handle into the bracket (B209692B) which is just to the rear of the turret.



MORE ABOUT GMC BRAKE- LINES

Here's more dope about protecting your GMC 2½-ton 6x6 brake-lines from all the signal wire, barbed wire, plain wire, swamp brush, brambles, and whatever else's been cutting hell out of the rubber hose. Last month (October ARMY MOTORS) you got an emergency protection for the rear brake-lines on your duck and truck. This month, you get more late news:

(1) If you're overseas in a location where the brake-lines are taking an awful beating, there's a limited supply of protector kits for the front brake-lines on both duck and truck. (2) If you're not overseas, the front brake-lines on both your duck and truck must do without kits—you aren't badly tangled in wire and brush, anyway. (3) For everyone, in the States and overseas, the rear-brake-line protection for the truck will have to wait until later—it's not quite ready. (4) And again for everyone—in the States and especially overseas—the hottest information: a rear brake-line protection for the duck is explained below, complete with drawings.

You people overseas who need the front-brake-line protector-kit bad, requisition back to the States through channels: Kit, front-brake-hose protector—Item Stock No. G501-5700571. You'll get the kit with instructions for both duck and truck—(Limited Distribution) MWO ORD G501-W28 on the duck and MWO ORD

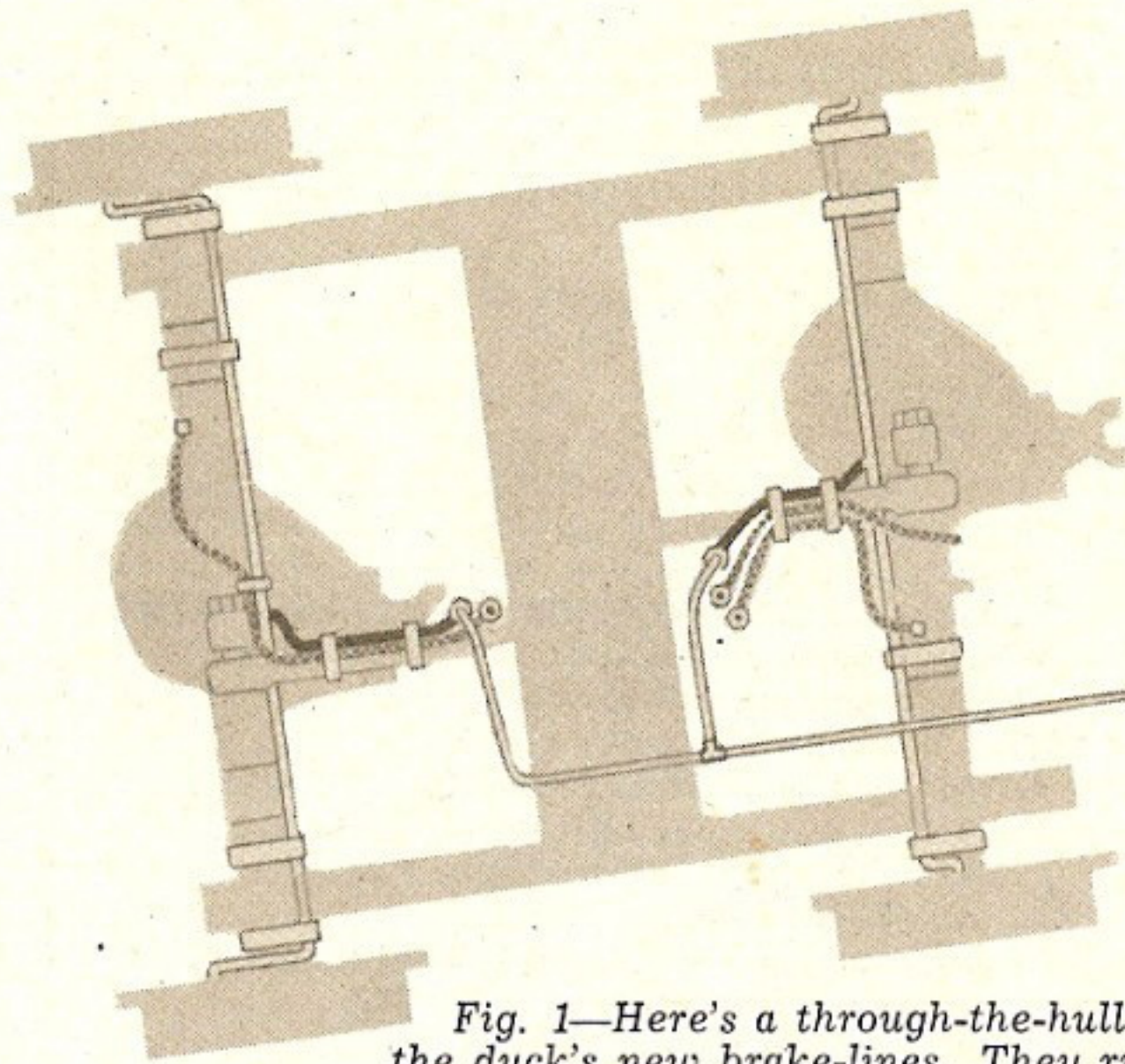


Fig. 1—Here's a through-the-hull view of the duck's new brake-lines. They run along both rear axles, along the torque arm, through the two cross-members, and then straight up front to the duck's nose and the hydrovac.

A PROTECTION FOR FRONT-LINES ON THE 2½-TON DUCK AND TRUCK—A CHANGE TO METAL TUBING FOR REAR-LINES ON THE DUCK

G508-W10 on the truck.

The rear-brake-line fix for the duck only is identical with the change being made in production, replacing the rubber brake-hose with metal tubing. Don't wait for kits (or parts which will be available sometime later). You can rig the tubing yourself. Like this:

Fig. 1 gives you an over-all picture of the installation. In few words, the fix consists of the ¼" tubing (actually the brake-line) inserted inside the larger 7/16" tubing for protection on the axles, bent to specifications, and installed as shown. You do it step by step.

First, run your duck onto a high, dry spot—plan to spend some of your valuable time because the total job per duck takes 8 man-hours. Start by removing the following parts (you might need your duck SNL G-501 to help locate them):

G. M.		Qty.
Part No.	Name	
2182001	Hydrovac Cylinder to Rear-Brake-Tube Assembly....	1
2182002	Right Rear to Left-Rear-Brake-Tube Assembly.....	1
2179975	Rear-Brake-Tube Assembly	2
2158154	Intermediate Right-Rear-Brake-Tube Assembly.....	1
2182168	Brake-Line Tee-Support	1
2181282	Left Rear to Intermediate-Right-Rear-Brake-Tube Tee	1
2018842	Right Front and Intermediate-Rear-Brake-Hose Frame Tee	2
2181819	Brake-Line Clip	4
2017609	Right Front and Intermediate-Rear-Brake-Tee Bolt...	2
2199500	Brake-Hose Spring	4
2179972	Brake-Hose Assembly (save 2 for reuse)	4
2207113	Brake-Line Tee-Support (save for reuse)	1
2207113	Brake-Line Tee-support (save for reuse)	1

(Continued on next page)

Find a safe spot for the parts you're going to reuse later. The rest should be returned to stock if they're serviceable and scrapped if they're not.

In addition to the parts you've saved, get the following from stock:

Item Stock No.	G. M. Part No.	Name	Qty.
H1-5451821	180042	Bolt, Hex. Hd. Cad. 1/4"x20-N.C.x1 3/4".....	8
H1-5452301	181003	Bolt, Hex. Hd. Cad. 1/4"x28-N.C.x 5/8".....	1
H1-5152341	181566	Bolt, Hex. Hd. Cad. 1/4"x28-N.C.x 3/4".....	1
H1-5461781	181759	Bolt, Hex. Hd. 5/8"x18x1 1/2".....	4
G85-3101880	476099	Bolt, Rear Wheel Cylinder Connection....	4
G85-3104660	476100	Connection, Rear Wheel Cylinder Inlet...	4
F.S.N. 52-C-3086		Compound Caulking (lbs.)	2
G85-3104560	497756	Connector, Rear Brake Hose to Axle.....	2
G85-3115260	231343	Gasket, Brake Inlet Fitting (at brake)....	8
H6-0230310	137397	Nut, Inverted Flared Tube Fitting, 1/4"x24 Steel	12
H6-0220211	137398	Nut, Inverted Flared Tube Fitting, 5/16"x20 Steel	2
H1-4185761	124944	Nut, Pl. Hex. Thin 5/8"x18-N.F.	2
H1-4167501	120375	Nut, Pl. Hex. Reg. 1/4"x20-N.C.	8
H1-4167521	120367	Nut, Pl. Hex. Reg. 1/4"x28	2
H1-4167761	121358	Nut, Pl. Hex. Reg. 5/8"x18	4
H1-01130999	130999	Washer, Pl. Cad. Pl. 5/8" I.D.	14
H1-7043681	120392	Washer, Pl. Small Cad. Pl. 1/4" I.D.	9
H1-01138557	138557	Washer, Lock, Internal Expanding 5/8" I.D. 2	
H1-7025681	120380	Washer, Lock, Med. Cad. Pl. 1/4" I.D.	2
H1-7025861	121574	Washer, Lock, Reg. 5/8" I.D.	4
	2158157	Tee Assembly, Brake Line	1

Listed below are the parts you'll have to make yourself. The correct tubing for the brake-lines is 1/4" O.D. x .028 wall, bundy steel-tubing, tinned on outside. The correct material for the outer tube that protects the brake lines is 7/16" O.D. x .028 wall, S.A.E. 1010 butt-welded C.D. steel tubing. But if you just can't beg, borrow, or find any, use the next best substitute. The clips and clamps you can make from scrap metal.

G. M. Part No.	Name	Qty.
2206534	Clamp, Brake Line to Rear Axle Housing (Fig. 8).....	7
2206535	Clamp, Brake Line to Rear Axle Housing (Fig. 9).....	1
065232	Clip, Brake Line to Axle Housing (Fig. 11).....	4
192107	Clip, 5/16" Pipe, 5/16" Bolt hole (Fig. 12).....	1
2165642	Clip, Rear Axle Vent Tube to Brake Line (Fig. 10)...	1
2207388	Line, Brake Assembly (Front Rear Axle R. H.) (Fig. 3a)	1
2207389	Line, Brake, Assembly (Front Rear Axle L. H.) Fig. 3b)	1
2207390	Line, Brake Assembly (Rear Rear Axle R. H.) (Fig. 2a)	1
2207391	Line, Brake Assembly (Rear Rear Axle L. H.) (Fig. 2b)	1
2207392	Line, Brake Assembly (Tee to Front Rear Axle) (Fig. 5)	1
2207393	Line, Brake Assembly (Tee to Rear Rear Axle) (Fig. 4)	1
2207394	Line, Brake Assembly (Hydrovac Tee to Brake Line Tee) (Fig. 6)	1

INSTALLATION

(1) Take care of the four holes in the hull and frame, where you removed the four brake lines, with caulking compound. Slap it on good. Then plug the holes with 4 bolts (H1-5461781), 8 plain washers (H1-01130999) one on each side of the hole, 4 lockwashers (H1-7025861), and 4 nuts (H1-4167761).

(2) Get your metal tubing together and cut it in the lengths shown (Figs. 2 thru 6). Fill the 7/16" outer tubing with caulking compound so water can't seep in around the brake-lines—then tape one end of the 1/4" tubing, to keep out the caulking compound, and insert it in the 7/16" tubing. On each piece of 1/4" tubing, put a nut (H6-0230310) on each end and flare the ends as shown in Fig. 7. With the tubing as it is, one inside the other, bend each piece as shown in the drawings (Figs. 2 thru 5). Don't bend the tubing shown in Fig. 6—it's a straight 67" piece.

(3) Put the 4 wheel-cylinder connections (G85-3104660), Fig. 16, on the four rear-wheels, right where you unscrewed the rubber brake-lines. Use 4 bolts (G85-3101880), and 8 gaskets (G85-3115260), one on each side of the wheel-cylinder connections.

(4) Connect the brake-line assemblies for the rear rear-axle (GM 2207390, Fig. 2a and GM 2207391, Fig. 2b) with 1 connector (G85-3104560) Fig. 15. Position the connected lines on the rear rear-axle and fasten the ends to the wheel-brake-cylinder connections. Unscrew 2 of the differential-carrier bolts and use them to fasten the brake line with 2 clips (GM 065232, Fig. 11), in the same manner as the clips and differential-carrier-cover bolts shown in Fig. 15. Then clamp the rest of the brake-line to the axle housing as shown in Fig. 14 (you can see a "close-up" of two clamps in Fig. 16) with 4 clamps (GM 2206534, Fig. 8), 4 bolts (H1-5451821), 4 washers (H1-7043681), and 4 nuts (H1-4167501). After the brake-line is fastened, the connector in the center should be about 15° off vertical—away from the axle.

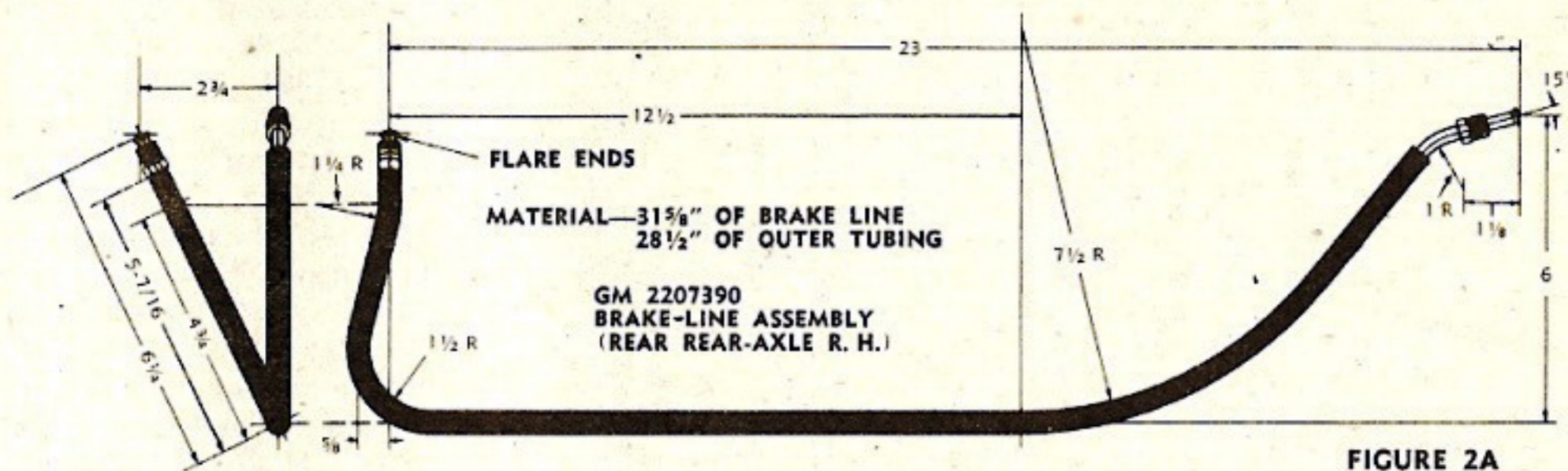


FIGURE 2A

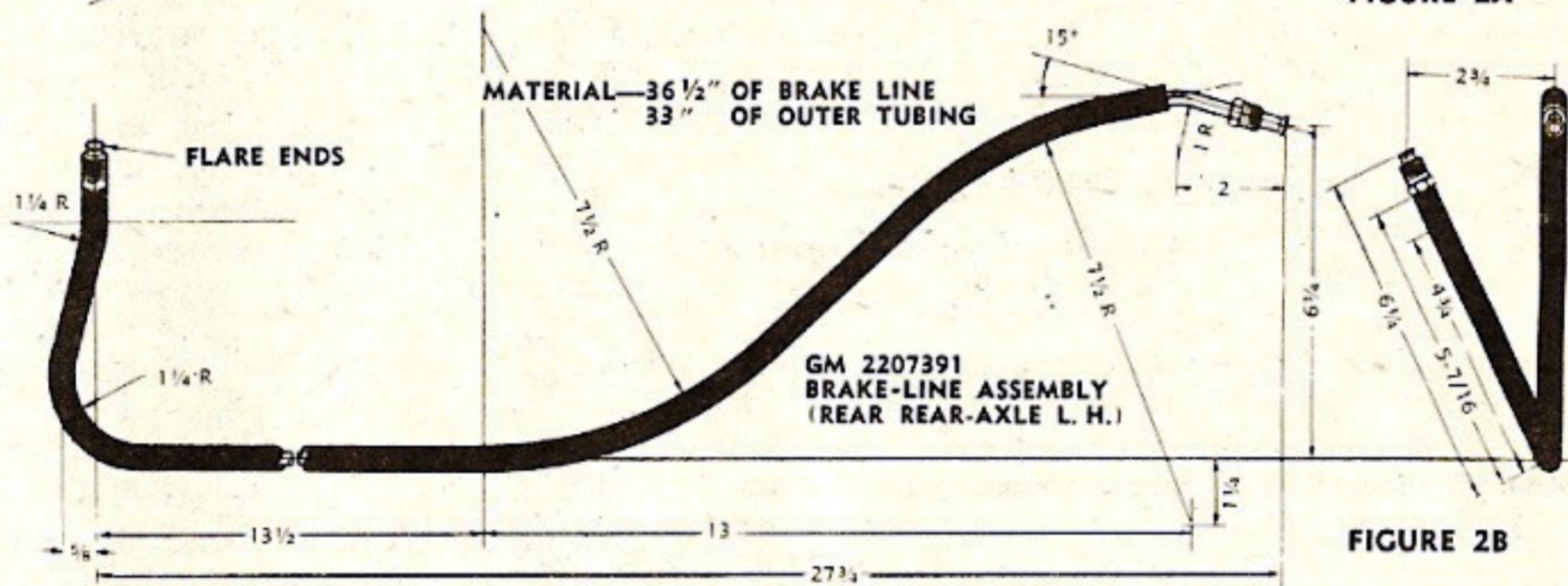


FIGURE 2B

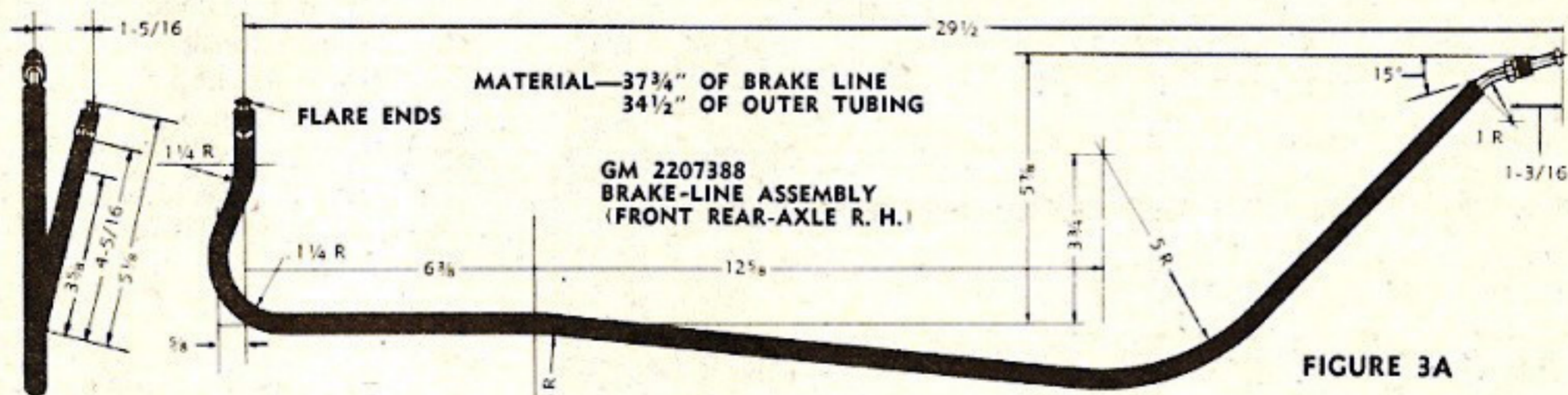


FIGURE 3A

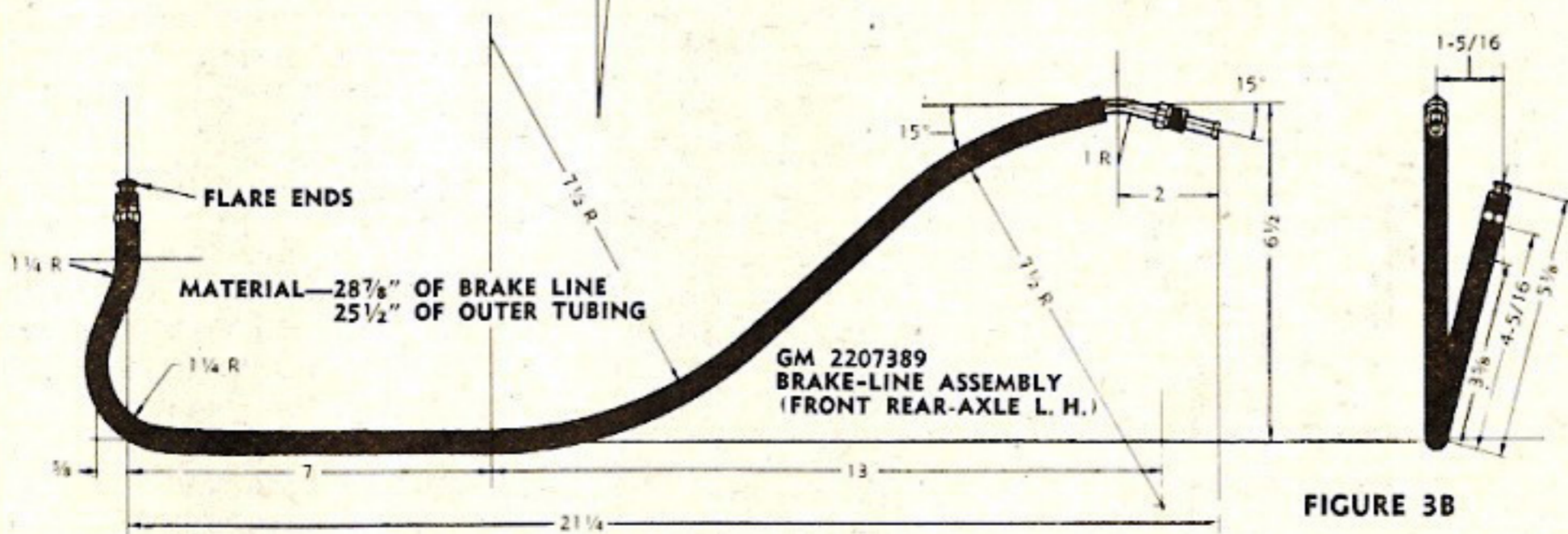
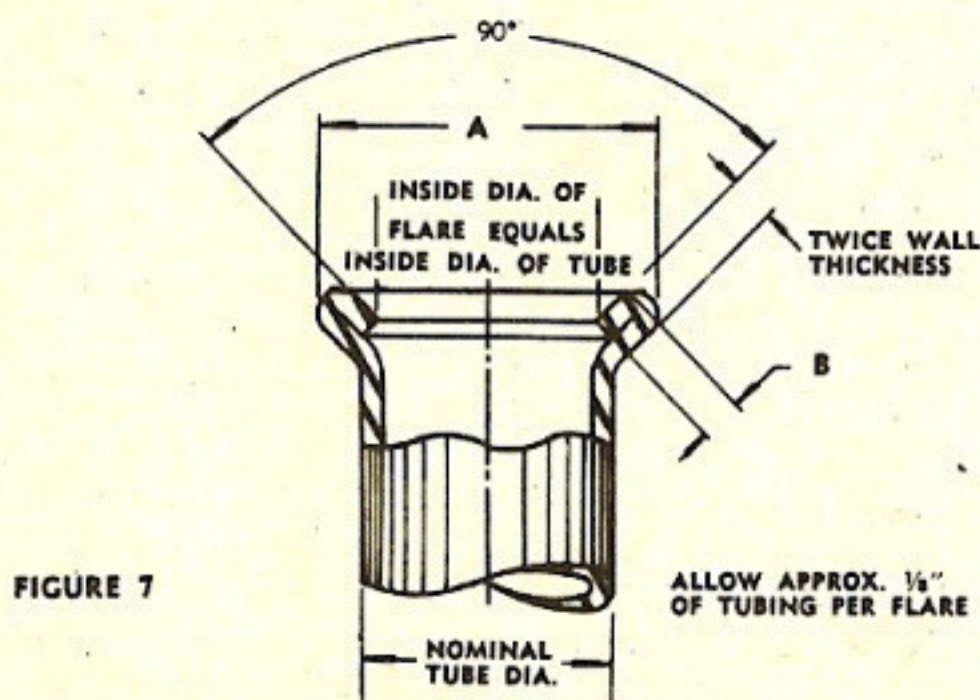
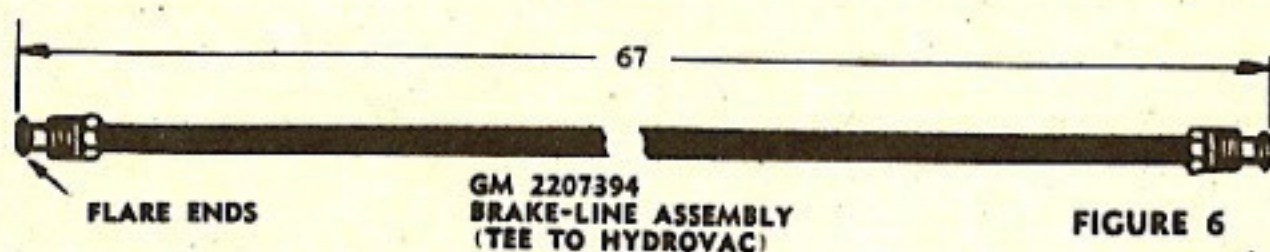
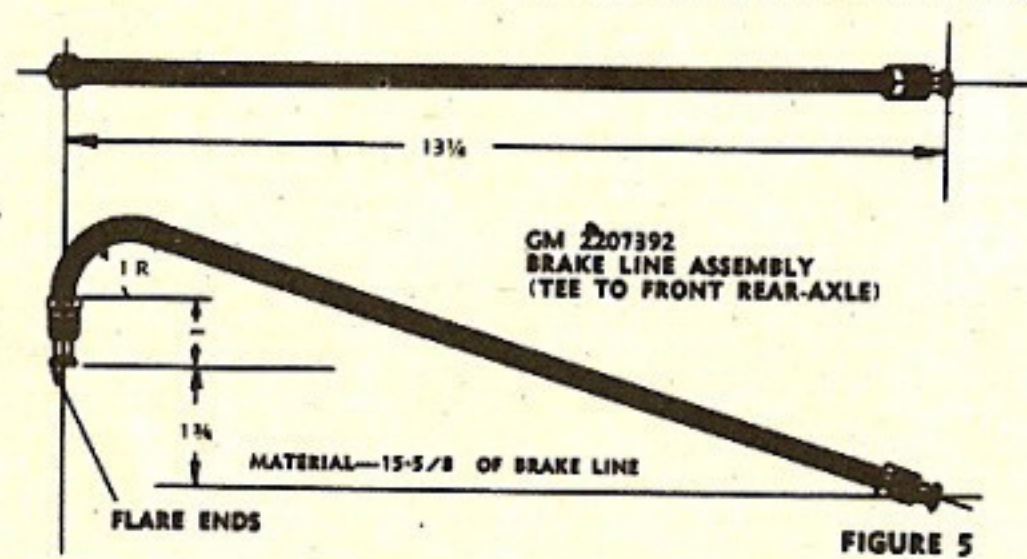
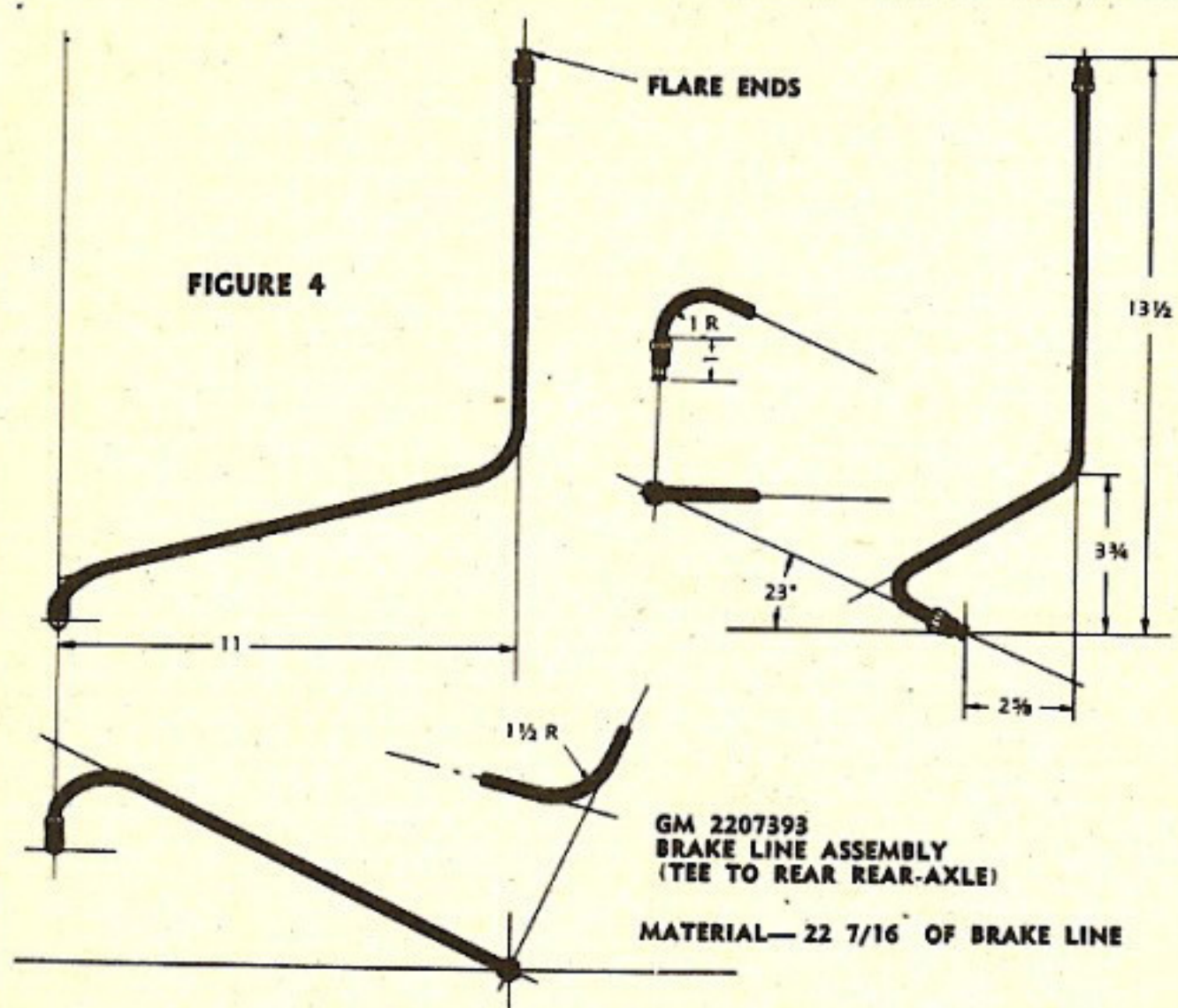


FIGURE 3B



NOMINAL TUBE DIA.	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4
A—FLARE DIA.	.187 ±.005	.275 ±.005	.355 ±.005	.420 ±.005	.495 ±.005	.565 ±.005	.635 ±.005	.705 ±.007	.765 ±.007	.905 ±.007
B—MIN. LENGTH OF SEAT	.080 MIN.					.062 MIN.				

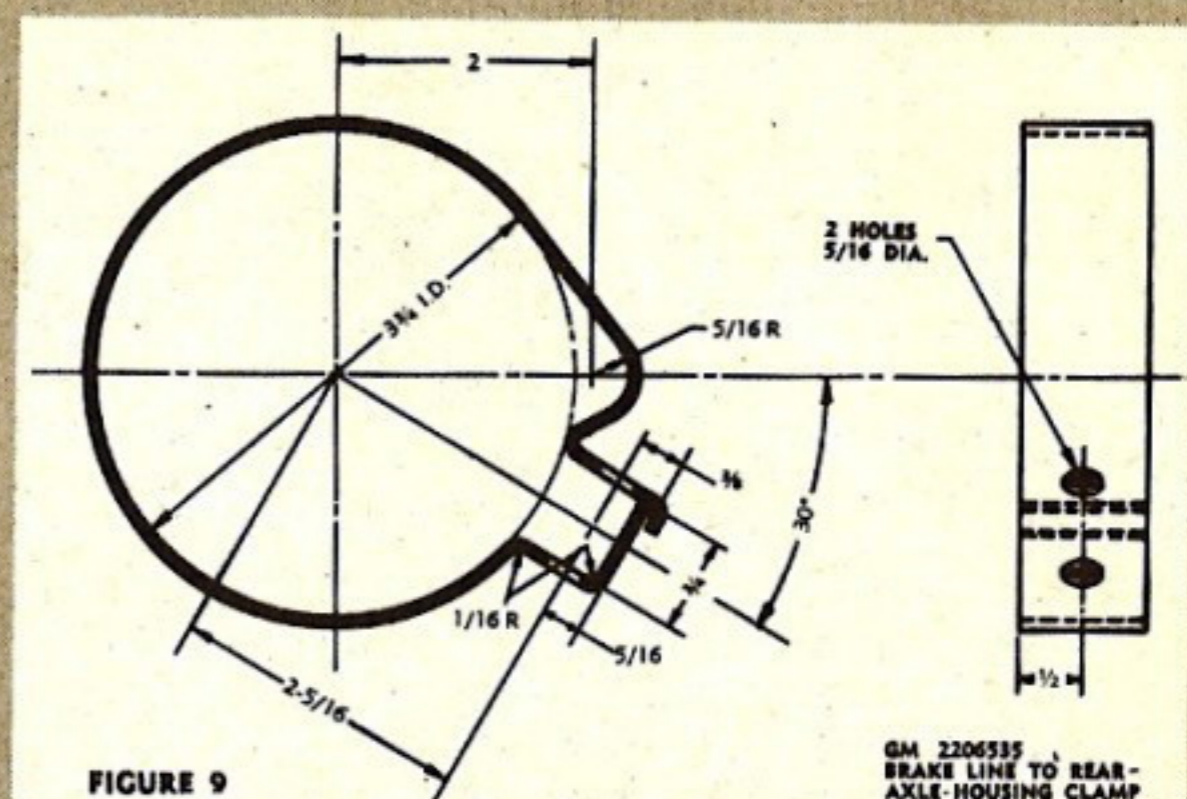
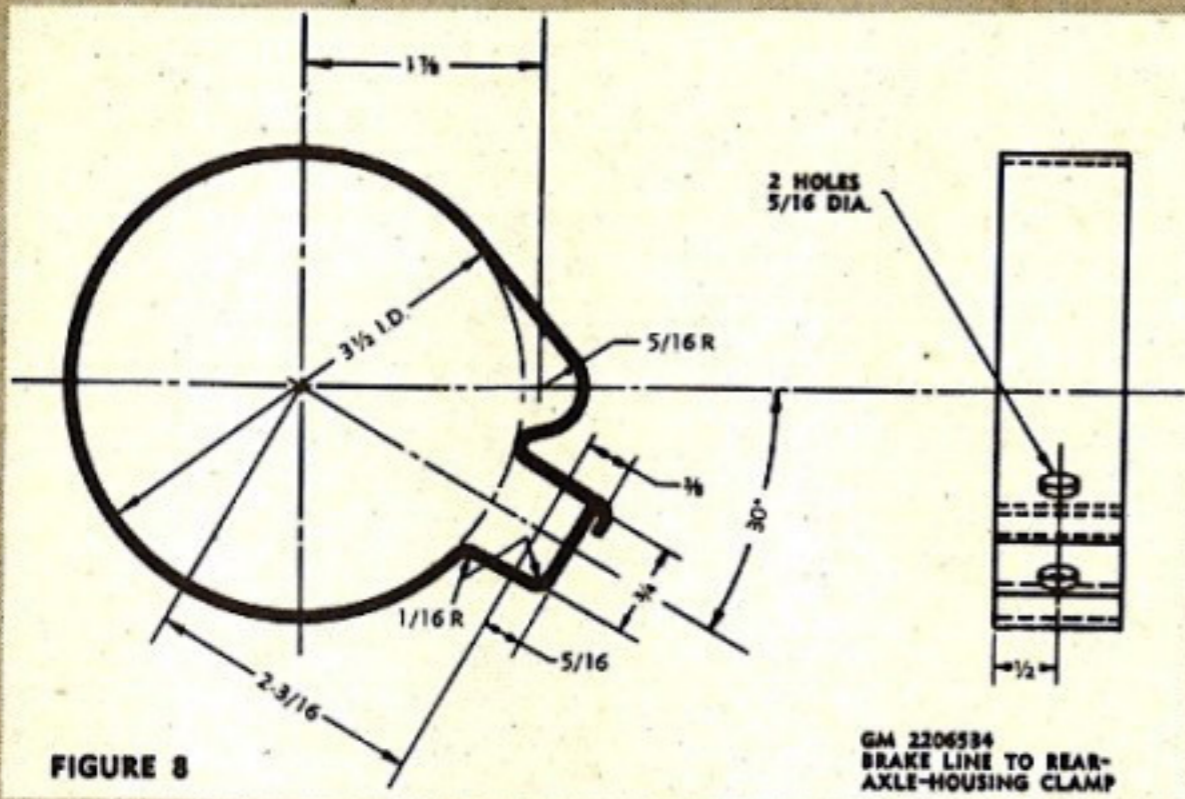
(5) Connect the brake-line assemblies for the front rear-axle (GM 2207388, Fig. 3a and GM 2207389, Fig. 3b) and fasten them to the front rear-axle in the same manner as those for the rear rear-axle, but use 2 axle-housing-cover bolts to fasten the brake-line with the 2 clips (GM 065232, Fig. 11). And instead of 4 clamps of the same size to fasten the rest of the brake-line to the axle, use only 3 clamps (GM 2206534, Fig. 8) and 1 larger clamp (GM 2206535, Fig. 11) as shown in Fig. 13.

(6) On the rear rear-axle, clip the brake-line and the vent tube together with clip (GM 2165642, Fig. 10) as shown in Fig. 14. First, though, wrap some slit wire-loom (about 2" length) around the vent tube to protect the rubber.

(7) For the flexible brake-hoses (those you removed and saved), you'll need two holes drilled through the hull—use a 21/32" drill. Drill the hole for the rear rear-axle hose 3 3/4" from the cross member and 3 3/4" to the right of the center line of vehicle chassis (facing front of vehicle) Fig. 14. For the front-rear-axle hose, the hole goes 1 1/4" from the cross-member and 1 1/4" to the right of the vehicle-chassis center-line (Fig. 13). Then slop caulking compound around the holes to avoid trouble with water leaks later.

(8) Attach the flexible brake-hoses (GM 2179972, those you saved) one on each axle, in the connectors (G85-3104560), as shown for the front rear-axle in Fig. 15. Run the female ends of the hose to the holes you drilled, and anchor them through the holes with 6 washers (H1-0113099) (3 for each hose—2 outside the hull, 1 inside the hull), 2 lock-washers (H1-01138557), and 2 nuts (H1-4185761).

(9) Attach the front-rear-axle hose and both vent tubes on top the torque arm. Wrap them with a 2" length of slit wire-loom and clip them to the torque arm with hose clamps GM 2118210 (those you removed and saved) Fig. 13. Then clip the rear-rear-axle hose and vent tubes in the same manner, using the other two hose clamps you saved, Fig. 14. Here's



a caution: Make sure you divide the slack in the brake-hose a little bit at each end instead of a lot at one end and none at the other, before you do any clamping. If you don't divide the slack, you can expect a ripped hose because you aren't allowing for torque-arm action.

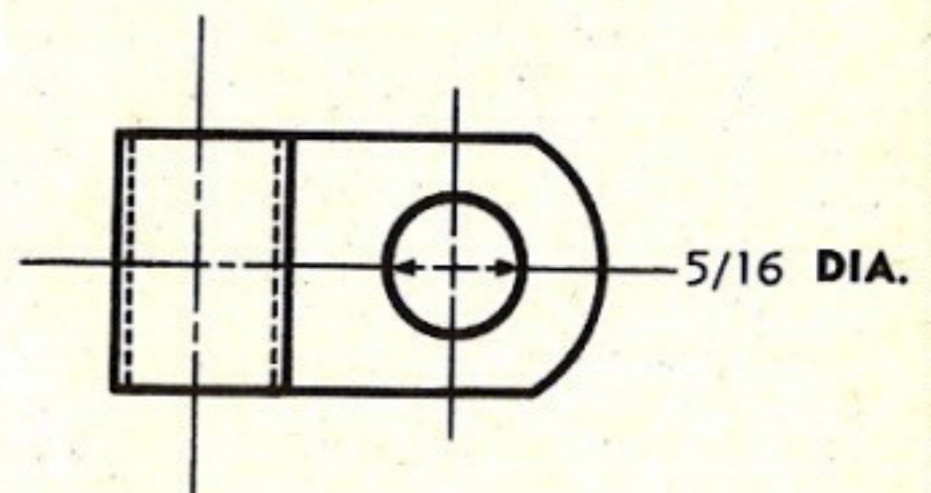
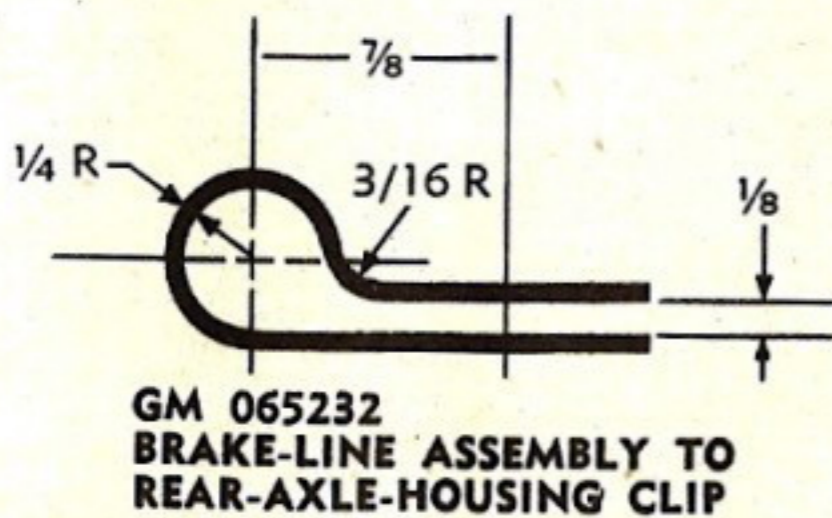
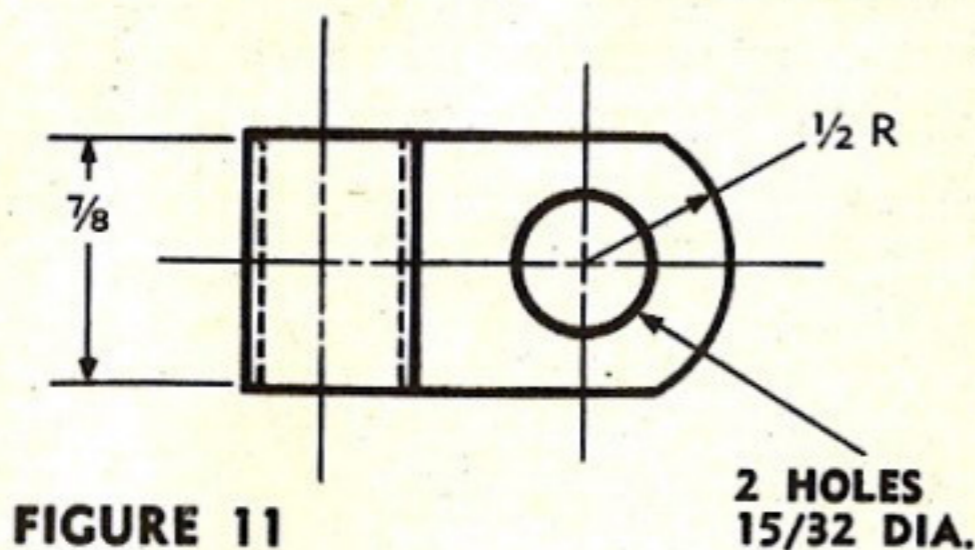
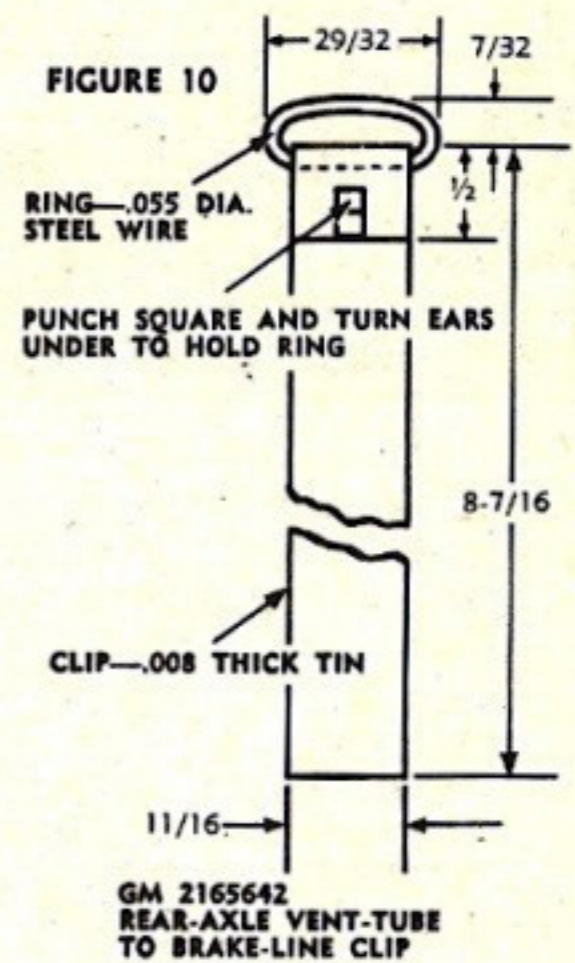
(10) Drill a $\frac{1}{4}$ " hole $\frac{1}{2}$ " above the large hole already in the right side of the cross-member and install the tee support you saved (GM 2207113) with 1 bolt (H1-5452301), 1 lockwasher (H1-7025681), and 1 nut (H1-4167521). Then connect tee assembly (GM 2158157, with the $\frac{5}{16}$ " end toward front of duck) to the tee

support using 1 bolt (H1-5152341), 1 plain washer (H1-7043681), 1 lockwasher (H1-7025681), and 1 nut (H1-4167521), Fig. 17.

(11) Now slide brake-line assembly (GM 2207393, Fig. 4) through the holes in both cross-members and connect the curved end to the rear-rear-axle brake-hose (inside the hull, Fig. 14) and the other end to the tee assembly (Fig. 17).

(12) Connect the curved end of brake-line assembly (GM 2207392, Fig. 5) to the front-rear-axle brake-hose (inside the hull, Fig. 13) and the other end to the tee assembly.

(13) Use the last piece of tubing



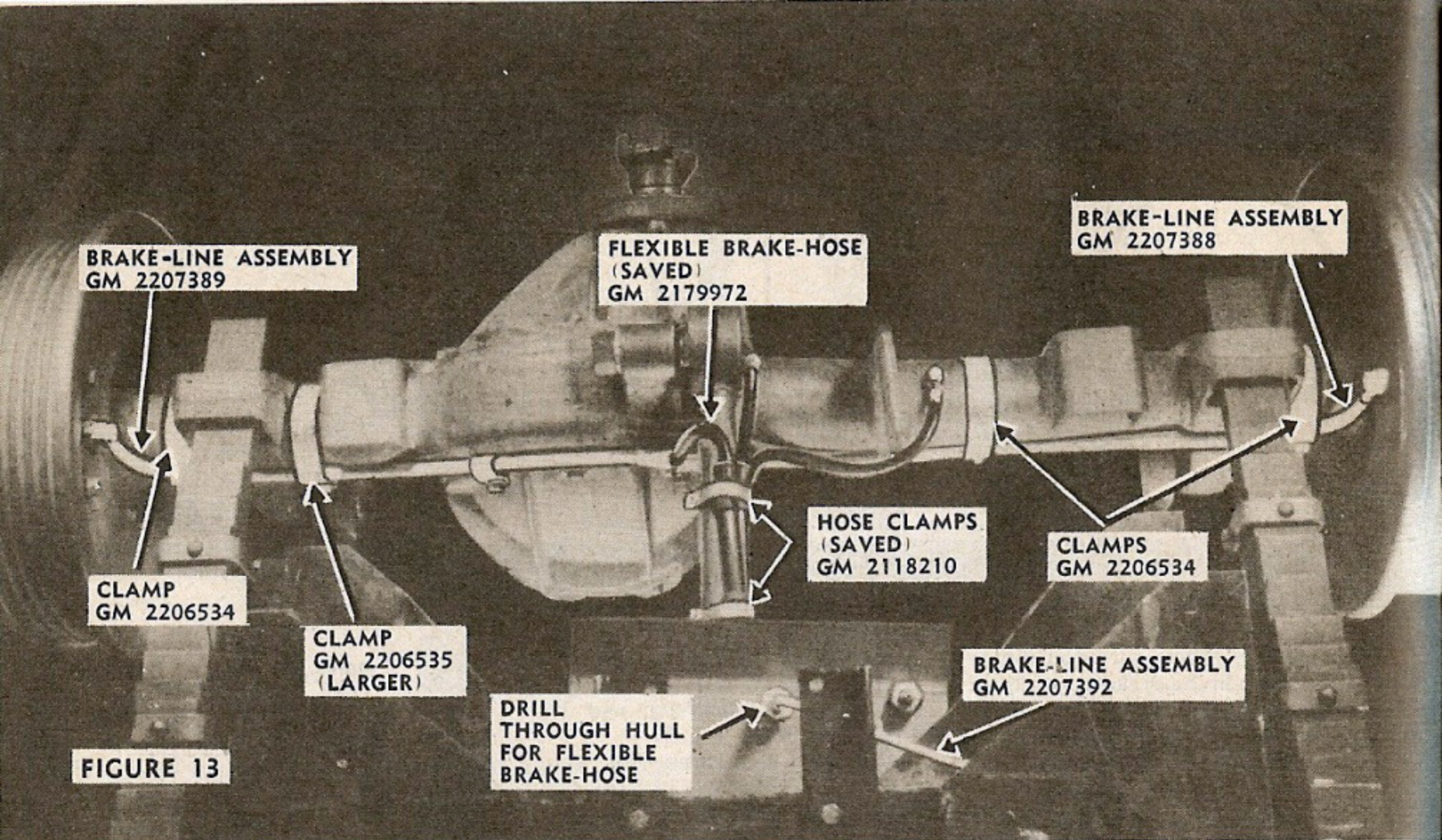


FIGURE 13

Fig. 13 — Front rear-axle — cut-away view. This substitute for the underside of a duck waddles off the top of the page, and you can't see the straight brake-line that runs to the hydrovac. What you can see are the bends in the brake line and outer tubing hugging the axle housing—the flexible hose clipped to the torque arm with the vent tubes, then connected through the hull to the metal brake-line (GM 2207392)—and the way the slit wire-loom wraps around the flexible hose and the vent tubes.

Fig. 14 — Rear rear-axle — another cut-away view. There's very little difference in the installation on either this axle (below) or the front rear-axle. The brake-line takes the same curves around the axle housing—the flexible hose runs along the torque arm and is connected through the hull to the metal brake-line (GM 2207393). In this picture you can see the slit wire-loom more clearly, and since it's on the flexible hose leading from the rear-axle, there's only one vent tube to wrap and clip.

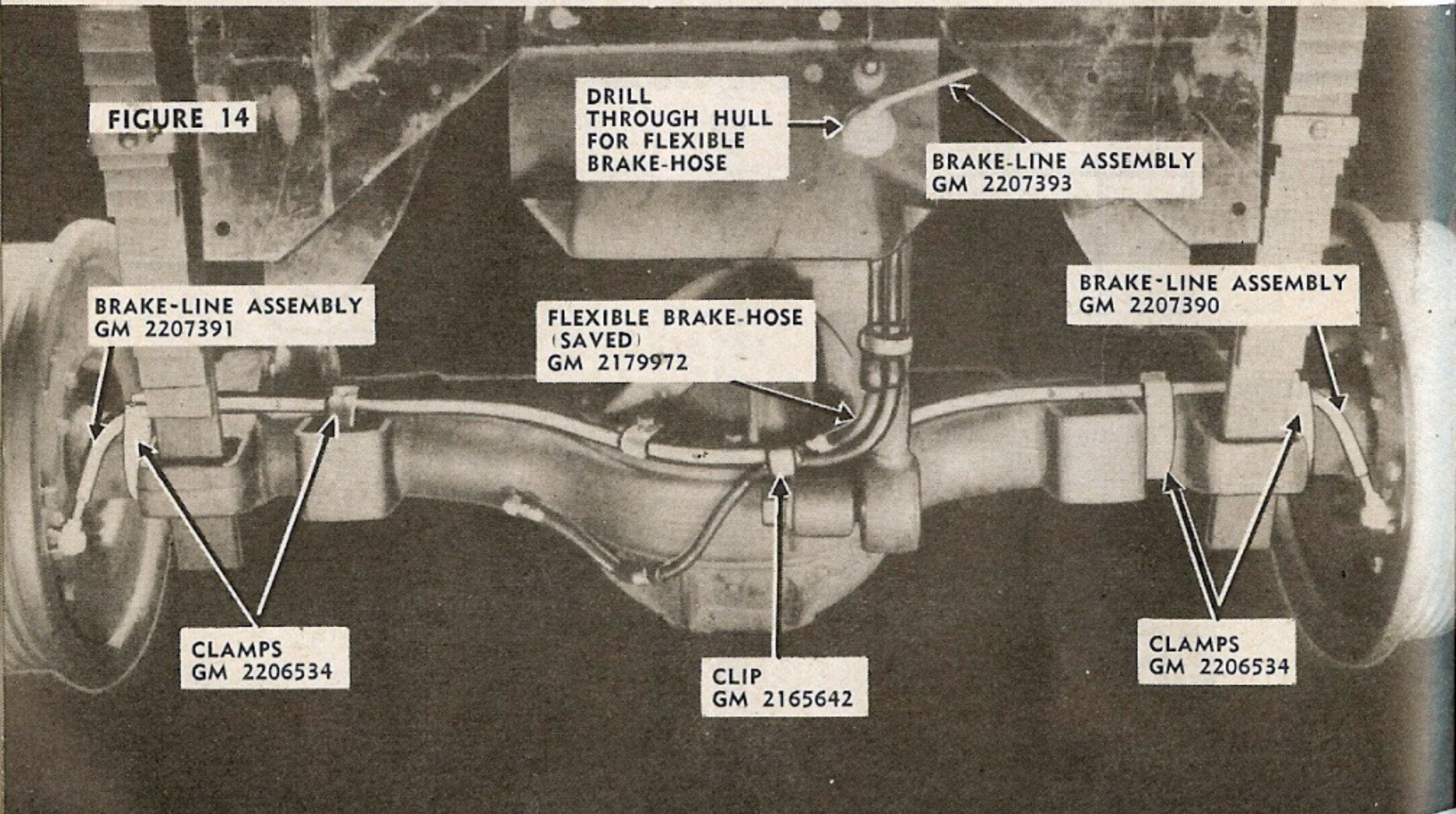
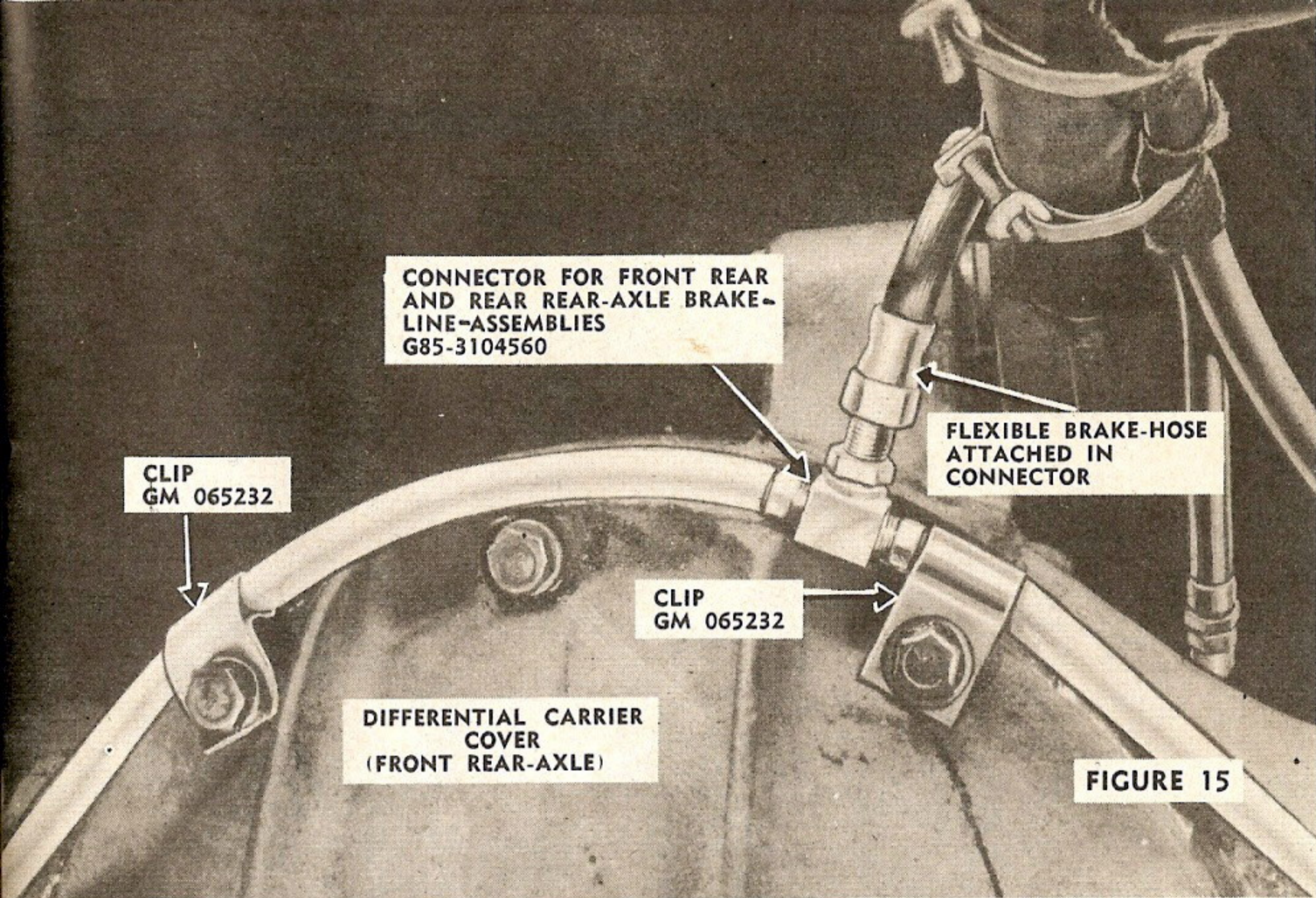


FIGURE 14



**CONNECTOR FOR FRONT REAR
AND REAR REAR-AXLE BRAKE-
LINE-ASSEMBLIES
G85-3104560**

**FLEXIBLE BRAKE-HOSE
ATTACHED IN
CONNECTOR**

**CLIP
GM 065232**

**CLIP
GM 065232**

**DIFFERENTIAL CARRIER
COVER
(FRONT REAR-AXLE)**

FIGURE 15

now, the long, 67 straight inches (GM 2207394, Fig. 6). Connect one end in the tee assembly at the cross-member (Fig. 17). Run the other end towards the front of the duck and connect it in the tee beside the hydrovac. Remove the center bolt from the floor-support angle (in the cross-member behind the hydrovac), slip your last clip (GM 192107, Fig. 12) over the brake-line and fasten the clip

with the center bolt.

(14) Spread caulking compound over the ends of the outer-tubing on the axles. They should be resealed in case you've squeezed out any compound juggling the tubes around.

(15) Put hydraulic fluid in the lines, bleed them, then service and test the brakes (TM 9-802 (1 Sep. 43, Section XXXIV). Check all the brake-lines for leaks. If every-

thing's according to Hoyle, you did a damn good job.

Last, but not least, of the story is 3 coats of Primer, metal, zinc chromate (Federal Stock No. 52-P-20624) and 1 coat of Enamel, synthetic, O.D. lusterless (Tentative Specification ES680B, Class 204) (Federal Stock No. 52-E-4171-15) for all the exposed metal parts. The primer and paint come in 1 gal. containers.

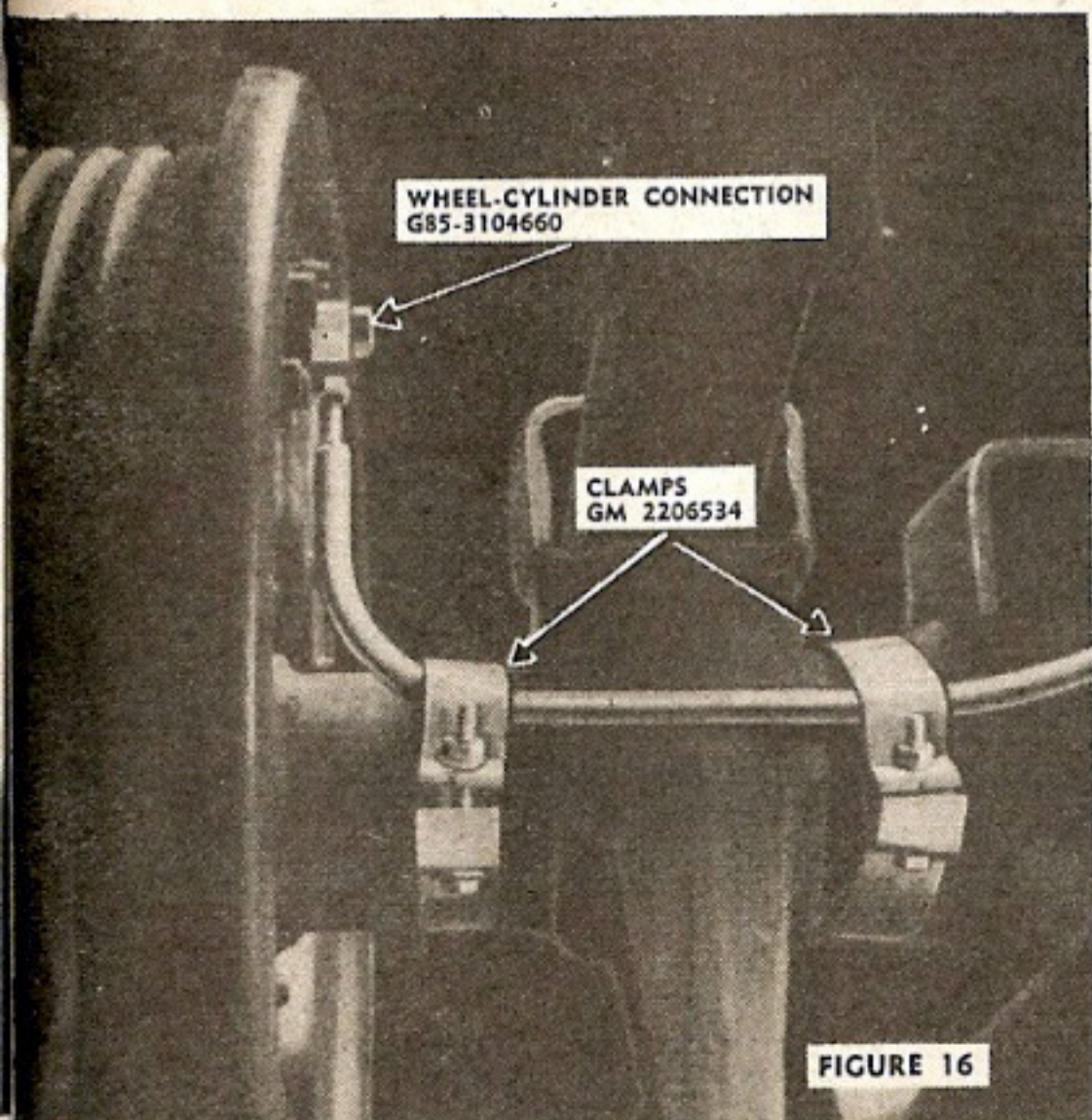


FIGURE 16

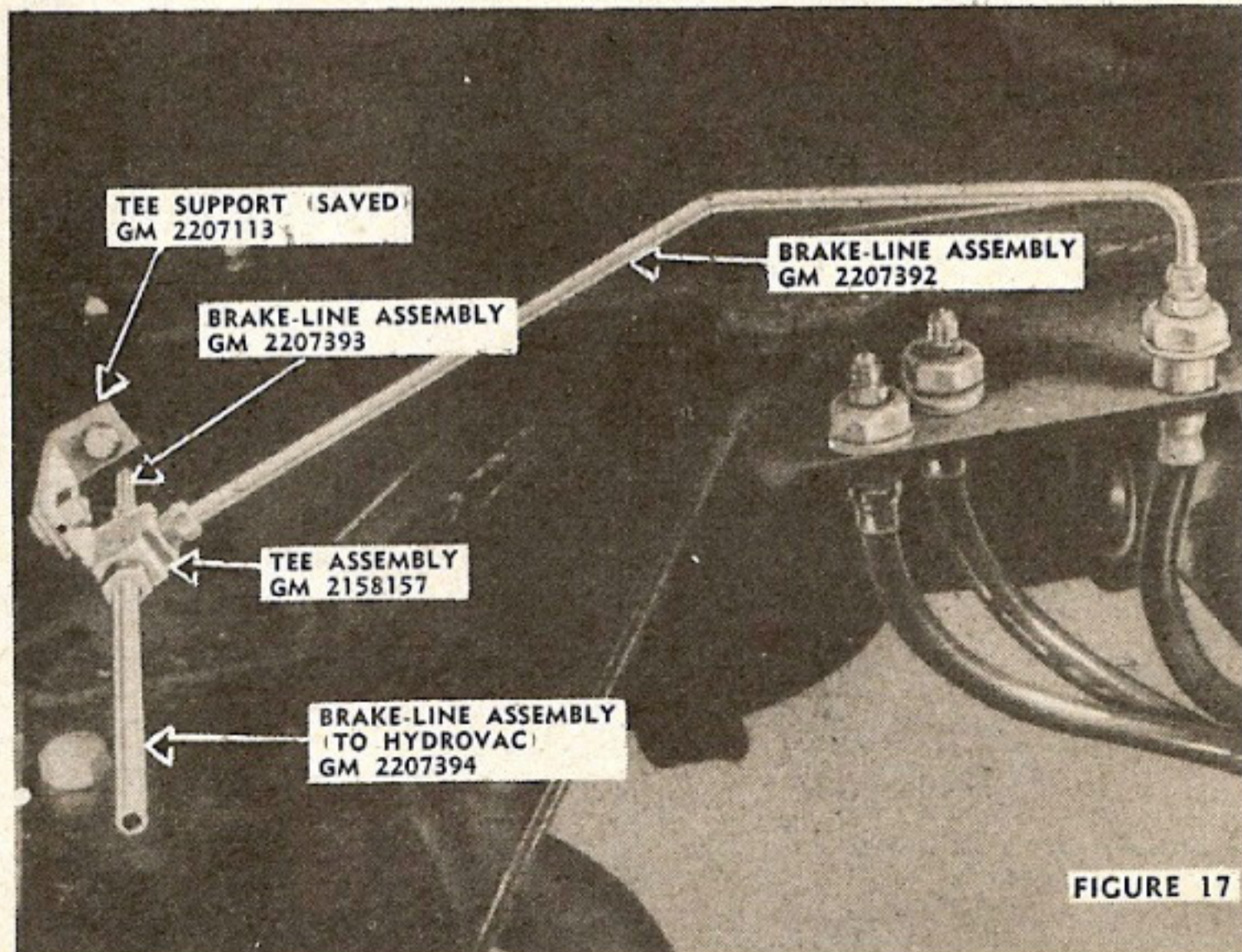


FIGURE 17

Adjusting Scintilla Magnetos on

HERE'S HOW TO MARK THEM SO YOU CAN FIND THE MAXIMUM POINT-OPENING EASILY

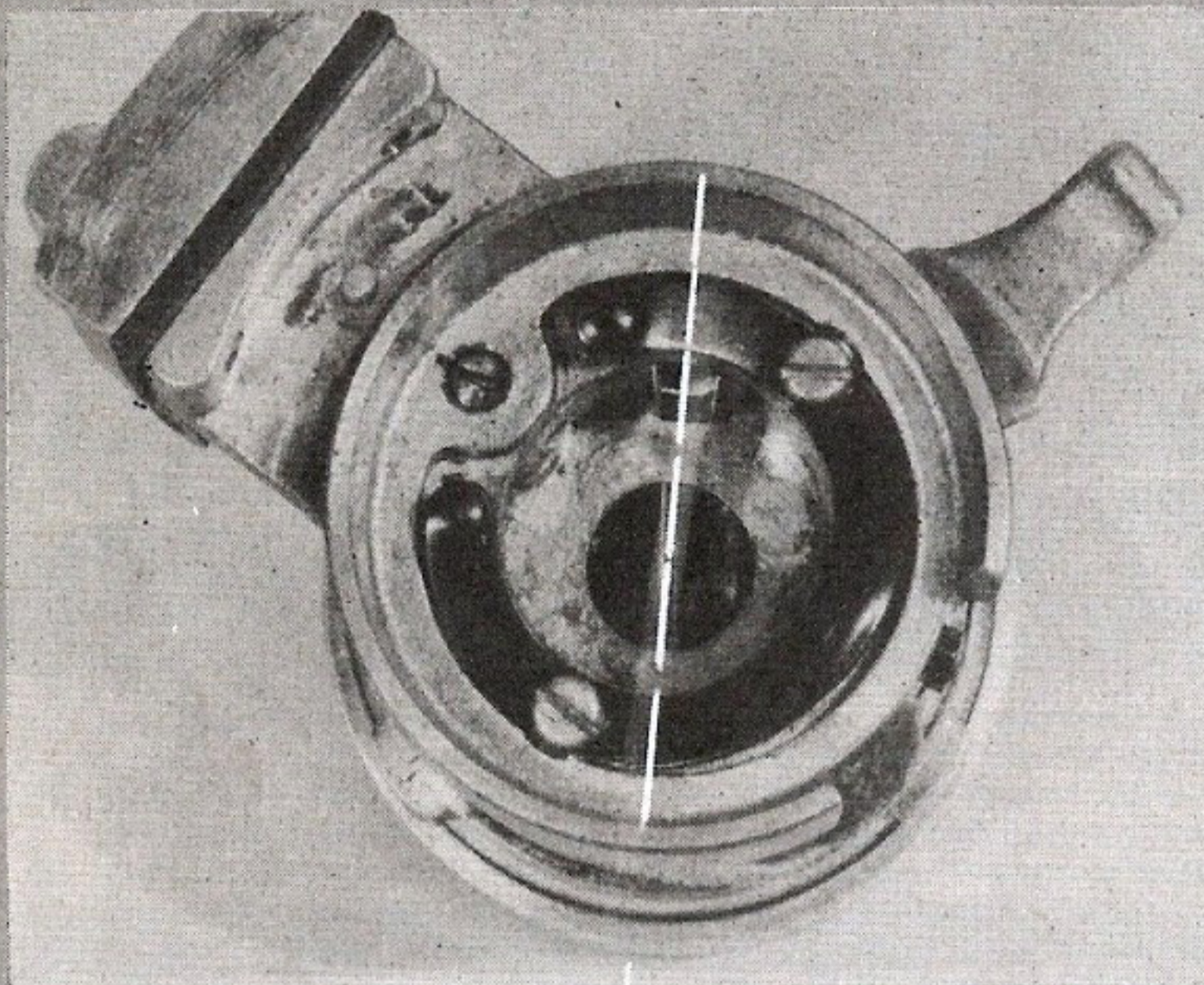


Fig. 1—Here's the backside of the breaker-point assembly removed from the magneto housing. Place a straight-edge (dotted line) across the assembly—bisecting the center screw and the cam follower. Prick punch as at left, above.

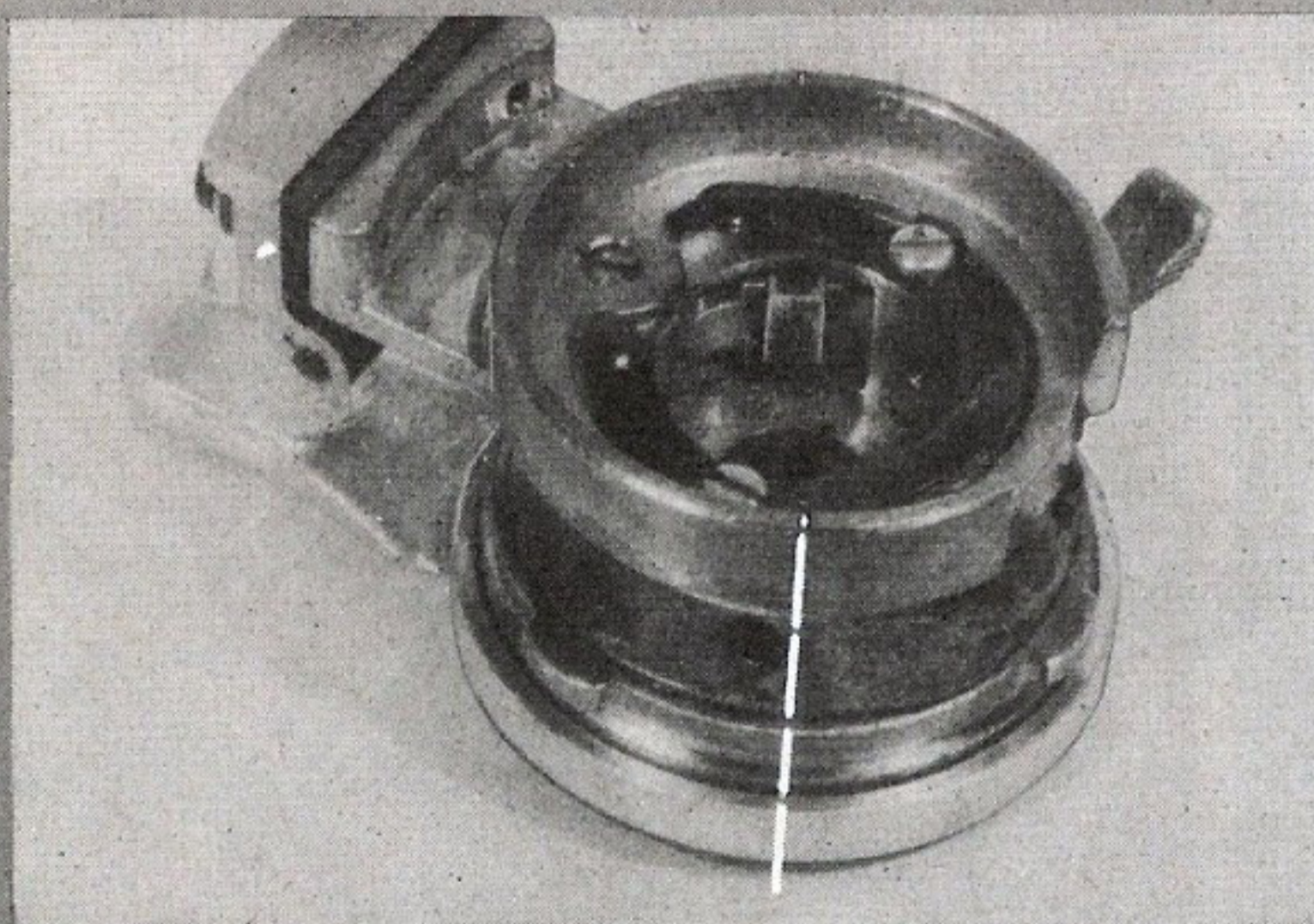


Fig. 2 (left)—Now you've got to transfer the prick-punch marks down to the exterior cap-face on both sides (dotted line). Finding the point opening depends on accuracy, so don't rely on your eyes—use another straight-edge held at right angles to the first (along the dotted line shown in Fig.).

Fig. 3—Put the breaker-point assembly back into position in the magneto housing. Mark the magneto-housing face with small prick-punch marks adjacent to the cap prick-punch marks (at right).

M4 and M4A1 Medium Tanks

Trying to find the maximum breaker-point opening when you're adjusting a Scintilla magneto with the engine reposing in your M4 or M4A1 medium tank always has been a tough proposition. But here's a way of marking the magneto cap and housing face on R975-C1 and R975-C4 engines, so you'll be able to find that maximum point-opening in a hurry—and without guesswork. All you need is a straight-edge, a prick punch, and a sharp eye.

Begin by removing the breaker-point assembly from the magneto housing, being careful not to lose the little spring-shim-washer (see Fig. 4) that keeps the magneto breaker box tight. The photographs on these pages take it from there.

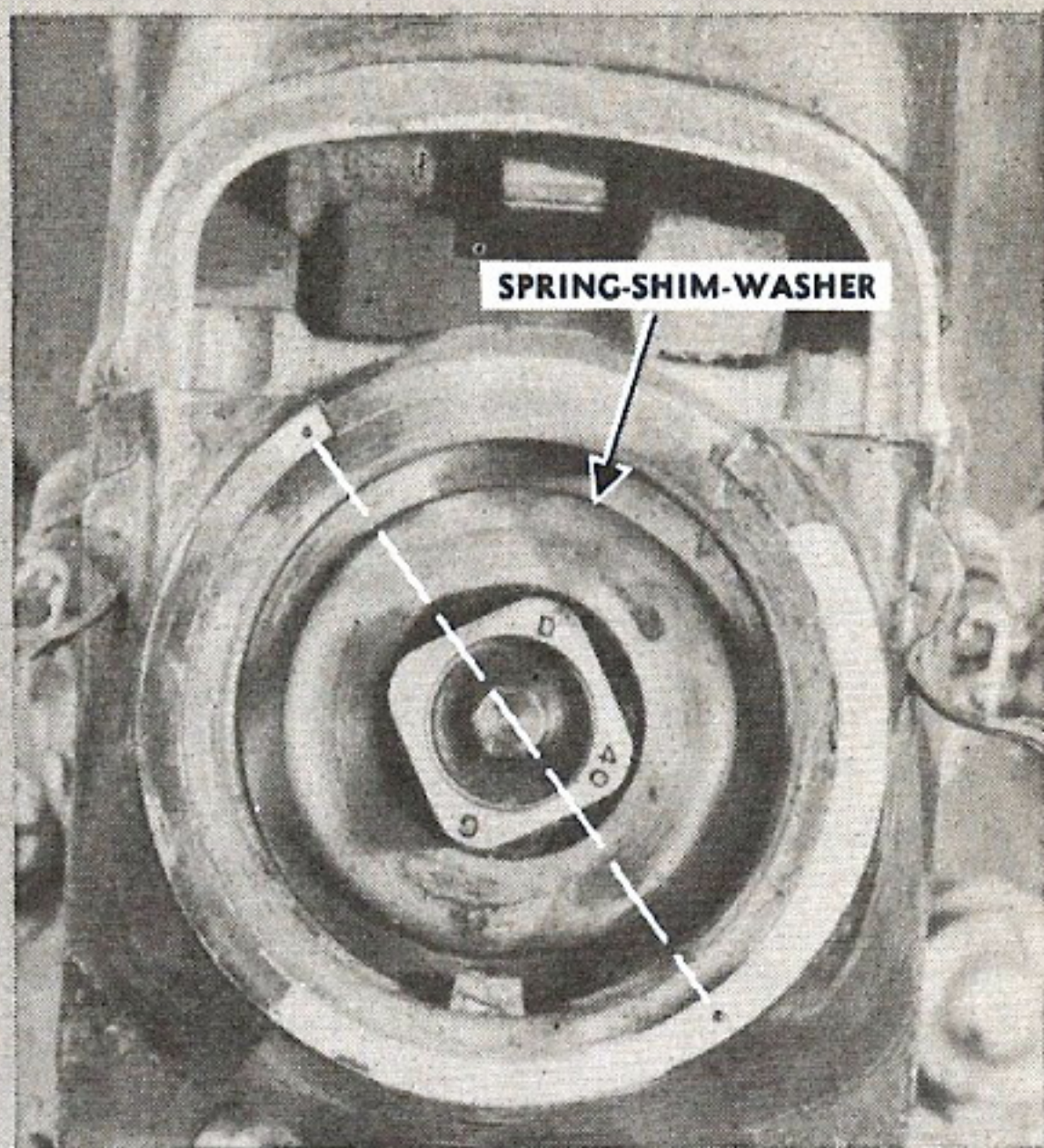
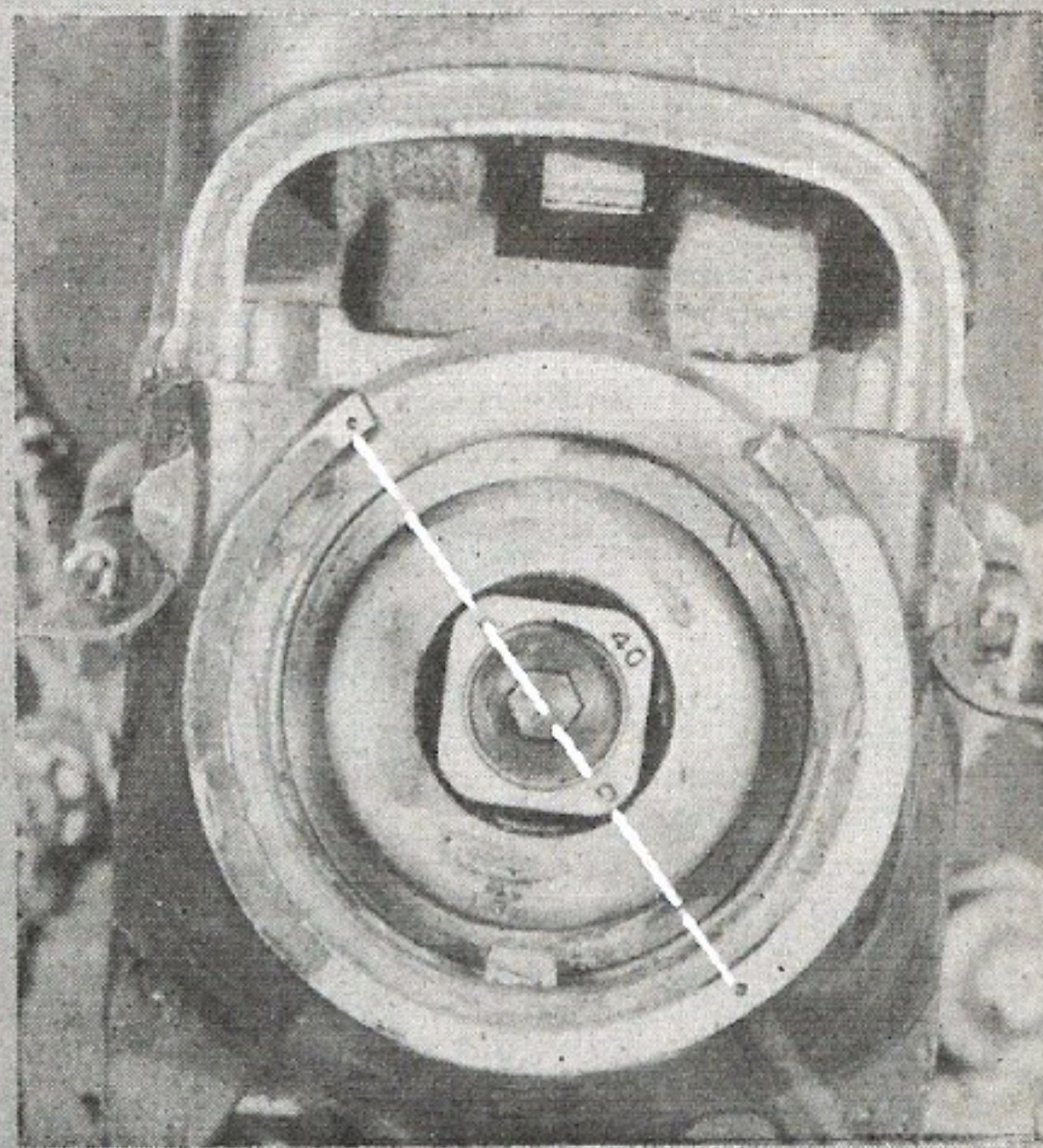
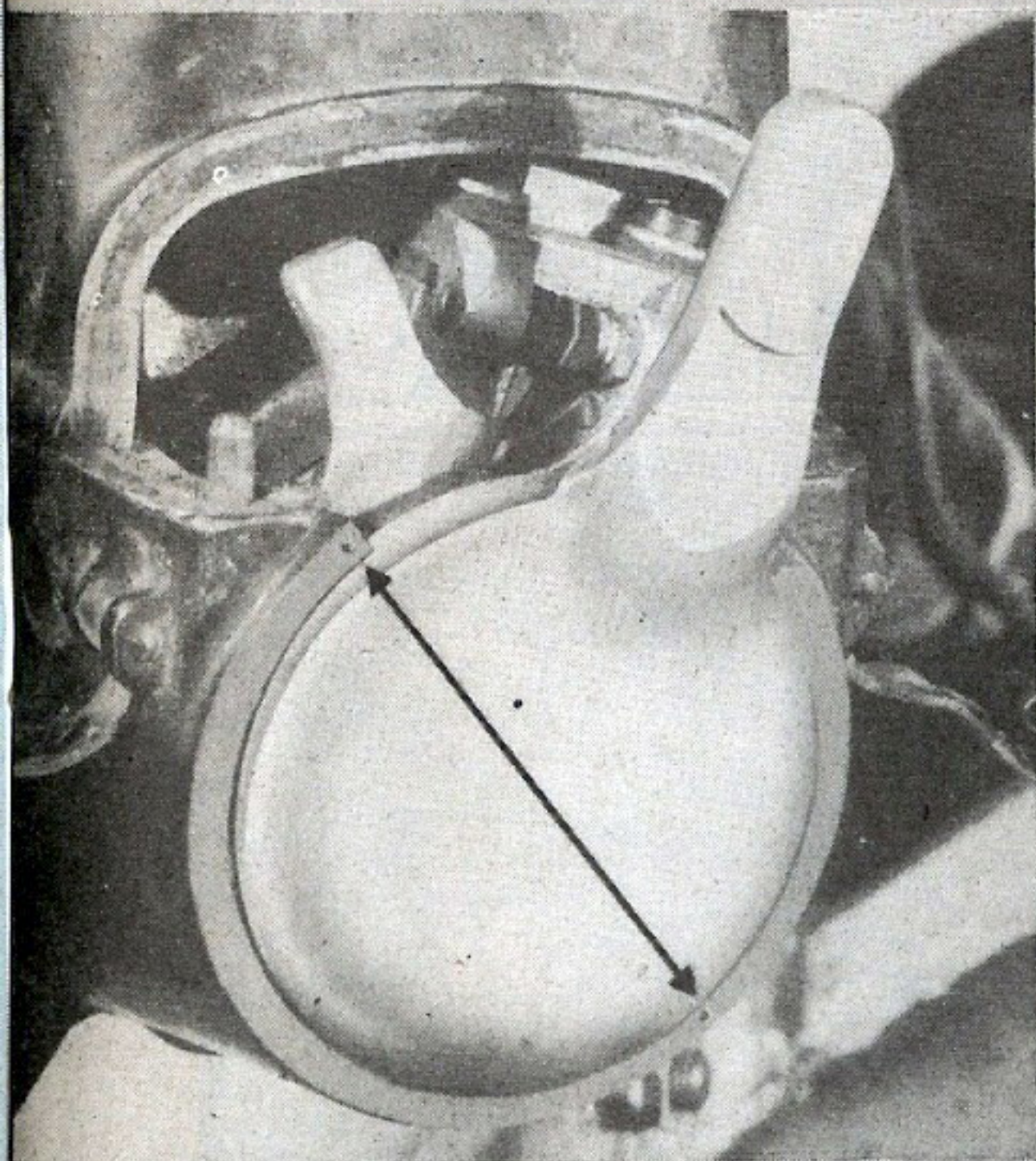
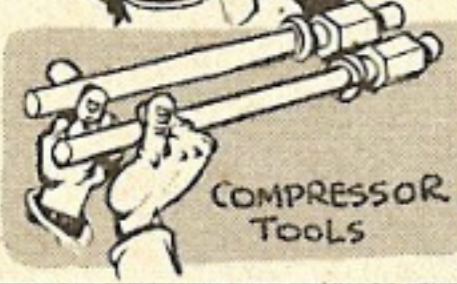
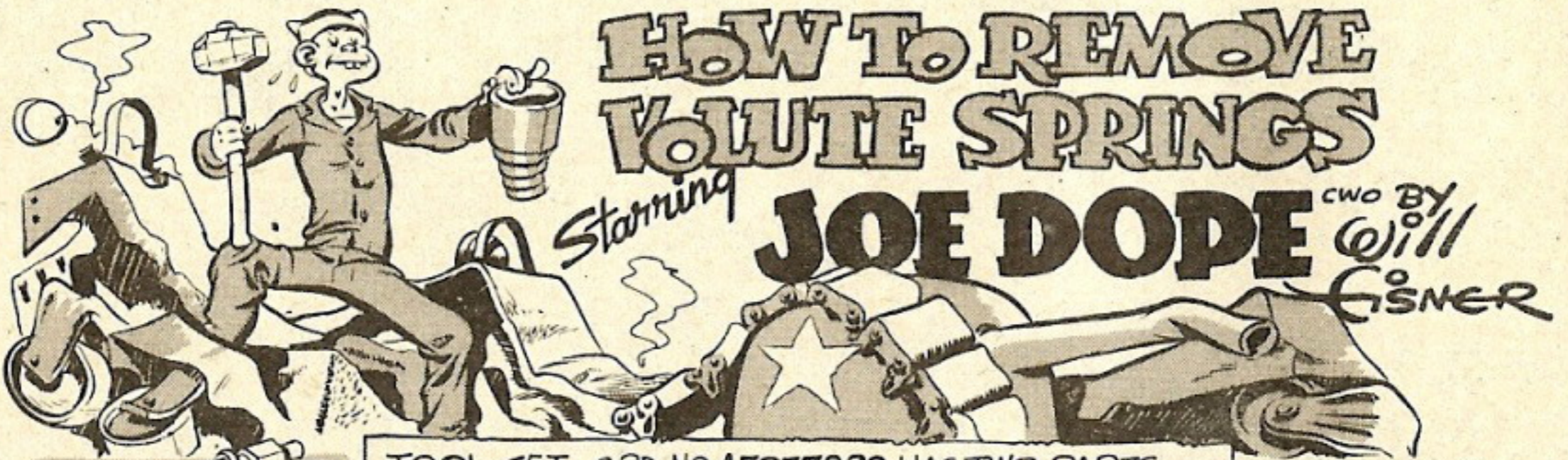


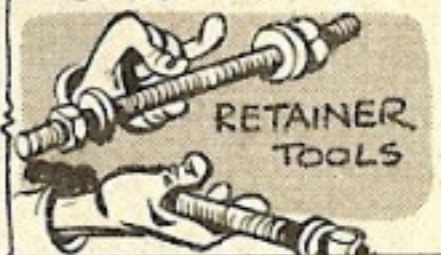
Fig. 4—Remove the breaker-point assembly again. Hold a straight-edge across the prick-punch marks and start cranking the engine by hand to bring opposite cam lobes into alignment with it.

Fig. 5—Cam lobes lined up with prick-punch marks. Maximum point opening is now set. Insert the breaker-point assembly and check the gap (0.012-inch clearance) with a feeler gage as usual.





TOOL SET ORD. NO. A7077222 HAS TWO PARTS....
**SPRING COMPRESSION TOOL #379940 AND
 RETAINER TOOL #379944**-THIS WORKS ONLY
 ON TANKS WITH SPRINGS SUSPENSION
 NO. D-417527A AND D-47527B..GOOD ON
 CAP SCREWS OR LOCKNUTS ON STUDS

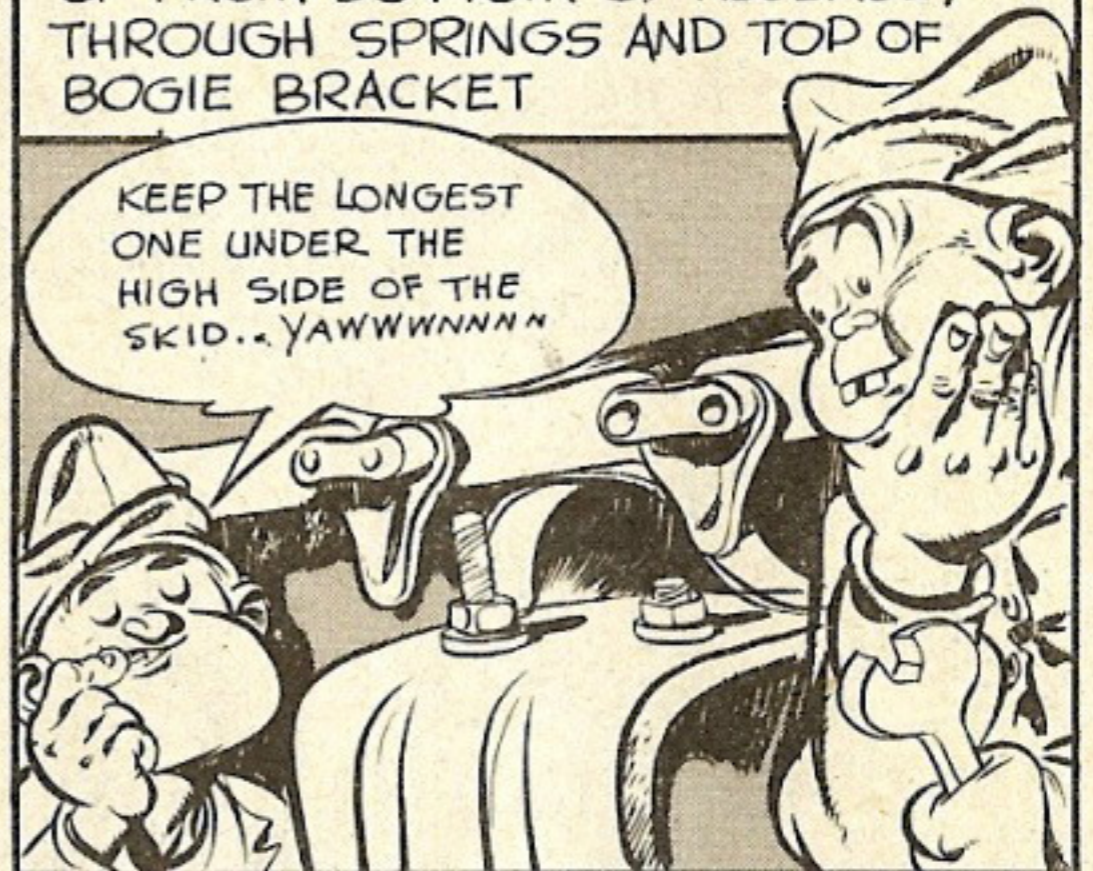


ROLL Y'R TANK
 SO'S THE CENTER OF A TRACK BLOCK IS
 DEAD UNDER THE CENTER STUD OF
 A HULL BOGIE-BRACKET CAP- AND
 REMOVE THE 5/8" PLUGS ATOP THE
 BOGIE BRACKET.....

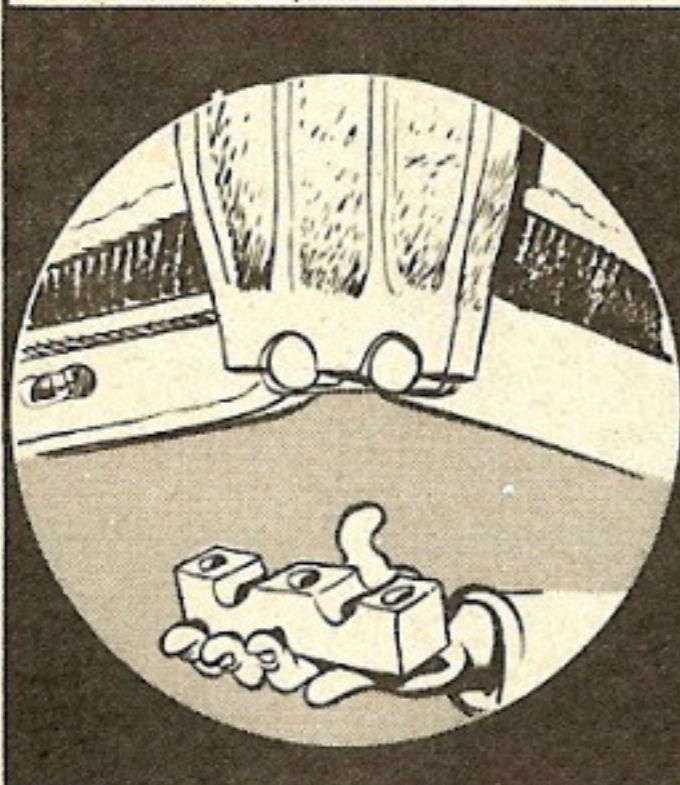


INSERT THE SPRING RETAINER
 UP FROM BOTTOM OF ASSEMBLY
 THROUGH SPRINGS AND TOP OF
 BOGIE BRACKET

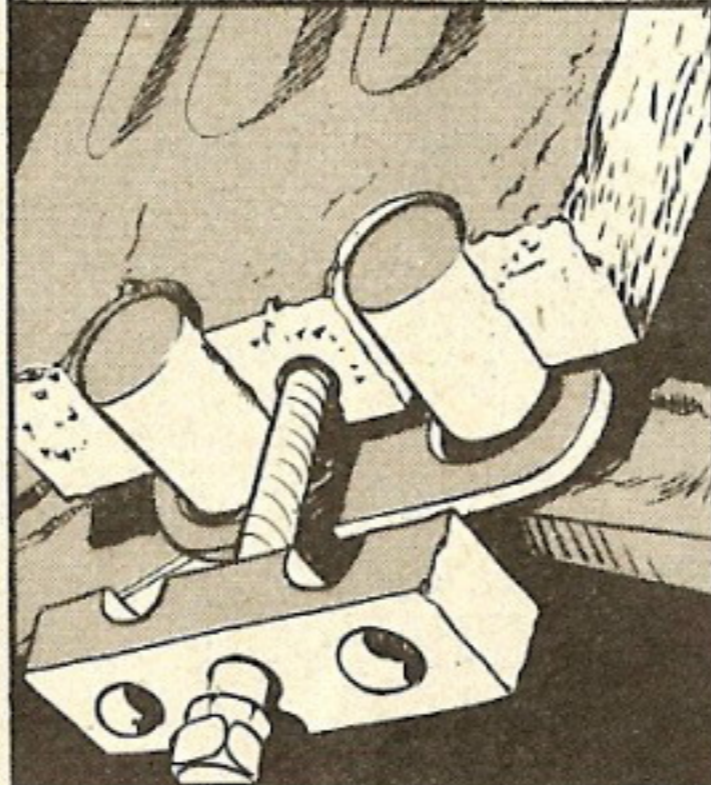
KEEP THE LONGEST
 ONE UNDER THE
 HIGH SIDE OF THE
 SKID.. YAWWWNNNN



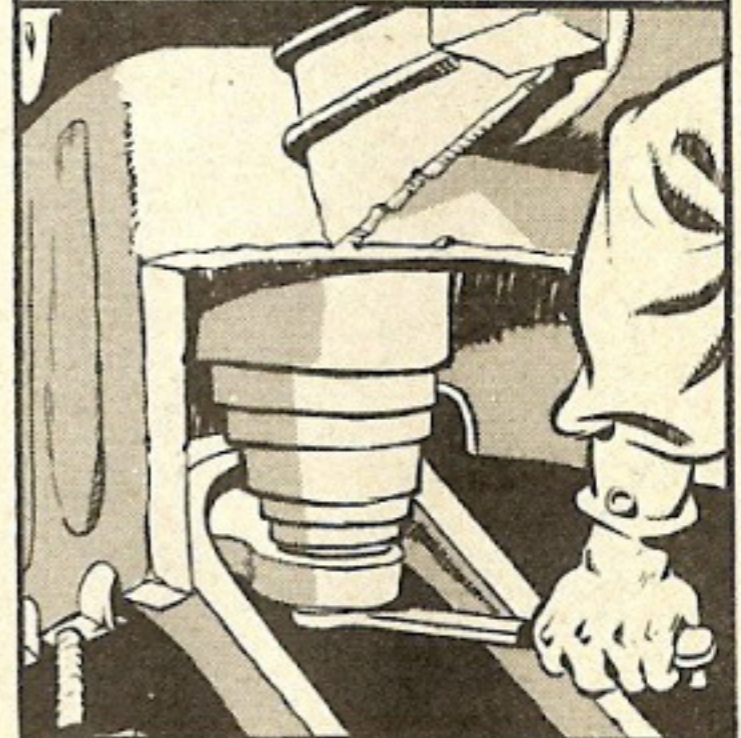
ON OUTSIDE BRACKET
**FIRST-REMOVE CAP
 AND STUDS!**



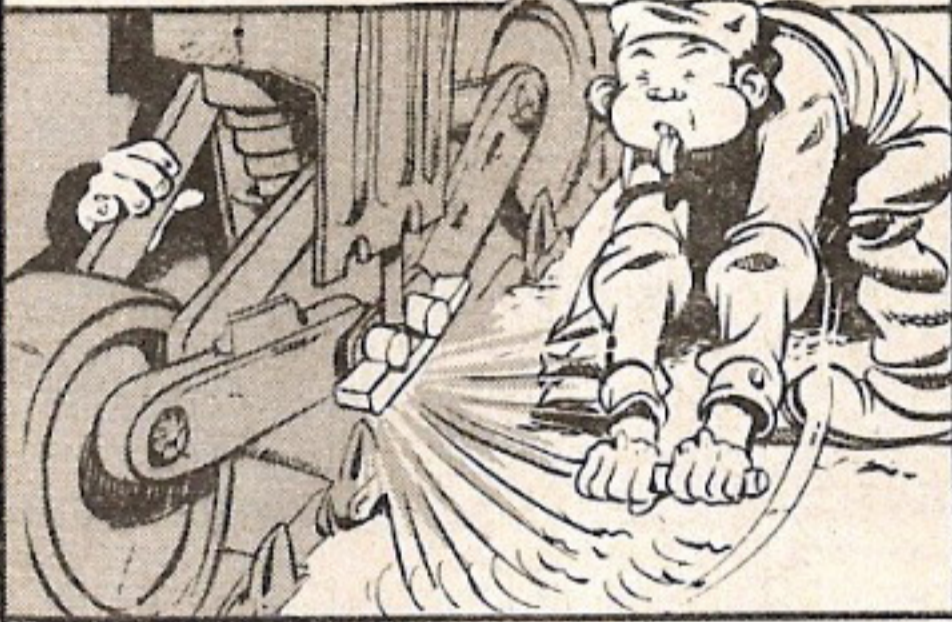
INSERT COMPRESSOR
 TOOL INTO CENTER STUD
 HOLE...WITH CAP



NOW....UNSCREW NUTS
 ON RETAINER WHICH HAS
 BEEN HOLDIN SPRING UP
 ... DON'T TAKE 'EM OFF !!



NOW, QUICK LIKE ALL HELL Y'GET A BUDDY AND TO THE TUNE OF DIXIE IN E-FLAT, Y'BOTH LOWER SPRINGS BY UNSCREWING NUTS ON THE COMPRESSORS... DO THE SAME ON THE OTHER SIDE OF THE TRACK



WHIP OFF THE SPACER ON BOTH SIDES OF THE TRACK



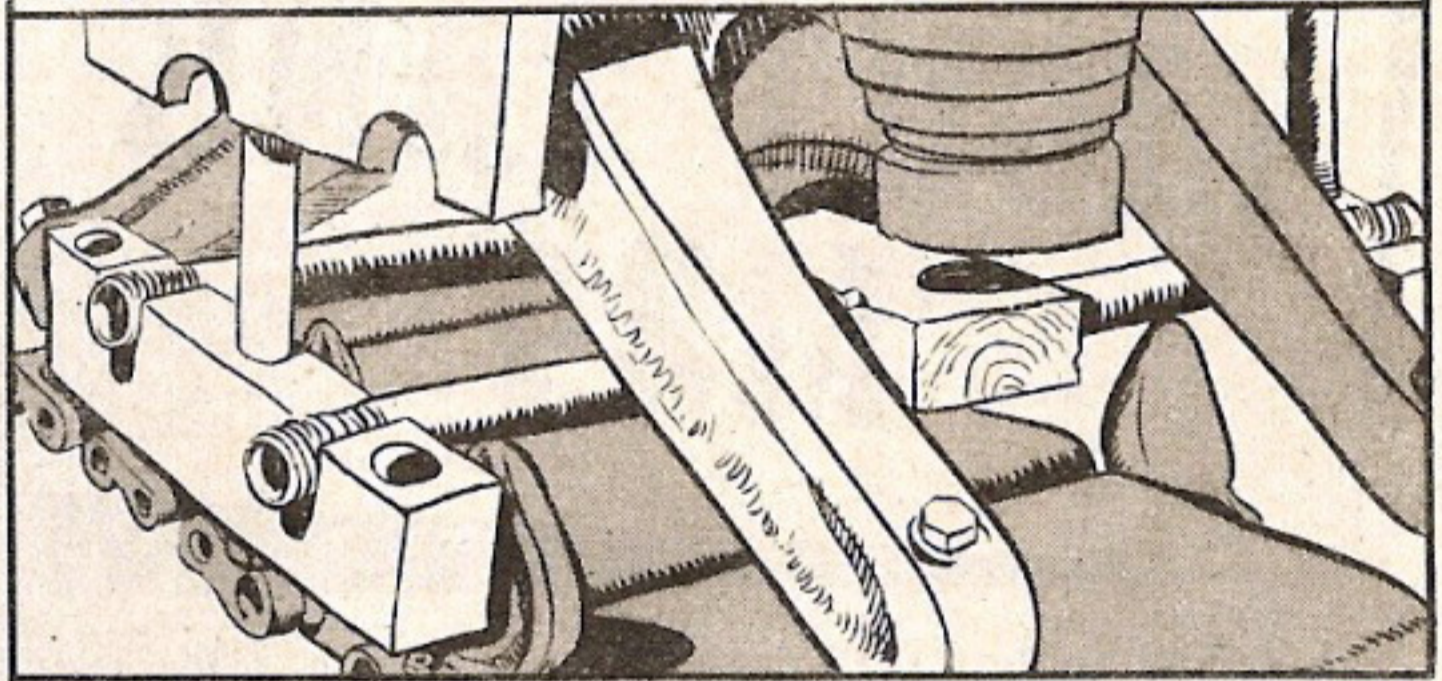
TIGHTEN THE SPRINGS WITH COMPRESSORS AGAIN



AND REMOVE THE WHEELS



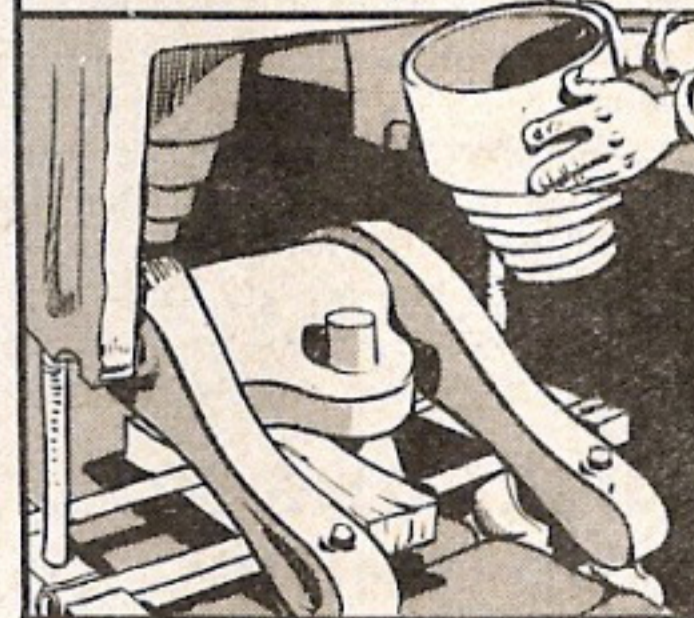
TIGHTEN UP THE RETAINER TOOL AGAIN AND RIG UP A GADGET THAT WILL HOLD UP THE BOGIE ARM ASSEMBLY... TRY A COUPLE OF PIPES AND A HUNK OF WOOD... DROP THE PIPES INTO THE GUDGEON CAP GROOVES.. MAKES A FINE BASE



NOW LOOSEN THE RETAINER AND RELEASE THE VOLUTE SPRINGS BY SCREWING UP THE COMPRESSOR... LIKE A JACK

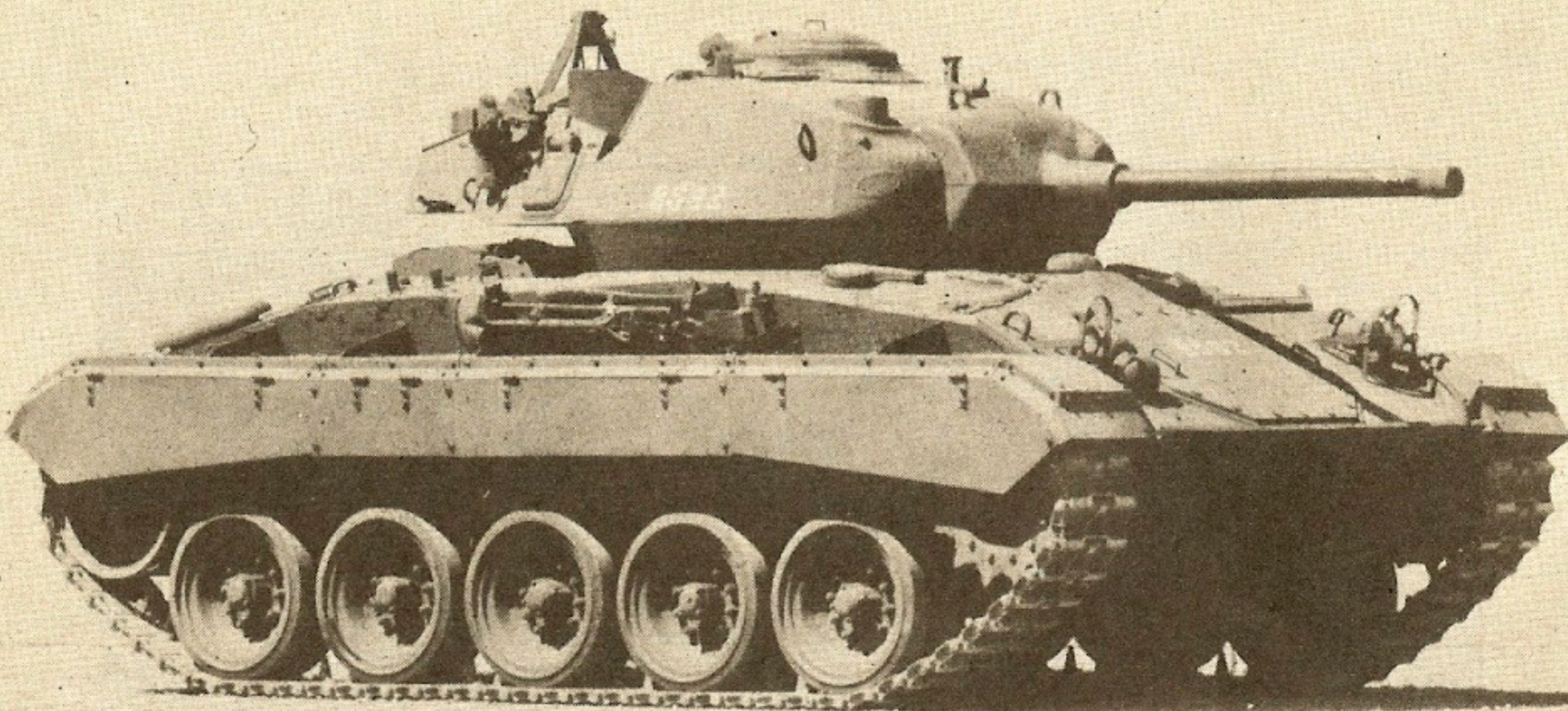


THEN UNSCREW THE COMPRESSOR DROPPING THE WHOLE ASSEMBLY LIKE A WORN-OUT GIRDLE... NOW LIKE A BREEZE, Y'REMOVE THE SPRING!



...AND THAT'S ALL THERE IS TO IT!... EASY AINT IT?





THINGS YOUR MOTHER NEVER
TOLD YOU ABOUT THE NEW...

LIGHT TANK M24

Introducing the M24 (T24), a "Greyhound" of a new light tank scheduled to replace the M5A1's now in the field. The M24 presents a lower silhouette and packs a lot more firepower than the M5A1. It weighs in at 20 tons and stands only 7'3", stocking feet.

The M24 and M5A1 engines are both built by Cadillac, but, sorry, they're not interchangeable between vehicles. Good news is that the engines on the M24 can be used in either the right or left side of the vehicle. The M5A1 had a special engine for the right side and a different one for the left, which often made engine parts-requisitioning a pain in the rompers.

This new tank has a power

train similar to the M5A1, except that the transfer unit is mechanical instead of hydraulic. In the M5A1, the transfer unit is shifted automatically; you hand-shift the transfer unit in the M24. There were more parts in the old hydraulic system; fewer parts in the mechanical transfer unit ought to cause fewer maintenance problems.

The electrical system has been stepped up to 24 volts. The old M5A1 had a 12-volt system.

The M24 has two guns mounted coaxially—the 75mm gun working together with a caliber .30 ma-

chine-gun, and a caliber .50 anti-aircraft gun in a turret with a 360° traverse (not 360° vertical, just horizontal, Hiram). The tank carries a four-man crew, with a caliber .45 submachine gun per crewman.

Following the style set by the M18, 76mm gun motor carriage, the M24 has torsion-bar suspension instead of the volute springs used on present light and medium tanks. Torsion-bar suspension gives a smoother ride and makes the tank a better gun platform—the torsion-bar arrangement eases bumps and shocks. Instead of the volute spring and bogie arm absorbing the shocks of rough terrain, a torsion-bar connected to each track wheel turns and twists every time the track runs over a bump or into a hollow. Shock absorbers attached to the arm of the track wheels, take some of the load off the torsion bars. This new suspension, so far, promises to be practically no trouble at all.

Benefiting by field experience, somebody was thoughtful enough to engineer a little more head and elbow room into this tank. There's more room for storage, more room for movement. The commander

**OPERATING TIPS, MAINTENANCE TIPS
AND THINGS TO KEEP AN EYE ON**

has an all-around vision cupola (six window-slots in the turret top so you can look out in any direction). The rest of the crew have periscopes and pistol ports.

WORDS TO THE WISE OPERATOR

Operating the M24 is different from operating the M5A1 light tank. You've got transmission and transfer levers to play with and a "neutral" pedal (puts transmission into neutral) to work. Driver training will, of course, be in your schedule for the new light tank. Here's a couple of tips to boot:

First, there's a trick to starting the engine. Both engines have to be started at the same time, except in extremely cold weather. When it's really cold, 10°F or below, then start one engine only—the batteries will just have oomph enough to start one engine (more about that in a minute).

In normal weather (above 10°F), start both engines with the transmission lever in **neutral** and the transfer-unit lever in **gear** (it's easier to shift the M24 into gear before you start the engines than after). Here's what happens to the deal if one engine is started before the other while the transfer unit's in neutral: The rotating action of the transmission is carried along through the idling-transfer-unit gears to the other engine's transmission. With one engine running and its parts moving, the output shaft on the second engine will be turned fast enough to kick up the oil pressure that opens the points on the oil-pressure signal switch. When those points are opened, the starter for the second engine can't make starting contact—and there you'll be, pushing the starter button that won't work. A little involved, but you get what we mean. Thing is, be sure to start both engines together, except when the weather's extra-wintery.

When it's cold, and you don't want to risk running the battery down by using it to start both engines, start one engine with the battery. Then use the running engine to start the other engine. This way: Put the transfer unit

and transmission lever in **neutral**, start one engine and warm it up to normal operating temperature, or run it at least 5 to 10 minutes at 1500 rpm's. Pull the transmission lever into **gear**, and the action of one engine running will start the second engine.

Here's something about shifting the M24 in very cold weather, before it's warmed up to normal operating temperature. A tip on putting it in reverse: First, bring the tank to a complete stop, then tromp down on the "neutral" pedal, and move the lever from "LO" or "HI" (whichever you're in) and reverse as rapidly as possible. Gear lube gets stiff and if you try to shift into reverse right off the bat, the gears will clash and eventually you'll be installing new gears.

Here's something to remember when you're driving the M24 down a steep hill or plowing through tough underbrush in low gear. Keep an eye on the tachometers and see that the engine speeds don't go over 3800 rpm's. Running over 3800 rpm's will age

the engines before their time and strew con rods all over the place. Maximum safe speed for this new tank is 35 mph.

Track tension isn't as tight on the M24 as on tanks that have gone before. The sag in the M24 track (between the second and third track-support rollers) shouldn't be less than 2¼", and it can be as much as 3½". Whenever you tighten the track, of course, make it 2¼". Reason for the greater sag is that the M24 track doesn't stretch as much as tracks on other tanks.

Don't knock yourself out on the driver's door when you're driving with it open. Make sure it's opened all the way, then push the handle all the way up to the roof—otherwise it'll swing back and conk you by surprise.

A good way to tell whether the shock absorbers for the track wheels are working is to stick your hand on the lower part of the shock after you've been rough-riding for about a half-hour. If it burns your fingers, the shock absorber is okay. If it feels

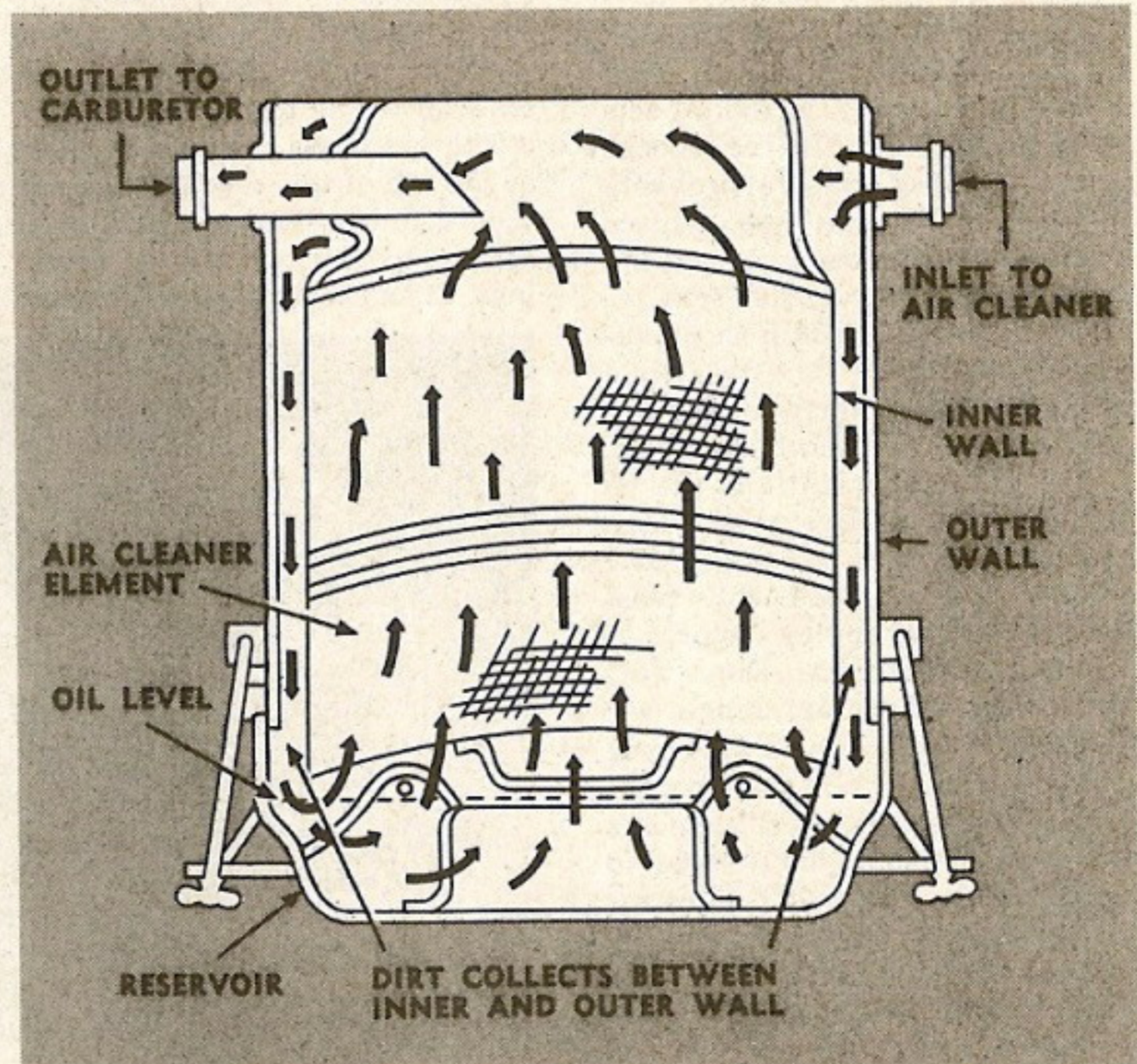


Fig. 1—The inside story of the new air cleaner on the M24. It needs watching because there's more room for dirt to pile up.

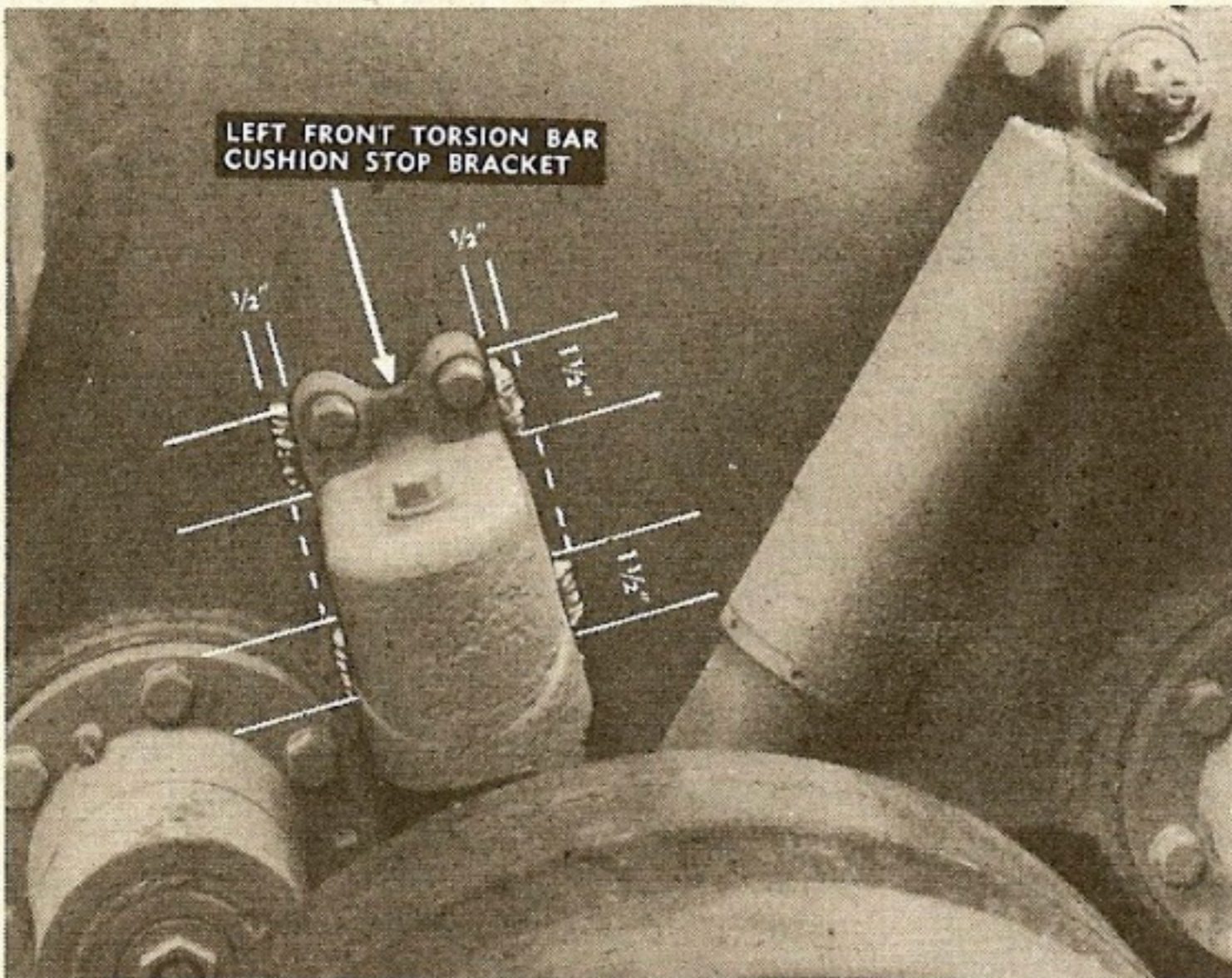


Fig. 2—Weld the front suspension-arm cushion-stop brackets on, or they'll be sheared off when you're traveling over rough roads. Leave the four mounting screws in place; weld with a $\frac{1}{2}$ " bead, $1\frac{1}{2}$ " long, top and bottom of each side of the bracket.

cold or only warm to your hand, something's wrong.

Inside the shock absorber, oil is squirted back and forth through layers of small funnels in such a way that friction in the oil sets up a lot of heat. If the shocks aren't working, they're probably leaking oil. In that case, replace them with new ones and send the worn shocks on to higher echelon, wrapped as a gift. Run shock absorbers for even a little while without fluid in them and pretty soon you ain't got shock absorbers.

You can hear a rattle in the U-joints on the fan-drive shaft, when your M24 engines are idling. The joints have to bend and twist around sharp angles, which is what makes the noise. Don't worry—it won't hurt anything.

If you're operating an M24 over dusty terrain, you'll find the engine oil and oil-filter elements get so dirty that you'll have to change them every 250 miles instead of every 500 miles, as prescribed in TM 9-729 (27 Jun. 44). The 500-mile change is for normal operating conditions.

Here's something else: The M24 has a different kind of air cleaner (see Fig. 1, page 243). The

air cleaner in the M5A1 had a double covering, but the outside case extended only half-way up the air cleaner. The air cleaner on the M24 has two covers that extend up to the top of the cleaner.

The air flows through an inlet at the top of this new cleaner and shoots down between the walls formed by the two outside coverings. Then the air goes up through

an oil bath, through the cleaner element to an outlet at the top.

You'll find, in this cleaner, that dirt piles up along the bottom of the walled section and collects all along the sides of the walls. So, besides changing the oil bath every two to four hours in dust areas, take a long piece of something like welding rod, poke it up between the walls, run it right around the entire cleaner and scrape the dirt off.

Another cleaning item that requires your undivided attention is the batteries. They're stuck in an armored box next to the engine compartment, on both sides, where lots of dirt and sand can get thrown up onto them. There's an armor-plate covering that can be lifted off to get at them. Be careful that the tops of the batteries are cleaned off before you take off the filler caps, to keep sand and dirt from sprinkling down into the electrolyte.

Another thing: See that the armor-plate battery-box cover is put back tight against the rubber seal to keep the batteries watertight. If dust collects on the tops of the batteries and gets wet, it'll form a dirt cake that's hard to get off. When corrosion and caked dirt collect on the battery cases, give them the old soda-ash-and-water treatment. Of course, washing soda, baking soda, or ammonia

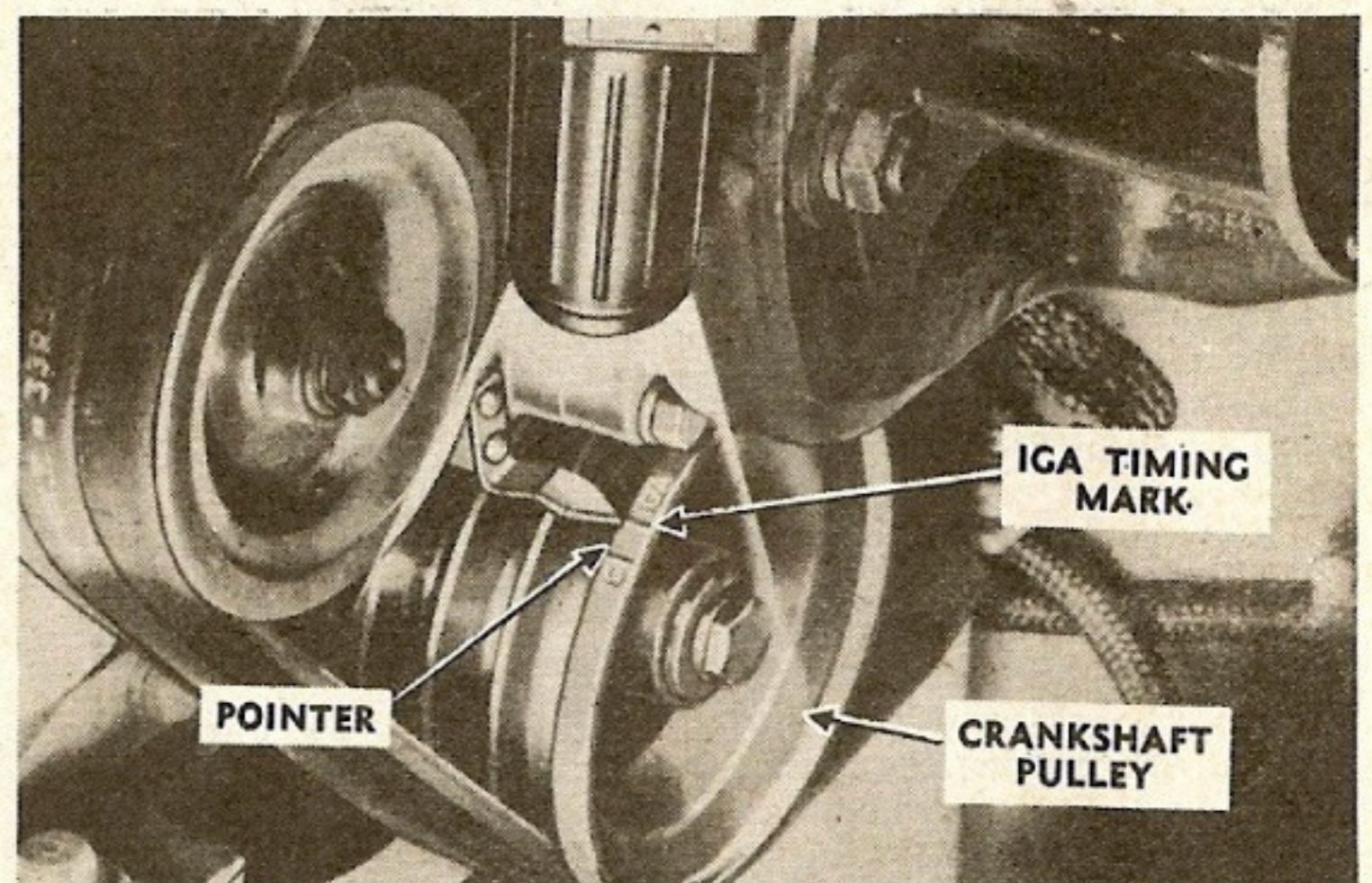


Fig. 3—Here's how the ignition timing neon light works hooked up to the No. 1 sparkplug. The timing's okay if the pointer lines up with the "IGA" mark on the crankshaft pulley.

will do the trick, too.

According to reports from the field, it's possible to shear the front suspension-arm cushion-stop brackets (see Fig. 2, page 244) on rough roads unless they're strengthened by welding. TB 729-FE-1 says to weld them to the hull in four places. This is in addition to the four mounting screws already holding the brackets. Weld on both sides of the bracket (top and bottom of each side) with a 1/2" bead, 1 1/2" long. Use 5/32" welding rod, Federal Stock No. 46-R-1485. Don't weld across the top of the bracket or you'll have a

devil of a time getting it off. Heavier brackets are being installed now and the new parts ought to hit the field soon.

There's a slight change to TM 9-729 in checking ignition timing. TB 9-729-1 (6 Sep. 44) says to use the neon light (Federal Stock No. 41-L-1440, 2nd-Echelon Set #1) to check timing instead of borderline detonation (see Fig. 3, page 244). You sure can't hear borderline detonation on the M24 over the blast and clatter of the fan and exhaust and moving U-joints.

Check the timing, in the good old-fashioned way, by hooking the

wire from the timing light to the No. 1 spark plug. Focus the light over the crankshaft pulley. With the engine idling, at 450 to 475 rpm's, the timing should be set so that the pointer indicator on the engine front cover, lines up with the "IGA" mark on the crankshaft pulley. Mark the "IGA" spot with chalk if it's hard to see.

Since the M24 is a new addition to the light tank family, designers, engineers, and everybody else around here will welcome suggestions or criticisms from the field. If you've got any news to report on the M24's operation or maintenance, let's hear about it.

FIREPROOF YOUR WINTERIZATION HEATER

Back in August, our story on Winterization Kits mentioned a coming modification for the Evans Underchassis Heater.

The modification for the heater, which will be available in "Conversion" kits (issue data below) shortly after November 1, promises to reduce any possible fire hazard.

There is always a fire hazard in heaters that use gasoline for fuel—which is why you never see them used to heat houses. So a good rule to follow is, use your heater only in the very cold kind of weather it was designed for—below zero.

First item to be modified is the fuel line stretching from the float bowl to the heater. The kit contains a smaller line that keeps vaporization from pushing an overdose of fuel into the heater.

Second, to take care of fuel fumes rising out of the heater's float bowl, the conversion kit contains a tube. This tube runs from the vent to the burner part of the heater and allows all fumes to burn harmlessly.

Next thing, give the "high-fire" adjustment screw on the heater a 3/4 turn clockwise. This will cut down the size of the flame in the heater.

The conversion kit contains an elbow to hold the fuel-line coming from the fuel tank a little farther away from the heater proper. This also cuts down vaporization in the float bowl. The elbow replaces the clip now holding the line to the bottom of the heater.

Finally, there's a last additional safety factor. If somebody should forget to properly tighten the connection at the fuel tank feeding the heater, a leak might develop. To keep leaking gas from running down the line and dripping on the hot heater, the kit contains a rubber grommet or collar to slip over the fuel line. Stray drops of gasoline running down the line will strike this grommet and be deflected harmlessly onto the ground.

As we mentioned in the August winterization story,

all kits containing the underchassis heater would be frozen in stock until the modification kits were ready. When the kits are again issued, they will include materials and instructions on how to modify the heater. You'll have to modify any new underchassis heaters you receive before you use them on your vehicles.

If you already have an underchassis heater, requisition the modification kit through your regular supply channels. Requisition: **Conversion Kit for Model HV203800 Evans Underchassis Heater, Kit No. WKSP-200, Official Stock No. G9-5700180.**

The following kits contain the underchassis heater:

Kit No.	Official Stock No.	Vehicles
WKT-111	G512-5700722	6-ton, 6x6 White, Corbitt, Brockway
WKT-113	G642-5700724	10-ton, 6x4 White
WKT-115	G116-5700727	Heavy Wrecker M1, Ward LaFrance
WKC-212	G67-5700742	Scout Car, M3A1, White

(Continued on page 256)

Here's still another improvement for your Evans Underchassis Heaters (see story above).

It seems that the first batch of Evans Underchassis Heaters had a float valve that you had to regulate by hand. However as time marched on, somebody worked out an **automatic** float valve which saved you the trouble of hauling your tail out in the cold and hand-regulating your heater. The automatic float valve was featured in all heaters purchased after the first batch.

Now, we hear that a special kit has been made up to enable you to convert any first-batch heaters you may have, from hand-regulated to automatic float valve.

Look at the nomenclature plate of your underchassis heaters. If they are Model HV203463, they are first-batch heaters. Requisition for each of these heaters a **Kit, Conversion, Float Valve, for Model HV203463 Evans Underchassis Heater, WKSP-200A, Official Stock No. G9-5700181.**

All you've got to do to make the changeover is simply take the old cast-iron float bowl off your HV203463 heaters and install the new float bowl from the kit. Of course, this is all in addition to the safety modifications described in the story above.

CONTRIBUTIONS



Dear Editor,

While on maneuvers, we had quite a time aligning ¼-ton, 4x4 transmissions when installing them. Due to mud we were unable to use the transmission jack; and also while working under blackout conditions, it was very hard to get the shaft aligned.

We found by taking four U.S.S. ⅜" bolts and sawing them off to lengths of 2½", we had four stud guides that we could easily screw in the flywheel housing. Then, by placing the transmission and transfer case assembly on the studs, it slid right into place. Be sure the studs aren't over 2½" long, or you'll have trouble getting them out. You'll find that this will save you a lot of time and headaches.

T/4 Lucian W. Royall
717th Airborne Ord. Co.

(Ed. Note—A word of warning. Be careful, when using studs without a supporting jack, that the weight doesn't crack the clutch housing.)

Dear Editor,

Here's a suggestion that was adopted in this shop and is passed along to you for whatever you think it's worth.

When brake drums are turned down, the amount of metal removed is indicated by stamping the figure, such as .010 or .020, etc. on the outside of the brake drum. By this method the shim stock doesn't have to be measured when the drums again require cutting. Time is saved, and the decision to turn or replace the drums can be instantly made.

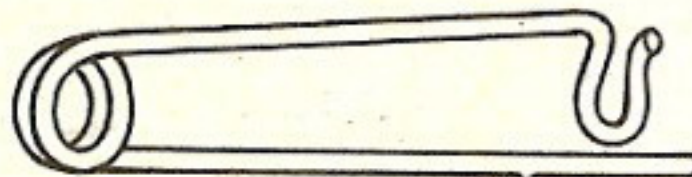
If this idea has merit, perhaps a universal plan of some sort might be developed.

Lt. Edward N. Henderson
Medium Maintenance Co.

(Ed. Note—Marking drums to record shim measurements is a good idea. And did you know also that shims are available in thicknesses of .015? It's a good system to use these and grind off .015 or .030 (whichever is necessary) and use either one or two shims. If you have to grind off more than .030 metal, use your regular shim stock, as three shims might be too thick for the rivets to hold the lining on the shoe.)

Dear Editor,

If you've lost the chain and cotter pin off your pintle-hook, this pintle-hook lock (see Fig.) is a good expedient.



Here's how you make it. Take a piece of ⅛" wire or brazing rod (if you can get hold of it) long enough to make the size pin you need. Bend it around a broom handle to form the circular end of the pin and leave one end longer than the other. Then bend both ends at right angles, turn the longer end into a loop, and you have an over-sized safety pin.

We have only one trouble with these pins. We don't dare leave 'em in the pintle because other

outfits have a method of procurement that isn't very original.

M. H. Holtz
Civilian Automotive Advisor

Dear Editor,

Here's a stunt to prolong the life of brake linings on GMC's (with Lockheed fronts), and Chevrolets.

When pulling the wheels on a GMC or Chevy at the 6000-mile mark for a repack job, take a look at the condition of the forward and reverse brake shoes. You'll find that the forward shoe is worn quite a lot more. Remove the shoes and install in opposite positions, thus placing the best lining where the most work is done. This way, the maximum mileage can be obtained from each set of linings. Actually, 6,000 miles of life can be added to a set. This procedure is **not** recommended where drums have been scored, or tapered. The only solution there is, of course, is a drum turning, shimming, relining and fitting job.

Be consistent, don't change linings on one wheel and not on the other of the same axle.

T/5 Russell J. Hahn
557th Ord. Co., H. M.

Dear Editor,

Here at Kellogg Field, we've found an easy way to trouble shoot compressors of the Portable Airport 2-stage type, Model S.E. 769 Brunner, and similar types. Instead of tearing them down completely, we just check the compression with an ordinary automotive cylinder compression gage (Federal Stock No. 41-G-124). Here's how:

Remove the bleeder pet-cock, which is located in the cylinder head, and starting at either head, test each one separately. With the engine running, insert the rubber nipple of the gage into the bleeder hole and take a reading of the compression. The pressure in the first stage (or low-pressure cylinder) should be about 35 lbs., and in the second stage (high-pressure cylinder) should be between 65 and 100 lbs. If no reading, or very low pressure is registered on the gage, remove the head of the offending cylinder—

10 to 1 it's the spring steel, reed, intake and exhaust valves that are coated with carbon and not functioning properly. Remove the carbon, reinstall the head, and watch that pressure rise. If it isn't the valves, it must be the rings—it's as simple as that.

Another good stunt is to use a vacuum gage (Federal Stock No. 41-G-500) to trouble shoot auxiliary power units, portable heaters, energizers or any small gasoline-driven field and hanger equipment. The gage can be installed at the intake manifold side of the unit or, in the blower type, at the blower outlet. On the portable heaters of the DI series, there is a screw plug in the elbow of the manifold leading out of the blower where the gage adapter assembly can be installed. With the gage in place, it's easy to set the carburetor or check the operation of the unit. Notice that the fuel-air mixture passing through this manifold is being blown by rotors of the Roots-type positive-pressure blower and as such, will read in lbs. per sq. in. rather than in inches of vacuum. With the engine operating correctly it will read 3 to 4 lbs. per sq. in. If the instrument registers only 1 to 1½ lbs. and the engine will not develop the required rpm's, it's probably the blower. Check as follows: Disconnect the choke-chamber side of the carburetor, then with the engine running, squirt an oil-can-full of lubricating oil into the carburetor intake. The engine rpm's will immediately increase, and the engine will operate normally. This proves that the gears or rotor vanes are worn and should be replaced.

J. E. McInerney
Civilian Automotive Advisor

Dear Editor,

We have a problem here with these Mississippi rains. Maybe it's small, but I believe a slight change in the design of the ¼-ton trailer would help.

The drain plug is located in the rear right hand corner. When the trailer is parked with the landing leg in the 45-degree position, the drain plug is in the

wrong end. After every rain we have to tip every trailer back to let the water run out. Canvas water-proofing is a critical item here, and most of our tops let a lot of water through. Even when parked with the landing leg straight the water won't drain out, and it collects in a puddle in the top, too.

The regimental exec has suggested punching holes along the front edge, but that would destroy the watertight box. Why not just have the manufacturer put the drain plug in a front corner?

Lt. George R. Dane
2nd Bn., 273rd Infantry

(Ed. Note—The main reason for placing the drain plug at the rear is to let water drain out while the trailer is being towed up a bank or incline when coming out of deep water. This location should let the water out when the trailer is in tow on level ground, too. Why not park it so it will drain or place a block of some sort under the landing leg to incline the trailer to the rear?)

Dear Editor,

Here's a good trick for making your own cork gaskets, in case the gasoline sediment-bowl gasket breaks on half-tracks. Rake up some old bottle caps and use the cork liner for the gasket material. Take the cork out, cut it the shape of a gas-bowl gasket and it works swell.

Pvt. Bennie Messina,
17th A.I. Bn.

Dear Editor,

In the July 1944 issue of ARMY MOTORS you asked if anyone else had trouble with battery electrolyte spilling on the distributor of M8 armored cars.

We had this trouble and finally decided the clamp-hold-down nuts on the battery were drawn too tight. This distorts the battery case, which pulls cracks in the sealing compound. And then the electrolyte leaks over the distributor. Leakage was especially noticeable driving up and down hills—electrolyte would pour out.

CWO Edward J. Rambie
Cavalry School

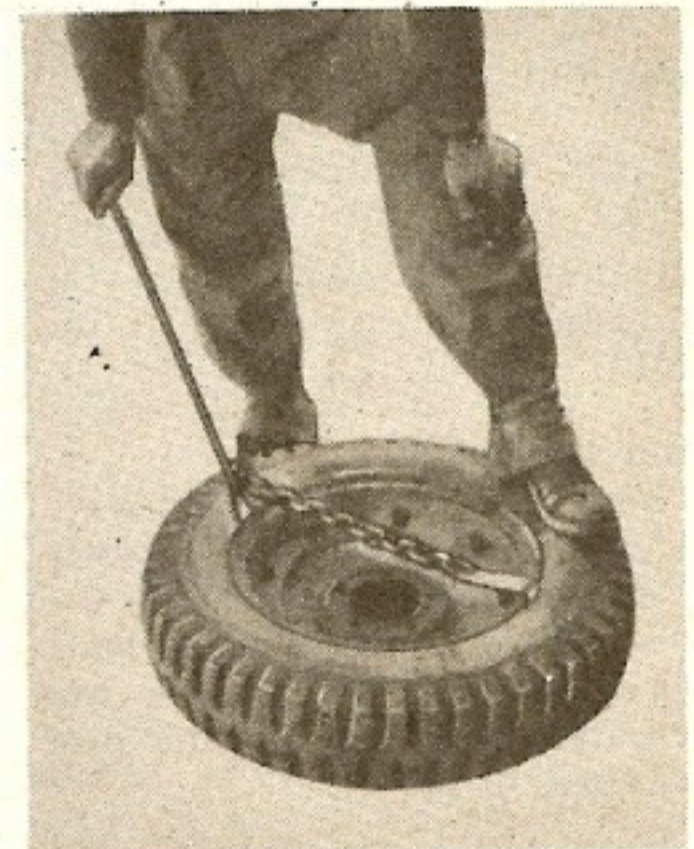
HELP WANTED, MALE

Men! Have you worked out ways of lightening your maintenance load, have you devised little tricks to make your job easier? Get in touch with us—we are an old established firm (U. S. Army) now engaged in essential war work. We pay off heavily (in United Cigar Store coupons) for bright ideas that keep vehicles off the deadline. You can win a valuable personal subscription to ARMY MOTORS if your idea is on the ball. Write now: ARMY MOTORS Magazine, Office, Chief of Ordnance-Detroit, Detroit 32, Michigan.

Dear Editor,

I am submitting an idea for a tire tool, made by **Cpl. Vernon A. Cunningham**, which cuts in half the work required in changing a tire on ¼-ton, 4x4 trucks. It can also be used with larger tires if the chain is lengthened to the diameter of the tire.

The tool is placed on the rim (Fig. below), and pressure is applied to the handle. This loosens the bead from the rim. It should be rotated around the tire at about 4" intervals until the whole rim is loose, then the tire can be removed. We've found this much



easier than using a mallet or other tire tool; it does not injure the tire in any way.

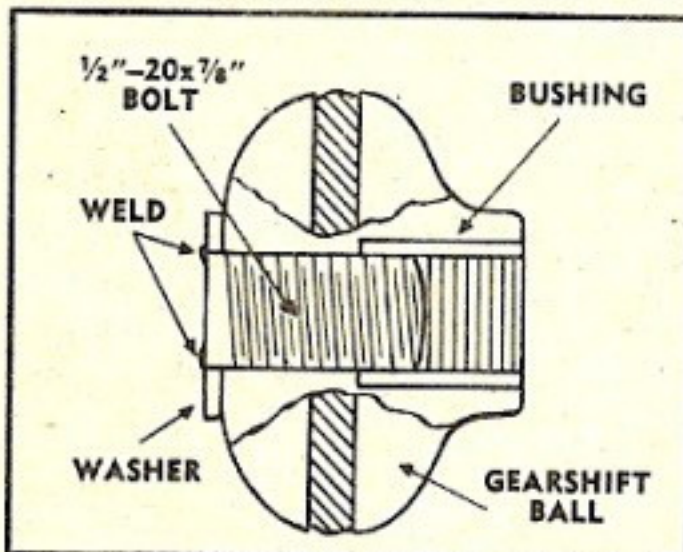
Lt. Perry R. Blackwell,
388th Bomb. Group

(Ed. Note—Just one caution—be sure the tool is handled carefully so as not to distort the rim.)

Dear Editor,

We've had quite a bit of trouble with the threaded bushing becoming loose in GMC gearshift balls, making for harder shifting.

Since we're not always able to get new balls, we pull the bushing out and drill a $\frac{1}{2}$ " hole through the ball, concentric with the bushing hole. Reinsert the bushing in its old socket. Next, find a $\frac{1}{2}$ "-20x $\frac{7}{8}$ " bolt and screw it from the top of the ball approximately half way into the bushing. Then cut the bolt $\frac{1}{16}$ " above the top surface of the ball, unscrew it and weld a $\frac{1}{2}$ " plain washer to make a flat head on it (see Fig.), or



else countersink the ball to accommodate the bolt head. You can slot the head to fit a screwdriver if you want to. Use the bolt to fasten the ball to the bushing. It would save a lot of time if you could requisition bolts that'll fill the requirements.

Sgt. L. Dennis Beams
Co. B, 28th Signal Const. Bn.

(Ed. Note—GMC has made a production change to keep the threaded bushing secure in the ball.)

Dear Editor,

Here in the ETO, air gages were included with the issue of tools to all drivers. After cleaning the cosmoline off the gages, some were found to be defective and just wouldn't register the tire pressure.

Mine was one of the bad ones. I unscrewed the barrel, inspected the insides, and everything looked good. When assembling it, I inserted the spring bottom side up (or upside down). This did the trick, and now our tire gage troubles are over.

Also, if the gage doesn't release when pushed down to zero again for a new reading, turn the slotted chuck to the left a quarter of a turn until the blocked air is free, and it'll work every time.

Pfc. Louis Nyer
Btry. A, 3rd FA Obsn. Bn.

(Ed. Note—Whatever you did to make those gages work, it wasn't inserting the springs upside down, as they'll work either way. Maybe cosmoline got inside the gages, too, and when you took them apart, you also got rid of the cosmoline. The same thing goes for the slotted chuck. Just turning it wouldn't free the air. You probably freed it from dirt or cosmoline by twisting it. These gages are hard to take apart, so be careful when disassembling them not to damage the thin wall of the barrels. The slightest dent will interfere with the free travel of the piston.)

Dear Editor,

Here are a couple of ideas that may make maintenance easier for some of the boys.

A magnetized screwdriver makes a swell tool for picking up bolts and nuts from places you can't reach with the fingers, and for starting screws in hard-to-get-at places.

Take a piece of insulated wire about two or three feet long, (size No. 10 or 12), and remove an inch or two of the insulation from each end. Coil the wire around a piece of one-inch pipe. Stick a long-bladed screwdriver between the pipe and the wire, letting the handle stick out one end and the blade out the other. Take one end of the insulated wire in each hand and strike them across the positive and negative posts of a six-volt battery four or five times, and the screwdriver will become magnetized.

The other idea is just as simple. When installing assemblies, such

as the third member on heavy trucks, make guides by sawing off the heads of three or four bolts as "line-ups." Use bolts the same size as those used to hold the assembly in place, and after removing the heads, slot the tops for a screwdriver. Then by staggering these line-up bolts around the banjo housing it's very easy to jack up the assembly and slide it into place.

Cpl. Joe B. Waldron
2052nd Ord. Co.

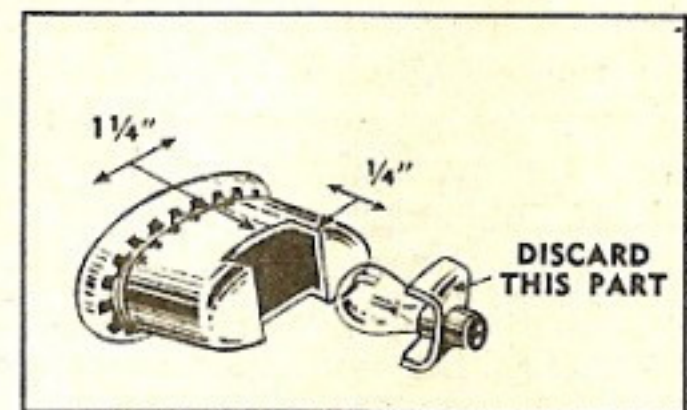
(Ed. Note—When striking the leads across the terminals to magnetize the screwdriver—use caution. Hydrogen, an explosive gas, is present in a fully charged battery.)

Dear Editor,

The "Red" Tail Lamp Unit, Ordnance No. C84908J, Federal Stock No. 8-L-419, is still an item of irregular supply and consequently remains one of a parts-man's annoyances.

Corporal Farrell Carpenter of 551st SAW Co. B, a mechanic, has devised what seems a foolproof solution and I pass it on for your approval and dissemination through your magazine.

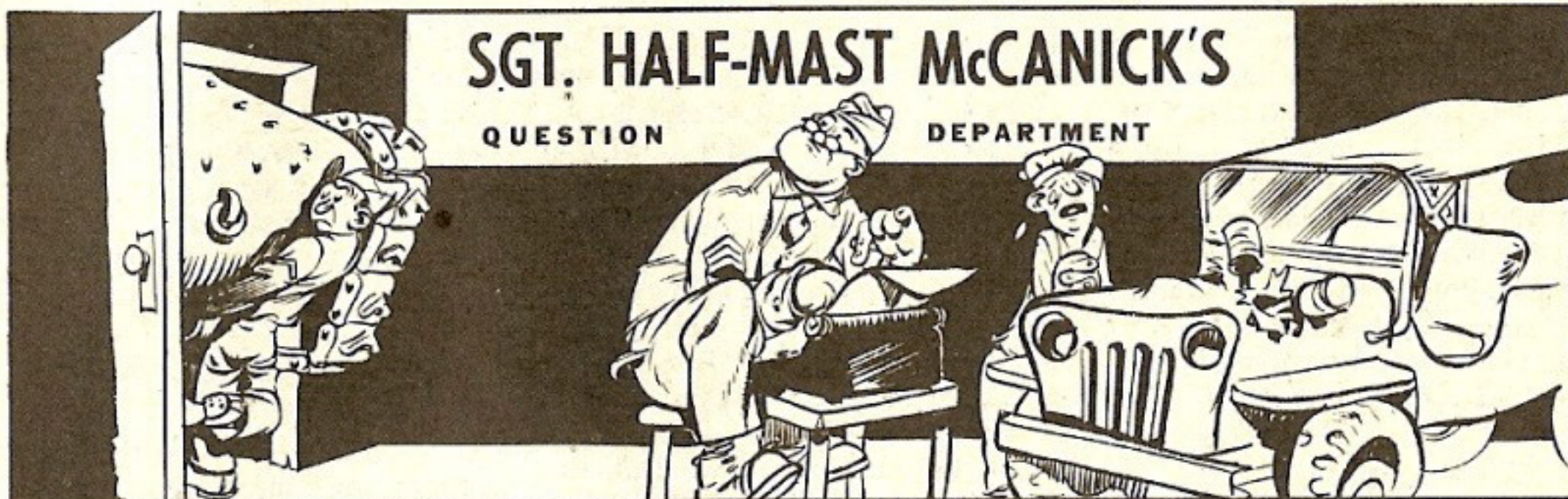
Take a burnt-out unit and using a hacksaw, cut out the section containing the old bulb and discard it. Make the cut about $1\frac{1}{4}$ " wide and $\frac{1}{4}$ " deep (see Fig.). Now



obtain a 1158 bulb (Federal Stock No. 17-L-5980) and insert it in the tail-lamp socket, put the cutaway unit back on, slap on the cover, screw it down. The bulb is in tight, the unit will be held firmly by the cover, and the seal around the lens has not been touched.

The above practice should be good when out on maneuvers or whenever the stock of units is exhausted.

Dale E. Jackson
Base Motor Storeroom



Dear Half-Mast,

Since arriving in the ETO we've had considerable trouble with 4-ton Diamond T exhaust valves burning.

Could the octane rating of the gasoline used in this theater cause the valves to burn? The manufacturer recommends the use of 68 octane gasoline, and we've been told the gas we're using is between 76 and 80.

The valves on these vehicles have been set to the manufacturer's specifications (.006" intake and .010" exhaust). Should additional tappet clearance be given? Or are there other adjustments that would remedy the condition?

Lt. H. K. G.

Dear Lieutenant,

Octane rating of gasoline **doesn't** cause valves to burn. That rating is just the measure of its anti-knock quality, and the manufacturer's recommendation of 68 octane is actually the **minimum** rating for your 4-ton Diamond T engine.

You may be getting gas that's unusually high in lead content that could cause your exhaust valve failures. Additional tappet clearance sure would help in this case. Try setting the tappet clearances when the engine is hot at .008" intake and .016" exhaust.

Dear Half-Mast,

I was taught in civilian life never to remove a cylinder head, carburetor, or manifold while the engine was hot or even warm because it would cause a casting to warp. My MTO claims it won't make any difference. Who's wrong

and who's right?

T/5 A. D.

Dear Corporal,

The cylinder head, carburetor, and manifold won't warp if you remove them while the engine is **warm**; that is, if you can handle these parts comfortably with your hands. But the engine shouldn't be sizzling hot, either, because then they could get out of shape.

Dear Half-Mast,

While in the States, we always used mineral oil in our tractors, but over here we've been unable to get it, and are using detergent oil. There was a publication at one time telling why not to use detergent oil in tractors, and I'd like to know what it had to say.

WOJG H. T. L.

Dear Mr. L.,

The TM you refer to was only a temporary TM, and has been superseded, so you can forget about it. There aren't any instructions against the use of detergent oils in Ordnance vehicle engines. In fact, lube orders and other publications **specify** their use—you'll find all the dope on it in TB 9-2835-4.

Dear Half-Mast,

Why don't they stop assigning stock numbers to straight lengths of radiator hose? Different part numbers for different lengths of hose are a nuisance. Let's just print in SNL's "Use 6¾" (or whatever the length may be) of 33-H-770."

Also, why stock a variety of flexible lines that can be made

up from that kit the Flex-O-Tube Company puts out? The couplings in this kit are re-usable, and any replacement, after replacing the original part, would call for a piece of hose only. Let's forget about lots of little hoses and just concentrate on making those kits available.

T/Sgt. R. K.

Dear Sergeant,

From now on, connecting hose for radiators, lube oil, and fuel lines will be stocked in bulk. Tubing for fuel lines and fire-extinguisher lines is also authorized for bulk stockage. It may be a while before you see this change in the SNL's, but it's on the way.

Fittings and clamps for the bulk stock are carried in parts common lists now. When special fittings or clamps are required, they'll be procured and stocked under their respective part numbers.

Dear Half-Mast,

From our experiences on these rough roads here in India, the mud guard just in front of the radiator bottom on the GMC 2½ ton, 6x6 does more damage than good. We've even had trouble with it puncturing the radiator and opening the drain taps on the right-hand side.

Our solution is to take off the guard. What do you say?

Lt. C. F. B.

Dear Lieutenant,

Better let it on—the radiator bottom-tank and drain cock will become a lot more damaged with the guard off than with it on. It's put there to prevent the hot air from re-circulating around the

radiator and into the radiator core. It ain't a mud guard—in fact, it's called radiator-bottom shield.

If it is getting bent out of shape after a little knocking around, just bend it back, leaving at least ¼" clearance between it and the tank. Then keep it in shape and you shouldn't have any trouble with punctured radiators.

Half-Mast

Dear Half-Mast,

Some of us guys have been bothered by questions regarding accidents that we'd like answered, so here goes:

How's the cost of repairs needed to put a vehicle back to service-able shape after an accident determined? If soldier labor is used, what's the rate?

When figuring the cost of repairs, is the civilian labor employed in Government shops which repair GI vehicles included? And what are they paid?

Is it legal to repair a civilian vehicle (damaged by a GI vehicle) in a Government shop?

And lastly, when is authority granted to go ahead with repairs on the vehicles involved in an accident?

WOJG S. E. S.

Dear Mr. S.,

I sent your question on to Washington and this is what I got. Quote:

"When a collision occurs between a civilian vehicle and a Government vehicle, only the latter may be repaired in a Government shop, even though the driver of the GI vehicle was negligent. Paragraph 8, AR 850-15, says no civilian vehicle may be repaired in a Government shop, and that's that. But this doesn't mean the Government won't make good the civilian's loss if the GI driver caused the accident. Lots of dough has been paid for claims filed under AR 25-20 and AR 25-25.

"But when the Claims Officer thinks the GI was right, and the civilian driver was wrong, AR 25-20 and AR 25-220 set out the Government's remedy. The cost of the parts required to fix the Government vehicle at the Ord-

nance Shop is taken from a price-list. The labor is fixed at 80 cents per hour if it's soldier labor (some shops use it) and at whatever is paid the workers per hour if it's civilian labor. Sometimes, if the civilian won't pay the cost of repairs, the Government's claim goes up through channels to the Attorney General for law-suit.

"There's nothing to prevent the immediate repair of a Government vehicle after an accident. And there's nothing to prevent the immediate repair of a civilian vehicle either, if the owner can find the mechanic or body-man with time on his hands."

Half-Mast

Dear Half-Mast,

When I took the distributor cap off my 2½-ton, 6x6 GMC to clean the wires and the cap, my helper turned the engine over at full cranking speed to get the compression reading.

When I put the distributor cap back on, and connected the high tension wires to the sparkplug, the engine was way out of time. I re-checked my wiring and found they were in the right firing order, yet it was way out of time.

Pvt. H. R. S.

Dear Private,

I'm not sure whether you replaced the high tension wires correctly. Could be you connected No. 1 wire to No. 2 sparkplug. The plugs would fire one after another and seem to be okay, but the timing would be thrown off.

If the wires were connected okay and No. 1 sparkplug wire was in the same position in the cap as before, timing might be snafued by a loose clamp at the base of the distributor. A loose clamp'll let the distributor revolve when you crank the engine.

Half-Mast

Dear Half-Mast,

In ARMY MOTORS (April issue) you mention a special water-proof envelope to be used for AGO Form 478. Are the envelopes for overseas duty only, or are they also for posts, camps, and stations? And if they are for the States, where can we get them and when will they be available?

T/Sgt. W. A. H.

Dear Sergeant,

The water-proof envelopes are now available in Adjutant General Depots and they're for use at domestic posts, camps, and stations as well as for overseas theaters.

The number of the envelope is AGO Form No. 478-1. And there's no reason why all motor vehicles shouldn't have both the envelope and Form 478.

Half-Mast

Dear Half-Mast,

A matter concerning the pneumatic-type tire for parking-wheels on the 1-ton cargo trailers has come to our attention several times. We've searched our files but are unable to help those inquiring. The question is this: What is the

Free! Free! For the Astin'!

ARMY MOTORS is now yours for the astin'. Through special arrangement with nobody in particular, Half-Mast is offering free personal subscriptions by direct mail to people who ast good, publishable questions. Are you up to the sweetbread\$ in problems? Do you find yourself up maintenance creek without any oars? Write your burning questions to "Dear Half-Mast," ARMY MOTORS MAGAZINE, Office, Chief of Ordnance-Detroit, Detroit 32, Michigan. If they're important enough to be published, you'll get a personal subscription. Even if they're not, you'll get an authoritative answer.

correct pressure for this tire?

Several organizations here have varied opinions, but have no publication to back them up. Moreover, they are stenciling those opinions on the trailers. Will you put us on the right track?

WOJG H. M. H.

Dear Mr. H.,

The recommended pressure for the 4.00x8, 4-ply tires on 1-ton cargo-trailer parking-wheels is 60 lbs.

Seems to me those organizations stenciling opinions on their trailers had better make sure they're stenciling the **right** opinions. Because for a long time, TM 31-200 (1 Apr. 43), Table III, page 94, listed 60 lbs. air pressure for 4-ply, 4.00x8 tires. Then this was changed by TB 31-200-4 (9 Mar. 44), which said 35 lbs. is the correct pressure. Now, TB 31-200-5 (22 Jun. 44), the very latest word, says the air pressure for 4.00x8, 4-ply tires is 60 lbs., instead of 35 lbs.

Maybe someday you won't have pneumatic tires on trailer landing-wheels to worry about. Remember TB 883A-1 (23 Apr. 43)? It says when the present stock of tires and tubes (for 1-ton, 2-wheel cargo-trailers and 250-gallon water-tank-trailers) is exhausted, the rubber-tired wheels will be replaced by a steel landing-wheel-assembly, Federal Stock No. 8-W-1550.

Half-Mast

Dear Half-Mast,

You asked for it this time, and here it is. I certainly hope you can answer these questions because I can't.

(1) What is the purpose and function of the pressure-type gas-tank cap?

(2) Why are some cranking-motor armature-commutators undercut and others are not?

(3) Where does the voltage that builds up the condenser come from?

Sgt. E. M.

Dear Sergeant,

Well, I guess I did ask for it—and you sure gave me the old one-two-three. I'm gonna pick myself up and dust off my stripes,

though, and see if I can't give you some good answers.

(1) The purpose of a pressure-type fuel tank-cap is to eliminate vapor lock in the fuel lines and fuel pump. Vapor lock's what happens when heat causes the fuel in the lines and pump to vaporize, and the vapor ain't letting any more fuel get through the pump to feed the carburetor.

The pressure-type fuel-tank cap (or two-way cap as it's called) solves the problem real simple. When heat causes the fuel and the air in the tank to expand, and build up pressure, the cap keeps enough pressure in the tank to force the fuel through the lines and fuel pump. Then, if too much pressure is built up (more than 3 lbs. above atmospheric pressure) a blow-off valve lets go and the dangerous pressure is released. Still, the cap keeps **enough** pressure in the tank to prevent any vacuum. This way, the pressure never gets too high or too low—it stays just right. Clear?

(2) You got me when you ask why some cranking-motor armature-commutators are undercut and others are not, but I'll bet that in short time manufacturers will undercut all commutators. Because undercutting keeps the commutator cleaner (especially from oil vapors), and I know that armatures with undercut commutators give several thousand more miles service than those not undercut.

(3) Now we get down to electricity—and where the voltage in the condenser comes from. It's like this: When the contact points of the distributor close, current from the battery or generator flows through the primary winding of the ignition coil. This causes a magnetic field to build up around both the primary and secondary windings.

Then when the contact points separate, the energy from the coil unloads in a high-voltage surge. The condenser across the points provides a place for this primary current to flow—until the points have separated enough to prevent voltage from establishing an arc across them.

When the points open, the condenser brings the current to a quick stop, and the magnetic field that's been built up, collapses quickly. It's the quick collapse of the magnetic field that puts the high voltage in both the primary and secondary windings. The induced current in the primary may be as high as 250 volts. That's where the voltage in the condenser comes from.

Half-Mast

Dear Half-Mast,

According to the specifications in FSMWO G502-W10 (21 Oct. 43), a large part of the windows in the back doors of the ¾-ton, '42 Dodge Ambulance are to be painted white. We're doing it, but we don't like it.

And there isn't anything said about painting the step, which, if left unpainted, spoils the color scheme when it's folded in the "up," or traveling position.

Sgt. O'C.

Dear Sergeant,

The FSMWO you mention is superseded by soon-to-be-released MWO G502-W10, which provides for clearing the back window of paint entirely.

About the step—there's nothing said about painting it, but there's nothing in print that says you can't, either. Just put it in the traveling position, and paint it to match the cross on the back of the ambulance.

Half-Mast

Dear Half-Mast,

TM 31-200 (1 Apr. 43) says the correct tire pressure for the rear duals of a 1½-ton, 4x4 Chevrolet truck is 55 pounds. TM 9-805 (30 Dec. 43) shows the pressure as being 40 pounds. Which is right?

Lt. Col. C. D. B.

Dear Colonel,

The correct pressure for your vehicle is 55 pounds, as stated in TM 31-200. The next TM 9-805 will be corrected accordingly, sir.

Half-Mast

CARRIER, PERSONNEL, HALF-TRACK, M5A1

WD Lubrication Order 116 (5 Apr. 44).

CAR, HALF-TRACK, M9A1

WD Lubrication Order 116 (5 Apr. 44).

CARRIER, CARGO, M29 (T24)

MWO ORD G179-W3, Replacing 40 amp generator with 55 amp.

TM 9-772, Operation and maintenance (5 Jul. 44).

WD Lubrication Order 98 (14 Apr. 44).

CARRIER, CARGO, M29C

MWO ORD G179-W3, Replacing 40 amp generator with 55 amp.

TM 9-772, Operation and maintenance (5 Jul. 44).

HALF-TRACKS

(See also individual vehicle listings)

ALL HALF-TRACKS

TB ORD 130, Tracks and bogies, removal, inspection, classification, reconditioning, disposition.

LIGHT TANKS

ALL LIGHT TANKS

TB ORD 125, Track connecting fixture 41-F-2997-86.

TB ORD 130, Tracks and bogies, removal, inspection, classification, reconditioning, disposition.

ALL SPECIAL PURPOSE VEHICLES ON LIGHT TANK CHASSIS

TB ORD 125, Track connecting fixture 41-F-2997-86.

ALL CARRIERS ON LIGHT TANK CHASSIS

TB ORD 125, Track connecting fixture 41-F-2997-86.

TANK, LIGHT, M3A3

MWO ORD G103-W47, Eliminating gunner's periscope sighting linkage slack.

TANK, LIGHT, M5

MWO ORD G103-W47, Eliminating gunner's periscope sighting linkage slack.

TANK, LIGHT, M5A1

MWO ORD G103-W47, Eliminating gunner's periscope sighting linkage slack.

TANK, LIGHT, M24 (T24)

MWO ORD G1-W17, Azimuth indicator, dust and moisture seals, new dials, gunner's aid.

WD Lubrication Order 153 (15 Apr. 44).

MEDIUM TANKS

ALL MEDIUM TANKS

TB ORD 125, Track connecting fixture 41-F-2997-86.

TB ORD 130, Tracks and bogies, removal, inspection, classification, reconditioning, disposition.

ALL SPECIAL PURPOSE VEHICLES ON MEDIUM TANK CHASSIS

TB ORD 125, Track connecting fixture 41-F-2997-86.

ALL CARRIERS ON MEDIUM TANK CHASSIS

TB ORD 125, Track connecting fixture 41-F-2997-86.

BULLDOZER, TANK MOUNTING

SNL G-228, ORD 7, 8 (10 Sep. 44).

TANK, MEDIUM, M3

WD Lubrication Order 32 (19 May 44).

TANK, MEDIUM, M3A1

WD Lubrication Order 32 (19 May 44).

TANK, MEDIUM, M3A2

WD Lubrication Order 32 (19 May 44).

TANK, MEDIUM, M4 SERIES

MWO ORD G1-W17, Azimuth indicator, dust and moisture seals, new dials, gunner's aid.

AM—TAT

ARMY MOTORS is always supposed To Accompany Troops. But if you want your magazines to tag along with your outfit, we've got to be told where you go. And you're the only guys who can tell us.

So be sure to send in your organization's change of address the moment you

- Get an APO number
- Reach a port of embarkation
- Arrive at an overseas base

Then we'll know exactly when to take your organization off our domestic station list and switch over to direct distribution. Then you'll keep getting your ARMY MOTORS—enough and on time.

TANK, MEDIUM, M4

WD Lubrication Order 84 (14 Mar. 44).

TANK, MEDIUM, M4A1

WD Lubrication Order 84 (14 Mar. 44).

TANK, MEDIUM, M4A3

TB ORD 131, Engine oil-pan level sending unit, oil level instrument panel gage.

TANK, MEDIUM, M4A6

WD Lubrication Order 149 (15 Apr. 44).

VEHICLE, TANK RECOVERY, M32 SERIES

TB 9-738-FE1, Winch cable clearance. WD Lubrication Order 152 (26 May 44).

VEHICLE, TANK RECOVERY, M32, M32B1, M32B3
SNL G-185, G-187, ORD 7, 8, 9 (1 Sep. 44).

TRUCKS

TRUCK, WEAPONS CARRIER, ¾-TON, 4x4 (DODGE)

TB 9-808-5, Installation of Ordnance maintenance sets A or B.

TRUCK, 1½-TON, 4x4 (FORD GTB)

TB ORD 10-1435-FE1, Relocation of voltage regulator.

TRUCK, 1½-TON, 4x4 (CHEVROLET)

WD Lubrication Order 503 (2 May 44).

TRUCK, 2½-TON, 6x4 (GMC CCW 353)

TB ORD 127, Pillow block assembly lubrication instructions.

TRUCK, CARGO, 2½-TON, 6x4 (STUDEBAKER)

TB ORD 127, Pillow block assembly lubrication instructions.

WD Lubrication Order 526 (3 May 44).

TRUCK, 2½-TON, 6x6 (GMC CCKW 352, 353, AFKW 353)

TB ORD 127, Pillow block assembly lubrication instructions.

TRUCK, AMPHIBIAN, 2½-TON, 6x6 (GMC DUKW 353)

WD Lubrication Order 505 (3 Jun. 44).

TRUCK, ORDNANCE MAINTENANCE, 2½-TON, 6x6 (GMC CHASSIS)

WD Lubrication Order 504 (25 Mar. 44).

TRUCK, CARGO, 2½-TON, 6x6 (REO)

TB ORD 127, Pillow block assembly lubrication instructions.

TRUCK, CARGO, 2½-TON, 6x6 (STUDEBAKER)

TB ORD 127, Pillow block assembly lubrication instructions.

TRUCK, REPAIR, 2½-TON, 6x6 (STUDEBAKER)

WD Lubrication Order 515 (2 Feb. 44).

TRUCK, INSTRUMENT REPAIR, 2½-TON, 6x6, M10, M10A1 (LOAD A)

SNL G-141, Vol. 1. ORD 7, OSPE (20 Aug. 44)

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

MWO G509-W3, Camouflage cover.

MWO G509-W6, Improving air-cooled engine when using high lead content fuel.

TRUCK, TRACTOR, 4-5 TON, 4x4, C.O.E. (FEDERAL 94x43C)

WD Lubrication Order 509 (2 May 44).

TRUCK, TRACTOR, 4-5 TON,
4x4, C.O.E. (AUTOCAR
U-7144-T)

WD Lubrication Order 502 (24 Apr. 44).

TRUCK, DUMP AND TRACTOR,
5-TON, 4x2 (INTERNATIONAL
K4-11)

TM 9-823, Operation and maintenance
(7 Jul. 44).

SNL G-542, ORD 7, 8, 9 (2 Sep. 44).

WD Lubrication Order 534 (3 Jun. 44).

TRUCK, TRACTOR, 5-TON, 4x2
(INTERNATIONAL H-542-9,
H-542-11)

WD Lubrication Order 543 (1 Apr. 44).

TRUCK, 6-TON, 6x6
(BROCKWAY)

WD Lubrication Order 518 (13 May 44).

TRUCK, 6-TON, 6x6 (MACK NM)

WD Lubrication Order 517 (4 May 44)

TRUCK, 7½-TON, 6x6, (MACK
NO)

TB 10-1679-FE1, Clutch release bearing
lubrication.

TRUCK, TRACTOR, 20-TON, 6x4,
DIESEL (FEDERAL 604)

WD Lubrication Order 516 (10 Jun. 44)

TRUCK, TRAILER, 40-TON,
TANK TRANSPORTER, M25

TB 9-767-1, Beadlock stud replacement.

TB 9-767-FE1, Removing interference
between sheave and web of roller
assembly.

TRUCK, TRAILER, 45-TON,
TANK TRANSPORTER, M19
WD Lubrication Order 160 (12 Apr. 44).

TRUCK, BOMB SERVICE, M27

TM 9-766, Operation and maintenance
(18 Aug. 44).

TRACTORS

TRACTOR, HIGH-SPEED,
38-TON, M6

TM 9-788, Operation and maintenance
(25 Jul. 44).

TB 9-788-2, Lunette for towing trans-
port wagon.

TRAILERS

TRAILER, BOMB, M5

TB 9-760-FE1, Caster wheel interference
with lunette adjusting handle.

TRAILER, AMMUNITION,
4-TON, 2W, M21

TM 9-792, Operation and maintenance
(5 Aug. 44).

TRAILER, AMMUNITION,
8-TON, 4W, M23

TM 9-793, Operation and maintenance
(12 Aug. 44).

LANDING VEHICLES

ALL TRACKED LANDING
VEHICLES

TB 9-775-4, Cold weather operation.

VEHICLE, LANDING, TRACKED
(UNARMORED) MK II,
LVT (2)

SNL G-167, G-168, ORD 7, 8, 9, C3
(31 Aug. 44).

VEHICLE, LANDING, TRACKED
(ARMORED) MK II, LVT (A)
(2)

SNL G-167, G-168, ORD 7, 8, 9, C3
(31 Aug. 44).

VEHICLE, LANDING, TRACKED
(UNARMORED) MK IV,
LVT (4)

WD Lubrication Order 206 (14 Feb. 44).

VEHICLE, LANDING, TRACKED
(ARMORED) MK IV, LVT (A)
(4)

WD Lubrication Order 159 (27 Mar. 44).

GENERAL

FM 21-6, Training publications, C6
(1 Aug. 44).

FM 21-6, Training publications, C7
(1 Sep. 44).

WDC 362, Diesel fuel (6 Sep. 44).

TB ORD E1, German and Italian fuels
and lubricants.

TB ORD E2, German, Italian, Japanese
materiel, preliminary fuel and lubri-
cant instructions.

TB ORD 117, All Ordnance vehicles,
WD Lubrication Order holder.

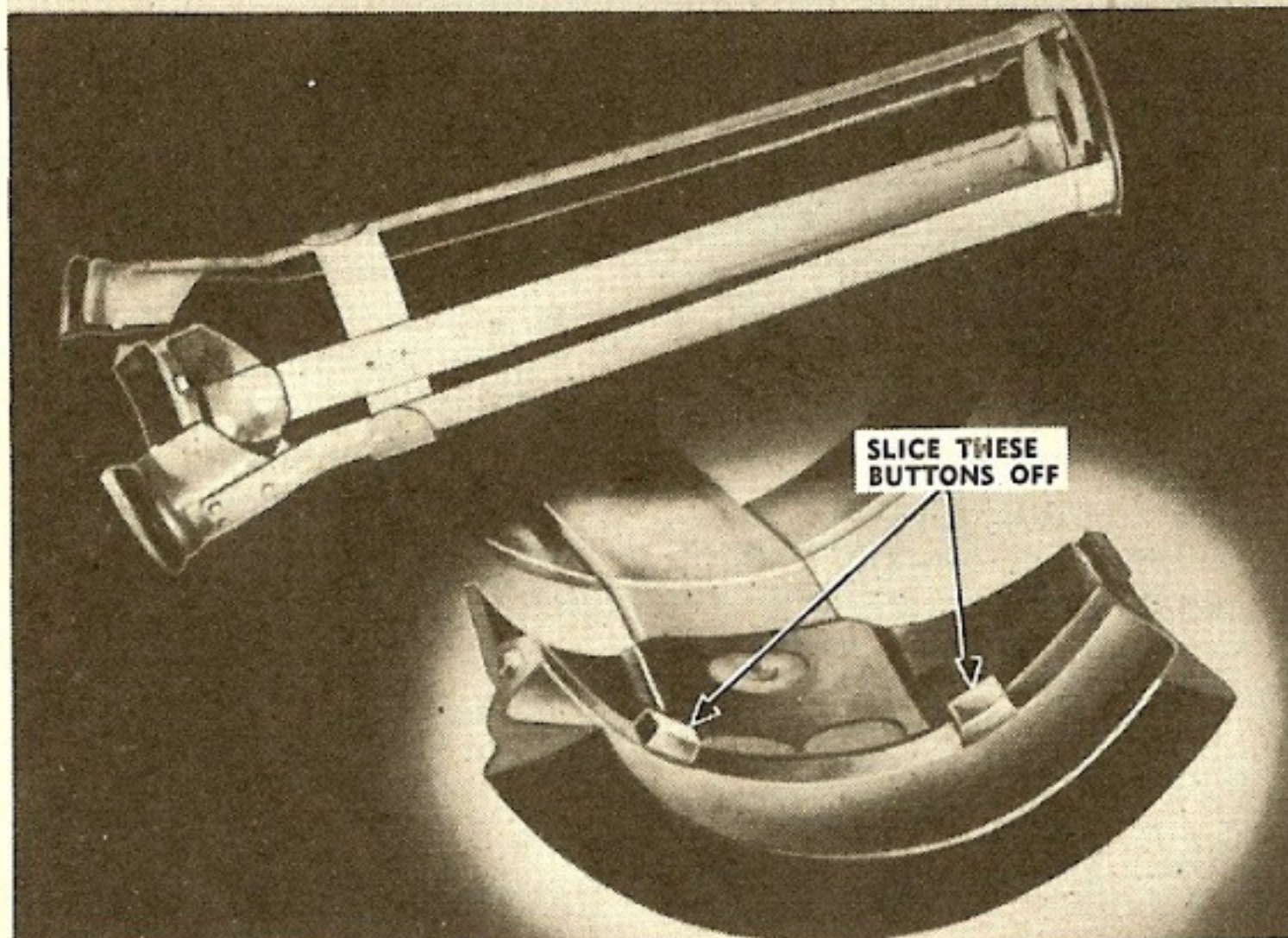
TB ORD 174, Generating Units M5 and
M6, fan lubrication.

OPSI, ORD 2 (1 Sep. 44).

WD Publications List, index to general
orders, bulletins, circulars (Aug. 44).

SB 9-29, Quarterly dropping allowance,
nonexpendable Ordnance items
(31 Jul. 44).

HOW TO BEAT THE SHELL (CLAMP) GAME



You don't have to be on the losing end anymore when you're trying to make time slipping 75mm and 76mm shells out of their clamps on the ammunition racks. Those shell clamps, used in medium tanks M4A3-W, 75mm; and M4A1, M4A2, and M4A3, 76mm, are the babies to work this neat trick on.

See those two rubber squares (see Figure) on the inside ridges of each finger on the shell clamp? Well, cut 'em off with a knife or tear 'em off with your teeth because they're what's slowing up your speed. Those buttons hold the clamp so tight to the shell, you have to use your shell extractor tool to yank 'em out. And most of the time it's never around when you need it. This way you can just lift the ammunition out of the clamps as fast as you want 'em.

PERPETUAL INDEX

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

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TOP HONORS IN MAINTENANCE

The individuals cited below have distinguished themselves in the campaign for better vehicle maintenance. So outstanding was their performance that the War Department has decorated them with the specified awards.

A perpetual personal subscription to ARMY MOTORS is the most—and the least—we can offer by way of additional tribute.

LEGION OF MERIT

CAPT. STANLEY J. KREDELER, Field Artillery (Armored)

For training a maintenance section that performed outstanding service for over a year in North Africa; for modifying vehicles to adapt them to the needs of Field Artillery. (Also awarded the Bronze Star Medal for maintenance while a 1st Lt.)

1st/SGT. WINSTON C. LOCKABEY, Field Artillery

For overcoming the lack of supplies, tools, and spare parts by improvising and utilizing parts from wrecked vehicles on the battlefield; for working under unusually difficult combat conditions to keep his vehicles moving during the two years he was motor sergeant.

CAPT. JOHN F. O'LOUGHLIN, Ordnance

For successfully conducting tests of cold weather maintenance and operation of automotive materiel at Shiloh, Manitoba; for developing auxiliary vehicle starting aids for use in sub-zero weather.

BRONZE STAR MEDAL

PVT. JAMES B. BEAN, Infantry (Armored)

For dismounting several times from his stalled half-track, under heavy enemy fire in Tunisia, to clean out the fuel sediment bowl in order to restart and save the vehicle.

T/5 ABE FORTNER, Infantry (Armored)

For performing driver maintenance duties, similar to the above, while under heavy enemy fire in North Africa.

S/SGT. LOUIS P. GUILMETTE, Coast Artillery Corps

For working under heavy enemy fire and without rest, as battery motor sergeant in North Africa, to perform vehicle maintenance and major repair jobs to meet his organization's march orders.

S/SGT. CALVIN L. KUCKER, Field Artillery (Tank Destroyer)

For keeping his unit's vehicles operating efficiently during the time he was chief mechanic and later motor sergeant in the United States, North Africa, and Italy (21 Dec. 41 to 13 Apr. 44)

S/SGT. ODEL R. McKISSACK, Field Artillery

For establishing his maintenance section near the front lines, so that he could quickly recover, repair, and return vehicles damaged by enemy fire or made inoperative by bad weather conditions.

Fireproof Your Winterization Heater

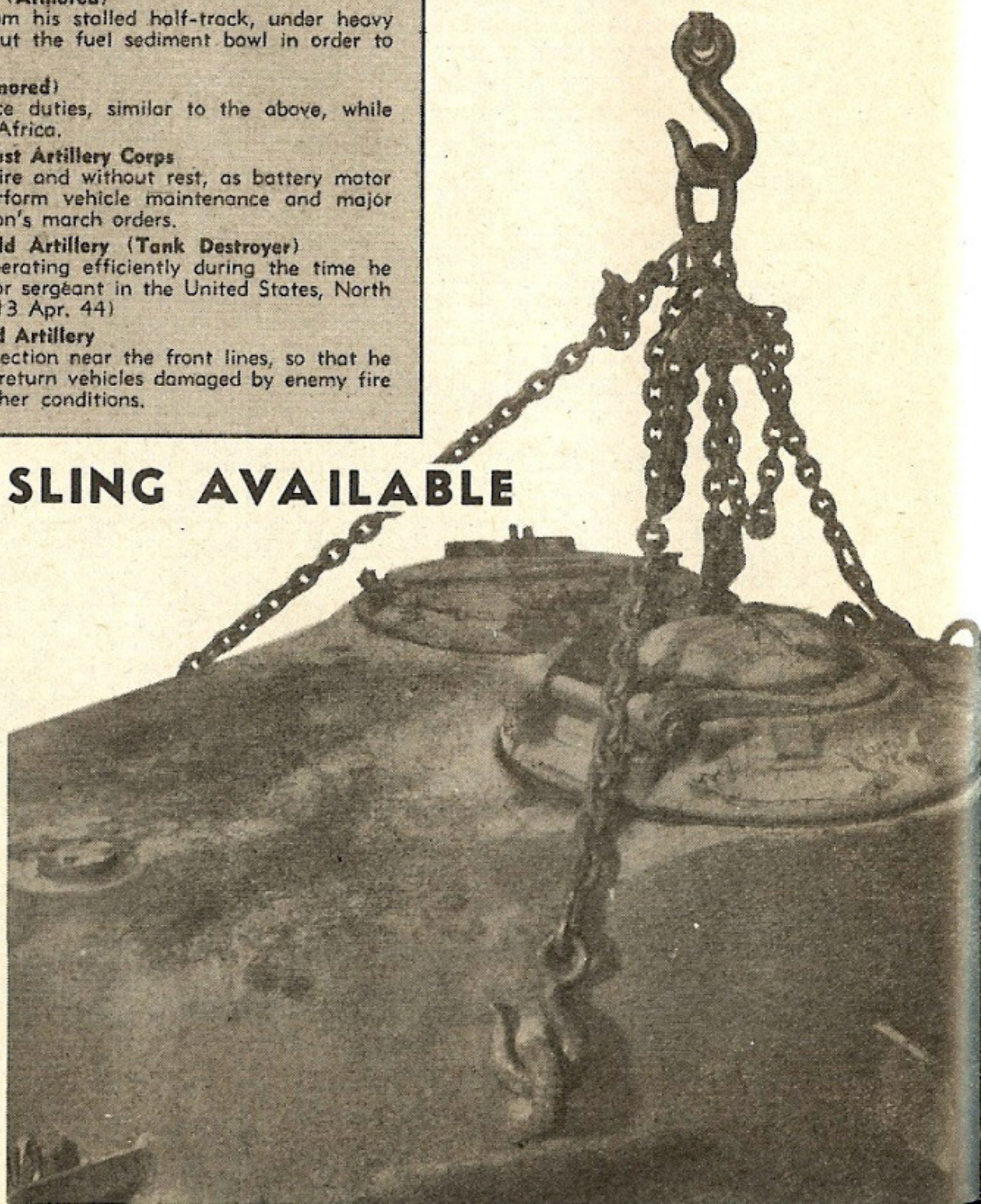
(Continued from page 245)

- WKC-213 G102-5700743
Car, Half-track, M2
- WKC-214 G102-5700745
Carrier, Half-track, Personnel, M3
- WKC-215 G102-5700747
Carrier, Half-track, 81mm Mortar, M4
- WKC-216 G102-5700748
Carrier, Motor, Half-track, Multiple Gun, M13
- WKC-217 G102-5700749
Carrier, Motor, Half-track, 75mm Howitzer T30
- WKC-218 G102-5700750
Carriage, Motor, Half-track, Multiple Gun, M15
- WKC-219 G147-5700751
Carrier, Half-track, Personnel, M5
- WKC-220 G147-5700752
Carrier, Half-track, M9
- WKC-221 G147-5700753
Carriage, Motor, Half-track, Multiple Gun, M14
- WKTR-307 G150-5700757
Tractor, Medium, 18-ton, M4
- WKQ-50 G9-5700764
Interim Kit (Quick Fix Type)

NEW TURRET SLING AVAILABLE

For you guys in the higher echelons, a new turret sling has been dreamed up that should save you sweat and tears. Instead of scrounging around for a different weight chain for every vehicle, you can use this one and handle anything up to and including a turret with a 90mm gun. But remember to adjust the chains at a 45° angle. If you shorten the chains and make the angle smaller it puts too much strain on the chains and hook.

The sling consists of four adjustable chains on a master ring, and can be requisitioned under Federal Stock No. 41-S-3832-54.



• • NEWS FLASHES • •

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

If you happen to supervise the operation of a 2nd or 3rd-echelon shop, you've got a real assistant on the way. It's the brand-new "**Unit Replacement and Repair Time Guide for Wheeled Vehicles**," called **TB ORD 173** (30 Aug. 44) for short. It'll help you plan your greaseballs' chores and make the most of your shop's time and facilities.

Included in the TB are time schedules for trucks from 1/4-ton up to 6-ton, job charts for teamwork on the 1/4-ton, 3/4-ton Dodge, 1 1/2-ton Chevrolet, 2 1/2-ton GMC, and 4-5-ton Federal C.O.E.

So watch for it—but don't wait for it unless you're one of the top men in a shop. Distribution will be strictly limited to same.

* * *

You can finally throw away that old TM 9-850 (13 Apr. 42) Cleaning, Preserving, Lubricating and Welding Materials (or keep it as a relic) because it's been superseded by **TM 9-850** (24 Aug. 44) Cleaning, Sealing, Lubricating and Related Materials.

In the new edition you'll find all the information you've been looking for brought up-to-date and under the same cover. There's also new stuff on antifreeze and gum-prevention compounds, etc. In general, it describes the materials listed in SNL K-1—and although information on welding, brazing, cutting, and soldering materials, fire extinguishers, decontamination, paint and brushes is omitted, the new TM tells where you can find it.

* * *

Instruction sheets in battery packing-boxes of the Perrine Quality Products Company (and maybe some others) have a bad mis-statement that could result in some dandy explosions and probably burn the hide off you. To mix electrolyte, the instructions advise, "do not add acid to the water, but add water to the acid, slowly." That's wrong. It should be the other way around. **TB ORD 67** (18 Mar. 44) says do **not** add water to the acid—you should **add acid to the water**.

* * *

Flashing red, **MWO ORD G501-W30** (16 Sep. 44) for the power tire-pump on your GMC 2 1/2-ton, 6x6 duck, has all the pump improvements you've been waiting for: (1) new and

better lubrication system, (2) a deeper crankcase to hold more oil, (3) a higher breather pipe to lessen oil loss, (4) a new filler-cap with an oil-level dip-stick attached, and (5) an intake-pumpbody-assembly to suck oil from the deeper crankcase.

The modification kit is for vehicles with the following serial numbers:

2005 thru 5136	8292 and 8295
5138 thru 8283	8298 thru 8300
8285 thru 8290	11979 thru 12129

If your duck hits the numbers, requisition through regular channels, Kit, power-tire-pump lubrication; Official Stock No. G501-5700598.

* * *

Don't be beatin' your haid with your wrench just because you've had trouble removing that 2" pipe-plug on the upper right half of the flywheel housing. That's the plug on the 7 1/2-ton, 6x6 Mack prime mover that you take off to lubricate the clutch release bearing.

TB 10-1679-FE1 says to braze a piece of 7/8" square or a hexagon steel stock 3/4" long on the top of the plug. It'll give you an easier plug to get hold of.

* * *

Be sure and look every intake-manifold tee (GM 2137687) over carefully when you get a GMC 2 1/2-ton, 6x6 replacement engine for your duck or truck.

Small parts (like nuts, bolts, and lockwashers) sometimes get stuck in the tee during shipment, since they're all together in a paper carton and when the tee's installed in the manifold, and the engine's operated, all these parts are sucked into the combustion chamber. They're not shipped that way now, but they've caused a mess of trouble—so take them out before installing the tee on the engine.

* * *

If the threaded trailing-idler-arm shaft on your light tank M5 or M5A1, or 75mm howitzer motor carriage M8 gets hot and burns out the grease in the bushing (as it will on a rough trip) and needs frequent lubrication, poke some grease into the fitting on the idler-arm shaft once daily or more often if necessary. TM 9-732 (27 Nov. 43), TM 9-732B (31 Jan. 44), and the WD Lubrication Orders prescribe lubricating the fitting every 250 miles, but a TB's rumored to come out soon, changing that to **daily lubrication**.

81.14.462

greasy
does it!

You can get gigged for having a **clean** copy of **ARMY MOTORS** in your desk or footlocker. This magazine is intended to collect honest greaseprints. It belongs over in the shop with that happy race of men, the gas-house gang. **ARMY MOTORS** is full of dirty stories—or should be when the hands get done passing it around. **ARMY MOTORS** should be read till it's black (yuk, yuk).

In theaters of operations, the magazine gets handed around from company to company, from battalion to battalion—until it's deadlined for lack of pages.

ARMY MOTORS stashed away in a desk or gathering dust in a corner is a crying shame. Pass it around, give it to a friend who can use it. **ARMY MOTORS** is a magazine for **use**, not just for reading.

HERE'S ARMY MOTORS' BASIS OF ISSUE:

One copy for every **motor officer** in your organization, one for every **motor sergeant**, and one for every **014 automotive mechanic** or equivalent. These copies are not personal property—they're for general circulation around the outfit, especially to **drivers**. Finally, a good contribution or a good question to Half-Mast will get you a personal subscription, a monthly copy you can call your own.