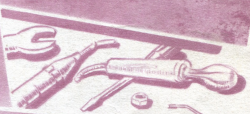
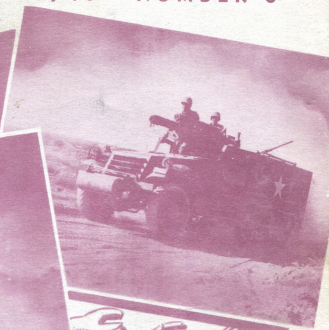


ARMY MOTORS

VOLUME 4 JUNE 1943 NUMBER 3

4 Lund



New Driver's Trip Ticket

The revised Driver's Trip Ticket (W.D. Form 48) brought forth two kinds of comment from guys who were shown the 'Driver's Daily PM Services' on the reverse side of the ticket.

The comment of those who had been schooled in the old 'Preventive Maintenance Schedules', was to the effect that, 'Hey, that's a good idea - cuttin' all the sheets down to one sheet and puttin' it on the back of the Trip Ticket.'

On the other hand, guys who had never been exposed to the old Preventive Maintenance Schedules took one look at the ample list on the back of the new Trip Ticket and said, 'Are youse kiddin', Bub? Who's gonna make all dem checks before drivin' a vee-hicle?'

The reason for the 'Are-you-kiddin'' school of thought is twofold. In the first place, to these people, the list of services looks big; second, they aren't convinced it's necessary to inspect all those units and assemblies over and over and over again. The complaint is that a man who's faithfully performed the 'After Operation' list of services at the end of a day's running, feels that he's doing double work servicing a great many of the same items the very next morning.

Of course, such criticism when you stop to think of it, is mostly nonsense. In the first place, any list would look big to a guy who had never given his vehicle any kind of regular inspection and service.

In the second place, the daily services are broken down into small doses: 'Before Operation,' 'During Operation,' 'At Halt,' and 'After Operation.' A properly trained man can knock off each servicing in a few minutes -- it becomes second nature.

In the third place, a lot of the items on the list are a part of everyday vehicle operation. Even if he didn't have the lists, a man would run his eyes over the dash instruments, 'feel' the operation of the controls, 'sense' the operation of the running gear and engine.

What the list really amounts to is a string around the finger reminding the driver what has to be done. Hit or miss and guesswork are out the window. It's all down on paper.

But the biggest and best reasons for a rigid daily program of PM servicing are the operating conditions reported from the battlefronts. Day in, day out, vehicles are subjected to abrasive sand, corrosive salt water, and roads that batter metal and wood in a manner to make designers and

maintenance men cross their fingers and hope for the best.

Unless the kind of constant vigilance represented by the PM services on the Trip Ticket, is maintained by the driver, vehicles go quickly to pieces.

In the zone of the interior where the only result of a neglected vehicle is a gigning and some sharp words, PM servicing to the short-sighted soldier, is just something else thought up to annoy him.

But out where the playing is for keeps, where the condition of equipment is often the difference between winning and losing, or living and dying, the driver's daily PM services are a formula for survival.

Take the formula, learn it by heart and perform it faithfully. One way to come out of this fracas alive is...to keep your olive-drab vehicle in the pink of condition.

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ARMY MOTORS is published monthly in the interest of Preventive Maintenance by the Preventive Maintenance Unit, Tank-Automotive Center, at the Holabird Ordnance Depot, Baltimore, Maryland. Your contributions of ideas, articles and illustrations are welcome. Address all correspondence to the Editor, at the above address.

Give Your Tanks A BRAKE!

When going downhill, rely on your brakes instead of your engine! That goes for trucks, too.



Take a good look at the picture below. What you see are the shattered remains of a once-good transfer case from a GMC Twin Diesel Engine M4A2 medium tank. How did it ever get busted up like that?

Very simple.

Some greenguard driver came flying down a steep grade with the clutch disengaged and the transmission in low gear. When he felt his tank start to get away from him, he decided to slow down by engaging his clutch, using the engine as a brake. He did it all right. Take another good look at the picture and you'll see the tragic, expensive result.

Before we go any further, let's make it clear that this business of using the engine as a brake is not something that's peculiar to tank drivers... the wheeled-vehicle boys are guilty of the same mistreatment of their equipment.

However, the practice of coasting downhill with the clutch disengaged (and the transmission in gear), or engaging the clutch part-way down the grade after terrific speed has been reached, has given maintenance men one of their biggest headaches. Transfer cases have been flying apart and clutch-driven discs have been disintegrating because of tremendous overspeed.

There's a basic difference in the way trucks and tanks get their power. This difference is what causes clutch-driven discs to go to pieces on trucks and transfer case destruction on medium tanks that have them.

Let's take the M4A2 medium tank first.

This tank transmits power from the engine through the clutch to the transfer case, then through the propeller shaft to the transmission and final drive. When the tank rolls along level ground, the drive gears (one from each of the two engines) are driving the driven gear. The power then travels along the propeller shaft to the front of the vehicle. In the transmission, differential, and final drive, small gears drive larger gears, and this process is repeated, right out to the sprockets.



Naturally, the smaller gears are going around much faster than the larger gears.

When this baby starts rolling downhill, things start to happen! Instead of little gears driving the big gears, the action is just reversed; big gears are now driving the little ones! For the sake of illustration, let's assume that the ratio of the gears is 3 to 1 (small gear making three complete revolutions to one revolution of the larger gear), and that the gear connected to the sprockets is making 100 rpm. This gear drives a smaller gear up to 300 rpm. So it goes all the way back to the power train, large gear driving small gear and increasing the rpm 3 to 1 every time. With the clutch disengaged, it's quite obvious that the full effect of this excessive speed is transmitted from the propeller shaft right to the transfer case. Centrifugal force itself is enough to wreck the transfer case! And it does. With the transmission in low range gear, the critical speed for the propeller shaft is about 4000 rpm and is approached at 4 miles per hour. Start downhill, and with every

mile per hour increase in speed, the propeller shaft will revolve 1000 more times per minute! Enter: centrifugal force; exit: propeller shaft.

Another neat way to rip out the transfer case or propeller shaft is to bring torque into the picture. It's done in this way. Coast halfway downhill with the clutch disengaged, then suddenly release the clutch pedal. The revolving parts can't stand the sudden deceleration. *Vam!* Goodbye transfer case or propeller shaft.

To take a tank down a hill safely, shift into a gear low enough to control the speed of the vehicle and use the steering brakes to keep the engine speed, as indicated by the tachometers, within the maximum recommended rpm of the power unit, as follows:

	Governed Speed	Maximum for Short Periods
R975 Continental	2300 rpm	2400 rpm
6046 Ser. 71 Twin Diesel	2100	2250
GAA Ford	2600	2800
Multibank Chrysler	2500	2900

Using the brakes this way will save the engine, clutch and drive line to perform their normal functions, which are to increase and maintain speed.

Now, let's look at trucks.

A truck transmits power from the engine through the clutch, to the transmission to the transfer case, to the final drive. Nearly the same thing happens to the power train of a truck going downhill with the clutch disengaged as happened to the tank above: the big gear drives the small gear in the differential and whips up the speed of the propeller shaft tremendously. Though this speed in itself is not enough to destroy the propeller shaft by the time it has gone through the gear ratios of the transmission and transfer case, it will have far exceeded the critical speed of the clutch-driven disc. No need to go further,

(Continued on page 96)

Cold weather operation of tanks and carriages equipped with radial engines

Volumes have been written warning drivers of the hazards of overheating, especially on the tanks and gun motor carriages powered with radial air-cooled engines. 'Watch your oil temperature, and don't operate over 190°!' This warning has become the watchword of all those holding G.I. permits on tanks. But, we have heard that some of our boys from the southern climes, transferred to the more frigid zones, are having trouble *keeping their engines up to the desired operating temperature.*

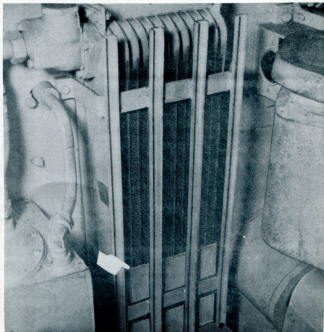
Well, there are two things a driver can do when operating in sub-normal temperatures. He can put on an extra overcoat and ignore the death-

rattle-due-to-cold of his engine or he can take a piece of cardboard and slip it behind the grille on the oil cooler radiator as shown below.

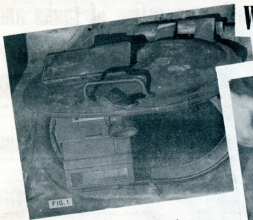
By cutting off a portion of the air being drawn through the oil cooler core you can raise the oil to any desired temperature. If the temperature gets too high, expose more of the core, if it gets too low, cover more of the core.

You won't have to worry about holding the cardboard in place as the air being drawn through the oil cooler core will hold it snugly in place.

A word of warning, though: **BE SURE TO REMOVE THE COVER IF THE OIL TEMPERATURE SHOWS SIGNS OF GOING ABOVE NORMAL.**

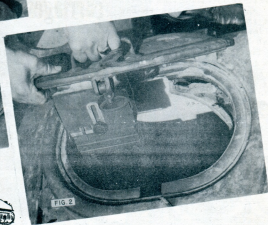


Watch that M4 Periscope!



When you close the driver's or assistant driver's hatch on the M-4 medium tanks you've got a fifty-fifty chance of smashing both the periscope and mount...unless you know the proper way to do it.

The reason for this gamble is, if the periscope is turned with the lens facing out or toward the front of the tank, it will strike the hull when the hatch is slammed closed (Fig. 1). Whereas if the



periscope is turned so that the lens is facing into the tank, it will clear the hull with room to spare (Fig. 2).

To design the hull so that this condition would be eliminated is possible, but it would mean changing the present manufacturing process, making new castings and other

changes that would slow up production.

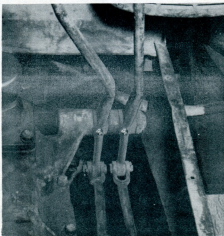
On the other hand, if each driver or assistant driver gives the periscope the proper twist before closing the hatch, the trouble is eliminated.

So before closing your hatch, make sure the periscope lens is facing into the tank.

Sticking Transfer-Case Levers on Half-Tracks

If your destiny in life is repairing or driving a half-track, you probably know that the transfer case levers sometimes freeze in position. It seems that dirt, mud, and corruption have been finding their way into the bosses and causing the levers to stick on the shaft. Since there isn't any provision for lubing these levers, the thing to do is to provide a way.

Remove the two levers, and drill $21/64$ " hole in each boss as illustrated at right. Then run a $1/8$ " pipe tap through the holes and screw in slemite fittings. The fittings, we are told, can be reached with the grease gun from under the vehicle. So that some greenguard won't forget them, we suggest that you make a notation on the lube chart of each vehicle that the fittings are installed on.





Motorcycle Chains

Interchangeability marches on: The Indian Company will provide a rear drive chain, for the Indian 640 of the same length and number of rolls as the Harley-Davidson WLA. The new Indian Part No. will be 44733; the present Harley-Davidson number remains the same.

When the present supply of rear drive chains, Indian Part No. 28000X, is exhausted, either the new Indian or the present Harley-Davidson rear drive chain may be used.

Caution: The new rear drive chain, Indian Part No. 44733, or Harley-Davidson Part No. 2003-15, can only be used on Indian motorcycles equipped with a 17-tooth countershaft sprocket. Either chain can be used on the Harley-Davidson Model WLA without change of sprockets.

Just for the sake of the record, the present chains are

built to the following specs:

Name & Model	Part No.	Rolls	Length
Indian 640	28000X	98	30"
Harley-Dav. WLA	2003-15	94	58-5/8"

Lubrication Fittings

Most of the excessive wear of chassis parts on combat and transport materiel is caused by contamination of the chassis lubricant with dirt, grit, sand and mud. These contaminants are highly abrasive and unless removed from the bearings, will quickly grind away the metal surfaces. This not only results in needless replacement of parts but also may render the vehicle dangerous to operate before the replacements can be made.

Considerable mud and sand accumulate on chassis fittings between lubrication service periods. Each fitting should be carefully wiped before lubrication to prevent intro-

ducing any dirt or grit into the bearing with the fresh lubricant. Grease should be pumped into the fitting until all of the old grease is forced out and new lubricant appears completely around the bushing after lubrication, but a thin collar of grease should be left on the outside of the bushing to keep out water, dirt and grit until the next lubrication service.

Water operation, such as fording creeks and streams, also causes contamination of the chassis lubricant by washing off the lubricant and depositing sand and grit in the bearings. It is good practice to lubricate all exposed chassis parts as soon as possible after immersion in water, both for rust prevention and to flush out the abrasive materials before they cause excessive wear and failure of the parts - parts that are not always available, especially under combat conditions.

So wipe the fittings before lubricating and keep abrasives out of the chassis parts - it may mean the difference between life and death some day when a breakdown in combat would be fins for you and your vehicle.

Manual Changes

Whip out your TM 10-1605 maintenance manual (4-ton, 6x6 Diamond T, Models 968, 969, 970) and install the following changes which are going to be made in the Specifications Section:

- Section 1, Page 0-13, Ref. 25
Description: Transfer Case
Type Fitting: Plug
No. of Fitting: 1
Capacity: 1
Lube: 3pts.
Gear oil
- Section 2, Page 2 - 6
Description: 9. Torque Rod Bracket
BB 6009
Part No.:
- Section 2, Page 4-9
Adjustment of Bearings - note
- rod bearings have shims on

one side only. Main bearings have shims on both sides. Shim thickness corresponding to the clearance figures should be added to the side opposite the locking lugs.

d. Section 2, page 13-12

Specifications: Service Brakes
Lining: Type - Moulded
Size - Rear - 9-5/16" x 4"
Front- 17-3/4" x 4"
Area: 69 square inches

Also there are changes being made in TM 10-1607, as follows:

a. Section 1, Page 0-13, Ref. 20
Description: Transfer Case
Type Fitting: Plug
No. of Fitting: 1
Capacity: 3 pts.
Lube: Gear oil

b. Section 2, Page 4-9
Adjustment of Bearings - note
- Rod bearings have shims on one side only. Main bearings have shims on both sides. Shim thickness corresponding to the clearance figures should be added to the side opposite the locking lugs.

c. Section 2, Page 13-12
Specifications: Service Brakes
Lining: Type - Moulded
Size - Rear - 9-5/16" x 4"
Front- 17-3/4" x 4"
Area: 69 square inches

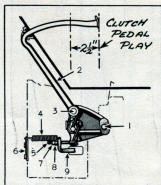
GMC Clutch Pedal Free Play

Here's the latest and last word (I hope) on the clutch-pedal free play of all 6x6 and 6x4 GMC's:

No matter what you've been told before, the free play of the GMC clutch pedal should be 2 1/2 inches at all times.

Whatever it is on your GMC's now, change it to 2 1/2 inches. Tests and field experiences have proven conclusively that this amount of free play results in longer clutch life and longer intervals between adjustments. Source of information: Tank-Automotive Center and a new GMC bulletin.

As if you didn't know, here's how to make the adjustment (see fig. 1):



1. Pedal Bracket
2. Clutch Pedal
3. Pedal Shaft
4. Full Beck Spring
5. Adjusting Link
6. Spring Bracket
7. Check Nut
8. Adjusting Nut
9. Clutch Release Fork

Figure 1

1) Loosen check nut (7) on adjusting link (5).

2) Turn adjusting nut (8) in or out as may be required to obtain 2 1/2" free travel of the clutch pedal before the clutch starts to release. Check the free play with your finger on the pedal and not with your foot. This adjustment is too sensitive to be horsed around.

3) Having 2 1/2" free play, turn up the check nut (7) firmly against the adjusting nut (8) to prevent the adjustment's coming loose.

Magnetic Plugs

You probably know that the drain plugs of crankcases, gear cases, etc. of most or many of your vehicles are magnetized so that they'll pick up any metal cuttings or chips knocked off the engine while in operation.

The appetite of these drain plugs is limited—after they've picked up their fill, they can't pick up anymore until the collected filings have been wiped off.

Neglecting to wipe off

these collected filings has resulted in transmission failures. The magnetic drain plugs, having picked up all the filings it can handle, refuses to pick up anymore; filings pass on into the oil feed lines and clog them up. No oil distribution, no transmission.

Service your magnetic plugs once in a while.

Disc Type Bogie Wheels

The disc-type bogie wheels on the first Light Tanks (M5, MSAL, and 75mm Howitzer Motor Carriage M8) did not have enough clearance around the grease fitting with the result that the fitting can't be reached with the standard grease gun.

When you run into this problem, you can reach the fitting by making a slight change in the grease gun. Simply take off the head of the gun and reinstall it in the reversed position so that the gun is applied to the fitting by pushing it straight on instead of hooking it around.

Disc-type bogie wheels of later design have enough clearance around the fitting to enable you to use the grease gun either way.

Installing Tracks on Radials

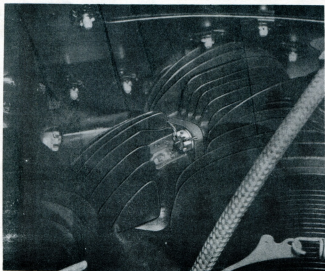
Some guys have been using the hand crank or the starter on radial engines to supply force through the power train to bring the end shoes of the track together so that the last pair of track guides, wedges, and nuts can be installed. This damages the starter gear train or produces an 'angular deflection' in the two piece crankshaft, which cuts down the life of the engine. Don't do it — use the track jack hook which is supplied with each of these tanks, for the job. You'll find the correct procedure on page 102, paragraph 97d of TM 9-750, 9 May 1942 and also an illustration, figure 56.

Exhaust Elbow Continental Engine

If you've been having trouble with the exhaust elbows leaking where they fasten to the cylinder heads on Continental radial engines, (R975-C1 and R975-EC2) examine the locking device used to keep the exhaust elbow nuts tight. According to some reports we've received, these nuts have been found locked with cotter pins. Cotter pins are no good because a locking device used in this position has two jobs to do: 1) Lock the studs in place, 2) Keep the nuts tight. Cotter pins can't do both.

The proper way to lock the exhaust elbow nuts is with safety lockwire #A171107 (see Fig. below). Twist the safety lockwire through both studs and it'll prevent the studs as well as the nuts from working loose.

Maybe you're wondering why so much fuss is being made over these studs, when you know of a dozen or more cases where the studs are not saftied with wire and yet they seem to stay in place.



Reason for the fuss is that when a steel stud is screwed into an aluminum thread housing and it's in a location that's subject to heat, the thread housing when hot will expand more than the stud thus making a looser fit. Vibration takes care of the rest.

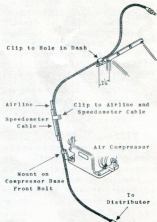
Don't use cotter pins - use safety wire to lock the exhaust elbow nuts on Continental engines.

Tachometer Cable Breakage

AC Victorygram reports trouble with tachometer breakage on Autocar Trucks, Models U-7144 and U-8144, which are used by the Air Forces as fuel trucks. An Autocar Service Engineer volunteers the following information:

"There are three clamps that hold the casing on these jobs (see Fig.) and where each clamp goes around the casing you will find a black mark around the casing. Clamps are to go where marks are, and by doing this the casing will have an even spread of cable and casing."

You Air Force guys check this on your Autocars to cure



present - and prevent future - Tac cable breakage.

3/4 Ton Distributor

On the early 3/4-ton Dodges (WC-52, WC-53, WC-54, WC-56, WC-58, WC-59, WC-60, and WC-61), ignition distributor assembly, Dodge Part Number 923891 and filter assembly, Dodge Part Number 924065 were installed.

Then somebody discovered that the filter assembly was not needed to prevent radio interference. So on later-production 3/4-ton's, distributor assembly, Dodge Part Number 919911 without the filter assembly, was installed.

What does this mean to you? When the present supplies of ignition distributor assemblies Number 923891, and filter assemblies Number 924065 in the depots are exhausted, you will be furnished as replacement parts, Ignition Distributor Assembly, Dodge Part Number 919911, and Ignition Coil Primary Cable, Dodge Part Number 929043.

This Ignition Coil Cable Number 929043 is a longer cable (27 inches) and it's necessary now that the filter has been dropped, because the original cable is too short.

Just thought I'd mention it.

(Continued on page 96)

Since no lights have been provided for the interior of 2nd and 3rd-echelon shop trucks, Willoughby, the office cockroach, wants to know what's a guy supposed to do on a dark day when it's raining and the top's up - the dark is so thick in them trucks you could use it for gear lubricant.

Willoughby: "How about installing some light by taking a sealed-beam unit out of the parts allowances and mounting it inside the truck on a bracket? Taking the proper blackout precautions, to be sure."

Anybody out there done this? Anybody got a better idea?

We hear that a new disc-type fuel-filter element made out of paper, instead of the brass that you now have in your filter elements, is being tried on Federal and Autocar trucks.

If so many of the delicate brass elements hadn't been blasted with air guns shot at them from the *outside* in (instead of from the *inside* out with the gun held a safe distance away) in attempts at cleaning, maybe we wouldn't have to go in so strong for ersatz.

You may or may not have Change 3 to AR 850-15 (basic automotive law) dated April 20, 1943. But if you have, you know it gives you all the forms - new and old - you need in connection with the operation, supply, maintenance, etc. of your motor vehicles. In one neat package it gives you the name and number of all the forms and describes briefly how they're used.

Having Change 3, maybe by this time you've discovered that many of the forms listed there are not yet available. The PM Work Sheets (W.D., AGO Forms 461, 462, and 463) and the revised Drivers Trip Ticket and PM Service Record (W. D. Form 48) that we raised so much



hullabaloo about on the first page of our April issue, should be available from your regional AG Depot by this time. But some of the other forms - like the "Locator and Inventory Control Card," and the "Exchange Part or Unit Identification Card" - are still in the mill.

Best we can say is, take advantage of par. 33 in Change 3 which says, "Pending availability of forms listed, locally improvised or old forms may be used."

We'll keep you posted.

Don't know whether the FSMWO (pronounced 'Fizmo') has come your way yet, but if you're driving a Tank, Light, M3 or M3A1 without a Blackout Driving Light, you're due to get one soon through FSMWO G103-W25.

This is just for your information - don't requisition until you get the formal Fizmo.

Why are so many 2nd-echelon shops and mechanics doing 3rd and 4th-echelon work?

Letters, visits, everything tells us that a huge volume of higher-echelon work is being handled by unit mechanics. Ask the reason why and invariably you get the answers: "Man, we need all the damn vehicles we got - if we send them away to a higher-echelon shop, we don't see them again for a month."

Another popular answer is, "What the hell's the use? When I get the job back, it ain't no good anyway and I gotta do

it sooner or later."

Still another: "I get a job that's broken down. The 3rd-echelon shop is 50 miles away. What t'hell am I supposed to do - tow it 50 miles? Nuts on that stuff - I fix it myself. Oh, sure - it's okay for a division that's got it's own 3rd-echelon outfit, but us un-divisional guys get the dirty end of the stick."

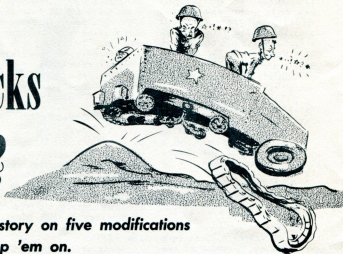
All this by way of introducing a statement from the head office of the Army Service Forces (ASF #30):

LACK OF PREVENTIVE MAINTENANCE: *Drastic action will be taken immediately to improve present status of preventive maintenance of motor vehicles and all other mechanical equipment. PROPER MAINTENANCE IS A COMMAND FUNCTION OF ALL ECHELONS WHICH MUST RECEIVE CONTINUOUS PERSONAL ATTENTION OF ALL COMMANDERS. Observations during maneuvers and inspections indicate a lack of first-echelon maintenance. During training in U.S., preventive maintenance must be overstressed so that later, under combat conditions, all echelons will take care of their equipment properly as a matter of routine procedure. THE TENDENCY OF SECOND ECHELON MECHANICS ATTEMPTING TO DO THIRD AND FOURTH-ECHELON WORK RESULTS IN THE NEGLECT OF SECOND-ECHELON MAINTENANCE. Continued neglect of first and second-echelon maintenance may reduce the life of a vehicle by one-half.*

What's it all mean to you?

(Continued on page 96)

Do Your Half-Tracks Come Off?



**Here's the inside story on five modifications
that will help keep 'em on.**

Do you have track trouble?

Are the tracks on your half-track vehicle constantly slipping off on cross-country jaunts? If so, you can do one of two things about it. You can gripe about it, or you can look over your half-track for possible modifications to the suspension system that will prevent track loss.

The half-tracks were originally designed to be used only as light personnel and cargo carriers. And when used as such, they worked O.K. But the War Dept. soon discovered more and more uses for these versatile vehicles. First, multiple machine guns, then light artillery and even medium artillery were mounted on them. With all this additional weight, things started to happen. Bent idler posts, bent tie bars, chewed-up bogie wheels, and tracks coming off were quite common.

Since the half-tracks had to continue to carry the heavy loads, the Ordnance Dept. did the only thing that could be done — modified the suspension system to take the extra weight. The five modifica-

tions they made areas follows:

- Spring Loaded Idler (FSMWO G102-W14)
- Flanged bogie roller (FSMWO G102-W26)
- New type track guides (Factory only)
- Stronger volute spring (FSMWO G102-W23)
- Machined tie bar (FSMWO G102-W23)

If you're having trouble keeping the tracks on your half-tracks, look for these modifications. If they're not there, notify your Ordnance Officer.

SPRING LOADED IDLER

The first modification, the spring loaded idler, provides for a powerful double coil spring (Fig. 1) to keep the idler wheel pressing against the track all times. But the idler wheel can also move toward the front of the vehicle whenever a strain more powerful than the spring is put on the track.

When a half-track is bounding over rough country, it's possible for a rock, a log, or somebody's tin hat to bounce into the suspension system.

The track, like a conveyor belt, will carry the obstruction along with it toward the rear. The first thing you know the tin hat, or whatever it is, will squeeze between the track and the idler. This has the same effect as lengthening the distance between the sprocket and idler wheel without enlarging the track. Something has to give. With the old-type fixed idler, the giving resulted in bending in the idler post or by breaking the track. In either case the track came off.

But with the spring loaded idler this can't happen. As soon as the object tries to squeeze between the idler wheel and track, the coil spring compresses, thus permitting the idler wheel to move forward and allowing the object to pass through without damage to the track (Fig. 2). The idler wheel moves forward, relieving the strain on the idler post.

The spring loaded idler also functions in the opposite manner. When a half-track is operated at high speed over a washboard terrain the bogies

have a tendency to bounce off the track, thus leaving slack in the track. You know that slack in a track means you'll soon be confronted with the problem of putting it back on.

Well, if the vehicle has a spring loaded idler, you can concentrate on Mabel instead of replacing tracks. Because, when the bogies get bounced off the track, the idler wheel, under tension of the spring (Fig. 3), moves back to take up the slack.

So, the spring loaded idler modification actually provides a two-way action for the idler wheel. If an unusual strain is placed on the track, the idler can move forward to relieve the strain; if the track develops momentary slack the idler moves back, thus keeping the track tight at all times. But, like all other equipment, the spring loaded idler can't protect the track and the idler post from damage unless its adjustments are properly maintained.

There are two types of spring loaded idlers on our half-tracks. Both operate on the same principle, but require slightly different preventive maintenance procedures.

The first type (Fig. 1), is the spring idler installed

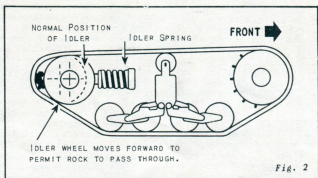


Fig. 2

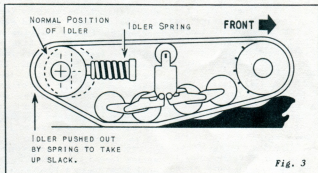


Fig. 3

at the factory. It has two coil springs, one inside the other. There are two adjustments necessary to maintain

this type. The first adjustment, the coil spring adjusting nut, puts tension on the track by compressing the spring that preloads the idler wheel. The tighter this nut is screwed against the spring, the more tension is put on the track. 'How tight should it be?' you ask. Good question - and a very important one. The answer is found in a recent teletype sent out by Brigadier General S. E. Reimel to all organizations using half-tracks. It states that *all previous instructions on adjusting track tension on vehicles equipped with the double coil spring loaded idler, should be disregarded and in their place the following procedure should be used.* When adjusting track tension, the adjusting nut (Fig. 1) should be tightened enough to compress the coil spring to a distance of 14 inches from the outside of the front flange to

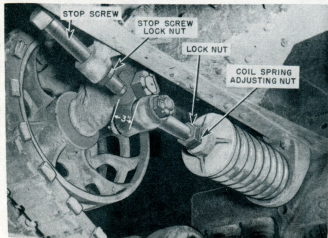


Fig. 1 - Double coil spring loaded idler, installed at factory.

the inside of the rear flange as shown in Figure 4. When the spring is compressed to this distance, there is enough tension on the track to keep it from slipping off, but not enough to overload the track or idler post. Remember that these instructions apply only to half-tracks equipped with the double coil type spring loaded idler.

As you can see, this adjustment is the key to whether or not you're going to keep the tracks on your vehicles. So at least once a week, check the distance the spring is compressed. Then, using a wrench, make sure the adjusting nut and the lock nut are tight.

Incidentally, we've just received word of an advance OFS Technical Bulletin which informs us that some of the adjusting nuts are larger than the opening on the 18-inch crescent wrench that comes with the vehicle. If this is true of your wrench, enlarge the jaw opening of the wrench by grinding the jaw surfaces. Just a word of caution: don't grind the wrench more than necessary and don't let it get too hot while grinding -- it will lose its temper.

The second adjustment which requires your attention is the stop screw mounted behind the shackle (Fig. 1). This screw is provided to prevent the idler from flying back under tension of the coil spring if the track should break or come off. That spring has a kick worse than an Army mule. So if the track breaks and the idler gets slammed back, it's likely to run amuck. To prevent this, keep the stop screw adjusted to leave a distance of 3 inches between the end of the screw and the shackle. Another thing, if the stop screw should become loose and screw in toward the shackle, it will keep the coil spring from pushing the idler back to its extreme position. This means you'll have a loose track. But by tightening the locknut at the same time you tighten the coil spring ad-

justing nut (every week), the stop screw won't give you any trouble.

The second type of spring loaded idler is installed in the field. It is located in the same place on the vehicle as the factory type but it contains only a single coil spring (Fig. 5). The track tension is maintained by the adjusting nut; the tighter the nut is screwed against the coil spring, the tighter the tension on the track. The nut should be tightened enough to compress the spring to a length of about 19 inches. Then check this adjustment by the old sag method. The old sag method calls for putting a 150-pound weight -- like a man -- on top of the track and measuring the deflection. If the adjustment is correct, the track will deflect 3/4 of an inch. After the spring is adjusted properly, the locknut should be tightened against the adjusting nut so as to jam it in position.

Unlike the factory-type spring loaded idler, the single coil type doesn't have a stop screw. Though this stop screw is highly desirable, it was not considered practical to be installed in the field.

FLANGED BOGIE ROLLER TRACK GUIDES

The next problem the Ordnance Dept. had to solve was how to prevent the track guides from sandwiching between the bogie flange plates and the bogie wheels. On the earlier model half-tracks, there was quite a gap between the flange plate and the rubber on the bogie rollers. Also the track guides on these models were scalloped (Fig. 6). Under heavy loads on rough terrain, the sharp corners of these scallops would work their way between the rubber and the flange plates and then chew the edges of the rubber away. This of course was playing hell with the rubber on the bogies as well as the track guides themselves.

The Ordnance Dept. overcame

this problem in short order by making two modifications. First, by getting rid of the scalloped guides and installing track guides that are flush on the top (Fig. 7), they avoided the sharp corners that were causing the guides to start riding between the flange and the roller. Then they developed a new-type flange plate for the bogie wheels (Fig. 8). This flange has a rim bent around the edges which prevents any further chance of the track guides worming their way between the rubber and the flange.

'Half-Track' Robbie of Tank-Automotive Center tells us that the modified track guides are not available for field installation except when the whole track is replaced. In other words, you can't get the new-type guide plates to install on tracks originally equipped with scalloped ones. But when you requisition new tracks they will have the new type guides. On the other hand, the modified bogie roller is a field modification. The installation instructions are very clearly written in FSMWO G102-W26.

STRONGER VOLUTE SPRINGS

The problem of supporting the additional weight of guns and other heavy equipment was met by installing a stronger set of volute springs. The old springs which compressed to 8-inches with a 5000-pound load would permit the crab to bottom on the tie bars. This meant that the whole bogie mechanism would be stretched to its limits instead of retaining a reserve of operating clearance for use over bumps.

To remedy this FSMWO G 102-W23 provides for a stronger volute spring to be installed. This new spring compresses to 9-1/4-inches under a load of 5000 pounds. This gives 1-1/4-inches more clearance than the old springs. In addition, the FSMWO prescribes that the tie bar surface be machined out (Fig. 9) to provide even more operating

clearance between it and the crab.

If you are having any track trouble at all, first make sure that you are carrying out all the usual track preventive maintenance. And if you've been a good boy and have been treating your half-track in the manner to which it is supposed to be accustomed, and you're still having track trouble -- then go over the suspension system for the modifications we've pictured. If your vehicle hasn't got them, tell your Ordnance officer. He'll see to it that you get them.

But above all, remember that even though half-tracks are built to take some rough riding, they do have their limitations.

Fig. 5 - (right) Single coil spring-loaded idler.



Fig. 6 - Old-type track guide plates.

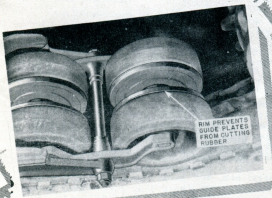


Fig. 8 - (above) New type bogie wheel flange plate.

Fig. 9 - (right) Machined tie bar surface gives greater clearance.

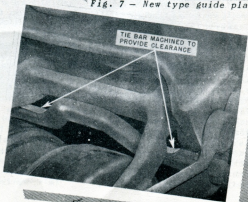


Fig. 4 - (right) Adjust coil spring to 14".

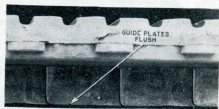
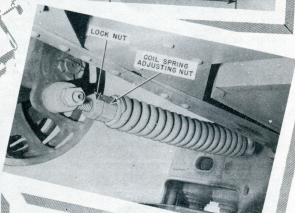
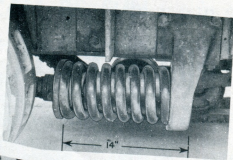


Fig. 7 - New type guide plates.

Spare Parts Kit

A box - full of goodies for your trucks and motorcycles to carry overseas.

The well-dressed Army truck or motorcycle wouldn't think of embarking on a trip abroad without its chic little Spare Parts Kit. Not since 15 January 1943, it wouldn't. The Chief of Ordnance, no less, directed that from that day forward *no motor vehicles are to leave the continental United States either for United States task force use or under Lend-Lease without the Standard 1st-Echelon Spare Parts Vehicle Kit*.

However, you needn't go tying jute twine (Federal Stock No. 21-T-613) around your fingers to remember that. You don't even have to yell for your kits when the time comes. They are automatically issued to alerted organizations, according to priority, by the Supply Branch of the Tank-Automotive Center - *without requisition*. And the kits are not available for vehicles operating within the continental United States. So stop drooling, will you, while we regale you with further details.

Such as: The Standard 1st-Echelon Spare Parts Kit was designed to provide every driver with certain frequently-needed replacements and supplies, little things that can be a big help. It was also designed to occupy a minimum of space, so that it can be tucked out-of-the-way in each vehicle. Kit components are basically the same for all trucks (10 items) - and for all motorcycles (12 items) - with variations as required. Here, take a fast gander at

the list -- and see what we mean.

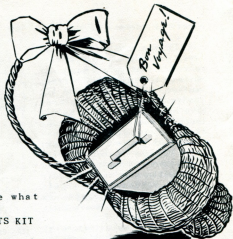
STANDARD SPARE PARTS KIT FOR TRUCKS

- Two (2) fuses of each type used
- One (1) set of light replacement units for markers, blackout, and tail lamps
- Two (2) valve caps (screw-type)
- One (1) box of valve cores (6)
- One (1) small box of assorted cotter pins
- One (1) coil of soft wire (1/4 lb. - 22 gage), for emergency fastening of loose parts, accessories or equipment
- One (1) roll of friction tape (4 oz. roll), for insulating, binding, fastening, etc.
- Four (4) shear pins for trucks with winch
- One (1) spark plug with gasket, for on-the-spot replacement
- One (1) fan belt set; trucks requiring two (2) belts get two (2)

All these tidbits are sardined in a sturdy metal box, which in turn is mounted in a convenient location - generally under the dash of your truck. Instructions for mounting, with pix of choice positions in various vehicles, are included in an Ordnance Field Service Technical Bulletin (TB) which will accompany each kit.

There's no metal box, by the way, for 1/4-tons. But the same basic items are pecked in a bag-type kit - to be stowed in the cowl compartment.

This bag-type container is



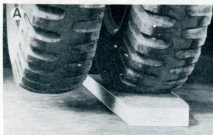
also used for all motorcycle kits, which snuggle in the saddle bag. The list, in this case, stacks up as follows:

STANDARD SPARE PARTS KIT FOR MOTORCYCLES

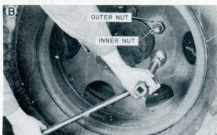
- One (1) tube repair kit (cold patch)
- One (1) roll of friction tape (4 oz. roll)
- One (1) spark plug
- One (1) box of valve inserts (5)
- Two (2) valve caps (screw-type)
- One (1) double repair link (rear-drive chain)
- One (1) double repair link (generator chain)
- Two (2) connecting links (primary chain)
- One (1) headlight bulb
- One (1) tail light replacement unit
- One (1) front marker light replacement bulb
- One (1) blackout tail-and-stoptlight replacement unit.

There you have what it takes to keep vehicles in the pink - across the Big Drink. Mark you, these Spare Parts Kits are only for use *outside* the continental United States. And they're definitely not requisitioned. When you get yours - *bon voyage!*

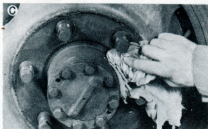
TIRE-CHANGING CAN BE FUN . . . in a pig's eye - but here's some tips to make it easier.



(A) YOU DON'T NEED A JACK to remove an outer dual. You can make it clear the ground by driving the inner dual onto a two-inch board. Won't work on single wheels or inner duals, of course.



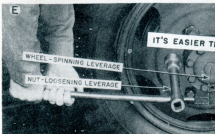
(B) OUTER WHEEL NUTS are threaded 'against the torque' delivered to the wheels. This keeps the nuts tight. But they can get too tight - run them off and on once a month.



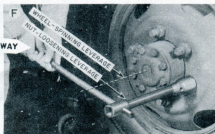
(C) BITS OF CAKED MUD, chipped paint, etc. between the mating surfaces of inner and outer duals, will throw the wheels out of line. Result: quickly scuffed, worn tires. Cure: clean the mating surfaces of inner and outer duals before mounting the outer dual.



(D) SOAP THE THREADS or rub them with an oily rag, so the nuts will be easier to remove next time. Don't be afraid they'll work loose...the same torque you're taking precautions against, in the picture above, will keep them tight.



(E, F) IF YOU'RE GOING to take a front wheel off, back the nuts off half a turn or so before jacking up the wheel. You'll have to compete with a spinning wheel if you try to loosen tight nuts with the wheel jacked up. However, if the vehicle is already jacked up for some other purpose, you don't have to un-jack it. Apply the wrench from the



side of the wheel *opposite* the nut (right-hand picture) and jerk like mad; the nut will loosen before the wheel can start to spin (inertia - a body at rest tends to stay at rest, etc.). Also, working from the side opposite the nut you're loosening, gives you the benefit of added leverage.



Installing the Superstructure IN WOOD CARGO BODIES

A new kit furnishes reinforcement to keep loads on the superstructure from tearing up the floor.

Mounting the superstructure (Fed. Stock No. 41-S-6025) on the steel body of those of your 2½-ton trucks entitled to it, was a cinch because the superstructure was designed for the steel body.

Mounting the superstructure on the wood body of your more recent 2½-ton's may lead to a pain in the rompers. Trouble is that the wood floor is not strong enough to take the extraordinary strain of loads on the superstructure.

To brace the wood cargo and keep it from ripping up when loads are placed on the superstructure, an 'Installation Kit' (Fed. Stock No. 41-K-109) has been made available. The kit contains material which creates a solid foundation in the wood cargo body to which the superstructure may be anchored. These materials are:

2 U-bolts	2 frame filler blocks
2 hex-head bolts	2 floor filler blocks
6 nuts	2 sill filler blocks
6 lockwashers	4 nails
6 flatwashers	

The two hex-head bolts are used to anchor the rear part of the superstructure (Fig. 3); the U-bolts are used to anchor the front.

Fig. 4 (opposite page) shows how the hex-head bolts are anchored simply to the body member at the tail gate, but the U-bolts at the front of the superstructure are a slightly more complicated proposition.

The U-bolts (one on each side) pass on down through the wood floor of the cargo body to the chassis frame members (Figs. 1 and 2). To make sure these U-bolts are well-rooted, 'filler blocks' are used to close up the empty spaces: a block of wood is set into the 'channel' of the frame member to keep the flanges of the member from buckling; a 'sill filler block' is set into the space between the frame member and the sill; and 'floor filler blocks' are nailed into the space between the floor and the top of the sill.

Before this can be done, however, a U-bolt which is already holding the floor sill to the frame must be moved. This original U-bolt is moved forward as shown in Fig. 2, at right.

If you have already installed a superstructure in the wood body of your 2½-ton truck, without the benefits of the 'Installation Kit,' requisition the kit by the Federal Stock No. noted above and do the job right. Our pictures on this and the page opposite will help. Superstructures issued in the future will come complete with the installation kit.

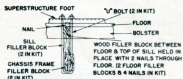


Fig. 1 - Sectional view at "U" bolt

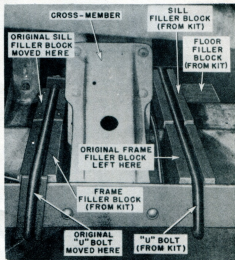


Fig. 2 - Worm's-eye view showing how the original U-bolt is moved forward to make way for one of the new U-bolts that comes in the 'Installation Kit.' The other new U-bolt (not in picture) is placed just like this one. Front of vehicle is to the left.

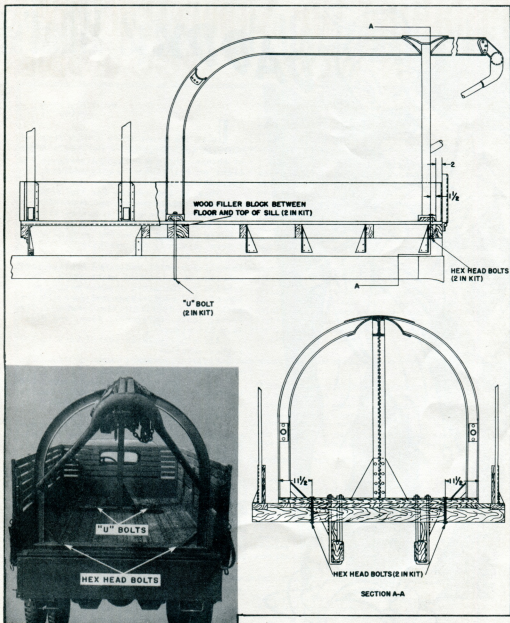


Fig. 3 - The superstructure, mounted in the wood body of a 2½-ton truck, is anchored firmly by assorted bolts and blocks in a new "Installation Kit."

Fig. 4 - Details of how the superstructure is installed in an 80x144-inch (2½-ton GMC) wood cargo body. All the bolts, nuts, blocks, nails and washers you need are in the new kit.



DADDY.. What's th

Up at the front where a high state of hysteria and emergency is the normal order of things, there's nothing like traveling light on maintenance equipment and responsibilities.

This is the reason for the echelon system of maintenance - and none of your lip, Murphy. The echelon system streamlines maintenance - what can't be done in a hurry up front is bucked on back where a more leisurely air prevails.

Army Regulations 850-15 (basic law on military motor vehicles) specify five echelons of automotive maintenance. Each echelon is furnished certain parts, personnel, and equipment - and does all the work it can do within the limits of its Parts, Tools, Personnel, Time, and Military Situation.

All other work is passed back to the higher echelons.

Skills (personnel) are authorized by the Tables of Organization.

Tools and equipment are authorized by Tables of Basic Allowances, Tables of Allowances, and, simplest of all, Tables of Equipment.

Parts are authorized in Ordnance SNL's (Standard Nomenclature Lists).

A good many motor transport vehicles still have old TM-style Parts Lists, but you'll see fewer and fewer of these as time goes by.

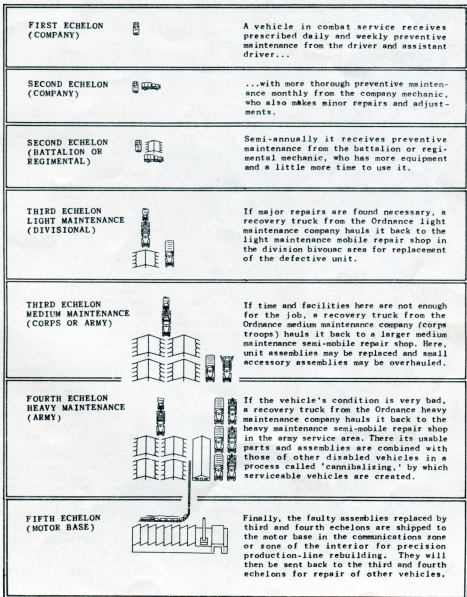
The *Military Situation* is a matter of opinion and you better judge for yourself unless you have orders from higher authority.

A bird's eye view of the echelons at work is shown on the opposite page. This illustrates what happens to a vehicle in an Infantry Division - the echelons through which it passes and the work each echelon does on it.

Almost the same plan holds for the other types of division, except the Armored. Someday, if you're real good, we're liable to give you a picture of how the echelon system works in an Armored Division.

In the meantime, study the chart on the next page, and find out where you stand.

Echelon System of Maintenance?



Transfer-Case Noises

*A couple of the boys have been hearing bones rattling in the Dodge transfer case
But that's all right — it's only the gears
gnashing each other's teeth.*



The guys who used to wake bolt upright in the middle of the night thinking they heard strange noises in the room, are now in the Army. In the Army, they sit bolt upright on the seat of Dodge trucks and hear strange noises in the transfer case.

Noise — don't make a mistake — is often a sure sign that something is wrong somewhere. But to grab a handful of tools and tear down an expensive and intricate assembly just because you've got a buzzing in your ears — well, you'd be better off wasting your time on something more important.

Although some of the sharp-eared citizens who've been detecting noises in the transfer case of the 3/4-ton Dodge merely and mistakenly attribute it to the 'angle of power delivery' to the transfer case, others have been known to take more forthright and harmful action.

To lay the ghost of noises in the Dodge transfer case, and put an end to unnecessary

tampering, the Fargo Corporation recently issued a technical bulletin.

What's all this mystery about the transfer case, it asks. When the truck is driven by the rear wheels alone, the power comes from the engine, passes through the transmission and intermediate propeller shaft, and goes directly without interruption or contribution through the transfer case to the rear axle.

What's inside the transfer case? Inside the transfer case are three helical gears (see Figure): the main-drive gear (A) which is in constant mesh with the idler gear (B), and the lower or drive-gear (C) to-the-front-axle, which is free to move on a splined shaft. When the going gets rough and requires all-wheel drive, the driver moves the transfer-case lever up in the cab, the shifter fork, which rides on a shifter rail nudges the front-axle-drive gear into mesh with the idler gear — and the front axle is engaged. The truck

takes the rough going in its all-wheel-drive stride.

Well, what's all the furse about? the bulletin asks. The furse is all about the noises in the transfer case.

There are noises — but they're natural noises.

Vibration — torsional vibration — sets up in all internal-combustion engines. This is due to 'power pulsations'. As the fuel explodes in the respective combustion chambers, power is delivered in 'fits and starts' to the crankshaft and these are in turn transmitted along the power train.

At higher speeds, the effects of the fits and starts are smoothed out and the 'jerkiness' is not so pronounced. But at lower speeds, the fits and starts are more pronounced: they run out of the engine, down along the power train and into the transfer case. Because there is a certain amount of clearance between the teeth of the main-drive gear and the idler gear in the transfer case, these fits and starts from the engine, cause the gears to 'rattle'.

If the front axle is not engaged, the idler gear is being rotated by the main-drive gear without load and, lacking the dampening effect that a load on the gears would have, the rattle is at its loudest. By the same token, when the front axle is engaged, a load may be placed on these

gears taking out the backlash.

At any rate, since the engine passes through the lower, 'critical' speeds upon speeding up, gear rattle may occur upon acceleration as well as upon deceleration.

Now if you've got your thinking cap on, a lesson is clear: when you've got to run your vehicle at a lower speed, shift into a lower gear - your engine won't lug and the rattle of the gears won't be excessive.

Some people have been blaming the bearings for the noise in the transfer case. They take them out and find looseness or evidence of only partial contact of the bearing rollers on the races. But the loose fit of the bearings and slight markings have nothing to do with the noise you might hear. The bearings were meant to be a free fit in the case. And to replace them just because you find traces of partial contact, is a waste of critical material and is guaranteed not to stop the noise of the transfer case.

Even if the cups are so loose that they're rotating in the housing, they're still not responsible for gear noise.

(Although in this case, you'll want to replace the bearings.)

Is heat responsible for transfer-case noise? Some people creep up to the transfer case after a particularly hard grind and apply a scientific finger to the housing. Ouch! It's hot. The natural thing then is to consider the heat excessive and blame it for the noise in the transfer-case.

But in the first place, you can't accurately gage the transfer-case operating temperature with your naked finger. The only reliable method is to place a thermocouple (which of course, you don't have) in the drain-plug opening.

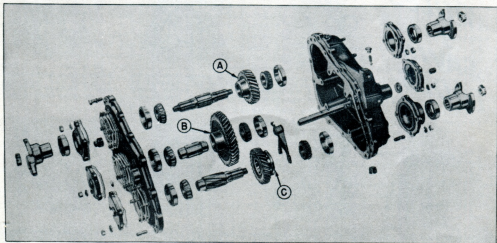
In the second place, no machine is 100% efficient, that is, there's a certain amount of power loss. The power loss is dissipated in the form of heat. In a compact little unit like the transfer case, transmitting a tremendous amount of power, the power loss may run the temperature up to 300° depending on the load and the air temperature.

But, says the Fargo Bulletin, tests show that complaints of excessive transfer-case

heat are usually unfounded and certainly, the temperature doesn't affect the operating noise one way or the other.

What it all boils down to is simply that the normal noise in the transfer case of the 3/4-ton Dodge is caused by the torsional vibration and the backlash between the main-drive gear and the idler gear (remember these gears are constantly rotating even when the truck is in rear-wheel drive alone). And it's times like these, when there's no load on the idler gear that the noise is loudest. When the truck is shifted into all-wheel drive, the output gear in the transfer case engages the idler gear and a load may be placed on the idler gear. Immediately then, the noise should be reduced.

Now there's a check for you: listen for the noise of the transfer case to change in character when you shift from rear-wheel drive to all-wheel drive. If the sound is very pronounced and doesn't seem to change in character when you make the shift, then it's possible that the noise is abnormal and the bearings may need replacement or adjust-



(A) Main-drive gear, (B) Idler gear, (C) Front-axle drive gear.

ment. Make the following checks:

1) Be sure you've got the right lube in the transfer case (we use 90 oil) and that the lube is at the proper level (from the filler hole to 1/2 inch below the filler hole when cool; never below the bottom of the filler hole when hot.)

2) Check for loose bearing adjustments: throw the truck out of front-wheel drive, put the transmission in neutral and release the hand brake. Get out and get under, and grab the companion flange and try to move it up and down. If you find you've got clearance, see first whether the companion-flange nut is loose - then decide whether the bearing clearance is excessive.

If you decide that the transfer-case bearings need adjustment, the 3rd or higher echelon will have to pull the transfer case off the truck. A good way to have the Fargo Corporation blow its top, is to let them hear you say the job can be done on the truck.

The correct procedure for making the bearing adjustment

is in the Dodge 3/4-ton manual.

At any rate, our final word to the people who hear strange noises in the transfer case is simply this: 1) The normal noise of the transfer case is due simply to vibration from the engine and backlash (which you or nobody else can successfully remove) between the main-drive gear and the idler gear and 2) the sound will change somewhat as the truck is shifted into all-wheel drive and may disappear when a load is placed on the idler gear.

Deal with any other strange noises in the transfer case by following the procedure outlined in our article.

Investigation into... **SPECIAL TOOLS**

From the Holabird Ordnance Depot Daily Activity Report comes the big news that 'tests

and conferences on special service tools have been completed and a report has been drafted recommending elimination of over 50% of such tools.'

Reasons given are: 1) *General purpose tools will do the work just as satisfactorily, in a great many instances. It is believed here that a general educational program on the uses of tools is all that is required to save considerable quantities of metal and, at the same time, reduce the size and weight of special service tools to be carried.*

2) *A number of the present special service tools actually do not fit, owing to changes that have been made in the vehicles since the tools were designed.*

3) *Most of the tools were designed in peace-time, when metals were not critical.*

Keep your shirt on, Buck, don't start unloading your special service tools - the report is just on its way to the TAC. Any action to be taken - if any - will be loudly disseminated to the field.

SEVEN RULES for SAVIN' TOOLS



Never hammer a ratchet. Soak the nut with penetrating oil to ease both fit and turning.



The leverage that can be applied to a ratchet is limited. Watch those extension handles!



Never use a screwdriver as a pry bar - if you expect to keep on using it as a screwdriver.



Don't look now - but you can kiss that feeler gage goodbye. That chump's usin' it as a screwdriver.



See that a socket goes all the way down. If it's not fully seated you'll crack it like an egg.



Don't whittle down a socket to get into a tight place - whittling weakens the walls.



Heat crystallizes metal; ruins the temper. Keep your tools away from flame and high voltage.



Desert Cooling System Kit

Overflow tank helps to keep your precious coolant in your radiator. Here's how to use it.

Cursing, the driver shifted to a still lower gear. Those blistering, shifting sands were tougher to fight than the Nazis. He glanced at the heat indicator. It looked bad.

Realizing how little of his reserve water supply was left, he stopped the truck to cool it. He climbed down from the cab. Then it happened... first a rumbling, gurgling noise followed by water gushing out the overflow pipe. He looked under the truck just in time to see the irreplaceable liquid disappear into the parched sand....

O.K. — you can relax now; it's only a yarn. But for you fellows whose vehicles don't have them, that's why radiator overflow tanks have been installed on half-tracks, scout cars, and some Dodges, and (in the future) on GMC's and 1/4-ton jeeps. Not all the Dodges, GMC's and 1/4-ton's are to be modified, but more on this later.

After reading the Desert Cooling System Kit modification work orders for these vehicles, we couldn't see why any mechanic should have trouble making the modification. In each case it means changing the fan assembly, radiator cap and fan belt, and installing an overflow tank which is hooked up to the

radiator overflow pipe. On the Willys and Ford 1/4-ton's the modification also requires installing a larger radiator core.

As anyone who has driven in hot climes knows, when coolant gets hot it expands. And if no place is provided to receive the expanded coolant — it will flow out the overflow pipe to the ground. If this happens in an area with a scarcity of water, somebody is going to be mighty thirsty. But on vehicles equipped with the overflow tank, this doesn't happen. The cooling system is sealed by a positive seal cap on the radiator and by tubing running from the radiator overflow pipe to the overflow tank. The tank has a pressure cap. When the coolant expands from heat, the water that would ordinarily run out the overflow pipe is conducted into the overflow tank.

When the temperature of the coolant in the radiator decreases it forms a partial vacuum in the line between the radiator and overflow tank. This partial vacuum causes the coolant in the tank to flow back into the cooling system — if you have kept the cooling system good and tight.

Any air leaks in the cooling system, such as loose hose

connections or a vented radiator cap, will break the vacuum and prevent the coolant in the tank from returning.

If the coolant level in the radiator is found low, the overflow tank should be checked for trapped liquid before any additional water is added. If there is water in the tank, it should be drained into a container by using the petcock and poured back into the radiator. But the presence of coolant in the tank after the radiator has cooled, is a sure indication that the system isn't working right.

In such cases, check for proper installation of the kit, check all hose connections for leaks, and check the radiator cap to make sure some one didn't slip you a vented one. (A vented one will break the vacuum in the radiator to overflow line). But if the water in the radiator is low and it isn't in the overflow tank, you can start looking over your cooling system for a water leak.

Now if you follow these few simple rules your desert cooling system kit will work O.K.

'Where and when do I requisition the desert cooling system kits for the GMC's, 1/4 ton jeeps and 3/4-ton Dodges?' The answer is you don't requisition them. They will requisition you. When your destiny is decided — that is, when it is known you are going to a water-short area, you will be given the desert cooling system kits.



'Oil,' as they say in the States, 'is ammunition.' But the big idea is to use it against the enemy -- not to shoot the guts out of our own trucks and tanks. And if you don't think oil and grease can do a pretty fair job of that -- well, brother, read on.

Lubricants can actually promote wear, rather than reduce it, if they're not stored and handled carefully. All you have to do is leave them alone for a spell -- exposed and unprotected. Every speck of dust absorbed, every tiny morsel of so-called foreign matter, becomes a punishing abrasive that can raise hell with any vehicle you name. And don't depend on your naked eye, or even the one in uniform, to tell you when a lubricant is contaminated. Maybe you can't see the dirt -- but a vehicle sure can feel it!

Remember, too, that perfectly pure water can make a mess of perfectly good oils and greases -- and seriously reduce their lubricating value. Some greases, for instance, can pick up enough water to change their color, soften them up, and shift their chemical balance. When that happens, the grease causes corrosion in the lubricated unit and tends to run out

Beware of Lube Contamination

"Keep it clean!" Warns the Society for the Prevention of Cruelty to Vehicles.

prematurely, leaving the poor unit with its lube down. Engine oil, when contaminated by water, promotes corrosion, among other things, in the crankcase.

Lubricants are naturally the highest-priced victims of lube contamination -- but they're not the only ones. All your lubricating equipment, too, can easily be damaged by dirt and water in the lube. Grease gun and pump mechanisms become corroded, leathers deteriorate, check valves and plunger shafts get stuck. Dirt wears out everything too fast -- so if you've got the idea that lubricants are an unmixed blessing, you're right -- provided the lubricants are unmixed with dirt or moisture. Otherwise, you might do just as well with maple syrup or suntan oil.

Getting down to preventive measures, let's start with the lube containers. Chief reason, of course, for providing standard small-quantity containers is to reduce the danger of contamination. The 1-quart, 5-quart, and 5-gallon cans of engine oil -- and the 25-pound pails of gear lubricants and greases -- can be readily identified and emptied with a minimum of exposure. Dust and moisture have little chance to do their dirty work. However, it's still important to keep full containers tightly closed, well covered, and as clean and dry as possible. Ditto for measuring cans, which should always be rinsed out with solvent or gasoline before

using.

There are plenty of other things you can do to save lubricants -- and lube equipment -- and vehicles. Clean your grease guns thoroughly before and after use, being careful not to wipe dirt into the nozzles. Remove dirt from the swivel and threaded joints, so it can't sneak into the operating mechanism or the lubricant container tube. Wipe grease fittings clean before applying a grease gun. Wipe filler plugs and the areas around them. Before using a grease gun, squirt a little grease through the nozzle to remove any accumulated dirt. Do the same with an oiler. Before connecting an air hose to a grease gun, send a short blast through the hose to blow out dust and whatnot. Clean the outside of lubricant-container tubes before sticking them in grease for a refill. Do likewise for the nozzle on suction-type guns. Keep cover-clamps tight on bucket pumps. *And never, never lay a grease gun on the ground!*

Even that isn't all. But you'll do a bang-up job of conservation -- and a vital one -- if you guard your lube's purity at every possible point. Which is exactly the point of our story. As OFSD 6-10 sums it up, 'Regardless of conditions under which troops are operating, extreme care must be exercised to prevent foreign substances from contaminating lubricants in use or in storage.' Extreme care, d'ya hear?

Dear Ed,

Corporal Morgan and the writer have discovered something which we are sure could save a great deal of time, and possibly many an oil line (inlet to filter) on the 1/4-ton Willys M.B.

In removing the fuel pump of said vehicle, we have discovered that it is impossible to remove the front bolt that holds the fuel pump to the engine, as presently arranged, because of the position of the oil line. You've got to remove the oil line to get at the bolt. With the cold weather we have up here it is nearly impossible to complete this job without breaking the oil line in the removing. Solution: We have slotted these bolts on all our vehicles. Result: We find it very easy to remove the bolts with a screwdriver, thus eliminating the necessity of removing the oil line. In so doing we have, in our estimation, saved several oil lines. Formerly, every time we removed the fuel pump before we slotted the bolt, it called for a new line.

John M. Segledi
Sgt., QMC
Somewhere on the
Alcan Highway

(Ed. note - Although it is of course, possible to remove the oil line without breaking it, Sgt. Segledi being up in the cold country has possibly found the oil line brittle and hard to work with. However, the Willys Corp. points out that you can't very well pull a fuel pump into place with a screwdriver alone. What you need is a hex screwdriver that you can put a wrench on to pull the screw up tight. Where you gonna get a hex screwdriver? Well, if you're in the same kind of spot Sgt. Segledi's in, we say get a higher-echelon shop to make you one for your organization.)

CONTRIBUTIONS

Dear Ed,
I have
invented
something
that will
save
time and
money.

Got a good idea? Invented something lately? Got a trick? Shoot it along to us. Maybe you've solved a problem rest of the boys in the field. You'll get a personal subscription if we like your idea - you lucky thing.



myself, if someone hasn't beat me to it.

The GPW 1/4-ton Ford rear seat has three indentations for strength. Water collects there during rain and dampens the waterproof seat and stays there, causing untold rust. To prevent this, drill a hole in the center and forward part of the indentation and, presto! the water is gone.

Also, keep the seat cushions up and hold them up with the safety strap during the rainy season to keep the sitting end of the driver dry.

Lt. Eugene R. Kroeck
501st Q.M. Car Company

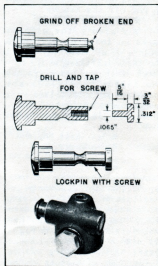
Dear Ed,

You know those little lockpins on the light switches of Army vehicles - WOW, what a headache we did have with them. The little nipple peened over the washer that holds the lockpin inside the switch would break and then blooey - you have to exchange the entire switch assembly. That isn't bad, but waiting a month and more for the new switch is what burned us. Here's what we did with the broken pins:

Grind smooth the broken end. Use a No. 36 drill (.1065") and drill to a depth of almost 3/8". Take a 6/32" tap and run a thread inside

the lockpin.

Now cut a screw and run a thread on it with a 6/32" die. The sketch below gives the



dimensions of the screw and a view of the finished product. No doubt you will appreciate the saving in time, dead-lined equipment, metal, and unstrung nerves afforded by this neat little trick.

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

Dear Ed,

I've enjoyed your ideas and want to contribute one

Dear Ed,

Gripe No. 1.

Why, in the specification of truck bodies, is not more space left for expansion of the bows in the cargo body, or dump bodies. Moisture gets in around the bows, they expand and the driver can't get them out. So he pounds on them and the first thing the bow is broken or the metal corner is ruined. More bows are broken removing and installing, than are ever broken in service. I see in your Wood Bodies article of last Sept. that plenty of space is left in the floor in case of expansion, due to cold or wet climates - yet on the new wood bodies, the bows are just as tight as ever. This specification ought to be changed because we in the field just have to plane and then paint the planed parts of the bows in order to get them on and off the trucks.

Gripe No. 2.

Why aren't the pioneer racks an integral part of a truck - or at least why aren't the racks installed at the factory? When the truck reaches the field, conditions are sometimes such that it's very inconvenient to install them, especially for a 2nd-echelon shop.

M/Sgt. Bill England
340th Engrs.

Dear Ed,

An idea for another practical use of the 1/4-ton jeep windshield cover came to me the other morning. It had rained rain during the night and also soot from the smoke stacks of the heating plants of the camp. The seats of the jeeps were a terrible mess, wet and dirty, and the floor was full of water. In an effort to clean up the mess, I raised the seat and noticed the windshield cover canvas lying in the water. I removed it to dry it out - and discovered that it would fit over both front seats with the seats folded up against the back. The closed part of the cover

has two openings, one in each corner. After the cover is installed over the seats and pulled down, the remaining upper part can be folded backward - the openings will be downward and no water will enter.

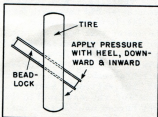
Keeping the seats dry and clean by this method, not only puts the windshield covers to additional use, instead of allowing them to deteriorate under the seat, but also adds to the maintenance of good health - why subject a man to a cold wet seat, not to mention the ruination of a newly cleaned and pressed uniform or coat? The idea is very well accepted here at Camp Atterbury and has been put to use by almost all of the units.

John G. Kemen
Automotive Advisor

Dear Ed,

I have just completed a division course of instruction on the mounting of tires, the instructor of which had been taught at the Goodyear Rubber Co. As best as I've been able to find out and also in accordance with training films on the subject, the beadlock on 1/4-ton jeep tires has to be inserted with tire irons. However, in the course of our practice work, I discovered that the beadlock can be easily inserted with the use of one (1) foot. I'll attempt to explain.

Place ring inside tire over valve stem being careful not



to insert to center (see fig.), leave largest part on top so bottom will clear tire bead when pushed, then kick ring with foot (heel) down and into

tire.

If done properly it takes only a very few seconds and is simple to do. It proved so easy and successful that it was recommended for use in our entire division. I hope it might be helpful to some other struggling tire changers.

Pvt. Robert D. Leach
Hq. Btry 102 Inf. Div.
Arty.

(Ed. Note - This is recommended by TM 31-200, 'Maintenance and Care of Pneumatic Tires and Rubber Treads.' Be sure the one (1) foot is clean so that dirt or stones don't get in the tire and lead to a flat.)

Dear Ed,

Here's an idea: on Duty Roster Form W.D. AGO #6, we are using a 'T' for our tire-rotation record. We rotate tires every 1000 miles by the speedometer.

We have recently been assigned used vehicles and find tires full of nails, glass, tacks and also treads injured to the point of distress. We've found tires on vehicles 6, 8, and 10 months old, with more than 6000 miles on the speedometer - and a brand new spare, dry and weather-cracked from being on the spare and never flexed.

Believe it or not, we're glad to get used and abused vehicles for training - they make it easier to point out the necessity for a perfect Preventive Maintenance operation in all echelons.

Allen Lovercheck
Automotive Advisor
671st Engineer Co.

Dear Ed,

Having spent most of my life in the Automotive Trades, it makes my already tired bones ache to see the boys doing a lot of needless work to correct troubles in their vehicles. I am thinking of several instances where they have removed and dismantled transfer cases, opened and adjusted differentials, gone into the transmis-

sion and clutch, to correct a backlash of the drive shaft that occurs when the vehicle is being slowed down. This has only happened on new vehicles and those that have been in storage. In each instance the lash has been caused by a drive-shaft-type parking brake dragging slightly, a drum rusted or band not properly adjusted.

In your apt phraseology will you tell the boys to look for the simple troubles first before dismantling a perfectly good unit.

L. R. Allen
Automotive Adv.

(Ed: 'Boys, will you look for simple troubles first before dismantling a perfectly good unit? 2nd-echelon boys: @!@&!!## don't tear down units - it's out of your echelon.')

Dear Ed,

Here's a couple of ideas that keep our tire gages and spare keys anchored and in plain sight too.

T/4 Benny Pilars, our shop foreman, is the pappy of the following: knock out the second rivet in each of the data plates on the glove-box door of the 1/4-ton, make a spring clip for each end of

door, slip the gage into the clips and there is no excuse for the cry, "I've lost my tire gage." And the spare key? Just drill a 3/16 hole in the glove-box door, insert a 3/16 x 3/4 stove bolt, tighten the nut, put the key on the bolt and fasten it in place with a wing nut taken from an ammunition box. The same idea may be used on any vehicle except the amphibian which has no glove compartment.

S. J. Freeman
M/Sgt. 387th Inf.

Dear Editor,

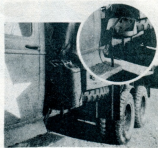
Upon receiving some new GMC, 2 1/2-ton, 6x6's we noticed that four of them were already forcing grease past the right, front-wheel, axle-shaft, inner grease seal on the split-type axle.

Investigation showed that the air vents, located on the upper left side of the differential housing, had been clogged due to heavily applied paint. Furthermore, all other trucks not throwing grease were found to have air-free vents.

These air vents should be one of the 'musts' in the original inspections as well as routine check-ups. Any paint-fouled vents should be

Dear Ed,

Enclosed is a photograph (below) of a solution to the difficulty of mounting the extra fuel can on the 2 1/2-ton truck. With this mounting, the can does not project past the body, as in the case when the bracket is mounted on the running board, nor does it interfere with care of the battery, as it does when mounted below the frame.



The only modification required on the truck is to move one cleat.

This solution was worked out by the Motor Officer of the 48th Engr. Combat Regt., Lt. James C. Ebeling.

K. S. Anderson, Colonel
48th Engr Combat Regt.

Dear Ed,

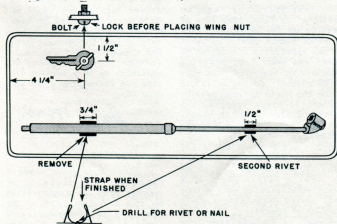
Here's a couple of thoughts on air brakes:

1) Have you ever noticed your air compressor continuously operating? Have you ever wondered why it should constantly pump air even when you use your brakes but very little?

Your trouble is at your air brake 'nose' - the air intake strainer, the little gadget mounted on the compressor with two bolts. It is the only source of air getting into your braking system. Service it often in ordinary operation; service it oftener in dusty operation.

2) So you're losing air pressure, eh? Sounds like it's coming from your trailer relay valve? Well, the leak could come from there, from your tractor-brake relay valve, or

(Continued on page 96)



the tire gage from the metal bands taken from any packing case and rivet them on the inside of the door. Paint the outline of the gage on the

cleaned out by a small wire or sharp instrument until air can be blown through easily.

Lt. Harold D. Jarvis
503 Ordnance Co. (HM)
(Tank)



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

Dear Half-Mast,

There's been a lot of talk about lubrication and nobody seems to care except the fellows who keep 'em rolling. Our system is to have two men from our Maintenance Section as greasers along with the driver. The boys have taken the nozzle and flexible hose from our pressure gun (the compressor never came) and attached it to our Lincoln hand gun. They also have an adapter welded to an extra grease-gun nozzle which can be screwed on for universal joints on 1/4 tons, etc. They never have to move the vehicle while greasing and nothing is missed.

(Motor) Sgt. K. E.
North Africa

P.S. Your duty roster 'used to keep PM records' (in the Oct. issue) has worked swell.

Dear Sarge,

Your spirit of "keep'em rolling" is fine, your idea of making up for an absent compressor sounds good — but what I was especially interested to see, was your P.S. praising the use of the duty roster as a PM record. Coming as it did from the North African battlefield, it kinda represents a trial by fire. A lot of people in damning paper work are too inclined to damn *all* paper work. But I say — and a lot of hardheaded motor officers and sergeants agree with me — that a *little* paper work used strategically goes a long way toward organizing a guy's method of operating. I suffer as much as anybody else from some of this &!!?! paperwork — but there are some pieces of paper I wouldn't be without. (By the way, Sarge, since the big new Work Sheet program

(see April ARMY MOTORS) has doubled the importance of the Duty Roster, we reprinted the October story in last month's issue with a couple of additional notes.)

Half Mast

Dear Half-Mast,

They issue us vacuum gages to use in our 2nd-echelon kits in our Battalion set-up. But it's really a waste of time due to the fact that the 1/4-ton jeeps have no place to hook in for a reading on the manifold. If there is a place on the 1/4-ton for such I would appreciate very much hearing about it.

I suggest that we take the drain plug out of the floor and tap the manifold to fit. This would make the vacuum gage useful to us.

What do you think of this idea?

Lt. R. J. M.

Dear Lieut.,

Since they didn't put a fitting in the manifold of the 1/4-ton jeep, it looks like they thought nothing would ever go wrong with the engine. But it was only an oversight and it's been corrected on later models which now have a hole tapped for the vacuum gage. For this reason, I see no objection to your tapping the manifolds on your present 1/4-tons and installing a 1/8-inch pipe plug.

Half Mast

Dear Half-Mast,

There have been several cases in this division of trouble with the transmission on the 1/4-ton Ford. The trouble is that the transmission seems to lock when shifting out of first gear and cannot be shifted into second or high. The Ordnance 3rd-echelon Shop has replaced several of these units, but has not found the

cause for the trouble.

Recently I disassembled one of these faulty transmissions and believe I found the cause of the trouble. When the transmission case is bolted up tight to the transfer case, the side of the transmission is distorted so that the holes that the low and reverse shifter shaft slides in, are not in line. This misalignment causes the shaft to bind so that when the shift lever is moved from first to neutral the shaft does not go all the way into the neutral position. The poppet ball cannot move the shaft this small fraction of an inch into the neutral position because the shaft is binding so tightly. Consequently, the shifter-shaft lock plunger will not allow the second and high shaft to be shifted.

The Ford Engineers would probably have kittens if they knew that I worked on their beautiful transmission with a file and emery cloth, but by enlarging the holes that the low and reverse shaft fits in, the unit was made to work fine.

Perhaps some other method could be worked out to remedy this situation. If you have any information on this please let me know before I ruin some more vehicles with my file, as several others seem to have the same tendency to lock.

B. F. H.
1st Lt., Inf.

Dear Lieutenant,

Henry Ford wants an autographed picture of you holding your file in your hand - says it'll make a fine target for his darts game. But kidding aside, the root of your trouble and the cure is as follows: there's a misalignment pin between the transfer case and the transmission assemblies. In bolting the two assemblies together, the heavier transfer case is allowed to sag placing the weight on this pin. The cases are thus distorted, making it hard to shift gears. You can correct the condition by

loosening the bolts between the two assemblies and placing a jack under the transfer case assembly. This will raise the case to the proper level where it can be properly tightened.

In welding your file, you unconsciously eliminated the trouble during disassembly and assembly without realizing it - enlarging the holes didn't do it.

Half-Mast

P.S. But remember, the disassembly of transmission, is not a 2nd-echelon job.



Dear Half-Mast,

In the past week we have run into some trouble with valves sticking on 1/4-ton jeeps. We tore a vehicle down and found the exhaust valves not only gummed up, but a corrosive action had taken place about half-way down the valve stem causing a severe pitting. There was also considerable traces of rust on the valve stem. The condition was only prevalent on the exhaust valves.

As a corrective measure, we resealed and ground all valves and thoroughly cleaned up the valve guides, removing all sludge and carbon from the motor and crankcase. We also checked the motor thoroughly for water leaks, but were unable to find any. Upon completion of this work, we assembled the motor and as could be expected, we had a very smooth running motor.

We have come to the conclusion that this condition was due to the fact that the

1/4-ton jeeps are not permitted to operate off the post and are used only in short runs around the post. This does not permit them to attain normal operating temperatures - which undoubtedly causes excessive crankcase dilution and sludge and creates the described condition.

We are wondering if you have had any similar experiences and if our diagnosis is correct and what your recommendations are in correcting this trouble.

F.P.L.
Automotive Tech.
Advisor

Dear F.P.L.,

You hit it on the head - cold crankcases collecting sludge, etc. - both Willys and Ford seem to agree with you, because both companies are adding crankcase ventilating systems to their 1/4-tons in production (so far, it has not been decided to issue kits for field installation of the ventilating system). Back in January, we carried a description of the ventilating system to be installed in GMC's which should give you a rough idea of what it'll look like on the 1/4-tons.

However, if drivers are properly trained, they will bring the engine to operating temperature before moving their vehicle - just plain old 1st-echelon 'Engine Warm-up' will go a long way towards correcting your trouble.

Half-Mast

Dear Half-Mast,

Why don't they use a better tow-hook idea than they do now on our trucks? I've seen so many tow-hooks twisted off and pulled out of shape that I just wonder.

M/Sgt. B. E.

Dear Sarge:

The reason that so many tow hooks are twisted off is that a lot of drivers and mechanics were being taught to

pass the tow chain around one tow hook and fasten it on to the other. The result was force exerted in a direction in which the hooks were never built to take strain - the hooks bent, twisted off, and sometimes the whole front bumper was yanked out of shape. You'll find the whole story in the December ARMY MOTORS. The gist of it is that you're supposed to use a spreader bar - or, not having a spreader bar - winch out smoothly using one tow-hook.

Half Mast



Dear Half-Mast,

In the course of a year with the supply platoon of a medium-maintenance company I have learned a great deal about automotive parts, but from time to time things come up that I cannot readily understand. For instance, we had on the dead-line a GMC model CCKW 352 truck waiting for a transfer case #215966 - this number was in the parts book and in the master parts book. After waiting four weeks we procured from the depot, a transfer case #2116208 which fitted and worked on our vehicle. Now, what I would like to know is, why are two different numbers used on a transfer case that fits two vehicles alike? Why should we have lost all that time waiting for the transfer

case of a particular number when another case, which was available, could have been used. I have learned from this experience, but I wonder how many people in supply depots and warehouses know the same thing?

Sgt. N. H. C.

Dear Half-Mast,

I have found many parts stocked by battalions which are the same but have different parts numbers. The supply depots give these parts to the battalions as part of their basic allowances - maybe because the depots themselves don't realize that these parts, although they bear different numbers, are identically the same.

Why not have the same part number for identical parts? Why not have an interchangeability list? It's a shame with the shortages and all, that so many parts are hidden in stock under different numbers.

L. N.

Dear Guys,

I get so many letters asking the same question that I've printed your two to emphasize the widespread lack of information in the field of the fact that: 1) there is an interchangeability book; and 2) that Ordnance does give parts, which are interchangeable, the same number. Let me explain:

The Interchangeability Book was prepared for transport vehicles at the time they were QM. This book - if you explain that you have a lot of use for it - may be obtained from the 'Part Number Control Section, Engineering-Manufacturing Branch, Tank-Automotive Center, Detroit, Michigan.' As I say, it only covers interchangeability of parts on transport vehicles, but according to a rumor I picked up in the Club La Trine, it is being expanded to include combat vehicles too.

In the meantime, parts interchangeable among combat vehicles are taken care of by

the Item Stock Number. That is, all parts which are interchangeable with each other, have the same Item Stock Number. So in stocking your parts, they are placed in one bin bearing this one number. The Item Stock Number is available from the SNL for your particular vehicle (we had a story in last month's magazine explaining the SNL system). If the Item Stock Number is not given in the SNL that's just too bad - you'll have to use the manufacturer's number or the Ordnance number to order your part - but of course, they don't cover interchangeability. (The Unit Manufacturer's number - if it is given - is another tipoff on interchangeability. The unit manufacturer gives his part one number no matter how many vehicles it's used in.)

Half-Mast

Down With Red Tape

There's one less piece of paper work for Unit Supply Officers to worry about. Formerly, Unit Supply Officers had to sign a duplicate shipping ticket every time a batch of supplies arrived ... then send the d.s.t. back to the shipping officer.

Now, with the appearance of War Dept. Circular 108, dated 23 April 1943, this little bit of business is out the window. From now on, Unit Supply Officers will receive one shipping ticket for their own files. No duplicate required. In fact, they can tear up any duplicates that may be still lying around.

Shortages in shipments received, will be reported to the shipping officer on an Over, Short, and Damaged report, marked "Information copy - accountability for this discrepancy will be adjusted at this station."

Did you get all the directives this month?

Here is your monthly checklist of recent official directives governing the 1st and 2nd echelons of maintenance. War Department publications issued through Adjutant General Depots (AGD distribution) in each Service Command reach you through your OJ; Ordnance publications distributed by regional Ordnance Publications Depots (OPD distribution) come through your Ordnance Officer. Ask these officers about it if you were missed; don't write to Holabird or the Tank-Automotive Center for any of these publications.

ABBREVIATIONS

*AR - Army Regulations
C - Change
*FM - Field Manual
*FSMWO - Field Service Modification Work Order
*OFSC - Ordnance Field Service Bulletin
*OFSC - Ordnance Field Service Circular
*OFPSI - Ordnance Publications for Supply, Index

*OSPE - Organizational Spare Parts and Equipment, SNL
*SNL - Standard Nomenclature List
*SPC - Service Parts Catalog, SNL
*TB - Ordnance Field Service Technical Bulletin
*TC - Training Circular
*TM - Technical Manual
*WDC - War Department Circular
*AGO Distribution
*OPS Distribution

SCOUT CARS

CAR, SCOUT, M5A1

FSMWO 067-46, Brake pedal lubrication, canceled by C2.
FSMWO 067-416, Blackout lights, canceled by C1.
TB 700-11, New type voltmeter.
TB 700-45, Fuel sediment bowl.

GUN CARRIAGES

CARRIAGE, MOTOR, 37-MM GUN, M6

SNL G-121, OSPE.
FSMWO G121-W1, Recoilote fuel line (red group).

CARRIAGE, MOTOR, 75-MM GUN, M5

SNL G-102, OSPE.
FSMWO G102-W20, Blackout lights, canceled by C1.
FSMWO G102-W24, Eliminate tire scuffing on hood side armor plate (red group).
TB 700-45, Fuel sediment bowl.
TB 700-47, Service limit bogie rollers.

CARRIAGE, MOTOR, 75-MM GUN, M5A1

TB 700-45, Fuel sediment bowl.
TB 700-47, Service limit bogie rollers.

CARRIAGE, MOTOR 81-MM MORTAR M4

OFBS 6-G-102, Lubrication
FSMWO G102-W20, Blackout lights, canceled by C1.
FSMWO G102-W24, Eliminate tire scuffing on hood side armor plate (red group).
TB 700-45, Fuel sediment bowl.
TB 700-47, Service limit bogie rollers.

CARRIAGE, MOTOR, 81-MM MORTAR M5A1

TB 700-45, Fuel sediment bowl.
TB 700-47, Service limit bogie rollers.

CARRIAGE, MOTOR, MULTIPLE GUN, M13

SNL G-102, OSPE.
TB 700-45, Fuel sediment bowl.
TB 700-47, Service limit bogie rollers.

CARRIAGE, MOTOR, MULTIPLE GUN, M14

SNL G-147, OSPE.

CARRIAGE, MOTOR, MULTIPLE GUN, M15

SNL G-102, OSPE.
TB 700-45, Fuel sediment bowl.
TB 700-47, Service limit bogie rollers.

CARRIAGE, MOTOR, MULTIPLE GUN, M16

TB 700-45, Fuel sediment bowl.
TB 700-47, Service limit bogie rollers.

CARRIAGE, MOTOR, 107-MM HOWITZER, M7

TC 59 (1943), Descending steep grades.
TC 61 (1943), Operation
FSMWO G128-W2, Oil-tank breather (red group).
FSMWO G128-W4, 80-octane fuel (green group).

CARRIAGE, MOTOR, 3-INCH GUN, M10

TC 59 (1943), Descending steep grades; also, removal of water from engine compartment.
SNL G-130, C1, OSPE.
FSMWO G130-W10, 3-inch-gun solenoid (red group).

CARRIAGE, MOTOR, 3-INCH GUN, M10A1

TC 59 (1943), Descending steep grades.

CARRIAGE, MOTOR, 105-MM GUN, M12

TC 59 (1943), Descending steep grades.

CARRIAGE, MOTOR, 105-MM HOWITZER, T12

SNL G-102, OSPE.
FSMWO G102-W24, Eliminate tire scuffing on hood side armor plate (red group).

TB 700-45, Fuel sediment bowl.

TB 700-47, Service limit bogie rollers.

CARRIAGE, MOTOR, 75-MM HOWITZER, T10

SNL G-102, OSPE.
FSMWO G102-W4, Eliminate tire scuffing on hood side armor plate (red group).
TB 700-45, Fuel sediment bowl.
TB 700-47, Service limit bogie rollers.

CARRIERS

CAR, HALF TRACK, M2

SNL G-102, OSPE.
OFBS 6-G-102, Lubrication.
FSMWO G102-W20, Blackout lights, canceled by C1.
FSMWO G102-W24, Eliminate tire scuffing on hood side armor plate (red group).
TB 700-45, Fuel sediment bowl.
TB 700-47, Service limit bogie rollers.

CARRIER, PERSONNEL, HALF TRACK, M3

SNL G-102, OSPE.
OFBS 6-G-102, Lubrication.
FSMWO G102-W24, Eliminate tire scuffing on hood side armor plate (red group).
TB 700-45, Fuel sediment bowl.
TB 700-47, Service limit bogie rollers.

TANKS

TANK, LIGHT, M1

SNL G-105, Vol. 1, Ch. 1, OSPE.
TB 700-50, Track installation.

TANK, LIGHT, M5A1

TB 700-50, Track installation.
FSMWO G105-W29, Turret storage (red group).

TANK, LIGHT, M5A5

SNL G-105, Vol. 7, OSPE.
TB 700-50, Track installation.

TANK, LIGHT, M6

SNL G-105, Vol. 2, OSPE.
TB 732-15, Air-cleaner filter element.
TB 732-16, Carburetor drain pipes.
TB 727C-5, 732-17, Fuel tank level, auxiliary power plant.
TB 727C-6, 732-18, 732B-7, Transmission adjustment.
TB 732-13, Hydraulic turret traversing mechanism adjustment.

TANK, LIGHT, M5A1

TB 727C-5, 732-17, Fuel tank level, auxiliary power plant.
TB 727C-6, 732-18, 732B-7, Transmission adjustment.

TANK, MEDIUM, M2 and M2A1

OFBS 6-G-81, Lubrication.

TANK, MEDIUM, M3

TC 59 (1943), Descending steep grades.
TC 61 (1943), Operation.
FSMWO G104-W29, Reduce vapor lock (red group).
TB 700-50, Track installation.

TANK, MEDIUM, M5A1 and M5A2

TC 59 (1943), Descending steep grades.
TB 700-50, Track installation.

TANK, MEDIUM, M5A3 & M5A5

TC 59 (1943), Descending steep grades.
FSMWO G104-W41, Cooling system and air cleaners (red group).

TANK, MEDIUM, M5A4

TC 59 (1943), Descending steep grades.

TANK, MEDIUM, M4

TC 59 (1943), Descending steep grades.
 TC 61 (1943), Operation.
 OPSS 6-G-104F, Cl, Lubrication.
 FPMW G104-W47, Canteen racks (red group).
 FPMW G104-W53, Lock for cal. .30 machine gun (red group).
 FPMW G104-W56, Ventilation (red group).
 TB 700-48, Crowbar bracket location.
 TB 700-49, Clutch-pedal interference.
 TB 700-50, Track installation.

TANK, MEDIUM, M4A1

TC 59 (1943), Descending steep grades.
 OPSS 6-G-104F, Cl, Lubrication.
 SNL G-104, Vol. II, C9, OSPE.
 FPMW G104-W47, Canteen racks (red group).
 FPMW G104-W53, Lock for cal. .30 machine gun (red group).
 FPMW G104-W56, Ventilation (red group).
 TB 700-49, Clutch-pedal interference.
 TB 700-50, Track installation.

TANK, MEDIUM, M4A2

TC 59 (1943), Descending steep grades; also, water in engine compartment.
 TB 700-48, Crowbar bracket location.
 TB 700-49, Clutch-pedal interference.
 FPMW G104-W41, Cooling system and air cleaners (red group).
 FPMW G104-W47, Canteen racks (red group).
 FPMW G104-W53, Lock for cal. .30 machine gun (red group).
 FPMW G104-W56, Ventilation (red group).

TANK, MEDIUM, M4A3

TC 59 (1943), Descending steep grades.
 TB 700-48, Crowbar bracket location.
 TB 700-49, Clutch-pedal interference.
 FPMW G104-W47, Canteen racks (red group).
 FPMW G104-W53, Lock for cal. .30 machine gun (red group).
 FPMW G104-W56, Ventilation (red group).
 FPMW G104-W59, Oil-filter thrust collar (Engines w/Serial Nos. below 1149) (red).
 FPMW G104-W56, Ventilation (red group).

TANK, MEDIUM, M4A1

TC 59 (1943), Descending steep grades.
 TB 700-48, Crowbar bracket location.
 TB 700-49, Clutch-pedal interference.
 FPMW G104-W47, Canteen racks (red group).
 FPMW G104-W53, Lock for cal. .30 machine gun (red group).
 FPMW G104-W56, Ventilation (red group).

TANK, MEDIUM, M7

TB 700-50, Track installation.

AMPHIBIAN TRUCKS

TRUCK, AMPHIBIAN, 1 1/2-TON, 4X4 (FORD)
 FPMW G50N-W8, Hopper-shaft packing-box lubrication (red group).

TRUCKS

TRUCK, 1 1/2-TON, 4X4 (FORD & WILLYS)
 TB 10-1206-1, Grease-gun adapter.
 TB 805-1, Rear Body-panel reinforcement.
 FPMW G505-W1, Surge tank (red group).
 TB 805-2, Carburetor air-cleaner tube.

TRUCK, 1 1/2-TON, 4X4 (DODGE)

SNL G502, Cl, OSPE.
 OPSS 6-G-502, Lubrication.

TRUCK, 1 1/2-TON, 4X2 (CHEVROLET)

TM 10-1521, Maintenance manual (model 5103).
 TM 10-1525, Maintenance manual, stave and cargo bodies (models 4405 & 4409).

TRUCK, 1 1/2-TON, 4X4 (CHEVROLET)

TM 10-1208, Parts list (models G-7103 and 7113).
 SNL G-506, OSPE
 TB 10-1000-7, Vent cover.
 FPMW G505-W1, Shift-lever linkage (red group).

TRUCK, 2 1/2-TON, 6X4 (GMC)

SNL G-508, OSPE
 TB 800-9, Spring-type radiator mounting.

TRUCK, 2 1/2-TON, 6X6 (GMC)

OPSS 6-G-505A, Lubrication
 TB 800-9, Spring-type radiator mounting.

TRUCK, 4-TON, 6X6 (DIAMOND T)

SNL G-509, OSPE.

TRUCK, 5-TON, 6X4 (MACK)

Maintenance manual (model 1M5W-59)

TRUCK, 5 1/2-TON, 4X4 (FOUR WHEEL DRIVE)

TM 10-1377, Maintenance manual (Model BU-008).

TRUCK, BOMB SERVICE, M1

FPMW G85-W1, C8, Electric brake-pedal control.

TRUCK, BOMB SERVICE, M1 (DIAMOND T)

FPMW G85-W8, Blackout lights, canceled by Cl.

TRUCK, BOMB SERVICE, M6 (CHEVROLET)

SNL G-85, Vol. 4, OSPE.
 FPMW G85-W11, Lube chart holder (red group).

TRUCK, WELDING, M12

SNL G-142, OSPE.

TRUCK, WELDING, M8A1

SNL G-142, OSPE.

TRUCK, WRECKING, HEAVY, M1 (WARD LA FRANCE)

SNL G-116, Vol. 2, Cl, Parts and Equipment.

TRUCK TRACTORS**TRUCK TRACTOR, 4-5-TON, 4X4, COE**

FELDTOP
 SNL G-515, OSPE.

TRUCK TRACTOR, 4-5-TON, 4X4, COE

(FEDERAL)
 TM 10-1458, Parts list (Model 94 x 43).

TRACTORS**TRACTOR, HEAVY, M1 (ALLIS-CHALMERS)**

BD - 104)
 FPMW G98-W1, Lube chart holder (red group).

SEMITRAILERS**SEMITRAILER, 6-TON, PAYLOAD (EIGENWALD)**

SNL G-505, OSPE.

SEMITRAILER, 7-TON, PAYLOAD, 2-WHEEL

(CARTRIER)
 TM 10-1040, Combined maintenance manual and parts list (Model C-11-691).

TRAILERS**TRAILER, 1 1/2-TON, 2-WHEEL CARGO**

(BANTAM AND WILLYS)
 SNL G-529, OSPE.

MOTORCYCLES**MOTORCYCLE, SOLO, CHAIN-DRIVE**

(BARLEY-DAVIDSON)
 TM 10-1350, Parts list.
 TB 879-1, Interchangeable rear drive chains.

MOTORCYCLE, SOLO, SHAFT-DRIVE

(BARLEY-DAVIDSON)
 SNL G-525, Cl, OSPE

MOTORCYCLE, SOLO, CHAIN-DRIVE

(INDIAN)
 TB 879-1, Interchangeable rear drive chains.

MAINTENANCE

TM 10-1199, Master parts list, Dodge trucks, 1/1/40 to 1/1/42.

OPSS 6-1, Ordnance lubrication program.
 TB 700-43, 1st-echelon spare parts kit.

TB 10-1206-1, Grease gun adapter.

STORAGE**SHIPMENT AND ISSUE**

10C, Introduction to the Ordnance Catalog.
 AR 890-20, Cl, Precautions in handling gasoline (Non-sparking shoes).
 TM 10-1199, Master parts list, Dodge trucks, 1/1/40 to 1/1/42.
 WDC 86, 111, 322, and 125 (1943), Tire and tube storage and issue.
 OPSS, Ordnance Publications for Supply Index (monthly).
 OPSS 15, C3, Shipping tickets.
 TB 700-43, 1st-echelon spare parts kit.

TRAINING

TC 57, (1943) Film strips and bulletins (add to FM 21-7).
 TC 58 (1943), List of Publications (add to FM 21-6).
 MTP 5-3, Unit Training Program for ASF Engineer Units.
 MTP 9-10, Ordnance Tire Repair Company.
 WDC 119 (1943), Motor Vehicle Driver and Mechanic Aboard authorized for instructors.

IOC, Introduction to the Ordnance Catalog.
OPSI, Ordnance Publications for Supply Index.

TOOLS

SNL G-27, C4, Tools, Maintenance, for repair of automotive vehicles.
SNL G-17D, Supp. 1, Special tools for Combat Vehicles.
SNL N-19, C2, Tool Sets, Motor Transport.

ADMINISTRATION

AR 890-15, C2, Military motor vehicles (Vehicle density reports)

WDC 86, 111, 122, and 125 (1943), Tire and tube purchase, storage, and issue, and inventory.
WDC 114 (1943), Automotive disability report, change in procedure.
WDC 119 (1943), Motor Vehicle Driver and Mechanic Award authorized for Instructors.
WDC 124 (1943), Responsibility for modification of Ordnance material.
OPSE 5-8, Removal of Vehicles from Service.

OPERATION

TC 59 (1943), Descending steep grades (medium tanks).
TB 700-43, 1st-echelon spare parts kits.

tubes; and on emergency tire and tube repairs.

Four copies are distributed by regional AG depots through channels to every company in the Army, as well as extras for higher headquarters; so your outfit should have its quota by now.

From now on it's going to be easier to tell which vehicle is which, and why. The Army has gone in for picture books on the subject - in fact two of them. One of them is

Standard Military Motor Vehicles

TM 9-2800, *Standard Military Motor Vehicles*, is the more complete. It covers 194 standard combat and transport vehicles of all sizes and shapes, from the 'Tank, Heavy, M6 (Cast)' down to 'Scooter, 3W, Motor, w/Package Carrier.' That's more military vehicles than we've ever seen in a single book before, but we understand it's still not complete and is now being revised to include all vehicles. Right now about all we can do is point out some of its features because this first edition had a limited distribution and if you don't have a copy now, there's no use asking for one - there aren't any left. Just be patient for about two months and then send for the second edition.

It contains all the information you'll need to know about a vehicle's performance, characteristics, outside dimensions, armament, load-carrying ability and applicable publications. For example, if you want to know how many filled 5-gallon gas cans you can stack in a 2½-ton GMC 6x6, you can turn to page 293 and by a little simple arithmetic, find it'll accommodate the capacity weight (which amounts to 125 cans) very nicely. Or, if you're coming to a bridge that'll support only 25-ton vehicles, you can look in Section XI and discover that the M3 Light Tanks can make it, but the M3 Mediums will have to swim.

BOOKS



Maintenance and Care of Pneumatic Tires and Rubber Treads

With more pictures and less wordage than the earlier edition, the revised TM 31-200, *Maintenance and Care of Pneumatic Tires and Rubber Treads* (April 1, 1943) is one of the most easily-understood TM's we've yet run across.

It doesn't look like a TM. The pages are twice as large as usual, and almost every page is from half to two-thirds photographs, clearly explained in large readable type. As a rule, each subject is treated fully on a page, and only on that page; so there are almost no confusing references to other parts of the manual or to other manuals.

We especially recommend Section II, Chapter 1, 'Maintenance of Tires on Vehicles,' where you will find the items which should be checked in preventive maintenance schedules and various inspections.

There is a new table of air pressures for artillery carriages. Also new sections on tire identification, types of beadlocks, effect of vehicle operation and maintenance on tires, and authorized tire tools in sets of all echelons.

The new edition increases the number of pictures from 151 to 269. This should bring special joy to the hearts of the guys who change the tires, because a large part of the new photos are step-by-step tire changing shots or tool pictures.

There's also more information on demounting and mounting divided-type wheels (split rims): on storage of tires and



GIVE YOUR TANKS A BRAKE!

(Continued from page 66)

you can easily see that there is no limit to the destruction possibilities.

A general rule to follow for trucks, tanks, or automobiles is to go downhill in approximately the same gear used for going up the same hill. The important thing is to put the vehicle in the lower gear immediately after you reach the top of the hill, or just after you start downhill...don't wait till you've drifted halfway down, and then suddenly slam the clutch down and throw the transmission into a lower gear. If you do, you'll probably find half the innards of the vehicle flying about you.

And use your brakes... that's what they're there for.

RUMORS

(Continued from page 71)

It recommends strongly that you 2nd-echelon guys start doing things the way it is planned for you to do them on the other side. Don't succumb to temptation and do those higher-echelon jobs yourself - send them on up through your higher-echelon replacement, repair, and overhaul channels. You might as well learn the ropes over here so you won't be a babe in the woods over there.

Don't think we're just sitting here shooting our mouth off in complete ignorance of what some of you are up against. But there's the law - it was laid down to keep things running as smoothly and efficient as possible. Don't violate it everytime the wind changes.

CONTRIBUTIONS

(Continued from page 88)

from the brake chambers when the brakes are applied. Brake chambers? Oh yeh, they're those pancake-looking things mounted on the axles, one for each wheel. And the relay valves and brake chambers have diaphragms made outa rubber. The same kinda stuff, you know, that used to leave a pattern on the pavement when we had it

on our tires.

Can you do anything to prevent that hiss, indicating brake valve or chamber failure? Well, you certainly can. You can open the drain cocks on your air reserve tanks to let out the water and moisture. How does water get into the tanks? Everybody knows there's moisture in the air and when condensed, the moisture becomes water.

Constant moisture will deteriorate the rubber diaphragms. Worse than that, water freezes when the mercury drops below 32° F. When the diaphragms become frozen to their seats and then crack from the pressure of a brake application, they develop a chronic leak. Then you just ain't gonna have any brakes until the damaged parts have been replaced. How are you gonna deliver that Mobile Operating Room to its destination on time, or those Pontoon Bridge sections, or that load of spare parts if your tractor or trailer is in a 3rd-echelon shop for brake repairs? Open those drain cocks twice daily.

Take it from a guy what knows:

Service your compressor air intake strainer.

Keep moisture out of your air brake system by draining your air reserve tanks twice daily during operation.

Earle L. Busl
Service Representative
Federal Motor Truck Co.
CONNIE RODD

(Continued from page 70)


Howitzer Rear Door Strap


A coming QFSB reports that the strap rear door, #B168419, on the early production models of 105mm Howitzer Motor Carriage, M7, does not provide sufficient clearance between the rear door strap and the towing pintle when the door is opened.

To provide clearance between the rear door strap and the towing pintle when the

INADVERTENTLY INVERTED

Eagle-eyed readers tell us that we baked an indigestible upside-down cake on pages 24-25 of the April issue. We showed you a couple of BO front marker lights like this

 - when of course they should have looked like this

 . How should we know that our handyman was handstanding when he put them on? As we warned on page 26, same issue, "make sure all the lamps are right side up."

door is opened, cut off the lower part of the strap, #B168419, approximately 3-13/16 inches from the bottom. Use this piece as a clamp when holding the door in closed position, using the lower bolt with a lock washer under the head to prevent the bolt from working loose.

SNL G-104 Error

There's a bit of an error on page 26 of SNL G-104 Vol. II, Sec. 20, dated March 1, 1943. The caption calls the track illustrated there, Track T48. But it's really Track T56. If you have SNL G-104, make the correction, if not, make it when you get it. Another thing: the track shown on page 31 is not numbered. It should be T54E2. This SNL is the List of All Parts for Track Suspension Group on the Tank, Medium, M4A1, but it's used as an SNL for track suspensions on M4, M4A2, M4A3, and M4A4 mediums as well.

ARE YOU BEING *Followed?*

ARMY MOTORS IS EAGER TO FOLLOW YOU WHEREVER YOU GO. BUT FIRST, YOU'VE GOT TO TELL US WHERE YOU'VE GONE. PLEASE REMEMBER...

NOTIFY US PROMPTLY
OF CHANGE OF ADDRESS

...AND INCLUDE BOTH
YOUR OLD AND NEW ADDRESS
WHEN YOU WRITE.

NEWS FLASHES

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

Long-needed 2nd-echelon unit equipment tool sets are now authorized for medical units in infantry divisions under new T/E 9-16, 9-17, and 9-18. Battalion maintenance now gets sets #2 (2½-ton cargo set), #5 (welding equipment), and #7 (wrecker superstructure) instead of the #1 set formerly authorized. Each collecting company and clearing company rates a #1 set (carried on 3/4-ton weapons carrier).

If your truck, in Continental United States, is equipped with one of those fancy batteries that come to you *charged but dry*, (the kind that, upon adding fluid, is ready to deliver juice without being recharged), you're supposed to turn it in to post, camp, station, or depot supply. Those are earmarked for overseas.

Don't use AC "Series S" or "Series L" oil filter elements until further notice, except for administrative vehicles in warm climates. Ordnance is making some special tests to determine which elements will work best under what conditions. Results of which we'll give you in a later issue. Meantime, it's O.K. to continue using elements (except clay-filled models), bearing the same stock numbers as the AC "Series S" and "Series L" models, but manufactured by other firms.

Confused about Figures 85 and 86 of the new "Maintenance and Care of Pneumatic Tires and Rubber Treads" (TM 31-200)? You should be, if *toe-in* is labeled *toe-out* and *toe-out* is labeled *toe-in*. This is a printing error in the first run and has been corrected in later runs. Better change them in your copy, if it is incorrect.

The list of All Parts for Chevrolet Bomb Service Truck, M6 is now available in a revised all-in-one volume, SNL G-85, Vol. IV, Part I. This volume supersedes Part I of the old SNL ("Parts"), but does not supersede Part II ("Equipment"). The supersession note gives you the idea that the new book supersedes Part II, but this is not correct.

From now on, the War Department will be publishing the Table of Organization and Table of Equipment for your company bound together in a single pamphlet, so it will be easier to keep them together. The new publication will be called "Table of Organization and Equipment," and (like the old T/E's) will be used as a basis for requisitioning equipment.

No excuse now for not knowing the latest SNL on your vehicles. Effective 1 May 1943, Ordnance began a policy of revising and re-issuing OPSI (the Ordnance Publications for Supply Index) every month.

Instructors of drivers and instructors of automotive mechanics are now eligible to receive the Driver and Mechanic Award, same as the drivers and mechanics themselves, according to W. D. Circular #119 (11 May 1943).

Automotive disability reports hereafter can't contain "lack of parts" as an excuse for deadlining vehicles unless action has been taken to obtain the needed parts. So says W. D. Circular #114 (5 May 1943).

NEWS FLASHES

CUT IT OUT!



THE PRACTICE OF SHIFTING INTO LOWER GEAR WHEN APPROACHING CORNERS OR COMING TO A HALT, IN ORDER TO "USE THE ENGINE AS A BRAKE," MUST STOP! TOO MANY VEHICLES ARE BEING BEATEN TO DEATH BY THE STRAIN IT PUTS ON THE POWER TRAIN.

INSTRUCTORS: IF YOU'RE STILL TEACHING DOWNSHIFTING, CUT IT OUT!*

DRIVERS: IF YOU'RE STILL PRACTICING DOWNSHIFTING, CUT IT OUT!*

THERE IS NOT NOW — AND NEVER WILL BE — ANY AUTHORIZATION FOR THIS DAMAGING HABIT.

* Except, of course, when necessary to avoid "lugging" the engine in heavy going or on up-grades. See page 65.