

Issue 58

PS

1960 Series

THE
PREVENTIVE
MAINTENANCE
MONTHLY



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IS BEST...

THESE ARE
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EDITORIAL
WORLD WIDE PERSPECTIVES ON MAINTENANCE
FROM THE EDITOR'S OFFICE

The Editor
PS Preventive Maintenance
Monthly
McGraw-Hill, New York

Dear Sirs:

As you are a proud member, I would like to give you a list of the things that will enhance your enjoyment of the magazine.

"I want your ideas, reports, correspondence, and contributions (including photos) - when you have suggestions, ideas, comments or a good article that you believe will be an improvement on the current issue." In addition, your subscription gives you more opportunities to obtain or enhance a number of facts or items.

"It is my hope that the interest of our readers will show themselves in the news material that you send." Our readers should also be in a position to indicate the topics, authors and areas of interest in their letters, notes, and the general nature of their letters.

"This is why I, and other staff of you, as a member of our New York office, are interested in the magazine, simply to indicate that we are interested in your ideas." Our readers should also be in a position to indicate the topics, authors and areas of interest in a short but constructive personal contribution program.

"The role needs of the magazine. We have the world's best maintenance are you in it?"

Sincerely,

James S. Edwards,
Editor
McGraw-Hill
New York
New York



**THE
PREVENTIVE
MAINTENANCE
MONTHLY**

Vol. 41, No. 1 1990 Dec 90

Published by the Department of the Army for the information of operational maintenance and repair personnel. Emphasis is made through various maintenance standards, which focus on acquiring these items for the additional funds from 20 major Army, Marine, Air Force, and Navy units.

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PS wants your ideas and contributions and would be glad to accept your questions, facts and opinions on any of the articles. Send them to:

James S. Edwards
PS Preventive Maintenance
Monthly
McGraw-Hill, New York

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HELP WANTED:
WANTED IMMEDIATELY TO OPERATE THE

NEW SNAKE BOXES



That's right, there's two new "snake-boxes" of low-voltage circuit breakers in the annual selection and this year.

The model TV-100 and the model 115, both priced under \$35 (950-000-0100). (Your insurance may have FIM 6882-293-54 M stamped on it.) There's 20-ampere bypass and range selection used on these two instruments, but electrically they're death to mice.

The new boxes have a way of feeding your circuit as you can fully use your vehicle's electrical system without having to use the motor to break down your battery charge in making the generator's output limited and the battery cables hot.



TV-100

TV-115

The new meters are a combination of multiple-range voltmeters and ammeters with a variable load bank. They include a field detector so let you control the field current in the generator you're testing. For those of you who have used the model 115 had had and field detector has in connection with the older (FIM 4918-114-6065, formerly 17-E-9175-80) low-voltage circuit meter (also represented), the new ones

do the same things for you, but they're all in one box, and the connections are simpler.

This combination of the load bank with the meters makes the new meters better than the old ones. They'll let you draw current from the battery or the generator right through the load bank and the ammeter to ground, without involving any other parts of the system.



The load drawing capacity, but you make a few more you could use make better, and it makes some of the old ones too spikes and noise. In this, the Model TV-100 has a slight edge on the Model 115, since the voltmeter can be switched from range to range, instead of changing leads from post to post. However, you're also going to more careful when you are switched that meter if you forget to switch back to the higher range.)

So let's follow through with a variety of tests on the changing system of a water-pump Mustang without vehicle.

YOU'LL NEED THESE



Normally, you'll need the vehicle one that's giving trouble, either from a battery that's always low or from a battery that's using more than an ounce of water a week for each battery cell, indicating that it must be recharging. And, of course, you'll need the FIM 4918-000-0100 meter, whatever model your shop happens to have.

You'll use the selected vehicle's adapter set, FIM 4918-114-7510, or the

new FIM 4918-114-7500 vehicle adapter set, and the quarter wrench, FIM 9110-288-6065, for the electrical connections.

And you'll want your regular second vehicle mechanic's tool set.

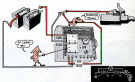
Two men can do the job in less than half the time one man can. Before you start these tests, make sure your vehicle's in normal operating temperature.

BATTERY TEST

First make sure you have good batteries. Begin with your hydrometer test, being sure both batteries are at least 1.275, temperature corrected, and that each battery and each cell in each battery is within 2% gravity points of all the others. Otherwise, send the batteries back on the shop and install a set of charged and tested ones.

STARTER DRAW TEST

You can now make your first backup. This is made on the battery side of your vehicle, and will let you test battery voltage and starter draw.



The load switch on the wire is left open, and the carbon pile brush is unscrewed—counterclockwise—until it moves freely. At this point, the voltmeter will show your battery voltage somewhere between 23 and 26 volts.

Now, with the vehicle ignition switch turned off, have your buddy hit the starter switch for not over 30 seconds, while you read the voltmeter and ammeter and note down the voltage that remains when the starting motor is cranking the vehicle engine. This vol-

age should be at least 18 volts to permit only five your ignition system.

The amperage you read is your starter draw. This should be between 45 and 60 amps on your 24-volt trucks, and around 18 to 24 amps on jeeps. For other vehicles, check the appropriate manuals. If the starter takes much more or much less than it should, you may have loose leadings or some other snag—high draw or perhaps loose or partially broken connections or bad brushes—low draw.

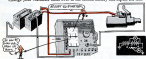
INDIVIDUAL BATTERY TESTS

For this test, and for the one following, it's best to have some one-point, clamp-on leads or short lengths of Hevi-welding rod, which you grip in the clips of your voltmeter leads and shove into the posts of your batteries to be sure you have a good contact with the post leads.



Now drop the battery voltage, uncrew the carbon pile and open the load switch.

Change your voltmeter leads over to the second battery and repeat the test.



Your batteries should be within two-tenths of a volt of each other, and should have no less than nine volts when under load. Nine is a minimum—good batteries will give you as high as 11 volts each.

If yours don't measure up, now you're in for a good matched pair. If they do give you nine volts each, you go on to test your ...

BATTERY CABLES:

This test is best done by two men.

With the voltmeter cords—18 gauge, not maximum a lead of about 20 square on the cables by closing the load switch and running down on the carbon pile

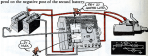
lead. The other man takes the voltmeter leads and rapidly moves from point to point checking for a voltage drop in the cable system.

Check the connections of the cable

system, **POSITIVE** lead on the front, **NEGATIVE** lead on the negative post of the first battery.



Then, **POSITIVE** lead on the positive post of the first battery, **NEGATIVE** lead on the negative post of the second battery.



Then, **POSITIVE** lead on the positive post of the second battery, **NEGATIVE** lead on the positive post (or the battery side of the magnetic switch on the 5 and 10 pin sockets).



If no noticeable voltage drops during these tests, you quickly flip the voltmeter to the **milli-ohm** range and repeat 'em. You should not have more than two-milliseconds of a volt drop at any test.

If you find more than that, you'll have to go over the cables in detail and find where the high resistance is like this:



Make these tests first with the voltmeter on the 10-volt range (not the *ohm's*), in case there was a high resistance at any of these connections. But, for service testing, make 'em again with the meter on the 1-volt range. You should not have any more than two cents of a volt at any test with a draw of 20 amperes.

If you do find a hiccup between any cable and the battery post, or between the cable and frame or cable and starter post, take off the cable, clean up both the terminal clamp and the battery post until the mating surfaces are bright and shiny, grease lightly and back it 'em up again. That should get rid of your voltage drop. If now you loose the carbon

poth and open the hood switch before you go on disconnecting your cables. You don't want even a 20 ampere arc flashing around there.

If you found a voltage drop between the two ends of a cable, it probably means broken strands, a loose lug, or corrosion, and you generally have to replace the cable.

At this point, you men with the 18-man Model D-770 series, have no more work to make.

Disconnect your heavy cables and slide in under the right side of the truck with your voltmeter leads set on the 10-v range. POSITIVE lead goes on the battery side of the magnetic switch, NEGATIVE lead on the starter side.

Have your buddy hit the starter and crank the engine briefly with the ignition OFF. Repeat the test with the voltmeter on the 1-volt scale. In this case you don't want more than one-tenth of a volt drop, or you need the relay back to have the contacts cleaned up.

Then move your POSITIVE lead over to the starter side of the relay, or clip your lead onto the terminal bolt, and take the NEGATIVE lead up to the main post. Once more, turn on the 15-volt range and then on the 1-volt range, crank the engine briefly. Have your taberna in the same room-while you allowed on all the other cables.

That winds up the test-you-can make from this booklet, so, unscrewing the carbon pile leads and opening the lead switch, you disconnect the heavy cables from the frame and the starter post.

But before moving up to the generator and regulator test, you'll want to check out your master ground circuit. To do this you want your voltmeter on the -10 range, first, with the POSITIVE lead touching the master frame. Don't attach this lead to the master attaching bolts. You want to check the return path from the master frame itself back through the engine and the track frame to the battery negative post. If you attach your voltmeter lead to the starter attaching bolt you will see a drop in this path, since the bolt is inserted into the engine block, and any high resistance due to gaskets or dirt between the starter and the engine would not show up. Use your post and take this reading from the frame of the starting motor. The voltmeter NEGATIVE lead goes to the negative post of the first battery.



Have your buddy hit the starter briefly and look for any voltage on the voltmeter. With the meter on the -10 range you shouldn't see any at all, and you then drop the meter over to the -1 scale and try again. If you find one-tenth of a volt on this test, you remove the meter, clean up the attaching

brackets and the mating surfaces on the engine and put it back. If you still have a voltage drop, check the grounding straps between the engine and the track frame.

You are now ready to set up for your ...

GENERATOR TESTS

For safety's sake, drop off your battery ground cable while you make your new hookups, and of course, stop your engine.

You take off the generator-to-regulator cable at the generator output terminal, using the lock-washer wrench to loosen the connector; install the generator testing adapter (the one with three pins and two outside leads) in the circuit at this point. Whether you put the adapter into the generator and the cable

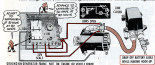
into the adapter, or whether you have to use the short flexible connector with the three pins, will vary according to what vehicle you are testing.

Take down the regulator-to-battery harness at the regulator, and put in the regulator test adapter. Once more, you may or may not need the short flexible lead to get in. Put the harness into the other end of the adapter. The link should be closed.

CAUTION: Be, and always stay, testing, to see that none of the exposed pins or leads of the adapter touch the engine or frame of the truck.

GENERATOR OUTPUT TEST

First thing, check your fan and generator belts for condition and tightness.



When you've completed your hookups, put the ground strap back on the battery so you can start the engine.

But, just as a precaution, before starting the engine, check the generator to be sure it's correctly polarized. Turn the field strength knob all the way clockwise and bring a hot jumper over and

touch it briefly to the terminal post of the generator test adapter. You can get your hot current from the starter post, the positive post of the second battery, or from the battery post of the regulator test adapter, whichever is handy according to the vehicle you're working on. Turn the field strength knob back

counterclockwise.

After you've stalled the generator, start up the engine and set it to run at a good high idle (1000-1200 RPM.) You should see a slight indication of voltage on the voltmeter, perhaps five to 10 volts.

Turn the field rheostat knob slowly clockwise, and you should see the voltage rise. When you have somewhere between 25 and 30 volts shown on the voltmeter, close the load switch and slowly turn the load bank control knob clockwise. Your ammeter will show you what current you're drawing.

You'll notice that as the amperage comes up, the voltage will fall off. Turn both knobs clockwise until you have drawn at least 30 amperes at 30 volts from your generator, then promptly turn the field rheostat knob back counterclockwise, loosen the carbon pile knob, and open the load switch. Stop your engine.

Now you have proved that your generator is OK, and will put out just a little more than its intended output. If it won't, replace the generator and test again. When you get the proper output, you're ready to move on to your ...

REGULATOR TESTS

It's not necessary to take the battery ground cable off when shifting the meter leads for the next test, since you won't be dealing with any hot terminals.



Start your engine again, and set it to the 1000-1200 RPM. Reading your voltmeter, and watching your ammeter, slowly turn the field rheostat knob clockwise. At some point above battery voltage (14-16V) and below your regulated voltage (17-20V) your ammeter should move off zero and show a charge. The exact rate of charge will depend on the condition of the battery, and does not matter for this test. It may be as low

as 2 amperes, or as high as 15 amperes. When you are looking for it the voltage at which the average current will stand, and that is whatever the voltmeter shows as the battery the ammeter knob jumped off zero. (This isn't as hard to read as you might expect. If you advance your field rheostat knob slowly enough, because the voltmeter has a tendency to sag rising when the load comes on the generator.)

Now turn your field rheostat back counterclockwise and watch your ammeter. You will notice that the ammeter on these meters are arranged to read a reverse current as well as a forward current. This current is indicated on the scale to the left of zero on the dial. As you cut down on your generator output by backing off the field rheostat, the ammeter will come back to zero and then go below zero. This means that the generator's output voltage has fallen below battery voltage, and current is now flowing back from the battery in

and through the generator.

As you continue to drop the generator output, this reverse current will increase until at some point the reverse current relay opens and disconnects the generator. You'll know when it happens because your ammeter will return to zero. The exact figure at which this happens is unimportant. It may be as low as five amperes, or as high as 35. Just as long as the lead does return to zero when your generator is not charging, you're all right.

CAUTION: Be prepared to take down an ammeter lead line from the one shown in earlier that your reverse current also does not flow back when you drop the generator output, because a generator which is not charging and is not disconnected from the battery will draw a heavy current, unless such a protective device as a diode is used. If the ammeter lead does not drop back to zero before it reaches the left end of the scale, push a lead, back end of scale, you again the diode's negative end not open.

Now, if your relay is behaving OK, only one change of lead is necessary to make the ...

CHARGING CIRCUIT TEST

With your engine still running at 1000-1200 RPM, advance your field rheostat knob until you are showing a 20-ampere charge on the ammeter. Now move your voltmeter **NEGATIVE** lead from its ground on the vehicle over to the battery post of the regulator and adapter.



... your voltmeter's positive, your ammeter's negative lead, regulator and adapter.

Your voltmeter should fall to zero, or so near to zero that you can't tell the difference on the $-10V$ scale. This again is a precautionary test to prevent burning out your voltmeter, just in case there is a real high resistance in the charging circuit.

Things done to date, you may change your voltmeter lead at the meter end to the $-1V$ scale. (It's more the range switch, according to which meter you have.) You should see somewhere .1 volt at the needle on this one, .1 is better.

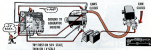
If you do find more than .1-volt drop between the generator output post and the battery post, first of course check all your worst connections and clips to be sure you are getting a true reading.

Then try replacing the generator-to-regulator cable with a new one and test again. If this doesn't fix it, you'll have to replace the regulator, but put the old cable back on the vehicle and use it again—these cables almost never give trouble.

OK, so your positive side of your charging circuit is OK. You can now shift your voltmeter back to the $-10V$ range, for safety, and check the voltage

direct from the regulator back to the generator. Your voltmeter **POSITIVE** lead goes to the end of the regulator, the voltmeter **NEGATIVE** lead to the frame of the generator. Once more, if everything is OK, you won't see any measurable voltage while your meter is on the $-10V$ scale, and you are therefore safe to shift it back to the $-1V$ scale. Check to make you don't want over .1 volt. If you show more, check the regulator ground straps, the mounting bolts, and the mounting flanges of the generator, etc., to see that they are clean and tight.

Some of you will see at once that when you take the adaptor out and re-connect the generator-to-regulator cable, you will be setting up another path for this ground circuit down the shielded cable. Yes, you will, and such high resistance between the vehicle frame and the generator or the regulator has little effect on the regulator's function. (BUT, remember that you're out to test this generator to charge a battery, and the ground return from that circuit has to come through the mounting. This just happens to be the quickest and easiest place to test the voltmeter.)



Now also check your engine and you can charge your hood up to make your...

VOLTAGE REGULATOR AND CURRENT LIMITER TESTS

Now you have y'r choice. You can either take another generator test adapter and hook the generator cable back up, or you can close both links of the adapter.

With the battery link on your regulator test adapter CLOSED, start your

engine and set it for 1000-1500 RPM. Then open the link. (Some vehicles can't be started with this link open, because the ignition circuit must pass through the battery ammeter about in the regulator.)



Now, with the adapter link open, and the lead-link lead-switch open, tell you are getting the "open-circuit voltage" at which your regulator is set. This should be between 27 and 29 volts, and should hold steady when you gun the engine. If it is not in this range, replace your regulator.

Trucks suffering from chronic low batteries, which get very little running, need a regulator setting in the top of this range. Talk to your supplier if you have a problem like this, and they can set you up some special regulators.

If your open circuit voltage is OK, you then close the lead switch and adjust your carbon pile adjusting links to load up the generator. Because the load until the voltmeter drops back below 26 volts, and read the ammeter. It should be between 24 and 27 amperes, steady.



OK, that's it. If you get these results for all these tests, you know your battery, generator and regulator are all working OK, and so are the connecting cables and leads. Shut down the truck, remove your test adapters and replace the cables in the connectors, setting 'em

up snug, but not too tight, with your hook-spanner wrench. Coil your extra leads away in the motor box and screw down the carbon pile back until it is snug, or prevent crawling plates in the carbon pile when the tractor is started around.



You wouldn't catch an old-time wagon driver riding his team back all day and then putting them away wet. The same goes for that mechanical horsepower sitting under your truck's hood.

Try thinking about that high-revving engine block as a fire-eating, air-breathing mechanical horse and you'll see what I mean. Your engine needs a cooling-off period same as you do after a hard day's run.

Hopping out of the cab without giving your overworked engine a chance to slow down is a sure way to get stalling. Once the ignition's turned off you could let her coast and oxidized pop and pour the ground until her operating temperature drops to normal. It's better, though, to turn on the ignition again and let the engine idle to cool off.

No, the best way to treat your mechanical animal is to let her rest up slow like by letting her idle long enough to cool down before you flip the ignition switch at the end of a long heavy-load run.

Why? Because stalling is usually caused by white-hot carbon particles still suspended in the combustion chamber—no clinging to the tops of the pistons. When the engine's overworked, these carbon particles are still hot enough to ignite the incoming gas in the combustion chamber without any help from your spark plugs.



DON'T DIESEL

With clutch jobs, there's one emergency type that you can use as a last resort. Try for an intentional stall, first, making sure nobody's standing close. Then lock the hand brake — hold both the clutch and foot brake in — shift as high — then, in a normal manner, let out just the clutch — not too fast.

In general, you shouldn't run into much stalling trouble on the newer type engines the Army's using... unless you have pushed that baby around awfully long and hard. So, whenever stalling becomes a habit with your truck and several minutes of idling won't do the trick, ask your mechanic to give your vehicle a checkover.

A defect in the cooling system's the most common cause for unnecessary over-heating. You might ask him to check for signs of rust or scale in the coolant, possible leaks, a stuck thermostat or a water pump that's not doing its job.

When the cooling system's in good working order and you still get over-heating, it's time to look elsewhere... Like your engine components, like by carburetors, bad lubrication, clogged valves or the ignition system—particularly the plugs. Could be you've got the wrong plugs in your engine. If so, your mechanic can dig out the swap-out when to use hot or cold plugs from a copy of TM 5-6058 (Eng 54).

You won't have much trouble with stalling, though, if you remember that the most direct always plays it cool by remembering his responsibility.

When your mind's on the trip when you practically "own" that vehicle right up



to the time you turn it back to the dispatcher. Your responsibility includes staying in your cab every minute that engine's running—and telling the mechanic's attention to that stalling trouble by marking it on your trip ticket. That engine may be even harder to shut off after the next long run—if you don't let the mechanic know about it.

IT'S FOR EMERGENCY

Works. It doesn't happen too often, but you can lose your hand brake when you're trying to help your wheel at an accident.

That's one of the reasons that temporary parking brake which is sliding up above an over-truck's dash, for... it's not just a parking for hand brake.



It's mainly an emergency stall as the as you're concerned. It can take the place of your hand brake (over-suspension)—when your mechanical brake won't do its job. Just like the hand brake, this electrical dash is also a holding device—not its main regular service brake.

In the ON position, this switch works an electric solenoid which closes a safety valve in the master cylinder master line. When most of the brake fluid is allowed to return to the master cylinder, up-on the service brakes and they are applied. Turning the switch to OFF opens the valve and allows the fluid to return to the master cylinder, releasing your brakes.

The difference between this electrical temporary parking brake and your hand-operated mechanical parking brake is that you can vary the holding power according to how hard you apply your service brakes. A light tap will put a slight drag



on your wheels, while full pressure on the foot brake pedal will lock your wheels. Since your brakes won't release until you switch back to OFF, you can add to the wheel drag by putting more pressure on the foot pedal. Now the help slide up until you reach the point where your wheel is completely locked.

That's why you should never before you switch to the dash switch to OFF while you're moving. In combination with your vehicle-handling, parking quick, sustained drag on your wheels can cause your truck to pull some wild maneuvers... particularly where the going is slippery or around a curve.



The best way to make use of this electrical brake is as a helper to your mechanical hand brake. It means extra holding action during wheeling operations or when you find it necessary to park your truck on a hill. Just remember to turn the switch to OFF before trying to move again. And never leave it on for long periods of time... the solenoid because it may run your battery down.



Another thing... this electric switch may be a replacement for a hand brake. Since the temporary parking brake uses the same air-hydraulic system as your service brakes, only the mechanical hand brake will give you an emergency holding action when the service brakes go on jobs.

So, use your mechanic first check, you get about an adjustment or repair job when that hand brake isn't up working-order.

Couinc Rodd's

"LARRY'S LATEST GUY"



Retrochambers freezing?

Heard an M125 16-hp track-scraper operator complain bitterly the other day. Claimed he needed a drain point at the bottom of the lower chamber assemblies on his winch controls because they were freezing up on him in cold weather.



**IF NEED OILS,
IN BETWEEN
CHECKS AND
OILS.**



**WIDE OPEN
OIL!**

The operator claimed the freeze-up was caused by water condensing from his air supply line. Nobby on, but it's doubtful. Chances are that the water getting into trouble was coming in through the top, or nonpressure side of his retrochambers.

This kind of leakage can be stopped by careful checking of the rubber boot, and by taking the cover off the cylinder and coating its edges with Permatex or some similar sticky-goo, then setting it back together right snug like.

Of course, if the winch is being used a lot in freezing weather, a bit of water from the air system may condense in the lower retrochambers. If it does, you can disconnect the retrochambers, drain 'em and replace 'em as often as it's needed.

Careful—here engine



**IF DUMPING DIRT ON
ENGINE WHEN IT'S HOT
OR IS DAMAGED**



100-402-0 (2000)

When you pull the M41-402-1 engine in your M41 HP you need run it outside the vehicle for any maintenance reason . . . you've got to be careful. For instance, when operating the engine on a hot tank.

You see, the Jeepster's engine compartment was specially designed for this engine to give it the right kind of cooling. So without this shrouding the engine will overheat and get damaged.

If you have to run the M41-402-1 engine outside the M41, for checking the fuel intake, timing or making other adjustments:

1. Don't run the engine for more than 15 minutes.
2. In this 15-minute period, run the engine in two shifts—five minutes at 1500 RPM for a warm up and not more than 10 minutes at 2000 RPM, or less, with no load.

Easy on the windshield

In sag-raming your windshield to have an open position will make you susceptible in the same spot. If your tilt adjustment's out of whack, be sure and call for the repair mechanic.



Unless you loosen up the adjusting screws on both sides of the windshield evenly, you're going to get a crack in that glass that can crack it with the first hard knock or sharp road shock that comes along.

There's an added danger when you're driving a vehicle with the windshield lowered against the road. It's an easy-to-break piece of glass, even though it might look like a temporary cargo plank when it's in the lowered position. So remember, it's not a handy resting place for boxes, tools, spare parts, your elbow or hat.

Periscope allowances chart



There're three different types of commander's requests on the MCO-APCs due to production changes . . . so things are up to get a bit confusing as to how many MCO periscopes your vehicle uses.

Here's how the shapes up:



	SEVCS	COMMENTS	CONDUCTS	SEVCS	SANDS	SEVCS
Equip equipped with six binoculars, no periscopes inside E1 to E115
Equip equipped with four or 1 periscopes, no binoculars inside E121 to E295
Equip equipped with 11 shapes



Wesley Attyden



Then snap on the leveling jacks (and stop) on your M200A1 generator trailer until you're stable! Especially the trailers purchased under contract No. DA-23-073-1023 (Spruce leaflet)?

Some find that with generators mounted on 'em, the added weight causes the rear spring shackles to swing backward. Now, when you want to raise or lower the jacks, the straps'll hit the shackles and it's just no go.

There's a way to get those jacks to swing up and down real easy. Get your CO's okay to let you do a little cutting on that strap. Since he has command responsibility for these trailers, he can give you permission to:



The angle to make when making the cut can best be judged by you—that may vary slightly on each trailer. Might be a good idea to have the generator on the trailer so you can't go wrong.

Now, the straps should move up and down as easy as the ol' farm pump handle.

Replacing the pistons

Get yourself installing a track or removing the link pin on these vehicles:

103 4x1 (100)

104 4x4 motor (100)

105 4x4 motor (100)

106 4x4 motor (100)

107 4x4 motor (100)

108 Light tank motor (100)

109 4x1 (100)

110 4x4 motor (100)

Could be that you've got track chains, **100** 1000-100-1000. This link isn't large enough to reach these track pins, which allows free movement of one pin to make it easy to allow the rollers for the link pin.



If this is your situation, make sure you turn to your track link for **1000**, track connecting, say, **100** 1000-100-1000. This track link'll reach these pins as shown in **100** 100 of **100** 1000-100-1000 and let the track pin slip to reach one.



A QUICK SHAKE



A quick shake.

That's what it takes to make sure that the emergency brake on your FWD motor-carrier has been released from the drum. Sometimes, when the brake is left on between periods of operation—such as overnight—the hand'll freeze to the drum, especially if the brake's hot when you stop.



If you start off with the brake locked, you'll get plenty of drag—and not the kind that'll do you any good. Stop your rig on level ground, and double-check to see that you've released the hand brake lever. Then, climb down and operate the brake hand lever by hand. If it's stubborn, tap it gently with a wood block. If this doesn't work, call a mechanic. But, make sure the hand'll free before you go on your way.

If you wear the hand down, you can never unlatch the drum before you leave it.

LET IT SAFELY

It's great to have big, hulking cranes, but they don't do you a lot of good if you don't know how to use 'em. Masterful that, you can bust a couple gears if you try to string-eme a weight that's out of your class.

Some things goes with your crane—cranes are weak-assed. It's got the strength to do just about every job that'll come your way. But, you gotta know how to go about it or think you and your rig will be repair' the deadlined line. All it takes for a small operator to cause good-old equipment some real pain you make your lifts.



WHAT DOES IT

First off, you want to be sure that your rig has the number on its side that tells you to make a job that's going to be a load-hunter. A guy can be a top lightweight, but he doesn't mean with heavyweights unless he's ready to swing on his best professional-to-be insurance.

If you're one of the few model cranes that have a small load capacity (20 plus) mounted inside the operator's cab, it'll show you on the operating station, beam height and lifting capacity in pounds. If beam height indicator is also usually installed to give you the capacity of your rig for any position of the crane.

Some of your older cranes are equipped with a radius indicator near the foot of the boom. If you use this along with charts in your rig's TM, you can find the safe load capacity.

1. Check your beam thoroughly and have line to confirm you have the right size line for your rig. Pull on a line or three and line depending on the weight of the load to be lifted and the line speed you want.

2. Make sure that the crane's cables, cold ground, the steel good looking when you start handling things, both also get a little in good old things.

3. Inspect the slings and fastenings. Be that there is a crane and it get fastenings.

4. Double-check your rigging to be sure it's in the right position to balance the load evenly without changing as you take up the tension.

5. Double-check each end of all cables to make sure that wedges and other load and fastenings are secure and correctly in place.



Your crane should be close enough to the load to give you a safe boom angle. The best deal is to position the crane boom directly over the load, you engage the swing clutch drive and disengage the swing brake or lock. Now, tighten up a little on the load and position the boom so lines are straight up and down over the load.



A word to the wise, You never lift a heavy load with the swing brake or lock engaged, and you always have the swing clutch drive in operation to give you control of the rig.

That's right, you. You only need one, but make sure you have a good view of the line.

CRANE BOOMS

Crane booms are designed to take heavy loads and stresses directly below the boom point. Loads off to one side will get you into trouble by causing one track side stress and strain—and your boom could buckle. Also, loads not under the boom point move when lifted, which could lead your rig toppling.



BOOM STOPS

Some rigs come with boom stops that disengage the master clutch, breaking the line of power to the clutch machinery, when the boom is raised to a position.

You'll find other cranes come with bumper-type boom stops. They're designed to keep the boom from going over backward from stress other than the power of the machine. This means they won't stop the boom from going over backward if you don't disengage the boom-braking clutch or make lube-check. You'll have to disengage the master or engine-clutch-lever if your boom continues to raise after you've disengaged the boom-braking clutch. This could happen if it's not adjusted properly. So, even if your rig is equipped with either type boom stop, play it safe. The stops are no substitutes for careful operation.



DRILL AND DRAIN



Has the radiator pipe smaller radiator on your Shop Equipment Set No. 2, Cross Model 28224, been running due to rust-formation and leakage?

A 1/2 in. hole drilled at the lowest part of the radiator and your radiator drains out. Check the hole before each operation to make sure it's open and the radiator isn't clogged with rust.

If the radiator needs replacing, you can get a kit consisting of a stainless aluminum radiator and two clamps from the Engineer Maintenance Center. You can expedite the kit through regular Engineer repair parts supply channels under Manufacturer's Part Number 98809-1 (2827-1).



On the level—that's the way you want to keep your Military Standard Engine Model 24815-0 (12-HP) and 24811 (11 1/2-HP) locomotives' off the nose.

If the engine requires tilt, then all of the moving parts won't get lubed since the rig wasn't designed to be operated at an angle steeper than 15 degrees.

Check the tilt on these engines at least every three hours during operation. This powerful, little job sometimes runs all day long.

If the tilt level goes too low or you run it at too steep an angle—you're in for trouble.

JOE'S DOPE

THE
PARTS
SWAPPER



CAN BE FOUND
BY ABOUT
ANY
WHERE

CALLING ALL
REPAIRMEN AS ON
THE LOOKOUT FOR
THE PARTS SWAPPER

GIVE YOU A
RUN-AROUND ON HOW
TO SPOT HIM



**ARMED
OPERATOR (M.O.)**

Controlled your message... He
phases you in and has a heading and
system...

THE BOSS
THANKS FOR NO
GOOD!

ER



**OPERATOR'S
ATTEMPTS... one afternoon**

HE TRIES TO
DIAL A C. I. T. I.

...CRAP... HE
LOOKS WORRY
ENOUGH... YOU
GUY... BARE!



M.O.

Never been known to use a word play
clever and witty—possible better
clever... the best... military... never
misses... being light... military...
for change about under or page of any
text.

**WERRY GOOD... HELL... LOOK
HOW DIRTY THAT IS!**



... and one hour later!

**DID YOU
PUT THAT IN
THE SHOP?**

SO WHAT?
WE'VE BEEN
KNOCKED OUT
BEFORE WITH
IT BUT A
FLAT TIRE.



**OPERATOR'S
ATTEMPTS... 4**

... in another installation...

**WHY... WHAT
WAS THAT SHOCK
ABOUT?**

**WELL... I'M
SURE... I'M
A GUY!**



**THAT GUY TRIED TO CON ME
INTO TOWING A TRANSMITTER—
BUT HE GOT... ALL THAT WAS
WORTH... IT WAS THE
TALKING... KNEW PULLED OFF!**



THE FACTS DEVELOPED
IS KNOWN THROUGHOUT FIELD
MAINTENANCE GROUP... SINCE
HE TURNED IN LARGE QUANTITIES
OF PARTS IN VIOLATION OF
SECTION 5122 OF THE
MILITARY
MAINTENANCE
CRIMINAL CODE.

WHEAT: A
PARTS TO TEST?

ANDERSON: I RUN
A FULL
MAINTENANCE
GROUP...

Suddenly I discovered he was turning
in great quantities of parts in violation
of 5122 of the Code. I confronted him?

WHEAT: GARRIE,
I'M GOING TO KEEP
MY EYE ON THE
MALL... SEE?

WHEAT:
NO!

I paid for my maintenance... for a
few weeks.

WHAT'S THE DELAY
IN THE CHECKS WITH
GARRIE??

WHEAT:
BLAT!
HE'S APPLYING
FOR THESE
PARTS.

THEY WERE TURNED IN FOR
A VIOLATION... BUT WE
DISCOVERED THEY'RE ALMOST
ALL DEFECTIVE!

HELL... JB, I KNOW OUR
MAINTENANCE WORK IS LATE
...NO, WE'RE NOT DEFENDING
AN INQUIRY, IT'S JUST THAT
WE'VE PROGRESS--(BUT)
FOR GOD, I'LL TRY TO GET IT



Dope Sheet

A bit of "Detection" my friend,
 To stop a most dangerous trend,
 Check each part you would swap,
 With test gear in your shop,
 You will use less new parts
 In the end!!



REWARD!



STOP THIS SWAPPER

HABIT: SWAPS PARTS LIKE MAD, NEVER TESTS.

**\$ THOUSANDS \$ CAN BE SAVED IN TIME
AND EQUIPMENT IF IMATED:**

LOOK FOR HIM IN ALL OUTLETS.

CAUTION: DO NOT ATTEMPT TO APPEARING SWAPPER, CAN
 YOUR HEARST MAINTENANCE OFFICE OR HOD, WHO WILL
 REMOVE ALL DANGEROUS WEAPONS ... SUCH AS WRENCHES,
 HAMMERS, Pliers, DRILLS, DRIFTS, PULLERS, ETC NOTIFY YOUR
 DISTRICT S-A AGENT BEFORE SYNCHRONIZING.

WE HAVE THE WORLD'S BEST EQUIPMENT ... *Take care of it*



NATURALLY, THIS RESULTED
IN A COMPLETE FOLL UP OF
THE RATE SYSTEM AND
LEASE CONTROL.



WE'VE BEEN THREATENED AGAIN ON
THE CONTRACT... SO NOW WE'VE HAD TO
FORGIVE US OF THINGS LIKE...





HE WAS PREVIOUSLY SENTENCED TO A MAINTENANCE SUPERVISOR COURSE... GOT INDULGED AFTER REMOVING THE CAPTIONS OF MAINTENANCE... HE IS CURRENTLY WANTED FOR PEOPLE WHO KNOW... BEHEAT! THIS MAN IS DANGEROUS! APPROACH WITH CAUTION... CAUTION! THIS TRANSMITTER SEEMS TO BE LOOSING POWER!

HERE'S A TUBE I CAN USE TO GET... THEY GOT BROKEN LEFT... THEY GOT BROKEN LEFT... THEY GOT BROKEN LEFT... THEY GOT BROKEN LEFT...



**QUESTIONS
AND
ANSWERS
DEPARTMENT**

TO EACH ITS OWN



Dear *Matt Wilson*,

These master cylinders on the G747-series 211-ton trucks look the same as the ones on the 211-ton G749-series vehicles . . . at least, to me they look like twins, even though one's got a filler pipe and they've got different P/N's.

Is it OK to interchange 'em? And, if not, just what'll happen if you get the wrong one on a vehicle?

FOUR E. J.

Dear *WOLFE, B. J.*,

Wolfekin' these bodies is apt to bring you more grief than going out on the town with your girlfriend's milk stout. Sir, aside from the filler pipe extension, they do look alike. But you can't count on 'em to act the same way.



Cylinder, master, hydraulic, master—P/N 2110-711-0010—goes with the G747-series.

Cylinder, master, hydraulic, master—P/N 2110-741-0010—goes with the G749-series.

It's all because each brake system has its own location for the check valve . . . which keeps anywhere from 5 to 12 PSI pressure in the brake lines after the brakes are released. This fluid keeps air out of the system by preventing a quick reverse of the fluid and a cushion effect. That check valve is inside your

brake master cylinder on your GM-series vehicles. On your GM-49-series vehicles, it's in the slave cylinder, or booster, assembly of your air-hydraulic system.

So, if you put the GM2 master cylinder in a GM49 truck, you have two check valves . . . one in the master cylinder and one in the air-hydraulic, or booster, assembly. This may work without a hitch, but it's the one place where you may be a-stumped.

Even if you did take out the spare valve, here's another thing to look into y'r noggin. There is each check valve were made to operate with a certain number of cubic inches of fluid. With a change in the brake fluid volume, the valves may start acting up.

Put the GM49 master cylinder on the GM2 and you've got no check valve in your system at all. Air gets sucked in and you start fighting a low, soft pedal.

So, give each vehicle its own master cylinder. And if you've got both master cylinders around, make 'em so they don't get mixed.

Hay-Mess



Dear Hay-Mess,

Since a year's mileage on our vehicles is never very high, our Bureau can't give Q service by calendar date. So, when the end of a quarter falls before or after our regular weekly shift date, is it OK to switch the Q service to our shift date?

At J. G. B.

Dear Lt. J. G. B.

That's just a paper tiger you've got by the tail, Sir, and you should find an answer in your month's RCP. If you don't find it in the RCP, just follow para. 15d of TM 9-2112 (4 Aug 55), which says a 10 percent variation in either direction in mileage is permissible. That figure is about 7 days here and all of the end of the calendar quarter . . . or a total of 14 days' leeway.

Make sure you keep track of the mileage, though, to see the miles pile up faster than you think.

Hay-Mess

BLOCKED UP BLOCKS

Dear Half-Mast:

I've having trouble getting match blocks for our 20½ and 21-in cargo trucks. As you know, you can't pull match until those vehicles receive a block. So what gives?

Sgt E. H. T.

Dear Sgt E. H. T.,

First, the big question is, do you want blocks for those trucks? You do, you've got your trucks are equipped with front-mounted winches. It says so right in Ord 7 356.0752, page 14, Ord 7 356.0748, page 11, and Ord 7 356.0744, page 13.

OK. Your trucks have winches, so you should have been issued blocks as part of the vehicle's OPE. But you don't have 'em!

First, check around and see if the blocks have been stored somewhere — like in the supply room. Blocks have a way of getting lost or "disappearing," so some units keep 'em locked up and treat them as an unneeded load and then take 'em back.

Now, if you still don't find those blocks, they have to be requisitioned. Your SSI is your authority, and the Transportation Group is the unit service that's responsible for issuing them.

If your trucks don't have winches and you still want the match blocks, you'll have to get your OD to requisition them to some unit and charge your TOE allowance — just like it says in the TOE.

When you requisition blocks, use those new manufacturers and stock numbers. If they're not available, TC will supply an equal substitute.

FIG 394 444 AND 449
7x10B BLOCK



FIG 394 449-PCS

Block, black, also eqpt, 7½" max diameter, match, safety loading, steel shell, single 1½" diameter, 11,000 lbs, safe working load (MIL-STD-1288, modification No. 5), Type 11, 1048 52.

FIG 394 444 7-10B BLOCK



FIG 394 444-PCS

Block, black, also eqpt, 7½" max diameter, match, safety loading, steel shell, single 1½" diameter, 11,000 lbs, safe working load (MIL-STD-1288, modification No. 5), Type 11, Type 12, 1048 52 (for 1048).

FIG 394 444-PCS

Block, black, also eqpt, 7½" max diameter, match, safety loading, steel shell, single 1½" diameter, 20,200 lbs, safe working load (MIL-STD-1288, Type 12, 1048 52. For front winches only.)

AYE—THERE'S THE RUB

Dear Half-Mast,

How are you supposed to drive if your rubber's sucked? That's the problem we're hit with our Ford F100 truck.

It's not someone gas-bossing the rubber of our brake vacuum booster's diaphragm is that, it's the best maintaining like they said, no-sucking with OIL.

Where are we going wrong?

Ally P. A.

1 800



OH NO! NO NO ANYTHING ON BOOSTER

Dear Ally P. A.,

I don't know who "they" are, but "they" sure have given you a hard time. You're lubricating rubber with a juice that'll destroy rubber. That's just what petroleum-base oils, like OIL, do to rubber: no rubber.

Rule: If you're driving an F100—or any other vehicle that has a diaphragm in the booster—don't use oil. As a matter of fact, don't use anything, because the diaphragm needs lubricating.

Now, even if you don't use oil, it's still possible to get petrol into the booster and see out your rubber. The cause of this is that little vacuum-check valve. The purpose of this valve is to keep maximum vacuum in the system. This check valve should open only when vacuum in the manifold is higher than vacuum in the brake system.

If this valve goes bad, gasoline vapor will enter the vacuum booster when manifold pressure increases during vehicle acceleration. In other words, fuel'll flow to the point with the highest vacuum—and that's your booster. The result is an attack on the rubber diaphragm by the gas fumes—and a ruined rubber.

So, when you go to replace the required diaphragm in your F100, give the booster a good cleaning to make sure no-oil or gas is left there. Clean metal parts with solvent and dry 'em with air when necessary, but wash rubber parts with alcohol only.



NEVER USE OIL!

Just as important . . . make sure the vacuum check valve flows freely without clogging in the line.

When you're assembling the brake, lube the hydraulic (slave) cylinder piston head with a thin film of hydraulic fluid. But remember to use only HB or HBA to avoid chlorine—the it says in TE-Def 2589-18/3-CL (Jan 58). HB and HBA are non-petroleum base fluids that won't rot rubber.

Hydraulic brake systems are "off limits" for petroleum base fluids, except where you have a vacuum cylinder of the piston-type hydraulic, mostly used with other vehicles. Even on this piston-type master, which doesn't have a diaphragm, only the vacuum cylinder gets petroleum base fluid. You fill it to plug level every 30,000 miles or once a year with light oil OSE-054.

Haystack

TOWING ADVICE



Dear Haystack:

If I've getting a shipment of Fagor and Bell buses soon, I've never decided about type buses before. How do you see these vehicles? I want to be prepared — you know, like the Ray-Bans.

—Ely S. A.

Dear Haystack E. S. A.,

When towing the Bell or Fagor bus with the M11 wrecker . . . the thing to remember is to be sure you use the "V" towing bar, P/N 4913-715-0004, and the bolting bar assembly, P/N 3916-147-0793. Both items are part of the wrecker's CTR. Trying to tow these buses any other way is just going to result in damage to the bus.

This is what the right towing arrangement looks like:



Haystack

LET'S
COMMUNICATE

GRAB THE RING



Any time you're checking the battery or other components of your FSC-B, B and H, use a method of care when you separate the chains from the battery and its case.

After the two clamps on the case are loosened, the only tie that binds the case and chains together is the battery cable. And the stories are being told about some operators who grab the chains in one hand—the battery case in the other—and **PULL!**

That separates things fast, but spells trouble on plug and socket. It simply ruins the fitting between battery and radio. The thing to pull, of course, is the ring on the battery plug. It's just there for one reason—to pull whenever the battery cable is disconnected.



So grab it. Pull it. No risk of damage or anything as long as the pressure is on the pulling ring. And it's a big ring. Room to loop one or three fingers into. Using it will pay dividends later on its performance and safety.

ALWAYS TIE UP THE END OF THE CABLE AND GET THE BALL ON.

ALWAYS REMEMBER TO ALWAYS CHECK THE BALL ON.

A REEL BALL

It's a good idea to have a ball on the end of the cable.



Instead of tying a knot in your cable, why not put a ball on the end of it. That'll prevent damage when you're finished with your mission and go to sleep in back seat plane.

Because the cable-rod inside the external microphone has at the rear of your tank puts a mighty strong pull on the cable and the handle. So strong, actually, that a rubber ball is to be careful he doesn't accidentally let go of the handle.

When and if that happens one way the handle is released—the whole works snaps back so fast that the plastic handle cracks up. Which means it's pretty much out of action.

Tying a knot in the cable a few inches from the handle will keep it from cracking in half, but won't do the cable any good. It wasn't designed for knot-tying.



A hard rubber ball on the cable puts a stop to all that. FOR MORE INFO, CALL 1-800-4-A-REEL. If your tank's external microphone lacks that ball, tap it next time the vehicle goes to the shop. Sometimes, of course, a knot in the cable will be a lesser evil than cracking a cracked handle.



But of all, keep your hand on the handle 'til she's all reeled in. That's the best kind of P.M.

LOOK AROUND THE CLOCK



Every time and all the time—day and night—the dial lock on the control panel of your AM/FRC-6, 9, or 10 is in action.

It's one of the most used and abused gadgets on the walkie-talkie. Used a lot because the dial lock keeps the dial set dead center when the operator wants it. Keeps the air from drifting off frequency.

Abused a lot because many an otherwise good operator forgets to release it when he grabs the calling knob and starts talking. This chews the gears inside your radio and also weakens the lock mechanism. Thus, of course, leads to drifting far quick.

Check the screw holding the dial lock in place. It should be nice and snug. Not loose. Not squeaky tight. And then exercise it to satisfy yourself everything is locking and unlocking smoothly.

NEW NUMBER

On your FRC-6 handle-talkie—there's a new number come to town for the battery station.

No longer can it be registered under FSN 8115-350-0000 like shown in Change 1 to DKG PAR dated 11-Oct-74. That number is out the window.

From now on, ask the man for Battery Receiver, FSN 8115-315-3750.



~~A HOLE STORY~~

A clogged hole usually leads to some kind of trouble.

Either something can't get in—or can't get out.

Take the Sikorski HO-11 chopper, Frimmons, with a drain hole on the underside of the fuselage up forward. That hole is drilled into the string that holds the antenna for the ABC/101 radio.



Trouble is, it gets clogged with dirt and that is no time at all, and then causes the trouble. Water wants to collect down there—especially when the aircraft is washed. Sometimes a pine or moss will grow around, unable to drain out.

No matter how little or how much, though, that water will shoot out the antenna lead-in. And pretty soon some angry questions will start flyin' around as to why the radio isn't putting out.

To open a clogged drain hole, a piece of safety wire will do nicely. Put the wire in and rotate it so's to free the dirt. Make sure you're clear the hole without injuring any internal wiring and will allow the dirt to fall free of the aircraft.



~~PUB FLUB~~

Oops! It's not number 11. The HO-11 B B for your AN/PRC-10 radio set. It lists the Federal stock number for the alignment tool incorrectly. Order the tool under P/N H 20-561-8917 instead of 1120-561-8976 as shown in the publication.



~~6-5TED-12~~

Sometimes the description of one of the electron tubes in your AN/CRC-12 got flubbed a bit. The 6G-7 B B lists it this way: ELECTRON TUBE: 6H1 type 12A61 (P/N 1060-100-2111). Instead, it should be: ELECTRON TUBE: 6H1 type 6AR6 (P/N 1060-100-2112). Every thing else is OK.

SHUTTER UP



Quick, quick, close the shutter!

That's what she said.

And at least nine out of ten operators will agree that closed (unless that shutter on your Model A-11 will be a life saver under certain conditions. Other times, of course, it has to be open to keep the cool air flowing.



THE SHUTTER,
THAT'S IT...

...AND THE SHUTTER

...SHUTS
IN THE
CARGO
TRUCK
BUT
KEEPS
THE
TRUCK



But there is one time when that shutter has to be kept shut tight. That's when ever anyone's running a ton of the AN/GBC-41 radio set when it's being transported from here or there aboard an M-111 cargo truck.

You guessed it right.

The fumes from the vehicle exhaust stack just naturally wander through the shutter and into the shelter. Which could mean maybe a fatal case of carbon monoxide poisoning for the crew inside the shelter.

Until a permanent cure is set up to deflect those fumes, the closed shutter policy will keep them out during testing operations while the M-111 is rolling.

A BAD RUB

Snap and wear are few. First, usually less of less around. But it can be overdone—in a least one case.

And that case is the LN-117 used with the TA-15 and TA-511 field telephones. The cause, of course, is water repellent. Trouble is, excessive washing, scrubbing and cleaning will soon do more harm than good.

Many cases come in from the field with a scrubbed out look which means the water repellent has been washed out and the canvas worn thin.

In case of field work on the scrub job, these the canvas should hang over its ability to repel water than be scrubbed clean.

PS: A good witness saying, of course, that painting or reworking these cases is variety PSC. They're completely interchangeable and there's little chance that a case will find its way back to the earth it came from. Your support people may as well clean away a scrubbed or painted case.



NO SMALL CRACK

Get a little crack?

It could lead to trouble, depending on where it is.

Like in the antenna leadline for any vehicle mounted radio set—AW/GRC-3, AN/GRC-19, AN/GRC-110, or what have you. They're ceramic—and a sharp bend can crack 'em like candy. Which opens the way for moisture and dirt. Moisty moisture.

Any trace of that stuff in the body of any leadline drains energy from the set and reflects range sharply. Thus reducing effect on the distance a signal will carry.

Look twice, maybe three times, at your leadlines. Try to find a crack. If you can, call a repairman. If you can't find a crack, fix.



A SHARP BEND WILL CRACK CERAMIC



ONE MORE WORD OF CAUTION—KEEP HAND AWAY FROM YOUR IN-TENTacles. IF SHOCKED UP ELECTRIC ENERGY

DO NOT AND DO NOT BE IN RANGE OF ELECTRIC ENERGY

POT WALLOPING



Dear G. D. C.

Do you have a solution for removing scales from the inside of ALUMINUM and enameled pots and for cleaning burned food particles from the exposed metal parts and other parts that go with these ranges?

GPO G. D. C.



Dear G. D. C.

There's a perfect solution, large, but it doesn't come in a bottle or can, and it's used before—not after—the equipment's finished up. It goes by the name PFL, but it's good any time of the day or night... and especially at meal time.

Actually, there's no-conditional method for cleaning up these ranges. In common sense, the right cleaners and masher'll have to do the trick.



Take the oven first. Scrub off all the stuff that'll lodge with a spatula or other sharp instrument.

After that comes the rub... rub... rub... with cleaning powder and matches steel wool... till you get the range spot and grime clean.



When it comes to the pots and pans depends on what metals they're made of. For instance, you wouldn't want to use an alkaline cleaner on aluminum ware. It'll clear it up. Soap and hot water's best for aluminum and chrome.

Soap and hot water'll also do for cast iron and steel iron. The masher and pot scrubbers, rings and rub and for better jobs will take care of ordinary grime, but for real hard cases use a few cleaning powder. For the enamel, best 'ole is a mixture of baking soda.

But there's absolutely nothing to fear the immediate cleaning of the equipment after it's used. A little soap and hot water at the right time will do a better job than a truck-load of cleaners after the food particles have "set" or been baked in.

Condit

STORING MATTRESSES

Dear Half-Kate,

The size of our world changes a lot from time to time due to training programs. This means us with a bunch of bed mattresses to be stored temporarily.

Can you show me how they should be stacked to prevent mildew, rot, staining and moisture, etc.? We've especially worried the top ones will separate the bottom ones out of shape.

Another thing, Sarge, what is the minimum size a mattress can be and still be fit for use?

Capt. A. B. M.

Dear Captain A. B. M.,

The way they're stacked determines how they'll feel under your heavy ar skinny, or like they should... soft and fluffy and even-smelling. If they've been piled right and aired well kept dry, moisture will come through any storage period in five days.

1. Remove the mattresses from the beds. Moisture on the bed springs could have got stuck on the mattress. Make sure they're dry.



2. Lay each mattress facing down or facing up—don't stack 'em with the wet.



3. Get half of some storage Duff's made to flow and build a platform of least 4 inches from the floor. Lay the mattresses flat. No head, no footboard, no springs.



4. Stack the mattresses one on top of the other no more than 3 mattresses deep. Do top of the whole stack sleep a sleep good both in polyethylene dust.



I can't repeat often enough how they the mattresses must be bottom and during storage. This means the barracks or supply room has to be waterproof, clean and closed tight in wet weather. And it should be aired frequently when the weather's dry and clear. If a mattress gets wet, lay flat in a bath in the cool, remove it from the wash process and dry it out thoroughly.

The minimum thickness of a mattress is 3 inches. It should be at least 28 inches wide and 72 inches long.

In general, though, a mattress will do as long as it's comfortable and won't hurt a guy's back. In other words, it's OK as long as it gives enough bounce to the man.



There's no need to get into a flap about what to put the unit marks on your primitive mark carrier. You don't put a marker's right—you don't mark your carrier in any way. Change 1 to AR 146-13 adds no per your unit marking inside the cover flap, but Change 1 to Doc 143 does away with that. So, no more marks of any kind.

Maybe some of you have found that it's easy to put ID marks on the outside of your carrier with grease, crayon or ink like pencil. Keep them away from your carrier because it's almost impossible to get rid of these marks when the carrier's cleaned for reuse. You're also flirting with a gig some inspection time.

It's fairly easy to keep your carrier in good condition by following a few simple rules. Shake as much dirt off the carrier as you can. Then dunk it up and down in a pail of warm soapy water. (You may think scrubbing with a brush will do a better job but it might damage the material). If there's still spots on your carrier after you've dunked it good, then scrub the spots with a white rag (or a rag that won't fade on your carrier), and soapy water.

Rinse with clear water, making sure you get rid of all the soap. Then stretch your carrier back to its original shape before it dries. It should be dried in the shade or indoors because the sun will cause it to fade.

Here are some things to steer clear of—chlorine bleach, yellow home soap, cleaning fluids (ammonia, etc.), and dyes.



KEEP THE MARK ...



**DOES IT MARK
SOFT WATER**



**YOUR UNIT
WILL BE IN A
FLAP**



**DOES IT MARK
WATER ...**



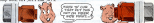
**KEEP THE
ORIGINAL SOAP ...**

**DOES NOT IN IN
THE HOUSE**

ARMY AIRCRAFT



It wouldn't think it, but some people are still having trouble with the classic wing nuts, AN 561's and 561's.



Not that the local Murphy's go quite as far as to try to put 'em on their side first, but they do never forget the rules and precautions like TM 1-1-34-8 tells 'em.

Like you can see, these wing nuts with holes, such as screws which have counter-pile holes. If they use W-1's or 1/2's, and if the counter-pile holes are not heated. Under W-1's, you only use 'em on drilled holes in aluminum, and replace with a new nut and undrilled hole as the best opportunity.



Obviously, you never use these wing nuts (or spacers) where they'll get hotter than 200° F. And of course you always think twice before re-using an elastic wing nut. If the fiber insert is not brittle, and has not lost its locking function, it can be re-used. However, repeated use are not advised because the gripping situation may have harmed the fibers.



On nuts 1/2-in. and smaller, you can use the "finger-tight" check to see if they're

HANDLE HER WITH KID GLOVES



Oh come, everybody knows that. But how about that other temperatureal help, the aircraft you fly?

It'll get you to want flight-flying gloves any time you're in the air. First of all, they'll cushion the vibration noise, so you'll have a little less of that wingy rattling in your hands when you land. Then, they'll give you a little better grip in low weather, when your hands tend to be numb. And while you aren't in danger of being any susceptible to sub-zero-air, still gloves are nice to have around in cold weather, and can be worth their weight in gold if you should have to bail out and walk back in a cold area.

But perhaps the best reason for wearing gloves is the one that everyone hopes he'll never meet—die. A pair of thin gloves will protect your hands for a short while even in a gasoline fire. And it may well be just that short while that breaks you up out of the aircraft.

In a recent crash, the pilot suffered only minor burns on his face, but received third degree burns on his hands. It seems unlikely that he'll ever fly again. A pair of gloves might very well have saved his career.

So you'll be wearing yours, won't you?

CHOCTAW (H-34) OIL



Dear Mr. Mack,

Look, I've been working around engines and motors since I was a kid, and every time I start one, when your oil warms up, there was some drop in the pressure. But come over my Choctaw (H-34) and PV by mistake if it's the main gear, but oil pressure doesn't go up when the temperature goes up. (Choctaw, please?)

Sgt. E. R. W.

Dear Sgt. E. R. W.,

Your Choctaw (H-34) doesn't have a gear case. That case is indicated oil pressure in the main gear box when the temperature rises is due to the nature of the base.

First, and for the second, the oil in that gear box behaves just like any other oil, that is, it gets more viscous when it warms up, and gets thick and stiff when it gets colder.

Has been thinking the oil comes inside bottom of your gear box to the oil pump right? And the rest of pump, the case has a pressure relief valve. Both valves are under pressure back into the gear box, but flow between the oil pump and the oil pressure gauge pick-up point to the oil line and the oil cooler, which are usually full of oil and oil when you start. The relief is made of steel passage opens through all the oil in a gas, after through the thermocouple gauge and it warms (oil), or through the cooling valve when that flow goes to the pressure gauge pick-up point and then to the oil jet inside the gear box.

So, your oil always leaves the oil pump at not more than the relief valve setting. When cold, it moves more slowly and sluggishly through the oil lines and oil cooler passages, and there is more pressure to force it through those lines, it is due to the oil pressure pick-up point is less than pump output pressure. Just as an electric current has a voltage drop when it passes through a resistor, your oil flow has a pressure drop when it passes through the resistance of the oil lines and cooler.

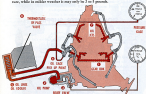
Then, as your oil warms up and becomes thinner, it moves through those lines with greater ease, and there is less pressure drop, so the oil arrives at the pressure gauge pick-up point at a higher and higher pressure until it reaches the pressure

PRESSURE INCREASE



established by the resistance of the oil just inside the gauge lens. Then you restrict the flow of oil into the gauge lens, and at the same time restrict the spray pattern that lubricates all the moving parts in the box.

Oh, so in cold weather, say 10°F, you may have as much as a 15 to 20 pound increase in indicated oil pressure until the oil reaches normal operating temperature, while in milder weather it may only be 2 or 3 pounds.



But, here's the point in the whole thing. You are not concerned with the oil pressure at the oil pump output—it isn't doing you any good there. What you want to know is that there is enough oil coming into the spray jets to adequately lubricate your moving parts. And that's why the gauge line is connected where it is. All the oil pressure in the world won't help you at the pump if there's not back to the jets, so you measure it at the jets, where you need it.

The oil pump pressure relief valve keeps you out of trouble both at the pump and lines.

Handwritten signature or mark.

ODD CLOCK?

Don't be surprised if your registration check, FSN 6641-511-6116, for your clock's and get back some nasty differences. According to SA 7-99 CTS (see 19), there're about 24 acceptable clocks in the system, and they're being 'run wild and up. Throw your on-hand notes for calibration before registration.

But they all fit your ship and give satisfactory results. If you do get the 6641-511-6116 check, you may have to modify your panel according to TR 45N 11-1.



SIOUX STARTER SLIPPIN'?



Here and there a Sioux (28.17) if model has been known to pop so much oil through the engine oil seal at the starter mounting pad that it built up in the motor clutch and let the clutch slip.



In new cases TR 1-28413-1811 (19 Nov, '59) which lets your field maintenance support drill a 1/8-in hole in the engine oilseal pad so that any excess oil can drain out. The hole goes through the oilseal pad 90° to the right of centerline.

Naturally, you keep an eye on that drain, and if you see any green amount of oil leaking out, you have the seal replaced.

NEW NAMES



You've probably heard that all aluminum alloys have been given new numbers under a system somewhat like the M.I. system for steel. Now you look at the number will tell you what the alloying elements are.

Like this: The first number of the four digit number will give you the alloying element.

all...aluminum...
all...aluminum...
all...aluminum...



- 111 Pure aluminum (99.99% or better).
- 2xxx Copper is major alloy.
- 3xxx Magnesium is major alloy.
- 4xxx Silicon is major alloy.
- 5xxx Magnesium is major alloy.
- 6xxx Magnesium and Silicon are major alloys.
- 7xxx Zinc is the major alloy.
- 8xxx Same other element is the major alloy.
- 9xxx Not being used.

3003



So, now let's see how your old blocks look in the new system:

aluminum...
aluminum...
aluminum...



OLD ALLOY NUMBER	NEW ALLOY NUMBER
5	100
5	200
14	303
15	307
615	310
16	309
17	307
18	304
19	303
20	302
21	307

And so it goes. The second digit with these modifications of the alloy, or impurity limits and the last two identify the alloy or aluminum purity.

So, if you can access new publications using the new numbers, or if you receive these annual printed with the new numbers, don't flip, it's just your old pal with a new number.

CHECK AND RECHECK BEAVER BRAKES



Those of you who maintain the (L-10) are probably aware that you have to watch your beaver brake links like a hawk, particularly if they are adjusted quite a way out of the lockout.

These guys, "Red, Beaver Cylinder Park, P/N 1430-211-0201, (P/N C201-1110)", have an annoying habit of bending if your pilot happens to get the least bit heavy-foot, like as if he was running out of runway. Rubber stop link roller pedal travel and the forward cross-tube limits master beaver cylinder movement—so the latter must have stops built by bending the link ends.

TEL. 800 726-8888
FAX. P/N 1430-211-0201

HEAVY RED BROWNS
CURE: 500 TO 600



They're working on a stronger link in a redesigned brake system, but until it gets here you'll do well to take a quick look at yours not only at every preflight, but every time your ship comes back to the line, as explained in TM 1-11-204-100 N.

But remember that too much weight on the adjusting members on the wheel units can bind the roll-adjusting pins—which will kill the heavy framework by your pilot. So please to run back over paragraph 3-14, Page 102 in TM 1-11-204-2, paying particular attention to item 4 which says you scope the adjusting nut to 30 fingerwidths. No more, no less.

Also, of course, the further out of your master cylinder the link end is adjusted, the more strain there is on it. You'll want here to tell your pilot on the line that adjusting the brake pedals "to suit the pilot" on the manual says (para 3-14, page 100) can be carried too far, and just might leave him with braking problems at the wrong end of a short strip if he insists on having the pedals all the way back.

But don't let's be impeding any home-brewed reinforcements, like slipping a length of steel tubing over the link. Both are not substituted, and you'll get your tail chewed. Just replace links, and if you can't get 'em from supply, BOP the strands.

SUBSTITUTE STRUT

Dear Editor,

We get our hydraulic equipment overhauled on a level-purchase basis by a nearby civilian facility. Which is fine, but when we need to use all our Hercules (J-28A) tailboom struts, it sometimes takes a few days to get it back.

Naturally, we didn't want the ship standing on the jacks for this length of time. Not only would it be up over jacks, but it's a safety hazard to have a ship on the hangar that can't be moved in case of fire or emergency.

But when we tried raising the jacks and lowering the ship down on its tail-wheel, we found that the unsupported end of the tailboom strut broke the tailboom struts.

So, we came up with a substitute strut.



We painted this pipe a bright red so nobody would try to fly the aircraft with it in place. We install it when we remove a tail strut for maintenance. Then we can take the ship off the jacks and wheel it around at our convenience. As a further precaution against accidental flying, we leave the tailboom off unless we find it necessary to move the ship out-over on the air-draw line.

But with the tail boom on, we attach a red streamer to the substitute strut and tag the tail boom as a warning. Then we red X this condition on the ship's DD Form 131. It's well worth the trouble.

Reginald L. Yarbrow
Fort Rucker, Ala.



down. Not only would it be up over jacks, but it's a safety hazard to have a ship on the hangar that can't be moved in case of fire or emergency.



WITH AIRCRAFT ON GROUND
BE WARNED WITH REDNESS!

EMPTY PIPELINES—EDP



No parts, no flying. Very simple.

Why no parts? That's not hard to figure, either. Clearly, you'd go back trying to buy all the reserve aircraft components that the overapplied and ground crewman thinks should be in the replacement channels. No, the only reasonable way to keep that supply pipeline flowing with parts is to serve separable type items around the system faster.



The overhaul people try to make quick repair replacements on these items. But, on the other hand, you can't expect a depot to overhaul a gear box or rotor head, for example, that's still sitting in an organizational hangar 5000 miles away. Too many of these unserviceable items are gathering dust just waiting for some forgotten type to fill out a parts-to item.



With only a limited number of spare aircraft components available, that pipeline runs dry pretty fast when somebody forgets to prime the pump or either end. Every time somebody breaks the machine, this pipeline loses its EDP-inhibitor qualities and collapses.

Have you been running in these unserviceable but separable type items as much as possible? They may be your future component replacements.

CONTRIBUTIONS

TEAM WITH THE



Dear Editors,

It's really a tough nut to crack for a training center to get carbide lamps for skidding skidights.

They're not industrial fire hoses, and the only way units can get them is for someone (generally the C.O.) to buy them with his own cash. They don't buy long either, because of the hard use they get.

Has we've whipped this problem here.

We get boxes of my Executive gear (I liquid the stock) from the hobby store and put it on the skids with unit's funds. It's cheap and does the job better than the carbon from carbide lamps. What's more, if anybody wants it off, you make it away with skidding skidights.

Fred H. Cook, OCMF
Fort Carson, Colorado

Old Man—That's great. A lot of men will welcome this improvement over the carbide lamps.

KEEPS YOU FIT



Dear Editor,

I have quite frequently during technical inspections that the brakes on UH-series, 2-wheel trailers are frozen, due to corrosion and rust from lack of use. Many of these trailers assigned to routes stand for months with hand brakes tightly applied.

I suggest that trailers standing for long periods of time should be blocked clear of the ground with hand brakes released, and exercised about every 30 days by applying hand brake on and off several times.

If corrosion was vehicle, oil can be applied in order to service the master cylinder and other service brake components. This is also a good time to check lights.

Wallace R. Englehart

Port Dix, N. J.

UH-Series-trailer-mech: Doing in garages would be wise to follow your suggestion on the UH-series trailers. Like they say, an ounce of PM is worth pounds of car body components. It'd also be a good idea to remind your buddies that EB B-7 tells you to keep hand brakes released on trailers in storage.

WATER TANK STRAINER





Dear Editor,

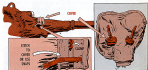
We have come up with a fix on the gas-diezel cover for the M4-series machine tanks—to keep from losing the auxiliary covers and clamps for the telescopic and machine gun barrel jackets.

We used two-inch strips about 11 to 12 inches long from the main gun cover to the auxiliary covers, with a loop at one end to hold the clamps. Saves money in the long run by stopping the loss of one screen. What do you think?

SFC J. J. Selig

Field Mater Dept

Armstrong National Guard



(Ed Note—If a steel rivet is used as a cover, large, gun-soft may be used instead of a lot of supply requisition headaches and funds. Instead of sewing the strip from the gun cover to the auxiliary covers . . . why not use rivets at either end with double. That way you could always be sure of unstrapping them with no rivet if it became necessary.)

Cornie Rodd's BRIEFS

Fast news

Have old Qrd 7 OHL Ys. I didn't get the faces that go in the face panel for the telephone switchboard in your Fleet-Aggs Operating control trailer. But they do show up in QRD 7 OHL Pd Section 1 of 4 Apr 59. Look up F233, CATERGOL: Is guard instantaneous, glass body, one view, female form, N skin, 1 lg, 200 v, 1 arm (lrg), F24 2P20-230-2793.

The right place

You guys who handle special weapons make 'em, remember. When you run into defective items stuff, you all five copies of DA Form 40 to the Commanding General, Ordnance Area Office, Command, Joint, Base, AFM ORCL-CA. Don't use any other address. The usage as sending to the LBB's is in the 29-24 (— —) and AF 700-36 14 Aug 59.

Cold numbers

When you're gotta go off zero to 40° below, you've got problems a-plenty. So don't go knocking out the seals in your vehicle to your convenience by using grade C diesel fuel oil. That info was put in Table II, Change 1 of 1 Oct 58 in TM 9-2833, for World War II vehicles only. Fleet foreign conversions get GAS, like the 10's 107.



Wired wrong?

Got a wheeled vehicle that's had the ammeter replaced by a battery-generator indicator? QRD Oct 5476 (31 Mar 56, top rounded), demurred the changeover. If you've got the indicator, it should operate only when the ignition is ON. So if it gives a reading when the switch is OFF, ask your Ordnance support to check the hookup.

Check that load

Before you go blinking onto any heavy load with that A62 or A624 breaker, better lay a sharp eye on its Safe Load Limit data plate. The vehicle models shown in Figs 51 and 52 in TM 9-2828 of 2 Jan 59 are reversed. Fig 51 is for the A624 and Fig 52 is for A62. You can check it by the busbar extension data in para 53d of 1 and 54d of 1 in the TM.

Watch the exceptions

You'll find plenty of exceptions listed in AF 701-2710 of 4 Apr 59 and AF 701-5120 of 4 Apr 59 when you're looking up the load service responsibility for supplying your common hand tools. Most were transferred to Quarter number from Ordnance, but you can still find about 280 items in the FM 8159 group and 2000 and around 5,000 items in the FM 8159 group and class belonging to the other load services.

*Would You Stake Your Life on
the Condition of Your Equipment?*

Be a **TROUBLE SHOOTER**—
not a "Parts Swapper!"



- Pinpoint bad parts
- Check out your equipment with the 2nd echelon test sets