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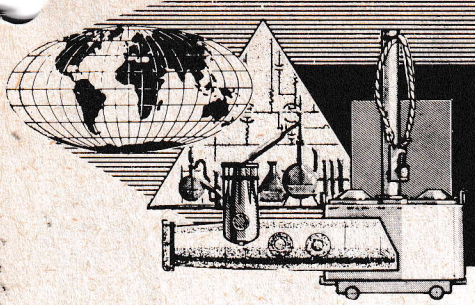
No. 2-66

36A



mine and depth-charge

THE TROUBLESHOOTER

- *Battery cards*
- *FSMT discrepancies*
- *Taming a pump*

AN OFFICIAL *NAVORD* PUBLICATION

in this issue . . .

THE TROUBLESHOOTER

mine and depth-charge

Published by the Naval Mine Engineering Facility, Yorktown, Virginia

George A. Harper, CAPT, USN ..... Officer-in-Charge
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REGULAR FEATURES

ARTICLES

COVER PHOTO: Baby, it's cold inside! So hums Thurlow Stubbs, in spite of his arctic clothing, as he lifts a pallet of new mine batteries into NWS/Yorktown's modern 129,472-cubic-foot freezer for a sojurn at −30° F. For more on frozen batteries and the history cards used to keep tabs on them see page 5.

1 JULY 1966

The Troubleshooter, an official NAVORD publication, contains technical information pertinent to the assembly, testing, and delivery of US naval depth charges and mines. It is both authoritative and directive in nature, and reference may be made to a particular issue as the authority for adoption of ideas promulgated therein.

Troubleshooter is also the official journal of the Rudminde Program a world-wide defect-reporting campaign designed to promote a high level of undersea warfare readiness in US naval depth charges and mines. The Program's basic instrument is NAVORD Form 8500/5 (1-63). Everyone who encounters problems with these weapons should report them via this form direct to the Naval Mine Engineering Facility as prescribed by NAVORDINST 8500.8.

ARTHUR R. GRALLA
Rear Admiral U.S. Navy
Commander, Ordnance Systems Command

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THE OFFICIAL JOURNAL OF THE *RUDMINDE* PROGRAM

RUDMINDE REPORT TO THE FLEET

A, B, Cs are easy?

Like everyone else who works with mines, Martin Mahoney has read OPNAVINST 08550.12A. What distinguishes Mahoney is that he faced the ensuing dilemma squarely, threw his hands in the air, and wrote us for help.

"Current publications for mine assembly," he says, "are based on assembly of mines [starting from] condition 4F. There is a wide variety of opinion as to just what steps should be performed to convert mines from 1C to 1A. It seems no one has given any thought to establishing assembly procedures for mines in varying readiness conditions."

Now we won't attempt to define those conditions here, not only because the definitions would be classified, but because in fact there isn't a living soul in these United States who could give you a specific definition for a specific mark and mod in a specific condition anyhow. The only exception is Condition D as applied to the Mk 52, 55, and 57 mines.

Readiness vs assembly

But we'll come back to that enigma later. Throughout his Rudminde Mahoney applied the term "readiness condition" to designations such as 1C and 4F, and we've heard plenty of others do the same thing. This is really not a correct usage in the context in which we are talking, so before we proceed we'd like to set it straight.

The aforementioned OPNAVINST established readiness conditions designated by arabic numerals (e.g., 1, 2, 3, 4, etc.) and assembly conditions designated by letters (A, B, C, D, etc.). It is only the assembly conditions with which NMEF is concerned: that is, conditions of material readiness which have to do with allocation of components, hardware, etc., and with specifications of included and excluded components in mines stored in each condition. Tied to this, of course, are the associated maintenance policy and provisions, and types and frequency of testing, which together impart the element of reliability so necessary to these assembly conditions.

The readiness conditions, by contrast, have nothing directly to do with material, maintenance, or reliability. They are instead a province of operational commanders, and they pertain to degrees of operational readiness which can be derived under various circumstances from the various assembly conditions, yet which in themselves do not reflect any specific assembly condition.

Consider a group of Mk 49-2 mines stored in Condition B, for example. Assuming a specific degree of assembly and test applicable Navy-wide for 49-2s in Condition B, we should have identical mines (e.g., identical assembly condition) whether the mines are on an island in the West Pacific or on flat cars in West Overshoe, Indiana. The readiness condition of these mines, however, is another thing altogether and will have relatively little to do with the fact that they are in Condition B. Rather it will depend on factors such as the number of mines vs the number of mine technicians available to convert them to Condition A, vs the man-hours required per mine, vs availability and capability of transportation or planting agents, vs distance from destination. The assembly condition of these mines could thus remain the same even for years, while the readiness condition is manipulated up and down yearly, monthly, or even daily, in response to changes in tactical plans.

And thus the line is drawn. There is no absolute connection between readiness conditions (numbers) and assembly conditions (letters), and this accounts for an administrative line of demarkation as well. Responsibility for tailoring definitions of assembly conditions to each mark and mod of mine, for specifying the degree and frequency of testing and maintenance etc. for each, and of supplying supporting instructions and manuals, is first and foremost an NOSC/NMEF responsibility. But using these conditions to establish or support a given state of warfare readiness is an operational command function. This is why, in the coming months, you'll be hearing nothing from NMEF about Conditions 1, 2, 3, etc., but plenty about Conditions A, B, and C: the assembly conditions.

Mahoney is right

When he wrote that no one appeared to have given any thought to adapting our present assembly manuals to today's requirements to assemble and convert mines to any specified assembly condition from whatever condition they happen to be in, Mahoney was unaware of work already underway. It is a complicated and hairy task, but we at NMEF recognized this need some time ago and selected Revision 1 to OP 2608 to use as a prototype. A hopefully slim single volume, this new revision to 2608 will cover assembly of all the mines now covered by Volumes 1 and 2 to 2608 Rev 0 and Volumes 1 and 2 of OP 2974, and it will provide explicit instructions for building standardized mines to any of the applicable assembly conditions, as well as for converting from any condition to any other condition. Currently the job is about half done.

In seeing the need for such manuals, though, as well as in everything else he wrote, Mahoney was dead right. "It is recommended," he writes, "that consideration be given to establishment of a brief procedure for mine assembly from various readiness conditions (he means "assembly" conditions). As it stands now each supervisor seems to have his own variations."

The implications are clear. Without standardized instructions for each mine type we cannot have standardized assembly conditions, and without standardized assembly conditions the foundation for CNO's readiness conditions is not all that it should be. The result is that assembly instructions are coming. They'll be brief for the time being to save time; crude at best if only because

(continued on page 5)

HOT STUFF

A screw with any other head

Dear Barnacles,

In response to about 90 percent of all our KZ-Cog screws ordered recently Phillips-head jobs have been substituted for the slotted type used in mines. The worst part is that if we use these substitutes when the good book says otherwise we're forever in danger of being shot down.

To get around this here at NAD Bangor we've been getting our screws on open purchase. Why? Not because we don't know that the substitutions are the result of standardization, but because we know of no authority to use the substitutes in place of what the OPs specify.

Care to take a stand on whether we should or should not?

JKH, MNC

Dear JKH

At once. DOD standardization is in fact the cause of your difficulty with screw heads and, since the federal supply system is being converted virtually across the board to Phillips-head (e.g., cross-recessed-head) screws, all hands are authorized to use them whenever supplied so long as material, thread, and size are the same as for the originally-specified slotted-head type. There are, of course, exceptions, but for mines only two are presently of great importance: One is the "military-standard" type screws, identified by MS numbers, that secure suspension lugs. These must be exactly as specified in current publications.

The second exception is screws which are identified by Ordnance-assigned drawing numbers. Such screws are used for non-magnetic applications, limited space applications, etc.

Screwdrivers for the Phillips-heads have already been added to appropriate allowances.

B. Macdebitt

Check those plugs

Dear Chief Butt

One of those dummy jumper plugs DWG 495722 in our basic tool set cost us two batteries BA-241/U while making operational tests with the Test Set Mk 97 Mod 2 on Mk 36-2 mines. A continuity check showed that the plug's pins D & K had been shorted to pins J & F, which drained the 135-volt section of BA-241/U.

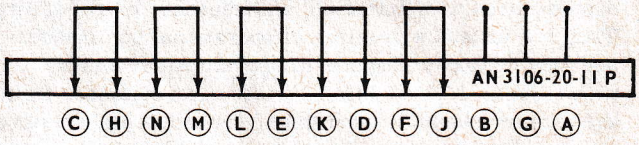
Now you can't inspect the plug's hook-up visually, since it is potted. To me this makes a continuity and insulation check necessary, to tell if these plugs are good or bad, yet DWG 495722 which shows the plug hook-up gives no test.

We believe it should. Our solution to the problem of the defective plug was to give it the deep six, but how many can we afford to test this way?

B. D. P. MNC

Dear B. D. P.

We agree that it would be more profitable to check out your dummy plugs some other way than by draining BA-241s, so here's a schematic which you can also find in OP 1860.



Using it, and a multimeter, one can quickly verify continuity between jumpered pins, C to H, N to M, L to E, K to D, F to J, at 0.5 ohms maximum. Also confirm insulation resistance of not less than 50 megohms at 500 VDC between non-jumpered pins: C to N, L, K, F, B, G, A; pin N to L, K, F, B, G, A; pin L to K, F, B, G, A; pin K to F, B, G, A; F to B, G, A; and all pins to shell.

This goes also for the plugs furnished with your 97-2 test set. A single drawing is being assigned to

both plugs (they really are identical) and it will call for these tests on new procurement lots.

B. Armadebutt

Torque wrenches

Dear Barnacles:

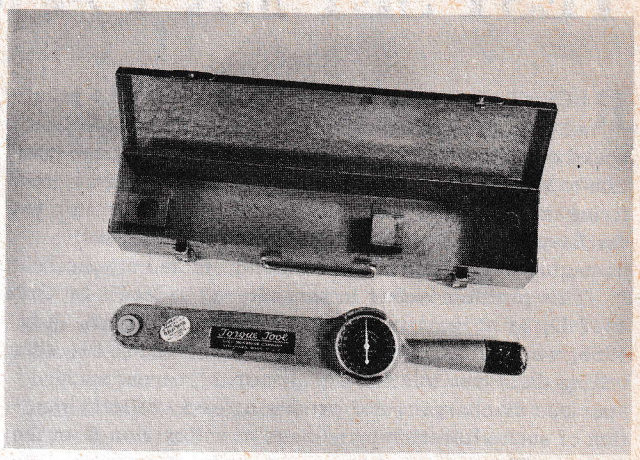
I could swear some of our torque wrenches are anything but accurate, especially a couple of "tie-beam" types that could only be adjusted by bending the beam. This means adjustment would only last a few days in actual use, so two questions: 1) Are such wrenches standard in the basic tool sets for mines? 2) Is there a standard or something for accuracy?

Our vote, by the way, is for single-beam type torque wrenches.

CTW

Dear CTW

Torque wrenches are calibrated instruments and should be treated as such. To keep them honest when they're in hard use even good ones should be calibrated every three months. The lab that calibrates your test sets should have FED SPEC GGG-W-686b and all the gear necessary to calibrate your wrenches, including stickers to show the results, including "reject" stickers which notify you your



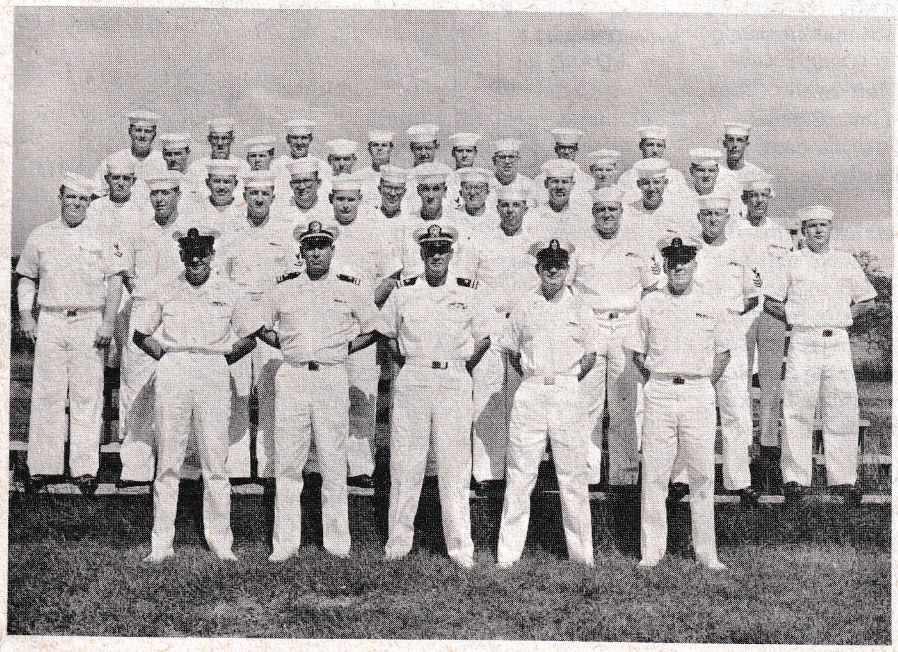
wrench should be discarded for a new one.

Adjustable-type wrenches are not authorized. When ordering torque wrench replacements for your basic tool set specify 5120-242-3264 for 50-0-50 ft-lbs, or 5120-230-6380 for 150-0-150 in-lbs. These are the same Type-II Style-A wrenches that are to be found in newer basic tool sets. Their actuating elements are enclosed in a rigid frame which affords some protection against accidental damage.

Even so a torque wrench should not be kept loose among other tools in a tool box but instead should be returned to the metal case issued with it for added protection. With this sort of care these wrenches should be good for a long time.

B. Armadebutt

MAHALO NUI LOA KAHUA . . . . Joe Hernandez sends greetings from State Number 50 to the desk of an envious editor, with a photo of a bright and happy group. And well they may be since they are the officers and men of the Mines Division, including members of MOMAT 0302, stationed at NAD, Oahu. These fortunates, left to right, are:



Front row: J.R.Hawks, MNC; LT(jg) B.P. Hernandez, OIC MOMAT 0302; LT J.J.Ireland, Mine Production Officer; D.G. Hutchinson, TMCM; R.F. Barnum, TMCS. Second row: J.R.Defrees, MN3; D.L.Valentine, MN3; V.J. Malanowski,MN3; A.A.Bauer,MN3; P.D.Jones, MNSN; T.E.Hogan, MN1; R.R.Beumer, MN1; J.H.Connell,MN1; W.L.Griner, MNSN. Third row: F.D.Grisham, MN3; N.L.Lalley, MN2; D.R.Webb,MN3;A.B.Hinman,MN1;J.L.Caulder, MN2; L.E.Sanders,MN2; B.G.Gates,MN2; G.S. Stanley, MN1. Fourth row: J.W.Hiestand, MN2; T.L.VanDevender, MNSN; G.A. Clark, MN2; T.W.Newton,MN1; D.M.Moore,MN3; T.E. Blanford,MNSN; J.E.Muessig,MN2. Fifth row: N.T.Older, MNSN; R.Tyrrell, MN3; J. Coers, MNSN; W.D.Voyles, MN3; E.H. Stanton,MN3; C.T.Christian, MN3; F.Foucault, MNSN; D.L. Cunningham, MNSN. Not present for photo: A.P.Ray, MN1; L.G.Bemis, MN1; D.R.Glaze, MN1; W.R. Sturgill, MN2; C.S. Cowell, MN2; T.W.Neal, MN2; W.R.Bash, MN2.

WIKKI WIKKI: This is the last group photo in our editorial drawers. Somebody send more, quick!

TEST SET MK 194 MOD 1 ALTERATIONS

RECENTLY WE LEARNED that, because of a peculiarity in the wiring of Test Set Mk 194 Mod 1, the act of changing that set's selector switch from one position to another could occasionally cause the Mk 19 firing mechanism's 125-microfarad firing capacitor to discharge during Mine Mk 50-0 operational tests, damaging tube filaments in both test set and mine circuits.

This problem exists in sets altered to Mod 1 by Ordalt 4447-D, or at least it did until Message 222155Z, July 1966, was released to all known holders of Mk 194 sets, telling them how to alter the circuit to prevent such spurious discharges, and promising early official sanction of such alteration by release of a Revision E to the Ordalt. This provided a sure cure, but one which could well prove harder to live with than the disease.

Why? Because it's only by the Mod number of the set that you can tell if its been ordalted: Mod 1, yes; Mod 0, no. But how do you tell a year from now, when you get a Mod 1, whether the ordalt that made your Mod 1 a Mod 1 is the bad Revision D of September 1965, or the good Revision E of sometime in 1966, or even the makeshift Revision E of Message 222155Z? With this sort of situation we can't go back and start over again. The best we can do is set up a procedure that will make all hands' Mod 1s identifiable as the right kind of Mod 1 without having to open each set up and compare it to a schematic before each use, at the same time saving the expense of having to issue a new ordalt and change drawings and stock records ad infinitum in order to insure fleet-wide standardization by creating a new Mod 2.

The first step is for all hands, everywhere, to identify all Test Sets Mk 194 Mod 1 that have been altered since July 1966 in accordance with that NMEF message. Those of you who did so know who you are, so now make it identifiable: mark a strip of masking tape to say "altered per Troubleshooter 2-66 (Ordalt 4447 Rev E)" and stick the tape in the lower left-hand corner, above the nameplate of each such set's control panel. Make the writing as legible and durable as you can. If you have plastic spray, spray it. Do this to each set you fixed, without fail.

Now about sets that may have escaped the fix provided by Message 222155Z. For depot stocks there will shortly be that promised Revision E to the ordalt together with work directives calling for performance of the fix and a similar "tape" identification for future users' reference. And with that done, there is only one remaining problem: the stray 194-1 that might get issued from depot stocks in the meantime, or the set already in the field, which did not "get the message."

If you have or receive a 194-1 with no tape on the panel you'll know that's what has happened to you. To fix, open it up and check with the wiring pictorial here, which shows the circuit alteration of Message 222155Z and the forthcoming Revision E to Ordalt 4447, superimposed on the wiring provided by Ordalt 4447 Rev D.

We think this illustration will let you determine without hesitation whether this "Message/E" alteration has or has not been made. If it has been, put the set back together and put tape on the panel exactly as instructed earlier in this article. If it has not been altered proceed as follows:

1. Remove the connection between R14 and R17 (this connection was made by Ordalt 4447-D).

2. Solder a new connection between the now free end of R-17 and contact 7 in section E of selector switch S2. (Section E is wafer nearest panel; use stranded hook-up wire, No. 20 or 22 AWG (6145-295-2823), and rosin-core solder.)

3. Check and clean all newly-soldered joints.

4. Prove the fix as follows:

   ► Turn selector OFF and read 2.7 ohms (with ohmmeter) between P and K of the CA-838 connector on test set's panel.
   ► Turn selector to 2 and read 2.7 ohms between pins K and A.

5. If set checks out per step 4, affix that tape to the set's control panel exactly as described earlier and the alteration will be complete.

(continued on page 5)

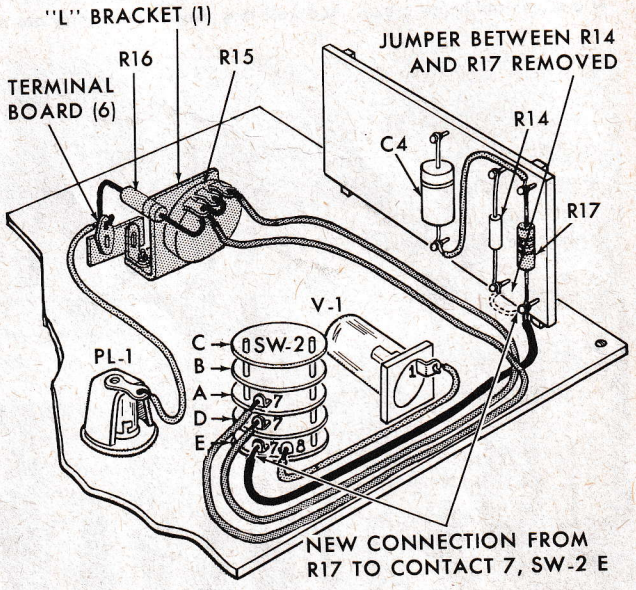


Figure 3 from Ordalt 4447 D, Showing "Message" Alteration

YOU CAN'T TELL THE AGE OF A DRY CELL BY LOOKING AT IT

THE RELIABILITY of dry batteries (remaining life) can be no better than the records kept via Battery History Records (NAVORD Form 2819), commonly called battery history cards. And since the life of a mine's batteries determines the life expectancy of the mine, poorly-kept cards can leave the state of readiness of the mine program in doubt.

Happily, judging from Rudmindes, when obvious errors in battery history cards are made the fleet seems to care, and to make efforts to correct them. But unhappily, in spite of such effort, the errors still account for lost man-hours and mine life. And as near as we can tell, the trouble lies mostly in incorrect entries in the cards, rather than with the cards themselves, or with the system for using them as explained in OP 1452. As usual, though, there's an exception.

The exception in this case is that the card provides no category (e.g., column) to cover the temperature span for storage of mercury-cell (BA-1300 series) batteries: 10 to 45 degrees, which falls part in the "frigid" and part in the "cold" classifications. The problem can be easily solved in cards on hand by writing-in the nominal temperature, within the appropriate storage classification. If entered in the "frigid" column (item 8) a notation should be made to indicate 10^{o} as the nominal storage temperature, rather than the 0^{o} nominal temperature cited in OP 1452 and in the heading of the frigid column in the card. If instead the "cold" column is used it can be assumed that the 40^{o} nominal temperature was maintained, give or take 5 degrees. As for cards not on hand, we've learned that Cog-I stocks have been exhausted. New ones have been ordered, however, and before long all hands should be receiving a revised form that supersedes the other cards and provides a column for recording storage of mercury cells.

So much for one problem. The ones that hurt most are still the errors made in filling in the long-established blanks in those history cards, if only because, unless a mere slip in mathematics, only the man who made the error can supply the correction and he may be several months or thousands of miles removed. The frequent slips, according to Rudmindes received, are:

- ▶ Errors in calculation.
- ▶ Entries in wrong columns.
- ▶ Missing contract numbers.
- ▶ Transposition of day and month in numerical dating.
- ▶ Manufacturer's dates recorded incorrectly. (Remember, manufacturers often code dates in four digits, such as 0864 which means 8th month (August) 1964. For history purposes always consider such a code to mean 1 August 1964. Similarly, 1165 is November 1965 (1 November), not 1 January 1965).

So what can you do to help? First, understand the job. Anyone making an entry on a Form 2819 should be familiar with Section 1 of Chapter 1 and Job Sheet 1, 1452 Vol 1 Rev 4. Only then will the instructions, item by item, on the back of the battery history record have meaning. Next, when you do make entries, also make it a point to double check your work. A review of entries, including all calculations, should be made by the supervisor promptly.

Even when these steps are honored, the name of the man making the entry and the name of his activity should be entered exactly as the card directs. This way the person reviewing the entries and the poor soul in the boondocks who may get them much later at least knows where to seek help when in doubt.

Also try hard to eliminate misunderstanding. Write all dates Navy style, 6 Jan 66, 10 Mar 66, etc., and be just as definitive in all other entries too. We at NMEF are as aware as you are that this is far from the best possible system for keeping track of battery life. But until a better one can be put into effect little things such as these can keep the present system doing a job.

SET 194 ALTERATIONS, cont'd from page 4

And that does it, except for a couple of loose ends that should be tied up. First, understand that this alteration applies only to Mod 1 of Test Set Mk 194. By this time there should be no such thing as a Code A Mod 0 in the system, but if you're unfortunate enough to have one exchange it for a Mod 1 and make sure the Mod 1 has this fix.

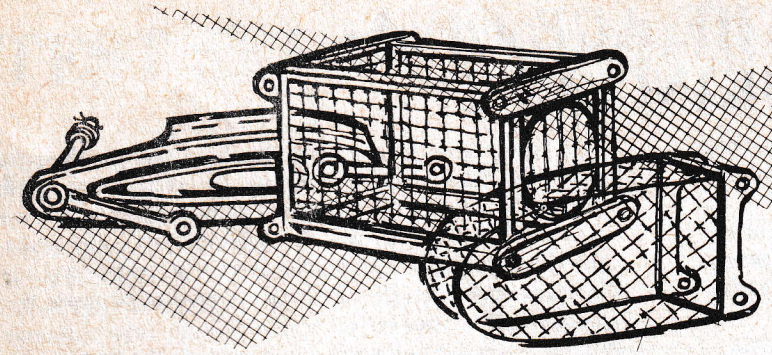
Next, don't expect the tests and temporary instructions in Ordalt 4447-D to work after your 194-1 has been altered and taped. The new Rev E will contain a changed step 10 calling for a 6.19-ohm shunt (resistor) placed across the set's meter for calibration purposes, as does a correction to the calibration instructions in OP 1860 which the cal labs will have received by the time you read this. That's just one more of the many factors that make it so important for all hands holding Test Set Mk 194 Mod 1 to make absolutely certain their sets conform to the requirements of this article.

Fix yours today!

RUDMINDE REPORT, cont'd from page 1

no mine in the system today has been designed for adaptability to CNO's conditions and goals; and restricted to Condition D because that is where the need for standardization is presently greatest.

But at least it will be a start. Later of course, the manuals for mines destined to remain active in the war plans will have to be rewritten to cover assembly conditions A through D at least, in the same way that they are being covered in the forthcoming OP 2608. Here's hoping the whole system doesn't get deep sixed before the job can be done!



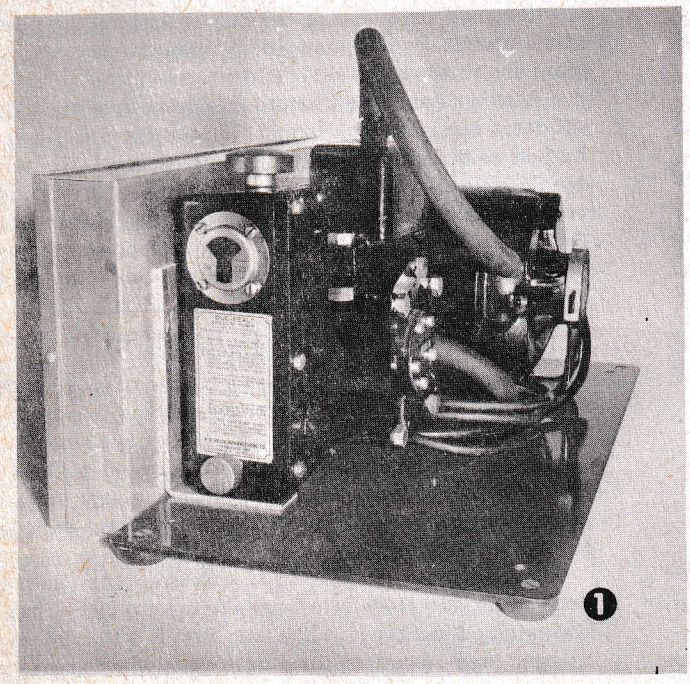
TAMING

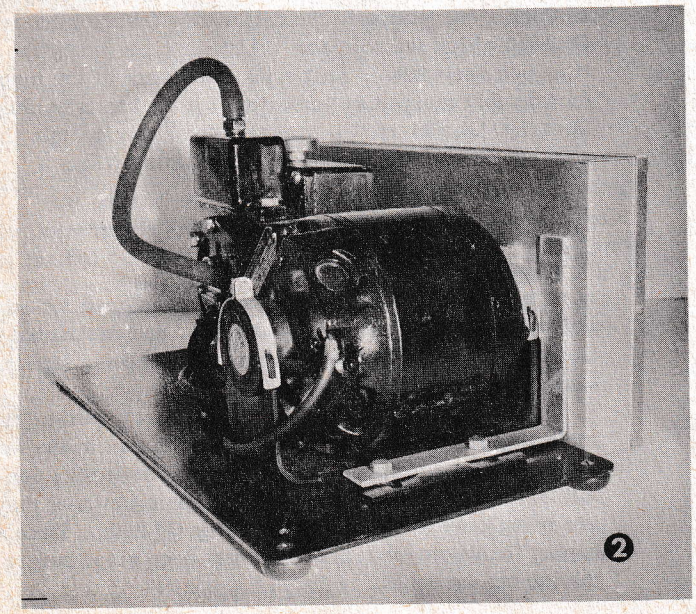
TEST SET MARK 157 MOD 0 is a mechanical test s that includes a 1725-rpm 1/4-horsepower motor th drives a vacuum pump by an exposed linkage of pulleys and belt. The rapidly rotating parts are a nasty safety hazard that can snatch a careless hand or an article of loose clothing.

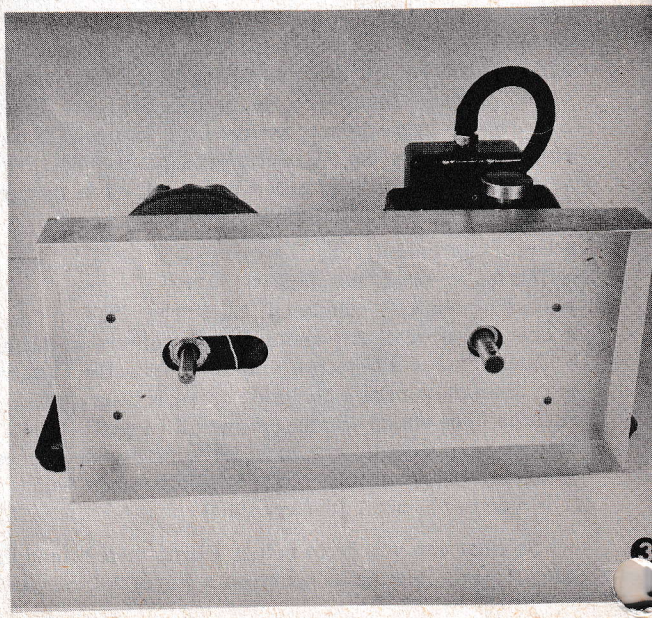
Users of this test set have built a variety of jury-r guards to protect themselves from this hazard, some good, some bad. To overcome shortcomings of some the bad ones, or provide a guide for shops whose pump are still unprotected, here is a permanent guard that encloses pulleys and belt 100 percent, front and rear, with the added advantage that, once installed, it doesn' have to be removed when the apparatus is stowed in its case. It is simple and inexpensive to construct and pa are relatively easy to acquire. The only shop work re quired is modification of a stock light-gage aluminum radio chassis by drilling and cutting, and the fabricatio of two brackets from 1-inch aluminum strap 1/8-inch thick.

To begin, make the two brackets that support the chassis, one for the motor-end and one for the pump-e Use dimensions shown on sketch. Then, cut the la holes in the aluminum chassis using dimensions sh sketch, but do not drill the four small mounting holes.

With that done, remove the four bolts that secure th pump to the base of the apparatus and place the bracket with the 3-inch foot under the pump support, the holes the bracket centered on the two outside bolt holes in the







VACUUM PUMP

pump support. Place four 3/8-inch flat steel washers under the pump support centered on the two inside bolt holes (two washers for each bolt) to level the pump. Do not let the pump tilt, which it will do if not held upright; the pump is filled with a special oil and will not operate properly if this oil is spilled.

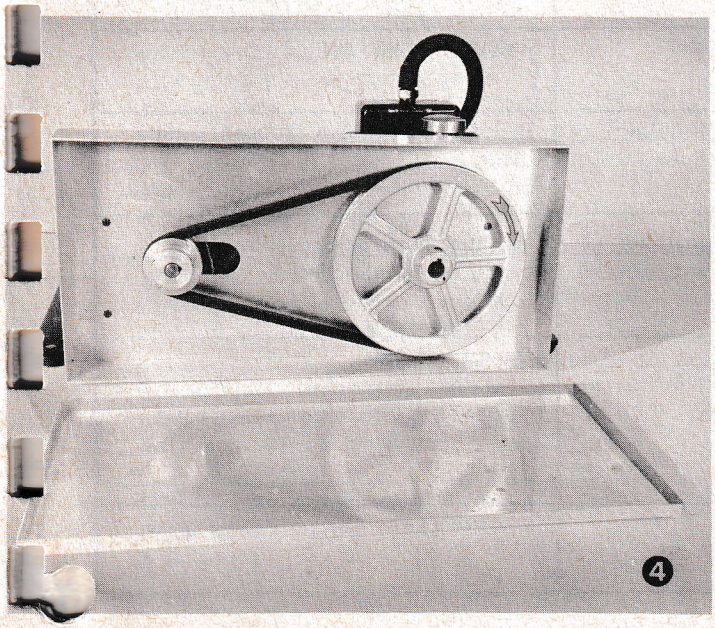
Now fasten the pump, with the bracket, back to the base. Due to the 1/8-inch increase in the elevation of the pump, mounting bolts 1/4-inch longer than the originals must be used to permit use of the original lock washers. ❶

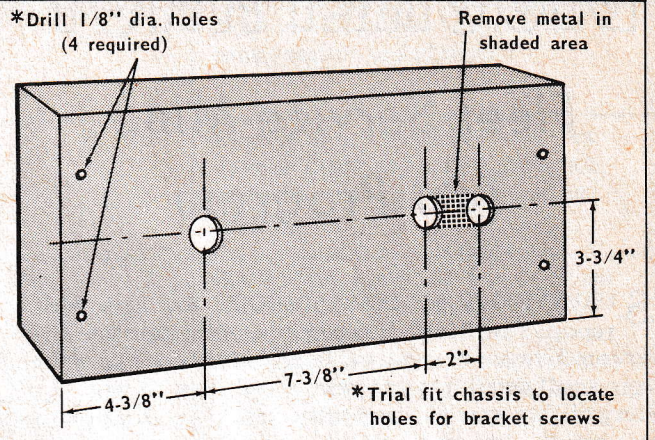
Next remove the two outside securing bolts from the motor support plate, line up the $6\frac{1}{2}$-inch bracket to the holes in the plate, and secure all with the bolts just removed. Be sure to include the flat washers that were originally installed under bolt heads, placing them instead under the bracket. ❷

The pump is now ready to receive the guard: Remove drive, pulleys, and belt from motor and pump, fit the chassis as shown and scribe centers for bracket-mounting-screw holes, then drill and mount with pan-head screws. ❸

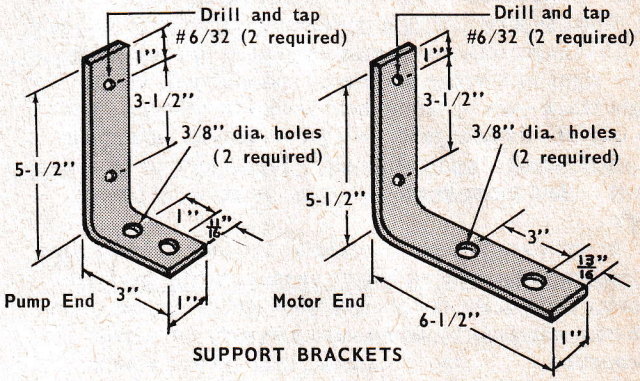
Next reinstall pulleys and belt, adjust until belt is [illegible]. Run the motor and pump long enough to determine [illegible]re is any pulley interference with the guard, and if [illegible]o adjust as necessary. ❹

Now fit the cover over the chassis and secure with the two screws that were supplied with it and you'll have a job that's neat, safe, and should be troublefree for as long as the pump lasts.





CHASSIS, MODIFIED, REAR VIEW



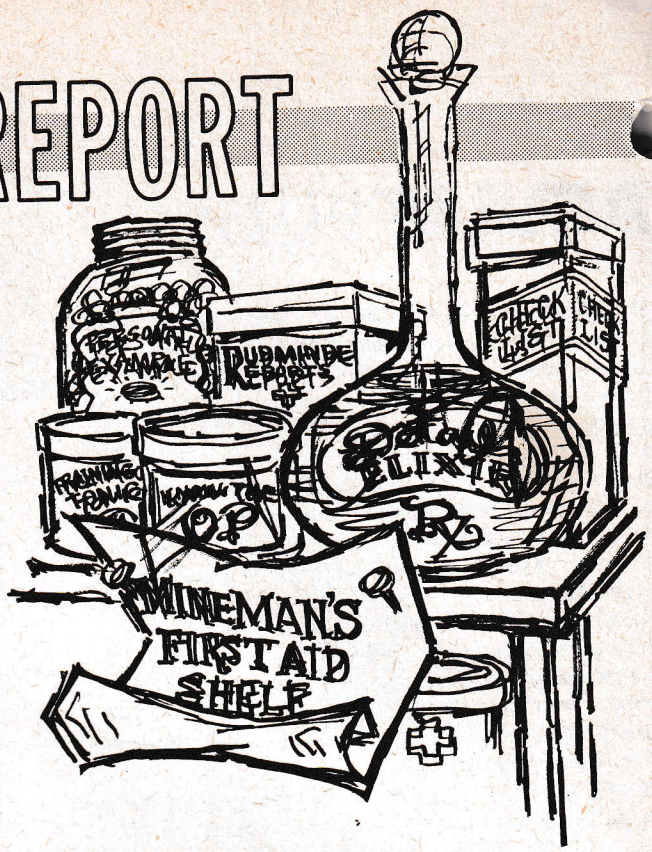
SUPPORT BRACKETS

PARTS LIST

Description	Qty	Source or Stock Number
Chassis, Aluminum, 8" x 17" x 2" including cover 8" x 17" x ½", with screws.	1	Open purchase, LMB (Heeger Inc., Los Angles, Calif., No. 8172C) or fabricate locally
Screw, Machine, Pan-head, slotted 6-32 x ½".	4	5305-558-2865
Washer, Lock, external tooth #6	4	5310-011-4601
Bracket, Support, 5½" x 6½" (motor end).	1	Fabricate locally
Bracket, Support, 5½" x 3" (pump end)	1	Fabricate locally
Washer, Flat, steel 3/8"	4	5310-087-7493
Bolt, Hex-head, Steel 5/16" – 18 x ¾" (These bolts replace ½-inch existing bolts holding pump to base and should match them in size and thread.)	4	5306-225-8497

DISCREPANCY REPORT

Fleet Service-Mine Test Program



SURVEYING SOME DISCREPANCIES that have been reported in FSMT it becomes evident that the difference between success and failure often rests on some very small detail that was overlooked. It's the old story of "for want of a horseshoe nail . . . a battle was lost." Admittedly this is old stuff, and horseshoe nails are not too common these days. But one thing is sure: lack of attention to detail is with us still!

Good supervision is a preventive but no cure-all, and by good supervision we mean the ability to get the job done right by keeping morale up and all hands on the right track – not by doing their work after them. Yet no man should take pride in a job he leaves incomplete in some detail, however small. Supervisor or no supervisor. And there is no such thing as being 99 percent right.

In any case failure of material and lack of knowledge of the job to be done no longer seem to be the problem, leaving us with the question of what advice can be given the man who fails to skin a wire properly for a good connection . . . who installs a clock starter with no gasket . . . who torques up a tail cover with a fire recorder tag sticking out . . . who forgets to install a condenser in a firing mechanism?

We have no solution except advice. If the shoe fits, wear it. Go to the Mineman's First Aid Shelf (above) and heal thyself.

DISCREPANCY	CAUSE	RESULT
Improper sling used for mine handling.	Carelessness	Safety hazard.
Fork lift operator allowed personnel to ride on pallet.	Disregard of safety rules.	Safety endangered.
Wooden pallet, dangerously deteriorated with age, used in transporting two mines.	Lack of maintenance of mine-handling equipment.	Pallet failed; mines dropped; safety hazard.
Parapak control units not properly set, and Fahnstock clips improperly installed on arming wires.	Did not use right publications.	Potential hazards to airplane and crew; potential duds.
Mines were issued to the final preparation activity with broken studs, missing cushions, and pinched, damaged, and shorted leads.	Personnel errors.	Delays or duds.
Brake tension on plummet spool improperly set, Mine Mk 6.	Personnel error.	Shallow plant.

DISCREPANCY	CAUSE	RESULT
Clock delay and search coil leads loosely connected to terminal board in a Mine Mk 36 Mod 1.	Personnel error.	Time wasted in correcting; might have resulted in dud mine.
Clock Delay CD-12 overwound "x" days at assembly activity and delivered to final prep with this setting.	Personnel error.	Loss of time since it had to be run down in final prep before the specified delay arming setting could be made.
CD-14 "S" dial improperly set.	Personnel error.	Since a Sterilizer SD-4-1 was used with the CD-14 in this mine, the mine's dual sterilization feature for increased reliability was aborted.
Sensitive-relay-can cover mounting holes drilled oversize to the extent that the securing nuts and washers passed through the holes.	Originally a manufacturing defect; acceptance of faulty material into the stockpile. At this stage a personnel error.	Relay, a delicate component, could not be adequately secured in its cushions. Delay until cover replaced.
Parachute Release Mechanisms Mk 18 Mod 0 received at final preparation activity without clevis pins.	Manufacturer's packaging error.	Needless delay until replacement pins could be obtained.
Cable Assembly CA-820 pinched during installation of instrument rack in a Mine Mk 50 Mod 0.	Personnel error.	Cable had to be replaced in final prep.
Threads on mounting studs of BA-205/U clamp assembly crossed when securing nuts were tightened.	Personnel error.	Plate assembly for mounting firing mechanism and batteries rendered unserviceable.
Sterilizer switches in Clock Delay CD-14 not set.	Personnel error.	Mine planted sterilized.
Cable Assembly CA-23 not routed properly in Mines Mk 36 Mod 2, and the securing nuts for the firing mechanism plate assembly were not tightened.	Personnel error.	Cable cut by shifting of the plate in two mines during planting. Both duds.
Tail cover installed on mine case with the mine fire recorder readout tag between the flange and cover.	Personnel error.	Flooded mine.
Safety pin not removed from arming device; arming wire not installed when mine loaded in bomb rack.	Personnel error.	Mine planted safe (dud).
Cables routed improperly and air dryers not installed at the time of instrument rack installation.	Personnel error.	Delay to correct, or plant dud.
The 300-mfd condenser was not installed in a Firing Mechanism A-6 Mod 3.	Personnel error.	Pressure influence feature of the mine aborted.

DISCREPANCY	CAUSE	RESULT
Mine settings were not recorded on mine assembly record/check-off sheets at the assembly activity.	Personnel error.	Unnecessary labor and time expended at final preparation activity in partial disassembly and reassembly of mines to determine if correct settings had been made.
Cable Assembly CA-821 connector plug was connected to its receptacle on the firing mechanism in a Mine Mk 50 Mod 0 by only two turns of the coupling ring.	Personnel error.	Mine did not fail, but at post recovery electrical contact could be broken by moving the cable.
String on air dryer bag in Mine Mk 52 left hanging out of the after section of case when the tail cover was installed.	Personnel error.	No water tight closure: a leaker.
Mine fire recorder starting date and time not recorded.	Personnel error.	No actuation data obtained.
Search coil badly bent.	Careless handling.	Coil ruined.
Clock Delay CD-12 Mod 0 mounting studs broken.	Careless handling or inadequate packaging protection.	Clock delay unserviceable.
Metal filings found in Sensitive Relays SR-7 Mod 1.	Fault of manufacturer, overhaul, or inspection.	Code E.
Deep grooves moulded into mine tail cover gaskets.	Manufacturing fault.	Code H.
Explosive Fittings Mk 18 Mod 0 not included in shipment to final prep.	Failure of assembly activity to comply with the mine finishing order.	Planting delay.
Pinger starting switch screw not removed before planting mine.	Personnel error.	No locating signal output; extra effort required to locate planted mine.
Search coil tube not long enough to accept search coil.	Accumulation of tolerances in design documents.	Time lost in shortening male end of the core extension.
Explosive Fittings Mk 1 Mod 0 shipped to final prep for use in Arming Devices Mk 5 Mod 1 vice Explosive Fittings Mk 18 Mod 0.	Carelessness.	Delay.
Mine case inert loads were soft.	Inadequate case loading procedure (since corrected).	Nose of mine extensively damaged by water impact.
Pin in shackle connecting plummet cord to pawl lever not secured in three Mine Anchors Mk 6.	Personnel error.	Planting delays or deep plants.
Cable assembly strain loops not secured.	Personnel error.	Potential dud.

DISCREPANCY	CAUSE	RESULT
Insulation not properly removed from detonator leads before connecting to the extender terminal board.	Personnel error.	Dud mine.
Short sterilization time set on a CD-14 vice setting specified by Op orders.	Personnel error.	Mine life shortened.
Interlook-dead-period setting plug very loose in its receptacle on the Circuit Break Mk 1 Mod 0.	Personnel error.	Possibility of a dud mine.
Mine fire recorder leads or pins broken at the recorder.	Too much force used in connecting leads to recorder, or striking recorder during assembly or final preparation of mine.	Loss of mine actuation data.
Wrong case serial numbers recorded on mine assembly check-off sheets.	Personnel error.	Inconclusive test data due to confusion and guess-work.
CA-275 connector plug not tightened securely to the Terminal Board TB-19-0.	Personnel error.	Probability of batteries becoming disconnected from mine circuits during delivery: a dud mine.
Sensitive Relay SR-7 Mod 2 connector plug not tightened properly when connected to the Control Box Mk 13 Mod 1.	Personnel error.	Possibility of plug coming loose breaking connection between relay and control box: a dud mine.
Clock starter installed in mine without gasket.	Personnel error.	Flooded mine, if it had not been discovered in final prep.
Suspension lug securing screws not torqued correctly and safety wire not installed.	Lack of proper instructions in torque requirements.	A safety hazard to personnel, and risk of damage to aircraft.
Terminal Board TB-19-0, not secured.	Personnel error.	Vibration and shock during mine delivery likely to tear connections loose: a dud mine.
Sensitivity Switch Mk 5 Mod 1 not secured to the TB-19 with screws; left hanging by its leads.	Personnel error.	Switch could carry away during planting, damaging components, and breaking electrical connections.
Wrong end of the CA-276 connected to SE-3.	Personnel error.	Ship count setting could not be made on the mechanism. Time and effort wasted correcting discrepancy.
CD-14 sterilizer switch allowed to close during mine assembly.	Personnel error.	Mine batteries were discharged. Time and expense involved in disassembly and reassembly of mine and replacement of the batteries.

SOPHISTICATED GUIDE BLOCK

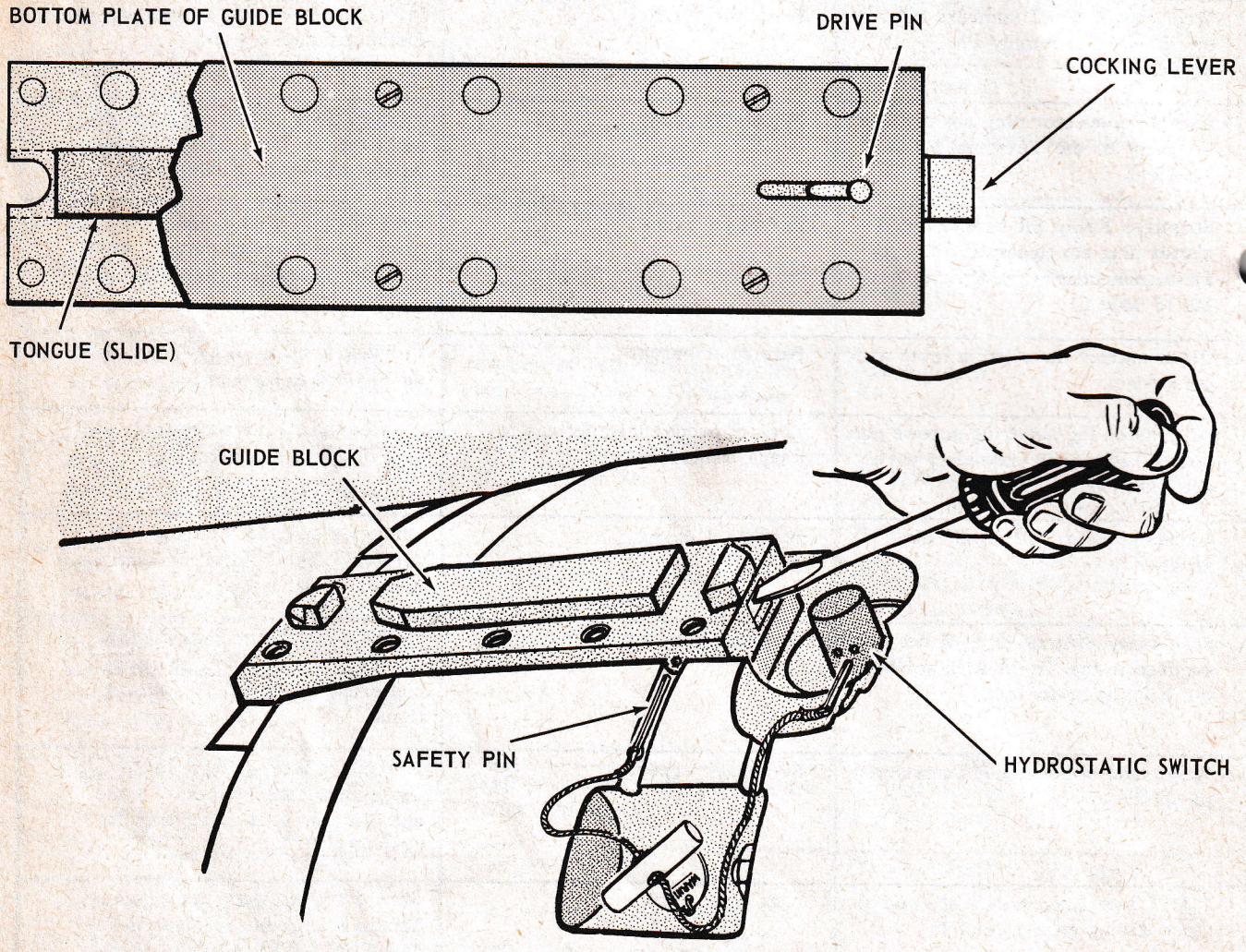
THE GUIDE BLOCK on the anchor of Mine Mk 57 Mod 0 contains a safety mechanism to prevent premature operation of the mud agitator. When the safety bar falls away after the mine leaves the torpedo tube it frees a spring-loaded cocking lever allowing a slide in the guide block to retract. When it does, the tongue of the slide uncovers a stop-release, which falls out freeing the explosive train to be lined up by hydrostatic pressure to a position where, when actuated, it operates the mud agitator. Thus if the guide-block mechanism fails to operate, so does the mud agitator.

A maladjustment in assembly that could cause such a failure (e.g., failure of the slide to retract) is a protruding of the drive pin that secures the cocking lever to the slide in the base of the guide block. If not driven home this pin can drag on the guide-block seat when the block is mounted on the anchor. Even when the drag is not enough to prevent cocking, it has proved to be enough to prevent the slide's spring from retracting the slide when the slide is released.

In the course of assembly, then, it will pay to insure free operation by turning the guide block over before installing it, to see if the drive pin is recessed slightly in its hole, below the bottom plate. If it isn't tap it smartly (a hammer and drift will do the job) until it is.

There is no use testing the operation, though, until later, after the guide block is torqued down in place. When it is, push the cocking lever in until the holes in lever and block line up and insert the safety pin, then pull the pin and see if the slide-tongue retracts.

When all is well the cocking lever should return smoothly and easily to its fully operated position, at which point the tongue will be retracted 100 percent.



Cocking the Guide Block on Mine MK 57

Do You do this Job Right?

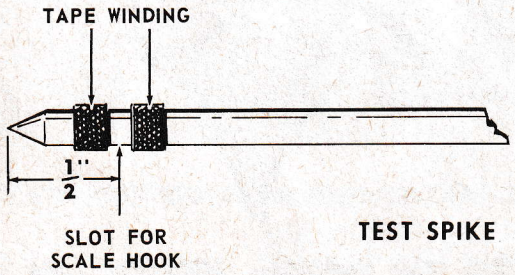
Testing Horns Mk 7 Mod 0 for Mines Mk 6 Mods 14 and 15 calls for a 7- to 17-pound pull in four equally-spaced directions, perpendicular to the spike. To do this the horn mechanism must be held in a vise with enough force to prevent slipping during the test, yet not enough to damage it.

Wooden blocks can be used to protect the horn from the vise grip, as suggested in Vol 4 and the forthcoming Vol 3 of OP 1853. But J. H. Keen, MNC at NAD Bangor, goes the OP one better. Instead of blocks he uses a standard 12-cent electrical junction box (5975-153-6395) as a test stand. Knock out the center blank in the bottom of the box, he says, and ream the hole to remove burrs, and it's ready to use. When you're ready to test, clamp the junction box in a vise tightly enough to hold it solid against a 17-pound pull in any direction, and mount the horn in the knock-out hole securing it exactly as you would in the mine itself. Next, insert your test spike, hook up the multimeter and you are all set to complete the test as prescribed by the OPs. The junction box can be used indefinitely.

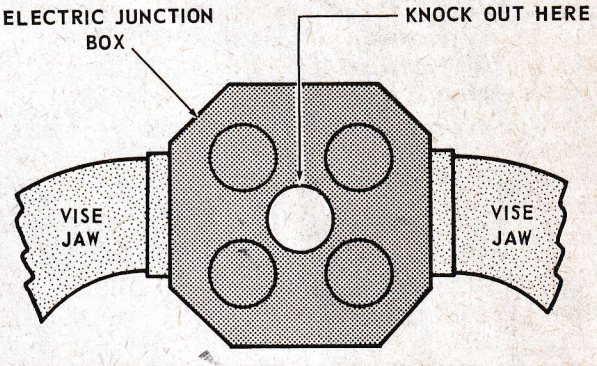
Another Keen idea has to do with the test spike. Instead of notching one to hold the scale hook as in the OPs, he uses turns of tape about the spike to serve the same purpose.

If the electrical junction box is not easily obtainable the same principle for holding the horn can be accomplished by boring a 7/8-inch hole in a $2\frac{1}{2}$ by 3-1/4-inch piece of sheet metal or 1/4-inch plywood. If the material is strong enough several holes can be drilled in a piece of same size and a number of horns can then be set up for testing at the same time.

The Editor



TEST SPIKE



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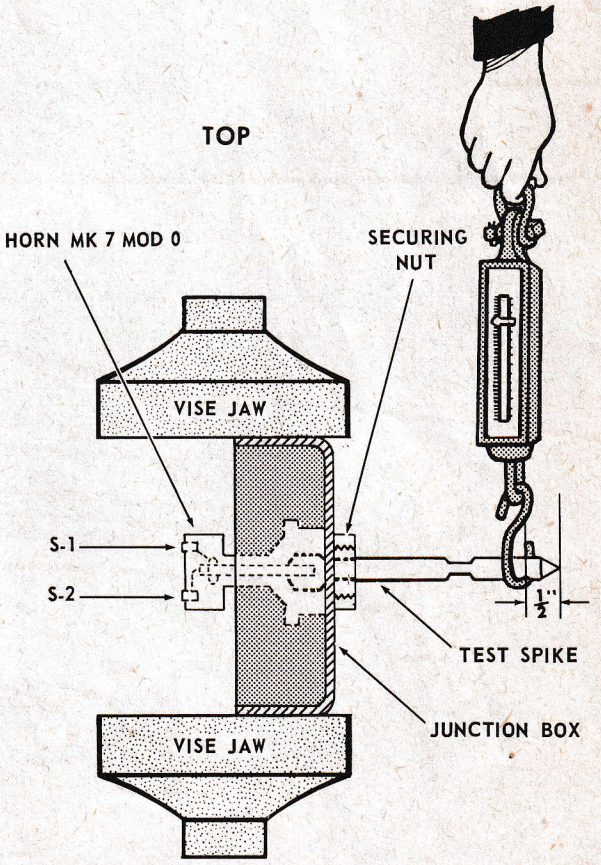

TOP

RUDMINDE!