**QDR is a Knockout**

Never let the lack of specific information keep you from submitting an SF 368. The Quality Deficiency Report still packs a punch… even if you don’t have the info to fill in every block in section I! The essential info the Heads of Needs comes from blocks 1a, 1b, 2a, 3, 4, 5, 6, 10, 11, 15e, 15d, 16a, 16b, 21, and 22.

---

### QUALITY DEFICIENCY REPORT (Category II)

1a. From (Originating point)
   (Include COMM Phone number for the benefit of contractor, etc.)

2. Report Control No.
   Date Deficiency Discovered
   National Stock No. (NSN)
   Description

7. Manufacturer/Shipper/Code/Shipper
   Mfg. Part No.
   Serial No./Lot/Batch No.

12. Deficient Item
   Quantity Received
   Quantity Issued
   Quantity Rejected
   Quantity Inspected
   Quantity Deficient

13. Operating Time or Failure
14. Defective Item
   Description
   Stock No.
   Each
   Case
   Carton
   Crate
   Container
   Unit
   Item

15. Quantity

16. Deficient Item
   Works On/With
   End Item
   (Depravity, etc.)

17. Dollar Value

---

**OF COURSE THE OTHER BLOCKS SHOULD BE FILLED IN IF YOU HAVE THE INFO! JUST DON’T LET THE ABSENCE OF INFO KEEP YOU FROM SUBMITTING THE FORM!** Chapter 12 and Appendices F and G of DA Pam 738-750 have the details on the SF 368. Paras 2-14 and 2-15 of DA Pam 738-751 have the scoop for you aircraft types!
The Army's new workhorse—the HEMTT—is a brute with plenty of muscle. But this heavy hauler has some quirks that you need to watch out for.

Once the big wheels get rollin', it takes a lot of braking power to stop 'em. Brakes on HEMTT's take a special look-see to keep all their stopping power ready to serve you.

Air hoses to the front wheel brake chambers rub against the tires when you turn. This rubbing will wear and tear the hoses, leaving you stomping a dead brake pedal.

Before you head out each day, get your buddy to watch those hoses while you turn the wheels full right, and then full left. There must be at least one inch clearance between the hose and tire.

If you see any wear, or have less than one inch of clearance, report it. Your mech will replace any hose that's worn thru the cover. If there's less than one inch clearance, your mechs will adjust the elbows on the brake chambers so they point directly toward the rear of the vehicle. The hose brackets need to point to the rear too. Excess hose is pulled back thru the clamps.

If that doesn't give enough clearance, loosen the hoses at the brake chambers and relay valve. Twist the hoses until there is enough space.
**Tie Down Ammo**

Cargo truck sidewalls and endgate are not strong enough to hold a load of ammo. That means t-r-o-u-b-l-e if the load's not tied down. Every curve or bump in the road will shift the load—and spill ammo everywhere.

Tie down ammo right with web strap tie-downs. Get proper tie-down procedures from:

**US Army Defense Ammunition Center and School**
**ATTN: SMACAC-DEO**
**Savanna, IL 61074**

---

**No-Spill Parking**

You've got to be careful how you park a fully loaded fuel tanker on uneven ground.

If you park headed downhill, fuel can leak from the vent valve that's located in front of the tank.

Prevent spillage by keeping the truck's nose headed uphill when the tank's full.

---

**Use Mirror for Battery Check**

The back set of batteries is a bear to check each month. You can't see down into the filler holes.

Use hand mirror, NSN 5120-00-892-5709. It's the extra set of eyes you need to look for cracks, leaks and low electrolyte levels in those hard-to-get-to places.

Appendix A of CTA 50-970 is your authorization to order the mirror.

---

**Big Loads and Light Bridges Don't Mix. Here's a Weight Class Guide for the HEMTT...**

<table>
<thead>
<tr>
<th>Model</th>
<th>Empty</th>
<th>Loaded</th>
<th>With Loaded Trailer</th>
</tr>
</thead>
<tbody>
<tr>
<td>M977</td>
<td>16</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>M978</td>
<td>15</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>M983 (w/o crane)</td>
<td>14</td>
<td>32 (w/Patriot)</td>
<td></td>
</tr>
<tr>
<td>M983 (w/crane)</td>
<td>16</td>
<td>36 (w/Pershing)</td>
<td></td>
</tr>
<tr>
<td>M984</td>
<td>18</td>
<td>45 (towing loaded M985)</td>
<td></td>
</tr>
<tr>
<td>M984E1</td>
<td>19</td>
<td>48 (towing loaded M985)</td>
<td></td>
</tr>
<tr>
<td>M985</td>
<td>17</td>
<td>28</td>
<td>39 (towing HEMTT M989)</td>
</tr>
<tr>
<td>M985E1</td>
<td>18</td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

Support each outrigger pad with two 2x12x24-in boards

The weight class sign kit, NSN 9905-00-565-6267, is on Pages 43-50 of TB 43-0209. Your authority to order is Appendix A of CTA 50-970.

**Board-Up Cargo Tilt**

Outrigger pads sink in soft or sandy soil when you load or unload your M977 or M985 HEMTT. This can let your truck roll over when you lift a heavy load, like an MLRS rocket pod or a pallet of ammo. Stop this problem by placing a couple of 2x12x24-in boards under each outrigger pad. Or use semitrailer ground jack boards, NSN 2510-00-741-7585. Center the boards before lowering the outriggers. They spread the weight and keep your HEMTT from coming up T-I-L-T!

When the job's done, store the boards in the cargo bed.

**Big Foot Destruction**

One of the big hazards to the M983's transmission is a Size 13 boot.

There's enough room on the back deck for a Bigfoot to cross without hurting a thing. But if you plant your big Number 13 on the transmission oil lines, you'll break the PTO sending unit or bust the transmission oil temperature sending unit.

Feet are made for walking, and that's what you'll be doing if you don't watch where you step on the M983.
Overinflation keeps a tire from flexing enough to take hard jolts. The cord body weakens with every bump until one day you hit a pot hole...Boom! You’ve got a blow out.

Overinflation makes center tread wear fast. The extra stress and strain of too much air also causes bruises, breaks and sometimes tread separation.

Underinflation is bad news, too. An underinflated tire runs hot, and excessive heat weakens the cords.

With underinflation, you get uneven tread wear, rapid wear on the outside edges of the tread, sidewall cracks and ply separation.

Play it safe...check tires when they’re cool...as part of your Before Operation checks. If a tire looks low, gage it. If it’s low, pump it up right away. Even driving a short distance generates a lot of heat. And this’ll throw off final readings.

For dual tires, use a hammer or lug wrench to thump the tires. A dull “thud” means the pressure is low—check it! A “pong” is good—a sign the pressure’s OK.

Use a gage to check the tire pressure weekly in all tires, including the spare.
Get a GO on Test

**STEP 1** TEST 74 PAGE 2-169 OF TM 9-2320-272-20-1 IS WRONG!

**WRONG**

1. **INSTALL CURRENT PROBE:**
   - Install the current probe around the output wire on the alternator/generator.
   - Point the arrow on the probe away from the alternator/generator.

**RIGHT**

**CONDITION CURRENT PROBE:**

Clamp current probe, TK item 11, around the positive battery cable connected to the starter. Point the arrow on the probe toward the starter. Make sure current probe is closed. Try to crank engine for several cycles with fuel shut off. Unclamp current probe from battery cable.

**THAT'S RIGHT!**

So make a note until the truck's TM is corrected.

---

**HMMWV's...**

**Here are Your MLC's**

**THE BRIDGE TROLL CAN'T GET ME NOW THAT I HAVE MY NEW MLC!**

**HERE ARE THE MILITARY LOAD CLASSIFICATIONS FOR THE HMMWV'S...**

**...FOLLOW THEM AND I CAN'T GET YOU!**

<table>
<thead>
<tr>
<th>Model</th>
<th>Empty</th>
<th>Cross-country</th>
<th>Highway</th>
</tr>
</thead>
<tbody>
<tr>
<td>M966, M996, M997, M998, M1025, M1026, M1036, M1044, M1045, M1046</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>M1035</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>M1037, M1038, M1042, M1043</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

The vehicle class sign kit, NSN 9905-00-565-6267, is authorized by Appendix A of CTA 50-970.

Mount the sign flush on the hood just above the right headlight. Put it 1/2-inch to the right of the radiator grill and about 3 inches up from the front of the hood.

Use the sign as a template and drill two 11/32-in holes in the hood that line up with the 9 o'clock and 3 o'clock positions in the sign. Use two 3/4-in long bolts, NSN 5306-00-225-9087, two washers, NSN 5310-00-167-0721, and two nuts, NSN 5310-00-880-7746. The bolts, washers and nuts are part of the sign kit's hardware.

Tighten the nuts only enough to hold the sign. Over tightening can damage the hood.
Dear Editor,

Removing and installing the plunger on the M1A1 tank breechblock can be a pain if you use a screwdriver like the TM tells you. Here's a tool I made from 3/4-in steel that makes the job easy and safe. The handle is 5 inches long and the shaft is 9 inches from tip to handle. There's a 1/2-in section removed at the tip 5/8-in down. Using this tool, you can avoid jamming the screwdriver between the plunger and the plunger hole. You can also remove and install the plunger without crawling under the breechblock. The materials for the tool cost about $7 and it can be made by unit maintenance mechs.

SSG Tommy Leach
Ft Knox, KY

(Editor's note: Great way to make a job easier and safer.)

Big Changes in TM's

Get ready, mechs, for real big changes in the TM's you use every day—like different numbering systems and fewer pages and volumes to use.

You'll benefit right off from having fewer TM's to haul around with you to the field. There won't be so much repetition either—some volumes have 55 percent fewer pages!

Until you get all the volumes of a series (all five of the -20-1-series, for example), don't get rid of any of the old volumes. Once you have all of them, chuck the old ones pronto.

Here's a quick rundown for M1A1 -20 manuals:

Old Manuals

- TM 9-2350 - 264-MAC
- 264-20-1-1
- 264-20-1-21
- 264-20-1-22
- 264-20-1-33
- 264-20-1-34
- 264-20-1-35
- 264-20-1-36
- 264-20-2-1
- 264-20-2-21
- 264-20-2-22
- 264-20-2-3
- 264-20-2-32
- 264-20-2-33

New Manuals

- TM 9-2350 - 264-20-1-1
- 264-20-1-2
- 264-20-1-3
- 264-20-1-4
- 264-20-1-5
- 264-24-1*
- 264-24-2-1
- 264-24-2-2
- 264-24-2-3
- 264-24-2-4

SURE GLAD THEY CUT OUR TM LOAD IN HALF!

*I can't wait to get rid of these old pubs!

The -24-1 is a single volume of all the schematics found scattered in many volumes before; a -24-2 will follow.

The -20P and -34P will also be combined into a single-volume -24P.

The TM lineup for the -255-20 series will be similar to the -264-20 TM's when it is printed. Keep the changes in mind so you use the most current info for maintenance and repairs.
Seize a New Anti-seize Compound

Anti-seize compound, NSN 8030-00-597-5367, found in the 20-series TM's for the M1/1PM1 and the M1A1 as an expendable item, should not be used because of its lead-base content.

Instead, use anti-seize compound, NSN 8030-00-664-6146. Apply the compound to the bolts before putting them in. The new compound won’t cause the bolts to “weld” to the combustor dome housing, like the old stuff did.

M48A5/M60-Series Vehicles...

Towing Tips and Your Safety

Towing heavy combat vehicles takes professional effort every time to prevent injury and equipment damage. Here are some TM warnings that bear repeating over and over:

- Use a second, hold-back vehicle when descending a grade of 20 degrees or more, even if you’re towing with a tow bar. A second vehicle is also required when the road surface or conditions make it necessary.
- Never exceed 8 MPH when towing a vehicle that has its tracks removed or final drives disconnected.
- Use tow bars when attempting a tow start. Tow cables are for use only when you’re faced with a real emergency. And never attempt a start by towing backwards.

FRH Safe, With Protection

Fire Resistant Hydraulic Fluid, MIL-H-46170B (FRH), is safe to use when proper personal protective measures are taken.

FRH and most other hydraulic fluids may contain the potential impurity ortho isomer of tricresyl phosphate (TCP). That’s why the warning labels are on the containers that do contain TCP.

However, the chemical is in such a low concentration that the right protective equipment—the gloves, apron and goggles, from the No. 1 Common shop set and the respirator from the No.1 Common Supplemental shop set—and good hygiene practices make FRH safe to use.

Prevent inhalation, ingestion or contact with the skin, and wash your clothing before using it again. Normal washing with detergent removes all traces of TCP.
**Instrument Testing Not in TM**

The micrometer test for the M1A1/M1A2 gunner’s quadrant was left out of TM 9-1015-203-12 (Feb 87).

Without the test, you won’t know whether you have a functional quadrant when you do the end-for-end test before firing. Bad readings lead to disasters, so make a note of this procedure until your TM catches up.

**Quadrant Setting Error Message**

That 300-mil setting for the M14A1 quadrant elevation counter when laying the M102 howitzer is not the only setting you can use.

Even though Step 3 on Page 2-35 of TM 9-1015-234-10 (Aug 85) says 300 mils and nothing else, your local unit SOP can prescribe a different setting.

The TM error will be corrected to say that the assistant gunner sets 300 mils or another elevation dictated by unit SOP on the M14A1 quadrant elevation counter.

**Always Take Grille Support Off**

Taking a shortcut with the intake grille support assembly, or armor jack, is a surefire ticket to a busted radiator, mechs.

The support must be removed as shown in the TM’s before pulling the powerpack and installed after the pack is in place.

Otherwise, there’s so little clearance between the radiator and the support that it’s almost impossible to prevent damage.

You may think you’re saving time and work by leaving the support in place, but you won’t have saved a thing if you ruin a radiator.

Remember—take the support off and pull the pack out. Put the pack in and install the jack. No shortcuts allowed.
Fuel Pump Failure Fix

Fuel pumps run when the master switch is ON. But sometimes you want the master switch on, but you don’t want the pumps to run.

Here’s a simple way to shut the pump off and save them from early deaths.

Get and install the NATO slave receptacle parts kit, NSN 2590-01-201-7858. The fuel pumps will no longer be on the same circuit as the master switch. The pumps won’t run as much, so they will last longer.

Complete installation and wiring instructions come with the kit, and plenty of the kits are on hand. Your CO can authorize you to get the kits and install them. Then you’ll start saving fuel pumps.

Oil Filter Housing NSN’s

TM 9-2350-260-20P omits the stock numbers for the engine oil filter head and housing for M113-series vehicles. Use NSN 2940-00-338-5933 for the head and NSN 2940-00-019-4775 for the housing.

Replace these items only when they are damaged or missing. If you just need a filter element, order NSN 2940-00-580-6283.
**Little Things Mean A LOT!**

The Pershing is the most powerful weapon you'll probably ever operate. But even the mighty Pershing can be brought down if you don't take care of little things. Trip up trouble with these tips:

- Never twist ground cable connectors hard to lock them on. Never turn them more than 180°. Cables have a fiberglass pin that breaks easily. Gently turn the connectors until they lock.

- Use dust caps on the connectors and jacks when cables are unplugged. Otherwise, dirt and moisture can cause shorts and bad connections.

- Turn off power before you plug in the cables to the power control and launch control assemblies. Burned-out capacitor filters are the price you pay for forgetting.

- Always use the two-man rule for switching heavier mod-switch adapters in the Systems Components Test Station (SCTS). Some adapters are too heavy—up to 67 pounds—for one person to lift.

- Keep your feet flat on the floor when you're operating the SCTS. Proping your foot on the floor-level chassis breaks control knobs and test points and throws off calibration.

- Never prop your foot on the floor-level chassis.

- Keep the inside of the SCTS clean. Drink and smoke outside, too. Sweep it out gently so dust's not knocked on equipment. Sweeping compound, NSN 7930-00-269-1272, prevents flying dust. Dust, liquids, and smoke damage sensitive computer equipment.

- It takes two to move heavier Mod-switch adapters.
If you follow the 25-meter zeroing procedures in TM 9-1005-319-10 and Change 4 (Jan 86) to TM 05538C-23&P/2, you’ll end up confused.

Army and Marine M16A2’s have slightly different elevation requirements. Marines zero their rifles like the TM’s say. Their rifle’s elevation knob should bottom out three clicks below the 300-meter mark, just like it says in Para 4 on Page 53 in the -10 TM and Para 2 on Page 2-5 in the -23&P/2.

But it’s a different story for Army M16A2’s. Their elevation knobs should bottom out at the 300-meter mark.

... out and will not pivot freely. Position elevation knob back slightly to its last whole click so the rear sight base is under tension of the bearing ball and helical spring (items 11 and 12 page 3-40). Now, rotate the elevation knob clockwise three clicks. The 300 meter mark should align with the mark on the receiver. If the 300...

... moved. Knob should be positioned on its last whole click. Now, rotate lower portion of elevation knob clockwise three clicks. Tighten index screw. Do not attempt to remove the index screw. This is an intermediate function.

... In Para 2 on Page 2-5 in the -23&P/2, change the fifth sentence to: "(Marines only: Now, rotate the elevation knob clockwise three clicks.) . . ."

... And change this sentence to: "(Marines only: Now, rotate lower portion of elevation knob clockwise three clicks.)"

In Para 4 on Page 53 in the -10 (the zeroing procedure’s for the Army, too), the second sentence should say: "The elevation knob should stop its clicks at the 300-meter mark."

If your M16A2’s elevation knob doesn’t bottom out at the 300-meter mark, your armorer can adjust the range scale’s index screw.

If that doesn’t fix the scale, armorers, turn in the rifle to DS. Never remove the index screw.

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Here's some tips that'll help you keep your M2 ready on the firing line...

Getting the feed right is a cinch if you look at the grooves beginning at the bolt's base. For left-hand feed, set the bolt switch so the left groove is unblocked.

Bolt switch

Left groove

Right groove

Feed lever

Bolt base

For right-hand feed, it's the right groove that's unblocked. If you forget the grooves, you damage the feed lever tip and the bolt.

After cleaning, reassembly is easier if you put the bolt, buffer, and barrel extension back together outside your gun instead of inside. Slide all three into the receiver in one piece with the cocking lever forward. Then put in the driving spring rod assembly and backplate. That prevents the burrs and scrapes that come from putting things together inside the receiver.

It's one way only—left—to slide the sear slide in the bolt. If you push it in from the right, your M2 can't fire.

Left to right

When you remove the front cartridge stop to train with the Multiple Integrated Laser Engagement System, pull the belt-holding pawl pins out just far enough to release the cartridge stop. Then slide the pins right back. If you pull the pins all the way out, the pawl and spring fly out.

Prevent the front cartridge stop from disappearing by tying it to a backplate handle with lacing wire. Your armorer has plenty of wire.

Armorer, when you put the two shoulder bolts through the receiver side plate, make sure their beveled edges point in opposite directions. The beveled edges of the bolt nearest the barrel points toward the barrel and the rear bolt's beveled edge to the rear of the machine gun.

If you point them in, the slide plate works loose during firing. That breaks the bolt stud and lets the charging handle fall out of place.

Never clean the backplate by dunking it in solvent. Solvent ruins the fiber discs in the backplate, which makes for hard recoil. Clean the backplate with a cloth and CLP.
Your AN/TSM-93 has lots of delicate components that need lots of delicate care if it’s to test true. Pass the test of a good operator with these tips.

- Cleanliness is right up there with godliness when it comes to the AN/TSM-93. Dirt and sand get in things like cable connectors and cause arcing and shorts. Dust off counters and sweep out the van. Shut the door. Keep caps on cable connectors not in use.

- When you’re troubleshooting patchboard pins, look for broken pin prongs or spread prongs. Those are the most common problems.

- When you’re not running tests, keep the patchboard receiver handle all the way down. Otherwise, voltage from the power supplies keeps running to the patchboard receiver and can damage the patchboard, power supply cable pins, or the filter adapter.

- Help the AN/TSM-93 stay cool by keeping its screens and filters clean, especially those on top of the operator control console and the electronics rack.

- Keep your finger off the HALT button if the signal generator’s power amplifier has been programmed or the 1A4 variable transformer is being used. Hitting HALT is like throwing your car in reverse when you’re going 55 MPH. Power surges with no place to go can cause circuit card damage, too.

- Upright’s the only position to set down a patchboard. If you lay it down flat, something as small as a pen can bend pins. Replacing pins is a major repair.

- Before you shut down the AN/TSM-93, turn the variable transformer dial back to 0. That prevents voltage surges from damaging the transformer when the AN/TSM-93’s turned back on.
Save Your MPL Pams

Wait! Don't pitch DA Pams 710-2-3 and 710-2-4, Mandatory Parts List (MPL) for Category I and II units. These Pams are superseded by DA Pams 710-2-117 and 710-2-118. The problem is there are no TROSCOM managed end items listed in the new Pams.

When you receive your new Pams, compare your on-hand items from your unit hand receipt or property book with the Mission Profile Development List (MPDL), Appendix J of DA Pam 710-2-1 in Supply UPDATE 11.

If your end items appear in the MPDL, check them on the new DA Pam for your unit category. If there's no MPL for the end item on the Pam, look at the item's NSN on the AMDF. TROSCOM-managed items have an A12 Source of Supply (SOS). If it's a TROSCOM item and you’ve established an MPL for that piece of equipment, keep the repair parts. Use your old Pam to identify and justify keeping the repair parts for these end items. If you haven’t established an MPL for the TROSCOM items, hold off. They’ll appear in the next update.

Maintenance & Safety-Of-Use Messages

AMCOM SOU-MSG—Operational, warns of a safety hazard when the turret relay box circuit breaker switch is OFF and the turret drive is in the powered mode on the Bradley Fighting Vehicle System, AMSCC-MA, 29150Z Jan 88.

AMCOM SOU-MSG—Advisory, Operational, warns of M1, M1A1 and JPM1 Tank loaders toe guard safety hazard, AMSCC-MA, 29194Z Dec 87.

CECOM SOU-MSG—Mandatory, Operational, confirms testing interval for ANPVS5 series goodies for aviation and ground use, AMSELPF-SEC, 151930Z Jan 88.

CECOM SOU-MSG—Advisory, Operational, deadlines lithium-sulfur dioxide BA-5590U batteries made by Duracell, contract No. DAAB07-85-C-5355, lot No. 0987, AMSEL-OF-TRCEC, 05230Z Jan 88.


MICOM SOU-MSG—Advisory, Increases distance between personnel and ignition point on MXU-4/AA Engine Starter Cartridge, M156, and all Army owned stocks used with Ballistic Aerial Target System (BATX), AMSCC-AM-AM, 26160Z Jan 88.

Your Direct Support or Logistic Assistance Office (LAO) can provide you with more information.

Audio-Visual Stuff

Available at battalion or post Learning Center

TVT 9-84 Bore sighting the integrated sight unit to the 25mm gun and night sight to day sight
TVT 9-93 M939 brake system: construction and operation
TVT 9-128 HMMWV: Troubleshooting the fuel system
TVT 9-130 Bradley fighting vehicle: basic operation of the weapon systems controls
TVT 11-179 AN/TYC-39 modem alignment
TVT 11-180 Repair AN/TYC-39 central processor group (CPG), part 1
TVT 11-184 Installation of the generator set 5KW AC
No matter who you are... Good PM is everybody's concern!

The flip-side of mission is maintenance!

No matter where you go... To the mid-level supervisor!

No matter what you do... To the command authority!
Save the Canopies

When your Modernized Cobra’s transmission cowling door is open for maintenance, it can rub against the pilot’s canopy and leave it looking like Scarface. But SP4 Darwin E. Elliott at Hunter Army Airfield came up with a SMART idea to prevent those ugly scars and costly repairs. Just add a bumper plate to the door where it rubs against the canopy.

To make the plate, get access cover, NSN 5340-01-159-8291, and rubber strip, PN 192139-1, CAGE 70210.

Make the bumper plate like so:

Attach the bumper plate to the cowling with rivets or screws. Put a bead of sealant, NSN 8030-00-723-2746, under it before putting it on. Be sure the holes in the bumper for the hardware are countersunk so that the hardware won’t touch the windshield and scratch it.
EASIER TRUNNION REMOVAL

HERE’S A HANDY HOME-MADE TOOL TO USE WITH THE WORK AID SHOWN IN FIG 5-38 OF TM 55-1520-210-23-1 TO REMOVE TRUNNION ASSEMBLIES FROM THE SWASHPLATE.

GET YOUR MACHINE SHOP TO MAKE IT FROM THESE MATERIALS...

Eye bolt  NSN  5306-00-271-4742
Hex nut    NSN  5310-00-582-8173
Clevis rod end NSN  5340-00-989-2983
Washer    NSN  5310-00-167-0771
1 3/8-in ID steel tubing

AVIATION MESSAGES

If your unit has not received a message you have an interest in, check with your next higher headquarters.


AH-64-87-26, SOF, Maintenance mandatory, Tail rotor yoke, 161900Z Dec 87.

AH-64-87-10, SOF, Maintenance mandatory, Multiple safety inspections, 1721002 Dec 87.
A Little Dab'll Undo You

Many of your bird’s major components need lube, crew chiefs, but the taillight’s not one of ’em!
So be mighty careful when you service your Huey’s tail rotor gearbox and chip detector that you don’t spill any oil.
If you do and the oil runs down the tailboom into the taillight, it can short out the light.
Then your bird’s NMC for night flight until the light’s fixed.
To prevent trouble if spills happen, cover the taillight with towels or rags when you service the gearbox.
It’ll only take a minute and it might save you an hour.

Careful, Kiowa mechs, when you drill out rivets in your bird’s airframe to replace a windscreen.
Shavings can fall into the J600 plug that holds the impedance matching network and circuit card at the rear of the instrument panel.
If the shavings get into the circuit card’s contacts, they short out your commo gear.
That adds up to a lot of grief in repair time and cost.
So next time, before you drill out rivets on a windscreen, remove the circuit card from the plug and put a strip of duct tape over the plug. This will protect the circuit card.

Before you start drilling rivets...

... remove circuit card
You can’t assume that just because your bird’s armament subsystem is seldom used, it seldom needs maintenance.

That kind of assumption can cause you a world of hurt. If your Huey, Black Hawk or Chinook has a mount for the M60D machine gun, it needs periodic cleaning, lubrication and inspection.

**Cleaning and Lubrication**

If the gun is mounted in your bird, clean and lube the mount monthly.

If you’re operating under unusual conditions—extreme temperatures, dust or sand, humid or salty atmosphere, rain or snow—clean and lube the mount at least twice a month.

Before you apply lube, clean the pintle and bearing with mineral spirits, NSN 6850-00-264-9039, like it says in Para 3-2 of TM 9-1005-262-13.

Always wear protective gloves when using mineral spirits to avoid skin irritation and inflammation.

After you’ve cleaned and dried the pintle and bearing on the M23, M24 or M41 mounts, give ‘em a light coat of lubricating oil, NSN 9150-00-889-3522.

Use solid film lubricant, NSN 9150-00-168-2000, on the pintle and bearing surfaces of the release arm on the Black Hawk’s M144 armament subsystem.

The bearings in the Huey’s M23 and the Chinook’s M24 also get a shot of grease, NSN 9150-00-985-7244.

**Inspections**

Always eyeball your bird’s armament subsystem before operation. Look for loose bolts on the pintle mount and mount assemblies. Tighten any loose bolts.

Check the ejection control bag for tears or torn seams. Make sure the slide fastener works and give the latch a slight tug to make sure it holds.

On the Huey’s M23 pintle mount, also make sure the pintle post assembly is locked into the base tube assembly. Tighten the slotted nut if it’s loose.

On the Black Hawk’s M144 gun mount assembly, eyeball the cotter pin and headed straight pin that secures the mount pintle to the release arm assembly. If they’re worn or broken, replace them.

In addition to before-operation checks, you have to inspect some components every 25 flying hours. They’re listed in the table beginning on Page 4-5 of the TM.
The pin on the apex fitting of your 10,000-lb sling set, NSN 1670-01-027-2902, can work its way under the keeper on the Black Hawk cargo hook. Then it can slip off the hook. Talk about a hard landing! KA-WHAM!!

To prevent unexpected equipment drops, modify your sling before you use it again. Add an aluminum spacer to the apex fitting pin and replace the safety bolt and dome-shaped nut with a new bolt, castellated nut and cotter pin.

The spacer prevents the apex fitting from raising the cargo hook keeper. It also centers the fitting on the hook to reduce shock loads from a rotating sling load.

Here's what you need:
- **Spacer**
  - NSN 1670-01-235-0908
- **Bolt**
  - NSN 5306-00-944-1536*
- **Nut**
  - NSN 5310-00-207-9274
- **Cotter pin**
  - NSN 5315-00-234-1864

If you have to sling equipment before you get the spacer parts to modify the apex fitting, either replace the fitting with one from a 25,000-lb set or make a temporary substitute for the spacer.

The substitute spacer should be a 3 7/16-in piece of steel or aluminum tubing that has a 1 3/16 inch inside diameter and an outside diameter of 1 1/2 to 1 7/8 inches. Your 10,000-lb sling sets don't have to be modified for use with Hueys or Chinooks.

To modify your 25,000-lb sling sets, add spacer, NSN 1670-01-235-0907 and bolt, NSN 5306-00-944-2659*, along with the same nut and cotter pin used to modify the 10,000-lb set.

* Not on the AMDF. Order on DD Form 1348-6 from S91.
Moisture inside your Black Hawk’s nose compartment can knock your lights out. That’s because the command instrument system processor is not sealed.

When the inside of the processor gets wet, some of your critical instruments can go haywire in a hurry.

Keep moisture out of the nose compartment by keeping a close eye on the compartment door seal. Check it out at least every 10 hours or 14 days, whichever comes first, like it says in Sequence 1.5 of TM 55-1520-237-PMS-1.

Look for cracks, cuts, brittleness and deformities in the rubber seal. If it’s damaged or hard and brittle, replace it with NSN 5330-01-114-2342.

A lot of APU and generator control boxes, PN 114E2077-41, being returned to depot for repair are not bad.

That’s right. The depot tests the relay control boxes before they repair them and find there’s nothing wrong with the boxes.

It might be because the -41 control box does not have the time-delay relays and load resistors that are built into the 114E2077-43 control box that’s installed in some C-model Chinooks.

The time-delay relays and load resistors are built into the generator control panel. Sending -41 boxes back to depot without thorough troubleshooting is a big waste of time, effort and money.

When your big bird’s APU fails to start or aborts after starting, go by the book in performing operational checks and troubleshooting.

Operational checks are listed in Para’s 15-4 through 15-8 of TM 55-1520-227-23-4. Para 15-9 tells you where to enter troubleshooting Table 15-1 based on the results of your operational checks.

If the operational checks and troubleshooting fail to isolate the cause of the no-start or start-abort, check out the troubleshooting procedures for the APU in Section 4 of TM 55-2835-203-24.

If the relay control box is at fault, replace it and turn it in to AVIM for repair.
Circuit Board Handling...

Even when those circuit card assemblies (CCA's) in your commo and electronics gear are bad, they're still good.

That's right! A burned-out resistor, capacitor or broken pin can be fixed. That's unless the board is battered, broken or gets built-up static electricity due to careless handling on its way to repair.

CCA's thrown helter-skelter into a carton will get ruined by sharp soldering pins scratching printed circuits. Electrostatic discharge (ESD) damage can also occur.

Stop additional damage to ESD-sensitive CCA's by pulling them out of your gear only after you've grounded yourself up to an ESD field service kit, such as NSN 5920-01-253-5368.

Package your CCA's for return shipment by wrapping each board in antistatic wrap or cushioning material. Place the wrapped board in an antistatic bag. Heat seal the bag.

Then put the bagged CCA in an electro-static free flexible cushion pouch!

**Table**

<table>
<thead>
<tr>
<th>Pouch Size (in inches)</th>
<th>NSN 8105-01-</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 by 12</td>
<td>197-2965</td>
</tr>
<tr>
<td>11 by 15</td>
<td>215-4752</td>
</tr>
<tr>
<td>10 by 10</td>
<td>197-2966</td>
</tr>
<tr>
<td>10 by 12</td>
<td>197-7846</td>
</tr>
<tr>
<td>8 by 8</td>
<td>215-0462</td>
</tr>
</tbody>
</table>

V-Belt NSN's

Physical and mechanical protection is the next step. Unit pack each bag or pouch in an antistatic "Fast Pack" container. (You'll find some listed on Page 49 of PS 405.)

**IF YOU NEED MORE INFO ON HANDLING ESD SENSITIVE ITEMS, WRITE TO...**

USAMC Packaging, Storage & Containerization Center
ATTN: SDSTO-TP-P
Tobyhanna, PA 18466-5097

AUTOVON 795-7685
Comm 717-894-7685

V-Belt NSN's

NSN's for the V-Belts on your RL-207 and -A reelers machines are not listed in the TM. Here they are!

<table>
<thead>
<tr>
<th>MODEL</th>
<th>PN/NSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLAIN MODEL</td>
<td></td>
</tr>
<tr>
<td>Upper belt</td>
<td>3030-00-892-4576</td>
</tr>
<tr>
<td>Lower belt</td>
<td>3030-00-892-4577</td>
</tr>
<tr>
<td>A-MODEL</td>
<td></td>
</tr>
<tr>
<td>Upper belt</td>
<td>PN 6BB0, CAGE 24161*</td>
</tr>
<tr>
<td>Lower belt</td>
<td>3030-01-156-7527</td>
</tr>
</tbody>
</table>

*Order on a DD Form 1348-6, using RIC S9C.
Pulling the Plug on Generator Problems

**USE THESE TIPS TO PULL THE PLUG ON GENERATOR PROBLEMS THAT CAN LEAVE YOU POWER-LESS IN THE FIELD!**

1. A rear vent door brace that can’t hold the air intake sucks the door shut—then the engine overheats. Make sure the brace will hold by gently pulling the door back and forth with the brace locked in place. Your mech can straighten out bad braces.

2. Test rear vent door brace for strength.

3. Never block open the radiator shutters to help the generator stay cool. That keeps the generator engine from reaching operating temperature. The engine also can’t reach operating temperature if you don’t shut all the side doors or shrouds. If the engine runs cold, its oil turns to sludge, the engine slobbers, and fuel gets in the oil.

4. Clean the screen on the fuel transfer pump at least monthly or every 100 hours of operation, especially in sandy areas. If the screen gets clogged, your generator has trouble getting fuel. Clean screens with solvent and low-pressure air like your TM says.

5. 5- and 10-KW Diesels
   - Always put the air filter cap back on with the arrows pointing up. If the cap’s on wrong, dirt gets sucked into the engine and shortens bearing and ring life.
   - Position the cap clamp so it’s at the bottom of the cap. That helps the cap seal out rain and dirt better.
   - Heat from the exhaust dries out batteries quick. Deflect that exhaust with a 45-degree elbow, NSN 4730-00-137-9218. You need an extra elbow for the 10-KW to also protect the fuel tank from exhaust.

6. Arrows should be UP ... clamp should be DOWN.

7. Add elbow to protect batteries and fuel tank.

8. No Idle Advice
   - Your TM’s don’t spell it out, but you never idle any generator at the start of operations for warm-up or the end for cool-down. That can wreck the exciter, burn out the voltage regulator, or blow the rotor rectifier diodes.

9. **THE BEST WAY TO WARM UP AND COOL DOWN YOUR GENERATOR IS TO RUN IT AT RATED SPEED WITH NO LOAD FOR 3 TO 5 MINUTES!**
Always check the oil level first thing every day you operate. If it’s low, add enough to bring it up to the full mark. If it’s over the full mark, drain a little out. The correct level is between the add and full mark.

Look for leaks, too. Even a slight oil leak can turn into a big leak surprisingly fast during operation.

If you see oil on the pump unit’s base plate, it’s probably coming from the oil filler tube. Engine vibration shakes it loose.

Here’s a quick fix for your mechanic:

- Loosen the bolt on the tube’s bracket.
- Set a 2 x 4 wood block on top of the tube. Tap the end of the block firmly. Tighten the bolt.

**Before You Put it Away**

If you’ve been running the M21 longer than 1 hour, purge the heater at least another 5 minutes. This prevents carbon build-up in the refractory chamber.

**Look Before You Go**

Before you go to the field, eyeball the regulator rectifier fuse for a blue tinge or broken wire or glass. If you see any of that, the fuse is bad. A bad fuse means the battery won’t recharge and your M12 won’t go. Report bad fuses.

Make sure the wiring harness is routed right around the engine and fastened down tight. If the harness is loose, you can damage it when you lock the shrouds down. Or the engine manifold can burn it.

Carefully disconnect the outlet hoses from the pump unit. Hot water can spray out and scald you. Disconnect the lower hose first.

In freezing weather, drain the main tank, prime detergent tank and pump. Drain it on level ground. If the M12’s on a slant, you won’t get out all the water. Even a cup of water will freeze and crack the pump tank.
Oil Filter Switcheroo

Oil filter assemblies used on 6-, 10-, 14- and 20-HP engines are either cartridge-type or spin-on, depending on the age of the engine.

When the repair parts for cartridge filter assemblies are gone, only the spin-on oil filter assembly will be used.

There's no need to have your engine down while you wait on parts for the cartridge-type filter, tho. You can install a spin-on filter assembly, NSN 2805-01-189-9698 now. That NSN gets you a base, gasket and filter element.

1. Disconnect the 2 ignition cables from the left side of the coil.
2. Remove the 3 bolts on the bracket for the filter assembly.
4. Reconnect the ignition cable and the switch is complete.
5. Start the engine and look for leaks.

Power Units...

Lighten the Load

Those heavy power cables used on your 5- and 10-KW power units put a big strain on the load terminal connectors. Nothing supports the cables except the connectors where the cables attach to the power switch box.

Heavy cables pull the connectors out by the roots. Then your set's down.

Take the strain off the connectors by installing an eye-nut to the trailer chassis.

Put the grip on the power cable and hook it to the eye-nut. As a temporary fix while your items are on order, use heavy tape to secure the cable to the trailer.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>NSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye nut</td>
<td>5310-01-169-2849</td>
</tr>
<tr>
<td>Cap screw</td>
<td>5305-00-071-2070</td>
</tr>
<tr>
<td>Flat washer</td>
<td>5310-01-164-5600</td>
</tr>
<tr>
<td>Lock washer</td>
<td>5310-00-834-7606</td>
</tr>
<tr>
<td>Power cable grip</td>
<td>5120-00-946-5148</td>
</tr>
</tbody>
</table>

Bolt eye nut to trailer chassis

Hook power cable grip to eye nut
Wire rope used on cranes and winches has a hard life. It’s exposed to the weather, and often doesn’t get any PM. Then when you need it, it lets you down. Dirt and grit work their way into the cable and wear away individual strands. Moisture gets rust started, weakening the cable.

**Cleaning**

A good cleaning goes a long way in making wire rope last. As a general rule, clean and oil winch cable after every operation. Since crane cables are usually not dragged through mud or dirt, you clean them only when they need it.

Always wear leather gloves when you handle wire rope. Unreel the wire rope and stretch it out straight. Use a wire brush—like the one in the No. 1 Common shop set—to get off old lube and dirt. Clean all of the cable. While you’re cleaning it, look for broken strands, kinks and other damage.

Kinks?

Broken strands?

Replace the cable if you find any kinks, or if four percent of the strands are broken within the distance that it takes a strand to make a complete turn around the cable. That’s spelled out in Para 1-14b(2)(b) of TM 5-725, Rigging.

**Lubing**

Lube wire rope according to the LO for your gear. If the LO doesn’t cover it, here’s what you do:

- Coat cable with clean OE-HDO 30 engine oil if the cable’s used a lot. Never pour on used oil. It contains acid that will weaken the rope fast.
- In dry, dusty areas, rope doesn’t need oiling. Fact is, oil collects dust and grit that will chew up the cable.

(These NSN’s get 35-lb cans)

<table>
<thead>
<tr>
<th>LO</th>
<th>NSN 1350-00-261-7891</th>
</tr>
</thead>
<tbody>
<tr>
<td>CW-IIA</td>
<td>-30 to +30 F</td>
</tr>
<tr>
<td>CW-IIB</td>
<td>-30 to +80 F</td>
</tr>
<tr>
<td>CW-IIC</td>
<td>-80 to +130 F</td>
</tr>
</tbody>
</table>

CW-II pours better when it’s heated. It soaks into the wire rope better when it’s hot, too.

**Careful With Covers**

Covering your winch is OK for travel. That keeps the cable from picking up a lot of road dirt. But don’t leave the winch covered when your vehicle’s parked. The cover traps moisture under it that’ll rust the rope.

**More Info**

For more information on wire rope care, see Para 1-12 of TM 5-725, Rigging.
JD410 Oil—One More Time

Turns out you can use Grade 10, OE/HDO engine oil (MIL-L-2104D) in your JD410 loader backhoe’s transmission.

Once again, the headshed says you don’t have to use special 10W oil.

There’s no need to flush out the old oil before adding the OE/HDO 10W to your JD 410. TACOM Msg AMSTA-MVB, 311400Z Jul 87 has the word.

RTFL’s, Hawk Loaders...

Ordering Generator, Regulator

There’s a trick to getting the 25-amp generator and regulator used on 6,000-lb and 10,000-lb rough terrain forklifts and Hawk missile loaders.

Your request must include a cover letter giving the vehicle’s LIN, SSN, NSN, model number and serial number.

Supply will send the requisition to:

Commander
US Army Tank-Automotive Command
ATTN: AMSTA-FTLD
Warren, MI 48397-5000

A socket is a socket is a... whoops, hold it! Not all sockets are the same! Impact sockets are hardened to take the extra force that impact wrenches dish out. Regular hand sockets are not as tough. If you use them on impact wrenches, the sockets deform or break.

It’s easy to keep the sockets straight. Hand sockets have thin walls. They’re used with speeders, ratchets or torque wrenches, so they won’t have to stand up to much force. There’s a notch or groove inside the square drive end that matches up with the retention ball on the handle. And they usually have a shiny, bright finish.

Impact sockets have thicker walls to stand up to repeated impact loads. There’s a hole thru the drive end to allow the socket to lock to the impact wrench with a pin. And they have a black or industrial finish.

When you’re using a socket and socket wrench handle, be sure that’s all you use. A cheater bar should never be used.

621B Scraper Battery NSN

Use NSN 6130-01-250-2113 (PN 9G4231) to order a battery. This NSN and PN replace PN 9G2648 shown on Page 76 of TM 5-3805-248-14&P-4. If you need a filler cap, order NSN 5340-01-160-0319.
There's no secret to searching for a substitute item on the Army Master Data File (AMDF). Interchangeable and Substitute (I&S) group info is now found in the Phrase Statement/Related NSN/MCN column on the AMDF.

So when you get a status card that gives a code saying there 'll be a long wait, don't go looking for the old I&S microfiches. They've been deleted. Instead, look on your AMDF.

**Phrase Code**

The phrase code located in the Phrase Statement/Related NSN/MCN column is a one-position code which shows changes and connections between the item in the Prime NSN/MCN column and information in the Related NSN/MCN column.

<table>
<thead>
<tr>
<th>Phrase Code</th>
<th>Phrase Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>The stock number in the prime NSN/MCN column and the stock number in the related NSN/MCN column are completely interchangeable.</td>
</tr>
<tr>
<td>3 Reverse of Phrase S</td>
<td>When you see this phrase code, the stock number in the prime NSN/MCN column is the actual item of production. Additional interchangeable production items are shown in the related NSN/MCN column with a phrase code &quot;J.&quot;</td>
</tr>
</tbody>
</table>

If you find I&S phrase codes G, 5 or 7 NSN's listed in Phrase Statement/Related NSN/MCN column, you'll need to check out two other columns—the Order-of-Use (OOU) column and the Jump-to-Code (JTC) column.

**Order-of-Use Code**

The first two positions of the OOU Code are the Subgroup (SG) code. Items with the same SG letter, such as AA, are interchangeable.

If the SG letters are different, the two items are substitutes. Use the item with the lower value subgroup code first. Example: Subgroup AB has a higher value than subgroup AA, so you would use the NSN with subgroup AA before the NSN with subgroup AB.

The third position of the OOU code is the sequence code. It shows the Order-of-Use within the subgroup. The least preferred item in the subgroup will have an "A" assigned.

APR 88
Jump-to-Code

When the Jump-to-Code is used, it directs the user to "go around" a subgroup that will not satisfy the requirement and "jump to" an NSN which can be substituted. The characters of the JTC have the same value as the OOU code of the item being "jumped to."

In this example, the JTC tells you that stock numbers 6210-00-299-6856, 6210-00-057-1910 and 6210-00-067-8384 are not suitable substitutes for one another, "jump-to" AEA, NSN 6210-00-045-5492, which is the preferred stock number. If you find a substitute NSN, check with your stockroom. The item could be in stock. Also, remember to cancel your back-ordered request.

Tank Slaving Change

To cut down generator drive shaft failure on your M1-series tanks, change the slave starting procedure. Add to Step 0 on Page 2-377 of TM 9-2350-255-10-2 and Step 0 on Page 2-402 of TM 9-2350-264-10-2 this info: Shut down the engine and turn off the master power switch in the live tank before starting the dead tank. Follow the other TM procedures as written. For details, see TACOM Msg AMSTA-MCD 281400Z Jan 86.

Cover the Slick Solution

If you think something's missing from "Slick Solution to Oil Pollution," Page 56 of PS 422, you're right. We should have shown a screen over the box. It's not a good idea to put funnels, spouts, oil cans and grease guns directly on top of the oil absorbent material. Material sticks to the oily equipment and then goes into your machinery with the fresh oil.

M4K Forklift Brake Maintenance

There are changes to the PMCS and brake maintenance procedures for these forklifts you need to know about. TACOM Msg AMSTA- MV 221030Z Jul 87 has new inspection and bleeding procedures. If you don't have a copy of the message, see your TACOM representative at the Logistic Assistance Office nearest you or write to PS.

M939 Oil Cooler Filter NSN

LO 9-2320-272-12 tells you to replace the oil cooler filter every time you change the transmission oil and filter. TM 9-2320-272-20-1 shows you how to change the filter, but the filter is not listed in your -20P TM. Get the transmission oil cooler filter and gasket with NSN 2520-01-123-2649.

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

**TO:** OIL ANALYSIS LAB  
**FT. HOOD**

**FROM:** F3S.CO.

**OPERATING ACTIVITY:** CHAIR  
**HDG 168 ARMOR**

**EQUIPMENT MODEL/TYPE:** AVDS 1790-2 D

**END ITEM MODEL/PULL:** TANK M60A1

**END ITEM SER. NO.:** 6486

**DATE SAMPLE TAKEN:** 21/24

**HOURS/MILES SINCE OVERHAUL:** 346

**HOURS/MILES SINCE OIL CHANGE:** 67

**REASON FOR SAMPLE:** OTHER

**OIL ADDED SINCE LAST SAMPLE:** 1/60AL

**ACTION TAKEN:**

**DISCREPANT ITEM:**

**HOW MALFUNCTIONED:**

**HOW FOUND:**

**RESULT:**

**REMARKS:**

**FOR LAB USE ONLY:**

**MIC**

**LAB REQUEST:**

**SIG OR GROUND CREW:**

**SAMPLE TEMPERATURE:** 87-88

**TYPE OIL:** OE-30

**SAMPLE NO.:**

**SIGNATURE:**

**FILE MAINT:**

**DATA SEQ:**

---

**PUT THE ODOMETER READING IN THE REMARKS BLOCK!**