

Station. Enter name of installation or tactical site designation (Examples: Fort Rucker, Sun FOC).

Subject of Log. Enter type of equipment or facility for which maintenance log applies (Examples: ILS; NDB; R-401 Tactical Site).

Month and Year. Enter calendar month and year for which maintenance form applies (Example: June 1992).

Date. Enter calendar day of month (Example: 6).

Time. Enter local time of entry using 24 hour clock (Example: 1430).

Code. Leave blank.

Remarks.

a. Begin a new page with each calendar month. On the first line, put "First Entry Month of _____."

b. After last entry of each month, state "Last Entry Month of _____." Draw a slash (/) through all unused lines.

c. Upon each visit, show "Arrived Site" and "Departed Site," and show what was found and/or done. As a minimum document the following:

(1) Purpose of site visit.

(2) Condition /configuration of site upon arrival.

(3) All actions or maintenance performed at site. Annotate change out of all circuit cards or electronic modules by nomenclature, National Stock Number (if one has been assigned), and/or manufacturer's part number.

(4) Condition/configuration of site at departure.

Initials. Initials of person making each entry.

Date/Signature of Sector Manager/Designee. Enter date of maintenance supervisor's review of log entries followed by maintenance supervisor's signature.

Date/Signature of Maintenance Technician. Enter date of last entry and signature of technician closing out maintenance log.

Chapter 4 Nonaeronautical Equipment, Army Oil Analysis Program (AOAP)

4-1. Objectives

a. The AOAP is a condition monitoring program which is designed to—

(1) Improve equipment reliability and readiness by early detection of potential failures.

(2) Lower support costs by reducing the number of catastrophic failures and curtailing excessive component wear.

(3) Reduce resource usage by conserving petroleum products by adhering to the On Condition Oil Change (OCOC) policy. (See policy in (a) through c below:)

(a) This policy eliminates the wasteful requirement of changing component oil based on hours/miles/calendar days as currently specified by many TMs and LOs. Oil will not be changed unless recommended by the AOAP laboratory. When recommended, both the oil and the oil filter(s) will be changed at the same time.

Note. Oil filter(s) will be serviced/cleaned/changed when they are known to be contaminated, or clogged; service is recommended by AOAP laboratory analysis; or at prescribed hard time intervals as described in LO or TM.

(b) When a unit is deployed and oil analysis service is not readily available, the unit maintenance officer may authorize an oil and filter change when oil contamination is evident. A sample will be submitted to the laboratory as soon as AOAP service becomes available or the unit is redeployed, whichever comes first. The remarks block of the DD Form 2026 (Oil Analysis Request) accompanying this sample to the laboratory will be annotated to reflect the oil and filter change, because it may affect the trend analysis performed by the AOAP laboratory.

(c) The OCOC policy does not change or modify procedures and guidance for new equipment under manufacturer's warranty or seasonal oil change requirements in current TMs and LOs.

b. An effective AOAP is only possible when the AOAP is fully

integrated into the maintenance system. This chapter provides pertinent information and instructions to commanders and equipment users and encourages efficient performance of the AOAP.

c. AOAP is an effective maintenance diagnostic tool and not a maintenance substitute. This chapter will not be interpreted to mean AOAP minimizes, in any way, the need to employ good maintenance practices and strong maintenance discipline.

4-2. Description

a. Oil, hydraulic fluid, and grease analysis is used as a diagnostic tool to determine the physical condition of used lubricants and the internal condition of engines, transmission, hydraulic systems, and other fluid-wetted components.

b. Spectrometric analysis is used to determine the concentrations of various wear metals in oil samples. Wear metals are metal particles of microscopic size, produced by the friction of moving parts within mechanical systems, that enter the oil stream and are dispersed and suspended throughout the lubricating oil system. The kinds of metal particles, and the quantities in which they are present, are detected by spectroscopy. Analysis helps determine which component parts may have generated the particles. By periodically sampling and testing the lubricants from mechanical systems, abnormal wear can be detected, and worn parts can be repaired or replaced before they cause damage.

c. Physical property tests are analytical tests used to detect property changes in used oil. For example, changes in viscosity, fuel dilution, or water content may be indicative of faulty equipment, operating conditions, or maintenance procedures.

d. Ferrographic analysis is used as a supplemental oil analysis test on selected components to monitor wear metals that cannot be detected by spectrometric analysis. Ferrography is used not only to determine the size, shape, and type of wear-metal particles being generated by a piece of equipment, but also to determine the kind of wear (spalling, cutting, and rubbing) producing the wear-metal particles.

e. A resample is a sample specifically requested by the laboratory, of the same oil taken under the same condition as the previous sample.

f. Designated equipment/components are those enrolled in AOAP.

g. Contamination is a problem that most frequently affects sample integrity. Wear-metal, water, unusual color, and particulate matter are indications of contamination.

h. Installation management reports are computer-generated reports provided by the laboratories to installation/unit monitors and others on a monthly or as requested basis.

4-3. AOAP participation

Participation in the AOAP is mandatory. AOAP responsibilities of the commanders of major Army commands, the U.S. Army Reserve, the Army National Guard, and the Program Director (PD) are defined in AR 750-1.

4-4. What to sample

a. Only the equipment/components listed in tables 4-1 through 4-3, and other equipment/components authorized by the PD, AOAP, will be sampled. Exceptions will be through letters of authorization from major command level to laboratories. To be valid, letters must be issued from the major command that owns and supports the laboratory. Copies of any such correspondence will be provided to the PD, AOAP.

b. To request authorization for new enrollment in the AOAP, the following information will be submitted to the PD, AOAP:

(1) Nomenclature and model of the end item.

(2) End item NSN.

(3) Component nomenclature and model.

(4) End Item Code (EIC) assigned to the NSN of the end item.

(5) Hydraulic system capacity.

4-5. When to sample

a. Routine samples are to be submitted at prescribed intervals as

established in paragraphs 4-11 through 4-15. Note that the intervals are not the same for all items of equipment. Samples should be taken as near the prescribed interval as possible. Sampling at the prescribed time is not always possible. In such instances a 10 percent variance before or after the scheduled date, hours, or miles for sampling is permissible.

b. Special samples are those samples other than routinely scheduled. Special samples will be submitted to the laboratory under the following circumstances:

- (1) At the request of the laboratory.
- (2) Immediately before transfer among commands or overseas deployment of equipment. These special samples will be processed by the laboratory prior to the transfer or deployment.
- (3) After maintenance, overhaul, or replacement of a component.
- (4) After indication of a problem, for example, overheating, excessive oil loss, or loss of oil pressure.
- (5) After indication of contamination, that is, cloudy, sludge, M60A1 Tank water, excessively dirty, visible metal particles, etc. AOS

Note. Special samples will be clearly marked "SPECIAL" and banded with red tape or marked in some other conspicuous manner so that the laboratory may easily identify them. The DD Form 2026 that accompanies the samples to the laboratory will be marked SPECIAL in the remarks block and its borders will be outlined in red.

c. When a vehicle is in storage, no sampling is required until the vehicle is scheduled for operational use.

d. Maintenance float equipment will be sampled at 25 hours of operation or quarterly, whichever occurs first.

e. When a vehicle is used for developmental purposes, used as a training aid or static display, authorization to discontinue sampling or to sample at longer intervals may be granted by the applicable major command. When the equipment returns to normal operation sampling intervals established in tables 4-1 through 4-7 will once again apply.

**Table 4-1
Combat vehicles**

End Item Model	Nomenclature	Component(s)
M1	Tank	AGT-1500 X1100-3B
M1A1	Tank	AGT-1500 X1100-3B
M1A2	Tank	AGT-1500 X1100-3B
M11P	Tank	AGT-1500 X1100-3B
M2	Infantry Fighting Vehicle	VTA-903T HMPT-500 HMPT-500-3 HMPT-500-3E HMPT-500-B
M2A1	Infantry Fighting Vehicle	VTA-903T HMPT-500 HMPT-500-3 HMPT-500-3E HMPT-500-B
M2A2	Infantry Fighting Vehicle	VTA-903T HMPT-500 HMPT-500-3 HMPT-500-3E HMPT-500-3TEC
M3	Cavalry Fighting Vehicle	VTA-903T HMPT-500 HMPT-500-3 HMPT-500-3E HMPT-500-B

**Table 4-1
Combat vehicles--Continued**

End Item Model	Nomenclature	Component(s)
M3A1	Cavalry Fighting Vehicle	VTA-903T HMPT-500 HMPT-500-3 HMPT-500-3E HMPT-500-B
M3A2	Cavalry Fighting Vehicle	VTA-903T HMPT-500-3 HMPT-500-3E HMPT-500-3TEC
M60	Tank	AVDS-1790-2DA CD-850-6A CD-850-6A1
M60A1	Tank	AVDS-1790-2DA CD-850-6A CD-850-6A1
M60A1 AOS	Tank	AVDS-1790-2DA CD-850-6A CD-850-6A1
M60A1 RISE	Tank	AVDS-1790-2C AVDS-1790-2CA CD-850-6A CD-850-6A1
M60A1 RISE PASSIVE	Tank	AVDS-1790-2C AVDS-1790-2CA CD-850-6A CD-850-6A1
M88A1	Recovery Vehicle	AVDS-1790-2DR XT-1410-4
M106A1	Self Propelled Carrier	6V53 TX100-1
M106A2	Mortar Carrier	6V53 TX100-1
M109A2	Self Propelled Howitzer	8V71T XTG-411-2A
M109A3	Self Propelled Howitzer	8V71T XTG-411-2A
M109A4	Self Propelled Howitzer	8V71T XTG-411-2A
M109A5	Self Propelled Howitzer	8V71T XTG-411-2A
M109A6	Self Propelled Howitzer	8V71T XTG-411-4
M110A2	Self Propelled Howitzer	8V71T XTG-411-2A
M113A1	Personnel Carrier	6V53 TX100-1
M113A2	Personnel Carrier	6V53 TX100-1
M113A3	Personnel Carrier	6V53 TX200-4
M125A1	Self Propelled Carrier	6V53 TX100-1
M125A2	Mortar Carrier	6V53 TX100-1
M132A1	Flame Thrower	6V53 TX100-1

**Table 4-1
Combat vehicles—Continued**

End Item Model	Nomenclature	Component(s)
M163A1	Vulcan Air Defense	6V53 TX100-1
M163A2	Vulcan Air Defense	6V53 TX100-1
M548	Cargo Carrier	6V53 TX100-1
M548A1	Carrier	6V53 TX100-1
M551 OP-FOR	Armor Reconnaissance Vehicle	6V53T XTG-250-1A
M551A1	Armor Reconnaissance Vehicle	6V53T XTG-250-1A
M577A1	Personnel Carrier, Command Post	6V53 TX100-1
M577A2	Command Post Carrier	6V53 TX100-1
M5781	Recovery Vehicle	8V71T XTG-411-2A
M667	Missile Carrier	6V53 TX100-1
M688A1	Loader Transporter	6V53 TX100-1
M728	Combat Eng Vehicle	AVDS-1790-2DA CD-850-6A CD-850-6A1
M730	Self Propelled Carrier	6V53
M730A1	Carrier, Chaparral	6V53 TX100-1
M730A2	Carrier SP (Rise)	6V53T X200-4
M741	Gun Chassis	6V53 TX100-1
M741A1	Vulcan	6V53 TX100-1
M752	Launcher, Self Propelled	6V53 TX100-1
M901	Combat Vehicle	6V53 TX100-1
M901A1	Tow 2	6V53 TX100-1
M981	FISTV	6V53 TX100-1
M981A1	FISTV	6V53T X200-4
M992	FAASV	8V71T XTG-411-2A
M992A1	FAASV	8V71T XTG-411-4
M993	Carrier, Multiple Launch Rocket System	VTA-903T HMPT-500 HMPT-500-3 HMPT-500-3E HMPT-500-B
M1015	Signal Intelligence/Early Warning Carrier	6V53 TX100-1

**Table 4-1
Combat vehicles—Continued**

End Item Model	Nomenclature	Component(s)
M1015A1	Signal Intelligence/Early Warning Carrier	6V53 TX100-1
M1059	Carrier, Smoke Generator	6V53 TX100-1
XM1050	Howitzer	8V71T XTG-411-2A
M48A5AVLB	Armored Vehicle, Launcher Br	AVDS-1790-2DA CD-850-6A CD-850-6A1
M60A1AVLB	Armored Vehicle, Launcher Br	AVDS-1790-2DA CD-850-6A CD-850-6A1

Notes:
¹ Indicates Hydraulic System

**Table 4-2
Tactical wheeled vehicles**

End Item Model	Nomenclature	Component(s)
M34A2	2 1/2 T Truck, Cargo	LD-465-1 LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M35A1	2 1/2 T Truck, Cargo	LDS-427-2 LD-465-1C LDT-465-1D LDT-465-1C
M35A1C	2 1/2 T Truck, Cargo	LDS-427-2 LD-465-1C LDT-465-1D LDT-465-1C
M35A2	2 1 / 2 T Truck, Cargo	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M35A2C	2 1/2 T Truck, Cargo	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M36A2	2 1/2 T Truck, Cargo	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M44A1	2 1/2 T Truck, Bolster	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M44A2	2 1/2 T Truck, Bolster	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M45A2	2 1/2 T Truck, Bolster	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2

Table 4-2
Tactical wheeled vehicles—Continued

End Item Model	Nomenclature	Component(s)
M46A2	2 1/2 T Truck, Chassis	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M49A1C	2 1/2 T Truck, Fuel, Tank	LDS-427-2 LD-465-1C LDT-465-1D LDT-465-1C
M49A2C	2 1/2 T Truck, Fuel, Tank	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M50A1	2 1/2 T Truck, Water, Tank	LDS-427-2 LD-465-1C LDT-465-1D LDT-465-1C
M50A2	2 1/2 T Truck, Water, Tank	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M50A3	2 1/2 T Truck, Water, Tank	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M51A2	5 T Truck, Dump	LDS-465-1
M52A2	5 T Truck, Tractor	LDS-465-1
M54A2	5 T Truck, Cargo	LDS-465-1
M54A2C	5 T Truck, Cargo	LDS-465-1
M54A2E1	Chaparral, Guided Missile System	DEUTZFL511
M55A2	5 T Truck, Cargo	LDS-465-1
M61A2	5 T Truck, Chassis	LDS-465-1
M62A2	5 T Truck, Wrecker	LD-465-A1 6453
M63A2	5 T Truck, Chassis	LDS-465-1
M109A1	2 1/2 T Truck, Shop Van	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M109A2	2 1/2 T Truck, Shop Van	LDS-427-2 LD-465-1C LDT-465-1D LDT-465-1C
M109A3	2 1/2 T Truck, Shop Van	LDS-427-2 LD-465-1C LDT-465-1D LDT-465-1C
M185A1	2 1/2 T Truck, Instr Repair	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M185A2	2 1/2 T Truck, Instr Repair	LDS-427-2 LD-465-1C LDT-465-1D LDT-465-1C
M185A3	2 1/2 T Truck, Instr Repair	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M246A2	5 T Truck, Wrecker	LDS-465-1

Table 4-2
Tactical wheeled vehicles—Continued

End Item Model	Nomenclature	Component(s)
M275A1	2 1/2 T Truck, Tractor	LDS-427-2 LD-465-1C LDT-465-1D LDT-465-1C
M275A2	2 1/2 T Truck, Tractor	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M291A2	5 T Truck, Exp Van	LDS-465-1
M292A1	2 1/2 T Truck, Exp Van	LDS-427-2 LD-465-1C LDT-465-1D LDT-465-1C
M292A2	2 1/2 T Truck, Exp Van	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M292A4	2 1/2 T Truck, Exp Van	LDS-427-2 LD-465-1C LDT-465-1D LDT-465-1C
M292A5	2 1/2 T Truck, Exp Van	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M328A2	5 T Truck, Stake	LDS-465-1
M342A2	2 1/2 T Truck, Dump	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M543A2	5 T Truck, Wrecker	LDS-465-1
M756A2	2 1/2 T Truck, Maintenance	LD-465-1C LDT-465-1D LDT-465-1C LDS-427-2
M764	2 1/2 T Truck, Maintenance	LD-465-1C
M809	5 T Truck, Chassis	NHC-250
M809A1	5 T Truck, Chassis	NHC-250
M810	5 T Truck, Chassis	NHC-250
M811	5 T Truck, Chassis	NHC-250
M811A1	5 T Truck, Chassis	NHC-250
M811A2	5 T Truck, Chassis	NHC-250
M812	5 T Truck, Chassis	NHC-250
M812A1	5 T Truck, Chassis	NHC-250
M813	5 T Truck, Cargo	NHC-250
M813A1	5 T Truck, Cargo	NHC-250
M814	5 T Truck, Cargo	NHC-250
M815	5 T Truck, Bolster	NHC-250
M816	5 T Truck, Wrecker	NHC-250
M817	5 T Truck, Dump	NHC-250
M818	5 T Truck, Tractor	NHC-250
M819	5 T Truck, Tractor	NHC-250
M820	5 T Truck, Exp Van	NHC-250

Table 4-2
Tactical wheeled vehicles—Continued

End Item Model	Nomenclature	Component(s)
M820A1	5 T Truck, Exp Van	NHC-250
M820A2	5 T Truck, Exp Van	NHC-250
M821	5 T Truck, Stake	NHC-250
M876	Telephone Truck, Maintenance	1HD-190 MT650
M911	22 1/2 T Truck, Tractor (HET)	DD8V92T DD8V92TA CLBT750
M915	Truck, Tractor (HET)	Cummins NTC-400 Cat D-7155
M915A1	10 T Truck, Cargo	Cummins NTC-400 DAA-HT750CRD
M915A2	10 T Truck, Cargo	DD 12.7L DD HT740
M916	Truck, Tractor (HET)	Cummins NTC-400 Cat D-7155
M916A1	Truck, Tractor (HET)	DD 12.7L DD HT740
M917	20 T Truck, Dump	Cummins NTC-400 Cat D-7155
M918	Bitum Dist	Cummins NTC-400 Cat D-7155
M919	Truck, Concrete	Cummins NTC-400 Cat D-7155
M920	Truck, Tractor (HET)	Cummins NTC-400 Cat D-7155
M923	5 T Truck, Cargo	Cummins NHC-250 MT654
M923A1	5 T Truck, Cargo	Cummins NHC-250 MT654
M923A2	5 T Truck, Cargo	6CTA-8.3 MT654
M924	5 T Truck, Cargo	Cummins NHC-250 MT654
M924A1	5 T Truck, Cargo	Cummins NHC-250 MT654
M925	5 T Truck, Cargo	Cummins NHC-250 MT654
M925A1	5 T Truck, Cargo	Cummins NHC-250 MT654
M925A2	5 T Truck, Cargo	6CTA-8.3 MY654
M926	5 T Truck, Cargo	Cummins NHC-250 MT654

Table 4-2
Tactical wheeled vehicles—Continued

End Item Model	Nomenclature	Component(s)
M926A1	5 T Truck, Cargo	Cummins NHC-250 MT654
M927	5 T Truck, Cargo	Cummins NHC-250 MT654
M927A1	5 T Truck, Cargo	Cummins NHC-250 MT654
M927A2	5 T Truck, Cargo	6CTA-8.3 MT654
M928	5 T Truck, Cargo (VLNB)	Cummins NHC-250 MT654
M928A1	5 T Truck, Cargo (VLNB)	Cummins NHC-250 MT654
M928A2	5 T Truck, Cargo	6CTA-8.3 MT654
M929	5 T Truck, Dump	Cummins NHC-250 MT654
M929A1	5 T Truck, Dump	Cummins NHC-250 MT654
M929A2	5 T Truck, Dump	6CTA-8.3 MT654
M930	5 T Truck, Dump	Cummins NHC-250 MT654
M930A1	5 T Truck, Dump	Cummins NHC-250 MT654
M930A2	5 T Truck, Dump	6CTA-8.3 MT654
M931	5 T Truck, Tractor	Cummins NHC-250 MT654
M931A1	5 T Truck, Tractor	Cummins NHC-250 MT654
M931A2	5 T Truck, Tractor	6CTA-8.3 MT654
M932	5 T Truck, Tractor	Cummins NHC-250 MT654
M932A1	5 T Truck, Tractor	Cummins NHC-250 MT654
M932A2	5 T Truck, Tractor	6CTA-8.3 MT654
M934	5 T Truck, Van Exp	Cummins NHC-250 MT654
M934A1	5 T Truck, Van Exp	Cummins NHC-250 MT654

**Table 4-2
Tactical wheeled vehicles—Continued**

End Item Model	Nomenclature	Component(s)
M934A2	5 T Truck, Van Exp	6CTA-8.3 MT654
M935	5 T Truck, Van Exp	Cummins NHC-250 MT654
M935A1	5 T Truck, Van Exp	Cummins NHC-250 MT654
M935A2	5 T Truck, Van Exp	6CTA-8.3 MT654
M936	5 T Truck, Wrecker	Cummins NHC-250 MT654
M936A1	5 T Truck, Wrecker	Cummins NHC-250 MT654
M936A2	5 T Truck, Wrecker	6CTA-8.3 MT654
M939	5 T Truck, Chassis	Cummins NHC-250 MT654
M940	5 T Truck, Chassis	Cummins NHC-250 MT654
M941	5 T Truck, Chassis	Cummins NHC-250 MT654
M942	5 T Truck, Chassis	Cummins NHC-250 MT654
M943	5 T Truck, Chassis	Cummins NHC-250 MT654
M944	5 T Truck, Chassis	Cummins NHC-250 MT654
M945	5 T Truck, Chassis	Cummins NHC-250 MT654
M973	SUSV	OM617,952 603.950 W4A-018
M973A1	Carrier, Cargo	603.950 W4A040
M977	10 T Truck, Cargo	DD8V92TA DDA-HT740D
M978	10 T Truck, Tanker	DD8V92TA DDA-HT740D
M983	10 T Truck, Tractor	DD8V92TA DDA-HT740D
M984	10 T Truck, Wrecker	DD8V92TA DDA-HT740D
M984A1	10 T Truck, Wrecker	DD8V92TA DDA-HT740D
M985	10 T Truck, Cargo	DD8V92TA DDA-HT740D

**Table 4-2
Tactical wheeled vehicles—Continued**

End Item Model	Nomenclature	Component(s)
M985E1	10 T Truck, Cargo	DD8V92TA DDA-HT740D
M1013	10 T Truck, Tractor (MAN)	D-2840 ZF4S-150-GP
M1014	10 T Truck, Tractor (MAN)	D-2840 ZF4S-150-GP
M1065	Carrier, Command Post	603.950 W4A040
M1066	Carrier, Ambulance	603.950 W4A040
M1067	Carrier, Cargo	603.950 W4A040
M1078	2 1/2 T Truck, Cargo	Cat 3116 Allison MD-D7
M1079	2 1/2 T Truck, Van	Cat 3116 Allison MD-D7
M1081	2 1/2 T Truck, Cargo LAPES	Cat 3116 Allison MD-D7
M1083	5 T Truck, Cargo	Cat 3116 Allison MD-D7
M1084	5 T Truck, Cargo W/MHE	Cat 3116 Allison MD-D7
M1085	5 T Truck, Cargo LWB	Cat 3116 Allison MD-D7
M1086	5 T Truck, Cargo LWB W/MHE	Cat 3116 Allison MD-D7
M1088	5 T Truck, Tractor	Cat 3116 Allison MD-D7
M1089	5 T Truck, Wrecker	Cat 3116 Allison MD-D7
M1090	5 T Truck, Dump	Cat 3116 Allison MD-D7
M1093	5 T Truck, Cargo LAPES	Cat 3116 Allison MD-D7
M1094	5 T Truck, Cargo LAPES	Cat 3116 Allison MD-D7
530B	Truck, Fire	LDS-465-1
530BAM	Truck, Fire	LDS-465-1
FT750	Truck, Firefighting, Pumper	LDT-465-1
2500L	Truck, Fire	DD6V92 HT750DRD

Notes:
* Indicates Hydraulic System.

**Table 4-3
Locomotives**

End Item Model	Components
Loco 10T	DD-3080
Loco 25T	Cummins HBI-600
Loco 44T	Cat D-17,000
Loco 45T	Cummins HBI-600
Loco 60T	Cat D-397
Loco 60T	Cat3508
Loco 80T	Cummins NHBIS-600

**Table 4-3
Locomotives—Continued**

End Item Model	Components
Loco 80T	Cummins HHBIS-600
Loco 80T	Cummins LI-600
Loco 80T	Cummins NTA-855-L4
Loco 100T	EMD 8-567B
Loco 100T	American 539
Loco 115T	American 539-S
Loco 120T	American 224F
Loco 120T	Baldwin 606A
Loco 120T	Fairbanks Morse 38D-81/8
Loco 120T	Fairbanks Morse H12-44
Loco 120T	EMD 16-567B
Rail Crane 25 T	D 13,000
Rail Crane 40 T	DD-671

**Table 4-4
Watercraft**

End Item Model	Nomenclature	Component(s)
BP	Boat Picket	4002
BP	Boat Picket	4003
BD	100T Crane, Barge, Design 264B	6EN-668 GAB4 DSM-6 31A6 5EN668
BDL	Lighter, Beach Discharge, Mark 1	5002
FMS	Repair Shop, Floating, Marine Equipment	7011
FS	Vessel, Freight Supply	381
FS	Vessel, Freight Supply and Sutton	7013
HSPB	High Speed Patrol Boat	400-Merlin
LACV	30T Lighter, Amphib Air Cushion	PWST6T-76 Comb Gearbox Xmsn APU
LARC-LX	60T Lighter, Amphib	6080RA 6081RC
LARC-XV	15T Lighter, Amphib	300
LCM-8	Landing Craft, Mech	671LB63A 671LD63A 671RB63A 671RD63A
LCU	Landing Craft, Utility	W-RC1062-7000 671
LCU	Landing Craft, Utility, Class 1466A	1062-7000 1062-3000 1033-7005 1043-5000
LCU-1646	Landing Craft, Utility	GM 1043-7000 GM 7122-7000 GM 1033-7005 MG-514
LCU2000	Landing Craft, Utility	KTA 50 M NTA-855 (Gen) 4BT3.9(Gen) NT855-M (Bow Thruster) WAV850PT WAV850SB

**Table 4-4
Watercraft—Continued**

End Item Model	Nomenclature	Component(s)
LSV	Logistic Support Vessel	EMD 16-645E6 3406-B (Gen) 3304-B (Gen) 3306-B (Bow Thruster) MG-509
LT	Tug 1200 Horsepower	LS6-DRT HS400-3
LT	Large Tug	EMD 12-645F7B Cat 3408DI-TA-JW Cat 3304 NA Cat 3306 TA
LVTC-7	Landing Craft	DD8V53T HS400-3
LVTC-7A1	Landing Craft	VT400 HS400-3
LVTP-7	Landing Craft	DD8V53T HS400-3
LVTP-7A1	Landing Craft	VT400 HS400-3
LVTR-7	Landing Craft	DD8V53T HS400-3
LVTR-7A1	Landing Craft	VT400-3 V903 HS400-3
ST	Tug 200 Horsepower	320 6DCMR 1879
ST	Tug 600 Horsepower	3004
T-449	Boat, Passenger and Cargo	Cat D 375
Main Engines on Watercraft		
Atlas Imperial 45M5X8		Detroit Diesel 6-71
Buda 6 DCSM-R-1879		Detroit Diesel 12V-711
Caterpillar D353		Fairbanks Morse 37-F-16
Caterpillar D375		Fairbanks Morse 38D-8-Y8
Cooper Bessemer FVA-8-MGT		GM 6 through 12-278A
Cooper Bessemer LS6DRT		Norberg 32112
Cummins V8-300		Pratt & Whitney ST6T-76
Auxiliary Engines on Watercraft		
Caterpillar D311, D318, D364, and D375		
Cleveland Diesel (all models)		
Detroit Diesel (all models)		
General Motors (all models)		
Joshua Hendy D-56-E		

**Table 4-4
Watercraft—Continued**

End Item Model	Nomenclature	Component(s)
Norberg 4SF2 and 4F53		
Waukesha (all models)		
Bridging Equipment		
Boat Bridge Erection, HPI-27A		DD-353
Boat Bridge Erection, HPI-27B	DD-353 Sabre 212 10-18-000-017	
Boat Bridge Erection, HPI-27C		DD-353
Boat Bridge Erection, HICE-27D		DD-353
Boat Bridge Erection, USCSBMK1	Sabre 212 10-18-002	
Boat Bridge Erection, USCSBMK2	Sabre 212	
Bridge, Mobile Assault		DD8V71 HT-70

**Table 4-5
Material handling equipment**

End Item Model	Nomenclature	Component(s)
50K ¹	RTCH	Cat 3408T, 3P9094 Cat 5R3855(11083)
H40XL-MIL ¹ MHE 265	Fork Lift 4,000 LB	Isuzu C240 360311
H60XL-MIL ¹ (MHE 266)	Fork Lift 6,000 LB	Isuzu C240 360311
MLT-6 ¹ (MHE200)	RTFL 6,000 LB	DD-453N Allison 3331-1
MLT-6CH ¹ (MHE202)	FL 6,000 LB	DD-453N Allison 3331-1
ARTFT-6 ¹ (MHE222)	FL 6,000 LB	DD-453N Allison 3331-1
RTL-10 ¹ (MHE199)	RTFL 10,000 LB	DD6V53 Allison CRT 3531-1
RTL-10-1 ¹ (MHE21 5)	RTFL 10,000 LB	DD6V53 Allison CRT 3531-1
MLT-6-2 ¹ (MHE230)	RTFL 6,000 LB	DD-453N Allison 3331-1
M10A ¹ (MHE236)	RTFL 10,000 LB	IHC DT-466B IHC S-700
M4K ¹ (MHE237)	RTFL 4,000 LB	Case 207D Clark 11.2 HR 18340
HC-238A ¹ (MHE248)	140T Crane	Upper DD6-71N Lower DD6V-92TC
6250TC1 ¹ (MHE247)	250 T CRANE	KT-1150-C450 KT-450 Allison CLBT 5960

**Table 4-5
Material handling equipment—Continued**

End Item Model	Nomenclature	Component(s)
9125TC ¹	140 T CRANE	Upper V-903-C-265 Lower NTF-365 Twin DISC CO-11500
6000M ¹	RTFL	6BT 5.9 FUNK 1723
RT875CC ¹	RTCC	6CTA-8.3 CLARK C273.5

Notes:
¹ Indicates Hydraulic System.

**Table 4-6
Construction equipment**

End Item Model	Nomenclature	Component(s)
1125	60 T Crane	Cummins NTC-380-1
120ROPS	Grader	Cat D-333 3R9859
130G	Grader, Road	Cat 3304 DIT 5R6192
130GNS	Grader, Road	Cat 3304 5R6192
130GNSCE	Loader	Cat 3304 DIT 5R6192
130GS	Grader, Road	Cat 3304 5R6192
130GSCE	Grader, Road	Cat 3304 5R6192
175B	Loader, Scoop	DD8V71N NT-855-C Clark 4000 Powershift
22BM	12 1/2 T Crane, Mtd	Cummins JN-6-1
270-9	Earth Auger	DD 353
2380	20 T Crane	Cummins V8-265-B1 Cummins JN6 CL 8402-2
2385	20 T Crane	Cummins V8-265-B1 Cummins JN6 13205E3554
290M	Tractor, Wheeled	NT380 Clark 8420-1
440HA	Grader, Road	DD4057C
4D	Grader, Road	DD4-025
4DW	Grader, Road	DD4-025
580D	Grader, RT, Wheeled	Case 207D
5060	40 T Crane, Crawler	DD 4-71-T DD 23010052
5157B	Crusher, Jaw	CM Corp SD-802
5230B	Crusher, Jaw	CM Corp SD-802 Cummins N855, P235
613BSNS	Scraper, Self Propelled	Cat 3208 613B/8S3543
613BSNS1	Scraper	Cat 3208 613B/8S3543

**Table 4-6
Construction equipment—Continued**

End Item Model	Nomenclature	Component(s)
613BSS	Scraper, Self Propelled	Cat 3208 613B/8S3543
613BSS1	Scraper	Cat 3208 613B/8S3543
613BWDNS	Water Distributor, Self Propelled	Cat 3208 613B/8S3543
613BWDS	Water Distributor, Self Propelled	Cat 3208 613B/8S3543
621B	Scraper, Self Propelled	3406 621B/7G2780
624VL	Ditcher	DD6V71N CLT-44-60
645M	Loader, Scoop	Allis-Chalmers 3500 Allison TT 2420-1
75TPH Eagle	Crusher	N855,P235
830MB	Tractor, Whld	Cat D343T 5S4350
855BG	40 T Crane, Shovel	Cat D333TA
855BG2	40 T Crane, Shovel	Cat D333TA
855BG3	40 T Crane, Shovel	Cat D333TA
950BNS	Loader, Scoop	Cat 3304 7G4851
950BNSCE	Loader	Cat 3304 7G4851
950BS	Loader, Scoop	Cat 3304 7G4851
950BSCE	Loader	Cat 3304 7G4851
B2-1171	Mixer, Rotary Tiller	FWD Corp JN130B HMD 23121 Funk
BFS-400	Paving Machine	DD 353
C350B	Roller, Tandem	DD 353
C350B-D	Roller	DD 353
C530A	Roller, Pneu	DD 353 393303
Cat 12	Grader, Road	Cat D-333
Cat 120	Grader, Road	Cat D-333 3R9859
Cat D5	Tractor, Full Tracked	Cat 3306 3S7094
Cat D5A	Tractor, Full Tracked	Cat 3306 3S7094
Cat D5B	Tractor, Full Tracked	Cat 3306 3T3394
Cat D7E	Tractor, Full Tracked	Cat D-333 3R2211 Cat 4 Cyl 811 CID
Cat D7F	Tractor, Full Tracked	Cat 6 Cyl 638 Cl 5R82
Cat D7G	Tractor, Full Tracked	Cat 3306 9P5382
D5BNS	Tractor, Full Tracked	Cat 3306 D5/3T3394

**Table 4-6
Construction equipment—Continued**

End Item Model	Nomenclature	Component(s)
D5BS	Tractor, Full Tracked	Cat 3306 D5/3T3394
D5BS1	Tractor, Full Tracked	Cat 3306 3T3394
D-60	Distributor, Bitum	NHC-250
D8K	Tractor, Full Tracked	Cat D342 3N1869
F1500M	Grader, Road	DD6V53 Clark 28420-6 Powershift
F1500MW	Grader, Road	DD6V53 Clark 28420-6 Powershift
F5070	20T Dump Truck	NTC-290 6881293 HT750CRD
H100C RB	Loader, Scoop	1HDT-817C P-2004 Powershift
H100C GPB	Loader	1HDT-817C P-2004 Powershift
H446	Crane	DD-353 1200-1865
H446A	5T Crane, Whld, Mtd	DD6V53N 8FLW1307
H-90CM	Loader, Scoop	Cummins JT-6-BI BDB-213C2 Powershift
HD16M	Tractor, Full	Allis 844 CID 642601
HMMH	Tractor, Wheeled	OM 352 BENZ
JD-410	Tractor, Backhoe	JD 4-2-19DT-03 DP23981
JD-550	Tractor, Full Tracked	4276TT01 JD550/AT49678
K300	Compactor, High Sp	Cat 3208 Clark 28000
LRT-110	Crane	4B 3.9 FUNK 1724
M320RT	20T Crane Carrier	Cummins V903 282472 (12-603) DD 453
M878A1	Tractor, Yard	DD 6V53T MT 653 DDA-ALS
M9	Armored Combat Earthmover	Cummins V903 Clark Powershift 288835
MT250	25T Crane	DD6V53N
MW24	Loader, Scoop	Case 504BD ALS TT2421-1
MW24B	Loader, Scoop	Case A504BDT Allison TT2421-1
MW24C	Loader, Scoop	Case A504BDT Allison TT2421-1
MW24ROPS	Loader, Scoop	Case 504BD Allison TT2421-1

Table 4-6
Construction equipment—Continued

End Item Model	Nomenclature	Component(s)
RS28	Roller, Vib	DD 4-53
RT41AA	Scamp, Crane SP	White D3400X289 Clark 12.6HR183278
SEE<fnref ftnote='tbl4-6-fn2'>	Tractor, Wheeled	OM 352 BENZ
SP-848	Roller, Vib	DD 353
SM54A	Roller, Towed	DEUTZ F2L511
TL-645	Loader Scoop	AC-3500 Allison TT 2420-1
T0730H-KEG	Mixer	Cummins 6BT-5-9
TMS 300-5	25T Crane	DD 671

Notes:

¹ Indicates Hydraulic System.

² Denotes multiple hydraulic systems to be sampled. Designate appropriate hydraulic on DD 2026; i.e., left or right.

Table 4-7
Support equipment—Generators

End Item Model	Nomenclature	Component(s)
MEP-004A	15/60 HZ Gen Set	D198ERX51
MEP-113A	15/400 HZ Gen Set	D198ERX51
MEP-103A	15/60 HZ Gen Set	D198ERX51
MEP-005A	30/60 HZ Gen Set	D298ERX37
MEP-104A	30/60 HZ Gen Set	D298ERX37
MEP-114A	30/400 HZ Gen Set	D398ERX37
MEP-006A	60/60 HZ Gen Set	AC 3500
MEP-105A	60/60 Gen Set	AC 3500
MEP-115A	60/400 HZ Gen Set	AC 3500
GTGE 709-2	60/400 HZ Gen Set	GTP 70-52
MEP-404B	60/400 HZ Gen Set	T62T32A
MEP-007A	100/60 HZ Gen Set	D 333C(T)
MEP-106A	100/60 HZ Gen Set	D 333C(T)
MEP-007B	100/60 HZ Gen Set	76-4106-CAT
MEP-116A	100/400 HZ Gen Set	D 333C(T)
B413	150/400 HZ Gen Set	RTG3600C-S1
D424A	150/400 HZ Gen Set	DDA 04043B02
MEP-009A	200/60 HZ Gen Set	Cat D 343T/A
MEP-108A	200/60 HZ Gen Set	Cat D 343T/A
MEP-009B	200/60 HZ Gen Set	Cat D 343T/A
MEP-029A	500/60 HZ Gen Set	VTA1 1710G VTA28G1
EMD 12-567	700/750 KW Gen Set	16-567-C
600-TV-75	750 KW Gas Turbine 50/60 HZ	T-1010S-39
MEP-208A	750 KQ 50/60 HZ Gen Set	KTA 2300G
MEP-362A	10 KW/28VDC	TT10-1
MP36A-60HZ	1250/50 HZ Power Plant	16-567-E4
SM500-6800-3	1500/60 HZ Power Plant	D 398A 3EA
SM500-6800-4	2000/60 HZ Power Plant	Cat D398A
MP36A	4500/60 HZ Power Plant	Cat D398A
1500M	Gen Set	DD-6V53
Support Equipment—Power Units		
Power Units	Generators	Component
PU-405A/M ...	MEP-004A	D198ERX51
PU-406B/M ...	MEP-005A	D298ERX37
PU-495A/G ...	MEP-007A	D 333C (T)
PU-495B/G ...	MEP-007B	76-4106-CAT
PU-650B/G ...	MEP-006A	AC 3500
PU-699A/M ...	MEP-006A	AC 3500
PU-700A/M ...	MEP-006A	AC 3500
PU-707A/M ...	MEP-115A	AC 3500
PU-732M	MEP-113A	D198ERX51
PU-760M	MEP-114A	D398ERX37
AN/MJQ-10A ..	MEP-114A	D398ERX37
AN/MJQ-11A ..	MEP-009A	CAT D 343T/A

Table 4-7
Support equipment—Generators—Continued

End Item Model	Nomenclature	Component(s)
AN/MJQ-12A ..	MEP-006A	AC 3500
AM/MJQ-14A	MEP-006A	AC 3500
AN/MJQ-15 ...	MEP-113A	D198ERX51
AN/MJQ-21 ...	MEP-4048	T62T32A
AN/MJQ-24 ...	D424A	DDA 0403B02

Support Equipment—Power Units (Utility)

Power Unit	Component
PPU 85-4	GTCP85-127 Airesearch
LPC 71W	GTCP85-127 Airesearch
PPU 85-5	GTCP85-127 Airesearch
LPU-71	GTCP85-127 Airesearch
APP-1	GTCP85-127 Airesearch
JHTWX 10/96	GTCP85-127 Airesearch
35KVA	GPT30-150E

Support Equipment—Air Compressors

End Item Model	Component
250 DCMS1	JD-403
250 PRV	DD-453
750 DPQ	DD-6V71N
RMS-250	DD-6V53N
P250-WDMH268	DEUTZ

Support Equipment—Pumps

800 GPM	Cummins NNTA-855-P450
US90 CCD-1	DD 353
US612 ACD-1	DEUTZ AG F6L 91213

Support Equipment—Well Drillers

LP-12	Navistar Int'l DT1-466C
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Support Equipment—Training Aid

AMCT ¹	Armor Moving Target Car- rier	Hydraulic Systems
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Notes:

¹ Indicates Hydraulic System.

4-6. Supplies

The unit will maintain an adequate level of sampling supplies. Supplies required for sampling operations are listed in Table 4-8. Quantities are determined by number and types of equipment enrolled in the AOAP and the frequency at which they are sampled.

Table 4-8
Supplies required for oil sampling operations

Item	NSN	Unit of issue
Tubing, Nonmetallic (1/4' OD)	4720-00-964-1433	Roll (1,000 ft.)
Pump, Oil Sampling	4930-01-119-4030	Each (1)
Bottle, Oil Sampling	8125-01-082-9697	Box (120 ea.)
Bag, Plastic	8105-00-837-7754	Box (1,000 ea.)
Sack, Shipping	8105-00-290-0340	Box (250 ea.)
Replacement O-Rings for the Oil Sampling Pump are:		
Old-Style Pump (with stand)		
O-Ring	5330-00-579-8156	Each (1)
O-Ring	5330-01-231-5216	Each (1)
New-Style Pump (no stand)		
O-Ring	5330-00-579-8156	Each (1)
O-Ring	5330-01-133-5858	Each (1)
O-Ring	5330-01-226-8750	Each (1)
O-Ring	5330-01-231-5216	Each (1)

4-7. How to sample

a. Samples may be taken without warming a component to operating temperature if the equipment has been operated within the last 30 days. If the equipment has not been operated within the last 30 days, it must be brought to operating temperature before sampling. This applies to both routine and special samples. There will be occasions when the laboratories may request that a component be

operated before sampling. This request will be complied with.

Note. Although the above procedure authorizes taking cold samples, all samples taken on components with turbine engines must be taken at normal operating temperature. It is recognized that there are times when the ambient temperature is so low that one cannot take a cold sample readily. Equipment may need to be operated to warm the oil enough to extract the sample easily; but it need not be brought to operating temperature. Equipment coming out of storage must always be brought to operating temperature prior to oil sampling.

b. Samples taken from an oil reservoir immediately after addition of new oil will not be representative, and will not become representative until complete mixing of the old and new oil has taken place. This requires operation until normal operating temperature has been obtained.

c. To take an oil sample using the valve method, simply open the valve and flush a small amount of oil from the line into an approved container to clear the valve. Fill the sample bottle to approximately 1/2-inch from top. Then close the valve.

d. The oil sampling pump method is used to take samples through the oil filler neck or through the dipstick hole. The procedure is as follows:

(1) Determine how far the tubing has to be inserted into the reservoir by using the dipstick as a gauge. Cut tubing to a length approximately 10 inches longer than the dipstick.

(2) Attach tubing to sampling pump by inserting tubing through "T" handle opening. Allow tubing to extend approximately 1/4-inch below pump head threads, and tighten "T" handle.

(3) Attach bottle to sampling pump.

(4) Carefully insert tubing into reservoir. Do not allow the tubing to touch the bottom or sides of the reservoir, since any sludge entering the tubing will contaminate the sample.

(5) Hold sampling pump horizontally and pump until oil starts entering the bottle. Fill the bottle to approximately 1/2-inch from top. Depress vacuum relief valve (on top of pump) to stop flow.

(6) Remove bottle from pump, replace and tighten bottle cap.

(7) Withdraw tubing from reservoir. Loosen "T" handle and remove tubing from pump. Discard tubing.

(8) Replace reservoir cover.

e. Once you have drawn a sample, fill in your equipment bumper number, component serial number, and hours and miles on the sample bottle label to identify sample and use to complete DD Form 2026.

4-8. Preparing the sample for the laboratory

a. Complete a DD Form 2026 (fig 4-1) for each oil sample being submitted to the laboratory. The automated version of DD Form 2026 (DA Form 5991-E, Oil Analysis Request (Automated)) (fig 12-8) will be used if your unit is equipped with the Unit Level Logistics System (ULLS).

b. When samples are to be mailed, and the number is four or less, use the shipping sack. Insert the sample bottle(s) into the plastic bag and seal. Place the completed DD Form 2026 into the shipping sack along with the plastic bag(s). Send it by first-class mail to your supporting laboratory. Do not use bulk mail or parcel post. When the number of samples is five or more, use the boxes that the empty bottles came in. Place the DD Form 2026 in a plastic bag and lay it on top of the bottles.

c. When delivering the sample directly to the laboratory by courier, fold the completed DD Form 2026 in half (length-wise), wrap it around the sample bottle and secure it with a rubber band. Dispatch by courier to the laboratory.

d. When the DD Form 2026 is received from the laboratory, either annotate all appropriate information on the DA Form 2408-20 (Oil Analysis Log) or maintain until receipt of automated print-out(s). The DD Form 2026 will be discarded unless directed otherwise by local SOP.

4-9. Feedback data

a. Laboratory recommendations will be annotated on DA Form 3254-R (Oil Analysis Recommendation and Feedback) (fig 4-2) for

components when the sample analysis indicates a problem. The form will be used only when a maintenance action is recommended and not to request resamples or recommend oil changes. The DA Form 3254-R will be forwarded to the using unit.

b. After personnel in the using unit have performed the laboratory-recommended inspection or maintenance action, they will complete the lower portion of DA Form 3254-R. Block 14 will be used to explain any diagnostics performed, discrepancies found, and actions taken to return the component to a serviceable condition. Also include in this block the QDR/EIR number and work order number. The DA Form 3254-R will be returned to the laboratory within 5 working days after maintenance is accomplished.

c. If a component is evacuated for repair, a copy of the DA Form 3254-R will accompany it along with other appropriate paperwork. The support maintenance or overhaul facility will record the maintenance accomplished on the DA Form 3254-R, and return it to the originating laboratory within 5 working days after maintenance is accomplished.

4-10. Special instructions

a. Store unused sampling supplies in a clean, closed container.

b. Avoid contamination of cut tubing and the inside of bottle caps.

c. Use new tubing to fill each sample bottle.

d. The relief valve on the oil sampling pump must be depressed at the proper time to prevent the used oil from entering the vacuum chamber of the pump. If this happens, clean thoroughly with dry-cleaning solvent and allow to air dry before reuse.

e. For new equipment under manufacturer's warranty, manufacturer's hard-time oil service intervals will be followed. However, if the laboratory recommends an oil change, the recommendation will be followed. The unit will also change oil at the appropriate hardtime interval in order to keep the warranty valid. After the warranty period expires, normal AOAP oil change procedures will apply. If the laboratory recommends that a warranty component be removed or maintenance performed, the AOAP monitor will contact the supporting warranty control office and provide details of laboratory recommendations relative to the item under warranty.

f. For the purpose of determining usage data on equipment (traveling at low speed) with no hour-meter, the following formula may be used as a guide in converting miles or kilometers to hours: 10 miles or 16 kilometers is equal to 1 hour of operation. When operating on open highway, single or convoy, and the speed exceeds 35 MPH, use actual travel time (clock time).

g. Anytime a unit relocates, either permanently or through temporary deployment, the following is necessary:

(1) The unit will notify the home base (servicing) laboratory concerning transfer/deployment schedules in advance of departure. Advance notice is required in order to provide the laboratory sufficient time for orderly processing of records for transfer to the supporting laboratory.

(2) The losing laboratory will forward equipment AOAP records directly to the gaining laboratory unless directed otherwise.

h. Transient units are responsible for obtaining complete oil analysis records for their equipment from the losing laboratory and for delivery of the records to the gaining laboratory at the new operating site. If sufficient time is not available to comply with these procedures before departure, the unit will notify the losing laboratory concerning the relocation, and the losing laboratory will mail all required oil analysis records to the gaining laboratory.

4-11. Combat vehicles

Refer to table 4-1 for enrolled equipment.

a. For the purpose of taking routine samples from the engines and transmissions, 25 hours of operation or 60 days, whichever occurs first, will be used as the prescribed interval for active Army units. Reserve and National Guard activities will use 25 hours or 180 days as the prescribed interval.

Note. The sampling interval for transmissions on the M1, M1A1, and M1IP

is 75 hours or 90 days for Active Army and 75 hours or 180 days for Reserve and National Guard activities.

b. Reserve and National Guard equipment in frequent use during active training periods will adhere to the schedule for active Army units.

c. Reserve and National Guard equipment not operated for 180 days or more will be considered in a temporary inactive status. This equipment will not be sampled until removed for use. At that time, a sample will be taken and then normal sampling intervals will apply. A sample will also be taken before equipment is put back in an inactive status.

d. All designated hydraulic fluid systems, as denoted by a footnote designator of ¹ (see table 4-1) after the end item model, will be sampled once a year.

Note. The recoil mechanism/gun mount on combat equipment is NOT to be sampled.

4-12. Tactical wheeled vehicles

Refer to table 4-2 for enrolled equipment.

a. For the purpose of taking routine samples from the engines and transmissions, 100 hours of operation or 90 days, whichever occurs first, will be used as the prescribed interval for active Army units. Reserve and National Guard activities will use 100 hours or 180 days as the prescribed interval.

b. Reserve and National Guard equipment in frequent use during active training periods will adhere to the schedule for active Army units.

c. Reserve and National Guard equipment not operated for 180 days or more will be considered in a temporary inactive status. This equipment will not be sampled until removed for use. At that time, a sample will be taken and then normal AOAP sampling intervals will apply. A sample will also be taken before equipment is put back in an inactive status.

d. All designated hydraulic fluid systems, as denoted by a footnote designator of ¹ (see table 4-2) after the end item model, will be sampled once a year.

e. When a tactical vehicle is scheduled for a mission that would cause it to exceed the 100 hours or 1,000 mile interval, the following applies:

(1) Oil sampling will be done before departure and on arrival at the destination, if possible. The procedure will be repeated when returning to home base.

(2) While at the deployment site, the regular sampling interval established for the end-item component will apply. Samples will be sent to the laboratory servicing the deployment site.

4-13. Diesel-electric (D-E) locomotives

Refer to table 4-3 for enrolled equipment. For the purpose of taking

routine samples from the engines aboard the locomotives, 25 hours of operation or every 90 days, whichever occurs first, will be used as the prescribed interval for active Army, Reserve, and National Guard activities. Locomotives in daily use may extend sampling intervals to 100 hours or 90 days.

4-14. Watercraft

Refer to table 4-4 for enrolled equipment.

a. For the purpose of taking routine samples from the engines and transmissions, 100 hours of operation or every 90 days, whichever occurs first, will be used as the prescribed interval for active Army units. Reserve and National Guard activities will use 50 hours or 180 days as the prescribed interval.

b. Reserve and National Guard equipment in daily use during active training periods will use the sample interval for active Army units.

c. Reserve and National Guard equipment not operated for 180 or more days will be considered in a temporary inactive status. This equipment will not be sampled until removed for use. At that time, a sample will be taken and then normal AOAP sampling intervals will apply. A sample will also be taken before equipment is put back in an inactive status.

4-15. Material handling/construction/support equipment

Refer to tables 4-5, 4-6, and 4-7 for enrolled equipment.

a. For the purpose of taking routine samples from the engines and transmissions, 50 hours of operation or 90 days, whichever occurs first, will be used as the prescribed interval for active Army units. Reserve and National Guard activities will use 50 hours or 180 days as the prescribed interval.

b. Reserve and National Guard equipment in frequent use during active training periods will adhere to the schedule for active Army units.

c. Reserve and National Guard equipment not operated for 180 or more days will be considered in a temporary inactive status. This equipment will not be sampled until removed for use. At that time, a sample will be taken and then normal sampling intervals will apply. A sample will also be taken before equipment is put back in an inactive status.

Note. Table 4-5 identifies material handling equipment. Table 4-6 identifies construction equipment. Table 4-7 identifies support equipment.

d. All designated hydraulic fluid systems, as denoted by a footnote designator of ¹ (see tables 4-5 and 4-6) after the end item model will be sampled once a year. The hydraulic fluid system on the AMCT (table 4-7) will be sampled every 500 hours or 90 days.

OIL ANALYSIS REQUEST			KEYPUNCH CODE
TO	OIL ANALYSIS LAB FT. HOOD		1-3
FROM	MAJOR COMMAND FORS COM		4
	OPERATING ACTIVITY (Include ZIP Code, APU, DODAAD) HQ CO 166 ARMOR, 2 AD (WAP 570) FT. HOOD, TX 76544 685-3988		5-10
EQUIPMENT MODEL/APL ENGINE AVDS 1790-2D			11-14
EQUIPMENT SER. NO. A0606			15-20
END ITEM MODEL/HULL NO. TANK M60A1			
END ITEM SER. NO./EIC 6486			
DATE SAMPLE TAKEN (Day, Mo, Yr) 15 MAR 90		LOCAL TIME SAMPLE TAKEN	21-24
HOURS/MILES SINCE OVERHAUL 346			25-29
HOURS/MILES SINCE OIL CHANGE 67			30-33
REASON FOR SAMPLE LAB REQUEST <input checked="" type="checkbox"/> TEST CELL <input type="checkbox"/> OTHER (Specify)			34
OIL ADDED SINCE LAST SAMPLE (Pt, Qt, Gal) 1 GAL			35-38
ACTION TAKEN			
DISCREPANT ITEM			
HOW MALFUNCTIONED			
HOW FOUND <input type="checkbox"/> LAB REQUEST <input type="checkbox"/> AIR OR GROUND CREW			
HOW TAKEN <input checked="" type="checkbox"/> GRAIN <input type="checkbox"/> TUBE	SAMPLE TEMPERATURE <input checked="" type="checkbox"/> HOT <input type="checkbox"/> COLD		TYPE OIL OE 30
REMARKS J. Palfrey MI 4761			
FOR LAB USE ONLY			
SAMPLE RESPONSE TIME			39-40
PE 41-43	AG 44-46	AL 47-49	CR 50-52
CU 53-55	MG 56-58	NI 59-61	
PR 62-64	SI 65-67	SN 68-70	TI 71-73
MO 74-76			
LAB RECOMMENDATION			77-78
SAMPLE NO	SIGNATURE	FILE MAINT 79	DATA SEQ 80

DD FORM 2026 NOV 77 PREVIOUS EDITION WILL BE USED

Figure 4-1. Sample of a completed DD Form 2026

Legend for Figure 4-1:

Completion Instructions for DD Form 2026

- To Oil Analysis Lab:** Enter the name of your supporting laboratory.
- From Major Command.** Operating Activity. Include on these two lines, your major command (FORSCOM, TRADOC, USAREUR, ELISA, and so forth), full unit designation and address, UIC, and telephone number.
- Equipment Model/APL.** Enter nomenclature and model number of the component; for example, Engine AVDS 1790-2A, Xmsn CD 850-6A, and Hydr Sys.
- Equipment Serial No.** This block shall contain the serial number of the engine or the components being sampled. On watercraft with twin

- engines, such as the LCM8s, the identification will consist of the serial number of the set and suffix identifying the particular engine. For example, the engines in serial number 12A7505 shall be designated 12A7505-LD or LB, and 12A7485 will be 12A7485-RD or RB.
- End Item Model/Hull No.** Self-explanatory.
- End Item Serial No./EIC.** Enter End Item Serial Number.
- Date Sample Taken.** Self-explanatory.
- Local Time Sample Taken.** Leave blank.
- Hours/Miles Since Overhaul.** Enter cumulative number of hours/miles on the component since new or last overhaul.
- Hours/Miles Since Oil Change.** Enter number of hours/miles since last oil change on the component. If neither the component nor the

end item has an odometer or hour-meter, enter the total estimated hours.

11 **Reason for Sample.** Check the block that is applicable. When the reason is other, explain under remarks; for example, initial sample, loss of engine power, and excessive smoke.

12 **Oil Added Since Last Sample.** Self-explanatory.

13 **Action Taken.** Leave blank.

14 **Discrepant Item.** Leave blank.

15 **How Malfunctioned.** Leave blank.

16 **How Found.** Leave blank.

17 **How Taken.** Self-explanatory.

18 **Sample Temperature.** Self-explanatory.

19 **Type Oil.** Self-explanatory.

20 **Remarks.** The individual who took the sample will print first initial

and last name and sign. In addition, record the following equipment usage data in the lower right corner of the REMARKS block.

a. The odometer reading of the end item in which the component is installed. (Indicate whether the odometer reading represents miles (MI) or kilometers (KM). Do not convert the readings from miles to kilometers or kilometers to miles.)

b. The end item hourmeter reading if the end item does not have an odometer; for example, HRS 50.

c. If the end item has both an odometer and hourmeter, only record he odometer reading.

d. Make sure total equipment usage is shown; i.e., the current meter reading plus usage from replaced meter(s). DID Form 314 (REMARKS block) will indicate if the equipment had a meter replaced and the usage of the old meter. Note: If the component is not installed in an end item, enter "uninstalled". Entries are NOT REQUIRED for end items not having an odometer or hourmeter.

OIL ANALYSIS RECOMMENDATION AND FEEDBACK <small>For use of this form, see YE 63-0106 and YD 43-0216; the proponent agency is DARCOM.</small>		REQUIREMENT CONTROL SYMBOL CSGLD-1813
1. TO: FIELD (Include ZIP Code and Telephone Number) HQ BTRY 7/7 FA ATTN: MAINTENANCE OFFICER BLDG. NO. 17082 FT. HOOD, TX 76844-8000 PHONE NO. 672-9882		2. LAB RECOMMENDATION NUMBER 86-108
		4. END ITEM MODEL M86AE
		5. END ITEM SERIAL NUMBER 7136-27841
3. FROM: LABORATORY (Include ZIP Code)		6. COMPONENT TYPE ENGINE
FT. HOOD OIL LABORATORY BLDG. NO. 18668-A2 FT. HOOD, TX 76844-8000		7. COMPONENT SERIAL NUMBER 6748298
		8. COMPONENT TIME (Hours/Hours) 424 HOURS
9. RECOMMENDATION AND REASON FOR ACTION OIL ANALYSIS SHOWS HIGH SILICON. RECOMMEND INSPECT AND REPAIR AIR INDUCTION SYSTEM. CHANGE OIL AND FILTER, AND RESAMPLE AFTER 6 HOURS OF NORMAL OPERATION.		
10. SIGNATURE AND TITLE OF INITIATOR <i>M. Stewart, Lab Chief</i>		11. DATE (Day Month Year) 22 May 90
13. NOTE FOR ARMY AVIATION ONLY: <small>Quality Deficiency Report (QDR), SF 308 will be submitted when maintenance is performed due to impending or incipient failure indicated by oil analysis. Failure Code 916</small>		12. QDR NUMBER
14. FEEDBACK (Maintenance Performed/Action Taken) REPLACED AIR INDUCTION HOSE. CHANGED OIL AND FILTER. RESAMPLED AFTER 6 HOURS OF NORMAL OPERATION.		
15. FROM: FIELD/DEPOT MAINTENANCE PERSONNEL <i>Mary Ann Banta</i>		16. DATE (Day-Month Year) 30 May 90
17. TO: LABORATORY		NOTE FOR ARMY AVIATION ONLY: <small>Copy of this form with SF 308 (QDR) attached will be sent to Commander, CCAD ATTN: DRSTS-MER S'op 36 Corpus Christi TX 78419</small>

Figure 4-2. Sample of a completed DA Form 3254-R

Legend for Figure 4-2:

Completion Instructions for DA Form 3245-R(1) through (11) These blocks will be completed by the laboratory.

(12) Aviation units will complete block 13 for Failure Code 916.

(13) Aviation units will complete in accordance with instructions in block 12.

(14) Feedback.

a. Explain any diagnostics performed, discrepancies found, and actions taken to return the component to a serviceable condition.

b. Include in this block the following information, when applicable.

(1) The Quality Deficiency Report (QDR)/Equipment Improvement Report (EIR) number.

(2) Work Order Number.

(15) **From.** Enter signature of the Field Depot Maintenance representative preparing the report.

(16) **Date.** Enter the calendar date (DDMMYY) the report was completed.

(17) **To.** Leave blank.

Chapter 5 Historical Records

5-1. General Information

a. Historical records are kept on specific items of equipment. They show required information and events in the life of equipment.

b. These records must be controlled and kept safe from loss or damage.

c. These records give commanders information on equipment transfers, gains, losses, usage, firing data, modifications, and the AOAP.

d. Historical records may be sent on dispatch. However, these forms are normally sent on dispatch only when they will be needed during the dispatch.

e. Never start a form until there is an entry needed on that form.

f. Remake a form only when it has been lost or so damaged that you cannot read the information on the form.

g. Commanders may consolidate historical records in one or more binders.

h. Historical records will always be filled out in ink or typewritten, unless the specific instructions for the form tell you to use pencil. Use blue or black ink.

5-2. Missing historical information or records

a. When equipment listed in appendix E arrives without forms or information, the Army activity that gets the equipment takes action.

(1) When the equipment comes from the Defense Logistics Agency or Defense Contract Administrative Services, fill out needed forms. Send copies out as the paragraph on the form directs you.

(2) When the equipment comes from an Army procurement activity, get any needed information from the manager. Look up the equipment's NSN on the AMDF. You can find the manager by the first position of the MATCAT Code column. You can also find the manager through the equipment's Federal Supply Class (FSC) in figures 11-6 through 11-12. The FSC is the first four numbers in the NSN. Send copies out as the paragraph on the form directs you.

(3) When the equipment comes from another Army activity, get the needed information from them. Then, make and send out needed forms.

(4) The equipment data plate, property book office, and maintenance forms can sometimes "fill in the blanks" on missing or damaged forms.

(5) If you have to remake a DA Form 2408-9 (Equipment Control Record) because the original form was lost or damaged, move all the information from the old form to the new form. In the

remarks blocks of the new form, print "NEW FORM INITIATED" and the date. If blocks 1, 2, and 3 of the lost or damaged form is unknown, your unit information goes in these blocks. Throw away the NMP copies of forms made to replace lost or damaged forms.

b. When none of these sources have the information you need, write a letter to the USAMC Logistics Support Activity (LOGSA). Send the letter to: Director, USAMC Logistics Support Activity, ATTN:AMXLS-RRM, Redstone Arsenal, AL 35898-7466. Give them the NSN, serial number, and registration number, if one's been assigned, for each item you're asking about. LOGSA can usually give you the information for blocks 6, 7, 8, 9, 10, 11, and 12 of the DA Form 2408-9 and the current owner. This information is based on the latest acceptance, transfer or usage reports turned in. But if no reports were turned in, they may have no information for you. In that case, fill out a DA Form 2408-9. Your unit information goes in blocks 1, 2, and 3.

c. Do not take components or assemblies apart to see if a MWO has been applied. Also, do not take them apart to see how much usage they have had.

d. Do not open items packaged and in storage at a supply activity just to finish forms. Complete the forms when the item is issued.

5-3. DA Form 2408-4 (Weapon Record Data)(RCS CSGLD-1051)

a. The DA Form 2408-4 is used to record firings and other information on the service life of weapons with cannon or mortar tubes. This information is important to your safety. (See figs 5-1 and 5-2.)

b. The DA Form 2408-4, used with TB 750-231 and TM 9-1000-202-14, tells you the estimated remaining life of the tube, cannon serial number (the breech ring), and the weapon on which they are mounted.

c. Use this form to figure the total equivalent full charge (EFC) for the "rounds".

d. Use a second DA Form 2408-4 solely to note zeroing and boresight information on the MI

e. Use this form to keep up with services pulled on a tube on a rounds fired or on time basis. However, it will always be maintained with the gun, cannon, or mortar tube.

f. Appendix E indicates which items of equipment require this form.

g. Keep all your DA Forms 2408-4 in one logbook binder. Normally, you send the form out on dispatch only when the weapon will be fired, repaired or sent to support maintenance.

h. If you need special information from a DA Form 2408-4, write Commander, Watervliet Arsenal, ATTN:SMCWV-QAL, Watervliet, NY 12189, or call DSN 974-5127. When you ask about a specific cannon, include the following information:

(1) Tube serial number.

(2) Cannon size, model or series.

(3) Cannon serial number.

(4) When you do not have serial, size, and model numbers, give them all the information you do have.

i. Entries on the DA Form 2408-4 will be made in blocks 10a through 10j by the section chief, crew chief or someone designated in writing by the unit commander. These entries will be made within 24 hours of firing.

j. The information on this form is critical to your safety. Make sure all entries are correct, "add up", and are readable.

k. Send the DA Form 2408-4, as shown below, to Commander, Watervliet Arsenal, ATTN: SMCWV-QAL, Watervliet, NY 12189, when the form is filled.

(1) Active Army units send in the form on 10 April and 10 October each year.

(2) Reserve and National Guard units send in the forms on 10 October each year.

(3) When the weapon is put in storage, transferred or turned in, keep a copy of the DA Form 2408-4 showing all the data from the form you sent in. The new form will stay with the weapon at all times.