Administrative Change to OO-ALCI21-107, *Engine Management*

OPR: 309 AMXG/MXDS

To bring the instruction into compliance with DAFMAN90-161, *Publishing Processes and Procedures*, paragraph 4.5.10.

The publication signature block is hereby changed to:

"RICHARD W. GIBBS, Brigadier General, USAF; Commander, Ogden Air Logistics Complex."

25 JANUARY 2023

BY ORDER OF THE COMMANDER
OGDEN AIR LOGISTICS COMPLEX

OGDEN AIR LOGISTICS COMPLEX
INSTRUCTION 21-107

12 MAY 2021
Certified Current, 7 August 2024
Maintenance

ENGINE MANAGEMENT

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

ACCESSIBILITY: Publications and forms are available for downloading or ordering on the e-publishing website at www.e-Publishing.af.mil

RELEASABILITY: There are no releasability restrictions on this publication

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OPR: 309AMXG/MXDS

Certified by: 309AMXG/CC
(Lt Col Aaron Rivers)

Supersedes: OO-ALCI23-112, 13 September 2018

Pages: 17

This publication implements Air Force Policy Directive (AFPD) 21-1, *Maintenance of Military Materiel*. It assigns roles and responsibilities and establishes policies, procedures, and instructions used by the Ogden Air Logistics Complex (OO-ALC), to include geographically separated units, in the maintenance and control of propulsion units. This instruction fulfills requirements set forth in Air Force Instruction (AFI) 63-101_20-101, *Integrated Life Cycle Management*; Technical Order (TO) 00-25-254-1, *Comprehensive Engine Management System (CEMS) Engine Configuration, Status and Time Compliance Technical Order (TCTO) Reporting Procedures*; Air Force Materiel Command (AFMC) Instruction 21-100, *Depot Maintenance Management*; and Air Force Sustainment Center Manual (AFSCMAN) 21-102, *Depot Maintenance Management.* This instruction applies to the OO-ALC, 309 Aircraft Maintenance Group (309 AMXG), 575th Aircraft Maintenance Squadron (575 AMXS), Joint Base San Antonio (JBSA)-Randolph Air Force Base (RAFB), Texas, 309 Missile Maintenance Group (309 MMXG), and Quality Assurance and Process Improvement Division, Hill Air Force Base (HAFB), Utah. 309th Aerospace Maintenance and Regeneration Group (AMARG) Engine Management is referenced in AFSCMAN 21-102_OO-ALCSUP_309 AMARG Addendum A, *AMARG Depot and Desert Maintenance Management*. 309 AMARG will use the OO-ALC Form 200, *Engine Management Data Sheet*, also referenced in the addendum. Ensure all records created as a result of processes prescribed in this publication are maintained in accordance with (IAW) AFI 33-322, *Records Management and Information Governance Program*, and disposed of in accordance with Air Force Records Information Management System Records Disposition Schedule. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not

imply endorsement by the Air Force (AF). Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*; route AF Forms 847 from the field through the appropriate functional chain of command. "This publication may not be supplemented or further implemented/extended."

SUMMARY OF CHANGES

This publication has been revised and is recommended to be reviewed in its entirety. Major changes include the reassignment of Stock Record Account Number (SRAN) Engine Manager (EM)/Base Engine Manager (BEM) under the 309th Aircraft Maintenance Group Business Office (MXDS), the timeframe required to accomplish downloads in section 2.1, as well as figure 1 and figure 2 in section 5. It also removes 309 AMARG specific roles and responsibilities that have been incorporated into AFSCMAN21-102_OO-ALCSUP_309 AMARG Addendum A.

1. General Information. Propulsion systems, to include aircraft jet engines, aerodynamic missile engines, aircraft reciprocation engines, and drone engines, require selective management. The high cost of these systems makes them 'unique' among the assets managed throughout the AF. There will be one primary OO-ALC SRAN EM/BEM for owning SRAN managed by 309 AMXG, OO-ALC and,575 AMXS, JBSA-RAFB, TX. There will also be one alternate identified for each SRAN. The SRAN designator for 309 AMXG is FJ2029 and the 575 AMXS designator is FJ2840. 309 AMXG Engine Management will assist in shipping/receiving and removal/install of 309 MMXG missile engines; this includes updating information in CEMS. The concept of selective management of these high-cost, low-volume items has been refined into a stand-alone computer system, CEMS (D042). The command engine manager (CEM) is located at AFMC Headquarters (HQ) A4MM, Wright-Patterson Air Force Base, and is the focal point for engine management matters for the command. The FJ2031 account, managed by 639th Aircraft Sustainment Group Propulsion CEMS/Program Management Office (PMO), within the aircraft sustainment wing located at Tinker Air Force Base, is the United States Air Force (USAF) accountable record for engines. Normally, the primary and alternate EMs will be the same personnel for all customer accounts. Engine management is responsible for engine, engine component, propeller and blade accountability, and inventory control. For USAF assets, the CEMS is the system of record. One of the engine management section's primary responsibilities is timely reporting in CEMS pertaining to asset status, condition, and location at all times.

1.1. The primary purpose of the CEMS program is to provide the current status of engines, tracked engine components, and TCTO compliance. CEMS identifies owning SRAN, status, condition, and configuration information for all CEMS accountable engines by serial number (S/N) and configuration item identifier (CII).

1.2. The primary objective of the engine management reporting in CEMS is to submit accurate information on the status, condition, and location of aircraft and missile engines at all times.

1.3. Policies and procedures that outline instructions for reporting actions and events to the CEM are outlined in TO 00-25-254-1.

1.4. No aircraft will be flown or delivered until the engine and/or components are reported in CEMS. Failure to comply with CEMS reporting will result in placement of equipment in questionable status that may cause unnecessary overage of critical life-limited parts.

1.5. All incoming/outgoing engines, modules, aircraft, or missiles arriving at OO-ALC and/or the Operating Location (OL) at JBSA will be processed by the SRAN EMs located at 309 AMXG/MXDS or 575 AMXS JBSA-RAFB,TX. This includes engines for programmed depot maintenance (PDM) aircraft, special projects, and missile maintenance.

1.5.1. Engines and engine components primarily managed at OO-ALC, to include the OL, consist of aircraft and missiles with various configurations.

1.5.1.1. Aircraft engines and serially controlled components:

1.5.1.1.1. Hercules (C-130), T56-Allison (A)-7 and T56-A-15

1.5.1.1.2. Fighting Falcon (F-16), F100-Pratt & Whitney (PW) 200/220B/220E/220F/229, F110-General Electric (GE)100, and F110-GE-129

1.5.1.1.3. Thunderbolt (A-10), TF34-GE-100

1.5.1.1.4. Raptor (F-22), F119-PW-100

1.5.1.1.5. Talon (T-38), J85-GE-5

1.5.1.1.6. Lightning II (F-35), F135-PW-100

1.5.1.2. Missile engines:

1.5.1.2.1. Air Launch Cruise Missile (ALCM) AGM086B, F107-Williams International (WR)-101

1.6. Engine status, actions, and events at OO-ALC/JBSA OL are reported to the SRAN EM/BEM by the propulsion personnel in the engine section, aircraft flight test organization, aircraft incoming, aircraft production, and AMXG scheduling. PDM responsibilities in reporting engine status are outlined in the applicable TO 00-20-5 series.

2. Reports and Codes.

2.1. Aircraft engine run: Report/download is processed through the work center Comprehensive Engine Trending and Diagnostics System (CETADS) to the SRAN EM/BEM host CETADS computer or through the Integrated Maintenance Information System (IMIS) (F-22 only) after the following events: green run/engine run or engine cycles time/total accumulated cycles update not later than (NLT) the end of shift following the date/time of the occurrence or 10:00 a.m. the next duty day when the download is not accomplished by swing shift. Each time the engine is run, the engine is downloaded and processed in the CETADS work center computer, then reconciled to the SRAN EM/BEM host computer and recorded in CEMS, IAW with TO 00-25-257-1, *Engine Health Management Plus (EHM+) User's Manual Instructions for Turbofan Engine Model: F100-220*; TO 00-25-257-2, *Engine Health Management Plus (EHM+) User's Manual Instructions for Turbofan Engine Model: F100-229*; TO 00-25-257-3, *Engine Health Management Plus (EHM+) User's Manual Instructions for Turbofan Engine Model: TF34-100A;* and TO 00-25-257-4, *Engine Health Management Plus (EHM+) User's Manual Instructions for Turbofan Engine Model: F110-129*.

2.1.1. IAW TO 00-25-254-1, paragraph 2.1 and AFSCMAN 21-102, paragraph 21.1.5.1, all incoming program, project, drop-in, modification, etc., aircraft will be downloaded NLT close of business (COB) the first duty day after the event (e.g., part removal, installation, time update, and TCTO status change). Reporting by any method must be accomplished no later than COB the next business day following the date/time of the occurrence. Ensure all transactions are reported and input in the order they occur.

2.2. Test cell engine run: OO-ALC Form 206, *F100-PW-220 Data Run Sheet*, OO-ALC Form 207, *F100-PW-229 Data Run Sheet*, or test cell printout is submitted to the SRAN EM/BEM for processing through CEMS after completion of the test cell run.

2.3. Aircraft flights: Report/download is processed through work center CETADS computer to the SRAN EM/BEM host CETADS computer or through the IMIS (F-22 only) each time the aircraft is flown for functional check flight, proficiency flight, or operational check flight NLT the end of shift following the date/time of the occurrence or 10:00 a.m. the next duty day when download is not accomplish by swing shift. **Note:** For C-130 and T-38 update flying hour (FHR) only.

2.4. AF Form 1534, *CEMS Central Database (CDB) Report* (Attachment 2), OO-ALC Form 205, *Modular Engine Time/Cycle Accumulation*, or equivalent email will be used to report engine removal/installation/cannibalization (CANN) of engines, modules, or components (reference applicable TO 00-20-5 series).

2.5. Event History Recorder (EHR): EHR Download Sample Data from CETADS (Aircraft Flight/Engine Run) (**Attachment 3**) or Engine Data Review (EDR) sheet (**Attachment 6**) provide window values of engine operating times (hot and cold sections).

2.6. How-Mal Code (HMC): The reason why the engine is reported or why the engine malfunctioned. Codes are identified in TO 00-25-254-1.

2.7. Transaction Condition Code (TCC): Logical sequence of events as referenced in TO 00-25-254-1.

2.8. CII is the CEMS equivalent of a work unit code (see TO 00-25-254-1).

2.9. Error code responsibilities as referenced in TO 00-25-254-1.

3. Responsibilities for OO-ALC and JBSA SRAN EM/BEM.

3.1. The SRAN EM/BEM and alternates (when applicable) will:

3.1.1. Manage and account for engines and engine serially controlled component-related actions for SRANs FJ2029 and FJ2840, from the time of receipt, shipment, transfer, or termination.

3.1.2. Assume responsibility at OO-ALC and JBSA to maintain the FJ2029/FJ2840 SRAN accounts.

3.1.3. Administer the Base Engine Management Program and maintain currency of all engine status, condition, location, and action related to propulsion units for the FJ2029/FJ2840 accounts.

3.1.3.1. Execute duties per applicable TOs and operating instructions and utilize checklists and other guidance as required (e.g., checklists, shipping data, historical records check, 180-day preservation, contingency plan).

3.1.3.2. Perform periodic audit of engine management program to ensure compliance IAW TO 00-25-254-1 by utilizing CEMS local products (e.g., Engine Manager Data List (EMDL), Daily Transaction Summary, Daily Inspection Status Inventory, and self-inspection checklist).

3.1.3.2.1. Assist Quality Assurance with group routine inventory listing and complex inspections as necessary.

3.1.4. Coordinate with applicable weapon system aircraft logistics scheduler (ALS) on engine and engine component maintenance, time change items, special inspections, TCTO modifications, and other documentation requirements (e.g., borescope inspections, blade blending, CANN actions) to ensure compliance.

3.1.4.1. Ensure engine, module, and component data is reported to the SRAN EM/BEM no later than COB the first duty day after the event (e.g., propeller and part removal, installation, time update, TCTO status change, and engine removal or installation in an aircraft or missile).

3.1.5. Establish a CEMS contingency plan when the system is down for extended periods (more than 48 hours).

3.1.6. Receive the following engine documentation:

3.1.6.1. AF Form 1534, OO-ALC Form 205, or email equivalent from the propulsion personnel in aircraft; incoming for receipt and direct delivery of all engines and engine modules, and also within the shops (engine shop, flight test and ALCM) with update status and action for all engine and engine components received for depot, PDM, or missile maintenance.

3.1.6.2. EHR, EDR, OO-ALC Form 206 or OO-ALC Form 207 are processed through CETADS after aircraft engine run and/or aircraft flight. OO-ALC Form 206 and OO-ALC Form 207 are submitted to the SRAN EM/ BEM after test cell completion. It's essential that this data be collected prior to the next flight or engine run. This includes quick turnaround provided that engines are shutdown. **NOTE:** For C-130 and T-38, update FHR only.

3.1.6.3. Engine S/N or modular S/N and engine related HMC and TCC.

3.1.6.4. Propulsion personnel will provide SRAN EM/BEM with applicable data for input into CEMS, automated history program by S/N for all accountable and non-accountable tracked items.

3.1.7. Monitor CEMS reporting data for accuracy and timeliness prior to input. Review CEMS requested reports screen F050, Job Number TCTO Configuration Reports to validate all TCTOs. E407 automated history parts 1 and 2 to validate engine and time compliance inspection data. Reconcile data between engine and aircraft historical data as required.

3.1.8. Monitor, analyze, and reconcile CETADS daily, to ensure that the aircraft download data on the work center computers and host computer are current.

3.1.9. Monitor and review EDR data downloads for F119-PW-100 engines using IMIS. Update CEMS screen A205, Engine Configuration and Status Reports.

3.1.10. Upon notification from the AGM-86 Missile scheduler, engine removal, installation, shipment or termination, update CEMS screen A205, *Engine Configuration and Status Reports*.

3.1.11. Process and download engine send file for F100-PW-200/220B/220E/220F/229, F110-GE-100, F110-GE-129, and TF34-GE-100 engines through CETADS for delivery aircraft only. Ensure send file is sent via email to applicable owning unit SRAN EM/BEM.

3.1.12. Review engine work packages that are maintained in the propulsion shop. Update engine status in CEMS screen A205, *Engine Configuration and Status Report*, IAW TO 00-25-254-1 and engine management share drive folders as required.

3.1.13. Review engine-related data in the Program Depot Maintenance Schedule System.

3.1.14. Input data to CEMS prior to next flight for engine operating time. **Note:** Accurate information is essential to provide current engine data used by engine management personnel.

3.1.15. Review the following CEMS local reports daily: EMDL (A590), Daily Transaction Summary (A600) and Daily Inventory Status List (C022A). SRAN EM/BEM will correct EMDL immediately upon receipt.

3.1.16. Ensure engine semiannual inventory report is completed and returned NLT the 15th of April and October.

3.1.17. Review and document engine automated history annually through CEMS screen A295, Automated History Program.

3.1.18. Review SRAN directory through CEMS browse reports. Submit request for change to the SRAN directory to CEMS PMO help desk and the CEM.

3.1.19. Ensure engine flying time, status, and TCTO reconciliation reports (if applicable) are completed.

3.1.20. Upon assignment of a new SRAN EM/BEM, the current BEM will request and accomplish a physical inventory. The outgoing and incoming SRAN EM/BEM must sign the inventory report, forward to CEMS/PMO help desk, and notify appropriate CEM upon completion.

3.1.21. Contact CEM first to resolve reporting problems not covered in TO 00-25-254-1.

3.1.22. Investigate and help resolve delays involving maintenance or supply.

3.1.23. Investigate and review transportation problems/delays by contacting Defense Logistics Agency (DLA) Distribution (HAFB) and Traffic Management Office (TMO) (JBSA) customer service. Note: This is for follow-up on delivery date feedback for the receiving party.

3.1.24. Initiate tracer action to locate assets shipped or transferred to another SRAN when not received within the required time frame of 20 calendar days for a shipment, or 10 calendar days for a transfer. Contact United Resource Service customer support for assistance.

3.1.25. Consider asset lost if not receipted within the above time frames and initiate a Report of Survey within 5 calendar days (reference, TO 00-25-254-1, page 1-3, paragraph 1.2.4*).*

3.1.26. Obtain disposition instructions from the CEM at AFMC HQ/A4MM for excess engines if applicable.

3.1.27. Document paired shipping devices (i.e., trailers, stands, dollies, cradles, containers, shipping systems, and adapters) serial numbers on a Department of Defense (DD) Form 1348-1A, *Issue Release/Receipt Document*, or DD Form 1149, *Requisition and Invoice/Shipping Document*. Verify either Air Force Technical Order (AFTO) Form 244, *Industrial/Support Equipment Record*, or Periodic Maintenance Inspection tags for inspection due date. At no time is engine management responsible for the handling, transportation, storage, maintenance, or physical receipt of engine shipping devices. Coordinate/contact DLA Distribution (HAFB) and TMO (JBSA) customer support as required.

3.1.28. Ensure parts requirement for engine not mission capable for supply are accurately reported.

3.1.29. Ensure engine shipments are properly documented and authorized. Prepare DD Form 1348-1A (**Attachment 4**), or DD Form 1149, (**Attachment 5**), for each shipment and transfer.

3.1.29.1. Create DD Form 1348-1A or DD Form 1149, IAW TO 00-85-20, *Engine Shipping Instructions*. Maintain a jacket file of engine shipping documents IAW AFI 33-322, *Records Management and Information Governance Program*, and TO 00-85-20.

3.1.29.2. Notify engineering technician via email for all shipping or receiving of support equipment (e.g., trailers, stands, containers, dollies, adapters, shipping devices).

3.1.29.3. Coordinate with DLA (HAFB) and TMO (JBSA) for all engine ground transportation IAW AFI 24-602, Volume 2, *Cargo Movement*.

3.1.30. Assume accountability for a shipped engine until the receiver acknowledges receipt in CEMS.

3.1.31. Notify the CEM at AFMC HQ/A4MM of all transactions or condition codes ‘ML’ or ‘LL’ that cannot be processed to the CEMS CDB. Reference TO 00-25-254-1 to obtain required reporting information from deployed activities when reporting responsibilities are retained at the home SRAN.

3.1.32. Assist program manager or master scheduler with the following:

3.1.32.1. F135-PW-100 engine shipment as required.

3.1.32.2. All foreign military sales engine shipment as required.

3.1.32.3. United States Navy, Marine Corps, or Coast Guard engine shipment as required.

3.2. The 309 AMXG, to include the JBSA OL, will be responsible for and provide information outlined in **paragraph 3.1.6** as applicable, and the following for all aircraft detailed in **paragraph 1.5.1**.

3.2.1. The master schedulers for each assigned Mission Design Series will provide a 72-hour notification for all deliveries.

3.2.2. The ALS and flight test aircraft forms and records technician will notify the SRAN EM/BEM no later than COB of the next business day following the date/time of the occurrence. Ensure all transactions are reported in the order they occur.

3.2.2.1. Date of engine arrival, removal, installation, shipment, or termination.

3.2.2.2. Engine S/N verification.

3.2.2.3. Arrival and shipping data (i.e., document number, location).

3.2.3. The ALS/engine scheduler will notify the SRAN EM/BEM of any engine and engine component removal and installation (to include propellers) no later than COB of the next business day following the date/time of the occurrence.

3.2.4. Propulsion personnel will notify the SRAN EM/BEM prior to transporting engines or engine components to flight test, aircraft production, or transportation shipment (central receiving).

3.3. The 309 MMXG will be responsible for and provide information outlined in **paragraph 3.1.6** as applicable, and the following for all missiles detailed in **paragraph 1.5.1**:

3.3.1. The 309 MMXG scheduler will notify the SRAN EM/BEM no later than COB of the next business day following the date/time of the occurrence. Ensure all transactions are reported in the order they occur.

3.3.1.1. Date of ALCM and engine arrival, shipment, or termination.

3.3.1.2. ALCM and engine S/N verification.

3.3.1.3. Arrival and shipping data (i.e., document number, location).

3.4. Coordination with DLA Distribution (HAFB) and TMO (JBSA) or transportation focal point will be required on all incoming engines, engine components, and support equipment (i.e., trailers, stands, dollies, and adapters).

ERIC E. FOX, NH-04, DAF
Vice Director, Ogden Air Logistics Complex

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFI 24-602, Volume 2, *Cargo Movement*, 12 Jun 19

AFI 63-101_20-101, *Integrated Life Cycle Management*, 30 Jun 20

AFI 33-322, *Records Management and Information Governance Program*, 23 Mar 20

AFPD 21-1, *Maintenance of Military Materiel*, 1 Aug 18

AFMCI 21-100, *Depot Maintenance Management*, 6 Sep 18

AFSCMAN 21-102, *Depot Maintenance Management*, 5 Apr 21

AFSCMAN21-102_OO-ALCSUP_309 AMARG Addendum A, *AMARG Depot and Desert Maintenance Management*, 29 Aug 18

TO 00-20-5 Series, *Engine Historical Records (Series of volumes with multiple dates)*

TO 00-25-254-1, *Comprehensive Engine Management System Engine Configuration, Status and TCTO Reporting Procedures*, 1 May 16

TO 00-25-257-1, *Engine Health Management Plus (EHM+) User's Manual Instructions for Turbofan Engine Model: F100-220*, 1 Aug 08

TO 00-25-257-2, *Engine Health Management Plus (EHM+) User's Manual Instructions for Turbofan Engine Model: F100-229*, 1 Aug 08

TO 00-25-257-3, *Engine Health Management Plus (EHM+) User's Manual Instructions for Turbofan Engine Model: TF34-100A*, 1 Dec 11

TO 00-25-257-4, *Engine Health Management Plus (EHM+) User's Manual Instructions for Turbofan Engine Model: F110-129*, 1 Aug 08

TO 00-85-20, *Engine Shipping Instructions*, 15 Mar 12

Prescribed Forms

OO-ALC Form 200, *Engine Maintenance Data Sheet*

OO-ALC Form 205, *Modular Engine Time/Cycle Accumulation*

OO-ALC Form 206, *F100-PW-220 Data Run Sheet*

OO-ALC Form 207, *F100-PW-229 Data Run Sheet*

Adopted Forms

AF Form 847, *Recommendation for Change of Publication*

AF Form 1534, *CEM CDB Report*

DD Form 1149, *Requisition and Invoice/Shipping Document*

DD Form 1348-1A, *Issue Release/Receipt Document*

Abbreviations and Acronyms

AF—Air Force

AFI—Air Force Instruction

AFMC—Air Force Materiel Command

AFPD—Air Force Policy Directive

AFTO—Air Force Technical Order

AFSCMAN—Air Force Sustainment Center Manual

AMARG—Aerospace Maintenance and Regeneration Group

ALCM—Air Launch Cruise Missile

ALS—Aircraft Logistics Scheduler

BEM—Base Engine Manager

CANN—Cannibalization

CDB—Central Data Base

CEM—Command Engine Manager

CEMS—Comprehensive Engine Management System

CETADS—Comprehensive Engine Trending and Diagnostics System

CII—Configuration Item Identifier

COB—Close of Business

DD—Department of Defense

DLA—Defense Logistics Agency

DMAFB—Davis-Monthan Air Force Base

EDR—Engine Data Review

EHM+—Engine Health Management Plus

EHR—Event History Recorder

EM—Engine Manager

EMDL—Engine Manager (Daily) List

FHR—Flying Hour

GE—General Electric

HAFB—Hill Air Force Base

HQ—Headquarters

HMC—How-Mal Code

IAW—In Accordance With

IMIS—Integrated Maintenance Information System

JBSA—Joint Base San Antonio

NLT—Not Later Than

OB—Business Operations

OL—Operating Location

OO-ALC—Ogden Air Logistics Complex

OPR—Office of Primary Responsibility

PDM—Programmed Depot Maintenance

PMO—Program Management Office

PW—Pratt & Whitney

RAFB—Randolph Air Force Base

S/N—Serial Number

SRAN—Stock Record Account Number

TCC—Transaction Condition Code

TCTO—Time Compliance Technical Order

TMO—Traffic Management Office

TO—Technical Order

USAF—United States Air Force

309AMARG—309th Aerospace Maintenance and Regeneration Group

309AMXG—309th Aircraft Maintenance Group

309MMXG—Missile Maintenance Group

575AMXS—575th Aircraft Maintenance Squadron

Attachment 2

SAMPLE AF FORM 1534, CEMS CDB REPORT

Figure A2.1. AF Form 1534, CEMS CDB Report.

CEMS CDB REPORT

1. Report Control System RCS:

Form Approved OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 5 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data as needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. Please DO NOT RETURN your form to either of these addresses. Send your completed form to: Headquarters, United States Air Force, Attn: AF/LGMY, Washington, DC, 20330-1000.

2. SUB SYS ID	3. CII DESIGNATION	4. SERIAL NUMBER	5. OCCURRENCE		6. SRAN	7. COMD		8. ORG	9. ACCT	10. TYPE REPORT
			5a. DATE	5b. HOUR		MAJ	SUB			

11. PART NUMBER	14. TO/FROM		15. SHIPPING DEVICE	16. SEQUENCE NO.
	CMD	SRAN		
	14a	14b		

12. TRANSACTION (Circle one)				13. CONDITION (Circle one)	
GAIN		ENMCS	E	SERVICEABLE	
NEW PRODUCTION	A	WORK COMPLETED	F	BUILT-UP	B
REIMBURSABLE	B	TEST CELL REJECT	G	RAW	R
NON-REIMBURSABLE	C	WORK STOPPED	H		
EXCHANGE	D	WORK STARTED	J	REPAIRABLE	
		REMOVED TRANSIENT	K	CONDEMNED	C
LOSS		REMOVED OTHER	L	WITH QEC	F
ATTRITION	W	CHANGE IN MAINT	M	WITHOUT QEC	G
FOR PARTS	X	AWAIT DISPOSITION	N	MINOR OVHL	K
SALVAGE/DPRO	Y	ISSUE MAINTENANCE	P	MAJOR OVHL	L
OTHER	Z				
		CAB/ORG CHANGE	2		
NON-GAIN/LOSS		CONFIGURATION	6		
RECEIVED	R			INSTALLED	
SHIPPED	S	INSTALLED TRANSIENT	U	ACTIVE	A
TRANSFERRED	T	INSTALLED OTHER	V	INACTIVE	Z

17. ENG RELATED HOW MAL CODE	18. REASON FOR RETURN TO OVHL	19. REPAIRABLE ENG. SERIAL NO.

20. PRIMARY/SECONDARY HOW MAL INDICATOR (Circle one) A Z	21. SAP NO.

22. DOCUMENT NO./NSN	

23. ENGINE FLYING TIME	24. CYCLE/SORTIE

25. ERROR SEQUENCE NO.	26. TMSM

27. NHA DESIGNATOR	28. NHA SERIAL NO.	29. POSITION NO.

30. REMARKS

AF FORM 1534, 19911001 *(EF-V1)* PREVIOUS EDITIONS ARE OBSOLETE.

Attachment 3

EHR DOWNLOAD SAMPLE DATA FROM CETADS (AIRCRAFT FLIGHT/ENGINE RUN)

Figure A3.1. EHR Download Sample 1.

```
ERAUFE509623112361546XXXXX
5900008666000100396100125426200047406300002960900197206900001196800002986700005586600009366500013217700018 65
```

Figure A3.2. EHR Download Sample 2.

```
EHRAUFE545260112361349XXXXX
5900004946000048016100056186200032256300001770900089186900000156800000936700002786600006066500008827700060 29
```

Attachment 4

SAMPLE DD FORM 1348-1A, ISSUE RELEASE/RECEIPT DOCUMENT

Figure A4.1. DD Form 1348-1A.

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

DI CODE: SHP | UI: EA | QUANTITY: 00001 | SUPPLEMENTARY ADDRESS: F B5001 | PRI: 02 | REQD DEL DATE: 999

1. TOTAL PRICE: UNIT PRICE (DOLLARS, CTS) / DOLLARS / CTS

2. SHIP FROM: FJ2029 TMO, Bldg 849 West, 5851 F. Ave

3. SHIP TO: FB5001, 8691 Artic Warrior Dr.

4. MARK FOR: REPAIRABLE F119 ENGINE

5. DOC DATE: 20200911 | 6. NMFC | 7. FRT RATE | 8. TYPE CARGO | 9. PS

10. QTY. REC'D | 11. UP | 12. UNIT WEIGHT | 13. UNIT CUBE | 14. UFC | 15. SL

16. FREIGHT CLASSIFICATION NOMENCLATURE: ENGINE INTERNAL COMBUSTION (UNFUELED)F119

17. ITEM NOMENCLATURE: F-119 PW-100 JET ENGINE PW0E730100

18. TY CONT: TAP6 | 19. NO CONT: 1 | 20. TOTAL WEIGHT: 7694 | 21. TOTAL CUBE: 779

22. RECEIVED BY | 23. DATE RECEIVED

24. DOCUMENT NUMBER & SUFFIX (30-44):
FJ20290255001YRXXX
FROM: FJ2029
5851 F. AVE, BLDG 849 WEST
HILL AFB, UT 84056-5713

SHIP TO: FB5001, 8691 ARCTIC WARRIOR DR., JBER AK 99506

25. NATIONAL STOCK NO. & ADD (8-22):
2840F119PW100 P/N 4321200 PW0E730100

ENGINE SHIPPING SYSTEM (ESS) P/N 4330450 S/N GSS93
3000E TRAILER P/N 2800-000-00 NSN 1740-01-381-2919 S/N 119-0035-GT204
F119 SHIPPING BAG P/N 4330813, S/N 66-3844

TAC CODE: F8FE

26. RIC (4-6) UI (23-24) QTY (25-29) CON CODE (71) DIST (55-56) UP (74-80):
AIR RIDE TRAILER REQUIRED FOR SURFACE MOVEMENT

PACKED BY/DATE______________________ INSPECTED BY/DATE______________________

27. ADDITIONAL DATA:
SHIPPED AND PREPARED IAW 2J-1-18 / 00-85-20 / IMIS TOD CMD ID P429435. ENGINE IS DRAINED AND PURGED OR HAS APPROPRIATE HAZARDOUS DECLARATION FORMS ATTACHED.
THIS SHIPMENT DOES NOT CONTAIN ANY CLASSIFIED, SENSITIVE, PROTECTIVE ITEMS, DRUGS, CONTRABAND OR HAZARDOUS MATERIAL
POC AT HILL AFB: HILL EM DSN 777-4492
POC AT JBER, AK: 3 MOS ENGINE MANAGEMENT DSN: 551-6137/6138/6139

PREVIOUS EDITION MAY BE USED

mFlow (DLA)

Attachment 5

SAMPLE DD FORM 1149, REQUISITION AND INVOICE/SHIPPING DOCUMENT

Figure A5.1. DD Form 1149.

SHIPPING CONTAINER TALLY ——— 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

1. FROM (Include ZIP Code) FJ2029 TMO (777-4492) 5851 F AVE BLDG. 849 W HILL AFB, UT. 84056-5212	SHEET NO. 1	NO. OF SHEETS 1	5. REQUISITION DATE 20200618	6. REQUISITION NUMBER FJ20290170001YR	
	7. DATE MATERIAL REQUIRED (YYYYMMDD) 2020622			8. PRIORITY	
2. TO (Include ZIP Code) FJ7209 (DODAAC -- FE4852) 99th LRS/LGRDCC 6159 MCGOUGH PKWY, BLDG 811/SHIPMENT SECTION NELLIS AFB, NV 89191-7222	9. AUTHORITY OR PURPOSE F119-PW-100 ENGINE - MISSION SUPPORT				
	10. SIGNATURE			11a. VOUCHER NUMBER & DATE (YYYYMMDD)	
3. SHIP TO - MARK FOR ATTN: OFFICE: 702-643-5414	12. DATE SHIPPED (YYYYMMDD)			b.	
	13. MODE OF SHIPMENT Fastest Traceable Means			14. BILL OF LADING NUMBER	
	15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.				
4. APPROPRIATIONS DATA TAC# F8FE CC - A					AMOUNT

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
1	F119-PW-100 ENGINE, P/N 4321200, NSN 2810-01-510-2863, S/N PW0E730064	EA	1				$10,850,000.00	$10,850,000.00
2	ENGINE SHIPPING SYSTEM(ESS), PN 4330450, ID GSS01, S/N 01-0028	EA	1				$30,000.00	$30,000.00
3	3000E TRAILER, ID G4217	EA	1				$11,000.00	$11,000.00
4	F119 ENGINE SHIPPING COVER (BLUE), PN 4330813, S/N 59-316	EA	1				$1,500.00	$1,500.00
	AIR RIDE TRAILER REQUIRED FOR SURFACE MOVEMENT Shipped & Prepared IAW 2J-1-18 / 00-85-20. Engine is Drained and Purged or has Appropriate Hazardous Declaration Forms Attached							$0.00

16. TRANSPORTATION VIA AMC OR MSC CHARGEABLE TO — 17. SPECIAL HANDLING

18. PREPARATION OF SHIPMENT	ISSUED BY	TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
		1	RS	196 X 71 X 99 ESS/ENGINE	7550	770
	CHECKED BY					
	PACKED BY					
				TOTAL	7550	770

19. RECEIPT				
CONTAINERS RECEIVED EXCEPT AS NOTED	DATE (YYYYMMDD)	BY	SHEET TOTAL $10,892,500.00	
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE (YYYYMMDD)	BY	GRAND TOTAL $10,892,500.00	
POSTED	DATE (YYYYMMDD)	BY	20. RECEIVER'S VOUCHER NO.	

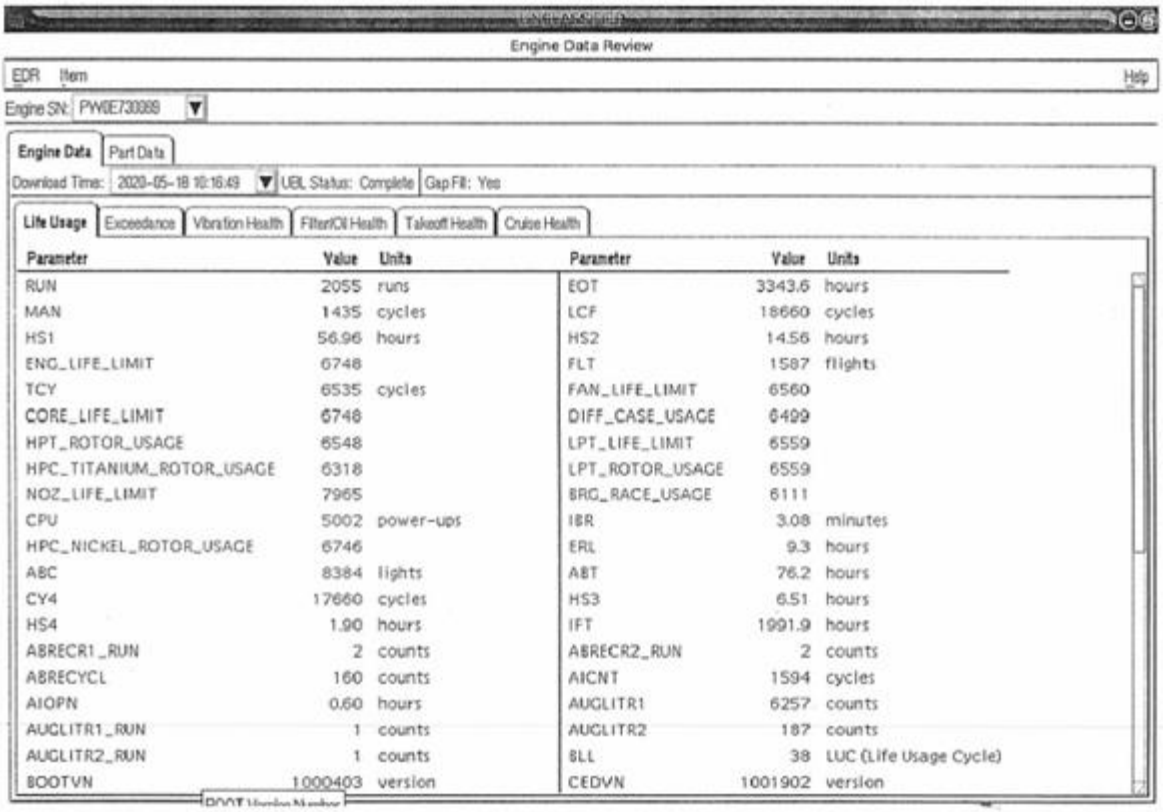
DD FORM 1149, JAN 2016 — PREVIOUS EDITION IS OBSOLETE. — Adobe Designer 9.0

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Attachment 6

SAMPLE OF ENGINE DATA REVIEW SHEET

Figure A6.1. Engine Data Review Sheet.



Engine Data Review

EDR Item Help

Engine SN: PWDE730089

Engine Data | Part Data

Download Time: 2020-05-18 10:16:49 | UBL Status: Complete | Gap Fill: Yes

Life Usage | Exceedance | Vibration Health | Filter/Oil Health | Takeoff Health | Cruise Health

Parameter	Value	Units	Parameter	Value	Units
RUN	2055	runs	EOT	3343.6	hours
MAN	1435	cycles	LCF	18660	cycles
HS1	56.96	hours	HS2	14.56	hours
ENG_LIFE_LIMIT	6748		FLT	1587	flights
TCY	6535	cycles	FAN_LIFE_LIMIT	6560	
CORE_LIFE_LIMIT	6748		DIFF_CASE_USAGE	6499	
HPT_ROTOR_USAGE	6548		LPT_LIFE_LIMIT	6559	
HPC_TITANIUM_ROTOR_USAGE	6318		LPT_ROTOR_USAGE	6559	
NOZ_LIFE_LIMIT	7965		BRG_RACE_USAGE	6111	
CPU	5002	power-ups	IBR	3.08	minutes
HPC_NICKEL_ROTOR_USAGE	6746		ERL	9.3	hours
ABC	8384	lights	ABT	76.2	hours
CY4	17660	cycles	HS3	6.51	hours
HS4	1.90	hours	IFT	1991.9	hours
ABRECR1_RUN	2	counts	ABRECR2_RUN	2	counts
ABRECYCL	160	counts	AICNT	1594	cycles
AIOPN	0.60	hours	AUGLITR1	6257	counts
AUGLITR1_RUN	1	counts	AUGLITR2	187	counts
AUGLITR2_RUN	1	counts	BLL	38	LUC (Life Usage Cycle)
BOOTVN	1000403	version	CEDVN	1001902	version