



## DEPARTMENT OF THE NAVY

COMMANDER, AIRBORNE COMMAND CONTROL  
AND LOGISTICS WING  
672 13<sup>TH</sup> STREET BUILDING 50  
POINT MUGU, CALIFORNIA 93042-5051

COMACCLOGWINGINST 11018.1J

N42

17 Oct 12

### COMACCLOGWING INSTRUCTION 11018.1J

From: Commander, Airborne Command Control and Logistics Wing

Subj: ENGINE/AUXILIARY POWER UNIT TURNUP PROGRAM

Ref: (a) NAVAIR 01-E2AAF-1  
(b) NAVAIR 01-E2AAG-1  
(c) NAVAIR A1-C2AHB-NFM-000  
(d) COMNAVAIRFORINST 4790.2B  
(e) OPNAVINST 3710.7U  
(f) COMACCLOGWINGINST 3740.4

Encl: (1) Taxi Turnup/APU License  
(2) C-2A Low Power Engine Turnup Operator Training Syllabus  
(3) C-2A High Power Engine Turnup Operator Training Syllabus  
(4) E-2C/D or C-2A APU/Engine Turn Qualifier Designation  
(5) APU/Engine Turn Operator Currency Log  
(6) Maintenance Turn Brief Guide  
(7) C-2A Auxiliary Power Unit Qualification Syllabus  
(8) E-2C Low Power Engine Turnup Operator Training Syllabus  
(9) E-2D Low Power Engine Turnup Operator Training Syllabus  
(10) E-2C High Power Engine Turnup Operator Training Syllabus  
(11) E-2D High Power Engine Turnup Operator Training Syllabus

1. Purpose. To define procedures and responsibilities for engine Low/High power and APU turn qualifications per references (a) through (f) and enclosures (1) through (11).

2. Cancellation. COMACCLOGWINGINST 11018.1H

3. Discussion. Auxiliary Power Unit (APU), Engine Low power and High Power turn qualifications are three distinct

achievements that require separate tests, designations, and licenses for each. All designations are valid for one year commencing on the date the APU Low or High Power License, enclosure (1), (as applicable) is signed by the Commanding Officer. When a currently qualified low power turn qualified individual earns their High power qualification, a new APU/Low power turn qualification license shall be issued to match the expiration date of the High power license. In addition, when a current APU turn Qualified individual earns their Low Power Qualification, a new APU turn qualification license shall be issued to match the expiration date of the Low Power License.

#### 4. Definitions

a. Low Power: Low power is defined as single engine operation up to 2000 Indicated Shaft Horsepower (ISHP), or operation of both engines with a maximum setting of reverse to ground idle. Ground idle may only be exceeded on one engine at a time. 1500 ISHP may only be exceeded to perform propeller IBIT.

**WARNING:**

**In some circumstances, changing wind conditions may make it necessary to increase the safe area aft of the aircraft to more than 180 feet. Plane Captain and FDC shall monitor wind conditions and ground activity around turning aircraft to prevent damage or injury to personnel and equipment.**

b. Propeller Balance: This is considered a low power turn evolution. However, aircraft wings shall be at the spread and locked position, main entry hatch closed, chocks removed and flaps set at 0 degree position during propeller balancing evolution. Aircraft must be positioned where there is no possibility of personnel, SE or aircraft entering the propeller wash area within 180 feet aft of turning aircraft.

c. Propeller IBIT: This is considered a low power turn evolution. However, aircraft wings shall be at the spread and locked position, main entry hatch closed, chocks removed and flaps set at 0 degree position during propeller IBIT evolution. Aircraft must be positioned where there is no possibility of personnel, SE or aircraft to enter the propeller wash area within 180 feet aft of turning aircraft.

**Note:** Additionally, keep engine operations to a minimum during operational checks with wings in the folded position. Limit operations at reverse to 1 minute with wings folded.

d. High Power: High Power is defined as one engine operating with a power setting greater than 2000 ISHP, or both engines operating with more than one power lever above ground idle.

e. Engine windmill is considered a low power turn.

f. Ground idle on the C-2A aircraft is known as "High Speed Ground Idle."

## 5. Responsibilities

a. The Commanding Officer (CO) shall:

(1) Designate individuals as APU/Engine Low/High power turn qualified utilizing enclosure (1).

(2) Ensure all personnel conducting engine low power and high power turns are thoroughly familiar with the contents of this instruction and its references, including system checks required to be performed by maintenance personnel during low power and high power turn evolutions.

b. The Maintenance Officer (MO) shall:

(1) Recommend personnel to begin comprehensive training program.

(2) Recommend approval or disapproval of APU/Engine Low/High power Turn license forms (OPNAV 4790/162) and forward to the CO.

(3) Recommend approval or disapproval of APU/Engine Low/High power turn qualifiers using enclosure (4) and forward to the CO.

(4) When necessary as determined by leadership discretion, recommend suspension for cause of APU/Engine Low/High power turn operator license(s) for a specified period of time.

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(5) Ensure re-qualification due dates for qualified personnel are included in the Monthly Maintenance Plan.

c. The Aircraft Division Officer (ADO) shall:

(1) Ensure sufficient numbers of personnel are qualified to effectively support maintenance requirements.

(2) Coordinate with the Training/Schedules Officer for flight simulator training requirements.

(3) Coordinate with Maintenance Control for training of engine turn candidates.

(4) Monitor progress of all engine turn candidates.

(5) Coordinate with the Naval Aviation Training Operating Procedures Standardization (NATOPS) Officer to administer open and closed book NATOPS tests and operational exams.

(6) Ensure copy of Taxi/Turnup/APU License (OPNAV 4790/162) is filed in the individual's Qualification and Certification Record (QCR) and forwarded to the personnel office for service record entries.

d. The NATOPS Officer shall:

(1) Manage the squadron APU/Low/High power engine turn qualification program.

(2) Develop open and closed book NATOPS examinations for APU, low power, and high power.

(3) Maintain a turn qualification program binder that contains at a minimum; points of contact, cross reference locator sheets, all applicable current instructions, copies of Taxi/Turn Up Licenses for all turn qualified personnel (including the most recent superseded license if individual has re-qualified), copies of completed training syllabi, QA program monitors, and applicable Air Forces (CNAF) Maintenance Advisories. Retain one full year of the APU/Engine Turn Operator Currency Log, enclosure (5).

(4) Ensure all written and operational examinations are administered in accordance with reference (d).

(5) Coordinate the scheduling of annual re-qualification examinations for all designated personnel with the Aircraft Division Officer.

(6) Ensure that any APU/Low/High power Turn personnel who fail a NATOPS test wait at least seven days prior to a re-take, with documented remedial training accomplished between test attempts.

**Note:** Annual simulator training shall be scheduled for all personnel in the engine/APU turn up program. By exception, this may be waived due to operational requirements, in writing by the Maintenance Officer. Waivers are expressly discouraged, and it is highly recommended that routine simulator training be conducted specifically to ensure personnel remain thoroughly familiar with all emergency procedures. Document all simulator training on enclosure (5).

e. Power Plants Work Center Supervisor shall:

(1) Screen all APU/Low/High power Turn candidates for maturity, motivation, and technical ability prior to recommending individual to the MO via the Division Officer.

(2) Ensure candidates have completed their in-rate specific QPT prior to commencing training.

(3) Assist the ADO in monitoring the progress of all engine/APU turn operator candidates.

(4) Ensure all APU/engine/simulator turns conducted by qualified personnel are logged utilizing enclosure (5). Each qualified individual shall have his or her own separate sheet in the currency log.

(5) Make inputs to the Monthly Maintenance Plan for qualified APU/Low/High Power Turn personnel and re-qualification due dates.

f. The Quality Assurance Officer (QAO) shall:

(1) Ensure that a Quality Assurance Representative (QAR) is present during all aircraft Low/High power engine turns to act as a safety representative (QAR is not required for APU operation).

g. Maintenance Control shall:

(1) Coordinate and direct all maintenance engine turn evolutions.

(2) Ensure Flight Line/Flight Deck Coordinator, required safety observers, and maintenance personnel are properly assigned for all engine turn evolutions.

(3) Prior to each turn, conduct a thorough brief with the engine turn operator and Flight Line/Flight Deck Coordinator, to include a review of the Aircraft Discrepancy Book for any outstanding discrepancies that could affect a safe turn evolution. Document brief utilizing enclosure (6) and retain for six months in turn currency log.

(4) Ensure the turn aircraft has at least 6000 lbs of fuel for high power turns and a sufficient amount of fuel on board to conduct a safe low power turn.

**Note:** For an unchained C-2A low power turn, the aircraft shall be fueled to at least 6000 lbs.

(5) When afloat, obtain permission from Flight Deck Control to conduct Low/High/APU power engine turns.

(6) Ensure only qualified personnel operate engines/APU (trainees shall be under direct supervision of a qualifier at all times).

(7) Forward completed turn currency log, enclosure (5) to Program Manager for filing.

h. The Flight Line/Flight Deck Coordinator shall:

(1) Conduct a brief prior to turn with all assigned turn personnel regarding their specific duties, safety precautions and troubleshooting to be accomplished during the engine turn.

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(2) Low Power/High Power: ensure six safety observers are posted, including one QAR.

(3) APU turns, ensure two safety observers are posted.

**WARNING:**

- **Ensure sufficient clearance exists to allow safe operation of all moveable aircraft surfaces, particularly for wingspread, droop operations, and propeller arc.**
- **For evolutions involving wingfold/spread, or flap/flight control movement, at least one safety observer shall be posted on each side of the aircraft in a position where he or she can monitor all movement of the wings, flaps, and flight controls.**

(4) Ensure sufficient firefighting equipment is available and manned prior to and during the entire engine turn.

(5) When performing a leak check on the engine, station an additional person (seventh individual) to act as a safety observer at the bottom of the ladder/B-4 stand. Ensure B-4 stand is properly secured with tie-down chains, handrails in place, and tow bar secured.

(6) Do not permit any panels to be removed or installed while engine is operating.

(7) Ensure all engine turns are authorized by Flight Deck Control and maintain communication with Flight Deck/Maintenance Control during entire evolution.

(8) Obtain permission from Flight Deck Control prior to any changes in power (i.e., reverse thrust, running power lever up to maximum power). Additionally, ensure area around aircraft is clear of all personnel and support equipment, which may be affected by propeller wash.

(9) Ensure a complete tool inventory and Foreign Object Damage (FOD) walk down is performed prior to any engine start or windmill.

(10) Assist Plane Captain (PC) as required when maintenance personnel must be positioned out of the PC's view.

i. The APU/Engine Low/High Power Turn Operator shall:

(1) Assume overall responsibility for aircraft placement and configuration during setup for APU, low and high power turn.

(2) Conduct all APU/engine turn evolutions in accordance with this instruction and references (a) through (e) with a firm emphasis on safety as the primary concern.

(3) Ensure both cockpit seats are occupied, preferably by qualified turn personnel or an individual under training who is cognizant of all emergency procedures (overall responsibility remains with the qualified turn operator).

**Note:** APU operations require only one person in the cockpit.

(4) Review the Aircraft Discrepancy Book for any discrepancies which might impact the turn evolution.

(5) Ensure pre-start, start, Low/High power, shutdown and post-operational checklists are complied with in accordance with references (a) through (c).

(6) Ensure all tie-down chains, including the high power chain and holdback, if applicable, are properly installed and properly load tested as applicable. This is not required for APU.

**Note:** Tie-down requirements ashore are waiverable by the Commanding Officer for low power turns in locations where tie-down fittings are unavailable. During an unchained low power turn, both power levers shall remain at ground idle or below. A NATOPS qualified pilot shall be present in the cockpit for all unchained turns that require power lever movement above ground idle, to include propeller balance and IBIT.

(7) Ensure wheel chocks are removed prior to high power turns.

(8) Ensure wheel chocks are installed for low power turns. During propeller balancing/IBIT evolution, aircraft wings shall be at spread position, locked, main entry hatch closed, chocks removed and flaps set at 0 degree position.

(9) Ensure that all fasteners, panels, and doors not required for engine turn or wing fold operation are fully secured.

(10) Ensure tow bar is removed prior to all turns.

**Note:** Keep engine operations to a minimum during operational check with wings in the folded position. Limit operation at reverse to one minute with wings folded.

(a) Nose wheel steering handle shall be in the stowed position during low and high power maintenance turns by ground maintenance personnel.

**WARNING:**

- **If the nose wheel steering is engaged for troubleshooters or final checkers, ensure that extreme caution is exercised to prevent injury to ground personnel.**
- **Do not engage nose wheel steering until chocks are removed. Positive communication is crucial to ensure safety.**

(b) Extreme caution should be used during power lever positioning on engine maintenance turns, especially at high power evolutions when setting the friction knob.

(11) Ensure all signals to/from the cockpit are relayed by a qualified Plane Captain.

(12) Establish and maintain radio contact with ground control (ashore only) prior to and during entire turn evolution, including windmills.

(13) Ensure personnel in cockpit during turn evolution wear appropriate safety clothing to include:

- (a) Steel-toed boots
- (b) Long sleeved shirts (not required for APU)
- (c) Radio-equipped cranial or headset

(14) Ensure all personnel in aircraft maintain ICS communication during start/secure sequence.

(15) Complete enclosures (5) and (6) and file in currency log in Maintenance Control.

(16) Ensure all ground locks are installed, with the exception of the arresting hook for engine turns (tail hook pin installed for APU).

(17) Ensure that no aircraft support equipment or personnel are directly behind propeller wash.

j. The Plane Captain shall:

(1) Assist the engine turn operator on pre/post-flight inspections.

(2) Be responsible for all hand signals relayed to/from engine turn operator, the huffer/wells unit operator and maintenance personnel outside of the aircraft.

(3) Stay within view of the flight line/deck coordinator, turn operator, and all maintenance personnel involved in the turn operation (if unable to do so due to aircraft position, the flight line/deck coordinator will assist on the other side of aircraft).

k. Troubleshooters shall:

(1) Ensure the flight deck/line coordinator is aware of all troubleshooting to be performed.

(2) Ensure all signals to/from cockpit are given via the Plane Captain.

**Note:** Safety Observers shall be especially watchful of their specific area assigned for monitoring.

## 6. Aircraft Tie-Down/Holdback Requirements

### **WARNING:**

**No deviation from chain configuration in paragraph 6.a can be made. Chains in unauthorized configuration can injure personnel and/or cause damage to aircraft and equipment.**

a. Low Power Ashore: Four TD-1B tie-down chains; one tie-down fore and one aft from each main landing gear lower 'D' ring.

b. High Power Ashore: One high power hold back chain properly secured to the deck and properly attached to the aircraft nose strut by means of an adapter.

c. Low/High Power Afloat: Refer to the applicable CVN/CVW instruction.

d. Engine Windmill: Same as low power ashore (if no pad eyes are available, chock both main mounts).

e. Tie-down Unavailable: Tie-down requirements ashore are waivable by the Commanding Officer for ground idle low power turns in locations where tie-down fittings are unavailable. During an unchained low power turn, both power levers shall remain at ground idle or below. A NATOPS qualified pilot shall be present in the cockpit for all unchained turns that require power lever movement above ground idle, to include propeller balance and IBIT.

**WARNING:**

- **If utilizing the upper 'D' ring on the C-2A to secure aircraft for Low/High power turns, ensure the catapult extend is not activated, or damage can occur to the aircraft.**

7. Qualifiers

a. All NATOPS-qualified pilots can sign off entries on the APU/Low/High power turn syllabus.

b. The Commanding Officer shall designate maintenance personnel as APU/Low/High power qualifiers utilizing enclosure (6). The turn qualifier shall be a qualified turn operator, E-5 and above, highly recommended by the NATOPS Officer and have been turn qualified for 3 months with no documented deficiencies.

8. Engine Turn Currency

a. Any APU/Low/High power Operator who has not performed a turn within the past 30 days must successfully pass an oral examination of emergency procedures and engine limits, and perform at least one engine start with either a NATOPS qualified pilot or Low/High power turn qualifier. The NATOPS Officer shall document these evolutions in the program binder.

**Note:** 30-day currency turns may be performed using a simulator. However, the next currency turn for any individual must be performed in the aircraft. The use of simulator shall not be allowed for two consecutive currency turns. Utilize enclosure (5) to document currency turns/simulator training.

b. Any APU/Low/High power Operator who has not performed an engine turn within the past 60 days must successfully pass the Low/High power NATOPS closed book exam and perform one turn with either a NATOPS qualified pilot or Low/High power qualifier. The NATOPS Officer shall document these evolutions in the program binder.

c. Any APU/Low/High power operator who has not performed an engine turn after 90 days must successfully pass the annual re-qualification requirements of this instruction. The NATOPS Officer shall document these evolutions in the program binder.

d. Personnel previously qualified by another command of the same platform, having turned within one year, need to meet currency requirements listed in paragraph 8.

e. For personnel with a previous qualification from another command that have been expired for over a year, the entire qualification process must be completed.

9. Annual Re-qualification. Re-qualification must be completed no later than one year from the day the Commanding Officer signed the designation of the initial or previous qualification. Re-qualification consists of successfully passing NATOPS open/closed book tests, and an operational examination. If the qualification has expired, the individual must begin the qualification process over.

10. CNS/ATM Upgrade. Qualified turn operators who have not performed a turn in a CNS/ATM upgraded aircraft shall complete a familiarization turn with a CNS/ATM turn qualifier or CNS/ATM qualified pilot. Specific areas that shall be covered by the qualifier are scan, gauge placement differences and radio operation. Familiarization turn shall be documented on enclosure (7).

11. Emergency Procedures. All emergencies shall be handled in accordance with applicable NATOPS procedures. The Commanding Officer must approve all deviations from NATOPS procedures and

limitations. In the case of an approved NATOPS deviation by the Commanding Officer, all personnel will document knowledge of the change to standard procedure prior to conducting a turn evolution.

## 12. Training

a. APU Operator candidates must complete the training syllabus requirements contained in enclosure (7) and pass the required NATOPS tests within six months of beginning the qualification process. If not completed in six months, they must restart from the beginning.

(1) Prospective candidates must complete specific rate/rank Qualified Proficient Technician (QPT) syllabus (Apprentice or Journeyman as applicable). Aircrew are exempt from this requirement.

(2) Candidates must pass closed and open book NATOPS examinations with a minimum score of 3.3 (82.5%) for closed book and 3.5 (87.5%) for open book (any emergency procedure question missed is an automatic failure of the test).

(3) Candidates shall complete APU operational examination.

(4) Candidates will be designated utilizing enclosure (1).

b. Low power Turn Operator candidates must complete the training syllabus and pass the required NATOPS tests within six months of commencement. If not completed in six months they must restart from the beginning.

(1) C-2A low power turn operator candidates shall be APU qualified as a prerequisite to Low power candidacy.

(2) Candidates must complete their specific rate/rank Qualified Proficient Technician (QPT) syllabus (Apprentice or Journeyman as applicable).

(3) Candidates must complete the training syllabus, enclosure (2) for C-2A, enclosure (8) for E-2C, or enclosure (9) for E-2D.

(4) Candidates must observe three low power turn evolutions from the right seat and document turns in training syllabus.

(5) Candidates must complete five low power turn evolutions from the left seat with a qualified pilot or turn qualifier. Document engine turns in the training syllabus.

(6) Candidates must pass the closed and open book NATOPS examination written by the NATOPS Officer with a minimum score of 3.3 (82.5%) for closed book and 3.5 (87.5%) for open book (any emergency procedure question missed is an automatic failure of the test).

(7) Candidates must complete low power emergency procedures examination in the simulator (if simulator is not available, conduct static drill in aircraft).

(8) Candidates must complete a low power evaluation turn.

(9) Candidates will be designated utilizing enclosure (1).

**Note:** It is highly recommended that the Program Manager or NATOPS Officer perform training using simulator prior to any aircraft turns to familiarize candidates with emergency procedures.

c. High power Turn Operator candidates must complete the training syllabus and pass the required NATOPS tests within six months of qualification commencement. If not completed in six months they must restart from the beginning.

(1) Candidates must complete the training syllabus, enclosure (3) for C-2A, enclosure (10) for E-2C, or enclosure (11) for E-2D.

(2) Candidates shall be APU, if applicable, and Low power Turn qualified as a prerequisite to high power candidacy.

(3) Candidates must observe two high power turn evolutions from the right seat and document engine turns in training syllabus.

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(4) Candidates must complete three high power turn evolutions from the left seat with a qualified pilot or turn qualifier. Document all turns in training syllabus.

(5) Candidates shall review aircraft turnup emergency procedures contained in references (a) through (c) as they apply to high power settings.

(6) Candidates shall review T56-A-425/T56-A-427/A engine limitations found in references (a) through (c) as they apply to high power settings.

d. High power Turn Operator Evaluation. After successful completion of the high power turn syllabus, the NATOPS Officer shall evaluate the candidate's performance as follows:

(1) Satisfactory completion of high power emergency procedures in a simulator. If the simulator is not available, conduct a static procedures drill in an aircraft.

(2) Successfully pass the closed and open book examinations with a minimum score of 3.3 (82.5%) for closed book and 3.5 (87.5%) for open book (any emergency procedure question missed is an automatic failure of the test).

(3) Successfully pass an operational turnup.

(4) Candidates will be designated utilizing enclosure (1).

  
M. W. DANEHY

Distribution:

COMACCLOGWINGINST 5216.1F

List A1, A2, A3 (Case I)

<b>TAXI TURNUP/APU LICENSE</b>			
<b>PART I - REQUEST</b>			
1. NAME-LAST, FIRST, MIDDLE INITIAL		2. RATE/GRADE	3. DEPARTMENT/DIVISION
4. AIRCRAFT TYPE/MODEL/SERIES	5. UNIT		6a. TYPE OF LICENSE 6b. HIGH/LOW POWER
7a. DATE OF WRITTEN EXAM(S)	7b. RESULTS	8a. ADMINISTERED BY (PRINT)	8b. SIGNATURE
9a. DATE OF OPERATIONAL EXAM	9b. RESULTS	10a. ADMINISTERED BY (PRINT)	10b. SIGNATURE
<b>PART II - CERTIFICATION</b>			
I certify that I understand my responsibilities as set forth in the current Wing/MAG/MALS instructions, applicable NATOPs manual and the OPNAV Instruction 4790.2.			
11a. SIGNATURE OF MEMBER			11b. DATE
I certify this member has completed all training and testing requirements and recommend approval.			
12a. SIGNATURE OF MAINTENANCE OFFICER			12b. DATE
<b>PART III - APPROVING OFFICIAL ACTION</b>			
Member in part I is authorized to perform Taxi/Engine/APU Turnups as indicated for a period of one year from this date unless suspended/revoked by approving official.			
13a. SIGNATURE OF COMMANDING OFFICER			13b. DATE
ORIGINAL TO QUAL/CERT RECORD			

OPNAV 4790/162 (APR 02)

**C-2A LOW POWER ENGINE TURNUP OPERATOR TRAINING SYLLABUS**

Notes: Only qualified turn operators or NATOPS qualified pilots may sign off completed sections after written and or oral examination or by observation of performance.

- |  | <u>Signature/Date</u> |
|--|-----------------------|
| 1. Required reading list   |                       |
| c. NAVAIR A1-C2AHB-NFM-000<br>(chapters 2-6, 12)   | _____                 |
| d. NAVAIR 00-80T-113 Aircraft hand signals   | _____                 |
| 2. Discuss safety precautions and associated hazards of the following with a designated qualifier. |                       |
| a. Awareness of C-2A danger areas:   |                       |
| (1) Propeller Arc  | _____                 |
| (2) Engine   | _____                 |
| (3) Bleed Air  | _____                 |
| (4) Flight Controls  | _____                 |
| (5) Arresting hook   | _____                 |
| (6) Ground support equipment positioning   | _____                 |
| b. Operation of radios   | _____                 |
| c. Location and proper operation of fire extinguishing equipment                                   | _____                 |
| d. FOD hazards   | _____                 |
| e. Tool control program (including lost or broken tool report procedures)                          | _____                 |
| f. Hearing conservation  | _____                 |
| g. Proper use of chocks and chains   | _____                 |
| h. Catapult extend   | _____                 |

Signature/Date

- i. Ramp and cargo door operation \_\_\_\_\_
  - j. Wings spread and fold operation \_\_\_\_\_
  - k. Nose wheel steering operation \_\_\_\_\_
  - l. Arresting hook operation \_\_\_\_\_
3. Discuss the uses, evolution of events, and applicable hazards of the following with a designated qualifier.
- a. Requirement for low power turnup \_\_\_\_\_
  - b. Review of aircraft discrepancy book \_\_\_\_\_
  - c. Currency log \_\_\_\_\_
  - d. Aircraft tie-down requirement(afloat/ashore) \_\_\_\_\_
  - e. NATOPS walk around inspection/pre-start requirements \_\_\_\_\_
  - f. Securing of panels/ requirements (include overhead cowling panels) \_\_\_\_\_
  - g. Support equipment requirement \_\_\_\_\_
  - h. Normal operation of cargo ramp and door \_\_\_\_\_
  - i. Normal/auxiliary brake operation \_\_\_\_\_
  - j. Wing fold system operation (include hazards associated with folding and spreading) \_\_\_\_\_
  - k. Flap operation \_\_\_\_\_
  - l. Operation of the catapult extend system \_\_\_\_\_
  - m. Arresting hook operation \_\_\_\_\_
  - n. External power operation \_\_\_\_\_
  - o. Normal generator operation \_\_\_\_\_

- p. Emergency generator operation \_\_\_\_\_  
Signature/Date
- q. Engine start \_\_\_\_\_
- (1) Hand signals (day and night) \_\_\_\_\_
- (2) Engine starts with APU and external power  
to low speed ground idle (LSGI) or normal RPM. \_\_\_\_\_
- (3) Engine starts with APU and EGEN power  
to low speed ground idle or normal RPM. \_\_\_\_\_
- (4) Engine starts using external air \_\_\_\_\_
- (5) Normal engine starting sequence \_\_\_\_\_
- (6) Scan during start \_\_\_\_\_
- (7) Ground start relay/holding circuit \_\_\_\_\_
- (8) Bleed air interlock \_\_\_\_\_
- (9) Bleed air valves during start \_\_\_\_\_
- (10) Starter inertial switch \_\_\_\_\_
- (11) Speed sense control (16%, 65%, 94%) \_\_\_\_\_
- (12) Speed sense valve \_\_\_\_\_
- (13) Engine operating limits (starting,  
LSGI, ground idle, flight idle, maximum reverse,  
transient) \_\_\_\_\_
- (14) Use of checklists \_\_\_\_\_
- (15) Blade angle calibration \_\_\_\_\_
- (16) Electronic propeller control \_\_\_\_\_
- r. Engine shutdown, post run walk around \_\_\_\_\_
- s. Emergency procedures \_\_\_\_\_
- (1) Fire during APU start \_\_\_\_\_
- (2) Emergency T-handle versus condition \_\_\_\_\_

lever

\_\_\_\_\_  
Signature/Date

- (3) Fluid leak \_\_\_\_\_
- (4) Fumes of any kind \_\_\_\_\_
- (5) Foreign object damage to engine  
or propeller \_\_\_\_\_
- (6) Hot start \_\_\_\_\_
- (7) Hung Start \_\_\_\_\_
- (8) Prop pump light > 60% \_\_\_\_\_
- (9) Engine fire on deck \_\_\_\_\_
- (10) Start valve control open after 60% \_\_\_\_\_
- (11) Bleed air overheat light \_\_\_\_\_
- (12) Chip light \_\_\_\_\_
- (13) Jammed/binding flight controls \_\_\_\_\_
- (14) Brake Failure \_\_\_\_\_
- (15) Multiple emergencies \_\_\_\_\_
  
- t. Conditions for aborting engine start
  - (1) Propeller fails to rotate on start \_\_\_\_\_
  - (2) No oil/hydraulic pressure indication \_\_\_\_\_
  - (3) No fuel flow/light-off \_\_\_\_\_
  - (4) Exceeding time to stabilized start \_\_\_\_\_
  - (5) Electronic Propeller control (EPC)/  
Channel Lights \_\_\_\_\_

4. Discuss the following maintenance turn evaluations with a  
qualifier:

- a. Engine anti-ice check \_\_\_\_\_
- b. Bleed air control check \_\_\_\_\_  
Signature/Date
- c. Engine wash \_\_\_\_\_
- d. Calibrate shaft horse power gauge \_\_\_\_\_
- e. Propeller balance \_\_\_\_\_
- f. Operational check flight control surfaces \_\_\_\_\_
- g. Blade angle calibration \_\_\_\_\_
- h. Propeller IBIT \_\_\_\_\_
- i. Mechanical Feather Check \_\_\_\_\_

5. Observe 3 engine turns from right seat.

<u>Aircraft</u>	<u>Signature/Date</u>
_____	_____
_____	_____
_____	_____

**Note:** Candidate must observe 3 turns from right seat prior to left seat starts.

6. Perform 5 engine starts from left seat.

<u>Aircraft</u>	<u>Signature/Date</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

**C-2A HIGH POWER ENGINE TURNUP OPERATOR TRAINING SYLLABUS**

**Note:** Only qualified turn operators or NATOPS qualified pilots may sign off completed sections after written and/or oral examination, or by observation of performance. Individual must be low power turn qualified before starting this syllabus.

1. Discuss safety precautions and associated hazards of the following with a designated qualifier:

- |  | <u>Signature/Date</u> |
|--|-----------------------|
| a. Proper use of chains for high power                       | _____                 |
| b. Flaps set at zero/wing spread                             | _____                 |
| c. Hatches and panels closed                                 | _____                 |
| d. Surrounding area clear of support equipment and personnel | _____                 |
| e. Proper position of tow link with high power chain.        | _____                 |

2. Discuss the uses, evolution of events, and applicable hazards of the following with a designated qualifier:

- |   |       |
|---|-------|
| a. Requirements for high power turnup                 | _____ |
| b. Aircraft tie-down requirements (afloat and ashore) | _____ |
| c. Designated high power turnup areas                 | _____ |
| e. Engine efficiency run                              | _____ |

3. Perform each of the following operational checks 3 times:

- |                           |       |
|---------------------------|-------|
| b. Engine performance run | _____ |
|                           | _____ |
|                           | _____ |

Signature/Date

d. Rich lean check

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

f. Temperature datum check

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

g. FCF Requirements prior to flight

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Discuss the following emergency scenarios (at a minimum, but not limited to) associated with high power turn evolutions with a qualified NATOPS pilot.

Signature/Date

a. Engine fire with max power set on one engine

\_\_\_\_\_

b. Loss of brakes with maximum power set

\_\_\_\_\_

c. EPC failure

\_\_\_\_\_

d. Engine Propeller Fluctuation

\_\_\_\_\_

e. Prop Pump light

\_\_\_\_\_

5. Observe 2 engine high power turns from right seat.

Aircraft

Signature/Date

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

6. Perform 3 engine starts from left seat.

**Note:** Candidate must observe 3 high power turns from right seat prior to left seat starts.

<u>Aircraft</u>	<u>Signature/Date</u>
_____	_____
_____	_____
_____	_____

E-2C/D OR C-2A APU/ENGINE TURN QUALIFIER DESIGNATION

From: Unit Pilot NATOPS Officer  
To: Commanding Officer VAW/VRC \_\_\_\_\_  
Via: Maintenance officer

Subj: RECOMMENDATION FOR DESIGNATION AS TURN QUALIFIER

Ref: (a) COMNAVAIRFORINST 4790.2B  
(b) COMACCLOGWINGINST 11018.1J

1. Recommendation For Designation As Turn Qualifier For:

- ( ) E-2C NU/MCU ACIS
- ( ) E-2C HE2K
- ( ) E-2D
- ( ) C-2A
- ( ) APU ( ) LOW POWER ( ) HIGH POWER

ICO \_\_\_\_\_  
Rate, Name

\_\_\_\_\_  
Unit Pilot NATOPS Officer/Date  
Signature

-----  
FIRST ENDORSEMENT

From: Maintenance Officer  
To: Commanding Officer

1. Having met the requirements in references (a) and (b), this individual is hereby recommended as an APU ( ) Low Power ( ) High Power ( ) Turn Qualifier for the following T/M/S license listed above.

2. Forwarded recommending ( ) approval or ( ) disapproval.

\_\_\_\_\_  
Maintenance Officer/Date  
Signature

SECOND ENDORSEMENT

From: Commanding Officer

To: \_\_\_\_\_  
Rate, Name

1. You are hereby designated as an APU( ), Low Power( ),  
High Power( ) Turn Qualifier for the following T/M/S:

- ( ) E-2C NU/MCU ACIS
- ( ) E-2C HE2K
- ( ) E-2D
- ( ) C-2A
- ( ) APU ( ) LOW POWER ( ) HIGH POWER

\_\_\_\_\_  
Commanding Officer/ Date  
Signature

Copy To:  
Maintenance Officer  
Pilot NATOPS Officer  
Aircraft Division Officer  
Service record  
Qualification and Certification Record



COMACCLOGWINGINST 11018.1J

17 Oct 12

Enclosure (5)

## MAINTENANCE TURN BRIEF GUIDE

BUNO	
DATE/TIME	
APU/LOW/HIGH	
FUEL LOAD	
REASON FOR TURN?	
TURN OPERATOR	
FDC	
QAR	
PROPERLY CHAINED FOR TYPE OF TURN?	Y / N / WAIVED BY CO OR OIC
PROPER AMOUNT OF PERSONNEL FOR SAFETY CHAIN?	Y / N
PERSONNEL QUALIFIED FOR THE JOB?	Y / N
ALL REQUIRED TOOLS AND SE AVAILABLE AND POSITIONED PROPERLY?	Y / N
ADB REVIEWED BY TURN OPERATOR?	Y / N

TURN OPERATOR SIGNATURE: \_\_\_\_\_

MAINTENANCE CONTROL SIGNATURE: \_\_\_\_\_

**C-2A AUXILIARY POWER UNIT QUALIFICATION SYLLABUS**

1. General Aircraft Information (A1-C2AHA-GAI-200)

Signature/Date

a. WP 017 00 (ground run-up/noise  
danger areas)

\_\_\_\_\_

b. WP 032 00 (exterior safety checks)

\_\_\_\_\_

c. WP 033 00 (interior safety checks)

\_\_\_\_\_

d. WP 042 00 (APU servicing)

\_\_\_\_\_

e. WP 051 00 (APU operation)

\_\_\_\_\_

2. C-2A NATOPS manual (A1-C2AHA-NFM-000)

a. Para 2.4 (APU)

\_\_\_\_\_

b. Para 2.5 (electrical)

\_\_\_\_\_

c. Para 2.6 (interior lights)

\_\_\_\_\_

d. Para 2.7 (exterior lights)

\_\_\_\_\_

e. Para 2.8 (hydraulics)

\_\_\_\_\_

f. Para 2.9 (flight controls)

\_\_\_\_\_

g. Para 2.12 (landing gear)

\_\_\_\_\_

h. Para 2.13 (wing fold)

\_\_\_\_\_

i. Para 2.16 (caution and advisory lights)

\_\_\_\_\_

j. Para 2.20 (environmental controls)

\_\_\_\_\_

k. Para 2.29.1 (cargo door and ramp)

\_\_\_\_\_

l. Para 2.30 (emergency equipment)

\_\_\_\_\_

m. Para 7.2 (pre-flight inspection)

\_\_\_\_\_

Signature/Date

- n. Para 7.5 (pre-start checklist) \_\_\_\_\_
  - o. Para 7.6 (before starting engine) \_\_\_\_\_
  - p. Para 7.9 (post start procedures) \_\_\_\_\_
  - q. Para 7.22 (ground secure checklist) \_\_\_\_\_
  - r. Para 12.2 (APU fire) \_\_\_\_\_
  - s. Para F0-9 (battery bus) \_\_\_\_\_
3. Pre-requisites
- a. C-2A Cockpit Familiarization/Electrical Power Application Training Syllabus Qualification \_\_\_\_\_
4. The trainee shall discuss and demonstrate the following tasks under the direct supervision/observation of an APU qualifier or NATOPS qualified pilot.
- a. Safety hazards associated with APU operation. \_\_\_\_\_
  - b. NATOPS checklist \_\_\_\_\_
  - c. Wing fold arresting hook operations \_\_\_\_\_
  - d. Actuation of cargo ramp and doors \_\_\_\_\_
  - e. Nose wheel steering \_\_\_\_\_
  - f. Catapult extend \_\_\_\_\_
  - g. Proper loading and unloading of hydraulic switch \_\_\_\_\_
5. The trainee shall discuss the following abnormal or emergency conditions while starting the APU with an APU qualifier or NATOPS qualified pilot.
- a. Unsolicited propeller rotation \_\_\_\_\_

Signature/Date

- b. APU fire during operation \_\_\_\_\_
  - c. Faults monitored by the APU Engine Control Unit (ECU) \_\_\_\_\_
6. The trainee will demonstrate a working knowledge of the following with an APU qualifier or NATOPS qualified pilot.
- a. APU fire procedures (3 times) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
  - b. Failure of the APU to shutdown normally \_\_\_\_\_
  - c. Perform an APU preoperational check (3 times) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
  - d. Perform an APU start (3 times) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**E-2C LOW POWER ENGINE TURNUP OPERATOR TRAINING SYLLABUS**

**Note:** Only qualified turn operators or NATOPS qualified pilots may sign off completed sections after written and/or oral examination, or by observation of performance.

1. Required reading list (trainee will sign required reading only after completion): NA01-E2AAF-1 (E-2C NATOPS)

Signature/Date

- a. Part I, chapter 1, Aircraft and engine (para 1.1 - 1.2) \_\_\_\_\_
  
- b. Part I, chapter 2 (systems)
  - (1) Power plants system (para 2.1-2.1.9) \_\_\_\_\_
  - (2) Propeller system (para 2.2-2.2.6) \_\_\_\_\_
  - (3) Fuel system (para 2.3-2.3.7) \_\_\_\_\_
  - (4) Electrical system (para 2.4-2.5.7) \_\_\_\_\_
  - (5) Exterior lighting system (para 2.6 - 2.6.5) \_\_\_\_\_
  
  - (6) Interior lighting system (para 2.7 - 2.7.6) \_\_\_\_\_
  
  - (7) Hydraulic system (para 2.8 - 2.8.9) \_\_\_\_\_
  - (8) Wing fold and automatic jury strut system (para 2.12 - 2.12.1) \_\_\_\_\_
  - (9) Advisory/caution lights (para 2.15 - 2.15.2) \_\_\_\_\_
  
  - (10) Engine fire detection (para 2.16 - 2.16.2) \_\_\_\_\_

Signature/Date

- (11) Environmental control system (para 2.18 - 2.18.3) \_\_\_\_\_
  
- c. Part I, chapter 3 (service and handling)
  - (1) Servicing data (para 3.1 - 3.6.2) \_\_\_\_\_
  - (2) External power requirements (para 3.7-3.8.3) \_\_\_\_\_
  
  - (3) Danger areas (para 3.9 - 3.9.3) \_\_\_\_\_
  - (4) Aircraft handling (para 3.10-3.10.2.3) \_\_\_\_\_
  
- d. Part I, chapter 4 (operating limitations)
  - (1) Starting time limit (para 4.3.1) \_\_\_\_\_
  - (2) Engine and propeller operating limits  
(fig 4-1, 4-2, 4-3) \_\_\_\_\_
  
- e. Part III, chapter 7 (shore based procedures)
  - (1) Line operations (para 7.3) \_\_\_\_\_
  - (2) Checklists (para 7.4) \_\_\_\_\_
  - (3) Pre-flight check (para 7.5 - 7.7.2) \_\_\_\_\_
  - (4) Pre-start checklist (para 7.8) \_\_\_\_\_
  - (5) Before starting engines  
(para 7.9, steps 1- 6) \_\_\_\_\_
  - (6) Starting engines (para 7.10 - 7.10.3) \_\_\_\_\_
  - (7) Engine ground operation (para 7.12) \_\_\_\_\_
  - (8) Secure check (para 7.23) \_\_\_\_\_

Signature/Date

- f. Part III, chapter 9 (carrier based procedures)
  - (1) Starting engines (para 9.5) \_\_\_\_\_
- g. Part V, chapter 13 (ground emergencies)
  - (1) Ground emergencies (para 13.1 - 13.2.7) \_\_\_\_\_

2. Discuss safety precautions and associated hazards of the following with a designated qualifier.

- a. Awareness of E-2C danger areas
  - (1) Propeller arc \_\_\_\_\_
  - (2) Engine exhaust \_\_\_\_\_
  - (3) Bleed air \_\_\_\_\_
  - (4) Control surfaces \_\_\_\_\_
- b. Operation of radios \_\_\_\_\_
- c. Location and proper operation of fire extinguishing equipment \_\_\_\_\_
- d. FOD hazards \_\_\_\_\_
- e. Tool control program (including lost/broken tool procedures) \_\_\_\_\_
- f. Hearing conservation \_\_\_\_\_
- g. Proper use of Chocks and Chains \_\_\_\_\_

3. Discuss the uses, evolution of events, and applicable hazards of the following with a designated qualifier.

- a. Requirements for low power turnup \_\_\_\_\_
- b. Review of aircraft discrepancy book \_\_\_\_\_
- c. Aircraft tie-down requirements (afloat and ashore) \_\_\_\_\_

Signature/Date

- d. NATOPS walk around inspection/pre start requirements \_\_\_\_\_
- e. Securing of panels/requirements (include overhead cowling panels) \_\_\_\_\_
- f. Support equipment requirements/positions \_\_\_\_\_
- g. Normal/auxiliary brake operation \_\_\_\_\_
- h. Wing fold system operation (include hazards associated with folding and spreading) \_\_\_\_\_
- i. Flap operation \_\_\_\_\_
- j. Tail hook operation \_\_\_\_\_
- k. External power application \_\_\_\_\_
- l. Normal generator operation \_\_\_\_\_
- m. Emergency generator operation \_\_\_\_\_
- n. Engine start
  - (1) Hand signals (day and night) \_\_\_\_\_
  - (2) Engine starts using external air \_\_\_\_\_
  - (3) Normal engine starting sequence \_\_\_\_\_
  - (4) Scan during start \_\_\_\_\_
  - (5) Ground start relay/holding \_\_\_\_\_
  - (6) Bleed air interlock \_\_\_\_\_
  - (7) ECS valve during start \_\_\_\_\_
  - (8) Starter inertial switch \_\_\_\_\_
  - (9) Digital electronic trim control \_\_\_\_\_

Signature/Date

- (10) Electronic Propeller Control \_\_\_\_\_
- (11) Speed sense valve \_\_\_\_\_
- (12) Use of checklists \_\_\_\_\_
- (13) Blade angle calibration \_\_\_\_\_
- (14) Engine operating limits (starting, LSGI,  
ground idle, flight idle, maximum reverse, transient) \_\_\_\_\_
- o. Engine shutdown, post run walk around \_\_\_\_\_
- p. Emergency procedures
- (1) Engine fire on deck \_\_\_\_\_
- (2) Emergency T-handle versus condition  
lever \_\_\_\_\_
- (3) Fluid leak \_\_\_\_\_
- (4) No oil pressure after 35% \_\_\_\_\_
- (5) Foreign object damage to engine  
or propeller \_\_\_\_\_
- (6) Hung start \_\_\_\_\_
- (7) Slow start \_\_\_\_\_
- (8) Bleed air overheat light \_\_\_\_\_
- (9) Engine chip light \_\_\_\_\_
- (10) Start valve open after 62% \_\_\_\_\_
- (11) Hot start Turbine Measured Temperature  
(TMT) exceeds 830 degrees \_\_\_\_\_
- (12) No primary pump out light on start \_\_\_\_\_
- (13) #1 or #2 prop pump light on above 60% \_\_\_\_\_

Signature/Date

- (14) RPM/HP/TMT/Fuel Flow fluctuations \_\_\_\_\_
- (15) Hydraulic system failure \_\_\_\_\_
- (16) Brake failure \_\_\_\_\_
- (17) Loss of Electrical Power \_\_\_\_\_
- (18) Jammed/binding flight controls \_\_\_\_\_
- q. Conditions for aborting engine start.
  - (1) Propeller fails to rotate on start \_\_\_\_\_
  - (2) No Oil/hydraulic pressure indication \_\_\_\_\_
  - (3) Exceeding time to stabilized start \_\_\_\_\_
  - (4) No fuel flow/light-off \_\_\_\_\_
  - (5) No suction/pressure on start \_\_\_\_\_
  - (6) Engine Propeller Control (EPC) and Channel lights \_\_\_\_\_
- 4. Discuss the following maintenance turn evaluations with a qualifier.
  - a. Engine anti-ice check \_\_\_\_\_
  - b. Ejector air check \_\_\_\_\_
  - c. Perform engine wash \_\_\_\_\_
  - d. Calibrate shaft horsepower gauge \_\_\_\_\_
  - e. Propeller balance \_\_\_\_\_
  - f. Oil cooler flap check \_\_\_\_\_
  - g. Emergency generator check \_\_\_\_\_
  - h. Mechanical feather check \_\_\_\_\_

Signature/Date

i. Propeller IBIT

\_\_\_\_\_

5. Observe 3 engine turns from right seat.

Aircraft

Signature/Date

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. Perform 5 engine starts from left seat.

**Note:** Candidate must observe three turns from right seat prior to left seat starts.

Aircraft

Signature/Date

\_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**E-2D LOW POWER ENGINE TURNUP OPERATOR TRAINING SYLLABUS**

**Note:** Only qualified turn operators or NATOPS qualified pilots may sign off completed sections after written and/or oral examination, or by observation of performance.

1. Required reading list (trainee will sign required reading only after completion): NA01-E2AAG-1 (E-2D NATOPS)

Signature/Date

a. Part I, chapter 1, Aircraft and engine (para 1.1 - 1.2)

\_\_\_\_\_

b. Part I, chapter 2 (systems)

(1) Power plants system (para 2.1-2.1.11) \_\_\_\_\_

(2) Propeller system (para 2.2-2.2.6) \_\_\_\_\_

(3) Fuel system (para 2.3-2.3.7) \_\_\_\_\_

(4) Electrical system (para 2.4-2.4.9) \_\_\_\_\_

(5) Exterior lighting system (para 2.5 - 2.5.6)

\_\_\_\_\_

(6) Interior lighting system (para 2.6 - 2.6.6)

\_\_\_\_\_

(7) Hydraulic system (para 2.7 - 2.7.9) \_\_\_\_\_

(8) Wing fold and automatic jury strut  
system (para 2.11 - 2.11.1) \_\_\_\_\_

(9) Advisory, caution and warning system  
(para 2.15 - 2.15.7) \_\_\_\_\_

(10) Engine fire detection (para 2.17 - 2.17.2)

\_\_\_\_\_

Signature/Date

- (11) Environmental control system (para 2.19-2.19.7) \_\_\_\_\_
  
- c. Part I, chapter 3 (service and handling)
  - (1) Servicing data (para 3.1 - 3.7.2) \_\_\_\_\_
  - (2) External power requirements (para 3.8-3.8.3) \_\_\_\_\_
  
  - (3) Danger areas (para 3.9 - 3.9.3) \_\_\_\_\_
  - (4) Aircraft handling (para 3.10-3.10.2) \_\_\_\_\_
  
- d. Part I, chapter 4 (operating limitations)
  - (1) Starting time limit (para 4.3.1) \_\_\_\_\_
  - (2) Engine and propeller operating limits  
(fig 4-1, 4-2, 4-3) \_\_\_\_\_
  
- e. Part III, chapter 7 (shore based procedures)
  - (1) Line operations (para 7.2) \_\_\_\_\_
  - (2) Checklists (para 7.3) \_\_\_\_\_
  - (3) Pre-flight check (para 7.4 - 7.6.2) \_\_\_\_\_
  - (4) Pre-start checklist (para 7.7) \_\_\_\_\_
  - (5) Before starting engines (para 7.8) \_\_\_\_\_
  - (6) Starting engines (para 7.9 - 7.9.3) \_\_\_\_\_
  - (7) Engine ground operation (para 7.12) \_\_\_\_\_
  - (8) Secure check (para 7.24) \_\_\_\_\_

Signature/Date

- f. Part III, chapter 9 (carrier based procedures)
  - (1) Starting engines (para 9.5) \_\_\_\_\_
- g. Part V, chapter 13 (ground emergencies)
  - (1) Ground emergencies (para 13.1 - 13.2.9) \_\_\_\_\_

2. Discuss safety precautions and associated hazards of the following with a designated qualifier.

- a. Awareness of E-2D danger areas/operation
  - (1) Propeller arc \_\_\_\_\_
  - (2) Engine exhaust \_\_\_\_\_
  - (3) Bleed air \_\_\_\_\_
  - (4) Control surfaces \_\_\_\_\_
  - (4) Automatic Power Reserve (inadvertent operation) \_\_\_\_\_
- b. Operation of radios \_\_\_\_\_
- c. Location and proper operation of fire extinguishing equipment \_\_\_\_\_
- d. FOD hazards \_\_\_\_\_
- e. Tool control program (including lost/broken tool procedures) \_\_\_\_\_
- f. Hearing conservation \_\_\_\_\_
- g. Proper use of Chocks and Chains \_\_\_\_\_

3. Discuss the uses, evolution of events, and applicable hazards of the following with a designated qualifier.

- a. Requirements for low power turnup \_\_\_\_\_
- b. Review of aircraft discrepancy book \_\_\_\_\_

Signature/Date

- c. Aircraft tie-down requirements (afloat and ashore) \_\_\_\_\_
- d. NATOPS walk around inspection/pre start requirements \_\_\_\_\_
- e. Securing of panels/requirements (include overhead cowling panels) \_\_\_\_\_
- f. Support equipment requirements/positions \_\_\_\_\_
- g. Normal/auxiliary brake operation \_\_\_\_\_
- h. Wing fold system operation (include hazards associated with folding and spreading) \_\_\_\_\_
- i. Flap operation \_\_\_\_\_
- j. Tail hook operation \_\_\_\_\_
- k. External power application \_\_\_\_\_
- l. Ground battery switch \_\_\_\_\_
- m. Normal generator operation \_\_\_\_\_
- n. Emergency generator operation \_\_\_\_\_
- o. Engine start
  - (1) Hand signals (day and night) \_\_\_\_\_
  - (2) Engine starts using external air \_\_\_\_\_
  - (3) Normal engine starting sequence \_\_\_\_\_
  - (4) Scan during start \_\_\_\_\_
  - (5) Ground start relay/holding \_\_\_\_\_
  - (6) Bleed air interlock \_\_\_\_\_
  - (7) ECS valve during start \_\_\_\_\_

Signature/Date

- (8) Starter inertial switch \_\_\_\_\_
- (9) PCMU \_\_\_\_\_
- (10) Speed sense valve \_\_\_\_\_
- (11) Use of checklists \_\_\_\_\_
- (12) Blade angle calibration \_\_\_\_\_
- (13) Engine operating limits (starting,  
LSGI, ground idle, flight idle,  
maximum reverse, transient) \_\_\_\_\_
- p. Engine shutdown, post run walk around \_\_\_\_\_
- q. Emergency procedures
  - (1) Engine fire on deck \_\_\_\_\_
  - (2) Emergency T-handle versus condition  
lever \_\_\_\_\_
  - (3) Fluid leak \_\_\_\_\_
  - (4) No oil pressure after 35% \_\_\_\_\_
  - (5) Foreign object damage to engine  
or propeller \_\_\_\_\_
  - (6) Hung start \_\_\_\_\_
  - (7) Slow start \_\_\_\_\_
  - (8) Bleed air overheat light \_\_\_\_\_
  - (9) Engine chip light \_\_\_\_\_
  - (10) Start valve open after 62% \_\_\_\_\_
  - (11) Hot start Turbine Measured Temperature  
(TMT) exceeds 830 degrees \_\_\_\_\_

Signature/Date

(12) L or R PCMU fail light on deck \_\_\_\_\_

(13) L or R prop main pump or standby  
pump ACAWS \_\_\_\_\_

(14) RPM/HP/TMT/Fuel Flow fluctuations \_\_\_\_\_

(15) Hydraulic system failure \_\_\_\_\_

(16) Brake failure \_\_\_\_\_

(17) Loss of Electrical Power \_\_\_\_\_

(18) Jammed/binding flight controls \_\_\_\_\_

r. Conditions for aborting engine start.

(1) Propeller fails to rotate on start \_\_\_\_\_

(2) No Oil/hydraulic pressure indication \_\_\_\_\_

(3) Exceeding time to stabilized start \_\_\_\_\_

(4) No fuel flow/light-off \_\_\_\_\_

(5) No suction/pressure on start \_\_\_\_\_

(6) Engine Propeller Control (EPC) and  
Channel lights \_\_\_\_\_

4. Discuss the following maintenance turn evaluations with a  
qualifier.

a. Engine anti-ice check \_\_\_\_\_

b. Ejector air check \_\_\_\_\_

c. Perform engine wash \_\_\_\_\_

d. Calibrate shaft horsepower gauge \_\_\_\_\_

e. Propeller balance \_\_\_\_\_

f. Oil cooler flap check \_\_\_\_\_

Signature/Date

- g. Emergency generator check \_\_\_\_\_
  - h. Mechanical feather check \_\_\_\_\_
  - i. Propeller IBIT \_\_\_\_\_
  - j. Torquemeter gain calibration \_\_\_\_\_
5. Observe 3 engine turns from right seat.

Aircraft

Signature/Date

_____	_____
_____	_____
_____	_____

6. Perform 5 engine starts from left seat.

**Note:** Candidate must observe three turns from right seat prior to left seat starts.

Aircraft

Signature/Date

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

**E-2C HIGH POWER ENGINE TURNUP OPERATOR TRAINING SYLLABUS**

**Note:** Only qualified turn operators or NATOPS qualified pilots may sign off completed sections after written and/or oral examination, or by observation of performance.

1. Discuss safety precautions and associated hazards of the following with a designated qualifier.

Signature/Date

- a. Proper use of chains for high power \_\_\_\_\_
- b. Flaps set at zero/wing spread \_\_\_\_\_
- c. Hatches and panels closed \_\_\_\_\_
- d. Surrounding area clear of support  
equipment and personnel \_\_\_\_\_
- e. Proper position of tow link with high  
power chain \_\_\_\_\_

2. Discuss the uses, evolution of events, and applicable hazards of the following with a designated qualifier.

- a. Requirements for high power turnup \_\_\_\_\_
- b. Aircraft tie-down requirements  
(afloat and ashore) \_\_\_\_\_
- c. Designated high power turnup areas \_\_\_\_\_
- d. Engine efficiency run \_\_\_\_\_

3. Perform each of the following operational checks 3 times each.

- a. Engine performance runs \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature/Date

b. FCF requirements prior to flight

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Discuss the following emergency scenarios (at a minimum, but not limited to) associated with high power turn evolutions with a qualified NATOPS pilot.

a. Engine fire with maximum power set on one engine

\_\_\_\_\_

b. Loss of brakes with maximum power set

\_\_\_\_\_

c. EPC channel/fail light

\_\_\_\_\_

d. Engine Propeller fluctuations

\_\_\_\_\_

e. Propeller pump light

\_\_\_\_\_

5. Observe 2 High Power engine turns from right seat.

Aircraft

Signature/Date

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

6. Perform 3 engine starts from left seat.

Aircraft

Signature/Date

\_\_\_\_\_  
\_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_

**E-2D HIGH POWER ENGINE TURNUP OPERATOR TRAINING SYLLABUS**

**Note:** Only qualified turn operators or NATOPS qualified pilots may sign off completed sections after written and/or oral examination, or by observation of performance.

1. Discuss safety precautions and associated hazards of the following with a designated qualifier.

Signature/Date

- a. Proper use of chains for high power \_\_\_\_\_
- b. Flaps set at zero/wing spread \_\_\_\_\_
- c. Hatches and panels closed \_\_\_\_\_
- d. Surrounding area clear of support  
equipment and personnel \_\_\_\_\_
- e. Proper position of tow link with high  
power chain \_\_\_\_\_

2. Discuss the uses, evolution of events, and applicable hazards of the following with a designated qualifier.

- a. Requirements for high power turnup \_\_\_\_\_
- b. Aircraft tie-down requirements  
(afloat and ashore) \_\_\_\_\_
- c. Designated high power turnup areas \_\_\_\_\_
- d. Engine efficiency run \_\_\_\_\_

3. Perform each of the following operational checks 3 times each.

- a. Engine performance runs \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature/Date

b. FCF requirements prior to flight

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Discuss the following emergency scenarios (at a minimum, but not limited to) associated with high power turn evolutions with a qualified NATOPS pilot.

a. Engine fire with maximum power set on one engine

\_\_\_\_\_

b. Loss of brakes with maximum power set

\_\_\_\_\_

c. PCMU failure

\_\_\_\_\_

d. Engine Propeller fluctuations

\_\_\_\_\_

e. L or R main pump or standby pump ACAWS

\_\_\_\_\_

5. Observe 2 High Power engine turns from right seat.

Aircraft

Signature/Date

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

6. Perform 3 engine starts from left seat.

Aircraft

Signature/Date

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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\_\_\_\_\_  
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