

**BY ORDER OF THE COMMANDER
AIR FORCE SPECIAL OPERATIONS COMMAND**

**AFSOCI 11-219 Volume 3
Addenda B, CF-6
March 7, 2011
*Flying Operations***

FLIGHT CREW CHECKLIST

**Mi-8MTV/Mi-17 ACCEPTANCE AND OR FUNCTIONAL
CHECKFLIGHT**

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This is an AFSOC publication immediately implementing Mi-17/Mi-8MTV Functional Check Flight (FCF) Operations Procedures and Checklists. This checklist is applicable to all subordinate AFSOC flying units, AFSOC gained ANG flying units, and AFRC units under AFSOC oversight that operate the Mi-8MTV/Mi-17 aircraft. Aircrew will use the abbreviated checklists during mission planning and execution. Individuals will carry the applicable guides in the USAF flight crew checklist. Additional notes and supplemental information may be added. This checklist compliments AFSOCI 11-219, Vol 3, Additional Aircraft Operations Procedures, and is printed on standard 8 ½" x 11" bond paper then trimmed to a unique size 4 ½" x 6 ½" that will fit the standard plastic aircrew checklist binders. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, Management of Records, and disposed of in accordance with Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) located at <https://www.my.af.mil/afirms/afirms/afirms/rims.cfm>.

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WARNING: A Functional Check Flight is an exceptionally demanding operation and requires a thorough flight readiness inspection (preflight). The flight readiness inspection is prescribed in the Operator's Manual. It must be completed before each Functional Check Flight. Emergency procedures are found in the applicable Operator's Manual or Checklist (-CL) and are not duplicated in this publication. Before each Functional Check Flight, the pilot will contact maintenance/quality assurance personnel regarding the maintenance that has been completed. In general, the MX schedule of technical manual specifies what MX procedures generate FCFs; consultate the specific system manual for details on accomplishment of the procedures. This manual should be used only by qualified Functional Check Flight pilots as required in AFIs.

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SECTION I. INTRODUCTION

1. PURPOSE

This manual has complete instructions for performing a Functional Check Flight of all variants of the MI8/17-Series. For the specific conditions which require a general or limited Functional Check Flight; refer to the MX schedule of technical manual.

2. DEFINITIONS.

a. Functional Check Flight: A functional test flight for which the primary purpose is to determine whether the airframe, powerplant, accessories, and other equipment are functioning in accordance with predetermined requirements while subjected to the intended environment.

b. **WARNINGS**, **CAUTIONS** and **NOTES**. Warnings, Cautions and Notes are used to emphasize important and critical instructions and are used for the following conditions:

WARNING: An operation procedure, practice, etc., which, if not correctly followed, will result in personnel injury or loss of life.

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CAUTION: An operating procedure, practice, etc., which, if not strictly observed, will result in damage to or destruction of equipment.

NOTE: An operating procedure, condition, etc., which is essential to highlight.

c. Designation Symbols. Designation Symbols, peculiar systems, peculiar systems automatic flight control system also referred to as autopilot, are used in conjunction with text context, paragraph titles, and illustrations to show limited effectively of the material. One or more designators may be used to indicate proper affectivity, unless the material applies to all models and configurations within the manual. Designator symbols shall precede procedural steps. If the material applies to all series and configurations, no designator symbols will be used. When practical, descriptive information is condensed and combined for all models to avoid duplication.

3. GENERAL INFORMATION.

a. This manual covers only Functional Check Flights of the MI-SERIES (MI-17VM) and MI-SERIES (MI-17MT) and in no way supersedes any information in OEM manual or -CL, but is to be used in conjunction with the OEM and -CL and MX manuals.

For the purpose of Functional Check Flights Only, this manual satisfies all the requirements of the -CL from "Preflight Inspection" through "Engine Shutdown".

NOTE: This manual does not contain Emergency Procedures, -CL and OEM for Emergency Procedures.

b. Crew requirements will be as specified in Operators Manual, -CL and the 11-219/11-202 series. A certified FUNCTIONAL CHECK pilot and flight engineer, as designated by the commander, may perform ground runs with the rotor system turning at flat pitch for the purpose of completing engine flushes, flat pitch rotor tracking, tail rotor balancing, engine and oil cooler vibration checks, and other maintenance operational checks that can be completed with the collective maintained in the full down position. The FUNCTIONAL CHECK pilot will occupy the left crew seat. If the MX procedures specify rotors turning, movement of flight control surfaces/engine control levers then the other seat must be occupied by a current and qualified first-pilot (FP), who has been briefed by the FCF pilot as to his specific duties.

4. SPECIAL INSTRUCTIONS.

a. Cargo and Passengers. Cargo and passengers are prohibited on Functional Check Flights.

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b. Forms and Records. Forms and records will be checked prior to the Functional Check Flight to determine maintenance performed and type of test flight required (i.e., general or limited).

c. Configuration. The configuration of the helicopter should be determined before the Functional Check Flight in order to assess performance parameters

d. Post Test Flight Inspection. A thorough visual inspection will be performed to the extent necessary to assure that any deficiencies or shortcomings that developed as a result of the Functional Check Flight are detected and documented.

e. References. When a Functional Check Flight is required to assure proper operation of a specific system(s), refer to the applicable maintenance manual for the limits of that system and specific procedures.

f. Asterisked Checks. An asterisk (*) prior to a check requires that the FCF Check Sheet be annotated with a specific reading, a check (✓) for satisfactory performance, or a (X) for a problem detected will be recorded and the write-up entered in the "remarks" block of the check sheet, and transcribed to the maintenance forms.

g. An (O) indicates a requirement if the equipment is installed.

h. Functional Check Flight Check Sheet. The Check Sheet contained in Section V will be used for all test flights. When

i. a limited FCF is performed for the purpose of determining if specific equipment or systems are operating properly, completion of only that portion of the FCF check sheet applicable to the specific equipment or systems being tested is required. The aircraft FCF check sheets may be locally reproduced. Continuation sheets may be used when necessary. Items that prove to be unsatisfactory during Functional Check Flights and require corrective action should be listed in the remarks block during flight and transferred to maintenance forms immediately after termination of the flight. The Functional Check Flight Check Sheet will be attached to upon completion. After accrual of two or more sheets, the data should be reviewed to determine if trends are developing.

j. Crew Briefings. Prior to the FCF, the FUNCTIONAL CHECK Pilot/MX will brief the aircrew (Copilot/technical observer/inspector, etc) on the maneuvers to be performed and any special requirements, inspections or duties requiring assistance by these personnel.

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SECTION II. FUNCTIONAL CHECK FLIGHT CHECKLIST

GENERAL.

This section contains the Functional Check Flight requirements peculiar to Mil Helicopter Model, MI-SERIES (MI-17VM) and MI-SERIES (MI-17MT) aircraft. Conditions requiring accomplishment of FCF shall be in accordance with applicable maintenance manual. The requirements contained herein are established to assure a thorough inspection of the aircraft before flight, during flight, and upon completion of the Functional Check Flight.

PRIOR TO FUNCTIONAL CHECK FLIGHT

- *1. Forms and records – Check
 - a. Aircraft logbook, MX forms/records, locally required forms, publications, availability of operator's manual, and Functional Check Flight manual/sheet.
- 2. A thorough Preflight inspection in accordance with the requirements contained in this manual, Operators Manual, and – CL
- 3. Special Preflight Checks:
 - a. Wiring of the Track and Balance equipment – secured

- b. Track and Balance Equipment – Installed
- c. Tie Downs/Plugs/Covers – Removed and secured

BEFORE EXTERIOR CHECK

- 1. Publications – Checked
- 2. Helicopter Covers, Plugs, Tie-downs, and Grounding Cables – Removed and Secured
- 3. Chocks Installed – As Required
- 4. Fuel – Check Quantity As Required

EXTERIOR CHECK (BOTTOM)

- 1. Battery Compartment – Closed
- 2. Windscreens and Pilot's Sliding Windows – Clean, No Cracks
- 3. Pitot Static Tubes – Covers Removed, & Unobstructed
- 4. Nose Landing Gear Strut and Tires – Check Condition:
 - a. Strut Extension 4.5" to 5.5" (.032.20.00a)
 - b. Tire Pressure 64 to 71 PSI (.032.40.00a)

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5. KO-50 Heater and RH Fuel Tank – Check for Leaks, Damage, Cap Secure
6. RH Main Landing Gear Strut and Tire – Inspect for overall condition and wear:
 - a. Strut Extension Empty Aircraft up to 9.4”(pg 3.2.3 flt manual)
 - b. Strut Extension 24,471lbs (11,100kg) 3.5”
 - c. Strut Extension 28,660 (13,000kg) 2.4”
 - d. Tire Pressure 78.2 to 85.3 PSI (.032.10.00b)
7. Main Rotor Blades – Check, No Visible Damage, BIM indicators are white
8. Intermediate and Tail Rotor Gearbox Oil Levels – Check
9. Tail Rotor Hub and Blades – Check, no damage
10. Blade Feathering Hinge Sight Gauge – Check
11. Tail Boom, Pylon Attachment, Stabilizer and Tail Skid – Check Condition
- (O)12. Cargo Doors – secured for flight.

13. LH main landing gear strut and tire inspect for overall condition and wear

- a. Strut extension empty aircraft up to 9.4”
- b. Strut extension 24,471 lbs (11,100kg) 3.5”
- c. Strut extension 28,660 (13,000kg) 2.4”

14. LH fuel tank (leaks, damage, cap secure)

(O)15. Inert gas system bursting disk (if installed)

16. Crew entrance door (normal operations)

(O)17. Hoist (visual inspection)

INTERIOR CHECK

1. Portable Fire Extinguisher (installed and serviceable)

2. Survival Gear and Mission Equipment – check as required

3. Pilots/FE Seats – Check

4. Cargo Hook – Check

(O)5. Inert Gas System (check condition)

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6. Load (CG within limits and properly secure)
7. Emergency Escape Hatches (secure for flight)
8. Tailboom Interior (no FOD, TR cables serviceable)

EXTERIOR CHECK (TOP)

ENGINE, MAIN GEARBOX, and APU DECK

1. Covers and Plugs (removed and stowed)
2. Right Engine:
 - a. Inspect Dust Protection Device
 - b. Inlet Section and Compressor Blades
 - c. Engine Driven Fuel Pump
 - d. Engine Temp Sensing Probe
 - e. NTK Tach Generator
 - f. Oil Filler Cap – Secure
 - g. Oil Tank Capacity – Minimum 8 liters/Maximum 11 liters

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- h. Fuel Control Unit – No Leaks, Control Rods Secure and No Excessive Play
 - i. Engine General Condition and Security
- 3. APU Area/Tailboom Top:
 - a. Air Intake Unobstructed
 - b. Oil Level check between lines
 - c. No Oil or Fuel Leaks
 - d. Exhaust Not Obstructed
 - e. Top of the Tailboom (lights, antennas horizontal stabilizer check for condition and security)
- 4. Main Rotor System:
 - a. Main Rotor Hub:
 - (1) Hydraulic Damper Reservoir Oil Level Check
 - (2) Check All Hinges (flap, feather, drag)
 - (3) Oil Beakers (undamaged and no water contamination)

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- (4) Pitch Links (safeties, no excessive play)
- (5) Drive Link (no excess play/no damage)
- (O)(6) Bifilar – Check Condition and Security
- b. Main Rotor Blades:
 - (1) Surfaces – Undamaged
 - (2) Anti-icing Electrical Connections – Tight
- 5. Main Gearbox Area Left Side:
 - a. AC Generators (1 rear & 2 front)
 - b. Main Hydraulic Pump (no leaks)
 - c. Main Rotor RPM Tach Generators (2)
 - d. Hydraulic Accumulators Check Secure
- 6. Left Engine:
 - a. Inspect Dust Protection Device
 - b. Inlet Section and Compressor Blades
 - c. Engine Driven Fuel Pump

- d. Engine Temp Sensing Probe
 - e. NTK RPM Tach Generator
 - f. Oil Filler Cap – Secure
 - g. Oil Tank Capacity – Minimum 8 liters/Maximum 11 liters
 - h. Fuel Control Unit – No Leaks, Control Rods Secure and no Excessive Play
 - i. Engine General Condition and Security
- 7. Main Gearbox and Engine Access Panels – Secure
 - 8. Overhead Hatch – Closed
 - 9. Crew/MX Briefing – Complete as required
 - 10. Final Walk-around – Complete

BEFORE STARTING ENGINES

***PEDAL AND SEAT ADJUSTMENT**

CAUTION: Use care when adjusting the pedals as not to damage the shaft when at maximum and minimum settings.

- 1. Tail Rotor Pedal Travel – Check (Pilot and Copilot)

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- a. Pedals – Adjust the pedals fore and aft using the worm screw
 - b. Adjustment range is +/-2.95 inches
 - c. Set pedals for flight
2. Seat Height Adjustment – Check (Pilot, and Copilot):
- a. Ensure that the Seat Adjustment Handles are mounted on the outboard of the Pilot's and Copilot's seats
 - b. Check full travel for smooth operation
 - c. Check that the lock will hold in different positions throughout travel range
 - d. Seat vertical adjustment is 6.3 inches from full down to full up
 - e. Set seat height for flight

NOTE: Before adjusting the tilt on cockpit seats, ensure clearance with avionics behind seats.

(O)3. Seat Tilt Adjustment, – Check (Pilot and Copilot)

- a. Ensure that the Seat Tilt Adjustment Handles are mounted on the outboard of the Pilot's and Copilot's seats

b. Check that lock will hold in different positions throughout travel range. Check that seat moves through full range smoothly

c. Range of motion is 19 to 23 degrees or 21 to 25 degrees depending on guide strut attachment to the floor brackets.
(.025.10.00a)

d. Set seat tilt for flight

4. Seatbelt and Shoulder Harness – Check (Pilot, Copilot and Crewmembers)

a. Check Condition and Security

b. Check inertia lock by jerking harness and with manual lock lever

c. Fasten and tighten for flight

d. Ensure the lock knob is on the left side of the seats

***FLIGHT CONTROLS**

NOTE: If the rotor brake is not in the full down position a micro switch on the base of the rotor brake handle will be activated and will not allow engine start.

5. Rotor Brake Handle – Check full down

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CAUTION: If the hydraulic mule is not connected, moving the controls will cause component damage.

6. Cyclic – Centered (check position)

NOTE: If the aircraft has not been run for an extended period of time, the brake cylinder (tank) pressure will be well below the normal range. Running the aircraft for about 20 minutes will allow the pressure to rebuild.

7. Parking Brake – Set

- a. Parking Brake Handle – SET (engage lock lever)
- b. Check Pressure – Normal range is between 31 to 34 Kgf/cm² Reservoir pressure 40 to 50 Kgf/cm².

CAUTION: If the hydraulic mule is not connected, moving the controls will cause component damage.

8. Collective – Full Down

- a. Throttle – Check throttle friction minimum and maximum friction. Check freedom of movement
- b. Turn the throttle full right then full left
- c. Set throttle friction as required

- d. Throttle Set – FULL LEFT
- 9. Engine Control Levers – Check
 - a. ECL's – centered in the detent
 - b. Using one ECL at a time:
 - (1) Check the Lock Button operation
 - (2) Check for smooth operation of the ECL to full up position then to full down position
 - (3) A force of 3 to 5 kg (7 to 11 lbs) is required to move the levers
 - (4) Ensure throttle is interconnected with ECL's and move accordingly
 - c. ECL's – DETEN/T (center position)
- 10. Cockpit Windows Check
 - a. Check condition, freedom of movement (fore and aft), proper locking in the detents
 - b. Check jettisonable window release handle for proper safety wire installation

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- c. Set for flight

11. Stopcocks

Check and Set as follows:

- a. Check fore and aft movement to ensure no binding, moves freely
- b. Ensure that both stopcocks lock in the forward position
- c. STOPCOCKS Set – AFT

***OVERHEAD CONSOLE/PANEL SWITCHES**

12. Left Side Console Switches

Check and Set as follows:

- a. Group 1 & Group 2 RED LIGHT/NVG rheostat knobs – OFF
- b. Upper and Lower signal flare switches – OFF
- (O)c. Voice WARNING System AMP – OFF (if installed)
- d. SRO transponder (if installed) – OFF
- (O)e. Voice WARNING system recorder – OFF (if installed)

- f. Flight Data Recorder – OFF (if installed)
- g. External load release switch – MANUAL (down)
- (O)h. Anti-collision – OFF (center) (if installed on left console)

13. Left Triangle Panel Switches

Check and Set as follows:

- a. Windshield wiper switch – OFF (center)
- b. Pitch limiter switch – OFF (down)
- c. Dome light switch – OFF (center)
- d. Fan switch – OFF (down)
- e. Gyro horizon switch – OFF (down)
- f. Gyro erect switch – OFF (down)
- (O)14. Circuit breaker for standby attitude indicator – OFF (to prevent power application uncaged)
- (O)a. Radar altitude (RV-3) switch – OFF (down) (if installed)

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(O)b. Audio WARNING switch (if installed) – OFF

15. Left Overhead Console Switches

Check and Set as follows:

a. Anti-icing switches – auto/manual switch – AUTO (up)

b. Heating Switches:

(1) Left Engine – OFF (down)

(2) Right Engine – OFF (down)

(3) Windshield heating – OFF (down)

(4) Ice detector switch – OFF (down)

(O)c. Command radio – as desired

d. Anti-icing load current rotary switch – OFF

16. Center Overhead Console

Check and Set as follows:

a. Main and Auxiliary Hydraulic System – ON (up)

b. Fire Extinguishing Switch – OFF (down)

- c. Fire Extinguishing Rotary Dial – OFF
 - d. Squib Selector Switch – I (down)
 - e. APU START/CRANK/FALSE START Switch – CRANK (centered)
 - f. ENGINE L/R START Switch – CENTERED
 - g. ENGINE START/CRANK Switch – CENTERED
 - h. FUEL FIRE SHUTOFF VALVES – OFF (down)
 - i. FUEL CROSSFEED Switch – OPEN (up)
 - j. FUEL BYPASS Switch – OFF (down)
 - k. REFUEL CHECK Switch – CENTERED
 - l. SERVICE TANK PUMP Switch – OFF (down)
 - m. LEFT MAIN TANK PUMP Switch – OFF (down)
 - n. RIGHT MAIN TANK PUMP – OFF (down)
17. Right Overhead Console

Check and Set as follows:

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a. HEATER Switches

- (1) MAN/AUTO Switch – OFF (centered)
- (2) PRIMING Switch – FULL RATE (centered)
- (3) FAN Switch – OFF (down)
- (4) Temperature Rotary Dial – Rotated Left. (0 degrees)

b. Dual ADF Receiver – OFF (left) Top Knob (Выкл)

c. ARK-UD VHF Homing Set – OFF (upper knob - Выкл)

d. Gyromagnetic Compass Control Panel:

- (1). Hemisphere Switch – North (Северно).
- (O)(2). Function Switch – As Desired (MK – Mag Compass, GPK – Directional Gyro, AK – Astro Compass, if installed)
- (3). Latitude Selector – Set at Correct Latitude

e. All Circuit Breakers – ON (up) except:

- (1) ANTI-ICING SYSTEM – OFF. (if not to be used)

*18. Circuit Breakers

Check and Set as follows:

(1) KO-50 HEATER – OFF (if not to be used)

(O)(2) C/B's – OFF (if system not required)

19. Right Triangle Panel Switches

Check and set as follows:

- a. Windshield wiper switch – OFF (center)
- b. 5.5V LIGHT (Doppler Sys) Switch – OFF (down)
- c. MIKE Switch – OFF (down)
- d. VHF ADF INTERLOCK Switch – OFF (down)
- (O)e. DOPPLER Switch – OFF (down)
- f. COMM RADIO Switch – OFF (down)
- g. COMPSYS Switch – OFF (down)
- h. Gyro horizon switch – OFF (down)
- i. Gyro erect switch – OFF (down)
- j. Fan switch – OFF (down)

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- k. Dome light switch – OFF (center)

20. Right Side Console Switches

Check and Set as follows:

- a. Group 1 & Group 2 RED LIGHT/NVG rheostat knobs – OFF
- b. DC VOLTMETER ROTARY Knob – OFF (lower left)
- c. #1/#2 BATTERY Switches – OFF (down)
- d. STBY GEN Switch – OFF (down)
- e. RECTIFIERS 1/2/3 – OFF (down)
- f. EXT PWR Switch – OFF (down)
- g. EQUIPM TEST Switch – OFF (down)
- h. LIGHTING STBY/GENERAL Switches – OFF (down)
- i. NAV LTS Switch – OFF (centered)
- j. FORMAT LIGHTS Switch – OFF (centered)
- k. BLADE TIP LIGHTS Switch – OFF (down)

- l. ANTI-COLL LIGHT Switch – OFF (down)
- m. ENG DUST PROTECTOR LEFT/RIGHT Switches – OFF (down)
- n. HEATING Switches:
 - (1) PITOT LEFT/RIGHT Switch – OFF (down)
 - (2) CLOCK Switch – OFF (down)
 - (3) BATT Switch – OFF (down)
- (O)o. INTER GAS HEAT Switch – OFF (down) (if installed)
- p. FLASH Switch – OFF (down)
- q. ANNUNC Switch – DAY (down)

21. Right Rear Console

Check and Set as follows:

- a. AC POWER VOLTMETER SELECTOR Knob – 115V (lower left)
- b. GENERATORS #1/#2 Switches – OFF (down)

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- c. EXT PWR Switch – OFF (down)
- d. 115VAC Switch – OFF (centered)
- e. 36VAC Switch – OFF (centered)

***PILOT'S/COPILOT'S INSTRUMENTS**

22. Copilot's Instrument Panel

Check and Set as follows:

- a. TAXI LIGHT Switch – OFF (down)
- b. SEARCH LIGHT – OFF (centered)
- (O)c. DOPPLER OFF Button – DEPRESSED
- d. NTK GAUGE – Check for static indication of 0, range markings, and slippage mark
- e. Rotor (MAIN ROTOR TACH) GAUGE – Check for static indication of 0, range markings, and slippage mark
- f. Radar altimeter – Off
- g. Vertical velocity indicators – Check indicators at zero (the set screw on the lower corner will adjust static indications)

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- h. HSI – Check as required, if installed
- i. Attitude Indicator AGB–3K – Check ball centered
- j. Altimeter – Check tower setting against field elevation. Unreliable for instrument flight if more than 70 foot error exists from field elevation. If more than 50 foot error exists, corrective action should be initiated
- k. Airspeed indicators – Compare indicator readings, also note calibration cards if installed
- l. Clock – Check set and running (wind as required)
- m. FUEL QUANTITY SELECTOR switch – OFF

23. Magnetic Compass

Check as follows:

- a. Check full of fluid, no bubbles or discoloration, free in the race
- b. Compensated within the last 12 months
- c. Compensated at every 45 degrees, with compass cards posted in windscreen Plexiglas holders

*24. Avionic Center Console/Stack

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Check and Set as follows:

- a. Transponder – OFF
- b. GPS – OFF
- c. VHF/FM #1 – OFF
- d. UHF #2 – OFF
- e. VHF/GNS #3 – OFF
- f. Pilot's and Copilot's ICS Boxes – Check Condition/Set as Desired
- (O)g. ADF MW/USW Switch – ADF USW (right)

25. Center Console

Check and Set as follows:

- a. GEAR BOX PRESSURE Gauges – Check static indications, range markings, and slippage marks
- b. MAIN GEARBOX OIL TEMP Gauge – Check static indication, range markings, and slippage mark

c. #1 ENG PRESSURE and TEMP Gauge – Check static indications, range markings, and slippage marks

d. #2 ENG PRESSURE and TEMP Gauge – Check static indications, range markings, and slippage marks

(O)e. COMMAND RS Switches – OFF (down)

f. EMERG RECT BYPASS Switch – OFF (down) Cover Closed

g. MAIN TRANSFORMER Switch – OFF (centered)

h. WARN LTS Switch – OFF (centered)

i. Engine Governor VM

Check and Set as follows:

(1) LH ENG GOV Switch – ON (forward)

(2) LEFT ENG EMER PWR Switch – ON (forward)

(3) LH N₂ TEST 1 Switch – ON (centered)

(4) RH NTK TEST Switch – ON (centered)

(5) RH N₂ TEST 1 Switch – ON (centered)

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(6) RIGHT ENG EMER PWR Switch – ON (forward)

(7) RH ENG GOV Switch – ON (forward)

j. Engine Governor MT

Check and Set as follows:

(1) ENG GVROTOR LH PWR Switch – ON (forward)

(2) ENG GVROTOR L FT1/FT2 TEST Switch –
OPERATE (centered)

(3) ENG GVROTOR R FT1/FT2 TEST Switch –
OPERATE (centered)

(4). ENG GVROTOR RH PWR Switch – ON (forward)

26. Pilot's Instrument Panel

Check and Set as follows:

a. Vertical velocity indicators – Check indicators at zero (the set screw on the lower corner will adjust static indications)

b. Turn and slip indicators – Check race full of fluid, needle and ball centered, and alignment between indicators

- c. Attitude Indicator AGB-3K – Check ball centered
- d. HSI – Check as required
- (O)e. ADF MW/USW Switch – ADF USW (right)
- f. Altimeter – Check tower setting against field elevation
Unreliable for instrument flight if more than 70 foot error
exists from field elevation. If more than 50 foot error exists,
corrective action should be initiated.
- g. Airspeed indicators – Compare indicator readings also
note calibration cards if installed
- h. PTIT Gauge – Check condition, range markings, static
indications, and slippage mark
- i. NTK GAUGE – Check for static indication of 0, range
markings, and slippage mark
- j. Rotor (MAIN ROTOR TACH) GAUGE – Check for static
indication of 0, range markings, and slippage mark
- k. Radar altimeter – Off.
- l. ROTOR PITCH INDICATOR – Check Condition (1
degree +/- .5 degrees)
- m. EPR Gauge – Check Condition

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- n. TAXI LIGHT Switch – OFF (down)
- (O) o. LANDING LIGHT Switch – OFF (centered)
- p. SEARCH LIGHT – OFF (centered)
- q. Static system – Combined (centered). Move the switch to the left and right position to check freedom of movement. Return to the centered position

BEFORE STARTING ENGINES – POWER ON

NOTE: For most post phase general test flights utilization of a ground power unit will ensure that the Batteries remain charged.

***1. Battery Switches and Volt Check**

Check and Set as follows:

- a. External Power Switch – OFF
- b. Both Battery Switches – ON
- c. DC Selector Switch – BOTH (Check Voltage)
- d. Battery 2 – OFF
- e. DC Selector Knob – Battery 1

- f. Any fuel boost pump – ON
- g. Check Volts $\geq 24V$
- h. Battery 2– ON
- i. Battery 1– OFF
- j. DC Selector Knob – Battery 2
- k. Check Volts $\geq 24V$
- l. Battery 1– ON (Check Volts ≥ 24)
- m. Fuel boost pump – OFF
- n. DC Selector Knob – Battery Bus

NOTE: Some aircraft have the Anti-Collision Light attached to the BATT BUS, others have it attached to the RECT BUS.

2. Anti-Collision Light – ON

NOTE: Some aircraft have WARNING, CAUTION, and advisory lights in English; a few are in Cyrillic. Most of the aircraft have been modified with NVG filters installed on the lights and at times it may be difficult to distinguish between red, yellow and green lights during daylight conditions.

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External Power – Connect as required (Section IV B. expanded checklist)

***3. WARNING Lights Test**

Check and Set as follows:

a. WARN LTS Switch – WARN LTS (forward)

b. Check these lights on:

(1) L TEMP CONT ON Light

(2) R TEMP CONT ON Light

(3) FLT RCDR ON Light

(4) HOOK OPEN Light. (SHACKLE OPEN)

(5) CLAMSHELLS OPEN Light. (DOORS OPEN)

(6) AUDIO WARN RI-65 ON Light. (SWITCH INF REPORT ON)

(7) ICING Light

(8) ANTI-ICE ON Light

(9) LFT ENG ANTI-ICE ON Light

- (10) RGT ENG ANTI-ICE ON Light
- (11) LFT PZU FWD Light
- (12) RGT PZU FWD Light
- (13) LFT PZU AFT Light
- (14) RGT PZU AFT Light
- (15) SECTION 1 Light
- (16) SECTION 2 Light
- (17) SECTION 3 Light
- (18) SECTION 4 Light
- (19) FIRE LFT ENG Light
- (20) FIRE RGT ENG Light
- (21) FIRE KO-50 Light
- (22) FIRE XMSN/APU Light
- (23) 1ST DISCH (x4) Lights
- (24) 2ND DISCH (x4) Lights

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- (25) MAIN SYS ON Light (hydraulics)
- (26) B/U SYS ON Light (hydraulics)
- (27) DETECTOR TEST Light
- (28) AUTO IGNITION ON Light (APU)
- (29) OIL PRES NORMAL Light (APU)
- (30) RPM NORMAL Light (APU)
- (31) MAXIMUM SPEED Light (APU)
- (32) AUTO IGNITION ON Light (ENGINE STARTING)
- (33) STARTER ON Light (ENGINE STARTING)
- (34) LFT VALVE CLOSED Light (Fuel Fire Shutoff Valves)
- (35) RGT VALVE CLOSED Light (Fuel Fire Shutoff Valves)
- (36) CROSSBLEED OPEN Light
- (37) SERVICE PUMP ON Light
- (38) LFT PUMP ON Light (Left Main Tank Pump)

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- (39) RGT PUMP ON Light (Right Main Tank Pump)
- (40) PREHEAT Light (KO-50 Heater)
- (41) IGNITION Light (KO-50 Heater)
- (42) KO-50 WORKING Light
- (43) LFT PZU ON Light
- (44) RGT PZU ON Light
- (45) TURN ON RECT 1 Light
- (46) TURN ON RECT 2 Light
- (47) TURN ON RECT 3 Light
- (48) EXT PWR ON Light (DC panel)
- (49) EQUIP TEST Light
- (50) GEN 1 FAIL Light
- (51) GEN 2 FAIL Light
- (52) EXT PWR ON Light (AC panel)
- (53) PO-500 ON Light (115VAC Inverter)

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- (54) DOPPLER FAIL Light (Copilot's panel)
- (55) 300 LTR FUEL Light
- (56) CHIP MAIN XMSN Light (Center Console)
- (57) MAINS TO BATT Light (Pilot's Inst Panel)
- (58) LOW OIL P RGT ENG Light
- (59) GOV OFF RGT ENG Light
- (60) LOW OIL P LFT ENG Light
- (61) GOV OFF LFT ENG Light
- (62) HIGH N₂ RGT ENG Light
- (63) EMER PWR RGT ENG Light
- (64) HIGH N₂ LFT ENG Light
- (65) EMER PWR LFT ENG Light
- (66) #2 FUEL FILTER Light
- (67) HIGH VIBE RGT ENG Light
- (68) SHUT OFF RGT ENG Light

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- (69) HIGH VIBE LFT ENG Light
- (70) #1 FUEL FILTER Light
- (71) SHUT OFF LFT ENG Light
- (72) CHIP RGT ENG Light
- (73) CHIP LFT ENG Light
- (74) FIRE Light
- (75) RIGHT ENG FREE TURBINE OVERSPEED Light
- (76) LEFT ENG FREE TURBINE OVERSPEED Light
- (77) R ENG HI VIBE Light
- (78) L ENG HI VIBE Light
- (79) SHUTDOWN R ENG Light
- (80) SHUTDOWN L ENG Light
- (81) CHIPS IN R ENG Light
- (82) AUGM ON Light
- (83) CHIPS IN L ENG Light

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(84) FIRE Light

c. Lamp test switch – Move to FLASH position

d. Place the FLASHER system – ON (up, on the right side console below the DC power panel)

e. Check that the following lights are flashing:

(1) CLAMSHELLS OPEN Light (with protective clip installed, on the cargo door micro switch or door closed the light will not illuminate)

(2) B/U SYS ON Light (hydraulics)

(3) ICING Light

(4) FIRE LFT ENG Light

(5) FIRE RGT ENG Light

(6) FIRE KO-50 Light

(7) FIRE XMSN/APU Light

(8) GEN 1 FAIL Light

(9) GEN 2 FAIL Light

(10) FIRE Light

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- (11) SHUT OFF LFT ENG Light
- (12) SHUT OFF RGT ENG Light
- (13) MAINS TO BATT Light (if installed)
- (14) 300 LTR FUEL Light

- f. Flasher system – OFF (down)
- g. Lamp test switch – OFF (centered)

4. 36 Volt Instrument Transformer Switch – ON (forward)

*5. Cockpit and Cabin Lights

Check as follows:

- a. Pilot's, Copilots, and Flight Engineer Instrument Lights
Rotary Knobs – ON (adjust rheostats to full bright)
- b. Check – All Post lights (only one on each gauge will be
lit with only DC power applied), and all are NVG
compatible
- c. All backdrop lights ON for Pilots & Copilots flight
instrument panel, overhead panels, and left and right side
console panels

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- d. Check Pilot's and Copilot's glare shield NVG floodlights (4 each side) and Center Console floodlight and left and right overhead console floodlights
- e. Rotary Knobs – OFF
- f. Pilot's, Copilot's, and Console NVG Lighting Switches – ON.
- g. Pilot's, Copilot's, and Console NVG Lighting Switches – OFF
- h. Check Pilots and Copilots overhead white & red dome lights and overhead floodlights. Turn on the Cabin lighting switches (located on the right side console). There are 5 white and 6 blue lights in the cabin
- i. Pilot's, Copilot's Switches, and Flight Engineer Instrument Light Rotary Knobs – OFF

NOTE: External power may be required to perform this task if the aircraft is not running.

6. External Lights

Check and Set as follows:

- a. NAV LTS and FORMATION Switches – BRIGHT (up)

- b. Fire Guard Check – Red light on the left side, green on the right side, and white on the tail
- c. NAV LTS and FORMATION Switches – DIM
- d. Fire Guard – Recheck lights. The formation lights are located on top of the tail boom and may be difficult to see
- e. All external light switches – OFF

WARNING: The Mi-17 series helicopters have an infrared filter on the copilot's searchlight (right side). Do not touch or look directly into the light. Care must be given when checking filament operation for presence of heat.

7. Landing and Taxi Lights

Check and Set as follows:

- a. Searchlight Switch – On
- b. Taxi Light – On
- c. Searchlight and Taxi Light – Extend, retract, and rotate from Pilot and Copilot collectives
- d. Searchlight – Set as Required

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- e. Taxi Light – OFF

CAUTION: Prior to conducting the Fire Extinguisher Continuity check, ensure that the Fire Extinguishing Switch is – OFF (down).

CAUTION: If any fire WARNING light is on after completing the test, press the FIRE WARN OFF button and cycle the system circuit breakers before setting the FIRE EXT/TEST switch to the FIRE EXT position.

***8. Fire Extinguisher Continuity Check**

Check as follows:

- a. Fire Detector switch – OFF (down)
- b. Squib Switch – Position 1 (down) lights should not illuminate. If any light comes on the compartment light that illuminates has faulty squib. Check position 2 (up) to same criteria. Return to position 1.
- c. Fire Detector Rotary Knob – Test, lights should not illuminate
- d. Rotary Knob to channel 1 – FIRE LFT ENG, FIRE RGT ENG, FIRE KO-50, FIRE XMSN/APU WARNING lights and FIRE light on Pilot's Console (lower left) should illuminate

e. Rotary Switch to channel 2 – FIRE LFT ENG, FIRE RGT ENG, FIRE KO-50, FIRE XMSN/APU WARNING lights and FIRE light on Pilot's Console (lower left) should illuminate

f. Rotary Switch to channel 3 – FIRE KO-50 light must go out and FIRE LFT ENG, FIRE RGT ENG AND FIRE XMSN/APU WARNING lights and FIRE light on Pilot's Console (lower left) should illuminate

g. Rotary Switch to channels 4, 5, & 6 – the FIRE XMSN/APU WARNING light and FIRE light on Pilot's Console (lower left) must illuminate; all other lights must be out

h. Rotary switch – Off

i. Fire Detector switch – ON (up) DETECTOR TEST LIGHT off

*9. Fuel Pumps Left, Right and Service Tank Switches – ON (up), check three lights, and listen for pumps.

NOTE: These lights may illuminate in the on or off position, check for proper illumination based on individual aircraft. Turn off Left/Right Pumps for battery start.

*10. Fuel Fire Shutoff Valve Switches:

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Check and Set as follows:

- a. Left Fuel Fire Shutoff Valve Switch – ON (up), check LFT VALVE CLOSED light out, listen for valve to cycle
- b. Right Fuel Fire Shutoff Valve Switch – ON (up), check RGT VALVE CLOSED light out, listen for valve to cycle

11. Hydraulic System Switches – ON (up), Main and Auxiliary Systems

12. 115 Volt Inverter Switch – Manual (up)

13. Avionics – ON (Primary Fire/Rescue comm)

*14. Engine Vibration Test

Check as follows:

- a. Engine Vibration Button – Push and Hold
- b. HIGH VIBE RGT ENG Light ON
- c. SHUT OFF RGT ENG Light ON
- d. HIGH VIBE LFT ENG Light ON
- e. SHUT OFF LFT ENG Light ON

- f. Engine Vibration Button – Release

NOTE: At times the test will be above 1,270 with the addition of high ambient temperature.

***15. PTIT Cold Indicator Test**

Check as follows:

- a. PTIT Cold Test Button – Push and hold
- b. Check that both engine PTIT gauges increase to 950–1,270 degrees C
- c. PTIT Test Button – Release

***16. Fuel Quantity Gauge Check**

Check and Set as follows:

- a. Rotate Fuel Quantity Selector to each position
- b. Check quantity of each tank
- c. Compare the total of all tanks to the TOTAL indicated
- d. Fuel Quantity Selector – Service Tank

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APU STARTING PROCEDURES

CAUTION: Abort APU start if any of the following conditions occur after initiating the start sequence:

EGT indication – None indicated in 9 seconds

EGT Rise – Rise above 880 degrees C

System voltage – Drops below 18 VDC.

Auto-start Light illuminated after 30 seconds

Max speed light – Light illuminates

System malfunction – Shut down if detected

NOTE: The oil pressure light may flash during the APU start sequence.

APU START

1. Area – Check clear, blades untied and blade not over the APU exhaust
2. Radio Call – Complete

3. 115V & 36V Inverter Switches – As Required

NOTE: For APU start w/battery – 115v Inverter “Off”.

4. Standby generator switch – Off (down)

5. APU start mode switch – Start (up)

6. Clock – Start

7. APU start button – Press and hold for 2-3 seconds

8. Time sequence:

-0 Sec – Auto ignition light – ON (Check that the Battery system voltage is not below 18 VDC)

-9 Sec – Check for a rise in EGT and not to exceed 880 degrees C during the start sequence

-20 sec – Check that the normal oil pressure and normal RPM lights have illuminated

-30 sec – Check that the Auto Ignition light has extinguished and that the APU air bleed line pressure is IAW the TOLD

9. Idle speed – check that the EGT is <720 degrees C

*10. Record APU max EGT temp for APU start

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11. Clock – Restart
12. APU – Cool down one minute
13. External power switch – OFF (down)
14. 115V Inverter Switch – MANUAL (up). (Battery Start, Check APU air bleed line pressure is IAW the TOLD)
15. 36V Inverter Switch – MANUAL (up)
16. APU STBY GEN Switch – ON
17. Battery Load Indicator – A negative indication confirms batteries being charged
18. EQUIPMENT TEST Switch – ON
19. MAINS TO BATT Light – Check OFF
20. EQUIPMENT TEST Switch – OFF
21. APU STBY GEN Switch – OFF
22. External power switch – ON (up)

1ST ENGINE START PROCEDURES

WARNING: Do not start the engine(s) with the APU in the DC generator mode (ON/UP); APU Gen switch is on the right side console.

WARNING: The engines cannot be started if the surface winds exceed the following limits:

Headwind – 25 m/s (48 Kts)

Left Crosswind – 15 m/s (29 Kts)

Right Crosswind – 10 m/s (19 Kts)

Tailwind – 8 m/s (15 Kts)

CAUTION: The APU must run for a minimum of 1 minute before attempting to start the engines.

CAUTION: Never engage the starter with the Fuel Fire Shutoff valve switches turned OFF.

(In the event this occurs, the fuel control units may require replacement.)

NOTE: Reference section IV for engine abort criteria.

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1. Fuel fire shutoffs – Confirm On (UP)
2. Engine start mode switch – Start (UP)
3. Engine select switch – Left or Right (the leeward engine is started first)
4. Rotor blades – Check clear and untied
5. EQUIP TEST Switch – OFF
6. STBY GEN Switch – OFF
7. Record – Engine #
 - a. Check DC voltage
 - b. Monitor APU Parameters
8. Engine start button – Press and hold for 2-3 sec maximum

CAUTION: If PTIT rises above limits during start of either engine, initiate shutdown using stopcock. DO NOT PRESS THE STOP BUTTON IMMEDIATELY

9. Start sequence is as follows:

-0 sec – AUTO CONTROL & STARTER lights – ON

-5 sec – NTK increasing, STOPCOCK – OPEN (fwd)

-18–21% NTK – check PTIT increasing

-20–25% NTK – check rotors are turning

-45% NTK – check engine oil pressure increasing. Note that the rotor Tach is increasing and hydraulic pressure is increasing. The cyclic may move at this time. If it is not in the neutral position it can be moved to the neutral position slowly.

-60–65% NTK – STARTER ON light – OFF

-30-60 sec – AUTO IGNITION ON light – OFF

10. Record:

*a. NTK when PTIT Initially Increases

*b. NTK when Rotor Tach Engages

*c. PTIT at 40% NTK

*d. Time to Starter Dropout

*e. NTK at Idle

*f. PTIT at Idle

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*g. Eng Oil Press

*h. Main XMSN Oil Press

*i. Rotor RPM

*11. NO. 1 Engine Idle Check

-NTK idle speed – check within allowable TOLD limits

-PTIT – check temperature < 780 degrees C or charted limits

-Engine oil pressure – check > 2 Kgf/cm²

-Main XMSN oil pressure – check > .5 Kgf/cm²

-Main Rotor RPM – 35 to 55% Rotor

2ND ENGINE START PROCEDURES

*1. Fuel Fire Shutoffs – Confirm ON (UP)

2. Engine select switch – select the opposite engine Record Eng #.

a. Check DC Voltage

b. Monitor APU Parameters

3. Engine start button – Press and hold for 2–3 sec maximum.

CAUTION: If PTIT rises above limits during start of either engine, initiate shutdown using stopcock. DO NOT PRESS THE STOP BUTTON IMMEDIATELY!

NOTE: Some Aircraft the Main Hydraulic System will not engage until the second engine is starting. See Force Trim & Hydraulics Check.

4. Start sequence is as follows:

-0 sec – AUTO CONTROL & STARTER lights – ON

-5 sec – NTK increasing, STOPCOCK – OPEN (fwd)

-18 – 21% NTK – check PTIT increasing

-45% NTK – check engine oil pressure increasing

-60 – 65% NTK – STARTER ON light – OFF

-30 – 60 sec – AUTO IGNITION ON light – OFF

5. Record:

*a. NTK when PTIT Initially Increases

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*b. PTIT at 40% NTK

*c. Time to Starter Dropout

*d. NTK at Idle

*e. PTIT at Idle

*f. Eng Oil Press

*g. Main XMSN Oil Press

*h. Rotor RPM

*6. 2nd Engine Idle Checks

-NTK idle speed – check within allowable TOLD limits

-PTIT – check temperature < 780 degrees C or Charted limits

-Engine oil pressure – check > 2 Kgf/cm²

7. Start panel switches – Neutral positions (engine start switch, APU start switch, and engine select switch)

8. Rotor RPM – Check between 45–65% Rotor

NOTE: Ensure engine oil temperature is above 30 degrees C and main XMSN is above -15 degrees before increasing throttle.

NOTE: One minute cool down of APU required after starting 2ND engine before throttle full right.

***9. Flight Controls**

NOTE: Maximum flight control displacement is 1/2 inch. Check as follows:

- a. MAIN Hydraulic Switches– ON (up)
- b. AUX Hydraulic Switches– ON (up)
- c. MAIN SYS ON Light – Illuminated
(Press 45 +/- 3 – 65 +/- 2)
- d. Cyclic – Move Forward, Aft, Left & Right without depressing the force trim button. The cyclic should return to the original position. There should be no binds, restrictions, or control feedback
- e. Cyclic – Depress the force trim button, move the cyclic and Release. The cyclic must remain in the position where the button is released
- f. Cyclic – Return to Neutral Position
- g. Check Pilot's Pedals – Move pedals fore and aft. Check for smooth operation and no binding. Check mag brake holds position and force gradient

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- h. Pedals – Return to Neutral Position
- i. Collective Clutch Hand-wheel – Adjust so a force of 45 to 55 lbs. is required to move the collective without depressing the clutch release button
- j. Collective – Depress the clutch release button and increase the collective (1 or 2 degrees pitch angle is sufficient) and check that the blade pitch angle pointer has moved. A force of no more than 12-15 lbs is required to move the collective
- k. Collective – Full Down

10. Hydraulics System Check

NOTE: The hydraulic system may start in either the Main or Auxiliary system. If the system starts in AUX, it is not a failure of the Main system. This is a high volume low pressure system. OEM recommends that the Auxiliary/Standby system be run for 2 minutes to ensure 100% circulation of fluid.

- a. MAIN HYD SYSTEM Switch – OFF (down) Check that the Auxiliary system has picked up the load. MAIN SYS ON light is OFF, and the red AUX SYS ON light is illuminated. (Press 45 +/- 3 – 65 +/- 2)
- b. Turn the Main system switch back to the ON position

- c. Cyclic – Move Forward, Aft, Left and Right without depressing the force trim button. The cyclic should return to the original position. There should be no binds, restrictions, or control feedback
- d. Cyclic – Depress the force trim button, move the cyclic and release. The cyclic must remain in the position when the button is released
- e. Cyclic – Return to Neutral Position
- f. Pedals – Move pedals fore and aft. Check for smooth operation and no binding. Check mag brake holds position and force gradient
- g. Pedals – Return to Neutral Position
- h. Collective – Depress the clutch release button and increase the collective (1 or 2 degrees pitch angle is sufficient) and check that the blade pitch angle pointer has moved. A force of no more than 12-15 lbs. is required to move the collective
- i. Collective – Full Down
- j. AUX OFF Button – Press and hold until MAIN SYS ON light is illuminated

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- k. Cyclic – Move Forward, Aft, Left and Right without depressing the force trim button. The cyclic should return to the original position. There should be no binds, restrictions, or control feedback
- l. Cyclic – Depress the force trim button, move the cyclic, and Release. The cyclic must remain in the position when the button is released
- m. Cyclic – Return to Neutral Position
- n. Pedals – Move pedals fore and aft. Check for smooth operation and no binding. Check mag brake holds position and force gradient. The tailboom may move during this check
- o. Pedals – Return to Neutral Position
- p. Collective – Depress the clutch release button and increase the collective (1 or 2 degrees pitch angle is sufficient) and check that the blade pitch angle pointer has moved. A force of no more than 12-15 lbs is required to move the collective
- q. Collective – Full Down
- r. Copilot's Cyclic – Depress the force trim button, move the cyclic, and release. The cyclic must remain in the position when the button is released

CAUTION: IF A/C external power is connected and turned “On”, turn off the rectifiers prior to maneuvering the Throttle full right to preclude damage to the A/C electrical system.

11. Throttle – Full right

*12. Rotor RPM – Check stabilized between 93 – 97% Rotor

13. ENGINE PARTIAL ACCELERATION CHECK

a. Throttle – Full right Note NTK

b. Throttle – Ground Idle (full left). Check NTK between 58 – 80%, Rotor between 55 – 70%, and PTIT IAW TOLD

c. Throttle – Full Right within 1 to 2 seconds

d. Note the time in seconds from initiation of adding power to NTK equal to at least 1 to 1.5% less than full established flight idle percent (step a)

e. Time to Flight Idle must be within 3 to 6 seconds

*14. Rotor RPM – Check stabilized between 93 – 97% Rotor

15. ENGINE PARTIAL ACCELERATION CHECK

a. Throttle – Full right Note NTK

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- b. Throttle – Ground Idle (full left). Check NTK between 58 – 80%, Rotor between 55 – 70%, and PTIT IAW TOLD
- c. Throttle – Full Right within 1 to 2 seconds
- d. Note the time in seconds from initiation of adding power to NTK equal to at least 1 to 1.5% less than full established flight idle percent (step a)
- e. Time to Flight Idle must be within 3 to 6 seconds

ENGINE GROUND RUN CHECKS

CAUTION: Ensure that Rotor is above 88% prior to turning the generators on.

CAUTION: Prior to selecting GEN 1 or 2, check and adjust the output voltage as necessary by using the #1 or #2 voltage control rheostats for the respective generator, located on the AC power panel.

1. Rectifier and Inverter switches – Set

DC EXT Power – N/A

- a. AC EXT Power – Rectifiers off
- b. Inverters 115 Manual, 36 Off

2. Generators 1 & 2 – ON (up) Check both generator fail lights are off

NOTE: The #1 generator controls the #1 & #3 rectifiers. The #2 generator controls #2 & #3 rectifiers.

*3. AC Voltmeter Check

Check as Follows:

- a. AC Voltmeter Selector Dial – #1 generator all three phases for 200 to 205 VAC
- b. AC Voltmeter Selector Dial – #2 generator all three phases for 200 to 205 VAC
- c. Check the 115V inverter for 109-121 VAC

NOTE: Adjust as necessary by using the voltage control rheostat located on the DC power panel.

4. Rectifiers 1, 2, & 3 – ON (up), check that all three rectifiers fail lights are off

*5. DC VOLTMETER CHECK

Check as Follows:

- a. DC Voltmeter Selector Dial – RECT (Check 27-29 VDC)

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b. DC Voltmeter Selector Dial – BATT (Check 27–29 VDC)

6. 115v & 36v Inverters – AUTO (down) check lights out

7. Ground power unit switch – OFF (down), check light off

8. Ground power unit – Disconnect as required

NOTE: If continuing with EER checks leave STBY GEN on and APU running until EER checks complete.

9. Rectifiers 1, 2, & 3 – ON (up), check that all three rectifiers fail lights are off

*10. APU OFF Button – PRESS, check for a decrease in EGT, decrease in air pressure, the OIL PRESS NORMAL & RPM NORMAL advisory lights go out

11. Attitude indicators – Cage

12. Compass/Gyro horizon & Gyro Erect switches – ON (up)

NOTE: Allow a 2-minute warm up for the AN/APN-209.

*13. RADAR ALTIMETER CHECK (AN/APN–209):

a. Place the low bug on 80' and the high bug on 800'

b. Press the push to test button and hold

- c. The low WARNING light should extinguish as the needle passes 80'
- d. The high light should come on as the needle passes 800'
- e. The analog and digital reading should be 1000 +/- 100'
- f. Release the test button
- g. The needle passes the 800' & 80' marks, the high light should extinguish
- h. The analog needle should read 0 to +/- 5' and the digital should read 0 +/- 3'

14. Avionics – ON, set as required

SYSTEMS CHECK AND FLIGHT PREPARATION

NOTE: Required testing prior to flight consists of system and power response checks. Ensure that the engines and gearboxes are operating in the normal temperature ranges prior to proceeding.

1. Ground-test preparation, verify as follows:
 - a. Throttle – Full right
 - b. APU – OFF

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- c. Gen 1 & 2 – ON (lights out)
- d. Rectifiers 1, 2, & 3 – ON (lights out)
- e. 36v & 115v Inverters – AUTO (down/lights out)
- f. DC External PWR switch – OFF (down)
- g. Dust Protectors – As required
- h. Chocks – Removed and stowed
- i. Collective – Full down
- j. Record:
 - *(1). Main Rotor % Rotor
 - *(2). #1 ENG NTK %
 - *(3). #2 ENG NTK %
 - *(4). #1 ENG PTIT
 - *(5). #2 ENG PTIT
 - *(6). #1 Eng Oil Press
 - *(7). #1 Eng Oil Temp

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*(8). #2 Eng Oil Press

*(9). #2 Eng Oil Temp

*(10). Main XMSN Press

*(11). Main XMSN Temp

*(12). T/R/G/B Temp

*(13). I/G/B Temp

*(14). Difference in Left and Right Pedals in inches

***2. TAIL ROTOR PITCH LIMIT CHECK (SPUU-52)**

CAUTION: Full deflection of the test indicator is required for the system to be considered airworthy. The needle may have to be nulled to center position prior to this check

NOTE: In flight, null indicator moves left as OAT or Altitude increases. As null indicator moves to the right, tail rotor pitch becomes more limited.

- a. Hydraulic System – Main pressure normal
- b. Pitch Limit C/B – ON (overhead C/B panel)
- c. Engine Vibration Button – Release

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- d. Pitch Limit Power Switch – ON (left triangle panel)
- e. Autopilot Solenoid C/B – ON (overhead C/B panel)
- f. Pitch Limit Light/Button – PRESS and HOLD (center console panel) Verify Light OFF
- g. Toggle Test Switch – "P" (indicator will deflect to first index left of travel)
- h. Toggle Test Switch – RELEASE
- i. Toggle Test Switch – "T" (test indicator will deflect to the first index right of travel)
- j. Toggle Test Switch – RELEASE
- k. Pitch Limit Light/Switch – RELEASE
- l. Pitch Limit Light/Button – PRESS and HOLD while simultaneously scrolling wheel to the right, full right needle deflection
- m. Pitch Limit Power Switch – OFF, release wheel and pitch limit; light/button, needle will deflect full left
- n. Pitch Limit Power Switch – On
- o. Needle will center based upon ambient conditions

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- p. Pitch Limit Light/Button – PRESS and HOLD, center needle with knob

***3. FULL AUTOPILOT (AP) TEST**

WARNING: Do not press the altitude channel TEST button in flight.

WARNING: Improper calibration, non–operational components, or the absence of signals from interacting systems may produce system instability.

CAUTION: Control inputs during the check should not exceed more than 2.0” (50 mm) deflection from the neutral position. One pilot should observe aircraft movement at all times.

NOTE: If excessive lateral and vertical vibrations are felt, the AFCS system will exacerbate the condition, care must be taken when these conditions are present and the AFCS is engaged. For the purposes of standardization, the terms autopilot (AP) and AFCS may be used interchangeably.

- a. AP CB Comp System, Copilot Gyro Horizon – ON
- b. AP Channels – All OFF(illuminated lights)
- c. Yaw Channel Input – Check

‘3K’ Switch on Compass Panel – Left then right

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Y scale indicator(SI) rotates opposite sw mov't

d. Roll Channel Input –

Deflect cyclic left then right

Roll SI indicates opposite cyclic mov't

e. Pitch Channel Input –

Deflect cyclic fwd then aft

Roll SI indicates opposite cyclic mov't .

f. All AP shutoff button check

Y, P/R and Alt Channels – ON (3 illuminated lights)

Pilot AP shutoff button (cyclic) – Press

Y, P/R and Alt Channels – OFF

Repeat for copilot

ALT Channel – ON

Pilot Collective trim release button – Press

ALT channel – OFF

Repeat for copilot

- g. Y, P/R & Alt Channels – ON (3 Green)
- h. Y, P/R & Alt Null Indicators (NI) – w/in +-1 bar width
- i. Primary Servo – Check

Cyclic – Deflect fwd & right

NI (Roll/Pitch) Banks left/Deflects up

Yaw Servo – Check

- j. Roll/Pitch Servo – Check
 - (1) SI (YAW) – Rotates left
 - (2) NI (YAW) – Deflects left
 - (3) Left pedal – Displaces fwd
 - (4) Yaw pedal micro switches – Depress with feet
 - (5) Pedals – Centered
 - (6) NI(YAW) – Centered
 - (7) Yaw Channel light – Remains On

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k. P/R Channels – ON

- (1) Pitch SI – Press and rotate left and right
- (2) Note corresponding movement of NI and rotor path
- (3) Center Pitch NI
- (4) Roll SI – Press and rotate left and right
- (5) Note corresponding movement of NI and rotor path
- (6) Center Roll NI

l. Altitude (collective) Servo – Check

CAUTION: Ensure collective firmly held during Altitude channel test

NOTE: During the Altitude Hold Check the aircraft will move. When the altitude hold test switch is pushed up, the aircraft will “jump”; and with downwards pressure, the aircraft will “squat”.

- (1) ALT Channel – ON
- (2) Alt test switch – Push up
- (3) NI (ALT) – Deflects up

- (4) Helicopter – Jumps up
- (5) Collective – Add 1 degree pitch
- (6) Alt Channel Button – ON
- (7) Alt test switch – Push Down
- (8) NI(ALT) – Deflects down
- (9) Helicopter – Squats down
- (10) Collective – Full Down

***4. PTIT Hot Test – Check first flight of the day**

- a. Note the temperature of both engine PTIT's
- b. Depress and hold the Air indicator "HOT" button on the left side console
- c. Both PTIT indicator gauge needles rotate below 100 degrees C
- d. Release the button and the indicators should return to the temperature noted prior to the test

***5. MAIN ROTOR TRIM CHECK**

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NOTE: If 96 to 99% Rotor is not obtained when checking the upper Rotor limit, warm up the oil in the main gearbox to between 40 and 60 degrees C and repeat the check.

- a. Pilot's Beep Switch
- b. Throttle – Full Right, Check Rotor 93 – 97%
- c. Main XMSN Oil Temp – >30 degrees C
- d. Collective pitch – Increase to 3 degrees pitch angle
- e. Beep Trim Switch – Decrease to 89 – 93% and stabilize
- f. Beep Trim Switch – Increase to 96 – 99% and stabilize
- g. Beep Trim Switch – Set to 95%
- h. Collective – Full Down
- i. Copilot's Beep Switch
- j. Throttle – Full Right, Check Rotor 93 – 97%
- k. Main XMSN Oil Temp – >30 degrees C
- l. Collective Pitch – Increase to 3 degrees Pitch
- m. Beep Trim Switch – Decrease to 89 – 93% and Stabilize

- n. Beep Trim Switch – Increase to 96 – 99% and Stabilize
- o. Beep Trim Switch – Set to 95%
- p. Collective – Full Down

***6. ENGINE TEMP LIMITER/FUEL REDUCTION CHECK**

WARNING: All precautions for flight must be taken. With favorable environmental conditions, the aircraft may hover on a single engine. Serious consideration must be given to adding internal weight to the aircraft to prevent takeoff. The pilot on the controls must be vigilant.

- a. Throttle – Full Right
- b. Collective – Full Down
- c. #1 ENG ECL – Leave in Detent
- d. #2 ENG ECL – Full Down
- e. PTIT – Monitor
- f. Collective – Increase until PTIT reaches 880 degrees C
- g. #1ENG Gov Temp LIMIT Light – Illuminate
- *h. ENG TEMP CONT Left Button – Press and Hold (FE)

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- i. Ensure engine limits (Fuel reduced, PTIT decrease) **N-79**
- j. ENG TEMP CONT LEFT Button – Release
- k. Collective – Full Down
- l. #2 ENG ECL – Increase to Center Detent
- m. #2 ENG ECL – Leave in Detent
- n. #1 ENG ECL – Full Down
- o. PTIT – Monitor
- p. Collective – Increase until PTIT reaches 880 degrees C
- q. #2 ENG Gov Temp LIMIT Light – Illuminate
- r. ENG TEMP CONT Right Button – Press and Hold (FE)
- s. Ensure engine limits (Fuel reduced, PTIT decrease)
- t. ENG TEMP CONT Right Button – Release
- u. Collective – Full Down
- v. #1 ENG ECL – Increase to Center Detent

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***7. ENGINE DUST PROTECTOR CHECK**

- a. Throttle – full right
- b. PTIT – Note
- c. Left and Right Dust Protector Switches – ON
- d. Clock – Start
- e. Left and Right Dust Protector Lights – ON, should illuminate in 20 – 40 seconds
- f. PTIT – Monitor for a 10 to 20 degrees C increase
- g. Left and Right Dust Protector Switches – OFF, check lights off
- h. Clock – Start
- i. PTIT – Monitor for a decrease, should decrease in 20-40 seconds

ENGINE RUN-UP CHECKS

Engine Run-Up for the BM and MT engines consists of power setting and system checks. These run-up checks verify system functionality.

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NOTE: Without the brushes installed for blade de-ice, a full functional check will not be complete

NOTE: This system must be used in the MANUAL if the PNO3 ice detection probe has been removed.

CAUTION: Main and tail rotor blade anti-ice should not be tested unless OAT is 15 Celsius or less.

NOTE: Some aircraft are configured differently and the #2 Engine 1919 valve will close with battery power and the C/B turned on.

***1. ANTI-ICING SYSTEM CHECK**

- a. Anti-icing system control, engine dust protector left, engine dust protector right, ice detection PNO3, and Windshield heating C/B switches – ON
- b. Mode select switch – MANUAL (up) check Anti-ice ON, Right engine anti-ice, Right dust protector fwd, Right dust protector rear lights come on
- c. Left engine anti-ice switch – ON (up) check left engine anti-ice, left dust protector fwd. Left dust protector rear lights on

- d. Load meter selector switches – Check main rotor blades sections 1 through 4. Each section indicator light should come on and ammeter load should read 65 to 80 for each section
- e. Load meter selector switch – Check tail rotor ammeter load at 120 to 150
- f. Windshield Heating switch – Manual (up) check ammeter load at 40 to 90 (only functions below +20 degrees C)
- g. PTIT – Monitor for a rise of 25 degrees to 50 degrees C when system is on
- h. NTK – Monitor for a rise of 1% to 2% when system is on

NOTE: System shutdown for anti-ice system:

- (1). Turn the left and right engine anti-ice switches off
- (2). Turn the Mode select switch to the Auto position
- (3). Turn the Control Circuit Breaker off (on overhead CB panel)
- (4). Watch for a decrease in PTIT (wait approx. 45 sec.)
- (5). Turn off the left and right engine dust protector circuit breakers (on the overhead CB panel) off

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***2. ENGINE GOVERNOR SYSTEM TEST (TB3-117 MT
Engines with PRP-3AM Gov)**

WARNING: If the HIGH N₂ light does not illuminate and or the engine does not automatically shut down when test switches are quickly cycled from the up to down position. Engine may overspeed, flight is prohibited and operation is only for maintenance functions.

CAUTION: If the ENG N₂ test switches are cycled between the up and down positions without stopping first in the center/reset detent, the engine will automatically shut down.

NOTE: Consideration should be given to have alternate power sources connected (STBY GEN, GND PWR) to prevent component damage if generators fall off line (Rotor RPM < 88%).

- a. Throttle – No less than 85 NR
- b. Emergency Rating & Speed Control C/B's Switches – ON
- c. Open cover of turbine limiter system
- d. #1 Eng. Governor Switch – ON (up)
- e. LH N₂ Test Switch – Test 1 (up & hold)
- f. Throttle – Open slowly until the HIGH N₂ CAUTION light illuminates

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- g. Rotor RPM – Check 91.5 +/- .5
- h. LH N₂ Test Switch – Release (check in the centered position & check the HIGH N₂ CAUTION light is off)
- i. RH/LH NTK Test Switch – Release (check in the centered position)
- j. Throttle – Full Left
- k. LH N₂ Test Switch – TEST 2 (down and hold)
- l. RH/LH NTK Test Switch – LH NTK (down and hold)
- m. Throttle – Open slowly until the HIGH N₂ CAUTION light illuminates & check the HIGH N₂ CAUTION light is off
- n. Rotor RPM – Check 89 to 94%
- o. LH N₂ Test Switch – Release (check in the centered position)
- p. RH/LH NTK Test Switch – Release (check in the centered position)
- q. Throttle – Full Left
- r. Check that the HIGH N₂ CAUTION light is off

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- s. #2 Eng. governor switch – ON (up)
- t. RH N₂ Test Switch – TEST 1 (up & hold)
- u. RH/LH NTK Test Switch – RH NTK (up & hold)
- v. Throttle – Open slowly until the HIGH N₂ CAUTION light illuminates
- w. Rotor RPM – Check 89 to 94%
- x. RH N₂ Test Switch – release (check in the centered position & check that the HIGH N₂ CAUTION light is off)
- y. RH/LH NTK Test Switch – Release (check in the centered position)
- z. Throttle – Full Left
- aa. RH N₂ Test Switch – TEST 2 (down and hold)
- bb. RH/LH NTK Test Switch – RH NTK (up & hold)
- cc. Throttle – Open slowly until the HIGH N₂ CAUTION light illuminates
- dd. Rotor RPM – Check 89 to 94%

- ee. #RH N₂ Test Switch – Release (check in the centered position)
- ff. NTK Test Switch – Release (check in the centered position)
- gg. Throttle – Full Left
- hh. Check that the HIGH N₂ CAUTION light is off
- ii. #1 ENG & #2 ENG governor switches – up
- jj. Close cover of turbine limiter system

***2a. ENGINE GOVERNOR SYSTEM TEST (TB3-117BM with ERD-3BM Gov)**

- a. Throttle – Full Left
- b. Check emergency rating & speed control C/B's switch – ON (overhead panel)
- c. Open cover of turbine limiter system
- d. ENG GVROTOR LH PWR Switch – ON (up)
- e. ENG GVROTOR L FT1/FT2 TEST Switch – OPERATE (centered)

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- f. ENG GVROTOR R FT1/FT2 TEST Switch – OPERATE (centered)
- g. ENG GVROTOR RH PWR Switch – ON (up)
- h. ENG GVROTOR L FT1/FT2 TEST Switch – FT1 (up and hold)
- i. Throttle – open slowly until the HIGH N₂ CAUTION light illuminates
- j. Rotor RPM – check 89 to 94%
- k. Throttle – Full Left
- l. ENG GVROTOR LH PWR Switch – OFF (down) then ON (up)
- m. ENG GVROTOR L FT1/FT2 TEST Switch – FT2 (down and hold)
- n. Throttle – open slowly until the HIGH N₂ CAUTION light illuminates
- o. Rotor RPM – check 89 to 94%
- p. Throttle – Full Left

- q. ENG GVROTOR LH PWR Switch – OFF (down) then ON (up)
- r. ENG GVROTOR R FT1/FT2 TEST Switch – FT1 (up and hold)
- s. Throttle – open slowly until the HIGH N₂ CAUTION light illuminates
- t. Throttle – Full Left
- u. ENG GVROTOR RH PWR Switch – OFF (down) then ON (up)
- v. Rotor RPM – check 89 to 94%
- w. ENG GVROTOR R FT1/FT2 TEST Switch – FT1 (up and hold)
- x. Throttle – open slowly until the HIGH N₂ CAUTION light illuminates
- y. Rotor RPM – check 89 to 94%
- z. ENG GVROTOR RH PWR Switch – OFF (down) then ON (up)
- aa. ENG GVROTOR LH PWR Switch – ON (up)

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bb. ENG GVROTOR RH PWR Switch – ON (up)

cc. Close cover of turbine limiter system

***PRE-TAXI CHECKLIST**

1. Steps, doors, chocks – secured
2. Systems – check
3. Ground equipment – clear
4. Ground personnel – clear
5. Gyro compass – align (check against Mag. Compass)
6. Pitch limiter – ON
7. Auto Pilot – ON (if not performing Track and Balance)
8. Cargo Area – Secure

***TAXI PROCEDURE CHECKLIST**

1. Throttle – Check full right
2. Brakes – Check

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3. Flight Instruments – Check (in a turn, mag compass, turn and slip, RMI and HSI all indicate a turn)

***BEFORE TAKEOFF CHECK**

1. Nose Wheel – Centered
2. Systems – Check indications of the following:
 - a. Rotor RPM
 - b. Engine RPM
 - c. Transmissions
 - d. Master CAUTION panel
3. Fuel Quantity Selector Switch – Service
4. Fuel Pump Switches – SERVICE, LEFT and RIGHT ON and all three lights work accordingly
5. Hydraulics – check the Main System ON and light is illuminated, check pressure
6. AFCS system – Engaged (if not performing Track and Balance)
7. Transponder – ON and set as required

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8. Brakes – As Required
9. Crew and Mission Equipment – Check
10. Crew Briefing-Performed (Pilot)
11. Hover Power Check – Perform as Required

WARNING: Binding or lack of proper control response is cause to terminate the flight and to determine the cause.

NOTE: The wind must be taken into consideration, as well as fore and aft center of gravity.

IN FLIGHT SYSTEM CHECKS

HOVER CHECKS IN GROUND EFFECT

- *1. Controllability – control response will be checked in a hover with autopilot off and then on, carefully bring the aircraft to a stabilized 10 ft. hover ensuring all control responses are normal
- *2. Hover – closely monitor control response and CG hang as the aircraft departs the ground and ensure no unusual vibrations
- *3. Flight Controls – note position, cyclic nearly centered, normal pedal position.

4. Record:

- *a. Main Rotor % Rotor
- *b. #1 ENG NTK %
- *c. #2 ENG NTK %
- *d. #1 Eng Oil Press
- *e. #1 Eng Oil Temp
- *f. #1 ENG PTIT
- *g. #2 ENG PTIT
- *h. #2 Eng Oil Press
- *i. #2 Eng Oil Temp
- *j. Main XMSN Press
- *k. Main XMSN Temp
- *l. T/R/G/B Temp
- *m. I/G/B Temp
- *n. Difference in Left and Right Pedals in inches

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***5. Control Response Checks**

- a. Hovering Turns – 45 degrees in each direction
- b. Sideward Flight – Cyclic response and rigging in both directions (5 knots max)
- c. Forward and Aft Flight – check control response and rigging

HOVER CHECKS OUT OF GROUND EFFECT

- *1. Controllability – control response, carefully bring the aircraft to a stabilized 70 ft. hover ensuring all control responses are normal
- *2. Record #1 Eng NTK
- *3. Record #2 Eng NTK
- *4. Record #1 engine PTIT
- *5. Record #2 engine PTIT

IN-FLIGHT CHECKS

CAUTION: Perform Track and Balance with AUTOPILOT/AFCS off. With vertical or lateral vibrations, the AUTOPILOT may amplify the vibrations to an unsafe level.

NOTE: Recommend:

- *1. Climb to predetermined altitude. Record Altitude
2. Allow engine to stabilize for minimum of one minute
3. Fuel consumption check – Initiate
4. Airspeed Establish – 80 KPH. (Take First Track and Balance Reading)

Record:

- *a. Main Rotor % Rotor
- *b. #1 ENG NTK %
- *c. #2 ENG NTK %
- *d. #1 ENG PTIT
- *e. #2 ENG PTIT

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- *f. KIAS difference Pilot and Copilot airspeed indicators
- *g. Altimeter difference between Pilot and Copilot altimeters
- *h. The difference between Heading Ind. and Mag. compasses
- *i. Difference in Left and Right Pedals in inches

5. Airspeed establish – 100 KPH (Take Track and Balance Readings)

6. Record:

- *a. Main Rotor % Rotor
- *b. #1 ENG NTK %
- *c. #2 ENG NTK %
- *d. #1 ENG PTIT
- *e. #2 ENG PTIT
- *f. KIAS difference Pilot and Copilot airspeed indicators
- *g. Difference in Left and Right Pedals in inches

7. Airspeed establish – 120 KPH (Take Track and Balance Readings)

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8. Record:

- *a. Main Rotor % Rotor
- *b. #1 ENG NTK %
- *c. #2 ENG NTK %
- *d. #1 ENG PTIT
- *e. #2 ENG PTIT
- *f. KIAS difference Pilot and Copilot airspeed indicators
- *g. Difference in Left and Right Pedals in inches
- *h. #2 ENG PTIT
- *i. KIAS difference Pilot and Copilot airspeed indicators
- *j. Difference in Left and Right Pedals in inches

WARNING: Do not exceed PTIT limits or rotor limits. Maintain a minimum of single engine airspeed. Perform check at or above 700 ft AGL.

NOTE: Accomplish this check if unable to load Aircraft to Max Gross Weight.

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***9. SINGLE ENGINE LOAD ASSUMPTION CHECK:**

a. With the helicopter into the wind and at a safe altitude for aircraft recovery and single engine flight possible, ensure that the main rotor rpm is at 95 +/- 2%

b. Record:

* (1). Altitude PA

* (2). OAT

* (3). PTIT on engine #1

* (4). PTIT on engine #2

c. The engine producing the highest PTIT will be checked first.

*d. Reduce the low PTIT engine ECL full down, Record Engine #

e. Regain main rotor rpm by increasing the other engine ECL to achieve 95 +/- 2%

*f. Establish a baseline PTIT (example 700, 720, 740, etc.) with the collective and note and record the NTK percent and PTIT

*g. Set the PTIT 20 degrees above the baseline by increasing the collective and record NTK and PTIT

*h. Increase the PTIT 20 degrees and record NTK and PTIT

i. Reduce the ECL being tested to detent and return the non-tested engine ECL to detent

j. Allow the engine PTIT's to stabilize

*k. Reduce the high PTIT engine ECL full down, Record Engine #

10. Regain main rotor rpm by increasing the other engine ECL to achieve 95 +/- 2%

*a. Set the engine being tested to the baseline PTIT from first engine tested, (example 700, 720, 740, etc.) record the NTK percent and PTIT

*b. Set the PTIT 20 degrees above the baseline by increasing the collective and record NTK and PTIT

*c. Increase the PTIT 20 degrees and record NTK and PTIT

d. Reduce the ECL being tested to detent and return the non-tested engine ECL to detent

e. Allow the engine PTIT's to stabilize

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f. Upon completion ensure that both ECL's are in the detent position

g. Compare the NTK's of both engines at the same PTIT's.
The maximum allowable difference is +/- 2%

11. AFCS STABILITY CHECK

***a. Pitch Axis Check**

- (1). Establish 140-160 KPH
- (2). Ensure aircraft stable in pitch axis
- (3). 180 degree turns and 30 degree bank angle – aircraft should be stable in turns with no excessive roll rate, feedback, and or pitch instability

***b. Roll and Yaw Axis with coordinated turn check**

- (1). Trim helicopter to a level roll attitude
- (2). At 150 KPH using the TRIM REL button
- (3). Trimmed attitude shall be maintained with +/- 3 degrees roll and heading within +/- 3 degrees
- (4). The ball on the turn and slip indicator shall be centered within 1/2 ball width

- (5). Without using the CD REL button, move the cyclic stick out of detent to the right to generate a 10 degrees – 15 degrees bank angle
- (6). Release the cyclic back to detent
- (7). Hold the turn for 60 degrees
- (8). The newly acquired bank angle shall be held within +/- 5 degrees
- (9). During entry into the turn, the ball shall not be off-centered by more than one ball width
- (10). When stabilized in the turn, the ball in the turn and slip indicator shall be centered within 1/2 ball width
- (11). Return the aircraft to level attitude
- (12). ACFT shall hold level roll attitude +/- 3 degrees and heading +/- 5 degrees with controls free
- (13). Repeat the above steps for left cyclic

***c. Barometric Altitude Hold Check**

- (1). Trim aircraft to level flight at 150 KPH

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- (2). Engage the altitude hold switch on the AFCS panel
- (3). Check that the aircraft holds the altitude within +/- 50 feet of the referenced altitude
- (4). Disengage the altitude hold either by the collective release button or on the AFCS panel

12. Establish 185 KPH (Take Track and Balance Reading)

Record:

- *a. Main Rotor % Rotor
- *b. #1 ENG NTK %
- *c. #2 ENG NTK %
- *d. #1 ENG PTIT
- *e. #2 ENG PTIT
- *f. #1 Eng Oil Press
- *g. #1 Eng Oil Temp
- *h. #2 Eng Oil Press
- *i. #2 Eng Oil Temp

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- *j. Main XMSN Press
- *k. Main XMSN Temp
- *l. T/R/G/B Temp
- *m. I/G/B Temp
- *n. KIAS difference Pilot and Copilot airspeed indicators
- *o. Difference in Left and Right Pedals in inches

NOTE: With clamshell doors removed, OEM states “Max Speed with Cargo Doors Removed is 200KPH Clamshell doors installed are required to complete readings at 222 KPH and VNE.

***13. Establish 222 KPH (Take Track and Balance Readings)**

Record:

- *a. Main Rotor % Rotor
- *b. #1 ENG NTK %
- *c. #2 ENG NTK %
- *d. #1 ENG PTIT

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*e. #2 ENG PTIT

*f. KIAS difference Pilot and Copilot airspeed indicators

*g. Difference in Left and Right Pedals in inches

*14. Establish VNE (Take Track and Balance Readings)

Record:

*a. Main Rotor % Rotor

*b. #1 ENG NTK %

*c. #2 ENG NTK %

*d. #1 ENG PTIT

*e. #2 ENG PTIT

*f. #1 Eng Oil Press

*g. #1 Eng Oil Temp

*h. #2 Eng Oil Press

*i. #2 Eng Oil Temp

*j. Main XMSN Press

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*k. Main XMSN Temp

*l. T/R/G/B Temp

*m. I/G/B Temp

*n. KIAS difference Pilot and Copilot airspeed indicators

*o. Difference in Left and Right Pedals in inches

***15. AUTOROTATION RPM CHECK**

CAUTION: The autorotation should be entered at an altitude that will allow a power recovery to be completed above 500 ft. AGL and a climb established.

CAUTION: At altitudes above 3,000 ft, the main rotor rpm will tend to over speed. Do not set below 95-97% for autorotation at higher altitudes or at low altitudes < 3,000 feet there may not be enough rotor rpm to arrest an auto rotational landing.

*a. Record Check Altitude OAT

*b. Record Check Altitude PA

c. Airspeed – 120 KPH

d. Collective – Full Down

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- e. Throttle – Full left
- f. NTK – Check between 73 – 79%
- *g. Rotor – Record MAX rotor rpm
- h. Throttle – Full right
- i. Perform a power recovery

***FLIGHT INSTRUMENTS CHECKS**

1. Altimeters – Proper indication, no large fluctuations
2. Attitude Indicators – Correct indications, no excessive precession or vibrations
3. Standby Compass – Correct heading, no excessive fluctuation (Magnetic compass within +/- 5 degrees of HSI/RMI/GPS)
4. Vertical Speed Indicators – Proper indication and no excessive fluctuations
5. Gyro Compass – Correct heading, operates smoothly, no fluctuations, Copilots the same as Pilots +/- 5 degrees
6. Turn and Slip Indicator – Proper indication

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***COMMUNICATION AND NAVIGATION EQUIPMENT**

1. UHF – Transmit & receive, preset and manual
2. VHF – Transmit & receive, check both AM and FM bands
3. FM – Transmit & receive
4. TRANSPONDER – Verify squawk and altitude encoding with ATC
5. VOR (if installed) – Tuning, reception and volume. Needle on HSI within +/- 3 degrees of true magnetic course to station
6. GPS – Verify system setup and current system data card
7. Fuel consumption check – Complete

***BEFORE LANDING CHECK**

1. Brakes – As required
2. Dust Protectors (PZU) – As required
3. Crew/passengers/mission equipment – Check

***AFTER LANDING CHECK**

1. Exterior lights – As required

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2. Dust Protectors (PZU) – As required
3. Radios/Avionics/mission equipment – As required

***ENGINE SHUTDOWN**

1. Aircraft Position – Into the wind
2. Parking Brake – Set
3. Chocks – As required
4. AFCS/Autopilot – OFF
5. Mission equipment – As required
6. Taxi/Search light – As required
7. SPUU-52 T/R Pitch limiter – OFF
8. RI-65 Audio Warning system – OFF
9. Gyros/Erect Cutout/Compass switches – OFF
10. Dust Protectors (PZU) – OFF
11. Blinking system flash switch – OFF
12. Rectifiers 1, 2, 3 – OFF (down)

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13. AC generators 1, 2 – OFF (down)
14. Throttle – Full Left (Idle 2 min)
15. Stopcocks (Fuel Cutoff Levers) – Closed (Levers Aft)
- *16. Engine Coast Down – 50 seconds min or 40 sec more than 3% NG, Record #1/#2
17. Hydraulic Standby Accumulator Check-Record Pressure needle drops off (nitrogen pressure)
18. Rotor brake – As required (< 20% Rotor)
19. Hydraulic Main Accumulator check – Record Pressure needle drops off (nitrogen pressure)
20. Fire EXT system – DETECT (down)
21. Fuel Fire Shutoff Valves – OFF (Zero NTK)
22. Fuel Boost Pumps – OFF
23. Radios/Avionics – OFF
24. Instrument transformer switch – OFF
25. 115V & 36V Inverter – OFF (center)

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26. Anti-collision light – OFF
27. Parking Brake – Release
28. Cockpit/Instrument lights – OFF
29. DC selector knob – OFF
30. Batteries 1 and 2 – OFF (down)

BEFORE LEAVING HELICOPTER – Check the following:

1. Fluid levels
2. Cabin and Mission Equipment
3. Functional Check flight check sheet signed and any faults discovered during the flight transcribed to appropriate forms
4. Maintenance personnel – Debriefed as necessary
- *5. Post Flight Inspections – Complete

SECTION III. FAULT ISOLATION PROCEDURES

GENERAL. Operational checkout procedures and logic-type troubleshooting charts give detailed step-by-step instructions to identify malfunctioning components. Component location diagrams and schematics are also included in these manuals.

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SECTION IV. SPECIAL/DETAILED PROCEDURES

GENERAL. This section contains special/detailed procedures that were referenced in Section II.

AC EXT POWER (Only if using external AC power)

1. AC selector knob EXT PWR
2. Ext Power switch – ON (Up, Voltage 204V)
3. Rectifiers 1, 2, and 3 – ON (Up, Voltage 27 +/- 3V)
4. 115VAC/36VAC Inverters – Auto (down)

DC EXT POWER (Only if using external DC power)

1. DC selector knob – EXT PWR
2. EGT – No indication within 9 sec
3. EGT – Rises above 880 degree C
4. Battery/Ext power voltage – Drops below 18v
5. Auto Ignition light – Illuminated after 30 sec
6. Max speed light – Illuminates

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7. Fire warning light – Illuminated

NOTE: Perform APU CRANK when an aborted start with no ignition/fuel. One minute cool-down between start attempts.

APU FAILS TO START OR IS ABORTED

1. APU OFF Button – Press (Hold for 2 to 3 seconds)
2. APU Selector Switch – CRANK
3. APU Start Button – Press (Hold for 2 to 3 seconds)
4. AUTO IGNITION Light – ON (20 sec)
5. OIL PRESS NORM Light – ON

ENGINE START ABORT CRITERIA

Check for the following indications:

Abort eng start if any of the following indications are not correct:

1. AUTO & STARTER lights – Illuminated
2. NTK – Increasing in 3-5 seconds
3. PTIT – Increasing

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4. Rotor – Engaged 20% - 25% NTK
5. ENG Oil pressure – Increasing ($>1\text{kgf/cm}^2$ by 45%)
6. Batt DC Volts – Greater than 16V
7. APU EGT – Less than 750 degrees C
8. ENG PTIT – Max 780°
9. Main G/B oil pressure – Greater than 0.5
10. Hyd Pres – Increasing
11. Start-line air pressure – In limits
12. Auto Ignition light – OFF (30 seconds)
13. Starter Light – OFF (60-65% NTK)
14. NTK – 58% NTK before 60 sec
15. Engine fire light

APU FLUSH PROCEDURES

NOTE: Only clean water will be used to flush the APU or the engines.

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NOTE: To accomplish the engine flush, the intake side of the APU cowling must be open. The crew chief must spray the water into the intake of the APU.

NOTE: Care must be taken to ensure that the container holding the water does not have residue from another substance in it.

1. Battery Switches – ON (up)
2. Fuel Boost Pumps – OFF (down)
3. APU Start Mode Switch – CRANK (centered)
4. APU Exhaust – Clear
5. APU Start Button – Press
6. Clock – Start Timer
7. Water – Start after 4-5 Seconds of APU turning
8. Water – Stop after 10 Seconds
9. APU IGNITION Light – OFF after 18-20 Seconds
10. Clock – Start Timer
11. Crew chief – Close Up Aircraft

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12. APU Starter – Cool Down, One Minute
13. Fuel Pump Service Tank Switch – ON (up)
14. APU Start Mode Switch – CRANK (centered)
15. Start Button – Press
16. Clock – Start Timer
17. Crank Cycle lasts 18-20 Seconds
18. APU Starter – Cool Down, One Minute
19. APU Start Mode Switch – START (up)
20. Complete Normal APU START

NOTE: Only clean water will be used to flush the Engines.

NOTE: Care must be taken to ensure that the container holding the water does not have residue from another substance in it.

NOTE: If going thru the aircraft bird bath DPU's off.

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ENGINE FLUSH PROCEDURES

With the APU Running:

1. Fuel Fire Shutoff Valves – OFF
2. ENG START/CRANK Switch – Crank
3. ENG Selector Switch – L/R As required
4. Area Clear
5. Start Button – Press 2 to 3 Seconds
6. Clock – Start Timer
7. Water – Start after 16% NTK
8. Water – Stop after 25 Seconds
9. START ENG Light – OFF After 55 Seconds (normal Crank sequence is 54-56 seconds)
10. Clock – Start Timer for one minute cool down
11. ENG Selector Switch – Other Engine
12. Area Clear

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13. Start Button – Press 2 to 3 Seconds
14. Clock – Start Timer
15. Water – Start after 16% NTK
16. Water – Stop after 25 Seconds
17. START ENG Light – OFF After 55 Seconds (normal Crank sequence is 54-56 seconds)
18. Clock – Start Timer for one minute cool down
19. Cowls – Closed
20. Perform Engine Starts to dry engines

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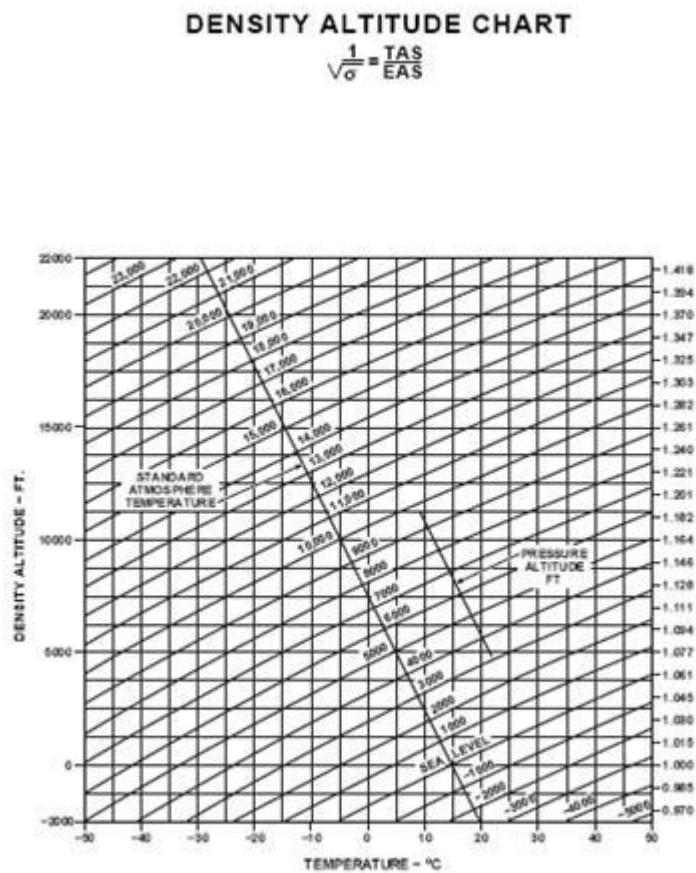
SECTION V. CHARTS AND FORMS

Figure 1. TEMPERATURE CONVERSION

TEMPERATURE CONVERSION FAHRENHEIT/CELSIUS



Figure 2. DENSITY ALTITUDE CONVERSION CHART



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Figure 3A. TEST FLIGHT CHECK SHEET

MI-17VM, MI-17MT MAINTENANCE TEST FLIGHT CHECK SHEET SUGGESTED FORMAT			
ACFT NO.	DATE	TIME	PILOT AND UNIT
GROSS WT LB	FAT C°	PRESS ALT	DENSITY ALT
PURPOSE OF TEST FLIGHT:			
SYMBOLS: √ = SATISFACTORY X = DEFICIENCY			
■ PRIOR TO MTF 1. Forms and Records 2. Flight Readiness Inspection 3. Special Preflight Checks		■ APU STARTING PROCEDURES 8. APU EGT Start Temp _____ °C 1st ENG START PROCEDURES 6. Engine # _____ a. N1 When PTIT Rises (18-21%) _____ %N1 b. N1 When Rotor Tach Engages (≈40% N1) _____ %N1 c. PTIT at 40% N1 _____ °C d. Time to Start Dropout _____ sec e. N1 at Idle _____ %N1 f. PTIT at Idle _____ °C g. Eng Oil Press _____ kgf/cm² h. Main Xmsn Oil Press _____ kgf/cm² i. Nr RPM (45 to 60% Nr) _____ % Nr 10. NO. 1 Engine Idle Check	
■ BEFORE STARTING ENGINES Pedal and Seat Adjustment Flight Controls Overhead Console/Panel Switches 17. Circuit Breakers Pilot/Co-pilot's Instruments 23. Avionic Center Console / Stack		■ BEFORE STARTING ENG-PWR ON 1. Battery Volts Check _____ V 3. Warning Lights 5. Cockpit and Cabin Lights 8. Fire Extinguisher Continuity Check 9. Fuel Pumps Left, Right & Service Tank 10. Fuel Fire Shutoff Valves 17. Engine Vibration Test 18. PTIT Cold Indicator Test 19. Fuel Quantity Gauge Check	
		■ FORCE TRIM & HYD CHECK 3. Flight Controls Check 2nd ENG START PROCEDURES 1. Engine # _____ a. N1 When PTIT Rises (18-21%) _____ %N1 b. PTIT at 40% N1 _____ °C c. Time to Start Dropout _____ sec	
Remarks:			

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Figure 3B. TEST FLIGHT CHECK SHEET (Continued)

MI-8, MI-17VM, MI-17MT MAINTENANCE TEST FLIGHT CHECK SHEET SUGGESTED FORMAT CONTINUED	
SYMBOLS: \checkmark = SATISFACTORY X = DEFICIENCY	
<input checked="" type="checkbox"/> 2nd ENG START PROCEDURES	2. Tail Rotor Pitch Limit Check (SPUU-52)
d. N1 at Idle _____ %N1	3. AFCS Axis Hold Channel Check
e. PTIT at Idle _____ °C	4. AFCS Directional Channel Check
f. Eng Oil Press _____ kgf/cm ²	5. Engine Partial Acceleration Check
g. Main Xmsn Oil Press _____ kgf/cm ²	6. PTIT Hot Test
h. Nr RPM (55 to 70% Nr) _____ % Nr	7. Eng Temp Limiter Check #1 _____ °C #2 _____ °C
5. 2nd Engine Idle Checks	8. Engine Dust Protector Check
9. Rotor RPM - 93 - 97% Nr _____ % Nr	9. Main Rotor Trim Check
<input checked="" type="checkbox"/> ENGINE GROUND RUN CHECKS	<input checked="" type="checkbox"/> ENGINE RUN-UP CHECKS
1. APU - OFF	1. Anti-Icing System Check
7. AC Voltmeter Check	2. Engine Governor System Test
8. DC Voltmeter Check	3. Power Check
11. Radar Altimeter Check	<input checked="" type="checkbox"/> PRE-TAXI CHECK
<input checked="" type="checkbox"/> SYS CHECK AND FLIGHT PREP	<input checked="" type="checkbox"/> TAXI PROCEDURE CHECK
(1). Main Rotor _____ %Nr	<input checked="" type="checkbox"/> BEFORE TAKEOFF CHECK
(2). #1 ENG N1 % _____ %N1	<input checked="" type="checkbox"/> HOVER CHECKS IN GND EFFECT
(3). #2 ENG N1 % _____ %N1	<input checked="" type="checkbox"/> HOVER CHECKS IN GND EFFECT
(4). #1 ENG PTIT _____ °C	1. Controllability
(5). #2 ENG PTIT _____ °C	2. Hover
(6). #1 ENG Oil Press _____ kgf/cm ²	3. Flight Controls
(7). #1 ENG Oil Temp _____ °C	4. Main Rotor _____ %Nr
(8). #2 ENG Oil Press _____ kgf/cm ²	5. #1 ENG N1 % _____ %N1
(9). #2 ENG Oil Temp _____ °C	6. #2 ENG N1 % _____ %N1
(10). Main XMSN Oil Press _____ kgf/cm ²	7. #1 ENG PTIT _____ °C
(11). Main XMSN Oil Temp _____ °C	8. #2 ENG PTIT _____ °C
(12). T/R/G/B Temp _____ kgf/cm ²	9. #1 ENG Oil Press _____ kgf/cm ²
(13). I/G/B Temp _____ °C	10. #1 ENG Oil Temp _____ °C
(14). Diff. Tail Rotor Pedals _____ inches	11. #2 ENG Oil Press _____ kgf/cm ²
Remarks:	

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Figure 3C. TEST FLIGHT CHECK SHEET (Continued)

MI-8, MI-17VM, MI-17MT MAINTENANCE TEST FLIGHT CHECK SHEET SUGGESTED FORMAT			
CONTINUED			
SYMBOLS: √ = SATISFACTORY X = DEFICIENCY			
12. #2 ENG Oil Temp _____ °C	c. #2 ENG N1 % _____ %N1		
13. Main XMSN Oil Press _____ kgf/cm ²	d. #1 ENG PTIT _____ °C		
14. Main XMSN Oil Temp _____ °C	e. #2 ENG PTIT _____ °C		
15. T/R/G/B Temp _____ °C	f. KIAS Diff. Pilots/Copilots _____ °		
16. I/G/B Temp _____ °C	g. Diff. Tail Rotor Pedals _____ inch.		
17. Diff. Tail Rotor Pedals _____ inch.	7. SINGLE ENGINE LOAD ASSUPTION CHECK		
5. Control Response Checks	(1). Altitude _____ ft PA		
■ HOVER CHECKS OGE		(2). OAT _____ °C	
1. Controllability	(3). #1 ENG N1 % _____ %N1		
2. #1 ENG N1 % _____ %N1	(4). #2 ENG N1 % _____ %N1		
3. #2 ENG N1 % _____ %N1	d. Engine # _____		
4. #1 ENG PTIT _____ °C	f. Base PTIT _____ °C _____ %N1		
5. #2 ENG PTIT _____ °C	g. 2nd PTIT _____ °C _____ %N1		
■ IN-FLIGHT CHECKS		h. 3rd PTIT _____ °C _____ %N1	
1. Cruise Altitude _____ ft	k. Engine # _____		
2. Establish 80 Knots	m. Base PTIT _____ °C _____ %N1		
a. Main Rotor _____ %Nr	n. 2nd PTIT _____ °C _____ %N1		
b. #1 ENG N1 % _____ %N1	o. 3rd PTIT _____ °C _____ %N1		
c. #2 ENG N1 % _____ %N1	9. AFCS STABILITY CHECK		
d. #1 ENG PTIT _____ °C	a. Pitch Axis Check		
e. #2 ENG PTIT _____ °C	b. Roll and Yaw Axis with coordinated turn check.		
f. KIAS Diff. Pilots/Copilots _____ °	c. Barometric Altitude Hold Check		
g. Altimeter Diff Pilot/Copilots _____	■ 6. Establish 100 Knots		
h. Diff. in Mag Compass and Heading Ind.	a. Main Rotor _____ %Nr		
i. Diff. Tail Rotor Pedals _____ inch.	b. #1 ENG N1 % _____ %N1		
■ Establish 80 knots	c. #2 ENG N1 % _____ %N1		
a. Main Rotor _____ %Nr	d. #1 ENG PTIT _____ °C		
b. #1 ENG N1 % _____ %N1	e. #2 ENG PTIT _____ °C		
Remarks:			

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Figure 3D. TEST FLIGHT CHECK SHEET (Continued)

MI-8, MI-17VM, MI-17MT MAINTENANCE TEST FLIGHT CHECK SHEET SUGGESTED FORMAT	
CONTINUED	
SYMBOLS: √ = SATISFACTORY X = DEFICIENCY	
■ 8. Establish 100 Knots Continued	i. #2 ENG Oil Temp _____ °C
f. #1 ENG Oil Press _____ kgf/cm ²	j. Main XMSN Oil Press _____ kgf/cm ²
g. #1 ENG Oil Temp _____ °C	k. Main XMSN Oil Temp _____ kgf/cm ²
h. #2 ENG Oil Press _____ kgf/cm ²	l. T/R/G/B Temp _____ kgf/cm ²
i. #2 ENG Oil Temp _____ °C	m. I/G/B Temp _____ kgf/cm ²
j. Main XMSN Oil Press _____ kgf/cm ²	n. KIAS Diff. Pilots/Copilots _____ °
k. Main XMSN Oil Temp _____ kgf/cm ²	o. Diff. Tail Rotor Pedals _____ inch.
l. T/R/G/B Temp _____ kgf/cm ²	13. AUTOROTATION
m. I/G/B Temp _____ kgf/cm ²	a. OAT at Check Altitude _____ °C
n. KIAS Diff. Pilots/Copilots _____ °	b. Check Altitude _____ ft PA
o. Diff. Tail Rotor Pedals _____ inch.	g. Nr – Record MAX Nr _____ %Nr
■ 11. Establish 120 Knots	FLIGHT INSTRUMENTS CHECK
a. Main Rotor _____ %Nr	COMM AND NAV EQUIPMENT
b. #1 ENG N1 % _____ %N1	BEFORE LANDING CHECK
c. #2 ENG N1 % _____ %N1	AFTER LANDING CHECK
d. #1 ENG PTIT _____ °C	ENGINE SHUTDOWN
e. #2 ENG PTIT _____ °C	16. Engine Coast Down #1: _____ sec
f. KIAS Diff. Pilots/Copilots _____ °	16. Engine Coast Down #2: _____ sec
g. Diff. Tail Rotor Pedals _____ inch.	BEFORE LEAVING HELICOPTER
■ 12. Establish VNE	5. Post Flight Inspections – Complete.
a. Main Rotor _____ %Nr	ACFT RELEASED FOR FLIGHT
b. #1 ENG N1 % _____ %N1	
c. #2 ENG N1 % _____ %N1	
d. #1 ENG PTIT _____ °C	
e. #2 ENG PTIT _____ °C	
f. #1 ENG Oil Press _____ kgf/cm ²	
g. #1 ENG Oil Temp _____ °C	
h. #2 ENG Oil Press _____ kgf/cm ²	
MTP Signature _____	
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Figure 4. WIND LIMITATIONS

Wind Speed and Direction Limits	Maximum Allowable Wind Speed in Knots, Miles per Hour, and Meters per Second					
	Main Rotor Start or Stop			Takeoff or Landing		
	kts	mph	m/s	kts	mph	m/s
Headwind	39	45	20	39	45	20
Right Crosswind	19	22	10	19	22	10
Left Crosswind	29	34	15	19	22	10
Tailwind	15	17	8	19	22	10
NOTE: The maximum allowable surface wind speed for taxiing the aircraft is 15 m/s (29 kts or 34 mph)						

Figure 5. Main Rotor Limitations

MAIN ROTOR LIMITATIONS		
Absolute Limits:	RPM, %	MAX Time Allowed
MAX Rated & Take-Off Power	103% Maximum	10 Seconds
MAX Rated & Take-Off Power	88% Minimum	30 Seconds
All Settings above LTD Cruise	101 % Maximum	20 Seconds
All Settings below LTD Cruise	103% Maximum	20 Seconds
Normal Operating Limits:	RPM, %	MAX Time Allowed
IDLE	55 to 70 (40 to 55 Single Engine)	20 Minutes
CRUISE	97% Maximum	Not Limited
LTD CRUISE	97% Maximum	60 Minutes
MAX LTD CRUISE	97% Maximum	60 Minutes
TAKE OFF	94% Maximum	6 to 15 Minutes
MAX RATED POWER	94% Maximum	6 to 60 Minutes
WARNING: Application of the Main Rotor Brake above 20% Nr prohibited		

Figure 6. TV3-117VM ENGINE OPERATING LIMITS

TV3-117VM Maximum Operating Limits								
POWER SETTING	MAX PTIT (°C)	MAX N ₁ (% N ₂)	MAX N _r (% MR RPM)	MAX Oil Temp (°C)	MIN Initial Oil Temp (°C)	MIN Oil Temp Continuous Operation (kgf/cm ²)	MIN Oil Pressure (kgf/cm ²)	MAX Operating Time Allowed* (Minutes)
MAX RATED	990	101.15%	94%	150	30	70	4.0	6 to 60
TAKE OFF	990	101.15%**	94%	150	30	70	4.0	6
MAX LTD CRUISE	955	99.0%	97%	150	30	70		60
LTD CRUISE	910	97.5%	97%	150	30	70	4.0	60
CRUISE	870	95.5%	97%	150	30	70	4.0	No Limit
IDLE	780	58 - 80%	55/70***	-	-	-	2.0	20

* Exceeding 6 minutes of operating time in the EMER/Take Off settings or the time limits for other power settings, will result in a reduction in engine service life.
 ** If the engine governor fails with the engines at the Take Off setting, the maximum permissible N₁ is 102.5%.
 ***The maximum N₂ at idle is 55% for single engine operation and 70% with both engines operating.

VM Table 5-3 TV3-117VM Engine Operating Limits

APU EGT Limits:

Start Mode 880 degrees C (1,616 degrees F)

Idle Mode 720 degrees C (1,328 degrees)

Airbleed/Generator Mode 750 degrees C (1,382 degrees)

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Figure 7. AIRSPEED OPERATING LIMITS

Airspeeds for Typical Flight Operations Data is Absolute Limits Altitude is shown in FEET, speed is shown in KIAS			
		V _{te} (Turbulence penetration)	
V _x (Best angle of climb)	27 to 32 KIAS	0 to 6562	86 to 102 KIAS
V _y (Best rate of climb)	60 to 65 KIAS	Above 6562 decrease V _{ne}	8 to 16 KIAS
Avoid due to high vibration	11 to 27 KIAS	Maneuver/Configuration Speeds	
Max running landing TD	20 to 30 KIAS	Autorotation - 0 to 6,562	49 to 97 KIAS
Min running landing TD	3 to 5 KIAS	Autorotation - 6,562 to 16,404	54 to 65 KIAS
V _{yse} (Best Single Eng)	65 to 70 KIAS	Sideward Flight	5 KIAS
Min SE Airspeed	30 to 40 KIAS	Rearward Flight	5 KIAS
		IFR flight @ 24,471 or lower	119 KIAS
		IFR flight @ 24,471 or higher	108 KIAS
V _{ne} at Gross Weight: 24,471 to 28,660		Traffic Patterns	86 KIAS
0' to 3,280'	124 KIAS	Paradrop for Free Fall	32 to 135 KIAS
3,280 to 6,651	105 KIAS	Paradrop for Static Line	76 KIAS
6,651 to 9,842	86 KIAS	Max speed external load	135 KIAS
9,842 to 13,123'	65 KIAS	Max speed w/cargo doors open	124 KIAS
V _{ne} at Gross Weight: 24,471 or less		Max speed w/cargo doors off	108 KIAS
0 to 3,280	135 KIAS	Long Range Cruise Speed	
3,280 to 6,651	124 KIAS	0 to 3,280	119 to 125 KIAS
6,651 to 9,842	113 KIAS	3,280 to 6,651	113 to 119 KIAS
9,842 to 13,123	92 KIAS	6,651 to 9,842	105 to 113 KIAS

Table 5-9 Airspeed Limitations for Typical Flight Operations **VM**

Figure 8. CONVERSIONS

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigrams = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Temperature Conversion

$^{\circ}\text{C to }^{\circ}\text{F} = (9/5 \times ^{\circ}\text{C}) + 32.$
 $^{\circ}\text{F to }^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9.$