

## **BEFORE STARTING CHECKS**

0. Exterior inspection --- **CHECKED**

1. Ground power unit connected --- **CHECKED**

2. External DC bus switch --- **ON**

3. External AC bus switch --- **ON**

4. Battery 1 e 2 --- **ON**

5. Inverter switch --- **AUTO**

6. Radio settings:

a. Intercom --- **ON**

b. R-828 VHF1 --- **ON**

c. R-800L1 VHF2 --- **ON**

d. Frequencies --- **AS REQUIRED**

e. Selftest R-800L1 --- **PERFORM**

7. EKRAN-HYDRO --- **OPER**

8. EKRAN Test:

a. “MASTER WARNING LIGHT” --- **PUSH 2X**

b. Display EKRAN: “SELFTEST” --- **CHECKED**

c. Display EKRAN: “EKRAN READY” --- **CHECKED**

d. Press “BETTY VOICE TEST” button --- ear “EKTRAN IS READY” message

9. Cockpit light test:

a. “LAMP TEST” --- **PRESS**

b. All lights are on --- **CHECKED**

10. Cockpit lightning --- **AS REQUIRED**

11. VOICE MESSAGE EMERGENCY --- **ON**

11. K-041 --- **ON**

12. ABRIS --- **ON & READY**

ABRIS complete startup sequence takes about 120 seconds

13. INU ALIGNMENT (choose from AA, NA or PA):

a1. ACCELERATED:

b1. PVI-800 status switch --- **OPER**

c1. INU --- **ON**

d1. INU heat --- **AS REQUESTED**

e1. SAI --- **ON**

f1. HUD --- **BRIGHTNESS UP**

g1. SIMBOLOGY ИKB/YB --- **CHECK ON HUD**  
(wait 3 min.)

h1. SIMBOLOGY ИКБ/УБ --- **CHECK DISAPPEAR**

i1. MAGNETIC DECLINATION --- **CHECK VALUE**

j1. MH/GYRO/MAG --- **MH**

k1. MH/GYRO/MAG --- **GYRO**

a2. NORMAL:

b2. PVI-800 status switch --- **OPER**

c2. INU NORM --- **PUSH**

d2. INU --- **ON**

e2. INU heat --- **AS REQUESTED**

f2. SAI --- **ON**

g2. HUD --- **BRIGHTNESS UP**

h2. SIMBOLOGY ИКБ/УБ --- **CHECK ON HUD**

(3 min.)

i2. SIMBOLOGY ИКБ/УБ --- **CHECK ON HUD**

(9 min.)

j2. INU NORM --- **CHECK FLASH**

k2. INU NORM --- **DEPRESS**

l2. SIMBOLOGY ИКБ/УБ --- **CHECK DISAPPEAR**

m2. MAGNETIC DECLINATION --- **CHECK VALUE**

n2. MH/GYRO/MAG --- **MH**

o2. MH/GYRO/MAG --- **GYRO**

a3. PRECISION:

b3. PVI-800 status switch --- **OPER**

c3. INU PREC --- **PUSH**

d3. INU --- **ON**

e3. INU heat --- **AS REQUESTED**

f3. SAI --- **ON**

g3. HUD --- **BRIGHTNESS UP**

h3. SIMBOLOGY ИКВ/УВ --- **CHECK ON HUD**

(3 min.)

i3. SIMBOLOGY ИКВ/ВГП --- **CHECK ON HUD**

(9 min.)

j3. SIMBOLOGY ИКВ/ТВ --- **CHECK ON HUD**

(8 min.)

k3. INU PREC --- **CHECK FLASH**

l3. INU PREC --- **DEPRESS**

m3. SIMBOLOGY ИКВ/ТВ --- **CHECK DISAPPEAR**

14. ADF mode switch --- **ANTENNA**

15. Set ADF Channel --- **DONE**

16. NDB beacon mode switch --- **INNER**

Check SAI bearing needle point to inner beacon

17. NDB beacon mode switch --- **OUTER**

Check SAI bearing needle point to outer beacon

18. ABRIS --- **SETUP**

19. QFE --- **SET**

20. ACCELEROMETER --- **RESET**

21. Radio call --- **COMPLETED**

## **STARTING APU**

22. Beacon light --- **ON**

23. Test EGT: set-point > 800 °C --- **CHECKED**

(EGT stopped engine test)

24. Test fire extinguisher – group 1,2,3 --- **OK**

25. Fire extinguisher switch --- **WORK**

26. Fuel quantity indicator --- **ON**

27. Fuel test --- **CHECK**

28. APU fuel valve --- **OPEN**

29. Forward tank fuel pump --- **ON**

30. “FORWARD TANK” on --- **CHECKED**

31. Aft tank fuel pump --- **ON**

32. “AFT TANK” on ---- **CHECKED**

33. Startup / Crank / False Start switch --- **START**

34. Turbo Gear / APU / Left Engine / Right Engine switch --- **APU**

35. APU Startup:

a. Start button --- **DEPRESS 2-3 sec**

b. EGT In start-up <850°C --- **CHECKED**

c. EGT stand-by <720°C --- **CHECKED**

d. “APU ON“ light --- **CHECKED (< 24 sec)**

e. “APU oil pressure normal” light --- **CHECKED**

## **CAUTION**

**OBSERVE THIS REMARKS FOR APU CONSECUTIVE**

**START OPERATIONS:**

In case of aborted start the APU should be cold cranked before restart

For the first 3 consecutive start observe 3 minutes of cool down in between

After 3rd start, observe 15 minute cool down

## **WARNING**

### **STOP START UP SEQUENCE IF:**

- No reaction from APU EGT indicator after 9 seconds since “START” button press
- APU EGT rises above 880 °C
- Fire warning light on
- Uncontrolled shut-down happen

In those cases please refer to DCS BS3 Flight Manual EN

## **STARTING ENGINES**

36. Rotor Brake --- **DISENGAGE**

37. Left engine fuel shutoff --- **ON**

38. Left EEG switches --- **ON**

39. “TURBO GEAR / APU /LEFT ENGINE / RIGHT ENGINE”  
switch --- **LEFT ENGINE**

40. Cronometer --- **START**

41. Left engine startup:

- a. Start button --- **DEPRESS 2-3 sec**

- b. 20% N1 --- **OPEN LEFT ENGINE CUTOFF VALVE**
- c. Engine RPM increase --- **CHECKED SMOOTH AND REGULAR**
- d. EGT increase --- **CHECKED**
- e. Rotor moves < 25% engine RPM --- **CHECKED**
- f. Upon reaching 60% N1: “START VALVE” lights off --- **CHECKED**
- g. N1 > 60%: “TURBO GEAR / APU /LEFT ENGINE / RIGHT ENGINE” switch --- **CENTRAL POSITION**
- h. Engine RPM in IDLE --- **CHECKED**
- i. “GEARBOX OIL TEMP NORM” light on --- **CHECKED**
- j. Hydraulic pressure increase --- **CHECKED**

## **WARNING**

### **STOP START UP SEQUENCE IF:**

- No rotor movement is observable when engine RPM is > 25%
- No observable EGT or engine RPM increase
- EGT over limits
- Engine RPM freezes more than 3 seconds during start.
- Engine goes IDLE in more than 1 minute



- Oil pressure in IDLE RPM < 2 kgf/cm<sup>2</sup> (bar)
- Lack of hydraulic pressure

In those cases please refer to DCS BS3 Flight Manual EN

42. Right engine fuel shutoff --- **ON**

43. Right EEG switches --- **ON**

44. “TURBO GEAR / APU /LEFT ENGINE / RIGHT ENGINE”  
switch --- **RIGHT ENGINE**

45. Cronometer --- **START**

46. Right engine startup:

- a. Start button --- **DEPRESS 2-3 sec**
- b. 20% N1 --- **OPEN RIGHT ENGINE CUTOFF VALVE**
- c. Engine RPM increase --- **CHECKED SMOOTH AND REGULAR**
- d. EGT increase --- **CHECKED**
- e. Rotor moves < 25% engine RPM --- **CHECKED**
- f. Upon reaching 60% N1: “START VALVE” lights off --  
**CHECKED**
- g. N1 > 60%: “TURBO GEAR / APU /LEFT ENGINE / RIGHT  
ENGINE” switch --- **CENTRAL POSITION**
- h. Engine RPM in IDLE --- **CHECKED**

i. "GEARBOX OIL TEMP NORM" light on --- **CHECKED**

j. Hydraulic pressure increase --- **CHECKED**

47. N1 in IDLE condition > 62% --- **CHECKED**

48. APU --- **SHUT DOWN**

49. APU fuel valve --- **CLOSED**

50. ENG OIL TEMP > 30°C --- **CHECKED**

## **BEFORE TAXI**

51. Anti-Ice system test

a. Collective --- **MIN**

b. Engine Thrust --- **RISE TO AUTO**

c. "ANTI ICING / DUST PROTECTION" switch ---  
**ANTI-ICING**

d. EGT raise 60 C° --- **CHECKED**

e. Engine RPM + 2% ca -- **CHECKED**

f. "ANTI ICING / DUST PROTECTION" switch ---  
**BACK TO CENTER**

## **CAUTION**

### **DO NOT PERFORM ANTI-ICE SYSTEM TEST IN INCORRECT ENVIRONMENTAL CONDITIONS**

To prevent damage to the engines, the engine anti-ice system shall be tested or activated when the aircraft is flown in visible moisture and Free Air Temperature (FAT) is less than +5° C.

#### 52. Anti-dust system test:

- a. Collective --- **MIN**
- b. Engine Throttles --- **RISE TO AUTO**
- c. “ANTI ICING / DUST PROTECTION” switch ---  
**DUST.PROT.**
- d. EGT raise 30 C° --- **CHECKED**
- e. Engine RPM + 0,5% ca --- **CHECKED**
- f. “ANTI ICING / DUST PROTECTION” switch ---  
**BACK TO CENTER**

#### 53. Rotor Anti-Ice system Test:

(only if OAT or FAT is  $\leq 5^{\circ}\text{C}$ ):

- a. “ICE DETECTOR CONTROL” button --- **PRESS (keep depressed)**
- b. “ICE” light turn on after 10 s ---- **CHECKED**
- c. “ICE DETECTOR CONTROL” button --- **RELEASE**
- d. “ICE DETECTOR OK” turn on after 30 and 50 s since release, off after 55 to 100 s from release --- **CHECKED**
- e. “ROTOR AIS” switch --- **AIS**
- f. “ROTOR AIS” lights turns off --- **CHECKED**

#### 54. EEG Test:

- a. “EEG GG Test” switch --- **GG**
- b. Parking brakes --- **SET**
- c. Left engine thrust lever --- **MAX**
- d. Increase collective since RPM = 86..87% --- **CHECKED**
- e. “LEFT ENG PWR LIMIT” light turns on --- **CHECKED**
- f. “EEG GG Test” switch --- **OFF**
- g. “LEFT ENG PWR LIMIT” light turns off --- **CHECKED**
- h. Repeat from “a” to “g” for right engine

#### 55. Test PT – EEG

- a. Turbines throttle levers --- **IDLE**

b. “EEG PT-1 TEST / OPER / EEG PT-2 TEST” switch --- **EEG PT-1 TEST**

c. Slowly and continuously increase throttle levers since:

> “LEFT ENG PT OVERSPEED” light is on --- **CHECKED**

> “RIGHT ENG PT OVERSPEED” light is on --- **CHECKED**

d. Betty voice messages --- **PLAYED**

e. Slowdown 5..7% engines RPM --- **OK**

f. “c” point light still on --- **CHECKED**

g. “EEG PT-1 TEST / OPER / EEG PT-2 TEST” switch --- **OPER**

h. “c” point light turns off --- **CHECKED**

i. Turbines throttle levers --- **IDLE**

j. Repeat “a” to “i” points for PT-2 test.

56. Rotor RPM readjustment test:

a. Collective --- **MIN**

b. Throttles’ levers --- **AUTO**

c. Read rotor RPM value --- **CHECKED**

d. RPM readjustment switch--- **LOW**

e. RPM -5% --- **CHECKED**

f. “ZEBRA” flashing light on --- **CHECKED**

g. RPM readjustment switch--- **NORM**

h. RPM +5% --- **CHECKED**

i. “ZEBRA” flashing light off --- **CHECKED**

57. Flight controls and hydraulic system check:

a. Flight controls free movement and mechanical part moves freely - **CHECKED**

b. Hydraulic system pressure between 65 and 80 kgf/cm2 --- **CHECKED**

c. “HYDRAULIC SYSTEM MAIN / OFF” switch --- **OFF**

d. “MWL” light flashing --- **CHECKED**

e. “HYDRAULIC VALVE 1” lights turns on --- **CHECKED**

f. “HYDRAULIC VALVE 2” lights turns on --- **CHECKED**

g. EKRA display writes “MAIN HYDRO” --- **CHECKED**

h. “HYDRAULIC SYSTEM MAIN / OFF” switch --- **MAIN**

i. “e” and “f” lights turn off --- **CHECKED**

j. Emergency hydraulic accumulator pressure is equal to main hydraulic system pressure --- **CHECKED**

58. Engine Throttles – **RISE TO AUTO**

59. AC left generator --- **ON**

60. AC right generator --- **ON**

61. Disconnect ground power--- **CHECKED**

62. SAI --- **UNCAGE**

63. UV-26 --- **ON**

64. UV-26 --- **PROGRAM**

## **BEFORE DEPARTURE**

65. “NAV” switch --- **ON**

66. “NAV” Datalink --- **DL**

67. PVI-800 --- **INITIAL SETUP**

68. PVTs-800 --- **SET ID & TYPE**

69. Radio panel:

a. DL switch --- **ON**

b. VHF-TLK switch --- **ON**

c. SA-TFL switch --- **ON**

70. L-140 switch --- **ON**

71. Stability augmentators

a. “BANK” channel --- **ON**

- b. "HEADING" channel --- **ON**
- c. "PITCH" channel --- **ON**
- d. "ALT-HOLD" channel --- **OFF**
- e. "FD" mode --- **AS REQUIRED**

72. "BARO/RALT" altitude mode --- **AS REQUIRED**

73. "DT / DH" route mode --- **CENTER POSITION**

74. ARK-22 ADF test --- **CHECKED**

75. Ejection system switches --- **ON**

76. Lightset:

- a. NAV LIGHTS --- **100%**
- b. FORMATION LIGHTS --- **100%**
- a. TIP LIGHTS --- **AS REQUIRED**

77. IFF switch --- **ON**

78. Signal flares power switch --- **ON**

79. Clock synchronization --- **DONE**

80. ADI test --- **CHECKED**

81. Radar altimeter test

- a. Alarm setpoint < 15 mt – **SET**
- b. Test button --- **PRESS (KEEP)**



c. Signal tone --- **PLAYED**

82. Pitot heating --- **ON**

83. RAM-air Pitot heating--- **ON**

84. Weapons control system --- **ON**

85. Weapons control panel

a. “MASTER ARM” switch --- **OFF**

b. Cannon AP/ HE rounds --- **CHECKED**

c. Weapons MAN / AUTO switch --- **AUTO**

d. Fire-rate switch --- **AS REQUIRED**

e. Shkval laser code --- **AS PLANNED**

86. K-041 Navigation and target system panel

a. TRAINING mode switch --- **AS REQUIRED**

b. Gun-Sight switch --- **AS REQUIRED**

## **HOVER CHECK**

87. Hover check execution:

a. Wind direction (PVI-800) --- **CHECK**

b. Lift up departure heading --- **PERFORM**

c. maintain horizontal position --- **PERFORM**

d. maintain 6 mt AGL --- **PERFORM**

88. Flight controls --- **CHECK**

89. Engine --- **WITHIN LIMITS**

When the engines are correctly regulated Rotor RPM in steady hover and flight is automatically maintained within the limits of  $(90 \pm 0.5) \%$  except for the maximum and minimum power ratings

90. Balancing --- **TRIM CYCLIC TO NEUTRAL**

91. Flight instruments reading --- **NORMAL**

## **BEFORE LANDING**

92. Master Arm switch --- **OFF**

93. Lightset:

a. NAV LIGHTS --- **100%**

b. FORMATION LIGHTS --- **100%**

c. TIP LIGHTS --- **AS REQUIRED**

94. Engine and transmission instruments --- **CHECK**

95. Rotor RPM at  $90 \pm 2\%$  --- **CHECK**

96. Wheel brakes --- **AS REQUIRED**

97. Dust protection --- **AS REQUIRED**

98. Landing information --- **COPIED**

Landing information include:

- ATS land informations

- ATS wheather and visibility remarks
- Landing flight procedures

99. Altitude hold damper channel --- **OFF**