21. Appropriate Battery Switch.....ON

22. Battery Volts/Ammeter .....MONITOR

23. APU AIR ..... AS REQUIRED

24. DC External Power..... DISCONNECT

2-03-00: ENGINE STARTING PROCEDURES

2-03-10: Before Starting Engines:

1. Preflight Checklists ..... COMPLETE
2. Circuit Breakers.....CHECK
3. EPMP Bus Switches (6) ..... AUTO
4. EPMP L/R Pwr Switches..... OFF
5. Battery 1 and 2 Switches .....ON
6. Essential AC/DC Bus Volts ..... CHECK 115VAC/400HZ/22 - 27VDC
7. Standby Electrical Power ..... OFF
8. HP Fuel Cocks..... SHUT
9. Electrical AUX Power/Air ..... ON (See APU GROUND OPERATION Checklist)
10. EMERGENCY POWER ..... OFF
11. Display Switches (3) .....ON
12. CABIN/GALLEY/RADIO MASTER Switches .....ON
13. Display Controllers (2).....ON
    For airplanes SN 1156 and subs. and airplanes SN 1000 thru 1155 with ASC 92.
14. IRS's.....NAV
15. FMS's.....INITIALIZE
16. Display Switching/Symbol Generator Control..... NORMAL

NOTE: Check First Flight of Month.

17. Engine Bleed Air/Temp Control .....OFF/AS REQUIRED

NOTE: Selecting engine bleed air switches OFF will help extend life of the bleed air valves by de-energizing the solenoids.

18. Pressurization Control ..... CHECK/SET

19. Outflow Valve ..... OPEN

20. Anti-Ice Switches (4) ..... OFF

21. Fuel System ..... CHECK

22. Remote Fuel Shutoffs (2) ..... OPEN

23. Engine Synchronizer. ..... OFF

24. Engine Temperature Controls (SN 1000 thru 1319) ..... ON

NOTE: Airplanes SN 1320 and subsequent and SN 1000 thru 1319 with ASC 394 have the Engine Temperature Controls removed.

25. EVM ..... TEST

NOTE: Test is valid only when engines are shut down.

26. Engine Start Switches ..... OFF

27. Exterior Lights ..... AS REQUIRED

28. Engine Fire/Fault Test ..... COMPLETE

29. Windshield Wipers ..... OFF

30. Anti-Ice Heater Switches ..... AS REQUIRED

31. Utility Pump ..... ARMED

32. Auxiliary Hydraulic Pump/Brake System ..... CHECKED

SECTION 2
NORMAL
PROCEDURES

Side Panels

33. Radar Controls ..... AS REQUIRED

34. ICS Panels ..... AS REQUIRED

35. Oxygen Systems ..... ON/CHECK

36. Oxygen Masks ..... TEST

37. Cockpit Lights ..... AS REQUIRED

38. Warning Lights ..... CHECK

39. RH Radio Rack Fan ..... AUTO

40. Inertial System Display Unit (ISDU) ..... CHECK

41. Tone Generator ..... TEST

NOTE: For SPZ 8400 equipped airplanes, the Tone Generator test is performed using the pilot's Display Controller TEST menu. Selecting TONE results in the test tone, a Klaxon (high-low - high-low) gear unsafe tone. While in the test mode, the pilot can adjust tone generator volume. The test is completed by selecting the RETURN prompt to return to the TEST main menu.

42. Landing Gear Emergency Reset ..... IN/SAFETIED

43. Emergency Gear Handle ..... IN/SAFETIED

44. Cockpit Voice Recorder ..... CHECK

45. Flight Data Recorder ..... SET

46. Non Essential Static Control (if installed)..... ON/NORMAL

47. Emergency Flap Handle .....NEUTRAL

48. Emergency Flap Switch.....NORMAL/GUARDED

49. Smoke Detector .....TEST
For airplanes SN 1000 thru 1155 with ASC 157 and/or airplanes SN 1000 and subs with ASC 268.

50. RH R/R Fan Indicator..... AUTO
For airplanes SN 1156 and subs.

Instrument Panels

51. Clocks.....CHECK

52. Display Controllers.....CHECK

53. EFIS.....TEST

54. EICAS .....TEST

55. IRS's..... NAV/TEST

56. ELWS Loadmeter (if installed) .....TEST/OFF

57. Standby Engine Instruments..... AUTO

NOTE: Check static indications with EICAS indications on first flight of day.

58. Altimeters (s).....SET/CROSS CHECKED

NOTE: In order to conduct operations in RVSM airspace, the pilot and copilot altimeters must agree within seventy-five (75) feet of known field elevation and must also agree within seventy-five (75) feet of each other.

59. Flight Guidance Panel ..... CHECK

60. Thrust Reverser Lights ..... CHECK

    a) REV ARM ..... ON

    b) REV Unlock/Deploy ..... OUT

NOTE: If either or both Unlock or Deploy lights are ON, maintenance is required before flight.

61. Standby Attitude Indicator ..... UNCAGED

62. Standby Warning Lights Panel (SPZ 8000 only) ..... AS DESIRED

63. Fuel Quantity (Normal and Standby) ..... TEST

64. DBDI's ..... TEST

NOTE: DBDI will return to standby after TEST, unless the corresponding IRS is in NAV.

65. Cabin Pressurization Controller ..... SET

66. Flap Indicator ..... CHECK

67. Handle ..... DOWN

Center Pedestal

68. Fire Handles ..... IN

69. Power Levers ..... IDLE

70. Gust Lock ..... AS REQUIRED

71. Ground Spoiler Flap Override Switch ..... OFF

72. Speed Brake Handle ..... RETRACT

73. Elevator Trim .....CHECK/SET (See Table for Recommended Elevator Trim Setting)

74. Stall Barrier Switch .....ON

75. Anti-Skid Switch .....ON

76. Ground Spoiler Switch ..... OFF

77. T/REV EMER STOW Switch ..... OFF

78. Nutcracker Test Switch .....GUARD DOWN

CAUTION: DO NOT DEPRESS NUTCRACKER TEST SWITCH WHILE THE AIRPLANE IS ON THE GROUND. DEPRESSING THE SWITCH SIMULATES THE IN-FLIGHT CONDITION WHICH AFFECTS AIRPLANE SYSTEMS INCLUDING MOMENTARY UNLOCKING OF THE LANDING GEAR HANDLE DOWN LOCK SOLENOID.

79. Parking Brake .....ON

80. Brake Accumulator Pressure .....3000 PSI

81. Flight Power Shutoff Handle..... DOWN

82. Radios ..... SET

83. TCAS/TCAS MODE/SET UP ..... TEST/TA-RA/ABOVE

84. E/GPWS ..... TEST

85. BTMS/Selector Switch..... TEST/ALL

NOTE: For SPZ-8000 equipped airplanes SN 1156 and subs and SN 1000 through 1155 with ASC 167. For SPZ-8400 equipped airplanes, BTMS is incorporated in the BRAKES System page. No test required or selection available.

86. Rudder and Aileron Trim ..... CHECK

87. EPR/V Speeds/AOA/Radio Altimeter..... SET

NOTE: The AOA indexer on the center post will operate only if an AOA value is set (boxed) on the Display Controller.

Figure 2-1: Table of Recommended Elevator Trim Tab Setting

FUEL LOADING POUNDS	ELEVATOR TRIM TAB POSITION UNITS									
29,000	11	10	9	8	7	6	5	4	3	2
28,000	11	10	9	8	7	6	5	4	3	2
27,000	11	10	9	8	7	7	6	5	4	3
26,000	12	11	10	9	8	7	6	5	4	3
25,000	12	11	10	9	8	7	6	5	4	3
24,000	12	11	10	9	8	7	6	5	4	3
23,000	12	11	10	9	8	7	6	5	4	3
22,000	12	11	10	9	8	7	6	5	4	3
21,000	12	11	10	9	8	7	6	5	4	3
20,000	12	11	10	9	8	7	6	5	4	3
19,000	12	11	10	9	8	7	6	5	4	3
18,000	12	11	10	9	8	7	6	5	4	3
17,000	12	11	10	9	8	7	6	5	3	3
16,000	12	11	10	9	8	7	6	4	3	2
15,000	12	11	10	9	8	6	5	4	3	2
14,000	12	11	10	8	7	6	5	4	3	1
13,000	12	10	9	8	7	6	5	4	2	1
12,000	11	10	9	8	7	5	4	3	2	1
11,000	11	10	9	7	6	5	4	3	1	0
10,000	11	9	8	7	6	5	3	2	1	-1
9,000	10	9	8	6	5	4	3	1	0	-2
8,000	10	8	7	6	5	3	2	1	-1	-3
7,000	9	8	7	5	4	3	1	0	-2	-4
6,000	9	7	6	5	3	2	0	-1	-2	-5
5,000	8	6	5	4	3	1	0	-2	-3	-5
4,000	7	6	5	3	2	0	-1	-3	-4	-6
3,000	7	5	4	2	1	-1	-2	-4	-5	-7
2,000	6	4	3	1	0	-2	-3	-5	-6	-8
1,000	5	3	2	0	-1	-3	-4	-6	-7	-8
	36	37	38	39	40	41	42	43	44	45
ZERO FUEL CENTER OF GRAVITY - % MAC										

NOTE: A minus sign (-) indicates nose down trim.

2-03-20: Before Engine Start – Thruflight:

1. Circuit Breakers ..... CHECK
2. Essential AC/DC Bus Volts ..... CHECK 115 VAC/400 HZ/22 – 27 VDC
3. HP Fuel Cocks ..... SHUT
4. Electrical Power/Air ..... ON
5. EMERGENCY POWER ..... OFF
6. Display Switches (3) ..... ON
7. IRSs ..... NAV
8. FMSs ..... INITIALIZE
9. Engine Bleed Air/Temp Control ..... OFF/AS REQUIRED

NOTE: Selecting engine bleed air switches OFF will help extend life of the bleed air valves by de-energizing the solenoids.

10. Pressurization Control ..... CHECK/SET
11. Outflow Valve ..... OPEN
12. Engine Synchronizer ..... OFF
13. Exterior Lights ..... AS REQUIRED
14. Utility Pump ..... ARMED
15. AUX Pump/Brake System ..... CHECKED
16. Radar Controls ..... AS REQUIRED
17. Clocks ..... CHECK
18. Cabin Pressurization Controller ..... SET
19. Power Levers ..... IDLE
20. Elevator Trim ..... CHECK/SET
21. Parking Brake ..... ON
22. Brake Accumulator Pressure ..... 3000 PSI
23. EPR/V Speed/AOA/Radio Altimeter ..... SET

2-03-30: Starting Engines:

1. Start Page.....SELECTED

NOTE: See cold start procedure when oil temperature is minus 10°C or less.

2. HP Fuel Cocks..... SHUT
3. Power Levers..... IDLE
4. Gust Lock..... OFF
5. Beacon Switch.....ON
6. APU Air/External Air.....ON/PRESSURE 25 PSI MINIMUM

NOTE: Normal air pressure from APU can vary between 25 to 50 psi. During starting cycle, APU air pressure drops, but should not fall below approximately 20 psi.

7. Fuel Boost Pumps (One Each Side) .....ON/MESSAGE OUT
8. Electrical Power .....CHECK (35% MAX)

NOTE: If using APU, limit APU alternator load (AC AUX PWR) to 35% during Main Engine Starts. At high elevation airports and/or in high ambient temperature conditions, limit AUX AC load to 30%.

9. Engine Start Master.....ON
10. Engine Start Switch.....PRESS

CAUTION: CONTINUED USE OF THE STARTER IS LIMITED TO THREE (3) CRANK CYCLES, WITH MAXIMUM OF THIRTY (30) SECONDS PER CYCLE. DELAY THREE (3) MINUTES BETWEEN START ATTEMPTS. AFTER THREE (3) CYCLES, DELAY USE OF STARTER FOR AT LEAST FIFTEEN (15) MINUTES.

11. Start Valve and Ignition .....ON

CAUTION: IF THE SVO INDICATION DOES NOT ILLUMINATE DURING THE START, DISCONTINUE THE START AND SEEK MAINTENANCE PRIOR TO DISPATCH. SEE SECTION 3-11-20: START VALVE FAILURE.

NOTE: If IGN mnemonic is not displayed on EICAS, start may be salvaged by selecting AIR START IGN-ON prior to opening HP Fuel Cock:

12. Positive LP RPM.....CHECK

13. HP Fuel Cock ..... OPEN (15% HP Minimum)

NOTE: In high tail wind conditions, direction of rotation of LP may initially be reversed and, if so, the HP fuel cock should not be selected to OPEN until HP is stabilized. This ensures that LP rotation is positive. Starts with tailwinds of up to 25 knots have been demonstrated.

NOTE: Ignition should occur within ten (10) seconds after selecting HP Cock to OPEN. HP RPM should increase to idling speed 40 seconds or less on an International Standard Atmosphere (ISA) day or 60 seconds or less on a minus 40 degrees day.

14. Start Valve and Ignition ..... OFF

NOTE: Start valve should close by 44.5% HP RPM. For SPZ 8000 equipped airplanes the SVO mnemonic changes from blue to amber above 42% (for SPZ 8400 equipped airplanes 44.5%) and starts flashing. Check at ground idle HP RPM, and if not closed (SVO still illuminated); execute START VALVE FAILURE TO CLOSE abnormal checklist.

15. TGT .....MONITOR (700°C MAX)

NOTE: During starting, TGT should not exceed 700°C. If there is any evidence of rapid rising TGT and it is anticipated that 700°C will be exceeded, select HP Cock to SHUT immediately. If TGT has not exceeded 700°C, second start may be attempted. If, under normal starting conditions, TGT exceeds 650°C, this will indicate a fault in the engine or starting systems. TGT may exceed 650°C when ambient conditions cause high density altitudes.

16. Engine RPM .....CHECK (46.6% HP MINIMUM)

17. Oil Pressure and Temperature .....CHECK

18. EVM. .....CHECK

NOTE: The EVM system is designed to monitor engine vibrations at idle and above. During start, the EVM system may occasionally display momentary EVM values above the ALERT level (0.60) which in turn causes EVM digits to an amber display momentarily on the CAS (for SPZ 8400 equipped airplanes). This normally occurs on the first start of the day.

19. Single Rudder Limit Message .....ON
(right engine only running)

20. Hydraulic Pressure .....CHECKED (0/3000/3000/0)

21. Flight Data Recorder Fail Message .....CHECK OUT

22. Second Engine Start ..... Repeat Steps 10 thru 18

23. Single Rudder Limit Message ..... OUT

24. Hydraulic Pressure .....CHECKED (3000/3000/0/0)

2-04-00: BEFORE TAKEOFF PROCEDURES

2-04-10: After Starting Engines:

1. Start Master ..... OFF
2. Electrical Master Left/Right Power Switches ..... ON
3. External Electrical Power/Air ..... OFF/CARTS REMOVED
4. Auxiliary Electrical Power/Air/Engine Bleed Air ..... AS DESIRED

NOTE: Only one source of Bleed Air, either APU or engines should be selected after engines are started. This is to prevent thermal transients on the APU or possible damage to the APU when the power levers are moved from idle. With engines as source of bleed air, ensure ISOL VLV is CLOSED.

5. Battery Ammeters ..... CHECK
6. ESS DC Bus Power Source ..... AUTO/LEFT MAIN ILLUMINATED

CAUTION: DO NOT DISPATCH WITH ESS DC POWERED BY BATTERIES.

7. Emergency Power ..... ARMED
8. Doors ..... CLOSE

NOTE: Check that the orange dot position indicators on each of the six locking pins is visible.

9. Anti-Ice Heat Switches ..... ON
   For airplanes SN 1096 and subs. (5), and airplanes SN 1000 thru 1095 (4)
10. Cowl/Wing Anti-Ice Switches ..... CHECK/AS REQUIRED

NOTE: Check or select cowl/wing anti-ice ON using engine bleed air only to prevent excessive APU EGT.

11. Pressurization Control ..... AUTO/FLIGHT/SET
12. Fuel Boost Pumps/Crossflow Valve ..... ON/CLOSED

13. Nose Wheel Steering ..... OFF

14. Ground Spoilers ..... CHECK

NOTE: Check first flight of the day.

15. Stall Barrier ..... TEST

NOTE: Check first flight of day. If flight time for the day exceeds 8 hours, a second stall barrier check is required prior to the second flight of the day.

16. Flight Controls/Bungee/Rudder Torque Limiter ..... CHECK
Check flight controls for freedom and correct movement over full range of motion while observing marshaller.

NOTE: While performing the elevator check pull the yoke aft and then release. The yoke should slowly fall forward until the elevator surface reaches its stop. A failed bungee has shown that when the yoke reaches the forward stop, there is a slight hesitation and the yoke cycles approximately one inch aft then forward. For a normal bungee, there should not be any hesitation or aft movement after the yoke is released. Any windy conditions may invalidate the yoke cycling test.

17. Yaw Damper ..... ON

18. Nose Wheel Steering ..... ON

19. Pedal Steering Disconnect Switch ..... ON/LIGHTS OUT

20. Auxiliary Hydraulic Pump ..... ARMED

21. Brake Test Switch (BITE)/Anti-Skid Test Switch ..... PRESS, THEN RELEASE

2-04-20: Taxi/Before Takeoff:

1. Transponder ..... AS REQUIRED
2. Exterior Lights ..... AS REQUIRED

NOTE: Limit ground operation of landing lights to five (5) minutes.

3. Cowl/Wing Anti-ice ..... AS REQUIRED

NOTE: Select cowl/wing anti-ice ON using engine bleed air only.

4. Brakes ..... CHECK
5. Slip Indicators/Compasses/Flight Instruments ..... CHECK

NOTE: (1) For SPZ 8400 equipped airplanes, the external slip indicator is removed from the PFD and replaced by an electronic slip indication just below the roll pointer on each PFD ADI.

(2) If flight instruments are inoperative, check AOA indicator. If a high angle-of-attack is indicated, briefly pressing the respective AOA test button will slew the AOA probe to lower angle-of-attack returning flight instruments to normal operation.

NOTE: If taxi operations are conducted with engine bleed air as source for ECS pack during warm weather operations it is recommended that one throttle be advanced above idle with ISOL VLV OPEN and opposite engine bleed air OFF to provide cooling air flow to the cabin.

6. Thrust Reverser Operational Check (first flight of the day)..... COMPLETE
7. Thrust Reverser Lights ..... CHECK (every flight)
   a) REV ARM ..... ON
   b) REV Unlock/Deploy ..... OUT

NOTE: If either or both Unlock or Deploy lights are ON, maintenance is required before flight.

8. Fuel Temperature ..... CHECK
9. Crew Briefing/EPR/V Speeds ..... BRIEFED
10. Trim Settings (3)..... SET

11. BTMS/OVHT Message (if installed) .....CHECK/OUT

NOTE: For SPZ 8400 equipped airplanes, BTMS display is incorporated on the BRAKES System page.

12. Flaps/Stabilizer ..... SET TAKEOFF

13. Engine Instruments .....CHECK

14. Hydraulic Pressure..... CHECK (3000-3000-0-0)

15. APU .....AS DESIRED

16. Flight Guidance Panel ..... SET

17. Warn Inhibit.....ON

2-04-30: Line Up:

1. Engine Bleed Air Switches.....ON

2. APU AIR/ISOL VLV .....OFF/CLOSED

3. Exterior Lights..... AS REQUIRED

4. Ground Spoilers..... ARMED

NOTE: Advance power levers before arming spoilers. Avoid retarding power levers to idle to prevent inadvertent ground spoiler deployment.

NOTE: At sixty (60) knots, the pilot shall confirm that the elevators are free and the yoke has reached the neutral position.

NOTE: If the Flight Power Shutoff Handle is pulled at rotation due to a flight control problem, high pull forces will be required to achieve the takeoff attitude. There will be a delay in airplane rotation and, once airborne, a push force will be necessary to maintain the climb attitude. Application of forward trim will be required shortly after becoming airborne. To avoid running out of forward trim, reduce speed as necessary.

5. Transponder/TCAS.....ON/ON

6. Crew Alerting System .....CHECK

7. Air Start Ignition ..... AS REQUIRED

NOTE: It is recommended that Air Start Ignition be selected ON for takeoff on a runway with standing water, slush, or snow.

8. Autothrottle ..... ARM/ENGAGED (if desired)

NOTE: On SPZ 8000 equipped airplanes, the autothrottle will annunciate “HOLD” at approximately 60 knots and will maintain power lever "HOLD" unless selected to another mode after attaining 400 ft. AGL.

NOTE: On SPZ 8400 equipped airplanes, the autothrottle will maintain takeoff EPR above 400 ft. AGL unless selected to another mode after attaining 400 ft. AGL.

9. Departure Runway Alignment.....BOTH PILOTS CONFIRM