



WEIGHTS	
Max Ramp XL / XLS	20,200 / 20,400
Max Take-Off XL / XLS	20,000 / 20,200
Max Landing XL / XLS	18,700
Max Zero Fuel Xl / XLS	15,000 / 15,100
Minimum Flight Weight	12,400
Max Tail Cone Baggage Weight	700 lbs 100 lbs/ft ²
DIMENSIONS	
Length	52' 10"
Height	17' 2"
Wingspan	55' 8"
Wheel Base	14' 11"
AIRSPEDS	
V _{mo} <8000	260
V _{mo} >8000 to 26,515	305
M _{mo}	.75
V _{turb}	180
V _{fe} 35	175
V _{fe} 7/15	200
V _{lo} extend	250
V _{lo} retract	200
V _{le}	250
V speed brakes	No Limit
V _{mca}	90
V _{mcg} (bias)	81
V _{mcg} (no bias)	98
Max Tire Speed	165
Autopilot Operations	305 / .75
Min Airspeed in Icing	160
Approx Gliding Speed	0.4 AOA
TAKE OFF & LANDING	
Max Alt	14,000'
Max Water / Slush	.5 inch
Max Temp	ISA + 39° C
Min Temp	-54° C
Max Tail Wind	10 knots
Max Demonstrated Cross Wind	24 knots



ENROUTE	
Max Operating Altitude	45,000'
Max Alt (1-3 vortex Gen Missing)	41,000'
Generator Load (in flight)	300 Amps
Intentional Stalls	Below 25,000'
LOAD FACTORS	
Flaps Up (20,000 lbs)	-1.2 + 3.0 G
Flaps 7- 35 (20,00 lbs)	0.0 + 2.0 G
Flaps 35 (18,700 lbs)	0.0 + 2.0 G
N₁	
Take-off	100 %
Max Continuous	100 %
Transient (20 sec)	102 %
N₂	
Take-off	101.8 %
Max Continuous	101.8 %
Ground Idle (min)	47 %
Flight Idle (min)	51.1 %
Flashing Red	>101.8 %
Transient (20 sec)	103 %
ITT	
Take-off	720°
Max Cont	720°
Transient (20sec)	760°
Start	670° 7 Secs.
OIL	
Approved Oils	Exxon 2380
Mixing Allowed	2 quarts in 400 hrs
Max Consumption	1 quart over 10 hr period
Tank Capacity	6.13 Quarts
Useable Capacity	2.44 Quarts
Check Oil Level	10 min. after Shutdown



FUEL		
Approved	All Commercial Jet Fuel	
Avgas	Not Approved	
Prist	Not Required	
Min Temp Take-Off	-40 C°	
Max Temp	+57 C°	
Max imbalance (Normal)	400 lbs	
Max Imbalance (Emergency)	800 lbs	
Max Fuel Capacity	6,790 lbs / 1,006 gal	
HYDRAULICS		
Approved	Skydrol / Hyjet	
Full Capacity	.5 gal	
Refill	.3 gal	
THRUST REVERSER		
Max Reverse	75% Take-Off Thrust	
Idle Thrust Required	60 knots	
Max Deploy Time	3 Min. in 10 Min. Period	
Check Prior to Every Flight	Yes	
Touch and Go	Prohibited	
To Back-Up Airplane	Prohibited	
Static Ground Operation	Idle Thrust	
Minimum Runway Width	75 ft	
LANDING GEAR AND BRAKES		
Main Tires	210 ± 5 PSI	
Nose Tire	135 ± 5 PSI (Loaded) 130 ± 5 (Unloaded)	
Anti Skid	Must Be Operational	
Take Off and Landing	Paved Surfaces Only	
Nose Wheel	Michelin M13701	
FLIGHT CONTROLS		
Vortex Generators	26 Each Wing (3 missing)	
Boundary Layer Energizers	11 Each Wing (0 missing)	
Elevator Trim	Preflight Check Prior Dispatch	
Rudder Bias	Must Be Operational	
Static Wicks	20 (3 missing)	



ICE AND RAIN		
Pitot Static Heat	2 min	
Anti - Ice ON (ground)	1 min	
PRESSURIZATION		
Max Differential	9.6 PSID ± .1 PSID	
Pressure Relief Valve	9.5 PSID ± .1 PSID	
AVIONICS		
AOA System	Preflight Required/Operational	
Min Alt Autopilot Enroute	1000 ft AGL	
Min Alt Autopilot Approach	180 ft AGL Precision / 300 Non-Precision	
RADOME FAIL ON	30 min. Ground, VMC Dispatch	
PFD Reversionary Modes	Not Approved for Dispatch	
Reversion Both PFD to MFD	Prohibited	
APU		
APU Operation Prohibited	Until Satisfactory Test Completed	
	During Applying Anti-Ice	
	T/R Deployment > 30 sec.	
	Unattended	
	Above FL 300	
APU Start Prohibited	APU FAIL Illuminated	
	After Dual GEN Failure	
	After 30 sec. RPM is 0%	
	Above FL 200	
Starter Limits	Same as Engine Limits	
ENGINE STARTS		
N ₁ Indication	25 % N ₂	
Gen assist	Operating Engine Stable, Ground Idle	
Battery limit	3 Engine Starts in 1 Hour	
Gen assist start	1/3 Battery Start	
Starter limit	3 Starts /30 min. 90 sec. Rest	
GPU amps	800 – 1000 Max	
Fuel Flow	10 sec.	
FIELD LENGTHS		
Absolute Minimum DRY Length	3800 ft	
PM Approval DRY Length	< 4500 ft	
PM Approval WET Length	< 5000 ft	
Absolute Minimum Runway Width	50 ft	



POWERPLANT

What type of engine is installed and what is its output?

XL PW 545A 3,804 lbs/thrust at sea level 25° C

XLS PW 545B 3,990 lbs/thrust at sea level 25° C

What is the time limit on Take Off thrust?

5 min all engines

10 min with one engine out

What is the bypass ratio of this engine?

4.0:1 (3.8:1 XLS)

What is the purpose of the bleed off valve?

Reduce the chance of compressor stalls

If the EEC malfunctions, will the bleed valves be operational?

Yes, they will revert to the pneumatic back up mode

Describe the internal components of the engine.

Titanium fan with booster fan (LPC), two stage axial and one stage centrifugal HPC which is followed by a reverse flow annular combustion chamber, one stage HPT and a 3 stage LPT, and a lobe mixer.

When should engine anti-ice be activated?

RAT below 10 C° with visible moisture

When operating on the ground in icing conditions, what precautions are there?

Eng anti-ice is limited for one minute.

What components of the engine are anti-ice protected and how?

Nose Cone	Continuous Bleed Air
T ¹ Probe (ITT)	Continuous Bleed Air
Fan	Continuous Bleed Air
Nacelle Inlet	Bleed Air (Eng Anti-Ice ON)
Stator Vanes	Bleed Air (Eng Anti-Ice ON)
T ⁰ probe (EEC)	Electrical (Eng Anti-Ice ON)
(RAT Right Eng)	



Name the accessories connected to the accessory gearbox.

- Fuel Control and Integral Fuel Pump
- Oil Pumps (1 pressure and 4 scavenge)
- Hydraulic Pump
- Starter Generator
- Alternator
- Impeller Breather (oil/air separator)

With the ignition in the Norm position, when will the ignition activate?

Start and Engine Anti-Ice

What does the green light associated with the ignition system tell you?

Power has been supplied to the exciter box

What is the function of the emergency shutoff valve?

Any rearward displacement of the LPT shaft will close the emergency shutoff valve, shutting down the engine.

What functions does the EEC provide in the AUTO mode?

- Detented throttle positions, automatic thrust settings
- Automatic idle governing
- Acceleration and deceleration limiting
- N₁ and N₂ limiting
- Closed loop bleed valve control
- Overspeed protection N₂
- N₁ or N₂ synchronization
- Engine diagnostic system functions
- N₂ correction for anti-ice on

When will the GRD IDLE light extinguish or illuminate?

- EEC in MANUAL – light will be on
- EEC in AUTO – light will remain on during take-off until airborne
- EEC in AUTO – light will come on 8 sec after touch down (flight idle in case of go-around)

The EEC in MANUAL provides what?

- Throttle adjustable power settings (no detents)
- Idle governing (N₂) at flight idle, always
- Acceleration and deceleration limiting by speed of throttle movement
- N₂ speed limiting
- Closed loop bleed valve control
- Limited engine diagnostic functions



If you loose ADC will you loose EEC?

Yes, it will revert to MANUAL

Does EEC sync the engines?

No, however it enables the switch so that the pilot can control the sync

Name 3 situations where the ENG SYNC should be off.

Takeoff and Landing

Eng Out

Large Power Changes / Airwork

What is the N₂ range of ground idle?

48%-51%

What is the N₂ range of flight idle?

57%-62%

After engine start the start button does not extinguish and the FUEL BOOST and GEN OFF annunciators of the respective engine are still ON, what could be the problem?

The generator speed sensor malfunctioned and the start did not terminate – depress the START DISG switch

After depressing START DISG switch the start button remains ON but the other annunciators extinguish, what could be the problem?

The start relay is stuck – both generators OFF, BATTERY DISCONNECT switch, shut down engine

What are your actions with a high ITT rise during engine start?

Abort start – motor the engine for 15 seconds then push the starter disengage switch

* Refer to the Checklist

What could be the problem if you have a fuel flow but no ITT during start and what do you do?

This is a wet start, the ignition is not working

Abort the start and motor for 15 seconds to purge any remaining fuel.



FIRE SYSTEM

What is the indication of an Engine Fire?

Fire switch light illuminated

What are the memory items for a fire?

Throttle – Idle

If light ON, Fire light – lift cover and push

Bottle armed light – push

What is the reason for the throttle in idle, in case of a fire?

To check if the warning was triggered by a hot bleed air leak

When do you push the second Fire Bottle Arm Light?

When checklist says to, not 30 seconds after first

Pressing the fire switch does what?

First: Opens the Gen Field Relay

Then: Closes Fuel Firewall Shutoff (F/W shutoff light)

Closes Hydraulic Firewall Shutoff (F/W shutoff light)

Arms Extinguisher Bottles

Disables the T/R Isolation Valve

What will pressing the fire switch light a second time do?

Opens the Fuel Firewall Shutoff

Opens Hydraulic Firewall Shutoff

Disarms Extinguisher Bottles

Enables the T/R Isolation Valve

(Will **NOT** Reset the Gen Field Relay)

If you depress fire switch, what annunciators will illuminate in cockpit?

Bottle Armed Lights

FW Shutoff Annunciator

LO Fuel Press Annunciator

LO Hyd Flow Annunciator

Gen Off Annunciator

If fire lights illuminate, will the Master Warning also illuminate?

No

When checking the fire lights during Rotary Test, what do you actually test?

Integrity of fire detection system



How does the loop function?

Steel tube with single wire inside surrounded by ceramic material.
If temp rises, the resistance of material decreases and current will flow from the outer tube to the inner tube making a circuit.

Is the fire detection system the same as the fire fighting system?

No, totally separate systems

What does the illumination of the FIRE BOTTLE LOW annunciator mean?

Means the bottle is low due to a discharge after a fire.
If it illuminates during flight with no FIRE WARNING, it could mean a tailcone fire, bottle discharged due to high temp in tailcone area, discharged automatically.
Land as soon as possible !!!

At what temperature do the Fire Lights illuminate ?

500° F

At what temperature does the fire bottle discharge if there is a fire in the tailcone?

210° F

Is the APU fire bottle the same as the Eng Fire Bottles?

No

Where are the fire bottles located?

All three are located in the aft access compartment

FUEL SYSTEM

What is the total useable fuel capacity?

6,790 lbs (1,006 gal)

If gauges indicate Zero, is there fuel remaining in the fuel tank?

There is fuel left, but it is unusable

How many drains are there for the fuel tanks?

5 drains per wing (4 alongside the fuselage, 1 by the wheel well)



What types of fuel pumps are there?

- Electric Boost Pump (1)
- Primary Ejector Pump (1)
- Transfer Ejector Pump (3)
- Engine Driven Fuel Pump (1)

What is the purpose of the ejector pump?

Provide positive pressure to the engine driven fuel pump

What is the function of the transfer ejector pump?

Provide uninterrupted supply of fuel to the hopper tank

With the boost pump in the Norm position, when will the pump activate?

- Start (steady)
- Cross-feed (steady)
- Low pressure (flashing)

With the boost pump in the OFF position, when will the pump activate?

Never

What would cause the low pressure light to illuminate?

On < 5 psi, Off > 8 psi

When will the LO FUEL LEVEL light illuminate?

360 ± 20 lbs

What does the FUEL FLTR BP indicate?

An actual or impending fuel filter bypass

What indications should you see to indicate that cross-feed is occurring?

- FUEL BOOST light respective eng ON first, then
- FUEL XFEED light on
- Fuel balance obtained

When X-feeding, which valves open/close and in what order ?

Boost pump selected engine comes on first, then x-feed valve opens, then opposite tank motive flow valve closes after 3 sec.

X-feed selected, but boost pumps in OFF, what will happen?

X-Feed valve will not open, but motive flow will close, resulting in a LO FUEL PRESS light on and maybe flame out.

How much fuel will transfer during x-feeding?

700 - 1000 lbs/hr



If you lose DC power during crossfeed, what will happen?

The crossfeed valve will remain in the open position (last known position) and the motive flow valve will fail open. Normal operation of the primary ejector pumps, however fuel cross-feed is no longer available.

What indications would there be if the primary ejector pump failed?

LO FUEL PRESS ON momentarily
Automatic operation of the boost pump
Flashing FUEL BOOST light

What is the problem if the FUEL XFEED light is flashing?

The crossfeed valve is not closed after selecting crossfeed OFF.
(will illuminate the MASTER CAUTION)

How does the APU receive its fuel?

The right boost pump will start automatically with an APU start
(boost pump light **Will NOT** be ON)

What will be your only indication in the cockpit that the boost pump is working for the APU?

The right LO FUEL PRESS light is extinguished

What does the FUEL GAUGE light indicate?

It indicates a probe fault or
It indicates a fault in the signal conditioner.
Read BITE indications prior to turning off DC power

Is prist required to be added to every fuel load?

Not required, but no problem if pre-mixed.

Is it possible to de-fuel through the single point attachment?

Yes no action is required

Is it possible to defuel a single tank?

Yes by opening the opposite manual defuel select lever

What kind of valves are the fuel precheck valve and defuel valve?

Prevention valves. They prevent defueling and prevent single point fueling when engaged.

How does the flow divider function?

Regulates fuel flow from the FCU to primary and secondary manifolds.
Fuel to prime manifolds is atomized by fuel press, and fuel to sec manifolds is atomized by P³ air.
Upon shutdown, drain valve in flow divider routes residual fuel into fuel holding reservoir, routes fuel back to manifold during starts.



Does the surge tank contain fuel ?

No, not normally, it does collect small amounts of fuel trapped in the vent lines during maneuvers or due to thermal expansion.

What are the limitations for fuel?

Min Temp	-40° C
Max Temp	+57° C
Max Altitude	45,0000 ft
Max Imbalance	400 lbs
Max Emergency Imbalance	800 lbs

Fuel planning estimates:

Reserve:	900 lbs
Taxi:	200 lbs
First Hour	1700 lbs
Second Hour	1400 lbs
Third Hour	1300 lbs

OIL SYSTEM

When is the recommended time to check the engine oil?

10 min after shutdown

How many oil sight gauges are there on every engine?

2, one inboard and one outboard

Which oil sight gauge do you use to check the oil and why?

The outer sight gauge, it is tilted to provide the most accurate information.
The inner sight gauge does not have an access door, and it is not tilted.

Why are there high oil pressure indications during large power changes?

The pressure transmitter record differential pressure
(pressure output versus scavenge output)

What is the maximum oil consumption?

1 quart in 10 hours, measured over a 10 hour period.
(*check oil level 10 minutes after shutdown*)

Are the oil press indicators and the LO Oil press annunciators the same system?

No, 2 completely independent systems



What is the limitation on TO for the oil pressure?

Press may exceed 140 psi NOT to exceed 250 psi for up to 5 min.

HYDRAULIC SYSTEM

What kind of hyd system does the XL have ?

An 'Open Center' Hydraulic System

What does open center mean?

The system operates at low pressure until a system is activated

What is the hydraulic pressure if the system is unpressurized?

60 psi

What is the hydraulic pressure if the system is pressurized?

1500 psi

If hyd system remains pressurized in flight, descent to FL 310 and reduce speed to 200 kts, why ?

To avoid building to much heat of the Hyd Fluid

What system are hydraulically controlled?

Landing Gear, Brakes, T/Rs, Speedbrakes, Flaps (Horizontal Stab)

If both engine driven hydraulic pumps failed, what indications would you have?

LO HYD FLOW L/R illuminates

LO HYD LEVEL illuminates

If both pumps fail, what systems would be affected?

Landing gear, T/R, Speedbrakes, Flaps (Horizontal Stab)

Would you have power brakes?

Yes

What does a HYD PRESS light on mean?

The system is pressurized to 1,500 psi (normal 60 psi)

What happens to hyd control valve in case of a total DC power failure?

It will Fail open, but can still be energized closed because it is powered from the Emer bus

How are the speedbrakes held extended?

Trapped hydraulic fluid



How are the flaps held extended?

Trapped hyd fluid

How is the horizontal stab held in position?

Locked by the horizontal stabilizer actuator motor

How is the landing gear held extended?

By a down-lock mechanism

How are the TR's held deployed?

By hyd press, hyd control valve remains closed, and system remains pressurized during the entire time that the TR's are held deployed. HYD PRESS ON annunciator remains illuminated

Is it possible to retract the speedbrakes after a total hydraulic failure with the speedbrakes extended?

No, moving the switch will allow them to float in trail

If you encounter a total electrical failure with the speedbrakes extended, can you retract the speedbrakes?

No, the safety valve will fail open, allowing them to blow to a trail position

When will the speedbrakes retract by means of the throttles?

If either throttle is advanced beyond 80-85% N₂ Throttle Position

Name 3 ways of retracting the speedbrakes?

By using the switch

By advancing the Throttle beyond 80-85% N₂ Throttle Position

When total loss of DC occurs, speedbrakes will blow in trail

What kind of flaps does the XL have?

Fowler flaps

If a total electrical failure occurred with the flaps extended, can the flaps be moved?

No, the flap solenoid valve will remain in its neutral position

If a total hydraulic failure occurred with the flaps extended, can you retract them fully?

No, moving the lever will allow them to float in trail.

Is asymmetrical extension of the flaps possible?

No, a mechanical interconnect will prevent this.



In flight, HYD PRESS ON annunciator remains on after selecting flaps down, however the flaps did not move, what could be the problem?

Failure of the flap control valve.

Can you operate the other hydraulic sub-systems normally?

Yes

What does an ARM light associated with the T/R mean?

Pressure has been sensed past the isolation valve

What does an UNLOCK light associated with the T/R mean?

T/R has moved from the mechanical locked position

What does a DEPLOY light associated with the T/R mean?

T/R has reached the fully deployed position

How are the T/R held in the stowed position?

Mechanically, with an overcentered lock

How are the T/R held in the deployed position and what indication will you see?

With hydraulic pressure. The 6 T/R lights with the HYD PRESS

If a T/R was stowed in flight with the EMER stow switch, what lights would be illuminated?

ARM light and HYD PRESS ON light

If a T/R deploys inadvertently during flight and stows, can the engine be used above idle thrust?

Yes, do not exceed 200 KIAS and FL310

When would the Master Warning light illuminate in association with the TR's ?

When doing the rotary test and checking the TR

When the ARM light illuminates in flight

When the UNLOCK light illuminates in flight

Why does the P/L go to idle after Emer stow?

The throttle feedback system moves the FCU lever and P/L to idle

Why is it **Prohibited** to use T/R for acft backing?

You will use more than allowable 75% thrust

Increased possibility of a tailstrike



How wide must a runway be to be allowed to use T/R?

Minimum of 75 ft wide

How are the T/R's wired?

The LH T/R gets it's power from the RH T/R CB.

The RH T/R gets it's power from the LH T/R CB.

Name 3 ways of extending the landing gear

Hydraulically with the gear handle

Mechanically by releasing the uplocks

Pneumatically by gear blow down

How is the landing gear held up and down?

Gear is held up with up-locks and down with down-lock

Hydraulic pressure is used to raise and lower the gear

In case of a hyd failure would you be able to extend the gear down?

No, only via the freefall/blowdown backup system.

Manual retraction of the uplock allows the gear to freefall

(yaw plane for downlock)

If manual release does not retract uplocks, pneumatic system will retract the uplocks and blowdown the gear for a positive down-lock.

In case of a DC failure would you be able to extend the gear down?

Yes, the gear control is on the Emer Bus

How can you activate the gear downlock?

Only hydraulically, by sending hyd fluid to the retract side of the gear

If the gear is selected down, but not locked, what are the indications in the cockpit?

Red indicator illuminated

Green lights illuminated except the one that is not locked

Would you know which gear is not locked?

Yes, respective gear will not have a green light illuminated

If the gear is selected up, but not retracted, what are the indications in the cockpit?

Red indicator illuminated

No illumination of green lights



Would you know which gear is not up?

No, because none of the green lights will illuminate.

When will you get an aural warning with unsafe gear down?

Both throttles < 70% N₂, flaps > 15

Both throttles < 70% N₂, alt < 500ft

Both throttles < 70% N₂, IAS < 150 (radar alt signal)

Will you still have enough pneumatic pressure for emergency braking after a blowdown?

Yes, you will still have approximately 10 brake applications

What do you have to take into consideration when using emergency braking?

Do not put your feet on the brake pedals, it will explode the hydraulic reservoir

Where is the gear blowdown/ emergency brake pneumatic bottle located?

In the LH nose compartment

Is the braking system on the XL/XLS part of the aircraft hyd system?

No, it has it's own separate hyd system.

Where is the brake hyd reservoir located?

In the LH nose compartment

Is the brake hyd reservoir pressurized by Nitrogen?

No, pressurized by Cabin Air

What does the LO BRK PRESS annunciator indicate?

Hyd brake press is low, below 900 psi

What other annunciator will illuminate in this case?

ANTI SKID INOP annunciator

If landing with ANTI SKID INOP annunciator, by how much do you have to increase the landing distance?

Increase by 1.6

If landing with ANTI SKID INOP annunciator but using the emergency brakes, by how much do you have to increase the landing distance?

Increase by 1.4

What is the difference between normal brakes and the pneumatic brake?

No differential braking and no anti-skid protection with the pneumatic brakes



Explain the touchdown protection?

Either or both squat switch

No brake pressure applied until wheelspeed reaches a certain value

Will the anti-skid work up to a complete stop?

No, it will drop out at 10 kts or below

Can you dispatch the XL/XLS with ANTISKD INOP light on?

NO, system must be operational before dispatch

What is the function of the fusible plugs?

It will melt to deflate the tire if excessive temp is generated by an overheated brake

Will the power brakes be available after a DC power failure?

NO, the brake system will not operate, use emergency brake system

What should be the position of the balls in the sight glasses of the brake reservoir during preflight?

They should be both on top with no BAT on

(with BATT ON, lower on top and upper on the bottom)

What is the problem when during ground operations you are unable to depress the brake pedals (hard brake)

This is caused by a malfunction of the antiskid system

Remove feet from the pedals and use the emergency brake system

What is the requirement for checking the brake wear indicator?

The parking brakes must be set

Is nose wheel steering available in the air with gear extended?

Yes

What is the degree of travel for the nose wheel steering?

20 degrees

What is the allowable degree of travel for the nose wheel steering when towing?

95 degrees

(Do not exceed 60 degrees when towing if the control lock is engaged.)

What are the positions of the horizontal stabilizer?

Flaps up, stab +1 (cruise position)

Flaps other than up, stab -2 (take off and landing position)



Why do you need a speed of less than 200 kts during initial climb out?

If the speed is > 200 kts an airspeed switch disables an arming valve which prevents movement to the -2 degree position

What is the significance of the STAB MIS COMP light?

This light will come on if the Stab is not in position within 30 sec.

What can be a cause for this light to illuminate?

If you select flaps down while the gear is in motion.

Wait for the HYD PRESS light to extinguish before selecting flaps

When will you get the NO TAKEOFF light?

When flaps are < 7 or > 15

When stab is not in -2 degree position

When trims are outside the takeoff range

When the speedbrakes are extended

If in cruise the flaps are selected down by mistake, what happens to the stab?

The stab will not move down to -2 because an airspeed switch disables the arming valve if speed is above 215 ± 10 kts

Name 2 situations when Touch & Go's are **Prohibited**

With the T/R's deployed

With the STAB MIS COMP annunciator on

ELECTRICAL SYSTEM

What kind of Battery does the Citation XL/XLS have?

24V, 44 Amp Nickel Cadmium

What busses power the Emer bus?

Powered by the X-feed Bus in BATT

Powered by the Battery Bus in EMER

What is the minimum Battery voltage for start?

24 volts (deep cycle charge required if anything less)

If operating correctly, how much difference is allowed between generator loads?

10% of system load (30 amps)



What is the purpose of the GCU?

Parallel, Protect, Regulate the Generators

What will cause the power relay to open?

Under Voltage, Reverse Current

What will cause the field relay to open

Over voltage, Fire Switch, Feeder Fault

If you reset a Gen, what relay are you closing?

Field Relay

If a current limiter is blown could you start that respective engine?

Yes, however if AFT J-BOX CB light is on the eng will not start

How could you determine which current limiter is blown?

The side which indicates the highest load (Amps) is charging the BAT thus is the good side

How would you determine if you had 1 or 2 current limiters blown?

By checking the Voltage. If you had 1 current limiter blown, the Voltmeter will indicate system voltage, so 28.5 V. If you had 2 blown current limiters, the Voltmeter will indicate 24 V, the voltage of only the battery

With a blown current limiter, would the Generator still work ?

Yes

Would you disconnect the Generator if a current limiter was blown?

NO, You will loose power to all instruments that are powered from that side

If you had a blown current limiter, and you turned the Gen off by mistake, apart from loss of instruments, what other indications would there be in the cockpit ?

Master Warning illuminates steady on the opposite side.

What is the normal output of the Generator?

28.5 volts 200 Amps Ground
250 Amps Transient for 4 min. (Ground)
300 Amps Air

What is the required output for an External Power Unit?

800-1000 Amps, 28 volts

What does a GEN OFF light indicate?

The respective Generator Power Relay is open



How are the current limiters protected during start?

By opening the battery isolation relay

When starting the second engine, why do both start buttons illuminate?

To allow the power to cross via the start relays

With the GEN OFF light on and the voltage indicates zero, what is the problem?

Field relay is tripped (reset is possible)

With the GEN OFF light on the voltage indicates normal, what is the problem?

Power relay is open, reset is not possible

What is the Emer battery pack in the RH nose compartment called, and what kind of battery is it?

Secondary Flight Display battery pack

28 V / 2.5 Amp Lead Acid

What is the function of the Sec Flight display battery pack?

In case of a DC failure it provides power for the Meggitt and backlighting for the standby HSI and N₁ gauges

What is the Emer Battery Pack in the LH nose compartment called and what kind of Bat is it?

Emer Avionics Bat pack

28 V / 2.5 Amp Lead Acid

What is the function of the Emer Avionics battery pack?

In case of a DC power failure it provides power for the AHRS 1,2 and FMS

Where are the Emer lights battery pack located?

One in the LH pilot console

One in the aft vanity area

What kind of battery are the Emer lights battery pack?

Nickel Cadmium

When will the emergency lighting battery pack provide power for emergency cabin lighting?

Loss of main DC power

5 'G' impact/inertia switch activates

Emer light switch is ON



What lights will come on with the Emer light battery pack?
Every third bulb of the LH fwd and RH aft dropped aisle lights
Cabin exit signs (6)
Reading Lights (4)
Overwing escape lights

What is powered directly from the battery bus?
Tailcone Baggage Compartment
Tailcone Access Compartment
Cabin Entrance Lights
Emer Exit Signs
APU Oil Light
Lav Service Overfill Light

What is powered directly from the X-feed bus?
Ignition in Norm/On
Taxi Lights
Wemac Fan
Fwd/Aft AC Evaporator Fans

What are the specifics of the alternator and what is its function?
Engine driven 3.0 kva, 115/200 volt, 3 phase, 200 – 400 Hz
Power to electrically heat the windshields

What is connected on the left squat switch in flight?
Flight hour meter
Opening of emergency press valve
TAS probe heater
Enables Flight idle
Normal (auto) control of pressurization
Enables ram air door modulation for precoolers

What is connected on the left squat switch on the ground?
Pressurization controller opens outflow valves
Pre-pressurization during take-off
Generator assists starts
Engine bypass valve for precooler operation
Ground idle

What do the left and right squat switch in parallel enable on the ground
T/R deployment
Stick shaker test
Anti-skid locked wheel protection



What is the reason to disconnect the BATT in case of an overheat?
 To remove the ground by opening the BAT DISC relay.
 (BATT has to be ON and will be drained until it is physically disconnected)

Why does the BATT DISC open during engine starts using a GPU?
 To save the BATT by allowing the GPU to provide all power required for starting

What does an AC BEARING light mean?
 Indicates an impending bearing failure (approx. 20 hrs)

With the Batt in EMER and the Gen OFF what instruments and systems will you have?
 Standby HSI and NAV1
 COMM1 (RMU1)
 Meggit
 Pressurization manual (cherry picker)
 Flap control
 Gear control
 Hyd control valve
 Engine and wing anti-ice (no x-flow)
 N1 tapes and digits
 Stby pitot-static heater

Total loss of DC (emer on and gen off) what systems will you loose?
 T/R
 Speedbrakes
 Powerbrakes / Anti-skid
 W/S heat
 Stick shaker
 Emer Dump
 Ignition (only sec available)
 Auto mask drop for pax
 EEC
 Rudder Bias and heater

Total loss of DC, how do the following valves fail?

Fuel x-feed valve:.....	Last Know Position
Fuel motive flow valve:.....	Open
Wing anti-ice x-feed valve:.....	Closed
Anti-ice stator valve:	Open
Hyd control valve:.....	Open
Outflow valves	Open



With IGN switch in SEC, when will the ignition function?

Powered from the emer bus and continuous operation

Is an in flight start a battery start or gen start ?

A battery start, squat switch inhibits gen start by not closing the starter relays.

What are the starter limitations?

3 starts in 30 min with 90 sec rest period between starts

What are the battery limitations?

3 starts in 1 hour

How do the following starts count against the battery?

Battery start:	1
Gen start:	1/3
EPU start:	0
Airstart:	1
APU start:	1/9
APU with eng running:	0
APU in flight:	1

APU starter limits:

3 starts in 30 min with 90 sec rest period between starts

APU battery starts:

1/3 of main engine start.

After start, the starter lights remain on. What could be the reason and what action do you take?

- | | |
|---|--|
| 1. Starter relay stuck | Press starter disconnect switch If light does not go out, battery disconnect switch in cockpit, leave battery on and physically disconnect battery in aft compartment. |
| 2. N ₂ speed sensor switch fault | Boost pump annunciator, ignition lights still on. Press starter disconnect switch. |

Why must the running engine P/L be in idle if starting the other engine?

To protect the gen shaft, the gen gearbox can shear



What lights will illuminate when both generators go off-line simultaneously?

MASTER CAUTION RESET steady
MASTER WARNING RESET flashing
LH/RH GEN off

What is the difference between the AC power used for the windshield heat and the electroluminescent panels?

The windshield heat derives its AC power from the alternator
The Electroluminescent panels derives its AC power from an inverter

ENVIRONMENTAL SYSTEMS

What is the purpose of the 23 psi service air?

Horizontal stabilizer deice boots
Pressurization components
Cabin entrance door seals
Throttle detents

Is pressurization lost when the DOOR SEAL light will come on?

No, the light will come on when the pressure in the seal drops below 5 PSI, secondary seal (non inflatable) around door will be able to hold pressurization

What is the purpose of service air through a vacuum ejector?

Provide vacuum for the pressurization system

How is the air from the wemac cooled?

Through a primary heat exchanger
Through a secondary heat exchanger
Through the expansion over the turbine wheel

What is your action when you have the ACM O'HEAT AND EMER PRESS lights on?

The ACM will automatically shutdown and Emer press will also come on automatically
Can be corrected by selecting a warmer setting (more air will bypass the ACM) either in auto or manual



What is the function of the 35° F temp control system?

If the temp exiting the water separator falls below 35° F the TCV modulates open to mix hot air with the cold air to prevent water from freezing the water separator.

(the melted water is sprayed on secondary heat exchanger)

What will happen if you take-off with the press selector in the OFF position?

The cabin will begin depressurizing (need DC power to close the PRSOV)

When the cabin reaches 10,000 ft CAB ALT will come on
(unless in high alt mode, than 14,500)

When the cabin reaches 14,500 ft the EMER PRESS will come on preventing the cabin to exceed 14,500 ft.

How is the temp regulated in the precoolers?

On the ground bypass air is used if temp > 405° F

In flight the ram intake modulates to control a temp of 475° F

What does the BLD AIR O'HEAT L/R mean?

Bleed air exiting the precoolers exceeds 560° F

If wing anti-ice is on, it will shut off wing bleed air automatically

How is the cabin pressure normally maintained?

By controlling the amount of air escaping the cabin

If the #1 ADC fails in flight, what will happen?

The controller amber light illuminates and switches to FL Isobaric mode

What are the indications if the pressurization controller fails, or loss of DC power?

The red warning light on the face of the controller will illuminate

The ALT SET window will go blank

What are the cabin rate limits of the controller?

+600 / -500 fpm (climb/dive rates)

What are the cabin rate limits of the controller in the high altitude mode?

+2500 / -1500 fpm

What is the function of the takeoff / pre-pressurization mode?

When throttles are beyond 85% it will descent the cabin to ± 50 ft below take off field elevation to preclude pressure bumps during take off



What will be the cabin altitude at FL 450?

Sea level will be maintained till 25230 ft with a 9.6 PSID
At FL 450 the cabin will be 6800 ft.

What will be your action if an over pressurization occurs. (exceeding 9.5 PSID)

The pressurization system should be selected to MANUAL and use the cherry picker to control cabin alt.
If MANUAL control does not correct the problem select the press source selector to LH or RH and control cabin with throttle.
Crew and pax should go on oxygen
If the cabin is still over pressurized the EMER DUMP switch will have to be activated

What is the location of the AIR DUCT sensor?

After the mixing muffs

What is the function of the temp control valve TCV?

To provide hot air (that bypasses the ACM) to the mixing muffs

Does the pre-cooler regulate service air?

Yes

What bleed air is not regulated by the pre-coolers?

The engine and stator anti-ice

Where does the Wemac air originate?

Directly from the ACM

Will the cherry picker also work in the auto mode?

Yes, but the auto mode will override any manual input

What systems use P³ air (16 PSI)?

ACM
Pressurization
Engine and Wing Anti-ice
Service Air
Flow Divider
Rudder Bias Heater

Which systems use service air (23 psi)?

Tail de-ice system
The outflow valves
The primary door seal
Throttle detents



Do you need the APU bleed on to have service air available?
No

Will the primary door seal deflate when pneumatics are lost?
No, a check valve prevents deflation

Which systems use cabin air?
The dive solenoid
The hydraulic brake reservoir

ICE AND RAIN PROTECTION

What systems are anti-iced on the Citation XL/XLS ?
Engine nose cone
T¹ probe (ITT)
Engine nacelle inlet
Engine stator vanes
Fan Assembly
T0 probe (EEC) (RAT Right Engine)
Wing
Windshield
Pitot/ Static ports
AOA vane
Rosemont probe

How are these systems anti-iced?
Nose Cone, Fan and T¹ Probe Engine running
Inlet, Stator Vanes, and T⁰ Probe..... ENG ANTI ICE ON
Wing..... WING ANTI ICE ON
Windshield..... WNDSH HEAT ON
Pitot/Static and AOA Vane..... PITOT&STATIC ON
Rosemont Probe..... Avionics ON and
Weight off Wheels

When do you select WING/ENG ANTI-ICE on?
If RAT below 10° C and with Visible Moisture

What is defined as Visible Moisture?
Visibility less than 1 NM

When do you select the W/S heat on?
W/S heat is always on, **Never Turned Off**



Why is the W/S heat always on?

It functions also as a W/S defogger

What is the problem if both the W/S O'HEAT and the W/S FAULT annunciators cycle ON and OFF?

It is indicating a controller failure and the system should be shutdown (may be used if in icing conditions)

When will the ENG ANTI-ICE illuminate steady or flashing?

Steady – when air in the inlet < 110° F

Flashing – if temp is not reached in 4min and 45sec

Flashing – if stator PRSOV doesn't open in 4 min and 45 sec

Flashing – if stator PRSOV doesn't close after eng anti-ice OFF

What will happen with the Eng Anti-Ice if a DC power failure occurs?

The PRSOV for inlet and the stators will fail open

What does a WING O'HEAT light mean?

The temp in the purge passage exceeds 160° F

What is a side note for using the wing XFLOW?

When selecting XFLOW it will disable the engine inlet temp and stator valve inputs to the engine anti-ice failure annunciators

What is the limit of using Engine Anti-Ice on the ground?

The engines should not be run above 70% for more than 1 min

BLD AIR O'HEAT can be tripped ON due to insufficient ram airflow to precool the eng bleed air)

(check system integrity and then select OFF)

What controls the temp of the bleed air to the wing

The precooler

Is the Horizontal STAB anti-iced or de-iced ?

De-iced by means of inflatable boots

What is the cycle of the TAIL in AUTO?

First 6 sec – left boot will inflate

Second 6 sec – vacuum will deflate the left boot

Third 6 sec – right boot will inflate

The timer rests for 3 minutes and the cycle repeats



What is the function of the TAIL in MANUAL?

With the switch in MANUAL bypasses the timer and will inflate the boots simultaneously. The boots will remain inflated as long as the switch is held in the MANUAL position.
(recommended 6-8 sec and release, repeat at 3 – 5 min intervals)

What does the TAIL DE-ICE FAIL annunciator indicate?

Loss of DC power
Loss of pressure
Fault in the timer
Switch is positioned in off and valve is still energized

How and when is the Rosemount probe heated?

The probe is heated electrically with the AVIONICS POWER switch ON in flight. (left squat switch)

What would be the indication that the secondary windshield sensor is activated?

None, it will take over automatically should a fault occur with the primary sensor

What if the secondary Temp sensor fails?

The spare Temp can be engaged, however this does not occur automatically, has to be done by maintenance.

When will the W/S FAULT annunciator illuminate?

When the controller fails or
When the alternator fails or
In case the W/S O'HEAT annunciator illuminates

Are we allowed to use any rain repellent coating?

No, the use of such coating will diminish the effectiveness of the existing coating. (use only plain water to clean the windshields)

What are the positions of the W/S AIR fan switch?

ON and OFF

If the W/S AIR switch is selected on, will it run in Low, or High speed?

High speed

Will the WINDSHIELD AIR fan work when the switch is in the OFF position?

Yes, if an overtemp (90° F) is sensed in the nose compartment it will activate automatically to blow hot air out of the compartment



At what speed will the W/S AIR run in this situation?

Low speed

Is this W/S avionics fan the same as the Radome fan?

No, two different fans that are located in the same Avionics compartment

What items are heated when the pitot-static switch is turned on?

Pitot tubes (3), static ports (6), AOA probe

What is the temp of the bleed air leaving the precooler?

475° F

When will the BLEED AIR O'HEAT annunciator illuminate?

If temp leaving precooler exceeds 560° F

Which valves will close during a BLEED AIR O'HEAT?

The Wing PRSOV

But NOT the EMER Pressurization valve

OXYGEN SYSTEM

Where is the 76 cubic bottle located?

Located in the right nose compartment

What should you check concerning the oxygen system during the walk around?

A fully serviced system should read 1,600 – 1,800 PSI

Make sure the overboard discharge disc is not ruptured

Explain the 3 positions of the oxygen selector?

OFF – crew only

ON – manual drop, regardless of altitude

AUTO – deploys the pax masks only if the cabin >14,500 ft

(will shut off automatically when cabin < 6,800)

Describe the 3 switches on the quick donning masks

EMER – for pressure breathing

100% - 100% oxygen assured

NORM – diluter demand

When you have a DC power failure, will you still be able to drop the masks?

Yes, it is a mechanical valve

(the AUTO system will not work, manual drop by selecting ON)



If the gauge is indicating 1,800 PSI, are you guaranteed to receive oxygen?

No, the pressure gauge indicates bottle pressure regardless of shutoff valve position

What has happened if the overboard discharge disc is ruptured?

An overpressure condition has occurred in the O² cylinder and the bottle is now empty. (maintenance is required)

If the cabin masks drop, will there be a flow of oxygen?

No, pull the mask towards you, this will start the flow of O².

What is the limitation of the crew and pax OXY Mask?

45,000 ft cabin alt

What is the limitation of the pax OXY Mask?

Not recommended for prolonged use above 25,000 ft cabin alt

FLIGHT CONTROLS

What is the function of the rudder bias system?

To automatically engage upon loss of one engine thrust by pulling the rudder into position to compensate for asymmetric thrust

Is the rudder bias system always on?

The system is automatically ON by main DC power but the system is shutoff if the T/R are deployed or Emergency stowed

How is the rudder bias actuator being prevented from freezing?

Normal by engine bleed air

Heater blanket for redundancy (ON <40° F, OFF >60° F)

What does the RUDDER BIAS HTR annunciator light mean?

If one or more of the thermostats have failed

What is a side note for using the control lock and towing?

The airplane must NOT be towed with the control lock engaged, will damage the nose wheel steering system

How can you interrupt a runaway or malfunctioning trim?

By momentarily depressing the AP/TRIM DISC switch



Will the stick shaker work if you have an DC power failure?

No, it requires main DC power

Can you dispatch a flight with an failure of the yaw damper?

Yes an operative yaw damper is not required for flight

How many vortex generators do we have and how many do we need for dispatch?

26 VG are installed on each wing and a total of 3 VG (both wings) may be missing.

What is the function of the Vortex Generators?

To delay drag rise at high speeds and prevent boundary layer separation to provide more aileron control

How many Boundary Layer Energizers do we have and how many are needed for dispatch?

There are 11 BLE's mounted on each wing and all must be present for dispatch

What is the function of the BLE's?

To increase airflow over the wing at high AOA to improve stall characteristics and maintain aileron effectiveness throughout the stall regimen

How many Static Wicks do we have and how many are needed for dispatch?

In total the airplane has 20 static wicks on the wing and empennage
Each wingtip and or stinger may be missing, the rest is required

What is the altitude limit for using the speedbrakes?

The speedbrakes should be retracted prior to 50 ft AGL

What is the advantage of the rudder bias system?

Increases rudder travel from 22° to 28.5°
Decreases V_{mcg} resulting in lower V₁ speeds
Shorter take-off field length especially WET

What does the RUDDER BIAS light means?

Malfunction of the system
If the BIAS Actuator valve fails close
Or when uncommanded rudder movement occurs

Can you overpower an uncommanded rudder movement?

Yes



APU

What kind of model APU does the Excel have?

Allied Signal Model RE100 , fully automatic, constant speed gas turbine

What is the electrical output of the APU?

28VDC, 300 Amps

What are the limitations for the use of the APU?

Max altitude for in flight starts – FL 200

Max altitude for operation – FL 300

What is the fuel flow during APU operation?

approx. 110 pph from the right tank

(provided the Gen is on-line and the bleed air valve is OPEN)

When checking the oil at the maintenance panel during the pre-flight check, what do the different lights tell you?

Amber – 300 cc below full, APU may be operated and service at the next available opportunity

Red – 550 cc below full, do not start APU until serviced

What will the ECU do when it senses an overheat or an overspeed?

In both cases the ECU will shut down the APU

In case of an APU fire, which of the two engine bottles will be used to extinguish the fire?

None, the APU has its own bottle located in the aft access compartment

Will the Master warning light come on during an APU fire?

No

What will happen during an APU fire?

APU FIRE light illuminates

ECU will immediately shut down the APU

G ECU will trip generator field relay to prevent re-ignition

De-energizes the APU fuel shut off valve

De-energizes the right fuel boost pump

8 sec delay for automatic fire extinguisher discharge

logs APU shut down in ECU memory



APU ON While Fueling:

If refueling while operating the Aircraft Auxiliary Power Unit (APU), a crewmember must remain with the aircraft for monitoring purposes. APU's **shall not** be started during the fueling process. Except for emergency purposes, the APU must not be shut-down during the fueling process.

GMM Fueling Procedures

Section V

Page 4 of 6 01/01/06

What is the indication that the fire bottle is discharged?

The APU fail light will remain illuminated

What is the reason for not starting the APU during a dual generator failure?

In the event that the APU does not start you will have drained the battery significantly.

Which APU system has priority, bleed air or electrical?

The electrical system

What will happen if you shutdown the APU?

The ECU will simulate an overspeed situation

AVIONICS

If a navigational data base outdated message is displayed, is the FMS legal for navigation?

Yes, if all lat/longs are verified

What are the consequences if you loose your attitude information?

The autopilot will no longer function

If the avionics switch were to fail, would you still be able to use the avionics?

Yes, you will not be able to shutdown the avionics

AHRS #2 is powered from which bus?

Emergency BATT Bus



What are the limitations for the Radom fan?

dispatch in VMC only
30 min. of ground time or when IC1 or IC2 HOT light is ON whichever comes first

What are the limitations of the IC1 or IC2 HOT lights?

Dispatch **Prohibited**

With the BAT ON and the Avionics switch OFF, what is the position of the Avionics relay?

The relay is energized OPEN

In this case what will the indication in the cockpit be?

AHRS 1 and 2 annunciators illuminated

Can you use the autopilot with a comparison monitor alert?

No

The autopilot is connected to which IAC?

No 1 IAC

You have a red X on a PFD or a blank display, what is the problem?

Signal conditioner failure (all modes are cancelled)

What is your corrective action in this case?

Select the opposite Signal Conditioner on the MFD controller

You have a blank PFD, what is the problem?

Failure of the PFD

What is your action in this case?

If needed you can revert your PFD to the MFD by switching your PFD to OFF. (Just hand over the controls to other person)

You have a red heading fail annunciator and the command bars are out of view, what is the problem?

This is a comparison monitor alert.

What is your corrective action?

Select the opposite heading by heading reversionary

You have a red attitude fail annunciator and an all blue sphere, what is the problem?

This is a comparison monitor alert



What is your corrective action?

Select the opposite attitude by attitude reversionary

You have a red X through the PFD airspeed and altitude, what is the problem?

This is an ADC failure

What is your corrective action?

Select opposite ADC by ADC reversionary

You have a CHECK PFD1 /2 annunciator light ON, what is the problem?

This is an IAC wrap around failure

What is your corrective action?

Disconnect the autopilot

What are the indications of a red gun failure?

The sky turns from blue to dull dark blue

The ground turns from brown to green

The compass rose turns from white to blue

LIGHTING

What does the MASTER LIGHT switch control?

The cockpit panel lights

Dims the annunciator lights

Illuminates the starter disengage button

Switches the windshield ice detection lights ON

Which amber annunciator lights will illuminate the MASTER WARNING?

Only the dual generator failure

Which white annunciator lights will illuminate the MASTER CAUTION?

Flashing white GROUND IDLE

Flashing white FUEL X-FEED

If a red annunciator failure is cleared prior to resetting the MASTER WARNING, will it remain illuminated?

Yes, the MASTER WARNING will continue to flash until reset

If a amber annunciator failure is cleared prior to resetting the MASTER CAUTION, will it remain illuminated?

No, the MASTER CAUTION will extinguish



What is the function of the interior Master Switch?

To remove all electrical power from the cabin, except emergency lighting

When will the cabin door annunciator illuminate?

If the door is closed with the BATT in OFF

If the vent door did not close within one sec

If one or more latch pins are not fully extended

If the door is unlocked

What is the problem if the FUEL GAGE light comes on?

Probe fault or

Signal conditioner fault

(leave BAT ON – Maintenance May Need to Check the BITE Indication)