Cessna 208B “Grand Caravan”

Flight Operations Manual

The Cessna 208B ‘Grand Caravan’ began as the 208 project which commenced on November 20, 1981, and the prototype first flew on December 9, 1982. The production model was certified by the FAA in October 1984 and its Cargomaster freighter variant was developed for FedEx. The 4 ft (1.2 m) longer 208B Super Cargomaster first flew in 1986 and was developed into the passenger 208B Grand Caravan.

Dimensions	**Performance***	**Weight and Limits**
Wingspan: 52’ 1”	Ground Roll: 1,399 ft	Empty: 5,301 lbs
Wing Area: 279 sq ft	Max Climb: 1,330 ft/min	Max TO Water: 8,807 lbs
Length: 41’ 7“	Max Cruise: 195 ktas	Max TO Land: 8,807 lbs
Height: 15’ 1”	Max Range: 964 nm	Useful Load: 3,692 lbs
Power: PT6A-140	* less with cargo pod	w/cargo pod: 3,532 lbs

Features

Configuration Options
The Cessna 208B includes many configuration options, all of which are available by loading a single aircraft. The set file name is C208B-set.xml. Loading from the command line can be accomplished using the command line option –aircraft-C208B.

Instrument Panel Options
This aircraft is equipped with 2 complete 3D instrument panels. The first and default is the original equipment “Steam Gauge” panel. The second is a Primus 1000 glass panel upgrade. Real World 208B’s can be upgraded with a Garmin 1000 system, however, given the progress of the FG “Farmin” project, the mostly working Primus 1000 was a logical substitute. You can switch between these 2 panels at any time by using the “Cessna-208B / Steam/Glass Instruments” menu command or simply by using the ⎕ key as a toggle.

Steam Gauges

Glass Panels

Amphibious Operations - (Yes you can load the aircraft on water)
The aircraft will determine where it is being loaded and will configure itself appropriately. Loading at a Seaplane Base (on the water) will result in the following configuration: Landing Gear Up / Parking Brake Off / Floats Attached - Loading at a land based Airport will result in the following configuration: Tricycle Gear / Parking Brake Set. These options are, of course, manually configurable at any time, however the aircraft will not allow you to do anything disastrous, i.e. removing the floats while being supported by them on water.

KEY REFERENCE
Knowing these shortcut keys will aid in learning the Cessna-208B and add to your flying enjoyment.

I	Toggle Steam Instruments / Glass panels
Alt + M	Toggle Map
F11	Autopilot Dialog
Shift + F11	Auto-throttle mini dialog
F12	Radios Dialog
Y	Show/Hide Yokes
U	Raise Pilots Seat
Shift + U	Lower Pilots Seat
Ctrl + U	Reset Pilots Seat to default height
Ctrl + A	Toggle Auto Coordination
F	Toggle Float configuration
R	Raise / Lower Float Rudders
G	Raise / Lower Gear (with floats attached)
C	Toggle Cargomaster configuration
J	Toggle Skydiving (Jumpship) configuration
S	Move starter switch forward
Shift + S	Move starter switch aft

ENGINE STARTUP

1. Battery switch to ON. The battery switch is a simple 2 position toggle. Click with the Left Mouse Button (LMB) to toggle ON/OFF

2. Fuel Boost Pump to ON. The Fuel Boost Pump switch is a three position switch – OFF, NORM and ON. Click with the LMB to move the switch forward. Click with the Middle Mouse Button (MMB) to move the switch aft.

3. Starter Switch to ON. The Starter switch is a three position switch – MOTOR, OFF, and ON. Click with the LMB or press  on the keyboard to move the switch forward. Click with the Middle Mouse Button (MMB) or press  on the keyboard to move the switch aft. In the ON position the starter motor is engaged AND the engine ignitors are energized allowing the engine to start when fuel is introduced at the correct N1 speed. In the MOTOR position, the starter motor is engaged but the ignitors are NOT energized. The engine will turn over but it will not start.

4. Add Fuel at N1 > 15%. When the engine N1 exceeds 15% move the Fuel Condition lever to the Low Idle position to introduce fuel into the engine. N1 will immediately begin increasing rapidly.

5. Starter Switch to OFF at N1 > 20%. When the engine N1 exceeds 20% (which should happen almost immediately after the introduction of fuel) move the Starter Switch to OFF with either the MMB or  on the keyboard.

6. Fuel Boost Pump Switch to NORM. Use the MMB to bring the Fuel Boost Pump switch back to the NORM position.

CHECKLISTS

Use the Checklists menu item to access complete checklists for all phases of flight. The checklist system of the Cessna 208B uses a new concept to both instruct and visually show you the steps required in each checklist without blocking your view of, or leaving you guessing about what it is you are supposed to be accomplishing. Items on the list are color coded to indicate whether the requirement has been satisfied or not. The single button for each item will first direct your view to the item that needs attention and then highlight the item with a marker. The checklist system will never perform an action for you. It will, however, provide you all the information you require to perform it yourself.

Pre-Start

Doors Closed / Locked
Fuel Selectors Both On
Parking Brake On
Prop Ctrl Lever Full Forward
Throttle Idle
De-Ice Off
Fuel Condition Lever Cutoff
Battery Switch On
Panel Lights as Required
Flaps Up
Fuel Quantity Check
Flight Controls Free and Correct
Seat Belt Sign On
No Smoking Sign On
Transponder to Standby (F12)

Startup

Throttle Idle
Fuel Boost Pump to ON
Starter Switch to ON
Oil Pressure (Rising)
N1 above 15%
Fuel Condition Lever to Low Idle
N1 above 20%
Starter Switch to OFF
Fuel Boost Pump to NORM
Avionics 1 - 2 On
Nav Lights On
Beacon Light On
Suction > 3.5

Taxi to Runway

Set Altimeter
Set Radio-Avionics for Dep
Transponder to On (F12)
Autopilot - Set (No Engage)
Taxi Lights On
Parking Brake Off
Taxi to Rwy Max 20 kts

Before Take Off

Parking Brake On
Throttle Idle
Fuel Condition Lever to High Idle
Elevator Trim for Takeoff
Flaps to Takeoff (10)
Flight Instruments Check
Engine Instruments Check
Strobe Light On
Landing Lights On
Pitot heat as required
De-Ice as required
Transponder to ALT (F12)

Take Off

Parking Brake Off
Throttle to Full
ITT Check
Annunciator Panel Check
Rotate at Vr
500-800 fpm climb
Flaps up before 120kts
Taxi Lights Off
Landing Lights Off

Descent & Approach

Parking Brake Off
De-Ice as required
Pitot heat as required
Set Radio-Avionics for Arr
Retrieve Dest ATIS
Throttle 120-140 KTS
Fuel Selectors Both On
Set Altimeter for Arr
Fuel Balance Check
Fuel Condition Lever vfy High Idle
Prop Ctrl Lever Full Forward
Landing Lights On
Reduce Speed - Add Flaps

Landing

Reduce Speed - Full Flaps
A/P Off or Auto-Off at 300 AGL
Touchdown Speed 75-90 kts
A/P Off or Auto-Off at 300 AGL
Throttle Idle
Touchdown on Mains
Reverse Thrust as Required
Brakes as Required
High Speed Rwy Exit - Max 20 kts
Normal Rwy Exit - Max 11 kts

Taxi to Ramp

Flaps Up
Fuel Condition Lever to Low Idle
Landing Lights Off
Taxi Lights On
Strobe Light Off
Transponder to Standby (F12)
Taxi to Ramp Max 20 kts

Shutdown

Parking Brake On
Pitot Heat Off
De-Ice Off
Avionics 1 - 2 Off
Elevator Trim to Takeoff
Throttle Idle
Prop Ctrl Lever Feather
Nav Lights Off
Beacon Light Off
Fuel Condition Lever Cutoff
Battery Switch Off
Parking Brake Verify On
Throttle Verify Idle

AUTOPILOT OPERATION

Although the instrumentation and control units installed in this Cessna-208B look suspiciously like a Bendix/King kfc200 flight control system, this is NOT a kfc200. This aircraft is equipped with the latest in FlightGear autopilot technology, the EP-C2H6O.

WARNING WARNING: The A/P operates only above 300 ft agl. Automatic disengagement occurs descending through 300 ft agl.

WARNING WARNING: Flight control deflection A/P disengagement: Deflecting any flight control more than 6 degrees will cause all A/P modes (except APPR Mode) to disengage and the A/P will revert to Full CWS Mode.

Full CWS mode: AP annunciator 'on' and no other modes active. This is the default A/P mode when A/P is activated and no vertical or lateral modes are active. Set aircraft pitch/bank with flight controls. Release flight controls and A/P will maintain last observed pitch and bank. If bank angle is less than +6/-6 degrees when flight controls are released the A/P will fly wings level and last observed pitch.

HDG Mode: Follow HSI Heading Bug

NAV Mode: Follow NAV1 Radial or ILS

ALT Mode: Achieve and maintain altitude displayed in the altitude selector.

FD Mode: Follow Route Manager laterally (and vertically if altitudes are specified in the Route Manager) If Route Manager does not specify altitudes then achieve and maintain altitude in the altitude selector.

APPR Mode: Full CWS Mode will remain active until NAV1 is in range, then lateral control is automatically switched to NAV mode. CWS Pitch mode will remain active until GlideSlope is captured, then GS Mode is automatically activated.

Pitch Up/Down: In ALT Mode: Increase/decrease selected altitude in 100 ft steps.
In all other modes including APPR Mode before GS capture: Increase/decrease last observed pitch by 0.5 degrees. In APPR Mode after GS Capture: No effect

ACTIVE LIVERY SYSTEM

The active livery system will reconfigure your aircraft as appropriate for the livery you choose. It will NOT make any unsafe changes, (i.e. removing floats if you are currently floating on them). There are currently 4 fuselage configuration options available and can be used in any combination.

Passenger / Cargomaster configuration: The passenger fuselage includes windows and seating, the cargomaster does not. Toggle the Cargomaster configuration with the C key

Tricycle Gear / Floats: Toggle this fuselage configuration option with F key. The system will not allow you to remove the floats if you are currently being supported by them on water. Doing so would, of course, have very unpleasant consequences.

Sky-Diving Configuration: This configuration removes the passenger seating and cabin doors and replaces the cabin doors with a quick release cargo net to allow skydivers easy exit from the aircraft. This configuration can be toggled with the J key.

Cargo Tank: The cargo tank can be installed or removed. There is currently no hotkey for this operation but it is accessible from the Cessna-208B Menu.

The active livery system uses 4 properties (found near the top of each livery .xml file) to function which you can add to any livery you create or you can modify existing liveries to your liking. If these properties are omitted from the livery xml file then no configuration changes will be made other than changing the livery.

float-command: set to 1 or true to add floats, 0 or false to remove floats
cargo: set to 1 or true to use Cargomaster fuselage, 0 or false to use Passenger configuration
cargo-pod: set to 1 or true to attach the cargo tank, 0 or false to remove the Cargo Tank
jumpship: set to 1 or true to enable the Skydiving fuselage configuration, 0 or false to disable

AMPHIBIOUS OPERATIONS

This aircraft is equipped with the WipAire 8750 Float package including retractable gear and Laser Gear Advisory System. The entire float package can be installed/removed at any time (unless you are currently floating on them) simply by tapping the F key. The installation of floats is automatic if you load at a seaplane base (on water).

Water taxiing - lower (and raise) the float rudders with the R key. With the float rudders lowered you will have excellent control of the aircraft for taxiing. DO NOT Takeoff OR Touch Down with float rudders lowered! In addition to damaging the aircraft this will likely kill you. Use the float rudders to get lined up for takeoff, raise them, then perform your takeoff. Use the flight control rudder to maintain heading on your takeoff run. Limit your use of float rudders to speeds less that 10-15 kts.

Lowering of the gear while on the water is permitted to perform amphibious operations BELOW 10-15 kts. Lowering the gear at higher speeds has very unpleasant side effects. Landing on water with the gear down will flip the aircraft!

Land taxiing - Contrary to the standard tricycle gear of the Cessna 208B the float nosewheels are NOT steerable - they are castering. Be prepared to steer with differential main wheel braking.

Wipaire Laser Gear Advisory System - At about 400 feet above ground level the Laser Gear Advisory begins detecting if you are over a water or land surface. After detecting the surface a light illuminates on the gear advisory display indicating either land or water surface. If the current gear configuration does NOT match the detected surface a warning light illuminates with the word GEAR.

On or Over Water	On or Over Land
	
Correct: Gear Up On or Over Water	Correct: Gear Down On or Over Land
	
Incorrect: Gear Down On or Over Water	Incorrect: Gear Up On or Over Land