

# **RCBgh-50.zip: Groundhandling gauges for FSX aircraft**

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## **Release 5.0**

PLEASE, READ THIS MANUAL CAREFULLY BEFORE INSTALLING & USING THESE GAUGES.

NOTE TO PAD USERS

**THIS GAUGE HAS ALREADY BEEN INSTALLED IN THE BAE 146/CC2 MODEL  
YOU CAN SKIP TO CHAPTER 3 "GAUGE OPERATION"**

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This archive contains a set of groundhandling gauges which you can add to the panel of any aircraft running in FSX:

- a Pushback gauge.
- a Taxispeed gauge.
- a Brakes gauge.

For existing users of these gauges (V 4.0) in FS2004:

- I suggest to read the whole document again, although most of it will sound familiar.
- The Pushback gauge now interacts with the new pushback tugs in FSX scenery !!!
- The Taxispeed gauge now has an ARM mode (ie. it includes the old ARM gauges).
- The new Brakes gauge combines the functionality of the old ParkingBrakes, Brakesound and BrakesPressure gauges.

\*\*\*\* VERY IMPORTANT \*\*\*\*

Although this gauge doesn't use FSUIPC itself, if you have the unregistered version of FSUIPC V4.0.0 or V4.0.1 (the very first FSX versions) installed, you MUST upgrade to V4.0.2 or higher, otherwise the Pushback-turn will not work. If you haven't got a clue what FSUIPC is, just ignore this remark :-)

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### 1. Introduction

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Do you recognise this ??

- I push Shift-P to start Pushback, press 1 or 2 for a Left c.q. Right turn, but the aircraft doesn't make the turn ....
- I want to see the Pushback from SpotPlane View mode ....
- I want to Pushback my aircraft from the gate onto the taxiway, but I don't know when to start the Left or Right Turn ....
- When my aircraft is taxiing, I can't control the speed properly ....
- Are my toebrakes working correctly, what's the applied brake pressure ? ...

This "groundhandling" package solves these problems, and adds some eye-candy too !!

What it offers:

- A Pushback gauge:
  - The Pushback sequence can be performed automatically, by setting the time it should be pushed straight back, plus the desired turn angle.
  - It uses the standard FSX Pushback mechanism, so you can hear the engine/environment sounds during Pushback.
  - During Pushback, you can change the views.
  - To support Pushback operation, the cockpit-ground conversation is made audible.
  - And most importantly: it now interworks with the pushback tugs in FSX.
- A Taxispeed gauge:
  - Controls the groundspeed of the aircraft while taxiing, by manipulating the throttles AND the brakes if needed.
  - Has an ARM mode, so it can be activated automatically e.g. after landing or after a pushback.
- A Brakes gauge:
  - Shows the position of the Parking Brakes, and lets you (de-)activate them.
  - Displays the brake pressure applied to the main brakes.
  - Makes the sound of the brakes audible.

## 2. Installation

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Note: "FSX" is shorthand for your main FSX folder.

(default: C:\Program Files\Microsoft Games\Microsoft Flight Simulator X\ )

Extract all files to a temporary folder, and then:

- Create a subfolder \Groundhandling5\ in the main "FSX"\Sound\ folder.
- Move all files \*.wav AND sound.ini to folder "FSX"\Sound\Groundhandling5\
- Move files Groundhandling5\_Sound.dll AND rcb\_groundhandling5.cab to folder "FSX"\Gauges\.

IMPORTANT: DO NOT UNZIP THIS .CAB FILE !!

## 2. Add the gauges to the panel of your aircraft(s). (Step is Note necessary for the BAE146-300)

Placing the gauges in your panel is done by adding some lines to the panel.cfg file of your aircraft, located in folder

"FSX"\SimObjects\Airplanes\"your aircraft"\Panel\.

The simplest way of doing that is by using Notepad, and Windows Copy/Paste.

\*\*\* MAKE A BACKUP OF YOUR panel.cfg FIRST \*\*\*

- In the [Window Titles] section, add the line:

## Window\*\*=Groundhandling

Replace '\*\*' with the next free number.  
For e.g. the default FSX 737\_800: '\*\*' is 10

- Add the new panel window:

```
[Window**]  
size_mm=204,65  
visible=0  
window_size= 0.20,0.09  
window_pos= 0.0,0.05  
background_color=16,16,16  
gauge00=RCB_Groundhandling5!PushbackDisplay, 2,2,74,61  
gauge01=RCB_Groundhandling5!PushbackStates, 0,0  
gauge02=RCB_Groundhandling5!Taxispeed, 79,2,64,61  
//gauge03=RCB_Groundhandling5!UseToebrakePedals, 0,0  
gauge04=RCB_Groundhandling5!Brakes, 146,2,56,61  
gauge05=RCB_Groundhandling5_Sound!dsd_xml_sound3, 0,0,0,0,  
./Sound/Groundhandling5/Sound.ini
```

Replace '\*\*' with the same number as used above.

### NOTES:

#### 1. IMPORTANT--IMPORTANT--IMPORTANT--IMPORTANT--IMPORTANT--IMPORTANT--IMPORTANT

Due to differences in the Brakes implementation in FSX with respect to the use of Toebrakes pedals, activate (remove the "/" in front of the line)  
gauge03= ONLY when you use proportional toebrake pedals, like the CH Pro Pedals.

Removing the "/" will force the Taxispeed gauge to use proportional Brake commands (like your pedals) instead of normal Brake commands.

For a detailed explanation, see Appendix-2.

#### 2. The included sound gauge (.dll) is signed by Doug Dawson.

So IF FSX asks you, you must "run" this gauge; if you also select the "More" option "Allways trust this publisher", you are never asked again for any of this publishers signed gauges.

#### 3. You can open the Groundhandling window in any view, via menu Views - Instrument Panel.

If you want to change views during operation, and like to have the Groundhandling visible permanently, you have to "undock" this window (right-mouseclick - Undock)

### 3. Gauge operation

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A few general remarks first:

- All gauges have Tooltips on their clickable area's, describing their function.

Make sure you have the Tooltips enabled in FSX to see them.

NOTE: Some videocards (like my Nvidia 7900GT) sometimes gives a distorted screen when a Tooltip pops up, if you fly FS9/FSX in Windowed Mode.

Toggleing from Windowed Mode to Fullscreen Mode and back, usually helps.

This is NOT a gauge problem !!

- To set dials, you can also use the mouse scrollwheel instead of clicking.

#### 3.1 Pushback operation

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### 3.1.1 Pushback timer/counters, buttons and phases

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The gauge has 4 clickable areas:

- A pushbutton, to activate Pushback.  
This button has an indicator light, giving the phase of pushback:
  - RED: Pushback cannot be activated; make sure your Parking Brakes are set, and the aircraft is standing still.
  - OFF: Click button to activate Pushback procedure.
  - Flashing GREEN: Waiting for release of the Parking Brakes.
  - GREEN: Pushing back.
  - Flashing YELLOW: Pushback finished, set your Parking Brakes.
  - YELLOW: Pushback procedure terminating.
- A StraightBack counter.  
This counter (0 - 999 meters, the right 3 digits) is started when you release the Parking Brakes and determines how long the aircraft is pushed straight back before the turn sequence (if selected) starts.  
Click to increment or decrement the value.
- A Turn selector.  
Toggles between pushing straight back, or left/right turn (after the set straight back distance). When Left or Right turn is selected, the Turn counter is set to 90 degrees.
- A Turn Counter.  
This counter (0 - 90 degrees, the left two digits) determines the angle of the Turn that you want the aircraft to make.  
Click to increment or decrement the value.

A few notes:

1. "Turning Left" means: the aircraft turns clockwise in TopView c.q. the heading increases while turning. As the standard FS pushback does.
2. When Pushback is active (GREEN light), you cannot change the Timer/Counter values anymore.
3. When Pushback is active (GREEN light), you can terminate the Pushback at anytime by setting the Pushback switch again.
4. After setting up the Timer/Counters, and activating the Pushback by clicking the button, you can change the view mode at any time.
5. After the StraightBack counter becomes 0, the aircraft goes straight back for another 5-20 seconds before starting to turn. This time depends on the aircraft length (this is caused by the FS implementation of Pushback).  
Note: unlike commonly stated, this is a fixed TIME per aircraft, and NOT necessarily after "another full length back".
6. You can use Pushback either with Engines off, or with engines running.  
You can also start your engines during Pushback operation.
7. Manipulating the Parking Brakes during the entire pushback procedure is inhibited, except where the procedure requires setting resp. releasing the Parking Brakes.
8. During the entire pushback procedure, the throttles forced to Idle position.

About the FSX Pushback tugs:

Whether a pushback tug shows up for pushback, depends on the following:

- The setting of the AirportVehicleDensity slider in menu Options - Settings - Display, tab Traffic.
- The spot where your aircraft is parked.  
Obviously, these spots are defined in the FSX scenery, and your aircraft has to be properly parked at a gate (with a pushback tug visible in front of you).  
The pushback gauge will work with or without a tug visible; but if a tug IS used, the gauge detects it and the tug movement/release is synchronised with

the pushback procedure/conversation !!

### 3.2.2 Pushback Operation and Ground-Cockpit conversation

- Set the Parking Brakes.  
The RED light goes off.
- Set the Straightback counter: number of meters before a turn.
- Select the Turn type: None, Left or Right.
- If Left/Right, adjust the turnangle if needed,
- Activate the Pushback procedure by clicking the Pushback button.  
The GREEN light starts flashing and the pushback truck is called.

When the pushback tug (if present) has arrived:

Cockpit: "Ground from cockpit"

Ground: "Go ahead"

Cockpit: "Ready for pushback"

Ground: "OK. Steering pin inserted, release brakes"

- The gauge now waits until you release the Parking Brakes; a ticker sound is played in the mean time, to indicate that the gauge awaits a Parking Brakes operation.

Cockpit: "Brakes are released"

Ground (if engine1 is running): "OK. Pushing back"

Ground (if engine1 NOT running): "OK. Pushing back. All engines cleared for startup"

The following Pushback sequence is performed:

- The light goes solid GREEN.
- If the StraightBack Timer was set, it counts down to 0 while the aircraft is pushed straight back.
- If the LeftTurn or RightTurn Counter was set, the aircraft is pushed straight back ANOTHER FULL LENGTH, and then turns the angle dialed into the Counter. During the turn the Counter indicates the remaining turn angle, and therefore counts down to 0.

While a pushback is active, an aircraft "rolling" sound is played; this sound is especially noticeable when the engines are off during the pushback.

Ground: "Set parking brakes"

- The AMBER light start flashing.  
The gauge waits until you set the Parking Brakes; the ticker sound is played.
- The light goes solid AMBER.

Cockpit: "Parking brakes are set. Prepare aircraft for taxi and give handsignal on left side"

Ground: "OK"

The pushback tug (if present) now moves away from the aircraft.  
After a few seconds:

Ground: "Towing system removed. Wait for handsignal on left-hand side"

- Now the pushback is finished, and the light goes off.

## 3.2 Taxispeed operation.

### 3.2.1 Taxispeed indicators and dials

The gauge consists of 3 clickable areas:

- A pushbutton, to activate/deactivate the gauge.  
This button has an indicator light, colored as follows:
  - OFF: Click button to arm the gauge.
  - FLASHING GREEN: Taxispeed control is Armed.
  - GREEN: Taxispeed control is Active.
- The Target Taxispeed (the Left two digits). Default: 15 knots.  
Click to increment or decrement the value.  
You can change the target speed at any time, even if the gauge is active.
- The Actual Groundspeed (the Right two digits).

### 3.2.2. How the Taxispeed control works

When Off, and clicked, the gauge becomes Armed.

When Armed or Active, and clicked, the gauge goes to Off.

When Armed, the gauge will become Active when if ALL the following conditions are true:

- The aircraft is on the ground.
- The engines are running.
- The Parking Brakes are released.
- Pushback is inactive.
- Groundspeed is less than 50 knots.  
If this is the last condition to become true (when e.g. Taxispeed is Armed for landing), the gauge also sets:
  - The Spoilers/Airbrakes Off.
  - The Autobrakes Off.
  - The flaps to Retracted.

When Active, the Taxispeed gauge controls the groundspeed of the aircraft while taxiing, by manipulating the throttles according to an adaptive algorithm.

- When activated, it disables the AP's AutoThrottle and SpeedHold functions.
- The target taxispeed can be adjusted from 4 - 40 knots.
- The actual taxispeed is kept constant within 1 knot of the set target speed when the aircraft is taxiing straight-ahead; the speed may deviate a bit more after initial acceleration, heavy braking or sharp turns.
- The gauge automatically deactivates when:
  - The Parking Brakes are set.
  - The throttle are manually set to > 60% (usually to start takeoff).
  - When Brakes are applied by the user, the gauge temporarily sets the throttles to idle, until they are released again.
- When the actual groundspeed - targetspeed is more than 4 knots, the Brakes are applied automatically. This happens in the following cases:
  - If you activate the gauge after a landing, when the groundspeed is still much larger than the set target speed (but less than 50 Knots).
  - If you substantially decrease the target speed while the gauge is already active.
  - Occasionally with heavy aircraft, after a long sharp turn (caused by the weight of the plane, combined with the engine spooldown time).
  - When your aircraft accelerates even with throttles set to idle, e.g. if there is a very strong tailwind while taxiing. Moreover, some aircraft in FS have the tendency to start rolling even with throttles at idle.

A few notes:

1. The control is based on actual groundspeed, so it will also work with wind enabled.
2. The adaptive control algorithm is obviously a compromise between accuracy (overshoot, undershoot, reaction time), and is strongly influenced by aircraft characteristics like weight and spoolup/spooldown times. But you will find that it works rather smooth, without constant "jumping" throttles, for most types of aircraft.
3. When the Taxispeed gauge is activated, make sure that your physical throttle axis is in the idle position, to avoid interference with the control (due to axis "jitter"). If your throttle controller still jitters in idle (you will have problems with Reverse Thrust too !), create a small deadzone by increasing the Nullzone for the Throttle axis via menu Options-Controls.

### 3.3 The Brakes gauge

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This gauge does the following:

- A lighted pushbutton switch that shows the position of the Parking Brakes, which is colored as follows:
  - Off: Parking Brakes are released. Click to set.
  - GREEN: Parking Brakes are set. Click to release.
- It displays the braking pressure (0 - 100 %) you apply with the Left/Right brakes, indicated by two green bars. Note that when the Parking Brakes are set, both bars always indicate max. pressure.
- It triggers a brakes sound when the aircraft is on the ground, the brake pressure is > 20% and groundspeed is > 5 knots.

### 4. Copyrights and Disclaimer

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This gaugeset is freeware, NOT Public Domain and it is available for your personal use.

Without my explicite permission, it may NOT be sold, re-distributed and/or uploaded to another website or bulletin board (in ANY shape or form).

If you want to bundle (part of) this gaugeset with your (freeware !!) panel, you may ONLY do so AFTER my explicite permission and inclusion of this README file AS-IS.

And obviously, installing & using this gauges is at your own risk !!

### 5. Credits

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- Doug Dawson, for his great XMLsound gauge (included in this package).

### 6. Closure

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I hope you enjoy using these gauges; I know many people did with the previous versions. And I'm always open to questions, or suggestions for improvement (no guarantee that I will make them though).

But PLEASE PLEASE, before asking me questions or report "bugs", make sure that the answer can't be found in this README file; I have spent considerable time

in making this README, just to avoid wasting both YOUR time and MINE with trivial questions and "issues".  
HOWEVER, FSX is as new to me as it is to you, so I might have missed something :-)

Rob Barendregt, The Netherlands  
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#### Appendix-1: Used sounds

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The following soundfiles are being used in this package:

- GH01\_Conversation1: "Ground from cockpit ... release brakes"
- GH02\_Conversation2: "Brakes are released. OK pushing back"
- GH03\_Conversation3: "Set Parking Brakes"
- GH04\_Conversation4A: "Parking Brakes are set, prepare aircraft ..... OK"
- GH09\_Conversation4B: Towing system removed. Wait for handsignal on left-hand side"
- GH05\_Conversation5: "Brakes are released. OK pushing back. All engines ...."
- GH06\_SoftClick: Click sound, when a pushbutton is clicked.
- GH07\_Error: Procedure error, when clicking a button/dial at the wrong moment.
- GH08\_PushbackRoll: Groundroll sound during Pushback.
- GH10\_Attention: Attention sound, when Pushback awaits ParkingBrakes action.
- GH11\_Brakes: Brakes sound.

It's possible to replace this sound set with your own conversation sounds.  
(the timing is not very time-critical).

You can use different file names for the .wav files; if you do, you only need to edit the sound.ini file, using the replacement filenames.

If you find the pushback conversation sounds too loud, you can change them yourself in the sound.ini file; individually per sound.

Just open the sound.ini file with Notepad, search for the GH\_\*\*\*\*.wav file, and edit the volume number in that line:

- 100 is max. (default) volume.
- 70 is the min. volume (makes the sound almost inaudible)

#### Appendix-2: The "brakes" problem in FS2004/FSX

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For its brakes, FS uses a differential, proportional braking system:  
left and right brakes, pressure dependant.

There are three ways to operate the brakes:

- Via the keyboard (or joystick buttons):  
Commands BRAKES (works on left AND right brakes), BRAKES\_LEFT, BRAKES\_RIGHT.  
I call these non-proportional, although there is some proportionality induced by giving these commands repetitively.
- Via toebrake pedals, separate for Left/Right brakes and proportional with the pedal pressure.
- Controlled from a gauge, either via proportional or non-proportional brake commands.

The FS2004/FSX brakes problem:



If FS2004/FSX detects that proportional brakes are used, either from toebrake pedals or controlled from a gauge (like my Taxispeed gauge), it disables the normal Brake commands, meaning that keyboard/button Brake commands no longer work. This is not a problem if you have toebrake pedals, but if you don't, you're stuck :-)

Hence the Taxispeed gauge can use both types of Brake commands, which is selected by activating the RCB\_Groundhandling!UseToebrakePedals gauge or not. So, ONLY activate the UseToebrakePedals gauge (remove the "//") when you use a proportional toebrakes controller, like the CH Pro pedals.

And as a personal note (please forgive me, I can't resist): I really don't understand why, with all the effort put into a new FS version like FSX, simple little "bugs" like these are not solved :-)

\*\*\*\*\* End Of Document  
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