RALLYpro and Driftpro Handbrake Installation Guide

For Pedal Add-on and Stand-Alone Models

Congratulations on your purchase of the most realistic sim-racing handbrake available. This guide will help you get the handbrake installed and adjusted to your liking. Your RALLYpro handbrake will provide you with all the adjustability that they would have in a real race car in order to provide you with the purest sim-racing experience possible. Further performance characteristics can be adjusted electronically, please refer to the manual provided with your electronic control unit (ECU) for details.

**Tools and Items Required for Installation (not included)**
- Fluid as indicated on the reservoir cap (if required)
- Mounting bolts, nuts, and washers
- Drill and drill bits
- Screwdrivers and wrenches

WARNING!
Please secure the cap on the master cylinder after filling with a long tie wrap or other adequate means if it is accessible to pets or children.

Step 1: Getting Your Handbrake Ready for Installation (RALLYpro Only)
The handbrake has been secured in the compressed position to prevent air from getting trapped at the pressure sensor during shipping. This is done to avoid the need to bleed the brake at the time of installation. Do not remove the strap yet. Fill the reservoir to at least 30% capacity with fluid (if needed, should be pre-filled). Set the assembly tilted as shown for a period of 15 minutes to allow any air bubbles to rise to the top of the reservoir. Remove the strap holding down the handle and keep the master cylinder in this position for an additional 5 minutes. Pump the handle several times while in this position to expel any remaining air. Turn assembly upright and do not lay it sideways from this point forward. Unscrew the reservoir cap and remove the plastic/rubber plug that is used to prevent spillage in transit.
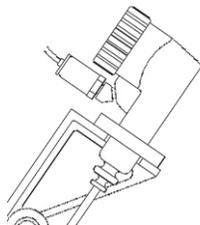
Pump the handle softly about 10 to 20 times to build up the pressure in the system. The handle should become stiffer and only travel about 2 inches (5cm), this is the normal operation of the handbrake. The handbrake should also be pumped before any racing to prime the system and build up pressure in the system. If the handle has more than 2 inches of travel, there may still be air trapped in the system. Allow the fluid to settle for a longer period of time and repeat the procedure above. If this does not remedy the problem, follow the bleeding instructions found at the end of this manual.

Step 2: Mounting Your Handbrake
Ricmotech recommends hard mounting the handbrake directly to your sim-racing chassis. Mount the unit using ¼

inch or 6mm thick bolts or screws (not included). Use nuts and washers to be sure the screws will not pull out. Route the cables to avoid having them get pinched or chafed using the supplied cable straps. Mount the ECU in a location that is both out of the way and within reach of the programming switch, such as next to your wheel or shifter.

Adjusting the Handle Position

The handle position can be adjusted by threading the master cylinder rod into or out of the clevis (arrow A below). First loosen the jam nut and then rotate the master cylinder shaft. After you have reached the desired position tighten the jam nut to prevent it from moving. Larger adjustments may be made by moving the clevis to a different hole on the handle (arrow B below). Always be sure there is no binding between the clevis and handle (arrow C below).
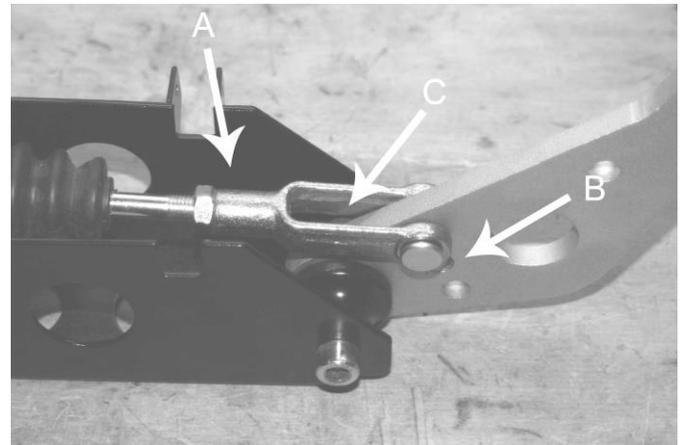
Step 3: Making the Connections
Plug the 4-pin connector for handbrake to the respective connector on the ECU. Stop here if using the pedal control box for the handbrake. Follow the programming instructions in the pedal manual.

NOTE: The rest of this manual applies only to handbrakes using the stand-alone control box.

If using the stand-alone ECU, plug the USB cable (sold separately) to an available USB port on your PC. Drivers will attempt to install automatically. Windows will install its internal drivers. After the drivers install, you may reconnect the network to the PC. The handbrake is powered from the USB port, no external power is required. You should see the LED pulse a red "heartbeat" signal. Restart the PC.

Step 4: Test Your Handbrake to be Sure Windows has Installed Drivers Correctly
Windows XP, Vista, and 7: click Start, type: **joy.cpl** and ENTER
On Windows 8 and 10: go to the Start screen, type: **joy.cpl** and ENTER

The Game Controllers panel will open and there should be a controller named RALLYpro H/B, double click on it. A window with several axis and buttons should appear. Pull the handle to verify the X axis responds. If it does then Windows has properly installed the drivers and the data is getting to the PC. There are other axis and buttons displayed in this window, those are not used at this time but are there for future use.

Only some games support an analog handbrake, while other games only support a digital handbrake similar to pressing a button on your controller. The RALLYpro handbrake may be configured to either mode. In the case it is set to digital mode, the ECU will emulate a pushbutton controller and report as the button being released when the handbrake is less than 50% applied and report as pressed when more than 50% applied. The overall force required to achieve 100% braking is set during calibration. The installation is now complete.

Step 5: Programming and Calibration
The ECU for the RALLYpro handbrake retains all the settings and profiles in its internal memory. You can plug the ECU into any available USB port and even into a different PC and all the settings will be retained.

During final assembly of your handbrake, a test configuration was programmed into the ECU and will still be there as a starting point when it arrives to you. Before making changes to the programming of the ECU, please familiarize yourself with the programmable features listed below.

Profiles: You may create five profiles which can be saved and later retrieved for use with different drivers or simulation titles. To create a profile simply change the settings to your preferences and then save the profile to one of the memory locations. To retrieve a profile, simply load the profile from the memory location you desire and those settings will replace the settings currently in the pedal controller. These settings will remain even after shutting down your pedals or connecting to another PC.

Max (Sensitivity) Calibration: The handbrake can be calibrated to a maximum force. This allows the handbrake to output its full signal range even if you prefer to use less than its full range.

Dead Zone Calibration: The handbrake can be calibrated to have a dead zone. With this setting, the handbrake will remain 'dead' until it has been pulled a predetermined amount. This will avoid applying brakes if you simply bump into the handle.

Handbrake Analog/Digital: Sets the output for the handbrake. Set to analog for games that support it, otherwise set to digital. When set to digital, the handbrake will trigger when it is pulled over 50% of its calibration.

Invert Axis: Most games and racing simulations will function regardless of this setting. If you find that your software applied the handbrake when you *let go* of the handle, then set this option to 'inverted' to correct this.

Linearity: Linearity settings allow you to modify the behavior of a handbrake axis. See Linearity profiles at the end of this manual

Programming is done with the 2-way toggle switch and the red/green LED. The toggle switch can be moved to 2 positions, 'Yes' and 'No' and each position is marked Y and N respectively. The LED will flash red and green to confirm the selection of options.

THESE PROGRAMMING INSTRUCTIONS ARE FOR STAND-ALONE HANDBRAKE ONLY. ADD-ON HANDBRAKES FOLLOW THE PROGRAMMING SHOULD FOLLOW THE INSTRUCTIONS SHIPPED WITH YOUR PEDALS.
The mechanics of programming
Programming settings on the controller involves 4 steps:
1. Enter program mode.
2. Select the programming option.
3. Follow the steps for that particular setting.
4. The controller returns to normal operating mode.

If another setting option is to be changed, the 4 steps above should be repeated. This was designed this way to avoid being lost in a several layers of menus.

Step 1. Enter programming mode by clicking and holding the switch to N until one long green pulse of the LED confirms you have entered programming mode.

Step 2. Click the switch to Y the number of times corresponding to the option you wish to select, the green LED will flash each time the switch is clicked. For example, to select option 1 click the switch once, to select option 2 click the switch twice, to select option 3 click three times, etc. **NOTE:** Failing to click or clicking more than 14 times results in a long red flash and the controller returns to normal operating mode.

Step 3. After 3 seconds, the LED will flash green confirming the selection you made. Skip to the respective section on this sheet and follow those instructions.

Option 1 – Load Profile	
1. Click Y according to the profile you wish to load.	
Click 1 Time	Load Profile 1
Click 2 Times	Load Profile 2
Click 3 Times	Load Profile 3

Click 4 Times	Load Profile 4
Click 5 Times	Load Profile 5

2. After 3 seconds, the LED will flash indicating the selection you made.
3. The controller will exit program mode with your new settings and return to normal operating mode.

Note: Failing to click or clicking more than 3 times results in a long red flash and the controller returns to normal operating mode.

Selecting a profile which has not been previously programmed may set up the pedals with non-functional settings.

Option 2 – Save Profile

1. Click Y according to the profile you wish to load.

Click 1 Time	Save Profile 1
Click 2 Times	Save Profile 2
Click 3 Times	Save Profile 3
Click 4 Times	Save Profile 4
Click 5 Times	Save Profile 5

2. After 3 seconds, the LED will flash indicating the selection you made.
3. The controller will exit program mode with your new settings and return to normal operating mode.

Note: Failing to click or clicking more than 3 times results in a long red flash and the controller returns to normal operating mode.

Option 3 – Handbrake Mode

1. Click Y according to the setting you desire.

Click 1 Time	Set Handbrake to Analog
Click 2 Times	Set Handbrake to Digital

2. After 3 seconds, the LED will flash indicating the selection you made.
3. The controller will exit program mode and return to normal operating mode and should show a "heartbeat".

Note: Failing to click or clicking more than 3 times results in a long red flash and the controller returns to normal operating mode.

Option 4 – Calibrate Handbrake (must be done for analog and digital handbrake mode)

The LED will pulse red 1 time indicating you are at Max Limit setting. You may click N if you want to skip this part.

1. Pull the handbrake to the maximum travel you desire. It does not have to be all the way up.
2. Release the handle.
3. Click Y to accept and the LED will pulse green 1 time to confirm, or click N to skip/cancel.

The LED will pulse red 2 times indicating you are at Dead Zone setting. You may click N if want to skip this part.

1. Pull the handle for the desired dead zone endpoint. Do not pull the handle if you would rather have no dead zone.
2. Release the handle.
3. Click Y to accept and the LED will pulse green 2 times to confirm, or click N to skip/cancel.

The controller will exit program mode and return to normal operating mode and should show a "heartbeat".

Option 5 – Invert Axis

1. Click Y according to the setting you desire.

Click 1 Time	Normal Axis (axis is 0 at rest)
Click 2 Times	Inverted Axis (axis is 1023 at rest)

2. After 3 seconds, the LED will flash indicating the selection you made.
3. The controller will exit program mode and return to normal operating mode and should show a "heartbeat".

Note: Failing to click or clicking more than 2 times results in a long red flash and the controller returns to normal operating mode.

Option 6 – Handbrake Linearity

1. Click Y according to the setting you desire (see table below).

Click 1 Time	Flat
Click 2 Times	A Weighted
Click 3 Times	B Weighted (recommended)
Click 4 Times	AB Weighted

2. After 3 seconds, the LED will flash indicating the selection you made.
3. The controller will exit program mode and return to normal operating mode and should show a "heartbeat".

Note: Failing to click or clicking more than 4 times results in a long red flash and the controller returns to normal operating mode.

Option 7– Heartbeat Mode

4. Click Y according to the setting you desire.

Click 1 Time	Enable
Click 2 Times	Disabled

5. After 3 seconds, the LED will flash indicating the selection you made.
6. The controller will exit program mode and return to normal operating mode and should show a "heartbeat".

Note: Failing to click or clicking more than 2 times results in a long red flash and the controller returns to normal operating mode.

The Concept of Linearity Curves

Linearity curves allow the handbrake axis to be tailored to allow better modulation at various ranges throughout its travel or force application. For instance, on a certain track, you may prefer to have better modulation at the low-end of the braking range to help with slippery turns or perhaps you prefer to have better modulation at the high-end of the range to better control over-steer. At first, these linearity profiles may appear to act like "cheats" in order to compensate for car or track conditions. In reality, these linearity profiles replicate various adjustments which can be done in a real race car and tailored to the driver's preferences. Brake linearity can easily be modified in a real race car by changing brake pad compounds and rotor machining and the brake pedal on your Real-Gear handbrake can be adjusted to replicate a similar level of customization.

The curves below are a representation of the four available linearity profiles available. Effectively, the closer to horizontal the curve is, the greater the level of modulation while the more vertical the curve is, the lesser the level of modulation. Of course, there is always a trade-off; when modulation is increased at one area of range, it must be reduced in another area. The flat curve, as it implies, has equal modulation throughout its range. The A-weighted curve has increased modulation near the end of its range, while sacrificing modulation toward the beginning of its range.

It is best to try all the curves with different cars and tracks until you find the one that helps you achieve faster lap times. It is not uncommon to find that different linearity profiles work best on different car and track combinations. Adjusting the linearity curves is much like tailoring a car setup to a different track, there is no one correct curve.

Pedal Linearity Profiles
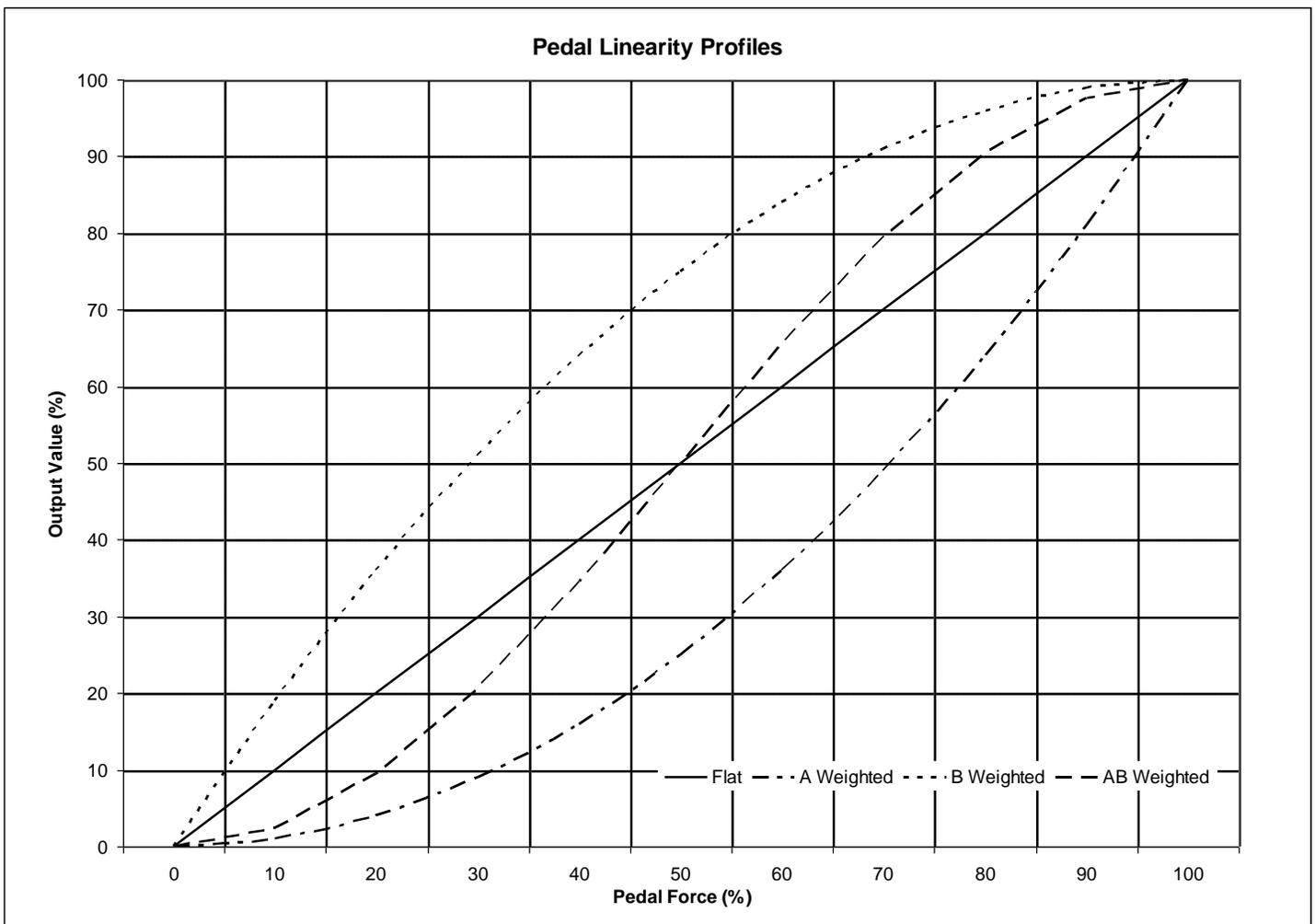
Bleeding the hydraulic assembly (RALLYpro Only)

Follow the steps below to bleed air out of the hydraulic assembly.

1. Remove the wing nut, washers and rubber bushings from the slave cylinder pullrod.

2. Place one washer and the wingnut back on the end of the pullrod, this will be used as a handle.

3. Pull the brake handle several times, the pullrod will inch inward with each pull.

4. Grab the wingnut and washer and slowly pull the rod out to its maximum.

5. Repeat steps 3 and 4 several times. This will cycle the fluid and help air bubbles rise to the top.

6. When satisfied all the air has been expelled, place the bushings and washers back on the pullrod.

7. Pull the brake handle to take up the slack in the bushings.

Need Help?

If you run into any problems during the installation of the RALLYpro handbrake, please contact us directly at tech support at (305) 417-9241 or via email at mail@ricmotech.com.

Due to constant improvements to our products, the product you receive may vary slightly from the product shown in the illustrations.

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