The Valve That Refuses to Turn

Three finished animations and a pressure equation behind Voltaic's jammed fourth valve

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November 22, 2026

Abstract

On the lower gantry of Voltaic's Dry Dock in *Myst III: Exile* (2001), four identical steam valves stand side by side: three turn smoothly and vent thick white plumes, while the fourth jerks in place and refuses to budge. Inside the disc archives, Presto Studios left behind all three finished animations for that fourth valve turning open, turning closed, and venting steam, together with the script plumbing that still tracks its state. Solving the Dry Dock's twelve-valve pressure puzzle reveals why the fourth valve had to be welded shut before release.

In **Myst III: Exile** (2001), stepping onto the bottom catwalk of Voltaic's Dry Dock (ENDD:46) puts four large red iron wheels in front of you along the boiler pipe. Three of them turn smoothly through a full rotation whenever you click them, changing the boiler pressure below. The fourth wheel sits shut and silent. Click it, and it twitches a few degrees, groans, and snaps right back where it started.

Most players take the jammed wheel as atmospheric flavor, one rusted pipe in an old industrial Age. Look inside the game's archives and scripts, however, and a very different story emerges: Presto built, animated, and wired up all four valves to work identically, then disabled the fourth one at the last stage of puzzle tuning.

Version of the game: unmodified Myst III: Exile 1.0 (April 2001, Macintosh four-CD release) tested live under Mac OS 9.2.1. The valve animations and Dry Dock valve scripts are identical in version 1.27.

How to See It in the Game

1. Link to Voltaic and ride the cavern lift down to the bottom gantry of the Dry Dock (ENDD:46), where four red iron valves face you across the steam pipe.
2. Click each of the first three wheels on the left. Each spins smoothly through a full rotation, shifting the boiler pressure gauge below.
3. Click the fourth wheel on the far right. Instead of turning, it shudders in place and stops dead. Click it as many times as you like. Unlike a certain door on Riven, six clicks will not help you here.

Live on April 2001 Macintosh Exile 1.0

Here are all four valves clicked in order on unmodified April 2001 Macintosh `1.0`. The first three red wheels spin closed one by one, raising boiler pressure in ten-unit

Cite as: Guillaume Lethuillier, "The Valve That Refuses to Turn", glthr.com, November 22, 2026. https://glthr.com/exile-fourth-valve
Interactive figures, animations and videos of the web page are shown here as still images or addresses.

steps, while clicking the fourth wheel twice triggers only the short stuck twitch and leaves its state untouched.[1]



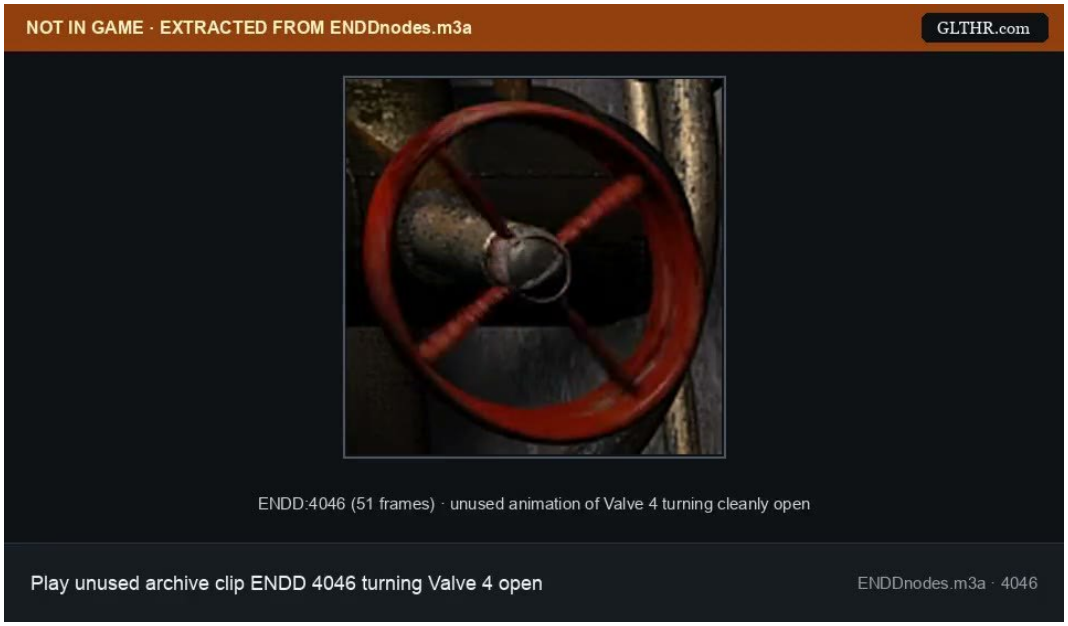
Video: https://media.glthr.com/exile-fourth-valve/exile-fourth-valve-proof.mp4

Three Finished Movies Left Inside `ENDDnodes.m3a`

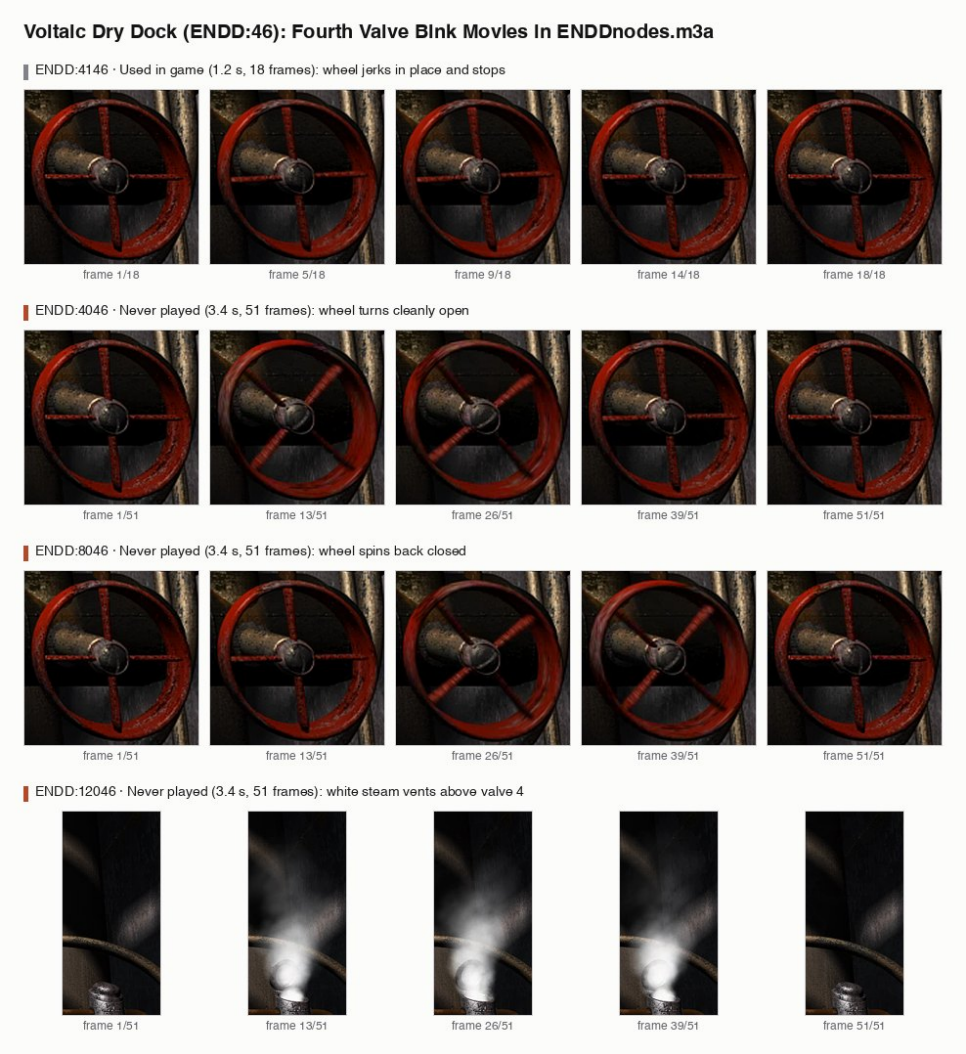
Each working valve on ENDD:46 uses three `51`-frame Bink clips stored in `ENDDnodes.m3a`: a turn-open animation, a turn-closed animation, and a looping steam jet (`1046/5046/9046` for valve 1, `2046/6046/10046` for valve 2, `3046/7046/11046` for valve 3). Valve 4 has the exact same complete trilogy sitting right next to them, plus the shorter `18`-frame replacement clip (`4146`) that the retail game actually plays.

The video below plays all four clips back to back, decoded straight from `ENDDnodes.m3a` with their original audio. Unlike the live capture above, the three `51`-frame clips cannot be triggered in unmodified play.

[1] Because the Dry Dock sits deep inside Voltaic, the live Mac 1.0 demonstration reached ENDD:46 using the game's built-in `TYRA23` warp command, then clicked all four valves natively while reading `v308`–`v311` and boiler pressure `v323` from guest RAM.



Video: https://media.glthr.com/exile-fourth-valve/exile-fourth-valve-unused.mp4



All four Bink animations authored for Valve 4 inside `ENDDnodes.m3a`: the shipped 18-frame stuck jerk (`4146`) above the three finished 51-frame animations that never play (`4046`, `8046`, and `12046`).

Archive clip	Frames	Dimensions	Size (bytes)	Script status
`ENDD:4146`	18	136 × 136	154,020	**Played** by `ENDD:46 hotspot 10` (`when v311 == 0`)
`ENDD:4046`	51	136 × 136	274,536	**Unreferenced** in all 1,169 scripts
`ENDD:8046`	51	136 × 136	299,896	**Unreferenced** in all 1,169 scripts
`ENDD:12046`	51	120 × 248	256,204	**Still preloaded** by `ENDD:46 init 0` (`when v311 != 0`), never triggered

Intact Script Plumbing Around a Dead Flag

Presto did not strip Valve 4's logic out of the scripts. Almost every piece of its original wiring is still executed every time you visit ENDD:46:

- `ENDD:46 init 0` still randomizes `v42` (`10..30`) and preloads the looping steam animation `movieInitCondPreloadLooping(12046, [v311 != 0])`.
- `ENDD:46 init 4` still resets `v42` to `0` when `v311 == 0`.
- `ENDD:46 background 3` still runs on every frame to clamp `v36` to `10` whenever `v311 != 0`.
- `ENDD:10000 init 4` still tests `when v311 == 0` and adds `+10` to boiler pressure `v323`.

Only the click handler itself was cut down. Where valves 1, 2, and 3 each have two full hotspots (one to open, one to close), Valve 4 has a single three-line block (`hotspot 10`) that plays `4146` and never writes to `v311`:

```
// ENDD:46 (hotspot 10, Valve 4)
hotspot 10 when v311 == 0, cursor 1
  zone pitch -10 heading 306 size 13x15
  varSetValue(vMovieVolume1, 25)
  varSetOne(vMovieNoFrameSkip)
  moviePlay(4146)
```

Because `XXXX:1000` (new-game setup) initializes `v308`, `v309`, and `v310` to `1` while leaving `v311` at `0`, `v311` stays zero for the entire game, `ENDD:12046` is preloaded into memory on every visit without ever playing a frame, and `ENDD:10000` faithfully adds Valve 4's permanent `+10` pressure on every recalculation.

The Pressure Equation Behind the Weld

Why did Presto build and render a working fourth valve, wire up its state variable, and then weld it shut? The answer sits in `ENDD:10000` and `ENDD:48`.

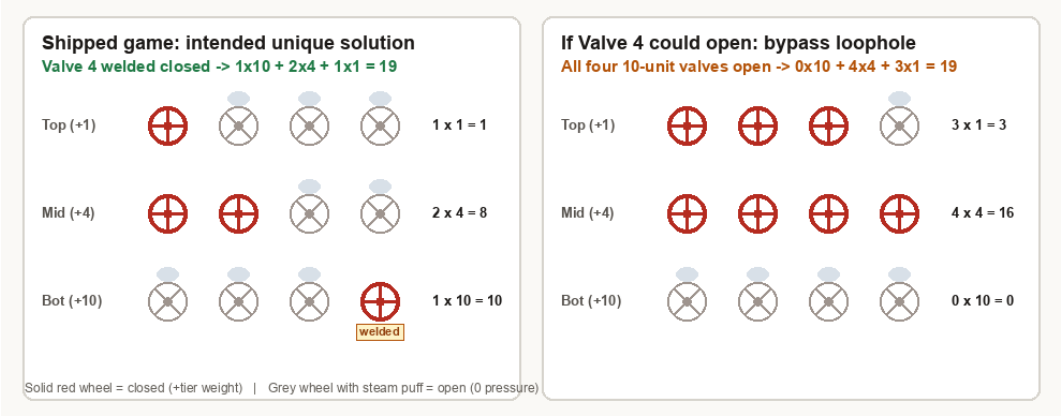
The Dry Dock holds twelve valves across three platforms: four `10`-unit valves on the bottom gantry (ENDD:46, `v308`–`v311`), four `4`-unit valves on the middle gantry (ENDD:52, `v312`–`v315`), and four `1`-unit valves on the top gantry (ENDD:53, `v316`–`v319`). Each closed valve adds its weight to boiler pressure `v323`. Reaching the middle gantry requires `v323 >= 22` (`ENDD:10046`), reaching the top gantry requires `v323 >= 49` (`ENDD:10052`), and docking the airship at the exact landing level (`ENDD:48`) requires:

$$10a + 4b + c = 19, \qquad a, b, c \in \{0, 1, 2, 3, 4\}$$

With all four bottom valves free (`a ∈ {0, 1, 2, 3, 4}`), that equation has **two** solutions:

$$(a, b, c) = (1, 2, 1) \implies 1 \times 10 + 2 \times 4 + 1 \times 1 = 19$$
$$(a, b, c) = (0, 4, 3) \implies 0 \times 10 + 4 \times 4 + 3 \times 1 = 19$$

The first is the intended three-tier solution. The second is a bypass that only exists if Valve 4 can open. Try both configurations on the twelve wheels below:



Locking Valve 4 permanently closed enforces `a >= 1` (`v311 == 0`). That single three-line edit accomplishes two design fixes at once:

1. **It makes `10 + 8 + 1 = 19` the unique solution.** You can no longer leave the middle tier completely closed (`4 × 4 = 16`) and open all four bottom valves (`0`) to reach `19`.
2. **It anchors the ascent thresholds cleanly.** Starting with `v323 = 10` instead of `0` lets closing two working bottom valves reach `30 >= 22` (climbing to the middle gantry), and closing all three reach `40` (requiring three middle valves closed to hit `52 >= 49` for the top gantry). On the descent back down, you simply open all three working bottom valves, letting the jammed fourth valve supply the required `10` automatically.

The three unused Bink clips in `ENDDnodes.m3a` preserve the moment that tuning happened: late enough that the full animation set was already rendered and packed onto the master discs, yet clean enough that replacing one hotspot with an 18-frame twitch sealed the loophole without rebuilding a single panorama.

How to cite this article

> Guillaume Lethuillier, “The Valve That Refuses to Turn”, glthr.com, November 22, 2026.
> https://glthr.com/exile-fourth-valve

For BibTeX:

```
@misc{lethuillier2026valve,
  author = {Lethuillier, Guillaume},
  title  = {The Valve That Refuses to Turn},
  year   = {2026},
  month  = nov,
  url    = {https://glthr.com/exile-fourth-valve},
  note   = {glthr.com}
}
```

Your questions and leads are welcome: myst@glthr.com

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