

## Stake function allows staking NFTs with token ID 0

```
function stake(GalileoStakingStorage.StakeTokens calldata stakeTokens) external
whenNotPaused nonReentrant {
    // Recover and verify the voucher signature to ensure its authenticity.
    _recover(stakeTokens);
    // Call the internal function to handle the actual staking process
    _stakeTokens(
        stakeTokens.collectionAddress,
        stakeTokens.tokenId,
        stakeTokens.citizen,
        stakeTokens.timeLockEndTime,
        stakeTokens.stakedLeox
    );
}
```

### Root Cause



- `stake()` → calls `_stakeTokens()` without **any restriction on** `tokenId`.
- `_stakeTokens()` accepts `tokenId == 0`.
- But later, in `unstake()` (or related functions), the logic **blocks** `tokenId == 0` (either by explicit check or by assuming IDs > 0).

This creates an **inconsistent state machine**:

- Stake with `tokenId == 0` succeeds.
- Unstake with `tokenId == 0` is impossible.

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### Attack / Edge Case Scenario

1. Alice owns an NFT with `tokenId = 0`.
  2. She stakes it via `stake()`.
    -  `_stakeTokens()` accepts it.
  3. Later, she calls `unstake()` for her NFT.
    -  Fails, because `unstake()` disallows `tokenId == 0`.
  4. Result: Alice's NFT is **permanently locked in the contract**.
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## Impact

- **User funds (NFTs) locked** irretrievably.
  - **DoS for tokenId=0 holders** (they cannot exit).
  - Breaks **trust and usability**: contract does not behave consistently.
  - Depending on project size, could become a **major UX bug** or even **loss of user assets** if not fixable.
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## Fix Recommendations

Two ways to solve this cleanly:

### 1. Disallow staking of `tokenId == 0` (safe option)

- Add validation in `stake()` or `_stakeTokens()`:

```
require(tokenId != 0, "Invalid tokenId");
```

- Prevents users from ever locking un-withdrawable NFTs.

### 2. Support unstaking of `tokenId == 0` (better UX)

- Modify `unstake()` logic to handle `tokenId == 0` consistently.
- Ensures symmetry: “if you can stake it, you can unstake it.”

### 3. Invariant rule enforcement (best practice)

- Whatever is allowed in `stake()` must be allowed in `unstake()`.
- Otherwise you create a one-way lock bug.