

Hit Reaction System

1. Problem Statement

In melee combat, landing a hit must clearly communicate:

- that damage was dealt
- how strong the hit was
- whether the defender can respond
- whether momentum has shifted

Without a well-defined hit reaction system:

- hits feel weak or ignored
- combat loses clarity
- player trust is reduced
- KO moments feel unearned

The Hit Reaction System defines how the defender responds when struck, ensuring combat feels impactful, readable, and fair.

2. Goals

1. Make every successful hit feel acknowledged
 2. Clearly differentiate light vs heavy hits
 3. Preserve combat flow without stun-locking
 4. Enable high-tension end-of-fight moments
 5. Support player agency through defense and choice
 6. Integrate cleanly with Combat State Machine and Camera
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3. Design Principles

- Readability always wins over realism

- Hits must interrupt to be felt
 - Light hits maintain flow
 - Heavy hits create momentum shifts
 - Stagger creates opportunity, not forced outcomes
 - KO is a player-triggered commitment, not automatic
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4. Reaction Severity Levels

4.1 Light Hit Reaction

- Brief flinch animation
 - Player retains control
 - No state lock
 - Can immediately:
 - Block
 - Dodge
 - Designed to:
 - Enable combos
 - Preserve pace
 - Avoid frustration
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4.2 Heavy Hit Reaction

- Full-body reaction animation
- Short state lock
- Longer recovery frames than light hit
- Can lead to:
 - Stagger (if conditions met)
- Includes:

- Micro directional camera shake
 - Hitstop (heavy hits only)
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5. Directional Reactions (MVP Scope)

- Supported directions:
 - Front
 - Back
- No left/right directional reactions in MVP
- Direction influences:
 - Animation selection
 - Reaction facing

This provides clarity while controlling animation scope.

6. Reaction Duration Control

- Reaction duration is fixed per hit type
 - Light hit → short, consistent duration
 - Heavy hit → longer, consistent duration
- No dynamic scaling in MVP

This ensures predictability and easier tuning.

7. Defense Interaction Rules

7.1 Block Interaction

- Successful block triggers:
 - Reduced reaction animation
 - Block-specific VFX/SFX
 - Haptic feedback

- Damage is reduced or negated
 - No full hit reaction on successful block
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7.2 Dodge Interaction

- If dodge avoids hurtbox:
 - No hit reaction
 - No damage
- Dodge fully cancels reaction

This reinforces dodge as a clean, skill-based defense.

8. Hitstop Rules

- Hitstop is applied only on heavy hits
- Duration is minimal (micro-freeze)
- Camera and animation pause together
- No hitstop on light hits

Hitstop exists to enhance impact, not slow combat.

9. Stagger System

9.1 Stagger Trigger Conditions

Stagger is triggered when:

- Opponent HP is $\leq 15\%$
- Any successful hit (light or heavy) connects

Stagger represents vulnerability, not guaranteed defeat.

9.2 Stagger Behavior

- Attacks are disabled

- Movement is restricted
 - Defense is allowed with very tight timing
 - Stagger window duration: ~2 seconds
 - Only one stagger opportunity per round
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10. KO Opportunity System

- During stagger, a KO prompt is available
- KO input:
 - Triggers cinematic finish
 - Is not dodgeable
 - Ends the round immediately
- If KO input is not used:
 - Combat continues
 - Defender may block/dodge non-KO attacks
 - Round can still end via normal attacks

KO is a player choice, not a forced outcome.

11. Reaction vs Combo Flow

- Reactions chain smoothly during combos
 - No hard reset between hits
 - Heavy reactions can break combo flow
 - Light reactions preserve combo continuity
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12. Camera Integration

- Heavy hits:
 - Micro directional camera shake

- Light hits:
 - No camera involvement
- Stagger:
 - Camera follows Stagger state rules
- KO:
 - Camera fully controlled by KO Camera System

Camera behavior is driven by combat state.

13. Integration with Combat State Machine

- Hit Reaction:
 - Overrides all active states
 - Stagger:
 - Higher priority than Attack and Movement
 - KO:
 - Highest priority state
 - Reactions never overlap with other states
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14. Acceptance Criteria

- All hits produce clear feedback
 - Light hits feel responsive, not punishing
 - Heavy hits feel impactful and distinct
 - Stagger creates tension, not helplessness
 - KO moments feel earned and climactic
 - No reaction-related soft locks or bugs
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15. Risks & Mitigations

Risk: Light-hit spam at low HP

- Mitigation: One stagger per round limit

Risk: Weak impact feel

- Mitigation: Heavy-only hitstop + micro camera shake

Risk: Player frustration during stagger

- Mitigation: Allow high-skill defensive responses

