# Adjustable Socket for Transfemoral Prosthese

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The post-amputation experience involves several physical and psychological changes. Despite technological advances, current prosthetic sockets present limitations by not accurately adapting to the changing morphology of the remaining limb, affecting the comfort and functionality of the user. This research proposes innovative solutions to overcome these restrictions, seeking to develop individualized and anatomically effective prostheses. A decisive strategy was adopted to divide the research into 4 phases. Phase 1 focuses on developing the design of a prosthetic socket. Proposed as an all-electric, sensor-driven model, this approach was discarded after tests showed it to be infeasible. In response to this limitation, two additional rounds of review were conducted to determine the most feasible option. Finally, the decision was made to develop the prosthetic socket manually. It is divided into 2 labelled plates which can be manually fitted to the desired size. In its standard state, the socket measures 48 cm in circumference and can be expanded to 60.5 cm in circumference for satisfactory functionality. The model scored a 72.96% pass rate on its criteria; and achieved 60 Newton of force. The prototype still requires optimizations to make the prosthetic anchorage fully self-adjusting and the remaining parts of the prosthesis. Results may vary as it has not been tested on individuals. The project aims to deliver prosthetic solutions that are not only more precise and functional but also tailored to the needs of everyone. This requires additional optimization efforts and testing with real users to ensure the efficacy and suitability of the developments.

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