ABSTRACT

An example vehicle wing assembly includes a multi-element wing with a main wing element and a leading edge slat element. A deployment mechanism moves the wing between a stowed position where the main wing element blends with a vehicle body panel and the slat element is concealed, and an active deployed position away from a vehicle. A rotation mechanism adjusts the wing's angle of attack when deployed. A controller dynamically controls deployment and rotation based on vehicle operating parameters. The wing assembly provides enhanced aerodynamic performance while maintaining vehicle styling and incorporating safety features for impact protection.