

Product Development - Tricoupler

In this project funded by the SBIR program, SA was tasked with the development of a special coupler which is capable of establishing electrical and pneumatic connections between cars, in addition to a mechanical connection (Tri-coupler). First, the project team studied gathering ranges, clearances and horizontal/vertical curving requirements between couplers to evaluate potential locations where a connector pod may be attached to a coupler. Based on this information, three different designs of a 'Tri-coupler' were developed. Subsequently, one of the



Coupler Test Setup

designs was chosen for further development based on its relative merits. This process also revealed the usefulness of a 'knuckle-open' device in improving the gathering range between couplers. The development of this feature was undertaken alongside the 'Tri-coupler' development project. Detailed designs were then developed, which included careful study of coupler contours, coupler internals, permissible wear levels and slack between couplers.



Close-up of Tri-couplers

Two prototype couplers were fabricated based on these designs. SA also developed a special test fixture for testing the new couplers for their mechanical connection and electrical/pneumatic continuity. The test fixture allows these couplers to be tested in various scenarios at a fraction of



the cost of full scale tests. Based on the initial series of tests, modifications were made to the prototypes to improve the design. Testing of the modified couplers is now underway. This project demonstrates the ability of SA to take a project from a conceptual stage, through design and testing, and produce a fully functional prototype.