On plenary train algebras of rank 4

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The existence of idempotent elements in plenary train algebras of rank greater than 3, is an open problem to be solved. J. Carlos Gutierrez's results on plenary train algebras in Gutierrez (2000) are based on the underlying assumption of the existence of an idempotent. In this article we study conditions on the scalars defining a plenary train algebra of rank 4 to assure the existence of such an idempotent.