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The prism graph is the dual of the complete graph on five vertices with an edge deleted, $K_5 \setminus e$. In this paper we determine the class of binary matroids with no prism minor. The motivation for this problem is the 1963 result by Dirac where he identified the simple 3-connected graphs with no minor isomorphic to the prism graph. We prove that besides Dirac's infinite families of graphs and four infinite families of non-regular matroids determined by Oxley, there are only three possibilities for a matroid in this class: it is isomorphic to the dual of the generalized parallel connection of F_7 with itself across a triangle with an element of the triangle deleted; its rank is bounded by 5; or it admits a non-minimal exact 3-separation induced by the 3-separation in P_9 . Since the prism graph has rank 5, the class has to contain the binary projective geometries of rank 3 and 4, F_7 and $PG(3, 2)$, respectively. We show that there is just one rank 5 extremal matroid in the class. It has 17 elements and is an extension of R_{10} , the unique splitter for regular matroids. As a corollary, we obtain Dillon, Mayhew, and Royle's result identifying the binary internally 4-connected matroids with no prism minor [5]. (Received November 23, 2012)