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We construct abelian extensions of the special orthogonal Lie algebras  $D_5$  and  $D_7$ , which we embed into the exceptional Lie algebras  $E_6$  and  $E_8$ , respectively. We then examine the finite-dimensional, irreducible representations of  $E_6$  and  $E_8$  restricted to the abelian extensions of  $D_5$  and  $D_7$ , respectively, under the embeddings. The irreducible representations of  $E_6$  remain indecomposable upon restriction to  $\tilde{D}_5$ . Irreducible representations of  $E_8$  may decompose upon restriction to  $\tilde{D}_7$ . Next, we illustrate why the methods used in the article cannot be extended to  $D_6$  and  $E_7$ . As a final application, we show that a certain “natural” embedding of  $D_7$  into  $E_8$  cannot be lifted to an extension of  $D_7$  by a 64-dimensional non-abelian algebra. (Received September 19, 2011)