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Darren A. Narayan*, School of Mathematical Sciences, Rochester Institute of Technology, Rochester, NY 14623, and **Brendan Rooney**, School of Mathematical Sciences, Rochester Institute of Technology, Rochester, NY 14623. *Minimally Non-Asymmetric Graphs*.

A graph is asymmetric if the automorphism group of its vertices is trivial. A graph G is minimally non-asymmetric if G is non-asymmetric, but $G - e$ is asymmetric for any $e \in E(G)$. We investigate necessary conditions for a graph to be minimally non-asymmetric. We present infinite families of graph with this property, including some that arise from combinatorial designs. Finally we present a surprising result: there exist vertex transitive graphs that are minimally non-asymmetric. This shows the existence of graphs G where the automorphism group of vertices is the symmetric group, but the removal of any edge results in a graph where the automorphism group of vertices is trivial. (Received September 17, 2019)