Singular Lagrangian fibrations on symplectic manifolds are a natural generalization of completely integrable Hamiltonian systems. We give a classification, up to topological equivalence, of singular Lagrangian fibrations on closed symplectic four-manifolds, provided that all singularities are nondegenerate, at least one singularity has rank 1, and the fibration base satisfies some orientability condition. A key step in the proof is a geometric classification of the singular affine structures that can occur on any open stratum of the base of such a singular Lagrangian fibration.