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Γ1 [vd_VD] := Module[{js, s1, i1, j1, s2, i2, j2},
  js = Cases[vd, X[_[_], j_] :=> j] ∩ Cases[vd, X[_[i_], _] :=> i - 1];
  If[Length[js] == 0, vd,
    j1 = RandomChoice[js]; i2 = j1 + 1;
    Cases[vd, X_s_[i_, j1] :=> (s1 = s; i1 = i)];
    Cases[vd, X_s_[i2, j_] :=> (s2 = s; j2 = j)];
  Tidy@Join[Complement[vd, VD[X_s1[i1, j1], X_s2[i2, j2]]],
    VD[X_s2[j1, j2], X_s1[i1, i2], X_s1_s2[i1 - s1 / 3, j2 + s2 / 3],
      X_-s1_s2[i1 + s1 / 3, j2 - s2 / 3]]
  ] ] ]

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