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Let W be a Weyl group and P the corresponding pure Artin braid group. The action of W on P gives a representation in cohomology that is well-understood from several points of view. Let G be the subgroup of P of braids with zero winding number; in cohomology, the action of P/G factors through a cyclic group of order equal to half the number of roots. By contrast, the cohomology of G is unknown in general. Its Euler characteristic is a virtual representation of W and the cyclic group that we find has an interesting description in some cases. (Received October 03, 2000)