

ABSTRACT. Let  $p$  be an odd prime number,  $k$  an imaginary abelian field containing a primitive  $p$ -th root of unity, and  $k_\infty/k$  the cyclotomic  $\mathbf{Z}_p$ -extension. Denote by  $L/k_\infty$  the maximal unramified pro- $p$  abelian extension, and by  $L'$  the maximal intermediate field of  $L/k_\infty$  in which all prime divisors of  $k_\infty$  over  $p$  split completely. Let  $N/k_\infty$  (resp.  $N'/k_\infty$ ) be the pro- $p$  abelian extension generated by all  $p$ -power roots of all units (resp.  $p$ -units) of  $k_\infty$ . In the previous paper, we proved that the  $\mathbf{Z}_p$ -torsion subgroup of the odd part of the Galois group  $\text{Gal}(N \cap L/k_\infty)$  is isomorphic, over the group ring  $\mathbf{Z}_p[\text{Gal}(k/\mathbf{Q})]$ , to a certain standard subquotient of the even part of the ideal class group of  $k_\infty$ . In this paper, we prove that the same holds also for the Galois group  $\text{Gal}(N' \cap L'/k_\infty)$ .