Agalakov, S.A.

Finite separability of groups and Lie algebras. (English. Russian original)
Algebra Logic 22, 261-268 (1984); translation from Algebra Logika 22, No.4, 363-371
(1983).

The author answers in the negative two questions, due to M. I. Kargapolov
and G. P. Kukin, on finite separability of finitely generated subgroups (resp.
subalgebras) in free soluble groups (resp. Lie algebras). For every $m \geq 3$
he produces a finitely generated, say, subgroup H and an element $g \notin H$ in
an arbitrary nonabelian free soluble group G of soluble length m such that
$g \in HK$ for any normal subgroup K of finite index in G. The same is true in
the Lie algebra case.

For $m = 2$ the above question in the Lie algebra setting has been answered
in the positive by the reviewer. In the same paper of the reviewer [J. Lond.
Math. Soc., II. Ser. 20, 415-422 (1979; Zbl. 432.17007)] a finitely inseparable
subalgebra was constructed in a free algebra of the soluble variety given by
$(x_1x_2x_3)(x_4x_5x_6) \equiv 0$.

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