It was guessed that the General restricted horse numbers (strong ordering on variables $x_1, x_2, x_3 \ldots x_k$) is the form $B'(k) = s(k,k)H(n) + s(k,k-1)H(n-1) + s(k, k-1)H(n-2)\ldots s(k,1)H(n-k+1)$ where $s(a,b)$ are the signed Stirling numbers.

This may be proven by assuming the following:

The translation operator $\exp(d/dn)$, $\exp(d/dn)H(n) = H(n+1)$

Then build the problem as a counting problem, first remove the k variables that are strongly ordered

$e^{-(k-1)d/dn}H(n)$

Then add them back one at a time, which is just increasing the number of variables, but also, need to subtract out any choice where the added variable is equal to one of the k variables, which if m variables are already added back, is just an additive constant -m multiplied on the possible number of configurations without that variable,

$(e^{d/dn} - 1) \, e^{-(k-1)d/dn}H(n)$ [k = 2]
$(e^{d/dn} - 2)(e^{d/dn} - 1) \, e^{-(k-1)d/dn}H(n)$ [k = 3]
$(e^{d/dn} - 3)(e^{d/dn} - 2)(e^{d/dn} - 1) \, e^{-(k-1)d/dn}H(n)$ [k = 4]