A type of primes that seem to lead to sequences of infinite Poulet numbers in a recurrent formula

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Abstract. Though I discovered a lot of sequences of Poulet numbers based on different types of formulas, I never succeded to find a recurrent formula able to produce a subset of Poulet numbers...until now, when I incidentally noticed an interesting relation between two Poulet numbers divisible by 73. Extrapolating the result I obtained a recurrent formula based on primes of the form 30k+13 that seem to lead often to possible infinite sequences of Poulet numbers.

Conjecture:
Any Poulet number P that has a prime divisor d of the form 60*k + 13 is the starting term in the following recurrent formula which produce a sequence containing an infinity of Poulet numbers P_i: P_i = ((P*2 – d)*2 – d)*2 – d)...).

Examples:

For P = 1387 = 19*73, we have:
: (1387*2 – 73) = 2701, a Poulet number;
: (((1387*2 – 73)*2 – 73))*2 – 73) = 10585, a Poulet number.

For P = 1729 = 7*13*19, we have:
: ((1729*2 – 13)*2 – 13) = 13741, a Poulet number.

For P = 7957 = 73*109, we have:
: (7957*2 – 73) = 15841, a Poulet number;
: ((1387*2 – 73)*2 – 73) = 31609, a Poulet number.
: ((((1387*2 – 73)*2 – 73))*2 – 73)*2 – 73) = 126217, a Poulet number.

For P = 31609 = 73*433, we have:
: (((31609*2 – 433)*2 – 433)*2 – 433) = 249841, a Poulet number.

Note (from above) that 31609 is also a term in other recurrence relation, based on the divisor 73.

For P = 49141 = 157*313, we have:
: (((49141*2 - 313)*2 - 313)*2 - 313) = 390937, a Poulet number.
For P = 65281 = 97*673, we have:
: (65281*2 - 673) = 129889, a Poulet number.