Refutation of ethical reasoning and HOL as a universal meta-logic

Abstract: An exemplary equation in HOL for ethical reasoning is *not* tautologous. By extension, HOL is refuted as "a universal meta-logic", and "ethical reasoning" is refuted. Therefore HOL and ethical reasoning are *non* tautologous fragments of the universal logic VŁ4.

We assume the method and apparatus of Meth8/VŁ4 with `T`autology as the designated proof value, **`F`** as contradiction, `N` as truthity (non-contingency), and `C` as falsity (contingency). The 16-valued truth table is row-major and horizontal, or repeating fragments of 128-tables, sometimes with table counts, for more variables.
(See ersatz-systems.com.)

LET ~ Not, ¬ ; + Or, ∨, ∪, ⊔ ; - Not Or; & And, ∧, ∩, ⊓ ,· ; \ Not And;
> Imply, greater than, →, ⇒ , ↦, ≻, ⊃, ↠ ;
< Not Imply, less than, ∈, ≺, ⊂, ⊬, ⊭, ↞, ≲ ;
= Equivalent, ≡, :=, ⇐⇒, ↔, ≙, ≈, ≃ ; @ Not Equivalent, ≠;
% possibility, for one or some, ∃, ◊, M; # necessity, for every or all, ∀, □, L;
(z=z) `T` as tautology, ⊤, ordinal 3; (z@z) **`F`** as contradiction, Ø, Null, ⊥ , zero;
(%z>#z) `N` as non-contingency, Δ, ordinal 1;
(%z<#z) `C` as contingency, ∇, ordinal 2;
~(y < x) (x ≤ y), (x ⊆ y); (A=B) (A~B); (B>A) (A⊢B); (B>A) (A⊨B).
Note for clarity, we usually distribute quantifiers onto each designated variable.

From: Benzmüller, C.; Parenta, X.; van der Torre, L. (2019). Designing normative theories of ethical reasoning: formal framework, methodology, and tool support. arxiv.org/pdf/1903.10187.pdf c.benzmueller@googlemail.com, c.benzmueller@fu-berlin.de, xavier.parent@uni.lu, leon.vandertorre@uni.lu

2. The SSE approach: HOL as a universal meta-logic

Remark 2: SSE is not defined as an acronym.

For example … ◊∀x.Px ≡ (λw.∃v.Rwv ∧ ∀x.Pxv).
(2.1)
This illustrates the embedding of ◊∀x.Px in HOL.

LET p, r, v, w, x, z: P, R, v, w, x, λ.

(%#x&(p&x))=(((z&w)&(%v&(r&(w&v))))&(#x&(p&(x&v)))) ;
`TTTT TTTT TTTT TTTT(16),`
`TCTC TCTC TCTC TCTC(12),`
`TCTC TTTT TCTC TTTT( 4)` (2.2)

Eq. 2.2 as rendered is *not* tautologous. By extension, HOL is refuted as "a universal meta-logic", and "ethical reasoning" is refuted.