

thm_2Erich__list_2ESNOC__REVERSE__CONS
(TMdjxkyoHP4s7D9NGuJjsbk2MWbsFuXyZnQ)

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Let $ty_2Elist_2Elist : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A0.nonempty\ A0 \Rightarrow nonempty\ (ty_2Elist_2Elist\ A0) \quad (1)$$

Let $c_2Elist_2ECONS : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A.27a.nonempty\ A.27a \Rightarrow c_2Elist_2ECONS\ A.27a \in (((ty_2Elist_2Elist\ A.27a)^{(ty_2Elist_2Elist\ A.27a)})^{A.27a}) \quad (2)$$

Let $c_2Elist_2ESNOC : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A.27a.nonempty\ A.27a \Rightarrow c_2Elist_2ESNOC\ A.27a \in (((ty_2Elist_2Elist\ A.27a)^{(ty_2Elist_2Elist\ A.27a)})^{A.27a}) \quad (3)$$

Let $c_2Elist_2EREVERSE : \iota \Rightarrow \iota$ be given. Assume the following.

$$\forall A.27a.nonempty\ A.27a \Rightarrow c_2Elist_2EREVERSE\ A.27a \in ((ty_2Elist_2Elist\ A.27a)^{(ty_2Elist_2Elist\ A.27a)}) \quad (4)$$

Definition 1 We define $c_2Emin_2E_3D$ to be $\lambda A.\lambda x \in A.\lambda y \in A.inj_o\ (x = y)$ of type $\iota \Rightarrow \iota$.

Definition 2 We define c_2Ebool_2ET to be $(ap\ (ap\ (c_2Emin_2E_3D\ (2^2))\ (\lambda V0x \in 2.V0x))\ (\lambda V1x \in 2.V1x))$

Definition 3 We define $c_2Ebool_2E_21$ to be $\lambda A.27a : \iota.(\lambda V0P \in (2^{A.27a}).(ap\ (ap\ (c_2Emin_2E_3D\ (2^{A.27a})))$

Assume the following.

$$\forall A.27a.nonempty\ A.27a \Rightarrow (\forall V0l \in (ty_2Elist_2Elist\ A.27a).((ap\ (c_2Elist_2EREVERSE\ A.27a)\ (ap\ (c_2Elist_2EREVERSE\ A.27a)\ V0l)) = V0l)) \quad (5)$$

Assume the following.

$$\begin{aligned} & \forall A_27a.nonempty\ A_27a \Rightarrow (\forall V0x \in A_27a. (\forall V1l \in \\ & (ty_2Elist_2Elist\ A_27a). ((ap\ (c_2Elist_2EREVERSE\ A_27a)\ (ap \\ & (ap\ (c_2Elist_2ESNOC\ A_27a)\ V0x)\ V1l)) = (ap\ (ap\ (c_2Elist_2ECONS \\ & A_27a)\ V0x)\ (ap\ (c_2Elist_2EREVERSE\ A_27a)\ V1l)))))) \end{aligned} \quad (6)$$

Theorem 1

$$\begin{aligned} & \forall A_27a.nonempty\ A_27a \Rightarrow (\forall V0x \in A_27a. (\forall V1l \in \\ & (ty_2Elist_2Elist\ A_27a). ((ap\ (ap\ (c_2Elist_2ESNOC\ A_27a)\ V0x) \\ & V1l) = (ap\ (c_2Elist_2EREVERSE\ A_27a)\ (ap\ (ap\ (c_2Elist_2ECONS \\ & A_27a)\ V0x)\ (ap\ (c_2Elist_2EREVERSE\ A_27a)\ V1l)))))) \end{aligned}$$