$$T\{\phi_x \phi_1 \phi_2\} = \phi_x T\{\phi_1 \phi_2\} \theta(t-t_1)\theta(t-t_2) \quad A$$
$$+ \phi_1 T\{\phi_x \phi_2\} \theta(t_1-t)\theta(t_1-t_2) \quad B$$
$$+ \phi_2 T\{\phi_x \phi_1\} \theta(t_2-t)\theta(t_2-t_1) \quad C$$

Check of Schwartz eq. 7.12

$$\partial_t\left[\theta(t-t_1)\theta(t-t_2)\right] = \delta(t-t_1)\theta(t-t_2) + \theta(t-t_1)\delta(t-t_2)$$

$$\Rightarrow \partial_t A = \dot{\phi}_x T\{\phi_1\phi_2\}\theta(t-t_1)\theta(t-t_2)$$
$$+ \phi_x T\{\phi_1\phi_2\}\left[\delta(t-t_1)\theta(t-t_2) + \theta(t-t_1)\delta(t-t_2)\right]$$

$$\partial_t B = \phi_1 T\{\dot{\phi}_x \phi_2\}\theta(t_1-t)\theta(t_1-t_2)$$
$$- \phi_1 T\{\phi_x\phi_2\}\delta(t_1-t)\theta(t_1-t_2)$$

$$\partial_t C = \phi_2 T\{\dot{\phi}_x \phi_1\}\theta(t_2-t)\theta(t_2-t_1)$$
$$- \phi_2 T\{\phi_x\phi_1\}\delta(t_2-t)\theta(t_2-t_1)$$

Laugh after some quick examination

$$= \delta(t-t_1)\left[\phi_x T\{\phi_1\phi_2\}\theta(t-t_2) - \phi_1 T\{\phi_x\phi_2\}\theta(t_1-t_2)\right]$$
$$+ \delta(t-t_2)\left[\phi_x T\{\phi_1\phi_2\}\theta(t-t_1) - \phi_2 T\{\phi_x\phi_1\}\theta(t_2-t_1)\right]$$
$$+ ~~\dot{\phi}_x T\{\phi_1\phi_2\}~~ + T\{\dot{\phi}_x \phi_1 \phi_2\}$$

$$= T\{\dot{\phi}_x \phi_1 \phi_2\}$$

$$T\{\dot\phi_x \, \phi_1 \, \phi_2\}$$

$$= \dot\phi_x \, T\{\phi_1 \phi_2\} \, \theta(t-t_1)\, \theta(t-t_2) \qquad A$$

$$\phi_1 \, T\{\dot\phi_x \, \phi_2\} \, \theta(t_1-t)\, \theta(t_1-t_2) \qquad B$$

$$\phi_2 \, T\{\dot\phi_x \, \phi_1\} \, \theta(t_2-t)\, \theta(t_2-t_1) \qquad C$$

$$\partial_t A = \ddot\phi_x \, T\{\phi_1 \phi_2\} \, \theta(t-t_1)\, \theta(t-t_2)$$ ✓

$$+ \dot\phi_x \, T\{\phi_1 \phi_2\} \left[\delta(t-t_1)\, \theta(t-t_2) + \theta(t-t_1)\, \delta(t-t_2) \right]$$ ✓

$$\partial_t B = \phi_1 \, T\{\ddot\phi_x \, \phi_2\} \, \theta(t_1-t)\, \theta(t_1-t_2)$$ ✓

$$- i\hbar \, \delta^4(x-x_2)\, \phi_1 \, \theta(t_1-t)\, \theta(t_1-t_2)$$ ✓

$$- \phi_1 \, T\{\dot\phi_x \, \phi_2\} \, \delta(t_1-t)\, \theta(t_1-t_2)$$ ✓

$$\partial_t C = \phi_2 \, T\{\ddot\phi_x \, \phi_1\} \, \theta(t_2-t)\, \theta(t_2-t_1)$$ ✓

$$- i\hbar \, \delta^4(x-x_1)\, \phi_2 \, \theta(t_2-t)\, \theta(t_2-t_1)$$ ✓

$$- \phi_2 \, T\{\dot\phi_x \, \phi_1\} \, \delta(t_2-t)\, \theta(t_2-t_1)$$ ✓

$$= T\{\ddot\phi_x \, \phi_1 \phi_2\} - i\hbar \, \delta^4(x-x_2)\, \phi_1 \, \theta(t_1-t)\, \theta(t_1-t_2)$$

$$- i\hbar \, \delta^4(x-x_1)\, \phi_2 \, \theta(t_2-t)\, \theta(t_2-t_1)$$

$$+ \delta(t-t_1) \left[\dot\phi_x \, T\{\phi_1 \phi_2\} \, \theta(t-t_2) - \phi_1 \, T\{\dot\phi_x \, \phi_2\} \, \theta(t_1-t_2) \right]$$ ⇐ vanish by inspection

$$+ \delta(t-t_2) \left[\dot\phi_x \, T\{\phi_1 \phi_2\} \, \theta(t-t_1) - \phi_2 \, T\{\dot\phi_x \, \phi_1\} \, \theta(t_2-t_1) \right]$$ ⇐

This confirms it.