Applying (3.17), (3.18), (3.19), (3.20) and (3.21), we obtain

$$\begin{aligned}(3.22)\qquad \tilde{y}'(t) + \bar{y}'(t) + \delta(t - t_1)(\Delta\, y(t_1)) &= U(t, t_1)(\tilde{y}(t) + \bar{y}(t)) + \\ + U(t, t_1)[-H(t - t_1)\, y(t_1 -) &- H(t_1 - t)\, y(t_1 +)] + \\ + \delta(t - t_1)(\Delta\, \hat{A}(t_1))\, y^*(t_1) + \tilde{f}(t) + \bar{f}(t) &+ \delta(t - t_1)(\Delta\, F(t_1))\,.\end{aligned}$$

Using Lemma 3.1 and (3.22), we infer that

$$(3.23)\qquad \Delta\, y(t_1) = (\Delta\, \hat{A}(t_1))\, y^*(t_1) + \Delta\, F(t_1)\,.$$

An application of condition (2.1) completes the proof of Lemma 3.3.

Proof of Theorem 2.1. We consider an arbitrary interval $[c, d]$ such that $c, d \in (a, b)$. Let $r_0 = \min(t_1 - a,\ b - t_1)$, where $t_1 \in [c, d]$. Then the properties of functions of locally bounded variation yield that the set of all points t_1 such that

$$(3.24)\qquad \int_{t_1 - r}^{t_1 + r} \|A\|\,(t)\,\mathrm{d}t > 1\,,$$

for every $0 < r < r_0$ is finite. Thus, applying (3.13), (3.14) and Lemma 3.2 we can extend uniquely the local solution in the whole interval (a, b) and this completes the proof of the theorem.

Remark 2. Let the assumptions of Theorem 2.1 be satisfied. Then by Lemma 3.3 and Theorem 2.1 it is not difficult to show that the system $(*)$ with the initial condition $y(t_0+) = y_0$ $(y(t_0-) = y_0)$ has exactly one solution in the class $V^n_{(a,b)}$.

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