For convenience of expression, we set the setup cost as $S_1, S_2, \ldots, S_n$ at interval point while the number of machine changes. And S_i denotes the setup cost when the machine number changes from i to $i-1$, especially, S_1 denotes the least setup cost when machine number is 1 and the corresponding subsidy is 0. We have the equality

$$S_1 = S_2 + \cdots + S_n = \sum_{i=2}^{n} S_i.$$

Notice that

$$(n-1) \sum_{s \in S \setminus \{V\}} \rho_s \geq \sum_{k \in V} \sum_{s \in S \setminus \{V\}: k \in s} \rho_s = n.$$

The left side of the inequality means for every ρ_s can appear at most $(n-1)$ times, so we should know that if and only if for every $\rho_s > 0$ appears $n-1$ times the quality holds.That is to say, the coalitions which contains $n-1$ players are all maximally unsatisfied coalitions. Then we have $\binom{n}{n-1}$ equalities.

$$\begin{cases} \alpha_1 + \alpha_2 + \cdots + \alpha_{n-1} & = x_1 \\ \alpha_1 + \alpha_3 + \cdots + \alpha_n & = x_2 \\ \quad \vdots & \ \vdots \\ \alpha_2 + \alpha_3 + \cdots + \alpha_n & = x_n. \end{cases}$$

Add these n equations together, and we can get

$$(n-1)(\alpha_1 + \alpha_2 + \cdots + \alpha_n) = \sum_{i=1}^{n} x_i$$

As we know, $x_1, x_2, \ldots, x_n$ can be expressed as follows:

$$\begin{cases} x_1 = S_0 + (n-1)t_1 + (n-2)t_2 + & \cdots + t_{n-1} \\ x_2 = S_0 + (n-1)t_1 + (n-2)t_3 + & \cdots + t_{n-1} \\ \quad \vdots & \quad \vdots \\ x_n = S_0 + (n-1)t_2 + (n-2)t_3 + & \cdots + t_n \end{cases}$$

According to SPT rule, we can obtain the equality $c(V) = \alpha_1 + \alpha_2 + \cdots + \alpha_n = S_0 + nt_1 + (n-1)t_2 + \cdots + t_n$ By replacing $x_1, x_2, \ldots, x_n$ together with the expression of $c(V)$, we can get a equality only with $S_0, x_1, x_2, \ldots, x_n$. Finally, we can obtain $S_0 = \sum_{k=1}^{n} (n-k) t_k$.