Given:

In theorem 5.15 Turing Machine *M* is modified so that head is never moved to the left hand side of the tape. Now, suppose modification is not made to Turing Machine *M*.

Proof:

Here, it is considered that changes are not made to Turing Machine so users are supposed to modify the Post Correspondence Problem to handle this case. Modification of Post Correspondence Problem is done as follows:

It is assumed that changes are not made to the Turing Machine so modification of PCP is done. As it is also given in the question that modification is done in a way so it head is never moved to the left end of the tape. So assume a case where its head at the leftmost tape cell and attempts to move left to do so add dominos left further:

$$[\frac{\#qa}{\#rb}]$$

Here, for every $q, r \in Q$ and $a, b \in r$, where $\delta(q, a) = (r, b, L)$.

And then replace the first dominos in the following manner:

$$[\frac{\#}{\#\# q_0, w_1, w_2 .... w_n}]$$

Hence, this Approach should be used to handle the case where head tries to move to the left.