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## THE SPECIAL METHOD OF SORTING MULTI-GROUP TRAINS

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**Abstract:** Marshalling or shunting yards play an important role in freight carrying railway transport system. The efficient use of shunting yards has a deep impact on the efficiency and reliability of rail freight services due to the reduction of the transportation cost and increasing reliability and punctuality. Main processes of marshalling yards focus on the disaggregation and forming composition of trains according to the freight wagons destination.

**Keywords:** marshalling yards, sorting methods, multi-group trains, the special method.

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**Annotatsiya:** Saralash yoki manyovr maydonlari temir yo'l transportida muhim rol o'ynaydi. Manyovr maydonlaridan samarali foydalanish transport xarajatlari pasayishi, ishonchlilik va aniqlikning oshishi hisobiga temir yo'l transporti xizmatlarining umumdorligiga sezilarli ta'sir qiladi. Saralash yo'llarining asosiy vazifasi vagon oqimlarini oraliq stansiyalar joylashuvi bo'yicha poyedlarga tarqatishdan iborat.

**Kalit so'zlar:** Saralash tepaligi, saralash usullari, ko'p guruhli poezdlar, maxsus usul.

The typical layout of a marshalling yard, shown in Fig.1, consists of a receiving yard where incoming trains arrive, a classification group of tracks where they are sorted, and a departure yard where outgoing trains are formed.[1]

The formation of multi-group trains shortens the time needed for collection, and enables concentration of maneuvering operations to a smaller number of marshalling

yards. This concentration of maneuvering operations leads to greater use of track capacities, maneuvering facilities and personnel, while also enabling rationalization of capacities and operating technology at intermediate and final stations where maneuvering is reduced to separation of vehicle groups that have already been formed.[2]

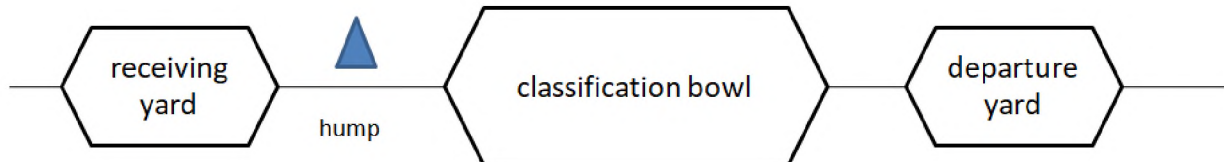


Figure 1 Common marshalling yard

The special method is based on an arbitrary number of tracks, i.e. the number of tracks that is available for shunting. Contrary to the previous methods, there is no correlation between the number of intermediate stations and the number of shunting tracks.

Forming of multi-group train after classification according to the intermediate stations is carried out to the following procedure:

In the first stage of sorting, wagons for intermediate stations  $n_{is}$  to  $n_{is} - n_t + 2$  are on separate tracks, and all the other wagons together at first track. Then, the first assembly of wagons on the tracks should be followed and unification from the first to the  $n_t - 1$  track in order to prepare for the second stage of sorting.

At this stage, all wagons for intermediate stations from  $n_{is} - 1$  to  $n_{is} - n_t + 2$  are grouped according to the order of intermediate stations and are left on the track  $n_t$  where wagons for intermediate station  $n_{is}$  are already situated.

Groups of wagons on the track  $n_t$ , added wagons for intermediate station  $n_{is} - n_t + 1$ , and on the other tracks are sorted in the following order: on track  $n_t - 1$ , wagons for intermediate station  $n_{is} - n_t$ , on track  $n_t - 2$ , wagons for intermediate station  $n_{is} - n_t - 1$  and so on, till the second track where coming wagons for intermediate station  $n_{is} - 2 \cdot n_t + 3$  are situated.

Any remaining wagons, for intermediate station 1 to  $n_{is} - 2 \cdot n_t + 2$ , are left on the first track. After this disassembling, the unification of wagons per tracks is carried out from the first to the  $n_t - 1$  tracks, followed by pulling them in order to prepare for the third stage sorting procedure that is similar to the previously described procedures.

This process continues until wagons for the first intermediate station are not sorted. So, the important parameter for the use of special method is the number of intermediate stations.

An example of the application of the special method is shown in Fig. 2 for the case of multi-group trains for 9 intermediate stations and 3 tracks for shunting.

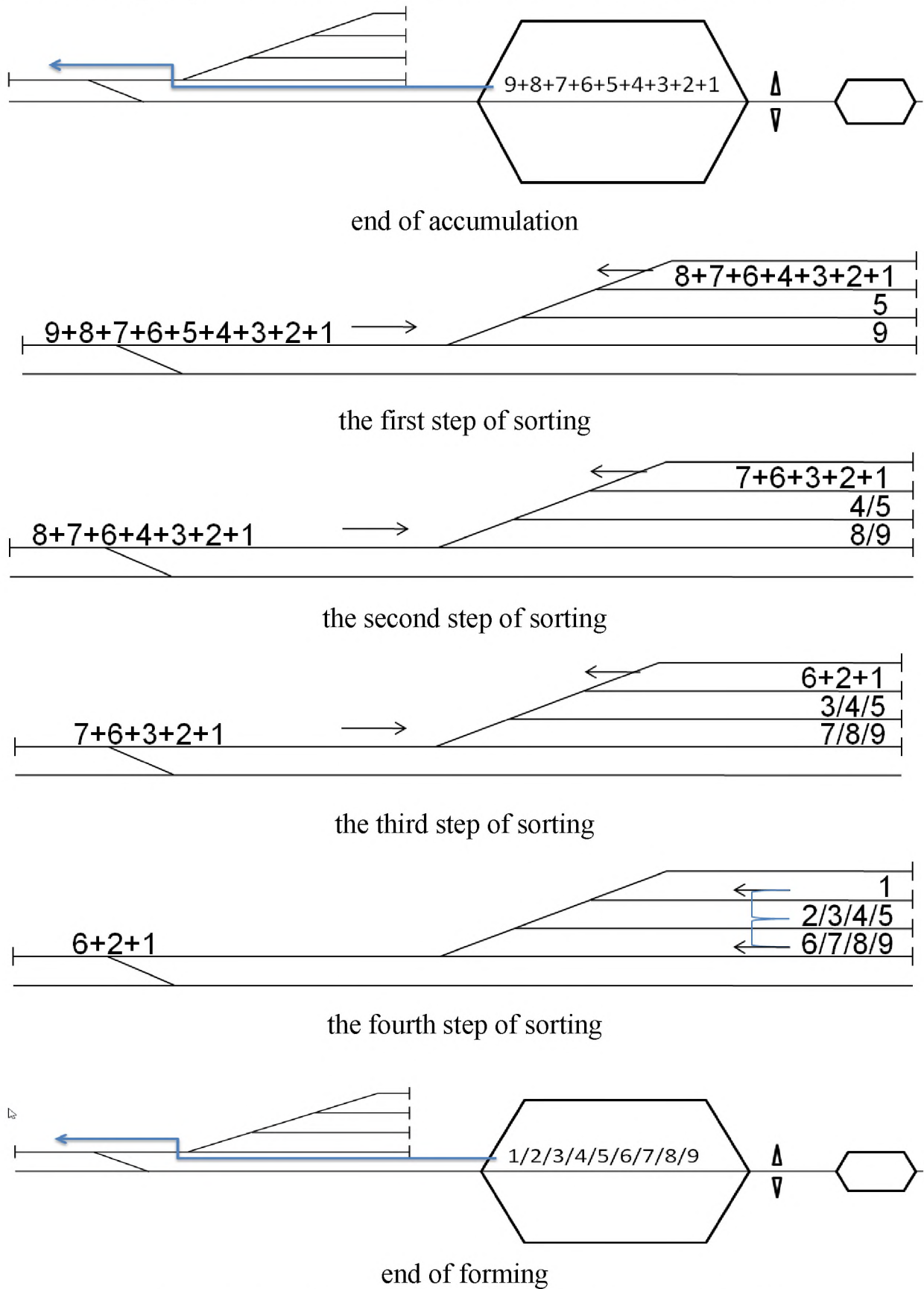


Figure 2 Special method of forming multi-group train [3]

Modification of the special method is achieved by eliminating the need for merging and unifying segregate groups of wagons, after the completion of each step of sorting. This switching operation of each next step is because of the smaller number of wagons that is needed to move. Unifying composition wagons segregate per tracks is done only after the last step of sorting thereby forming a composition for multi-group train, in the order of intermediate stations.

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