

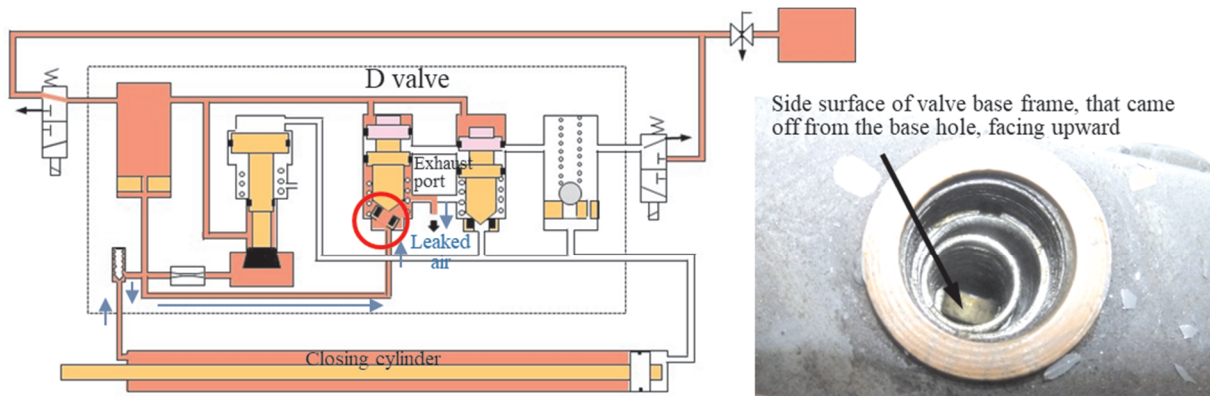
"The railway serious incident that the situation as the entrance door for passengers in the cabin opened while the train was running, *i.e.*, Dangerous trouble in vehicle"

Railway operator : West Japan Railway Company
 Incident type : Dangerous trouble in vehicle
 Date and time : About 19:01, December 30, 2020
 Location : In the premises of Hommataga station, Yamaguchi Line, Masuda City, Shimane Prefecture

<SUMMARY>

On Wednesday, December 30, 2020, the driver of the inbound 2556D train, composed of one vehicle and started from Masuda station bound for Yamaguchi station, Yamaguchi Line of West Japan Railway Company, noticed the door-pilot lamp, etc., has been turned off while operating the braking operation when arriving at the platform of Hommataga station. After the train stopped at the station, the driver implemented the inspection of the cabin, and found that the rear door in right side, opposite to the platform, had been opened by about 70%. Therefore, the driver locked the door, and after reported it to the train dispatcher, continued the train operation.

There were seven passengers and a train crew, *i.e.*, the driver, onboard the train, but no one was injured by being fallen to the track.



<Flew out route of compressed air in closing cylinder, left, and valve base frame of the D valve came off from counterbore, right>

<PROBABLE CAUSES>

The JTTSB concludes that the probable cause of this serious incident was highly probable that the force pushing the slide door had decreased and became smaller than the inertial force caused by the braking operation, because the valve base frame which was press fitted to the counterbore had come off, in the D valve in the valve cabinet of the door operating equipment, which opened while the train was running, and consequently the compressed air in the closing cylinder of the door operating equipment flew out to the air.

It is probable that the valve base frame, which had been press fitted to the counterbore, came off from the counterbore related with the following situations.

1. There was the possibility that the upward force by the restoring force of the spring had acted to the switching valve A, and the upward force had also acted to the valve base frame indirectly, when there is no compressed air in the closing cylinder of the door operating equipment. The friction force of the side surface of the counterbore of the D valve and the side surface of the valve base frame was small compared in the status when press fitted as usual, and the valve base frame had been in the status to be risen easily.
2. The valve base frame had been in the status that the unexpected force acted to rise the valve base frame in the undersurface of the valve base frame, while the vehicle was operating and the doors were closed (there was the compressed air in the closing cylinder of the door operating equipment) because there was the space between the undersurface of the valve base frame and bottom surface of the counterbore.
3. There was the possibility that the switching valve A and the valve base frame were strongly pressed and adhered, because the unexpected force had been acted for a long period to the contacted part between the switching valve A and the valve base frame.
4. As the results of the above situations 1 to 3, there was the space that the valve base frame could pass through inside of the spring when the valve base frame was rising in the counterbore, and, at the same time, the valve base frame could rise to the upper edge of the counterbore between the undersurface of the screw cock and the upper edge of the switching valve B.

It is likely that the valve base frame settled in the inside of the counterbore in the status as the side surface was in the upside, because the situations of the above 1 to 3 had been repeated for a long period, the undersurface of the valve base frame, which rose gradually inside the counterbore, got over the upper edge of the counterbore when the serious incident occurred, that caused the leakage of the compressed air in the closing cylinder of the door operating equipment, and resulted that the valve base frame fell when the pressed and adhered valve base frame and the switching valve A were released by the wind pressure of the air stream.

Furthermore, it is probable that the chance to prevent the concerned serious incident could not be used in the most, because, although the driver of the train had been noticed that there was the leakage of air from the door before departed from the starting station, and it took a long time to turn on the door pilot lamp compared to as usual, the driver departed the train not reporting it to the related sections such as the train dispatcher or the station master, etc., because the doors had closed.

<SAFETY ACTIONS>

(1) Safety actions of West Japan Railway Company

It is necessary to implement the visual inspection of the valve cabinet that has been currently implemented in the periodic inspection especially focus on the valve base frame, check whether the valve base frame is rising or not by pushing the valve base frame, etc., and

implement the exchange, etc., promptly when the same incident as the concerned serious incident or its signs were found.

Furthermore, it is necessary to check continuously the existence of the leaked air from the door operating equipment in the daily inspection or the inspection before departure from depot, etc., and communicate to the relevant sections promptly when there was the leaked air. In addition, for the case that it took a long time definitely until the door pilot lamp turn on, it is desirable to implement the guidance thoroughly to communicate to the relevant parties such as the train dispatcher or the station master, etc., as well as when it did not turn on, and to mention in the internal rule in the abnormal situation for the train crews, etc.

(2) Safety actions of the company who made the door operating equipment

It is desirable to check thoroughly on the mother material of the valve cabinet when the parts were delivered, and to increase the numbers of the sampling check for the other parts in order to reduce the delivered poor products, from now on, because the manufacturing of the TK105 type door operating equipment is continued even at present.

In addition, as for the press fitting works of the valve base frame, it is necessary to implement thoroughly the certain works considering that it is the part which could not be adjusted after shipping, and might influence badly for the long term resulted by the uncertain works.

Details can be obtained by the railway accident investigation report in the website of the Japan Transport Safety Board, i.e., <https://www.mlit.go.jp/jtsb>