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CLASSIFICATION OF TIRE INFLATION VALVES

(Item IX.21 on Agenda)

I. BACKGROUND

1. On 19 January 2000, the Secretariat received the following Note from the US Administration requesting that the classification of tire inflation valves for motor vehicles be included on the Agenda of the 25th Session of the Harmonized System Committee. The Note is reproduced below.

II. US NOTE ON THE CLASSIFICATION OF TIRE INFLATION VALVES FOR MOTOR VEHICLES

2. "The tire inflation valve in question is comprised of a rubber stem, a screw-on cap and a brass insert. The insert is comprised of an opening, a pin and a spring-loaded plunger mechanism. After importation, the valve is inserted into a wheel on which a tire is mounted.

3. In its closed position, the plunger head is seated flush with the valve opening in order to prevent the air from escaping. The plunger head is held in place by a spring mechanism. This design prevents air from entering or escaping the inner tube when the tire is in use.

4. The pin head must be manually depressed in order to open the valve. While the valve is open, air may flow in either direction depending upon pressure differential. Air flows out if the pressure inside the tire is greater than the pressure outside the tire. Conversely, air flows into the tire if the pressure outside the tire is greater than the pressure inside the tire. Typically, an automatic air pump is used to inject air into the tire.

Nomenclature

5. Heading 84.81 provides in part for "valves". Subheading 8481.30 provides specifically for "check valves". Subheading 8481.80 covers other valves that are not more specifically described elsewhere within the heading.

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6. Item (1) in the Explanatory Note to heading 84.81 (p.1431) indicates that the heading covers “non-return valves (e.g., swing check valves and ball valves”.

Classification

7. The issue presented is whether or not the tire inflation valve is a check valve. If so, the valve is classified in subheading 8481.30. If not, the valve is classified in subheading 8481.80.

8. The expression “check valve” has been defined as follows:

> “*Check valves* (also known as *nonreturn valves*) are automatic valves that prevent a return or reverse flow of the process. Check valves are unique in that they do not require an outside power supply or a signal to operate. Rather, the check valve’s operation is dependent upon the flow direction of the process, which may be created by a pump or a pressure drop. If the flow stops or if pressure conditions change so that flow begins to move backward, the check valve’s closure element moves with the reverse flow until it is seated, preventing any backward flow. The check valve remains closed until positive flow direction is again achieved, at which time it opens with the flow direction and remains open as long as the flow continues.”
>
> P. Skousen, Valve Handbook, p.177 (1977)

9. Thus, a check valve possesses two distinguishing characteristics. First, it prevents a return or reverse flow of the process. Stated differently, a check valve is a one-way valve. Second, a check valve is an automatic valve that operates without outside intervention. The valve opens and closes depending upon the flow direction of a gas, liquid or solid.

10. The tire inflation valve meets the first criterion because it prevents air from escaping once it has been injected into the tire. However, the tire inflation valve is not an automatic valve because it is opened and closed manually by depressing the pin head. Consequently, it cannot be classified as a check valve of subheading 8481.30.

Conclusion

11. The tire inflation valve is not classified as a check valve because it is hand-operated. Therefore, the tire inflation valve is classified in subheading 8481.80.”

III. SECRETARIAT COMMENTS

12. The following is a description of a tire inflation valves :

A tire inflation valve is comprised of a rubber stem, a screw-on cap and a brass insert consisting of an opening, a pin and a spring-loaded plunger mechanism, the whole of which is inserted into a wheel on which a tire is mounted. When the pin head is manually depressed, the valve opens, thereby allowing the flow of air into or out of the tire, depending upon the pressure differential.

13. Tire inflation valves (also called tire stem valves) are commonly used in automotive or truck-type tires. During inflation of the tire, the tire valve is opened, allowing pressurized air from the compressed air line to enter the tire. When the inflation process is stopped, the tire valve is allowed to close, thus maintaining pressure in the tire. In the process of deflating the tire, the tire valve is opened to allow the pressurized air in the tire to escape.

Check valve

14. Subheading 8481.30 provides specifically for "check valves". As there are no legal notes nor any Explanatory Notes at the heading or subheading level to provide any interpretation of this term, the Secretariat referred to technical sources to determine its industrial or technical meaning.

15. Brent T. Stojkov, in the The Valve Primer, (1997, p. 37), states that "check valves come in two basic styles. In the first, the flow control element, called a disc, flapper or plate, rotates about an axis perpendicular to the fluid path. In the second style, the flow control element, which can be a disc, piston or ball, moves along the axis of the fluid path. In both styles the force of the fluid causes the flow element to unseat automatically, opening and maintaining the fluid path through the valve. If the flow stops, the weight of the flow control element, an auxiliary spring, or both, causes the flow control element to return to its seated closed position. In the case of prevented reverse flow, the back-pressure of the fluid assists in seating the flow control element and makes for a tighter seal. "

16. As shown by the definitions of “check valves” provided by the US Administration and the Secretariat, check valves share two common characteristics (limiting the flow to one direction and acting automatically in response to the direction of flow in the piping system). Unlike the United States, the Secretariat believes that tire inflation valves do not meet the criterion of limiting the flow to one direction. While a tire inflation valve prevents air from escaping once it has been injected into the tire, it is clear that under the correct conditions, tire inflation valves allow for flow in both directions (otherwise you would only be able to inflate the tire and never deflate the tire).

17. The second common characteristic of “check valves” is that they act automatically in response to the direction of flow in the piping system. While these valves typically incorporate a spring to assist in closing or seating the closure element, it does not make the valve "automatic". The valve is opened by manually depressing the spring plunger either directly or by means of a tool (a tire gauge incorporating a short pin on the back of the gauge head) or an air chuck (the fitting at the end of an air pressure hose). The essential point being that the tire valve does not open and close automatically in response to the flow of the fluid (in this case, air). Consequently, the Secretariat agrees with the United States that tire inflation valves do not meet the “automatic” criterion referred to in the previous paragraph.

18. Missing either one of the two common characteristics of check valves would rule out a valve being classified as a check valve. Accordingly, the Secretariat would agree with the US Administration that tire inflation valves are not check valves and, as a consequence, classification in subheading 8481.30 would be precluded. As tire inflation valves do not meet the terms of subheadings 8481.10 (pressure-reducing valves), 8481.20 (valves for oleohydraulic or pneumatic transmissions), or 8481.40 (safety or relief valves), they must fall to be classified in subheading 8481.80 as “other appliances”.

19. A sample will be made available to delegates in the meeting room.

IV. CONCLUSION

20. The Committee is invited to take into account the arguments put forward by the US Administration and the comments of the Secretariat in paragraphs 2 to 11 and 12 to 19, respectively, in considering the question of the classification of tire inflation valves.