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SELECTING PROPER VALVE HARDWARE

This Technically Speaking focuses on the selection of valve hardware for passenger, light truck, medium and heavy truck wheels. It establishes tire valve, core and cap selection guidelines. Tire valves are selected based on type of wheel, size of wheel and air pressure requirements.

OVERALL VALVE QUALITY

Be aware that many fleets specify that their valve stem purchases are only from North American or European manufacturers. Offshore valves have been coming into the US and Europe for the last few years and are inexpensively priced. The quality of these valves varies from manufacturer to manufacturer and from shipment to shipment. In addition, many manufacturers do not carry any product liability insurance. Many times there is usually no name or marking on these valve stems so there is no traceability when problems arise. Good quality valve stems conform to SAE Standards that set the performance criteria for heat resistance, aging and ozone resistance. Most valves have a T&R number (Tire & Rim Association). This number does not guarantee a level of quality, however it does indicate that the manufacturer should have produced the product to conform to published dimensional standards. Look for the manufacturer's name of trademark, part number and country of origin. Many manufacturers of snap-in valves have mold cavity numbers on their valves for better traceability. Not all manufacturers supply the proper information on their valves, but the more information you see, the more likely the manufacturer is reputable, produces a quality product and stands behind it. The Tech Quick-Air product does have all of the proper markings and has been thoroughly tested to meet quality standards.

PASSENGER VALVES

Valve Caps – most passenger valves are fitted with plastic valve caps. This is not an acceptable practice for any valve. A metal valve cap must be fitted to every valve stem. Plastic valve caps are only used to protect the valve stem threads during transportation of the valve. The metal valve cap keeps out water and debris, as well as maintaining air pressure in the event of a valve core failure. Plastic caps have a low temperature rating of 0°F (-18°C), while metal caps have a lower temperature range for use in colder climates.

Valve Cores – the valve core allows the air pressure within the tire and wheel assembly to be adjusted. It must be in good working order with no debris within it. Debris would not allow the core to seal properly. There are two types of cores used for passenger valve stems; with the main difference being the temperature rating. A standard valve core usually has a black seal with a temperature range of between -65°F (-54°C) and 225°F (107°C). The high temperature core usually has a red seal and has a temperature range of -65°F (-54°C) and 250°F (121°C) and is designed more for use in truck applications.

Valve Stems – snap-in valve stems for passenger tires have a maximum air pressure rating of 65 psi (4.5 bars). This will allow snap-in valves to be used in all passenger and some light truck applications.

Proper rubber compound - All snap-in valve stems must be made with EPDM synthetic rubber rather than natural rubber to meet SAE 1205 – 1206 ozone requirements. EPDM rubber also has a broader temperature range than natural rubber and will remain flexible in extremely cold weather.

LIGHT TRUCK VALVES

Valve Caps - many light truck valves are fitted with plastic valve caps. This is not acceptable due to the higher air pressure required by most light truck tire sizes. In addition, the plastic valve cap should only be used to protect the valve stem threads during transportation of valves. A metal valve cap must be fitted to every valve stem. The valve cap keeps out water and debris, as well as maintaining air pressure in the event of a valve core failure. Plastic caps have a low temperature rating of 0°F (-18°C), while metal caps have a lower temperature range for use in colder climates.

Valve Cores – the valve core allows the air pressure within the tire and wheel assembly to be adjusted. It must be in good working order with no debris within it. Debris would not allow the core to seal properly. There are two types of cores used for light truck valve stems; with the difference being the temperature rating. A standard valve core usually has a black seal with a temperature range of between -65°F (-54°C) and 225°F (107°C). The high temperature core usually has a red seal and has a temperature range of -65°F (-54°C) and 250°F (121°C) and is designed more for use in truck applications.

Valve Stems –TR600HP series valves for wheels with .453” valve holes and TR800HP series valves for wheels with .625” valve holes. These valves are designed for the higher air pressure of many of today’s light truck tires. These valve stems have a maximum rating of 100 psi (6.9 bars). Another alternative to a TR600HP valve would be a TR416 clamp-in valve. This type of valve must be used when using a metal extension and when the rim thickness is greater than .205” (5.2mm). The TR416 valve is used for wheels with .453” valve holes. Snap-in valve stems for passenger tires have a maximum air pressure rating of 65 psi (4.5 bars). This will not allow snap-in valves to be used in most light truck applications.

Proper Torque - When installing a TR416 valve it must be installed with proper torque. The torque range for the TR416 is 35 to 55 in./lbs.

Proper rubber compound - All snap-in valve stems and grommets must be made with EPDM synthetic rubber rather than natural rubber to meet SAE 1205 – 1206 ozone requirements. EPDM rubber also has a broader temperature range than natural rubber and will remain flexible in extremely cold weather.

TRUCK VALVES

Valve Caps – medium and heavy truck valves must never be fitted with plastic valve caps. This is not an acceptable practice because a plastic valve cap should never be used other than for transporting valves. The low temperature limit for plastic valve caps is 0°F (-18°C), if the wheel assembly is used in climates below this temperature a metal valve cap should be used. A valve cap must be fitted to every valve stem. The valve cap keeps out water and debris, as well as maintaining air pressure in the event of a valve core failure.

Valve Cores – the valve core allows the air pressure within the tire and wheel assembly to be adjusted. It must be in good working order with no debris within it. Debris would not allow the core to seal properly. There are two types of cores used for truck valve stems; with the difference being the temperature rating. A standard valve core has a temperature range of between -65°F (-54°C) and 225°F (107°C). The high temperature core has a temperature range of -65°F (-54°C) and 250°F (121°C) and is designed more for use in truck applications.

Valve Stems For Aluminum Wheels – there are several different types of truck valves depending on wheel type. O-ring seal type valves stems are only recommended for aluminum wheels with 9.7mm (.380”) valve holes. The required rim thickness for these valves is .218” to .410” (5.5mm to 10.4mm). Aluminum rims with valve hole that are .625” must use the TR509 through TR511 valves. Most manufacturers recommend that a paste type mounting compound is applied to the o-ring and valve to minimize corrosion.

Rubber Compounding – All o-ring seals should be made of the heat resistance rubber that is red in color. The temperature range for these o-rings is -65°F(-54°C) and 250°F(121°C).

Proper Torque - All truck valves must be installed with the proper torque. The torque ranges for truck valves are as follows.

TR540 Series – 80 to 125 in/lbs

TR509 through TR511 – 100 to 125 in/lbs

Valve Stems For Steel Wheels - Steel wheels have a .625” valve hole and must use the TR500, TR501 or TR570 series valves. The brass for truck valves must be bendable; if the brass is too rigid it will crack and cause a leak.

Rubber Compounding - All grommets for truck valve stems must be made with EPDM synthetic rubber rather than natural rubber to meet SAE 1205 – 1206 ozone requirements. EPDM rubber also has a broader temperature range than natural rubber and will remain flexible in extremely cold weather.

Proper Torque - All truck valves must be installed with the proper torque. The torque ranges for truck valves are as follows.

TR500, TR501 & TR570 Series – 35 to 55 in/lbs