

ATTACHMENT A

PROPOSED 15-DAY MODIFICATIONS TO THE AMENDMENTS TO CP-201: CERTIFICATION PROCEDURE FOR VAPOR RECOVERY SYSTEMS AT GASOLINE DISPENSING FACILITIES

[Note: The originally proposed modifications to the regulatory language are shown in underline to indicate additions and ~~striketrough~~ to indicate deletions. The proposed 15-day modifications to the proposed regulations are shown in double underline to indicate additions and ~~double striketrough~~ to indicate deletions. Only text with proposed 15-day modifications is included in this attachment. For all amendments to CP-201 approved by the Board during the October 25, 2018, hearing, refer to [Staff Report: Initial Statement of Reasons Appendix B](#). The symbol “***” means that intervening text not amended is not shown. [Bracketed text] is not part of the proposed amendments.]

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4. PHASE II PERFORMANCE STANDARDS AND SPECIFICATIONS APPLICABLE TO ALL PHASE II VAPOR RECOVERY SYSTEMS

Table 4-2
Phase II Nozzle Spout Assembly Dimensions Including Nozzle Bellows

(Figures 4A and 4B illustrate the dimensions and correspond to the symbols in Table 4-2.)

<u>Symbol</u>	<u>Description</u>	<u>Dimension Range (Minimum/Maximum)</u>
<u>D₁</u>	<u>Spout Outside Diameter</u> <u>Minimum Length of D₁</u> <u>Roundness of D₁</u>	20.4250 /21.34 mm (0.792807/0.840 in) <u>L₂ – A₁</u> <u>Within diameter limits</u>
<u>D₂^(a)</u>	<u>Nozzle Anchor Device Outside Diameter^(a)</u>	<u>25.1/32.1 mm (0.988/1.264 in)^(a)</u>
<u>C_t</u>	<u>Spout Tip Chamfer or Radius</u>	<u>2.0 mm max (0.080 in max)</u>
<u>C_a</u>	<u>Spout Tip Chamfer Angle</u>	<u>30° to 45°</u>
<u>A_r</u>	<u>Anchor Radius</u>	<u>1.5 mm max (0.059 in max)</u>
<u>A_a</u>	<u>Anchor minimum angle</u>	<u>45°</u>
<u>A₁</u>	<u>Overall Length of Anchor</u>	<u>6.5/20.2 mm (0.256/0.795 in)</u>
<u>A₂</u>	<u>Length of Anchor without Chamfer</u>	0.5 /12.5 mm max (0.020/0.500 in max)
<u>A_H^(b)</u>	<u>Anchor Latch Height^(b)</u>	<u>Maximum for all styles constrained by D₂^(b)</u> <u>Minimum for Balance Nozzles:</u> <u>2.59 mm (0.102 in)</u> <u>Minimum for Assist Nozzles:</u> <u>3.50 mm (0.138 in)</u>
<u>S_a^(c)</u>	<u>Bend Angle of Nozzle Spout^(c)</u>	<u>19.5° / 26.0°^(c)</u>
<u>L₁</u>	<u>Length of Straight Part of Nozzle Spout</u>	<u>L₂ + 5.0 mm min</u> <u>(L₂ + 0.197 in min)</u>
<u>L₂</u>	<u>Distance Between Nozzle End and First Anchor Position</u>	<u>85.0/95.0 mm (3.346/3.740 in)</u>
<u>L₃^(d)</u>	<u>Distance Between Nozzle End and Aspirator Port Centerline^(d) (Aspirator can be in front face of tip)</u>	<u>18.0 mm max (0.709 in max)^(d)</u>
<u>L₄</u>	<u>Clearance from Fuel Dispensing End to Spout Connection to Nozzle Body</u>	<u>150 mm min (5.906 in min)</u>
<u>B₁</u>	<u>Nozzle Bellows Face Outer Diameter</u>	<u>77 mm max (3.031 in max)</u>
<u>B₂</u>	<u>Nozzle Bellows Face Inner Diameter</u>	<u>29.0/45.0 mm (1.142/1.772 in)</u>

Table 4-2 (continued)

Phase II Nozzle Spout Assembly Dimensions Including Nozzle Bellows

(Figures 4A and 4B illustrate the dimensions and correspond to the symbols in Table 4-2.)

<u>Symbol</u>	<u>Description</u>	<u>Dimension Range (Minimum/Maximum)</u>
<u>B₃</u>	<u>Nozzle Bellows Face Flatness Profile</u>	<u>2.5 mm (0.098 in) total indicator reading (TIR) max over seal surface profile tolerance on seal surface</u>
<u>B₄</u>	<u>Nozzle Bellows Contact Angle</u>	<u>40° maximum angle</u>
<u>P^(e)</u>	<u>Aspirator Port Diameter^(e)</u>	<u>2.00/4.25 mm (0.079/0.167 in)^(e)</u>
<u>H</u>	<u>Calibration Hole^(f)</u>	<u>^(f)</u>

- (a) If an offset anchor is utilized, anchor outside diameter measurement will be the effective length (greatest length) across the anchor surface.
- (b) Measurement of anchor latch height (A_H) taken from ~~spout to virtual sharp~~ anchor largest diameter to spout diameter.
- (c) If spout bend angle (S_a) is out of the recommended range, ~~full nozzle review is mandatory in the vehicle fill pipe clearance zone described in the SAE recommended practice document J1140~~ the nozzle spout assembly and body must be able to be inserted within the vehicle fill pipe access zone defined in Section 4.7.4.
- (d) If L₃ is greater than 18.0 mm (0.709 in) the distance difference between L₂ and L₃ must be greater than 69 mm (2.72 in), and L₃ can be no greater than 25.4 mm (1.000 in).
- (e) Reference only dimension. Aspirator (sensor) placement can be in spout end or along bottom of spout.
- (f) Reference only dimension. Calibration holes may be present in nozzle bellows to avoid premature shutoff caused by excess vacuum during the refueling of ORVR equipped vehicles. Such holes shall be blocked/sealed during V/L ratio nozzle adjustments.

Figure 4A
Phase II Nozzle Spout Dimensions as Specified by Table 4-2

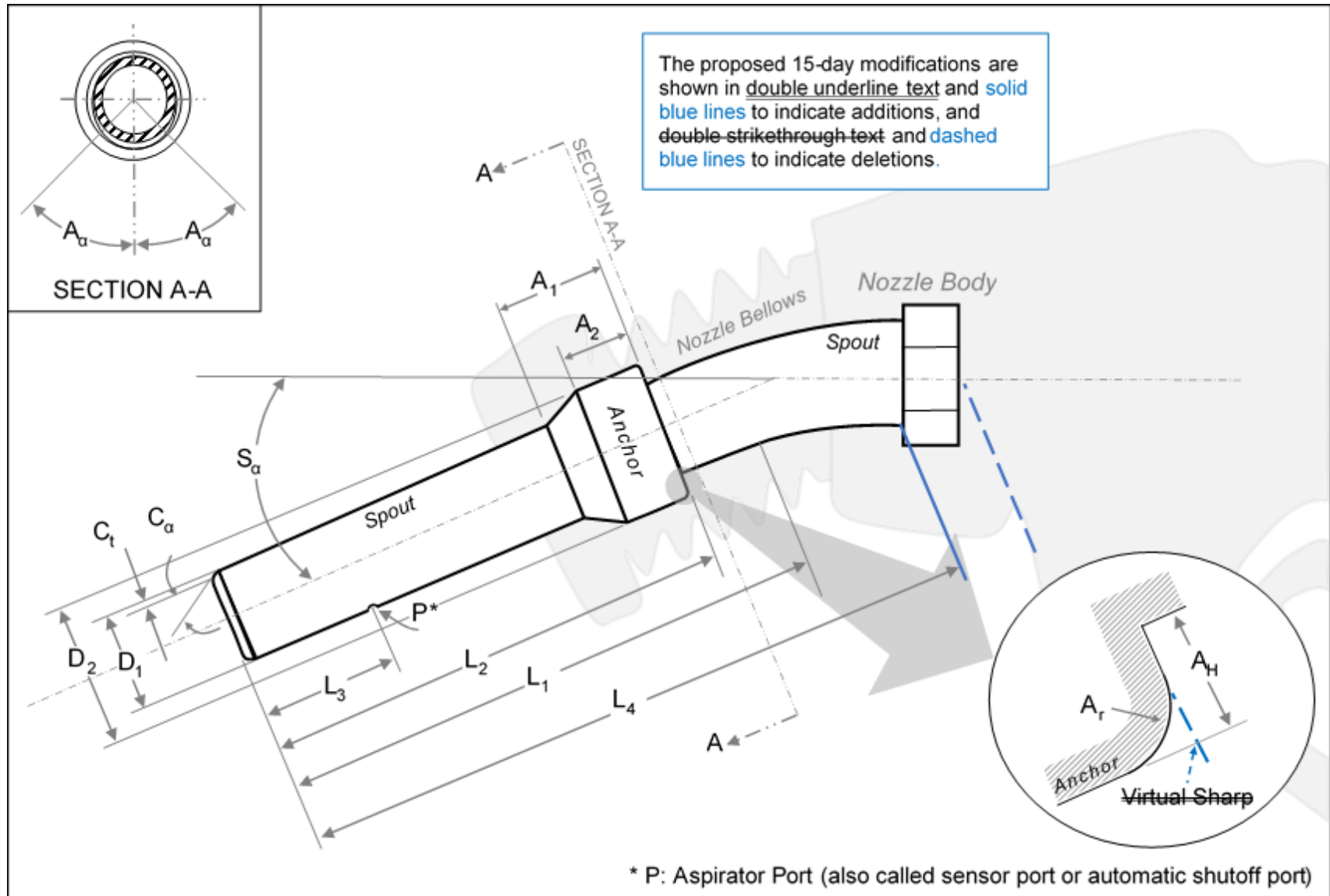
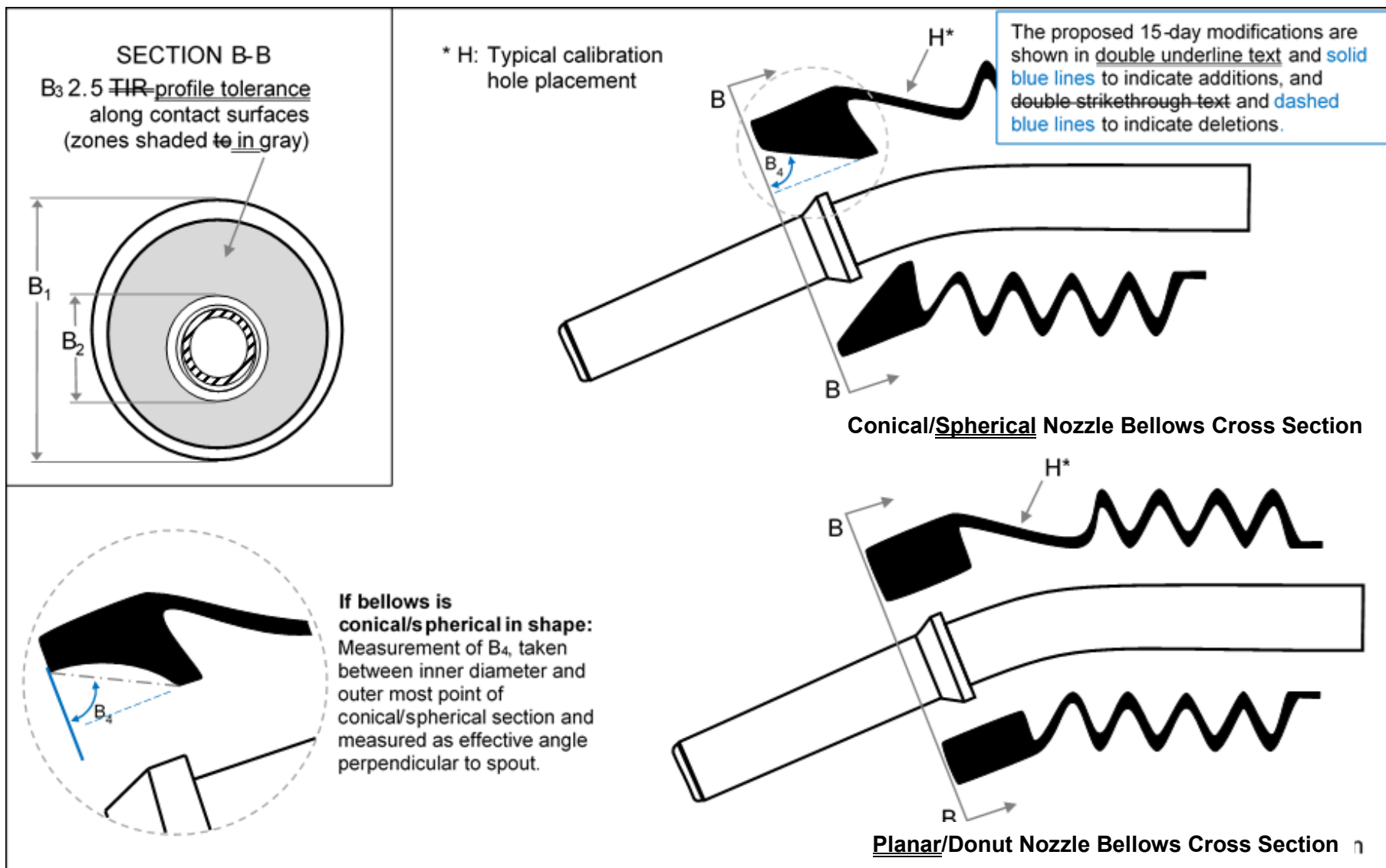


Figure 4B
Phase II Nozzle Bellows Dimensions as Specified by Table 4-2



4.7.4 If a Phase II EVR nozzle spout's bend angle is outside of the range specified in Table 4-2 (S_{α} of 19.5° to 26.0°), the nozzle spout assembly and body must be able to be inserted within the vehicle fill pipe access zone defined by the following geometries.

- (a) Zone construction of fill pipe access zone (Figure 4C).
- (b) A fill pipe face that is flat within 0.25 mm profile tolerance and has a smooth surface against which a Phase II EVR nozzle can affect a vapor-tight seal.
- (c) The fill pipe and all surrounding bumpers, body parts, and factory-installed accessories designed and fabricated so that the fill pipe access zone allows for insertion of a Phase II EVR nozzle in at least one orientation within ± 15 degrees swing of the upright or vertical position. It is recommended that the zone be based on the vertical since this is the primary customer filling position.
- (d) Allowance must be made for production tolerances as these are not included in the access zone.
- (e) The access zone consists of three parts as follows:
 - (1) A bellows interface zone with a fixed circular shaped cross section that is fixed relative to the sealing surface of the fill pipe and designed to accommodate the sealing portion of a Phase II EVR nozzle. Additional clearance for the Phase II EVR nozzle is prescribed per Figure 4D from the seal surface of the nozzle and pipe, a clearance inward of the pipe to a depth of 12 mm along a 40° cone to the seal surface of the fill pipe.
 - (2) A nozzle swing zone with a rectangular cross-section tapered at the bottom that accommodates the handle portion of a nozzle. This zone is the portion shown on Figure 4C, within the lines defined by points C, D, E, F, and G.
 - (3) A transition zone consisting of a smooth blend from the rectangular nozzle swing zone to the circular bellows zone. The top of this transition zone is the line G-H in Figure 4C and the bottom of this zone is Line A-C.
- (f) Zone construction of fill pipe latching templates (Figure 4E). The templates shown in Figure 4E are for usage with nozzle insertion clearance review. There are nozzle resting and nozzle insertion position templates.
 - (1) The nozzle resting position template simulates a vehicle fill pipe with a minimum height locking lip, minimum depth locking lip, and a centered pipe expansion. A cross-section and face view are shown with appropriate

dimensions to simulate the worst case lower handle position when the nozzle anchor is placed into the latched position and nozzle spout end is installed into the centered expansion inner diameter.

(2) The nozzle insertion position template simulates a vehicle fill pipe with a maximum height locking lip, maximum latching lip depth and a maximum pipe inner diameter. A cross-section and face view are shown with appropriate dimensions to simulate the worst case upper nozzle swing position when the nozzle anchor is resting on the latching lip and nozzle spout end contacts fill pipe interior diameter.

(g) Zone placement (Figures 4F and 4G).

(1) For usage in vehicle clearance, align the centerline of the bellows interface zone with the centerline of the fill pipe-sealing surface. See Figure 4F for example.

(2) For usage with nozzle insertion clearance, the following steps apply:

(i) Align the centerline of the bellows interface zone with the centerline of the nozzle resting position template.

(ii) Superimpose the nozzle design into the model, positioning the nozzle spout into a resting position as shown in Figure 4G. No sections of nozzle can encroach the boundaries of the zone. Design should be reviewed with bellows compressed to seal surface of template.

(iii) Align the centerline of the bellows interface zone with the centerline of the nozzle insertion position template.

(iv) Superimpose the nozzle design into the model, positioning the nozzle spout into an insertion position as shown in Figure 4G. No sections of nozzle can encroach the boundaries of the zone. Design should be reviewed with bellows compressed to seal surface of template.

4.7.45 Additional nozzle criteria are contained in Sections 5 and 6.

Figure 4C
Fill Pipe Access Zone for Comparison to Nozzles with Spout Angles Outside of the
Range Specified in Table 4-2 (S_{α} of 19.5° to 26.0°)

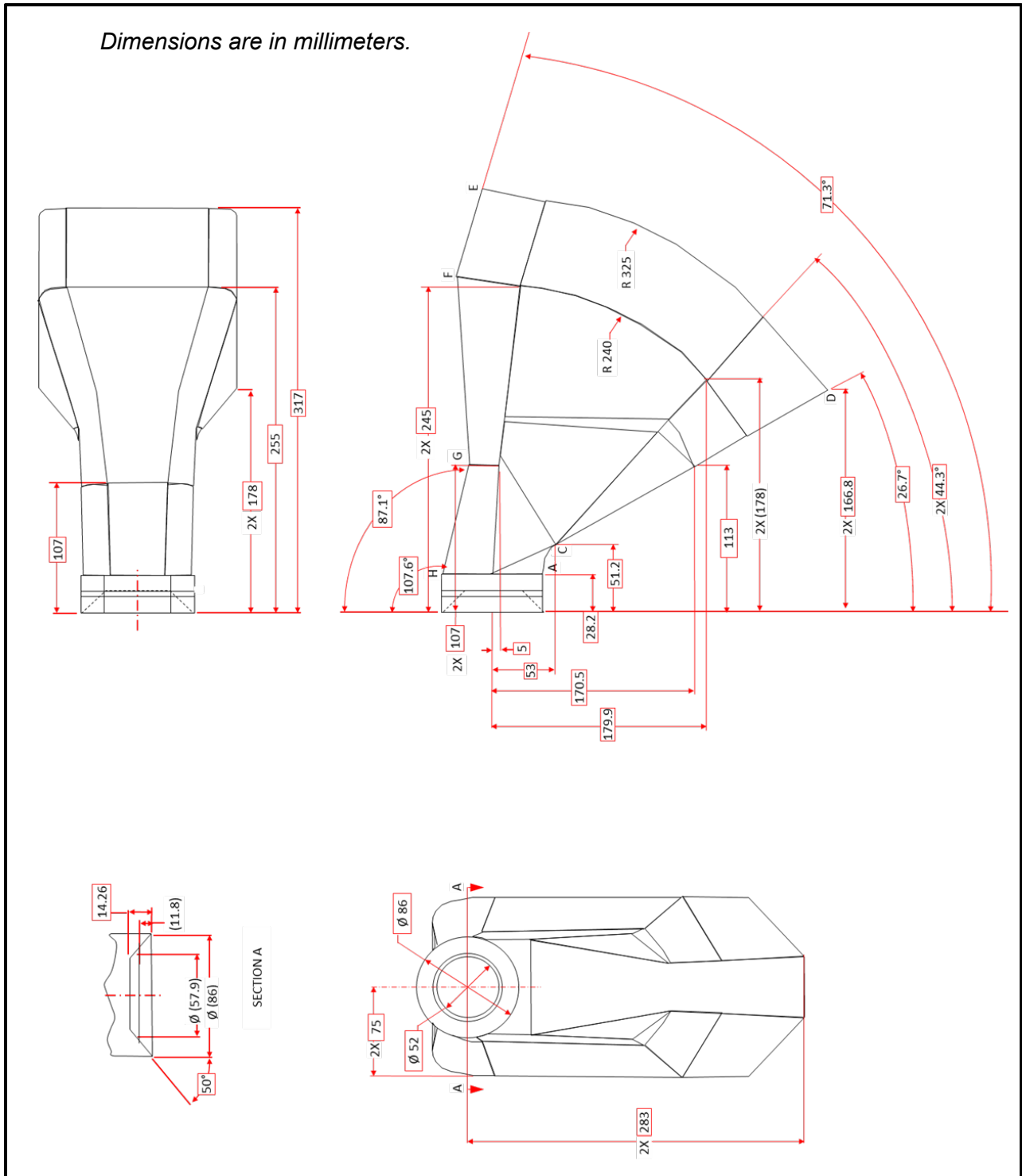


Figure 4D
Fill Pipe Access Zone for Comparison to Nozzles with Spout Angles Outside of the Range Specified in Table 4-2 (S_α of 19.5° to 26.0°)

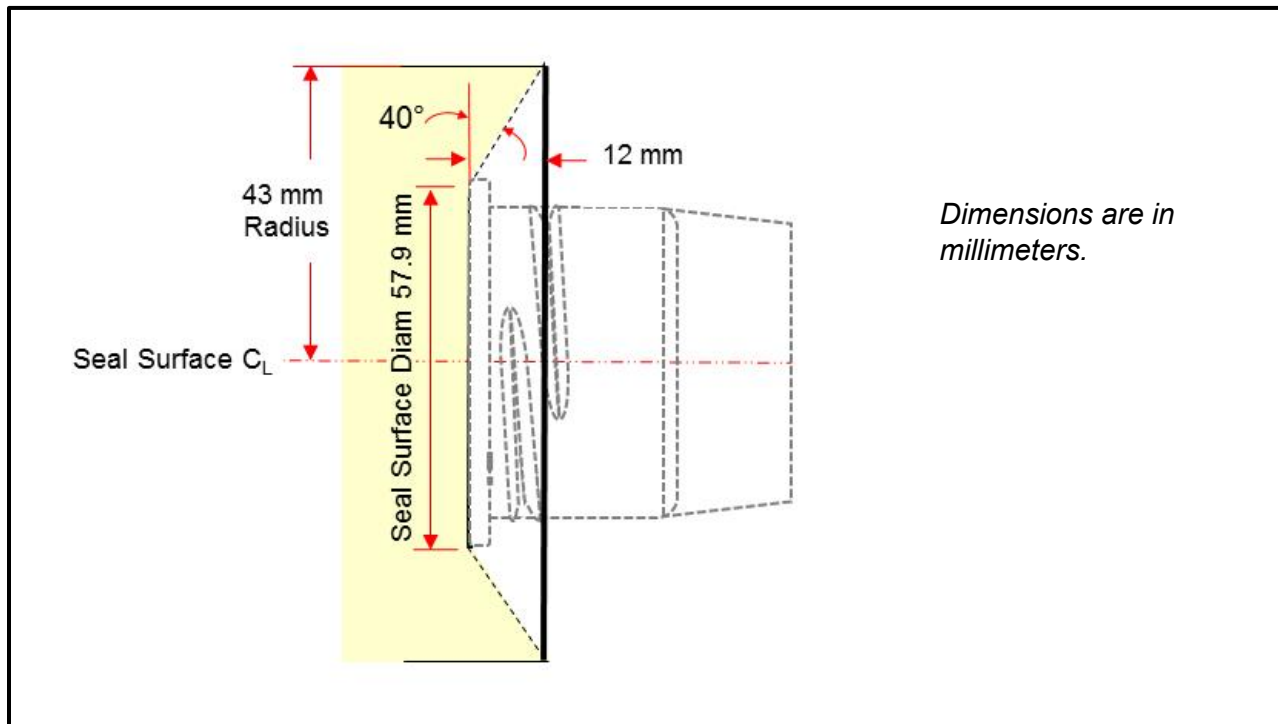


Figure 4E
Fill Pipe Latching Templates for Comparison to Nozzles with Spout Angles Outside
of the Range Specified in Table 4-2 (S_{α} of 19.5° to 26.0°)

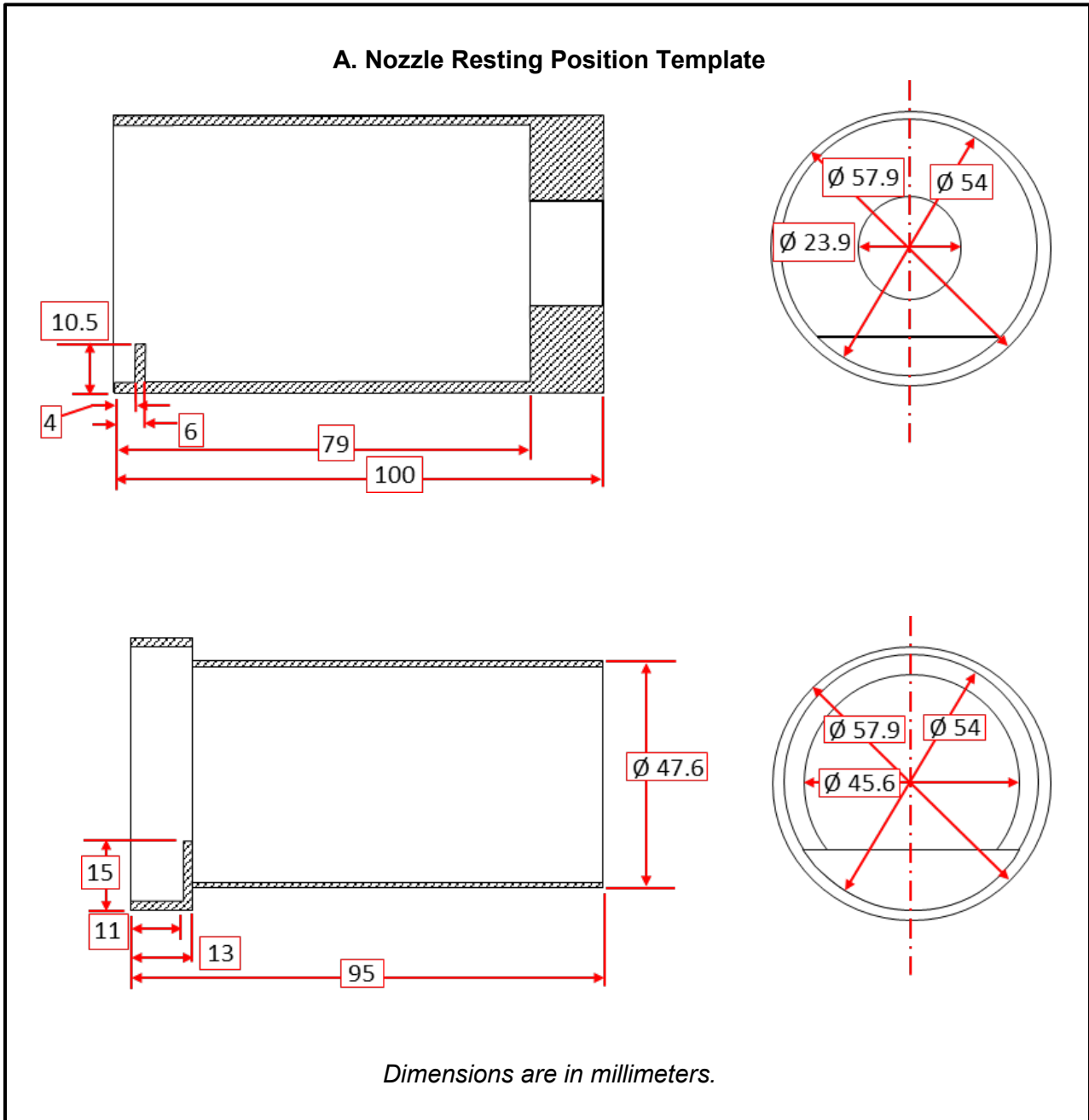


Figure 4F
Zone Placement for Vehicle Usage for Comparison to Nozzles with Spout Angles Outside of the Range Specified in Table 4-2 (S_{α} of 19.5° to 26.0°)

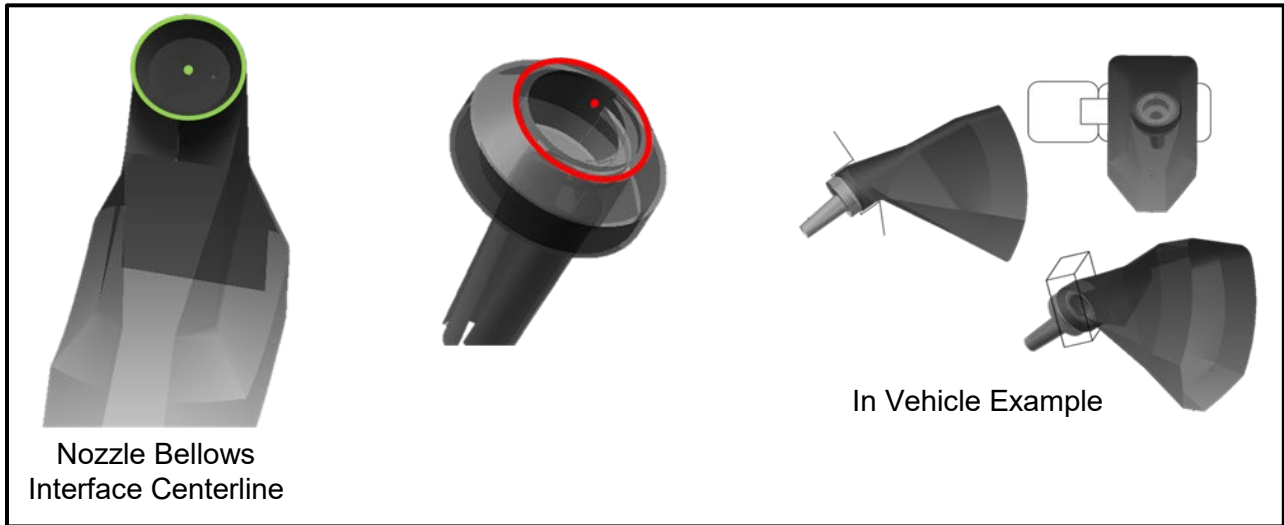


Figure 4G
Nozzle Vehicle Clearance for Comparison to Nozzles with Spout Angles Outside of the Range Specified in Table 4-2 (S_{α} of 19.5° to 26.0°)

