PACCAR Illustration Standards for Technical Manuals

PRIMARILY FOR THIRD PARTY ARTISTS

ROOK WATTERS

Contents

Introduction

In this document your team will learn:

- What a PACCAR illustration looks like – see Graphics Standards.
- How graphic files are formatted – see File Standards.
- How work is received and submitted – see Fulfilling a Graphic Request.

Terms

The following terms are used in this document:

Illustration (graphic) – *Illustrations will be referred to as both "graphics" and "illustrations" interchangeably throughout this document. Typically, "graphic" will be used when referring to the file or workflow used to generate and track an illustration.*

Smartsheet – *Online platform PACCAR uses to, communicate request concerns, and store draft and final graphic deliverables. Smartsheet has several pricing levels. A minimum of Team level is required to use some of the features described in this document. If you cannot access certain features, then contact the Technical Content Liaison (TCL).*

Requestor – *The person who made the graphic request. This could be a PACCAR author or someone working with PACCAR to generate graphics for our documentation (like a 3rd-party authoring team). The Requestor can be found in the* ***Requested By*** *column on the Request a Graphic for a Topic Smartsheet.*

Artist – *The artist assigned to a particular graphic request and for whom this document was designed. The artist assigned for a particular request is located in the* ***Artist Assigned*** *column on the Request a Graphic for a Topic Smartsheet.*

Quick-Reference Guide

The Technical Publications team has also created a quick-reference guide containing the artboard sizes that should be used when generating illustrations. Please ask for the **Technical Manuals Illustrations Quick Reference** Adobe Illustrator document.

Illustrations Standards

PACCAR illustrations have an identifiable style and construction:

- Quality & Composition
- Shading & Coloring
- Dimensions.

Quality & Composition

PACCAR illustrations need to be *accurate*, *clear*, and *relevant*. The Requestor will determine if the illustration's needs have been met (see Fulfilling a Graphic Request).

If you don't understand what you're looking at, there's a chance that our readers won't as well.

Composition

Technical publications illustrations should:

- Be composed in layers. Place:
  - Callouts and leader lines in a separate layer.
  - Removed/exploded components (colored green and yellow in service manuals) in their own layer.
  - Primary components (colored blue in service manuals) in a separate layer.
- Not link to images outside the file.
- Not add images into vector illustrations.
- Reduce whitespace – Increase the dimensions of the illustration proportionally until the largest dimension almost touches the artboard (while avoiding pixilation for PNGs).

Stroke Weights and Style

An illustration must be recognizable, conveying both shape and depth. To accomplish this, PACCAR uses two different line types in our illustrations. We refer to these as *shape lines* and *detail lines*.

PACCAR expects to see both shape lines and detail lines in almost all requested illustrations.

Shape Lines

Shape lines emphasize the "shape" of the illustration while also emphasizing important features that give meaning to the shape. Shape lines use the thickest stroke on the illustration (typically 1 pt) and **must use a greater stroke than detail lines**. The outermost line will almost always use a shape line.

If you are working with an illustration where most of the lines are thin (less than .5 pt) and thicker shape lines are not present, work with the Requestor to determine which lines should be shape lines.

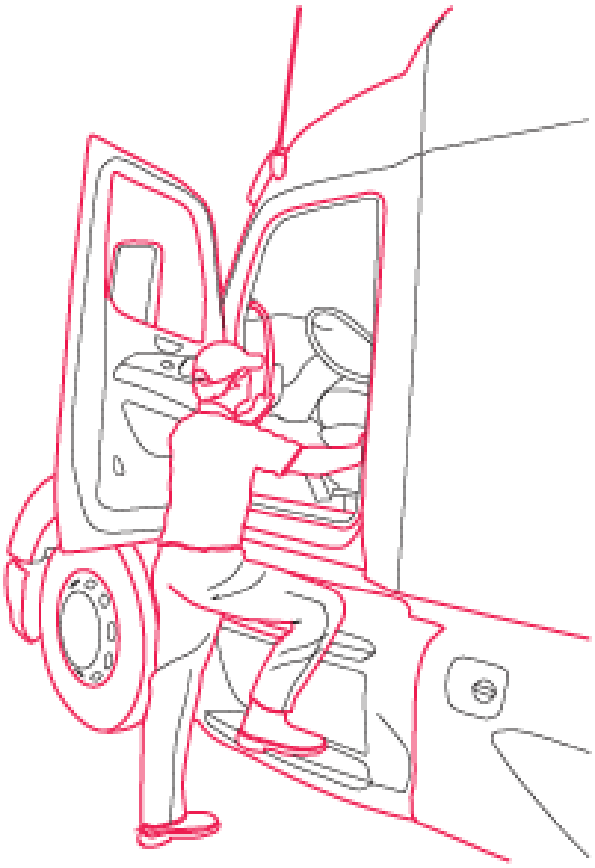
Detail Lines

Detail lines convey "depth," and are also used for features that are not essential to identify the object. Detail lines use a thinner stroke than a shape line (sometimes the same stroke weight as the leader line) and are often **half the weight of the shape line**. For Example: If the shape lines have a stroke weight of 1 pt., the detail lines should have a stroke weight of .5 pt.

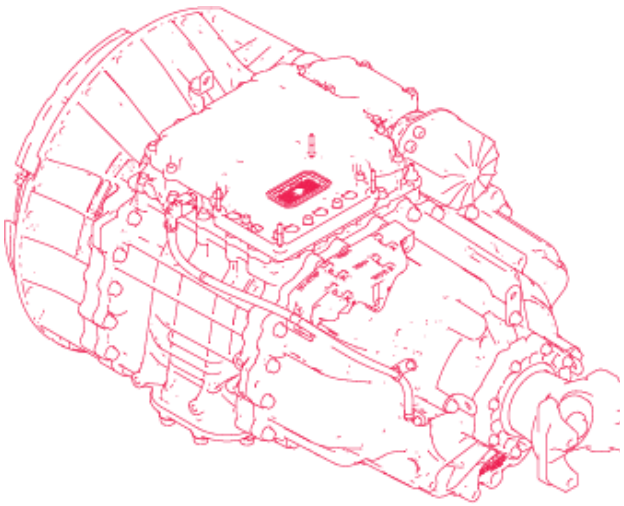
In the following examples, shape lines are shown in **red** and detail lines in **black**. Notice that when the detail lines are removed, the reader can still identify the object:

Shape Lines Only

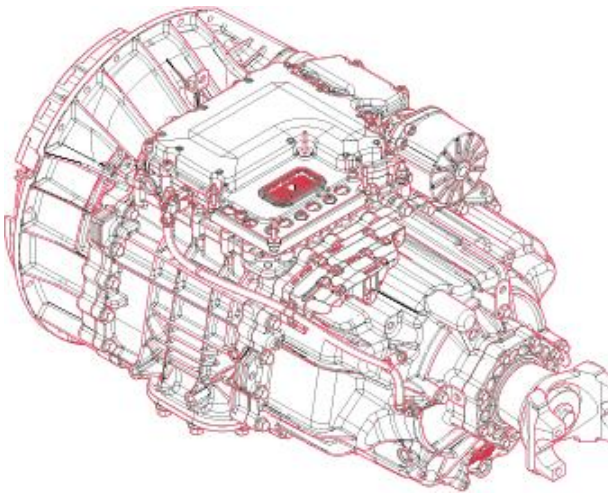
Shape Lines and Detail Lines



Shape Lines Only



Shape Lines and Detail Lines



Shading and Coloring

Areas in the illustration that require emphasis will be communicated in the graphic request. These areas will either require color for service manuals or shading for operator's manuals. Check the **Manual Type** column in the Smartsheet request to see if the graphic is for an operator's manual or a service manual.

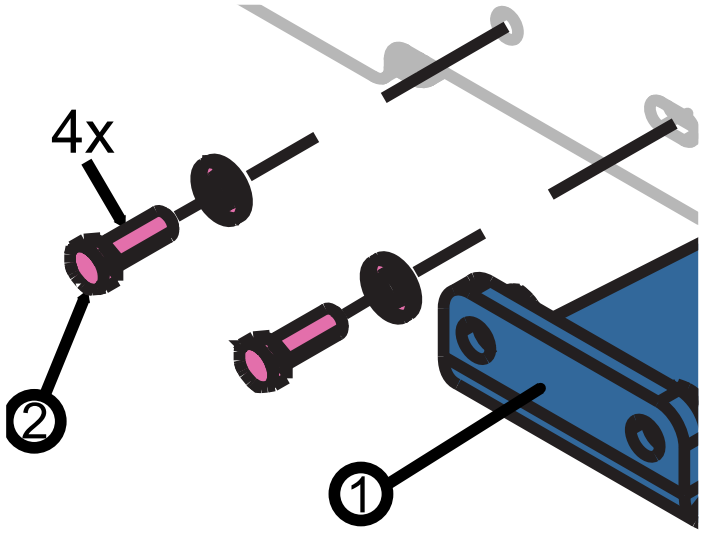
Service Manuals Requests

Service manuals use color to emphasize areas of interest. Use the colors listed in the **Service Manual Illustration Color Code** table if required and as directed in the **Special Instructions – Notes** column of the Request a Graphic for a Topic sheet.

Service Manual Illustration Color Code

Color	Description	RGB / Hex Values
	Blue – Target or primary component to be removed/installed (or disassembled/assembled).	RGB: 51 102 153 Hex: 336699
	Green – Components that need to be removed prior to or installed after the target/primary.	RGB: 102 204 51 Hex: 66cc33
	Pink – Fasteners being removed or installed.	RGB: 204 102 153 Hex: cc6699
	Yellow – Components to be set aside for access but not removed. Also, highlighted areas to inspect or adjust.	RGB: 255 204 0 Hex: ffcc00
	Magenta – Electrical connectors and fasteners such as clamps or clips to be detached, attached, loosened, removed, or installed.	RGB: 102 51 153 Hex: 663399
	Pale Blue – Special tool(s), general equipment, or common tools used in an uncommon way.	RGB: 102 102 153 Hex: 666699
	Cyan – Indicates where sealant is applied.	RGB: 102 204 204 Hex: 66cccc
	Orange – High-voltage electrical connectors and harnesses.	RGB: 255 102 51 Hex: ff6633
	Teal – Use for harness color in routing diagrams	RGB 102 204 153 Hex: 66cc99

Service Manual Example



Pink is used for the fasteners (2) that are being installed (only two of four of are shown).

Blue is the primary component (1) that will need to be positioned prior to being secured with fasteners (2).

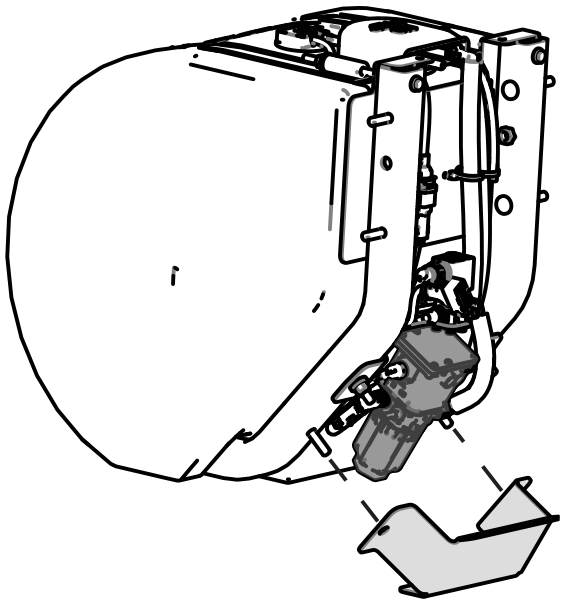
Operator's Manuals Requests

Operator's manuals use shading to emphasize areas of interest. Use only black, white, and gray shading for operator's manuals. See **Operator's Manual Illustration Shading** table.

Operator's Manual Illustration Shading

Color	Description	RGB / Hex Values
	Dark Gray - Target or primary component	RGB: 97, 97, 97 Hex: 616161
	Light Gray - Secondary component or parent component.	RGB: 221, 221, 221 Hex: dddddd
	White - Background assembly.	RGB: 255, 255, 255 Hex: ffffff

Operator's Manual Example 1

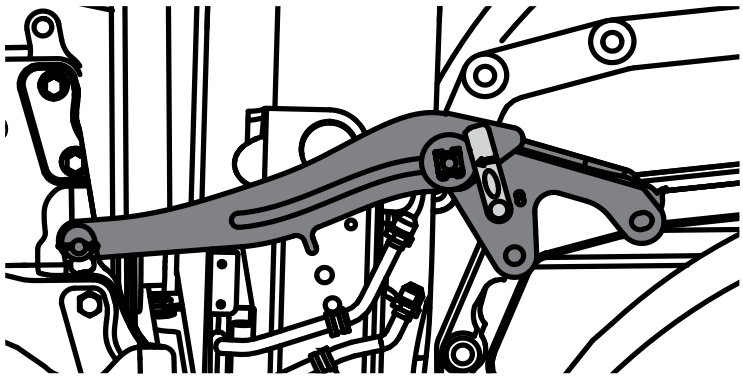


■ Dark Gray is used for the primary component.

□ Light Gray is used for the secondary component. In this case, the component needed to be removed to access the primary component.

When shading small components on a larger shaded background, invert the shading standards listed on the **Operator's Manual Illustration Shading** table. Use Dark Gray for the "secondary" component and Light Gray for the "primary" component. The light gray is used to emphasize a small or specific primary component.

Operator's Manual Example 2 (Inverted)



□ Light Gray was used to indicate the primary component because the component was very small compared to the secondary component.
■ Dark Gray was used for the secondary component.

Dimensions

PACCAR illustrations fall into six size categories:

- **Icon** – to be viewed at a size less than 1 in^2.
- **Small** – to be viewed at a size of roughly 2.15 in^2.
- **Wide** – to be viewed at a width of 6.6 inches and a height less than 3.5 inches.
- **Tall** – to be viewed at a height between 2.15 and 3.5 inches, and a width less than 2.15 inches.

- **Large** – to be viewed at both a height and width greater than 3 inches. **For service manuals usually.**
- **Full Page** – to viewed at a width of 6.75 in. and height of 10 in. – **For service manuals only.**

Attempt to fill the prescribed dimensions for each illustration size listed. The prescribed size is listed first under each dimension (icon, small, wide, etc.). What is important is that the illustration be clear and usable at the size it is created for.

Artboards for the illustration sizes exist in the attached Adobe Illustrator file.

Operator's Manuals Illustrations Dimensions

Operator's manuals illustrations fall into four categories: *Icon*, *Small*, *Wide,* and *Tall*. Operator's manuals do not use *Large* or *Full Page* illustrations.

Icons

Icons should be as close to .67 in^2 (48 pixels X 48 pixels) as possible.

- **Use a .67 in^2 artboard when creating an icon.**
- Create the illustration so it takes up the dimensions of the entire artboard, if possible.
- If either the width or height exceeds .67 in., reduce the dimensions ***proportionally*** so that the largest dimension is less than or equal to .67 in.
- If an icon-sized illustration is not **clear** and **usable** using a .67 in^2 artboard, contact the Requestor and consider making it as a *small* illustration.

Small

Small illustrations should be as close to 2.15 in^2 as possible.

- **Use a 2.15 in^2 artboard when creating a *small* illustration.**
- Create the illustration so it takes up the dimensions of the entire artboard, if possible.
- If either the width or height exceeds 2.15 in., reduce the dimensions ***proportionally*** so that the largest dimension is equal to 2.15 in.
- If a small illustration is not **clear** and **usable** using a 2.15 in^2 artboard, contact the Requestor and consider making it a *wide* or *tall* illustration.

Wide

Wide illustrations are created for operator's manuals.

- **Use a 6.6 in. x 3.5 in. (width x height) artboard when creating a *wide* illustration.**
- Create the illustration so it takes up the dimensions of the entire artboard, if possible.
- If either the width or height exceeds the artboard requirements, reduce the dimensions ***proportionally*** so that the largest dimension fits within the artboard.
- If a wide illustration is not **clear** and **usable** using a 6.6 in. x 3.5 in. artboard, contact the Requestor.

Tall

Tall illustrations are created for operator's manuals. Tall illustrations can be any height between 2.15 to 3.5 inches but **can be no wider** than 2.15 inches.

- **Use a 2.15 in. x 3.5 in. (width x height) artboard when creating a *tall* illustration.**
- Create the illustration so it takes up the dimensions of the entire artboard, if possible.
- If either the width or height exceeds the artboard requirements, reduce the dimensions ***proportionally*** so that the largest dimension fits within the artboard.
- If a tall illustration is not **clear** and **usable** using a 2.15 in. x 3.5 in. artboard, contact the Requestor.

Service Manual Illustrations Dimensions

Though all illustration sizes can exist in a service manual, service manual illustrations are typically *Large***.**

Large

Large illustrations are created for service manuals.

- **Use a 6.75 in. x 5 in. (width x height) artboard when creating a *large* illustration.**
- If a Large illustration is not **clear** and **usable** at the above dimensions, contact the Requestor.

Full Page

Full Page illustrations are created for service manuals.

- **Use a 6.75 in. x 5 in. (width x height) artboard when creating a *full page* illustration.**
- If a Full Page illustration is not **clear** and **usable** at the above dimensions, contact the Requestor.
- Full Page illustrations are rarely used.

Resolution

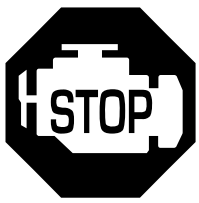
- Print (operator's manuals): minimum 200, maximum 600 dots per inch (dpi).
- Web (service manuals): 72 dpi.

Boarders

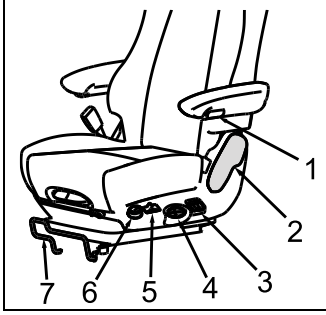
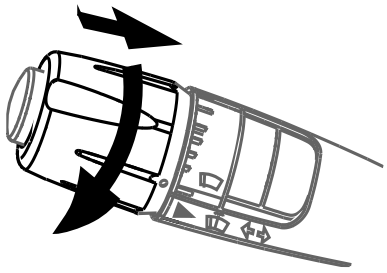
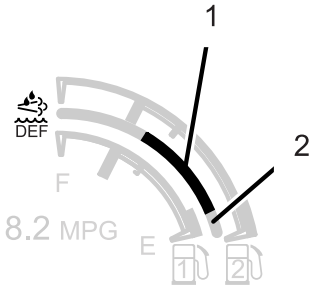
Remove unnecessary whitespace when saving images in file formats PNG or SVG. If necessary, increase the height and width of the illustration **proportionally** until it fills the artboard (see File Formats).

Examples of Illustration Sizes

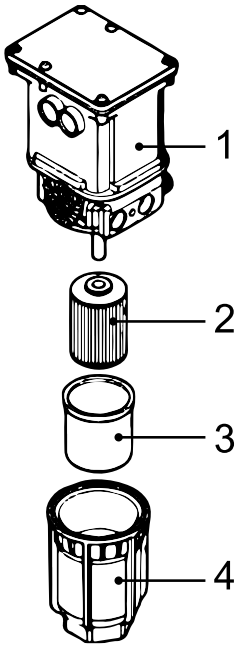
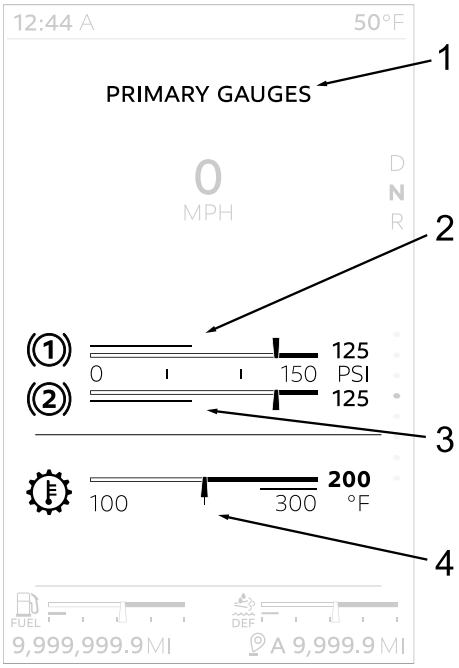
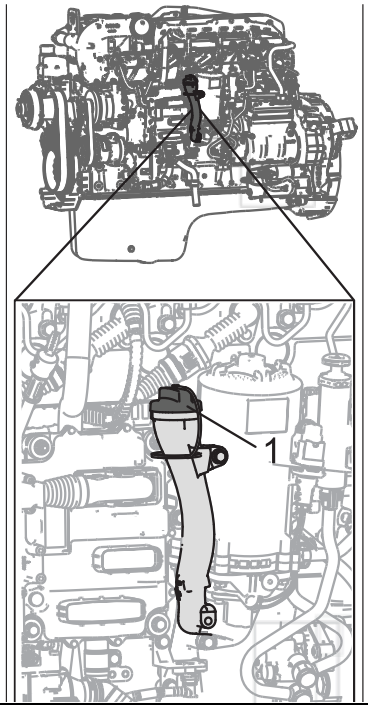
Icon

Dash indications	Switch/dial icons	Actual Icons
		

Small

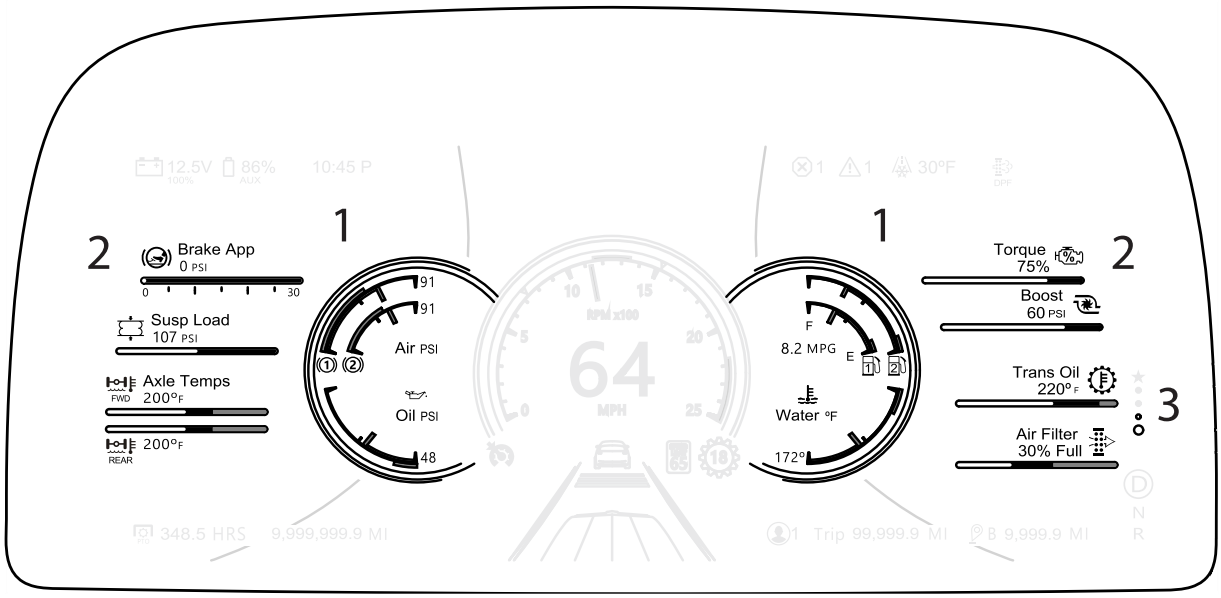
Seat Controls - 2.15 in² - 12 pt font	*Left-hand Stalk - 2.15 in. x 1.5 in.*	*DEF Gauge - 2.15 in.²*
		

Tall

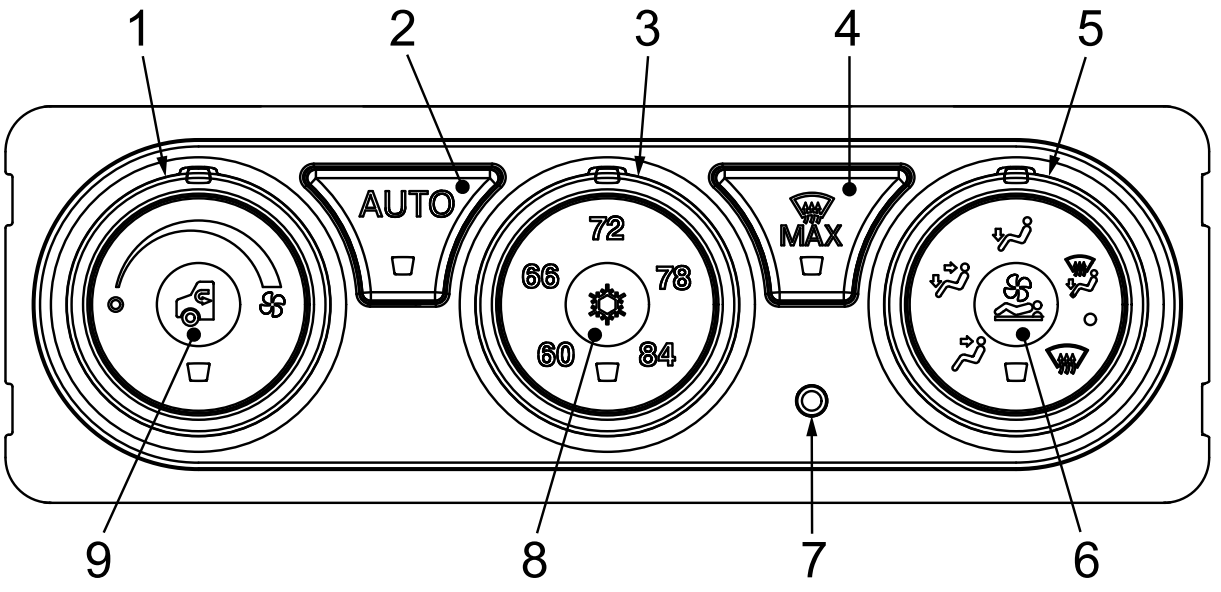
DPF Filter - 3.5 in.– 18 pt font	*7" Display Screen - 2.15 x 3.5 in. – 18 pt font*	*3.5 in. illustration with exploded area*
		

Wide

15 in. Display Screen (6 in. x 3.5 in.)

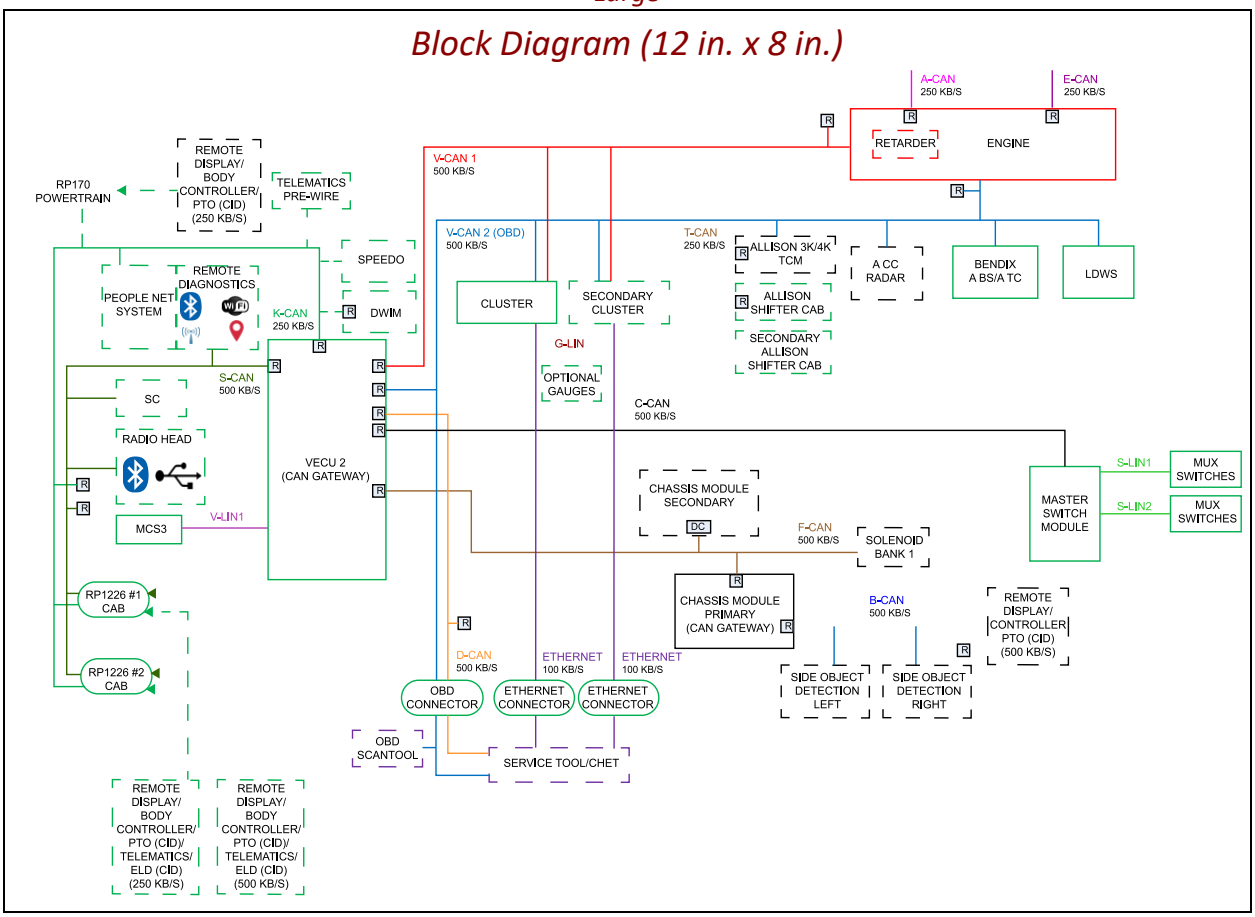


HVAC Controls (6 in. x 3 in.)



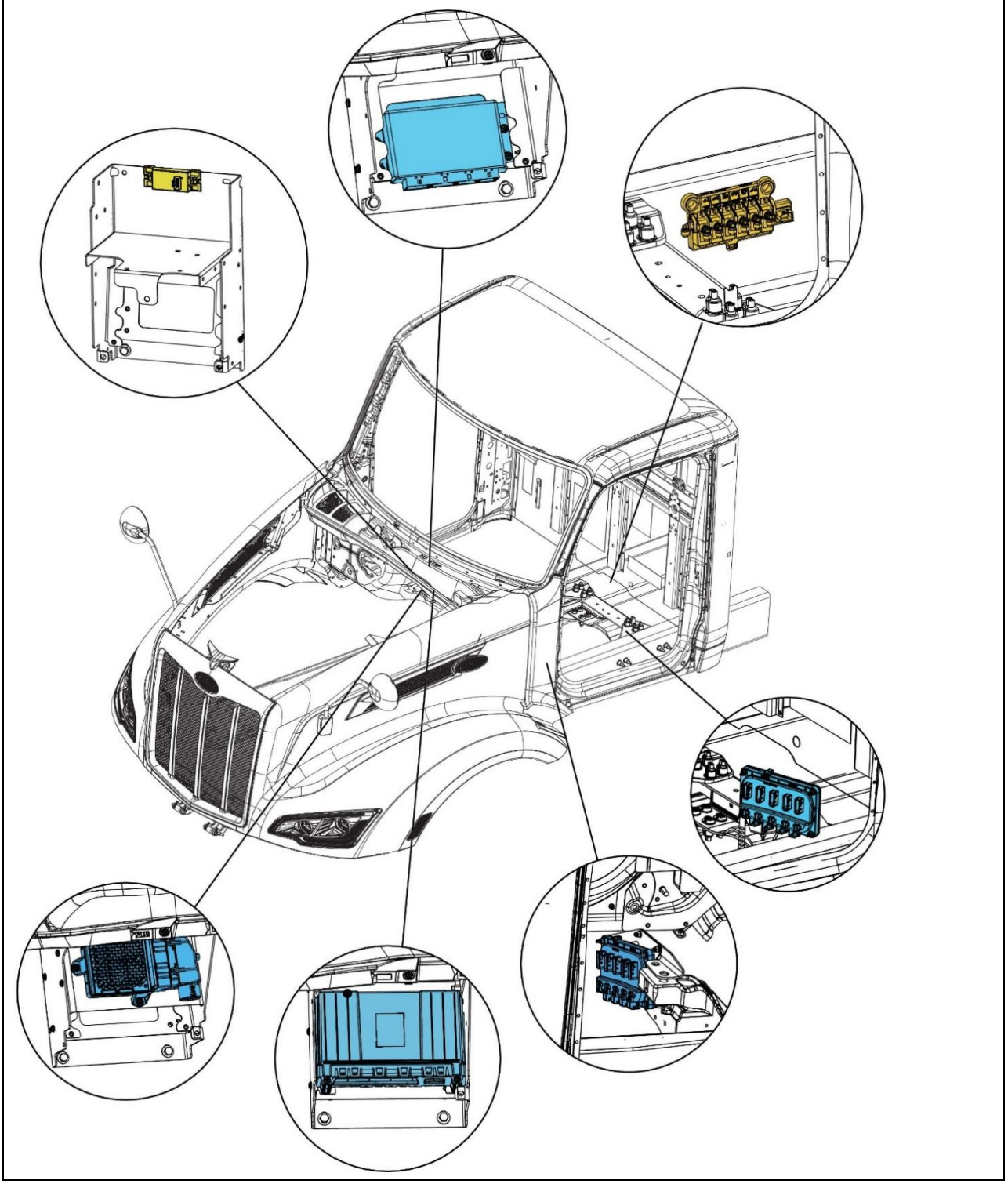
Large

Block Diagram (12 in. x 8 in.)



Full Page

Exploded View (30 in. x 40 in.) using only one zoom line per component.[1]



Leader Lines

Your team may be asked to add (or alter) leader lines to your illustration. Leader lines connect a callout number to a location on your illustration.

Leader Lines **should:**

- Have a callout number attached (see Callouts).
- Exist in their own layer, separate from line art.
- Be continuous, thin lines (not dashed).
- Be a lesser line weight (ideally half) than the line weight used in the illustration.
- Must end using a *line end* or arrowhead (see Leader Line Ends).

Leader lines **should not:**

- Cross other leader lines.
- Be longer than 75pt. for full scale.
- Be parallel to dimension or extension lines.
- Make a small angle with the surface to which it refers.

Leader Line Strokes

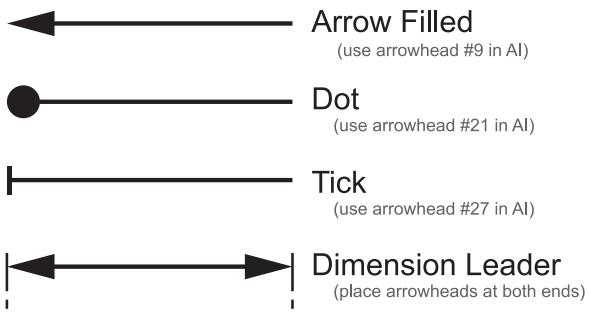
The leader line stroke, which connects images to callout numbers, should be half the line weight of most of the *shape* lines used in the illustration.

- For example, if the lines in the illustration use a 1-inch (75pt.) stroke, the leader line stroke should be .5 inches (36pt.).
- When the stroke of most of the *shape* lines in the illustration are very small (and difficult to see), the leader line stroke should be 2x the shape line stroke weight.

Many engineering source illustrations will mostly use very small lines. If you are asked to add leader lines to these illustrations, use a stroke weight that is twice as thick as the lines used.

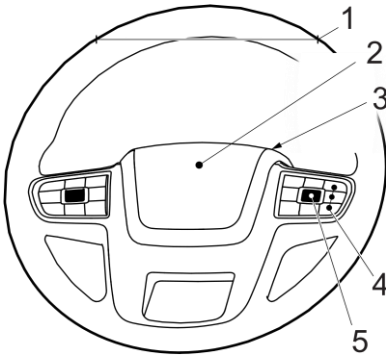
Leader Line Ends (Arrowheads):

One end of a leader line should end with the arrowhead appropriate for what the line is targeting. Use one of the following arrowheads:

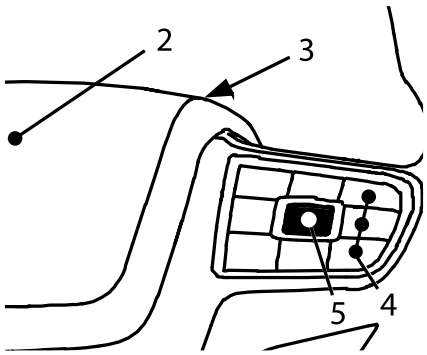


[1] PACCAR uses multiple methods when using zoom lines that will be defined by the Requestor (see Zoom Lines.)

Leader Line End Examples



2 inch² illustration with 12 pt Callouts

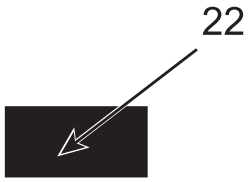


2 in. x 1.7 in. illustration with 12 pt Callouts

1. Grip points
2. Horn pad
3. Steering Wheel
4. Volume Buttons
5. Scroll Wheel

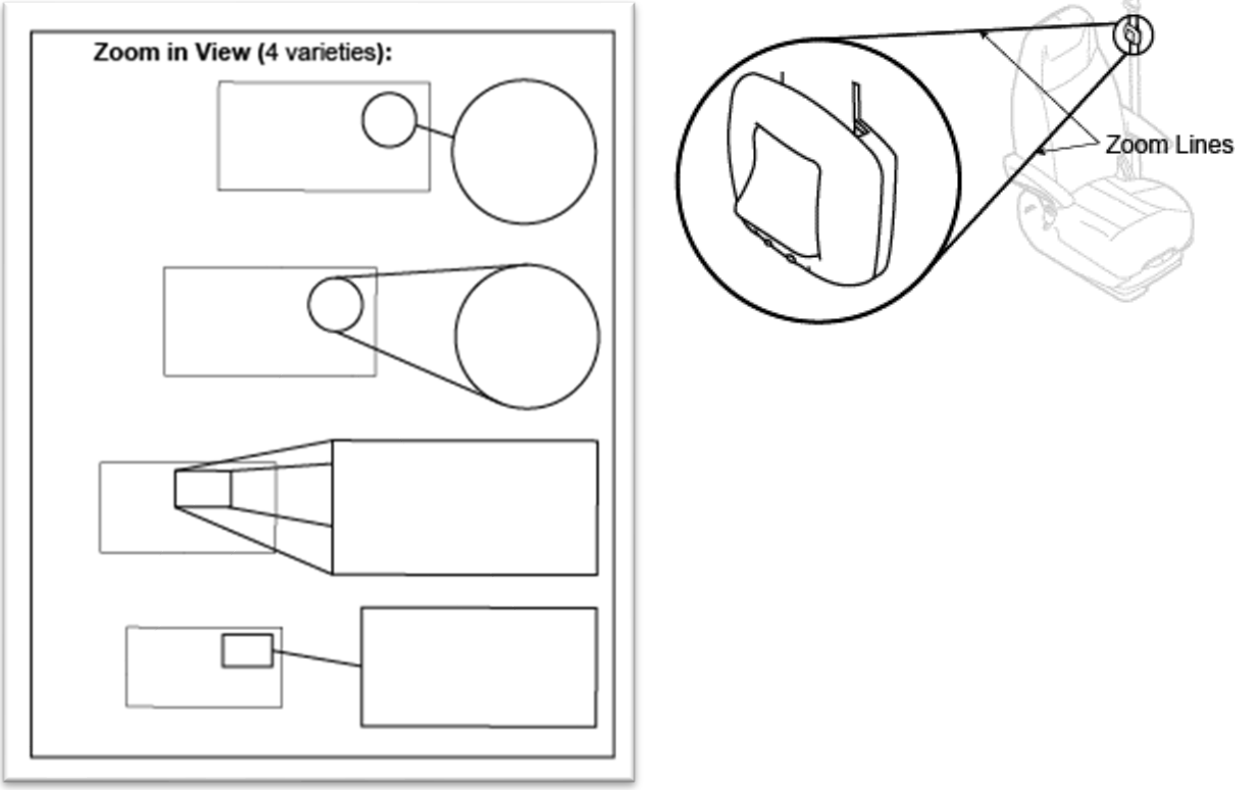
When targeting:

- The edge of a component, use an arrow (3).
- The face or plane of a component, use a dot (2).
- Multiple edges using the same leader line, use a tick (1) – you may need to create multiple leader lines to target multiple edges.
- Multiple faces or planes using the same leader line, use multiple dots (4) – you may need to create multiple leader lines to do this.
- A shaded or dark colored surface, use a white line end (5) or copy a white line of a wider stroke and place it beneath the black line creating this effect:



Zoom Lines (Only for Exploded Views)

"Zoom Lines," lines that connect to exploded images, should be thicker than both leader lines and the shape lines (ideally 1.5x the weight). For example, if the shape lines strokes are 1 pt., make the Zoom Lines stroke 1.5 pt. The type of zoom view needed (circle or rectangle) depends on the content that needs to be "zoomed" and you will receive direction from the Requestor in the **Special Instructions** located on Smartsheet.

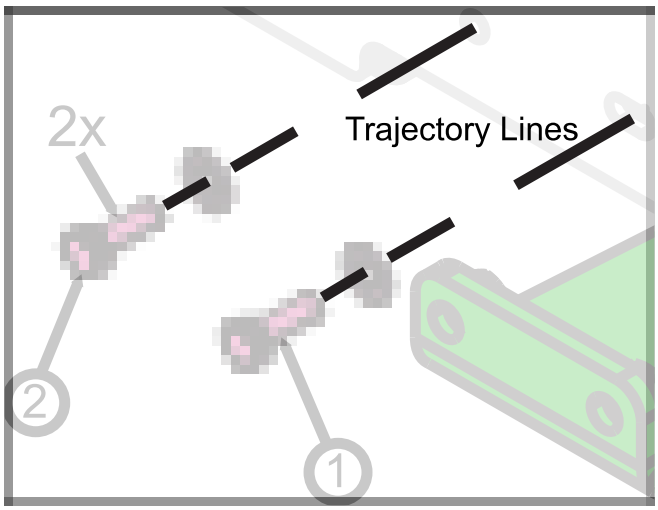


Zoom Line Examples

Trajectory Lines

Trajectory lines show the path followed by an object. They are typically used to show the direction a secondary component must be moved to access the primary component, or the direction to move a component during assembly or disassembly.

The trajectory line stroke should be 1 pt. with a dash-gap pattern of 4, 4, 16, 4:



Callouts

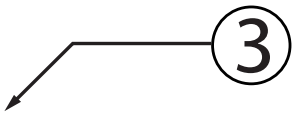
Operator's Manuals

Callouts are numbers located in the illustration. With few exceptions (see Callouts without Leader Lines), operator's manual callouts should use **numbers only** and should be centered to the leader line:

The gap between the callout number and the leader line should be the **width** of one character at the font size used for the callout (roughly 0.08 inches for 12 pt. Arial, and 0.14 inches for 18 pt. Arial).
A list with the specific number of callouts required will be created by the Requestor and should not be included with the illustration.

Service Manuals

Service manual callouts should use numbers to point out areas and components. The number should be circled and centered to the leader line:



The circle should be the same diameter as the font's height[2] (not to be confused with the character[3] height.) The font height is shown in the **Transform** box of the **Properties** tab.

Example Circle Diameters

A 12pt. callout font is roughly 0.19 inches in height, so the circle surrounding the callout should be 0.19 inches in diameter.

An 18 pt. callout is roughly 0.29 inches in height, so the circle surrounding the callout should be 0.29 inches in diameter.

Many service manual illustrations will use text instead of numbers to orient the reader or give short instructions. These are the exception and not the rule. Please use numbered callouts.

Call Out Order

Number the leader line closest to the 12 o'clock position with a "1." Continue numbering the leader lines, moving clockwise from the first callout, until all leader lines are numbered.

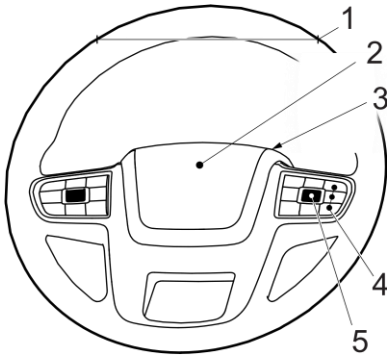
Call Out Font

There are two callout font sizes: 12 pt. Arial and 18 pt. Arial. Which one is used is based on the illustration dimensions.

To change to inches in Adobe Illustrator select Edit > Preferences > Units and change to inches.

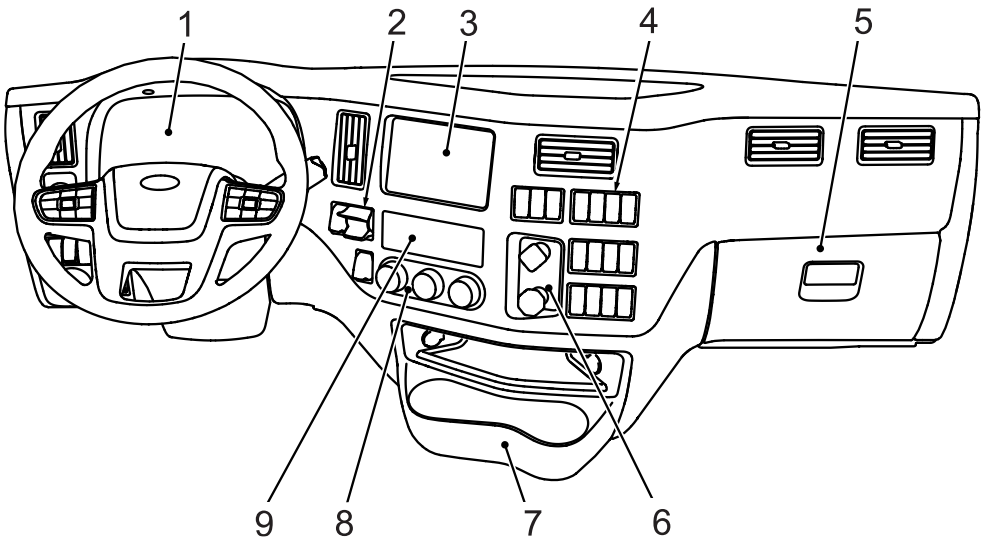
[2] Also known as the "em square" height.
[3] Also referred to as a glyph's "cap height."

A small illustration (see Small) uses a 12 pt. Arial font:

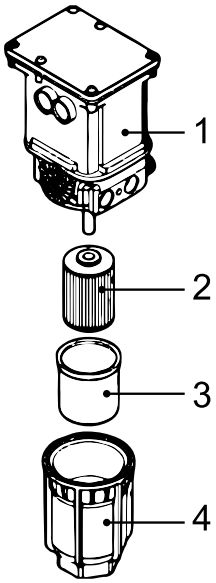


A Two-inch-by-Two-inch Illustration – 12 pt. Arial Font

Tall, Wide, Large and Full Page illustrations use an 18 pt. Arial font (see Dimensions).



PB Dash - Six-inch (Wide) – 18 pt. Arial Font

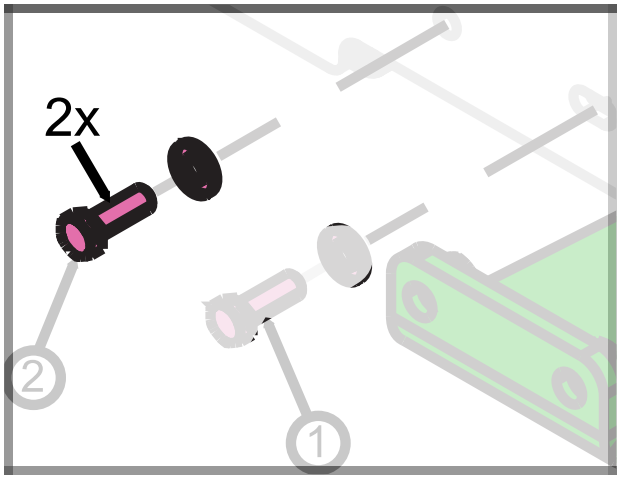


DPF Filter - 3.5-inch (Tall) – 18 pt. Arial Font

Special Callouts

Sometimes a callout is used to indicate multiple, identical items targeted by the leader line – *2x, 3x, 4x*, etc. These callouts are not circled:

Two fasteners (2x) of the type targeted by callout (2).



Callouts Without Leader Lines

Occasionally, the location of a component will use only a callout and omit the leader line. This is not the rule, so if you are asked to use callouts without leader lines, it will be specifically requested in the illustration request. Callouts without leader lines are often, but not always, circled:

Callouts without Leader Lines (callouts shaded by request of Requestor)

File Standards

Titling/Labeling

Label illustration files with the name presented in the **Graphic Name** column in Smartsheet (see Fulfilling a Graphic Request).

If during the creation process multiple revisions of the illustration are required, label each successive revision with an underscore and a number.

Example

Steering Wheel, Steering Wheel_2, or Steering Wheel_3

File Formats

The only acceptable file types for submission are:

- PNG
- SVG
- Adobe Illustrator

Upload all three file types for your final deliverable.

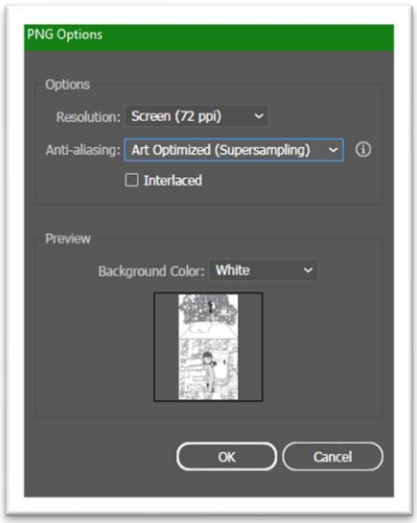
PNG (Low Resolution)

Remove all unnecessary whitespace when saving a PNG, and if necessary, increase the height and width of the illustration **proportionally** until it fills the artboard (see File Formats). If this pixilates the illustration, leave the illustration as it was originally.

If using an Adobe product use the Export feature to create a PNG:

1. Select **File > Export > Export As…**)
2. Select Save as type: **PNG (*.PNG)**
3. Select the **Use Artboards** radio box.
4. Select the **Range** radio box, and then input the artboard number containing the illustration.
5. Select **Export.**

In the **PNG Options** dialog box, select:



- Screen (72 ppi)
- Art Optimized (Supersampling)
- DO NOT select **Interlaced.**
- Select Background Color: **White**

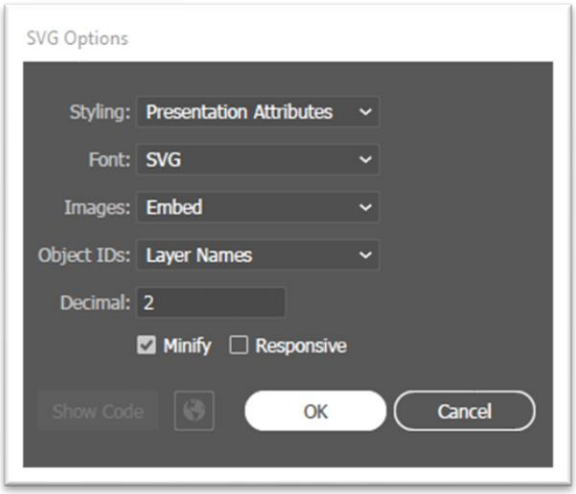
SVG (High Resolution)

Remove all unnecessary whitespace when saving an SVG, and if necessary, increase the height and width of the illustration **proportionally** until it fills the artboard (see File Formats).

If using an Adobe product use the Export feature to create an SVG:

1. Use the Export option – (**File > Export > Export As…**)
2. Select Save as type **SVG (*.SVG)**
3. Select the **Use Artboards** radio box.
4. Select the **Range** radio box, and then input the artboard number containing the illustration.
5. Select **Export.**

In the **SVG Options** dialog box, select:



- Styling: Presentation Attributes
- Font: SVG
- Images: Embed
- Object IDs: Layer Names
- Decimal: 2
- Check Minify
- DO NOT check Responsive

Adobe Illustrator (Source Format)

This is the native file format created by Adobe systems.

File Size

If the file size is very large (>25 MB), **reduce the file size**. One way is to use Adobe's Simplify feature:

Simplify Feature (Adobe Illustrator)

1. Select the image (using direct select tool).
2. Use the **Object > Path > Simplify** Illustrator feature to reduce illustration size. *The Simplify dialog box will open.*
3. Choose the **Auto-Simplify** selection, and then select **OK**.

Remember, the illustration must look professional and presentable for distribution.

Fulfilling a Graphic Request

Graphic requests are located on the Smartsheet web platform on the Request a Graphic for a Topic page.

There are many columns located in the Request a Graphic for a Topic Smartsheet, but when you are assigned an illustration, please pay attention to the following columns:

- **The first, unnamed column** – use this column to view any graphics provided by the Requestor, upload your deliverables, and communicate with the Requestor concerning the graphics request.
- **Request Number** – this number serializes the graphic request. Title uploaded files using this alphanumeric value (e.g., GR0848) and refer to the graphic by this name.
- **Special Instructions** – detailed requirements about the graphic request. Communicate directly with the Requestor if you are unsure how to meet these requirements.
- **PCP Number** – States which program will be charged for the graphic.

- **Requested By** – The individual requesting the graphic. *Also, sometimes referred to as the Author.*
- **Status –** This column will be updated by both the Artist and the Requestor at various times during the graphic request process and may generate emails based on the selection.
- **Artist Assigned –** The artist assigned to a particular graphic request.
- **Manual Type** –This tells you whether you will use operator's manual standards (black & white shading), or service manual standards (color).
- **Size of Image** – Icon, Small, Wide, Tall, Large or Full Page. Tells you the dimensions of the illustration in inches – see Graphics Dimensions – also suggests the required detail for the illustration. Appropriate size art boards are included in the templates.
- **Model File Name** – If filled out, provides the file name for the source file that will be used to generate the illustration.