



Automotive Aftermarket
Industry Association

Imaging Workgroup:

Automotive Aftermarket: Imaging Best Practices

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Mission Statement

The mission of the AAIA Imaging Standards Workgroup is to establish a comprehensive set of Best Practices and Industry Guidelines for image; capture, formatting, management and supply chain distribution in the Automotive Aftermarket.

To carry out the mission, the Workgroup's membership includes; 'motor and equipment' and 'specialty equipment' manufacturers, retailers, distributors, and electronic catalog and software solution providers.

The Imaging Standards Workgroup will function as a workgroup of the AAIA Technology Standards and Solutions Committee. The resulting standards and best practices will be published as an open standard by the AAIA. The AAIA will publish and promote the use of these standards and best practices for the benefit of the members of AAIA as well as freely sharing them with other trade associations for their benefit.

The goals of the Workgroup include:

- Imaging Best Practices and Guidelines Development: to create imaging best practices and guidelines satisfying the present and future requirements of the Automotive Aftermarket in the following areas;
 - Image specifications including image; quality, views, background, format, resolution, mode, size, compression, and naming convention.
 - Image distribution to supply chain trading partners.
 - Image update procedures for new product introductions and distribution to supply chain trading partners.
 - Image use in print, electronic and other marketing purposes.
- Advisement: make recommendations regarding the adoption of these Best Practices and Guidelines by trading partners within the Automotive Aftermarket.
- Communication:
 - The Imaging Standards Workgroup will share and report the 'Best Practices' for image format, management and distribution with members of related committees and associations.
 - Share information in a supportive, collaborative manner with other Workgroup members.
 - Value input from all Workgroup members in a fair and equitable manner.

Best Practices Guideline vs. Industry Standard

This document represents a 'Best Practice Guideline' for image capture, management and distribution in the Automotive Aftermarket. At the outset of the Imaging Workgroup process, members decided that developing a 'Best Practices Guideline' would be a better approach than developing a 'Standards' document. Best practices has the benefit of providing recommendations for the most important imaging issues facing the automotive aftermarket without mandating a firm standard that must be followed by all trading partners. The automotive aftermarket is a large, diverse industry; establishing a set of firm standards for trading images that must be followed by all supply chain participants would not be efficient. The Best Practices approach provides recommendations for imaging related issues while also providing the flexibility to accommodate diverse product lines and unique trading partner circumstances.

The workgroup has decided on the 'Best Practices' approach for the following reasons;

- **De Facto Standard:** This Best Practices Guideline document has gone through a thorough, collaborative discussion process by a diverse group of retailers, manufacturers, and electronic catalog and solution providers. If, in time, the guideline's recommendations prove to be efficient for image capture, management and distribution within the Automotive Aftermarket it should become a de facto standard adopted by all trading partners.
- **Trading Partner Negotiation:** Due to the diverse nature of product lines in the Automotive Aftermarket, efficient trading of part images requires flexibility for negotiations between trading partners. For example, if a manufacturer of a particular product line is not able to meet one or two of the 'Image Specifications' requirements outlined in this document they would have the flexibility to discuss possible alternatives and approaches with their trading partners.
- **Product Line Uniqueness:** The Automotive Aftermarket includes light, medium and heavy duty motor and equipment parts and specialty equipment and performance parts. For the management and trading of part images to work efficiently in a vast and diverse industry there has to be flexibility in the requirements and approach. The 'Best Practices' approach provides this flexibility.

Imaging Workgroup: Phase 1 & 2

The process of developing a Best Practices Guideline for image capture, management and distribution is divided into two phases. Imaging issues that the Workgroup discussed and was able to make reasonable recommendations on are included in this document representing Phase 1 of the process. Imaging issues that the group was **1)** unable to come to a consensus on, **2)** the topic was too large to deal with in a reasonable time frame, and/or **3)** the resources available to the Workgroup were insufficient have been deferred to Phase 2 of the process. There will be ongoing Imaging Workgroup collaboration for the following reasons;

- The image related needs of the Automotive Aftermarket are significant in scope. As the industry changes and new technologies and standards are introduced the imaging Best Practices Guideline will need to be updated.
- Current industry technology standards such as ACES and PIES are in the late stages of development and the early stages of adoption. Once these standards experience wide-spread industry adoption new image related issues will arise that require Workgroup discussion, recommendations and publication.
- There are several imaging topics that require input from the industry as a whole. For example, developing a 'Part Category Image Reference' requires involvement of multiple manufacturers in each product category.

Phase 1 imaging issues:

- Image capture and processing.
- Image specifications: digital, line art and Internet Parts Ordering images.
- Part names requiring line art.
- Representative images.
- Part category views.
- Image data delivery file.
- Additional image definitions and fields to PIES.
- Image protection and copyright.

Phase 2 imaging issues:

- Evaluation and feedback of AAIA's phase 1 'Best Practices Guideline'. The refinement of the guideline according to the industry feedback received.
- Discussion and creation of guidelines for images used in other marketing purposes i.e. planograms.
- Development of a 'Part Category Image View' reference database.
- Discussion of the issues involving ACES and application based images.

Image Use: Catalog / IPO Images

The imaging recommendations in this guideline apply to images used for print and electronic catalogs, Internet Parts Ordering (IPO), and low resolution marketing purposes. Images that are used for higher-end specialized marketing purposes including posters, full-page magazine ads and other high-resolution print marketing will require a separate set of images. High-end marketing images require sophisticated photography equipment, expert photography personnel and an image resolution much higher than defined in the 'Image Specifications' section of this document.

Supply Chain Participant: Responsibilities

To facilitate the efficient creation and distribution of images throughout the Automotive Aftermarket supply chain, this Best Practices Guideline has defined the responsibilities of the supply chain participants.

The 'creator' of the images;

- The creator of the images is typically the manufacturer.
- They are responsible for creating and formatting their images according to one image specification accepted by all supply chain trading partners. This image specification is detailed in this document.
- They are responsible for formatting and including an 'Image Data Delivery' file when they deliver their images to trading partners. This 'Image Data Delivery' file is detailed in this document.

The 'receiver' of the images;

- The receiver of the images is typically the retailer or electronic catalog provider.
- They will receive the images from the image creators formatted according to the image specifications detailed in this document.
- They will accept the 'Image Data Delivery' file as detailed in this document.
- Once they have received the images they can format them according to their unique standards and purposes of use.

Image Capture

There are many effective methods that can be used to capture high-quality part images. Because there is no 'right' way to capture high-quality images, this document does not provide specific recommendations on image capture equipment, techniques and methods. The following section presents information on the advantages and disadvantages of image capture formats and sizes.

Image Format

Most digital cameras allow for capture in JPEG and TIFF format and many of the newer cameras also include RAW format. Below is a brief description of each format and the advantages and disadvantages of each mode.

JPEG

This is the most popular mode used for image capture. JPEG format has the smallest file sizes out of the camera and high quality images that can be used for electronic and print purposes. Although, when a JPEG is saved by the camera and manipulated and saved at a later time an undetermined amount of data is permanently lost.

Capturing images in JPEG format has the following *advantages*:

- Small file size allows for maximum images to be stored on the camera's drive.
- Universal compatibility.
- High quality images.
- Saves quickly on camera drive.
- Images are ready to be used for electronic purposes.
- Ready for image processing.
- Does not require conversion software to be used; it can be used immediately straight out of the camera.

Capturing images in JPEG format has the following *disadvantages*:

- Due to the 'lossy' format of JPEG, image data is permanently discarded when compression is used.
- Opening, manipulating and saving a JPEG image file causes permanent data loss.
- Due to camera manipulation upon capture, JPEG quality can be lower than that of TIFF and RAW.

TIFF

Most digital cameras have the option to save images in TIFF mode. When you capture images in TIFF mode you lose very little, if any, image data, the image quality is very high but the file size limits the numbers of images you can capture at one time and the camera's processing time for each image can be high.

Capturing images in TIFF format has the following *advantages*:

- Very high image quality.
- Compatibility with the print industry.
- Due to TIFF's 'lossless' format, it will not lose any image data when compressed using LZW.
- There is no image data loss when the image is manipulated and saved.
- The image does not require conversion software to be used; it can be used immediately straight out of the camera.

Capturing images in TIFF format has the following *disadvantages*:

- Large file size minimizes the number of images that can be stored on the camera's drive.
- The large file size out of the camera makes transfer times and storage requirements a consideration.
- Takes longer to process in the camera than with a JPEG.

RAW

Most high-end and newer cameras offer the option to capture images in RAW format. As the name suggests, images captured in RAW format are unaltered by the camera in any way. These images are in their purest form; the camera does not process the image as it is captured. RAW format is not an established format, each camera manufacturer has a proprietary RAW format, and the image file sizes can be very large.

Capturing images in RAW format has the following *advantages*:

- The image file is unprocessed by the camera with no image data manipulation or loss.
- The highest quality images when compared to JPEG and TIFF.
- Maintain control over the final image quality; the camera does not do any image processing.

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Capturing images in RAW format has the following *disadvantages*:

- The image file must be converted prior to printing.
- Image manipulation software must be used to convert the image into a compatible format i.e. TIFF. Adobe Photoshop, above 7.01, has this capability.
- The large file size out of the camera makes transfer times and store requirements a consideration.
- There is no standard for RAW image format; each camera OEM has their own proprietary RAW format.

Image Format: Conclusion

The choice for image format is subjective and depends on the camera equipment and the end use of the image. If the priority is image quality and file size and compatibility are less important then RAW format would be the best choice, with TIFF a close second. If the camera does not support RAW format and/or the priorities are download speed, file size, and compatibility then JPEG is the best choice. Because TIFF image files can be manipulated without losing data, a good approach is to capture the image in JPEG format and convert it immediately to TIFF before any image manipulation is done. By doing this, the highest image quality will be retained.

Image Size

Today's entry level digital cameras start at 3.0 megapixels and higher-end cameras start at 8.0 megapixels. As can be seen from the table below, images taken at 3.0 megapixels have a maximum size of 28.44 inches x 21.33 inches at 72 DPI, which can be used for electronic purposes, and 6.82 inches x 5.12 inches at 300 DPI, which can be used for print purposes. These image sizes are sufficient for the majority of the print catalog, electronic catalog and basic marketing uses in the Automotive Aftermarket today.

	JPG						TIFF (no compression)					
	Image Size: Pixels		Image Size: Inches		Image Size: MBs	DPI	Image Size: Pixels		Image Size: Inches		Image Size: MBs	DPI
	Width	Height	Width	Height			Width	Height	Width	Height		
3.0 Megapixels	2,048	1,536	28.44	21.33	1.24	72	2,048	1,536	6.83	5.12	9.23	300
							1,200	900	4.00	3.00	3.18	300
5.0 Megapixels	2,560	1,920	35.56	26.67	1.90	72	2,536	1,920	8.45	6.40	14.42	300
							1,200	900	4.00	3.00	3.18	300

The general rule of thumb is to divide the image capture size by 50% for an "acceptable" print image, divide by 30% for a "near continuous tone" print image, and divide by 25% for an "exquisite continuous tone" print image.

Image Processing

The methods, techniques, and equipment employed when capturing and processing part images are subjective and not within the scope of the Imaging Workgroup discussions. The quality of the final image depends on many factors working in unison. Although, the imaging specifications guidelines included in this document will have a positive affect on the overall quality of the image i.e. a white background and the removal of shadows. Image quality depends on;

- The equipment used; camera and lighting.
- Environmental control; lighting, product angles, shadows etc.
- Photography techniques.
- Postproduction image processing; color correction, background, levels etc.

Image Specifications

The Workgroup has developed image specifications for the following image types;

- Print and electronic catalog digital images.
- Print and electronic catalog line art images.
- AAIA's Internet Parts Ordering program images.

The tables below provide detailed specifications for each image type. These specifications have been accepted by most major trading partners although it is advisable to consult with your trading partner(s) prior to formatting images.

Print & Electronic Catalog Digital Image Specifications

All digital images to be used in print and electronic catalogs, on trading partner web sites or for marketing purposes should be formatted according to the following specifications;

Print and Electronic Catalog Image Specifications		Notes
Format:	TIFF	
Size:	5 inches X 5 inches or 1,500 pixels X 1,500 pixels @ 300 DPI	Maximum image height or width. The size of the image canvas is assigned by the longest side to allow for long or tall parts
Mode:	RGB or CMYK	Grayscale images are not acceptable. Images saved as RGB can have up to a 20% smaller file size (see table below)
Resolution:	300 DPI	High resolution for print and electronic purposes
Compression:	None or LZW	Images with LZW compression can have a 35% smaller file size
Image File Name:	Generated from the 'Image Delivery Data' file	The image file is associated to the part number and other attributes via the 'Image Delivery Data' file
Platform:	PC or Mac	Check with trading partner
White Space:	Between 5 and 15 pixels around the edge of the image	Does not apply to close-up images where only a section of the part is in the image
Background:	White	RGB: 255, 255, 255 unless the product is white; in this case background color, borders or shadowing can be used
Shadows:	Removed	Some shadows are acceptable when used to define a white part on a white background

Table Notes:

- Formatting the images as TIFF allows trading partners to open, manipulate and save the images for various uses without losing any image data (no quality loss).
- Formatting the images at 300 DPI allows the trading partner to size the images for most print and electronic catalog purposes.
- The above image specifications allow the 'receiver' of the images to create image files according to their needs as long as the image size does not exceed the equivalent of 5" by 5" at 300 DPI.
- Formatting the images as CMYK or RGB and compressed and uncompressed can affect the image file size considerably (see the table below);

Product Test: Brake Caliper, no background, 80% product / 20% white space, 300 DPI			
Image Size (inches: W X H)	Image Mode	Compression	Image Size (MB)
5" X 5"	CMYK	No	8.8
5" X 5"	RGB	No	6.6
5" X 5"	CMYK	Yes: LZW	6.3
5" X 5"	RGB	Yes: LZW	3.9
3" X 3"	CMYK	No	3.1
3" X 3"	RGB	No	2.3
3" X 3"	CMYK	Yes: LZW	2.4
3" X 3"	RGB	Yes: LZW	1.5

- The 'Image Name' should consist only of alphanumeric characters and hyphens; spaces and any other special characters should not be used. All image names must include the extension, i.e. tif.

Print & Electronic Catalog Line Art Image Specifications

All line art images that are being used in print catalogs, electronic catalogs, on trading partner web sites or for marketing purposes should be formatted according to the following specifications;

Print & Electronic Line Art Image Specifications		Notes
Format:	TIFF or EPS	
Size:	5 inches X 5 inches or 4,000 pixels X 4,000 pixels @ 800 DPI	Maximum image height or width. The size of the image canvas is assigned by the longest side to allow for long or tall parts
Mode:	Vector Black / White, Vector Color, Bitmap, Grayscale, or Color	
Resolution:	800 DPI	
Compression:	None or LZW	Images with LZW compression can have a 35% smaller file size (only applicable to TIFF)
Image File Name:	Generated from the 'Image Delivery Data' file	Image file is associated to the part number and other attributes via the 'Image Delivery Data' file
Platform:	PC or Mac	Check with trading partner
White Space:	Between 5 and 15 pixels around the edge of the image	Does not apply to close-up images where only a section of the part is in the image
Background:	White	RGB: 255, 255, 255
Scale:	Must be to scale	
General Quality	1) Proofed for artifacts and smears, 2) Corners, edges and lines must be sharp	

Table Notes:

- Formatting the images as TIFF or EPS at 800 DPI allows trading partners to size the images for most print and electronic catalog purposes.
- The 'Image Name' should consist only of alphanumeric characters and hyphens; spaces and any other special characters should not be used. All image names must include the extension, i.e. tif.
- The above image specifications allow the 'receiver' of the images to create image files according to their needs as long as the image size does not exceed the equivalent of 5" by 5" at 800 DPI.

Internet Parts Ordering (IPO) Image Specifications

All images that are used for AAIA's Internet Parts Ordering program should be formatted according to the following specifications;

Internet Parts Ordering Image Specifications		Notes
Format:	JPEG	
Size:	5.5 inches X 5.5 inches or 400 pixels X 400 pixels @ 72 DPI	Maximum image height or width. The size of the image canvas is assigned by the longest side to allow for long or tall parts
Mode:	RGB	Grayscale images are not acceptable
Resolution:	72 DPI	Low resolution for electronic purposes
Compression:	Hi-Quality	Hi-Quality should be used
Image File Name:	Generated from the 'Image Delivery Data' file	The image file is associated to the part number and other attributes via the 'Image Delivery Data' file
Platform:	PC or Mac	Check with your trading partner
White Space:	Between 5 and 15 pixels around the edge of the image	Does not apply to close-up images where only a section of the part is in the image
Background:	White	RGB: 255, 255, 255 unless the product is white; in this case background color, borders or shadowing can be used
Shadows:	Removed	Some shadows are acceptable when used to define a part on a white background

Table Notes:

- Internet Parts Ordering images are formatted as a low-resolution JPEG for electronic use only.
- The 'Image Name' should consist only of alphanumeric characters and hyphens; spaces and any other special characters should not be used. All image names must include the extension, i.e. tif.

Other Document Specifications

All other documents including; MSDS, installation instructions, technical bulletins, and reference drawings should be formatted as an Adobe PDF.

Image Naming Convention

All image files delivered to trading partners will be accompanied by the 'Image Data Delivery' file (see below). This file associates the image file name to the part number that the image represents making the actual name of the image file irrelevant; it can be named anything at all. The 'Image Name' should consist only of alphanumeric characters and hyphens with no spaces. All image names must include the extension, i.e. tif.

Image Data Delivery File

Images delivered to trading partners will be accompanied by a completed 'Image Data Delivery' file as seen in the table below. Each image file delivered will occupy a row in the table. Depending on the trading partner's requirements, all columns or specified columns may need to be completed. If a PIES file is accompanying the images then the 'Image Data Delivery' file may not be required; this will depend on the trading partner's requirements. All fields in the 'Image Data Delivery' file will be included in PIES 5.0.

Preferred format:

The preferred format for the 'Image Data Delivery' file is text with pipe/vertical bar delimiter; this is consistent with other AAIA technology group standards. The recommended alternative format is Excel. Check with your trading partner for their acceptable formats.

File Name	Part Number	Actual (A) / Representative (R)	Image View	Primary View	Image Style	Maintenance Type	Date Modified	Old Image Name
1234-Front-06-30-05.tif	1234	A	FRO	FRO	P01	A	June 30, 2005	Brake-1234-Fro-May-02.tif
1234-Top-06-30-05.tif	1234	A	TOP	FRO	P01	A	June 30, 2005	Brake-1234-Top-May-02.tif

Table Notes:

- **Image File Name:** Enter the name of the image file into this field. The 'Image Name' should consist only of alphanumeric characters and hyphens; spaces and any other special characters should not be used. All image names must include the extension, i.e. tif.
- **Part Number:** Enter the part number that the image file represents. It is important that the part number entered into this cell matches the part number that is being used by trading partners for other documents and standards i.e. PIES, ACES and price sheets. This part number should contain special characters used

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by the other documents and standards but should not include characters that do not match. Some trading partners may have additional requirements for this field.

- **Actual (A) / Representative (R):** Enter an 'A' into this field if the image is of the actual part or an 'R' if the image is a representative image. This follows the same format as PIES.
- **Image View:** Enter the name of the image view into this field. Only the views listed in PIES should be entered into this field unless an arrangement has been made with the trading partner.
- **Primary View:** If there are multiple views for a part number, enter the view that will be used as the primary view for the part. The purpose of the 'Primary View' field is to allow the trading partner to identify which image should be used as a 'feature' image; for example the first image that displays when the part is searched.
- **Image Style:** Enter the image type according to the format in PIES (IMAG Segment Codes table). Examples of 'Image Style' is; Technical Bulletin, Technical Drawings, Installation Instructions, Digital Image, Line Art, MSDS etc.
- **Maintenance Type:** Enter the code that applies to the image according to the following definitions:
 - 'A' should be used when the image is to be **added** to the trading partner's image repository / server / database
 - 'D' should be used when the image is to be **deleted** or **removed** from the trading partner's image repository / server / database
 - 'C' should be used when the image is to **replace** or change an existing image in the trading partner's image repository / server / database. The contents of the 'Old Image Name' field will be relevant when this maintenance type is used.
 - 'N' should be used when the image does not **change**; in other words the image record is to be ignored. This maintenance type should only be used only when a complete set of images is sent to the trading partner which includes images that need to be added, deleted and/or changed as well as images that do not need to be added, deleted or changed.
- **Date Modified:** Enter the date the image was modified. This will act as a date stamp for the image.
- **Old Image Name:** If the image is replacing an image that the trading partner already has (in other words it is a new updated image) enter the name of the old image in this field.

Image Distribution Method

The three methods of distributing images to trading partners are; **1)** on CD-ROM or DVD and sent to trading partners accompanied by a 'Image Data Delivery' file, **2)** by accessing the trading partner's web server; the location of the image / image folder URL would be obtained through a PIES file (the 'Image Data Delivery' file does not support a web server URL), or **3)** encoded in valid XML characters using BINHEX or BASE64 encoding and sent to trading partners in a PIES file. Trading partners may prefer one method over the other, accept either method or require the use of only one method; consult the trading partner accordingly.

1. **CD-ROM or DVD:** This method can be used when distributing small or large quantities of images to trading partners. The Imaging Workgroup recommends that when large quantities of image files are distributed, this method be used simply because method **3)** below will result in an unmanageably large file. For example, if 2,000 images are sent to trading partner A from image creator B encoded in an XML file the time to transfer the file would be unreasonable.

Note: When sending images to trading partners on CD-ROM or DVD it is important to separate the images into a logical folder or media structure based on brand or other important differentiating aspects. This will allow the trading partners to easily access the images they need.

2. **Access to trading partner's web server:** This method can be used when an 'image creator' (i.e. a manufacturer) provides trading partner (i.e. retailers / eCat providers) access to a server for the purpose of downloading specific images.
3. **BINHEX or BASE64 Encoded:** This method will work well when sending small quantities of image files to trading partners. The following are some examples of when you might use this method;
 - a. Sending a small number of image files for update with your trading partner.
 - b. Sending supporting image documents like MSDS sheets, and reference and installation drawings.

Line Art Images

Depending on the product line and trading partner, line art images may be required in addition to digital images. In general, digital images are required for all parts and line art images are only required for specific product lines. Because the list of part names that require line art images differs considerably between trading partners it is best to check with your trading partners for their specific requirements.

Representative Image Definition

A Representative Image is a digital image that is an “exact likeness” of a part number, but it is not captured from the actual part number being described. Thus, to the naked eye, a representative image appears identical to one or more part numbers. The following conditions must be satisfied in order to qualify as a representative image. If any of these conditions are not met, a separate image of each part number is required.

1. **Color:** The color of the part in the representative image must match the color of the actual parts exactly. The exception to this is if the representative image is accompanied by a color swatch. This color swatch can be a separate image file or as part of the representative image file. Text describing the color codes can also be included on the color swatch, positioned below each color i.e. 01 White, 02 Black etc.
2. **Shape:** The shape of the part in the representative image must match the shape of the actual parts exactly.
3. **Material:** The material of the part in the representative image must match the material of the actual parts exactly. The exception to this is if the representative image is accompanied by a material swatch. This material swatch can be a separate image file or as part of the representative image file. Text describing the material codes can also be included on the material swatch below each material sample i.e. 01 Smooth, 02 Ridged etc.
4. **Physical characteristics:** The human eye can not discern any physical characteristic differences between the representative image and the actual parts.
5. **Labels, stampings and part numbers:** If the labels, stampings and/or part numbers on the part in the representative image match the labels, stampings and/or part numbers of the actual parts exactly then they must not be removed from the representative image. If the color, shape, material and physical characteristics conditions (points 1-4 above) are met and the labels, stampings and/or part numbers on the part in the representative image are different than the labels, stampings and/or part numbers of the actual parts they must be removed from the representative image. Note: only remove the part attributes that are different; for example, if the labels and stampings are the same for all the actual parts that the representative image is representing but the part numbers are different on each actual part, remove only the part numbers from the representative image and do not remove the labels and stampings.

Acceptable Part Image View Definition

An acceptable image view of a part is an image view that displays the key physical characteristics of the part from the perspective of the persons who are viewing the image. The persons viewing the image should be able to clearly identify and determine that this image represents the right part satisfying their need and application. Specifically, an acceptable part image view should meet the following conditions;

1. **Key Part Features:** The image view or views of the part should clearly display the important features and physical attributes of the part or parts.
2. **Part Connectors:** If the part has connectors and these connectors are important for the viewer of the image to accurately determine whether the image represents the part they require, these connectors should be imaged at an angle offering the user a definitive view of the connectors so that they can confirm that the image represents the part they require.
3. **Installer / Fitment Views:** Image views of the part should be captured so that an installer can clearly see the features of the part that are important from the perspective of installing the part on a make / model / year vehicle.

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Below are several examples of parts and their image views as well as descriptions of why these image views are important. This will help illustrate an acceptable image view.

- **Part Example #1: Radiator**

Part Category	Image Style	Image View	Part Attribute Highlighted
Radiator	Photo - Primary	Front	Offers the viewer a full, wide angle straight-on view of the entire radiator positioned with the hose connector side up.
	Photo - Close Up	Left	Offers the viewer a close-up view showing one side of the radiator cooler tank with the hose connector side up.
	Photo - Close Up	Right	Offers the viewer a close-up view showing the other side of the radiator cooler tank with the hose connector side up.
	Photo - Close Up	Top	Offers the viewer a close-up view showing the upper hose connector.
	Photo - Close Up	Bottom	Offers the viewer a close-up view showing the lower hose connector.
	Photo - Close Up	Angle	Offers the viewer a close-up 3/4 angled view showing the opening of the fill neck.
	Photo - Out of package	Angle	Offers the viewer a close-up 3/4 angled view showing the opening of the drain.

▪ **Part Example #2: Compressor**

Part Category	Image Style	Image View	Part Attribute Highlighted
Compressor	Photo - Primary	Top	Offers the viewer a full wide 3/4 side / top view showing the entire compressor.
	Photo - Out of package	Connector	Offers the viewer a close-up view showing the terminals and indexing tabs of the electrical connector.
	Photo - Close Up	Connector	Offers the viewer a close-up view showing the hose connection ports.
	Photo - Close Up	Back	Offers the viewer a close-up view showing the back of the compressor with any mounting area details.
	Photo - Close Up	Front	Offers the viewer a close-up front view slightly angled showing the front of the compressor with mounting area details.
	Photo - Close Up	Side	Offers the viewer a close-up view showing the side of the compressor capturing the pulley groves and any mounting area details.

▪ **Part Example #3: Fuel Pump**

Part Category	Image Style	Image View	Part Attribute Highlighted
Fuel Pump	Photo - Primary	Top	Offers the viewer a full wide 3/4 side / top view showing the entire fuel pump.
	Photo - Close Up	Connector	Offers the viewer a close-up view showing the terminals and indexing tabs of the electrical connector.
	Photo - Out of package	Connector	Offers the viewer a close-up view showing the fuel line connector.
	Photo - Close Up	Top	Offers the viewer a close-up view showing the full top of the part.
	Photo - Close Up	Side	Offers the viewer a close-up view showing the full side view of the part.
	Photo - Out of package	Kit	Offers a view showing the part with additional component parts included with the package.

▪ **Part Example #4: Fuel Injector**

Part Category	Image Style	Image View	Part Attribute Highlighted
Fuel Injector	Photo - Primary	Top	Offers the viewer a full wide 3/4 side / top view showing the entire fuel injector.
	Photo - Close Up	Connector	Offers the viewer a close-up view showing the terminals and indexing tabs of the electrical connector.
	Photo - Close Up	Side	Offers the viewer a close-up view showing the full side view of the part.
	Photo - Close Up	Top	Offers the viewer a close-up view showing the top inlet end of the part.
	Photo - Close Up	Bottom	Offers the viewer a close-up view showing the bottom outlet nozzle end of the part.

▪ **Part Example #5: Alternator**

Part Category	Image Style	Image View	Part Attribute Highlighted
Alternator	Photo - Primary	Top	Offers the viewer a full wide 3/4 side / top view showing the entire alternator.
	Photo - Close Up	Connector	Offers the viewer a close-up view showing the terminals and indexing tabs of the electrical connector.
	Photo - Close Up	Front	Offers the viewer a close-up front view slightly angled showing the front of the part with mounting area details.
	Photo - Close Up	Back	Offers the viewer a close-up view showing the rear of the part with mounting area details.
	Photo - Close Up	Side	Offers the viewer a close-up view showing the side of the part capturing the pulley groves and mounting area details.

Image Management and Distribution

There are many aspects of image management and distribution that are important to all supply chain participants including;

- **Image library management:** This includes managing images by part number, trading partner, image views, date images captured, date images delivered, etc.
- **Image coverage management:** This includes managing images that have and have not been captured and delivered to trading partners.
- **Image delivery management:** This includes managing when and which images are delivered to trading partners.
- **Image delivery procedures:** This includes the procedures that retailers and electronic catalog providers establish for delivering images and image related data.
- **Supplier approval / reject procedures:** This includes the procedures established by trading partners for the approval and rejection of images.
- **Image update procedures:** This includes the procedures for sending replacement images to trading partners.

Although these issues and procedures are very important, for the most part they are managed between trading partners and therefore not within the scope of the Imaging Workgroup Best Practices Guidelines.

PIES: Image Information

The following sections provide detail on the changes to the imaging related sections in PIES that are a result of the Workgroup's recommendations included in this document. Due to the fact that the PIES committee is responsible for publishing formal changes to PIES, the details below may be different than what will be included in the latest version of PIES.

IMAG Segment ID Table

In PIES 5.0, the ***new*** 'IMAG Segment ID' table is represented below;

#	Field Name	Reg	Format	Example	Comment
M01	IMAG Segment ID	KM	ID4	"IMAG"	Image File Information Segment - A Loop of ITEM
M02	Maintenance Type	O	ID1	A	(A-Add, C-Change, D-Delete, N-No Change)
M05	Image Style	KM	ID3	LIN	Style Table - Images Only
M10	File Type	R	ID2/4	JPG	TIF, JPG, EPS, BMP, GIF, PNG
M15	Image Resolution - DPI	KO	ID3/4	72	72; 300; 600; 800; 1200
M20	Image Representation	R	ID1	A	A-Actual Product; R-Representative Of The Product
M25	File Size - Kilobytes	O	N1/10	600	
M40	Color Mode	O	ID3	RGB	PIES Color Mode Table
M45	Background	R	ID3	WHI	PIES Background Table
M50	Orientation View	R	ID3	TOP	PIES Orientation View Table
M55	Additional Orientation Info	O	AN1/48	30 DEGREES	User freeform
M60	Additional Details/Description	O	AN1/80		
M65	Image File Location	O	AN1/80		Location of current image record in file provided by supplier
M70	Image File Name	KM	AN1/80		Name of current image record in file provided by supplier
M72	Old Image File name	O	AN1/80		Name of previous image record
M73	Date Image Modified	O	D		Last date of addition or change

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M78	Manufacturer's Link to Image Object	O	AN1/2000		Manufacturer's Web page of image record
M80	Pixel Height	R	R1/6	2000	
M85	Pixel Width	R	R1/6	2000	
M87	Image File	O	AN1/infinity		Actual image file, encoded into valid XML characters
M88	Image File Encode Type	C	ID6	BASE64	BINHEX or BASE64 - Method used to encode image into valid XML characters
M90	Language Code	KO	ID2	EN	ISO Table 639-1 (defaults to HEAD record)

Notes:

- M10: The options for file type have changed to 3 character extension instead of 4 i.e. JPEG to JPG and TIFF to TIF. As well some file types have been removed and some have been added.
- M15: Instead of choosing between 'High' or 'Low' resolution the choice is now the image DPI; 72, 300, 600, 800, and 1,200.
- New to PIES 5.0: M65: The file path where the image is located on the CD-ROM or DVD. For example, if the image was in the root folder then you may put in a "/".
- New to PIES 5.0: M70: The actual image file i.e. 12345-Sept-05.tif.
- New to PIES 5.0: M72: The actual image file that the new image is replacing i.e. 12345-May-03.jpg.

In PIES 5.0, the following **changes** are to be made to the 'IMAG Segment ID' table;

#	Field Name	Reg	Format	Example	Comment
M01	IMAG Segment ID	KM	ID4	"IMAG"	Image File Information Segment - A Loop of ITEM
M10	File Type	R	ID2/4	JPG	File types changed in PIES 5.0: TIF, JPG, EPS, BMP, GIF, PNG
M15	Image Resolution	KO	ID3/4	High	Removed in PIES 5.0
M15	Image Resolution - DPI	KO	ID3/4	72	Added to PIES 5.0 with the following DPI choices: 72; 300; 600; 800; 1200
M30	Files Sizes UOM	O	ID2	MB	Removed in PIES 5.0
M35	DPI	O	N1/9	72	Removed in PIES 5.0, see new M15 above

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M65	Image File Location	O	AN1/80		Added in PIES 5.0: Location of current image record in file provided by supplier
M70	Image File Name	KM	AN1/80		Added in PIES 5.0: Name of current image record in file provided by supplier
M72	Old Image File name	O	AN1/80		Added in PIES 5.0: Name of previous image record
M73	Date Image Modified	O	D		To be added in PIES 5.0: Last date of addition or change
M78	Manufacturer's Link to Image Object	O	AN1/2000		Added in PIES 5.0: Manufacturer's Web page of image record
M65	Location	O	AN1/80		Removed in PIES 5.0; see new M65 above
M70	Path	R	AN1/2000		Removed in PIES 5.0
M75	Page	O	AN1/80		Removed in PIES 5.0

Image Style Table

In PIES 5.0, the ***new*** 'Image Style' table is represented below;

IMAG Segment Codes	
Name	Description
Image Style	
Field(s)	M05
Source	PIES
Code	Description
LIN	Line Art
P01	Photo – Out of package
P02	Photo – In package
P03	Photo – Lifestyle
P04	Photo - Primary
P05	Photo - Close Up
P06	Photo - Mounted
THU	Thumbnail
ZZ1	User 1
ZZ2	User 2
ZZ3	User 3
ZZ4	User 4
ZZ5	User 5

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ZZ6	User 6
ZZ7	User 7
ZZ8	User 8
ZZ9	User 9

Notes:

- By expanding the 'Image Style' table more combinations of image style / image views are possible as per the following examples;
 - Image Style: Photo – Close Up; Image View: Front
 - Image Style: Photo – Close Up; Image View: Connector
 - Image Style: Photo – Mounted; Image View: Side
- ZZ1 through ZZ9 are to be used for image styles that are not listed in the 'Image Style' table; this allows trading partners to agree to and accept image styles not defined in PIES.

In PIES 5.0, the following **changes** are to be made to the 'Image Style' table;

IMAG Segment Codes		
Name	Image Style	
Field(s)	M05	
Source	PIES	
Code	Description	Notes
P01	Photo – Out of package	Description changed in PIES 5.0
P02	Photo – In package	Description changed in PIES 5.0
P03	Photo – Lifestyle	Description changed in PIES 5.0
P04	Photo - Primary	Added in PIES 5.0
P05	Photo - Close Up	Added in PIES 5.0
P06	Photo - Mounted	Added in PIES 5.0
P07	Photo - Unmounted	Added in PIES 5.0
BUL	Technical Bulletin	Moved to LINK Codes Table in PIES 5.0
BRO	Brochure URL	Moved to LINK Codes Table in PIES 5.0
DRW	Technical Drawing	Moved to LINK Codes Table in PIES 5.0
FED	Full Engineering Drawing	Moved to LINK Codes Table in PIES 5.0
INS	Installation Instructions	Moved to LINK Codes Table in PIES 5.0
MSD	Material Safety Data Sheet	Moved to LINK Codes Table in PIES 5.0
OEM	OEM Filename	Moved to LINK Codes Table in PIES 5.0
PAL	Pallet Configuration Drawing	Moved to LINK Codes Table in PIES 5.0
PC1	Planogram Consumer Pack 1	Moved to LINK Codes Table in PIES 5.0
PC2	Planogram Consumer Pack 2	Moved to LINK Codes Table in PIES 5.0

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PC3	Planogram Consumer Pack 3	Moved to LINK Codes Table in PIES 5.0
PI1	Planogram Inner Pack 1	Moved to LINK Codes Table in PIES 5.0
PI2	Planogram Inner Pack 2	Moved to LINK Codes Table in PIES 5.0
PI3	Planogram Inner Pack 3	Moved to LINK Codes Table in PIES 5.0
PP1	Planogram Case Pack 1	Moved to LINK Codes Table in PIES 5.0
PP2	Planogram Case Pack 2	Moved to LINK Codes Table in PIES 5.0
PP3	Planogram Case Pack 3	Moved to LINK Codes Table in PIES 5.0
SPE	Specification Sheet	Moved to LINK Codes Table in PIES 5.0
TON	Tone Art	Removed in PIES 5.0

Image Orientation View Table

In PIES 5.0, the **new** 'Orientation View' table is represented below;

Name	Orientation View
Field(s)	M45
Source	PIES
Code	Description
ANG	Angle
BAC	Back
BOT	Bottom
CON	Connector
FRO	Front
KIT	Kit
LEF	Left
LIF	Lifestyle
NUL	Not Applicable
RIT	Right
SID	Side
TOP	Top
ZZ1	User 1
ZZ2	User 2
ZZ3	User 3
ZZ4	User 4
ZZ5	User 5
ZZ6	User 6
ZZ7	User 7
ZZ8	User 8
ZZ9	User 9

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Notes:

- ZZ1 through ZZ9 are to be used for image views that are not listed in the 'Orientation View' table; this allows trading partners to agree to and accept image views not defined in PIES.

In PIES 5.0, the following **changes** are to be made to the 'Orientation View' table;

Name	Orientation View	
Field(s)	M45	
Source	PIES	
Code	Description	Notes
ANG	Angle	Description changed from 'Angle View' to 'Angle' in PIES 5.0
CON	Connector	Added in PIES 5.0
KIT	Kit	Added in PIES 5.0
LEF	Left	Added in PIES 5.0
LIF	Lifestyle	Removed and moved to the 'Image Style' table
OTH	Other	Removed in PIES 5.0
RIT	Right	Added in PIES 5.0
ZZ1	User 1	Added in PIES 5.0
ZZ2	User 2	Added in PIES 5.0
ZZ3	User 3	Added in PIES 5.0
ZZ4	User 4	Added in PIES 5.0
ZZ5	User 5	Added in PIES 5.0
ZZ6	User 6	Added in PIES 5.0
ZZ7	User 7	Added in PIES 5.0
ZZ8	User 8	Added in PIES 5.0
ZZ9	User 9	Added in PIES 5.0

Color Mode Table

In PIES 5.0, the **new** 'Color Mode' table is represented below;

Name	Color Mode
Field(s)	M40
Source	PIES
Code	Description
RGB	RGB
CMY	CMYK

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GRA	Gray Scale
OTH	Other
WEB	Vector B/W
VEC	Vector Color
BIT	Bitmap

Notes:

- Additional 'Color Mode' options added to accommodate line art color modes.

In PIES 5.0, the following **changes** are to be made to the 'Color Mode' table;

Name	Color Mode	
Field(s)	M40	
Source	PIES	
Code	Description	Notes
WEB	Vector B/W	Added in PIES 5.0
VEC	Vector Color	Added in PIES 5.0
BIT	Bitmap	Added in PIES 5.0

LINK Segment ID Table

In PIES 5.0, the **new** 'LINK Segment ID' table is represented below;

#	Field Name	Reg	Format	Example	Comment
L01	LINK Segment ID	KM	ID4	"LINK"	Uniform Resource Location (URL) or File Reference Segment - A Loop of ITEM
L02	Maintenance Type	O	ID1	A	(A-Add, C-Change, D-Delete, N-No Change)
L04	Document Name	KM	AN1/80		Name of the current document as provided by supplier
L05	LINK Code	KM	ID3	PIC	PIES Link Code Table.
L10	File Type			PDF	PDF, TIF, DOC, JPG, EPS
L15	Document URL	E	AN1/2000		Manufacturer's Web page of document format
L20	Image File	O	AN1/Infinity		Actual image file, encoded into Valid XML characters

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L25	User File Encode Type	C	ID6	Base64	BINHEX or BASE64 - Method used to encode image into valid XML characters
L30	User Defined Application Name	O	AN1/256	PIC Front View	User-supplied data to modify, qualify, or describe purpose of URL
L35	Language Code	KO	ID2	EN	ISP Table 639-1 (defaults to head record)

Notes:

- New L10: This field has been changed in PIES 5.0 with the 'File Type' options of PDF, TIF, DOC, JPG and EPS.

In PIES 5.0, the following **changes** are to be made to the 'LINK Segment ID' table;

#	Field Name	Reg	Format	Example	Comment
L01	LINK Segment ID	KM	ID4	"LINK"	Uniform Resource Location (URL) or File Reference Segment - A Loop of ITEM
L04	Document Name	KM	AN1/80		Added in PIES 5.0: Name of current document as provided by supplier
L10	File Type	M	ID3	PDF	File types changed in PIES 5.0: PDF, JPG, DOC, TIF, EPS
L10	Location	O	AN1/80		Removed in PIES 5.0, see new L10
L15	Path	M	AN1/2000		Removed in PIES 5.0, see new L15
L20	Page	O	AN1/80		Removed in PIES 5.0, see new L20

LINK Segment Code Table

In PIES 5.0, the **new** 'LINK Segment Codes' table is represented below;

Field(s)	L05
Source	PIES
Code	Application
BRO	Brochure
BUL	Technical Bulletin
CRW	Certificate of Origin
DRW	Technical Drawing
FED	Full Engineering Drawing
INS	Installation Instructions
LIN	Line Art
MSD	Material Safety Data Sheet
OEM	OEM Filename
PAG	Link to Manufacturer Page
PAL	Pallet Configuration Drawing
GEN	Generic Image
SPE	Specification Sheet Filename
WAR	Warranty
PC1	Planogram Consumer Pack 1
PC2	Planogram Consumer Pack 2
PC3	Planogram Consumer Pack 3
PI1	Planogram Inner Pack 1
PI2	Planogram Inner Pack 2
PI3	Planogram Inner Pack 3
PP1	Planogram Case Pack 1
PP2	Planogram Case Pack 2
PP3	Planogram Case Pack 3
ZZ1	User 1
ZZ2	User 2
ZZ3	User 3
ZZ4	User 4
ZZ5	User 5
ZZ6	User 6
ZZ7	User 7
ZZ8	User 8
ZZ9	User 9

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In PIES 5.0, the following **changes** are to be made to the 'LINK Segment Codes' table;

LINK Segment Codes		
Name	LINK Code	
Field(s)	L05	
Source	PIES	
Code	Application	Notes
BRO	Brochure	Moved from IMAG Codes Table; no 'URL' in name
BUL	Technical Bulletin	Moved from IMAG Codes Table; no 'URL' in name
DRW	Technical Drawing	Moved from IMAG Codes Table; no 'URL' in name
FED	Full Engineering Drawing	Moved from IMAG Codes Table; no 'URL' in name
INS	Installation Instructions	Moved from IMAG Codes Table; no 'URL' in name
LIN	Line Art	No 'URL' in name
MSD	Material Safety Data Sheet	Moved from IMAG Codes Table; no 'MSDS' or 'URL' in name
OEM	OEM Filename	Moved from IMAG Codes Table
PAG	Link to Manufacturer Page	Added in PIES 5.0
PAL	Pallet Configuration Drawing	Moved from IMAG Codes Table; no 'URL' in name
GEN	Generic Image	Added in PIES 5.0
SPE	Specification Sheet Filename	Moved from IMAG Codes Table
WAR	Warranty	No 'URL' in name
PC1	Planogram Consumer Pack 1	Moved from IMAG Codes Table
PC2	Planogram Consumer Pack 2	Moved from IMAG Codes Table
PC3	Planogram Consumer Pack 3	Moved from IMAG Codes Table
PI1	Planogram Inner Pack 1	Moved from IMAG Codes Table
PI2	Planogram Inner Pack 2	Moved from IMAG Codes Table
PI3	Planogram Inner Pack 3	Moved from IMAG Codes Table
PP1	Planogram Case Pack 1	Moved from IMAG Codes Table
PP2	Planogram Case Pack 2	Moved from IMAG Codes Table
PP3	Planogram Case Pack 3	Moved from IMAG Codes Table

Image Protection, Copyright and Ownership

The issues regarding the protection, copyright and ownership of images as they are traded throughout the supply chain is a concern to both the creator of the images and the trading partner who is using the images. The main area of concern is the use of the images for electronic purposes; online catalogs, Extranets, and e-commerce sites. Images published online are vulnerable to misappropriation. The image creator (the supplier) requires an assurance that their images are being reasonably protected while in use by their trading partners against theft and misuse. The receivers of the images (the retailers and eCat providers) require the flexibility to use the images in various marketing capacities in order to maximize their ability to sell parts. The following are the Workgroup recommendations regarding image protection, copyright and ownership;

- **Image Protection:** This issue involves protecting the creator's images while they are in use by the trading partner for both print and electronic purposes.
 - **Image Watermarks:** The majority of retailers and eCat providers feel that watermarks are a distraction to the viewer of the image and should therefore not be used. Although, in certain cases trading partners will accept watermarked images. It is recommended that before watermarks are applied each trading partner's policy regarding this issue is reviewed.
 - **Intended Image Use:** All retailers and eCat providers are using the images for the purpose of selling more of the right parts to the right customers. The workgroup consensus is that the image receivers will protect the images electronically to the best of their ability and they will discontinue using the images if the image creator no longer supplies the parts that the images represent to the trading partner.
 - **Legal Agreements:** Some retailers and eCat providers are prepared to enter into legal agreements with the image creators addressing the use, protection, and ownership of the images. The image creators should check with their trading partners to discuss possible legal agreements that protect the image creator's asset (the images).
- **Ownership and Copyright:** This issue addresses the copyright and ownership of the images.
 - The issue of copyright and ownership involves determining whether or not the creator of the images owns the copyright to the images after they have been distributed to supply chain trading partners. In other words, does the copyright of the image transfer to the trading partner or is it retained by the image creator. The Workgroup's viewpoint is that ownership and copyright of the images is a legal issue between trading partners and therefore not within the scope of the Workgroup's discussions. Ultimately the ownership of and right to use an image will be governed by the agreement between the image creator and the trading partner.

Additions, Suggestions and Feedback Process

This document is the result of a collaborative effort between a diverse group of retailers, manufacturers, and electronic catalog and solution providers. Overtime, and as a result of feedback from the industry some of the recommendations in this guideline may be changed and updated. The Imaging Workgroup encourages as much feedback as possible from the Automotive Aftermarket. To provide feedback to the Imaging Workgroup follow the process below;

1. Contact an Imaging Workgroup member or a member of AAIA's Standards and Technology Committee by writing to technology@aftermarket.org.
2. Explain the issue(s) or make a recommendation(s).
3. The issue(s) or recommendation(s) will be brought up and discussed by the members of the Imaging Workgroup at regularly scheduled meetings.
4. The Imaging Workgroup will make a recommendation(s) which will be included in the next updated version of the Imaging Best Practices Guideline.
5. The recommendation(s) will be published by AAIA in the latest version of the guideline.