Federal DOT Light Requirements

Lens Codes

The following are the Federal Department of Transportation (DOT) approved code markings found on publicly available trailer lighting and reflectors. Based on the markings found on the lens or reflector, a light can or can not be used in required location or as a combination light and reflector. This information can be found in the Federal DOT guidelines, as well as the National Highway Traffic Safety Administration's (NHTSA) website. All information found here is to be used as *reference only* and remains the advisor's and student's responsibility to under the requirements for trailer DOT compliance.

On the lens of every DOT approved light and reflectors, one or more of the following markings will be found, along with a DOT and Society of Automotive Engineers (SAE) approval:

P2: CLEARANCE SIDEMARKER AND IDENTIFICATION LAMPS

This marking is currently used for both "over" 80 inch and "under" 80-inch vehicles. It has become the standard for vehicles under 80 inches, but government specifications (FMVSS-108) have never called out increased requirements for the smaller width. P2 is the minimum standard for clearance, side marker or identification lights.

*Example: This light is a standard 2" 10 diode LED light. It has the DOT P2 SAE ratings stamped at the bottom of the lens. This light **CAN** be used as a clearance, side marker, and/or identification light, but **CAN NOT** be used as a combination light and reflector.*

PC: COMBINATION MARKER AND CLEARANCE OR IDENTIFICATION FOR VEHICLES OVER 80 INCHES WIDE

To be used as a "combination" light, devices must be mounted on a 45° bevel at the corner of a vehicle. This allows Clearance and Marker functions to be "combined" in one light and eliminates the need for a second device. A PC light can always be used anywhere a P2 light would have been used, but the reverse is not true.

*Example: This light is a rectangle LED light. It has the DOT PC SAE ratings stamped at the bottom of the lens. This light **CAN** be used as a clearance, side marker, and/or identification light, but **CAN NOT** be used as a combination light and reflector.*

P3: CLEARANCE, SIDEMARKER OR IDENTIFICATION LIGHTS FOR USE ON VEHICLES OVER 80 INCHES WIDE

A P3 designated lamp has wider light outputs than a P2 rated lamp. It is legal wherever a P2 light would be used. Because the federal regulations (FMVSS-108) has yet to adopt P3, many manufacturers have not made lights to meet the standard.

*Example: This light is a standard .750" "bullet" light. It has the DOT P2 SAE ratings stamped at the bottom of the lens. This light **CAN** be used as a clearance, side marker, and/or identification light, but **CAN NOT** be used as a combination light and reflector.*

PC2/P2P3: COMBINATION MARKER AND CLEARANCE OR IDENTIFICATION LIGHTS USED ON A VEHICLE OVER 80 INCHES WIDE

PC2/P2P3 Lamps meet an increased angle output and are designed as combination lamps. When used as combination lamps, they must be mounted on a 45° beveled corner. Because the federal regulations (FMVSS-108) have yet to adopt P3, many manufacturers have not made lights to meet the standard.

*Example: This light is a standard 2" LED light. It has the DOT P2P3 SAE ratings stamped at the bottom of the lens. This light **CAN** be used as a clearance, side marker, and/or identification light, but **CAN NOT** be used as a combination light and reflector.*

A: Reflex Reflector- ***<u>ALL LIGHTS USED AS COMBINATION LIGHTS AND REFLECTORS MUST HAVE AN "A" RATING.</u>***

Based on the DOT, NHTSA, and Society of Automotive Engineers reflex reflectors have the characteristic of returning a substantial fraction of the incident light toward the source from which it originates regardless of the incident angle.

A reflector shall be:

(1) mounted at a height from 15 to 60 inches; and

(2) visible at night at all distances:

(A) from 100 to 600 feet when directly in front of lawful lower beams of headlamps.

(B) from 100 to 350 feet when directly in front of lawful upper beams of headlamps if the vehicle was manufactured or assembled before January 1, 1972.

Example: This light is a standard 2" LED light. It has the DOT AP2 SAE ratings stamped at the bottom of the lens. This light ***CAN*** *be used as a clearance, side marker, and/or identification light, and* ***CAN*** *be used as a combination light and reflector.*

Stop, Turn, Taillight Requirements

The T, S, and I markings are used in conjunction with the DOT, P, A, and SAE ratings to signify approval to be used as a Stop, Turn, and/or Taillight. The light ***MUST*** has the "A" rating to be used as combination light and reflector for the rear facing lights. The following requirements are taken from the Texas Transportation Code (TTC) Subchapter E: General Lights Requirements for Vehicles, sections 547.322-547.325. There are slight variations from the TTC to the Federal DOT and NHSTA codes, the information listed below has been modified to fit all required regulations.

I: Turn- Light displayed must be red or amber in color. Indicate the vehicle is braking. The I lens code must be present to use as a turn light. A turn signal lamp must be visible in normal sunlight at a distance of:

(1) at least 500 feet from the front and rear of the vehicle if the vehicle is at least 80 inches wide; and

(2) at least 300 feet from the front and rear of the vehicle if the vehicle is less than 80 inches wide. According to the TTC.

S: Stop- Light displayed must be red in color when the vehicle service brake is applied and indicate the vehicle is braking. The S lens code must be present to use as a brake light. The light must be visible from 300ft away in daylight driving conditions according to the TTC.

T: Tail- The T lens code must be present to use as a taillight. Taillamps shall be mounted on the rear of the vehicle at a height from 15 to 72 inches; and emit a red light plainly visible at a distance of 1,000 feet from the rear of the vehicle according to the TTC.

*Example: The light below is a 4" Stop, Turn, Tail 3 wire LED light that is commonly sold for this purpose. This light **DOES NOT** have the proper DOT IST SAE or "A" code stamped on the lens and **CAN NOT** be used according to federal DOT guidelines.*

*Example: The light below is a 4" Stop, Turn, Tail 3 wire LED light that is commonly sold for this purpose. This light **DOES** have the proper DOT IST SAE code stamped on the lens and **CAN** be used as a combination Stop, Turn , Taillight, but **DOES NOT** have the "A" code and **CAN NOT** be used as a combination light and reflector, according to federal DOT guidelines.*

*Example: The light below is a Common Stop, Turn, Tail 3 wire LED with side rear marker light that is commonly sold for this purpose. This light **DOES** have the proper DOT AIST SAE code stamped on the lens and **CAN** be used as a combination Stop, Turn , Taillight, and **DOES** have the "A" code and **CAN** be used as a combination light and reflector, according to federal DOT guidelines.*

TRAILERS: FEDERAL LIGHTING EQUIPMENT LOCATION REQUIREMENTS

IMPORTANT NOTE: Every lamp, reflex reflector, and conspicuity treatment (device) must be permanently attached in the location specified below and must comply with all applicable requirements prescribed for it by FMVSS/CMVSS 108. The face of any device on the front/rear and sides should be, respectively perpendicular and parallel to vehicle centerline, unless it is photometrically certified at installation angle. No part of the vehicle shall prevent any device from meeting its prescribed requirements unless an auxiliary device meeting all prescribed requirements is installed.

In Canada: Manufacturers and importers of vehicles must have the proper certification test records demonstrating compliance of lighting components with all prescribed requirements.

BASIC EQUIPMENT REQUIRED ON ALL TRAILERS

DESCRIPTION				MANDATORY REQUIREMENTS			
Area	**Equipment**	**(SAE Lens Coding)**	**Functional Purpose**	**Quantity**	**Color**	**Location**	**Height in from the ground**
1	**Tail Lamps**	(T)	Indicate vehicle's presence and width	Minimum 2	Red	On the rear - symmetrical - as far apart as practicable	15-72
	Stop Lamps	(S)	Indicate braking	Minimum 2	Red	On the rear - symmetrical - as far apart as practicable	15-72
	Rear Turn Signal Lamps	(I)	Indicate direction of turn	Minimum 2	Red or Yellow	On the rear - symmetrical - as far apart as practicable	15-83
	Rear Reflex Reflectors	(A)	Indicate vehicle's presence and width	Minimum 2	Red	On the rear - symmetrical - as far apart as practicable- facing rearward	15-60
2	**License Plate Lamp(s)**	(L)	Illuminates license plate	Minimum 1	White	On the rear - above or at the sides of license plate	No requirement

3	**Rear Side Marker Lamps**	(P2,PC* or P3, PC2*) **photometrically certified at installation angle*		Minimum 2	Red	Each side at rear - as far back as practicable	15-60". No max. for vehicle under 80" wide
	Rear Side Reflex Reflectors	(A)	Front and rear side marker lamps / side reflex reflectors indicate vehicle's presence and length	Minimum 2	Red	Each side at rear - as far back as practicable facing sideward	15-60
4a	**Front Side Marker Lamps**	(P2, PC* or P3, PC2*) ** photometrically certified at installation angle*		Minimum 2	Yellow	Each side at front - as far forward as practicable	15" minimum
4b	**Front Side Reflex Reflectors**	(A)		Minimum 2	Yellow	Each side at front - as far forward as practicable facing sideward	15-60

ADDITIONAL EQUIPMENT FOR TRAILERS EXCEEDING THE FOLLOWING PARAMETERS

30 ft. OR LONGER

DESCRIPTION				MANDATORY REQUIREMENTS			
Area	**Equipment**	**(SAE Lens Coding)**	**Functional Purpose**	**Quantity**	**Color**	**Location**	**Height in. from the ground**
5a	**Intermediate Side Marker Lamps**	(P2 or P3)	Indicate presence of a long vehicle	Minimum 2	Yellow	Each side near center - facing sideward	15" minimum
5b	**Intermediate Side Reflex Reflectors**	(A)	Indicate presence of a long vehicle	Minimum 2	Yellow	Each side near center - facing sideward	15-60

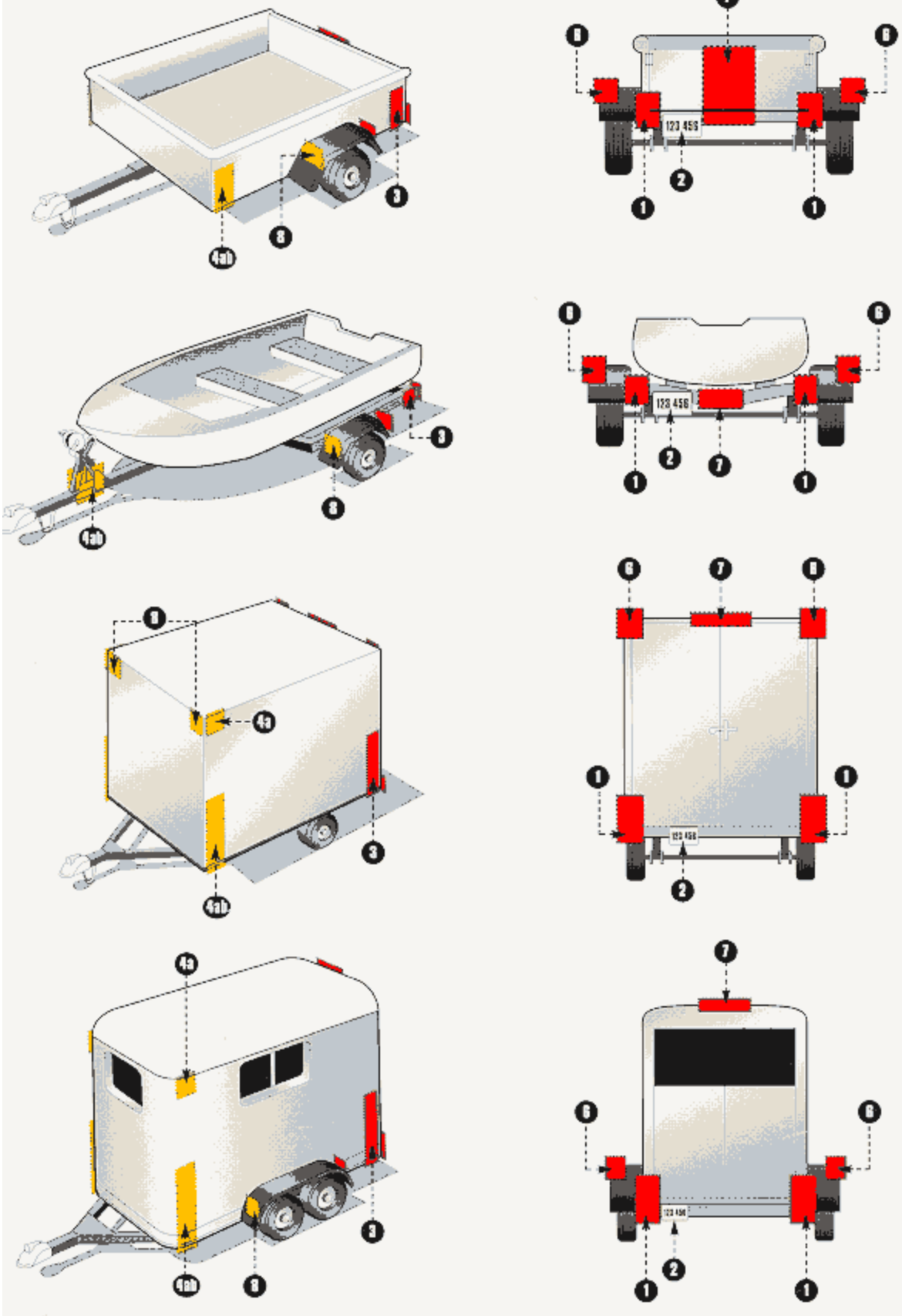
80 in. OR WIDER

DESCRIPTION				MANDATORY REQUIREMENTS			
Area	**Equipment**	**(SAE Lens Coding)**	**Functional Purpose**	**Quantity**	**Color**	**Location**	**Height**
6	**Rear Clearance Lamps**	(P2, PC*or P3, PC2*) ** photometrically certified at installation angle*	Show vehicle's width - MAY NOT be	Minimum 2	Red	At widest point - symmetrical - on the rear or near the rear - facing rearward	As high as practicable - may be lower only if ID lamps are at the top

			combined with tail lamps				
7	**Rear Identification Lamps**	(P2 or P3)	Indicate presence of a wide vehicle	Exactly 3	Red	On the rear - center, facing rearward - horizontally spaced 6 in. to 12 in. apart	as high as practicable
8	**Front Clearance Lamps**	(P2, PC*or P3, PC2*) ** photometrically certified at installation angle*	Show vehicle's width	Minimum 2	Yellow	At widest point - symmetrical - as far forward as practicable - facing forward	As high as practicable

80 in. OR WIDER ***AND*** GVWR 10,000 lb. OR MORE

DESCRIPTION		**MANDATORY REQUIREMENTS**					
Area	**Conspicuity Treatment**	**DOT Coding**	**Quantity**	**Color**	**Location**	**Height**	**OPTIONS**
9	**Rear Upper Body Marking**	DOT-C, DOT-C2, DOT-C3, or DOT-C4	Exactly 2 pairs of 300mm long strips	White	On the rear upper corners - facing rearward	At the top	Reflex reflectors may not be required if they are replaced, in their required location, with conspicuity treatment Rear lower body and side conspicuity treatment may also be solid white, solid yellow, or white and yellow.
10	**Bumper Bar Marking**		Continuous	Red/White	On the rear bumper bar's horizontal element - full width - facing rearward	No requirement	
11	**Rear Lower Body Marking**		Continuous	Red/White *see options*	On the rear - full width of the vehicle - facing rearward	As horizontal as practicable and as close as practicable to the range of 375 to 1525 mm from the ground	
12	**Side Marking**		*see location*	Red/White *see options*	Each side - facing sideward - continuous, or evenly spaced over minimum of 50% of length, starts and ends as close to the front and rear or vehicle as practicable	As horizontal as practicable and as close as practicable to the range of 375 to 1525 mm from the ground	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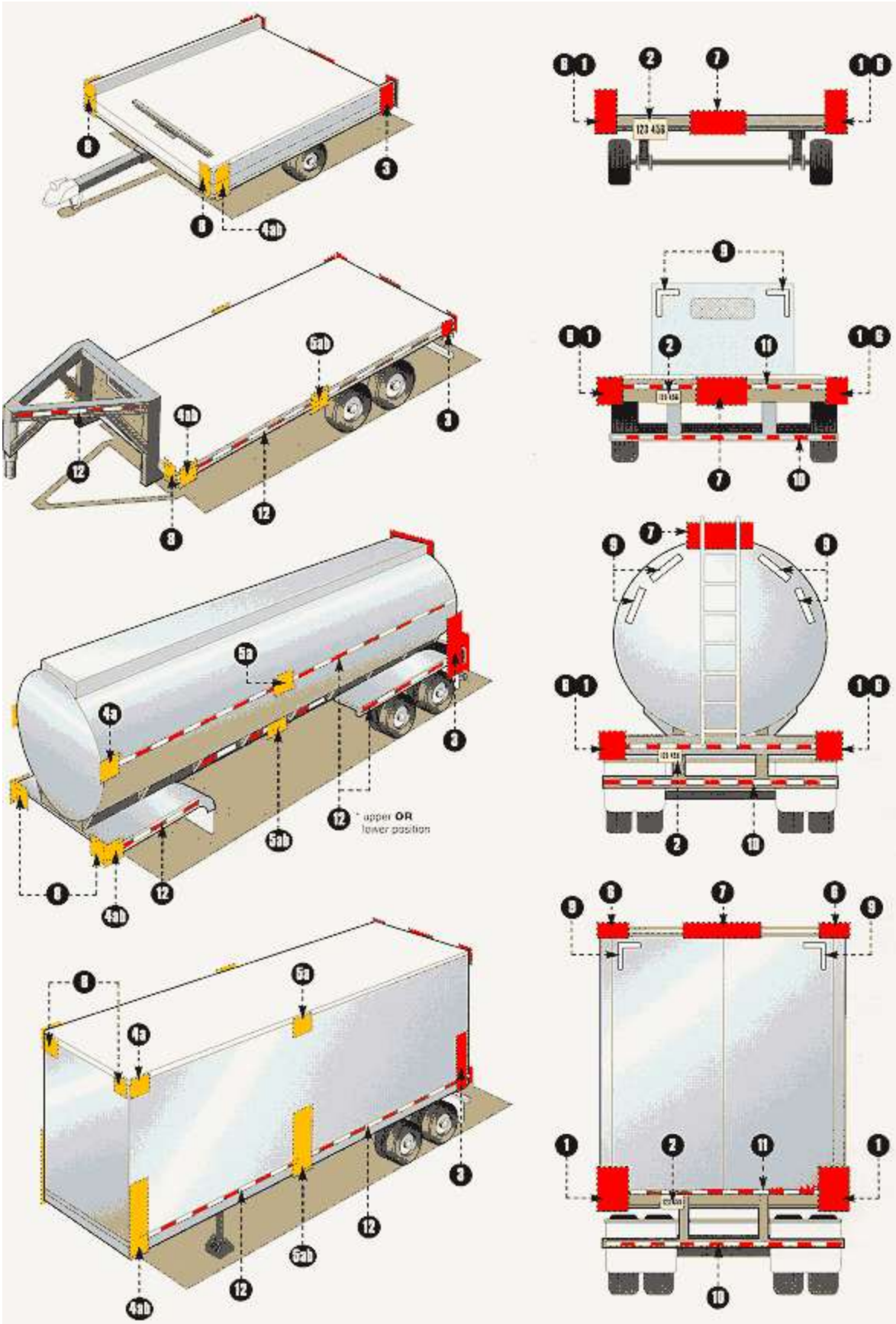
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