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# CHAPTER 3 – Vehicle Qualification and Inspection

## 300 General

This chapter discusses hauling equipment and vehicles operated at extralegal weight on the State Highway System. It covers allowable axle loading groups, selection of hauling equipment, close coupling, suspension systems, steering requirements, vehicle inspection requirements for hauling equipment, fixed vehicles, and cranes. It also covers equipment reviews and special hauling equipment topics.

An overweight transportation permit is required for the movement of any vehicle that exceeds the allowable weights authorized in Division 15 of the California Vehicle Code (CVC). Generally, a transportation permit is required if 1) the weight imposed upon the roadway by the wheels on any single axle, including the front steering axle referenced in CVC 35550(a), exceeds 20,000 pounds; 2) when the gross weight upon any group of axles exceeds the legal weight referenced in CVC 35551(a).

Sections of road that include load posted bridges (signed for load restriction) will not be available for the movement of extralegal weight vehicles and/or loads. The movement of extralegal weight vehicles and vehicle combinations will be reviewed based on the orange, green, and purple weight charts and the load rating capacity of the structure on the proposed route.

For discussion and explanation of bridge rating and vehicle classification, see Chapter 5 (Sections 500.1, 500.2, 500.3).

## 301 Non-Weight Applications

Permit vehicle inspections are not generally required for vehicles or vehicle combinations described on non-weight applications except those required in Section 303 of this chapter.

Extralegal size vehicles shall not be used except when the load justifies their use.

The application shall be reviewed for reducibility before issuing a permit authorizing the use of an extralegal size vehicle.

## 302 Extralegal Weight Applications

Extralegal weight is not authorized on any motor vehicle or semitrailer with a fixed-load that has equipment or features that can be reasonably reduced to a lesser size or weight, unless permitted elsewhere in this manual.

Extralegal size vehicles shall not be used except when the load justifies their use. Extralegal weight applications are authorized only when the hauling equipment meets certain requirements. Discussed below are the pertinent design characteristics needed.

### **302.1 Minimum Vehicle Size**

In order to qualify for extralegal weight, the minimum hauling configuration shall consist of a two-vehicle combination, including a three (3) axle tractor and a two (2) axle semitrailer with a 5th wheel connection. Vehicles with pintle hook connections do not qualify for extralegal weight.

- The vehicle shall be equipped with dual tires on all axles except the steering axle.
- Super single tires of a minimum size of 18” x 19.5” are an acceptable substitute for dual tires. The metric equivalent cross section width of 445mm is also acceptable. Tires marked by the manufacturer with a 17.5” cross section width will be treated as 18” tires.

When the vehicle is equipped with super single tires, only non-bonus weight is authorized in the axle loading group.

Extralegal weight is not authorized on a single axle unless that axle is a front steering axle or is used in combination with adjacent axles to make one commonly suspended axle group.

Extralegal weight is authorized on a single vehicle only when that vehicle is a fixed load vehicle and the equipment mounted on that vehicle is used to perform a single job site function.

### **302.2 Selection of Hauling Equipment**

Applications shall be reviewed for appropriate hauling equipment. The load shall justify the size of hauling equipment, i.e., 5-axle vs 7-axle etc., except that the permittee, at his option, may use either a 5-axle purple or a 7-axle green combination on a 5-axle purple route.

Non-qualifying vehicles may also be issued a transportation permit when one leg of a move involves the movement of a qualifying load. See Chapter 1, Section 111 for further details.

### 302.3 Close Coupling

Permit weight is authorized on groups of axles and not for gross weight. When these groups are properly spaced, the maximum chart weight for orange, green, or purple is authorized on each group. However, when the spacing between adjacent groups of axles reduces to a certain point, the combined weight of both axle groups may overstress pavement and structures. This situation is called “Close Coupling.”

When evaluating groups of axles to determine if a “close coupling” situation exists, the distance between two groups as well as the axle spacing within the groups shall be considered. “Close coupling” exists when two axles of the first group are less than 18’1” from the closest axle of the adjacent group(s). Refer to Figure A and B below, TPM Appendix 6 Close Coupled Calculations.

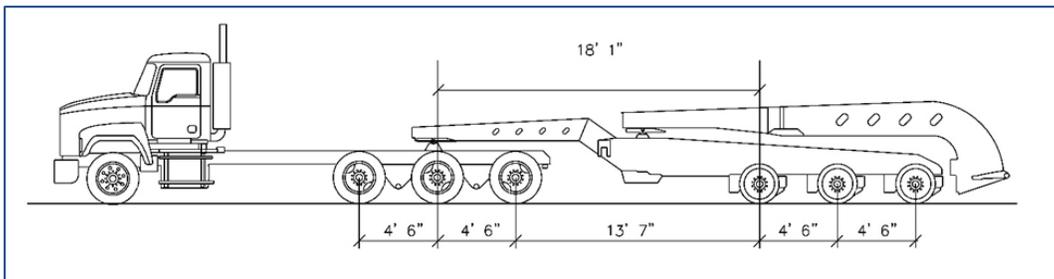


Figure A. The tractor and the jeep are not close coupled. The two closest tractor drive axles are at least 18’1” from the closest jeep axle. The same is true for rear tractor axle and two closest jeep axles.

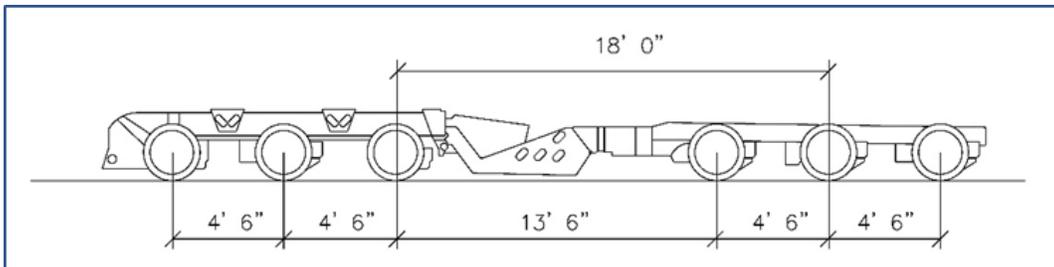


Figure B. The trailer and the Mechanical Distribution Unit (MDU) are close coupled. The closest trailer axle is not at least 18’1” from the two closest MDU axles. The same is true for the two rear trailer axles and the closest MDU axle.

### **302.4 Suspension Systems**

Vehicles operating at extralegal weight shall be equipped with acceptable suspension systems.

All axles within the same suspension group shall have a common suspension system that naturally divides weight between all axles equally and equitably, both statically and dynamically, under all loading conditions without any influence from an outside source. Mixed suspension on any axle in an axle loading group makes the vehicle ineligible for extralegal weight.

Air bag suspension systems are required to have a common air supply to all bags without any valving or quick disconnects to alter the natural flow of air between bags. Left to right leveling valves are allowed.

Vehicles equipped with an air or hydraulic operated booster axle system do not qualify for extralegal weight.

Front steering axles of self-propelled vehicles that incorporate tandem or tridem axles and that do not exceed GREEN weight are not required to have common suspension, but the weight carried shall be equitably distributed between the two axles.

Fixed load motor vehicles such as construction equipment, i.e., scrapers and loaders, not having suspension systems between the axles and frame, may only be incidentally operated on non-freeway portions of State highways with posted speed limits of 50 MPH or less and for a maximum distance not to exceed 25 miles. In all other circumstances, these units shall be transported as a load.

Suspension systems that incorporate the use of shims and/or air or hydraulic devices, or manual air pressure regulators, that alters the natural weight distribution between axles in a loading group are not acceptable.

Exception for Rotator-Type Tow Trucks:

Rotator-type tow trucks bought and first registered in California prior to May 1, 2000 are allowed to have “Purple” weight on a mixed suspension system provided the following conditions are met:

- 1) The tow truck is equipped with reliable on-board scales indicating the gross weight on the axle loading group,

- 2) Each axle within the axle group carries no more than 10% additional weight than any other axle in the axle group,
- 3) The tow truck operates within a 100-mile radius of the tow yard as noted on the face of the permit.

## **302.5 Allowable Axle Weight**

### **302.5.1 Minimum Axle Width for Extralegal Weight**

Axle width shall be a minimum of 96 inches to qualify for extralegal weight. The maximum axle width is measured from the extreme width of the axle or tire on the left side to the extreme width of the axle or tire of the same axle on the right side. Do not measure the load-induced tire bulge. Dimensions shall be noted in feet and inches, rounded to the nearest whole inch.

### **302.5.2 Single Front Steering Axle**

Single steering axle, referenced in CVC 35550(a), shall be limited to 20,000 pounds (legal weight) unless additional weight is requested and the applicant provides sufficient proof that the vehicle has been modified or equipped with an axle of a rating equivalent to or greater than the weight requested. Additionally, the axle shall have adequate tires to carry the weight requested. The maximum permissible weight on a single steering axle is limited to one-half of the allowable weight on tandem drive axles, or one-third the weight allowed on tridem drive axles.

### **302.5.3 Dual Front Steering Axles**

Standard weight charts will be used for determining maximum allowable weight provided there is equipment capacity equivalent to or greater than the weight requested. Refer to Appendix 20, Weight Chart Plate 25-4 and 25-5.

### **302.5.4 Axle Loading Group**

An “axle loading group” is defined as all axles within 18’0” axle bridge regardless of whether they use a common suspension system or not.

The maximum allowable weight for the loading group is that weight which corresponds to the respective axle spacing in the standard weight charts. A set of tandem axles with spacing between axles of less than 3’6” is considered a single axle.

The maximum allowable weight for any tandem, whether or not it is used in combination with other axle groups in the same suspension system – shall not exceed the following:

	Unbonused	Bonused
Orange	40,000 lbs	42,000 lbs
Green	48,000 lbs	52,000 lbs
Purple	56,000 lbs	60,000 lbs

These weights are derived from the maximum single axle weight of 26,000 lbs green and 30,000 lbs purple. Tridem axles are allowed chart weight for the given axle spread.

Single axles are not allowed extralegal weight unless they are used in conjunction with a tandem or tridem axle group, using a common suspension system between both groups or if they are front steering axles. Single axles used in this configuration shall be allowed a proportionate share of the multi-axle group with a  $\pm 10\%$  tolerance, but not to exceed the following:

	Unbonused Single Axle	Bonused Single Axle
Orange	20,000 lbs	21,000 lbs
Green	24,000 lbs	26,000 lbs
Purple	28,000 lbs	30,000 lbs

Allowable axle group weight when mixing bonus axles with unbonused axles is discussed in Appendix 6, Close Coupled Calculations.

### 302.5.5 Trunnion Axles Bonus Weight

Eight tire axles shall be a minimum of 96 inches wide in order to qualify for the 15 percent bonus and 120 inches wide to qualify for the 25 percent bonus. All tires per axle must be of equal size. Tires must have capacity for the weight requested.

### 302.5.6 Lift Axles

Lift axles are acceptable for extralegal weight if they meet these two simple tests:

- 1) The lift axle loading group shall have common suspension; and 2) all axles in the

loading group shall meet the +/- 10% equal weight distribution requirement. The lift axle controls shall be located outside the cab and inaccessible to the driver while driving.

#### Test 1: Common Suspension Requirement

All axles within an axle loading group shall have the same suspension system. Mixed suspension on any axle in an axle loading group makes the vehicle ineligible for extralegal weight.

#### Test 2: Equal Weight Distribution Requirement

Each axle in an axle loading group shall carry an equal share of the axle loading group weight within plus or minus ten percent of (+/-10%) of the average weight per axle in the loading group.

Note: A lifting device that raises an axle for backing is acceptable as long as its function does not interfere with the equal weight distribution requirement.

#### Special Provisions for Tow Trucks

Extralegal “Green” weight is available for tow trucks equipped with acceptable lift axles. Extralegal “Purple” weight is available for tow trucks with acceptable lift axles when equipped with reliable on-board scales indicating the gross weight on the axle loading group.

#### **302.5.7 Tridem Bonus Weight**

For tridem groups to qualify for bonus weight, the axle group(s) must comply with the following:

- No more than two (2) bonus weight tridem groups per vehicle combination.
- Minimum spacing between the bonus tridem groups is 25’0” or greater, measured from the center of the last axle to center of the first axle of the next tridem axle group.
- Be inspected laden if the vehicle combination contains a mechanical distribution unit.
- Not be close coupled.
- Measured no less than 8’0” and no greater than 10’4” from the center of the first axle to the center of the last axle within the same tridem group.

- Minimum of four (4) tires per axle.
- Minimum axle width of 8’0”, measured from extreme width of the axle or tire on the left side to the extreme width of the axle or tire of the same axle on the right side, not including the load induced tire bulge.
- Not be a crane.

Tridem\* qualifying under this policy shall be routed as follows:

- 5 axle – One (1) tridem group in a combination (i.e. 3 axle tractor 3 axle trailer).
- 7 axle – Two (2) tridem groups in a combination (i.e. 4 axle tractor 3 axle trailer).
- 9 axle – Two (2) tridem groups in a 3-vehicle combination.
- 11 axle – Two (2) tridem groups in a 4-vehicle combination.

\*Note: Mechanical Distribution Units (MDUs), i.e. 3+3, 3+2, 3+1, will be considered as one (1) vehicle for routing purposes.

The weight chart below shall be used for assignment of Tridem Bonus GREEN group weight.

Note: Weights are drawn from 8’0” wide, 8 tires per axle line of Weight Chart Plate 25-4.

Ft/In	0	1	2	3	4	5	6	7	8	9	10	11
8	50,232	50,319	50,406	50,494	50,581	50,668	50,755	50,842	50,930	51,017	51,104	51,191
9	51,279	51,366	51,453	51,540	51,627	51,715	51,802	51,889	51,976	52,000	52,000	52,000
10	52,000	52,000	52,000	52,000	52,000							

The weight chart below shall be used for assignment of Tridem Bonus PURPLE group weight.

Note: Weights are drawn from 8’0” wide, 8 tires per axle line of Weight Chart Plate 25-5.

Ft/In	0	1	2	3	4	5	6	7	8	9	10	11
8	57,960	58,061	58,161	58,262	58,363	58,463	58,564	58,664	58,765	58,866	58,966	59,067
9	59,168	59,268	59,369	59,469	59,570	59,671	59,771	59,872	59,973	60,000	60,000	60,000
10	60,000	60,000	60,000	60,000	60,000							

### **302.5.8 Tridems Bonus Weight – Equal Axle Weight Distribution for Hauled Vehicles**

This policy only applies to hauled vehicles (i.e. three (3) or more vehicle combinations with jeeps, dollies, etc...). Hauled vehicles with qualified Bonus GREEN tridem axle groups may be allowed to redistribute weight between adjacent straight GREEN tridem groups. Hauled vehicles with qualified Bonus PURPLE tridem axles groups may be allowed to redistribute weight between adjacent straight PURPLE tridem groups. Requests for equal weight distribution for tridem groups that are not close coupled shall comply with the following:

- No more than two (2) Bonus weight tridem groups per vehicle combination, regardless of the number of axles.
- Minimum spacing between the Bonus tridem groups is 25'0", measured from the center of the last axle to center of the first axle of the next tridem group.
- Measured no less than 8'0" and no greater than 10'4" from the center of the first axle to the center of the last axle within the same tridem group.
- Minimum of four (4) tires per axle.
- Minimum axle width of 8'0", measured from extreme width of the axle or tire on the left side to the extreme width of the axle or tire of the same axle on the right side, not including the load induced tire bulge.
- Not be a crane.
- Only Bonus tridem groups are allowed to split or redistribute weight with an adjacent tridem group.
- Tridem groups must not be close coupled.
- Maximum of two (2) split tridem groups.
- Equal weight distribution for GREEN weight is allowed only between a qualified Bonus GREEN tridem weight group and an adjacent straight GREEN tridem weight group.

- Equal weight distribution for PURPLE weight is allowed only between a qualified Bonus PURPLE tridem weight group and an adjacent straight PURPLE tridem weight group.
- Tridem groups are only allowed equal split weight (50/50 distribution) from the combined total weights.
- Weight shall be determined and is limited to equipment capacity.
- Redistributed weights must be shown on the inspection report.

Equal weight distribution policy will only be allowed with a valid inspection report. Customers must request for equal weight distribution of tridem axles at the time of vehicle inspection. For previously inspected equipment, the Department may reinspect the vehicle and issue a revised inspection report. The customer shall contact the Caltrans vehicle inspector to request a revised inspection report.

See examples of equal weight distribution in Appendix of this manual.

### **302.5.9 Minimum Axle Width for Tractor Drive Axles**

- Axle width shall be a minimum of 96 inches to qualify for extralegal weight. The maximum axle width is measured from the extreme width of the axle or tire on the left side to the extreme width of the axle or tire of the same axle on the right side. Do not measure load induced tire bulge. Actual measurements are required, no “rounding-off”.
- Axle width for Tractor Drive Axles equipped with New Generation Wide Base Single (NGWBS) tires shall be a minimum of 92 inches to qualify for extralegal straight GREEN and straight PURPLE weights.
- Weight Chart Plates 25-4 and 25-5 shall be used for assignment of Tractor Drive Axles equipped with NGWBS tires. Weights are drawn from 8’-0” wide, 4 tires per axle line, and are limited to equipment capacity.
- For all vehicles equipped with NGWBS tires, the provisions for single wide type tires apply.

### **302.6 Fixed in-line Axles**

Extralegal weight is not authorized on fixed in lines axles, non-steering axles that are mounted on a common frame (non-articulating), when the axle bridge dimension from

the first to last axle exceeds 10'-4". This generally occurs on mechanical distribution systems, platform trailers and at times when secondary axle(s) are placed under the load deck of a semitrailer.

### **302.7 Tandem Axle Semitrailer**

Extralegal axle weight is authorized on tandem axle semitrailers that do not exceed an 8'0" spacing between axles. Axle spreads greater than 8'0" apart are considered two single axles, and are limited to the axle weights allowed in the California Vehicle Code. Combinations that use a tandem axle semitrailer with spreads greater than 8'0" between axles are allowed maximum chart weight on the drive axles of the truck tractor only.

### **302.8 Tire Capacity**

Extralegal weight is not authorized on any axle unless that axle is equipped with tires of a total capacity equal to or greater than the weight requested. The tire with the least capacity shall be used to determine axle weight if equipped with tires of different rating capacity.

Movement at reduced speed to qualify for greater weight authorized by Title 13, Article 14 of the California Administrative Code may be permitted.

## **303 Virtual Vehicle Inspection**

Virtual Vehicle Inspections are performed to record data and evaluate the acceptability of extralegal vehicles. A record is provided for the convenience of the owner and used by the Department when appropriate on permit applications. Inspections will be required for the following cases:

- Four-axle power units
- Power units that exceed 20,000 pounds on the steering axle
- Fixed-load vehicles including crane, self-propelled and trailer-mounted
- Heavy haul combinations routed as 9-axles or more
- Vehicles with mechanical distribution units (MDU)
- Vehicle combinations where there is reason to believe a weight distribution problem or a dimensional inconsistency exists

- Boat trailers that require extralegal weight

Note: Inspection reports are valid for the life of the vehicle. However, any change in ownership or a change in configuration/or modification to the vehicle will require a re-inspection.

Caltrans Transportation Permits Program utilizes virtual inspections in lieu of field inspections. The Permit Program has developed seven vehicle inspection report forms (using pdf format) to accommodate various vehicles, including crane, heavy haul, self-propelled vehicle, tow truck, tractor, trailer-mounted fixed load, and heavy haul dual lane. Whenever an inspection report is requested, Caltrans staff will provide the appropriate inspection report via email to the customer to fill out. If the vehicle falls outside the seven categories, the vehicle may require an equipment review.

Completed vehicle inspection information, which includes all the required documents, will then be sent back electronically for Caltrans Permit Vehicle Inspector (PVI) approval. The PVI will review and verify the inspection report with supporting documents such as photographs/diagrams of the load or vehicle, and may request additional information if needed. The customers will be liable and accountable for the information that they have provided to the Caltrans PVI. Caltrans PVIs will examine and verify all the vehicle information against Caltrans Transportation Permits Policies and Procedures, and assign the maximum allowed weights based on axle width, axle spacing, suspension type, and tire size, etc., and issue signed Vehicle Inspection Report to the customer.

The implementation of the virtual inspection program is intended to streamline the process and reduce turnaround time. However, the hauler shall be encouraged not to wait until the last minute to request a virtual inspection. The turnaround time for a virtual inspection is approximately two weeks from the time of the complete submission. The applicant is welcome to check the status of the inspection report if no feedback is given after seven days.

If the customer desires to move the load immediately, the customer may request a verbal approval for a one time move by any of the Caltrans PVIs. The request may be grant at the discretion of the PVI only when sufficient information has been provided to ascertain probable compliance.

Caltrans PVIs are required to return calls or emails no later than the following working day or to inform the caller where to call for assistance.

## 304 Equipment Reviews

Equipment reviews may be requested for unusual equipment which may fall outside of Caltrans' extralegal vehicle parameters or policies. Equipment reviews are performed by the Equipment Engineer of the Transportation Permits Policy and Compliance Branch.

To determine the transportation permit qualification of unusual vehicles, please provide the following information for each proposed permit vehicle.

1. A cover letter on company letter head signed and dated by a company officer with the following information:

- Detailed equipment description and primary task.
- Haul, drive or tow.
- Description and purpose of all non-integral components that will accompany the equipment during transport (outriggers, load block, internal components, etc.).
- Signing officer's title, mailing address and telephone number.

2. One (1) 11" X 17" drawing of the equipment with plan and elevation views. Include:

- Manufacturer's company name, mailing address, phone and model number.
- All equipment component dimensions (height, width, length, axle spreads & spacings, etc.).
- If expandable/stretchable show least and greatest dimensions.
- All suspension types with sufficient details to qualify.
- Number of tires on each axle and tire and wheel ratings.
- Ratings and requested weights for each axle/axle group.
- Indicate all axle types (steering, lift, flip, etc.).
- Indicate mechanical distribution units (MDUs) and other special components.

3. Copies of all California Transportation Permit applications and related material.

4. Close-up photographs showing the entire front, rear and both side views.
5. Include a copy of the Equipment Review Checklist (this checklist) with your submittal.

Please be sure to include all requested information on the equipment drawing, clearly written. Please be sure to provide both plan and elevation views (top and side views) on the equipment drawing. Please provide all dimensions in feet and inches, weight in pounds.

All submittals are processed in a timely manner. For scheduling purposes, please allow a minimum of 20 business days for review. Once the review is complete, a letter containing the findings and decision will be issued.

The Equipment Engineer may be reached at the following email address  
[Equipment.review@dot.ca.gov](mailto:Equipment.review@dot.ca.gov).

## **305 Fixed Load Vehicles**

### **305.1 General**

All fixed load vehicles requiring permits shall be weighed and inspected for extralegal features before the initial permit is issued. Subsequent weighings and inspections shall be at the State's option. New inspections may be required if overweight citations are issued or when ownership is changed.

Caltrans Transportation Permits Program utilizes virtual inspections in lieu of field inspections. Refer to Section 303 Virtual Vehicle Inspection of this Chapter for further details.

Inspection will only be made when the vehicle is set up for highway travel. For cranes this includes counterweights, outriggers and other related equipment.

Weighing may be done on either privately owned or State operated scales. Scales shall have a current seal issued by the appropriate State or County agency authorized to certify calibration. All charges at private scales shall be borne by the applicant. No charge will be made for scale weights at California Highway Patrol weigh stations, and no inspection charges shall be made for routine required inspection by Caltrans.

The permittee is responsible for compliance with the permit. Permits may be written authorizing the movement of a vehicle to scale facilities for axle weight verification; however, if the vehicle exceeds the weight authorized on the permit, the permittee may

be subject to enforcement action. Permits will not be available to leave the scale facilities for vehicles that exceed purple weight.

A copy of the inspection report shall be submitted by the applicant with any permit application. The report fully describes the unit (length, width, height, weight) and will list the equipment to be included or excluded as the case may be.

The inspection report will be a part of the permit and shall remain attached to the permit.

## **305.2 Fixed Loads Other Than Cranes**

### **305.2.1 General**

Operations of extralegal weight fixed load vehicles under permit are controlled by the orange, green or purple standard weight charts. Permit weight will not be authorized for reasonably reducible loads or for portions of loads which are not necessary to perform a primary and singular task at the job site, e.g., drilling, servicing, pumping, and testing. Extralegal weight permits may be issued for critical operational components such as sand line, drill rod, drums etc., as long as these components do not cause the weight to jump to the next higher level, etc. (green to purple).

Extralegal weight will not be allowed on motor vehicles where the equipment required to complete the prime function may be reasonably transferred to a single or tandem axle trailer and the combination complies with legal axle and gross weight, nor where the motor vehicle can be made legal by the addition of another axle or the use of a longer wheelbase chassis.

### **305.2.2 Booms or Masts**

Front boom or mast extension shall not exceed 30 feet beyond the front of the front tires. The maximum rear extension shall not exceed 35 feet measured from the center of the last axle of the vehicle.

### **305.2.3 Length**

Motor vehicles shall conform to the 40'0" maximum legal vehicle length by provision of CVC 35400. Fixed load trailer and semi-trailer length will be reviewed on the basis that the unit is designed to perform a single function and the positioning of that equipment does not generate unreasonable length. Any device

or attachment, whether bolted or welded to the vehicle, which is a component of a boom or mast shall not be included in the length measurement of the single vehicle, but will be included in the overall length measurement of the vehicle or combination of vehicles.

#### **305.2.4 Width**

Motor vehicles, trailers and semi-trailers shall not exceed 14'0" in width. However, any extralegal width shall be reviewed on the basis that the unit is designed to perform a single function and the positioning of that equipment does not generate unreasonable width. Certain devices required by or permitted by the California Vehicle Code may extend beyond the permitted width. Devices not authorized by statute shall be included in the width measurement.

#### **305.2.5 Height**

Motor vehicles, trailers, semitrailers and the load or equipment that is permanently attached to the vehicle may be any height. However, any extralegal height shall be reviewed on the basis that the unit is designed to perform a single function and the positioning of that equipment does not generate unreasonable height.

#### **305.2.6 Fixed Load Inspection Reports**

All Fixed Load Inspection Reports shall include:

- Complete company name, company address, name of the person preparing the report, telephone number, email address and fax number if applicable.
- Complete description of the vehicle including type of equipment/vehicle, make and model, VIN /serial number, tire size and tire load rating.
- Maximum vehicle width and height. Maximum width shall exclude lights, mirrors and other required devices that are allowed to extend up to 10" beyond the permissible width per CVC 35109. If the tires extend beyond the body of the vehicle or load, the maximum width shall be measured from the outside of one tire to the outside of the opposite tire, but not at the load-induced tire bulge. Tire width up to 108 inches is legal per CVC 35101.
- Vehicle configuration including single vehicle length, overall length (including mast or load), boom/mast/overhang information, number of tires on each axle, axle spacing, axle width, suspension type, and scale weight

per axle group. Permit weight per axle group will be calculated as follows:

- Fixed Load – The transporter will provide the scale weight per axle group. The permit weight consists of the scale weight plus 700 pounds per axle group or 102 percent of the scale weight, whichever is greater, rounded off to the nearest 100 pounds, but not to exceed chart weight.
- Truck Tractor – The inspector will record the maximum allowable chart weight as determined by the scale weight of the truck tractor when attached to the fixed load. If the truck tractor scale weight is legal, the truck tractor will not qualify for extralegal weight. If the truck tractor scale weight falls within “green” chart weight, the truck tractor will qualify for maximum “green” weight. If the truck tractor scale weight falls within “purple” chart weight, the truck tractor will qualify for maximum “purple” weight. The inspector will limit the allowable axle weights if the tires and/or axles will not accommodate maximum chart weight. If the transporter later wants to increase the allowable axle weights, and proposes to use a tractor with higher tire and/or axle capacities, the transporter must request a re-inspection, and a new inspection report must be approved.

The report shall also include a list of any miscellaneous equipment authorized to be carried.

### **305.3 Truck Cranes**

Operations of extralegal weight cranes under permit are controlled by the orange, green or purple standard weight charts. Cranes can be permitted with standard working components which are commensurate with the rated capacity of the crane.

Components not necessary for the basic operation or maintenance of the truck crane shall not be permitted.

#### **305.3.1 General**

Operations of extralegal weight cranes under permit are controlled by the orange, green or purple standard weight charts. Cranes can be permitted with standard working components which are commensurate with the rated capacity of the crane. Components not necessary for the basic operation or maintenance of the truck crane shall not be permitted.

Attachments to the boom for the purpose of transferring load to meet weight

requirements shall not be permitted exclusive of the standard working load block, hook and cable tension ball assembly, which are commensurate with the rated capacity of the crane.

Any boom suspended forward shall be tied down while traveling on State highways.

Counterweights and outrigger assemblies may be carried on mobile cranes. However, the removal of the appropriate counterweights or outrigger assemblies from the truck crane to assure compliance for traveling over State highways will be required when any “purple” designated truck crane is found to exceed the allowable weights subsequent to the initial inspection and issuance of the permit.

An extralegal weight crane which qualifies for single trip permit travel only may qualify for a repetitive permit when travelling on a section of highway opened to public and within the contract limits. Project Resident Engineer may contact the Caltrans Transportation Permits Construction Liaisons to discuss the movement of extralegal equipment on highway within the contract limits. The permittee should not exceed permit weight in a construction area without approval of the Resident Engineer. If propose to cross a bridge or operate on bridge, the Bridge Representative shall be consulted.

Weights for two-axle cranes shall conform to the standard weight charts. No transfer of loads will be permitted. Two-axle cranes not having a suspension system between the axles and frame may only be incidentally operated on non-freeway portions of State highways with posted speed limits of 50 mph or less and for a maximum distance not to exceed 25 miles. For movement in other locations, these cranes shall be transported as a load.

The policy relating to permitting cranes does not apply to fixed loads (such as concrete pumps, shovels, drilling, or servicing equipment) that may be categorized as cranes by a court of law for licensing vehicles. The mast and boom extensions of all fixed loads are adjudicated by CVC 35407 unless permitted by the policies of the Department of Transportation.

### **305.3.2 Trailers and Dollies**

A trailer or dolly will be permitted only when the boom is attached to the crane upper works and is supported on the dolly or trailer. When the boom is unsupported or carried in the forward position, the trailer or dolly is considered as a

reducible feature and will not be authorized.

Counterweights, outrigger assemblies, and other components commensurate with the operation or maintenance of the truck crane may be carried on the boom dolly or boom trailer. These components shall be listed on the inspection report.

Boom dollies and trailers shall not exceed statute limits for length, width or height and the distance from center of rotation of crane upper works to centerline of the rearmost axle of the boom dolly shall not exceed 38 feet. Close coupling of the dolly or trailer axles to the crane axles is not permitted. See Section 302.3 of this Chapter for further details.

### **305.3.3 Grandfather Exemption**

Cranes under permit prior to September 2002 and which exceed the current policy and regulations may continue to be moved under permit with special waiver until phased out of operation if in the Department’s judgment it is impractical or unreasonable to make conforming modifications.

### **305.3.4 Load Transfer**

Truck cranes equipped with four-axles or more which meet the following requirements may be allowed a load transfer from one end of the carrier to the other if:

- Axle width is at least 10’0” measured from outside to outside of the widest part of the tires (not to include load-induced tire bulge).
- Equipped with four tires per axle. When equipped with single wide type tires of a minimum size of 18x19.5 only two tires per axle are required. The metric equivalent cross section width of 445mm is also acceptable.
- Equipped with tires that have a minimum cross-section of 14 inches.

#### **305.3.4.1 Load Transfer for Close Coupled Cranes**

Crane carrier with close coupled “purple” chart weight axles and the “green” chart weight boom support vehicle are allowed to have load transfer from one end of the carrier to the other. To qualify for load transfer, the crane carrier must meet all of the following:

- The crane carrier shall meet all Section 305.3.4 equipment requirements.

- The crane carrier must be equipped with hydrogas suspension system.
- Scale or proposed axle group weights may not exceed the values in the Appendix 20 weight charts (Plate 25-5) by 7.5 percent
- Weight may be transferred from only one axle weight group to any other axle weight group(s), provided that sufficient weight capacity is available for transfer.
- The unbonused group weight values in the Appendix 20 weight charts (Plate 25-5) may be increased by up to 2.0 percent for qualifying crane carriers.
- The maximum weight that may be transferred is 7,000 pounds.
- The boom support vehicle shall not be close coupled.
- Weights shall be determined by the Department and is limited to the equipment capacity.

### **305.3.5 Load Bonus**

Truck cranes having an axle or axle group whose suspension is dependent upon pneumatic or hydraulic devices to carry any portion of its weight shall not be allowed a load bonus.

Truck cranes equipped with three-axles which meet the following requirements may be allowed a load bonus on axles 2 and 3.

- Axle width is at least 10'0" measured from outside to outside of the widest part of the tires (not to include load-induced tire bulge).
- Equipped with four tires per axle on axles 2 and 3. When equipped with flotation-type tires of a minimum size of 18x19.5 only two tires per axle are required.
- Equipped with tires that have a minimum cross-section of 14 inches.

### **305.3.6 Allowable Axle Weights**

- Two-axle cranes shall conform to the standard weight charts for orange, green or purple weight. Transfer or bonus weights will not be allowed.

Two-axle cranes with a spacing of 18'0" or less are allowed a gross weight from the standard weight charts for orange, green or purple weight for the corresponding axle spacing; however, no single axle shall exceed 20,000

pounds for orange, 24,000 pounds for green or 28,000 pounds for purple.

Two-axle cranes with a spacing greater than 18'0" are allowed up to 20,000 pounds per axle for orange weight, up to 24,000 pounds per axle for green weight and 28,000 pounds for purple weight.

- Three-axle truck cranes with a 1-3 bridge dimensions of 18'0" or less are allowed a gross weight computed from the formula  $1.50 \times 700 (L + 40) + 7000$  for purple and  $1.30 \times 700 (L + 40) + 6000$  for green. L refers to the distance between first and last axle in an axle loading group, in feet. The steering axle may not exceed 50 percent of that allowed for the drive axles in the standard weight charts for orange, green or purple.

If the 1-3 bridge dimensions exceeds 18'0" the gross weight is that allowed from the standard weight charts for orange, green or purple weight on the drive axles plus up to 50 percent of that weight on the steering axle. The drive axles, if qualified, may be allowed an additional 7,000 pounds bonus load for purple weight and 6,000 pounds for green weight. However, the tandem drive axles shall not exceed 54,300 pounds for purple and 47,000 pounds for green.

- Four axles or more cranes are allowed a maximum GVW determined from the standard weight charts for orange, green or purple. Once the maximum GVW is determined, either the front or rear axle group may, if qualified, be allowed a load transfer. Load transfer does not increase the allowable gross vehicle weight but rather redistributes axle loading group weights. Load transfer is limited to 7,000 pounds for purple and 6,000 pounds for green with the following limitations on individual axle loading groups:

	Maximum Green Load	Maximum Purple Load
Tandem Axles	47,000 pounds	54,300 pounds
Tridem Axles	51,700 pounds	59,500 pounds

If the axle loading groups of the carrier are close coupled, the applicable load transfer is added to the allowable chart weight of the close coupled axles. In any case, the maximums shown above shall not be exceeded.

- The gross weight imposed on the highway by a boom or dolly trailer shall not exceed 54,000 pounds. The allowable axle weights will be determined from the California Vehicle Code Section 35550 and section 35551.

Truck cranes with straight "purple" weight carriers with hydrogas suspension,

and straight “green” weight boom dolly or trailer with air ride suspension, may qualify for single trip permit travel only. The Office of Structures Maintenance and Investigations will determine the appropriate vehicle configuration (9-axle “purple”, 7-axle “purple”, etc.) to be used for routing.

Boom support cables must be slack with the full weight of the boom resting on dolly or trailer. Hydraulic systems used to raise and lower hydraulic cranes shall be in a neutral or open position so that all hydraulic influence loads can be relieved.

- Cranes with four (4) or five (5) axles are allowed tridem axle weights in accordance with tridem bonus “purple” weight chart shown below. To qualify for maximum tridem bonus weight, the cranes shall meet all of the following requirements:
  1. Crane and boom shall not be attached to a boom dolly or trailer.
  2. Axles cannot be close coupled.
  3. No load transfer allowed.
  4. Vehicle combination contains only one (1) bonus tridem group.
  5. Tridem axle distance measures no less than 8’-0” and no greater than 10’4” from the centerline of the first axle to the centerline of the last axle within the tridem group.
  6. Axles have a minimum width of 8’0” sidewall to sidewall, not including the load induced tire bulge.
  7. Minimum of four (4) tires per axle.
  8. Boom height shall comply with California Vehicle Code (CVC), Section 35407 (c) and (d).
    - i. *CVC 35407(c) No part of the structure which extends beyond the front tires shall be less than seven feet from the roadway.*
    - ii. *CVC 35407(d) The driver's vision shall not be impaired by the projecting or supporting structure.*
  9. Axle group weight shall be determined by the Department and is limited by equipment capacity.
  10. Crane must be inspected by a Caltrans’ Vehicle Inspector and have a valid Inspection Report.

11. The following weight chart contains the maximum allowable tridem bonus axle weights:

Ft/In	0	1	2	3	4	5	6	7	8	9	10	11
8	57,960	58,061	58,161	58,262	58,363	58,463	58,564	58,664	58,765	58,866	58,966	59,067
9	59,168	59,268	59,369	59,469	59,570	59,671	59,771	59,872	59,973	60,000	60,000	60,000
10	60,000	60,000	60,000	60,000	60,000							

### 305.3.7 Truck Crane Length

#### 305.3.7.1 Truck Crane Carrier Length

Truck crane carriers shall conform to the 40'0" maximum legal single vehicle length per CVC 35400.

Exceptions:

- Four or Five axle, low profile, cab forward type crane carriers shall not exceed 50 feet in length.
- Truck crane carriers with six or more axles shall not exceed 50 feet in length.
- Truck crane carriers with multi-axle steering capability are exempt from carrier length limitations if the turning test requirements in Section 305.3.7.3 are met.
- Truck crane carriers with multi-axle steering capability and a carrier length of up to 50 feet may qualify for an annual permit if the turning test requirements in Section 305.3.7.3 are met.

#### 305.3.7.2 Truck Crane Combination Length

Truck cranes in combination with boom support vehicle shall not exceed an overall length of 75'0", measured from the front of the crane carrier to the end of the boom support vehicle. The maximum overall length including boom shall not exceed 80'0".

Exceptions:

- A crane with a low profile, cab forward type crane carrier is allowed 80'0" maximum combination length provided that it meets the off-tracking ability of a 75'0" long standard crane.
- Truck crane carriers with steering capability in combination with a boom support vehicle are exempt from combination length limitations if the turning test requirements in Section 305.3.7.3 are met.
- Truck crane carriers with multi-axle steering capability, in combination with a boom support vehicle, with a combination length not to exceed 95 feet, may qualify for an annual permit if the turning test requirements in Section 305.3.7.3 are met.

### **305.3.7.3 Turning Test Requirements**

A licensed civil or mechanical engineer must stamp, sign, and date a written statement saying that the subject vehicle is in compliance with Section 305.3.7.3 of the Transportation Permits Manual. This statement shall be faxed to the Caltrans Equipment Engineer for review and approval prior to obtaining the vehicle inspection report. The Permit Vehicle Inspector shall not process the inspection until the turning test has been passed. The turning requirements are as follows:

1. The crane carrier, boom, and boom support vehicle must meet or exceed the turning performance of a 7-axle truck tractor–semitrailer combination. In addition, the crane carrier, boom and boom support vehicle shall not exceed a maximum swept width of 35'7" when driven through a test track with the following limitations:
  - 90-degree turn with an outside radius of 59' 0.7" (18 meters)
  - Tangent distance of 150 feet beyond the 90-degree turn.
2. Booms rotated to the front may extend 2'10" beyond the outside limits of the test track, but this portion of the vehicle shall return to the limits of the test tract area before the boom enters the tangent area.
3. If the self-contained truck crane requires steering at both ends of the carrier to comply with the above test, it shall be designed so that the steering geometry cannot be altered whenever the crane is configured for highway movement.

4. If the boom support vehicle requires steering to comply with the above test, it shall be designed so that the steering geometry cannot be altered whenever the crane is configured for highway movement.

### **305.3.8 Boom Overhang, Unsupported**

Maximum allowable boom overhang measured to the last hard metal shall not exceed:

- Front overhang shall not exceed 30'0" measured from the front of the front tire.
- Rear extension shall not exceed 25'0" from the centerline of the rearmost crane axle.

### **305.3.9 Boom Overhang, Supported**

Booms supported from a trailer shall not extend more than 35'0" measured from the center of rotation of the boom support.

Booms supported on a dolly shall not extend more than 30'0" measured from the centerline of the rearmost axle of the dolly.

### **305.3.10 Width**

Extralegal width for annual permit is allowed up to 12'0" for crane carrier or crane including all projections except lights, mirrors and equipment defined in CVC 35110 and tire width, not including load induced tire bulge, up to 12'0".

Extralegal width for single trip permits is allowed up to 13'0" for crane carrier or crane including all projections except lights, mirrors and equipment defined in CVC 35110. Additionally, the distance measured from extreme width of the axle or tire on the left side to the extreme width of the axle or tire of the same axle on the right side, not including load induced tire bulge, is allowed up to 13'4".

### **305.3.11 Height**

In the judgment of the Department, height that cannot be reduced to legal may be permitted as limited by the route clearance. Annual permit cannot exceed legal height.

## **306 Boat Trailer**

Boat trailers require an inspection report only when they are transporting boats that generate extralegal axle weights. These trailers are often designed so the outside wheels and tires can be removed. See Section 201.2 for further details.

Extralegal trailer width is not authorized when the width exceeds the width of the boat, unless the increased trailer width is used to reduce an extralegal height dimension to a more acceptable dimension. Outside duals that generate an extralegal width shall be removed unless the boat width exceeds that of the trailer with the duals installed.

## **307 Expandable and Stretch Trailers**

### **307.1 General**

Expandable and stretch trailers are authorized but they shall be reduced to their minimum dimensions when unladen. A semi-trailer capable of increasing the distance from the kingpin or hitch to the axles shall be designated as a stretch trailer. This is usually accomplished by using a "telescoping principle" in the trailer bed. A "double drop" stretch trailer is one where the bed or carrying portion of the trailer is the lowest part of the trailer and the hitch and the rear axle assembly are both higher than the center or bed portion. This bed portion can be lengthened to accommodate loads thus reducing the loaded height, but usually resulting in an overlength trailer.

### **307.2 Stretch Trailers**

Permits shall be issued to stretch trailers that meet all the following criteria:

- Trailer must be justified by a non-reducible qualifying permit load, such as a load that exceeds the 80'0" length limitation as stated in California Vehicle Code Section 35414 and would be damaged by allowing it to overhang.
- Trailers may be justified by reducing the height of an over height permit load to an acceptable height to maintain a 3" vertical clearance on the permitted route and to eliminate the necessity of the load traversing a circuitous route to destination.
- All extralegal features of the stretch trailer, when laden, shall be fully described on the face of the permits; e.g., laden dimensions: kingpin to rearmost axle is 43'6", stretched trailer length is 47'0", and combination vehicle length is 65'6".

### **307.3 Expandable Trailers**

Expandable trailers may be expanded when needed for weight or for stability of the load. They must be retracted to legal width when unladen. Trailers expanded more than 10'0" do not warrant any additional weight over and above bonus purple.

### **308 Modular Hauling Equipment**

All permit applications requesting the use of beam and dolly or house moving equipment shall be referred to Caltrans Transportation Permits. Increased tire capacity at reduced vehicle speed prohibited in Section 302.7 is not applicable for this type of equipment.

### **309 Add-On Axles**

Add on axles are only acceptable if the suspension system for the original axle and the add-on axle are the same. The add on axle may be a simple addition to the existing frame (chassis) or a "flip" axle.

All axles within the same suspension group shall have a common suspension system. Additionally, this suspension system shall naturally divide weight between all axles equally and equitably, both statically and dynamically under all loading conditions without any influence from an outside source. The use of manual air pressure regulators is not allowed.

Air bag suspension systems are required to have like mounting hardware and a common air supply to all bags without any valves or quick disconnects to alter the natural flow of air to all bags. Left to right leveling valves are allowed.

Pin-on axles and hydraulic booster axles do not qualify for extralegal weight.

### **310 Scraper Moves**

This section covers general information and requirements for heavy haul earth moving scrapers.

#### **310.1 Haul and Tow Units**

Applications for motor driven scrapers transported as a "haul and tow" are acceptable. Axle weights up to 35,600 pounds for purple loading and 32,500 pounds for green loading on the towed scraper axle are authorized.

These weights are available only when close coupling does not exist and the move is

limited to a maximum of 25-miles from origin to destination. Moves over 25 miles require the use of a “dolly” or “basket” dolly on the last scraper axle or hauled in its entirety on qualified hauling equipment.

Notes: Some scraper axles, by design, exceed the maximum authorized weights. Any addition of ballast or other add-on components may cause the scraper axles to exceed authorized weights.

### **310.2 Axle Spacings**

“Minimum” axle spacings are acceptable on the permit when the scrapers are hauled on a jeep, semitrailer, and dolly, or basket dolly. However, caution should be exercised when writing permits to move scrapers on hauling equipment that does not incorporate full bonused axles on the semitrailer or jeep when used in conjunction with a basket or stinger dolly.

A small amount of adjustment of the scraper on the semitrailer or jeep is authorized. The adjustment can be controlled by placing a limit on the overall vehicle combination length.

The overall vehicle combination length on the permit shall not be more than one foot longer than the actual overall length when all of the axle spacing are at the minimum. This will allow for adjustment of a sliding fifth wheel and placement of the scraper axle on either the jeep or semitrailer.