

A Case Study On the Compliance of the Heavy Duty Diesel Vehicle Regulation

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In December of 2008 the California Air Resource Board approved the On Road Heavy Duty Diesel Vehicle Regulation. The purpose of this new law is to reduce the emissions from existing on-road diesel vehicles operating throughout California. However, this new regulation is drastically affecting trucking companies throughout the state of California. Trucking companies across state lines are left with a few costly options to comply with the On Road Heavy Duty Diesel Vehicle Regulation. This case study focuses on two similar trucking companies and how they went about complying with the new regulation and which options have been most effective for their business. The findings from this case study are intended to help other trucking companies comply with the new regulation with the least significant impact on their business.

Key Words: Trucking, California Air Resource Board, Emission Compliance

Introduction

The California Air Resource Board is responsible for developing statewide programs and strategies to reduce the amount of emissions in smog-forming pollutants and toxins (ARB, 2017). In December of 2008 the California Air Resource Board (CARB) passed the On Road Heavy Duty Diesel Vehicle Regulation. CARB passed the new regulation with the hopes that it would reduce the emissions from on-road diesel vehicles. The On Road Heavy Duty Diesel Vehicle Regulation, also known as the Truck and Bus regulation, requires all diesel trucks and buses that operate in California to be upgraded to reduce emissions (ARB, 2017). The implementation of this regulation has been introduced slowly and will last over an eleven-year span. At the end of the process all trucks and buses operating in California will have a year 2010 engine or equivalent technology (ARB, 2017). See Figure-1 for the Air Resource Board's timeline.

Engine Model Year Schedule for Heavier Vehicles	
Engine Model Year	Requirements for Heavier Trucks from January 1
Pre-1994	No requirements until 2015, then 2010 engine
1994-1995	No requirements until 2016, then 2010 engine
1996-1999	PM filter from 2012 to 2020, then 2010 engine
2000-2004	PM filter from 2013 to 2021, then 2010 engine
2005-2006	PM filter from 2014 to 2022, then 2010 engine
2007-2009*	No requirements until 2023, then 2010 engine
2010 or newer	Meets final requirement

* Must install a PM filter by January 1, 2014 if not originally equipped.

Figure 1: Truck and Bus Regulation Schedule (ARB, 2017)

Currently, we are in the 2016-2020 year bracket. This means that all truck models from the year 1999 and older are being phased out or upgraded. The largest portions of the trucks being used in our state today are from the year 1996-2006 (Equipment World, 2016). This means that most truck owners in California are forced to comply with the Truck and Bus Regulation in the years of 2016-2020. See Figure-2 for a breakdown of the Trucks operating in California by model year.

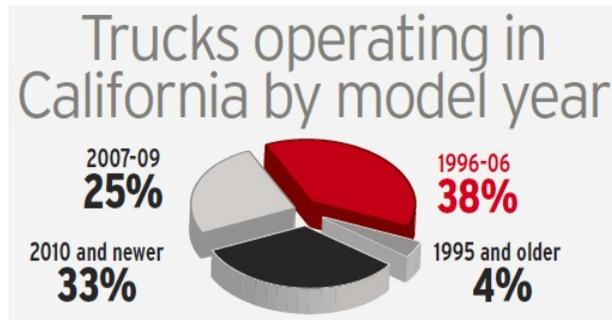


Figure 2: Truck Operating in California by Model Year (Equipment World, 2017)

Complying with the Truck and Bus Regulation

Complying with the current code involves understanding what phase of regulations California is in, and identifying the particular options associated with the model of the truck. In order to comply with the Truck and Bus Regulation the options include applying for the low use exemption program, retrofitting an existing truck, or buying a truck with a 2010 year motor or greater (ARB, 2017). These options differ each year depending on the model of the specific truck therefore it is important to understand what phase of the program California is in.

The Low Use Vehicle Exemption Program is a process where owners can identify which vehicles will operate under 5,000 miles per year in California and therefore will be exempt from having to upgrade their engine or exhaust (ARB, 2017). Owners that are eligible are able to take advantage of this particular program until January 1st, 2020. Each January (up until 2020) owners must designate which trucks they plan to use for low exemption. This includes a report which entails vehicle information as well as odometer readings by January 31st of that year. The report also includes an end of the year odometer reading, this is used to verify that the particular truck did not operate more than 5,000 miles (ARB, 2017). If it is found that the truck has been operated over the given amount the owner is subject to fines.

Retrofitting is a process in which fleet owners install a verified diesel emission control strategy to a particular truck. The most common piece of technology used today is a diesel particulate filter, also known as DPF (ARB, 2014). The DPF works as a filter on your exhaust pipe in which catches chemicals and compounds that would end up in the air we breathe (Thompson, 2011). These chemicals and compounds are caught by a combination of materials (composite cordierite, silicon carbide, and metal fibers) in the filter. The particles that are caught are referred to as soot (Thompson, 2011). Once the device is full of soot it triggers the passive regeneration cycle. This is a process where the exhaust is heated to a temperature where the particles can be burnt off and clean the filter to its original state (Thompson, 2011). The particular process can last up to 45 minutes (Fleet Serv, 2017). However this does not fully clean the entire filter. Non-combustible materials trapped in the filter will still be left behind (Fleet Serv, 2017). To properly clean the DPF it must be removed from the vehicle and put through a designed cleaning process. The cleaning process can be integrated into the vehicles regular maintenance schedule (Fleet Serv, 2017). Once this process is completed the DPF is restored to 95% of its original set up (Fleet Serv, 2017). See Figure-3 for a break down of the components on a Diesel Particulate Filter.

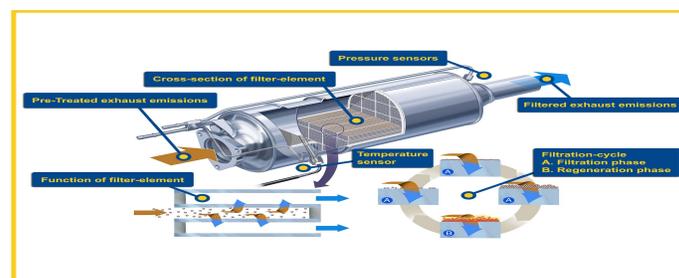


Figure 3: Diesel Particulate Filter Diagram (C.B.L Autoelectrics, 2016)

The final option that is used to comply with the Truck and Bus Regulation is buying a new truck with a 2010 engine or newer. By buying a truck with a 2010 engine or newer you are fully complying with the regulation and will be valid for compliance at the end of the implementation process (January, 2023). This is appealing in that owners will no longer have to deal with compliance through the implementation process and be able to run their unit freely throughout the state.

Interviews with Independent Owner/Operators

The individuals who have a substantial amount of experience with the Truck and Bus regulation so far are the individual owner operators with trucks that already have been affected (1996 and older). Randy Potts, owner of R. Potts Trucking, and Carl Schmidt, owner of Schmidt Trucking, have been in the industry for over 30 years. Both R. Potts Trucking and Schmidt Trucking have already been affected by the Heavy Duty Diesel Vehicle Regulation. In 2016, the two owner operators were forced to apply for the Low Use Vehicle Exemption Program. Both companies continue to operate less than 5,000 miles per year in the Northern California area.

R. Potts Trucking was established in the mid 1980's and has been operating in the Bay area for the past 20 years. The company owns two Peterbuilt Semi Trucks that both have the capabilities of hauling end dumps as well as flat beds. Randy Potts was forced to comply with the Truck and Bus Regulation in 2016. Currently, both his trucks are able to operate in the Bay Area for less than 5,000 miles a year. When asked about making his decision on how to comply, Randy explains that financially it made most sense to apply for the mileage program. He explained that he debated between the mileage program as well as retrofitting his units. Randy then explained that with all costs that go into running a truck these days retrofitting his vehicles just did not make sense. He claimed that his yard is centrally located in the Bay Area and that he would not be forced to travel very far for any operations. He explained that with all the components going into costs and the current state of his business it was best to operate under 5,000 miles each year to earn the most amount of profit. Randy then broke down for me the average components that go into running a truck. See Figure-4 for a break down of running an individual truck.

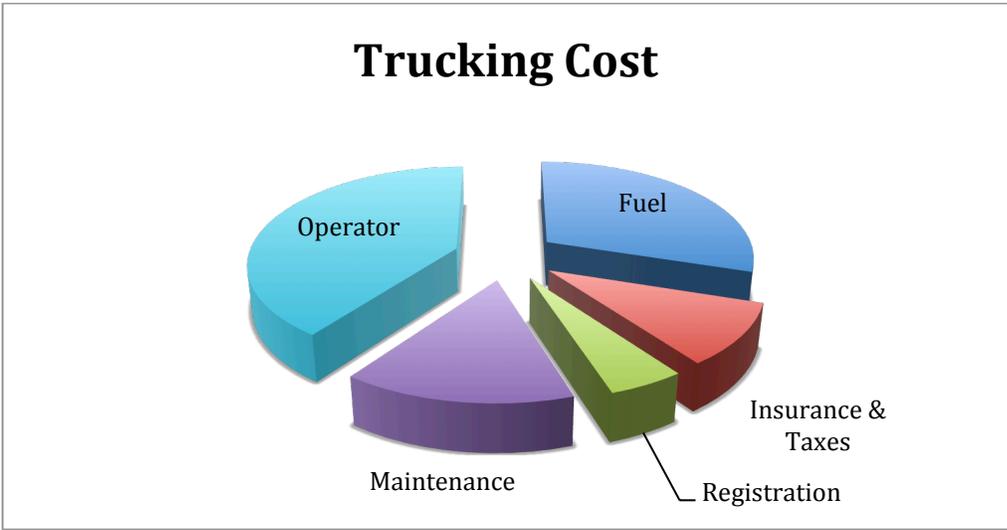


Figure 3: A Breakdown of Operating & Overhead Costs (Potts, Randy)

Schmidt Trucking was established in the early 1990's by Carl Schmidt. The company is based out of Lodi, CA and primarily operates in the San Joaquin County. Carl Schmidt owns and operates one 1994 Peterbuilt semi-truck. The truck primarily pulls an end dump trailer in which usually hauls asphalt, concrete, drain rock, and a variety of other materials. When interviewing Carl, he explained that his response to the new regulation was based off of reliability rather than cost. Carl claimed that retrofitting the older trucks was just not working. Carl explained that other truck owners tried to retrofit their non-compliant units but were having trouble with the engine temperature on the road.

He described that the older engines were not meant to run with a filter on the exhaust in which increases the internal engine temperature. Therefore, forcing trucks to pull over on the side of the road and wait for their engine to cool down or filter to burn off. Carl claimed that he has witnessed numerous amounts of trucks pulled over on the side of the road, in which results in an upset contractor due to the lack of trucking efficiency on the job. Carl then concluded that this was the sole reason he applied for the mileage program. He said that he was going to barely make it by with the 5,000 miles however, it was better than ruining the value of his truck.

Case Study: Riverside Trucking

Riverside Transport is located in Isleton, California. This organization primarily operates in the central valley and serves the agricultural and construction industries. Riverside operates about 30 units in which are capable of hauling all types of trailers (Riverside, 2017). Matt Sailors is the field manager when it comes to the Riverside transport sector. His includes overseeing trucking operations as well as serving as a direct contact to the client. Riverside Trucking was directly affected by the Truck & Bus regulation in 2015. Most of their trucks in their fleet were older and required attention when it came to the regulation. Matt and Riverside upper management decided to buy new compliant trucks and retrofit the remainder. Today those specific trucks have been in operation for almost two years. When asked about their performance Matt described it as both good and bad. He claimed that the new trucks are reliable and he hasn't had any issues with them. However, the units that were retrofitted are a constant issue. Matt described the retrofitted units as unreliable and unpredictable. He entailed that these particular trucks are always in and out of the shop, the engines are always trying to be tuned to run with the DPF filter. This causes an organization issue in his fleet due to the fact that he does not know which trucks will be able to fully operate each day. The process of buying and retrofitting trucks has also led to an increase in operation cost. Matt said that riverside is still doing the same amount of work as previous years however, there is a smaller margin for profit due to an increase in operation cost. At the end of the day, matt described the process as difficult but something we must abide to. See figure-4 for a break down of Riverside Transport truck inventory.

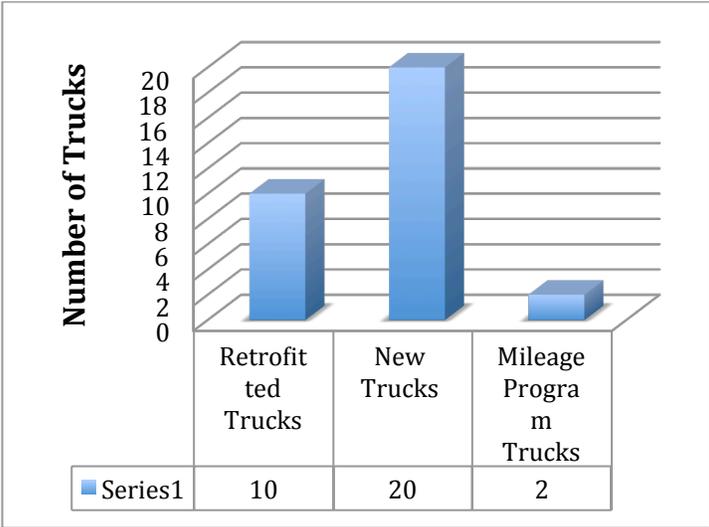


Figure 4: Riverside Transport Truck Inventory

Case Study: Conti Materials Service

Conti Materials Service was founded in 1986 based out of Stockton, California. The company remains a family operated business that serves the central valley and bay area. Their fleet contains about 70 trucks that haul bulk tankers, transfers, and bottom dumps (Conti Materials, 2017). Louie Conti has worked in his family's business for the past 5 years. He has work experience in the service department, dispatch department, as well as operations. When asked about the new trucking regulations Louis described the process as originally intimidating, due to their large fleet size, but now just treats it as another hurdle the company must deal with. When the new regulation came out Conti Materials Service has a feeling that the retrofit program would not work for their trucks. However they

couldn't go out and replace their entire fleet with new units. Louie said the goal was to buy the trucks they could and retrofit the trucks they needed. Currently the majority of their fleet is new trucks (55) and the remainder are retrofitted units (15). See Figure-5 for the Conti Trucking inventory breakdown.

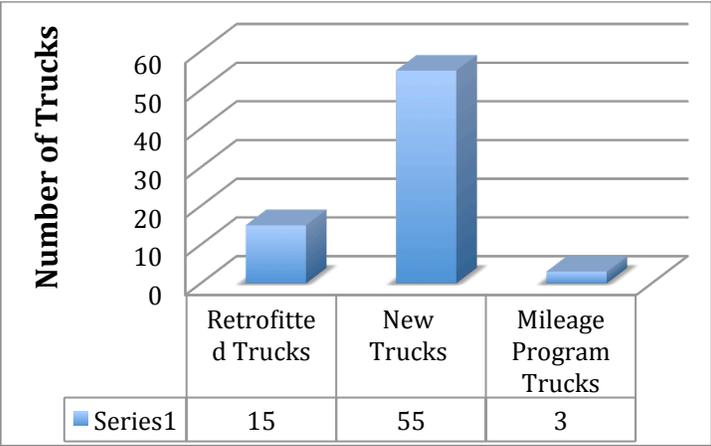


Figure 5: Conti Materials Truck Inventory

After going over the current truck inventory breakdown, Louie emphasized that these new trucks and retrofitted units are no where close to the performance as the old trucks. He described the older units as much more reliable and required much less maintenance. Louie claimed that the Conti Materials maintenance department is constantly busy cleaning the new filters on top of the normal maintenance required for these particular trucks. Louie said the results to the increase in maintenance and internal spending on new trucks is operation cost. Louie concluded with the fact that the company is doing the same amount of work but with a smaller profit margin due to the spending on new units as well as maintenance.

Conclusion

After concluding my case study I found that equipment costs as well as productivity have the greatest impact when updating a larger trucking fleet. Taking this into consideration, the most effective way to go about the On Road Heavy Duty Diesel Vehicle Regulation is to consider how many operating units you will need. Then determine how many new trucks your company can afford and retrofit the remainder. This allows for the most productivity and the least amount of burden on cost. After updating a larger fleet operation cost must be increased due to the fact that there will be an increase in maintenance as well as payments on newer trucks. Moving forward, this case study should serve as a guidance into the On Road Heavy Duty Diesel Vehicle Regulation and how different individuals are dealing with compliance. Further research into the used truck market throughout the country would help others benefit that are not affected by the regulation. The knowledge gained from this particular study can help truck owners throughout the state of California comply and remain successful in the trucking industry.

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