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Design and fabrication of diesel tank safe guard model for heavy motor vehicles

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Abstract
In recent years many manufactures design is based on quality, reliability, performance and safety and other considerable aspects. In modern world many transportation vehicles are designed, manufactured and sold throughout the world. In our newer design they are giving more importance to the aesthetic design, performance, safety and other considerable factors. In this regard we are Innovate new novel idea about diesel tank safe guard for Heavy Motor Vehicles (HMV's). These innovative ideas Information are gathered from various problems faced by the HMV's during transportation of products from one place to another and unexpected accidents in the location of diesel tank fitted with vehicles.

Keywords: diesel tank, design of tank safe guard, innovative idea and fabricated model

1. Introduction
Now a days in transportation vehicles met unexpected accident it will create huge problems to human beings and the society. Based on the experience and problems faced by the manufactures of HMV's and diesel tank manufactures we are create new innovative idea about diesel tank to avoid the accidents in the location of the diesel tank we are suggested fabricate safe guard for HMV's. For example a vehicle moving on the road side, bend suddenly a two wheeler (or) stone may be forced hit on the tank, suddenly fire will take place due to sudden accident and the whole vehicle may be burn. To avoid this situation we are fabricated one model to avoid this type of uncertainties.

2. Existing Tank over view
In vehicles left side or right side between front wheel and rear wheel tank is located and fitted with vehicle chassis. The fittings are fitted with tank is 30% and 70% of its length to evenly carry over the load of fuel tank. If the vehicles is going on in rainy season the mud, dust and some corrosive particles are stored in the bottom and some corrosive particles are stored in the bottom and two sides of diesel tank. It will create gradual corrosive action external surface of the diesel tank. If the vehicle is moving in uneven surfaces on road side suddenly one stone is hit on the bottom surface of the fuel tank. If will damage it and the fuel may be leak fuel after some time duration. In existing method there is no prevention for avoid the accidents, dust storage, and a considerable factor, the life of the diesel tank is reduced.

Fig 1: View of diesel tank attached with vehicle chassis

Related to the issue of water entrapment between mounts, cribbing, or supports and the tank itself is the subject of drainage. It comes as a surprise to many cruisers, other than those who have experienced it, one of the more common corrosion related failure scenarios involves the top, rather than the bottom, of metallic tank. This problem stems from deck leaks, which are almost guaranteed to occur at some point.

Fig 2: View of damaged fuel tank

Just as it's undesirable to have standing water on top of your fuel tank, it's equally undesirable to have your metallic tank standing in water. If the aforementioned procedures are followed, it's unlikely that exterior corrosion issues will arise. However, if the tank is allowed to stand in bilge water or other accumulated water, then corrosion is virtually guaranteed. Therefore, it is imperative that no metallic tank be allowed to rest in water. Tank should be installed well above the normal "high tide" mark of any bilge.

3. New model

In this fabricated model may be full fill and satisfy the expected performance during the running/moving of HMV's. This fabricated we are used the using field marshal engine diesel tank of 5L capacity for study purpose. In the fabricated model is designed 5cm air gap from diesel tank to safe guard.

Basic size of diesel tank:

- Length-310mm
- Breath-150mm
- Height-190mm
- Capacity-5liters
- Diesel tank thickness-1mm

4. Fabrication

4.1 Internal support

Internal support is directly fitted with diesel tank and vehicle chassis basic dimensions.

Fig 3: Internal support top view

4.2 External support

External support is directly connected with safe guard fittings. The gap is maintained between the diesel tank and safe guard is 5cm.

Fig 4: External support front views

4.3 Bottom view

Bottom support is used to avoid mud, dust storage in bottom surface of the diesel tank.

Fig 5: Bottom view of tank safe guard

4.4 Basic dimensions of supports

Internal support dimensions 980 mm = 320 mm – 170 mm – 320 mm- 170 mm (1 Number)

External support dimensions 1120 mm = 340 mm – 220 mm – 340 mm- 220 mm (1 Number)

Bottom support dimensions 400 mm = 100.5 mm – 220 mm – 100.5 mm (2 Numbers)

External guarded plate dimensions = 380 mm X 250 mm (2 Numbers)

Side guarded plate dimensions = 250 mm X 200 mm (1 Number)

Bottom guarded plate dimensions = 380 mm X 250 mm (1 Number)

All the above dimensions are measured after the fabrication of the model external (circumferential) dimensions.

Fig 6: Top view of fabricated model attached with safe guard

5. Importance of fabricated model

The model is made from 15mm and 3mm thick plates using internal and external support the model is fully fabricated with the weights of internal support 300g, external support 450g, bottom support 150gms. Based on above said dimensions in previous section, following tools are used to fabricate the model Anvil, chisel, steel rule, marker, welding machine, during machine, hammer, and wooden hammer. The plates are bended, welded in mechanical laboratory and the final model is concluded.

Fig 7: Overall view fabricated model

Fig 8: Side view of fabricated model

6. Advantages

- Safe the diesel tank from external dust, mud and corrosion formation.
- It is easily dismantle and assemble with the vehicle chassis with the separate setup.
- It helps unwanted damage of diesel tank from external factors.
- It will help to increase the life time of the diesel tank.

7. Cost Estimation

Table 1

S.no	Description	Weight(Kg)	Amount (Rs)
1	Iron	1.760kg	150
2	Diesel tank model	300kg	250
3	Metal plate	1.600kg	200
4	Joint and bends	-	250
5	Planning	-	350
		Total	1200

8. Conclusion

In modern vehicle, new techniques are used in HMV's from manufacture's point of view to satisfy all level customers, as well as human welfare. For example, ABS, power steering, air bags are mounted in the vehicle for safety point of view. In current situation diesel tank safety problem may create huge lose so that point of view some HMV's manufactures are trying to fulfil this needs in foreign countries. This type of safety model may be used in vehicles. To avoid unnecessary accidents happen in diesel tank location and also improve the life time of diesel tank.

9. References

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