ROLLER BRAKE TEST PASS-FAIL CRITERION FOR VEHICLE FITNESS CERTIFICATION, AIS-128, AND SCOPE FOR IMPROVEMENT

Amlan Dey
NATRiP Silchar Center
dey.amlan0006@gmail.com

Dr. Abhijit Kumar Mandal
GARC Chennai, under NATRiP
abhijit.mandal@natrip.in

Abstract- Inspection & Certification (I&C) centers with automated and computerized testing facilities for vehicle Fitness Certification are being implemented and discussed increasingly now-a-days which eventually will replace the manual inspection and certification practices. In this regard some rules are being modified for adoption in the CMVR. In the Central Motor vehicle Rules, 1989, in rule 62, sub-rule (1), in the proviso for the table, in serial no. 18 for item "Braking System", in the remark column the following addition was made in May 2014 – "(b) in case of authorized testing station using roller brake tester, testing procedure and requirements shall be as per AIS-128:2014".

AIS-128 contains rules and guidelines for Headlamp beam testing and Brake testing and their pass/Fail criterions. AIS-128 was first framed and published in Feb 2014 and once amended on 5th June 2015 clarifying that Brake tests should be carried out with vehicles in unladen condition (in clause 3.2).

As per AIS-128, Roller Brake test Pass/Fail criterion was set as "*Breaking efficiency when measured on roller brake tester should be more than 27.23%*". While talking about fitness certifying, Brake Test is the most important parameter.

1. **This study and research is about the limitations of Roller Brake Test Pass-Fail criterion in fitness certification and possibilities of certifying an unfit vehicle.** In this paper we wanted to show with analysis how vehicles with poor braking action may easily get passed with the cut-off set by AIS-128, thus seriously compromising roadworthiness or safe driving.
2. The paper analyzes the consequences and significances of ignoring 'Braking Imbalance' and 'Braking Efficiency Per Axle-wise' parameters in the cut-off settings with real data case-studies.
3. We have analyzed the actual braking conditions of the vehicles plying on roads using brake forces measured for each & individual wheels on roller brake tester. **A database comprising brake test data of more than 400 numbers of vehicles which have been tested on Roller Brake Tester for Fitness Certification purpose was created and used for the study.** The objective of the data analysis is to realize the effectiveness of AIS-128 pass/fail criterion for brake testing. Also some important statistics about braking imbalance and brake efficiency have been extracted.
4. The paper also suggests the cut-off criterion which may be adopted to bring in more efficiency and safety in roller brake testing.

Keywords- Inspection & Certification (I&C), Roller-Brake Test, Vehicle Fitness Certification, Braking Efficiency, Braking Imbalance, Vehicle Road Worthiness, CMVR-1989 and AIS-128.

I. INTRODUCTION

AN OVERVIEW OF I&C CENTERS

The I&C centers worldwide generally maintain a common practice having a standard set-up. It consists of *Gas analyzing/Opacity test, Side-slip test, Brake Test, Speedometer test, Sound/Noise Test, Suspension Test, Joint Play Test, Pit Visual Tes, Headlight beam test*. The main objective of establishing I&C centers is to replace fitness certification of on-road vehicles by only visual inspection and reducing human intervention. The certificate generated from an I&C center contains result report of various test parameters of the particular vehicle.

AN OVERVIEW OF THE ROLLER BRAKE TESTER

Brake test is the most important parameter of vehicle fitness certification. The roller brake tester eventually replaces the manual and Decelerometer method of brake testing. Roller brake tester consists of a floor unit with electrical motors, two independent sets of three rollers, brake force transducers or load sensors, computer & display unit etc. The two sets of rollers (except the middle smaller ones) are run by two individual electric motors attached with gearbox. Test is done per axle-wise. When brake is applied on the running rollers, the wheels try to resist the rotation of the rollers thus applying forces opposite to the direction of the rollers. The maximum force induced by each of the wheels is measured and displayed in the computer. The third smaller roller, on each side between the driving rollers, has two functions: The first is to detect if a vehicle is present on the roller bed and second function is to detect when tyre slippage or skidding occurs. They are often called as safety bars and painted in yellow color with speed sensors attached. The brake force is measured in KN or Kg.

Advantages of Roller Brake Tester

1. **Unlike manual methods or Decelerometers, a Roller Brake Tester can measure Brake Force for each and individual Wheel**. Thus giving opportunity to precisely analyze the overall Braking system of a vehicle.
2. It measures overall Braking Efficiency and Axle-wise braking efficiency.
3. It measures Braking Imbalance.
4. It also measures Parking Brake force per wheel basis.

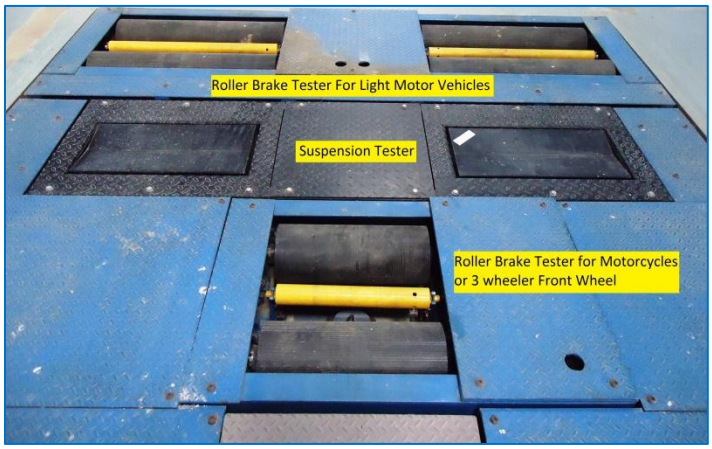

Figure 1- Test Floor of Roller Brake Tester

II. Definitions

Braking Efficiency

Braking efficiency of a vehicle is calculated from the sum of all braking forces (peak) measured for all wheels in comparison to the gross weight of the vehicle. It means that the maximum braking force applied on individual wheel is required to be measured at the time of testing & after adding these measured braking forces of all individual wheels, the total braking force of the vehicle can be obtained. So, to calculate the overall braking efficiency of a vehicle, the total braking force measured needs to be divided by the gross vehicle weight.

Please refer to the Fig#2, suppose for a two axle vehicle, Front axle weight is measured as W1Kg and W2Kg for Rear Axle.
Then the Gross weight of the Vehicle is (W1+W2)Kg.

The Braking force measured for individual wheels are F1 Kg, F2 Kg, F3 Kg and F4 Kg.

Then the Braking Efficiency =

$$\left(\frac{F1+F2+F3+F4}{W1+W2} X\ 100\right)\ \%$$

The unit of Braking Efficiency is Percentage (%).

Braking Efficiency per Axle-wise

In the similar manner Braking Efficiency can be measured per axle-wise. According to Roller Brake Testing procedure, the vehicle weight measurement and the brake test is done per axle-wise so it is relevant to calculate Braking Efficiency per axle-wise.

The Braking efficiency for front axle would be=

$$\left(\frac{F1+F2}{W1} X\ 100\right)\ \%$$

And, the Braking Efficiency of the Rear Axle would be=

$$\left(\frac{F3+F4}{W2} X\ 100\right)\ \%$$

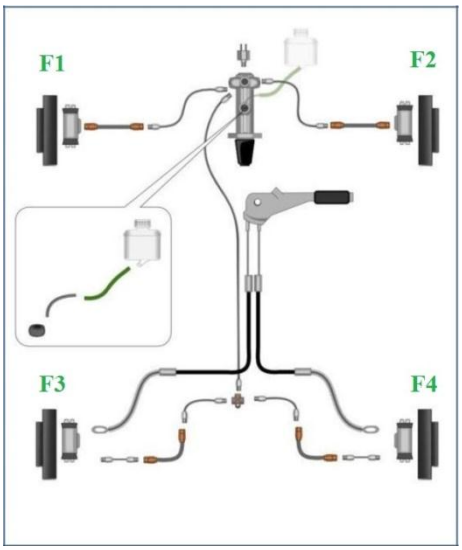

Figure 2- Braking System of a car

Braking Imbalance

Braking Imbalance is the difference between the braking forces measured for left and right side of a particular axle. Brake Imbalance is also expressed in percentage.

Suppose, for Fig#2, for front axle if F2>F1 then, the brake imbalance for front axle would be

$$\left(\frac{F2-F1}{F2} X\ 100\right)\ \%$$

And for Rear Axle if F3>F4 then, the brake imbalance for rear axle would be

$$\left(\frac{F3-F4}{F3} X\ 100\right)\ \%$$

So, as higher as the difference between Braking forces will be higher will be the braking imbalance.

III. Braking Efficiency Cut-off Setting

There are two processes of Roller Brake Testing. They are as followed.

A. Measuring Maximum Braking Efficiency of a Vehicle

To determine the maximum braking efficiency and maximum braking forces applied, no cut-off or input is fed to the system before testing. When brake is applied at the time of testing, the wheels will intend to be locked and if the braking force is strong

enough then the wheels will be locked and start to skid on the roller. This will be sensed by the machine (with the help of third smaller roller or the yellow bar) and instantly stops the rollers. The machine will measure the maximum braking force applied for individual wheels. These measured values would be used to determine the maximum braking efficiency of the vehicle.
If the braking force is not strong enough to lock the wheels then the rollers will run for its pre-specified time and measure the maximum brake force applied during test with which maximum braking efficiency can be calculated.

B. Measuring Braking Efficiency at per Cut-off Set

This is the most common practice used for Roller Brake Testing worldwide. As per this testing procedure it is being measured that the Braking Efficiency of a vehicle is higher or lower than a particular cut-off value. The cut –off parameter is fed to the system prior to the test. When the measured value reaches the cut-off, the test is stopped and accordingly the vehicle gets passed or failed.
The cut-off value is set in accordance with the gross weight of the vehicle. This may be 50% or 40% of vehicle weight. As roller brake testing and vehicle weight measuring is done per axle-wise so the cut-offs are also fed to the system per axle-wise.

IV. Example of a Brake Test Real Result

Below is a real test data for Roller Brake Test of a Force Cruiser vehicle, mfd. Year 2010 (please refer database sl. no. 252)

Report No.	Date of test	Braking Eff. Cut-off per Axle	FRONT AXLE			REAR AXLE		
			Axle Wt. (Kg)	Braking Force (Kg.)		Axle Wt. (Kg)	Braking Force (Kg.)	
				Left Wheel	Right Wheel		Left Wheel	Right Wheel
IMS/F/230	19-10-15	50	976	253	326	1153	405	293

Here, Front axle Braking Efficiency = (253+326)/976*100
= 59.32%

Rear Axle Braking Efficiency = (405+293)/1153*100
= 60.54%

Overall Braking Efficiency of the Vehicle
= (253+326+405+293)/ (976+1153)*100
= 59.98%

Front Axle Braking Imbalance = (326-253)/326*100
= 22.39%

Rear Axle Braking Imbalance = (405-293)/405*100
= 27.65%

Clarification #1

Braking Imbalance does not depend on Braking Efficiency cut-off value. Braking Imbalance is basically a ratio so for higher braking efficiency cut-off value (per axle) the left and right wheel braking force will be increased proportionately keeping the imbalance same.

Clarification #2

Ideally when Braking Efficiency Cut-off is set at a particular value then the test should automatically stop when the measured value reaches that point. Suppose when Cut-off is set at 50% then the rollers should stop when braking efficiency of an axle reaches 50% but in many cases it may be found that the measured braking efficiencies are much more than the cut-off. In some cases it may go more than 100%. This is because many a times the driver pushes the brake paddle aggressively at an instant instead of gradually applying brake at the time of testing. So, the peak value of braking force is measured higher than required.
This may not be considered a shortcoming of the test because the test objective i.e. weathers the braking efficiency is higher or lower than the desired is fulfilled. Many roller brake tester also measures the Brake Paddle force applied.

Clarification #3

Roller Brake tester always tests Braking forces of a vehicle per axle-wise. So, the braking efficiency cut-off value has to be put per axle-wise. Now, in many cases an authority fixes the overall braking efficiency cut-off value and not axle-wise cut-off. In such cases the maximum braking efficiency should be measured. Otherwise, cut-off value per axle may be fixed much higher than the overall braking efficiency cut-off. Suppose, the overall braking efficiency cut-off is 40% then the cut-off per axle may be fixed 60% or 70% or higher. The reason is that when overall braking efficiency is considered then braking efficiency for any of the front or rear axle may be lower or higher but the addition of the both is the limiting factor for overall Braking Efficiency.

V. AIS-128

AIS-128 is Automotive Industry Standard rule framed by CMVR technical standing committee set up by MORTH and published by ARAI, Pune. It was first published in February 2014 and once amended on 5th June 2015. AIS-128 deals with Headlight Beam and Brake test pass/ fail criterion. It is adopted in CMVR Rule-62, in Table for fitness certification checklist on May 19th 2014 through notification published in The Gazette of India (Extraordinary).
This paper does not relate to Headlamp Beam Pass/Fail criterion in AIS-128. It deals with the Pass/Fail criterion fixed for Roller Brake Tester.
The Pass/Fail criterion for Roller Brake Testing had been fixed in AIS-128 as quoted below:-
"Breaking efficiency when measured on roller brake tester should be more than 27.23%."

VI. Limitations or Inadequacies of AIS-128

The following three limitations about AIS-128 brake fail Pass/Fail criterion are hereby noted and analyzed for improvement.

1. NOT CONSIDERING BRAKING EFFICIENCY PER AXLE-WISE

In Pass/Fail criterion of Brake Testing, AIS-128 only considers Braking Efficiency or Overall Braking efficiency of a vehicle and not axle-wise braking efficiency. Although in test procedure, under section 3.3, point no. (xii) it is written that:-

"Total braking efficiency of vehicle is calculated from the sum of all braking forces of all wheels and total weight of vehicle. Also the difference between the braking efficiency of two wheels on the same axle will be calculated."

The later sentence probably indicates the difference between Braking efficiency of two Axles. Because efficiency cannot be measured for wheels, it is measured for an axle or for a vehicle. But in the pass/fail criterion no input is considered axle-wise.

Now, if Braking efficiency per axle-wise is not considered then there are chances of one axle wheels' braking forces being too high whereas the other being too low or no brake. This situation is not a good braking condition for a vehicle.

Below is a real test data for Roller Brake Test of a Force Cruiser vehicle, mfd. year 2009 (please refer database sl. no. 382)

Report no. – IMS/F/440; Date of test:- 16-08-16

Braking Eff. Cut-off per Axle	FRONT AXLE				REAR AXLE				Overall braking Efficiency (%)
	Axle Wt. (Kg)	Braking Force (Kg.)		Braking Eff. (Ft. Axle) %	Axle Wt. (Kg)	Braking Force (Kg.)		Braking Eff. (Rr. Axle) %	
		Left Wheel	Right Wheel			Left Wheel	Right Wheel		
50	975	249	419	68.51	1050	27	44	6.76	36.49

Here the rear axle left and right wheel braking forces are measured as 27Kg and 44Kg respectively and the braking efficiency for rear axle is calculated 6.76% which is too low in comparison with the axle weight. It can be observed from this test result that the vehicle is having ALMOST NO BRAKE in rear axle wheels. But because the front axle brake force is good enough so the overall braking efficiency converts to 36.49% which is greater than 27.23%. So, the vehicle gets passed as per AIS-128. This vehicle is potentially risky in terms of safety concerns. These situations could be avoided if the pass/fail criterion includes braking efficiency per axle-wise cut-offs.

2. NOT CONSIDERING BRAKING IMBALANCE

AIS-128 mentions about Braking Imbalance. In AIS-128, under section 3.2, in third sentence it is written *"Roller brake tester shall also measure the brake imbalance."* But for the Pass/Fail criterion Brake Imbalance input is not considered.

Braking Imbalance is an important term in accident analysis. Because it is evident from many accident data that brake imbalances have severe impacts especially, in high speed driving or highway driving. If the brake forces are not balanced or there is high imbalance then when brake is applied the vehicle will tend to skid in one side resulting in increasing risk and severity of accident for self and other road users.

Report No:- IMS/F/161, Date of Test:- 30-07-15

Braking Eff. Cut-off per Axle	FRONT AXLE				REAR AXLE				Overall braking Efficiency (%)
	Axle Wt. (Kg)	Braking Force (Kg.)		Braking Imbalance %	Axle Wt. (Kg)	Braking Force (Kg.)		Braking Imbalance %	
		Left Wheel	Right Wheel			Left Wheel	Right Wheel		
40	1862	1132	255	77.47	2123	89	1033	91.38	62.96

Above is a real test data for Roller Brake Test of a Telco Bus (body), mfg. year 2006 (please refer database sl.no. 213)

Here, it can be observed that both front and rear axle brake imbalances are too high. There is almost no brake in rear left wheel. The front right wheel is also having a little braking force. This vehicle should not be treated as fit. But the vehicle gets passed as per present AIS-128 criterion because the Braking efficiency of the vehicle is calculated 62.96% which is higher than AIS-128 cut-off.

As mentioned earlier the major advantage of roller brake tester is that it can measure braking forces exerted by each wheel so to analyze actual braking condition but if braking imbalance is ignored then one of the most important features of roller brake tester will be unutilized.

3. CUT- OFF VALUE IS TOO LOW

The braking efficiency cut-off '27.23%' as framed by AIS-128 may be considered as very low. The inspection and certification system or the vehicle test lanes have a global standard worldwide because in all the test lanes almost same parameters of a vehicle are being tested using similar kind of test equipments. Most of the authorities or agencies keep the Braking efficiency cut-off as 50% or 55% or higher. It can be understood that the cut-offs may vary country to country or zone to zone depending on the road condition, vehicle types and other aspects but the very fact is that the vehicles are tested in unladen or no-load condition. So, when the vehicles ply with loads then the required braking force is also much higher.

We have found from our test records that only less than 1% of all tested vehicles get Failed as per criterion framed by AIS-128! Please refer to the following database and charts for more details.

VII. DATABASE

Figure 3- Mobile Inspection Lane at NATRiP Silchar center

A database is prepared with the real test data of Roller Brake tests conducted with different categories of vehicles in

between period May-2014 to Mar-2017 at the Inspection and Maintenance station(IMS), NATRiP Silchar center, Assam. The center is having two Fix Inspection Lanes and two Mobile Inspection lanes which are imported and of latest technology. There are four numbers of Roller Brake Testers which have been used for the testing purpose.

The objective of the database and data analysis is to determine the effectiveness of Pass/Fail criterion of AIS-128. Also, some vital statistics have been extracted viz. what percentage of commercial vehicles are plying on road with high braking imbalance, percentage of axle-wise brake efficiency failures with different cut-offs etc.

BASIC INFORMATION ABOUT DATA

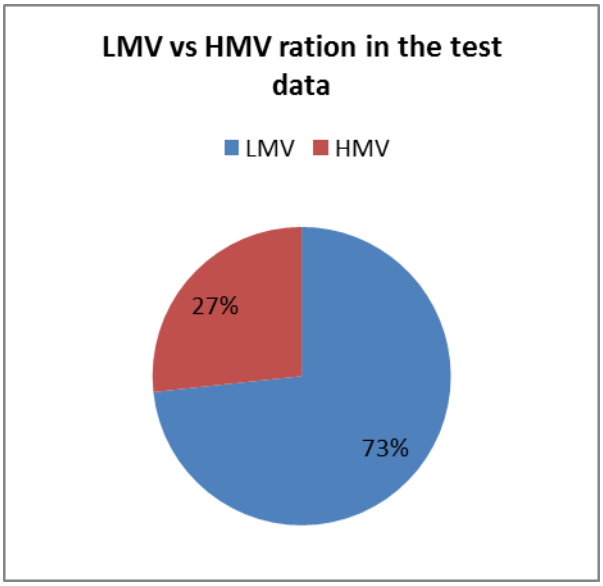

Figure 4

Test data for number of commercial vehicles = 408.

No. of HMV = 109.
No. of LMV = 299.

Generally vehicles with gross weight (VGW) more than 3500kg is considered as Heavy Motor Vehicle (HMV) and vehicles with VGW lower than 3500kg are considered as Light Motor Vehicle (LMV).

The vehicles are tested with three different Brake Efficiency cut-off per axle-wise.

Cut-offs per Axle	No. of Vehicles
27.23%	53
40%	79
50%	276

This is to clarify here that the Overall Braking Efficiency and Axle-wise braking Efficiency calculated in the database are not the maximum Braking Efficiency of respective vehicles. As described earlier, we used Braking Efficiency Cut-off value per axle-wise to determine whether the braking efficiency of each axle is higher or lower than that cut-off. Here, it has to be understood that when an axle braking efficiency fails or the value is lower than the cut-off value then it means that the measured braking efficiency of that particular axle is Maximum because the roller is not stopped and the value won't go higher. So, when a vehicle's braking efficiency for an axle gets failed with 27.23% then it will be failed with cut-off values 40% or 50%.

It can be found in the database that the types of vehicles cover most of the commercial vehicle categories in India (considering 2-Axle Vehicles). The vehicle category varies Vehicle registration number, owner's name, address etc are not disclosed in the database.

PLEASE FIND THE DATABASE IN ANNEXURE-I
Data Analysis and Conclusion in the following pages

VIII. Data Analysis And Statistics

After analyzing the data the following statistics are found.

PERCENTAGE OF OVERALL AND AXLEWISE BRAKING EFFICIENCY FAILURE AT DIFFERENT CUT-OFFS

WHEN CUTOFF @27.23%			WHEN CUTOFF @40%			WHEN CUTOFF @50%		
% of Overall Braking Efficiency FAILURE	% of FRONT AXLE Braking Efficiency FAILURE	% of REAR AXLE Braking Efficiency FAILURE	% of Overall Braking Efficiency FAILURE	% of FRONT AXLE Braking Efficiency FAILURE	% of REAR AXLE Braking Efficiency FAILURE	% of Overall Braking Efficiency FAILURE	% of FRONT AXLE Braking Efficiency FAILURE	% of REAR AXLE Braking Efficiency FAILURE
0.74	0.74	4.41	3.66	1.69	6.48	8.70	5.43	11.59
(3 out of 408)	(3 out of 408)	(18 out of 408)	(13 out of 355)	(6 out of 355)	(23 out of 355)	(24 out of 276)	(15 out of 276)	(32 out of 276)

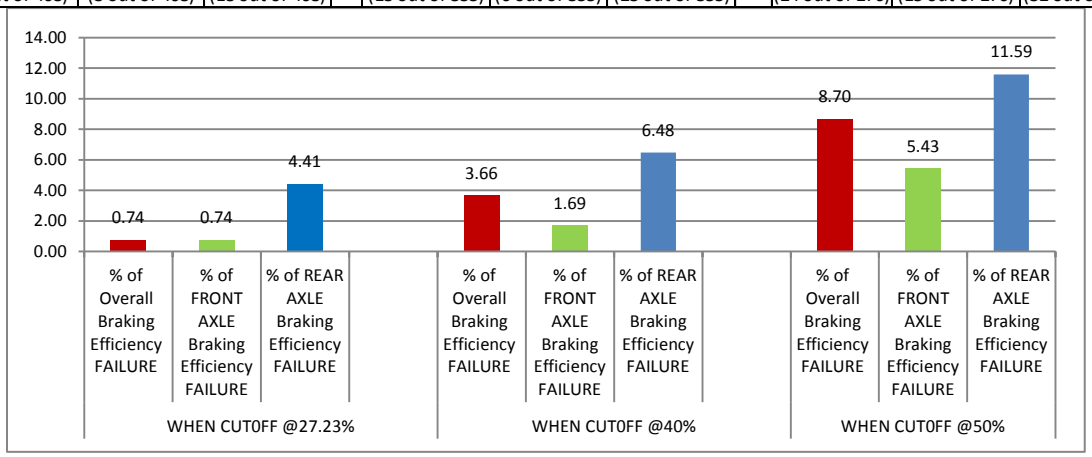

Figure 5- Chart#1

PERCENTAGE OF FAILURE OF BRAKE IMBALANCE AT DIFFERENT IMBALANCE CUT-OFFS

PERCENTAGE OF FRONT AXLE BRAKING IMBALANCE FAILURE AT DIFFERENT CUT-OFFS				PERCENTAGE OF REAR AXLE BRAKING IMBALANCE FAILURE AT DIFFERENT CUT-OFFS			
% of Imbalance greater than 90%	% of Imbalance greater than 80%	% of Imbalance greater than 70%	% of Imbalance greater than 60%	% of Imbalance greater than 90%	% of Imbalance greater than 80%	% of Imbalance greater than 70%	% of Imbalance greater than 60%
0.00	2.21	4.66	13.24	2.21	5.39	9.56	19.85
(0 out of 408)	(9 out of 408)	(19 out of 408)	(54 out of 408)	(9 out of 408)	(22 out of 408)	(39 out of 408)	(81 out of 408)

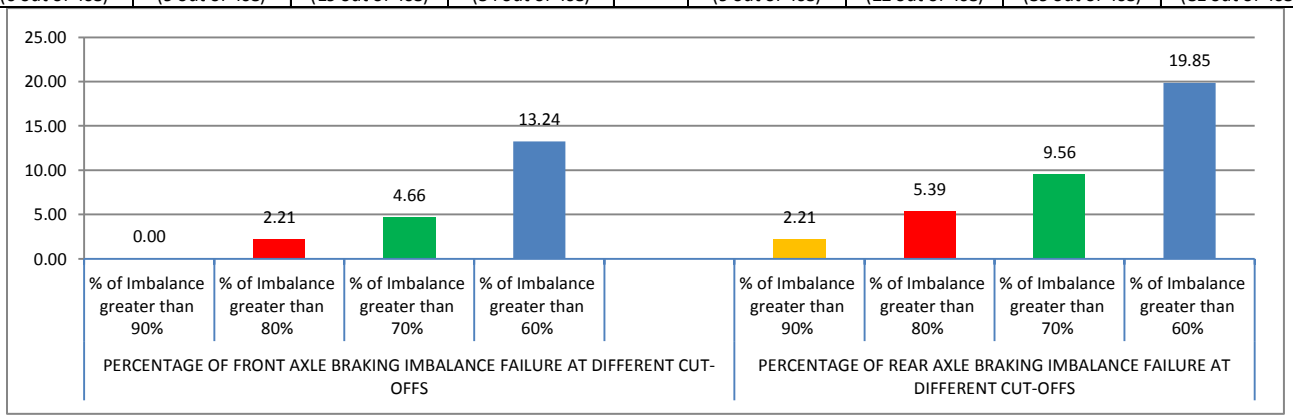

Figure 6-Chart#2

It can be observed from the chart#1 that only 0.74% vehicles get Failed with the AIS-128 pass/fail criterion but 5.15% (0.74+4.41=5.15%) vehicles have either axle braking efficiency lower than 27.23%. Similarly, at the maximum 8.17% (1.69+6.48=8.17%) vehicles would have failed if Braking Efficiency Per Axle cut-off had been set at 40%. And, at the maximum 17.02% (5.43+11.59=17.02%) vehicles would have failed if Braking Efficiency Per Axle cut-off had been set at 50%.

From chart#2, it can be observed that 2.21% vehicles have either axle Braking Imbalance more than 90%. Similarly, 7.6% (2.21+5.39=7.6%) vehicles have either axle Braking Imbalance more than 80%; 14.22% (4.66+9.56=14.22%) vehicles have either axle Braking Imbalance more than 70% and 33.09% (13.24+19.85=33.09%) vehicles have either axle Braking Imbalance more than 60%.

IX. CONCLUSION

It has been shown in this paper with real data analysis that conditions arising where vehicles having no brakes in either axle get easily passed with the AIS-128 criterion. Also, vehicles having more than 80% or 90% Braking Imbalance get passed. Even it can be shown from calculations that a vehicle having brake in only one wheel and no brake in other wheels can also get passed through with present AIS-128 criterion.

These situations can be avoided if the brake efficiency cut-off is considered axle-wise and brake imbalance is taken into account in the pass/fail criterion. Also, braking efficiency cut-off as 27.23% is too low considering the fact that the vehicles are tested at umladen condition. **It is suggested that in a country like India the Braking Efficiency Per Axle cut-off may be framed as 40% and Braking Imbalance cut-off may be fixed as high as 70%** (the higher the Braking Imbalance cut-off, higher is the tolerance) in the initial periods which means that a vehicle needs to have braking efficiency per axle 40% or higher and Braking Imbalance per axle 70% or lower. As per this criterion a maximum of 22.39% (8.17+14.22=22.39%) vehicles fail from the database. But there will be common factor failures for some failed vehicles i.e. same vehicle failing in say rear axle brake efficiency and front brake imbalance at the same time and likewise. So, the percentage of failure would be lesser than 22.39%, say around 15% for this database.

REFERENCES

[1] Automotive Industry Standard rules AIS-128 published by ARAI, Pune in May 2014 and 5th June 2015.
[2] CMVR, 1989, rule 62.
[3] The Gazette of India, Extraordinary, Part II, Section 3, Subsection (i) dated 19th May 2014.

ANNEXURE-I

DATABASE

SL. NO.	VEHICLE MANUFACTURER	MODEL	LMV / HMV	YEAR OF MANUFACYURING	REPORT / RECORD NUMBER	DATE OF TESTING	Cut-off Brake efficiency per Axle (%)	ROLLER BRAKE TEST RESULTS											Overall Braking Efficiency of the Vehicle (%)
								FRONT AXLE					REAR AXLE						
								AXLE WT. (kg)	Left Wl. PEAK FORCE (Kg)	Right Wl. PEAK FORCE (Kg)	Front Axle Braking Efficiency (%)	IMBALANCE (%) bet. R & L wheel F Axle	AXLE WT. (kg)	Left Wl. PEAK FORCE (Kg)	Right Wl. PEAK FORCE (Kg)	Rear Axle Braking Efficiency (%)	IMBALANCE (%) bet. R & L wheel R Axle	
1	TATA MOTORS	Truck	HMV	2012	IMS/F/9984	09-05-14	50	2631	846	149	37.82	82.39	3173	834	1123	61.68	25.73	50.86
2	TATA MOTORS	Truck	HMV	2012	IMS/F/9985	09-05-14	50	2352	878	637	64.41	27.45	2572	649	1079	67.19	39.85	65.86
3	TELCO LTD	Truck	HMV	2011	IMS/F/9986	30-06-14	50	4743	1553	1541	65.23	0.77	2981	947	1119	69.31	15.37	66.80
4	TATA TELCO	407	HMV	2003	IMS/F/9987	01-07-14	50	2010	678	1789	122.74	62.10	2535	982	3191	164.62	69.23	146.09
5	TATA MOTORS	Truck	HMV	2008	IMS/F/9988	19-08-14	50	3947	1706	1142	72.16	33.06	3119	649	6290	222.48	89.68	138.51
6	TATA MOTORS	TIPPER	HMV	2007	IMS/F/9989	19-08-14	50	3988	1100	2777	97.22	60.39	2930	798	1035	62.56	22.90	82.54
7	ASHOK LEYLAND	TIPPER	HMV	2010	IMS/F/9990	21-08-14	50	4181	2255	1759	96.01	22.00	2953	1487	1472	100.20	1.01	97.74
8	ASHOK LEYLAND	TIPPER	HMV	2006	IMS/F/9991	21-08-14	50	4140	1169	1347	60.77	13.21	3197	844	948	56.05	10.97	58.72
9	ASHOK LEYLAND	TIPPER	HMV	2011	IMS/F/9992	21-08-14	50	4163	1106	1695	67.28	34.75	3059	916	1063	64.69	13.83	66.19
10	ASHOK LEYLAND	BUS BODY	HMV	2012	IMS/F/9993	21-08-14	50	4628	1228	1172	51.86	4.56	6288	1637	1700	53.07	3.71	52.56
11	ASHOK LEYLAND	BUS BODY	HMV	2012	IMS/F/9994	21-08-14	50	4798	5304	1234	136.27	76.73	6376	1750	2596	68.16	32.59	97.40
12	TATA MOTORS	CARGO	HMV	2010	IMS/F/9995	21-08-14	50	2686	924	1310	83.17	29.47	2728	1202	880	76.32	26.79	79.72
13	TELCO LTD	MINI BUS	HMV	2003	IMS/F/9996	26-08-14	50	1923	668	746	73.53	10.46	2627	358	1564	73.16	77.11	73.32
14	TATA MOTORS	MINI BUS	HMV	2003	IMS/F/9997	29-08-14	50	1913	603	1006	84.11	40.06	2433	2419	620	124.91	74.37	106.95
15	TATA MOTORS	TATA SUMO	LMV	2011	IMS/F/1A	05-09-14	50	971	327	286	63.13	12.54	1017	744	431	115.54	42.07	89.94
16	TATA MOTORS	TATA SUMO	LMV	2012	IMS/F/2A	18-09-14	50	984	290	251	54.98	13.45	1017	615	417	101.47	32.20	78.61
17	TELCO LTD	407	HMV	2003	IMS/F/9998	22-09-14	50	1682	671	753	84.66	10.89	2490	748	640	55.74	14.44	67.40
18	TATA MOTORS	SPACIO	LMV	2011	MOB2/LCV/35	23-09-14	40	1052	212	241	43.06	12.03	1116	224	247	42.20	9.31	42.62
19	FORCE	CRUISER	LMV	2011	MOB2/LCV/34	23-09-14	40	1018	205	230	42.73	10.87	1216	213	285	40.95	25.26	41.76
20	TATA MOTORS	TRUCK	HMV	2009	MOB1/HCV/19	24-09-14	40	3506	724	947	47.66	23.55	6756	1396	3074	66.16	54.59	59.84
21	TATA MOTORS	TATA SUMO	LMV	2011	IMS/F/3A	29-09-14	50	984	260	285	55.39	8.77	995	207	343	55.28	39.65	55.33
22	MAHINDRA	MAXIMO MINI VAN	LMV	2012	IMS/F/4A	29-09-14	50	712	180	249	60.25	27.71	505	158	118	54.65	25.32	57.93
23	TATA MOTORS	TATA TANKER	HMV	2001	IMS/F/9999	13-10-14	50	3197	877	980	58.09	10.51	4062	3122	1456	112.70	53.36	88.65
24	FORCE	CRUISER	LMV	2010	IMS/F/5A	14-10-14	50	981	301	270	58.21	10.30	1044	212	495	67.72	57.17	63.11
25	FORCE	CRUISER	LMV	2011	IMS/F/6A	15-10-14	50	975	281	252	54.67	10.32	1094	230	443	61.52	48.08	58.29
26	FORCE	CRUISER	LMV	2011	IMS/F/7A	15-10-14	50	995	379	303	68.54	20.05	1117	693	35	65.17	94.95	66.76
27	FORCE	CRUISER	LMV	2010	IMS/F/7AB	15-10-14	50	958	261	298	58.35	12.42	1069	35	166	18.80	78.92	37.49
28	TELCO LTD	TRUCK	HMV	2003	IMS/F/10000	21-10-14	50	1495	994	464	97.53	53.32	1509	444	459	59.84	3.27	78.60
29	TATA MOTORS	608 BUS	HMV	1995	IMS/F/10002	24-10-14	50	2079	1110	590	81.77	46.85	1208	401	273	55.79	31.92	72.22
30	TATA MOTORS	STAR BUS	HMV	2011	IMS/F/10003	03-11-14	50	2585	611	539	44.49	11.78	2930	875	707	53.99	19.20	49.54
31	FORCE	CRUISER	LMV	2011	IMS/F/8	15-11-14	50	978	247	257	51.53	3.89	1068	296	213	47.66	28.04	49.51
32	TATA MOTORS	TATA SUMO	LMV	2009	IMS/F/9	17-11-14	50	932	276	244	55.79	11.59	955	196	332	55.29	40.96	55.54
33	TATA MOTORS	BUS BODY	HMV	2002	IMS/F/10009	20-11-14	50	1982	778	790	79.12	1.60	2177	548	938	68.26	41.63	73.43
34	ASHOK LEYLAND	BUS BODY	HMV	2008	IMS/F/10010	26-11-14	50	1427	360	539	62.96	33.16	1714	522	474	58.11	9.11	60.32
35	ASHOK LEYLAND	BUS BODY	HMV	2009	IMS/F/10012	26-11-14	50	1976	503	529	52.19	4.90	2225	972	853	82.01	12.20	67.98
36	TELCO LTD	407 BUS	HMV	2002	IMS/F/10015	01-12-14	50	1846	383	392	41.96	2.26	2309	1287	709	86.47	44.92	66.70
37	TATA MOTORS	BUS BODY	HMV	2006	IMS/F/10016	04-12-14	50	1701	2270	583	167.72	74.30	1442	324	377	48.62	14.19	113.08
38	TATA MOTORS	TATA SUMO	LMV	2010	IMS/F/21	05-12-14	50	702	193	214	58.07	9.89	692	178	221	57.62	19.32	57.85

SL. NO.	VEHICLE MANUFACTURER	MODEL	LMV / HMV	YEAR OF MANUFACYURING	REPORT / RECORD NUMBER	DATE OF TESTING	Cut-off Brake efficiency per Axle (%)	ROLLER BRAKE TEST RESULTS										Overall Braking Efficiency of the Vehicle (%)
								FRONT AXLE					REAR AXLE					
								AXLE WT. (kg)	Left Wl. PEAK FORCE (Kg)	Right Wl. PEAK FORCE (Kg)	Front Axle Braking Efficiency (%)	IMBALANCE (%) bet. R & L wheel F Axle	AXLE WT. (kg)	Left Wl. PEAK FORCE (Kg)	Right Wl. PEAK FORCE (Kg)	Rear Axle Braking Efficiency (%)	IMBALANCE (%) bet. R & L wheel R Axle	
39	FORCE	CRUISER	LMV	2012	IMS/F/28	11-12-14	50	974	259	291	56.43	11.08	1054	217	216	41.05	0.33	48.44
40	TATA MOTORS	TATA SUMO	LMV	2010	IMS/F/291	11-12-14	50	965	355	250	62.67	29.47	923	263	387	70.42	32.22	66.46
41	TATA MOTORS	MAGIC	LMV	2010	IMS/F/30	11-12-14	50	709	220	201	59.38	8.93	427	86	192	65.03	55.08	61.51
42	TATA MOTORS	MAGIC	LMV	2012	IMS/F/31	11-12-14	50	687	203	211	60.26	3.58	392	112	98	53.40	12.68	57.77
43	ASHOK LEYLAND	BUS BODY	HMV	2006	IMS/F/10021	16-12-14	50	3039	1817	935	90.58	48.54	4568	2227	1149	73.90	48.38	80.57
44	FORCE	CRUISER	LMV	2012	IMS/F/54	29-12-14	50	994	282	311	59.66	9.32	1075	222	245	43.44	9.39	51.23
45	TATA MOTORS	TATA SUMO	LMV	2007	IMS/F/55	29-12-14	50	965	290	281	59.17	3.10	1000	383	258	64.10	32.64	61.68
46	FORCE	CRUISER	LMV	2010	IMS/F/56	31-12-14	50	950	252	265	54.42	4.91	1051	338	144	45.86	57.40	49.93
47	TATA MOTORS	207 DI	LMV	2010	IMS/F/57	31-12-14	50	1149	290	397	59.79	26.95	850	173	232	47.65	25.43	54.63
48	TATA MOTORS	Truck	HMV	1995	IMS/F/10048	01-01-15	50	3465	550	1625	62.77	66.15	3361	479	3726	125.11	87.14	93.47
49	TATA MOTORS	TATA SUMO	LMV	2011	IMS/F/58	05-01-15	50	958	243	265	53.03	8.30	986	223	271	50.10	17.71	51.54
50	TATA MOTORS	TATA SUMO	LMV	2010	IMS/F/58A	05-01-15	27.23	953	130	307	45.86	57.65	894	113	261	41.83	56.70	43.91
51	FORCE	CRUISER	LMV	2010	IMS/F/59	06-01-15	50	929	245	278	56.30	11.87	1081	221	240	42.65	7.92	48.96
52	TATA MOTORS	TATA SUMO	LMV	2004	IMS/F/60	06-01-15	50	1001	294	280	57.34	4.76	1079	336	219	51.44	34.82	54.28
53	TATA MOTORS	VAN ACE	LMV	2012	IMS/F/61	07-01-15	50	919	299	276	62.57	7.69	533	300	86	72.42	71.33	66.18
54	TATA MOTORS	407	HMV	2004	IMS/F/10053	07-01-15	50	1805	187	1541	95.73	87.87	1497	161	1210	91.58	86.69	93.85
55	FORCE	CRUISER	LMV	2012	IMS/F/63	09-01-15	50	984	282	271	56.20	3.90	1046	246	296	51.82	16.89	53.94
56	TATA MOTORS	BUS BODY	HMV	2004	IMS/F/10061	13-01-15	50	1869	351	2257	139.54	84.45	1860	304	1366	89.78	77.75	114.72
57	TATA MOTORS	BUS BODY	HMV	2005	IMS/F/10061A	13-01-15	50	1941	379	2245	135.19	83.12	2545	278	951	48.29	70.77	85.89
58	TATA MOTORS	BUS BODY	HMV	2005	IMS/F/10066	14-01-15	50	1969	410	1613	102.74	74.58	2223	348	2304	119.30	84.90	111.52
59	TATA MOTORS	TATA SUMO	LMV	2009	IMS/F/64	16-01-15	50	1003	268	338	60.42	20.71	951	313	266	60.88	15.02	60.64
60	TATA MOTORS	TRUCK	HMV	2004	IMS/F/10067	16-01-15	50	1229	319	790	90.24	59.62	1696	43	1351	82.19	96.82	85.57
61	TELCO LTD	BUS BODY	HMV	2008	IMS/F/10069	16-01-15	50	2009	232	796	51.17	70.85	2046	313	793	54.06	60.53	52.63
62	TATA MOTORS	INDICA	LMV	2010	IMS/F/68	20-01-15	50	331	87	105	58.01	17.14	184	58	68	68.48	14.71	61.75
63	TATA MOTORS	BUS BODY	HMV	2012	IMS/F/10075	21-01-15	50	2513	462	966	56.82	52.17	2663	339	1075	53.10	68.47	54.91
64	TATA MOTORS	TRUCK	HMV	2011	IMS/F/10077	21-01-15	50	3964	148	1204	34.11	87.71	4051	659	1295	48.24	49.11	41.25
65	FORCE	CRUISER	LMV	2008	IMS/F/69	22-01-15	50	950	248	393	67.47	36.90	996	29	192	22.19	84.90	44.30
66	TATA MOTORS	TATA SUMO	LMV	2011	IMS/F/10082A	22-01-15	50	989	170	602	78.06	71.76	1057	172	396	53.74	56.57	65.49
67	TATA MOTORS	SPACIO	LMV	2009	IMS/F/10082	23-01-15	50	975	56	454	52.31	87.67	998	52	374	42.69	86.10	47.44
68	TATA MOTORS	407	HMV	2005	IMS/F/10087	29-01-15	50	1887	161	712	46.26	77.39	1928	284	826	57.57	65.62	51.98
69	TATA MOTORS	ACE	LMV	2013	MOB1/LCV/43	31-01-15	50	535	251	156	76.07	37.85	392	242	125	93.62	48.35	83.50
70	TATA MOTORS	SALOON	LMV	2007	IMS/F/10093	02-02-15	27.23	998	128	267	39.58	52.06	984	127	211	34.35	39.81	36.98
71	TATA MOTORS	BUS BODY	HMV	2006	IMS/F/10095	03-02-15	27.23	1941	162	859	52.60	81.14	2018	314	585	44.55	46.32	48.50
72	FORCE	CRUISER	LMV	2007	IMS/F/10096	05-02-15	27.23	953	122	282	42.39	56.74	1057	103	322	40.21	68.01	41.24
73	TATA MOTORS	TIPPER	HMV	2011	IMS/F/10099	06-02-15	27.23	3506	587	320	25.87	45.49	3992	519	1466	49.72	64.60	38.57
74	TATA MOTORS	OPEN BODY	HMV	2011	IMS/F/10102	06-02-15	27.23	4726	591	1077	35.29	45.13	3057	384	1085	48.05	64.61	40.31
75	TATA MOTORS	SPACIO	LMV	2010	IMS/F/10103	07-02-15	27.23	971	128	359	50.15	64.35	966	121	393	53.21	69.21	51.68
76	TATA MOTORS	SPACIO	LMV	2011	IMS/F/10104	10-02-15	27.23	984	124	409	54.17	69.68	943	119	276	41.89	56.88	48.16
77	FORCE	CRUISER	LMV	2011	IMS/F/10107	10-02-15	27.23	971	123	363	50.05	66.12	1080	128	286	38.33	55.24	43.88
78	FORCE	CRUISER	LMV	2011	IMS/F/10112	11-02-15	27.23	953	121	270	41.03	55.19	1048	125	295	40.08	57.63	40.53
79	FORCE	CRUISER	LMV	2010	IMS/F/10114	11-02-15	27.23	975	125	261	39.59	52.11	1111	141	306	40.23	53.92	39.93
80	TATA MOTORS	SPACIO	LMV	2012	IMS/F/10118	13-02-15	27.23	975	125	221	35.49	43.44	971	126	441	58.39	71.43	46.92
81	FORCE	CRUISER	LMV	2010	IMS/F/10119	16-02-15	27.23	962	123	302	44.18	59.27	1070	76	324	37.38	76.54	40.60
82	TATA MOTORS	SPACIO	LMV	2012	IMS/F/10121	16-02-15	27.23	966	122	310	44.72	60.65	971	123	384	52.21	67.97	48.48
83	TATA MOTORS	TATA SUMO	LMV	2010	IMS/F/10122	17-02-15	27.23	966	125	237	37.47	47.26	962	121	372	51.25	67.47	44.35
84	FORCE	CRUISER	LMV	2009	IMS/F/10123	18-02-15	27.23	984	125	410	54.37	69.51	1084	174	107	25.92	38.51	39.46
85	TATA MOTORS	SPACIO	LMV	2012	IMS/F/10124	19-02-15	27.23	948	121	271	41.35	55.35	948	120	360	50.63	66.67	45.99
86	TATA MOTORS	Truck 1613	HMV	2003	IMS/F/10126	19-02-15	27.23	3456	435	693	32.64	37.23	3416	219	211	12.59	3.65	22.67
87	FORCE	CRUISER	LMV	2008	IMS/F/10129	20-02-15	27.23	984	124	317	44.82	60.88	1030	138	183	31.17	24.59	37.84
88	TATA MOTORS	SPACIO	LMV	2012	IMS/F/10131	20-02-15	27.23	957	125	304	44.83	58.88	971	125	268	40.47	53.36	42.63
89	TATA MOTORS	ACE ZIP	LMV	2011	IMS/F/10132	21-02-15	27.23	472	61	146	43.86	58.22	390	41	161	51.79	74.53	47.45
90	TATA MOTORS	SPACIO	LMV	2010	IMS/F/10136	26-02-15	27.23	953	121	217	35.47	44.24	980	123	244	37.45	49.59	36.47
91	FORCE	CRUISER	LMV	2010	IMS/F/10137	26-02-15	27.23	998	135	322	45.79	58.07	1066	49	484	50.00	89.88	47.97
92	TATA MOTORS	SPACIO	LMV	2012	IMS/F/10138	02-03-15	27.23	957	134	349	50.47	61.60	980	125	285	41.84	56.14	46.10
93	TATA MOTORS	ACE	LMV	2008	IMS/F/10142	03-03-15	27.23	762	96	297	51.57	67.68	449	68	211	62.14	67.77	55.49
94	TATA MOTORS	BUS BODY	HMV	2005	IMS/F/10139	03-03-15	27.23	1964	361	76	22.25	78.95	1855	235	808	56.23	70.92	38.75
95	TATA MOTORS	STAR BUS	HMV	2011	IMS/F/10140	03-03-15	27.23	2617	401	1066	56.06	62.38	2717	386	1279	61.28	69.82	58.72
96	FORCE	CRUISER	LMV	2012	IMS/F/10145	04-03-15	27.23	993	127	378	50.86	66.40	1127	153	52	18.19	66.01	33.49
97	TATA MOTORS	MINI BUS	HMV	2004	IMS/F/10146	09-03-15	27.23	1837	225	619	45.94	63.65	1606	204	390	36.99	47.69	41.77
98	TATA MOTORS	TIPPER	HMV	2011	IMS/F/10149	09-03-15	27.23	4191	525	1433	46.72	63.36	4046	545	993	38.01	45.12	42.44
99	TATA MOTORS	SPACIO	LMV	2012	IMS/F/10151	10-03-15	27.23	957	127	292	43.78	56.51	948	122	141	27.74	13.48	35.80
100	TELCO LTD	BUS BODY	HMV	2004	IMS/F/10153	11-03-15	27.23	1760	238	389	35.63	38.82	1610	178	670	52.67	73.43	43.77
101	TELCO LTD	BUS BODY	HMV	2002	IMS/F/10154	12-03-15	27.23	1909	299	365	34.78	18.08	2504	28	1045	42.85	97.32	39.36
102	TATA MOTORS	407	HMV	2004	IMS/F/10155	12-03-15	27.23	1692	179	942	66.25	81.00	1642	216	457	40.99	52.74	53.81
103	FORCE	CRUISER	LMV	2011	IMS/F/10156	16-03-15	27.23	980	129	273	41.02	52.75	1048	132	368	47.71	64.13	44.48
104	FORCE	CRUISER	LMV	2008	IMS/F/10157	16-03-15	27.23	975	124	308	44.31	59.74	1034	131	346	46.13	62.14	45.25
105	TATA MOTORS	ACE	LMV	2010	IMS/F/10158	16-03-15	27.23	821	104	182	34.84	42.86	998	126	243	36.97	48.15	36.01
106	TATA MOTORS	SALOON	LMV	2008	IMS/F/10159	17-03-15	27.23	1007	126	344	46.67	63.37	871	116	310	48.91	62.58	47.71
107	TATA MOTORS	SALOON	LMV	2009	IMS/F/10160	19-03-15	27.23	984	125	255	38.62	50.98	934	118	154	29.12	23.38	33.99
108	FORCE	CRUISER	LMV	2010	IMS/F/10162	21-03-15	27.23	953	122	378	52.47	67.72	1057	86	219	28.86	60.73	40.05
109	TATA MOTORS	SALOON	LMV	2012	IMS/F/10164	21-03-15	27.23	934	119	264	41.01	54.92	916	115	257	40.61	55.25	40.81
110	FORCE	CRUISER	LMV	2005	IMS/F/10165	21-03-15	27.23	903	113	227	37.65	50.22	1116	140	180	28.67	22.22	32.69
111	MAHINDRA	HARDTOP	LMV	2012	IMS/F/10169	23-03-15	27.23	671	88	241	49.03	63.49	503	55	96	30.02	42.71	40.89
112	TATA MOTORS	HARDTOP	LMV	2012	IMS/F/10171	24-03-15	27.23	417	55	118	41.49	53.39	367	50	109	43.32	54.13	42.35
113	TATA MOTORS	ACE	LMV	2012	IMS/F/10174	25-03-15	27.23	730	91	183	37.53	50.27	413	53	107	38.74	50.47	37.97
114	TATA MOTORS	BUS BODY	HMV	2009	IMS/F/10175	25-03-15	27.23	1751	219	629	48.43	65.18	1501	202	646	56.50	68.73	52.15
115	TATA MOTORS	TATA SUMO	LMV	2009	IMS/F/10176	26-03-15	27.23	971	132	292	43.67	54.79	930	128	275	43.33	53.45	43.50
116	TATA MOTORS	TATA SUMO	LMV	2010	IMS/F/10178	27-03-15	27.23	962	145	378	54.37	61.64	894	115	289	45.19	60.21	49.95
117	TATA MOTORS	MINI TRUCK	LMV	2007	IMS/F/10179	27-03-15	27.23	744	99	269	49.46	63.20	354	53	170	62.99	68.82	53.83
118	FORCE	CRUISER	LMV	2011	IMS/F/10180	27-03-15	27.23	953	120	257	39.56	53.31	1065	72	197	25.26	63.45	32.01

SL. NO.	VEHICLE MANUFACTURER	MODEL	LMV / HMV	YEAR OF MANUFACYURING	REPORT / RECORD NUMBER	DATE OF TESTING	Cut-off Brake efficiency per Axle (%)	ROLLER BRAKE TEST RESULTS										Overall Braking Efficiency of the Vehicle (%)
								FRONT AXLE					REAR AXLE					
								AXLE WT. (kg)	Left Wl. PEAK FORCE (Kg)	Right Wl. PEAK FORCE (Kg)	Front Axle Braking Efficiency (%)	IMBALANCE (%) bet. R & L wheel F Axle	AXLE WT. (kg)	Left Wl. PEAK FORCE (Kg)	Right Wl. PEAK FORCE (Kg)	Rear Axle Braking Efficiency (%)	IMBALANCE (%) bet. R & L wheel R Axle	
119	TELCO LTD	BUS BODY	HMV	2003	IMS/F/10181	27-03-15	27.23	1760	229	641	49.43	64.27	1533	200	528	47.49	62.12	48.53
120	TATA MOTORS	SPACIO	LMV	2011	MOB1/LCV/38	31-03-15	50	805	299	219	64.35	26.76	916	287	267	60.48	6.97	62.29
121	TATA MOTORS	TATA SUMO	LMV	2011	MOB1/LCV/35	31-03-15	50	835	303	217	62.28	28.38	973	535	349	90.85	34.77	77.65
122	TATA MOTORS	SALOON	LMV	2012	MOB1/LCV/38	06-04-15	50	726	291	190	66.25	34.71	878	432	268	79.73	37.96	73.63
123	ASHOK LEYLAND	BUS BODY	HMV	2012	MOB1/HCV/16	06-04-15	50	3010	915	1265	72.43	27.67	3599	1482	925	66.88	37.58	69.41
124	ASHOK LEYLAND	BUS BODY	HMV	2013	MOB1/HCV/17	06-04-15	50	2649	819	750	59.23	8.42	3001	763	932	56.48	18.13	57.77
125	TATA MOTORS	BUS BODY	HMV	2006	MOB1/HCV/18	06-04-15	50	1830	703	537	67.76	23.61	2540	648	1296	76.54	50.00	72.86
126	FORCE	CRUISER	LMV	2012	IMS/F/10185	07-04-15	27.23	980	127	331	46.73	61.63	1084	117	132	22.97	11.36	34.25
127	FORCE	CRUISER	LMV	2011	MOB1/LCV/43	16-04-15	50	753	261	256	68.66	1.92	891	234	292	59.03	19.86	63.44
128	FORCE	CRUISER	LMV	2009	MOB1/LCV/42	16-04-15	50	748	235	231	62.30	1.70	921	614	277	96.74	54.89	81.31
129	TATA MOTORS	207 DI	LMV	2010	MOB1/LCV/45	16-04-15	50	975	309	379	70.56	18.47	941	215	236	47.93	8.90	59.45
130	MAHINDRA	BOLERO	LMV	2007	MOB1/LCV/46	18-04-15	50	601	242	211	75.37	12.81	796	364	222	73.62	39.01	74.37
131	TATA MOTORS	ACE	LMV	2009	IMS/F/10193	20-04-15	40	744	140	320	61.83	56.25	513	104	213	61.79	51.17	61.81
132	TATA MOTORS	SPACIO	LMV	2011	MOB1/LCV/47	20-04-15	50	737	247	196	60.11	20.65	844	428	298	86.02	30.37	73.94
133	TATA MOTORS	BUS BODY	LMV	2009	MOB1/LCV/51	20-04-15	50	1427	1238	369	112.61	70.19	1295	1406	408	140.08	70.98	125.68
134	FORCE	CRUISER	LMV	2008	IMS/F/10191	21-04-15	27.23	989	126	294	42.47	57.14	1120	110	281	34.91	60.85	38.45
135	TATA MOTORS	ACE	LMV	2011	IMS/F/10201	22-04-15	40	694	116	359	68.44	67.69	490	87	213	61.22	59.15	65.46
136	FORCE	CRUISER	LMV	2011	IMS/F/10200	22-04-15	50	971	178	509	70.75	65.03	1052	76	81	14.92	6.17	41.72
137	TATA MOTORS	709 BUS	HMV	1998	IMS/F/10198	22-04-15	40	2295	439	932	59.74	52.90	3202	222	381	18.83	41.73	35.91
138	TATA MOTORS	407	HMV	1998	IMS/F/10204	23-04-15	40	1542	306	749	68.42	59.15	1501	248	649	59.76	61.79	64.15
139	TATA MOTORS	SALOON	LMV	2012	IMS/F/10210	24-04-15	40	957	167	393	58.52	57.51	993	115	285	40.28	59.65	49.23
140	FORCE	CRUISER	LMV	2007	IMS/F/10211	24-04-15	40	939	161	431	63.05	62.65	1025	179	445	60.88	59.78	61.91
141	ASHOK LEYLAND	BUS BODY	HMV	2012	IMS/F/10206	24-04-15	40	3461	573	1639	63.91	65.04	4032	591	1521	52.38	61.14	57.71
142	TATA MOTORS	Truck 709	HMV	2000	IMS/F/10207	24-04-15	40	1969	380	855	62.72	55.56	3338	349	1121	44.04	68.87	50.97
143	TATA MOTORS	ACE	LMV	2013	IMS/F/10215	27-04-15	40	753	143	306	59.63	53.27	549	110	306	75.77	64.05	66.44
144	TATA MOTORS	SPACIO	LMV	2012	MOB1/LCV/52	05-05-15	50	801	292	226	64.67	22.60	984	304	249	56.20	18.09	60.00
145	TATA MOTORS	ACE ZIP	LMV	2012	MOB1/LCV/53	05-05-15	50	465	266	119	82.80	55.26	327	249	90	103.67	63.86	91.41
146	TATA MOTORS	SPACIO	LMV	2010	MOB1/LCV/56	05-05-15	50	798	260	220	60.15	15.38	794	286	204	61.71	28.67	60.93
147	TATA MOTORS	ACE ZIP	LMV	2012	MOB1/LCV/62	06-05-15	50	449	280	156	97.10	44.29	406	248	132	93.60	46.77	95.44
148	FORCE	CRUISER	LMV	2010	MOB1/LCV/63	07-05-15	50	776	273	238	65.85	12.82	962	379	254	65.80	32.98	65.82
149	FORCE	CRUISER	LMV	2010	MOB1/LCV/66	08-05-15	50	719	344	262	84.28	23.84	903	268	277	60.35	3.25	70.96
150	TATA MOTORS	SPACIO	LMV	2012	MOB1/LCV/67	13-05-15	50	658	273	192	70.67	29.67	744	306	260	76.08	15.03	73.54
151	TATA MOTORS	SALOON	LMV	2008	IMS/F/89	14-05-15	50	993	250	319	57.30	21.63	997	357	262	62.09	26.61	59.70
152	TATA MOTORS	SALOON	LMV	2008	MOB1/LCV/69	15-05-15	50	826	29	230	31.36	87.39	921	435	237	72.96	45.52	53.29
153	MAHINDRA	MAXIMO MINI VAN	LMV	2013	MOB1/LCV/70	16-05-15	50	447	255	153	91.28	40.00	318	109	173	88.68	36.99	90.20
154	TATA MOTORS	SALOON	LMV	2012	MOB1/LCV/71	18-05-15	50	754	263	196	60.88	25.48	846	294	275	67.26	6.46	64.25
155	TATA MOTORS	SALOON	LMV	2013	IMS/F/90	25-05-15	50	965	282	406	71.30	30.54	985	357	344	71.17	3.64	71.23
156	TATA MOTORS	TATA SUMO	LMV	2009	IMS/F/91	26-05-15	50	1040	273	310	56.06	11.94	880	224	390	69.77	42.56	62.34
157	FORCE	CRUISER	LMV	2011	IMS/F/94	26-05-15	50	963	252	330	60.44	23.64	1030	258	320	56.12	19.38	58.20
158	TATA MOTORS	SALOON	LMV	2013	IMS/F/95	27-05-15	50	994	259	329	59.15	21.28	1000	262	288	55.00	9.03	57.07
159	TATA MOTORS	SALOON	LMV	2010	IMS/F/97	27-05-15	50	956	250	363	64.12	31.13	972	262	394	67.49	33.50	65.82
160	FORCE	CRUISER	LMV	2013	IMS/F/98	29-05-15	50	984	249	322	58.03	22.67	1095	281	297	52.79	5.39	55.27
161	TATA MOTORS	SPACIO	LMV	2010	IMS/F/99	06-06-15	50	963	252	333	60.75	24.32	963	489	251	76.84	48.67	68.80
162	FORCE	CRUISER	LMV	2011	IMS/F/100	06-06-15	50	975	259	382	65.74	32.20	1111	308	367	60.76	16.08	63.09
163	FORCE	CRUISER	LMV	2013	IMS/F/101	06-06-15	50	966	289	368	68.01	21.47	1097	280	676	87.15	58.58	78.19
164	TATA MOTORS	WINGER	LMV	2011	IMS/F/102	08-06-15	50	1198	323	506	69.20	36.17	825	234	556	95.76	57.91	80.03
165	TATA MOTORS	ACE	LMV	2013	IMS/F/104	09-06-15	50	713	182	221	56.52	17.65	447	113	216	73.60	47.69	63.10
166	TATA MOTORS	ACE	LMV	2013	IMS/F/106	09-06-15	50	698	185	219	57.88	15.53	438	113	316	97.95	64.24	73.33
167	TATA MOTORS	ACE	LMV	2013	IMS/F/107	09-06-15	50	702	183	237	59.83	22.78	396	110	103	53.79	6.36	57.65
168	TATA MOTORS	ACE	LMV	2013	IMS/F/108	09-06-15	50	744	206	289	66.53	28.72	445	143	119	58.88	16.78	63.67
169	TATA MOTORS	SALOON	LMV	2012	IMS/F/109	16-06-15	50	967	262	335	61.74	21.79	920	260	252	55.65	3.08	58.77
170	FORCE	CRUISER	LMV	2011	IMS/F/110	16-06-15	50	898	244	361	67.37	32.41	1078	374	273	60.02	27.01	63.36
171	TATA MOTORS	ACE	LMV	2013	IMS/F/111	17-06-15	50	737	193	236	58.21	18.22	477	136	176	65.41	22.73	61.04
172	TATA MOTORS	TIPPER	HMV	2012	IMS/F/10336	17-06-15	40	3298	660	1104	53.49	40.22	3547	681	1081	49.68	37.00	51.51
173	FORCE	CRUISER	LMV	2011	IMS/F/113	22-06-15	50	973	274	246	53.44	10.22	1075	270	429	65.02	37.06	59.52
174	TATA MOTORS	Truck	HMV	2003	IMS/F/10223	22-06-15	40	3738	605	1416	54.07	57.27	4246	641	1422	48.59	54.92	51.15
175	TATA MOTORS	ACE ZIP	LMV	2013	IMS/F/115	23-06-15	50	469	140	237	80.38	40.93	411	114	103	52.80	9.65	67.50
176	TATA MOTORS	Turbo Bus	HMV	1998	IMS/F/10225	23-06-15	40	2318	322	988	56.51	67.41	3307	120	1411	46.30	91.50	50.51
177	TATA MOTORS	Bus	HMV	2011	IMS/F/10226	23-06-15	40	2481	397	875	51.27	54.63	2318	319	877	51.60	63.63	51.43
178	TELCO LTD	Bus	HMV	2002	IMS/F/10227	23-06-15	40	1978	295	823	56.52	64.16	2259	227	978	53.34	76.79	54.83
179	TATA MOTORS	407	HMV	2003	IMS/F/10228	24-06-15	40	1932	181	724	46.84	75.00	2640	176	944	42.42	81.36	44.29
180	TATA MOTORS	SALOON	LMV	2011	IMS/F/116	25-06-15	50	962	257	383	66.53	32.90	941	354	279	67.27	21.19	66.89
181	TATA MOTORS	ACE	LMV	2007	IMS/F/117	25-06-15	50	758	201	215	54.88	6.51	453	114	220	73.73	48.18	61.93
182	TATA MOTORS	SPACIO	LMV	2012	IMS/F/118	26-06-15	50	938	247	396	68.55	37.63	989	513	245	76.64	52.24	72.70
183	TATA MOTORS	TRUCK OPEN BODY	HMV	2011	IMS/F/10231	29-06-15	40	4903	802	2038	57.92	60.65	3103	598	1661	72.80	64.00	63.69
184	TATA MOTORS	SPACIO	LMV	2011	IMS/F/119	30-06-15	50	965	285	379	68.81	24.80	995	254	692	95.08	63.29	82.14
185	FORCE	CRUISER	LMV	2010	IMS/F/120	30-06-15	50	998	271	405	67.74	33.09	1104	406	280	62.14	31.03	64.80
186	Force	CRUISER	LMV	2013	IMS/F/122	30-06-15	50	1008	253	300	54.86	15.67	1149	288	380	58.14	24.21	56.61
187	TATA MOTORS	SPACIO	LMV	2012	IMS/F/126	01-07-15	50	967	269	293	58.12	8.19	973	246	582	85.10	57.73	71.65
188	TATA MOTORS	SALOON	LMV	2011	IMS/F/127	02-07-15	50	961	245	296	56.30	17.23	964	341	334	70.02	2.05	63.17
189	TATA MOTORS	MAGIC	LMV	2012	IMS/F/133	04-07-15	50	699	191	271	66.09	29.52	420	106	154	61.90	31.17	64.52
190	TATA MOTORS	SUMO	LMV	2013	IMS/F/134	04-07-15	50	1015	264	343	59.80	23.03	999	232	611	84.38	62.03	72.00
191	TELCO LTD	BUS BODY	HMV	2004	IMS/F/129	04-07-15	40	1835	462	1358	99.18	65.98	1579	265	933	75.87	71.60	88.40
192	ASHOK LEYLAND	BUS	HMV	2008	IMS/F/10236	04-07-15	40	3302	585	1523	63.84	61.59	4540	606	1519	46.81	60.11	53.98
193	TATA MOTORS	SPACIO	LMV	2013	IMS/F/135	06-07-15	50	960	245	372	64.27	34.14	932	299	453	80.69	34.00	72.36
194	FORCE	CRUISER	LMV	2012	IMS/F/136	07-07-15	50	969	242	324	58.41	25.31	1078	411	275	63.64	33.09	61.16
195	TATA MOTORS	ACE	LMV	2013	IMS/F/139	07-07-15	50	733	210	304	70.12	30.92	502	127	193	63.75	34.20	67.53
196	FORCE	CRUISER	LMV	2009	IMS/F/141	07-07-15	50	983	268	383	66.23	30.03	1059	404	265	63.17	34.41	64.64
197	TELCO LTD	BUS BODY	HMV	2000	IMS/F/10238	07-07-15	40	1901	380	615	52.34	38.21	2118	302	1041	63.41	70.99	58.17
198	FORCE	CRUISER	LMV	2012	IMS/F/142	09-07-15	50	994	254	264	52.11	3.79	1051	438	91	50.33	79.22	51.20

SL. NO.	VEHICLE MANUFACTURER	MODEL	LMV / HMV	YEAR OF MANUFACYURING	REPORT / RECORD NUMBER	DATE OF TESTING	Cut-off Brake efficiency per Axle (%)	ROLLER BRAKE TEST RESULTS										Overall Braking Efficiency of the Vehicle (%)
								FRONT AXLE					REAR AXLE					
								AXLE WT. (kg)	Left Wl. PEAK FORCE (Kg)	Right Wl. PEAK FORCE (Kg)	Front Axle Braking Efficiency (%)	IMBALANCE (%) bet. R & L wheel F Axle	AXLE WT. (kg)	Left Wl. PEAK FORCE (Kg)	Right Wl. PEAK FORCE (Kg)	Rear Axle Braking Efficiency (%)	IMBALANCE (%) bet. R & L wheel R Axle	
199	ASHOK LEYLAND	BUS BODY	HMV	2010	IMS/F/10238	09-07-15	40	2948	597	1415	68.25	57.81	4590	653	1603	49.15	59.26	56.62
200	TATA MOTORS	ACE	LMV	2012	IMS/F/144	13-07-15	50	800	214	291	63.13	26.46	488	123	135	52.87	8.89	59.24
201	FORCE	TRAVELLER	LMV	2013	IMS/F/145	13-07-15	50	1287	340	336	52.53	1.18	1358	362	513	64.43	29.43	58.64
202	TATA MOTORS	TRUCK 1613 C	HMV	2008	IMS/F/10239	13-07-15	40	3724	749	1832	69.31	59.12	4309	787	1552	54.28	49.29	61.25
203	TATA MOTORS	ACE ZIP	LMV	2013	IMS/F/149	14-07-15	50	474	119	243	76.37	51.03	396	117	106	56.31	9.40	67.24
204	FORCE	CRUISER	LMV	2011	IMS/F/150	14-07-15	50	980	251	269	53.06	6.69	1085	536	37	52.81	93.10	52.93
205	TATA MOTORS	SALOON	LMV	2013	IMS/F/151	14-07-15	50	995	268	366	63.72	26.78	985	248	329	58.58	24.62	61.16
206	FORCE	CRUISER	LMV	2012	IMS/F/152	16-07-15	50	1003	269	452	71.88	40.49	1074	284	654	87.34	56.57	79.87
207	FORCE	CRUISER	LMV	2010	IMS/F/153	17-07-15	50	981	264	402	67.89	34.33	1078	286	271	51.67	5.24	59.40
208	FORCE	CRUISER	LMV	2011	IMS/F/155	17-07-15	50	972	247	526	79.53	53.04	1061	216	420	59.94	48.57	69.31
209	FORCE	CRUISER	LMV	2011	IMS/F/154	17-07-15	50	973	244	476	74.00	48.74	1061	69	371	41.47	81.40	57.03
210	TELCO LTD	BUS BODY	HMV	2008	IMS/F/10241	17-07-15	40	2486	385	1111	60.18	65.35	2790	110	1069	42.26	89.71	50.70
211	TATA MOTORS	SALOON	LMV	2012	IMS/F/159	27-07-15	50	944	237	287	55.51	17.42	975	249	460	72.72	45.87	64.25
212	TELCO LTD	Small Truck	LMV	2000	IMS/F/160	27-07-15	50	1445	407	458	59.86	11.14	1380	276	710	71.45	61.13	65.52
213	TELCO LTD	BUS BODY	HMV	2006	IMS/F/161	30-07-15	40	1862	1132	255	74.49	77.47	2123	89	1033	52.85	91.38	62.96
214	TATA MOTORS	SUMO	LMV	2012	IMS/F/162	31-07-15	50	1010	282	297	57.33	5.05	1016	236	268	49.61	11.94	53.46
215	FORCE	TRAVELLER	LMV	2013	IMS/F/163	03-08-15	50	1275	338	373	55.76	9.38	1395	279	517	57.06	46.03	56.44
216	TATA MOTORS	SMALL STARBUS	LMV	2010	IMS/F/10248	04-08-15	50	1169	247	243	41.92	1.62	1185	76	660	62.11	88.48	52.08
217	TATA MOTORS	SALOON	LMV	2008	IMS/F/166	06-08-15	50	1008	269	276	54.07	2.54	992	317	250	57.16	21.14	55.60
218	TATA MOTORS	SALOON	LMV	2008	IMS/F/165	06-08-15	50	1019	263	275	52.80	4.36	1001	106	331	43.66	67.98	48.27
219	MAHINDRA	MAXIMA	LMV	2011	IMS/F/167	10-08-15	50	680	173	231	59.41	25.11	497	85	91	35.41	6.59	49.28
220	FORCE	TRAVELLER	LMV	2013	IMS/F/169	11-08-15	50	1283	333	431	59.55	22.74	1355	131	144	20.30	9.03	39.39
221	FORCE	CRUISER	LMV	2009	IMS/F/173	12-08-15	50	960	284	391	70.31	27.37	1095	275	520	72.60	47.12	71.53
222	TATA MOTORS	ACE	LMV	2011	IMS/F/174	13-08-15	50	696	177	271	64.37	34.69	472	121	191	66.10	36.65	65.07
223	FORCE	TRAVELLER	LMV	2013	IMS/F/176	13-08-15	50	1242	313	367	54.75	14.71	1339	363	443	60.19	18.06	57.57
224	TATA MOTORS	SE 1613	HMV	2010	IMS/F/10252	13-08-15	40	3515	459	738	34.05	37.80	4100	655	386	25.39	41.07	29.39
225	FORCE	CRUISER	LMV	2013	IMS/F/177	20-08-15	50	980	252	275	53.78	8.36	1133	347	285	55.78	17.87	54.85
226	TELCO LTD	MINI BUS	HMV	2003	IMS/F/10267	21-08-15	40	1910	473	663	59.48	28.66	2545	149	126	10.81	15.44	31.67
227	TATA MOTORS	SUMO	LMV	2009	IMS/F/180	24-08-15	50	950	262	324	61.68	19.14	940	256	379	67.55	32.45	64.60
228	TATA MOTORS	SUMO	LMV	2006	IMS/F/179	24-08-15	50	1014	259	343	59.37	24.49	969	244	338	60.06	27.81	59.71
229	TATA MOTORS	SPACIO	LMV	2012	IMS/F/181	26-08-15	50	968	245	364	62.91	32.69	968	266	316	60.12	15.82	61.52
230	FORCE	TRAVELLER	LMV	2013	IMS/F/183	27-08-15	50	1325	369	460	62.57	19.78	1416	362	432	56.07	16.20	59.21
231	FORCE	TRAVELLER	LMV	2013	IMS/F/182	27-08-15	50	1310	361	457	62.44	21.01	1416	151	368	36.65	58.97	49.05
232	TATA MOTORS	SPACIO	LMV	2012	IMS/F/185	29-08-15	50	985	267	417	69.44	35.97	992	304	295	60.38	2.96	64.90
233	FORCE	TRAVELLER	LMV	2013	IMS/F/187	29-08-15	50	1299	354	474	63.74	25.32	1425	364	358	50.67	1.65	56.90
234	FORCE	CRUISER	LMV	2012	IMS/F/188	01-09-15	50	976	259	416	69.16	37.74	1069	287	404	64.64	28.96	66.80
235	TATA MOTORS	ACE	LMV	2011	IMS/F/194	07-09-15	50	744	199	252	60.62	21.03	463	125	123	53.56	1.60	57.91
236	TATA MOTORS	SUMO	LMV	2012	IMS/F/196	14-09-15	50	949	244	330	60.48	26.06	969	258	308	58.41	16.23	59.44
237	TELCO LTD	BUS BODY	HMV	2003	IMS/F/10268	15-09-15	40	1751	162	452	35.07	64.16	2667	339	609	35.55	44.33	35.36
238	TATA MOTORS	SUMO GOLD	LMV	2012	IMS/F/198	21-09-15	50	1023	278	264	52.98	5.04	1088	369	356	66.64	3.52	60.02
239	TATA MOTORS	SE 1613	HMV	2008	IMS/F/10269	21-09-15	40	3588	698	1144	51.34	38.99	4078	715	1152	45.78	37.93	48.38
240	TATA MOTORS	MAGIC	LMV	2012	IMS/F/206	23-09-15	50	681	183	278	67.69	34.17	422	110	156	63.03	29.49	65.91
241	TATA MOTORS	EX2	HMV	2012	IMS/F/10271	29-09-15	40	2862	517	978	52.24	47.14	2826	482	851	47.17	43.36	49.72
242	TATA MOTORS	SUMO	LMV	2011	IMS/F/208	30-09-15	50	958	243	346	61.48	29.77	993	257	307	56.80	16.29	59.10
243	TATA MOTORS	ACE	LMV	2013	IMS/F/209	06-10-15	50	736	186	228	56.25	18.42	482	124	169	60.79	26.63	58.05
244	TATA MOTORS	SPACIO	LMV	2012	IMS/F/212	06-10-15	50	966	258	319	59.73	19.12	1040	279	329	58.46	15.20	59.07
245	TATA MOTORS	ACE	LMV	2013	IMS/F/216	08-10-15	50	711	179	252	60.62	28.97	489	160	133	59.92	16.88	60.33
246	FORCE	CRUISER	LMV	2011	IMS/F/225	13-10-15	50	1014	257	274	52.37	6.20	1113	435	283	64.51	34.94	58.72
247	FORCE	CRUISER	LMV	2012	IMS/F/226	13-10-15	50	983	362	257	62.97	29.01	1093	282	372	59.84	24.19	61.32
248	TATA MOTORS	ACE	LMV	2007	IMS/F/223	13-10-15	50	757	207	235	58.39	11.91	425	30	323	83.06	90.71	67.26
249	TATA MOTORS	SE 1613	HMV	2011	IMS/F/10273	13-10-15	40	4277	917	1412	54.45	35.06	4336	742	1186	44.46	37.44	49.43
250	TATA MOTORS	SUMO	LMV	2012	IMS/F/228	16-10-15	50	1024	260	314	56.05	17.20	853	216	265	56.39	18.49	56.21
251	TATA MOTORS	CITYBUS	LMV	2004	IMS/F/228A	17-10-15	50	1755	576	454	58.69	21.18	1641	522	416	57.16	20.31	57.95
252	FORCE	CRUISER	LMV	2012	IMS/F/230	19-10-15	50	976	253	326	59.32	22.39	1153	405	293	60.54	27.65	59.98
253	FORCE	CRUISER	LMV	2010	IMS/F/232	26-10-15	50	985	410	265	68.53	35.37	1138	460	335	69.86	27.17	69.24
254	FORCE	CRUISER	LMV	2010	IMS/F/237	27-10-15	50	948	266	368	66.88	27.72	1038	260	424	65.90	38.68	66.36
255	FORCE	CRUISER	LMV	2013	IMS/F/239	27-10-15	50	976	247	274	53.38	9.85	1097	284	466	68.37	39.06	61.31
256	TATA MOTORS	SPACIO	LMV	2012	IMS/F/240	27-10-15	50	959	253	370	64.96	31.62	974	251	245	50.92	2.39	57.89
257	FORCE	CRUISER	LMV	2012	IMS/F/243	28-10-15	50	969	249	298	56.45	16.44	1077	406	423	76.97	4.02	67.25
258	TATA MOTORS	SUMO EZI PLUS	LMV	2009	IMS/F/241	28-10-15	50	950	241	322	59.26	25.16	959	116	655	80.40	82.29	69.88
259	TATA MOTORS	SUMO	LMV	2009	IMS/F/246	31-10-15	50	954	269	366	66.56	26.50	963	258	385	66.77	32.99	66.67
260	TATA MOTORS	OIL TANKER	HMV	2004	IMS/F/10273	05-11-15	40	1731	447	542	57.13	17.53	3806	452	986	37.78	54.16	43.83
261	TATA MOTORS	STAR BUS	HMV	2011	IMS/F/249	06-11-15	40	2560	667	654	51.60	1.95	2509	97	67	6.54	30.93	29.30
262	FORCE	CRUISER	LMV	2011	IMS/F/257	13-11-15	50	984	255	426	69.21	40.14	1136	286	428	62.85	33.18	65.80
263	TATA MOTORS	SPACIO	LMV	2009	IMS/F/258	16-11-15	50	970	273	378	67.11	27.78	1029	268	690	93.10	61.16	80.49
264	TATA MOTORS	TIPPER	HMV	2012	IMS/F/10275	16-11-15	40	4096	793	1285	50.73	38.29	4001	746	1166	47.79	36.02	49.28
265	TATA MOTORS	SPACIO	LMV	2009	IMS/F/265	17-11-15	50	923	247	381	68.04	35.17	1015	272	404	66.60	32.67	67.29
266	TATA MOTORS	BUS407	HMV	2002	IMS/F/262	17-11-15	40	1952	506	717	62.65	29.43	2165	545	979	70.39	44.33	66.72
267	TATA MOTORS	BUS407	HMV	2002	IMS/F/269	20-11-15	40	1953	507	593	56.32	14.50	2145	690	712	65.36	3.09	61.05
268	TATA MOTORS	SPACIO	LMV	2011	IMS/F/272	24-11-15	50	960	241	295	55.83	18.31	960	255	350	63.02	27.14	59.43
269	FORCE	CRUISER	LMV	2009	IMS/F/273	25-11-15	50	978	247	297	55.62	16.84	1115	282	308	52.91	8.44	54.18
270	FORCE	CRUISER	LMV	2009	IMS/F/271	26-11-15	50	1004	260	305	56.27	14.75	1123	175	501	60.20	65.07	58.35
271	TATA MOTORS	207 DI	LMV	2012	IMS/F/276	03-12-15	50	1133	291	421	62.84	30.88	845	356	348	83.31	2.25	71.59
272	TATA MOTORS	INDICA V2	LMV	2012	IMS/F/277	03-12-15	50	694	197	236	62.39	16.53	363	96	125	60.88	23.20	61.87
273	TATA MOTORS	STAR BUS	HMV	2011	IMS/F/10281	04-12-15	40	2590	526	938	56.53	43.92	2944	477	895	46.60	46.70	51.25
274	TATA MOTORS	BUS BODY	HMV	2008	IMS/F/10282	07-12-15	40	3747	784	1195	52.82	34.39	4999	804	1269	41.47	36.64	46.33
275	ASHOK LEYLAND	BUS	HMV	2012	IMS/F/10283	08-12-15	40	3388	540	288	24.44	46.67	3048	469	367	27.43	21.75	25.85
276	TATA MOTORS	SPACIO MAXI CAB	LMV	2011	IMS/F/285	09-12-15	50	953	251	282	55.93	10.99	1005	275	389	66.07	29.31	61.13
277	FORCE	CRUISER	LMV	2011	IMS/F/286	14-12-15	50	973	255	351	62.28	27.35	1075	279	405	63.63	31.11	62.99
278	TATA MOTORS	BUS BODY	HMV	2006	IMS/F/10294	14-12-15	40	1873	350	598	50.61	41.47	1946	304	596	46.25	48.99	48.39

SL. NO.	VEHICLE MANUFACTURER	MODEL	LMV / HMV	YEAR OF MANUFACYURING	REPORT / RECORD NUMBER	DATE OF TESTING	Cut-off Brake efficiency per Axle (%)	ROLLER BRAKE TEST RESULTS										Overall Braking Efficiency of the Vehicle (%)
								FRONT AXLE					REAR AXLE					
								AXLE WT. (kg)	Left Wl. PEAK FORCE (Kg)	Right Wl. PEAK FORCE (Kg)	Front Axle Braking Efficiency (%)	IMBALANCE (%) bet. R & L wheel F Axle	AXLE WT. (kg)	Left Wl. PEAK FORCE (Kg)	Right Wl. PEAK FORCE (Kg)	Rear Axle Braking Efficiency (%)	IMBALANCE (%) bet. R & L wheel R Axle	
279	ASHOK LEYLAND	BUS	HMV	2006	IMS/F/10295	14-12-15	40	3071	547	1125	54.44	51.38	4522	751	1197	43.08	37.26	47.68
280	ASHOK LEYLAND	BUS	HMV	2007	IMS/F/10292	14-12-15	40	2799	503	959	52.23	47.55	3016	397	591	32.76	32.83	42.13
281	TATA MOTORS	BUS	LMV	2006	IMS/F/10296	15-12-15	50	1882	343	655	53.03	47.63	1937	358	663	52.71	46.00	52.87
282	ASHOK LEYLAND	BUS BODY	HMV	2007	IMS/F/10299	15-12-15	40	2749	597	950	56.28	37.16	3016	524	858	45.82	38.93	50.81
283	ASHOK LEYLAND	BUS BODY	HMV	2006	IMS/F/10301	15-12-15	40	3075	779	934	55.71	16.60	4486	736	1233	43.89	40.31	48.70
284	TATA MOTORS	BUS BODY	HMV	2005	IMS/F/10303	16-12-15	40	2322	438	719	49.83	39.08	2681	333	635	36.11	47.56	42.47
285	TATA MOTORS	BUS	HMV	2005	IMS/F/10302	16-12-15	40	2350	469	773	52.85	39.33	2649	420	737	43.68	43.01	47.99
286	TATA MOTORS	SUMO MAXICAB	LMV	2012	IMS/F/291	17-12-15	50	986	255	366	62.98	30.33	959	483	241	75.50	50.10	69.15
287	TATA MOTORS	BUS BODY	HMV	2005	IMS/F/10311	17-12-15	40	2368	465	794	53.17	41.44	2640	420	748	44.24	43.85	48.46
288	TATA MOTORS	MAGIC	LMV	2009	IMS/F/292	18-12-15	50	725	197	263	63.45	25.10	470	156	118	58.30	24.36	61.42
289	TATA MOTORS	SPACIO	LMV	2009	IMS/F/293	18-12-15	50	971	254	287	55.72	11.50	982	390	325	72.81	16.67	64.31
290	TATA MOTORS	SPACIO	LMV	2012	IMS/F/296	19-12-15	50	953	251	261	53.73	3.83	954	244	290	55.97	15.86	54.85
291	TATA MOTORS	SUMO MAXICAB	LMV	2012	IMS/F/301	19-12-15	50	979	246	365	62.41	32.60	994	268	281	55.23	4.63	58.79
292	TATA MOTORS	SPACIO	LMV	2010	IMS/F/302	19-12-15	50	980	267	388	66.84	31.19	1005	255	370	62.19	31.08	64.48
293	TATA MOTORS	ACE HT	LMV	2011	IMS/F/304	21-12-15	50	733	198	351	74.90	43.59	447	130	112	54.14	13.85	67.03
294	TATA MOTORS	TRUCK 1613 TC	HMV	2000	IMS/F/10314	21-12-15	40	3307	636	1194	55.34	46.73	3860	607	946	40.23	35.84	47.20
295	TATA MOTORS	TRUCK 1613 TC	HMV	2000	IMS/F/10312	21-12-15	40	3302	636	1143	53.88	44.36	3887	541	773	33.80	30.01	43.02
296	TATA MOTORS	ACE HT	LMV	2011	IMS/F/308	22-12-15	50	725	187	233	57.93	19.74	438	131	158	65.98	17.09	60.96
297	TATA MOTORS	SPACIO	LMV	2011	IMS/F/310	23-12-15	50	963	261	320	60.33	18.44	1005	348	255	60.00	26.72	60.16
298	FORCE	CRUISER	LMV	2010	IMS/F/311	28-12-15	50	961	258	285	56.50	9.47	1080	276	367	59.54	24.80	58.11
299	TATA MOTORS	SPACIO	LMV	2013	IMS/F/312	28-12-15	50	980	266	334	61.22	20.36	1034	283	443	70.21	36.12	65.84
300	TATA MOTORS	WINGER	LMV	2010	IMS/F/313	28-12-15	50	1064	276	390	62.59	29.23	781	205	241	57.11	14.94	60.27
301	TATA MOTORS	SPACIO	LMV	2007	IMS/F/314	28-12-15	50	966	267	379	66.87	29.55	989	310	381	69.87	18.64	68.39
302	TATA MOTORS	SPACIO	LMV	2013	IMS/F/315	28-12-15	50	974	257	320	59.24	19.69	987	261	310	57.85	15.81	58.54
303	TATA MOTORS	SPACIO	LMV	2011	IMS/F/319	28-12-15	50	1000	252	290	54.20	13.10	1026	272	341	59.75	20.23	57.01
304	TATA MOTORS	SPACIO	LMV	2013	IMS/F/320	28-12-15	50	1024	284	355	62.40	20.00	1001	292	389	68.03	24.94	65.19
305	TATA MOTORS	SPACIO	LMV	2013	IMS/F/317	28-12-15	50	982	265	343	61.91	22.74	1005	256	540	79.20	52.59	70.66
306	TATA MOTORS	SALOON	LMV	2013	IMS/F/323	31-12-15	50	980	266	320	59.80	16.88	972	265	362	64.51	26.80	62.14
307	TATA MOTORS	ACE	LMV	2013	IMS/F/324	04-01-16	50	749	192	265	61.01	27.55	543	169	139	56.72	17.75	59.21
308	TATA MOTORS	SUMO	LMV	2004	MOB2/LCV/43	05-01-16	50	1039	250	224	45.62	10.40	1175	246	235	40.94	4.47	43.13
309	FORCE	CRUISER	LMV	2012	MOB2/LCV/45	08-01-16	50	998	216	235	45.19	8.09	1170	243	282	44.87	13.83	45.02
310	TATA MOTORS	407 BUS	HMV	2005	MOB2/LCV/46	10-01-16	40	1998	410	599	50.50	31.55	2109	427	424	40.35	0.70	45.29
311	TATA MOTORS	ACE ZIP	LMV	2013	MOB2/LCV/47	12-01-16	50	458	114	92	44.98	19.30	469	85	60	30.92	29.41	37.86
312	FORCE	CRUISER	LMV	2013	MOB2/LCV/48	12-01-16	50	1007	222	241	45.98	7.88	1213	322	254	47.49	21.12	46.80
313	TATA MOTORS	407 BUS	HMV	2005	MOB2/HCV/16	12-01-16	40	1948	574	507	55.49	11.67	2665	495	691	44.50	28.36	49.14
314	TATA MOTORS	SUMO	LMV	2009	IMS/F/331	14-01-16	50	1012	298	325	61.56	8.31	980	255	266	53.16	4.14	57.43
315	TATA MOTORS	BUS	HMV	2012	MOB2/HCV/18	20-01-16	40	2676	703	875	58.97	19.66	2978	753	825	52.99	8.73	55.82
316	ASHOK LEYLAND	TRUCK	HMV	2015	MOB2/HCV/19	26-01-16	40	3259	799	1024	55.94	21.97	3924	1161	989	54.79	14.81	55.31
317	ASHOK LEYLAND	TRUCK	HMV	2015	MOB2/HCV/20	26-01-16	40	3307	827	940	53.43	12.02	3937	1024	1017	51.84	0.68	52.57
318	TATA MOTORS	SUMO MAXICAB	LMV	2008	MOB2/LCV/53	28-01-16	50	932	214	255	50.32	16.08	1095	221	324	49.77	31.79	50.02
319	TATA MOTORS	407 BUS	HMV	2005	MOB2/LCV/49	28-01-16	40	1950	392	406	40.92	3.45	2123	82	18	4.71	78.05	22.05
320	TATA MOTORS	407 BUS	HMV	2005	MOB2/HCV/51	28-01-16	40	1926	387	534	47.82	27.53	2220	524	453	44.01	13.55	45.78
321	TATA MOTORS	SUPER ACE	LMV	2012	MOB2/LCV/54	08-02-16	50	980	204	204	41.63	0.00	748	101	101	27.01	0.00	35.30
322	TATA MOTORS	SPACIO	LMV	2012	MOB2/LCV/56	09-02-16	50	989	232	206	44.29	11.21	1116	225	230	40.77	2.17	42.42
323	TATA MOTORS	SPACIO	LMV	2012	MOB2/LCV/57	10-02-16	50	1009	224	252	47.18	11.11	1102	222	222	40.29	0.00	43.58
324	TATA MOTORS	TIPPER	HMV	2015	IMS/F/10318	16-02-16	40	4091	782	1251	49.69	37.49	3320	667	818	44.73	18.46	47.47
325	TATA MOTORS	TIPPER	HMV	2015	IMS/F/10317	16-02-16	40	4268	808	1237	47.91	34.68	3443	697	788	43.13	11.55	45.78
326	TATA MOTORS	BUS BODY	HMV	2014	IMS/F/10322	17-02-16	40	3524	821	1090	54.23	24.68	4300	849	1262	49.09	32.73	51.41
327	TATA MOTORS	TRUCK	HMV	2008	IMS/F/10323	17-02-16	40	4078	939	1390	57.11	32.45	4309	714	1234	45.21	42.14	51.00
328	FORCE	CRUISER	LMV	2009	IMS/F/344	18-02-16	50	967	264	253	53.46	4.17	1056	268	365	59.94	26.58	56.85
329	TATA MOTORS	ACE	LMV	2011	IMS/F/345	18-02-16	50	471	122	151	57.96	19.21	383	89	114	53.00	21.93	55.74
330	TATA MOTORS	CLB	LMV	2011	IMS/F/347	18-02-16	50	704	177	251	60.80	29.48	407	106	146	61.92	27.40	61.21
331	TATA MOTORS	SPACIO	LMV	2012	MOB2/LCV/58	18-02-16	50	987	265	224	49.54	15.47	1143	230	238	40.94	3.36	44.93
332	TATA MOTORS	SUMO	LMV	2012	IMS/F/348	26-02-16	50	1059	307	388	65.63	20.88	855	253	519	90.29	51.25	76.65
333	TATA MOTORS	SALOON	LMV	2013	IMS/F/360	23-05-16	50	970	258	342	61.86	24.56	1018	259	381	62.87	32.02	62.37
334	FORCE	CRUISER	LMV	2011	IMS/F/362	24-05-16	50	1006	258	334	58.85	22.75	1062	303	267	53.67	11.88	56.19
335	FORCE	CRUISER	LMV	2011	IMS/F/365	24-05-16	50	980	264	332	60.82	20.48	1064	266	302	53.38	11.92	56.95
336	FORCE	CRUISER	LMV	2011	IMS/F/362	24-05-16	50	1006	258	334	58.85	22.75	1062	303	267	53.67	11.88	56.19
337	TATA MOTORS	SALOON	LMV	2010	IMS/F/371	26-05-16	50	964	266	387	67.74	31.27	1001	253	452	70.43	44.03	69.11
338	TATA MOTORS	SALOON	LMV	2008	IMS/F/368	26-05-16	50	941	238	325	59.83	26.77	1021	339	447	76.98	24.16	68.76
339	TATA MOTORS	SALOON	LMV	2013	IMS/F/370	26-05-16	50	976	282	465	76.54	39.35	1015	254	303	54.88	16.17	65.49
340	TATA MOTORS	SALOON	LMV	2010	IMS/F/372	26-05-16	50	964	276	388	68.88	28.87	996	254	330	58.63	23.03	63.67
341	TATA MOTORS	SALOON	LMV	2009	IMS/F/376	26-05-16	50	973	273	374	66.50	27.01	885	240	298	60.79	19.46	63.78
342	TATA MOTORS	SALOON	LMV	2010	IMS/F/371	26-05-16	50	964	266	387	67.74	31.27	1001	253	452	70.43	44.03	69.11
343	FORCE	CRUISER	LMV	2008	IMS/F/378	27-05-16	50	975	269	299	58.26	10.03	1034	56	762	79.11	92.65	68.99
344	TATA MOTORS	SPACIO	LMV	2012	IMS/F/380	30-05-16	50	991	261	515	78.30	49.32	970	266	336	62.06	20.83	70.27
345	FORCE	CRUISER	LMV	2008	IMS/F/381	30-05-16	50	972	248	311	57.51	20.26	1036	242	617	82.92	60.78	70.62
346	TATA MOTORS	SALOON	LMV	2012	IMS/F/383	30-05-16	50	968	286	341	64.77	16.13	987	257	594	86.22	56.73	75.60
347	TATA MOTORS	SALOON	LMV	2012	IMS/F/385	30-05-16	50	1010	267	365	62.57	26.85	1002	256	346	60.08	26.01	61.33
348	TATA MOTORS	SALOON	LMV	2012	IMS/F/384	30-05-16	50	973	256	338	61.05	24.26	987	95	720	82.57	86.81	71.89
349	TATA MOTORS	ACE	LMV	2013	IMS/F/386	03-06-16	50	706	195	255	63.74	23.53	462	122	123	53.03	0.81	59.50
350	TATA MOTORS	ACE	LMV	2013	IMS/F/390	08-06-16	50	724	204	261	64.23	21.84	457	117	153	59.08	23.53	62.24
351	TATA MOTORS	ACE	LMV	2013	IMS/F/391	08-06-16	50	691	184	290	68.60	36.55	406	135	108	59.85	20.00	65.36
352	TATA MOTORS	SUMO GOLD	LMV	2013	IMS/F/393	13-06-16	50	1031	278	326	58.58	14.72	978	258	320	59.10	19.38	58.84
353	TATA MOTORS	SALOON	LMV	2012	IMS/F/392	13-06-16	50	966	250	310	57.97	19.35	971	260	354	63.23	26.55	60.61
354	FORCE	CRUISER	LMV	2011	IMS/F/394	16-06-16	50	989	259	299	56.42	13.38	1108	282	481	68.86	41.37	62.99
355	TATA MOTORS	ACE	LMV	2007	IMS/F/396	23-06-16	50	782	213	365	73.91	41.64	450	125	152	61.56	17.76	69.40
356	TATA MOTORS	SPACIO	LMV	2011	IMS/F/397	27-06-16	50	931	258	380	68.53	32.11	1021	273	392	65.13	30.36	66.75
357	TATA MOTORS	ACE ZIP	LMV	2012	IMS/F/399	27-06-16	50	387	106	112	56.33	5.36	419	185	106	69.45	42.70	63.15
358	TATA MOTORS	SPACIO	LMV	2012	IMS/F/400	27-06-16	50	939	246	310	59.21	20.65	1006	266	394	65.61	32.49	62.52

SL. NO.	VEHICLE MANUFACTURER	MODEL	LMV / HMV	YEAR OF MANUFACYURING	REPORT / RECORD NUMBER	DATE OF TESTING	Cut-off Brake efficiency per Axle (%)	ROLLER BRAKE TEST RESULTS										Overall Braking Efficiency of the Vehicle (%)
								FRONT AXLE					REAR AXLE					
								AXLE WT. (kg)	Left Wl. PEAK FORCE (Kg)	Right Wl. PEAK FORCE (Kg)	Front Axle Braking Efficiency (%)	IMBALANCE (%) bet. R & L wheel F Axle	AXLE WT. (kg)	Left Wl. PEAK FORCE (Kg)	Right Wl. PEAK FORCE (Kg)	Rear Axle Braking Efficiency (%)	IMBALANCE (%) bet. R & L wheel R Axle	
359	TATA MOTORS	SPACIO	LMV	2012	IMS/F/398	27-06-16	50	981	251	327	58.92	23.24	1025	262	618	85.85	57.61	72.68
360	FORCE	CRUISER	LMV	2010	IMS/F/406	28-06-16	50	998	255	344	60.02	25.87	1107	277	417	62.69	33.57	61.43
361	TATA MOTORS	SALOON	LMV	2011	IMS/F/404	28-06-16	50	968	245	328	59.19	25.30	970	259	252	52.68	2.70	55.93
362	FORCE	CRUISER	LMV	2013	IMS/F/401	28-06-16	50	998	539	256	79.66	52.50	1121	285	357	57.27	20.17	67.82
363	TATA MOTORS	ACE ZIP	LMV	2013	IMS/F/405	28-06-16	50	457	119	162	61.49	26.54	410	73	82	37.80	10.98	50.29
364	FORCE	TRAVELLER	LMV	2013	IMS/F/407	30-06-16	50	1309	357	467	62.95	23.55	1378	289	696	71.48	58.48	67.32
365	TATA MOTORS	MAGIC	LMV	2012	IMS/F/409	01-07-16	50	672	214	207	62.65	3.27	416	105	159	63.46	33.96	62.96
366	TATA MOTORS	ACE	LMV	2013	IMS/F/410	05-07-16	50	735	186	205	53.20	9.27	502	127	134	51.99	5.22	52.71
367	TATA MOTORS	SPACIO	LMV	2013	IMS/F/411	06-07-16	50	961	254	406	68.68	37.44	954	240	356	62.47	32.58	65.59
368	FORCE	CRUISER	LMV	2010	IMS/F/412	13-07-16	50	982	276	410	69.86	32.68	1104	29	650	61.50	95.54	65.44
369	FORCE	CRUISER	LMV	2010	IMS/F/413	14-07-16	50	983	256	343	60.94	25.36	1091	265	296	51.42	10.47	55.93
370	FORCE	CRUISER	LMV	2011	IMS/F/414	19-07-16	50	997	254	313	56.87	18.85	1067	268	310	54.17	13.55	55.47
371	TATA MOTORS	TRUCK 2518	HMV	2012	IMS/F/10338	25-07-16	40	3561	713	1180	53.16	39.58	2531	530	813	53.06	34.81	53.12
372	TATA MOTORS	TRUCK 2518	HMV	2012	IMS/F/10337	25-07-16	40	3479	672	1152	52.43	41.67	2436	351	693	42.86	49.35	48.49
373	TELCO LTD	BUS	HMV	2006	IMS/F/417	29-07-16	40	1912	501	610	58.11	17.87	2078	221	680	43.36	67.50	50.43
374	FORCE	CRUISER	LMV	2012	IMS/F/419	30-07-16	50	958	241	466	73.80	48.28	1044	263	263	50.38	0.00	61.59
375	TATA MOTORS	SUMO	LMV	2003	IMS/F/423	02-08-16	50	1000	259	271	53.00	4.43	977	245	402	66.22	39.05	59.53
376	TATA MOTORS	SPACIO	LMV	2012	IMS/F/429	04-08-16	50	980	288	271	57.04	5.90	1000	307	296	60.30	3.58	58.69
377	FORCE	TRAVELLER	LMV	2013	IMS/F/434	08-08-16	50	1306	331	393	55.44	15.78	1423	262	452	50.18	42.04	52.69
378	TATA MOTORS	ACE	LMV	2013	IMS/F/436	09-08-16	50	755	194	206	52.98	5.83	546	144	364	93.04	60.44	69.79
379	TATA MOTORS	ACE	LMV	2013	IMS/F/437	10-08-16	50	741	202	245	60.32	17.55	545	138	279	76.51	50.54	67.19
380	TELCO LTD	BUS	HMV	2006	IMS/F/438	11-08-16	40	1918	603	529	59.02	12.27	2099	536	977	72.08	45.14	65.85
381	FORCE	CRUISER	LMV	2013	IMS/F/439	12-08-16	50	997	255	394	65.10	35.28	1097	322	282	55.06	12.42	59.84
382	FORCE	CRUISER	LMV	2009	IMS/F/440	16-08-16	50	975	249	419	68.51	40.57	1050	27	44	6.76	38.64	36.49
383	FORCE	CRUISER	LMV	2012	IMS/F/445	17-08-16	50	982	269	354	63.44	24.01	1107	277	543	74.07	48.99	69.08
384	FORCE	CRUISER	LMV	2009	IMS/F/443	17-08-16	50	982	249	331	59.06	24.77	1056	264	470	69.51	43.83	64.47
385	FORCE	CRUISER	LMV	2009	IMS/F/442	17-08-16	50	966	248	712	99.38	65.17	1045	261	410	64.21	36.34	81.10
386	FORCE	TRAVELLER	LMV	2013	IMS/F/446	20-08-16	50	1348	403	431	61.87	6.50	1468	157	206	24.73	23.79	42.51
387	FORCE	CRUISER	LMV	2012	IMS/F/447	22-08-16	50	1000	256	285	54.10	10.18	1086	272	343	56.63	20.70	55.42
388	TATA MOTORS	SUMO	LMV	2006	IMS/F/449	22-08-16	50	992	260	354	61.90	26.55	984	256	251	51.52	1.95	56.73
389	TATA MOTORS	SALOON	LMV	2012	IMS/F/453	24-08-16	50	1012	284	425	70.06	33.18	1069	237	333	53.32	28.83	61.46
390	TATA MOTORS	SPACIO	LMV	2012	IMS/F/454	24-08-16	50	960	269	656	96.35	58.99	982	249	393	65.38	36.64	80.69
391	TATA MOTORS	SALOON	LMV	2012	IMS/F/450	24-08-16	50	1019	276	441	70.36	37.41	1046	262	456	68.64	42.54	69.49
392	TATA MOTORS	SPACIO	LMV	2012	IMS/F/449	24-08-16	50	972	289	387	69.55	25.32	983	255	621	89.11	58.94	79.39
393	FORCE	TRAVELLER	LMV	2013	IMS/F/457	26-08-16	50	1326	358	625	74.13	42.72	1388	365	654	73.41	44.19	73.77
394	FORCE	TRAVELLER	LMV	2013	IMS/F/455	29-08-16	50	1266	317	468	62.01	32.26	1352	310	486	58.88	36.21	60.39
395	TATA MOTORS	XENON PICKUP	LMV	2014	MOB2/LCV/60	17-02-17	40	1245	264	253	41.53	4.17	1343	283	322	45.05	12.11	43.35
396	TATA MOTORS	SPACIO	LMV	2012	MOB2/LCV/61	17-02-17	40	998	247	233	48.10	5.67	1159	235	235	40.55	0.00	44.04
397	MAHINDRA	MAXXIMO LOAD	LMV	2012	MOB2/LCV/62	22-02-17	40	714	145	160	42.72	9.38	662	88	68	23.56	22.73	33.50
398	TATA MOTORS	ACE ZIP	LMV	2011	MOB2/LCV/66	23-02-17	40	538	133	135	49.81	1.48	467	110	87	42.18	20.91	46.27
399	TATA MOTORS	SUMO	LMV	2012	MOB2/LCV/67	23-02-17	40	1080	219	240	42.50	8.75	971	238	289	54.27	17.65	48.07
400	TATA MOTORS	SUMO VICTA	LMV	2010	MOB2/LCV/68	24-02-17	40	1032	232	212	43.02	8.62	1125	245	234	42.58	4.49	42.79
401	TATA MOTORS	SPACIO	LMV	2010	MOB2/LCV/69	27-02-17	40	977	232	218	46.06	6.03	1107	245	223	42.28	8.98	44.05
402	TATA MOTORS	SUMO	LMV	2011	MOB2/LCV/70	08-03-17	40	993	204	209	41.59	2.39	1168	236	321	47.69	26.48	44.89
403	TATA MOTORS	SPACIO	LMV	2012	MOB2/LCV/71	08-03-17	40	980	198	225	43.16	12.00	1114	227	267	44.34	14.98	43.79
404	TATA MOTORS	ACE	LMV	2015	MOB2/LCV/74	10-03-17	40	746	154	154	41.29	0.00	660	129	192	48.64	32.81	44.74
405	FORCE	CRUISER	LMV	2011	MOB2/LCV/76	15-03-17	40	1050	214	228	42.10	6.14	1182	222	286	42.98	22.38	42.56
406	TATA MOTORS	ACE	LMV	2008	MOB2/LCV/77	16-03-17	40	792	162	207	46.59	21.74	519	128	105	44.89	17.97	45.92
407	TATA MOTORS	ACE ZIP	LMV	2014	MOB2/LCV/78	20-03-17	40	481	98	96	40.33	2.04	499	101	136	47.49	25.74	43.98
408	TATA MOTORS	ACE HT	LMV	2008	MOB2/LCV/79	20-03-17	40	782	147	203	44.76	27.59	642	135	129	41.12	4.44	43.12