



Industry Assessment & Roadmap for Zero-Emission Medium and Heavy-Duty Trucks in India

D2a-Market Research for Product Landscape



Enabling Smart & Clean Tech Markets



P' in our name stands for triple bottom line sustainability of people, profit and planet that we want to bring in all our internal functioning, projects we do, and industries we support. It also keeps us prompt, progressive and partnership valuing. **Manifold** represent abstraction of complex problem to smaller dimension, still preserving elements which matters and are available to influence/control and also measure the system dynamics. We are '**small data**' company and take pride in collecting and analysing most relevant data to help our clients with decisions and actions.



Abbreviations

CV	Commercial Vehicle
GVW	Gross vehicle weight
HDT	Heavy Duty Truck
ICCT	International Council on Clean Transportation
IDT	Intermediate Duty Truck
kW	Kilo-watt
LDT	Light Duty Truck
MDT	Medium Duty Truck
MHDT	Medium & Heavy Duty Truck
MHIPE	Ministry of Heavy Industries & Public Enterprises
MoP	Ministry of Power
MoRTH	Ministry of Road Transport & Highways
NHAI	National Highways Authority of India
N-m	Newton-metre
OEM	Original Equipment Manufacturer
PTO	Power take-off
PTU	Power Distribution Units
RTO	Regional Transport Office
SCV	Small commercial Vehicle
T	Ton
TC	Transfer Cases

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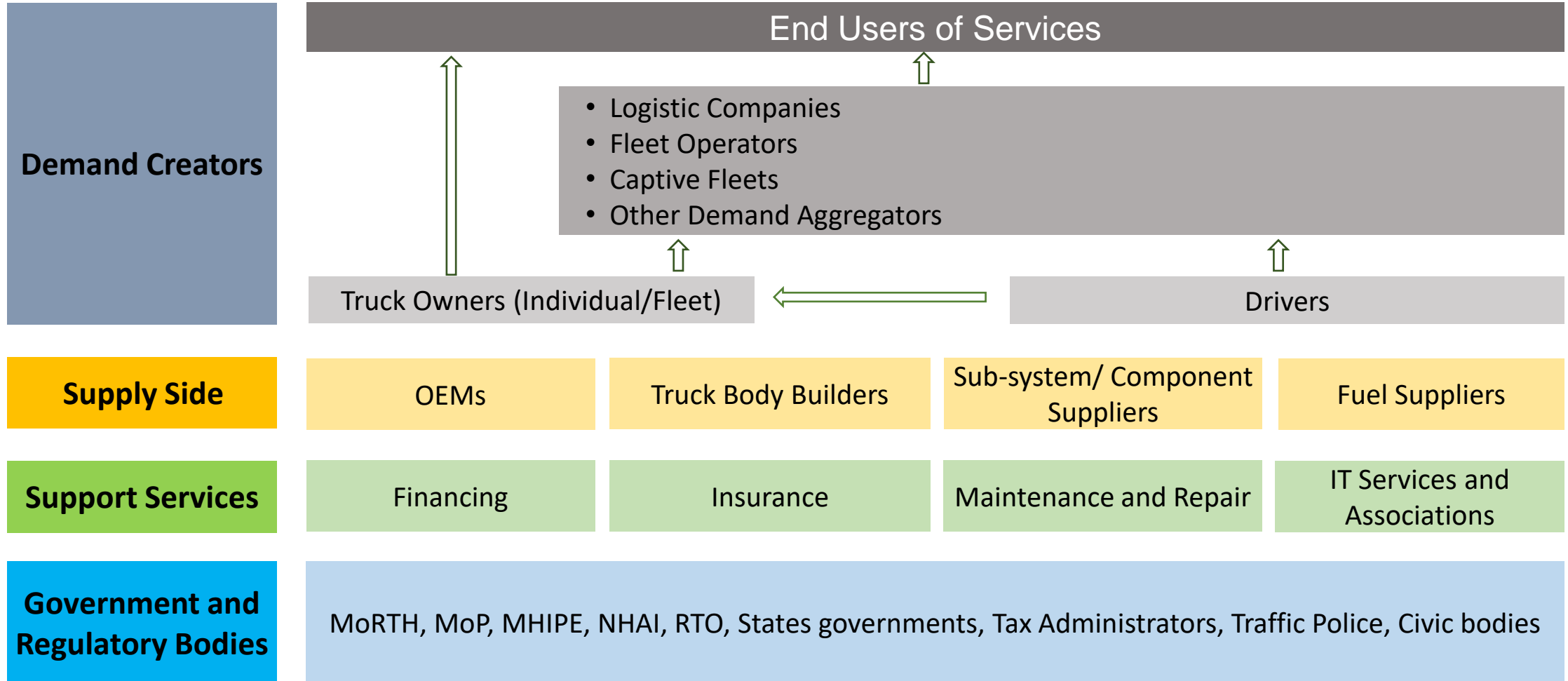
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MHDT Industry in India

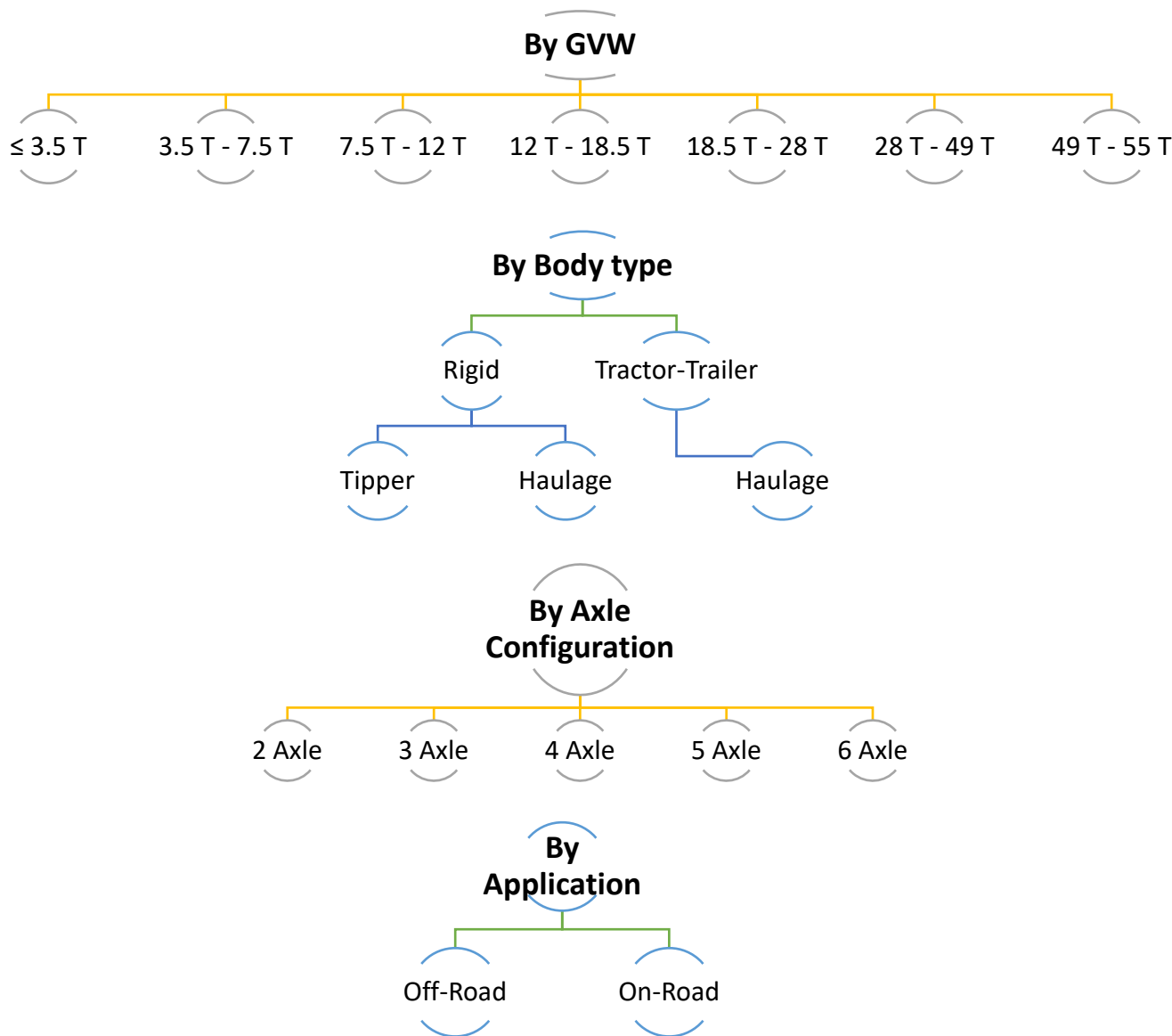


Structure of MHDT Industry in India





Categorization of MHDT in India



Segments as per MoRTH

Segment	GVW range, in Tonnes	Category	Pre-Fixes
LCV	GVW ≤ 3.5 T	N1	N1A
MDT	3.5 T < GVW ≤ 7.5 T	N2	N2A
	7.5 T < GVW ≤ 12 T	N2	N2B
HDT	12 T < GVW ≤ 18.5 T	N3 2 Axle Rigid	N3A
	18.5 T < GVW ≤ 28 T	N3 Multi Axle Rigid	N3B
	28 T < GVW ≤ 49 T	N3 Multi Axle Rigid	N3C
	30 T < GVW ≤ 55 T	N3 Tractor	N3D

Source: Draft AIS-017(Part 6) / D5 Apr 2019

Segments as per OEMs

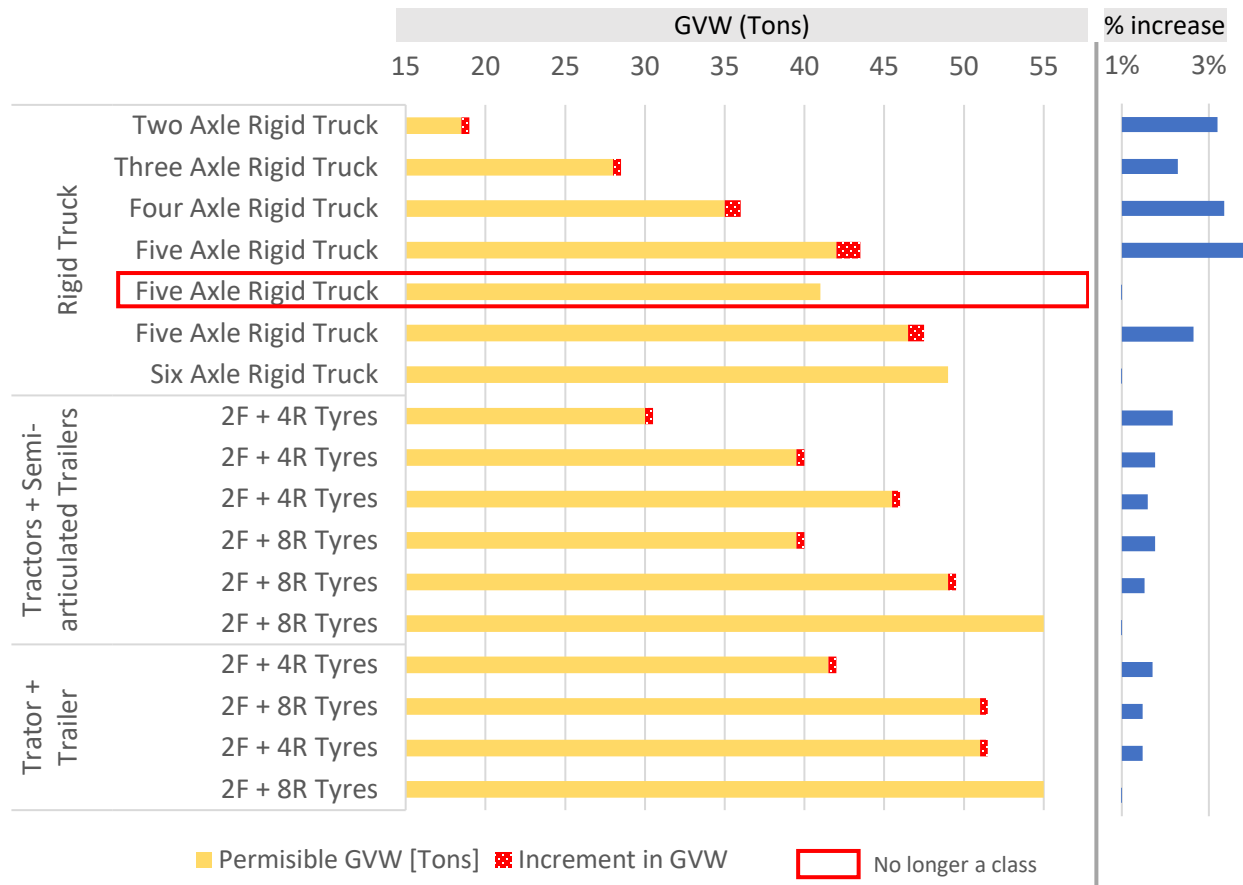
Upto 3.5 Ton	SCV	Small Commercial Vehicle
3.5 Ton < GVW ≤ 8 Ton	LDT	Light Commercial Vehicle
8 Ton < GVW ≤ 16.2 Ton	IDT	Intermediate Commercial Vehicle
16.2 Ton < GVW ≤ 28 Ton	MDT	Medium Commercial Vehicle
28 Ton < GVW ≤ 49 Ton	HDT	Heavy Commercial Vehicle
30 Ton < GCW ≤ 55 Ton	HDT TT	Tractor Trailer

Source: Truck India

**MoRTH- Ministry of Road transport & Highway



Revised Permissible GVW (since 2018)



Source: [Ministry of Road Transport & Highway \(MoRTH\)](#)

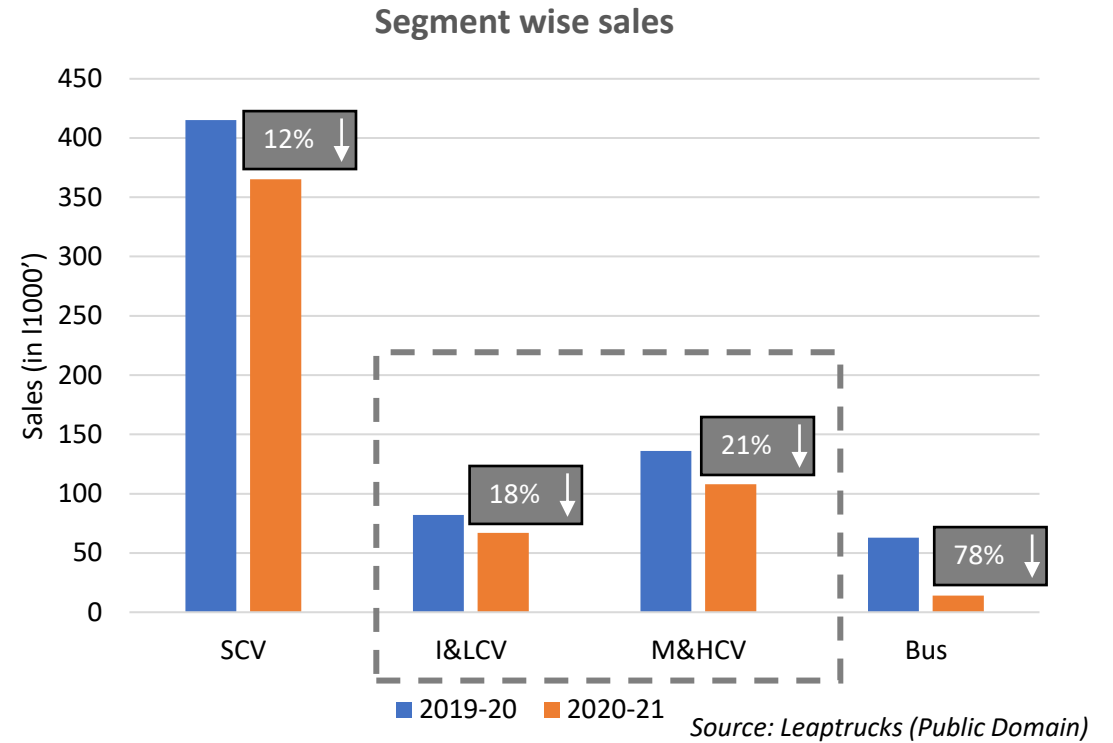
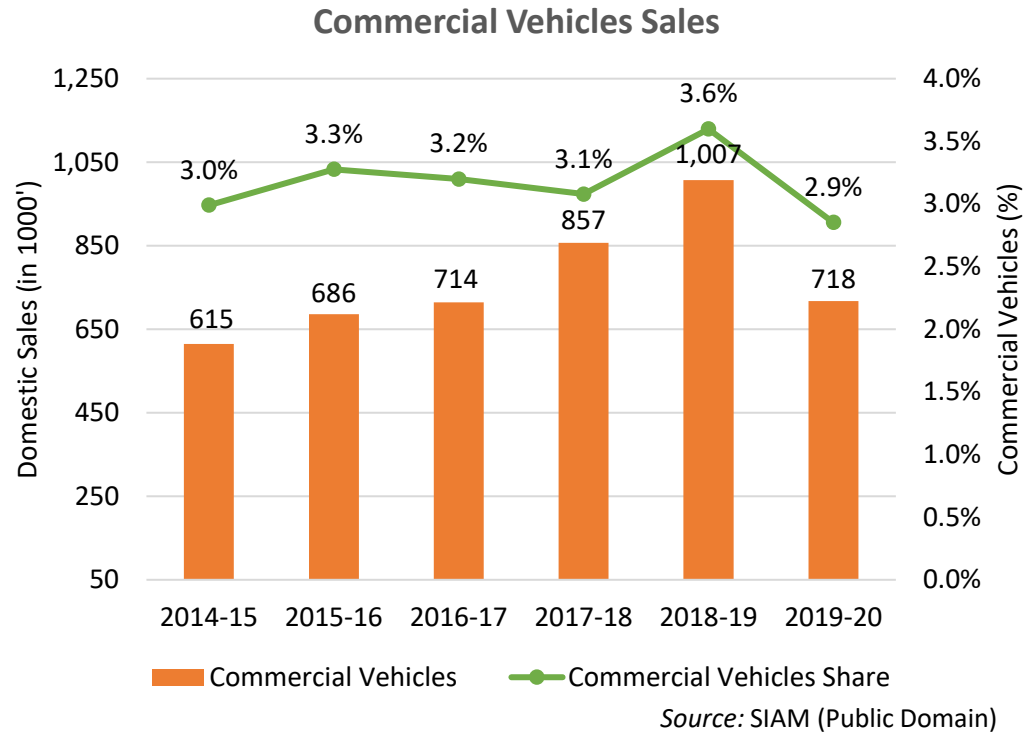
Segments		ICCT sales data based on	Current GVW Segments
Notification released by		MINISTRY OF POWER	MINISTRY OF ROAD TRANSPORT & HIGHWAYS
LCV	Rigid	3.5 < GVW ≤ 7.5 T	3.5 < GVW ≤ 7.5 T
ICV	Rigid	7.5 < GVW ≤ 12 T	7.5 < GVW ≤ 12 T
MDV 1	Rigid	12 < GVW ≤ 18.5 T	12 < GVW ≤ 19 T
MDV 2	Rigid	18.5 < GVW ≤ 25 T	19 < GVW ≤ 28.5 T
	Tractor - Trailer	18.5 < GVW ≤ 31 T	19 < GVW ≤ 31 T
HDV 1	Rigid	25 < GVW ≤ 40 T	28.5 < GVW ≤ 40 T
	Tractor - Trailer	31 < GVW ≤ 40 T	31 < GVW ≤ 40 T
HDV 2	Rigid	40 T < GVW	40 T < GVW
	Tractor - Trailer		

- Product rationalization as per new segments would be apparent from 2020-21
- However, truck owner started loading as per revised notification from 2018

D2a-Market Research Vehicle Sales Trends in India



Indian Commercial Vehicle (CV) industry



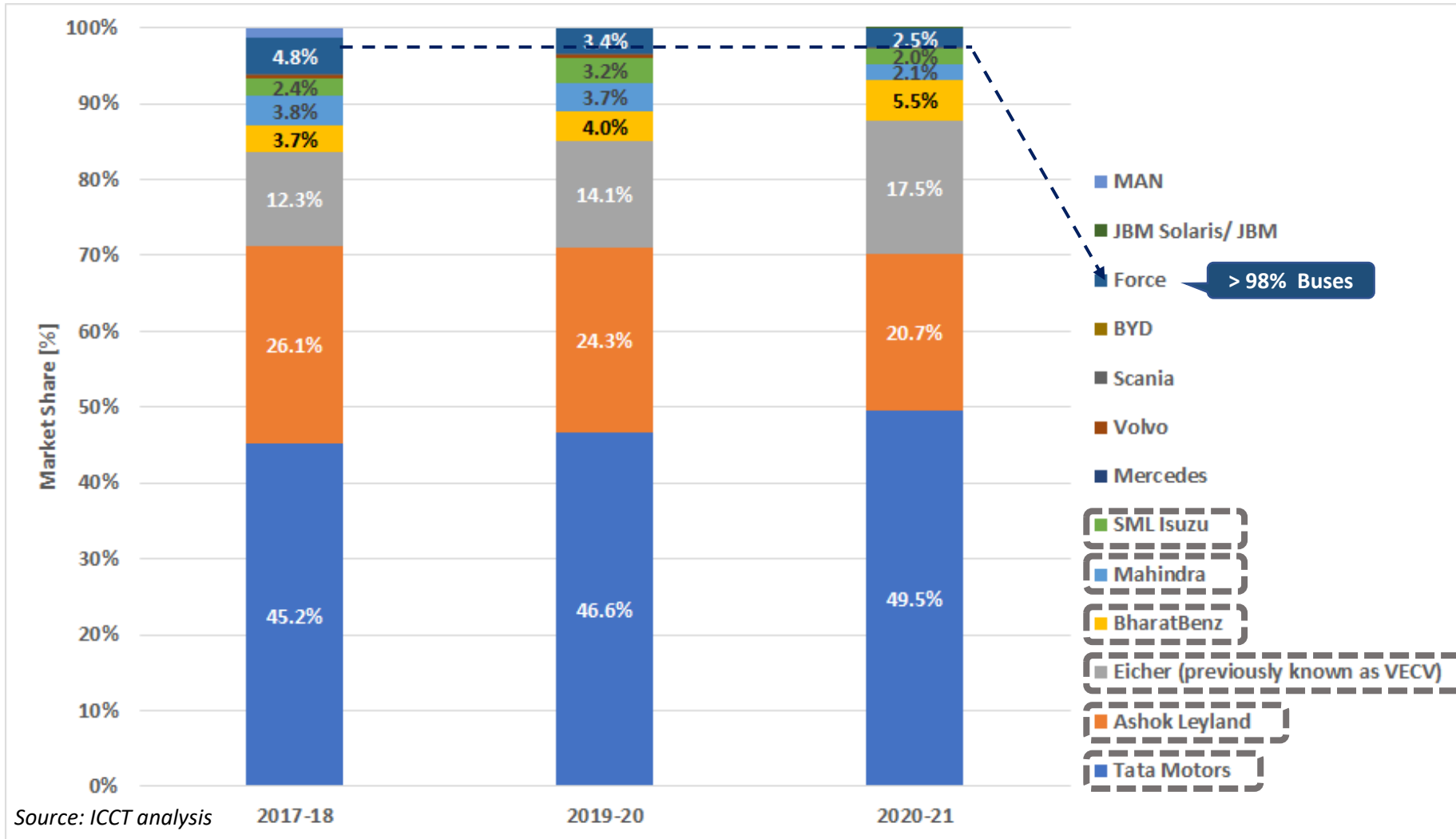
- There is a steady drop in MHDT sales since past 5 years
- 2020-21 sales also hit by pandemic

- Bus segment had the steepest fall of 78% as the pandemic impacted passenger transportation across India.
- SCV has lowest impact compared to other sub-segments of CV and had declined by 12%

Note: SCV: Small commercial vehicle, I&LCV: Intermediate and Light commercial vehicle, M&HCV: Medium and heavy commercial vehicle



MHDV in India – Market Share Trends



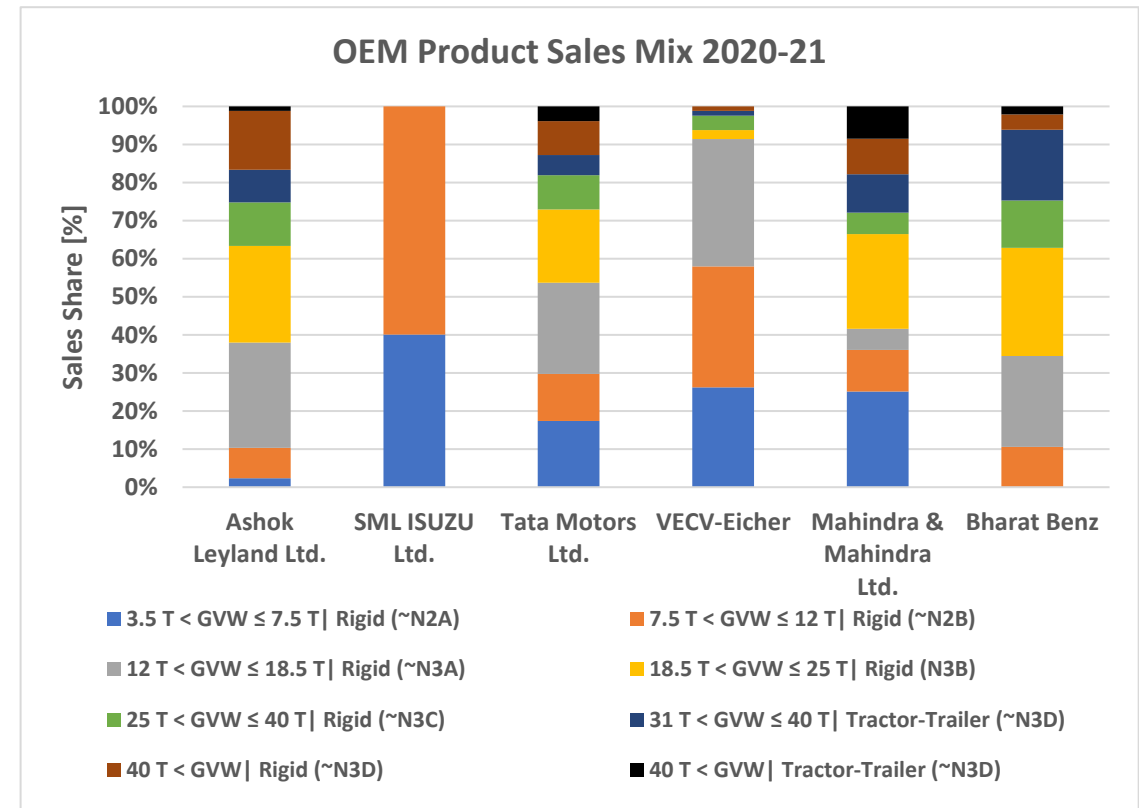
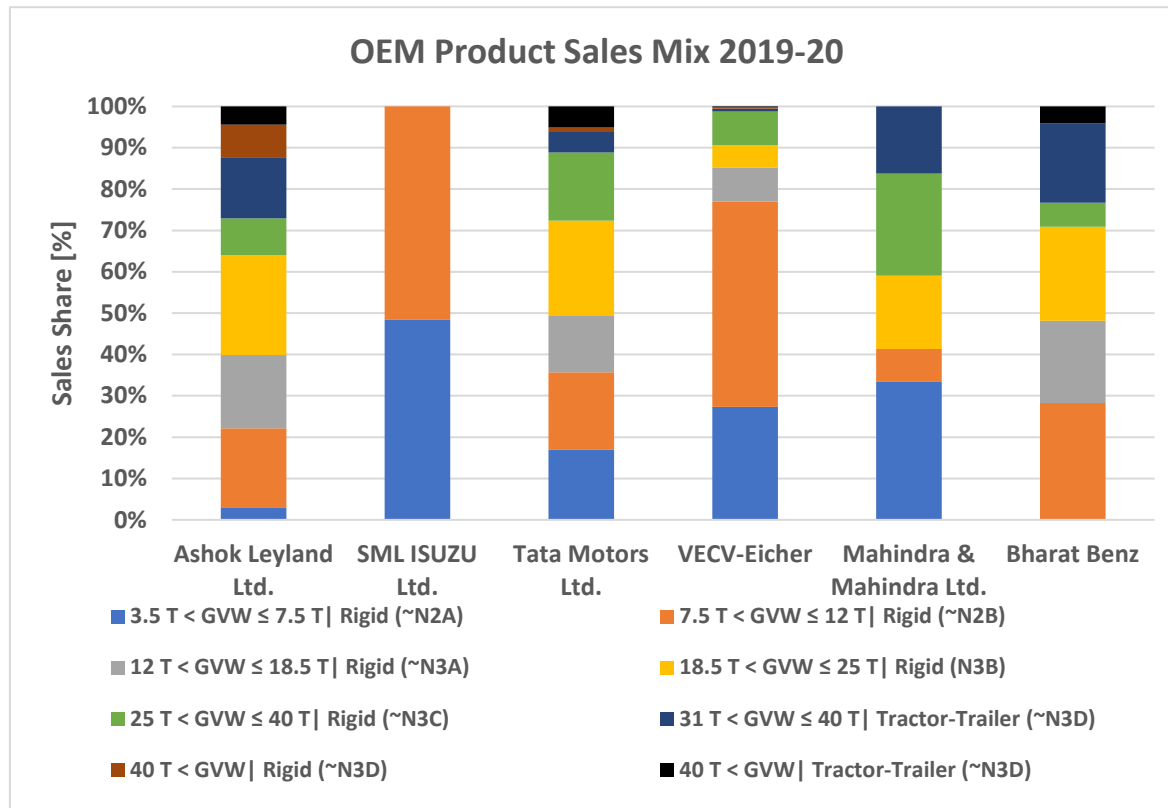
Medium & Heavy Duty Vehicles

	2017-18	2019-20	2020-21
JBM Solaris/ JBM	2.4%	3.2%	2.0%
Mahindra	3.8%	3.7%	2.1%
BharatBenz	3.7%	4.0%	5.5%
Eicher (previously known as VECV)	12.3%	14.1%	17.5%
Ashok Leyland	26.1%	24.3%	20.7%
Tata Motors	45.2%	46.6%	49.5%
Total (6 players)	93.5%	95.9%	97.3%

➤ Overall 6 players make up more than 95% of total MHDV market in India



MHDT in India – OEM Product Sales Mix

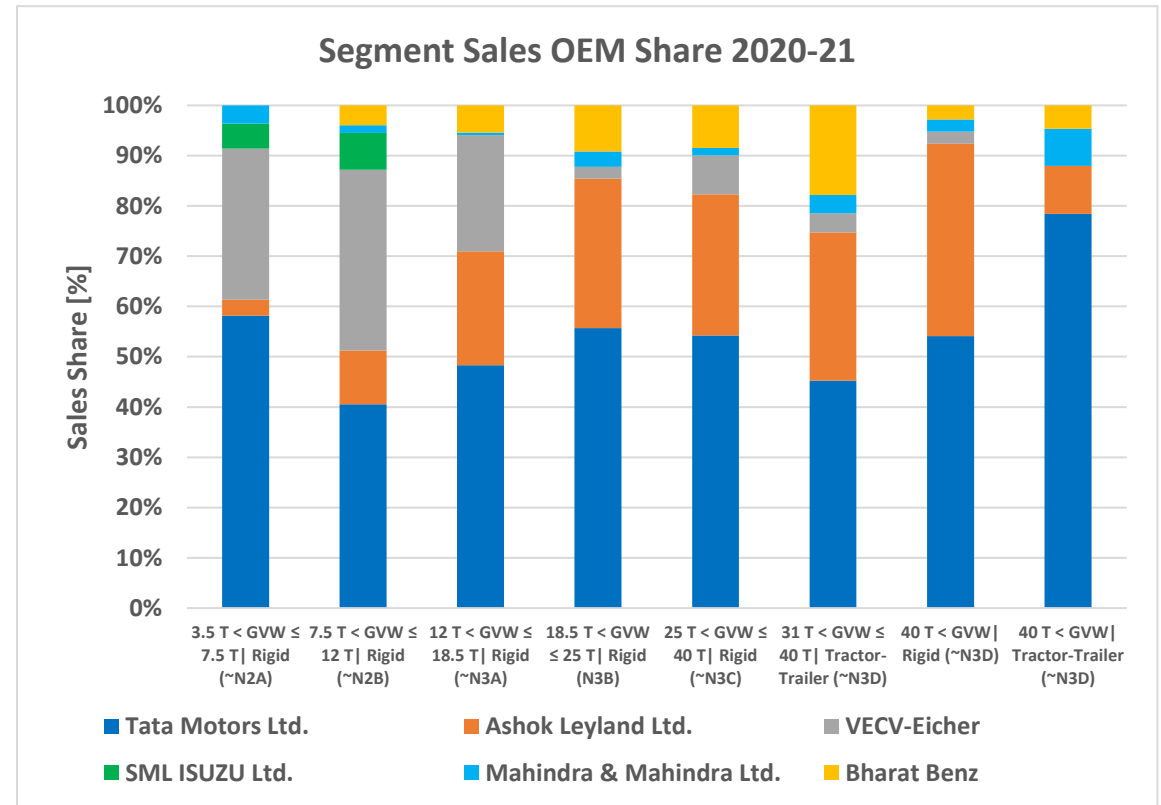
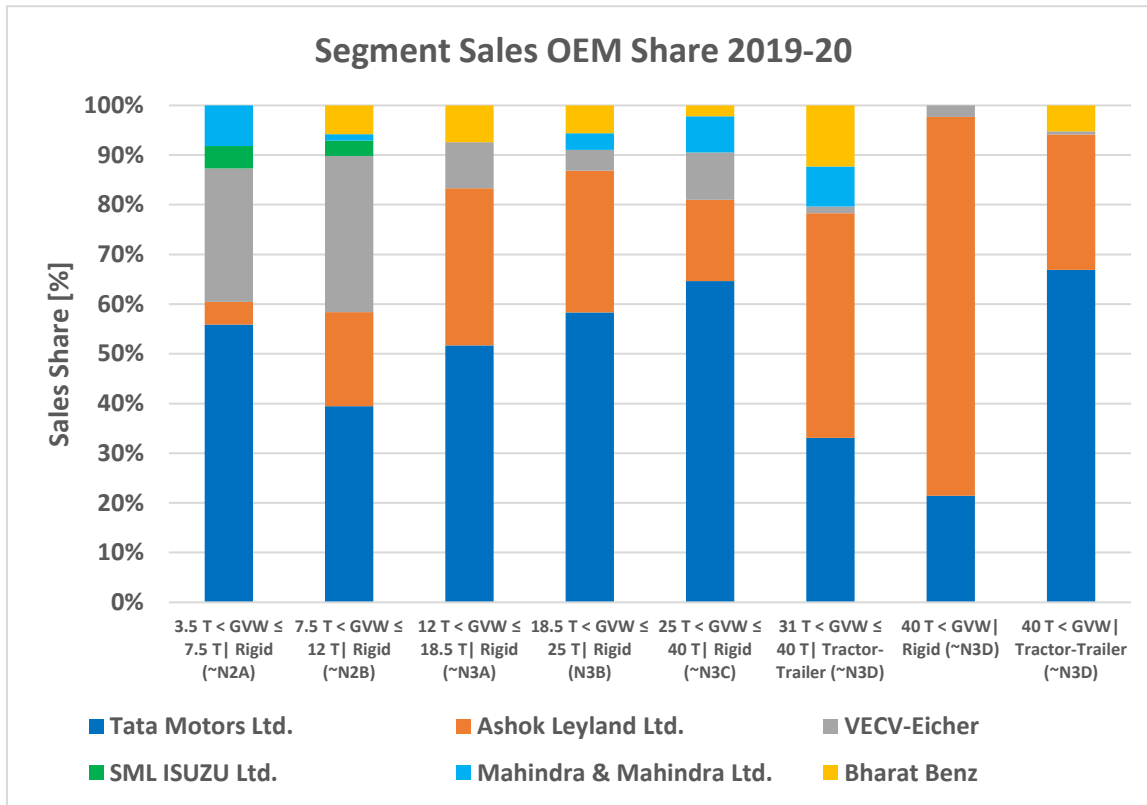


Source: ICCT analysis

- Tata Motors, Ashok Leyland, Volvo-Eicher, Bharat Benz and Mahindra & Mahindra has presence across all MHDT segments
- SML ISUZU is a player in 'Light' & 'Intermediate' trucks only
- However, Tata Motors and Ashok Leyland can adequately represent all segments by virtue of their market share



MHDT in India – Segment Sales OEM Share



Source: ICCT analysis

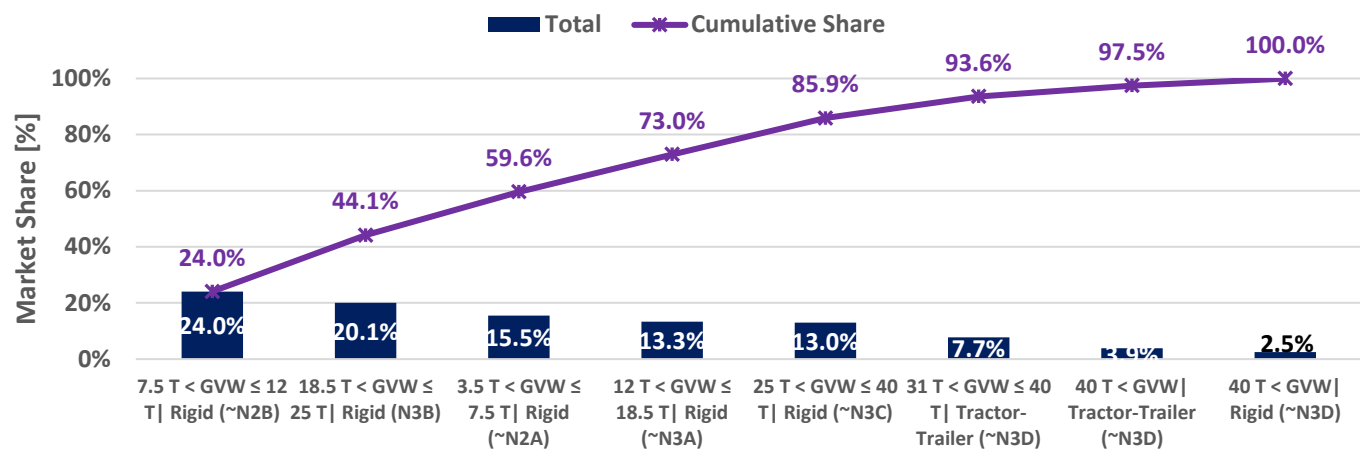
- ‘Light’ and ‘Intermediate’ truck market is mostly **Tata Motors (49%)** & **Volvo-Eicher (33%)**; other 4 players share 18%
- More than three – quarters of ‘Medium’ truck market is shared between **Tata Motors (51%)** & **Ashok Leyland (25%)**
- Nearly 85% of the ‘Heavy’ truck market is split between **Tata Motors (55%)** & **Ashok Leyland (30%)**



MHDT in India – Segment wise Analysis



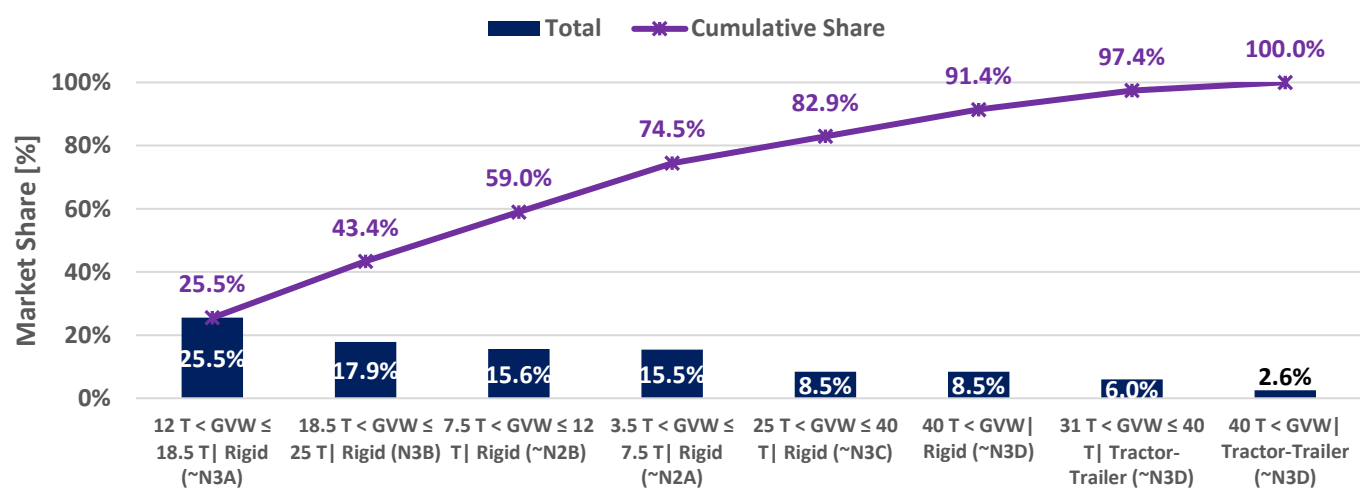
MHDT Segment Analysis 2019-20



Because of the effects of pandemic on truck sales, 2020-21 is not used as a representative year

- 7.5 T < GVW ≤ 12 T | Rigid (~N2B) is the largest in terms of sale (24%) with 18.5 T < GVW ≤ 25 T | Rigid (N3B) segment is the second most selling segment (20.1%)
- Rigid trucks make up over 89% of MHDT sales
- The top-selling segments are (2019-20)
 1. 7.5 T < GVW ≤ 12 T | Rigid (~N2B) (IDT)
 2. 18.5 T < GVW ≤ 25 T | Rigid (N3B) (MDT 2)
 3. 3.5 T < GVW ≤ 7.5 T | Rigid (~N2A) (LDT)
 4. 12 T < GVW ≤ 18.5 T | Rigid (~N3A) (MDT 1)

MHDT Segment Analysis 2020-21



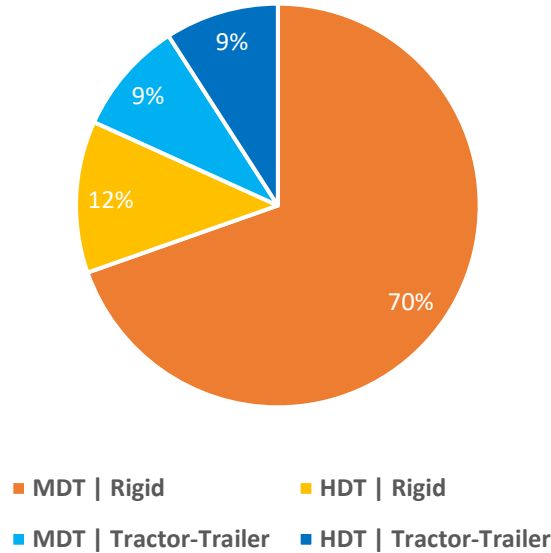
Source: ICCT analysis



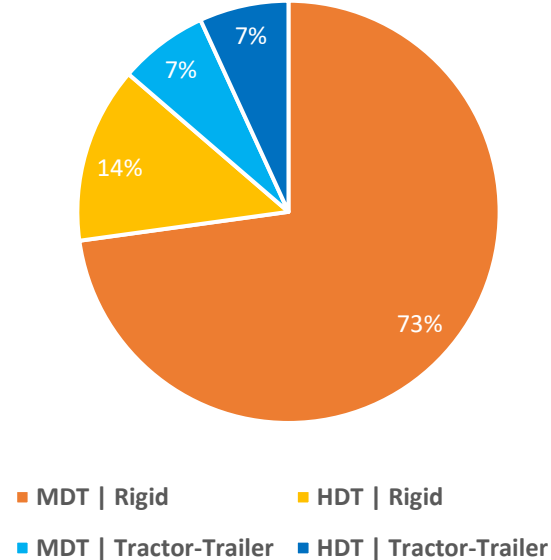
MHDT in India – Rigids vs Tractor-Trailers



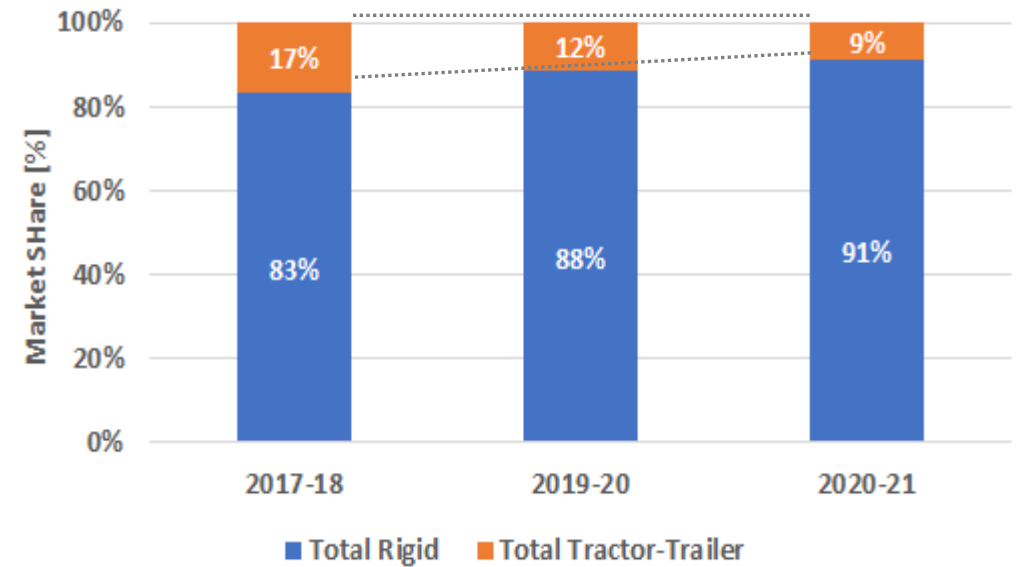
Total MHDT (2019-20)



Total MHDT (2020-21)



Year-on-Year Change in Tractor-Trailer Sales

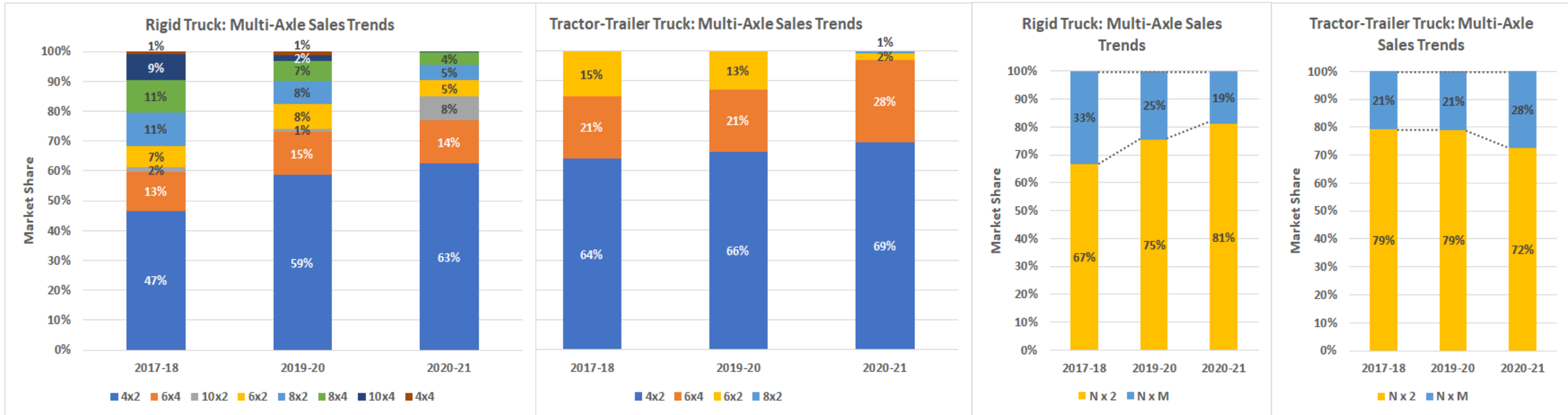


Source: ICCT analysis

- Tractor-trailers seem to be steadily losing share in overall MHDT sales
- However, they make up a significant portion of HDT market



MHDT in India – Multi-Axle Trucks



Source: ICCT analysis

- The 4x2 sales are growing steadily across both – Rigid & Tractor-Trailer trucks*
- The 6x4 sales are also growing gradually across both – Rigid & Tractor-Trailer trucks
- Overall, 2WD system share is growing in Rigid trucks, but reducing among Tractor-Trailer trucks
- In ICE trucks, drive to multiple axles is given through Power Distribution Units (PTU) or Transfer Cases (TC)
- In electric trucks, this can be achieved more efficiently by providing motors in each ‘live’ axle or even hub-motors in each ‘live’ wheel

* Possibly due to increase in permitted axle weights by MoRTH in regulations

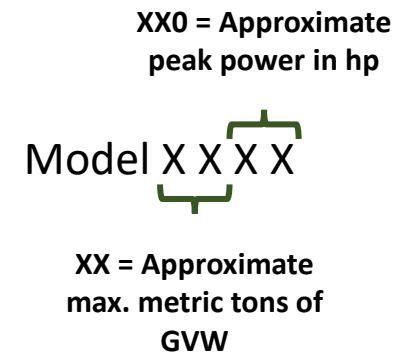


MHDT in India – Segment-Wise Top Sellers



Segment	Top Selling Products	2019-20 segment share in total MHDT	Top model sales share	Top 5 models sales share
LDT 3.5 T < GVW ≤ 7.5 T	1 Tata SFC 407 V1 2 Tata SFC 410 3 Tata SFC 407 V2 4 Tata SFC 407 V3 5 Eicher 10.59	15.50%	36.20%	60.40%
IDT 7.5 T < GVW ≤ 12 T	1 Tata LPT 1109 2 AL Boss 1113 3 Eicher 11.10 4 AL eComet 1012 5 Tata Ultra 1012	24.0%	11.80%	39.40%
MDT 1 12 T < GVW ≤ 16 T	1 Tata LPT 1109 2 AL Boss 1213 3 Tata Ultra 1518 4 AL Guru 5 Bharat Benz 1217	13.30%	21.00%	75.70%
MDT 2 16 T < GVW ≤ 25 T	1 Tata LPT 2518 2 Tata Prima LX 2528 K 3 Tata Prima LX 2523 K 4 Tata LPT 1613 5 AL 2523	20.10%	14.30%	42.20%
HDT GVW ≥ 25 T	1 Tata Prima 3138 K 2 Tata LPT 3118 3 Tata Signa 3118 T 4 Tata Prima LX 4928 S 5 AL 3718	27.10%	9.20%	32.80%

Nomenclature followed by TATA Motors & Ashok Leyland:



Illustrations:

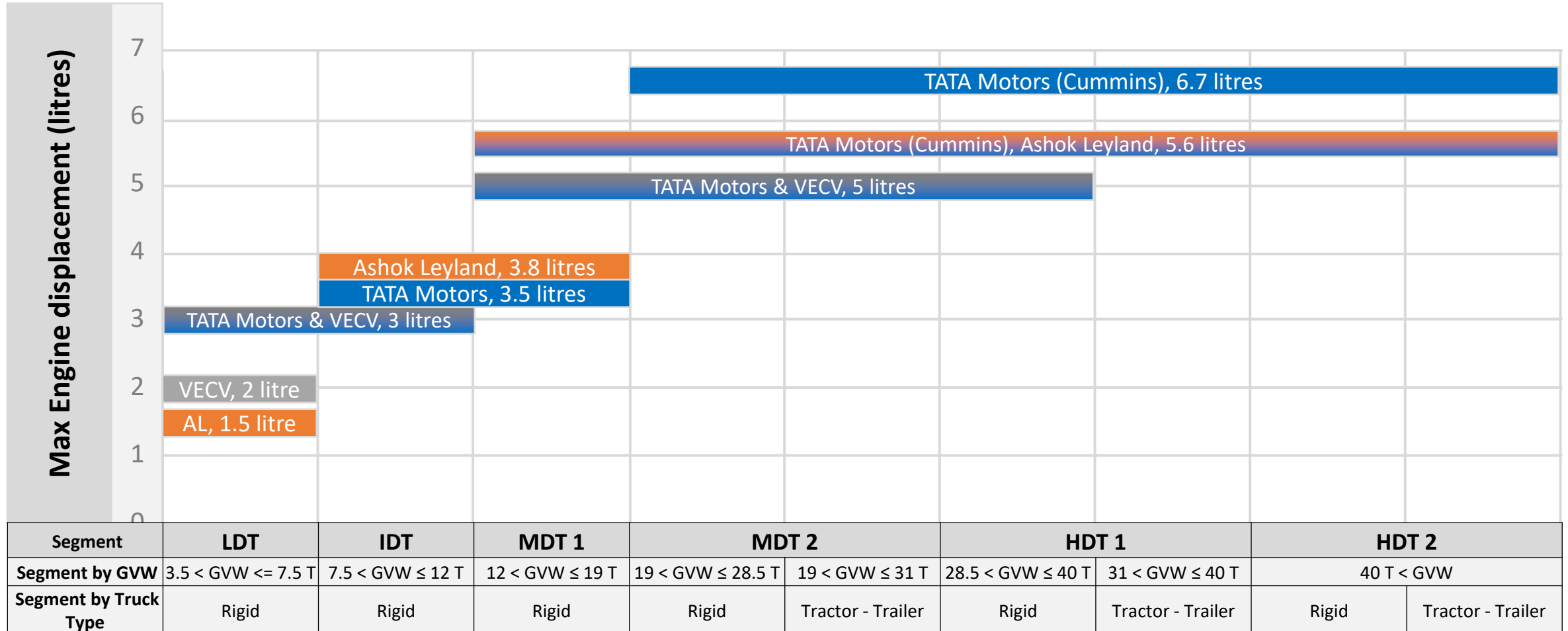
407 → 4 ton GVW & 70 hp peak power

4928 → 49 ton GVW & 280 hp peak power

Source: ICCT analysis



Engine Displacement



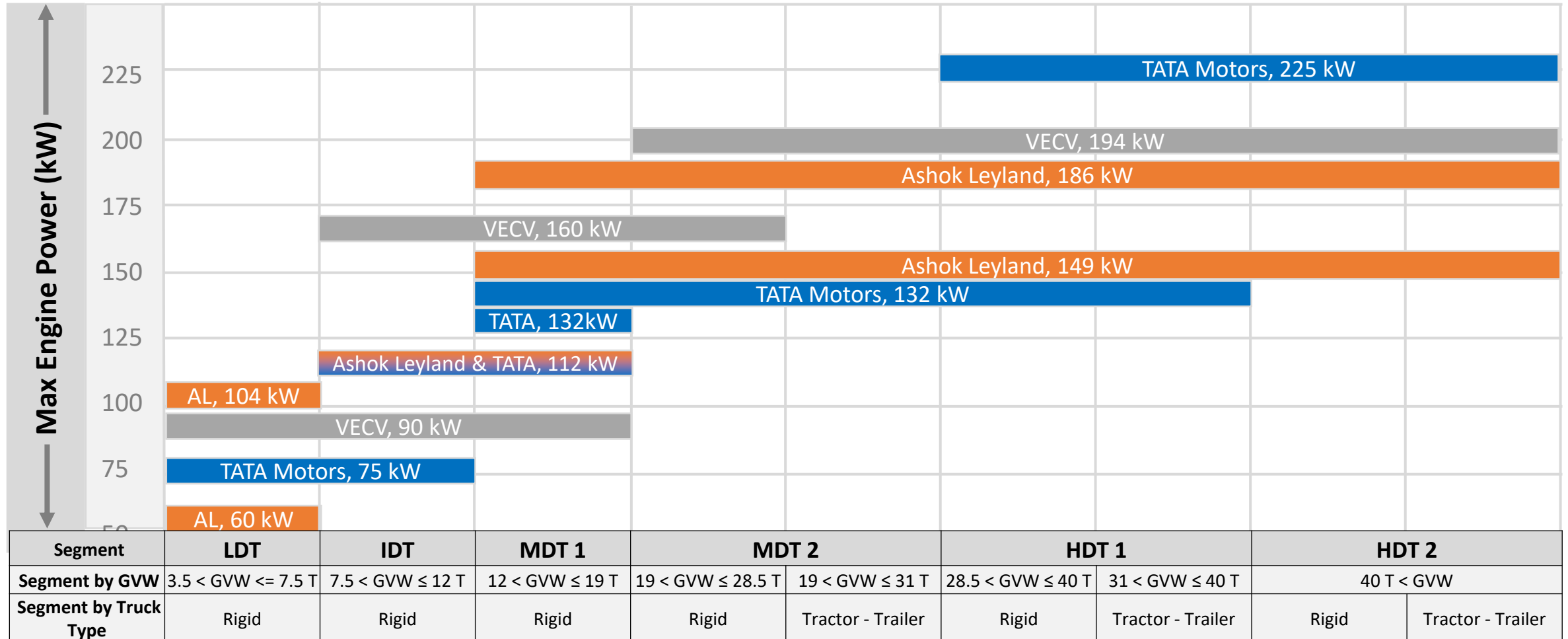
Source: pManifold Analysis

➤ 5 litres, 5.6 litres, 3.8 litres, 3.5 litres, 3.3 litres, 3 litres & 6.7 litres are common engines which are being re-use across segments

[Refer Annexure Slides for details](#)



Engine Power



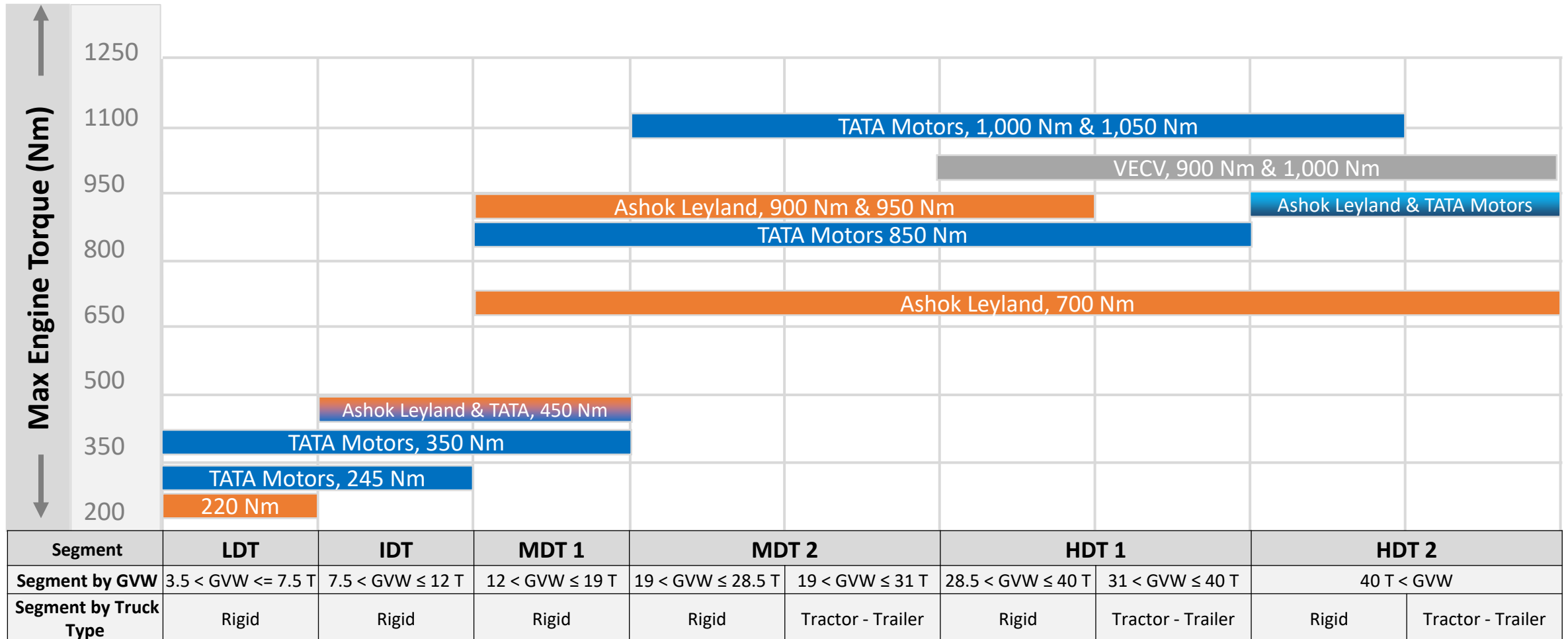
Source: pManifold Analysis

➤ 75 kW, 186 kW, 149 kW, 112 kW, 194 kW & 206 kW are common power ratings which are being re-use across segments

[Refer Annexure Slides for details](#)



Engine Torque



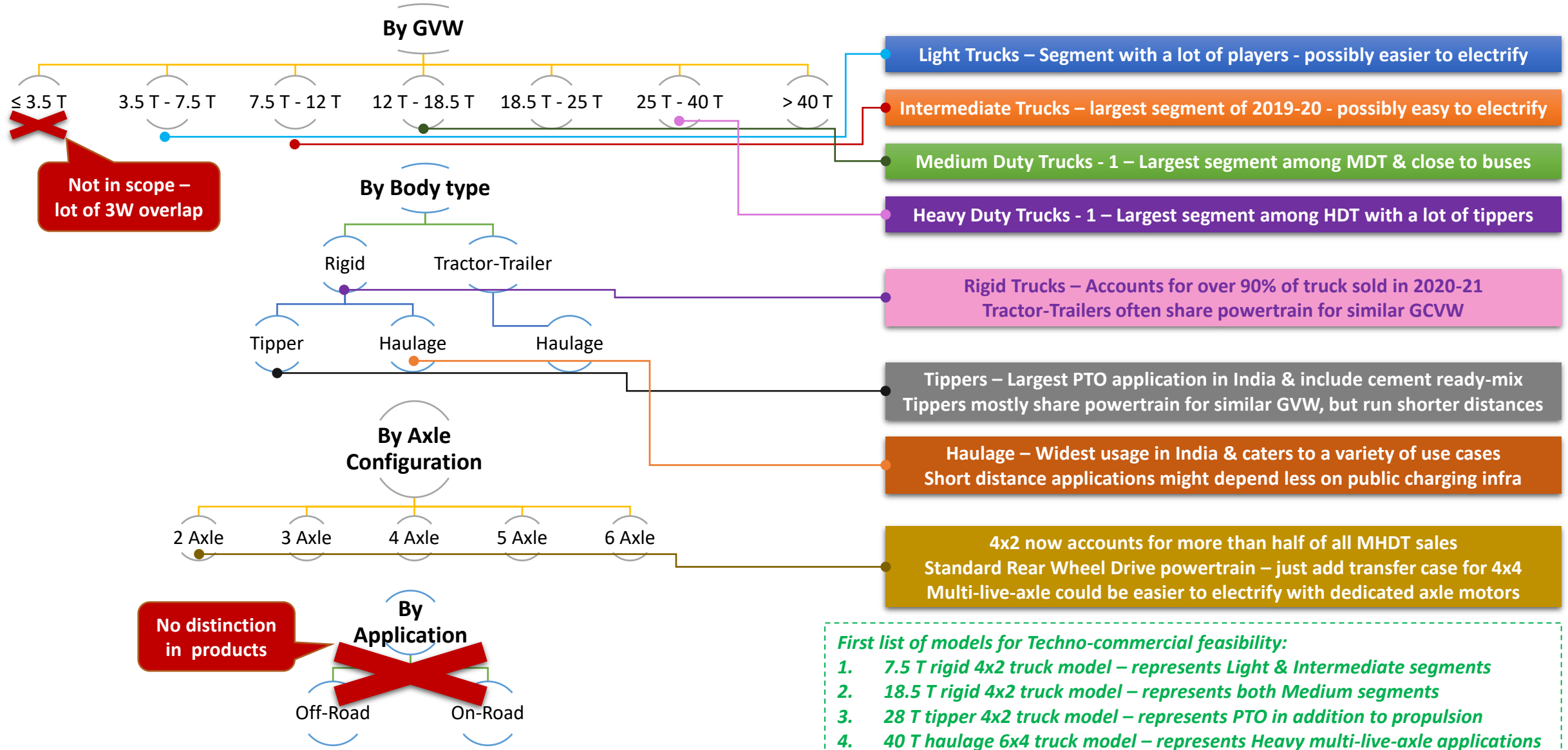
➤ 700 Nm, 450 Nm, 850 Nm, 950 Nm & 900 Nm are common torque ratings

Source: pManifold Analysis

With respect to displacement, power and torque, same engines are being re-use across segments, which can also be explored for electric powertrain.



Conclusions – Priority Segments & Product-lines



ANNEXURE

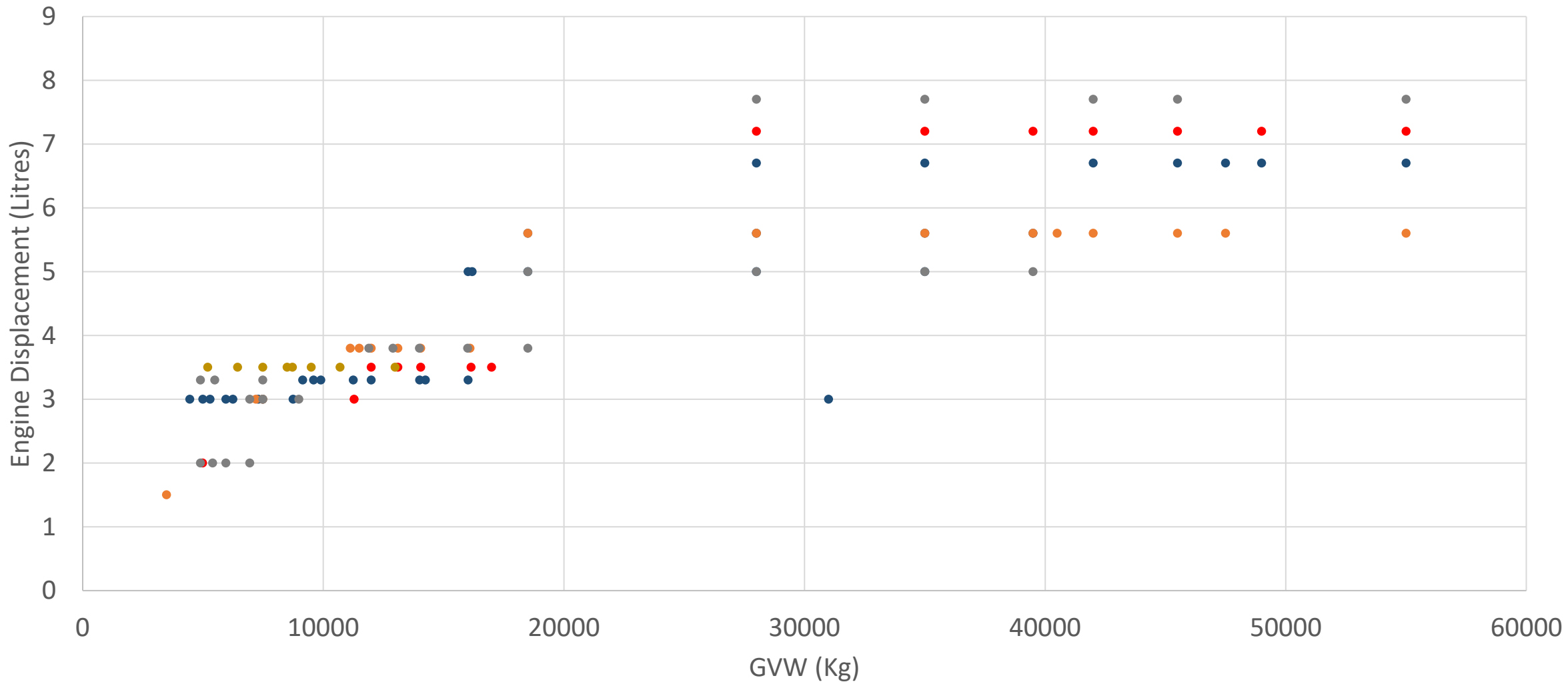
Engine Displacement

Engine Power

Engine Torque



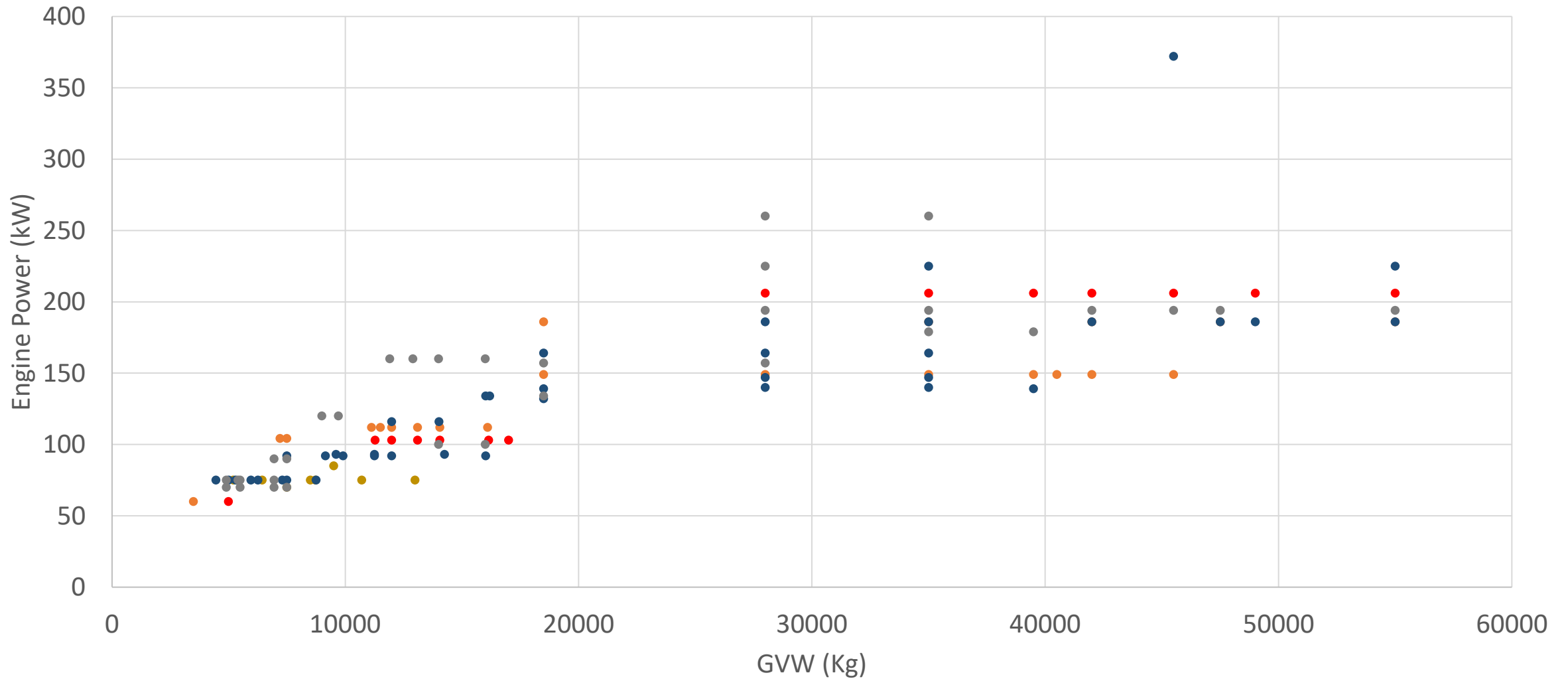
Engine Displacement



• TATA MOTORS • Ashok Leyland • Mahindra & Mahindra Ltd • SML ISUZU Ltd • VECV-Eicher

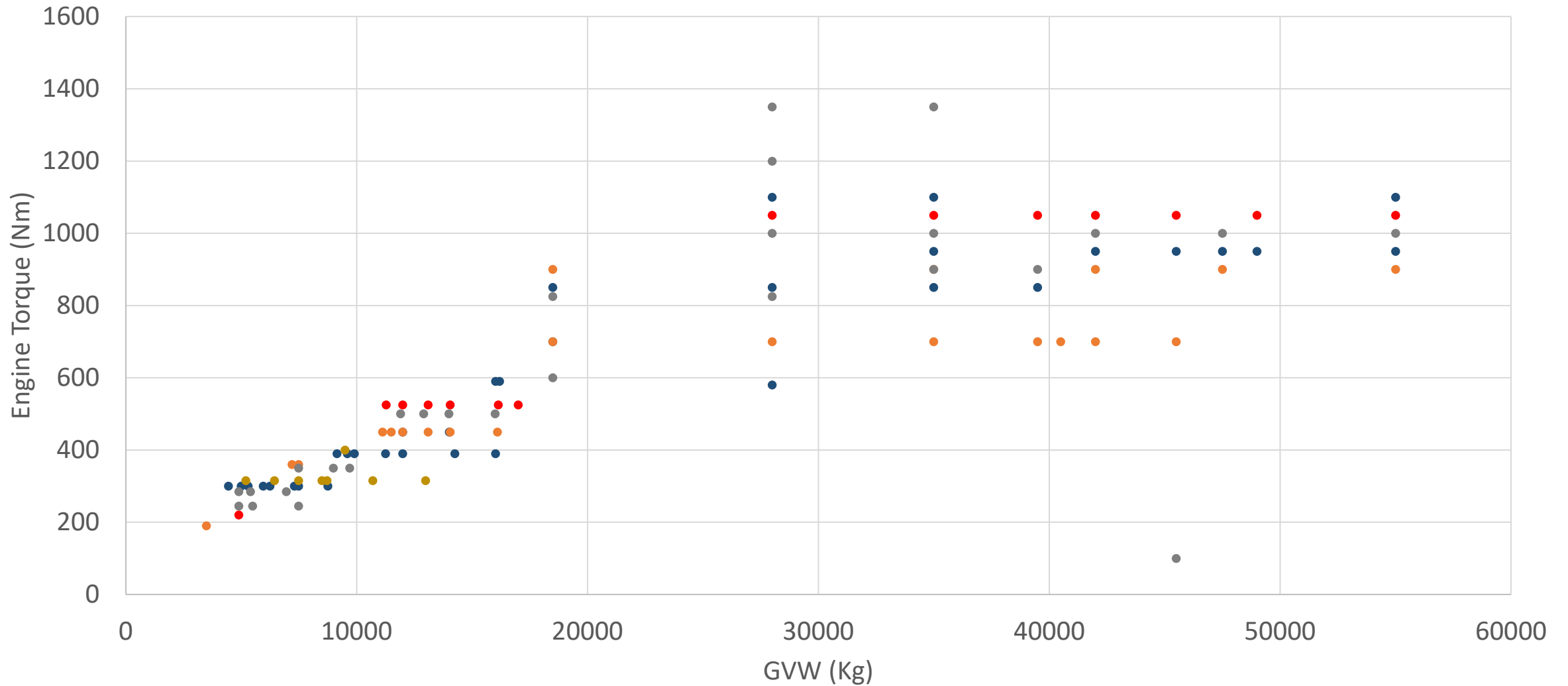


Engine Power



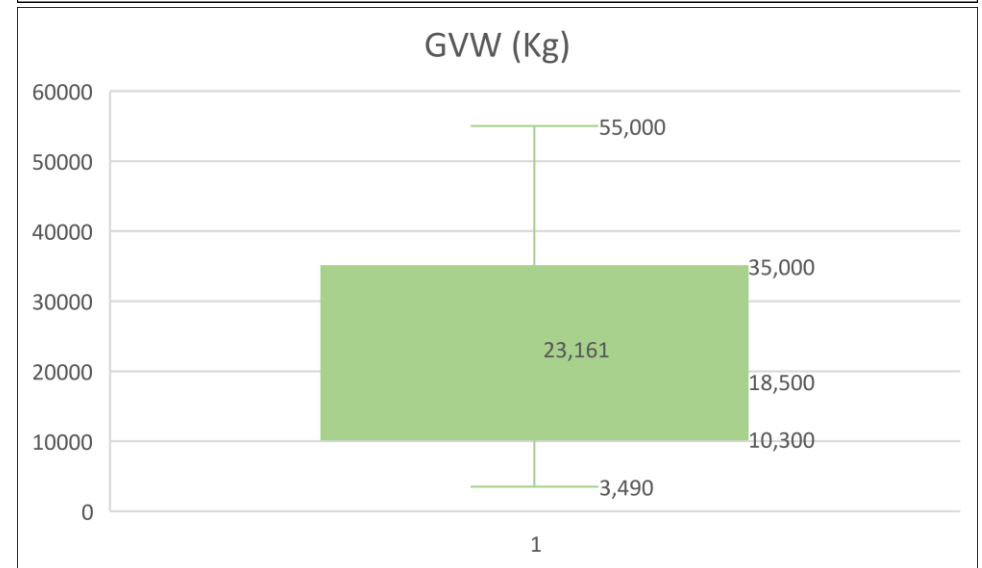
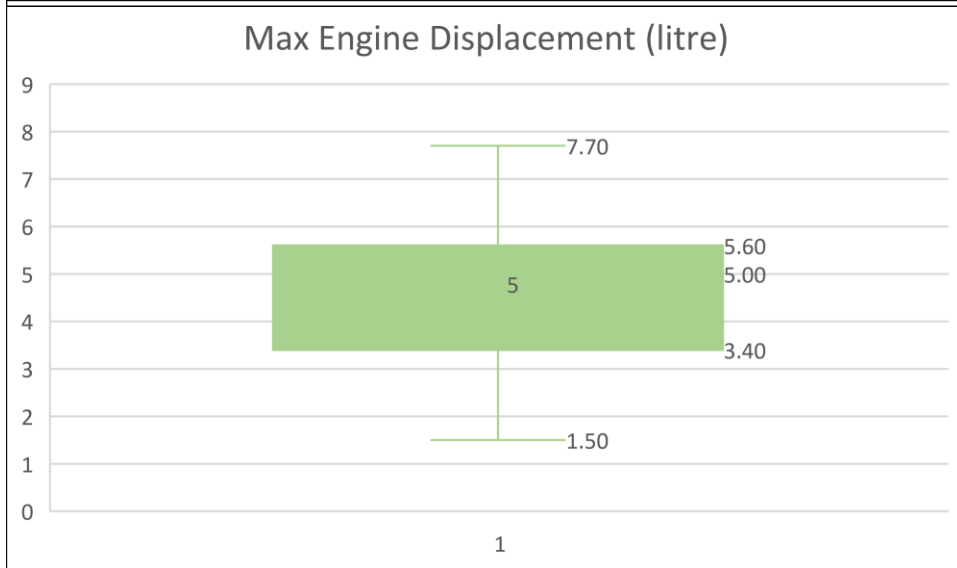
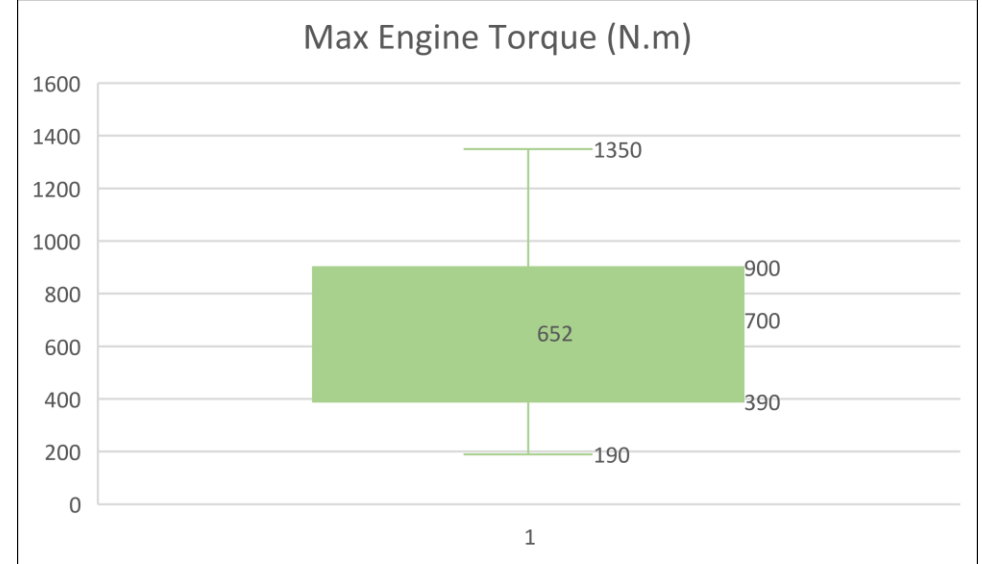
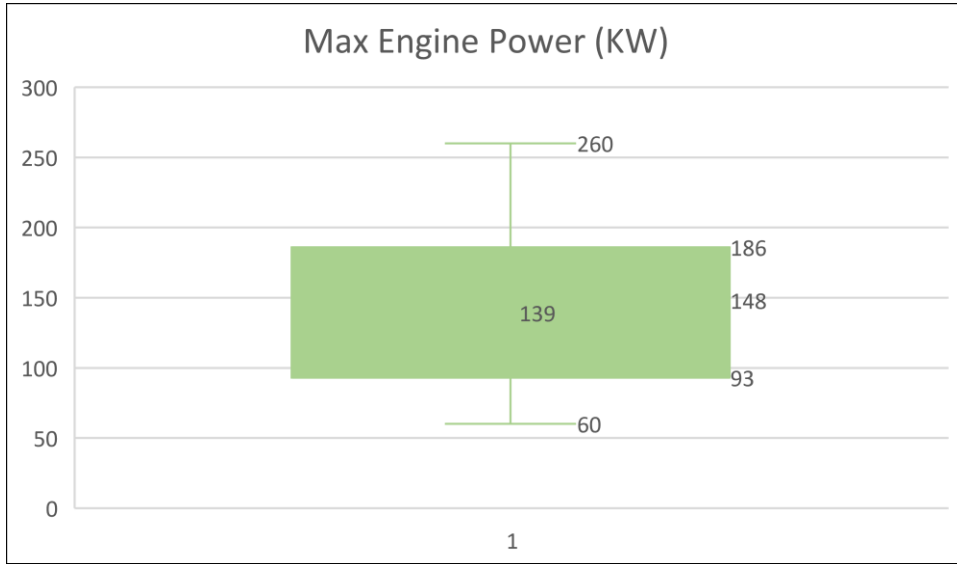


Engine Torque





Overall Products Specification



<http://www.pmanifest.com>



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