ASHOK LEYLAND

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BSVI TATA 2823.K Vs AL AVTR 2820 Tipper

Driveline comparison report

Product Benchmarking Report dated 05-April-2021

BSVI Specification Comparison

Model	TML 2823.K 6X4 Tipper	AVTR 2820 6X4 Tipper
Cabin	Fully forward, SIGNA Day cabin,FBV	Fully forward, G91 Day cabin,FBV
Engine type	Cummins ISBe 5.6 L BS6	H6E6T20–H series
Max. power	230 HP @ 2300 rpm	220 Hp @ 2200 rpm
Max. torque	850 Nm @ 1200 - 1600 rpm	900 Nm @ 1100 - 1800 rpm
Clutch	Ø380 mm, Single plate dry friction	380mm, Ceramic Axial spring Clutch
Gearbox type	TATA G1150 9 Speed gear box (8F +1C + 1R Manual Synchromesh)	ZF 9S1110 9 speed gear box
Front suspension details	Semi eliptic leaf spring with Double acting shock absorber	Parabolic Springs with Double acting Telescopic type
Rear suspension details	Bogie	Bogie
Brakes	Dual line, Full air s cam brakes	Full air Dual line with ABS with ASA, Drum brakes
Fuel tank capacity	300 L	300 L
Adblue tank capacity	60 L	60Ltr Tank(DEF 48L Max)
Tyre	10.00-20 16 PR	295/90R20, 295/95D20 and 295/80R22.5
GVW, kg	28000	28000

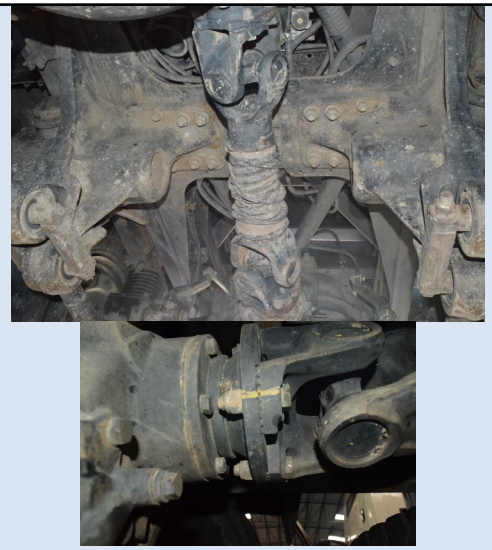
BSVI Specification Comparison

AXLE	TML 2823 K BSVI	AVTR 2820 BSVI
Front axle	Heavy Duty forged I beam reverse Elliot type	FA99
Rear axle	Fully floating, Single reduction, Heavy duty rear axle with differential lock- RA 109 RX 5.58:1	MT 1497/ HDT
Rear axle ratio	5.58:1	200 HP- MT1497 6.5:1
Number of Wheel bolt	10	10
TYRES AND WHEELS		
Front Tyre	Actual-MRF SUPER MILER 9090_10.00-20 16 PR	Apollo ENDURACE- MA 326_295/90 R20
Rear Tyre	Actual-MRF STEEL MUSCLE S3 C8 PLUS_10.00-20 16 PR	Apollo ENDURACE RD HD_295/90 R20
Spare wheel carrier Mechanism	Rope with ratchet	Rope with ratchet

Gear Box Comparison

MODEL	ASHOK LEYLAND 2820 6X4 Tipper	TATA 2823 6X4 Tipper
AGGREGATE PICTURE		
FEATURES	1. Selection of right Gear Box (& Gear Ratios) as per the Load-Road-Application 2. Unilever Clutch actuation 3. Requires no greasing	1. Twin cone Synchro with carbon lining for enhanced shift performance. 2. High Reliability design - Profile Ground gears. 3. Higher Capacity G1150 9S GB for application suitability
Observation	1. Smooth engagement of gears due to cable sift mechanism. 2. NO cost effective CSO assembly	1. Less fatigue in gear shifting. 2. Same clutch as in BSIV. 3. Mechanical shifting 4. Cost effective CSO assembly 5. Clutch pedal pressing hard at 8 bar System air pressure.

Propellershaft Comparison

MODEL	ASHOK LEYLAND 2820 6X4 Tipper	TATA 2823 6X4 Tipper
AGGREGATE PICTURE		
Observation	1. No of Shaft- 2 (1 main shaft & 1inter axle shaft) 2. No Greasing required 3. 4 point mounting 4. Main shaft 6.7 deg	1. No of Shaft- 2 (1 main shaft & 1inter axle shaft) 2.Greasing required 3. 4 point mounting with M14 X1.5 bolts 4. Main shaft 5.1 deg & Inter axle shaft 13.6 deg 5. Boot provided for inter axle shaft slip

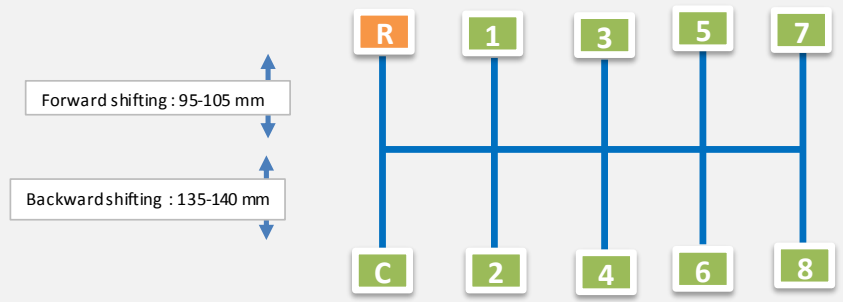
IPU Comparison

MODEL	ASHOK LEYLAND 2820 6X4 Tipper	TATA 2823 6X4 Tipper
AGGREGATE PICTURE		
Observation	1. Brake pedal -Pendant type (Integrated pedal unit)	1.Brake pedal -Floor mounted

Technical Data-TATA 2823.K Tipper

CLUTCH	
Disc Type and Dia, mm	Single dry plate , Ø380 mm
Type of clutch disc facing	Organic lining
Clutch Housing Size (Approx.)	Length (X-axis)- 200 mm
Clutch Housing Mounting Bolt Details	M10x 10.9 Grade (Make: IMF and TVS used)
Clutch Booster Location	RH center of Gear box
CLUTCH BOOSTER	
Over all Dimensions, mm	OAL-275(with cylinder)/Dia -Ø108
Booster stand out as mounted on vehicle / as Lying on ground	Mounted on Vehicle (in to Clutch housing)
Mounting Details	4 Point mounting, M8x 8.8 Grade
Booster Dimension	Booster L- 170, Dia-Ø 108
Hydraulic Pipe OD / pneumatic Hose OD, (mm)	Pipe Ø-9 (Booster end), Ø6.3 (Master cylinder end)/ Hose Ø-12.4, 6.3

Technical Data-TATA 2823.K Tipper

GEARBOX	VEHICLE MODEL
Gear box model	TATA G1150 9 Speed gear box (8F +1C + 1R Manual Synchromesh)
Configuration (Vert/Hori)	Vertical
Gear box Dimension (Length, Width and Height), mm	Length-980, W @ Rear- 400 and W @ Center- 300 & H @ Rear End- 420
Location of shifting system w.r.t gearbox	Top of Gear box
Oil Filler Position & Drain plug position	Filling plug at RH center of GB, Drain plug at Bottom of GB
Selector Fork location	Top of Gear box
Clutch Housing type / CWG arrangement	Type : Splited, Cast Iron/ CWG arrangement in crosswise (Horizontal)
Drain plug type	Magnetic, Allen Key type , Size 12 mm
Shifter arrangement	Single lever RH side, Range change inhibited on Tower
PTO dimensions,(Length X Width) mm	L-310 , W- 150x125 at Rear
CSO	
Gear shift mechanism	Mechanical CSO (Mechanical with ball joint type in cabin side, Ball joint +Reaction rod + control tube at GB side)
Gear shifting Pattern and Travel dimensions in mm	

Technical Data-TATA 2823.K Tipper

PROPELLER SHAFT	
No .of Bolt	4 Point mounting
(a) Shaft one	
Length / Dia, (mm)	Flange to Flange L- 1255 (Main shaft + Slip joint) , Main shaft Tube L- 645, Main shaft- Ø 200 mm
Inclination Angle, (degrees)	5.1 deg
No.of Mounting Bolts, PCD (mm)	4 , PCD- Ø 150 mm
Size of Mounting bolts	M14x 10.9 Grade x 55 mm long on both ends
Bolt accessibility (For Assembly)	Available
Serrated / Non Serrated	Serrated
Slip joint Bigger dia , (mm)	Ø100
Slip joint Smaller dia , (mm)	Ø90
Slip length (installed), (mm)	65
(b) shaft two (Inter axle shaft)	
Length / Dia, (mm)	Flange to Flange L- 655, Dia @ Front Ø 90
Inclination Angle, (degrees)	13.6 deg
No.of Mounting Bolts, PCD (mm)	4 , PCD- Ø 130 mm
Size of Mounting bolts	M12x 10.9 Grade x 45 mm long on both ends
Bolt accessibility (For Assembly)	Available
Serrated / Non Serrated	Serrated
Center Bearing (Type/Position)	Not available
Clearance with cross member, (mm)	120 @ top

Technical Data-TATA 2823.K Tipper

Front Axle assembly	
Front Track, (mm)	2000
King pin center (KPC) distance, (mm)	Bottom-1750, Top 1610
Wheel bolt to wheel bolt Distance (Outer to Outer), (mm)	1680
Caster, (degrees)	3.5^{o}
Wheel bolt size (Diameter x pitch)	M22x 2.5
Number of threads projection beyond wheel nut	3
Spring pad centers, (mm)	850
Spring / suspension mounting holes position i.e. hole centers horizontal (A) x vertical (B) and Dowel hole position from beam center (L)	Horizontal (A)- 425, Vertical (B)-138
Beam center to track rod tube center distance, (mm)	235
Ground Clearance (i.e. bottom of beam to ground), (mm)	300
Track rod socket to wheel rim/tyre clearance, (mm)	Wheel rim-25 @ SAP condition
Axle drop (i.e. kingpin center to spring seat), (mm)	90
Axle drop (i.e. Axle beam kingpin boss top to spring seat), (mm)	140
Track rod Lever pitch (i.e. track rod lever ball joint to king pin center), (mm)	220
Hub cap and King pin cover plate mounting arrangement	Thread type Hub cap & King pin cover plate fitted by retaining ring on top and bottom

Technical Data-TATA 2823.K Tipper

Front axle beam	
Beam Height at center of beam (A), (mm)	At Center- 97, At Edge- 90
Top Flange width at center of beam (A), (mm)	91.5
Bottom Flange width at center of beam (A), (mm)	91.5
Web thickness at center of beam (A), (mm)	20
Horizontal Distance of 'B' from Beam center at which below dimension were captured, ref figure, (mm)	425
Beam Height at spring mounting i.e. at dowel center (B), (mm)	115
Top Flange width at spring mounting i.e. at dowel center (B), (mm)	160
Bottom Flange width at spring mounting i.e. at dowel center (B), (mm)	47
Web thickness at spring mounting i.e. at dowel center (B), (mm)	25
Horizontal Distance of 'C' from Beam center at which below dimension were captured, ref figure, (mm)	770
Beam Height after spring mounting i.e. at 'C', (mm)	96
Top Flange width after spring mounting i.e. at 'C', (mm)	100
Bottom Flange width after spring mounting i.e. at 'C', (mm)	80
Web thickness after spring mounting i.e. at 'C', (mm)	60

Technical Data-TATA 2823.K Tipper

REAR AXLE ASSEMBLY (VEHICLE LEVEL)	
Axle model	Fully floating, Single reduction, Heavy duty rear axle with diffential lock
Type of Axle (construction)	Banjo housing(Fully floating axle)
Axle housing type	Fabricated with Dome type
Axle Ratio (Ratio Split in case of HR and Twin speed axle)	RA 109 RX 5.58:1
Brake chamber position	RA1- Front of axle, RA2-Rear of axle
Axle housing Box Section (Outer profile) (8- Refer attached diagram),mm	RA1 & RA2: L-144x H-158
Axle housing circular section OD	Ø500
diff cover / dome type	Dome type
Castor Angle (pinion inclination to the ground surface) (9- Refer attached diagram), Deg	RA1-3.2^{o} to 3.4^{o}; RA2-3.6^{o}
Spring mounting centers / spring span (1- Refer attached diagram), mm	Bogie span- 1090
spring seat width , thk	W-110, T-90
No of brake mounting holes	10 point mounting
Brake mounting screw size	M16
Reinforcement ring on dome side availability	Available
Spring seat and bottom bracket type	Integrated with Bogie bracket
Antiroll bracket and any other brackets	ARB available
Shock Absorber Bracket	Not available
Tyre outer to outer (4- Refer attached diagram),mm	2445
Number of threads projection beyond wheel nut	4 threads, Projection beyond nut end-11.2, Projection from rim face- 40.5
brake assembly make	TVS
S cam shaft length from brake flange	410
Distance b/w brake chamber (2- Refer attached diagram), mm	465
Tyre to suspension clearance, (mm)	70
Slack adjuster type	Automatic slack adjuster
Slack adjuster make	ASA- MEI
Slack adjuster offset distance, (mm)	Offset- 90, Pitch-160
U bolt pitch, (mm)	235 at bottom (Inverted U bolt, inclined fitment)
U bolt dia, (mm)	24
Tyre make and size	MRF STEEL MUSCLE S3 C8 PLUS 10.00-20 16 PR
Wheel rim make and size	OD-Ø585 mm
Rear track (3- Refer attached diagram), mm	1915
SLR height (5- Refer attached diagram), mm	510
Dual space (6- Refer attached diagram), mm	320
Minimum ground clearance (7- Refer attached diagram), mm	RA1-260, RA2-260

Technical Data-TATA 2823.K Tipper

REAR AXLE ASSEMBLY (SUB ASSEMBLY LEVEL)	
RA1- Z Axis offset output flange axis to Axle hub axis (15- Refer attached diagram), mm	120
RA1- X Axis offset between input flange surface to Axle Hub axis (16- Refer attached diagram), mm	570
RA1- X Axis offset Axle Hub axis to output flange surface (17- Refer attached diagram), mm	240
RA1- Y Axis offset Input flange axis to Output flange offset (10- Refer attached diagram), mm	70
RA2- Y Axis offset Axle Hub axis to input flange axis (13- Refer attached diagram), mm	40
RA2- X Axis offset between input flange surface to Axle Hub axis (18- Refer attached diagram), mm	380
RA2- Z Axis offset Axle Hub axis to output flange axis (19- Refer attached diagram), mm	50
Spindle outer to outer (12- Refer attached diagram), mm	2200
Bowl dia (20- Refer attached diagram), mm	RA1 & RA2- Ø460
Dist b/w brake flange inner face (14- Refer attached diagram), mm	1490

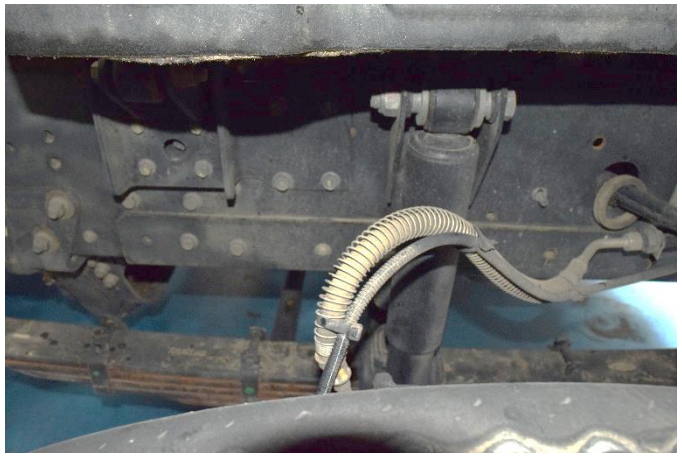
Technical Data-TATA 2823.K Tipper

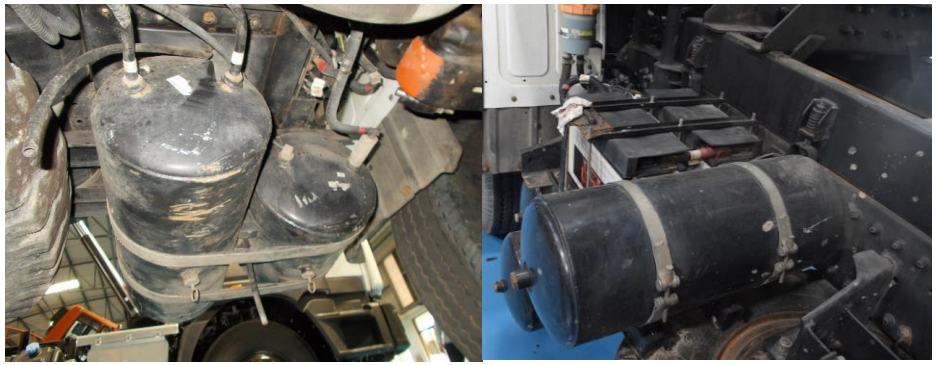
GENERAL	
Total no of tires (Front / Rear / Spare)	Front-2, Rear-8,Spare-1
FRONT TYRES	
Make and model	MRF SUPER MILER 9090
Tyre specification	10.00-20
Ply and tread pattern	16 PR
Tube or tubeless (Mentioned in tyre)	Tube type
Rated Tyre pressure, (PSI)	115 Psi
Distance between Tyre center to ground at Unladen condition, (mm)	510
REAR TYRES	
Make and model	MRF Steel Muscle
Tyre specification	10.00-20
Ply and tread pattern	16 PR
Tube or tubeless (Mentioned in tyre)	Tube type
Rated Tyre pressure, (PSI)	115 Psi
Distance - Tyre center to ground - Unladen, (mm)	510
SPARE WHEEL	
Spare wheel carrier type	Rope with Ratchet Mechanism
Mounting Details	SWC- 4 Point mounting on FSM
Make and model	MRF Steel Muscle
Tyre specification	10.00-20
Ply and thread pattern	16 PR
Tube or tubeless	Tube type
WHEEL RIM	
Wheel PCD, (mm)	335
Wheel stud size x pitch	M22x2.5
Number of ventilations slots	10, Ø35
WHEEL CHOCK	
Type	Fabricated
Mounting location	Bolted on LH front of Load body

Technical Data-TATA 2823.K Tipper

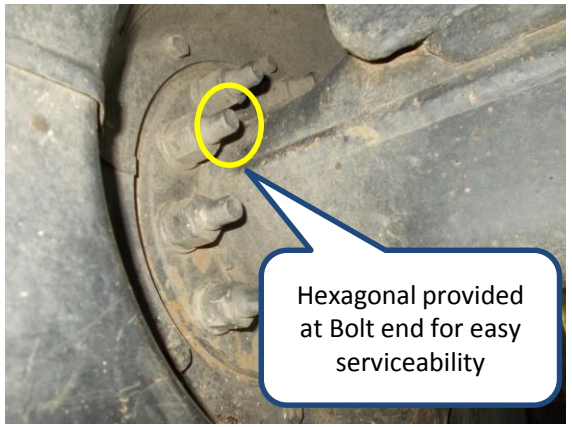
BRAKE SYSTEM	
No of air tanks	3 Nos
Air tank capacity	35 Liters- 2 Nos, 20 Litres-1 No
Air piping from reservoir to Brake chamber	Rubber hose with spring at Brake chamber/SBA end, Others- Nylon hoses
Mounting arrangement for Brake carrier	Rear- 10 point mounting on axle flange , M16/ Front- Mounted on stub axle
Slack adjustor - automatic / manual / Make	Automatic Slack adjuster, Front ASA Make- WABCO , Rear ASA Make- MEI
Slack adjuster pitch, (mm)	Rear- 160 mm, Front- 140 mm
Slack adjuster offset	Rear- 90 mm, Front- 0 mm
FOUNDATION BRAKES	
Brake Type - Disc or Drum	Drum brake
If Drum Brake - Type of brake :	Dual line, Full air s cam brakes
Brake drum OD, mm	Ø450 mm
Brake chamber size at Front axle	FA- Type27
Spring brake actuator size at Rear axle 1 & 2	RA1 Type 24/24, RA2 - Type 27/30

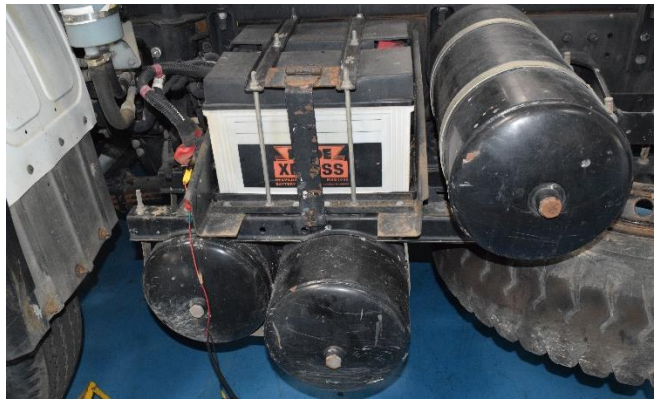
Foot Brake & Air piping system





Foot Brake & Air piping system



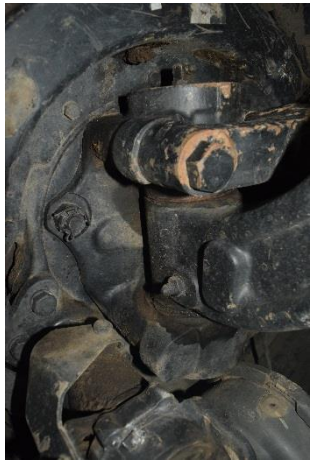


Propeller shaft & Rear Axle

Clutch,GB & Front Axle






THANK YOU!