

## Allison Transmission Bundled Report

Application	116-A347238-1
Iteration	1
Date	February 6, 2025 10:25:19
Units Of Measure	SI

The vehicle performance calculated by iSCAAN is an estimate for the specified vehicle and power train operating at standard engine conditions per SAE J1995 at 91 m (300 feet) altitude of 100 kPa barometric pressure and 25°C (77°F) inlet air temperature. Engine performance is significantly affected as operating altitude increases, therefore, Allison Transmission, Inc. does not represent and hereby disclaims that, under all conditions, the actual vehicle will achieve the simulated performance.

### Application Profile

Application Name	Paul Actros 2532 - OM936 235kW 1300Nm - Refuse - i=5,222 - copy
Owner	Andreas Wolf @ DGS Mainz
SCAAN Analysis Type	Standard Vehicle Run
Optional Analysis Type	
Classification	Standard
Review Status	Not Submitted

### Mission

End User	Unknown
Selected Vocation	Refuse / Recycling — Rear Loader - No Landfill — Straight Truck - No Snow Plow (40-30-12)

### Platform

Vehicle Manufacturer	Daimler Trucks - Europe (Europe/ME/SA)
Vehicle Model	Actros 2532 L 6x2
Vehicle Configuration	Refuse Truck
Engine	Mercedes-Benz OM936LA (Diesel) -- 235kW@1800rpm 1300Nm@1200-1600rpm -- without SEM/LRTP (116-L014103-E, Rev B)
Transmission	3200 INTL Retarder (1-L007353-T, Rev E)
Transmission Rating	3200 INTL Retarder Refuse - Diesel Allison 6th Generation Controls without SEM/LRTP (1-L022095-R, Rev B)
Vehicle Parameters	Standard
Torque Converter	TC418 (1-L001252-TC, Rev B) - Recommended
Transmission Retarder	3000 Series High Capacity (1-L001294-TR, Rev A)
LRTP Status	

## Allison Transmission Input Summary

### Mission

End User	Unknown
Selected Vocation	Refuse / Recycling — Rear Loader - No Landfill — Straight Truck - No Snow Plow (40-30-12)

### Platform

Vehicle Manufacturer	Daimler Trucks - Europe (Europe/ME/SA)
Vehicle Model	Actros 2532 L 6x2
Vehicle Configuration	Refuse Truck
User Expected Engine Load	0%

### Platform - Area and Weight

Frontal Area	8.588 m²
Height / Width	3.435 m / 2.500 m
Standard Wind Resistance Coefficient	0.800 (no Deflector)
User Defined Wind Resistance Coefficient	0.800 (no Deflector)
Gross Vehicle Weight	26000 kg (no Trailer)
Weight On Drive Wheels	11500 kg (44.23%)

### Platform - Tires

Number Of Tires	6 (Low Profile Radial (Metric))
Selected Tire	Continental Conti EcoPlus HD3 (315/70R22.5, 547) (1190-L021129-TI)
Tire Revolutions	340 revs/km
Tire Rolling Radius	0.468 m
Standard Surface	Smooth Concrete (SC Factor = 1.00)
Selected Surface	Smooth Concrete (SC Factor = 1.00)
Standard On-Road Traction Limit Coefficient	0.700
Standard Off-Road Traction Limit Coefficient	0.000
User Defined On-Road Traction Limit Coefficient	0.700
User Defined Off-Road Traction Limit Coefficient	0.000
Tire/Wheel Inertia (estimated)	44.8368 kg-m²

### Accessory Losses (Power @ Governed Speed)

Accessory	Standard Loss (kW)	User Defined Loss (kW)
Fan (Clutch Fan)	36.2	36.2
Alternator / Generator	1.2	1.2
Air Compressor	1.6	1.6
Steering Pump	1.6	1.6
Air Conditioning	0.0	0.0
Implement Drive	0.0	0.0

**Engine**

Number of Power Packs	<b>1</b>
Engine	<b>Mercedes-Benz OM936LA (Diesel) -- 235kW@1800rpm 1300Nm@1200-1600rpm -- without SEM/LRTP (116-L014103-E, Rev B)</b>
Engine Controls Type	<b>Electronic</b>
Evaluate at Altitude	<b>No</b>
Certifications	<b>Europe / Russia / EAEU Euro VI</b>
Displacement	<b>7.70 l</b>
Peak Torque	<b>1300.0 N-m</b>
Peak Torque Speed	<b>1400 rpm</b>
Peak Power	<b>235.0 kW</b>
Peak Power Speed	<b>1800 rpm</b>
Governed Power	<b>219.4 kW</b>
Governed Speed	<b>2400 rpm</b>
Number Of Curves	<b>1</b>
Engine Curve Reference	
Cruise Velocity @ Speed	<b>0.0 km/h @ 0 rpm</b>
Engine Retarder	
Engine Inertia (estimated)	<b>1.0843 kg-m<sup>2</sup></b>
Engine Idle Speed	<b>600 rpm</b>

**Engine Curve - Standard Losses - Combined Low & High Curves (AC On Where Applicable)**

Speed (rpm)	Gross Power (kW)	Gross Torque (N-m)	Net Power Fan On (kW)	Net Torque Fan On (N-m)	Net Power Fan Off (kW)	Net Torque Fan Off (N-m)	Point Identification
1000	118.0	1127.0	112.9	1077.9	115.5	1102.9	
1100	146.6	1273.0	140.5	1219.7	144.0	1250.0	
1200	163.4	1300.0	156.0	1241.8	160.6	1277.8	
1400	190.6	1300.0	180.3	1230.1	187.5	1279.2	Peak Torque
1600	217.8	1300.0	203.8	1216.1	214.5	1280.2	
1700	227.5	1278.0	211.2	1186.3	224.1	1258.6	
1800	235.0	1246.7	216.1	1146.6	231.4	1227.7	Peak Power
1900	236.4	1188.0	214.7	1079.0	232.7	1169.3	
2000	236.0	1127.0	211.2	1008.5	232.2	1108.6	
2100	236.0	1073.0	207.7	944.5	232.0	1054.9	
2200	234.5	1018.0	202.5	879.0	230.4	1000.2	
2300	227.6	945.0	191.5	795.0	223.4	927.4	
2400	219.4	873.0	178.8	711.4	215.0	855.6	Governed
2500	209.4	800.0	164.0	626.3	204.9	782.8	
2600	163.4	600.0	112.7	413.8	158.7	583.0	
2730	0.0	0.0	-58.1	-203.4	-4.8	-16.8	No Load Governed

**Engine Curve - User Defined Losses - Combined Low & High Curves (AC On Where Applicable)**

Speed (rpm)	Gross Power (kW)	Gross Torque (N-m)	Net Power Fan On (kW)	Net Torque Fan On (N-m)	Net Power Fan Off (kW)	Net Torque Fan Off (N-m)	Point Identification
1000	118.0	1127.0	112.9	1077.9	115.5	1102.9	
1100	146.6	1273.0	140.5	1219.7	144.0	1250.0	
1200	163.4	1300.0	156.0	1241.8	160.6	1277.8	
1400	190.6	1300.0	180.3	1230.1	187.5	1279.2	Peak Torque
1600	217.8	1300.0	203.8	1216.1	214.5	1280.2	
1700	227.5	1278.0	211.2	1186.3	224.1	1258.6	
1800	235.0	1246.7	216.1	1146.6	231.4	1227.7	Peak Power
1900	236.4	1188.0	214.7	1079.0	232.7	1169.3	
2000	236.0	1127.0	211.2	1008.5	232.2	1108.6	
2100	236.0	1073.0	207.7	944.5	232.0	1054.9	
2200	234.5	1018.0	202.5	879.0	230.4	1000.2	
2300	227.6	945.0	191.5	795.0	223.4	927.4	
2400	219.4	873.0	178.8	711.4	215.0	855.6	Governed
2500	209.4	800.0	164.0	626.3	204.9	782.8	
2600	163.4	600.0	112.7	413.8	158.7	583.0	
2730	0.0	0.0	-58.1	-203.4	-4.8	-16.8	No Load Governed

Transmission

Transmission Manufacturer	Allison Transmission
Transmission Family	3000 Series (1-L001243-TF, Rev AI)
Transmission	3200 INTL Retarder (1-L007353-T, Rev E)
Transmission Rating	3200 INTL Retarder Refuse - Diesel Allison 6th Generation Controls without SEM/LRTP (1-L022095-R, Rev B)
Torque Converter	TC418 (1-L001252-TC, Rev B) - Recommended
Transmission Retarder	3000 Series High Capacity (1-L001294-TR, Rev A)

Controls

Controls Release	Production Calibration (PC) for 3000 Series (1-L001194-CR, Rev F)
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Controls - Primary Gears (Shift Schedule)

DynActive	No
Speed Profile	Performance
Shift Speed & Strategy	2400 rpm S1 Performance
Equivalent DynActive Bias	0
Primary Mode: Gears	Low = 1, Start = 1, High = 6 (1-1-6)

Driveline

Transmission Output Torque Limit	No
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Driveline - Components

Component	Description	Ratio	Standard Efficiency (%)	User Defined Efficiency (%)
Propshaft -- One Piece -- Two Joint (1-L003521-DL)	Single	1.000	98.60	98.60
Axle -- On Hwy Single Red -- 6x2 (1-L003533-DL)	Single	4.778	97.00	97.00

Driveline - Overall Driveline Ratio

Description	Ratio	Standard Efficiency (%)	User Defined Efficiency (%)	N over V Ratio (rpm/kph)
Single	4.778	95.64	95.64	27.061

## Allison Transmission Ratings and Guidelines Check

### Note

This SCAAN information is subject to the SCAAN Disclaimer set forth elsewhere.  
Results indicate the vehicle operating conditions at steady state (acceleration = 0).  
The exclamation symbol indicates that Wheel Slip may occur.








### Converter Rating And Guideline Checks

		<b>Section Score - OK</b>	
<b>C01</b>		<b>Transmission / Converter Compatibility</b>	
Overall Status		OK: Acceptable	
<b>C02</b>		<b>Engine / Converter Compatibility</b>	
Overall Status		OK: Acceptable	
<b>C04</b>		<b>Engine Speed at Converter Stall</b>	
Overall Status		Reference	
Actual		1956 rpm	
<b>C05</b>		<b>Minimum Engine Speed</b>	
Overall Status		OK: Acceptable	
Rating/Recommendation		1300 rpm (Min)	
Actual		1956 rpm	
Notes		Net peak torque speed (1200 rpm) + allowable variation (100 rpm).	
<b>C07</b>		<b>Turbine Torque at Converter Stall</b>	
Overall Status		OK: Acceptable	
Rating/Recommendation		2169.0 N-m (Max)	
Actual		2023.5 N-m	
<b>C08</b>		<b>Converter Speed Ratio at Engine Governed Speed</b>	
Overall Status		OK: Acceptable	
Rating/Recommendation		0.800 (Min)	
Actual		0.911	
<b>C03</b>		<b>Converter Stall Torque Ratio</b>	
Overall Status		Reference	
Actual		1.980	

## Transmission Rating And Guideline Checks

✓ Section Score - OK		
<b>T01</b>	✓	<b>Transmission / Vocation Compatibility</b>
Overall Status		OK: Acceptable
<b>T02</b>	✓	<b>Transmission / Engine Compatibility</b>
Overall Status		OK: Acceptable
<b>T17</b>	✓	<b>Transmission Permitted in End User/Chassis Mfg Locations</b>
Overall Status		OK: Acceptable
<b>T15</b>	✓	<b>Transmission Input Power (Gross)</b>
Overall Status		OK: Acceptable
Rating/Recommendation		276.0 kW (Max)
Actual		236.4 kW
<b>T14</b>	✓	<b>Transmission Input Torque (Gross)</b>
Overall Status		OK: Acceptable
Rating/Recommendation		1491.0 N-m (Max)
Actual		1300.0 N-m
<b>T03</b>	✓	<b>Transmission Input Speed</b>
Overall Status		OK: Acceptable
Rating/Recommendation		1900 rpm / 2800 rpm
Actual		2400 rpm
<b>T11</b>	✓	<b>Transmission Output Speed</b>
Overall Status		OK: Acceptable
Rating/Recommendation		3600 rpm (Max)
Actual		2831 rpm
Notes		Check made in Range 6L at 65 mph

## Vehicle Rating And Guideline Checks - Standard

<b>!</b>		<b>Section Score - C</b>	
<b>V01</b>		<b>Vehicle Weight</b>	
Overall Status		OK: Acceptable	
Rating/Recommendation		28500 kg (Max)	
Actual		26000 kg	
<b>V21</b>		<b>1st Range Converter Stall Gradeability</b>	
Overall Status		Reference	
Actual		27.33 %	
<b>V13</b>		<b>1st Range 70% Converter Efficiency Gradeability</b>	
Overall Status		Reference	
Actual		20.57 %	
<b>V14</b>	<b>!</b>	<b>1st Range 80% Converter Efficiency Gradeability</b>	
Overall Status		C: Consider - manufacturer to assess	
Rating/Recommendation		18.00 % (Min)	
Actual		17.69 %	
Notes		Customer is responsible for determining acceptability between 15 - 18 Gradeability.	
<b>V17</b>		<b>Maximum Geared Vehicle Speed at Engine Governed Speed</b>	
Overall Status		Reference	
Actual		136.0 km/h	
Notes		Check is in 6L Lockup.	
<b>V18</b>		<b>Maximum Speed on 0.5% Grade</b>	
Overall Status		OK: Acceptable	
Rating/Recommendation		104.6 km/h (Min)	
Actual		110.0 km/h	
Notes		At 2233.1 rpm Engine Speed, Range 5L.	
<b>V43</b>		<b>Heat Generated in 1st Range 70% Converter Efficiency</b>	
Overall Status		Reference	
Actual		68.17 kW	
Notes		At 2025.8 rpm Engine Speed.	
<b>V44</b>		<b>Heat Generated in 1st Range 80% Converter Efficiency</b>	
Overall Status		Reference	
Actual		47.79 kW	
Notes		At 2076.9 rpm Engine Speed.	

Allison Transmission  
Vehicle Performance Summary

Note

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Full Throttle Automatic Upshifts (Gradeability)

Engine Fan	Air Conditioning	Engine Power	Vehicle Parameters	Axle Ratio	Auxiliary Gearing Ratio
On	Off	Standard Power Curve	Standard	4.778	1.000

Gradeability	Percent Grade	Vehicle Speed (km/h)	Gear Range	Match Point
Stall Gradeability	27.3	0.0	1C	Stall
Launch Gradeability	25.3	0.0	1C	
Low Speed Gradeability	17.7	12.2	1C	80 Percent
Maximum Speed on Grade	0.0	115.2	6L	Road Load
	0.3	108.7	5L	
	0.5	105.1	5L	
	1.0	97.5	5L	
	2.0	79.7	4L	
	3.0	68.7	4L	
	4.0	55.4	3L	
	5.0	48.9	3L	
	6.0	41.0	2L	
	7.0	37.0	2L	
	8.0	27.0	2C	
	9.0	23.3	2C	
	10.0	19.8	2C	

Full Throttle Automatic Upshifts (Acceleration)

Engine Fan	Air Conditioning	Engine Power	Vehicle Parameters	Axle Ratio	Auxiliary Gearing Ratio
On	Off	Standard Power Curve	Standard	4.778	1.000

Speed (km/h)	Time (sec)	Distance (m)
0 - 20 km/h	3.3	11
0 - 30 km/h	6.7	34
0 - 40 km/h	10.9	75
0 - 60 km/h	23.7	257
0 - 80 km/h	44.7	670
0 - 100 km/h	87.3	1751



## Allison Transmission Vehicle Full Throttle Performance

### Note

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Results indicate the vehicle operating conditions at steady state (acceleration = 0).  
The exclamation symbol indicates that Wheel Slip may occur.

Full Throttle Automatic Upshifts (1C, 2C, 2L, 3L, 4L, 5L, 6L)

Engine Fan		Air Conditioning		Engine Power		Vehicle Parameters		Axle Ratio	Auxiliary Gearing Ratio	
On		Off		Standard Power Curve		Standard		4.778	1.000	
Gear Range	Vehicle Speed (km/h)	Engine Speed (rpm)	Output Speed (rpm)	Tractive Effort (kN)	Drawbar Pull (kN)	Wheel Power Available (kW)	Net Grade (%)	Transmission Heat Rejection (kW)	Match Point	
1C	0.0	1956	0	68.11	67.22	0.0	27.33	212.80		
1C	3.2	1971	87	64.79	63.87	57.9	25.87	151.72		
1C	6.4	1991	174	59.38	58.42	106.2	23.54	100.54		
1C	9.4	2026	253	52.36	51.37	136.1	20.57	68.04	70 Percent	
1C	9.7	2031	261	51.62	50.62	138.5	20.26	65.40		
1C	12.2	2077	330	45.44	44.41	153.9	17.69	47.68	80 Percent	
1C	12.9	2091	348	43.85	42.80	156.8	17.03	44.09		
1C	14.4	2123	389	40.42	39.35	161.4	15.62	37.80	85 Percent	
1C	16.1	2163	436	36.64	35.55	163.8	14.08	33.20		
1C	19.1	2231	516	30.54	29.39	161.8	11.60	29.93		
2C	19.1	2040	516	27.03	25.88	143.2	10.20	60.16		
2C	19.3	2042	523	26.85	25.70	144.1	10.13	59.14		
2C	22.5	2074	610	24.62	23.39	154.1	9.21	47.56		
2C	25.7	2109	697	22.49	21.20	160.9	8.34	39.00		
2C	29.0	2148	784	20.44	19.07	164.5	7.50	33.25		
2C	31.9	2184	863	18.70	17.25	165.7	6.78	30.13		
2L	31.9	1609	863	21.49	20.04	190.4	7.88	5.37		
2L	32.2	1624	871	21.41	19.95	191.4	7.85	5.39		
2L	35.4	1786	958	20.37	18.82	200.3	7.40	5.98		
2L	38.6	1948	1045	18.42	16.77	197.6	6.59	6.37		
2L	41.8	2111	1132	16.47	14.72	191.4	5.78	7.02		
2L	45.1	2273	1219	14.29	12.43	178.9	4.88	7.44		
2L	46.1	2324	1247	13.51	11.61	172.9	4.56	7.61		
3L	46.1	1757	1247	15.57	13.67	199.3	5.37	5.65		
3L	48.3	1841	1307	14.95	12.97	200.5	5.09	5.91		
3L	51.5	1964	1394	13.78	11.68	197.1	4.59	6.37		
3L	54.7	2086	1481	12.66	10.43	192.5	4.10	6.95		
3L	57.9	2209	1568	11.53	9.17	185.6	3.60	7.46		
3L	61.0	2325	1650	10.19	7.69	172.6	3.02	7.84		
4L	61.0	1650	1650	11.46	8.96	194.1	3.52	4.59		
4L	61.2	1655	1655	11.44	8.94	194.4	3.51	4.61		
4L	64.4	1742	1742	11.14	8.48	199.2	3.33	5.00		
4L	67.6	1829	1829	10.71	7.90	201.2	3.10	5.40		
4L	70.8	1916	1916	10.12	7.15	199.1	2.81	5.91		
4L	74.0	2003	2003	9.52	6.38	195.7	2.50	6.48		
4L	77.2	2090	2090	8.96	5.65	192.3	2.22	6.96		
4L	80.5	2178	2178	8.40	4.91	187.7	1.93	7.44		
4L	83.7	2265	2265	7.71	4.04	179.3	1.58	7.94		
4L	85.9	2325	2325	7.21	3.40	172.1	1.33	8.39		
5L	85.9	1744	2325	8.20	4.39	195.6	1.72	8.86		
5L	86.9	1764	2352	8.13	4.27	196.4	1.67	9.04		
5L	90.1	1829	2439	7.88	3.81	197.2	1.50	9.56		
5L	93.3	1894	2526	7.54	3.28	195.6	1.28	10.25		
5L	96.6	1960	2613	7.20	2.72	193.1	1.07	10.72		
5L	99.8	2025	2700	6.86	2.17	190.3	0.85	11.41		
5L	103.0	2090	2787	6.55	1.63	187.4	0.64	12.14		
5L	106.2	2156	2874	6.23	1.08	183.7	0.42	12.72		
5L	109.4	2221	2961	5.87	0.49	178.6	0.19	13.46		
5L	112.7	2286	3049	5.46	-0.16	171.0	-0.06	14.23		
5L	114.6	2326	3101	5.22	-0.56	166.0	-0.22	14.63		
6L	114.6	2022	3101	5.87	0.09	186.7	0.04	15.23		
6L	115.9	2044	3136	5.77	-0.11	185.7	-0.04	15.49		
6L	119.1	2101	3223	5.53	-0.60	182.9	-0.24	16.46		
6L	122.3	2158	3310	5.28	-1.11	179.4	-0.44	17.13		
6L	125.5	2215	3397	5.02	-1.64	174.9	-0.64	18.03		
6L	128.7	2272	3484	4.70	-2.23	168.1	-0.88	18.83		
6L	132.0	2328	3571	4.39	-2.82	160.8	-1.11	19.72		
6L	135.2	2385	3658	4.07	-3.42	153.0	-1.34	20.70		
6L	136.0	2400	3681	3.99	-3.58	150.9	-1.40	21.06	Governed	
6L	138.4	2442	3745	3.76	-4.03	144.4	-1.58	21.56		
6L	141.6	2499	3832	3.44	-4.65	135.2	-1.83	22.78		

6L	144.8	2556	3920	2.67	-5.72	107.5	-2.25	23.12	
6L	148.1	2612	4007	1.69	-7.02	69.6	-2.75	23.77	
6L	151.2	2668	4092	0.00	-9.02	0.0	-3.54	22.94	

Full Throttle Manual 1st Hold - Lockup Apply (1C, 1L)

Engine Fan	Air Conditioning	Engine Power	Vehicle Parameters	Axle Ratio	Auxiliary Gearing Ratio
On	Off	Standard Power Curve	Standard	4.778	1.000

Gear Range	Vehicle Speed (km/h)	Engine Speed (rpm)	Output Speed (rpm)	Tractive Effort (kN)	Drawbar Pull (kN)	Wheel Power Available (kW)	Net Grade (%)	Transmission Heat Rejection (kW)	Match Point
1C	0.0	1956	0	68.11	67.22	0.0	27.33	212.80	
1C	3.2	1971	87	64.79	63.87	57.9	25.87	151.72	
1C	6.4	1991	174	59.38	58.42	106.2	23.54	100.54	
1C	9.4	2026	253	52.36	51.37	136.1	20.57	68.04	70 Percent
1C	9.7	2031	261	51.62	50.62	138.5	20.26	65.40	
1C	12.2	2077	330	45.44	44.41	153.9	17.69	47.68	80 Percent
1C	12.9	2091	348	43.85	42.80	156.8	17.03	44.09	
1C	14.4	2123	389	40.42	39.35	161.4	15.62	37.80	85 Percent
1C	16.1	2163	436	36.64	35.55	163.8	14.08	33.20	
1C	16.5	2172	447	35.75	34.65	164.1	13.72	32.43	
1L	16.5	1559	447	40.07	38.96	183.8	15.46	6.71	
1L	19.3	1822	523	37.08	35.92	198.9	14.23	7.82	
1L	22.5	2126	610	30.16	28.94	188.8	11.42	8.99	
1L	25.4	2400	688	22.84	21.55	161.4	8.48	10.08	Governed
1L	25.7	2430	697	21.98	20.69	157.2	8.14	9.99	
1L	28.4	2680	769	0.00	-1.36	0.0	-0.53	7.65	

Full Throttle Reverse Performance (R1C)

Engine Fan	Air Conditioning	Engine Power	Vehicle Parameters	Axle Ratio	Auxiliary Gearing Ratio
On	Off	Standard Power Curve	Standard	4.778	1.000

Gear Range	Vehicle Speed (km/h)	Engine Speed (rpm)	Output Speed (rpm)	Tractive Effort (kN)	Drawbar Pull (kN)	Wheel Power Available (kW)	Net Grade (%)	Transmission Heat Rejection (kW)	Match Point
R1C!	0.0	1956	0	95.75	94.85	0.0	40.08	212.80	
R1C!	3.2	1974	87	88.80	87.88	79.4	36.71	129.15	
R1C	6.4	2025	174	74.21	73.26	132.7	30.00	71.63	
R1C	6.5	2026	176	73.94	72.98	133.3	29.87	70.93	70 Percent
R1C	8.5	2077	229	64.22	63.24	150.9	25.60	50.81	80 Percent
R1C	9.7	2113	261	58.62	57.63	157.2	23.20	42.66	
R1C	10.0	2123	270	57.16	56.16	158.3	22.58	40.98	85 Percent
R1C	12.9	2219	348	44.75	43.71	160.0	17.40	33.10	
R1C	16.1	2400	435	32.33	31.24	144.3	12.34	27.92	Governed
R1C	16.1	2403	436	32.23	31.14	144.1	12.30	27.78	
R1C	19.3	2660	523	4.95	3.79	26.5	1.49	6.36	
R1C	19.7	2681	532	0.01	-1.16	0.0	-0.45	5.73	

Allison Transmission  
Vehicle Acceleration Performance

Note

This SCAAN information is subject to the SCAAN Disclaimer set forth elsewhere.  
The symbol indicates that Wheel Slip may occur.  
Initial conditions for this report are Service Brakes locked and Engine at Full Throttle.

Full Throttle Automatic Upshifts (1C, 2C, 2L, 3L, 4L, 5L)

Engine Fan	Air Conditioning	Engine Power	Vehicle Parameters	Axle Ratio	Auxiliary Gearing Ratio	Grade
On	Off	Standard Power Curve	Standard	4.778	1.000	0

Gear Range	Vehicle Speed (km/h)	Time (seconds)	Distance (m)	Acceleration Rate (m/sec²)	Engine Speed (rpm)	Tractive Effort (kN)	Drawbar Pull (kN)	Wheel Power Available (kW)	Transmission Heat Rejection (kW)
1C	3.2	0.4	0	2.387	1971	64.79	63.87	57.9	151.72
1C	6.4	0.8	1	2.173	1991	59.38	58.42	106.2	100.54
1C	9.7	1.2	2	1.876	2031	51.62	50.62	138.5	65.40
1C	12.9	1.7	3	1.581	2091	43.85	42.80	156.8	44.09
1C	16.1	2.3	6	1.311	2163	36.64	35.55	163.8	33.20
1C	19.1	3.0	9	1.081	2231	30.54	29.39	161.8	29.93
2C	19.3	3.1	10	0.973	2042	26.85	25.70	144.1	59.14
2C	22.5	4.1	15	0.885	2074	24.62	23.39	154.1	47.56
2C	25.7	5.1	22	0.802	2109	22.49	21.20	160.9	39.00
2C	29.0	6.3	31	0.721	2148	20.44	19.07	164.5	33.25
2C	31.9	7.5	41	0.651	2184	18.70	17.25	165.7	30.13
2L	32.2	7.6	42	0.741	1624	21.41	19.95	191.4	5.39
2L	35.4	8.9	54	0.700	1786	20.37	18.82	200.3	5.98
2L	38.6	10.2	68	0.625	1948	18.42	16.77	197.6	6.37
2L	41.8	11.8	85	0.548	2111	16.47	14.72	191.4	7.02
2L	45.1	13.5	107	0.464	2273	14.29	12.43	178.9	7.44
2L	46.1	14.2	114	0.434	2324	13.52	11.62	173.0	7.61
3L	48.3	15.4	131	0.488	1841	14.95	12.97	200.5	5.91
3L	51.5	17.3	157	0.440	1964	13.78	11.68	197.1	6.37
3L	54.7	19.5	189	0.393	2086	12.66	10.43	192.5	6.95
3L	57.9	21.9	227	0.346	2209	11.53	9.17	185.6	7.46
3L	61.0	24.6	272	0.289	2325	10.19	7.69	172.6	7.84
4L	61.2	24.7	274	0.338	1655	11.44	8.94	194.4	4.61
4L	64.4	27.4	321	0.321	1742	11.14	8.48	199.2	5.00
4L	67.6	30.3	374	0.300	1829	10.71	7.90	201.2	5.40
4L	70.8	33.5	434	0.271	1916	10.12	7.15	199.1	5.91
4L	74.0	37.0	505	0.242	2003	9.52	6.38	195.7	6.48
4L	77.2	40.9	588	0.215	2090	8.96	5.65	192.3	6.96
4L	80.5	45.4	686	0.186	2178	8.40	4.91	187.7	7.44
4L	83.7	50.7	806	0.154	2265	7.71	4.04	179.3	7.94
4L	85.9	55.1	910	0.129	2325	7.21	3.40	172.1	8.39
5L	86.9	56.7	951	0.162	1764	8.13	4.27	196.4	9.04
5L	90.1	62.6	1093	0.145	1829	7.88	3.81	197.2	9.56
5L	93.3	69.2	1263	0.125	1894	7.54	3.28	195.6	10.25
5L	96.6	77.1	1471	0.104	1960	7.20	2.72	193.1	10.72
5L	99.8	86.8	1736	0.083	2025	6.86	2.17	190.3	11.41
5L	103.0	99.3	2087	0.062	2090	6.55	1.63	187.4	12.14
5L	106.2	116.9	2600	0.042	2156	6.23	1.08	183.7	12.72
5L	109.4	148.0	3535	0.019	2221	5.87	0.49	178.6	13.46

Full Throttle Manual 1st Hold - Lockup Apply (1C, 1L)

Engine Fan		Air Conditioning		Engine Power		Vehicle Parameters		Axle Ratio	Auxiliary Gearing Ratio		Grade
On		Off		Standard Power Curve		Standard		4.778	1.000		0

Gear Range	Vehicle Speed (km/h)	Time (seconds)	Distance (m)	Acceleration Rate (m/sec²)	Engine Speed (rpm)	Tractive Effort (kN)	Drawbar Pull (kN)	Wheel Power Available (kW)	Transmission Heat Rejection (kW)
1C	3.2	0.4	0	2.387	1971	64.79	63.87	57.9	151.72
1C	6.4	0.8	1	2.173	1991	59.38	58.42	106.2	100.54
1C	9.7	1.2	2	1.876	2031	51.62	50.62	138.5	65.40
1C	12.9	1.7	3	1.581	2091	43.85	42.80	156.8	44.09
1C	16.1	2.3	6	1.311	2163	36.64	35.55	163.8	33.20
1C	16.5	2.4	6	1.272	2172	35.75	34.65	164.1	32.43
1L	19.3	3.0	9	1.257	1822	37.08	35.92	198.9	7.82
1L	22.5	3.8	14	1.013	2126	30.16	28.94	188.8	8.99
1L	25.7	4.9	21	0.729	2430	21.98	20.69	157.2	9.99

Full Throttle Reverse Performance (R1C)

Engine Fan		Air Conditioning		Engine Power		Vehicle Parameters		Axle Ratio	Auxiliary Gearing Ratio		Grade
On		Off		Standard Power Curve		Standard		4.778	1.000		0

Gear Range	Vehicle Speed (km/h)	Time (seconds)	Distance (m)	Acceleration Rate (m/sec²)	Engine Speed (rpm)	Tractive Effort (kN)	Drawbar Pull (kN)	Wheel Power Available (kW)	Transmission Heat Rejection (kW)
R1C!	3.2	0.3	0	3.184	1974	88.80	87.88	79.4	129.15
R1C	6.4	0.6	1	2.624	2025	74.21	73.26	132.7	71.63
R1C	9.7	1.0	1	2.048	2113	58.62	57.63	157.2	42.66
R1C	12.9	1.5	3	1.552	2219	44.75	43.71	160.0	33.10
R1C	16.1	2.2	6	1.038	2403	32.23	31.14	144.1	27.78
R1C	19.3	3.8	14	0.180	2660	4.95	3.79	26.5	6.36

## Allison Transmission Vehicle Closed Throttle Braking Performance

### Note

This SCAAN information is subject to the SCAAN Disclaimer set forth elsewhere.  
Results indicate the vehicle operating conditions at steady state (acceleration = 0).  
The exclamation symbol indicates that Wheel Slip may occur.

**Closed Throttle Downshifts, Standard Retarder (6L, 5L, 4L, 3L, 2L, 2C)**

Engine Fan	Air Conditioning	Engine Power	Vehicle Parameters	Axle Ratio	Auxiliary Gearing Ratio
On	Off	Standard Power Curve	Standard	4.778	1.000

**Engine Retarder = OFF & Transmission Retarder = OFF**

Gear Range	Vehicle Speed (km/h)	Engine Speed (rpm)	Output Speed (rpm)	Equilibrium Grade (%)	Transmission Heat Rejection (kW)	Deceleration Rate (m/sec <sup>2</sup> )	Wheel Power (kW)
6L	154.7	2730	4187	-4.98	27.26	-0.482	142.1
6L	154.5	2726	4181	-4.97	27.17	-0.481	141.6
6L	151.3	2669	4094	-4.80	25.86	-0.465	135.0
6L	148.1	2612	4007	-4.64	24.60	-0.450	128.5
6L	144.8	2556	3920	-4.49	23.38	-0.434	122.0
6L	141.6	2499	3832	-4.33	22.21	-0.419	115.8
6L	138.4	2442	3745	-4.18	21.08	-0.405	109.8
6L	135.2	2385	3658	-4.03	19.99	-0.390	103.9
6L	132.0	2328	3571	-3.88	18.97	-0.376	98.3
6L	128.7	2272	3484	-3.74	17.99	-0.362	92.9
6L	125.5	2215	3397	-3.60	17.03	-0.349	87.7
6L	122.3	2158	3310	-3.46	16.10	-0.335	82.7
6L	119.1	2101	3223	-3.33	15.22	-0.322	77.9
6L	115.9	2044	3136	-3.20	14.35	-0.310	73.2
6L	112.7	1988	3049	-3.07	13.52	-0.297	68.7
6L	109.4	1931	2961	-2.94	12.73	-0.285	64.4
6L	106.2	1874	2874	-2.82	11.97	-0.273	60.4
6L	103.0	1817	2787	-2.71	11.23	-0.262	56.6
6L	99.8	1760	2700	-2.59	10.52	-0.251	52.9
6L	96.6	1704	2613	-2.48	9.84	-0.240	49.5
6L	93.9	1657	2542	-2.39	9.29	-0.232	46.7
5L	93.9	1907	2542	-2.58	9.15	-0.250	59.3
5L	93.3	1894	2526	-2.56	9.04	-0.248	58.4
5L	90.1	1829	2439	-2.44	8.41	-0.237	54.3
5L	86.9	1764	2352	-2.33	7.82	-0.226	50.3
5L	83.7	1698	2265	-2.23	7.26	-0.215	46.5
5L	80.5	1633	2178	-2.12	6.70	-0.205	42.9
5L	77.2	1568	2090	-2.02	6.23	-0.196	39.6
5L	74.0	1502	2003	-1.92	5.83	-0.186	36.4
5L	70.8	1437	1916	-1.83	5.46	-0.177	33.4
5L	68.4	1388	1850	-1.76	5.18	-0.171	31.3
4L	68.4	1850	1850	-2.20	5.65	-0.212	52.5
4L	67.6	1829	1829	-2.17	5.54	-0.209	51.3
4L	64.4	1742	1742	-2.06	5.10	-0.198	46.4
4L	61.2	1655	1655	-1.95	4.66	-0.188	41.8
4L	57.9	1568	1568	-1.84	4.30	-0.178	37.5
4L	54.7	1481	1481	-1.74	4.04	-0.168	33.7
4L	51.5	1394	1394	-1.65	3.79	-0.159	30.0
4L	48.3	1307	1307	-1.56	3.50	-0.150	26.7
4L	47.0	1271	1271	-1.52	3.37	-0.147	25.4
3L	47.0	1791	1271	-2.22	4.85	-0.212	48.6
3L	45.1	1718	1219	-2.13	4.56	-0.204	44.6
3L	41.8	1595	1132	-1.99	4.07	-0.190	38.5
3L	38.6	1473	1045	-1.85	3.73	-0.177	33.0
3L	35.4	1350	958	-1.73	3.42	-0.165	28.1
3L	34.4	1312	931	-1.69	3.30	-0.162	26.6
2L	34.4	1735	931	-2.46	4.46	-0.233	45.4
2L	32.2	1624	871	-2.31	4.04	-0.219	39.7
2L	29.0	1461	784	-2.13	3.70	-0.201	32.5
2L	25.7	1299	697	-1.95	3.34	-0.184	26.2
2L	22.5	1136	610	-1.78	2.86	-0.169	20.8
2L	19.8	999	536	-1.66	2.41	-0.157	16.8
2C	19.8	600	536	-1.27	5.31	-0.120	11.3

**Engine Retarder = OFF & Transmission Retarder = ON**

Gear Range	Vehicle Speed (km/h)	Engine Speed (rpm)	Output Speed (rpm)	Equilibrium Grade (%)	Transmission Heat Rejection (kW)	Deceleration Rate (m/sec <sup>2</sup> )	Wheel Power (kW)
6L	154.7	2730	4187	-9.28	474.83	-0.895	609.9
6L	154.5	2726	4181	-9.28	474.73	-0.895	609.4
6L	151.3	2669	4094	-9.20	473.43	-0.888	602.8
6L	148.1	2612	4007	-9.14	472.16	-0.882	596.3
6L	144.8	2556	3920	-9.08	470.95	-0.876	589.8

6L	141.6	2499	3832	-9.03	469.78	-0.871	583.6
6L	138.4	2442	3745	-8.98	468.64	-0.867	577.6
6L	135.2	2385	3658	-8.95	467.55	-0.863	571.7
6L	132.0	2328	3571	-8.92	466.53	-0.861	566.1
6L	128.7	2272	3484	-8.90	465.55	-0.859	560.7
6L	125.5	2215	3397	-8.89	464.59	-0.858	555.5
6L	122.3	2158	3310	-8.90	463.67	-0.859	550.5
6L	119.1	2101	3223	-8.91	462.78	-0.860	545.7
6L	115.9	2044	3136	-8.93	461.91	-0.862	541.0
6L	112.7	1988	3049	-8.97	461.08	-0.865	536.5
6L	109.4	1931	2961	-9.02	460.29	-0.870	532.2
6L	106.2	1874	2874	-9.08	459.53	-0.876	528.2
6L	103.0	1817	2787	-9.16	458.79	-0.883	524.4
6L	99.8	1760	2700	-9.25	458.08	-0.892	520.8
6L	96.6	1704	2613	-9.36	457.41	-0.903	517.3
6L	93.9	1657	2542	-9.46	456.85	-0.913	514.5
5L	93.9	1907	2542	-9.66	456.72	-0.930	527.1
5L	93.3	1894	2526	-9.68	456.60	-0.932	526.3
5L	90.1	1829	2439	-9.82	455.98	-0.946	522.1
5L	86.9	1764	2352	-9.98	455.39	-0.961	518.1
5L	83.7	1698	2265	-10.17	454.82	-0.979	514.3
5L	80.5	1633	2178	-10.39	454.27	-1.000	510.7
5L	77.2	1568	2090	-10.63	453.79	-1.023	507.4
5L	74.0	1502	2003	-10.91	453.39	-1.050	504.2
5L	70.8	1437	1916	-10.97	440.83	-1.055	488.5
5L	68.4	1388	1850	-10.90	425.55	-1.049	470.7
4L	68.4	1850	1850	-11.35	426.02	-1.087	491.9
4L	67.6	1829	1829	-11.32	421.18	-1.084	485.7
4L	64.4	1742	1742	-11.20	401.00	-1.073	460.2
4L	61.2	1655	1655	-11.09	380.83	-1.063	435.0
4L	57.9	1568	1568	-10.99	360.73	-1.053	410.1
4L	54.7	1481	1481	-10.89	340.67	-1.043	385.5
4L	51.5	1394	1394	-10.79	320.54	-1.034	361.1
4L	48.3	1307	1307	-10.69	300.37	-1.025	337.0
4L	47.0	1271	1271	-10.65	292.14	-1.021	327.2
3L	47.0	1791	1271	-11.36	293.61	-1.080	350.4
3L	45.1	1718	1219	-11.27	281.55	-1.072	334.2
3L	41.8	1595	1132	-11.12	261.18	-1.058	307.2
3L	38.6	1473	1045	-10.69	233.30	-1.017	273.0
3L	35.4	1350	958	-9.43	187.29	-0.899	220.3
3L	34.4	1312	931	-9.05	174.06	-0.863	205.1
2L	34.4	1735	931	-9.83	175.22	-0.925	223.9
2L	32.2	1624	871	-8.93	147.65	-0.842	189.8
2L	29.0	1461	784	-7.69	112.49	-0.725	146.2
2L	25.7	1299	697	-6.51	82.75	-0.615	109.3
2L	22.5	1136	610	-5.43	58.33	-0.512	78.8
2L	19.8	999	536	-4.60	41.88	-0.435	58.1
2C	19.8	600	536	-4.21	44.78	-0.398	52.6



**Closed Throttle Manual 1st Hold - Lockup Release, without Retarder (1L, 1C)**

Engine Fan	Air Conditioning	Engine Power	Vehicle Parameters	Axle Ratio	Auxiliary Gearing Ratio
On	Off	Standard Power Curve	Standard	4.778	1.000

**Engine Retarder = OFF & Transmission Retarder = OFF**

Gear Range	Vehicle Speed (km/h)	Engine Speed (rpm)	Output Speed (rpm)	Equilibrium Grade (%)	Transmission Heat Rejection (kW)	Deceleration Rate (m/sec <sup>2</sup> )	Wheel Power (kW)
1L	28.9	2730	783	-6.66	11.09	-0.589	125.2
1L	25.7	2430	697	-5.81	9.30	-0.514	96.4
1L	22.5	2126	610	-4.98	7.66	-0.440	71.7
1L	19.3	1822	523	-4.23	6.17	-0.374	51.6
1L	16.1	1519	436	-3.59	4.83	-0.318	36.0
1L	12.9	1215	348	-3.04	3.75	-0.269	24.0
1L	9.7	911	261	-2.61	2.62	-0.231	15.1
1L	8.6	809	232	-2.46	2.22	-0.218	12.6
1C	8.6	600	232	-1.56	1.31	-0.139	7.2

**Engine Retarder = OFF & Transmission Retarder = ON**

Gear Range	Vehicle Speed (km/h)	Engine Speed (rpm)	Output Speed (rpm)	Equilibrium Grade (%)	Transmission Heat Rejection (kW)	Deceleration Rate (m/sec <sup>2</sup> )	Wheel Power (kW)
1L	28.9	2730	783	-12.27	119.52	-1.082	238.5
1L	25.7	2430	697	-10.40	88.71	-0.919	179.4
1L	22.5	2126	610	-8.64	63.13	-0.764	129.6
1L	19.3	1822	523	-7.07	43.15	-0.626	90.2
1L	16.1	1519	436	-5.63	26.92	-0.499	59.1
1L	12.9	1215	348	-4.31	14.77	-0.382	35.5
1L	9.7	911	261	-3.25	6.80	-0.288	19.5
1L	8.6	809	232	-2.94	5.05	-0.261	15.5
1C	8.6	600	232	-2.05	4.14	-0.182	10.1