

Allison Transmission
Bundled Report

Application	116-A347283-1
Iteration	1
Date	February 6, 2025 15:45:38
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 2533 - OM470 240kW 1700Nm - Refuse - i=4,778
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 2533 L 6x2
Vehicle Configuration	Refuse Truck
Engine	Mercedes Benz OM 470 -- 240kW at 1600 rpm, 1700 Nm at 1100rpm -- without SEM/LRTP (116-L020905-E, Rev A)
Transmission	4000 INTL Retarder (1-L007406-T, Rev E)
Transmission Rating	4000 INTL Retarder Refuse - Diesel Allison 6th Generation Controls without SEM/LRTP (1-L024333-R, Rev A)
Vehicle Parameters	Standard
Torque Converter	TC561 (1-L001260-TC, Rev B) - Acceptable
Transmission Retarder	4000 Series High Capacity (1-L004745-TR, Rev E)
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 2533 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)	26.1	26.1
Alternator / Generator	1.2	1.2
Air Compressor	1.4	1.4
Steering Pump	1.4	1.4
Air Conditioning	0.0	0.0
Implement Drive	0.0	0.0

Engine

Number of Power Packs	1
Engine	Mercedes Benz OM 470 -- 240kW at 1600 rpm, 1700 Nm at 1100rpm -- without SEM/LRTP (116-L020905-E, Rev A)
Engine Controls Type	Electronic
Evaluate at Altitude	No
Certifications	Europe / Russia / EAEU Euro VI
Displacement	10.70 l
Peak Torque	1700.0 N-m
Peak Torque Speed	1100 rpm
Peak Power	240.0 kW
Peak Power Speed	1600 rpm
Governed Power	240.0 kW
Governed Speed	1900 rpm
Number Of Curves	1
Engine Curve Reference	
Cruise Velocity @ Speed	0.0 km/h @ 0 rpm
Engine Retarder	
Engine Inertia (estimated)	2.2446 kg-m²
Engine Idle Speed	650 rpm

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
700	121.0	1650.0	117.4	1601.7	118.7	1619.5	
800	139.5	1665.0	135.2	1613.3	137.1	1636.5	
900	158.3	1680.0	153.0	1623.7	155.8	1653.1	
1000	178.0	1700.0	171.5	1638.0	175.3	1674.4	
1100	195.8	1700.0	187.9	1631.4	193.0	1675.4	Peak Torque
1200	213.6	1700.0	204.1	1623.9	210.6	1676.3	
1250	222.5	1700.0	212.0	1619.9	219.5	1676.6	
1300	228.7	1680.0	217.2	1595.6	225.6	1657.0	
1400	238.0	1623.4	224.3	1529.8	234.7	1601.0	
1500	239.0	1521.5	222.7	1417.9	235.6	1499.7	
1600	240.0	1432.4	220.8	1318.0	236.4	1411.0	Peak Power
1800	240.0	1273.2	213.9	1134.9	236.1	1252.7	
1900	240.0	1206.2	209.9	1054.8	236.0	1186.0	Governed
2000	180.0	859.4	145.4	694.2	175.8	839.5	
2200	0.0	0.0	-45.0	-195.3	-4.5	-19.4	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
700	121.0	1650.0	117.4	1601.7	118.7	1619.5	
800	139.5	1665.0	135.2	1613.3	137.1	1636.5	
900	158.3	1680.0	153.0	1623.7	155.8	1653.1	
1000	178.0	1700.0	171.5	1638.0	175.3	1674.4	
1100	195.8	1700.0	187.9	1631.4	193.0	1675.4	Peak Torque
1200	213.6	1700.0	204.1	1623.9	210.6	1676.3	
1250	222.5	1700.0	212.0	1619.9	219.5	1676.6	
1300	228.7	1680.0	217.2	1595.6	225.6	1657.0	
1400	238.0	1623.4	224.3	1529.8	234.7	1601.0	
1500	239.0	1521.5	222.7	1417.9	235.6	1499.7	
1600	240.0	1432.4	220.8	1318.0	236.4	1411.0	Peak Power
1800	240.0	1273.2	213.9	1134.9	236.1	1252.7	
1900	240.0	1206.2	209.9	1054.8	236.0	1186.0	Governed
2000	180.0	859.4	145.4	694.2	175.8	839.5	
2200	0.0	0.0	-45.0	-195.3	-4.5	-19.4	No Load Governed

Transmission

Transmission Manufacturer	Allison Transmission
Transmission Family	4000 Series (1-L001323-TF, Rev T)
Transmission	4000 INTL Retarder (1-L007406-T, Rev E)
Transmission Rating	4000 INTL Retarder Refuse - Diesel Allison 6th Generation Controls without SEM/LRTP (1-L024333-R, Rev A)
Torque Converter	TC561 (1-L001260-TC, Rev B) - Acceptable
Transmission Retarder	4000 Series High Capacity (1-L004745-TR, Rev E)

Controls

Controls Release	Production Calibration (PC) for 4000 Series (1-L007292-CR, Rev E)
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Controls - Primary Gears (Shift Schedule)

DynActive	No
Speed Profile	Performance
Shift Speed & Strategy	1900 rpm S1 Performance
Equivalent DynActive Bias	1
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

		Section Score - OK	
C01		Transmission / Converter Compatibility	
Overall Status		OK: Acceptable	
C02		Engine / Converter Compatibility	
Overall Status		OK: Acceptable	
C04		Engine Speed at Converter Stall	
Overall Status		Reference	
Actual		1379 rpm	
C05		Minimum Engine Speed	
Overall Status		OK: Acceptable	
Rating/Recommendation		1100 rpm (Min)	
Actual		1379 rpm	
Notes		Net peak torque speed (1000 rpm) + allowable variation (100 rpm).	
C07		Turbine Torque at Converter Stall	
Overall Status		OK: Acceptable	
Rating/Recommendation		3322.0 N-m (Max)	
Actual		2387.5 N-m	
C08		Converter Speed Ratio at Engine Governed Speed	
Overall Status		OK: Acceptable	
Rating/Recommendation		0.800 (Min)	
Actual		0.910	
C03		Converter Stall Torque Ratio	
Overall Status		Reference	
Actual		1.578	

Transmission Rating And Guideline Checks

✔ Section Score - OK		
T01	✔	Transmission / Vocation Compatibility
Overall Status		OK: Acceptable
T02	✔	Transmission / Engine Compatibility
Overall Status		OK: Acceptable
T17	✔	Transmission Permitted in End User/Chassis Mfg Locations
Overall Status		OK: Acceptable
T15	✔	Transmission Input Power (Gross)
Overall Status		OK: Acceptable
Rating/Recommendation		373.0 kW (Max)
Actual		240.0 kW
T14	✔	Transmission Input Torque (Gross)
Overall Status		OK: Acceptable
Rating/Recommendation		2102.0 N-m (Max)
Actual		1700.0 N-m
T03	✔	Transmission Input Speed
Overall Status		OK: Acceptable
Rating/Recommendation		1700 rpm / 2300 rpm
Actual		1900 rpm
T04	📖	Transmission Output Speed
Overall Status		Reference
Actual		2973 rpm
Notes		Check made in Range 6L at 1900 rpm Engine Governed Speed.

Vehicle Rating And Guideline Checks - Standard

✓ Section Score - OK		
V21	🔖	1st Range Converter Stall Gradeability
Overall Status	Reference	
Actual	33.04 %	
V13	🔖	1st Range 70% Converter Efficiency Gradeability
Overall Status	Reference	
Actual	23.13 %	
V14	✓	1st Range 80% Converter Efficiency Gradeability
Overall Status	OK: Acceptable	
Rating/Recommendation	18.00 % (Min)	
Actual	20.18 %	
V17	🔖	Maximum Geared Vehicle Speed at Engine Governed Speed
Overall Status	Reference	
Actual	109.9 km/h	
Notes	Check is in 6L Lockup.	
V18	✓	Maximum Speed on 0.5% Grade
Overall Status	OK: Acceptable	
Rating/Recommendation	104.6 km/h (Min)	
Actual	108.0 km/h	
Notes	At 1866.8 rpm Engine Speed, Range 6L.	
V43	🔖	Heat Generated in 1st Range 70% Converter Efficiency
Overall Status	Reference	
Actual	73.07 kW	
Notes	At 1528.5 rpm Engine Speed.	
V44	🔖	Heat Generated in 1st Range 80% Converter Efficiency
Overall Status	Reference	
Actual	51.81 kW	
Notes	At 1596.2 rpm Engine Speed.	

Allison Transmission
Vehicle Performance Summary

Note

This SCAAN information is subject to the SCAAN Disclaimer set forth elsewhere.

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	33.0	0.0	1C	Stall
Launch Gradeability	31.0	0.0	1C	
Low Speed Gradeability	20.2	11.3	1C	80 Percent
Maximum Speed on Grade	0.0	110.3	6L	Road Load
	0.3	107.1	6L	
	0.5	103.3	6L	
	1.0	95.8	6L	
	2.0	80.6	5L	
	3.0	67.5	5L	
	4.0	57.2	4L	
	5.0	48.2	4L	
	6.0	42.5	3L	
	7.0	38.0	3L	
	8.0	32.8	2L	
	9.0	30.1	2L	
	10.0	27.5	2L	

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	6.3	32
0 - 40 km/h	10.3	71
0 - 60 km/h	22.5	244
0 - 80 km/h	43.6	659
0 - 100 km/h	89.6	1830

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	1379	0	80.89	80.00	0.0	33.04	222.87		
1C	3.2	1412	87	74.69	73.77	66.8	30.23	154.32		
1C	6.4	1474	174	65.58	64.62	117.3	26.20	100.55		
1C	8.8	1528	238	58.45	57.46	142.8	23.13	72.85	70 Percent	
1C	9.7	1552	261	56.00	55.00	150.2	22.09	64.72		
1C	11.3	1596	306	51.47	50.45	161.8	20.18	51.77	80 Percent	
1C	12.9	1644	348	47.17	46.13	168.7	18.40	42.92		
1C	13.4	1661	362	45.76	44.71	170.2	17.81	40.81	85 Percent	
1C	15.0	1711	406	41.46	40.38	172.8	16.04	36.36		
2C	15.0	1511	406	32.86	31.78	137.0	12.56	79.35		
2C	16.1	1527	436	31.91	30.82	142.7	12.18	73.07		
2C	19.3	1574	523	29.22	28.07	156.8	11.07	57.44		
2C	22.5	1624	610	26.63	25.41	166.7	10.02	45.73		
2C	24.7	1661	668	24.85	23.58	170.4	9.29	40.56		
2L	24.7	1273	668	28.82	27.55	197.7	10.87	7.79		
2L	25.7	1328	697	28.23	26.94	201.9	10.62	8.07		
2L	29.0	1494	784	25.38	24.01	204.2	9.46	9.26		
2L	32.2	1660	871	22.33	20.87	199.7	8.21	10.01		
2L	35.4	1824	957	19.53	17.98	191.8	7.07	12.39		
3L	35.4	1368	957	20.89	19.34	205.2	7.61	7.39		
3L	35.4	1369	958	20.88	19.33	205.3	7.60	7.40		
3L	38.6	1494	1045	19.12	17.47	205.1	6.87	8.39		
3L	41.8	1618	1132	17.36	15.61	201.8	6.13	9.20		
3L	45.1	1743	1219	15.74	13.88	197.0	5.45	9.89		
3L	47.2	1825	1277	14.70	12.77	192.8	5.01	11.39		
4L	47.2	1277	1277	14.85	12.91	194.6	5.07	11.33		
4L	48.3	1307	1307	14.69	12.71	197.1	4.99	11.65		
4L	51.5	1394	1394	14.14	12.04	202.3	4.73	12.33		
4L	54.7	1481	1481	13.20	10.97	200.6	4.30	13.32		
4L	57.9	1568	1568	12.32	9.96	198.3	3.91	14.11		
4L	61.2	1655	1655	11.53	9.02	195.8	3.54	14.21		
4L	64.4	1742	1742	10.76	8.11	192.5	3.18	14.71		
4L	67.4	1825	1825	10.07	7.26	188.6	2.85	15.76		
5L	67.4	1345	1825	10.45	7.65	195.8	3.00	15.68		
5L	67.6	1348	1829	10.44	7.63	196.0	2.99	15.72		
5L	70.8	1412	1916	10.09	7.12	198.4	2.79	16.63		
5L	74.0	1476	2003	9.57	6.44	196.9	2.53	17.26		
5L	77.2	1541	2090	9.08	5.77	194.8	2.26	18.24		
5L	80.5	1605	2178	8.61	5.12	192.4	2.01	19.47		
5L	83.7	1669	2265	8.17	4.50	190.0	1.77	19.78		
5L	86.9	1733	2352	7.74	3.87	186.8	1.52	20.91		
5L	90.1	1797	2439	7.30	3.24	182.8	1.27	22.86		
5L	91.5	1825	2476	7.14	2.99	181.4	1.17	23.29		
6L	91.5	1582	2476	7.44	3.29	189.0	1.29	23.54		
6L	93.3	1614	2526	7.24	2.97	187.7	1.16	24.14		
6L	96.6	1670	2613	6.91	2.43	185.2	0.95	24.76		
6L	99.8	1725	2700	6.57	1.88	182.2	0.74	26.03		
6L	103.0	1781	2787	6.24	1.32	178.5	0.52	27.93		
6L	106.2	1837	2874	5.93	0.78	175.0	0.31	29.49		
6L	109.4	1892	2961	5.63	0.25	171.3	0.10	31.14		
6L	109.9	1900	2973	5.59	0.17	170.7	0.07	31.41	Governed	
6L	112.7	1948	3049	4.50	-1.12	140.9	-0.44	31.60		
6L	115.9	2004	3136	3.22	-2.66	103.6	-1.04	33.55		
6L	119.1	2059	3223	1.67	-4.46	55.2	-1.75	31.18		
6L	122.3	2115	3310	0.12	-6.27	4.1	-2.46	31.71		
6L	122.6	2119	3317	0.00	-6.41	0.0	-2.52	31.87		

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	1379	0	80.89	80.00	0.0	33.04	222.87		
1C	3.2	1412	87	74.69	73.77	66.8	30.23	154.32		
1C	6.4	1474	174	65.58	64.62	117.3	26.20	100.55		
1C	8.8	1528	238	58.45	57.46	142.8	23.13	72.85	70 Percent	
1C	9.7	1552	261	56.00	55.00	150.2	22.09	64.72		
1C	11.3	1596	306	51.47	50.45	161.8	20.18	51.77	80 Percent	
1C	12.0	1617	325	49.61	48.58	165.5	19.41	47.22		
1L	12.0	1141	325	53.74	52.71	179.3	21.13	7.05		
1L	12.9	1223	348	53.49	52.45	191.3	21.02	7.70		
1L	16.1	1529	436	45.46	44.37	203.2	17.67	9.69		
1L	19.3	1834	523	35.68	34.52	191.4	13.66	12.43		
1L	20.0	1900	541	33.82	32.65	187.9	12.91	13.39	Governed	
1L	22.5	2140	610	0.25	-0.97	1.6	-0.38	10.44		
1L	22.5	2142	610	0.00	-1.22	0.0	-0.48	10.50		

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	1379	0	107.95	107.05	0.0	46.26	222.87		
R1C!	3.2	1433	87	95.58	94.66	85.5	39.98	134.46		
R1C	6.4	1528	174	78.47	77.51	140.2	31.91	75.61	70 Percent	
R1C	6.4	1529	174	78.44	77.49	140.3	31.90	75.55		
R1C	8.3	1596	224	69.11	68.13	158.8	27.73	54.86	80 Percent	
R1C	9.7	1655	261	62.12	61.13	166.6	24.69	44.73		
R1C	9.8	1661	265	61.48	60.48	167.2	24.42	43.99	85 Percent	
R1C	12.9	1854	348	47.44	46.39	169.6	18.50	34.39		
R1C	13.3	1900	360	45.73	44.68	169.1	17.80	33.12	Governed	
R1C	16.1	2129	436	2.88	1.79	12.9	0.70	8.71		
R1C	16.3	2144	440	0.00	-1.10	0.0	-0.43	8.75		

Allison Transmission
Vehicle Acceleration Performance

Note

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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, 6L)

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	0.3	0	2.603	1412	74.69	73.77	66.8	154.32
1C	6.4	0.7	1	2.268	1474	65.58	64.62	117.3	100.55
1C	9.7	1.1	2	1.913	1552	56.00	55.00	150.2	64.72
1C	12.9	1.6	3	1.596	1644	47.17	46.13	168.7	42.92
1C	15.0	2.0	5	1.393	1711	41.46	40.38	172.8	36.36
2C	16.1	2.3	6	1.147	1527	31.91	30.82	142.7	73.07
2C	19.3	3.1	10	1.045	1574	29.22	28.07	156.8	57.44
2C	22.5	4.0	15	0.945	1624	26.63	25.41	166.7	45.73
2C	24.7	4.7	20	0.876	1661	24.85	23.58	170.4	40.56
2L	25.7	5.0	22	0.973	1328	28.23	26.94	201.9	8.07
2L	29.0	5.9	29	0.869	1494	25.38	24.01	204.2	9.26
2L	32.2	7.1	38	0.756	1660	22.33	20.87	199.7	10.01
2L	35.4	8.3	50	0.650	1824	19.53	17.98	191.8	12.39
3L	35.4	8.3	50	0.714	1369	20.88	19.33	205.3	7.40
3L	38.6	9.7	64	0.647	1494	19.12	17.47	205.1	8.39
3L	41.8	11.1	80	0.578	1618	17.36	15.61	201.8	9.20
3L	45.1	12.8	100	0.514	1743	15.74	13.88	197.0	9.89
3L	47.2	14.0	116	0.472	1825	14.70	12.77	192.8	11.39
4L	48.3	14.6	124	0.477	1307	14.69	12.71	197.1	11.65
4L	51.5	16.5	151	0.451	1394	14.14	12.04	202.3	12.33
4L	54.7	18.6	181	0.412	1481	13.20	10.97	200.6	13.32
4L	57.9	20.9	217	0.374	1568	12.32	9.96	198.3	14.11
4L	61.2	23.4	259	0.339	1655	11.53	9.02	195.8	14.21
4L	64.4	26.2	308	0.305	1742	10.76	8.11	192.5	14.71
4L	67.4	29.2	362	0.272	1825	10.07	7.26	188.6	15.76
5L	67.6	29.3	365	0.288	1348	10.44	7.63	196.0	15.72
5L	70.8	32.5	426	0.270	1412	10.09	7.12	198.4	16.63
5L	74.0	36.0	497	0.244	1476	9.57	6.44	196.9	17.26
5L	77.2	39.9	579	0.219	1541	9.08	5.77	194.8	18.24
5L	80.5	44.3	674	0.194	1605	8.61	5.12	192.4	19.47
5L	83.7	49.2	786	0.171	1669	8.17	4.50	190.0	19.78
5L	86.9	54.9	921	0.147	1733	7.74	3.87	186.8	20.91
5L	90.1	61.5	1085	0.123	1797	7.30	3.24	182.8	22.86
5L	91.5	64.8	1167	0.113	1825	7.14	2.99	181.4	23.29
6L	93.3	69.1	1278	0.113	1614	7.24	2.97	187.7	24.14
6L	96.6	77.9	1510	0.092	1670	6.91	2.43	185.2	24.76
6L	99.8	89.0	1812	0.072	1725	6.57	1.88	182.2	26.03
6L	103.0	103.9	2233	0.051	1781	6.24	1.32	178.5	27.93
6L	106.2	127.0	2904	0.030	1837	5.93	0.78	175.0	29.49
6L	109.4	177.7	4427	0.010	1892	5.63	0.25	171.3	31.14

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	0.3	0	2.603	1412	74.69	73.77	66.8	154.32
1C	6.4	0.7	1	2.268	1474	65.58	64.62	117.3	100.55
1C	9.7	1.1	2	1.913	1552	56.00	55.00	150.2	64.72
1C	12.0	1.5	3	1.680	1617	49.61	48.58	165.5	47.22
1L	12.9	1.6	3	1.661	1223	53.49	52.45	191.3	7.70
1L	16.1	2.2	6	1.414	1529	45.46	44.37	203.2	9.69
1L	19.3	2.9	9	1.101	1834	35.68	34.52	191.4	12.43

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	3.177	1433	95.58	94.66	85.5	134.46
R1C	6.4	0.6	1	2.556	1529	78.44	77.49	140.3	75.55
R1C	9.7	1.0	1	2.001	1655	62.12	61.13	166.6	44.73
R1C	12.9	1.5	3	1.371	1854	47.44	46.39	169.6	34.39
R1C	16.1	3.3	11	0.106	2129	2.88	1.79	12.9	8.71

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/sec²)	Wheel Power (kW)
6L	127.2	2200	3443	-4.19	39.50	-0.404	137.0
6L	125.5	2171	3397	-4.11	38.57	-0.396	133.1
6L	122.3	2115	3310	-3.96	36.82	-0.382	126.0
6L	119.1	2059	3223	-3.82	35.11	-0.368	119.1
6L	115.9	2004	3136	-3.68	33.43	-0.354	112.4
6L	112.7	1948	3049	-3.53	31.69	-0.341	105.8
6L	109.4	1892	2961	-3.40	30.04	-0.327	99.4
6L	106.2	1837	2874	-3.26	28.46	-0.314	93.3
6L	103.0	1781	2787	-3.13	26.97	-0.302	87.5
6L	99.8	1725	2700	-3.00	25.56	-0.290	82.0
6L	96.6	1670	2613	-2.88	24.23	-0.278	76.7
6L	93.3	1614	2526	-2.76	22.95	-0.266	71.8
6L	90.1	1558	2439	-2.65	21.69	-0.255	67.2
6L	88.0	1521	2381	-2.57	20.87	-0.248	64.2
5L	88.0	1755	2381	-2.82	20.99	-0.271	79.3
5L	86.9	1733	2352	-2.77	20.58	-0.267	77.3
5L	83.7	1669	2265	-2.65	19.42	-0.255	71.7
5L	80.5	1605	2178	-2.53	18.31	-0.244	66.4
5L	77.2	1541	2090	-2.42	17.19	-0.233	61.5
5L	74.0	1476	2003	-2.31	16.13	-0.223	56.8
5L	70.8	1412	1916	-2.22	15.39	-0.214	52.9
5L	67.6	1348	1829	-2.12	14.53	-0.204	48.9
5L	64.4	1284	1742	-2.03	13.66	-0.196	45.1
5L	62.8	1253	1700	-1.99	13.23	-0.191	43.3
4L	62.8	1700	1700	-2.57	15.24	-0.246	69.4
4L	61.2	1655	1655	-2.51	14.96	-0.239	66.1
4L	57.9	1568	1568	-2.39	14.33	-0.228	60.0
4L	54.7	1481	1481	-2.28	13.49	-0.217	54.3
4L	51.5	1394	1394	-2.16	12.37	-0.206	48.8
4L	48.3	1307	1307	-2.07	11.69	-0.197	44.1
4L	45.1	1219	1219	-1.96	10.71	-0.187	39.3
4L	42.5	1150	1150	-1.87	9.89	-0.179	35.4
3L	42.5	1643	1150	-2.65	8.77	-0.249	58.8
3L	41.8	1618	1132	-2.61	8.53	-0.246	57.0
3L	38.6	1494	1045	-2.42	7.40	-0.228	48.6
3L	35.4	1369	958	-2.26	6.47	-0.213	41.5
3L	32.2	1245	871	-2.11	5.59	-0.198	35.0
3L	30.8	1192	834	-2.04	5.22	-0.192	32.4
2L	30.8	1590	834	-3.10	8.82	-0.285	55.5
2L	29.0	1494	784	-2.94	7.91	-0.270	49.2
2L	25.7	1328	697	-2.70	6.76	-0.248	39.9
2L	22.5	1162	610	-2.45	5.61	-0.225	31.5
2L	19.4	1001	525	-2.22	4.58	-0.204	24.2
2C	19.4	650	525	-1.86	8.40	-0.169	19.3

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/sec²)	Wheel Power (kW)
6L	127.2	2200	3443	-9.42	487.05	-0.905	604.8
6L	125.5	2171	3397	-9.41	486.12	-0.904	600.9
6L	122.3	2115	3310	-9.40	484.37	-0.903	593.8
6L	119.1	2059	3223	-9.40	482.67	-0.903	586.9
6L	115.9	2004	3136	-9.42	480.98	-0.904	580.2
6L	112.7	1948	3049	-9.44	479.25	-0.906	573.6
6L	109.4	1892	2961	-9.47	477.60	-0.910	567.2
6L	106.2	1837	2874	-9.52	476.03	-0.914	561.1
6L	103.0	1781	2787	-9.59	474.55	-0.920	555.3
6L	99.8	1725	2700	-9.67	473.14	-0.928	549.8
6L	96.6	1670	2613	-9.77	471.82	-0.937	544.6
6L	93.3	1614	2526	-9.88	470.54	-0.949	539.6
6L	90.1	1558	2439	-10.03	469.29	-0.962	535.0
6L	88.0	1521	2381	-10.13	468.48	-0.972	532.1

5L	88.0	1755	2381	-10.38	468.61	-0.994	547.2
5L	86.9	1733	2352	-10.43	468.20	-0.998	545.2
5L	83.7	1669	2265	-10.60	467.05	-1.015	539.5
5L	80.5	1605	2178	-10.81	465.95	-1.034	534.3
5L	77.2	1541	2090	-11.04	464.84	-1.056	529.4
5L	74.0	1476	2003	-11.31	463.80	-1.082	524.8
5L	70.8	1412	1916	-11.63	463.07	-1.112	520.8
5L	67.6	1348	1829	-11.98	462.22	-1.145	516.9
5L	64.4	1284	1742	-12.39	461.36	-1.183	513.1
5L	62.8	1253	1700	-12.60	460.94	-1.204	511.3
4L	62.8	1700	1700	-13.20	462.95	-1.249	537.4
4L	61.2	1655	1655	-13.43	462.68	-1.271	534.0
4L	57.9	1568	1568	-13.87	459.74	-1.311	525.6
4L	54.7	1481	1481	-13.75	434.16	-1.300	494.0
4L	51.5	1394	1394	-13.63	408.29	-1.289	462.6
4L	48.3	1307	1307	-13.53	382.87	-1.280	432.0
4L	45.1	1219	1219	-13.43	357.14	-1.270	401.4
4L	42.5	1150	1150	-13.34	336.60	-1.261	376.9
3L	42.5	1643	1150	-14.14	335.48	-1.317	400.3
3L	41.8	1618	1132	-14.09	330.21	-1.313	393.2
3L	38.6	1494	1045	-13.90	304.34	-1.296	359.0
3L	35.4	1369	958	-13.74	278.66	-1.280	326.0
3L	32.2	1245	871	-13.58	253.03	-1.266	293.6
3L	30.8	1192	834	-13.51	242.16	-1.259	280.0
2L	30.8	1590	834	-14.60	245.75	-1.328	303.2
2L	29.0	1494	784	-13.56	214.00	-1.235	264.6
2L	25.7	1328	697	-11.46	158.39	-1.046	198.4
2L	22.5	1162	610	-9.43	111.51	-0.863	142.2
2L	19.4	1001	525	-7.55	74.37	-0.692	97.2
2C	19.4	650	525	-7.19	78.19	-0.651	92.3

Closed Throttle Manual 1st Hold, 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/sec²)	Wheel Power (kW)
1L	23.2	2200	627	-7.36	16.09	-0.592	112.5
1L	22.5	2140	610	-7.14	15.31	-0.574	105.9
1L	19.3	1834	523	-5.95	11.13	-0.479	75.0
1L	16.1	1529	436	-4.93	8.06	-0.397	51.2
1L	12.9	1223	348	-4.18	5.86	-0.337	34.4
1L	9.7	917	261	-3.50	4.13	-0.282	21.2
1L	8.5	811	231	-3.36	3.51	-0.271	18.0
1C	8.5	650	231	-2.58	2.62	-0.201	13.3

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/sec²)	Wheel Power (kW)
1L	23.2	2200	627	-14.78	130.26	-1.136	231.8
1L	22.5	2140	610	-14.19	121.20	-1.093	216.6
1L	19.3	1834	523	-11.27	80.02	-0.871	147.0
1L	16.1	1529	436	-8.68	48.65	-0.672	93.7
1L	12.9	1223	348	-6.48	25.82	-0.503	55.2
1L	9.7	917	261	-4.46	10.41	-0.346	27.8
1L	8.5	811	231	-3.93	6.77	-0.305	21.4
1C	8.5	650	231	-3.14	5.88	-0.244	16.7