

Allison Transmission
Bundled Report

Application	116-A347268-1
Iteration	1
Date	February 6, 2025 15:16:31
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=4,300
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	4440 INTL Retarder (1-L007499-T, Rev E)
Transmission Rating	4440 INTL Retarder Refuse - Diesel Allison 6th Generation Controls without SEM/LRTP (1-L024258-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	4440 INTL Retarder (1-L007499-T, Rev E)
Transmission Rating	4440 INTL Retarder Refuse - Diesel Allison 6th Generation Controls without SEM/LRTP (1-L024258-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	4.300	97.00	97.00

Driveline - Overall Driveline Ratio

Description	Ratio	Standard Efficiency (%)	User Defined Efficiency (%)	N over V Ratio (rpm/kph)
Single	4.300	95.64	95.64	24.354

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		317.0 kW (Max)
Actual		240.0 kW
T14	✓	Transmission Input Torque (Gross)
Overall Status		OK: Acceptable
Rating/Recommendation		1776.0 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		2827 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	40.83 %	
V13		1st Range 70% Converter Efficiency Gradeability
Overall Status	Reference	
Actual	28.29 %	
V14	✓	1st Range 80% Converter Efficiency Gradeability
Overall Status	OK: Acceptable	
Rating/Recommendation	18.00 % (Min)	
Actual	24.59 %	
V17		Maximum Geared Vehicle Speed at Engine Governed Speed
Overall Status	Reference	
Actual	116.1 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	108.3 km/h	
Notes	At 1773 rpm Engine Speed, Range 6L.	
V20	✓	Acceleration Rate Check
Overall Status	OK: Acceptable	
Rating/Recommendation	2.01 kg/N-m (Min)	
Actual	3.69 kg/N-m	
Notes	(Vehicle Weight / Driveline Reduction Ratio / Max Net Input Torque). If < Recomm/Rating indicates Vehicle Susceptible to Shift Stacking.	
V43		Heat Generated in 1st Range 70% Converter Efficiency
Overall Status	Reference	
Actual	73.05 kW	
Notes	At 1528.5 rpm Engine Speed.	
V44		Heat Generated in 1st Range 80% Converter Efficiency
Overall Status	Reference	
Actual	52.00 kW	
Notes	At 1596.2 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	4.300	1.000

Gradeability	Percent Grade	Vehicle Speed (km/h)	Gear Range	Match Point
Stall Gradeability	40.8	0.0	1C	Stall
Launch Gradeability	38.8	0.0	1C	
Low Speed Gradeability	24.6	9.4	1C	80 Percent
Maximum Speed on Grade	0.0	112.1	6L	Road Load
	0.3	108.2	6L	
	0.5	104.3	6L	
	1.0	95.3	5L	
	2.0	81.5	5L	
	3.0	67.5	4L	
	4.0	58.0	4L	
	5.0	47.9	3L	
	6.0	42.9	3L	
	7.0	38.3	3L	
	8.0	32.4	2L	
	9.0	29.9	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	4.300	1.000

Speed (km/h)	Time (sec)	Distance (m)
0 - 20 km/h	3.2	11
0 - 30 km/h	6.2	31
0 - 40 km/h	10.2	71
0 - 60 km/h	22.4	244
0 - 80 km/h	43.4	656
0 - 100 km/h	88.3	1802

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		4.300	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	97.28	96.38	0.0	40.83	222.87	
1C	3.2	1423	78	87.78	86.86	78.5	36.23	141.91	
1C	6.4	1502	157	74.13	73.17	132.6	29.96	84.12	
1C	7.3	1528	178	70.37	69.40	142.9	28.29	72.84	70 Percent
1C	9.4	1596	229	61.89	60.89	161.6	24.59	51.96	80 Percent
1C	9.7	1605	235	60.89	59.89	163.3	24.17	49.91	
1C	11.1	1661	271	54.99	53.97	169.9	21.66	41.14	85 Percent
1C	12.4	1710	303	49.88	48.84	172.4	19.52	36.81	
2C	12.4	1487	303	36.29	35.25	125.4	13.96	91.83	
2C	12.9	1492	314	35.86	34.82	128.3	13.78	88.78	
2C	16.1	1537	392	32.76	31.66	146.4	12.51	68.94	
2C	19.3	1587	470	29.85	28.69	160.1	11.32	53.69	
2C	22.5	1642	549	26.98	25.76	168.9	10.16	42.84	
2C	23.6	1661	575	26.01	24.77	170.6	9.76	40.37	
2L	23.6	1272	575	30.15	28.91	197.8	11.41	7.60	
2L	25.7	1388	627	28.74	27.44	205.6	10.83	8.48	
2L	29.0	1561	705	25.18	23.81	202.6	9.38	9.72	
2L	32.2	1735	784	21.97	20.51	196.4	8.07	10.86	
2L	33.9	1826	825	20.36	18.85	191.6	7.41	12.59	
3L	33.9	1261	825	21.02	19.51	197.8	7.68	6.42	
3L	35.4	1318	862	20.60	19.05	202.6	7.49	6.71	
3L	38.6	1438	941	19.29	17.64	207.0	6.94	7.30	
3L	41.8	1558	1019	17.57	15.82	204.2	6.21	8.14	
3L	45.1	1678	1097	16.02	14.16	200.5	5.56	8.46	
3L	48.3	1798	1176	14.52	12.54	194.7	4.92	10.42	
3L	49.0	1826	1194	14.21	12.20	193.5	4.79	10.61	
4L	49.0	1194	1194	13.59	11.58	185.0	4.55	9.63	
4L	51.5	1254	1254	13.51	11.41	193.3	4.48	10.38	
4L	54.7	1333	1333	13.11	10.88	199.2	4.27	11.25	
4L	57.9	1411	1411	12.59	10.22	202.6	4.01	12.32	
4L	61.2	1489	1489	11.80	9.29	200.4	3.65	13.37	
4L	64.4	1568	1568	11.09	8.44	198.4	3.31	14.05	
4L	67.6	1646	1646	10.44	7.63	196.0	2.99	14.27	
4L	70.8	1725	1725	9.82	6.85	193.1	2.69	14.62	
4L	74.0	1803	1803	9.20	6.07	189.2	2.38	15.98	
4L	74.9	1825	1825	9.05	5.86	188.4	2.30	15.99	
5L	74.9	1396	1825	9.56	6.37	198.9	2.50	16.01	
5L	77.2	1439	1881	9.24	5.93	198.2	2.33	16.40	
5L	80.5	1499	1960	8.78	5.29	196.2	2.08	17.58	
5L	83.7	1559	2038	8.36	4.69	194.4	1.84	18.36	
5L	86.9	1619	2116	7.96	4.09	192.1	1.60	19.36	
5L	90.1	1679	2195	7.57	3.51	189.6	1.38	19.89	
5L	93.3	1739	2273	7.19	2.92	186.4	1.15	21.17	
5L	96.6	1799	2352	6.80	2.32	182.5	0.91	23.19	
5L	98.1	1827	2388	6.64	2.06	180.9	0.81	23.67	
6L	98.1	1605	2388	6.87	2.29	187.2	0.90	24.91	
6L	99.8	1633	2430	6.71	2.02	186.1	0.79	25.15	
6L	103.0	1686	2508	6.41	1.49	183.5	0.59	26.02	
6L	106.2	1738	2587	6.11	0.96	180.4	0.38	27.47	
6L	109.4	1791	2665	5.81	0.43	176.7	0.17	29.49	
6L	112.7	1844	2744	5.54	-0.09	173.3	-0.03	30.93	
6L	115.9	1896	2822	5.27	-0.61	169.7	-0.24	32.65	
6L	116.1	1900	2827	5.25	-0.64	169.4	-0.25	32.79	Governed
6L	119.1	1949	2900	4.20	-1.93	138.9	-0.76	33.10	
6L	122.3	2002	2979	3.06	-3.34	103.8	-1.31	35.27	
6L	125.5	2054	3057	1.67	-4.99	58.1	-1.96	32.94	
6L	128.7	2107	3135	0.28	-6.66	9.9	-2.61	33.22	
6L	129.4	2117	3151	0.00	-6.99	0.0	-2.74	33.58	

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		4.300	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	97.28	96.38	0.0	40.83	222.87		
1C!	3.2	1423	78	87.78	86.86	78.5	36.23	141.91		
1C	6.4	1502	157	74.13	73.17	132.6	29.96	84.12		
1C	7.3	1528	178	70.37	69.40	142.9	28.29	72.84	70 Percent	
1C	9.4	1596	229	61.89	60.89	161.6	24.59	51.96	80 Percent	
1C	9.7	1605	235	60.89	59.89	163.3	24.17	49.91		
1C	10.0	1617	243	59.63	58.63	165.3	23.63	47.45		
1L	10.0	1141	243	64.61	63.60	179.1	25.76	7.31		
1L	12.9	1472	314	57.08	56.03	204.1	22.53	9.74		
1L	16.1	1840	392	42.61	41.51	190.5	16.50	13.14		
1L	16.6	1900	405	40.58	39.47	187.3	15.67	14.05	Governed	
1L	18.7	2141	456	0.00	-1.15	0.0	-0.45	11.17		

Full Throttle Reverse Performance (1C-1C)

Engine Fan		Air Conditioning		Engine Power		Vehicle Parameters		Axle Ratio	Auxiliary Gearing Ratio	
On		Off		Standard Power Curve		Standard		4.300	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	112.23	111.34	0.0	48.54	222.87		
R1C!	3.2	1436	78	98.65	97.73	88.2	41.50	131.54		
R1C!	6.2	1528	151	81.59	80.64	140.1	33.34	75.75	70 Percent	
R1C!	6.4	1538	157	80.14	79.18	143.3	32.67	72.20		
R1C	7.9	1596	194	71.85	70.88	158.7	28.94	55.03	80 Percent	
R1C	9.4	1661	229	63.91	62.92	167.0	25.46	44.17	85 Percent	
R1C	9.7	1671	235	62.61	61.61	167.9	24.90	42.80		
R1C	12.8	1900	311	47.53	46.49	168.8	18.54	33.36	Governed	
R1C	12.9	1907	314	46.60	45.55	166.6	18.16	30.86		
R1C	15.6	2143	380	0.00	-1.09	0.0	-0.43	8.94		

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	4.300	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	2.965	1423	87.78	86.86	78.5	141.91
1C	6.4	0.6	1	2.484	1502	74.13	73.17	132.6	84.12
1C	9.7	1.0	1	2.000	1605	60.89	59.89	163.3	49.91
1C	12.4	1.4	3	1.624	1710	49.88	48.84	172.4	36.81
2C	12.9	1.5	3	1.297	1492	35.86	34.82	128.3	88.78
2C	16.1	2.3	6	1.176	1537	32.76	31.66	146.4	68.94
2C	19.3	3.1	10	1.067	1587	29.85	28.69	160.1	53.69
2C	22.5	4.0	15	0.956	1642	26.98	25.76	168.9	42.84
2C	23.6	4.3	17	0.917	1661	26.01	24.77	170.6	40.37
2L	25.7	4.9	21	0.987	1388	28.74	27.44	205.6	8.48
2L	29.0	5.8	29	0.858	1561	25.18	23.81	202.6	9.72
2L	32.2	7.0	38	0.739	1735	21.97	20.51	196.4	10.86
2L	33.9	7.6	44	0.678	1826	20.36	18.85	191.6	12.59
3L	35.4	8.2	50	0.706	1318	20.60	19.05	202.6	6.71
3L	38.6	9.5	64	0.655	1438	19.29	17.64	207.0	7.30
3L	41.8	11.0	80	0.587	1558	17.57	15.82	204.2	8.14
3L	45.1	12.6	99	0.526	1678	16.02	14.16	200.5	8.46
3L	48.3	14.4	123	0.466	1798	14.52	12.54	194.7	10.42
3L	49.0	14.9	129	0.453	1826	14.21	12.20	193.5	10.61
4L	51.5	16.5	151	0.429	1254	13.51	11.41	193.3	10.38
4L	54.7	18.6	183	0.409	1333	13.11	10.88	199.2	11.25
4L	57.9	20.8	218	0.385	1411	12.59	10.22	202.6	12.32
4L	61.2	23.3	258	0.350	1489	11.80	9.29	200.4	13.37
4L	64.4	26.0	305	0.318	1568	11.09	8.44	198.4	14.05
4L	67.6	28.9	360	0.288	1646	10.44	7.63	196.0	14.27
4L	70.8	32.2	423	0.258	1725	9.82	6.85	193.1	14.62
4L	74.0	35.9	497	0.229	1803	9.20	6.07	189.2	15.98
4L	74.9	37.0	520	0.221	1825	9.05	5.86	188.4	15.99
5L	77.2	39.8	579	0.225	1439	9.24	5.93	198.2	16.40
5L	80.5	44.0	671	0.201	1499	8.78	5.29	196.2	17.58
5L	83.7	48.8	779	0.178	1559	8.36	4.69	194.4	18.36
5L	86.9	54.2	907	0.155	1619	7.96	4.09	192.1	19.36
5L	90.1	60.4	1061	0.133	1679	7.57	3.51	189.6	19.89
5L	93.3	67.8	1249	0.111	1739	7.19	2.92	186.4	21.17
5L	96.6	76.8	1488	0.089	1799	6.80	2.32	182.5	23.19
5L	98.1	81.9	1623	0.078	1827	6.64	2.06	180.9	23.67
6L	99.8	87.7	1785	0.077	1633	6.71	2.02	186.1	25.15
6L	103.0	101.3	2167	0.057	1686	6.41	1.49	183.5	26.02
6L	106.2	120.8	2734	0.037	1738	6.11	0.96	180.4	27.47
6L	109.4	156.5	3806	0.017	1791	5.81	0.43	176.7	29.49

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	4.300	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	2.965	1423	87.78	86.86	78.5	141.91
1C	6.4	0.6	1	2.484	1502	74.13	73.17	132.6	84.12
1C	9.7	1.0	1	2.000	1605	60.89	59.89	163.3	49.91
1C	10.0	1.1	2	1.951	1617	59.63	58.63	165.3	47.45
1L	12.9	1.5	3	1.668	1472	57.08	56.03	204.1	9.74
1L	16.1	2.1	6	1.236	1840	42.61	41.51	190.5	13.14

Full Throttle Reverse Performance (1C-1C)

Engine Fan		Air Conditioning		Engine Power		Vehicle Parameters		Axle Ratio	Auxiliary Gearing Ratio		Grade
On		Off		Standard Power Curve		Standard		4.300	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	3.250	1436	98.65	97.73	88.2	131.54
R1C!	6.4	0.6	1	2.582	1538	80.14	79.18	143.3	72.20
R1C	9.7	1.0	1	1.996	1671	62.61	61.61	167.9	42.80
R1C	12.9	1.5	3	1.394	1907	46.60	45.55	166.6	30.86

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-1C)

Engine Fan	Air Conditioning	Engine Power	Vehicle Parameters	Axle Ratio	Auxiliary Gearing Ratio
On	Off	Standard Power Curve	Standard	4.300	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 ²)	Wheel Power (kW)
6L	134.4	2200	3274	-4.38	41.54	-0.422	139.1
6L	132.0	2160	3214	-4.26	40.15	-0.411	133.8
6L	128.7	2107	3135	-4.11	38.37	-0.397	126.9
6L	125.5	2054	3057	-3.97	36.63	-0.383	120.2
6L	122.3	2002	2979	-3.82	34.91	-0.369	113.8
6L	119.1	1949	2900	-3.68	33.13	-0.355	107.4
6L	115.9	1896	2822	-3.54	31.44	-0.342	101.2
6L	112.7	1844	2744	-3.40	29.82	-0.328	95.3
6L	109.4	1791	2665	-3.27	28.28	-0.316	89.6
6L	106.2	1738	2587	-3.14	26.83	-0.303	84.2
6L	103.0	1686	2508	-3.02	25.45	-0.291	79.1
6L	99.8	1633	2430	-2.89	24.13	-0.279	74.2
6L	96.6	1580	2352	-2.78	22.84	-0.268	69.6
6L	94.4	1545	2299	-2.70	21.99	-0.261	66.7
5L	94.4	1759	2299	-2.90	21.14	-0.279	79.8
5L	93.3	1739	2273	-2.85	20.72	-0.275	77.9
5L	90.1	1679	2195	-2.73	19.50	-0.263	72.4
5L	86.9	1619	2116	-2.61	18.35	-0.252	67.3
5L	83.7	1559	2038	-2.50	17.23	-0.241	62.5
5L	80.5	1499	1960	-2.39	16.15	-0.230	58.1
5L	77.2	1439	1881	-2.29	15.22	-0.220	54.0
5L	74.0	1379	1803	-2.19	14.67	-0.211	50.5
5L	70.8	1319	1725	-2.10	13.88	-0.202	46.9
5L	69.8	1300	1700	-2.07	13.64	-0.200	45.9
4L	69.8	1700	1700	-2.55	15.33	-0.244	69.5
4L	67.6	1646	1646	-2.47	14.94	-0.237	65.5
4L	64.4	1568	1568	-2.36	14.27	-0.226	60.0
4L	61.2	1489	1489	-2.25	13.47	-0.215	54.7
4L	57.9	1411	1411	-2.14	12.43	-0.205	49.7
4L	54.7	1333	1333	-2.03	11.40	-0.195	44.9
4L	51.5	1254	1254	-1.93	10.39	-0.185	40.4
4L	48.3	1176	1176	-1.83	9.40	-0.175	36.0
4L	45.1	1097	1097	-1.73	8.44	-0.165	31.7
4L	44.4	1081	1081	-1.70	8.25	-0.163	30.9
3L	44.4	1653	1081	-2.59	8.04	-0.244	58.7
3L	41.8	1558	1019	-2.44	7.22	-0.230	52.0
3L	38.6	1438	941	-2.28	6.35	-0.215	44.7
3L	35.4	1318	862	-2.13	5.58	-0.201	38.2
3L	32.2	1199	784	-1.99	4.85	-0.188	32.3
3L	30.1	1121	733	-1.88	4.38	-0.178	28.4
2L	30.1	1622	733	-3.26	9.00	-0.298	57.7
2L	29.0	1561	705	-3.14	8.37	-0.287	53.4
2L	25.7	1388	627	-2.85	6.84	-0.261	42.8
2L	22.5	1214	549	-2.59	5.52	-0.237	33.6
2L	19.3	1041	470	-2.31	4.35	-0.211	25.4
2L	18.6	1000	452	-2.25	4.10	-0.206	23.7
2C	18.6	650	452	-1.88	7.91	-0.169	18.8

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 ²)	Wheel Power (kW)
6L	134.4	2200	3274	-9.33	489.09	-0.897	606.9
6L	132.0	2160	3214	-9.30	487.71	-0.894	601.6
6L	128.7	2107	3135	-9.28	485.93	-0.892	594.7
6L	125.5	2054	3057	-9.27	484.19	-0.891	588.0
6L	122.3	2002	2979	-9.26	482.47	-0.890	581.6
6L	119.1	1949	2900	-9.26	480.70	-0.890	575.2
6L	115.9	1896	2822	-9.28	479.01	-0.892	569.0
6L	112.7	1844	2744	-9.30	477.40	-0.894	563.1
6L	109.4	1791	2665	-9.34	475.87	-0.898	557.4
6L	106.2	1738	2587	-9.40	474.42	-0.903	552.1
6L	103.0	1686	2508	-9.47	473.05	-0.910	546.9

6L	99.8	1633	2430	-9.56	471.74	-0.918	542.1
6L	96.6	1580	2352	-9.66	470.46	-0.928	537.5
6L	94.4	1545	2299	-9.74	469.62	-0.936	534.6
5L	94.4	1759	2299	-9.94	468.77	-0.953	547.6
5L	93.3	1739	2273	-9.98	468.35	-0.957	545.8
5L	90.1	1679	2195	-10.11	467.14	-0.970	540.3
5L	86.9	1619	2116	-10.27	466.00	-0.984	535.2
5L	83.7	1559	2038	-10.45	464.88	-1.002	530.4
5L	80.5	1499	1960	-10.66	463.82	-1.022	526.0
5L	77.2	1439	1881	-10.90	462.90	-1.045	521.9
5L	74.0	1379	1803	-11.19	462.36	-1.072	518.5
5L	70.8	1319	1725	-11.51	461.59	-1.102	514.9
5L	69.8	1300	1700	-11.61	461.35	-1.112	513.8
4L	69.8	1700	1700	-12.10	463.04	-1.151	537.5
4L	67.6	1646	1646	-12.34	462.66	-1.173	533.4
4L	64.4	1568	1568	-12.67	459.66	-1.204	525.5
4L	61.2	1489	1489	-12.56	436.59	-1.193	497.0
4L	57.9	1411	1411	-12.44	413.28	-1.183	468.7
4L	54.7	1333	1333	-12.34	389.98	-1.173	440.6
4L	51.5	1254	1254	-12.23	366.70	-1.163	412.9
4L	48.3	1176	1176	-12.13	343.44	-1.153	385.2
4L	45.1	1097	1097	-12.02	320.21	-1.143	357.6
4L	44.4	1081	1081	-12.00	315.35	-1.141	351.9
3L	44.4	1653	1081	-12.91	315.15	-1.207	379.7
3L	41.8	1558	1019	-12.76	296.73	-1.194	354.6
3L	38.6	1438	941	-12.59	273.58	-1.178	324.0
3L	35.4	1318	862	-12.44	250.54	-1.164	294.3
3L	32.2	1199	784	-11.51	210.92	-1.079	247.7
3L	30.1	1121	733	-10.43	177.58	-0.979	209.5
2L	30.1	1622	733	-11.83	182.21	-1.075	238.8
2L	29.0	1561	705	-11.19	165.03	-1.018	217.2
2L	25.7	1388	627	-9.45	121.17	-0.860	162.3
2L	22.5	1214	549	-7.79	84.58	-0.710	116.3
2L	19.3	1041	470	-6.21	55.20	-0.567	78.5
2L	18.6	1000	452	-5.86	49.38	-0.535	71.1
2C	18.6	650	452	-5.49	53.19	-0.494	66.1

Closed Throttle Downshifts, Preselect Retarder (6L-5L-4L-3L-2L-2C-1C)

Engine Fan	Air Conditioning	Engine Power	Vehicle Parameters	Axle Ratio	Auxiliary Gearing Ratio
On	Off	Standard Power Curve	Standard	4.300	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 ²)	Wheel Power (kW)
6L	134.4	2200	3274	-4.38	41.54	-0.422	139.1
6L	132.0	2160	3214	-4.26	40.15	-0.411	133.8
6L	128.7	2107	3135	-4.11	38.37	-0.397	126.9
6L	125.5	2054	3057	-3.97	36.63	-0.383	120.2
6L	122.3	2002	2979	-3.82	34.91	-0.369	113.8
6L	119.1	1949	2900	-3.68	33.13	-0.355	107.4
6L	118.2	1934	2878	-3.64	32.64	-0.351	105.6
5L	118.2	2202	2878	-3.94	33.19	-0.379	130.5
5L	115.9	2159	2822	-3.83	31.84	-0.369	125.0
5L	112.7	2099	2744	-3.68	30.02	-0.355	117.4
5L	109.4	2039	2665	-3.54	28.28	-0.341	110.1
5L	106.2	1979	2587	-3.39	26.59	-0.327	103.1
5L	103.0	1919	2508	-3.25	24.97	-0.313	96.3
5L	99.8	1859	2430	-3.11	23.46	-0.300	89.8
5L	96.6	1799	2352	-2.98	22.04	-0.287	83.7
5L	93.3	1739	2273	-2.85	20.72	-0.275	77.9
5L	90.3	1683	2200	-2.74	19.58	-0.264	72.8
4L	90.3	2200	2200	-3.41	19.07	-0.326	115.6
4L	90.1	2195	2195	-3.40	19.01	-0.325	115.0
4L	86.9	2116	2116	-3.25	18.23	-0.311	106.8
4L	83.7	2038	2038	-3.11	17.39	-0.297	98.7
4L	80.5	1960	1960	-2.97	16.86	-0.284	91.3
4L	77.2	1881	1881	-2.84	16.47	-0.272	84.3
4L	74.0	1803	1803	-2.71	16.00	-0.260	77.7
4L	70.8	1725	1725	-2.59	15.49	-0.248	71.4
4L	67.6	1646	1646	-2.47	14.94	-0.237	65.5
4L	64.4	1568	1568	-2.36	14.27	-0.226	60.0
4L	61.2	1489	1489	-2.25	13.47	-0.215	54.7
4L	59.1	1439	1439	-2.18	12.81	-0.209	51.5
3L	59.1	2200	1439	-3.61	14.95	-0.340	111.3
3L	57.9	2157	1411	-3.53	14.34	-0.333	106.6
3L	54.7	2038	1333	-3.29	12.69	-0.311	93.7
3L	51.5	1918	1254	-3.06	10.98	-0.289	81.6
3L	48.3	1798	1176	-2.84	9.48	-0.268	70.5
3L	45.1	1678	1097	-2.63	8.27	-0.248	60.6
3L	41.8	1558	1019	-2.44	7.22	-0.230	52.0
3L	40.8	1520	994	-2.39	6.90	-0.225	49.5
2L	40.8	2200	994	-4.61	17.35	-0.422	113.8
2L	38.6	2082	941	-4.33	15.47	-0.396	100.6
2L	35.4	1908	862	-3.90	12.65	-0.357	82.5
2L	32.2	1735	784	-3.50	10.24	-0.320	66.6
2L	29.0	1561	705	-3.14	8.37	-0.287	53.4
2L	25.7	1388	627	-2.85	6.84	-0.261	42.8
2L	22.5	1214	549	-2.59	5.52	-0.237	33.6
2L	19.3	1041	470	-2.31	4.35	-0.211	25.4
2L	18.6	1000	452	-2.25	4.10	-0.206	23.7
2C	18.6	650	452	-1.88	7.91	-0.169	18.8

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 ²)	Wheel Power (kW)
6L	134.4	2200	3274	-9.33	489.09	-0.896	606.9
6L	132.0	2160	3214	-9.30	487.71	-0.893	601.6
6L	128.7	2107	3135	-9.28	485.93	-0.891	594.7
6L	125.5	2054	3057	-9.27	484.19	-0.890	588.0
6L	122.3	2002	2979	-9.26	482.47	-0.889	581.6
6L	119.1	1949	2900	-9.26	480.70	-0.889	575.2
6L	118.2	1934	2878	-9.27	480.21	-0.890	573.4
5L	118.2	2202	2878	-9.57	480.76	-0.916	598.3
5L	115.9	2159	2822	-9.57	479.42	-0.917	592.8
5L	112.7	2099	2744	-9.59	477.60	-0.918	585.3
5L	109.4	2039	2665	-9.61	475.86	-0.921	578.0

5L	106.2	1979	2587	-9.65	474.18	-0.925	570.9
5L	103.0	1919	2508	-9.71	472.57	-0.930	564.1
5L	99.8	1859	2430	-9.78	471.07	-0.937	557.7
5L	96.6	1799	2352	-9.87	469.66	-0.945	551.5
5L	93.3	1739	2273	-9.98	468.35	-0.955	545.8
5L	90.3	1683	2200	-10.10	467.22	-0.967	540.7
4L	90.3	2200	2200	-10.78	466.70	-1.024	583.5
4L	90.1	2195	2195	-10.79	466.65	-1.024	582.9
4L	86.9	2116	2116	-10.92	465.88	-1.037	574.6
4L	83.7	2038	2038	-11.07	465.04	-1.051	566.6
4L	80.5	1960	1960	-11.25	464.53	-1.068	559.2
4L	77.2	1881	1881	-11.47	464.15	-1.088	552.3
4L	74.0	1803	1803	-11.72	463.70	-1.111	545.6
4L	70.8	1725	1725	-12.00	463.20	-1.138	539.4
4L	67.6	1646	1646	-12.34	462.66	-1.169	533.4
4L	64.4	1568	1568	-12.67	459.66	-1.200	525.5
4L	61.2	1489	1489	-12.56	436.59	-1.190	497.0
4L	59.1	1439	1439	-12.48	421.62	-1.183	478.8
3L	59.1	2200	1439	-13.95	423.76	-1.295	538.6
3L	57.9	2157	1411	-13.87	415.19	-1.287	525.5
3L	54.7	2038	1333	-13.63	391.27	-1.265	489.4
3L	51.5	1918	1254	-13.39	367.29	-1.244	454.0
3L	48.3	1798	1176	-13.16	343.52	-1.223	419.6
3L	45.1	1678	1097	-12.95	320.04	-1.203	386.5
3L	41.8	1558	1019	-12.76	296.73	-1.186	354.6
3L	40.8	1520	994	-12.70	289.29	-1.180	344.7
2L	40.8	2200	994	-14.99	299.74	-1.337	408.9
2L	38.6	2082	941	-14.69	282.70	-1.312	379.9
2L	35.4	1908	862	-14.25	257.61	-1.273	338.6
2L	32.2	1735	784	-13.05	216.31	-1.168	282.0
2L	29.0	1561	705	-11.19	165.03	-1.004	217.2
2L	25.7	1388	627	-9.45	121.17	-0.849	162.3
2L	22.5	1214	549	-7.79	84.58	-0.701	116.3
2L	19.3	1041	470	-6.21	55.20	-0.559	78.5
2L	18.6	1000	452	-5.86	49.38	-0.528	71.1
2C	18.6	650	452	-5.49	53.19	-0.494	66.1

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	4.300	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	19.2	2200	469	-8.81	17.00	-0.660	113.4
1L	16.1	1840	392	-7.12	11.72	-0.534	76.1
1L	12.9	1472	314	-5.69	7.92	-0.427	48.0
1L	9.7	1104	235	-4.57	5.13	-0.343	28.6
1L	7.1	808	172	-3.93	3.34	-0.295	17.7
1C	7.1	650	172	-2.98	2.37	-0.213	13.0

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	19.2	2200	469	-12.74	67.31	-0.904	166.0
1L	16.1	1840	392	-9.87	41.31	-0.703	107.0
1L	12.9	1472	314	-7.25	21.51	-0.518	62.2
1L	9.7	1104	235	-5.13	8.75	-0.366	32.3
1L	7.1	808	172	-3.93	3.34	-0.281	17.7
1C	7.1	650	172	-2.98	2.37	-0.213	13.0