

Allison Transmission

Bundled Report

Application	116-A347254-1
Iteration	1
Date	February 6, 2025 14:53:51
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=3,077
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	3.077	97.00	97.00

Driveline - Overall Driveline Ratio

Description	Ratio	Standard Efficiency (%)	User Defined Efficiency (%)	N over V Ratio (rpm/kph)
Single	3.077	95.64	95.64	17.427

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 - C		
V21		1st Range Converter Stall Gradeability
Overall Status	Reference	
Actual	27.99 %	
V13		1st Range 70% Converter Efficiency Gradeability
Overall Status	Reference	
Actual	19.73 %	
V14	!	1st Range 80% Converter Efficiency Gradeability
Overall Status	C: Consider - manufacturer to assess	
Rating/Recommendation	18.00 % (Min)	
Actual	17.21 %	
Notes	Customer is responsible for determining acceptability between 15 - 18 Gradeability.	
V17		Maximum Geared Vehicle Speed at Engine Governed Speed
Overall Status	Reference	
Actual	162.2 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	110.9 km/h	
Notes	At 1478.7 rpm Engine Speed, Range 5L.	
V20		Acceleration Rate Check
Overall Status	OK: Acceptable	
Rating/Recommendation	2.01 kg/N-m (Min)	
Actual	5.16 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	3.077	1.000

Gradeability	Percent Grade	Vehicle Speed (km/h)	Gear Range	Match Point
Stall Gradeability	28.0	0.0	1C	Stall
Launch Gradeability	26.0	0.0	1C	
Low Speed Gradeability	17.2	13.1	1C	80 Percent
Maximum Speed on Grade	0.0	117.1	5L	Road Load
	0.3	112.7	5L	
	0.5	108.3	5L	
	1.0	97.9	4L	
	2.0	83.0	4L	
	3.0	67.3	3L	
	4.0	58.5	3L	
	5.0	49.3	3L	
	6.0	42.4	2L	
	7.0	37.8	2L	
	8.0	26.3	2C	
	9.0	21.2	2C	
	10.0	17.4	1C	

Full Throttle Automatic Upshifts (Acceleration)

Engine Fan	Air Conditioning	Engine Power	Vehicle Parameters	Axle Ratio	Auxiliary Gearing Ratio
On	Off	Standard Power Curve	Standard	3.077	1.000

Speed (km/h)	Time (sec)	Distance (m)
0 - 20 km/h	3.5	11
0 - 30 km/h	7.0	36
0 - 40 km/h	11.1	76
0 - 60 km/h	23.1	245
0 - 80 km/h	43.9	654
0 - 100 km/h	84.4	1688

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		3.077	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	69.61	68.72	0.0	27.99	222.87		
1C	6.4	1455	112	58.70	57.74	105.0	23.25	113.71		
1C	10.2	1528	178	50.35	49.35	142.9	19.73	72.84	70 Percent	
1C	12.9	1590	224	44.81	43.77	160.3	17.42	53.47		
1C	13.1	1596	229	44.28	43.24	161.6	17.21	51.96	80 Percent	
1C	15.5	1661	271	39.35	38.26	169.9	15.18	41.14	85 Percent	
1C	17.4	1710	303	35.69	34.57	172.4	13.69	36.81		
2C	17.4	1487	303	25.97	24.85	125.4	9.79	91.83		
2C	19.3	1504	337	24.98	23.83	134.0	9.39	82.56		
2C	25.7	1573	449	21.92	20.63	156.8	8.12	57.41		
2C	32.2	1651	561	18.98	17.52	169.7	6.89	41.72		
2C	33.0	1661	575	18.62	17.13	170.6	6.73	40.37		
2L	33.0	1272	575	21.58	20.10	197.8	7.91	7.60		
2L	38.6	1490	673	19.05	17.40	204.4	6.84	9.23		
2L	45.1	1738	785	15.68	13.81	196.2	5.43	10.91		
2L	47.3	1826	825	14.57	12.62	191.6	4.96	12.59		
3L	47.3	1261	825	15.04	13.10	197.8	5.14	6.42		
3L	51.5	1372	897	14.39	12.29	205.9	4.83	7.02		
3L	57.9	1544	1010	12.71	10.34	204.6	4.06	8.03		
3L	64.4	1715	1122	11.13	8.48	199.0	3.33	8.76		
3L	68.5	1826	1194	10.17	7.31	193.5	2.87	10.61		
4L	68.5	1194	1194	9.72	6.87	185.0	2.69	9.63		
4L	70.8	1234	1234	9.69	6.72	190.7	2.64	10.13		
4L	77.2	1346	1346	9.32	6.01	200.0	2.36	11.41		
4L	83.7	1458	1458	8.66	4.99	201.4	1.96	12.78		
4L	90.1	1571	1571	7.92	3.86	198.3	1.51	14.08		
4L	96.6	1683	1683	7.26	2.78	194.8	1.09	14.30		
4L	103.0	1795	1795	6.63	1.71	189.6	0.67	15.86		
4L	104.7	1825	1825	6.47	1.43	188.4	0.56	15.99		
5L	104.7	1396	1825	6.84	1.80	198.9	0.70	16.01		
5L	109.4	1459	1907	6.50	1.12	197.7	0.44	16.69		
5L	115.9	1545	2019	6.06	0.18	194.9	0.07	18.11		
5L	122.3	1631	2131	5.64	-0.75	191.6	-0.29	19.41		
5L	128.7	1716	2244	5.25	-1.69	187.7	-0.66	20.60		
5L	135.2	1802	2356	4.85	-2.64	182.3	-1.04	23.26		
5L	137.0	1827	2388	4.75	-2.91	180.9	-1.14	23.67		
6L	137.0	1605	2388	4.92	-2.75	187.2	-1.08	24.91		
6L	141.6	1659	2468	4.70	-3.39	184.9	-1.33	25.50		
6L	148.1	1734	2580	4.39	-4.31	180.7	-1.69	27.32		
6L	154.5	1809	2692	4.09	-5.26	175.5	-2.06	30.08		
6L	160.9	1885	2805	3.81	-6.20	170.5	-2.43	32.23		
6L	162.2	1900	2827	3.76	-6.39	169.4	-2.51	32.79	Governed	
6L	167.4	1960	2917	2.83	-7.87	131.7	-3.09	33.42		
6L	173.8	2035	3029	1.55	-9.88	74.8	-3.88	33.47		
6L	180.2	2111	3141	0.12	-12.04	6.3	-4.73	33.34		
6L	180.8	2117	3151	0.00	-12.23	0.0	-4.80	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		3.077	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	69.61	68.72	0.0	27.99	222.87		
1C	6.4	1455	112	58.70	57.74	105.0	23.25	113.71		
1C	10.2	1528	178	50.35	49.35	142.9	19.73	72.84	70 Percent	
1C	12.9	1590	224	44.81	43.77	160.3	17.42	53.47		
1C	13.1	1596	229	44.28	43.24	161.6	17.21	51.96	80 Percent	
1C	13.9	1617	243	42.67	41.61	165.3	16.54	47.45		
1L	13.9	1141	243	46.23	45.17	179.1	18.00	7.31		
1L	19.3	1580	337	37.53	36.38	201.4	14.41	10.69		
1L	23.2	1900	405	29.04	27.80	187.3	10.97	14.05	Governed	
1L	25.7	2107	449	4.46	3.17	31.9	1.24	10.33		
1L	26.2	2141	456	0.00	-1.31	0.0	-0.51	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		3.077	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	80.31	79.42	0.0	32.78	222.87		
R1C	6.4	1477	112	65.07	64.11	116.3	25.98	101.47		
R1C	8.6	1528	151	58.38	57.40	140.1	23.11	75.75	70 Percent	
R1C	11.1	1596	194	51.42	50.40	158.7	20.16	55.03	80 Percent	
R1C	12.9	1652	224	46.46	45.42	166.2	18.10	45.31		
R1C	13.1	1661	229	45.73	44.69	167.0	17.80	44.17	85 Percent	
R1C	17.9	1900	311	34.01	32.88	168.8	13.00	33.36	Governed	
R1C	19.3	1985	337	23.56	22.40	126.4	8.82	22.93		
R1C	21.8	2143	380	0.00	-1.21	0.0	-0.47	8.94		

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-6L)

Engine Fan	Air Conditioning	Engine Power	Vehicle Parameters	Axle Ratio	Auxiliary Gearing Ratio	Grade
On	Off	Standard Power Curve	Standard	3.077	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	6.4	0.8	1	2.075	1455	58.70	57.74	105.0	113.71
1C	12.9	1.8	3	1.564	1590	44.81	43.77	160.3	53.47
1C	17.4	2.7	7	1.225	1710	35.69	34.57	172.4	36.81
2C	19.3	3.3	10	0.899	1504	24.98	23.83	134.0	82.56
2C	25.7	5.4	24	0.777	1573	21.92	20.63	156.8	57.41
2C	32.2	7.9	44	0.659	1651	18.98	17.52	169.7	41.72
2C	33.0	8.3	47	0.645	1661	18.62	17.14	170.6	40.37
2L	38.6	10.5	69	0.645	1490	19.05	17.40	204.4	9.23
2L	45.1	13.6	106	0.513	1738	15.68	13.81	196.2	10.91
2L	47.3	14.9	122	0.467	1826	14.57	12.62	191.6	12.59
3L	51.5	17.3	156	0.463	1372	14.39	12.29	205.9	7.02
3L	57.9	21.5	220	0.390	1544	12.71	10.34	204.6	8.03
3L	64.4	26.6	306	0.319	1715	11.13	8.48	199.0	8.76
3L	68.5	30.5	378	0.275	1826	10.17	7.31	193.5	10.61
4L	70.8	33.0	426	0.255	1234	9.69	6.72	190.7	10.13
4L	77.2	40.4	578	0.228	1346	9.32	6.01	200.0	11.41
4L	83.7	48.9	769	0.190	1458	8.66	4.99	201.4	12.78
4L	90.1	59.7	1029	0.147	1571	7.92	3.86	198.3	14.08
4L	96.6	74.1	1403	0.106	1683	7.26	2.78	194.8	14.30
4L	103.0	95.5	1998	0.065	1795	6.63	1.71	189.6	15.86
4L	104.7	103.6	2232	0.055	1825	6.47	1.43	188.4	15.99
5L	109.4	127.6	2948	0.043	1459	6.50	1.12	197.7	16.69
5L	115.9	219.9	5859	0.007	1545	6.06	0.18	194.9	18.11

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	3.077	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	6.4	0.8	1	2.075	1455	58.70	57.74	105.0	113.71
1C	12.9	1.8	3	1.564	1590	44.81	43.77	160.3	53.47
1C	13.9	2.0	4	1.476	1617	42.67	41.61	165.3	47.45
1L	19.3	3.0	9	1.215	1580	37.53	36.38	201.4	10.69
1L	25.7	5.8	28	0.141	2107	4.46	3.17	31.9	10.33

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	3.077	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	6.4	0.7	1	2.272	1477	65.07	64.11	116.3	101.47
R1C	12.9	1.6	3	1.589	1652	46.46	45.42	166.2	45.31
R1C	19.3	3.1	10	0.773	1985	23.56	22.40	126.4	22.93

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	3.077	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	187.9	2200	3274	-6.19	41.54	-0.598	139.1
6L	186.7	2186	3253	-6.12	41.06	-0.592	137.3
6L	180.2	2111	3141	-5.78	38.50	-0.559	127.4
6L	173.8	2035	3029	-5.45	36.01	-0.527	117.9
6L	167.4	1960	2917	-5.12	33.50	-0.496	108.7
6L	160.9	1885	2805	-4.81	31.08	-0.466	99.9
6L	154.5	1809	2692	-4.51	28.81	-0.436	91.6
6L	148.1	1734	2580	-4.22	26.71	-0.408	83.8
6L	141.6	1659	2468	-3.94	24.77	-0.381	76.6
6L	135.2	1583	2356	-3.67	22.91	-0.356	69.9
6L	131.9	1545	2299	-3.54	21.99	-0.343	66.7
5L	131.9	1759	2299	-3.68	21.14	-0.356	79.8
5L	128.7	1716	2244	-3.55	20.25	-0.344	75.8
5L	122.3	1631	2131	-3.30	18.57	-0.319	68.3
5L	115.9	1545	2019	-3.05	16.96	-0.296	61.5
5L	109.4	1459	1907	-2.83	15.53	-0.274	55.3
5L	103.0	1373	1795	-2.62	14.59	-0.253	50.2
5L	97.5	1301	1700	-2.45	13.64	-0.237	45.9
4L	97.5	1700	1700	-2.79	15.33	-0.269	69.5
4L	96.6	1683	1683	-2.75	15.21	-0.266	68.2
4L	90.1	1571	1571	-2.54	14.30	-0.245	60.1
4L	83.7	1458	1458	-2.33	13.07	-0.225	52.7
4L	77.2	1346	1346	-2.13	11.58	-0.206	45.8
4L	70.8	1234	1234	-1.95	10.14	-0.188	39.3
4L	64.4	1122	1122	-1.77	8.72	-0.170	33.0
4L	62.0	1081	1081	-1.70	8.25	-0.164	30.9
3L	62.0	1653	1081	-2.34	8.04	-0.224	58.7
3L	57.9	1544	1010	-2.17	7.10	-0.208	51.1
3L	51.5	1372	897	-1.95	5.92	-0.187	41.1
3L	45.1	1201	785	-1.74	4.86	-0.167	32.4
3L	42.1	1121	733	-1.64	4.38	-0.158	28.4
2L	42.1	1622	733	-2.63	9.00	-0.248	57.7
2L	38.6	1490	673	-2.43	7.67	-0.229	48.7
2L	32.2	1241	561	-2.11	5.72	-0.199	35.0
2L	25.9	1000	452	-1.80	4.10	-0.170	23.7
2C	25.9	650	452	-1.53	7.91	-0.143	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	187.9	2200	3274	-9.74	489.09	-0.939	606.9
6L	186.7	2186	3253	-9.69	488.62	-0.935	605.1
6L	180.2	2111	3141	-9.48	486.06	-0.914	595.2
6L	173.8	2035	3029	-9.28	483.57	-0.895	585.7
6L	167.4	1960	2917	-9.10	481.07	-0.878	576.5
6L	160.9	1885	2805	-8.94	478.65	-0.863	567.7
6L	154.5	1809	2692	-8.81	476.39	-0.851	559.4
6L	148.1	1734	2580	-8.71	474.30	-0.841	551.6
6L	141.6	1659	2468	-8.63	472.37	-0.834	544.4
6L	135.2	1583	2356	-8.59	470.53	-0.829	537.7
6L	131.9	1545	2299	-8.58	469.62	-0.829	534.6
5L	131.9	1759	2299	-8.72	468.77	-0.841	547.6
5L	128.7	1716	2244	-8.71	467.88	-0.841	543.7
5L	122.3	1631	2131	-8.73	466.21	-0.842	536.2
5L	115.9	1545	2019	-8.79	464.62	-0.848	529.4
5L	109.4	1459	1907	-8.90	463.21	-0.858	523.2
5L	103.0	1373	1795	-9.07	462.29	-0.875	518.1
5L	97.5	1301	1700	-9.26	461.35	-0.893	513.8
4L	97.5	1700	1700	-9.61	463.04	-0.923	537.5
4L	96.6	1683	1683	-9.64	462.92	-0.926	536.2
4L	90.1	1571	1571	-9.89	460.49	-0.950	526.5
4L	83.7	1458	1458	-9.68	427.39	-0.930	485.8

4L	77.2	1346	1346	-9.48	394.03	-0.911	445.5
4L	70.8	1234	1234	-9.29	360.72	-0.893	405.7
4L	64.4	1122	1122	-9.11	327.44	-0.876	366.2
4L	62.0	1081	1081	-9.05	315.35	-0.870	351.9
3L	62.0	1653	1081	-9.69	315.15	-0.923	379.7
3L	57.9	1544	1010	-9.52	293.94	-0.908	350.9
3L	51.5	1372	897	-9.30	260.89	-0.886	307.6
3L	45.1	1201	785	-8.56	211.89	-0.816	248.8
3L	42.1	1121	733	-7.74	177.58	-0.739	209.5
2L	42.1	1622	733	-8.74	182.21	-0.820	238.8
2L	38.6	1490	673	-7.73	146.00	-0.727	193.3
2L	32.2	1241	561	-5.97	89.81	-0.562	122.9
2L	25.9	1000	452	-4.38	49.38	-0.413	71.1
2C	25.9	650	452	-4.11	53.19	-0.384	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	3.077	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	187.9	2200	3274	-6.19	41.54	-0.598	139.1
6L	186.7	2186	3253	-6.12	41.06	-0.592	137.3
6L	180.2	2111	3141	-5.78	38.50	-0.559	127.4
6L	173.8	2035	3029	-5.45	36.01	-0.527	117.9
6L	167.4	1960	2917	-5.12	33.50	-0.496	108.7
6L	165.1	1934	2878	-5.01	32.64	-0.485	105.6
5L	165.1	2202	2878	-5.23	33.19	-0.506	130.5
5L	160.9	2146	2805	-5.02	31.43	-0.485	123.3
5L	154.5	2060	2692	-4.70	28.88	-0.455	112.6
5L	148.1	1974	2580	-4.40	26.45	-0.425	102.5
5L	141.6	1888	2468	-4.10	24.18	-0.397	92.9
5L	135.2	1802	2356	-3.82	22.11	-0.370	84.0
5L	128.7	1716	2244	-3.55	20.25	-0.344	75.8
5L	126.2	1683	2200	-3.45	19.58	-0.334	72.8
4L	126.2	2200	2200	-3.93	19.07	-0.379	115.6
4L	122.3	2131	2131	-3.76	18.38	-0.363	108.3
4L	115.9	2019	2019	-3.49	17.21	-0.336	96.8
4L	109.4	1907	1907	-3.23	16.60	-0.312	86.6
4L	103.0	1795	1795	-2.99	15.95	-0.288	77.0
4L	96.6	1683	1683	-2.75	15.21	-0.266	68.2
4L	90.1	1571	1571	-2.54	14.30	-0.245	60.1
4L	83.7	1458	1458	-2.33	13.07	-0.225	52.7
4L	82.6	1439	1439	-2.30	12.81	-0.222	51.5
3L	82.6	2200	1439	-3.32	14.95	-0.318	111.3
3L	77.2	2058	1346	-3.05	12.98	-0.292	95.9
3L	70.8	1887	1234	-2.73	10.57	-0.262	78.6
3L	64.4	1715	1122	-2.44	8.61	-0.233	63.5
3L	57.9	1544	1010	-2.17	7.10	-0.208	51.1
3L	57.0	1520	994	-2.14	6.90	-0.205	49.5
2L	57.0	2200	994	-3.73	17.35	-0.351	113.8
2L	51.5	1986	897	-3.31	13.95	-0.311	90.5
2L	45.1	1738	785	-2.83	10.28	-0.266	66.9
2L	38.6	1490	673	-2.43	7.67	-0.229	48.7
2L	32.2	1241	561	-2.11	5.72	-0.199	35.0
2L	25.9	1000	452	-1.80	4.10	-0.170	23.7
2C	25.9	650	452	-1.53	7.91	-0.143	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	187.9	2200	3274	-9.74	489.09	-0.938	606.9
6L	186.7	2186	3253	-9.69	488.62	-0.934	605.1
6L	180.2	2111	3141	-9.48	486.06	-0.914	595.2
6L	173.8	2035	3029	-9.28	483.57	-0.895	585.7
6L	167.4	1960	2917	-9.10	481.07	-0.878	576.5
6L	165.1	1934	2878	-9.04	480.21	-0.872	573.4
5L	165.1	2202	2878	-9.26	480.76	-0.892	598.3
5L	160.9	2146	2805	-9.15	479.01	-0.882	591.1
5L	154.5	2060	2692	-9.01	476.46	-0.868	580.5
5L	148.1	1974	2580	-8.89	474.04	-0.857	570.3
5L	141.6	1888	2468	-8.80	471.78	-0.848	560.8
5L	135.2	1802	2356	-8.74	469.73	-0.842	551.9
5L	128.7	1716	2244	-8.71	467.88	-0.840	543.7
5L	126.2	1683	2200	-8.72	467.22	-0.840	540.7
4L	126.2	2200	2200	-9.20	466.70	-0.883	583.5
4L	122.3	2131	2131	-9.20	466.03	-0.883	576.2
4L	115.9	2019	2019	-9.22	464.87	-0.885	564.7
4L	109.4	1907	1907	-9.31	464.28	-0.893	554.5
4L	103.0	1795	1795	-9.44	463.65	-0.906	545.0
4L	96.6	1683	1683	-9.64	462.92	-0.925	536.2
4L	90.1	1571	1571	-9.89	460.49	-0.949	526.5
4L	83.7	1458	1458	-9.68	427.39	-0.929	485.8

4L	82.6	1439	1439	-9.65	421.62	-0.925	478.8
3L	82.6	2200	1439	-10.69	423.76	-1.014	538.6
3L	77.2	2058	1346	-10.41	395.43	-0.988	495.6
3L	70.8	1887	1234	-10.09	361.15	-0.958	445.0
3L	64.4	1715	1122	-9.79	327.33	-0.930	396.7
3L	57.9	1544	1010	-9.52	293.94	-0.905	350.9
3L	57.0	1520	994	-9.49	289.29	-0.901	344.7
2L	57.0	2200	994	-11.10	299.74	-1.032	408.9
2L	51.5	1986	897	-10.67	268.92	-0.993	357.0
2L	45.1	1738	785	-9.65	217.30	-0.899	283.3
2L	38.6	1490	673	-7.73	146.00	-0.722	193.3
2L	32.2	1241	561	-5.97	89.81	-0.558	122.9
2L	25.9	1000	452	-4.38	49.38	-0.410	71.1
2C	25.9	650	452	-4.11	53.19	-0.384	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	3.077	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)
1L	26.9	2200	469	-6.49	17.00	-0.548	113.4
1L	25.7	2107	449	-6.17	15.60	-0.521	103.1
1L	19.3	1580	337	-4.48	8.91	-0.379	55.1
1L	12.9	1053	224	-3.29	4.81	-0.278	26.3
1L	9.9	808	172	-2.93	3.34	-0.248	17.7
1C	9.9	650	172	-2.25	2.37	-0.185	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/sec ²)	Wheel Power (kW)
1L	26.9	2200	469	-9.28	67.31	-0.759	166.0
1L	25.7	2107	449	-8.73	59.93	-0.715	149.4
1L	19.3	1580	337	-5.84	26.57	-0.479	73.5
1L	12.9	1053	224	-3.61	7.52	-0.296	29.1
1L	9.9	808	172	-2.93	3.34	-0.241	17.7
1C	9.9	650	172	-2.25	2.37	-0.185	13.0