

Allison Transmission
Bundled Report

Application	116-A353472-1
Iteration	1
Date	April 4, 2025 12:39:16
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	Titan HET Z75 - Mercedes 447kW red.2370Nm - 4700
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	Heavy Haul — Equipment Hauler with Escort or Permit — Tractor Trailer (22-10-20)

Platform

Vehicle Manufacturer	Titan (Europe/ME/SA)
Vehicle Model	Z75
Vehicle Configuration	Hauler 6x6
Engine Rating	Mercedes Benz OM 473 -- 480kW@1600rpm 3100Nm@1300rpm Stufe 3a - red. 447kW 2360Nm -- without SEM/LRTP (116-L032709-E, Rev A)
Transmission	4700 INTL Retarder (1-L007442-T, Rev E)
Transmission Rating	4700 INTL Retarder Heavy Equipment Transport (HET) - Diesel Allison 6th Generation Controls without SEM/LRTP (1-L024294-R, Rev A)
Vehicle Parameters	Standard
Torque Converter	TC571 (1-L001261-TC, Rev D) - Recommended
Transmission Retarder	4000 Series High Capacity (1-L004745-TR, Rev E)
LRTP Status	

Allison Transmission Input Summary

Mission

End User	Unknown
Selected Vocation	Heavy Haul — Equipment Hauler with Escort or Permit — Tractor Trailer (22-10-20)

Platform

Vehicle Manufacturer	Titan (Europe/ME/SA)
Vehicle Model	Z75
Vehicle Configuration	Hauler 6x6
User Expected Engine Load	0%

Platform - Area and Weight

Frontal Area	14.000 m²
Height / Width	4.000 m / 3.500 m
Standard Wind Resistance Coefficient	0.800 (no Deflector)
User Defined Wind Resistance Coefficient	0.800 (no Deflector)
Gross Combined Weight	145000 kg (with Trailer)
Weight On Drive Wheels	78000 kg (53.79%)

Platform - Tires

Number Of Tires	6 (High Flotation (Terra))
Selected Tire	
Tire Revolutions	208 revs/km
Tire Rolling Radius	0.767 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)	1038.2511 kg-m²

Accessory Losses (Power @ Governed Speed)

Accessory	Standard Loss (kW)	User Defined Loss (kW)
Fan (Clutch Fan)	38.1	38.1
Alternator / Generator	2.1	2.1
Air Compressor	2.3	2.3
Steering Pump	2.3	2.3
Air Conditioning	0.0	0.0
Implement Drive	0.0	0.0

Engine

Number of Power Packs	1
Engine Rating	Mercedes Benz OM 473 -- 480kW@1600rpm 3100Nm@1300rpm Stufe 3a - red. 447kW 2360Nm -- without SEM/LRTP (116-L032709-E, Rev A)
Engine Controls Type	Electronic
Evaluate at Altitude	No
Certifications	
Displacement	15.60 l
Peak Torque	2360.0 N-m
Peak Torque Speed	1300 rpm
Peak Power	420.1 kW
Peak Power Speed	1700 rpm
Governed Power	447.0 kW
Governed Speed	1900 rpm
Number Of Curves	1
Engine Curve Reference	100 07 315
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
800	197.7	2360.0	190.8	2277.7	193.7	2311.6	
900	222.4	2360.0	214.1	2271.4	218.1	2314.4	
1000	247.1	2360.0	237.0	2263.6	242.6	2316.6	
1100	271.9	2360.0	259.7	2254.2	267.1	2318.4	
1200	296.6	2360.0	281.9	2243.5	291.5	2319.9	
1300	321.3	2360.0	303.8	2231.6	316.0	2321.2	Peak Torque
1400	346.0	2360.0	325.2	2218.3	340.5	2322.3	
1500	370.7	2360.0	346.2	2203.9	364.9	2323.2	
1600	395.4	2360.0	366.6	2188.3	389.4	2324.1	
1700	420.1	2360.0	386.6	2171.5	413.9	2324.8	Peak Power
1800	444.8	2360.0	405.9	2153.6	438.3	2325.5	
1900	447.0	2246.6	402.1	2021.1	440.2	2212.6	Governed
2030	0.0	0.0	-53.5	-251.9	-7.1	-33.3	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
800	197.7	2360.0	190.8	2277.7	193.7	2311.6	
900	222.4	2360.0	214.1	2271.4	218.1	2314.4	
1000	247.1	2360.0	237.0	2263.6	242.6	2316.6	
1100	271.9	2360.0	259.7	2254.2	267.1	2318.4	
1200	296.6	2360.0	281.9	2243.5	291.5	2319.9	
1300	321.3	2360.0	303.8	2231.6	316.0	2321.2	Peak Torque
1400	346.0	2360.0	325.2	2218.3	340.5	2322.3	
1500	370.7	2360.0	346.2	2203.9	364.9	2323.2	
1600	395.4	2360.0	366.6	2188.3	389.4	2324.1	
1700	420.1	2360.0	386.6	2171.5	413.9	2324.8	Peak Power
1800	444.8	2360.0	405.9	2153.6	438.3	2325.5	
1900	447.0	2246.6	402.1	2021.1	440.2	2212.6	Governed
2030	0.0	0.0	-53.5	-251.9	-7.1	-33.3	No Load Governed

Transmission

Transmission Manufacturer	Allison Transmission
Transmission Family	4000 Series (1-L001323-TF, Rev U)
Transmission	4700 INTL Retarder (1-L007442-T, Rev E)
Transmission Rating	4700 INTL Retarder Heavy Equipment Transport (HET) - Diesel Allison 6th Generation Controls without SEM/LRTP (1-L024294-R, Rev A)
Torque Converter	TC571 (1-L001261-TC, Rev D) - Recommended
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	0
Primary Mode: Gears	Low = 1, Start = 2, High = 7 (1-2-7)

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 -- Off Hwy Single Red -- 6x6 (1-L003573-DL)	Single	12.700	88.40	88.40
Aux Gearing -- Transfer Case -- Two Speed (1-L003523-DL)	Low	2.040	97.00	97.00
Aux Gearing -- Transfer Case -- Two Speed (1-L003523-DL)	High	1.030	97.00	97.00

Driveline - Overall Driveline Ratio

Description	Ratio	Standard Efficiency (%)	User Defined Efficiency (%)	N over V Ratio (rpm/kph)
High	13.081	84.55	84.55	45.229
Low	25.908	84.55	84.55	89.581

Allison Transmission Ratings and Guidelines Check









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.








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		1514 rpm	
C05		Minimum Engine Speed	
Overall Status		OK: Acceptable	
Rating/Recommendation		900 rpm (Min)	
Actual		1450 rpm	
Notes		Net peak torque speed (800 rpm) + allowable variation (100 rpm).	
C07		Turbine Torque at Converter Stall	
Overall Status		OK: Acceptable	
Rating/Recommendation		3525.0 N-m (Max)	
Actual		3521.6 N-m	
C08		Converter Speed Ratio at Engine Governed Speed	
Overall Status		OK: Acceptable	
Rating/Recommendation		0.800 (Min)	
Actual		0.831	
C03		Converter Stall Torque Ratio	
Overall Status		Reference	
Actual		1.620	

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		447.0 kW (Max)
Actual		447.0 kW
T14		Transmission Input Torque (Gross)
Overall Status		OK: Acceptable
Rating/Recommendation		2508.0 N-m (Max)
Actual		2360.0 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 7L at 1900 rpm Engine Governed Speed.

Vehicle Rating And Guideline Checks - Standard

 Section Score - C		
V22		2nd Range Converter Stall Gradeability
Overall Status		Reference
Actual		23.59 %
V47		2nd Range 80% Converter Efficiency Gradeability
Overall Status		Reference
Actual		15.324
V16		Gradeability Required at Governed Speed
Overall Status		OK: Acceptable
Rating/Recommendation		8.00 % (Min)
Actual		28.58 %
Notes		Check is in Lockup Mode.
V17		Maximum Geared Vehicle Speed at Engine Governed Speed
Overall Status		Reference
Actual		65.7 km/h
Notes		Check is in 7L Lockup.
V18		Maximum Speed on 0.5% Grade
Overall Status		C: Consider - manufacturer to assess
Rating/Recommendation		104.6 km/h (Min)
Actual		41.7 km/h
Notes		At 1875.5 rpm Engine Speed, Range 6L.
V45		Heat Generated in 2nd Range 80% Converter Efficiency
Overall Status		Reference
Actual		91.45 kW
Notes		At 1740.3 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	12.700	2.040

Gradeability	Percent Grade	Vehicle Speed (km/h)	Gear Range	Match Point
Stall Gradeability	23.6	0.0	2C	Stall
Launch Gradeability	21.6	0.0	2C	
Low Speed Gradeability	15.3	3.9	2C	80 Percent
Maximum Speed on Grade	0.0	33.8	7L	Road Load
	0.3	33.6	7L	
	0.5	33.4	7L	
	1.0	27.6	6L	
	2.0	20.4	5L	
	3.0	14.3	4L	
	4.0	14.3	4L	
	5.0	10.7	3L	
	6.0	10.7	3L	
	7.0	7.5	3C	
	8.0	6.3	3C	
	9.0	4.7	3C	
	10.0	4.5	2C	

Full Throttle, Automatic Upshifts (Gradeability)

Engine Fan	Air Conditioning	Engine Power	Vehicle Parameters	Axle Ratio	Auxiliary Gearing Ratio
On	Off	Standard Power Curve	Standard	12.700	1.030

Gradeability	Percent Grade	Vehicle Speed (km/h)	Gear Range	Match Point
Stall Gradeability	10.9	0.0	2C	Stall
Launch Gradeability	8.9	0.0	2C	
Low Speed Gradeability	6.9	7.7	2C	80 Percent
Maximum Speed on Grade	0.0	40.3	5L	Road Load
	0.3	40.3	5L	
	0.5	35.6	5L	
	1.0	28.2	4L	
	2.0	21.2	3L	
	3.0	14.2	3C	
	4.0	9.0	2C	
	5.0	9.0	2C	
	6.0	9.0	2C	
	7.0	7.4	2C	
	8.0	5.4	2C	
	9.0	3.6	2C	
	10.0	1.6	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	12.700	2.040

Speed (km/h)	Time (sec)	Distance (m)
0 - 20 km/h	12.6	46
0 - 30 km/h	34.8	203
0 - 40 km/h	Not Possible	Not Possible
0 - 60 km/h	Not Possible	Not Possible
0 - 80 km/h	Not Possible	Not Possible
0 - 100 km/h	Not Possible	Not Possible

Full Throttle, Automatic Upshifts (Acceleration)

Engine Fan	Air Conditioning	Engine Power	Vehicle Parameters	Axle Ratio	Auxiliary Gearing Ratio
On	Off	Standard Power Curve	Standard	12.700	1.030

Speed (km/h)	Time (sec)	Distance (m)
0 - 20 km/h	14.6	51
0 - 30 km/h	39.1	228
0 - 40 km/h	97.6	801
0 - 60 km/h	Not Possible	Not Possible
0 - 80 km/h	Not Possible	Not Possible
0 - 100 km/h	Not Possible	Not Possible

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 (2C-3C-3L-4L-5L-6L-7L)

Engine Fan		Air Conditioning		Engine Power		Vehicle Parameters		Axle Ratio	Auxiliary Gearing Ratio	
On		Off		Standard Power Curve		Standard		12.700	2.040	
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	
2C	0.0	1514	0	349.23	326.48	0.0	23.59	349.15		
2C	1.6	1454	144	303.30	280.55	135.6	20.13	176.25		
2C	2.8	1574	248	268.40	245.64	206.6	17.54	116.97	70 Percent	
2C	3.2	1636	288	255.14	232.39	228.1	16.57	104.12		
2C	3.9	1740	347	238.15	215.39	256.2	15.32	91.40	80 Percent	
2C	4.5	1838	406	217.66	194.90	274.0	13.84	80.48		
3C	4.5	1535	406	151.49	128.73	190.7	9.09	127.77		
3C	4.8	1554	433	148.86	126.09	199.6	8.90	121.24		
3C	6.4	1679	577	135.15	112.38	241.7	7.93	96.50		
3C	7.5	1769	668	127.55	104.77	264.2	7.39	87.51		
3L	7.5	1273	668	117.89	95.12	244.2	6.70	9.16		
3L	8.0	1374	721	117.15	94.37	261.9	6.65	9.98		
3L	9.7	1649	865	114.76	91.97	307.8	6.48	12.34		
3L	10.7	1824	957	111.52	88.71	330.9	6.25	13.70		
4L	10.7	1368	957	88.14	65.34	261.5	4.60	8.96		
4L	11.3	1442	1009	87.68	64.87	274.4	4.57	9.59		
4L	12.9	1648	1154	86.24	63.41	308.4	4.46	11.51		
4L	14.3	1825	1277	83.71	60.86	331.4	4.28	13.04		
5L	14.3	1277	1277	62.08	39.23	245.8	2.76	8.07		
5L	14.5	1298	1298	61.99	39.14	249.4	2.75	8.31		
5L	16.1	1442	1442	61.30	38.42	274.0	2.70	9.91		
5L	17.7	1586	1586	60.53	37.62	297.6	2.65	11.79		
5L	19.3	1730	1730	59.70	36.76	320.2	2.59	13.70		
5L	20.4	1825	1825	58.31	35.36	329.9	2.49	14.77		
6L	20.4	1345	1825	44.61	21.65	252.4	1.52	14.95		
6L	20.9	1382	1875	44.46	21.50	258.4	1.51	15.64		
6L	22.5	1488	2019	44.04	21.04	275.6	1.48	17.63		
6L	24.1	1594	2163	43.60	20.56	292.4	1.45	19.62		
6L	25.7	1700	2307	43.15	20.07	308.6	1.41	21.64		
6L	27.4	1807	2451	42.51	19.39	323.1	1.36	23.56		
6L	27.6	1825	2476	42.00	18.87	322.4	1.33	23.70		
7L	27.6	1582	2476	37.29	14.16	286.2	1.00	24.47		
7L	29.0	1659	2596	37.00	13.83	297.7	0.97	26.22		
7L	30.6	1751	2740	36.64	13.42	311.2	0.94	28.35		
7L	32.2	1843	2884	35.37	12.11	316.3	0.85	30.26		
7L	33.2	1900	2973	33.94	10.64	312.9	0.75	32.09	Governed	
7L	33.8	1935	3028	22.85	-0.47	214.5	-0.03	32.00		
7L	35.1	2007	3141	0.00	-23.36	0.0	-1.64	31.79		

Full Throttle, Manual Hold (7.6269 Ratio) (1C-1L)

Engine Fan		Air Conditioning		Engine Power		Vehicle Parameters		Axle Ratio	Auxiliary Gearing Ratio	
On		Off		Standard Power Curve		Standard		12.700	2.040	
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	1514	0	750.88	728.12	0.0	59.61	349.15		
1C!	1.3	1574	114	575.45	552.70	203.9	42.19	120.22	70 Percent	
1C	1.6	1679	144	530.28	507.53	237.1	38.21	102.00		
1C	1.8	1740	160	509.88	487.13	252.4	36.46	95.86	80 Percent	
1C	2.0	1806	177	483.85	461.10	265.5	34.28	91.73		
1L	2.0	1350	177	459.37	436.61	252.1	32.26	16.37		
1L	2.8	1900	249	413.56	390.80	319.4	28.58	24.38	Governed	
1L	2.9	2015	264	-15.86	-38.62	-13.0	-2.72	17.42		

Full Throttle, Manual Hold (3.5102 Ratio) (2C-2L)

Engine Fan		Air Conditioning		Engine Power		Vehicle Parameters		Axle Ratio	Auxiliary Gearing Ratio	
On		Off		Standard Power Curve		Standard		12.700	2.040	
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	
2C	0.0	1514	0	349.23	326.48	0.0	23.59	349.15		
2C	1.6	1454	144	303.30	280.55	135.6	20.13	176.25		
2C	2.8	1574	248	268.40	245.64	206.6	17.54	116.97	70 Percent	
2C	3.2	1636	288	255.14	232.39	228.1	16.57	104.12		
2C	3.6	1700	325	244.20	221.44	246.0	15.77	95.51		
2L	3.6	1141	325	217.55	194.79	219.2	13.83	9.49		
2L	4.8	1518	433	212.14	189.37	284.5	13.44	13.46		
2L	6.0	1900	541	193.72	170.95	325.1	12.11	17.64	Governed	
2L	6.4	2012	573	-0.26	-23.03	-0.5	-1.62	14.62		

Full Throttle, Automatic Upshifts (2C-3C-3L-4L-5L-6L-7L)

Engine Fan		Air Conditioning		Engine Power		Vehicle Parameters		Axle Ratio	Auxiliary Gearing Ratio	
On		Off		Standard Power Curve		Standard		12.700	1.030	
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	
2C	0.0	1514	0	176.33	153.58	0.0	10.86	349.15		
2C	1.6	1480	73	164.25	141.49	73.4	10.00	255.16		
2C	3.2	1455	146	152.90	130.14	136.7	9.19	175.07		
2C	4.8	1532	218	140.61	117.85	188.6	8.32	129.71		
2C	5.5	1574	248	135.52	112.75	206.6	7.95	116.97	70 Percent	
2C	6.4	1641	291	128.38	105.60	229.6	7.45	103.35		
2C	7.7	1740	347	120.24	97.46	256.2	6.87	91.40	80 Percent	
2C	8.0	1771	364	117.72	94.93	263.1	6.69	89.17		
2C	9.0	1838	406	109.90	87.11	274.0	6.14	80.48		
3C	9.0	1535	406	76.49	53.70	190.7	3.78	127.77		
3C	9.7	1558	437	74.95	52.15	201.0	3.67	120.27		
3C	11.3	1617	510	71.31	48.50	223.2	3.41	106.23		
3C	12.9	1684	582	67.99	45.16	243.2	3.18	95.82		
3C	14.5	1757	655	64.98	42.12	261.4	2.96	88.36		
3C	14.8	1769	668	64.40	41.54	264.2	2.92	87.51		
3L	14.8	1273	668	59.52	36.67	244.2	2.58	9.16		
3L	16.1	1388	728	59.10	36.22	264.2	2.55	10.10		
3L	17.7	1526	801	58.51	35.61	287.7	2.50	11.27		
3L	19.3	1665	874	57.87	34.93	310.4	2.46	12.49		
3L	20.9	1804	946	57.04	34.07	331.5	2.40	13.75		
3L	21.2	1824	957	56.30	33.33	330.9	2.34	13.70		
4L	21.2	1368	957	44.50	21.53	261.5	1.51	8.96		
4L	22.5	1457	1019	44.22	21.22	276.8	1.49	9.72		
4L	24.1	1561	1092	43.87	20.83	294.2	1.46	10.67		
4L	25.7	1665	1165	43.48	20.40	311.0	1.43	11.67		
4L	27.4	1769	1238	43.07	19.95	327.3	1.40	12.70		
4L	28.2	1825	1277	42.26	19.12	331.4	1.34	13.04		
5L	28.2	1277	1277	31.35	8.20	245.8	0.58	8.07		
5L	29.0	1310	1310	31.27	8.10	251.6	0.57	8.43		
5L	30.6	1383	1383	31.10	7.88	264.1	0.55	9.24		
5L	32.2	1456	1456	30.91	7.65	276.4	0.54	10.08		
5L	33.8	1529	1529	30.72	7.40	288.4	0.52	11.01		
5L	35.4	1602	1602	30.52	7.14	300.1	0.50	12.02		
5L	37.0	1675	1675	30.31	6.88	311.6	0.48	12.95		
5L	38.6	1747	1747	30.09	6.60	322.8	0.46	13.92		
5L	40.2	1820	1820	29.54	5.98	330.1	0.42	14.74		
5L	40.3	1825	1825	29.44	5.89	329.9	0.41	14.77		
6L	40.3	1345	1825	22.52	-1.03	252.4	-0.07	14.95		
6L	41.8	1395	1893	22.42	-1.19	260.6	-0.08	15.91		
6L	43.5	1449	1966	22.31	-1.37	269.3	-0.10	16.88		
6L	45.1	1502	2039	22.21	-1.55	278.0	-0.11	17.92		
6L	46.7	1556	2111	22.09	-1.74	286.4	-0.12	18.88		
6L	48.3	1610	2184	21.98	-1.92	294.8	-0.14	19.91		
6L	49.9	1663	2257	21.86	-2.12	303.0	-0.15	20.90		
6L	51.5	1717	2330	21.75	-2.32	311.1	-0.16	21.93		
6L	53.1	1771	2403	21.63	-2.52	319.0	-0.18	22.94		
6L	54.7	1824	2475	21.21	-3.02	322.4	-0.21	23.70		
6L	54.7	1825	2476	21.20	-3.03	322.4	-0.21	23.70		
7L	54.7	1582	2476	18.83	-5.41	286.2	-0.38	24.47		
7L	56.3	1628	2548	18.74	-5.58	293.2	-0.39	25.52		
7L	57.9	1675	2621	18.65	-5.76	300.1	-0.41	26.60		
7L	59.5	1721	2694	18.56	-5.95	306.9	-0.42	27.68		
7L	61.2	1768	2767	18.46	-6.14	313.6	-0.43	28.75		
7L	62.8	1814	2839	18.22	-6.48	317.6	-0.46	29.72		
7L	64.4	1861	2912	17.63	-7.17	315.3	-0.50	30.73		
7L	65.7	1900	2973	17.14	-7.75	312.9	-0.55	32.09	Governed	
7L	66.0	1907	2985	15.95	-8.96	292.3	-0.63	32.07		
7L	67.6	1954	3058	8.50	-16.52	159.5	-1.16	31.94		
7L	69.2	2000	3131	1.04	-24.08	20.0	-1.69	31.82		
7L	69.4	2007	3141	0.00	-25.14	0.0	-1.77	31.79		

Full Throttle, Manual Hold (7.6269 Ratio) (1C-1L)

Engine Fan		Air Conditioning		Engine Power		Vehicle Parameters		Axle Ratio	Auxiliary Gearing Ratio	
On		Off		Standard Power Curve		Standard		12.700	1.030	
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	1514	0	379.12	356.37	0.0	25.89	349.15		
1C	1.6	1463	73	323.46	300.71	144.6	21.64	167.46		
1C	2.5	1574	114	290.55	267.79	203.9	19.18	120.22	70 Percent	
1C	3.2	1684	146	266.76	244.00	238.5	17.42	101.37		
1C	3.5	1740	160	257.44	234.68	252.4	16.73	95.86	80 Percent	
1C	3.9	1806	177	244.30	221.54	265.5	15.77	91.73		
1L	3.9	1350	177	231.94	209.18	252.1	14.87	16.37		
1L	4.8	1666	218	226.12	203.36	303.3	14.45	21.10		
1L	5.5	1900	249	208.81	186.04	319.4	13.20	24.38	Governed	
1L	5.8	2011	264	-0.57	-23.34	-0.9	-1.64	17.67		

Full Throttle, Manual Hold (3.5102 Ratio) (2C-2L)

Engine Fan		Air Conditioning		Engine Power		Vehicle Parameters		Axle Ratio	Auxiliary Gearing Ratio	
On		Off		Standard Power Curve		Standard		12.700	1.030	
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	
2C	0.0	1514	0	176.33	153.58	0.0	10.86	349.15		
2C	1.6	1480	73	164.25	141.49	73.4	10.00	255.16		
2C	3.2	1455	146	152.90	130.14	136.7	9.19	175.07		
2C	4.8	1532	218	140.61	117.85	188.6	8.32	129.71		
2C	5.5	1574	248	135.52	112.75	206.6	7.95	116.97	70 Percent	
2C	6.4	1641	291	128.38	105.60	229.6	7.45	103.35		
2C	7.2	1700	325	123.30	100.52	246.0	7.09	95.51		
2L	7.2	1141	325	109.84	87.06	219.2	6.13	9.49		
2L	8.0	1278	364	108.93	86.15	243.5	6.07	10.94		
2L	9.7	1533	437	106.98	84.18	286.9	5.93	13.61		
2L	11.3	1789	510	104.63	81.81	327.4	5.76	16.54		
2L	12.0	1900	541	97.81	74.99	325.1	5.28	17.64	Governed	
2L	12.7	2012	573	0.00	-22.83	0.0	-1.61	14.63		

Full Throttle, Reverse Performance (Standard 4.801 Ratio) (R1C-R1C)

Engine Fan		Air Conditioning		Engine Power		Vehicle Parameters		Axle Ratio	Auxiliary Gearing Ratio	
On		Off		Standard Power Curve		Standard		12.700	2.040	
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	1514	0	465.85	443.10	0.0	32.79	349.15		
R1C	1.6	1502	144	383.02	360.27	171.2	26.19	144.19		
R1C	2.0	1574	182	360.61	337.86	202.9	24.46	121.30	70 Percent	
R1C	2.8	1740	254	320.53	297.78	252.1	21.42	96.26	80 Percent	
R1C	3.2	1821	288	299.47	276.71	267.8	19.84	88.49		
R1C	3.6	1887	322	272.77	250.01	272.5	17.86	80.33	85 Percent	
R1C	3.7	1900	329	267.50	244.74	272.9	17.47	79.40	Governed	
R1C	4.7	2012	422	0.00	-22.76	0.0	-1.60	12.48		

Full Throttle, Reverse Performance (Optional 17.120 Ratio - LRTP Required) (R2C-R2C)

Engine Fan		Air Conditioning		Engine Power		Vehicle Parameters		Axle Ratio	Auxiliary Gearing Ratio	
On		Off		Standard Power Curve		Standard		12.700	2.040	
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
R2C!	0.0	1514	0	1654.41	1631.66	0.0	999.00	349.15		
R2C!	0.6	1574	51	1281.93	1259.17	202.3	190.59	122.09		70 Percent
R2C!	0.8	1740	71	1139.79	1117.03	251.3	126.95	97.15		80 Percent
R2C!	1.0	1887	90	970.26	947.51	271.8	89.36	81.19		85 Percent
R2C!	1.0	1900	92	951.57	928.82	272.2	86.27	80.24		Governed
R2C	1.3	2012	118	-0.46	-23.21	-0.2	-1.63	11.70		

Full Throttle, Reverse Performance (Standard 4.801 Ratio) (R1C-R1C)

Engine Fan		Air Conditioning		Engine Power		Vehicle Parameters		Axle Ratio	Auxiliary Gearing Ratio	
On		Off		Standard Power Curve		Standard		12.700	1.030	
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	1514	0	235.21	212.46	0.0	15.11	349.15		
R1C	1.6	1465	73	214.70	191.95	96.0	13.62	225.37		
R1C	3.2	1505	146	192.97	170.21	172.5	12.06	143.15		
R1C	4.0	1574	182	182.07	159.31	202.9	11.27	121.30		70 Percent
R1C	4.8	1654	218	171.08	148.32	229.4	10.49	106.00		
R1C	5.6	1740	254	161.84	139.07	252.1	9.83	96.26		80 Percent
R1C	6.4	1827	291	150.17	127.39	268.5	9.00	87.35		
R1C	7.1	1887	322	137.72	114.94	272.5	8.11	80.33		85 Percent
R1C	7.3	1900	329	135.06	112.28	272.9	7.92	79.40		Governed
R1C	8.0	1940	364	84.56	61.78	189.0	4.35	45.98		
R1C	9.3	2012	422	0.00	-22.79	0.0	-1.60	12.48		

Full Throttle, Reverse Performance (Optional 17.120 Ratio - LRTP Required) (R2C-R2C)

Engine Fan		Air Conditioning		Engine Power		Vehicle Parameters		Axle Ratio	Auxiliary Gearing Ratio	
On		Off		Standard Power Curve		Standard		12.700	1.030	
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
R2C!	0.0	1514	0	835.32	812.57	0.0	69.63	349.15		
R2C!	1.1	1574	51	647.25	624.49	202.3	48.88	122.09		70 Percent
R2C!	1.6	1740	71	575.48	552.73	251.3	42.19	97.15		80 Percent
R2C!	1.6	1755	73	569.97	547.21	254.8	41.69	95.97		
R2C	2.0	1887	90	489.89	467.13	271.8	34.78	81.19		85 Percent
R2C	2.0	1900	92	480.45	457.70	272.2	34.00	80.24		Governed
R2C	2.6	2012	118	0.00	-22.75	0.0	-1.60	11.70		