

## Allison Transmission Bundled Report

Application	116-A353471-1
Iteration	1
Date	April 4, 2025 12:20:58
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 2500Nm - 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 2500Nm -- without SEM/LRTP (116-L032705-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) - Unacceptable
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)	40.4	40.4
Alternator / Generator	2.2	2.2
Air Compressor	2.5	2.5
Steering Pump	2.5	2.5
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 2500Nm -- without SEM/LRTP (116-L032705-E, Rev A)
Engine Controls Type	Electronic
Evaluate at Altitude	No
Certifications	
Displacement	15.60 l
Peak Torque	2500.0 N-m
Peak Torque Speed	1300 rpm
Peak Power	445.1 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	209.4	2500.0	202.1	2412.2	205.1	2448.2	
900	235.6	2500.0	226.7	2405.6	231.0	2451.1	
1000	261.8	2500.0	251.0	2397.3	256.9	2453.5	
1100	288.0	2500.0	275.0	2387.4	282.8	2455.4	
1200	314.2	2500.0	298.6	2376.1	308.8	2457.1	
1300	340.3	2500.0	321.7	2363.4	334.7	2458.4	Peak Torque
1400	366.5	2500.0	344.4	2349.4	360.6	2459.6	
1500	392.7	2500.0	366.6	2334.1	386.5	2460.6	
1600	418.9	2500.0	388.3	2317.5	412.4	2461.5	
1700	445.1	2500.0	409.4	2299.8	438.3	2462.3	Peak Power
1800	447.0	2371.4	405.7	2152.2	440.0	2334.4	
1900	447.0	2246.6	399.4	2007.2	439.8	2210.2	Governed
2030	0.0	0.0	-56.8	-267.4	-7.6	-35.7	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	209.4	2500.0	202.1	2412.2	205.1	2448.2	
900	235.6	2500.0	226.7	2405.6	231.0	2451.1	
1000	261.8	2500.0	251.0	2397.3	256.9	2453.5	
1100	288.0	2500.0	275.0	2387.4	282.8	2455.4	
1200	314.2	2500.0	298.6	2376.1	308.8	2457.1	
1300	340.3	2500.0	321.7	2363.4	334.7	2458.4	Peak Torque
1400	366.5	2500.0	344.4	2349.4	360.6	2459.6	
1500	392.7	2500.0	366.6	2334.1	386.5	2460.6	
1600	418.9	2500.0	388.3	2317.5	412.4	2461.5	
1700	445.1	2500.0	409.4	2299.8	438.3	2462.3	Peak Power
1800	447.0	2371.4	405.7	2152.2	440.0	2334.4	
1900	447.0	2246.6	399.4	2007.2	439.8	2210.2	Governed
2030	0.0	0.0	-56.8	-267.4	-7.6	-35.7	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) - Unacceptable
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

<b>!</b>		<b>Section Score - XXX</b>	
<b>C01</b>	<b>✓</b>	<b>Transmission / Converter Compatibility</b>	
Overall Status		OK: Acceptable	
<b>C02</b>	<b>✓</b>	<b>Engine / Converter Compatibility</b>	
Overall Status		OK: Acceptable	
<b>C04</b>	<b>!</b>	<b>Engine Speed at Converter Stall</b>	
Overall Status		Reference	
Actual		1557 rpm	
<b>C05</b>	<b>✓</b>	<b>Minimum Engine Speed</b>	
Overall Status		OK: Acceptable	
Rating/Recommendation		900 rpm (Min)	
Actual		1490 rpm	
Notes		Net peak torque speed (800 rpm) + allowable variation (100 rpm).	
<b>C07</b>	<b>!</b>	<b>Turbine Torque at Converter Stall</b>	
Overall Status		XXX: Not Acceptable - rating or usage violation	
Rating/Recommendation		3525.0 N-m (Max)	
Actual		3720.3 N-m	
<b>C08</b>	<b>✓</b>	<b>Converter Speed Ratio at Engine Governed Speed</b>	
Overall Status		OK: Acceptable	
Rating/Recommendation		0.800 (Min)	
Actual		0.835	
<b>C03</b>	<b>!</b>	<b>Converter Stall Torque Ratio</b>	
Overall Status		Reference	
Actual		1.620	

## Transmission Rating And Guideline Checks

 <b>Section Score - OK</b>		
<b>T01</b>		<b>Transmission / Vocation Compatibility</b>
Overall Status		OK: Acceptable
<b>T02</b>		<b>Transmission / Engine Compatibility</b>
Overall Status		OK: Acceptable
<b>T17</b>		<b>Transmission Permitted in End User/Chassis Mfg Locations</b>
Overall Status		OK: Acceptable
<b>T15</b>		<b>Transmission Input Power (Gross)</b>
Overall Status		OK: Acceptable
Rating/Recommendation		447.0 kW (Max)
Actual		447.0 kW
<b>T14</b>		<b>Transmission Input Torque (Gross)</b>
Overall Status		OK: Acceptable
Rating/Recommendation		2508.0 N-m (Max)
Actual		2500.0 N-m
<b>T03</b>		<b>Transmission Input Speed</b>
Overall Status		OK: Acceptable
Rating/Recommendation		1700 rpm / 2300 rpm
Actual		1900 rpm
<b>T04</b>		<b>Transmission Output Speed</b>
Overall Status		Reference
Actual		2973 rpm
Notes		Check made in Range 7L at 1900 rpm Engine Governed Speed.

## Vehicle Rating And Guideline Checks - Standard

 <b>Section Score - C</b>		
<b>V22</b>		<b>2nd Range Converter Stall Gradeability</b>
Overall Status		Reference
Actual		25.10 %
<b>V47</b>		<b>2nd Range 80% Converter Efficiency Gradeability</b>
Overall Status		Reference
Actual		15.712
<b>V16</b>		<b>Gradeability Required at Governed Speed</b>
Overall Status		OK: Acceptable
Rating/Recommendation		8.00 % (Min)
Actual		28.35 %
Notes		Check is in Lockup Mode.
<b>V17</b>		<b>Maximum Geared Vehicle Speed at Engine Governed Speed</b>
Overall Status		Reference
Actual		65.7 km/h
Notes		Check is in 7L Lockup.
<b>V18</b>		<b>Maximum Speed on 0.5% Grade</b>
Overall Status		C: Consider - manufacturer to assess
Rating/Recommendation		104.6 km/h (Min)
Actual		41.6 km/h
Notes		At 1863.1 rpm Engine Speed, Range 6L.
<b>V45</b>		<b>Heat Generated in 2nd Range 80% Converter Efficiency</b>
Overall Status		Reference
Actual		94.32 kW
Notes		At 1759.9 rpm Engine Speed.

Allison Transmission  
Vehicle Performance Summary

Note

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Full Throttle, Automatic Upshifts (Gradeability)

Engine Fan	Air Conditioning	Engine Power	Vehicle Parameters	Axle Ratio	Auxiliary Gearing Ratio
On	Off	Standard Power Curve	Standard	12.700	2.040

Gradeability	Percent Grade	Vehicle Speed (km/h)	Gear Range	Match Point
Stall Gradeability	25.1	0.0	2C	Stall
Launch Gradeability	23.1	0.0	2C	
Low Speed Gradeability	15.7	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	30.8	7L	
	2.0	20.4	5L	
	3.0	15.1	5L	
	4.0	14.3	4L	
	5.0	10.7	3L	
	6.0	10.7	3L	
	7.0	9.5	3L	
	8.0	7.0	3C	
	9.0	5.7	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	11.6	0.0	2C	Stall
Launch Gradeability	9.6	0.0	2C	
Low Speed Gradeability	7.1	7.8	2C	80 Percent
Maximum Speed on Grade	0.0	43.5	6L	Road Load
	0.3	40.3	5L	
	0.5	39.1	5L	
	1.0	28.2	4L	
	2.0	21.2	3L	
	3.0	14.8	3C	
	4.0	9.7	3C	
	5.0	9.0	2C	
	6.0	9.0	2C	
	7.0	7.8	2C	
	8.0	6.5	2C	
	9.0	4.8	2C	
	10.0	3.0	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	11.7	43
0 - 30 km/h	31.5	183
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	13.5	47
0 - 30 km/h	34.9	202
0 - 40 km/h	83.1	675
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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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	1557	0	368.94	346.19	0.0	25.10	379.10		
2C	1.6	1492	144	322.06	299.31	144.0	21.53	194.67		
2C	2.8	1617	255	283.65	260.89	224.3	18.66	126.61	70 Percent	
2C	3.2	1669	288	271.98	249.23	243.2	17.80	115.22		
2C	3.9	1760	351	243.47	220.71	264.9	15.71	93.95	80 Percent	
2C	4.5	1837	406	216.88	194.12	273.0	13.78	80.51		
3C	4.5	1568	406	161.22	138.46	202.9	9.78	141.47		
3C	4.8	1588	433	158.53	135.77	212.6	9.59	134.36		
3C	6.4	1706	577	142.82	120.05	255.4	8.47	107.18		
3C	7.5	1777	668	129.72	106.94	268.6	7.54	88.85		
3L	7.5	1273	668	125.02	102.24	258.9	7.21	9.31		
3L	8.0	1374	721	124.24	101.46	277.7	7.15	10.13		
3L	9.7	1649	865	121.71	98.92	326.5	6.97	12.53		
3L	10.7	1824	957	111.28	88.47	330.2	6.23	13.67		
4L	10.7	1368	957	93.47	70.66	277.3	4.98	9.08		
4L	11.3	1442	1009	92.98	70.17	291.0	4.94	9.71		
4L	12.9	1648	1154	91.46	68.63	327.1	4.83	11.65		
4L	14.3	1825	1277	83.52	60.67	330.7	4.27	13.01		
5L	14.3	1277	1277	65.85	43.00	260.7	3.03	8.07		
5L	14.5	1298	1298	65.76	42.90	264.6	3.02	8.31		
5L	16.1	1442	1442	65.03	42.15	290.7	2.97	9.91		
5L	17.7	1586	1586	64.22	41.32	315.8	2.91	11.79		
5L	19.3	1730	1730	62.23	39.30	333.9	2.76	13.41		
5L	20.4	1825	1825	58.18	35.23	329.2	2.48	14.75		
6L	20.4	1345	1825	47.35	24.39	267.9	1.72	15.10		
6L	20.9	1382	1875	47.20	24.24	274.3	1.70	15.79		
6L	22.5	1488	2019	46.76	23.76	292.7	1.67	17.80		
6L	24.1	1594	2163	46.30	23.26	310.5	1.64	19.80		
6L	25.7	1700	2307	45.81	22.73	327.7	1.60	21.82		
6L	27.4	1807	2451	42.47	19.35	322.7	1.36	23.55		
6L	27.6	1825	2476	41.90	18.78	321.7	1.32	23.67		
7L	27.6	1582	2476	39.63	16.50	304.2	1.16	24.67		
7L	29.0	1659	2596	39.32	16.16	316.4	1.14	26.42		
7L	30.6	1751	2740	37.77	14.55	320.8	1.02	28.12		
7L	32.2	1843	2884	35.25	11.99	315.2	0.84	30.21		
7L	33.2	1900	2973	33.69	10.39	310.6	0.73	32.07	Governed	
7L	33.8	1935	3028	22.59	-0.73	212.0	-0.05	31.97		
7L	35.0	2006	3139	0.00	-23.36	0.0	-1.64	31.76		

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	1557	0	793.26	770.50	0.0	64.47	379.10		
1C!	1.3	1617	117	608.20	585.45	221.4	45.18	130.12	70 Percent	
1C!	1.6	1706	144	560.54	537.79	250.6	40.85	112.84		
1C	1.8	1760	161	521.30	498.54	261.0	37.44	98.54	80 Percent	
1C	2.0	1807	177	485.53	462.77	266.4	34.42	90.15		
1L	2.0	1350	177	487.40	464.64	267.5	34.57	16.76		
1L	2.8	1900	249	410.59	387.83	317.1	28.35	24.32	Governed	
1L	2.9	2014	264	-16.28	-39.03	-13.3	-2.75	17.40		

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	1557	0	368.94	346.19	0.0	25.10	379.10		
2C	1.6	1492	144	322.06	299.31	144.0	21.53	194.67		
2C	2.8	1617	255	283.65	260.89	224.3	18.66	126.61	70 Percent	
2C	3.2	1669	288	271.98	249.23	243.2	17.80	115.22		
2C	3.6	1723	325	256.33	233.57	258.3	16.65	103.12		
2L	3.6	1141	325	230.73	207.97	232.5	14.78	9.66		
2L	4.8	1518	433	225.03	202.27	301.8	14.37	13.68		
2L	6.0	1900	541	192.34	169.57	322.8	12.01	17.61	Governed	
2L	6.4	2011	573	-0.27	-23.04	-0.5	-1.62	14.61		

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	1557	0	186.28	163.53	0.0	11.58	379.10		
2C	1.6	1522	73	173.94	151.19	77.8	10.69	279.58		
2C	3.2	1493	146	162.36	139.61	145.2	9.87	193.37		
2C	4.8	1565	218	149.64	126.88	200.7	8.96	143.46		
2C	5.6	1617	255	143.21	120.45	224.3	8.50	126.61	70 Percent	
2C	6.4	1673	291	136.77	114.00	244.6	8.04	114.49		
2C	7.8	1760	351	122.93	100.15	264.9	7.06	93.95	80 Percent	
2C	8.0	1778	364	119.61	96.83	267.4	6.83	90.30		
2C	9.0	1837	406	109.51	86.71	273.0	6.11	80.51		
3C	9.0	1568	406	81.40	58.61	202.9	4.13	141.47		
3C	9.7	1592	437	79.82	57.03	214.1	4.01	133.28		
3C	11.3	1650	510	76.07	53.25	238.0	3.75	117.42		
3C	12.9	1710	582	71.73	48.90	256.5	3.44	105.63		
3C	14.5	1767	655	66.44	43.59	267.3	3.07	90.78		
3C	14.8	1777	668	65.50	42.64	268.6	3.00	88.85		
3L	14.8	1273	668	63.12	40.26	258.9	2.83	9.31		
3L	16.1	1388	728	62.67	39.79	280.2	2.80	10.26		
3L	17.7	1526	801	62.06	39.15	305.2	2.75	11.44		
3L	19.3	1665	874	61.37	38.44	329.2	2.70	12.68		
3L	20.9	1804	946	56.98	34.02	331.2	2.39	13.74		
3L	21.2	1824	957	56.18	33.21	330.2	2.34	13.67		
4L	21.2	1368	957	47.19	24.22	277.3	1.70	9.08		
4L	22.5	1457	1019	46.90	23.89	293.5	1.68	9.84		
4L	24.1	1561	1092	46.52	23.48	311.9	1.65	10.81		
4L	25.7	1665	1165	46.12	23.04	329.9	1.62	11.82		
4L	27.4	1769	1238	43.88	20.76	333.5	1.46	12.46		
4L	28.2	1825	1277	42.17	19.03	330.7	1.34	13.01		
5L	28.2	1277	1277	33.25	10.10	260.7	0.71	8.07		
5L	29.0	1310	1310	33.17	10.00	266.9	0.70	8.43		
5L	30.6	1383	1383	32.99	9.78	280.2	0.69	9.24		
5L	32.2	1456	1456	32.80	9.53	293.2	0.67	10.08		
5L	33.8	1529	1529	32.59	9.28	306.0	0.65	11.01		
5L	35.4	1602	1602	32.38	9.01	318.5	0.63	12.02		
5L	37.0	1675	1675	32.16	8.73	330.7	0.61	12.95		
5L	38.6	1747	1747	31.05	7.56	333.2	0.53	13.58		
5L	40.2	1820	1820	29.48	5.93	329.5	0.42	14.72		
5L	40.3	1825	1825	29.38	5.82	329.2	0.41	14.75		
6L	40.3	1345	1825	23.91	0.35	267.9	0.02	15.10		
6L	41.8	1395	1893	23.81	0.19	276.7	0.01	16.06		
6L	43.5	1449	1966	23.69	0.01	286.0	0.00	17.04		
6L	45.1	1502	2039	23.58	-0.18	295.1	-0.01	18.09		
6L	46.7	1556	2111	23.46	-0.37	304.2	-0.03	19.05		
6L	48.3	1610	2184	23.34	-0.56	313.1	-0.04	20.09		
6L	49.9	1663	2257	23.22	-0.76	321.8	-0.05	21.08		
6L	51.5	1717	2330	22.87	-1.20	327.1	-0.08	21.89		
6L	53.1	1771	2403	22.01	-2.14	324.7	-0.15	22.71		
6L	54.7	1824	2475	21.16	-3.07	321.7	-0.22	23.67		
6L	54.7	1825	2476	21.16	-3.08	321.7	-0.22	23.67		
7L	54.7	1582	2476	20.01	-4.23	304.2	-0.30	24.67		
7L	56.3	1628	2548	19.92	-4.41	311.6	-0.31	25.73		
7L	57.9	1675	2621	19.82	-4.59	319.0	-0.32	26.81		
7L	59.5	1721	2694	19.48	-5.03	322.1	-0.35	27.62		
7L	61.2	1768	2767	18.83	-5.77	319.9	-0.41	28.53		
7L	62.8	1814	2839	18.19	-6.51	317.1	-0.46	29.70		
7L	64.4	1861	2912	17.55	-7.25	313.8	-0.51	30.68		
7L	65.7	1900	2973	17.01	-7.88	310.6	-0.55	32.07	Governed	
7L	66.0	1907	2985	15.82	-9.09	290.0	-0.64	32.05		
7L	67.6	1954	3058	8.36	-16.65	157.0	-1.17	31.92		
7L	69.2	2000	3131	0.90	-24.22	17.3	-1.70	31.79		
7L	69.4	2006	3139	0.00	-25.13	0.0	-1.77	31.76		

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	1557	0	400.52	377.76	0.0	27.56	379.10		
1C	1.6	1500	73	343.72	320.97	153.7	23.17	184.89		
1C	2.6	1617	117	307.08	284.33	221.4	20.41	130.12	70 Percent	
1C	3.2	1710	146	281.53	258.77	251.7	18.51	111.35		
1C	3.6	1760	161	263.20	240.45	261.0	17.16	98.54	80 Percent	
1C	3.9	1807	177	245.14	222.38	266.4	15.83	90.15		
1L	3.9	1350	177	246.09	223.33	267.5	15.90	16.76		
1L	4.8	1666	218	239.97	217.20	321.8	15.46	21.57		
1L	5.5	1900	249	207.31	184.54	317.1	13.09	24.32	Governed	
1L	5.8	2010	264	-0.80	-23.56	-1.3	-1.66	17.65		

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	1557	0	186.28	163.53	0.0	11.58	379.10		
2C	1.6	1522	73	173.94	151.19	77.8	10.69	279.58		
2C	3.2	1493	146	162.36	139.61	145.2	9.87	193.37		
2C	4.8	1565	218	149.64	126.88	200.7	8.96	143.46		
2C	5.6	1617	255	143.21	120.45	224.3	8.50	126.61	70 Percent	
2C	6.4	1673	291	136.77	114.00	244.6	8.04	114.49		
2C	7.2	1723	325	129.42	106.64	258.3	7.52	103.12		
2L	7.2	1141	325	116.50	93.72	232.5	6.61	9.66		
2L	8.0	1278	364	115.54	92.76	258.3	6.54	11.13		
2L	9.7	1533	437	113.48	90.69	304.4	6.39	13.83		
2L	11.3	1789	510	105.28	82.47	329.5	5.81	16.43		
2L	12.0	1900	541	97.11	74.29	322.8	5.23	17.61	Governed	
2L	12.7	2011	573	0.00	-22.83	0.0	-1.61	14.62		

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	1557	0	492.14	469.39	0.0	34.97	379.10		
R1C	1.6	1537	144	407.22	384.47	182.0	28.08	159.45		
R1C	2.1	1617	187	380.98	358.23	220.3	26.03	131.40	70 Percent	
R1C	2.9	1760	257	327.63	304.87	260.6	21.95	99.03	80 Percent	
R1C	3.2	1821	288	299.29	276.54	267.6	19.83	87.90		
R1C	3.6	1883	322	271.75	248.99	271.0	17.79	79.87	85 Percent	
R1C	3.7	1900	330	264.80	242.04	271.2	17.27	78.64	Governed	
R1C	4.7	2011	422	0.00	-22.76	0.0	-1.60	12.47		

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	1557	0	1747.79	1725.04	0.0	999.00	379.10		
R2C!	0.6	1617	52	1354.29	1331.54	219.6	266.85	132.26		70 Percent
R2C!	0.8	1760	72	1164.98	1142.23	259.8	134.87	99.95		80 Percent
R2C!	1.0	1883	90	966.64	943.88	270.3	88.75	80.72		85 Percent
R2C!	1.0	1900	93	941.97	919.21	270.5	84.73	79.47		Governed
R2C	1.3	2012	118	-0.66	-23.41	-0.2	-1.65	11.68		

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	1557	0	248.48	225.73	0.0	16.08	379.10		
R1C	1.6	1507	73	227.50	204.75	101.7	14.55	247.85		
R1C	3.2	1540	146	205.17	182.41	183.4	12.93	158.30		
R1C	4.1	1617	187	192.36	169.60	220.3	12.01	131.40		70 Percent
R1C	4.8	1684	218	181.80	159.04	243.8	11.26	117.76		
R1C	5.7	1760	257	165.42	142.65	260.6	10.08	99.03		80 Percent
R1C	6.4	1826	291	149.90	127.12	268.0	8.98	87.04		
R1C	7.1	1883	322	137.21	114.43	271.0	8.07	79.87		85 Percent
R1C	7.3	1900	330	133.70	110.92	271.2	7.82	78.64		Governed
R1C	8.0	1939	364	84.23	61.45	188.3	4.33	45.76		
R1C	9.3	2011	422	0.00	-22.79	0.0	-1.60	12.47		

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	1557	0	882.46	859.71	0.0	75.90	379.10		
R2C!	1.2	1617	52	683.78	661.03	219.6	52.51	132.26		70 Percent
R2C!	1.6	1760	72	588.20	565.45	259.8	43.34	99.95		80 Percent
R2C!	1.6	1766	73	583.04	560.29	260.6	42.87	98.70		
R2C	2.0	1883	90	488.06	465.30	270.3	34.63	80.72		85 Percent
R2C	2.0	1900	93	475.60	452.85	270.5	33.60	79.47		Governed
R2C	2.6	2012	118	0.00	-22.75	0.0	-1.60	11.69		