

Allison Transmission
Bundled Report

Application	116-A355080-1
Iteration	1
Date	April 23, 2025 14:02:06
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 red. 447kW 2345Nm - 4700 - Tractor empty
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 2345Nm -- without SEM/LRTP (116-L033081-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 Vehicle Weight	34000 kg (no Trailer)
Weight On Drive Wheels	34000 kg (100.00%)

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)	39.4	39.4
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 2345Nm -- without SEM/LRTP (116-L033081-E, Rev A)
Engine Controls Type	Electronic
Evaluate at Altitude	No
Certifications	
Displacement	15.60 l
Peak Torque	2345.0 N-m
Peak Torque Speed	1300 rpm
Peak Power	442.0 kW
Peak Power Speed	1800 rpm
Governed Power	425.0 kW
Governed Speed	2000 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	196.5	2345.0	189.7	2264.5	192.2	2294.6	
900	221.0	2345.0	212.9	2259.5	216.5	2297.5	
1000	245.6	2345.0	235.9	2252.9	240.8	2299.9	
1100	270.1	2345.0	258.6	2245.0	265.2	2301.8	
1200	294.7	2345.0	281.0	2235.8	289.5	2303.5	
1300	319.2	2345.0	303.0	2225.4	313.8	2304.8	Peak Torque
1400	343.8	2345.0	324.6	2213.9	338.1	2306.0	
1500	368.4	2345.0	345.8	2201.3	362.4	2307.0	
1600	392.9	2345.0	366.5	2187.6	386.7	2307.9	
1700	417.5	2345.0	386.8	2172.8	411.0	2308.7	
1800	442.0	2345.0	406.6	2157.1	435.3	2309.4	Peak Power
1900	447.0	2246.6	406.3	2041.9	440.0	2211.6	
2000	425.0	2029.2	378.4	1806.8	417.8	1994.8	Governed
2100	375.0	1705.2	322.0	1464.0	367.5	1671.3	
2140	0.0	0.0	-55.8	-249.0	-7.6	-33.7	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	196.5	2345.0	189.7	2264.5	192.2	2294.6	
900	221.0	2345.0	212.9	2259.5	216.5	2297.5	
1000	245.6	2345.0	235.9	2252.9	240.8	2299.9	
1100	270.1	2345.0	258.6	2245.0	265.2	2301.8	
1200	294.7	2345.0	281.0	2235.8	289.5	2303.5	
1300	319.2	2345.0	303.0	2225.4	313.8	2304.8	Peak Torque
1400	343.8	2345.0	324.6	2213.9	338.1	2306.0	
1500	368.4	2345.0	345.8	2201.3	362.4	2307.0	
1600	392.9	2345.0	366.5	2187.6	386.7	2307.9	
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2000	425.0	2029.2	378.4	1806.8	417.8	1994.8	Governed
2100	375.0	1705.2	322.0	1464.0	367.5	1671.3	
2140	0.0	0.0	-55.8	-249.0	-7.6	-33.7	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) - 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	2000 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	1.450	97.00	97.00
Aux Gearing -- Transfer Case -- Two Speed (1-L003523-DL)	High	1.040	97.00	97.00

Driveline - Overall Driveline Ratio

Description	Ratio	Standard Efficiency (%)	User Defined Efficiency (%)	N over V Ratio (rpm/kph)
High	13.208	84.55	84.55	45.669
Low	18.415	84.55	84.55	63.673

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	1513 rpm	
C05	✓	Minimum Engine Speed
Overall Status	OK: Acceptable	
Rating/Recommendation	900 rpm (Min)	
Actual	1449 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	3517.9 N-m	
C08	✓	Converter Speed Ratio at Engine Governed Speed
Overall Status	OK: Acceptable	
Rating/Recommendation	0.800 (Min)	
Actual	0.884	
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		2345.0 N-m
T03		Transmission Input Speed
Overall Status		OK: Acceptable
Rating/Recommendation		1700 rpm / 2300 rpm
Actual		2000 rpm
T04		Transmission Output Speed
Overall Status		Reference
Actual		3130 rpm
Notes		Check made in Range 7L at 2000 rpm Engine Governed Speed.

Vehicle Rating And Guideline Checks - Standard

 Section Score - C		
V22		2nd Range Converter Stall Gradeability
Overall Status		Reference
Actual		106.10 %
V47		2nd Range 80% Converter Efficiency Gradeability
Overall Status		Reference
Actual		56.534
V16		Gradeability Required at Governed Speed
Overall Status		OK: Acceptable
Rating/Recommendation		8.00 % (Min)
Actual		119.59 %
Notes		Check is in Lockup Mode.
V17		Maximum Geared Vehicle Speed at Engine Governed Speed
Overall Status		Reference
Actual		68.5 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		72.2 km/h
Notes		At 2106.1 rpm Engine Speed, Range 7L.
V45		Heat Generated in 2nd Range 80% Converter Efficiency
Overall Status		Reference
Actual		91.57 kW
Notes		At 1741.2 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	12.700	1.450

Gradeability	Percent Grade	Vehicle Speed (km/h)	Gear Range	Match Point
Stall Gradeability	106.1	0.0	2C	Stall
Launch Gradeability	104.1	0.0	2C	
Low Speed Gradeability	56.5	5.5	2C	80 Percent
Maximum Speed on Grade	0.0	52.0	7L	Road Load
	0.3	52.0	7L	
	0.5	51.9	7L	
	1.0	51.8	7L	
	2.0	51.7	7L	
	3.0	51.7	7L	
	4.0	49.9	7L	
	5.0	47.7	7L	
	6.0	42.0	7L	
	7.0	39.7	6L	
	8.0	30.2	5L	
	9.0	30.2	5L	
	10.0	30.2	5L	

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	1.040

Gradeability	Percent Grade	Vehicle Speed (km/h)	Gear Range	Match Point
Stall Gradeability	60.5	0.0	2C	Stall
Launch Gradeability	58.5	0.0	2C	
Low Speed Gradeability	37.2	7.6	2C	80 Percent
Maximum Speed on Grade	0.0	72.2	7L	Road Load
	0.3	72.0	7L	
	0.5	71.8	7L	
	1.0	71.4	7L	
	2.0	69.5	7L	
	3.0	65.0	7L	
	4.0	56.8	6L	
	5.0	42.1	5L	
	6.0	42.1	5L	
	7.0	40.5	5L	
	8.0	29.5	4L	
	9.0	29.5	4L	
	10.0	29.5	4L	

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	1.450

Speed (km/h)	Time (sec)	Distance (m)
0 - 20 km/h	2.8	9
0 - 30 km/h	5.7	29
0 - 40 km/h	9.9	71
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	1.040

Speed (km/h)	Time (sec)	Distance (m)
0 - 20 km/h	2.9	10
0 - 30 km/h	5.7	29
0 - 40 km/h	9.9	71
0 - 60 km/h	23.4	262
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	1.450	
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	1513	0	247.97	242.64	0.0	106.10	348.61		
2C	1.6	1462	102	224.52	219.19	100.4	87.24	219.09		
2C	3.2	1512	205	200.82	195.48	179.5	72.37	135.90		
2C	3.9	1573	248	190.67	185.33	206.4	66.86	116.88		70 Percent
2C	4.8	1669	307	177.26	171.92	237.7	60.18	99.33		
2C	5.5	1741	347	169.44	164.09	256.6	56.53	91.53		80 Percent
2C	6.4	1846	410	154.28	148.93	275.9	49.92	80.17		
2C	6.7	1870	427	149.08	143.72	277.7	47.77	78.00		
3C	6.7	1550	427	106.11	100.75	197.6	31.70	122.38		
3C	8.0	1620	512	100.18	94.82	223.9	29.66	105.74		
3C	9.7	1716	615	93.87	88.49	251.8	27.53	92.26		
3C	11.0	1802	703	88.45	83.05	271.2	25.72	85.86		
3L	11.0	1340	703	83.25	77.85	255.3	24.01	9.68		
3L	11.3	1367	717	83.12	77.72	260.1	23.97	9.91		
3L	12.9	1563	820	82.09	76.67	293.6	23.63	11.58		
3L	14.5	1758	922	80.90	75.46	325.5	23.24	13.34		
3L	15.9	1925	1010	73.89	68.43	325.5	20.97	14.31		
4L	15.9	1443	1010	62.21	56.75	274.1	17.27	9.60		
4L	16.1	1465	1025	62.13	56.66	277.7	17.24	9.79		
4L	17.7	1611	1127	61.48	55.99	302.3	17.04	11.18		
4L	19.3	1758	1230	60.77	55.26	326.0	16.80	12.60		
4L	20.9	1904	1332	56.90	51.35	330.7	15.59	14.02		
4L	21.2	1925	1347	55.48	49.92	325.9	15.14	13.85		
5L	21.2	1347	1347	43.79	38.23	257.3	11.54	8.82		
5L	22.5	1435	1435	43.52	37.93	272.4	11.45	9.83		
5L	24.1	1537	1537	43.17	37.55	289.5	11.33	11.12		
5L	25.7	1640	1640	42.81	37.14	306.2	11.21	12.49		
5L	27.4	1742	1742	42.43	36.72	322.4	11.08	13.86		
5L	29.0	1845	1845	41.13	35.38	331.0	10.67	15.01		
5L	30.2	1925	1925	38.60	32.81	324.1	9.89	15.97		
6L	30.2	1419	1925	31.44	25.65	264.0	7.72	16.33		
6L	30.6	1435	1947	31.40	25.60	266.7	7.70	16.63		
6L	32.2	1511	2050	31.20	25.35	279.0	7.63	18.06		
6L	33.8	1586	2152	31.00	25.10	291.0	7.55	19.47		
6L	35.4	1662	2255	30.79	24.84	302.9	7.47	20.87		
6L	37.0	1737	2357	30.58	24.57	314.4	7.39	22.31		
6L	38.6	1813	2460	30.18	24.10	323.8	7.25	23.63		
6L	40.2	1888	2562	28.85	22.71	322.4	6.83	24.98		
6L	41.0	1925	2612	27.76	21.59	316.3	6.49	25.23		
7L	41.0	1669	2612	26.28	20.11	299.4	6.04	26.47		
7L	41.8	1703	2665	26.19	19.99	304.5	6.01	27.28		
7L	43.5	1768	2767	26.03	19.76	314.2	5.94	28.77		
7L	45.1	1834	2870	25.42	19.08	318.2	5.73	30.12		
7L	46.7	1899	2972	24.40	17.99	316.4	5.40	32.11		
7L	48.3	1965	3075	22.38	15.89	300.1	4.77	33.27		
7L	49.1	2000	3130	21.28	14.75	290.5	4.43	34.81		Governed
7L	49.9	2030	3177	19.92	13.36	276.1	4.01	34.78		
7L	51.5	2096	3280	16.98	10.34	242.9	3.10	37.00		
7L	52.4	2130	3334	0.00	-6.69	0.0	-2.01	34.22		

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	1.450	
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	1513	0	533.16	527.82	0.0	999.00	348.61		
1C!	1.6	1537	102	421.94	416.60	188.6	999.00	130.40		
1C!	1.8	1573	114	408.80	403.46	203.7	999.00	120.14	70 Percent	
1C!	2.5	1741	160	362.77	357.44	252.8	999.00	96.00	80 Percent	
1C!	2.8	1821	181	340.07	334.73	268.5	999.00	89.03		
1L!	2.8	1380	181	325.10	319.76	256.7	338.42	16.80		
1L!	3.2	1563	205	320.97	315.63	287.0	293.69	19.52		
1L!	4.1	2000	262	261.13	255.79	298.7	119.59	25.16	Governed	
1L	4.4	2128	279	24.49	19.14	29.8	5.75	18.60		

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	1.450	
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	1513	0	247.97	242.64	0.0	106.10	348.61		
2C	1.6	1462	102	224.52	219.19	100.4	87.24	219.09		
2C	3.2	1512	205	200.82	195.48	179.5	72.37	135.90		
2C	3.9	1573	248	190.67	185.33	206.4	66.86	116.88	70 Percent	
2C	4.8	1669	307	177.26	171.92	237.7	60.18	99.33		
2C	5.4	1731	342	170.40	165.06	254.2	56.97	92.40		
2L	5.4	1200	342	153.55	148.20	229.0	49.62	10.15		
2L	6.4	1439	410	151.42	146.07	270.8	48.73	12.58		
2L	8.0	1799	512	147.40	142.03	329.5	47.08	16.68		
2L	8.9	2000	570	122.48	117.10	304.4	37.51	18.40	Governed	
2L	9.5	2134	608	-3.46	-8.84	-9.2	-2.65	14.87		

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	1.040

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	1513	0	177.85	172.52	0.0	60.46	348.61	
2C	1.6	1478	74	165.50	160.16	74.0	54.77	253.75	
2C	3.2	1454	147	153.89	148.55	137.6	49.76	173.43	
2C	4.8	1534	221	141.47	136.12	189.7	44.72	128.49	
2C	5.4	1573	248	136.76	131.41	206.4	42.88	116.88	70 Percent
2C	6.4	1646	294	129.19	123.83	231.0	40.00	102.62	
2C	7.6	1741	347	121.53	116.17	256.6	37.17	91.53	80 Percent
2C	8.0	1778	368	118.51	113.14	264.9	36.07	88.99	
2C	9.3	1870	427	106.93	101.55	277.7	31.98	78.00	
3C	9.3	1550	427	76.11	70.73	197.6	21.71	122.38	
3C	9.7	1561	441	75.40	70.02	202.2	21.48	119.18	
3C	11.3	1622	515	71.75	66.36	224.5	20.31	105.39	
3C	12.9	1690	588	68.45	63.03	244.8	19.25	95.23	
3C	14.5	1763	662	65.42	59.98	263.2	18.29	88.07	
3C	15.4	1802	703	63.44	57.99	271.2	17.66	85.86	
3L	15.4	1340	703	59.71	54.26	255.3	16.49	9.68	
3L	16.1	1401	735	59.50	54.04	266.0	16.42	10.22	
3L	17.7	1541	809	58.96	53.47	290.0	16.25	11.39	
3L	19.3	1681	882	58.38	52.86	313.2	16.06	12.66	
3L	20.9	1821	956	57.14	51.59	332.1	15.66	13.75	
3L	22.1	1925	1010	52.99	47.42	325.5	14.37	14.31	
4L	22.1	1443	1010	44.62	39.04	274.1	11.79	9.60	
4L	22.5	1471	1029	44.54	38.95	278.8	11.76	9.85	
4L	24.1	1576	1103	44.21	38.59	296.5	11.65	10.83	
4L	25.7	1681	1176	43.86	38.20	313.7	11.53	11.85	
4L	27.4	1786	1250	43.49	37.78	330.5	11.41	12.90	
4L	29.0	1891	1323	41.23	35.48	331.8	10.70	13.88	
4L	29.5	1925	1347	39.79	34.02	325.9	10.26	13.85	
5L	29.5	1347	1347	31.41	25.64	257.3	7.71	8.82	
5L	30.6	1397	1397	31.30	25.50	265.9	7.67	9.41	
5L	32.2	1470	1470	31.13	25.28	278.3	7.60	10.27	
5L	33.8	1544	1544	30.95	25.05	290.6	7.53	11.20	
5L	35.4	1617	1617	30.76	24.81	302.5	7.46	12.21	
5L	37.0	1691	1691	30.57	24.56	314.3	7.39	13.19	
5L	38.6	1764	1764	30.37	24.30	325.8	7.31	14.16	
5L	40.2	1838	1838	29.62	23.49	331.1	7.06	14.92	
5L	41.8	1911	1911	28.16	21.96	327.3	6.60	15.99	
5L	42.1	1925	1925	27.69	21.47	324.1	6.45	15.97	
6L	42.1	1419	1925	22.55	16.34	264.0	4.91	16.33	
6L	43.5	1463	1985	22.47	16.20	271.2	4.86	17.15	
6L	45.1	1517	2058	22.37	16.03	280.0	4.81	18.17	
6L	46.7	1571	2132	22.26	15.85	288.6	4.76	19.17	
6L	48.3	1625	2205	22.16	15.67	297.2	4.71	20.19	
6L	49.9	1680	2279	22.05	15.49	305.6	4.65	21.22	
6L	51.5	1734	2352	21.94	15.29	313.9	4.59	22.24	
6L	53.1	1788	2426	21.83	15.10	322.1	4.53	23.29	
6L	54.7	1842	2499	21.28	14.46	323.4	4.34	23.99	
6L	56.3	1896	2573	20.59	13.69	322.2	4.11	25.19	
6L	57.2	1925	2612	19.91	12.96	316.3	3.89	25.23	
7L	57.2	1669	2612	18.85	11.89	299.4	3.57	26.47	
7L	57.9	1691	2646	18.81	11.81	302.7	3.55	27.00	
7L	59.5	1738	2720	18.72	11.63	309.7	3.49	28.07	
7L	61.2	1785	2793	18.64	11.45	316.6	3.44	29.18	
7L	62.8	1832	2867	18.25	10.97	318.3	3.29	30.08	
7L	64.4	1879	2940	17.73	10.35	317.0	3.10	31.36	
7L	66.0	1926	3014	16.92	9.43	310.1	2.83	32.32	
7L	67.6	1973	3088	15.87	8.27	297.9	2.48	33.57	
7L	68.5	2000	3130	15.26	7.61	290.5	2.28	34.81	Governed
7L	69.2	2020	3161	14.62	6.92	281.1	2.08	34.72	
7L	70.8	2067	3235	13.11	5.30	257.9	1.59	35.64	
7L	72.4	2114	3308	6.57	-1.36	132.2	-0.41	34.85	

7L	73.0	2130	3334	0.00	-7.97	0.0	-2.39	34.22	
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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	1.040

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	1513	0	382.40	377.07	0.0	999.00	348.61	
1C!	1.6	1463	74	325.50	320.16	145.5	343.83	165.95	
1C!	2.5	1573	114	293.21	287.87	203.7	171.11	120.14	70 Percent
1C!	3.2	1690	147	268.53	263.19	240.1	128.56	100.84	
1C!	3.5	1741	160	260.20	254.86	252.8	118.54	96.00	80 Percent
1C!	4.0	1821	181	243.91	238.57	268.5	102.42	89.03	
1L	4.0	1380	181	233.17	227.83	256.7	93.59	16.80	
1L	4.8	1682	221	228.09	222.75	305.9	89.78	21.37	
1L	5.7	2000	262	187.29	181.94	298.7	65.12	25.16	Governed
1L	6.1	2134	280	-7.47	-12.83	-12.7	-3.85	18.13	

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	1.040

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	1513	0	177.85	172.52	0.0	60.46	348.61	
2C	1.6	1478	74	165.50	160.16	74.0	54.77	253.75	
2C	3.2	1454	147	153.89	148.55	137.6	49.76	173.43	
2C	4.8	1534	221	141.47	136.12	189.7	44.72	128.49	
2C	5.4	1573	248	136.76	131.41	206.4	42.88	116.88	70 Percent
2C	6.4	1646	294	129.19	123.83	231.0	40.00	102.62	
2C	7.5	1731	342	122.22	116.86	254.2	37.42	92.40	
2L	7.5	1200	342	110.13	104.77	229.0	33.10	10.15	
2L	8.0	1290	368	109.59	104.22	244.9	32.91	11.07	
2L	9.7	1548	441	107.80	102.42	289.2	32.28	13.77	
2L	11.3	1806	515	105.34	99.95	329.7	31.42	16.69	
2L	12.5	2000	570	87.84	82.43	304.4	25.52	18.40	Governed
2L	12.9	2064	588	76.66	71.25	274.2	21.87	17.87	
2L	13.3	2133	608	-0.14	-5.57	-0.5	-1.67	14.84	

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	1.450

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	1513	0	330.78	325.44	0.0	448.67	348.61	
R1C!	1.6	1451	102	289.91	284.57	129.6	163.77	182.23	
R1C!	2.8	1573	181	256.18	250.84	202.8	114.19	121.21	70 Percent
R1C!	3.2	1623	205	246.23	240.89	220.1	104.49	110.90	
R1C	4.0	1741	254	228.05	222.71	252.5	89.75	96.40	80 Percent
R1C	4.8	1861	307	203.55	198.20	273.0	73.92	83.55	
R1C	5.1	1892	323	195.07	189.72	275.0	69.19	81.08	85 Percent
R1C	5.8	2000	368	163.98	158.63	263.5	54.09	66.76	Governed
R1C	6.4	2107	410	110.42	105.07	197.5	33.20	21.88	
R1C	7.0	2132	446	1.36	-4.00	2.6	-1.20	12.69	

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	1.450	
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	1513	0	1174.71	1169.38	0.0	999.00	348.61		
R2C!	0.8	1573	51	910.69	905.35	202.1	999.00	122.00		70 Percent
R2C!	1.1	1741	71	810.93	805.60	251.7	999.00	97.29		80 Percent
R2C!	1.4	1892	91	693.87	688.54	274.3	999.00	81.95		85 Percent
R2C!	1.6	1991	102	590.74	585.41	264.1	999.00	68.65		
R2C!	1.6	2000	103	583.52	578.18	262.9	999.00	67.47		Governed
R2C	2.0	2132	125	6.10	0.76	3.3	0.23	11.89		

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	1.040	
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	1513	0	237.25	231.91	0.0	96.81	348.61		
R1C	1.6	1463	74	216.26	210.92	96.7	81.68	223.70		
R1C	3.2	1507	147	194.18	188.84	173.6	68.72	141.85		
R1C	4.0	1573	181	183.74	178.40	202.8	63.33	121.21		70 Percent
R1C	4.8	1659	221	172.19	166.84	230.9	57.79	105.34		
R1C	5.6	1741	254	163.57	158.22	252.5	53.91	96.40		80 Percent
R1C	6.4	1834	294	151.19	145.84	270.4	48.64	86.74		
R1C	7.1	1892	323	139.91	134.55	275.0	44.11	81.08		85 Percent
R1C	8.0	1997	368	118.05	112.69	263.9	35.91	67.11		
R1C	8.1	2000	368	117.61	112.25	263.5	35.75	66.76		Governed
R1C	9.7	2129	441	10.93	5.55	29.3	1.67	13.71		
R1C	9.8	2132	446	0.98	-4.41	2.6	-1.32	12.69		

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	1.040	
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	1513	0	842.55	837.22	0.0	999.00	348.61		
R2C!	1.1	1573	51	653.18	647.85	202.1	999.00	122.00		70 Percent
R2C!	1.6	1741	71	581.63	576.30	251.7	999.00	97.29		80 Percent
R2C!	1.6	1762	74	573.89	568.56	256.6	999.00	95.72		
R2C!	2.0	1892	91	497.67	492.34	274.3	999.00	81.95		85 Percent
R2C!	2.3	2000	103	418.53	413.19	262.9	999.00	67.47		Governed
R2C	2.7	2132	125	4.37	-0.97	3.3	-0.29	11.89		