



CITY AND COUNTY OF SAN FRANCISCO
San Francisco Municipal Transportation Agency
Request for Proposals
THE PROCUREMENT OF
30-Foot, 40-FOOT AND 60-FOOT LOW FLOOR
DIESEL HYBRID COACHES

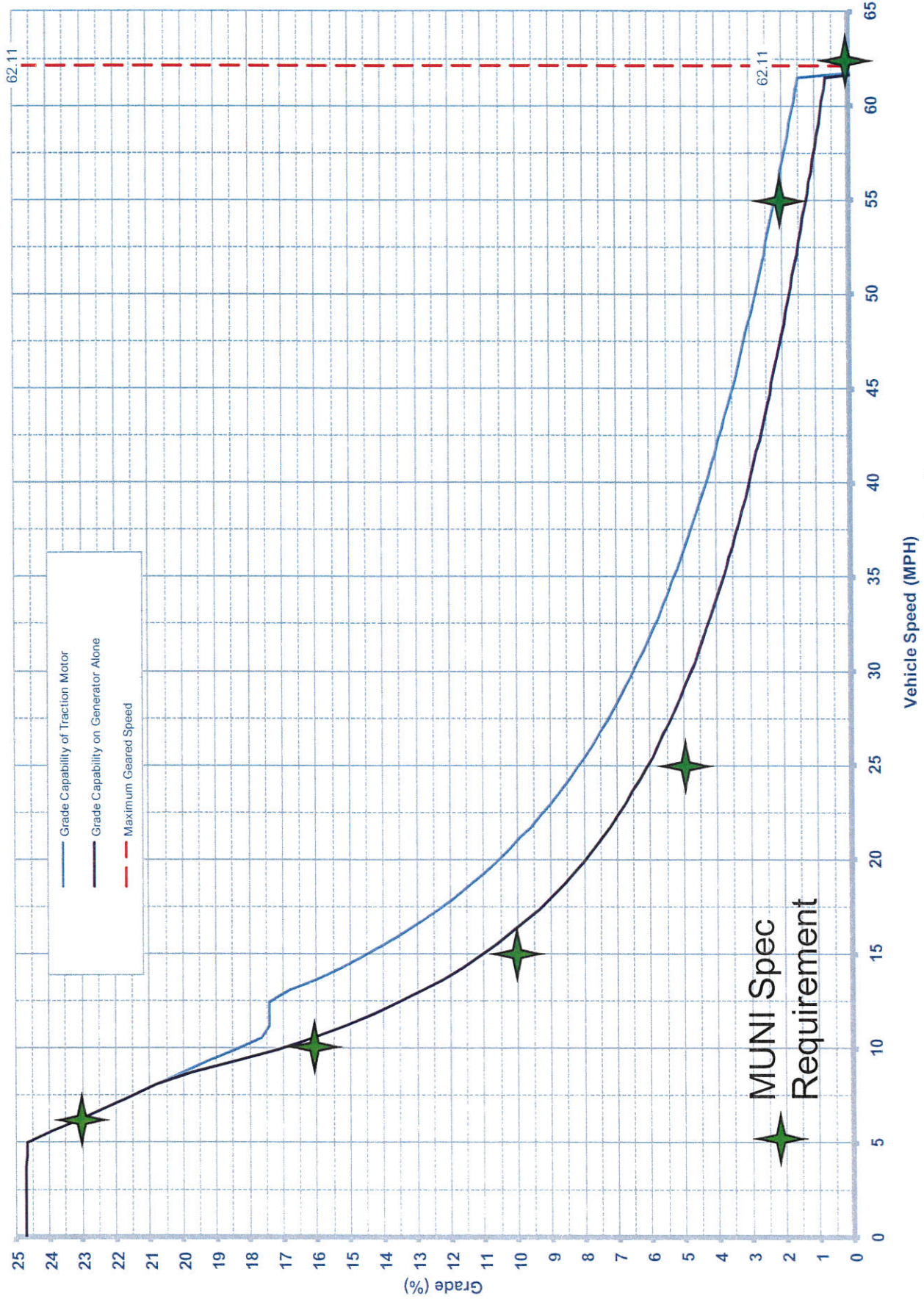
Proposal Section	Title	Bid Submission Requirements
3-D	Performance Curves	1) Supply coach performance curves and data, indicating time, distance, speed, acceleration, complete engine and motor usage (second by second) and energy storage system state of charge (during the entire set of performance runs) for a coach at the load referenced in Section 1.3 of the Technical Specification-Volume 2 for 0%, 5%, 10% and 16% grades. 2) Supply coach performance curves and data for the speed reduction operation of the regenerative braking system for the grades and load required in D.1 above. Include specific second by second data showing regenerative electrical power captured. 3) Discuss how the gear ratios (motor, rear axle, and any other gear ratio transfer device) have been selected for optimal performance in San Francisco and designed for maximum life.

New Flyer is providing performance curves with both models proposed. Both BAE and Allison hybrids systems are provided. The axle ratios are recommended by BAE and Allison for optimal performance.

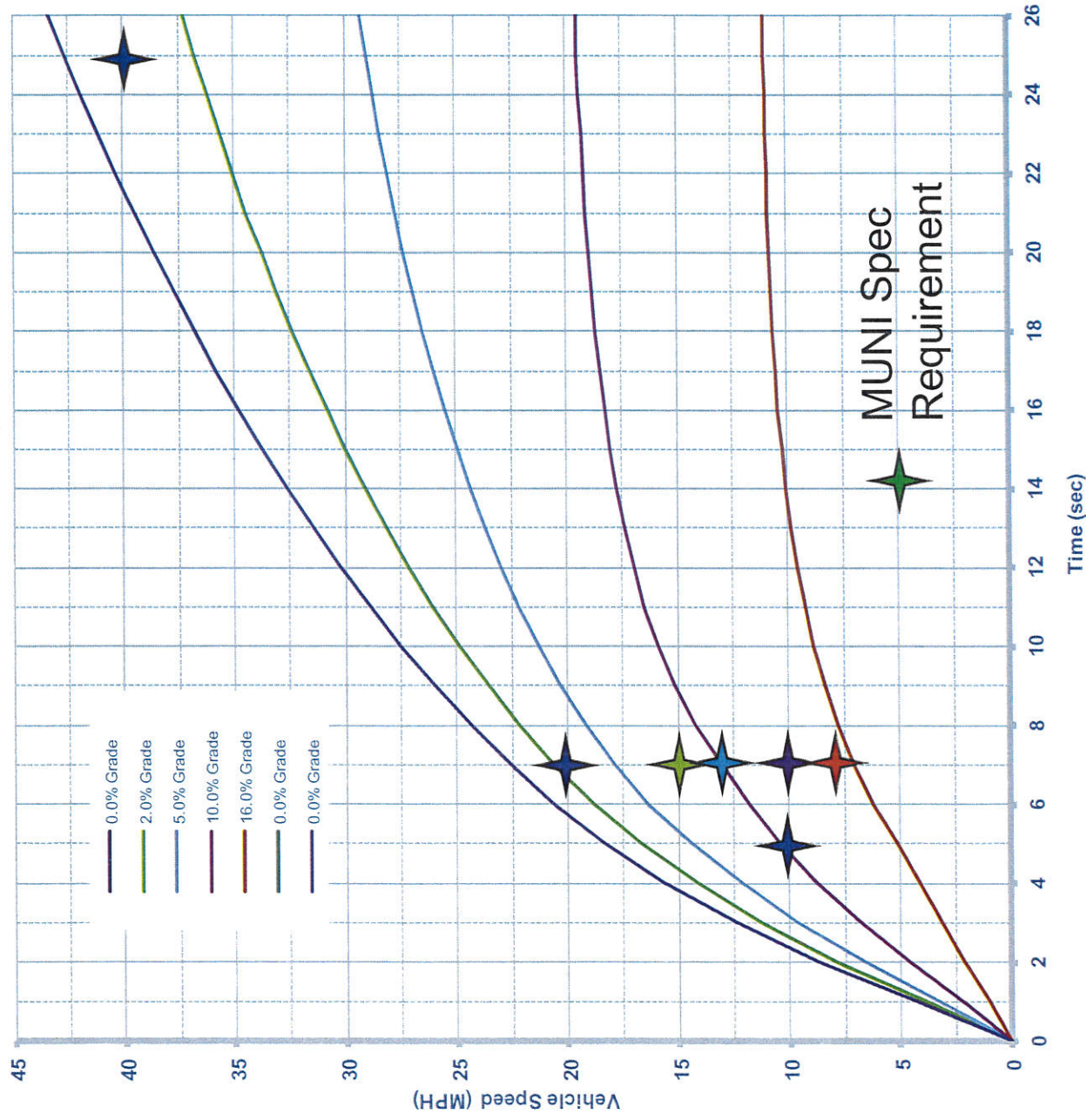
SF-MUNI Hybrid – Vehicle Characteristics - - Updated NFI Inputs 27 July 2012

- Empty Weight: 28,500 lbs
- Pax + Driver 85 +1 = 12,900 lbs
- **GVW** **41,400 lbs**
- Tires (~~12R22.5~~) 305/70R22.5 at (~~484~~) 519 rev/mile, Firestone
- Crr 0.0061
- Rf 1.5 <30mph / 1.2 >30mph
- Cd (~~0.65~~) 0.60
- Af 80 sq.ft.
- Accessory Load 24 kW
- Engine Power 280 hp
- **Rear Axle Ratio** **4.625:1 / 4.111:1**

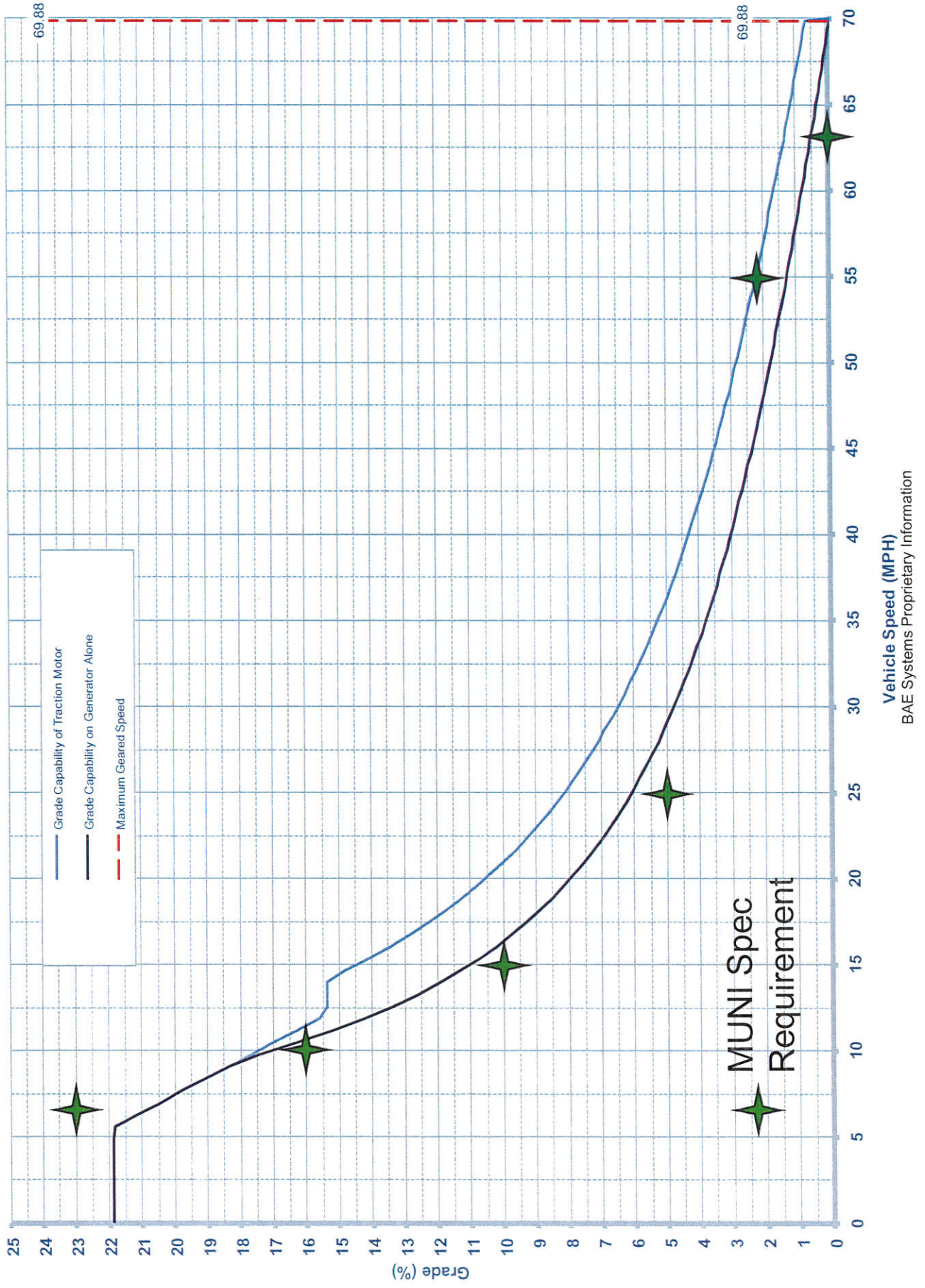
Grade Capability – HEV @ GWV - 4.625 Axle Ratio



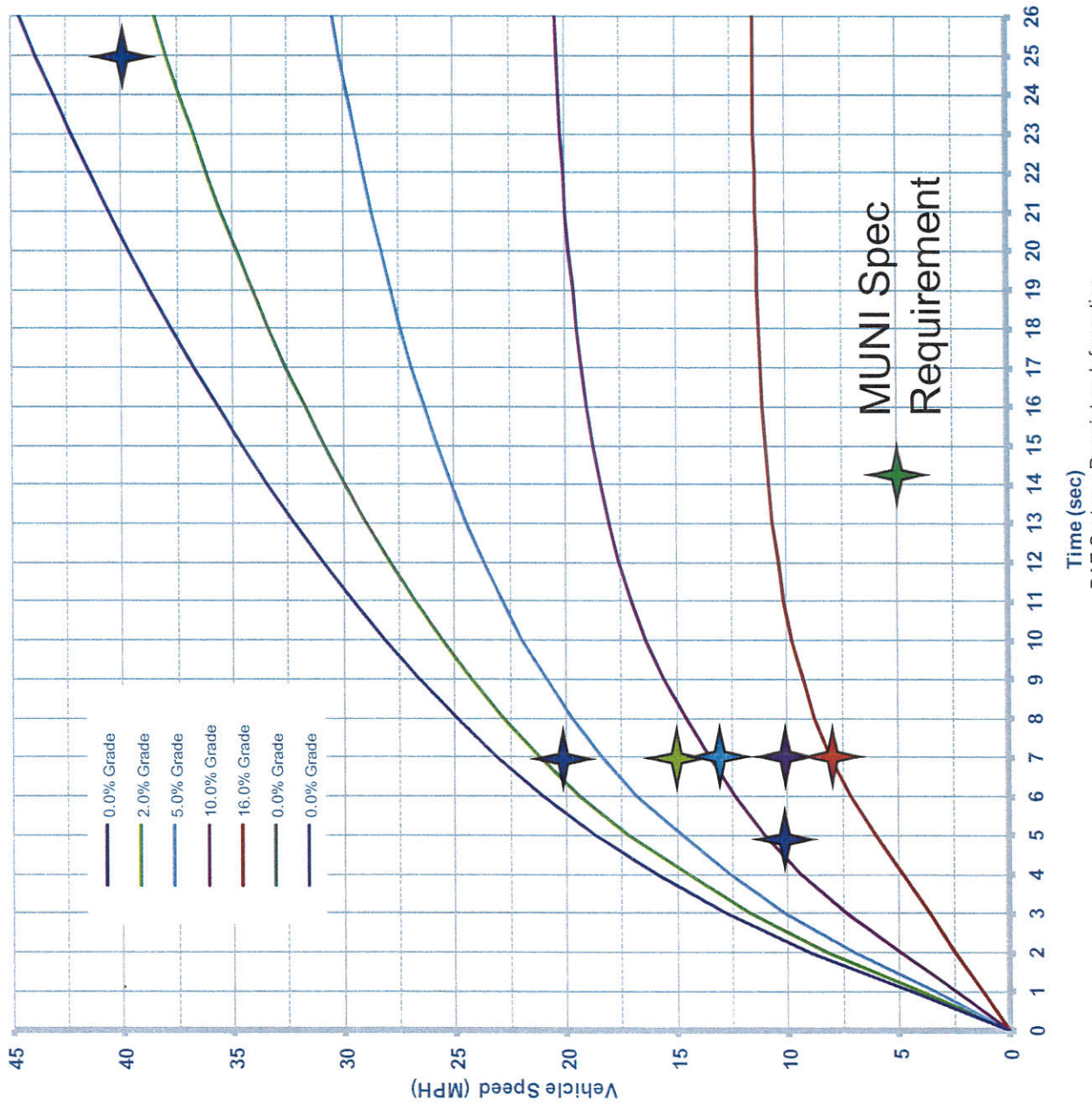
Acceleration Capability – HEV @ GWV - 4.625 Axle Ratio



Grade Capability – HEV @ GW – 4.111 Axle Ratio



Acceleration Capability – HEV @ GWW - 4.111 Axle Ratio



SCAAN No. : 201289
 Description : 12-057 WMATA XDE40 Norm
 Date : 12/21/2012
 User : Seval Karaman, New Flyer Industries
 Application Review Status :
 Output Units : US

ALLISON TRANSMISSION
 INPUT SUMMARY

VOCATION

Service	Bus
Application	City / Transit Bus - U.S. APTA
Configuration	Straight Vehicle
Vocation Number	44-65-14

VEHICLE PARAMETERS

Description

End User (and Region, Sub Region)	12-057 WMATA XDE40 Norm (North America)
Manufacturer (and Region, Sub Region)	New Flyer (North America, Canadian)
Model	XDE40
Description	Diesel-Electric 40-ft Low Floor Bus

Area and Weight

Power Packs	1
Height	10.83 (ft)
Width	8.50 (ft)
Standard Wind Resistance Coefficient (No Deflector)	0.55
User Defined Resistance Coefficient (No Deflector)	0.60
Weight (No Trailer, GVW)	42540 (lb)
Weight on Drive Wheels	65.26 (%)
Weight on Drive Wheels	27760 (lb)

Tires

Number of Tires	6
Manufacturer	
Tire Model & Size	
Tire Type	Low Profile Radial Tire
Revs	518 (revs/mi)
Radius	19.47 (in.)
Standard Surface Factor	1.0 Smooth Concrete
User Defined Surface Factor	0.0
Standard Traction Limit Coefficient (On-Road)	0.70

ENGINE

Engine Manufacturer	Cummins
Model	ISB6.7 Hybrid
Description	280hp / 660lbft / 2600rpm Hybrid
Certification Year	2010, 2013
Peak Torque/Speed	660.0/1600 (lb-ft)/(rpm)
Peak Power/Speed	280.0/2300 (hp)/(rpm)
Governed Power/Speed	270.3/2600 (hp)/(rpm)
Vocation	0
Engine Curve Reference	FR92502, FR93336H
No. Of Curves	Single
SCAAN File Number	2-1516

This SCAAN information is subject to the SCAAN Disclaimer set forth elsewhere.

ACCESSORIES (Power at governed speed)

	Standard (hp)	User (hp)
Fan (clutch fan)	34.38	0.00
Alt/Generator	5.60	9.00
Air Compressor	1.58	2.00
Steer Pump	1.58	2.00
Air Conditioning	0.00	15.00

TRANSMISSION

Manufacturer	Allison
Configuration	H40EP ISB280H 2010 EP Output 240hp / 3500lbft (1-H40EP-5)
System Calibration	H40EP Generic (1-H40EP-0001)
Rating	Transit H40EP (1-H40EP-1)

DRIVELINE

Propshaft	DriveAxles
Std Efficiency	98.60 (%)
Axle	4x2 On Hwy Single Red
Manufacturer	
Description	
Ratio Description	Single
Ratio	4.625
Std Efficiency	97.00 (%)
Overall Driveline	
Ratio	4.625
Std Efficiency	95.64 (%)

GRADES

Std Acceleration	0.00 (%)
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ENGINE DETAIL - Standard Accessories (AC On where applicable)

Low And High Power

Speed (rpm)	Power (hp)	Torque (lb-ft)	Fan On/AC On Net Power (hp)	Fan On/AC On Net Torque (lb-ft)	Fan Off/AC On Net Power (hp)	Fan Off/AC On Net Torque (lb-ft)	
1500	165.7	580.0	151.6	530.9	158.2	554.0	
1600	201.1	660.0	185.5	608.9	193.5	635.2	Peak Torque
1700	213.6	660.0	196.4	606.6	206.0	636.3	
1800	226.2	660.0	207.0	604.0	218.4	637.3	
1900	238.8	660.0	217.4	601.0	230.9	638.1	
2000	251.3	660.0	227.6	597.8	243.3	638.9	
2100	263.9	660.0	237.6	594.3	255.7	639.6	
2200	276.5	660.0	247.4	590.5	268.2	640.2	
2300	280.0	639.4	247.8	565.9	271.6	620.2	Peak Power
2400	279.7	612.0	244.1	534.2	271.1	593.4	
2500	275.6	579.0	236.4	496.6	267.0	560.8	
2600	270.3	546.0	227.2	458.8	261.5	528.3	Governed
2800	0.0	0.0	-51.9	-97.4	-9.0	-16.9	No Load Governed

Peak Power point has been defined for the purposes of assessing Accessory Losses

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ENGINE DETAIL - User Defined Accessories (AC On where applicable)

Low And High Power

Speed (rpm)	Power (hp)	Torque (lb-ft)	Fan On/AC On Net Power (hp)	Fan On/AC On Net Torque (lb-ft)	Fan Off/AC On Net Power (hp)	Fan Off/AC On Net Torque (lb-ft)	
1500	165.7	580.0	145.7	510.1	145.7	510.1	
1600	201.1	660.0	180.4	592.1	180.4	592.1	Peak Torque
1700	213.6	660.0	192.2	593.8	192.2	593.8	
1800	226.2	660.0	204.0	595.4	204.0	595.4	
1900	238.8	660.0	215.9	596.7	215.9	596.7	
2000	251.3	660.0	227.7	598.0	227.7	598.0	
2100	263.9	660.0	239.6	599.1	239.6	599.1	
2200	276.5	660.0	251.4	600.1	251.4	600.1	
2300	280.0	639.4	254.2	580.5	254.2	580.5	Peak Power
2400	279.7	612.0	253.1	553.9	253.1	553.9	
2500	275.6	579.0	248.3	521.7	248.3	521.7	
2600	270.3	546.0	242.3	489.4	242.3	489.4	Governed
2800	0.0	0.0	-29.5	-55.3	-29.5	-55.3	No Load Governed

Peak Power point has been defined for the purposes of assessing Accessory Losses

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SCAAN No. : 201289
 Description : 12-057 WMATA XDE40 Norm
 Date : 12/21/2012
 User : Seval Karaman, New Flyer Industries
 Application Review Status :
 Output Units : US

ALLISON TRANSMISSION
 SCAAN SUMMARY
 Based On Standard Parameters

Vocation: Bus, City / Transit Bus - U.S. APTA, Straight Vehicle
 End User: 12-057 WMATA XDE40 Norm (North America)
 Manufacturer: New Flyer (North America, Canadian)
 Model: XDE40, Diesel-Electric 40-ft Low Floor Bus

Engine: Cummins ISB6.7 Hybrid 280hp / 660lbft / 2600rpm Hybrid
 Engine Certification Year: 2010, 2013
 Transmission: H40EP ISB280H 2010 EP Output 240hp / 3500lbft
 Rating: Transit H40EP

Transmission

Check	Check Name	Recomm/Rating	Units	Min/ Max	Actual	Overall Status
T1_E	Transmission/Vocation Compatibility					OK
T2_E	Transmission Compatible with High Torque Rise Diesel Engines					OK
T3_E	Input Speed (Engine Governed Speed)	780 / 2300	rpm		2600	XXX
T10_E	Transmission / Engine Prewire Compatibility					
T17_E	Transmission Permitted in End User/Chassis Mfg Locations					OK

Vehicle/DriveLine

Check	Check Name	Recomm/Rating	Units	Min/ Max	Actual	Overall Status
V17_E1	Maximum Geared Vehicle Speed (Nominal)		mph		82.6	
V17_E2	Maximum Geared Vehicle Speed (Battery Protection)		mph		82.6	

OK: Acceptable
 OK-1: OK based on pre-acceptance by Engineering
 OK-2: OK based on Accepted Application Review
 C: Consider - manufacturer to assess
 XX: Questionable - may not be acceptable
 XXX: Not Acceptable - rating or usage violation

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Notes

Check	Comments
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SCAAN SUMMARY-APTA GUIDELINES

Vehicle/DriveLine

Check	Check Name	Recomm/Rating	Units	Min/Max	Actual	Overall Status
V36_E1	Vehicle Speed On 2.50% Grade (Nominal) (APTA)	40.0	mph	Min	52.1	OK
V36_E2	Vehicle Speed On 2.50% Grade (Battery Protection) (APTA)	40.0	mph	Min	51.1	OK
V37_E1	Vehicle Speed On 16.00% Grade (Nominal) (APTA)	7.0	mph	Min	12.5	OK
V37_E2	Vehicle Speed On 16.00% Grade (Battery Protection) (APTA)	7.0	mph	Min	11.5	OK
V39_E1	Acceleration Time, 0-10.0 mph, 0.0% Grade (Nominal) (APTA)	5.0	sec	Max	2.1	OK
V39_E2	Acceleration Time, 0-10.0 mph, 0.0% Grade (Battery Protection) (APTA)	5.0	sec	Max	2.2	OK
V40_E1	Acceleration Time, 0-20.0 mph, 0.0% Grade (Nominal) (APTA)	10.8	sec	Max	5.7	OK
V40_E2	Acceleration Time, 0-20.0 mph, 0.0% Grade (Battery Protection) (APTA)	10.8	sec	Max	6.0	OK
V41_E1	Acceleration Time, 0-30.0 mph, 0.0% Grade (Nominal) (APTA)	20.0	sec	Max	12.0	OK
V41_E2	Acceleration Time, 0-30.0 mph, 0.0% Grade (Battery Protection) (APTA)	20.0	sec	Max	12.5	OK
V42_E1	Acceleration Time, 0-40.0 mph, 0.0% Grade (Nominal) (APTA)	31.0	sec	Max	21.6	OK
V42_E2	Acceleration Time, 0-40.0 mph, 0.0% Grade (Battery Protection) (APTA)	31.0	sec	Max	22.4	OK

Notes

Check	Comments
V39_E1	Full Throttle & Vehicle Brakes Locked Start
V39_E2	Full Throttle & Vehicle Brakes Locked Start
V40_E1	Full Throttle & Vehicle Brakes Locked Start
V40_E2	Full Throttle & Vehicle Brakes Locked Start
V41_E1	Full Throttle & Vehicle Brakes Locked Start
V41_E2	Full Throttle & Vehicle Brakes Locked Start
V42_E1	Full Throttle & Vehicle Brakes Locked Start
V42_E2	Full Throttle & Vehicle Brakes Locked Start

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 Description : 12-057 WMATA XDE40 Norm
 Date : 12/21/2012
 User : Seval Karaman, New Flyer Industries
 Application Review Status :
 Output Units : US

ALLISON TRANSMISSION
 SCAAN SUMMARY
 Based On User Defined Parameters

Vocation: Bus, City / Transit Bus - U.S. APTA, Straight Vehicle
 End User: 12-057 WMATA XDE40 Norm (North America)
 Manufacturer: New Flyer (North America, Canadian)
 Model: XDE40, Diesel-Electric 40-ft Low Floor Bus

Engine: Cummins ISB6.7 Hybrid 280hp / 660lbft / 2600rpm Hybrid
 Engine Certification Year: 2010, 2013
 Transmission: H40EP ISB280H 2010 EP Output 240hp / 3500lbft
 Rating: Transit H40EP

Vehicle/DriveLine

Check	Check Name	Recomm/Rating	Units	Min/ Max	Actual
V17_E1	Maximum Geared Vehicle Speed (Nominal)		mph		82.6
V17_E2	Maximum Geared Vehicle Speed (Battery Protection)		mph		82.6

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Check	Comments
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SCAAN SUMMARY-APTA GUIDELINES

Vehicle/DriveLine

Check	Check Name	Recomm/Rating	Units	Min/Max	Actual
V36_E1	Vehicle Speed On 2.50% Grade (Nominal) (APTA)	40.0	mph	Min	51.5
V36_E2	Vehicle Speed On 2.50% Grade (Battery Protection) (APTA)	40.0	mph	Min	50.5
V37_E1	Vehicle Speed On 16.00% Grade (Nominal) (APTA)	7.0	mph	Min	12.5
V37_E2	Vehicle Speed On 16.00% Grade (Battery Protection) (APTA)	7.0	mph	Min	11.5
V39_E1	Acceleration Time, 0-10.0 mph, 0.0% Grade (Nominal) (APTA)	5.0	sec	Max	2.1
V39_E2	Acceleration Time, 0-10.0 mph, 0.0% Grade (Battery Protection) (APTA)	5.0	sec	Max	2.2
V40_E1	Acceleration Time, 0-20.0 mph, 0.0% Grade (Nominal) (APTA)	10.8	sec	Max	5.7
V40_E2	Acceleration Time, 0-20.0 mph, 0.0% Grade (Battery Protection) (APTA)	10.8	sec	Max	6.0
V41_E1	Acceleration Time, 0-30.0 mph, 0.0% Grade (Nominal) (APTA)	20.0	sec	Max	12.1
V41_E2	Acceleration Time, 0-30.0 mph, 0.0% Grade (Battery Protection) (APTA)	20.0	sec	Max	12.5
V42_E1	Acceleration Time, 0-40.0 mph, 0.0% Grade (Nominal) (APTA)	31.0	sec	Max	21.7
V42_E2	Acceleration Time, 0-40.0 mph, 0.0% Grade (Battery Protection) (APTA)	31.0	sec	Max	22.5

Notes

Check	Comments
V39_E1	Full Throttle & Vehicle Brakes Locked Start
V39_E2	Full Throttle & Vehicle Brakes Locked Start
V40_E1	Full Throttle & Vehicle Brakes Locked Start
V40_E2	Full Throttle & Vehicle Brakes Locked Start
V41_E1	Full Throttle & Vehicle Brakes Locked Start
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V42_E1	Full Throttle & Vehicle Brakes Locked Start
V42_E2	Full Throttle & Vehicle Brakes Locked Start

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 Application Review Status :
 Output Units : US

**ALLISON TRANSMISSION
 CUSTOMER PERFORMANCE SUMMARY
 Based on Standard Parameters**

Vocation: Bus, City / Transit Bus - U.S. APTA, Straight Vehicle
 End User: 12-057 WMATA XDE40 Norm (North America)
 Manufacturer: New Flyer (North America, Canadian)
 Model: XDE40, Diesel-Electric 40-ft Low Floor Bus

Engine: Cummins ISB6.7 Hybrid 280hp / 660lbft / 2600rpm Hybrid
 Engine Certification Year: 2010, 2013
 Transmission: H40EP ISB280H 2010 EP Output 240hp / 3500lbft
 Rating: Transit H40EP
 Weight: 42540 (lb) (GVW)
 Driveline Ratio : 4.62
 Tires: Low Profile Radial Tire, 518.0 (revs/mi)

Geared Speed: 82.6 (mph)

Gradeability

	Nominal	Battery Protection Mode
Launch Gradeability	22.6(%)	22.6(%)
	0.00(%) at 79.5(mph), Road Load Speed	0.00(%) at 78.6(mph), Road Load Speed
	0.25(%) at 76.5(mph)	0.25(%) at 75.5(mph)
	0.50(%) at 73.5(mph)	0.50(%) at 72.5(mph)
	1.00(%) at 67.7(mph)	1.00(%) at 66.6(mph)
	2.00(%) at 56.9(mph)	2.00(%) at 55.8(mph)
	3.00(%) at 47.8(mph)	3.00(%) at 46.7(mph)
	4.00(%) at 40.4(mph)	4.00(%) at 39.4(mph)
	5.00(%) at 34.6(mph)	5.00(%) at 33.6(mph)
	6.00(%) at 30.0(mph)	6.00(%) at 29.2(mph)
	7.00(%) at 26.4(mph)	7.00(%) at 25.7(mph)
	8.00(%) at 23.5(mph)	8.00(%) at 22.9(mph)
	9.00(%) at 21.2(mph)	9.00(%) at 20.6(mph)
	10.00(%) at 19.3(mph)	10.00(%) at 18.6(mph)

Acceleration (full throttle, brakes locked start)

Time And Distance To Speed, 0(%) Grade	0-20 (mph)	in 5.7(sec) 98(ft)
	0-30 (mph)	in 12.0(sec) 333(ft)
	0-40 (mph)	in 21.6(sec) 828(ft)
	0-50 (mph)	in 35.7(sec) 1763(ft)
	0-60 (mph)	in 57.2(sec) 3517(ft)

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**ALLISON TRANSMISSION
 CUSTOMER PERFORMANCE SUMMARY**
 Based on User Defined Parameters

Vocation: Bus, City / Transit Bus - U.S. APTA, Straight Vehicle
 End User: 12-057 WMATA XDE40 Norm (North America)
 Manufacturer: New Flyer (North America, Canadian)
 Model: XDE40, Diesel-Electric 40-ft Low Floor Bus

Engine: Cummins ISB6.7 Hybrid 280hp / 660lbft / 2600rpm Hybrid
 Engine Certification Year: 2010, 2013
 Transmission: H40EP ISB280H 2010 EP Output 240hp / 3500lbft
 Rating: Transit H40EP
 Weight: 42540 (lb) (GVW)
 Driveline Ratio : 4.62
 Tires: Low Profile Radial Tire, 518.0 (revs/mi)

Geared Speed: 82.6 (mph)

Gradeability

	Nominal	Battery Protection Mode
Launch Gradeability	22.6(%)	22.6(%)
	0.00(%) at 77.7(mph), Road Load Speed	0.00(%) at 76.7(mph), Road Load Speed
	0.25(%) at 74.8(mph)	0.25(%) at 73.8(mph)
	0.50(%) at 71.9(mph)	0.50(%) at 71.0(mph)
	1.00(%) at 66.4(mph)	1.00(%) at 65.4(mph)
	2.00(%) at 56.1(mph)	2.00(%) at 55.1(mph)
	3.00(%) at 47.3(mph)	3.00(%) at 46.3(mph)
	4.00(%) at 40.1(mph)	4.00(%) at 39.1(mph)
	5.00(%) at 34.4(mph)	5.00(%) at 33.5(mph)
	6.00(%) at 29.9(mph)	6.00(%) at 29.1(mph)
	7.00(%) at 26.3(mph)	7.00(%) at 25.6(mph)
	8.00(%) at 23.5(mph)	8.00(%) at 22.8(mph)
	9.00(%) at 21.2(mph)	9.00(%) at 20.6(mph)
	10.00(%) at 19.3(mph)	10.00(%) at 18.6(mph)

Acceleration (full throttle, brakes locked start)

Time And Distance To Speed, 0(%) Grade	0-20 (mph)	in 5.7(sec) 98(ft)
	0-30 (mph)	in 12.1(sec) 333(ft)
	0-40 (mph)	in 21.7(sec) 832(ft)
	0-50 (mph)	in 36.0(sec) 1783(ft)
	0-60 (mph)	in 58.4(sec) 3607(ft)

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 Description : 12-057 WMATA XDE40 Norm
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 User : Seval Karaman, New Flyer Industries
 Application Review Status :
 Output Units : US

ALLISON TRANSMISSION
 VEHICLE FULL THROTTLE PERFORMANCE
 Based on User Defined Parameters

Power Packs: 1

Clutch Fan Status : Fan Off
 Air Conditioning Status : Off

Axle Ratio: 4.625
 Auxiliary Gearing Ratio: 1.000

Reverse

Vehicle Speed (mph)	Nominal				Battery Protection Mode			
	Tractive Effort (lb)	Drawbar Pull (lb)	Wheel Power (hp)	Net % Grade (%)	Tractive Effort (lb)	Drawbar Pull (lb)	Wheel Power (hp)	Net % Grade (%)
0.0	5999	5850	0.0	13.9	5999	5850	0.0	13.9
0.5	5999	5849	8.0	13.9	5999	5849	8.0	13.9
1.0	5999	5848	16.0	13.9	5999	5848	16.0	13.9
1.5	5999	5846	24.0	13.9	5999	5846	24.0	13.9
2.0	5999	5845	32.0	13.9	5999	5845	32.0	13.9
2.5	5999	5844	40.0	13.9	5999	5844	40.0	13.9
3.0	5999	5842	48.0	13.9	5808	5652	46.5	13.4
3.5	5999	5841	56.0	13.9	5507	5349	51.4	12.7
4.0	5999	5839	64.0	13.9	5096	4936	54.4	11.7
4.5	5999	5838	72.0	13.9	4575	4414	54.9	10.4
5.0	5973	5811	79.6	13.8	3959	3796	52.8	9.0
5.5	5489	5325	80.5	12.6	3589	3424	52.6	8.1
6.0	5009	4843	80.1	11.5	3272	3106	52.4	7.3
6.5	4533	4364	78.6	10.3	3008	2840	52.1	6.7
7.0	4060	3890	75.8	9.2	2796	2626	52.2	6.2
7.5	3591	3419	71.8	8.1	2638	2466	52.8	5.8
8.0	3115	2941	66.5	6.9	2364	2190	50.4	5.2
8.5	2639	2462	59.8	5.8	2081	1905	47.2	4.5
9.0	2162	1984	51.9	4.7	1794	1615	43.1	3.8
9.5	1686	1505	42.7	3.5	1501	1320	38.0	3.1
10.0	1210	1027	32.3	2.4	1204	1020	32.1	2.4
10.5	734	548	20.5	1.3	734	548	20.5	1.3
11.0	257	69	7.5	0.2	257	69	7.5	0.2
11.1	188	0	5.6	0.0	188	0	5.6	0.0

Forward

Vehicle Speed (mph)	Nominal				Battery Protection Mode			
	Tractive Effort (lb)	Drawbar Pull (lb)	Wheel Power (hp)	Net % Grade (%)	Tractive Effort (lb)	Drawbar Pull (lb)	Wheel Power (hp)	Net % Grade (%)
0.0	9543	9395	0.0	22.6	9543	9395	0.0	22.6
2.0	9543	9390	50.9	22.6	9543	9390	50.9	22.6
4.0	9543	9384	101.8	22.6	9543	9384	101.8	22.6
6.0	9543	9377	152.7	22.6	9543	9377	152.7	22.6
8.0	9543	9369	203.6	22.6	9368	9194	199.9	22.1
10.0	8612	8429	229.7	20.2	7891	7708	210.4	18.4
12.0	7212	7019	230.8	16.7	6627	6433	212.0	15.3
14.0	6129	5924	228.8	14.1	5721	5517	213.6	13.1
16.0	5371	5155	229.2	12.2	5074	4858	216.5	11.5
18.0	4779	4550	229.4	10.8	4598	4369	220.7	10.3
20.0	4303	4060	229.5	9.6	4173	3929	222.6	9.3

22.0	3910	3651	229.4	8.6	3796	3537	222.7	8.3
24.0	3585	3309	229.4	7.8	3476	3201	222.5	7.5
26.0	3310	3017	229.5	7.1	3209	2916	222.5	6.9
28.0	3074	2762	229.5	6.5	2981	2669	222.6	6.3
30.0	2869	2538	229.5	6.0	2782	2451	222.6	5.8
32.0	2689	2338	229.5	5.5	2608	2257	222.5	5.3
34.0	2531	2158	229.5	5.1	2455	2081	222.5	4.9
36.0	2391	1995	229.5	4.7	2318	1923	222.6	4.5
38.0	2265	1846	229.5	4.3	2196	1777	222.6	4.2
40.0	2152	1708	229.5	4.0	2087	1642	222.6	3.9
42.0	2049	1579	229.5	3.7	1987	1517	222.6	3.6
44.0	1956	1459	229.5	3.4	1897	1400	222.6	3.3
46.0	1871	1346	229.5	3.2	1814	1289	222.6	3.0
48.0	1793	1239	229.5	2.9	1739	1185	222.6	2.8
50.0	1721	1137	229.5	2.7	1669	1085	222.6	2.6
52.0	1655	1040	229.5	2.4	1605	990	222.6	2.3
54.0	1594	946	229.5	2.2	1546	898	222.6	2.1
56.0	1537	856	229.5	2.0	1490	810	222.6	1.9
58.0	1484	769	229.5	1.8	1439	724	222.6	1.7
60.0	1434	684	229.5	1.6	1391	641	222.6	1.5
62.0	1388	601	229.5	1.4	1346	559	222.6	1.3
64.0	1345	520	229.5	1.2	1304	480	222.5	1.1
66.0	1304	441	229.5	1.0	1264	401	222.5	0.9
68.0	1266	363	229.5	0.9	1227	325	222.5	0.8
70.0	1230	287	229.5	0.7	1192	249	222.6	0.6
72.0	1195	211	229.5	0.5	1159	174	222.5	0.4
74.0	1163	136	229.5	0.3	1128	100	222.5	0.2
76.0	1133	61	229.5	0.1	1098	27	222.6	0.1
77.7	1108	0	229.5	0.0	1088	0	222.5	0.0

Clutch Fan Status : Fan On
Air Conditioning Status : Off

Axle Ratio: 4.625
Auxiliary Gearing Ratio: 1.000

Reverse

Vehicle Speed (mph)	Nominal				Battery Protection Mode			
	Tractive Effort (lb)	Drawbar Pull (lb)	Wheel Power (hp)	Net % Grade (%)	Tractive Effort (lb)	Drawbar Pull (lb)	Wheel Power (hp)	Net % Grade (%)
0.0	5999	5850	0.0	13.9	5999	5850	0.0	13.9
0.5	5999	5849	8.0	13.9	5999	5849	8.0	13.9
1.0	5999	5848	16.0	13.9	5999	5848	16.0	13.9
1.5	5999	5846	24.0	13.9	5999	5846	24.0	13.9
2.0	5999	5845	32.0	13.9	5999	5845	32.0	13.9
2.5	5999	5844	40.0	13.9	5999	5844	40.0	13.9
3.0	5999	5842	48.0	13.9	5808	5652	46.5	13.4
3.5	5999	5841	56.0	13.9	5507	5349	51.4	12.7
4.0	5999	5839	64.0	13.9	5096	4936	54.4	11.7
4.5	5999	5838	72.0	13.9	4575	4414	54.9	10.4
5.0	5973	5811	79.6	13.8	3959	3796	52.8	9.0
5.5	5489	5325	80.5	12.6	3589	3424	52.6	8.1
6.0	5009	4843	80.1	11.5	3272	3106	52.4	7.3
6.5	4533	4364	78.6	10.3	3008	2840	52.1	6.7
7.0	4060	3890	75.8	9.2	2796	2626	52.2	6.2
7.5	3591	3419	71.8	8.1	2638	2466	52.8	5.8
8.0	3115	2941	66.5	6.9	2364	2190	50.4	5.2
8.5	2639	2462	59.8	5.8	2081	1905	47.2	4.5
9.0	2162	1984	51.9	4.7	1794	1615	43.1	3.8
9.5	1686	1505	42.7	3.5	1501	1320	38.0	3.1

10.0	1210	1027	32.3	2.4	1204	1020	32.1	2.4
10.5	734	548	20.5	1.3	734	548	20.5	1.3
11.0	257	69	7.5	0.2	257	69	7.5	0.2
11.1	188	0	5.6	0.0	188	0	5.6	0.0

Forward

Vehicle Speed (mph)	Nominal				Battery Protection Mode			
	Tractive Effort (lb)	Drawbar Pull (lb)	Wheel Power (hp)	Net % Grade (%)	Tractive Effort (lb)	Drawbar Pull (lb)	Wheel Power (hp)	Net % Grade (%)
0.0	9543	9395	0.0	22.6	9543	9395	0.0	22.6
2.0	9543	9390	50.9	22.6	9543	9390	50.9	22.6
4.0	9543	9384	101.8	22.6	9543	9384	101.8	22.6
6.0	9543	9377	152.7	22.6	9543	9377	152.7	22.6
8.0	9543	9369	203.6	22.6	9368	9194	199.9	22.1
10.0	8612	8429	229.7	20.2	7891	7708	210.4	18.4
12.0	7212	7019	230.8	16.7	6627	6433	212.0	15.3
14.0	6129	5924	228.8	14.1	5721	5517	213.6	13.1
16.0	5371	5155	229.2	12.2	5074	4858	216.5	11.5
18.0	4779	4550	229.4	10.8	4598	4369	220.7	10.3
20.0	4303	4060	229.5	9.6	4173	3929	222.6	9.3
22.0	3910	3651	229.4	8.6	3796	3537	222.7	8.3
24.0	3585	3309	229.4	7.8	3476	3201	222.5	7.5
26.0	3310	3017	229.5	7.1	3209	2916	222.5	6.9
28.0	3074	2762	229.5	6.5	2981	2669	222.6	6.3
30.0	2869	2538	229.5	6.0	2782	2451	222.6	5.8
32.0	2689	2338	229.5	5.5	2608	2257	222.5	5.3
34.0	2531	2158	229.5	5.1	2455	2081	222.5	4.9
36.0	2391	1995	229.5	4.7	2318	1923	222.6	4.5
38.0	2265	1846	229.5	4.3	2196	1777	222.6	4.2
40.0	2152	1708	229.5	4.0	2087	1642	222.6	3.9
42.0	2049	1579	229.5	3.7	1987	1517	222.6	3.6
44.0	1956	1459	229.5	3.4	1897	1400	222.6	3.3
46.0	1871	1346	229.5	3.2	1814	1289	222.6	3.0
48.0	1793	1239	229.5	2.9	1739	1185	222.6	2.8
50.0	1721	1137	229.5	2.7	1669	1085	222.6	2.6
52.0	1655	1040	229.5	2.4	1605	990	222.6	2.3
54.0	1594	946	229.5	2.2	1546	898	222.6	2.1
56.0	1537	856	229.5	2.0	1490	810	222.6	1.9
58.0	1484	769	229.5	1.8	1439	724	222.6	1.7
60.0	1434	684	229.5	1.6	1391	641	222.6	1.5
62.0	1388	601	229.5	1.4	1346	559	222.6	1.3
64.0	1345	520	229.5	1.2	1304	480	222.5	1.1
66.0	1304	441	229.5	1.0	1264	401	222.5	0.9
68.0	1266	363	229.5	0.9	1227	325	222.5	0.8
70.0	1230	287	229.5	0.7	1192	249	222.6	0.6
72.0	1195	211	229.5	0.5	1159	174	222.5	0.4
74.0	1163	136	229.5	0.3	1128	100	222.5	0.2
76.0	1133	61	229.5	0.1	1098	27	222.6	0.1
77.7	1108	0	229.5	0.0	1088	0	222.5	0.0

Clutch Fan Status : Fan Off

Axle Ratio: 4.625

Air Conditioning Status : On

Auxiliary Gearing Ratio: 1.000

Reverse

Vehicle Speed	Nominal				Battery Protection Mode			
	Tractive Effort	Drawbar Pull	Wheel Power	Net % Grade	Tractive Effort	Drawbar Pull	Wheel Power	Net % Grade

(mph)	(lb)	(lb)	(hp)	(%)	(lb)	(lb)	(hp)	(%)
0.0	5999	5850	0.0	13.9	5999	5850	0.0	13.9
0.5	5999	5849	8.0	13.9	5999	5849	8.0	13.9
1.0	5999	5848	16.0	13.9	5999	5848	16.0	13.9
1.5	5999	5846	24.0	13.9	5999	5846	24.0	13.9
2.0	5999	5845	32.0	13.9	5999	5845	32.0	13.9
2.5	5999	5844	40.0	13.9	5999	5844	40.0	13.9
3.0	5999	5842	48.0	13.9	5808	5652	46.5	13.4
3.5	5999	5841	56.0	13.9	5507	5349	51.4	12.7
4.0	5999	5839	64.0	13.9	5096	4936	54.4	11.7
4.5	5999	5838	72.0	13.9	4575	4414	54.9	10.4
5.0	5973	5811	79.6	13.8	3959	3796	52.8	9.0
5.5	5489	5325	80.5	12.6	3589	3424	52.6	8.1
6.0	5009	4843	80.1	11.5	3272	3106	52.4	7.3
6.5	4533	4364	78.6	10.3	3008	2840	52.1	6.7
7.0	4060	3890	75.8	9.2	2796	2626	52.2	6.2
7.5	3591	3419	71.8	8.1	2638	2466	52.8	5.8
8.0	3115	2941	66.5	6.9	2364	2190	50.4	5.2
8.5	2639	2462	59.8	5.8	2081	1905	47.2	4.5
9.0	2162	1984	51.9	4.7	1794	1615	43.1	3.8
9.5	1686	1505	42.7	3.5	1501	1320	38.0	3.1
10.0	1210	1027	32.3	2.4	1204	1020	32.1	2.4
10.5	734	548	20.5	1.3	734	548	20.5	1.3
11.0	257	69	7.5	0.2	257	69	7.5	0.2
11.1	188	0	5.6	0.0	188	0	5.6	0.0

Forward

Vehicle Speed (mph)	Nominal				Battery Protection Mode			
	Tractive Effort (lb)	Drawbar Pull (lb)	Wheel Power (hp)	Net % Grade (%)	Tractive Effort (lb)	Drawbar Pull (lb)	Wheel Power (hp)	Net % Grade (%)
0.0	9543	9395	0.0	22.6	9543	9395	0.0	22.6
2.0	9543	9390	50.9	22.6	9543	9390	50.9	22.6
4.0	9543	9384	101.8	22.6	9543	9384	101.8	22.6
6.0	9543	9377	152.7	22.6	9543	9377	152.7	22.6
8.0	9543	9369	203.6	22.6	9368	9194	199.9	22.1
10.0	8612	8429	229.7	20.2	7891	7708	210.4	18.4
12.0	7212	7019	230.8	16.7	6627	6433	212.0	15.3
14.0	6129	5924	228.8	14.1	5721	5517	213.6	13.1
16.0	5371	5155	229.2	12.2	5074	4858	216.5	11.5
18.0	4779	4550	229.4	10.8	4598	4369	220.7	10.3
20.0	4303	4060	229.5	9.6	4173	3929	222.6	9.3
22.0	3910	3651	229.4	8.6	3796	3537	222.7	8.3
24.0	3585	3309	229.4	7.8	3476	3201	222.5	7.5
26.0	3310	3017	229.5	7.1	3209	2916	222.5	6.9
28.0	3074	2762	229.5	6.5	2981	2669	222.6	6.3
30.0	2869	2538	229.5	6.0	2782	2451	222.6	5.8
32.0	2689	2338	229.5	5.5	2608	2257	222.5	5.3
34.0	2531	2158	229.5	5.1	2455	2081	222.5	4.9
36.0	2391	1995	229.5	4.7	2318	1923	222.6	4.5
38.0	2265	1846	229.5	4.3	2196	1777	222.6	4.2
40.0	2152	1708	229.5	4.0	2087	1642	222.6	3.9
42.0	2049	1579	229.5	3.7	1987	1517	222.6	3.6
44.0	1956	1459	229.5	3.4	1897	1400	222.6	3.3
46.0	1871	1346	229.5	3.2	1814	1289	222.6	3.0
48.0	1793	1239	229.5	2.9	1739	1185	222.6	2.8
50.0	1721	1137	229.5	2.7	1669	1085	222.6	2.6

52.0	1655	1040	229.5	2.4	1605	990	222.6	2.3
54.0	1594	946	229.5	2.2	1546	898	222.6	2.1
56.0	1537	856	229.5	2.0	1490	810	222.6	1.9
58.0	1484	769	229.5	1.8	1439	724	222.6	1.7
60.0	1434	684	229.5	1.6	1391	641	222.6	1.5
62.0	1388	601	229.5	1.4	1346	559	222.6	1.3
64.0	1345	520	229.5	1.2	1304	480	222.5	1.1
66.0	1304	441	229.5	1.0	1264	401	222.5	0.9
68.0	1266	363	229.5	0.9	1227	325	222.5	0.8
70.0	1230	287	229.5	0.7	1192	249	222.6	0.6
72.0	1195	211	229.5	0.5	1159	174	222.5	0.4
74.0	1163	136	229.5	0.3	1128	100	222.5	0.2
76.0	1133	61	229.5	0.1	1098	27	222.6	0.1
77.7	1108	0	229.5	0.0	1088	0	222.5	0.0

Clutch Fan Status : Fan On
Air Conditioning Status : On

Axle Ratio: 4.625
Auxiliary Gearing Ratio: 1.000

Reverse

Vehicle Speed (mph)	Nominal				Battery Protection Mode			
	Tractive Effort (lb)	Drawbar Pull (lb)	Wheel Power (hp)	Net % Grade (%)	Tractive Effort (lb)	Drawbar Pull (lb)	Wheel Power (hp)	Net % Grade (%)
0.0	5999	5850	0.0	13.9	5999	5850	0.0	13.9
0.5	5999	5849	8.0	13.9	5999	5849	8.0	13.9
1.0	5999	5848	16.0	13.9	5999	5848	16.0	13.9
1.5	5999	5846	24.0	13.9	5999	5846	24.0	13.9
2.0	5999	5845	32.0	13.9	5999	5845	32.0	13.9
2.5	5999	5844	40.0	13.9	5999	5844	40.0	13.9
3.0	5999	5842	48.0	13.9	5808	5652	46.5	13.4
3.5	5999	5841	56.0	13.9	5507	5349	51.4	12.7
4.0	5999	5839	64.0	13.9	5096	4936	54.4	11.7
4.5	5999	5838	72.0	13.9	4575	4414	54.9	10.4
5.0	5973	5811	79.6	13.8	3959	3796	52.8	9.0
5.5	5489	5325	80.5	12.6	3589	3424	52.6	8.1
6.0	5009	4843	80.1	11.5	3272	3106	52.4	7.3
6.5	4533	4364	78.6	10.3	3008	2840	52.1	6.7
7.0	4060	3890	75.8	9.2	2796	2626	52.2	6.2
7.5	3591	3419	71.8	8.1	2638	2466	52.8	5.8
8.0	3115	2941	66.5	6.9	2364	2190	50.4	5.2
8.5	2639	2462	59.8	5.8	2081	1905	47.2	4.5
9.0	2162	1984	51.9	4.7	1794	1615	43.1	3.8
9.5	1686	1505	42.7	3.5	1501	1320	38.0	3.1
10.0	1210	1027	32.3	2.4	1204	1020	32.1	2.4
10.5	734	548	20.5	1.3	734	548	20.5	1.3
11.0	257	69	7.5	0.2	257	69	7.5	0.2
11.1	188	0	5.6	0.0	188	0	5.6	0.0

Forward

Vehicle Speed (mph)	Nominal				Battery Protection Mode			
	Tractive Effort (lb)	Drawbar Pull (lb)	Wheel Power (hp)	Net % Grade (%)	Tractive Effort (lb)	Drawbar Pull (lb)	Wheel Power (hp)	Net % Grade (%)
0.0	9543	9395	0.0	22.6	9543	9395	0.0	22.6
2.0	9543	9390	50.9	22.6	9543	9390	50.9	22.6
4.0	9543	9384	101.8	22.6	9543	9384	101.8	22.6
6.0	9543	9377	152.7	22.6	9543	9377	152.7	22.6
8.0	9543	9369	203.6	22.6	9368	9194	199.9	22.1

10.0	8612	8429	229.7	20.2	7891	7708	210.4	18.4
12.0	7212	7019	230.8	16.7	6627	6433	212.0	15.3
14.0	6129	5924	228.8	14.1	5721	5517	213.6	13.1
16.0	5371	5155	229.2	12.2	5074	4858	216.5	11.5
18.0	4779	4550	229.4	10.8	4598	4369	220.7	10.3
20.0	4303	4060	229.5	9.6	4173	3929	222.6	9.3
22.0	3910	3651	229.4	8.6	3796	3537	222.7	8.3
24.0	3585	3309	229.4	7.8	3476	3201	222.5	7.5
26.0	3310	3017	229.5	7.1	3209	2916	222.5	6.9
28.0	3074	2762	229.5	6.5	2981	2669	222.6	6.3
30.0	2869	2538	229.5	6.0	2782	2451	222.6	5.8
32.0	2689	2338	229.5	5.5	2608	2257	222.5	5.3
34.0	2531	2158	229.5	5.1	2455	2081	222.5	4.9
36.0	2391	1995	229.5	4.7	2318	1923	222.6	4.5
38.0	2265	1846	229.5	4.3	2196	1777	222.6	4.2
40.0	2152	1708	229.5	4.0	2087	1642	222.6	3.9
42.0	2049	1579	229.5	3.7	1987	1517	222.6	3.6
44.0	1956	1459	229.5	3.4	1897	1400	222.6	3.3
46.0	1871	1346	229.5	3.2	1814	1289	222.6	3.0
48.0	1793	1239	229.5	2.9	1739	1185	222.6	2.8
50.0	1721	1137	229.5	2.7	1669	1085	222.6	2.6
52.0	1655	1040	229.5	2.4	1605	990	222.6	2.3
54.0	1594	946	229.5	2.2	1546	898	222.6	2.1
56.0	1537	856	229.5	2.0	1490	810	222.6	1.9
58.0	1484	769	229.5	1.8	1439	724	222.6	1.7
60.0	1434	684	229.5	1.6	1391	641	222.6	1.5
62.0	1388	601	229.5	1.4	1346	559	222.6	1.3
64.0	1345	520	229.5	1.2	1304	480	222.5	1.1
66.0	1304	441	229.5	1.0	1264	401	222.5	0.9
68.0	1266	363	229.5	0.9	1227	325	222.5	0.8
70.0	1230	287	229.5	0.7	1192	249	222.6	0.6
72.0	1195	211	229.5	0.5	1159	174	222.5	0.4
74.0	1163	136	229.5	0.3	1128	100	222.5	0.2
76.0	1133	61	229.5	0.1	1098	27	222.6	0.1
77.7	1108	0	229.5	0.0	1088	0	222.5	0.0

This SCAAN information is subject to the SCAAN Disclaimer set forth elsewhere.

SCAAN No. : 201289
 Description : 12-057 WMATA XDE40 Norm
 Date : 12/21/2012
 User : Seval Karaman, New Flyer Industries
 Application Review Status :
 Output Units : US

ALLISON TRANSMISSION
 VEHICLE ACCELERATION PERFORMANCE
 Brakes Locked Start
 Based on User Defined Parameters

Power Packs: 1

Clutch Fan Status : Fan Off
 Air Conditioning Status : Off
 Grade: 0.0 percent

Axle Ratio: 4.625
 Auxiliary Gearing Ratio: 1.000

Reverse

Vehicle Speed (mph)	Nominal			Battery Protection Mode		
	Time (sec)	Distance (ft)	Accel Rate (mph/sec)	Time (sec)	Distance (ft)	Accel Rate (mph/sec)
0.5	0.2	0.1	2.944	0.2	0.1	2.944
1.0	0.3	0.2	2.944	0.3	0.2	2.944
1.5	0.5	0.6	2.943	0.5	0.6	2.943
2.0	0.7	1.0	2.942	0.7	1.0	2.942
2.5	0.8	1.6	2.942	0.8	1.6	2.942
3.0	1.0	2.2	2.941	1.0	2.3	2.862
3.5	1.2	3.1	2.940	1.2	3.1	2.715
4.0	1.4	4.0	2.939	1.4	4.2	2.514
4.5	1.5	5.0	2.939	1.6	5.5	2.258
5.0	1.7	6.2	2.927	1.8	7.2	1.952
5.5	1.9	7.6	2.724	2.1	9.3	1.740
6.0	2.1	9.3	2.468	2.4	11.9	1.582
6.5	2.3	11.2	2.227	2.8	15.0	1.445
7.0	2.5	13.6	1.988	3.1	18.6	1.334
7.5	2.8	16.5	1.751	3.5	22.7	1.250
8.0	3.1	20.1	1.511	3.9	27.6	1.123
8.5	3.5	24.5	1.270	4.4	33.4	0.977
9.0	3.9	30.3	1.029	5.0	40.7	0.831
9.5	4.5	38.1	0.788	5.7	49.9	0.683
10.0	5.3	49.4	0.547	6.5	62.1	0.533
10.5	6.6	69.0	0.306	7.8	81.7	0.306
11.0	10.7	134.2	0.065	11.9	146.9	0.065

Forward

Vehicle Speed (mph)	Nominal			Battery Protection Mode		
	Time (sec)	Distance (ft)	Accel Rate (mph/sec)	Time (sec)	Distance (ft)	Accel Rate (mph/sec)
2.0	0.4	0.6	4.727	0.4	0.6	4.727
4.0	0.8	2.5	4.724	0.8	2.5	4.724
6.0	1.3	5.6	4.720	1.3	5.6	4.720
8.0	1.7	9.9	4.716	1.7	10.0	4.632
10.0	2.1	15.8	4.265	2.2	16.1	3.913
12.0	2.6	24.1	3.559	2.7	25.3	3.257
14.0	3.3	35.9	2.997	3.4	38.1	2.789
16.0	4.0	51.8	2.605	4.2	55.0	2.454
18.0	4.8	72.3	2.299	5.0	76.6	2.205
20.0	5.7	98.2	2.050	6.0	103.4	1.984
22.0	6.8	130.0	1.844	7.1	136.3	1.786
24.0	7.9	168.7	1.671	8.2	176.2	1.616

26.0	9.2	214.8	1.523	9.5	223.9	1.472
28.0	10.6	269.4	1.394	11.0	280.4	1.347
30.0	12.1	333.3	1.281	12.5	346.5	1.237
32.0	13.7	407.5	1.180	14.2	423.4	1.139
34.0	15.5	493.2	1.089	16.0	512.2	1.050
36.0	17.4	591.6	1.007	18.0	614.3	0.970
38.0	19.4	704.1	0.931	20.2	731.0	0.897
40.0	21.7	832.2	0.862	22.5	864.1	0.829
42.0	24.1	977.7	0.797	25.0	1015.6	0.766
44.0	26.7	1142.9	0.736	27.8	1187.6	0.706
46.0	29.6	1330.1	0.679	30.7	1382.9	0.651
48.0	32.6	1542.2	0.625	33.9	1604.5	0.598
50.0	36.0	1782.9	0.574	37.4	1856.4	0.548
52.0	39.6	2056.2	0.525	41.3	2143.3	0.500
54.0	43.6	2367.6	0.478	45.5	2470.9	0.454
56.0	48.1	2723.8	0.432	50.1	2846.8	0.409
58.0	52.9	3133.2	0.388	55.3	3280.6	0.366
60.0	58.4	3607.3	0.346	61.2	3785.5	0.324
62.0	64.6	4161.6	0.304	67.8	4379.3	0.283
64.0	71.7	4817.6	0.263	75.5	5087.7	0.243
66.0	80.0	5607.8	0.223	84.5	5950.3	0.203
68.0	89.9	6582.5	0.184	95.5	7030.4	0.165
70.0	102.2	7826.7	0.146	109.4	8440.5	0.127
72.0	118.3	9505.8	0.107	128.4	10417.4	0.089
74.0	141.6	12006.6	0.069	158.1	13600.6	0.052
76.0	184.1	16686.2	0.032	229.3	21460.2	0.015

Clutch Fan Status : Fan On

Axle Ratio: 4.625

Air Conditioning Status : Off

Auxiliary Gearing Ratio: 1.000

Grade: 0.0 percent

Reverse

Vehicle Speed (mph)	Nominal			Battery Protection Mode		
	Time (sec)	Distance (ft)	Accel Rate (mph/sec)	Time (sec)	Distance (ft)	Accel Rate (mph/sec)
0.5	0.2	0.1	2.944	0.2	0.1	2.944
1.0	0.3	0.2	2.944	0.3	0.2	2.944
1.5	0.5	0.6	2.943	0.5	0.6	2.943
2.0	0.7	1.0	2.942	0.7	1.0	2.942
2.5	0.8	1.6	2.942	0.8	1.6	2.942
3.0	1.0	2.2	2.941	1.0	2.3	2.862
3.5	1.2	3.1	2.940	1.2	3.1	2.715
4.0	1.4	4.0	2.939	1.4	4.2	2.514
4.5	1.5	5.0	2.939	1.6	5.5	2.258
5.0	1.7	6.2	2.927	1.8	7.2	1.952
5.5	1.9	7.6	2.724	2.1	9.3	1.740
6.0	2.1	9.3	2.468	2.4	11.9	1.582
6.5	2.3	11.2	2.227	2.8	15.0	1.445
7.0	2.5	13.6	1.988	3.1	18.6	1.334
7.5	2.8	16.5	1.751	3.5	22.7	1.250
8.0	3.1	20.1	1.511	3.9	27.6	1.123
8.5	3.5	24.5	1.270	4.4	33.4	0.977
9.0	3.9	30.3	1.029	5.0	40.7	0.831
9.5	4.5	38.1	0.788	5.7	49.9	0.683
10.0	5.3	49.4	0.547	6.5	62.1	0.533
10.5	6.6	69.0	0.306	7.8	81.7	0.306
11.0	10.7	134.2	0.065	11.9	146.9	0.065

Forward

Vehicle Speed (mph)	Nominal			Battery Protection Mode		
	Time (sec)	Distance (ft)	Accel Rate (mph/sec)	Time (sec)	Distance (ft)	Accel Rate (mph/sec)
2.0	0.4	0.6	4.727	0.4	0.6	4.727
4.0	0.8	2.5	4.724	0.8	2.5	4.724
6.0	1.3	5.6	4.720	1.3	5.6	4.720
8.0	1.7	9.9	4.716	1.7	10.0	4.632
10.0	2.1	15.8	4.265	2.2	16.1	3.913
12.0	2.6	24.1	3.559	2.7	25.3	3.257
14.0	3.3	35.9	2.997	3.4	38.1	2.789
16.0	4.0	51.8	2.605	4.2	55.0	2.454
18.0	4.8	72.3	2.299	5.0	76.6	2.205
20.0	5.7	98.2	2.050	6.0	103.4	1.984
22.0	6.8	130.0	1.844	7.1	136.3	1.786
24.0	7.9	168.7	1.671	8.2	176.2	1.616
26.0	9.2	214.8	1.523	9.5	223.9	1.472
28.0	10.6	269.4	1.394	11.0	280.4	1.347
30.0	12.1	333.3	1.281	12.5	346.5	1.237
32.0	13.7	407.5	1.180	14.2	423.4	1.139
34.0	15.5	493.2	1.089	16.0	512.2	1.050
36.0	17.4	591.6	1.007	18.0	614.3	0.970
38.0	19.4	704.1	0.931	20.2	731.0	0.897
40.0	21.7	832.2	0.862	22.5	864.1	0.829
42.0	24.1	977.7	0.797	25.0	1015.6	0.766
44.0	26.7	1142.9	0.736	27.8	1187.6	0.706
46.0	29.6	1330.1	0.679	30.7	1382.9	0.651
48.0	32.6	1542.2	0.625	33.9	1604.5	0.598
50.0	36.0	1782.9	0.574	37.4	1856.4	0.548
52.0	39.6	2056.2	0.525	41.3	2143.3	0.500
54.0	43.6	2367.6	0.478	45.5	2470.9	0.454
56.0	48.1	2723.8	0.432	50.1	2846.8	0.409
58.0	52.9	3133.2	0.388	55.3	3280.6	0.366
60.0	58.4	3607.3	0.346	61.2	3785.5	0.324
62.0	64.6	4161.6	0.304	67.8	4379.3	0.283
64.0	71.7	4817.6	0.263	75.5	5087.7	0.243
66.0	80.0	5607.8	0.223	84.5	5950.3	0.203
68.0	89.9	6582.5	0.184	95.5	7030.4	0.165
70.0	102.2	7826.7	0.146	109.4	8440.5	0.127
72.0	118.3	9505.8	0.107	128.4	10417.4	0.089
74.0	141.6	12006.6	0.069	158.1	13600.6	0.052
76.0	184.1	16686.2	0.032	229.3	21460.2	0.015

Clutch Fan Status : Fan Off

Axle Ratio: 4.625

Air Conditioning Status : On

Auxiliary Gearing Ratio: 1.000

Grade: 0.0 percent

Reverse

Vehicle Speed (mph)	Nominal			Battery Protection Mode		
	Time (sec)	Distance (ft)	Accel Rate (mph/sec)	Time (sec)	Distance (ft)	Accel Rate (mph/sec)
0.5	0.2	0.1	2.944	0.2	0.1	2.944
1.0	0.3	0.2	2.944	0.3	0.2	2.944
1.5	0.5	0.6	2.943	0.5	0.6	2.943
2.0	0.7	1.0	2.942	0.7	1.0	2.942

2.5	0.8	1.6	2.942	0.8	1.6	2.942
3.0	1.0	2.2	2.941	1.0	2.3	2.862
3.5	1.2	3.1	2.940	1.2	3.1	2.715
4.0	1.4	4.0	2.939	1.4	4.2	2.514
4.5	1.5	5.0	2.939	1.6	5.5	2.258
5.0	1.7	6.2	2.927	1.8	7.2	1.952
5.5	1.9	7.6	2.724	2.1	9.3	1.740
6.0	2.1	9.3	2.468	2.4	11.9	1.582
6.5	2.3	11.2	2.227	2.8	15.0	1.445
7.0	2.5	13.6	1.988	3.1	18.6	1.334
7.5	2.8	16.5	1.751	3.5	22.7	1.250
8.0	3.1	20.1	1.511	3.9	27.6	1.123
8.5	3.5	24.5	1.270	4.4	33.4	0.977
9.0	3.9	30.3	1.029	5.0	40.7	0.831
9.5	4.5	38.1	0.788	5.7	49.9	0.683
10.0	5.3	49.4	0.547	6.5	62.1	0.533
10.5	6.6	69.0	0.306	7.8	81.7	0.306
11.0	10.7	134.2	0.065	11.9	146.9	0.065

Forward

Vehicle Speed (mph)	Nominal			Battery Protection Mode		
	Time (sec)	Distance (ft)	Accel Rate (mph/sec)	Time (sec)	Distance (ft)	Accel Rate (mph/sec)
2.0	0.4	0.6	4.727	0.4	0.6	4.727
4.0	0.8	2.5	4.724	0.8	2.5	4.724
6.0	1.3	5.6	4.720	1.3	5.6	4.720
8.0	1.7	9.9	4.716	1.7	10.0	4.632
10.0	2.1	15.8	4.265	2.2	16.1	3.913
12.0	2.6	24.1	3.559	2.7	25.3	3.257
14.0	3.3	35.9	2.997	3.4	38.1	2.789
16.0	4.0	51.8	2.605	4.2	55.0	2.454
18.0	4.8	72.3	2.299	5.0	76.6	2.205
20.0	5.7	98.2	2.050	6.0	103.4	1.984
22.0	6.8	130.0	1.844	7.1	136.3	1.786
24.0	7.9	168.7	1.671	8.2	176.2	1.616
26.0	9.2	214.8	1.523	9.5	223.9	1.472
28.0	10.6	269.4	1.394	11.0	280.4	1.347
30.0	12.1	333.3	1.281	12.5	346.5	1.237
32.0	13.7	407.5	1.180	14.2	423.4	1.139
34.0	15.5	493.2	1.089	16.0	512.2	1.050
36.0	17.4	591.6	1.007	18.0	614.3	0.970
38.0	19.4	704.1	0.931	20.2	731.0	0.897
40.0	21.7	832.2	0.862	22.5	864.1	0.829
42.0	24.1	977.7	0.797	25.0	1015.6	0.766
44.0	26.7	1142.9	0.736	27.8	1187.6	0.706
46.0	29.6	1330.1	0.679	30.7	1382.9	0.651
48.0	32.6	1542.2	0.625	33.9	1604.5	0.598
50.0	36.0	1782.9	0.574	37.4	1856.4	0.548
52.0	39.6	2056.2	0.525	41.3	2143.3	0.500
54.0	43.6	2367.6	0.478	45.5	2470.9	0.454
56.0	48.1	2723.8	0.432	50.1	2846.8	0.409
58.0	52.9	3133.2	0.388	55.3	3280.6	0.366
60.0	58.4	3607.3	0.346	61.2	3785.5	0.324
62.0	64.6	4161.6	0.304	67.8	4379.3	0.283
64.0	71.7	4817.6	0.263	75.5	5087.7	0.243
66.0	80.0	5607.8	0.223	84.5	5950.3	0.203

68.0	89.9	6582.5	0.184	95.5	7030.4	0.165
70.0	102.2	7826.7	0.146	109.4	8440.5	0.127
72.0	118.3	9505.8	0.107	128.4	10417.4	0.089
74.0	141.6	12006.6	0.069	158.1	13600.6	0.052
76.0	184.1	16686.2	0.032	229.3	21460.2	0.015

Clutch Fan Status : Fan On

Axle Ratio: 4.625

Air Conditioning Status : On

Auxiliary Gearing Ratio: 1.000

Grade: 0.0 percent

Reverse

Vehicle Speed (mph)	Nominal			Battery Protection Mode		
	Time (sec)	Distance (ft)	Accel Rate (mph/sec)	Time (sec)	Distance (ft)	Accel Rate (mph/sec)
0.5	0.2	0.1	2.944	0.2	0.1	2.944
1.0	0.3	0.2	2.944	0.3	0.2	2.944
1.5	0.5	0.6	2.943	0.5	0.6	2.943
2.0	0.7	1.0	2.942	0.7	1.0	2.942
2.5	0.8	1.6	2.942	0.8	1.6	2.942
3.0	1.0	2.2	2.941	1.0	2.3	2.862
3.5	1.2	3.1	2.940	1.2	3.1	2.715
4.0	1.4	4.0	2.939	1.4	4.2	2.514
4.5	1.5	5.0	2.939	1.6	5.5	2.258
5.0	1.7	6.2	2.927	1.8	7.2	1.952
5.5	1.9	7.6	2.724	2.1	9.3	1.740
6.0	2.1	9.3	2.468	2.4	11.9	1.582
6.5	2.3	11.2	2.227	2.8	15.0	1.445
7.0	2.5	13.6	1.988	3.1	18.6	1.334
7.5	2.8	16.5	1.751	3.5	22.7	1.250
8.0	3.1	20.1	1.511	3.9	27.6	1.123
8.5	3.5	24.5	1.270	4.4	33.4	0.977
9.0	3.9	30.3	1.029	5.0	40.7	0.831
9.5	4.5	38.1	0.788	5.7	49.9	0.683
10.0	5.3	49.4	0.547	6.5	62.1	0.533
10.5	6.6	69.0	0.306	7.8	81.7	0.306
11.0	10.7	134.2	0.065	11.9	146.9	0.065

Forward

Vehicle Speed (mph)	Nominal			Battery Protection Mode		
	Time (sec)	Distance (ft)	Accel Rate (mph/sec)	Time (sec)	Distance (ft)	Accel Rate (mph/sec)
2.0	0.4	0.6	4.727	0.4	0.6	4.727
4.0	0.8	2.5	4.724	0.8	2.5	4.724
6.0	1.3	5.6	4.720	1.3	5.6	4.720
8.0	1.7	9.9	4.716	1.7	10.0	4.632
10.0	2.1	15.8	4.265	2.2	16.1	3.913
12.0	2.6	24.1	3.559	2.7	25.3	3.257
14.0	3.3	35.9	2.997	3.4	38.1	2.789
16.0	4.0	51.8	2.605	4.2	55.0	2.454
18.0	4.8	72.3	2.299	5.0	76.6	2.205
20.0	5.7	98.2	2.050	6.0	103.4	1.984
22.0	6.8	130.0	1.844	7.1	136.3	1.786
24.0	7.9	168.7	1.671	8.2	176.2	1.616
26.0	9.2	214.8	1.523	9.5	223.9	1.472
28.0	10.6	269.4	1.394	11.0	280.4	1.347
30.0	12.1	333.3	1.281	12.5	346.5	1.237

32.0	13.7	407.5	1.180	14.2	423.4	1.139
34.0	15.5	493.2	1.089	16.0	512.2	1.050
36.0	17.4	591.6	1.007	18.0	614.3	0.970
38.0	19.4	704.1	0.931	20.2	731.0	0.897
40.0	21.7	832.2	0.862	22.5	864.1	0.829
42.0	24.1	977.7	0.797	25.0	1015.6	0.766
44.0	26.7	1142.9	0.736	27.8	1187.6	0.706
46.0	29.6	1330.1	0.679	30.7	1382.9	0.651
48.0	32.6	1542.2	0.625	33.9	1604.5	0.598
50.0	36.0	1782.9	0.574	37.4	1856.4	0.548
52.0	39.6	2056.2	0.525	41.3	2143.3	0.500
54.0	43.6	2367.6	0.478	45.5	2470.9	0.454
56.0	48.1	2723.8	0.432	50.1	2846.8	0.409
58.0	52.9	3133.2	0.388	55.3	3280.6	0.366
60.0	58.4	3607.3	0.346	61.2	3785.5	0.324
62.0	64.6	4161.6	0.304	67.8	4379.3	0.283
64.0	71.7	4817.6	0.263	75.5	5087.7	0.243
66.0	80.0	5607.8	0.223	84.5	5950.3	0.203
68.0	89.9	6582.5	0.184	95.5	7030.4	0.165
70.0	102.2	7826.7	0.146	109.4	8440.5	0.127
72.0	118.3	9505.8	0.107	128.4	10417.4	0.089
74.0	141.6	12006.6	0.069	158.1	13600.6	0.052
76.0	184.1	16686.2	0.032	229.3	21460.2	0.015

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