



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
7	TECHNICAL PROPOSAL WORKSHEET	The Technical Proposal Worksheet, Follow-up Service Worksheet, and Delivery Schedule Worksheet included in Appendix B-Volume 1 RFP shall be completed in their entirety.

Please refer to the Technical Proposal sheets attached for XDE40, XDE35 and XDE60 buses with the BAE and Allison propulsion system.

Delivery schedule worksheets is part of Section 6-B as instructed in the RFP.





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
7	TECHNICAL PROPOSAL WORKSHEET	The Technical Proposal Worksheet, Follow-up Service Worksheet, and Delivery Schedule Worksheet included in Appendix B-Volume 1 RFP shall be completed in their entirety.

XDE35 BAE

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

Bus Manufacturer: New Flyer of America Inc.

Bus Model Number: XDE35

1. Dimensions

A. Overall Length

i. Over Bumpers $\underline{36}$ Feet $\underline{3}$ Inches ii. Over Body $\underline{35}$ Feet $\underline{5}$ Inches

B. Overall Width

i. Over Body excluding mirrors and lights
 ii. Over body including mirrors
 iii. Over tires
 102 Inches
 132 Inches
 102 Inches

C. Overall Height

i. Excluding Roof-Mounted H&V System
ii. Including Roof-Mounted H&V System
130 Inches

D. Angle of Approach 9.0 + /-0.5 Degrees

E. Angle of Departure 9.0 +/-0.5 Degrees

F. Breakover Angle <u>12.0 +/-0.5</u> Degrees

G. Doorway Clear Opening With Grab Handles No Grab Handles

i. Front Door $\frac{33.8}{40.9}$ In. $\frac{36.8}{45.2}$ In. $\frac{77.0}{10.2}$ In.

K. Interior Head Room (center of aisle)

i. First Axle Location 79.5 Inches ii. Drive Axle Location 78 Inches

L. Aisle Width

i. Minimum Width on Floor Between First Axle Wheel Housings
ii. Minimum Width on Floor Between Second Axle Wheel Housings
41.5 Inches

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

iii. Minimum Aisle Width Between Longitudinal Seats	30.6 Inches
iv. Minimum Aisle Width Between Transverse Seats	21.75 Inches

M. Minimum Ground Clearance

i. Excluding Axles	<u>10.0</u> Inches
ii. At Axles	5.6 Inches

N. Turning Envelope

i. Outside Body Corner Turning Radius Including Bumper	468 Inches
ii. Inside Turning Radius	252 Inches

O. Wheel Base

i. First axle to Drive axle	226.75 Inches
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P. Track

i. First axle measured center of tire to center of tire	87.5 Inches
ii. Drive axle measured center of dual tires to center of dual tires	75 Inches

Q. Overhang, Centerline of Axle Over Bumper

i. Front	<u>87.3</u> Inches
ii. Rear	<u>120.8</u> Inches

R. Floor

i. Interior Length	<u>29</u> Feet	7.5 Inches
ii. Interior Width	<u>8</u> Feet	0 Inches
iii. Height of floor from ground le	vel at front doors	15.5 Inches
iv. Height of floor from ground le	vel at back doors	15.5 Inches

S. Capacity

i. Total Number of Passenger Seats	<u>26</u>
ii. Total Number of Standing Passengers	34

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

2. Bus Weight	Curb Weight	Curb Weight plus	Curb Weight plus
		Seated Load	Gross Load (GVWR)
A. First Axle	8,460 lbs.	9,121 lbs.	11,628 lbs.
B. Drive Axle	20,000 lbs.	23,389 lbs.	25.982lbs.
C. Total	28,460 lbs.	32,510 lbs.	37,610 lbs.

3. Bicycle Rack Provision

A. Manufacturer

Sportworks

B. Model

TSB quick Release

4. Paint

A. Manufacturer

Axalta

B. Type

Imron Elite

5. Windshield Wipers and Washer

A. Manufacturer

B. Type

Electric

C. Reservoir Capacity

5 gal.

6. Bumpers

A. Manufacturer

Romeo Rim

B. Type

3 piece HELP

7. Floor

A. Subfloor

i. Material

Thermo-Lite Board Series 2862

ii. Thickness

0.750 in.

B. Floor Covering

i. Manufacturer

Altro

ii. Thickness

2.7mm / 0.11"

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

8. Windows

A. Passenger Windows

i. Manufacturer

Arow Global (Stormtite)

ii. Number of Windows

10 (including Driver's window)

iii. Dimensions of Windows

42.12 in. (width) x 42.60 in. (height)

62.28 in. (width) x 42.60 in. (height) 62.28 in. (width) x 35.12 in. (height)

02.20

iv. Total Window area (Street side)

13,800 sq. in.

v. Total Window area (Curb side)

9,500 sq. in.

B. Rear Window

i. Dimensions of Windows

N/A in. (width) x N/A in. (height)

9. Door System

A. Manufacturer

Vapor

B. Model

i. Front door

Slide Glide

ii. Rear door

Slide Glide Activair

C. Open/Close Mechanism (air, electric, spring, other)

i. Front door

<u>air</u>

ii. Rear door

<u>air</u>

10. Exterior Lighting

A. LED Lights Manufacturer

J.W Speaker (headlights) & Dialight

B. Deceleration Lighting System

Manufacturer and Model Number

Dialight

11. Interior Lights

A. Manufacturer

<u>TCB</u>

B. Type

<u>LED</u>

C. Model Number

<u>LED</u>

E. Size of Fixtures

D. Number of Fixtures

72 to 96 inches

F. Power Supplies (Ballasts)

Not Applicable to LED

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

12. Heating and Ventilating Equipment

A. Heating System Capacity	<u>105,000</u> B.T.U.
B. Ventilating Capacity	2400 total cfm per passenger
C. Heater Cores	
i. Manufacturer & Model	Thermo King
ii. Number of Rows	2
iii. Number of Fins per Inch	<u>2</u> <u>9</u>
iv. Outer Diameter of Tube	0.375 ln.
v. Fin Thickness	<u>0.008</u> In.
vi. Number of Heater Cores	1
D. Heater Blowers	
 i. Manufacturer & Model 	N/A
ii. Horsepower	N/A
iii. Speed(s)	N/A
iv. Capacity	N/A cfm
E. Controls	
i. Manufacturer	Thermo King
ii. Type	Microprocessor
iii. Model Number	IntelligAIRE III
F. Heating Equipment Location 0	_ Above Engine Compt1 Roof Under Floor 0 Other (describe)
0	Under Floor0_ Other (describe)

13. Wheelchair Ramp Equipment

A. Manufacturer B. Type C. Model Number D. Capacity E. Dimensions	New Flyer Flip-out Gen II 660 lbs.
i. Width of Ramp	<u>32.0</u> ln.
ii. Length of Ramp	<u>47.5</u> ln.

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

F. Cycle Times	Normal Idle	Fast Idle
i. Stowed to Ground	10 Sec.	10 Sec.
ii. Ground to Stow	10 Sec.	10 Sec.
iii. Total Cycle	20 Sec.	20 Sec.
C Mainht of Complete Domen	420 15-	

G. Weight of Complete Ramp 130 lbs.

14. Passenger Seat

A. Manufacturer	American Seating 6468
B. Type	Cantilever/Pedestal
C. Seat Material	Stainless Steel
D. Seat Insert Material	<u>Fiberglass</u>
E. Minimum Hip-to-Knee Room	<u>27</u> in.
F. Minimum Foot Room	10.5 in

15. Destination Signs

A. Manufacturer

B. Size	Rows	Columns
 Front Destination Sign 	<u>16</u>	<u>112</u>
ii. Curb Side Destination Sign	9	72
iv. Rear Destination Sign	14	<u>108</u>
v. Dash Mount Run Number Sign	14	40

16. Voice Annunciation System

A. Manufacturer <u>Digital Recorders Inc.</u>

B. Model Number <u>DR600</u>

17. Public Address System

A. Microphone Manufacturer	and Model	Digital Recorders / AGC & Sleath
B. Amplifier Manufacturer an	d Model	DRI Stealth MIC processor Type 1
C. Number of Speaker(s)	Inside	Outside
	6	1

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

18. Surveillance Camera System

A. Manufacturer Kratos
B. Number of Cameras 10

C. Digital Disk Storage Capacity 72 hr. minimum

19. Automatic Passenger Counter

A. Manufacturer UTA

B. Model Number <u>Smart Sensor</u>

20. Driver's Area

A. Steering Wheel

i. Manufacturer <u>Vehicle Improvement Products</u>

ii. Model Number BKBL1824D4V
iii. Size 18.00 diameter

B. Operator's Seat

i. Manufacturer <u>USSC</u> ii. Model Number 9100

C. Driver Heater/Defroster

i. Manufacturer <u>Mobile Climate Control</u>

ii. Type <u>24 V Litton Motor</u>

iii. Model Number
iv. Capacity

12-60020
84,000 B.T.U.

v. Blower Speed(s) 3 speeds

D. Windshield

i. Dimensions (Length x Height) 49(per side) in. x 42 in.

2

ii. Number of Sections

iii. Material <u>Laminate glass</u>

iv. Thickness 0.232 to 0.260 Inches

1A. TECHNICAL PROPOSAL WORKSHEET **FOR** 30-FT LOW FLOOR DIESEL HYBRID COACHES

E. Driver's Side Window

i. Dimensions (Length x Height) 42.16 in. x 41.78 in.

ii. Number of Sections

iii. Material

Laminated Glass

iv. Thickness

6 mm

F. Side Mirrors

Curb Side

Street Side

i. Manufacturer(s)

Lucerix

Lucerix

ii. Model Number(s)

32.602.00-01-12V

31.757.00-01-12V

G. Storage Locker

i. Number of Lockers

ii. Size

10.5 + 11.7 Cu. Ft.

iii. Location

Above Driver and behind Driver's Seat

21. Engine

A. Manufacturer	<u>Cummins</u>
B. Type	2013 Diesel
C. Model Number	ISB 6.7 280
D. Number of Cylinders	6 (six)

4.21 In.

E. Bore F. Stroke

4.88 In.

G. Displacement Cu.

408 In.

H. Compression Ratio

17.3:1

I. Injector Size & Type

Bosch Closed Nozzle

J. Power K. Peak Torque 280 HP 660 lb. ft.

209 (kW) 895 (Nm)

2400 at rpm 1600 at rpm

L. Engine Speed at

Idle

Fast Idle 900 rpm

Governed 2,800 rpm

M. Dry Weight

700 rpm 1,150 lbs.

N. Crankcase Oil Capacity

i. New Engine, Dry 3 Gals.

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

ii. New Engine, Wet

<u>3</u> gals.

O. Turbo Charger

i. Manufacturer

Holset

ii. Type

HX40

iii. Maximum rpm, not at load

2,800 rpm

iv. Maximum rpm, at full load

2,400 rpm

22. Cooling System

A. Radiator

i. Manufacturer

EMP

ii. Type

Aluminum Bar-Plate

iii. Model Number

XPL1

iv. Core Area

TBD in. x TBD in. = TBD in2

v. Number of Tubes

37rows (radiator) 15 rows (CAC)

vi. Tube Outer Diameter 0.098 major In.

vii. Fins per Inch

8.5

viii. Fin Thickness

0.003 In.

ix. Fin Construction

Non-louvered wavy

B. Total Cooling System Capacity C. Radiator Fan Speed Control Type

23 gals. Electronic

D. Surge Tank Capacity

5 gals

E. Surge Tank Material

Stainless Steel

F. Engine Thermostat Temperature

Settings Degrees

200 F

G. Overheat Alarm Temperature

Sending Unit Settings Degrees

225 F

H. Maximum Ambient Operating Temperature Degree

235 F

1A. TECHNICAL PROPOSAL WORKSHEET FOR

30-FT LOW FLOOR DIESEL HYBRID COACHES

23. Propulsion Generator

A. Manufacturer <u>BAE</u>

B. Type <u>In-line drive</u>

C. Size <u>6 in. x 23.6 in. x 23.6 in.</u>

D. Weight, Complete 804 lbs.

E. Power Output 200 kW (268 hp) @ 2300rpm

24. Traction Motor

A. Manufacturer BAE

B. Type Series Hybrid Drive

C. Model Number <u>HDS200</u>

F. Oil Capacity (including

heat exchanger) 3 gal.

25. Energy Storage

A. Manufacturer BAE

B. Type <u>Nano-iron-phosphate</u>

C. Size 200 kW peak

D. Weight, Complete 800 lbs.

E. Power Output 635 Vdc nominal
F. Cooling Requirement Ambient air-cooled

26. Energy Storage Controller

A. Manufacturer BAE

27. Propulsion Control System

A. Manufacturer BAE

B. Cooling Media <u>water ethylene/glycol (or propylene glycol)</u>

C. Cooling Requirements 15gpm (57 lpm)

1A. TECHNICAL PROPOSAL WORKSHEET FOR

30-FT LOW FLOOR DIESEL HYBRID COACHES

28. Axle

A. First Axle

i. Manufacturer & Model Number

MAN VOK-07-F

ii. Type

Reverse Elliot cast beam, dropped center, non-driven

iii. Rating

15,873 lbs

B. Drive Axle Ratio

i. Differential Ratio

4.56:1

ii. Hub Reduction Ratio (if used)

N/A

iii. Final Axle Ratio (if hub reduction is used)

4.56:1

29. Suspension

A. Air Bags

i. Manufacturer

Firestone

ii. Number of Air Bag per Wheel

2 Front 4 Rear

iii. Total Air Bag Volume

TBD Cu. In. TBD Cu. In.

B. Shock Absorbers

i. Manufacturer

Koni

ii. Type

double-acting, telescoping type

iii. Number of Shock per Wheel

2 Front

4 Rear

30. Brake System

A. Fundamental System Manufacturer

B. First Axle Brake Actuator Model

and Part Number

Knorr

C. Drive Axle Brake Actuator Model

and Part Number

MGM/ 1621705, 1621706

MGM/ MJB2024ET752

D. First Axle Brake Rotor

i. Manufacturer

MAN

ii. Part Number

81.50803.0040

iii. Diameter

16.14

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

iv. Width TBD In.

E. Drive Axle Brake Disc

i. Manufacturer MAN

ii. Part Number <u>81.50803.0041</u>

iii. Diameter 16.14 In. iv. Width TBD In.

F. Brake Pad Manufacturer <u>Ferrodo</u>

G. First Axle Brake Pad Identification

i. Forward <u>81.50820.5104</u> ii. Reverse <u>81.50820.5104</u>

H. Drive Axle Brake Pad Identification

i. Forward <u>81.50820.5104</u> ii. Reverse <u>81.50820.5104</u>

I. Brake Pads <u>2 pads/caliper, 4 pads per axles</u>

 J. Brake Pad Size
 Length
 Width

 i. First Axle
 7.09 In.
 TBD In.

 ii. Drive Axle
 7.09 In.
 TBD In.

K. Pad Thickness 0.827 In.

L. Pad Area per Wheel

i. First Axle 30.38 Sq. In. ii. Drive Axle 30.38 Sq. In.

M. Anti-Lock Brake System Manufacturer WABCO

31. Air System

A. Air Compressor

i. Manufacturer Powerex ii. Type Scroll

iii. Model Number
iv. Capacity at Idle
v. Capacity at Maximum Speed
vi. Maximum Warranted Speed

SLAEOSE-HP
13.5 cfm
13.5 cfm
TBD rpm

1A. TECHNICAL PROPOSAL WORKSHEET FOR

30-FT LOW FLOOR DIESEL HYBRID COACHES

vii. Idle Speed <u>TBD</u> rpm

viii. Drive Type Belt to electric motor

B. Air Reservoir Capacity

 i. Supply Reservoir
 800 Cu. In.

 ii. Primary Reservoir
 1200 Cu. In.

 iii. Secondary Reservoir
 2000 Cu. In.

 iv. Parking Reservoir
 2000 Cu. In.

 v. Accessory Reservoir
 1400 Cu. In.

 vi. Other Reservoir
 2150 Cu. In.

C. Air Dryer

i. Manufacturer <u>Graham White</u>

ii. Model Number <u>SludgeBreaker QBA60NX5</u>

32. Fuel System

A. Fuel Tank

i. Manufacturer New Flyer

ii. Size <u>100 usable Gallons</u>

iii. Material Cross-linked polyethylene

B. Filler

i. Manufacturer <u>EMCO Wheaten</u>

ii. Model Number Posi-snap

33. Hydraulic System

A. Fan Drive

i. Manufacturer
 ii. Type
 iii. Model Number
 N/A, electric Radiator
 N/A, electric Radiator
 N/A, electric Radiator

B. Power Steering

i. Steering Gear Manufacturer
ii. Type
iii. Relief Pressure
iv. Power Steering Fluid Capacity

Sheppard
M110
2175 psi
20 qts.

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

v. Effort at Steering Wheel (Unloaded stationary coach on dry asphalt pavement)

9 lbs. to 10 degrees

34. Wheels

 A. Manufacturer
 Accuride

 B. Type
 Aluminum

 C. Size
 22.5" x 8.25"

 D. Mounting
 Hub Piloted

35. Tires

A. Manufacturer Customer Supplied Firestone

 B. Type
 Low Profile

 C. Size
 305/70R22.5

D. Load Range <u>Depends on tire manufacturer</u>

E. Inflation Pressure 1st Axle <u>Depends on tire manufacturer</u> p.s.i. Drive Axle <u>Depends on tire manufacturer</u> p.s.i.

36. Starter

A. Manufacturer

B. Model Number

C. Tank volume

N/A

37. Fire Detection/Suppression System

A. Manufacturer

B. Model Number

C. Dry Chemical Tank Capacity

Amerex
SafetyNet
25 lbs.

D. Expellant Gas Tank Capacity Not Applicable

38. Chassis Electrical

A. Multiplex System

i. Manufacturer Parker VANSCO
ii. Model Number Parker VANSCO

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

B. Starter Batteries

i. Manufacturer (DEKA) East Penn Manufacturing Co.

 ii. Model Number
 8A8DT978

 iii. Type
 AGM-8D

39. Alternator

A. Manufacturer BAE

B. Type <u>Beltless (Auxiliary power from ESS)</u>

C. Model Number

D. Output at Idle

E. Output at Maximum Speed

APS-2

545 Amps

545 Amps

F. Maximum Warranted Speed

G. Speed at Idle

N/A Beltless rpm

N/A Beltless rpm

H. Drive Type Beltless (Auxiliary power from ESS)

40. Charge Air Cooler

A. Manufacturer <u>EMP</u>

B. Material (s) Aluminum

C. Core Area TBD in. x TBD in. = TBD in2.

D. Number of tubes <u>15 rows</u>

E. Tube outer diameter 0.098 major in.

F. Fins per inch $\underline{8.5}$ G. Fin thickness $\underline{0.003}$ in.

H. Fin construction Non-louvered wavy

41. Chassis and Frame

A. Roof Structure Material High tensile steel tube

B. Roof Anti-Corrosion Material Zinc rich primer

C. Roof Skin Material Fiberglass

D. Sidewall Structure Material High tensile steel tube

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

E. Sidewall Anti-Corrosion Material Zinc rich primer and Corritube

F. Sidewall Skin Material <u>Fiberglass</u>

G. Skirt Material Fiberglass

H. Main Bus Structure/Frame Material High Tensile steel tube and plate

I. Main Bus Structure/Frame Anti-Corrosion Material Zinc rich primer, Coritube & Corishield

42. Special Tools

A. Tools

B. Special Test Equipment





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XDE35 Allison

1A. TECHNICAL PROPOSAL WORKSHEET **FOR** 30-FT LOW FLOOR DIESEL HYBRID COACHES

Bus Manufacturer: New Flyer of America Inc.

Bus Model Number: XDE35

1. Dimensions

A. Overall Length

i. Over Bumpers <u>36</u> Feet 3 Inches ii. Over Body 35 Feet 5 Inches

B. Overall Width

i. Over Body excluding mirrors and lights 102 Inches ii. Over body including mirrors 132 Inches iii. Over tires 102 Inches

C. Overall Height

i. Excluding Roof-Mounted H&V System 126 Inches 130 Inches ii. Including Roof-Mounted H&V System

D. Angle of Approach

9.0 +/-0.5 Degrees

E. Angle of Departure

9.0 +/-0.5 Degrees

F. Breakover Angle

12.0 +/-0.5 Degrees

G. Doorway Clear Opening With Grab Handles No Grab Handles

Width Width Height i. Front Door 36.8 In. 77.0 In. 33.8 In. 77.3 ln. 45.2 In. ii. Rear Door 40.9 ln.

K. Interior Head Room (center of aisle)

i. First Axle Location 79.5 Inches ii. Drive Axle Location 78 Inches

L. Aisle Width

i. Minimum Width on Floor Between First Axle Wheel Housings 35.5 Inches ii. Minimum Width on Floor Between Second Axle Wheel Housings 41.5 Inches

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

iii. Minimum Aisle Width Between Long iv. Minimum Aisle Width Between Tran			30.6 Inches 21.75 Inches
M. Minimum Ground Clearance i. Excluding Axles ii. At Axles			10.0 Inches 5.6 Inches
N. Turning Envelope i. Outside Body Corner Turning Radius ii. Inside Turning Radius	s Including Bumper		468 Inches 252 Inches
O. Wheel Base i. First axle to Drive axle		226.7	75 Inches
P. Track i. First axle measured center of tire to ii. Drive axle measured center of dual		tires	87.5 Inches 75 Inches
Q. Overhang, Centerline of Axle Over Bumpe i. Front ii. Rear	er		87.3 Inches 120.8 Inches
R. Floor i. Interior Length ii. Interior Width iii. Height of floor from ground level at iv. Height of floor from ground level at			
S. Capacity i. Total Number of Passenger Seats ii. Total Number of Standing Passenge	ers	<u>26</u> <u>34</u>	

1A. TECHNICAL PROPOSAL WORKSHEET **FOR**

30-FT LOW FLOOR DIESEL HYBRID COACHES

2. Bus Weight	Curb Weight	Curb Weight plus	Curb Weight plus
		Seated Load	Gross Load (GVWR)
A. First Axle	<u>8,460</u> lbs.	<u>9,121</u> lbs.	<u>11,628</u> lbs.
B. Drive Axle	20,000 bs.	<u>23,389</u> lbs.	25,982 lbs.
C. Total	28,460 lbs.	32,510 lbs.	37,610 lbs.

3. Bicycle Rack Provision

A. Manufacturer

Sportworks

B. Model

TSB quick Release

4. Paint

A. Manufacturer

Axalta

B. Type

Imron Elite

5. Windshield Wipers and Washer

A. Manufacturer

B. Type

Electric

C. Reservoir Capacity

5 gal.

6. Bumpers

A. Manufacturer

Romeo Rim

B. Type

3 piece HELP

7. Floor

A. Subfloor

i. Material

Thermo-Lite Board Series 2862

ii. Thickness

0.750 in.

B. Floor Covering

i. Manufacturer

Altro

ii. Thickness

2.7mm / 0.11"

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

8. Windows

A. Passenger Windows

i. Manufacturer Arow Global (Stormtite)

ii. Number of Windows 10 (including Driver's window)

iii. Dimensions of Windows 42.12 in. (width) x 42.60 in. (height)

62.28 in. (width) x 42.60 in. (height)

62.28 in. (width) x 35.12 in. (height)

iv. Total Window area (Street side) 13,800 sq. in. v. Total Window area (Curb side) 9,500 sq. in.

B. Rear Window

i. Dimensions of Windows N/A in. (width) x N/A in. (height)

9. Door System

A. Manufacturer Vapor

B. Model

i. Front door Slide Glide

ii. Rear door Slide Glide Activair C. Open/Close Mechanism (air, electric, spring, other)

i. Front door

ii. Rear door air

10. Exterior Lighting

A. LED Lights Manufacturer J.W Speaker (headlights) & Dialight

B. Deceleration Lighting System

Manufacturer and Model Number Dialight

11. Interior Lights

A. Manufacturer TCB B. Type LED C. Model Number LED D. Number of Fixtures

E. Size of Fixtures 72 to 96 inches

F. Power Supplies (Ballasts) Not Applicable to LED

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

12. Heating and Ventilating Equipment

A. Heating System Capacity	<u>105,000</u> B.T.U.
B. Ventilating Capacity	2400 total cfm per passenger
C. Heater Cores	
i. Manufacturer & Model	Thermo King
ii. Number of Rows	
iii. Number of Fins per Inch	<u>2</u> <u>9</u>
iv. Outer Diameter of Tube	0.375 ln.
v. Fin Thickness	0.008 ln.
vi. Number of Heater Cores	1
D. Heater Blowers	<u> </u>
i. Manufacturer & Model	N/A
ii. Horsepower	N/A
iii. Speed(s)	N/A
iv. Capacity	N/A cfm
E. Controls	<u>14774</u> OIIII
i. Manufacturer	Thermo King
ii. Type	Microprocessor
iii. Model Number	IntelligAIRE III
F. Heating Equipment Location 0	Above Engine Compt1 Roof
0_	Under Floor 0_ Other (describe)

13. Wheelchair Ramp Equipment

New Flyer
Flip-out
Gen II
660 lbs.
, -

i. Width of Ramp 32.0 In. ii. Length of Ramp 47.5 In.

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

F. Cycle Times	Normal Idle	Fast Idle
i. Stowed to Ground	<u>10</u> Sec.	10 Sec.
ii. Ground to Stow	<u>10</u> Sec.	10 Sec.
iii. Total Cycle	20 Sec.	20 Sec.
G. Weight of Complete Ramp	130 lbs.	

14. Passenger Seat

A. Manufacturer	American Seating 6468
B. Type	Cantilever/Pedestal
C. Seat Material	Stainless Steel
D. Seat Insert Material	<u>Fiberglass</u>
E. Minimum Hip-to-Knee Room	<u>27</u> in.
F. Minimum Foot Room	<u>10.5</u> in

15. Destination Signs

A. Manufacturer

B. Size	Rows	Columns
i. Front Destination Sign	<u>16</u>	<u>112</u>
ii. Curb Side Destination Sign	9	72
iv. Rear Destination Sign	14	<u>108</u>
v. Dash Mount Run Number Sign	14	40

16. Voice Annunciation System

A. Manufacturer	Digital Recorders Inc.	
B. Model Number	DR600	

17. Public Address System

A. Microphone Manufacturer and Model		Digital Recorders / AGC & Sleath	
B. Amplifier Manufacturer an	d Model	DRI Stealth MIC processor Type 1	
C. Number of Speaker(s)	Inside	Outside	
	<u>6</u>	<u>1</u>	

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

18. Surveillance Camera System

A. Manufacturer Kratos
B. Number of Cameras 10

C. Digital Disk Storage Capacity 72 hr. minimum

19. Automatic Passenger Counter

A. Manufacturer UTA

B. Model Number <u>Smart Sensor</u>

20. Driver's Area

A. Steering Wheel

i. Manufacturer Vehicle Improvement Products

ii. Model Number
BKBL1824D4V
iii. Size
18.00 diameter

B. Operator's Seat

i. Manufacturer <u>USSC</u> ii. Model Number <u>9100</u>

C. Driver Heater/Defroster

i. Manufacturerii. TypeMobile Climate Control 24 V Litton Motor

iii. Model Number

iv. Capacity

v. Blower Speed(s)

12-60020

84,000 B.T.U.

3 speeds

D. Windshield

i. Dimensions (Length x Height) 49(per side) in. x 42 in.

ii. Number of Sections 2

iii. Material Laminate glass

iv. Thickness 0.232 to 0.260 Inches

1A. TECHNICAL PROPOSAL WORKSHEET FOR

30-FT LOW FLOOR DIESEL HYBRID COACHES

E. Driver's Side Window

i. Dimensions (Length x Height) 42.16 in. x 41.78 in.

ii. Number of Sections

iii. Material Laminated Glass

iv. Thickness 6 mm

F. Side Mirrors **Curb Side** Street Side

i. Manufacturer(s) Lucerix Lucerix

ii. Model Number(s) 32.602.00-01-12V 31.757.00-01-12V

G. Storage Locker

i. Number of Lockers

ii. Size 10.5 + 11.7 Cu. Ft.

iii. Location Above Driver and behind Driver's Seat

21. Engine

A. Manufacturer **Cummins** 2013 Diesel B. Type C. Model Number ISL9 330 D. Number of Cylinders 6 (six) 4.49 In. E. Bore F. Stroke 5.69 In. G. Displacement Cu. 543 In. H. Compression Ratio 16.6:1 I. Injector Size & Type **Bosch Closed Nozzle** J. Power 330 HP 246 (kW) 2200 at rpm

K. Peak Torque 1100 lb. ft. 1491 (Nm) 1300 at rpm Fast Idle L. Engine Speed at Idle Governed 750 rpm 1000 rpm 2,800 rpm

M. Dry Weight 1,695 lbs.

N. Crankcase Oil Capacity

i. New Engine, Dry 6.3 Gals.

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

ii. New Engine, Wet

6.3 gals.

O. Turbo Charger

i. Manufacturer Holset ii. Type HX40 iii. Maximum rpm, not at load 2,800 rpm iv. Maximum rpm, at full load

2,400 rpm

22. Cooling System

A. Radiator

i. Manufacturer **EMP**

ii. Type Aluminum Bar-Plate

iii. Model Number XPL1

TBD in. x \overline{TBD} in. = \overline{TBD} in2 iv. Core Area v. Number of Tubes 37rows (radiator) 15 rows (CAC)

vi. Tube Outer Diameter 0.098 major In.

vii. Fins per Inch 8.5 viii. Fin Thickness 0.003 In.

ix. Fin Construction Non-louvered wavy

B. Total Cooling System Capacity 23 gals. C. Radiator Fan Speed Control Type Electronic D. Surge Tank Capacity 5 gals

E. Surge Tank Material Stainless Steel

F. Engine Thermostat Temperature

Settings Degrees 200 F

G. Overheat Alarm Temperature

Sending Unit Settings Degrees 225 F H. Maximum Ambient Operating Temperature Degree 235 F

1A. TECHNICAL PROPOSAL WORKSHEET FOR

30-FT LOW FLOOR DIESEL HYBRID COACHES

23. Propulsion Generator

A. Manufacturer Allison
B. Type In-line drive

C. Size 33 in. x 25 in. x 21 in.

D. Weight, Complete 944 lbs.

E. Power Output <u>280W (330 hp) @ 2300rpm</u>

24. Traction Motor

A. Manufacturer Allison

B. Type Parallel Hybrid Drive
C. Model Number H 50 EP (Ev50)

F. Oil Capacity (including

heat exchanger) <u>13 g</u>al.

25. Energy Storage

A. Manufacturer Allison

B. Type <u>Nickel Metal Hydride</u>

C. Size 11.14 in. x 85.96 in. x 45.21 in.

D. Weight, Complete 970 lbs.
E. Power Output 432-780 Volts

F. Cooling Requirement 2 kW Freon Evaporator

26. Energy Storage Controller

A. Manufacturer Allison

27. Propulsion Control System

A. Manufacturer <u>Allison</u>

B. Cooling Media N/A

C. Cooling Requirements N/A

1A. TECHNICAL PROPOSAL WORKSHEET FOR

30-FT LOW FLOOR DIESEL HYBRID COACHES

28. Axle

A. First Axle

i. Manufacturer & Model Number MAN VOK-07-F

ii. Type Reverse Elliot cast beam, dropped center, non-driven

iii. Rating <u>15,873</u> lbs

B. Drive Axle Ratio

i. Differential Ratio
 ii. Hub Reduction Ratio (if used)
 iii. Final Axle Ratio (if hub reduction is used)
 4.56:1
 4.56:1

29. Suspension

A. Air Bags

i. Manufacturer
ii. Number of Air Bag per Wheel
iii. Total Air Bag Volume

Firestone
2 Front
TBD Cu. In. TBD Cu. In.

B. Shock Absorbers

i. Manufacturer Koni

ii. Type
iii. Number of Shock per Wheel

double-acting, telescoping type
2 Front
4 Rear

30. Brake System

A. Fundamental System Manufacturer Knorr

B. First Axle Brake Actuator Model

and Part Number

C. Drive Axle Brake Actuator Model

MGM/ 1621705, 1621706

and Part Number MGM/ MJB2024ET752

D. First Axle Brake Rotor

i. Manufacturer MAN

ii. Part Number <u>81.50803.0040</u>

iii. Diameter <u>16.14</u>

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

iv. Width <u>TBD</u> In.

E. Drive Axle Brake Disc

i. Manufacturer MAN

ii. Part Number <u>81.50803.0041</u>

iii. Diameter <u>16.14 In.</u> iv. Width <u>TBD In.</u>

F. Brake Pad Manufacturer Ferrodo

G. First Axle Brake Pad Identification

i. Forward <u>81.50820.5104</u> ii. Reverse <u>81.50820.5104</u>

H. Drive Axle Brake Pad Identification

i. Forward <u>81.50820.5104</u> ii. Reverse <u>81.50820.5104</u>

I. Brake Pads 2 pads/caliper, 4 pads per axles

 J. Brake Pad Size
 Length
 Width

 i. First Axle
 7.09 In.
 TBD In.

 ii. Drive Axle
 7.09 In.
 TBD In.

K. Pad Thickness 0.827 In.

L. Pad Area per Wheel

i. First Axle 30.38 Sq. In. ii. Drive Axle 30.38 Sq. In.

M. Anti-Lock Brake System Manufacturer WABCO

31. Air System

A. Air Compressor

i. Manufacturer
ii. Type
iii. Model Number
iv. Capacity at Idle
v. Capacity at Maximum Speed
vi. Maximum Warranted Speed

WABCO
Twin Cylinder
HD 30.4
6.9 cfm
30.4 cfm
3000 rpm

1A. TECHNICAL PROPOSAL WORKSHEET FOR

30-FT LOW FLOOR DIESEL HYBRID COACHES

vii. Idle Speed 750 rpm viii. Drive Type Direct

B. Air Reservoir Capacity

i. Supply Reservoir
ii. Primary Reservoir
iii. Secondary Reservoir
iv. Parking Reservoir
v. Accessory Reservoir
vi. Other Reservoir
2000 Cu. In.
2150 Cu. In.

C. Air Dryer

i. Manufacturer <u>Graham White</u>

ii. Model Number <u>SludgeBreaker QBA60NX5</u>

32. Fuel System

A. Fuel Tank

i. Manufacturerii. SizeNew Flyer100 usable Gallons

iii. Material Cross-linked polyethylene

B. Filler

i. Manufacturer EMCO Wheaten

ii. Model Number <u>Posi-snap</u>

33. Hydraulic System

A. Fan Drive

i. Manufacturerii. Typeiii. Model Numberii. Model Numberiii. N/A, electric Radiatoriii. N/A, electric Radiator

B. Power Steering

i. Steering Gear Manufacturer
 ii. Type
 iii. Relief Pressure
 iv. Power Steering Fluid Capacity
 Sheppard
 M110
 2175 psi
 20 qts.

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

v. Effort at Steering Wheel (Unloaded stationary coach on dry asphalt pavement)

9 lbs. to 10 degrees

34. Wheels

A. Manufacturer	<u>Accuride</u>
B. Type	<u>Aluminum</u>
C. Size	22.5" x 8.25"
D. Mounting	Hub Piloted

35. Tires

A. Manufacturer Customer Supplied Firestone

B. Type <u>Low Profile</u>
C. Size <u>305/70R22.5</u>

D. Load Range <u>Depends on tire manufacturer</u>

E. Inflation Pressure 1st Axle <u>Depends on tire manufacturer</u> p.s.i. Drive Axle <u>Depends on tire manufacturer</u> p.s.i.

36. Starter

A. Manufacturer	<u>N/A</u>
B. Model Number	N/A
C. Tank volume	N/A

37. Fire Detection/Suppression System

A. Manufacturer

B. Model Number

C. Dry Chemical Tank Capacity

Amerex
SafetyNet
25 lbs.

D. Expellant Gas Tank Capacity Not Applicable

38. Chassis Electrical

A. Multiplex System

i. Manufacturerii. Model NumberParker VANSCOParker VANSCO

1A. TECHNICAL PROPOSAL WORKSHEET FOR

30-FT LOW FLOOR DIESEL HYBRID COACHES

B. Starter Batteries

i. Manufacturer (DEKA) East Penn Manufacturing Co.

 ii. Model Number
 8A8DT978

 iii. Type
 AGM-8D

39. Alternator

A. Manufacturer **EMP** B. Type Air cooled C. Model Number Power 450 D. Output at Idle 280 Amps E. Output at Maximum Speed 455 Amps F. Maximum Warranted Speed 6500 rpm G. Speed at Idle 2000 rpm H. Drive Type Belt

40. Charge Air Cooler

A. Manufacturer <u>EMP</u>

B. Material (s) Aluminum

C. Core Area TBD in. x TBD in. = TBD in2.

D. Number of tubes 15 rows

E. Tube outer diameter 0.098 major in.

F. Fins per inch $\underline{8.5}$ G. Fin thickness $\underline{0.003}$ in.

H. Fin construction Non-louvered wavy

41. Chassis and Frame

A. Roof Structure Material High tensile steel tube

B. Roof Anti-Corrosion Material Zinc rich primer

C. Roof Skin Material Fiberglass

D. Sidewall Structure Material High tensile steel tube

1A. TECHNICAL PROPOSAL WORKSHEET FOR 30-FT LOW FLOOR DIESEL HYBRID COACHES

E. Sidewall Anti-Corrosion Material

Zinc rich primer and Corritube

F. Sidewall Skin Material

Fiberglass

G. Skirt Material

Fiberglass

H. Main Bus Structure/Frame Material High Tensile steel tube and plate

I. Main Bus Structure/Frame Anti-Corrosion Material Zinc rich primer, Coritube & Corishield

42. Special Tools

A. Tools

B. Special Test Equipment





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
7	TECHNICAL PROPOSAL WORKSHEET	The Technical Proposal Worksheet, Follow-up Service Worksheet, and Delivery Schedule Worksheet included in Appendix B-Volume 1 RFP shall be completed in their entirety.

XDE40 BAE

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

Bus Manufacturer: New Flyer of America Inc.

Bus Model Number: XDE40

1. Dimensions

A. Overall Length

i. Over Bumpers 41 Feet 0 Inches ii. Over Body 40 Feet 2.0 Inches

B. Overall Width

i. Over Body excluding mirrors and lights
 ii. Over body including mirrors
 iii. Over tires
 102 Inches
 132 Inches
 102 Inches

C. Overall Height

i. Excluding Roof-Mounted H&V System
ii. Including Roof-Mounted H&V System

126 Inches
130 Inches

D. Angle of Approach 9.0 ± 1.05 Degrees

E. Angle of Departure 9.0 +/-0.5 Degrees

F. Breakover Angle 9.0 +/-0.5 Degrees

G. Doorway Clear Opening With Grab Handles No Grab Handles

i. Front Door 33.8 In. 36.8 In. 77.0 In. ii. Rear Door 40.9 In. 45.2 In. 77.3 In.

K. Interior Head Room (center of aisle)

i. First Axle Locationii. Drive Axle Location79.5 Inches78 Inches

L. Aisle Width

i. Minimum Width on Floor Between First Axle Wheel Housings 35.5 Inches ii. Minimum Width on Floor Between Second Axle Wheel Housings 41.5 Inches

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

iii. Minimum Aisle Width Between Long iv. Minimum Aisle Width Between Tran			30.6 Inches 21.75 Inches
M. Minimum Ground Clearance i. Excluding Axles ii. At Axles			10.0 Inches 5.6 Inches
N. Turning Envelope i. Outside Body Corner Turning Radius ii. Inside Turning Radius	Including Bumper		528 Inches 263 Inches
O. Wheel Base i. First axle to Drive axle		283.7	75 Inches
P. Track i. First axle measured center of tire to dii. Drive axle measured center of dual to		ires	87.5 Inches 75 Inches
Q. Overhang, Centerline of Axle Over Bumpe i. Front ii. Rear	r		87.3 Inches 120.8 Inches
R. Floor i. Interior Length ii. Interior Width iii. Height of floor from ground level at iv. Height of floor from ground level at			
S. Capacity i. Total Number of Passenger Seats ii. Total Number of Standing Passenge	ers	32 39	

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

2. Bus Weight	Curb Weight	Curb Weight plus Seated Load	Curb Weight plus Gross Load (GVWR)
A. First Axle	9,460 lbs.	10,750 lbs.	13,519 lbs.
B. Drive Axle	21,200 bs.	23,860 lbs.	26,941 lbs.
C. Total	29,660 lbs.	34.610 lbs.	40.460 lbs.

3. Bicycle Rack Provision

A. Manufacturer

Sportworks

B. Model

TSB quick Release

4. Paint

A. Manufacturer

Axalta

B. Type

Imron Elite

5. Windshield Wipers and Washer

A. Manufacturer

B. Type

Electric

C. Reservoir Capacity

5 gal.

6. Bumpers

A. Manufacturer

Romeo Rim

B. Type

3 piece HELP

7. Floor

A. Subfloor

i. Material

Thermo-Lite Board Series 2862

ii. Thickness

0.750 in.

B. Floor Covering

i. Manufacturer

Altro

ii. Thickness

2.7mm / 0.11"

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

8. Windows

A. Passenger Windows

i. Manufacturer Arow Global (Stormtite)

ii. Number of Windows 12 (including Driver's window)

iii. Dimensions of Windows 42.12 in. (width) x 42.60 in. (height) 62.28 in. (width) x 42.60 in. (height)

62.28 in. (width) x 35.12 in. (height)

iv. Total Window area (Street side) 15,800 sq. in. v. Total Window area (Curb side) 11,500 sq. in.

B. Rear Window

i. Dimensions of Windows N/A in. (width) x N/A in. (height)

9. Door System

A. Manufacturer Vapor

B. Model

i. Front door Slide Glide

ii. Rear door <u>Slide Glide Activair</u> C. Open/Close Mechanism (air, electric, spring, other)

i. Front door <u>air</u>

ii. Rear door <u>air</u>

10. Exterior Lighting

A. LED Lights Manufacturer J.W Speaker (headlights) & Dialight

B. Deceleration Lighting System

Manufacturer and Model Number Dialight

11. Interior Lights

A. Manufacturer TCB
B. Type LED
C. Model Number LED

D. Number of Fixtures 10

E. Size of Fixtures 72 to 96 inches

F. Power Supplies (Ballasts) Not Applicable to LED

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

12. Heating and Ventilating Equipment

A. Heating System Capacity	<u>105,000</u> B.T.U.
B. Ventilating Capacity	2400 total cfm per passenger
C. Heater Cores	
i. Manufacturer & Model	Thermo King
ii. Number of Rows	To the state of th
iii. Number of Fins per Inch	<u>2</u> <u>9</u>
iv. Outer Diameter of Tube	0.375 ln.
v. Fin Thickness	0.008 ln.
vi. Number of Heater Cores	1
D. Heater Blowers	-
i. Manufacturer & Model	N/A
ii. Horsepower	N/A
iii. Speed(s)	N/A
iv. Capacity	N/A cfm
E. Controls	<u> </u>
i. Manufacturer	Thermo King
ii. Type	Microprocessor
iii. Model Number	IntelligAIRE III
F. Heating Equipment Location 0	Above Engine Compt. 1 Roof
0	Under Floor 0 Other (describe)
	(00001100)

13. Wheelchair Ramp Equipment

A. Manufacturer	<u>New Flye</u>
B. Type	Flip-out
C. Model Number	Gen II
D. Capacity	660 lbs.
E. Dimensions	
i. Width of Ramp	32.0 ln.
ii. Length of Ramp	<u>47.5</u> In.

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

F. Cycle Times	Normal Idle	Fast Idle
 Stowed to Ground 	<u>10</u> Sec.	<u>10</u> Sec.
ii. Ground to Stow	<u>10</u> Sec.	10 Sec.
iii. Total Cycle	20 Sec.	20 Sec.
G. Weight of Complete Ramp	<u>130</u> lbs.	

14. Passenger Seat

A. Manufacturer	American Seating 6468
B. Type	Cantilever/Pedestal
C. Seat Material	Stainless Steel
D. Seat Insert Material	Fiberglass
E. Minimum Hip-to-Knee Room	27 in.
F. Minimum Foot Room	10.5 in

15. Destination Signs

A. Manufacturer

B. Size	Rows	Columns
 Front Destination Sign 	<u>16</u>	<u>112</u>
ii. Curb Side Destination Sign	9	72
iv. Rear Destination Sign	14	<u>108</u>
v. Dash Mount Run Number Sign	14	40

16. Voice Annunciation System

A. Manufacturer	<u>Digital Recorders Inc.</u>
B. Model Number	DR600

17. Public Address System

A. Microphone Manufacturer	and Model	Digital Recorders / AGC & Sleath
B. Amplifier Manufacturer an	d Model	DRI Stealth MIC processor Type 1
C. Number of Speaker(s)	Inside	Outside
	<u>6</u>	<u>1</u>

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

18. Surveillance Camera System

A. Manufacturer Kratos
B. Number of Cameras 10

C. Digital Disk Storage Capacity 72 hr. minimum

19. Automatic Passenger Counter

A. Manufacturer <u>UTA</u>

B. Model Number Smart Sensor

20. Driver's Area

A. Steering Wheel

i. Manufacturer Vehicle Improvement Products

ii. Model Number
iii. Size

BKBL1824D4V
18.00 diameter

B. Operator's Seat

i. Manufacturer <u>USSC</u> ii. Model Number 9100

C. Driver Heater/Defroster

i. Manufacturer <u>Mobile Climate Control</u>

ii. Type <u>24 V Litton Motor</u>

iii. Model Number
iv. Capacity
v. Blower Speed(s)

12-60020
84,000 B.T.U.
3 speeds

D. Windshield

i. Dimensions (Length x Height) 49(per side) in. x 42 in.

ii. Number of Sections 2

iii. Material Laminate glass

iv. Thickness 0.232 to 0.260 Inches

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

E. Driver's Side Window

i. Dimensions (Length x Height) $\underline{42.16}$ in. x $\underline{41.78}$ in.

ii. Number of Sections

iii. Material Laminated Glass

iv. Thickness 6 mm

F. Side Mirrors Curb Side Street Side

i. Manufacturer(s) <u>Lucerix</u> <u>Lucerix</u>

ii. Model Number(s) <u>32.602.00-01-12V</u> <u>31.757.00-01-12V</u>

G. Storage Locker

i. Number of Lockers 2

ii. Size 10.5 + 11.7 Cu. Ft.

iii. Location Above Driver and behind Driver's Seat

21. Engine

A. Manufacturer

B. Type

C. Model Number

D. Number of Cylinders

E. Bore

F. Stroke

Cummins

2013 Diesel

ISB 6.7 280

6 (six)

4.21 In.

4.88 In.

G. Displacement Cu. 4.88 In.
H. Compression Ratio 17.3:1

I. Injector Size & Type Bosch Closed Nozzle

 J. Power
 280 HP
 209 (kW)
 2400 at rpm

 K. Peak Torque
 660 lb. ft.
 895 (Nm)
 1600 at rpm

 L. Engine Speed at
 Idle
 Fast Idle
 Governed

700 rpm 900 rpm 2,800 rpm

M. Dry Weight <u>1,150</u> lbs.

N. Crankcase Oil Capacity

i. New Engine, Dry 3 Gals.

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

ii. New Engine, Wet <u>3</u> gals.

O. Turbo Charger

i. Manufacturer <u>Holset</u> ii. Type HX40

iii. Maximum rpm, not at load 2,800 rpm iv. Maximum rpm, at full load 2,400 rpm

22. Cooling System

A. Radiator

i. Manufacturer <u>EMP</u>

ii. Type <u>Aluminum Bar-Plate</u>

iii. Model Number XPL1

iv. Core Area <u>TBD</u> in. x <u>TBD</u> in. = <u>TBD</u> in₂
v. Number of Tubes <u>37rows (radiator) 15 rows (CAC)</u>

vi. Tube Outer Diameter 0.098 major In.

vii. Fins per Inch $\frac{8.5}{0.003}$ In.

ix. Fin Construction Non-louvered wavy

B. Total Cooling System Capacity
C. Radiator Fan Speed Control Type
D. Surge Tank Capacity

23 gals.

Electronic
5 gals

E. Surge Tank Material Stainless Steel

F. Engine Thermostat Temperature

Settings Degrees 200 F

G. Overheat Alarm Temperature

Sending Unit Settings Degrees 225 F
H. Maximum Ambient Operating Temperature Degree 235 F

2A. TECHNICAL PROPOSAL WORKSHEET FOR

40-FT LOW FLOOR DIESEL HYBRID COACHES

23. Propulsion Generator

A. Manufacturer

BAE

B. Type

In-line drive

C. Size

6 in. x 23.6 in. x 23.6 in.

D. Weight, Complete

804 lbs.

E. Power Output

200 kW (268 hp) @ 2300rpm

24. Traction Motor

A. Manufacturer

BAE

B. Type

Series Hybrid Drive

C. Model Number

HDS200

F. Oil Capacity (including

heat exchanger)

3 gal.

25. Energy Storage

A. Manufacturer

BAE

B. Type

Nano-iron-phosphate

C. Size

200 kW peak

D. Weight, Complete

800 lbs.

E. Power Output

635 Vdc nominal

F. Cooling Requirement

Ambient air-cooled

26. Energy Storage Controller

A. Manufacturer

BAE

27. Propulsion Control System

A. Manufacturer

BAE

B. Cooling Media

water ethylene/glycol (or propylene glycol)

C. Cooling Requirements

15gpm (57 lpm)

2A. TECHNICAL PROPOSAL WORKSHEET **FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES**

28. Axle

A. First Axle

i. Manufacturer & Model Number

MAN VOK-07-F

ii. Type

Reverse Elliot cast beam, dropped center, non-driven

iii. Rating

15,873 lbs

B. Drive Axle Ratio

i. Differential Ratio

4.56:1

ii. Hub Reduction Ratio (if used)

N/A

iii. Final Axle Ratio (if hub reduction is used)

4.56:1

29. Suspension

A. Air Bags

i. Manufacturer

Firestone

ii. Number of Air Bag per Wheel

2 Front 4 Rear

iii. Total Air Bag Volume

TBD Cu. In. TBD Cu. In.

B. Shock Absorbers

i. Manufacturer

Koni

ii. Type

double-acting, telescoping type

iii. Number of Shock per Wheel

2 Front

Knorr

4 Rear

30. Brake System

A. Fundamental System Manufacturer

B. First Axle Brake Actuator Model

and Part Number

MGM/ 1621705, 1621706

MGM/ MJB2024ET752

C. Drive Axle Brake Actuator Model

and Part Number

D. First Axle Brake Rotor

i. Manufacturer

ii. Part Number

MAN

81.50803.0040

16.14

iii. Diameter

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

iv. Width <u>TBD</u> In.

E. Drive Axle Brake Disc

i. Manufacturer MAN

ii. Part Number <u>81.50803.0041</u>

iii. Diameter <u>16.14</u> In. iv. Width <u>TBD</u> In.

F. Brake Pad Manufacturer <u>Ferrodo</u>

G. First Axle Brake Pad Identification

i. Forward <u>81.50820.5104</u> ii. Reverse <u>81.50820.5104</u>

H. Drive Axle Brake Pad Identification

i. Forward <u>81.50820.5104</u> ii. Reverse 81.50820.5104

I. Brake Pads 2 pads/caliper, 4 pads per axles

 J. Brake Pad Size
 Length
 Width

 i. First Axle
 7.09 In.
 TBD In.

 ii. Drive Axle
 7.09 In.
 TBD In.

K. Pad Thickness 0.827 In.

L. Pad Area per Wheel

i. First Axle 30.38 Sq. In. ii. Drive Axle 30.38 Sq. In.

M. Anti-Lock Brake System Manufacturer WABCO

31. Air System

A. Air Compressor

i. Manufacturer Powerex ii. Type Scroll

iii. Model Number <u>SLAEOSE-HP</u>

iv. Capacity at Idle
v. Capacity at Maximum Speed
vi. Maximum Warranted Speed

13.5 cfm
TBD rpm

2A. TECHNICAL PROPOSAL WORKSHEET FOR

40-FT LOW FLOOR DIESEL HYBRID COACHES

vii. Idle Speed TBD rpm

viii. Drive Type Belt to electric motor

B. Air Reservoir Capacity

vi. Other Reservoir

i. Supply Reservoir 800 Cu. In. ii. Primary Reservoir 1200 Cu. In. iii. Secondary Reservoir 2000 Cu. In. iv. Parking Reservoir 2000 Cu. In. v. Accessory Reservoir 1400 Cu. In.

C. Air Dryer

i. Manufacturer **Graham White**

ii. Model Number SludgeBreaker QBA60NX5

2150 Cu. In.

32. Fuel System

A. Fuel Tank

i. Manufacturer New Flyer ii. Size 100 usable Gallons Cross-linked polyethylene

iii. Material

B. Filler

i. Manufacturer **EMCO Wheaten** ii. Model Number Posi-snap

33. Hydraulic System

A. Fan Drive

i. Manufacturer N/A, electric Radiator ii. Type N/A. electric Radiator iii. Model Number N/A, electric Radiator

B. Power Steering

i. Steering Gear Manufacturer Sheppard ii. Type M110 iii. Relief Pressure 2175 psi iv. Power Steering Fluid Capacity 20 qts.

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

v. Effort at Steering Wheel (Unloaded stationary coach on dry asphalt pavement)

9 lbs. to 10 degrees

34. Wheels

A. Manufacturer

B. Type

C. Size

D. Mounting

Accuride

Aluminum

22.5" x 8.25"

Hub Piloted

35. Tires

A. Manufacturer Customer Supplied Firestone

B. Type <u>Low Profile</u>
C. Size <u>305/70R22.5</u>

D. Load Range <u>Depends on tire manufacturer</u>

E. Inflation Pressure 1st Axle <u>Depends on tire manufacturer</u> p.s.i. Drive Axle <u>Depends on tire manufacturer</u> p.s.i.

36. Starter

A. Manufacturer

B. Model Number

C. Tank volume

N/A

37. Fire Detection/Suppression System

A. Manufacturer

B. Model Number

C. Dry Chemical Tank Capacity

Amerex
SafetyNet
25 lbs.

D. Expellant Gas Tank Capacity Not Applicable

38. Chassis Electrical

A. Multiplex System

i. Manufacturerii. Model NumberParker VANSCOParker VANSCO

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

B. Starter Batteries

i. Manufacturer (DEKA) East Penn Manufacturing Co.

 ii. Model Number
 8A8DT978

 iii. Type
 AGM-8D

39. Alternator

A. Manufacturer <u>BAE</u>

B. Type <u>Beltless (Auxiliary power from ESS)</u>

C. Model Number APS-2
D. Output at Idle 545 Amps
E. Output at Maximum Speed 545 Amps

F. Maximum Warranted Speed N/A Beltless rpm
G. Speed at Idle N/A Beltless rpm

H. Drive Type Beltless (Auxiliary power from ESS)

40. Charge Air Cooler

A. Manufacturer <u>EMP</u>

B. Material (s) Aluminum

C. Core Area <u>TBD</u> in. x <u>TBD</u> in. = <u>TBD</u> in2.

D. Number of tubes <u>15 rows</u>

E. Tube outer diameter 0.098 major in.

F. Fins per inch $\underline{8.5}$ G. Fin thickness $\underline{0.003}$ in.

H. Fin construction Non-louvered wavy

41. Chassis and Frame

A. Roof Structure Material High tensile steel tube

B. Roof Anti-Corrosion Material Zinc rich primer

C. Roof Skin Material <u>Fiberglass</u>

D. Sidewall Structure Material High tensile steel tube

2A. TECHNICAL PROPOSAL WORKSHEET **FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES**

E. Sidewall Anti-Corrosion Material

Zinc rich primer and Corritube

F. Sidewall Skin Material

Fiberglass

G. Skirt Material

Fiberglass

H. Main Bus Structure/Frame Material High Tensile steel tube and plate

I. Main Bus Structure/Frame Anti-Corrosion Material Zinc rich primer, Coritube & Corishield

42. Special Tools

A. Tools

B. Special Test Equipment





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
7	TECHNICAL PROPOSAL WORKSHEET	The Technical Proposal Worksheet, Follow-up Service Worksheet, and Delivery Schedule Worksheet included in Appendix B-Volume 1 RFP shall be completed in their entirety.

XDE40 Allison

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

Bus Manufacturer: New Flyer of America Inc.

Bus Model Number: XDE40

1. Dimensions

A. Overall Length

i. Over Bumpers 41 Feet 0 Inches ii. Over Body 40 Feet 2.0 Inches

B. Overall Width

i. Over Body excluding mirrors and lights
 ii. Over body including mirrors
 iii. Over tires
 iii. Over tires

C. Overall Height

i. Excluding Roof-Mounted H&V System
ii. Including Roof-Mounted H&V System
130 Inches

D. Angle of Approach 9.0 ± -0.5 Degrees

E. Angle of Departure 9.0 +/-0.5 Degrees

F. Breakover Angle 9.0 +/-0.5 Degrees

G. Doorway Clear Opening With Grab Handles No Grab Handles

 Width
 Width
 Height

 i. Front Door
 33.8 In.
 36.8 In.
 77.0 In.

 ii. Rear Door
 40.9 In.
 45.2 In.
 77.3 In.

K. Interior Head Room (center of aisle)

i. First Axle Locationii. Drive Axle Location79.5 Inches78 Inches

L. Aisle Width

i. Minimum Width on Floor Between First Axle Wheel Housings
ii. Minimum Width on Floor Between Second Axle Wheel Housings
41.5 Inches

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

iii. Minimum Aisle Width Betwee iv. Minimum Aisle Width Betwee			30.6 Inches 21.75 Inches
M. Minimum Ground Clearance i. Excluding Axles ii. At Axles			10.0 Inches 5.6 Inches
N. Turning Envelope i. Outside Body Corner Turning ii. Inside Turning Radius	Radius Including Bumper		528 Inches 263 Inches
O. Wheel Base i. First axle to Drive axle		<u>283.</u>	75 Inches
P. Track i. First axle measured center of ii. Drive axle measured center of		tires	87.5 Inches 75 Inches
Q. Overhang, Centerline of Axle Over E i. Front ii. Rear	Bumper		87.3 Inches 120.8 Inches
R. Floor i. Interior Length ii. Interior Width iii. Height of floor from ground le iv. Height of floor from ground le		-	
S. Capacity i. Total Number of Passenger Siii. Total Number of Standing Pas		32 39	

2A. TECHNICAL PROPOSAL WORKSHEET FOR

40-FT LOW FLOOR DIESEL HYBRID COACHES

2. Bus Weight	Curb Weight	Curb Weight plus	Curb Weight plus
		Seated Load	Gross Load (GVWR)
A. First Axle	9,460 lbs.	<u>10,750</u> lbs.	<u>13,519</u> lbs.
B. Drive Axle	21,200 bs.	<u>23,860</u> lbs.	26,941 lbs.
C. Total	29,660 lbs.	34,610 lbs.	40,460 lbs.

3. Bicycle Rack Provision

A. Manufacturer Sportworks

B. Model <u>TSB quick Release</u>

4. Paint

A. Manufacturer <u>Axalta</u>
B. Type <u>Imron Elite</u>

5. Windshield Wipers and Washer

A. Manufacturer

B. Type <u>Electric</u>
C. Reservoir Capacity <u>5 gal.</u>

6. Bumpers

A. Manufacturer Romeo Rim
B. Type 3 piece HELP

7. Floor

A. Subfloor

i. Material Thermo-Lite Board Series 2862 ii. Thickness 0.750 in.

B. Floor Covering

i. Manufacturer Altro

ii. Thickness <u>2.7mm / 0.11"</u>

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

8. Windows

A. Passenger Windows

i. Manufacturer <u>Arow Global (Stormtite)</u>

ii. Number of Windows 12 (including Driver's window)

iii. Dimensions of Windows 42.12 in. (width) x 42.60 in. (height)

62.28 in. (width) x 42.60 in. (height)

62.28 in. (width) x 35.12 in. (height)

iv. Total Window area (Street side) 15,800 sq. in.

v. Total Window area (Curb side) 11,500 sq. in.

B. Rear Window

i. Dimensions of Windows N/A in. (width) x N/A in. (height)

9. Door System

A. Manufacturer <u>Vapor</u>

B. Model

i. Front door Slide Glide

ii. Rear door <u>Slide Glide Activair</u>

C. Open/Close Mechanism (air, electric, spring, other)

i. Front door <u>air</u> ii. Rear door air

10. Exterior Lighting

A. LED Lights Manufacturer J.W Speaker (headlights) & Dialight

B. Deceleration Lighting System

Manufacturer and Model Number <u>Dialight</u>

11. Interior Lights

A. Manufacturer TCB
B. Type LED
C. Model Number LED

D. Number of Fixtures 10

E. Size of Fixtures 72 to 96 inches

F. Power Supplies (Ballasts) <u>Not Applicable to LED</u>

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

12. Heating and Ventilating Equipment

A. Heating System Capacity	<u>105,000</u> B.T.U.
B. Ventilating Capacity	2400 total cfm per passenger
C. Heater Cores	
 Manufacturer & Model 	Thermo King
ii. Number of Rows	2
iii. Number of Fins per Inch	<u>2</u> <u>9</u>
iv. Outer Diameter of Tube	0.375 ln.
v. Fin Thickness	0.008 In.
vi. Number of Heater Cores	1
D. Heater Blowers	_
 Manufacturer & Model 	N/A
ii. Horsepower	N/A
iii. Speed(s)	N/A
iv. Capacity	N/A cfm
E. Controls	
i. Manufacturer	Thermo King
ii. Type	Microprocessor
iii. Model Number	IntelligAIRE III
F. Heating Equipment Location 0	Above Engine Compt1 Roof
0_	Under Floor 0 Other (describe)

13. Wheelchair Ramp Equipment

A. Manufacturer	New Flyer
B. Type	Flip-out
C. Model Number	Gen II
D. Capacity	660 lbs.
E. Dimensions	
i. Width of Ramp	32.0 ln.
ii. Length of Ramp	47.5 ln.

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

F. Cycle Times	Normal Idle	Fast Idle
i. Stowed to Ground	<u>10</u> Sec.	10 Sec.
ii. Ground to Stow	<u>10</u> Sec.	10 Sec.
iii. Total Cycle	20 Sec.	20 Sec.
G. Weight of Complete Ramp	<u>130</u> lbs.	

14. Passenger Seat

A. Manufacturer	American Seating 6468
B. Type	Cantilever/Pedestal
C. Seat Material	Stainless Steel
D. Seat Insert Material	<u>Fiberglass</u>
E. Minimum Hip-to-Knee Room	<u>27</u> in.
F. Minimum Foot Room	<u>10.5</u> in

15. Destination Signs

A. Manufacturer

B. Size	Rows	Columns
i. Front Destination Sign	<u>16</u>	<u>112</u>
ii. Curb Side Destination Sign	9	72
iv. Rear Destination Sign	14	<u>108</u>
v. Dash Mount Run Number Sign	14	40

16. Voice Annunciation System

A. Manufacturer	<u>Digital Recorders Inc.</u>	
B. Model Number	DR600	

17. Public Address System

 A. Microphone Manufacturer and Model 		Digital Recorders / AGC & Sleath
B. Amplifier Manufacturer and Model		DRI Stealth MIC processor Type 1
C. Number of Speaker(s)	Inside	Outside
	<u>6</u>	<u>1</u>

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

18. Surveillance Camera System

A. Manufacturer Kratos
B. Number of Cameras 10

C. Digital Disk Storage Capacity 72 hr. minimum

19. Automatic Passenger Counter

A. Manufacturer UTA

B. Model Number Smart Sensor

20. Driver's Area

A. Steering Wheel

i. Manufacturer
 ii. Model Number
 iii. Size
 Vehicle Improvement Products
 BKBL1824D4V
 18.00 diameter

B. Operator's Seat

i. Manufacturer <u>USSC</u> ii. Model Number 9100

C. Driver Heater/Defroster

i. Manufacturerii. TypeMobile Climate Control 24 V Litton Motor

iii. Model Number 12-60020 iv. Capacity 84,000 B.T.U.

v. Blower Speed(s) 3 speeds

D. Windshield

i. Dimensions (Length x Height) 49(per side) in. x 42 in.

ii. Number of Sections

iii. Material Laminate glass

iv. Thickness <u>0.232 to 0.260</u> Inches

2A. TECHNICAL PROPOSAL WORKSHEET **FOR** 40-FT LOW FLOOR DIESEL HYBRID COACHES

E. Driver's Side Window

i. Dimensions (Length x Height) 42.16 in. x 41.78 in.

ii. Number of Sections

iii. Material Laminated Glass

iv. Thickness 6 mm

F. Side Mirrors **Curb Side** Street Side i. Manufacturer(s) Lucerix

Lucerix

ii. Model Number(s) 32.602.00-01-12V 31.757.00-01-12V

G. Storage Locker

i. Number of Lockers

ii. Size 10.5 + 11.7 Cu. Ft.

iii. Location Above Driver and behind Driver's Seat

21. Engine

A. Manufacturer	Cummins
B. Type	2013 Diesel
C. Model Number	ISL9 330
D. Number of Cylinders	6 (six)
E. Bore	4.49 ln.
F. Stroke	<u>5.69</u> ln.
G. Displacement Cu.	<u>543</u> In.
H. Compression Ratio	<u>16.6:1</u>
I Injector Size & Type	Pacab Classed No-

Bosch Closed Nozzle I. Injector Size & Type

J. Power 330 HP 246 (kW) 2200 at rpm K. Peak Torque 1100 lb. ft. 1491 (Nm) 1300 at rpm L. Engine Speed at Fast Idle Idle Governed 1000 rpm 2,800 rpm 750 rpm

M. Dry Weight 1,695 lbs.

N. Crankcase Oil Capacity

i. New Engine, Dry 6.3 Gals.

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

ii. New Engine, Wet <u>6.3</u> gals.

O. Turbo Charger

i. Manufacturer
ii. Type
iii. Maximum rpm, not at load
iv. Maximum rpm, at full load

22. Cooling System

A. Radiator

i. Manufacturerii. TypeEMPAluminum Bar-Plate

iii. Model Number XPL1

iv. Core Area <u>TBD</u> in. x <u>TBD</u> in. = <u>TBD</u> in₂
v. Number of Tubes <u>37rows (radiator) 15 rows (CAC)</u>

vi. Tube Outer Diameter 0.098 major In.

vii. Fins per Inch 8.5 viii. Fin Thickness 0.003 In.

ix. Fin Construction Non-louvered wavy

B. Total Cooling System Capacity
C. Radiator Fan Speed Control Type
D. Surge Tank Capacity

23 gals.

Electronic
5 gals

E. Surge Tank Material Stainless Steel

F. Engine Thermostat Temperature

Settings Degrees 200 F

G. Overheat Alarm Temperature

Sending Unit Settings Degrees 225 F
H. Maximum Ambient Operating Temperature Degree 235 F

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

23. Propulsion Generator

A. Manufacturer Allison B. Type In-line drive

33 in. x 25 in. x 21 in. C. Size

D. Weight, Complete 944 lbs.

E. Power Output 280W (330 hp) @ 2300rpm

24. Traction Motor

A. Manufacturer Allison

B. Type Parallel Hybrid Drive C. Model Number H 50 EP (Ev50)

F. Oil Capacity (including

heat exchanger) 13 gal.

25. Energy Storage

A. Manufacturer Allison

B. Type Nickel Metal Hydride

11.14 in. x 85.96 in. x 45.21 in. C. Size

D. Weight, Complete 970 lbs.

E. Power Output 432-780 Volts

F. Cooling Requirement 2 kW Freon Evaporator

26. Energy Storage Controller

A. Manufacturer Allison

27. Propulsion Control System

A. Manufacturer Allison

B. Cooling Media N/A

C. Cooling Requirements N/A

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

28. Axle

A. First Axle

i. Manufacturer & Model Number

MAN VOK-07-F

ii. Type

Reverse Elliot cast beam, dropped center, non-driven

iii. Rating

15,873 lbs

B. Drive Axle Ratio

i. Differential Ratio

4.56:1

ii. Hub Reduction Ratio (if used)

N/A

iii. Final Axle Ratio (if hub reduction is used)

4.56:1

29. Suspension

A. Air Bags

i. Manufacturer

Firestone

ii. Number of Air Bag per Wheel

2 Front

4 Rear

iii. Total Air Bag Volume

TBD Cu. In.

TBD_Cu. In.

B. Shock Absorbers

i. Manufacturer

Koni

ii. Type

double-acting, telescoping type

iii. Number of Shock per Wheel

2 Front

4 Rear

30. Brake System

A. Fundamental System Manufacturer

B. First Axle Brake Actuator Model

and Part Number

Knorr

C. Drive Axle Brake Actuator Model

and Part Number

MGM/ 1621705, 1621706

D. First Axle Brake Rotor

MGM/ MJB2024ET752

i. Manufacturer

MAN

ii. Part Number

81.50803.0040

iii. Diameter

16.14

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

iv. Width <u>TBD</u> In.

E. Drive Axle Brake Disc

i. Manufacturer <u>MAN</u>

ii. Part Number 81.50803.0041 iii. Diameter 16.14 In.

iv. Width TBD In.

F. Brake Pad Manufacturer Ferrodo

G. First Axle Brake Pad Identification

i. Forward <u>81.50820.5104</u> ii. Reverse <u>81.50820.5104</u>

H. Drive Axle Brake Pad Identification

i. Forward <u>81.50820.5104</u> ii. Reverse <u>81.50820.5104</u>

I. Brake Pads <u>2 pads/caliper, 4 pads per axles</u>

 J. Brake Pad Size
 Length
 Width

 i. First Axle
 7.09 In.
 TBD In.

 ii. Drive Axle
 7.09 In.
 TBD In.

K. Pad Thickness 0.827 In.

L. Pad Area per Wheel

i. First Axle 30.38 Sq. In. ii. Drive Axle 30.38 Sq. In.

M. Anti-Lock Brake System Manufacturer WABCO

31. Air System

A. Air Compressor

i. Manufacturer
ii. Type
iii. Model Number
iv. Capacity at Idle
v. Capacity at Maximum Speed
vi. Maximum Warranted Speed

WABCO
Twin Cylinder
HD 30.4
6.9 cfm
30.4 cfm
3000 rpm

2A. TECHNICAL PROPOSAL WORKSHEET FOR

40-FT LOW FLOOR DIESEL HYBRID COACHES

vii. Idle Speed 750 rpm viii. Drive Type Direct

B. Air Reservoir Capacity

i. Supply Reservoir

ii. Primary Reservoir

iii. Secondary Reservoir

iv. Parking Reservoir

v. Accessory Reservoir

vi. Other Reservoir

2000 Cu. In.

C. Air Dryer

i. Manufacturer Graham White

ii. Model Number <u>SludgeBreaker QBA60NX5</u>

32. Fuel System

A. Fuel Tank

i. Manufacturer New Flyer

ii. Size <u>100 usable Gallons</u>

iii. Material <u>Cross-linked polyethylene</u>

B. Filler

i. Manufacturer <u>EMCO Wheaten</u>

ii. Model Number Posi-snap

33. Hydraulic System

A. Fan Drive

i. Manufacturerii. Typeiii. Model Numberiii. Model NumberN/A, electric RadiatorN/A, electric Radiator

B. Power Steering

i. Steering Gear Manufacturer
ii. Type
iii. Relief Pressure
iv. Power Steering Fluid Capacity

Sheppard
M110
2175 psi
20 qts.

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

v. Effort at Steering Wheel (Unloaded stationary coach on dry asphalt pavement)

9 lbs. to 10 degrees

34. Wheels

A. Manufacturer

B. Type

C. Size

D. Mounting

Accuride

Aluminum

22.5" x 8.25"

Hub Piloted

35. Tires

A. Manufacturer <u>Customer Supplied Firestone</u>

 B. Type
 Low Profile

 C. Size
 305/70R22.5

D. Load Range <u>Depends on tire manufacturer</u>

E. Inflation Pressure 1st Axle <u>Depends on tire manufacturer</u> p.s.i. Drive Axle <u>Depends on tire manufacturer</u> p.s.i.

36. Starter

A. Manufacturer

B. Model Number

C. Tank volume

N/A

37. Fire Detection/Suppression System

A. Manufacturer
B. Model Number
C. Dry Chemical Tank Capacity
SafetyNet
25 lbs.

D. Expellant Gas Tank Capacity Not Applicable

38. Chassis Electrical

A. Multiplex System

i. Manufacturerii. Model NumberParker VANSCOParker VANSCO

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

B. Starter Batteries

i. Manufacturer (DEKA) East Penn Manufacturing Co.

 ii. Model Number
 8A8DT978

 iii. Type
 AGM-8D

39. Alternator

A. Manufacturer **EMP** B. Type Air cooled C. Model Number Power 450 D. Output at Idle 280 Amps E. Output at Maximum Speed 455 Amps F. Maximum Warranted Speed 6500 rpm G. Speed at Idle 2000 rpm H. Drive Type Belt

40. Charge Air Cooler

A. Manufacturer <u>EMP</u>

B. Material (s) Aluminum

C. Core Area <u>TBD</u> in. x <u>TBD</u> in. = <u>TBD</u> in₂.

D. Number of tubes 15 rows

E. Tube outer diameter 0.098 major in.

F. Fins per inch $\underline{8.5}$ G. Fin thickness $\underline{0.003}$ in.

H. Fin construction Non-louvered wavy

41. Chassis and Frame

A. Roof Structure Material High tensile steel tube

B. Roof Anti-Corrosion Material Zinc rich primer

C. Roof Skin Material <u>Fiberglass</u>

D. Sidewall Structure Material High tensile steel tube

2A. TECHNICAL PROPOSAL WORKSHEET FOR 40-FT LOW FLOOR DIESEL HYBRID COACHES

E. Sidewall Anti-Corrosion Material Zinc rich primer and Corritube

F. Sidewall Skin Material <u>Fiberglass</u>

G. Skirt Material <u>Fiberglass</u>

H. Main Bus Structure/Frame Material High Tensile steel tube and plate

I. Main Bus Structure/Frame Anti-Corrosion Material Zinc rich primer, Coritube & Corishield

42. Special Tools

- A. Tools
- **B. Special Test Equipment**





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
7	TECHNICAL PROPOSAL WORKSHEET	The Technical Proposal Worksheet, Follow-up Service Worksheet, and Delivery Schedule Worksheet included in Appendix B-Volume 1 RFP shall be completed in their entirety.

XDE60 BAE

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

Bus Manufacturer: New Flyer of America Inc.

Bus Model Number: XDE60

1. Dimensions

A. Overall Length

i. Over Bumpers 60 Feet 10.0 Inches ii. Over Body 60 Feet 0 Inches

B. Overall Width

i. Over Body excluding mirrors and lights
 ii. Over body including mirrors
 iii. Over tires
 iii. Over tires

C. Overall Height

i. Excluding Roof-Mounted H&V System
ii. Including Roof-Mounted H&V System

126 Inches
130 Inches

D. Angle of Approach 9.0 ± -0.5 Degrees

E. Angle of Departure 12.0 +/-0.5 Degrees

F. Breakover Angle 9.0 +/-0.5 Degrees

G. Doorway Clear Opening With Grab Handles No Grab Handles

	Width	Width	Height
i. Front Door	33.8 ln.	<u>36.8</u> ln.	<u>77.0</u> ln.
ii. Center Door	<u>40.9</u> ln.	<u>45.2</u> ln.	<u>77.3</u> ln.
iii.Rear Door	<u>40.9</u> In.	<u>45.2</u> In.	77.3 ln.

K. Interior Head Room (center of aisle)

i. First Axle Location	<u>79.5</u> Inches
ii. Second Axle Location	79.5 Inches
iii. Third Axle Location	78 Inches

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

L. Aisle Width

i. Minimum Width on Floor Between First Axle Wheel Housings	35.5 Inches
ii. Minimum Width on Floor Between Second Axle Wheel Housings	25.0 Inches
iii. Minimum Width on Floor Between Third Axle Wheel Housings	41.5 Inches
iii. Minimum Aisle Width Between Longitudinal Seats	30.6 Inches
iv. Minimum Aisle Width Between Transverse Seats	21.75 Inches

M. Minimum Ground Clearance

i. Excluding Axles	<u>10.0</u> Inches
ii. At Axles	5.6 Inches

N. Turning Envelope

i. Outside Body Corner Turning Radius Including Bumper	528 Inches
ii. Inside Turning Radius	267.3 Inches

O. Wheel Base

 First axle to Second axle 	<u>229.0</u> Inches
i. Second axle to third axle	293.0 Inches

P. Track

 First axle measured center of tire to center of tire 	87.5 Inches
ii. Second axle measured center of dual tires to center of dual tires	75 Inches
iii. Third axle measured center of dual tires to center of dual tires	75 Inches

Q. Overhang, Centerline of Axle Over Bumper

i. Front	<u>87.3</u> Inches
ii. Rear	120.8 Inches

R. Floor

Interior Length	<u>54</u> Feet	<u>5.5</u> Inches
ii. Interior Width	<u>8</u> Feet	<u>0</u> Inches
iii. Height of floor from ground le	vel at front doors	15.5 Inches
iv. Height of floor from ground level at center doors		15.5 Inches
v. Height of floor from ground lev	vel at rear doors	15.5 Inches

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

S. Capacity

i. Total Number of Passenger Seats	<u>53</u>
ii. Total Number of Standing Passengers	<u>61</u>

2. Bus Weight	Curb Weight	Curb Weight plus Seated Load	Curb Weight plus Gross Load (GVWR)
A. First Axle	9,880 lbs.	10,867 lbs.	12,473 lbs.
B. Second Axle	12,220 bs.	15,384 lbs.	22,220 lbs.
B. Third Axle	21,000 bs.	24,950 lbs.	25,657 lbs.
C. Total	43,100 lbs.	51,200 lbs.	60,350 lbs.
E. Weight on the joint (+/	-) <u>TBD</u> lbs.	TBD lbs.	TBD lbs

3. Articulation Joint

A. Manufacturer	<u>ATG</u>
B. Model Number	LIMBO II
C. Bellow Manufacturer	<u>Hubner</u>
D. Below Material	<u>S1</u>
E. Maximum vertical angle	10 degrees
F. Maximum lateral angle	52 degrees

4. Bicycle Rack Provision

A. Manufacturer	Sportworks	
B. Model	TSB quick Release	

5. Paint

A. Manufacturer	Axalta	
B. Type	Imron Elite	

6. Windshield Wipers and Washer

A. Manufacturer	Sprague
B. Type	Electric
C. Reservoir Capacity	5 gal.

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

7. Bumpers

A. Manufacturer

Romeo Rim

B. Type

3 piece HELP

8. Floor

A. Subfloor

i. Material

Thermo-Lite Board Series 2862

ii. Thickness

0.750 in.

B. Floor Covering

i. Manufacturer

Altro

ii. Thickness

2.7mm / 0.11"

9. Windows

A. Passenger Windows

i. Manufacturer

Arow Global (Stormtite)

ii. Number of Windows

17 (including Driver's window)

iii. Dimensions of Windows

43.62in. (width) x 42.60 in. (height) 49.31 in. (width) x 42.60 in. (height)

62.28 in. (width) x 42.60 in. (height

62.28 in. (width) x 35.12 in. (height)

iv. Total Window area (Street side)

21,800 sq. in.

v. Total Window area (Curb side)

14,900 sq. in.

B. Rear Window

i. Dimensions of Windows

N/A in. (width) x N/A in. (height)

10. Door System

A. Manufacturer

Vapor

B. Model

i. Front door

Slide Glide

ii. Center door

Slide Glide Activair

iii. Rear door

Slide Glide Activair

C. Open/Close Mechanism (air, electric, spring, other)

i. Front door

air

ii. Center door

air

iii. Rear door

air

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

11. Exterior Lighting

A. LED Lights Manufacturer

J.W Speaker (headlights) & Dialight

B. Deceleration Lighting System

Manufacturer and Model Number

Dialight

12. Interior Lights

A. Manufacturer B. Type LED C. Model Number **LED**

D. Number of Fixtures 16

E. Size of Fixtures 72 to 96 inches

F. Power Supplies (Ballasts) Not Applicable to LED

13. Heating and Ventilating Equipment

A. Heating System Capacity 210,000 B.T.U.

B. Ventilating Capacity 4800 total cfm per passenger

C. Heater Cores

i. Manufacturer & Model Thermo King ii. Number of Rows <u>2</u>

9 iii. Number of Fins per Inch

iv. Outer Diameter of Tube 0.375 In. v. Fin Thickness 0.008 In. 2

vi. Number of Heater Cores

D. Heater Blowers

i. Manufacturer & Model N/A ii. Horsepower N/A iii. Speed(s) N/A iv. Capacity N/A cfm

E. Controls

i. Manufacturer Thermo King

3A. TECHNICAL PROPOSAL WORKSHEET FOR

60-FT LOW FLOOR DIESEL HYBRID COACHES

ii. Type iii. Model Number F. Heating Equipment Location	Microprocess IntelligAIRE I 0 Above Engir 0 Under Floor	<u>II</u> ne Compt	2 Roof 0 Other (describe)
14. Wheelchair Ramp Equipme	ent		
A. Manufacturer B. Type C. Model Number D. Capacity E. Dimensions i. Width of Ramp ii. Length of Ramp F. Cycle Times i. Stowed to Ground ii. Ground to Stow iii. Total Cycle G. Weight of Complete Ramp	New Flyer Flip-out Gen II 660 lbs. 32.0 ln. 47.5 ln. Normal Idle 10 Sec. 10 Sec. 20 Sec. 130 lbs.	Fast Idle 10 Sec. 10 Sec. 20 Sec.	
15. Passenger Seat			
A. Manufacturer B. Type C. Seat Material D. Seat Insert Material E. Minimum Hip-to-Knee Room F. Minimum Foot Room	American Se Cantilever/Pe Stainless Ste Fiberglass 27 in. 10.5 in	edestal	
16. Destination Signs			

i. Front Destination Sign

A. Manufacturer

B. Size

Columns

<u>16</u>

112

3A. TECHNICAL PROPOSAL WORKSHEET FOR

60-FT LOW FLOOR DIESEL HYBRID COACHES

ii. Curb Side Destination Sign	<u>9</u>	<u>72</u>
iv. Rear Destination Sign	<u>14</u>	<u>108</u>
v. Dash Mount Run Number Sign	<u>14</u>	<u>40</u>

17. Voice Annunciation System

A. Manufacturer

B. Model Number

Digital Recorders Inc.

DR600

18. Public Address System

A. Microphone Manufacturer and Model
B. Amplifier Manufacturer and Model
C. Number of Speaker(s)

Inside
8

Digital Recorders / AGC & Slealth
DRI Stealth MIC processor Type 1

Outside
1

19. Surveillance Camera System

A. Manufacturer

B. Number of Cameras

C. Digital Disk Storage Capacity

Kratos

11

72 hr. minimum

20. Automatic Passenger Counter

A. Manufacturer UTA

B. Model Number <u>Smart Sensor</u>

21. Driver's Area

A. Steering Wheel

i. Manufacturer
 ii. Model Number
 iii. Size
 Vehicle Improvement Products
 BKBL1824D4V
 18.00 diameter

B. Operator's Seat

i. Manufacturer <u>USSC</u> ii. Model Number 9100

3A. TECHNICAL PROPOSAL WORKSHEET **FOR** 60-FT LOW FLOOR DIESEL HYBRID COACHES

C. Driver Heater/Defroster

i. Manufacturer Mobile Climate Control ii. Type 24 V Litton Motor iii. Model Number 12-60020

iv. Capacity 84,000 B.T.U. 3 speeds

v. Blower Speed(s)

D. Windshield

i. Dimensions (Length x Height) 49(per side) in. x 42 in.

ii. Number of Sections

iii. Material Laminate glass

iv. Thickness 0.232 to 0.260 Inches

E. Driver's Side Window

i. Dimensions (Length x Height) 42.16 in. x 41.78 in.

ii. Number of Sections

iii. Material Laminated Glass

iv. Thickness 6 mm

Curb Side F. Side Mirrors Street Side

i. Manufacturer(s) Lucerix Lucerix

ii. Model Number(s) 32.602.00-01-12V 31.757.00-01-12V

G. Storage Locker

i. Number of Lockers

ii. Size 10.5 + 11.7 Cu. Ft.

iii. Location Above Driver and behind Driver's Seat

22. Engine

A. Manufacturer Cummins 2013 Diesel B. Type C. Model Number ISL9 330 D. Number of Cylinders 6 (six) <u>4.4</u>9 In. E. Bore F. Stroke 5.69 In.

3A. TECHNICAL PROPOSAL WORKSHEET FOR

60-FT LOW FLOOR DIESEL HYBRID COACHES

G. Displacement Cu.

543 In.

H. Compression Ratio

16.6:1

Idle

I. Injector Size & Type

Bosch Closed Nozzle

J. Power

330 HP

246 (kW)

2200 at rpm

K. Peak Torque

1100 lb. ft.

<u>1491</u> (Nm)

1300 at rpm Governed

L. Engine Speed at

750 rpm

Fast Idle 1000 rpm

2,800 rpm

M. Dry Weight

1,695 lbs.

N. Crankcase Oil Capacity

i. New Engine, Dry <u>6.3</u> Gals.

ii. New Engine, Wet 6.3 gals.

O. Turbo Charger

i. Manufacturer

Holset

ii. Type

HX40

iii. Maximum rpm, not at load

2,800 rpm

iv. Maximum rpm, at full load

2,400 rpm

23. Cooling System

A. Radiator

i. Manufacturer

EMP

ii. Type

Aluminum Bar-Plate

iii. Model Number

XPL1

iv. Core Area

 $\underline{\mathsf{TBD}}$ in. x $\underline{\mathsf{TBD}}$ in. = $\underline{\mathsf{TBD}}$ in₂

v. Number of Tubes

37rows (radiator) 15 rows (CAC)

vi. Tube Outer Diameter

0.098 major In.

vii. Fins per Inch

8.5

viii. Fin Thickness

0.003 In.

ix. Fin Construction

Non-louvered wavy

3A. TECHNICAL PROPOSAL WORKSHEET FOR

60-FT LOW FLOOR DIESEL HYBRID COACHES

B. Total Cooling System Capacity
C. Radiator Fan Speed Control Type
D. Surge Tank Capacity

23 gals.

Electronic
5 gals

E. Surge Tank Material Stainless Steel

F. Engine Thermostat Temperature

Settings Degrees 200 F

G. Overheat Alarm Temperature

Sending Unit Settings Degrees 225 F

H. Maximum Ambient Operating Temperature Degree 235 F

24. Propulsion Generator

A. Manufacturer BAE

B. Type In-line drive

C. Size 6 in. x 23.6 in. x 23.6 in.

D. Weight, Complete 855 lbs.

E. Power Output <u>230 kW (308 hp) @ 2000rpm</u>

25. Traction Motor

A. Manufacturer BAE

B. Type Series Hybrid Drive

C. Model Number <u>HDS300</u>

F. Oil Capacity (including

heat exchanger) <u>3 gal.</u>

26. Energy Storage

A. Manufacturer BAE

B. Type Nano-iron-phosphate

C. Size <u>230 kW peak</u>

D. Weight, Complete <u>800</u> lbs.

E. Power Output 635 Vdc nominal
F. Cooling Requirement Ambient air-cooled

3A. TECHNICAL PROPOSAL WORKSHEET FOR

60-FT LOW FLOOR DIESEL HYBRID COACHES

27. Energy Storage Controller

A. Manufacturer

BAE

28. Propulsion Control System

A. Manufacturer

BAE

B. Cooling Media

water ethylene/glycol (or propylene glycol)

C. Cooling Requirements

15gpm (57 lpm)

29. Axle

A. First Axle

i. Manufacturer & Model Number

MAN VOK-07-F

ii. Type

Reverse Elliot cast beam, dropped center, non-driven

iii. Rating

15,873 lbs

B. Second Axle

i. Manufacturer & Model Number

ZF AVN 132

ii. Type

Non-driven

iii. Rating

25,350 lbs

C. Third Axle

i. Manufacturer & Model Number

MAN HY-1350-F

ii. Type

Single Reduction

iii. Rating

28,660 lbs

B. Drive Axle Ratio

i. Differential Ratio

4.56:1

ii. Hub Reduction Ratio (if used)

N/A

iii. Final Axle Ratio (if hub reduction is used)

4.56:1

30. Suspension

A. Air Bags

i. Manufacturer

Firestone

ii. Number of Air Bag per Wheel iii. Total Air Bag Volume

2 Front

TBD Cu. In. TBD Cu. In.

4 Rear

3A. TECHNICAL PROPOSAL WORKSHEET FOR

60-FT LOW FLOOR DIESEL HYBRID COACHES

B. Shock Absorbers

i. Manufacturer

ii. Type

iii. Number of Shock per Wheel

Koni

double-acting, telescoping type

2 Front

4 Rear

31. Brake System

A. Fundamental System Manufacturer

B. First Axle Brake Actuator Model

and Part Number

C. Second Axle Brake Actuator Model

and Part Number

D. Third Axle Brake Actuator Model

and Part Number

E. First Axle Brake Rotor

i. Manufacturer

ii. Part Number

iii. Diameter

iv. Width

F. Second Axle Brake Disc

i. Manufacturer

ii. Part Number

iii. Diameter

iv. Width

G. Third Axle Brake Disc

i. Manufacturer

ii. Part Number

iii. Diameter

iv. Width

Knorr

MGM/ 1621705, 1621706

ZF/ 0501329539

MGM/ MJB2024ET752

MAN

81.50803.0040

<u>16.14</u>

TBD In.

MAN

81.50803.0041

16.14 In.

TBD In.

MAN

81.50803.0041

16.14 In.

TBD In.

3A. TECHNICAL PROPOSAL WORKSHEET FOR

60-FT LOW FLOOR DIESEL HYBRID COACHES

H. Brake Pad Manufacturer	Ferrodo

I. First Axle Brake Pad Identification

i. Forward <u>81.50820.5104</u> ii. Reverse <u>81.50820.5104</u>

J. Second Axle Brake Pad Identification

i. Forward <u>81.50820.5104</u> ii. Reverse <u>81.50820.5104</u>

K. Third Axle Brake Pad Identification

i. Forward <u>81.50820.5104</u> ii. Reverse <u>81.50820.5104</u>

I. Brake Pads 2 pads/caliper, 4 pads per axles

 J. Brake Pad Size
 Length
 Width

 i. First Axle
 7.09 In.
 TBD In.

 ii. Drive Axle
 7.09 In.
 TBD In.

K. Pad Thickness 0.827 In.

L. Pad Area per Wheel

 i. First Axle
 30.38 Sq. In.

 ii. Second Axle
 30.38 Sq. In.

 ii. Drive Axle
 30.38 Sq. In.

M. Anti-Lock Brake System Manufacturer WABCO

32. Air System

A. Air Compressor

i. Manufacturer

ii. Type

iii. Model Number

iv. Capacity at Idle

v. Capacity at Maximum Speed

vi. Maximum Warranted Speed

vii. Idle Speed

Scroll

SLAEOSE-HP

13.5 cfm

13.5 cfm

TBD rpm

TBD rpm

TBD rpm

viii. Drive Type Belt to electric motor

Powerex

3A. TECHNICAL PROPOSAL WORKSHEET FOR

60-FT LOW FLOOR DIESEL HYBRID COACHES

B. Air Reservoir Capacity

i. Supply Reservoir <u>1200/800 split Cu. In.</u>

ii. Primary Reservoir2000 Cu. In.iii. Secondary Reservoir2000 Cu. In.iv. Parking Reservoir2000 Cu. In.

v. Accessory Reservoir <u>2150/1400</u> split Cu. In.

vi. Other Reservoir 2000 Cu. In.

C. Air Dryer

i. Manufacturer Graham White

ii. Model Number SludgeBreaker QBA60NX5

33. Fuel System

A. Fuel Tank
i. Manufacturer
New Flyer

ii. Size 100 usable Gallons

iii. Material Cross-linked polyethylene

B. Filler

i. Manufacturer <u>EMCO Wheaten</u>

ii. Model Number <u>Posi-snap</u>

34. Hydraulic System

A. Fan Drive
i. Manufacturer
N/A, electric Radiator

ii. Type N/A, electric Radiator iii. Model Number N/A, electric Radiator

B. Power Steering

iii. Relief Pressure 2175 psi iv. Power Steering Fluid Capacity 20 qts.

iv. Power Steering Fluid Capacity 20 q
v. Effort at Steering Wheel

(Unloaded stationary coach

on dry asphalt pavement) <u>9</u> lbs. <u>to 10 degrees</u>

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

35. Wheels

A. Manufacturer

B. Type

C. Size

D. Mounting

Accuride

Aluminum

22.5" x 8.25"

Hub Piloted

36. Tires

A. Manufacturer <u>Customer Supplied Firestone</u>

 B. Type
 Low Profile

 C. Size
 305/70R22.5

D. Load Range <u>Depends on tire manufacturer</u>

E. Inflation Pressure 1st Axle <u>Depends on tire manufacturer</u> p.s.i. Drive Axle <u>Depends on tire manufacturer</u> p.s.i.

37. Starter

A. Manufacturer

B. Model Number

C. Tank volume

N/A

38. Fire Detection/Suppression System

A. Manufacturer

B. Model Number

C. Dry Chemical Tank Capacity

Amerex
SafetyNet
25 lbs.

D. Expellant Gas Tank Capacity Not Applicable

39. Chassis Electrical

A. Multiplex System

i. Manufacturerii. Model NumberParker VANSCOParker VANSCO

B. Starter Batteries

i. Manufacturer (DEKA) East Penn Manufacturing Co.

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

 ii. Model Number
 8A8DT978

 iii. Type
 AGM-8D

40. Alternator

A. Manufacturer BAE

B. Type <u>Beltless (Auxiliary power from ESS)</u>

C. Model Number

D. Output at Idle

E. Output at Maximum Speed

APS-2

545 Amps

545 Amps

F. Maximum Warranted Speed N/A Beltless rpm
G. Speed at Idle N/A Beltless rpm

H. Drive Type Beltless (Auxiliary power from ESS)

41. Charge Air Cooler

A. Manufacturer EMP
B. Material (s) Aluminum

C. Core Area TBD in. x TBD in. = TBD in2.

D. Number of tubes <u>15 rows</u>

E. Tube outer diameter <u>0.098 major</u> in.

F. Fins per inch $\frac{8.5}{0.003}$ in.

H. Fin construction Non-louvered wavy

42. Chassis and Frame

A. Roof Structure Material High tensile steel tube

B. Roof Anti-Corrosion Material Zinc rich primer

C. Roof Skin Material <u>Fiberglass</u>

D. Sidewall Structure Material High tensile steel tube

E. Sidewall Anti-Corrosion Material Zinc rich primer and Corritube

F. Sidewall Skin Material Fiberglass

G. Skirt Material Fiberglass

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

- H. Main Bus Structure/Frame Material High Tensile steel tube and plate
- I. Main Bus Structure/Frame Anti-Corrosion Material Zinc rich primer, Coritube & Corishield
 - 43. Special Tools
 - A. Tools
 - B. Special Test Equipment





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
7	TECHNICAL PROPOSAL WORKSHEET	The Technical Proposal Worksheet, Follow-up Service Worksheet, and Delivery Schedule Worksheet included in Appendix B-Volume 1 RFP shall be completed in their entirety.

XDE60 Allison

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

Bus Manufacturer: New Flyer of America Inc.

Bus Model Number: XDE60

1. Dimensions

A. Overall Length

i. Over Bumpers $\underline{60}$ Feet $\underline{10.0}$ Inches ii. Over Body $\underline{60}$ Feet $\underline{0}$ Inches

B. Overall Width

i. Over Body excluding mirrors and lights
ii. Over body including mirrors
iii. Over tires

102 Inches
132 Inches
102 Inches

C. Overall Height

i. Excluding Roof-Mounted H&V System
ii. Including Roof-Mounted H&V System
130 Inches

D. Angle of Approach 9.0 ± -0.5 Degrees

E. Angle of Departure <u>12.0 +/-0.5</u> Degrees

F. Breakover Angle 9.0 +/-0.5 Degrees

G. Doorway Clear Opening With Grab Handles No Grab Handles

	Width	Width	Height
i. Front Door	<u>33.8</u> ln.	<u>36.8</u> ln.	<u>77.0</u> ln.
ii. Center Door	<u>40.9</u> ln.	45.2 In.	<u>77.3</u> ln.
iii.Rear Door	<u>40.9</u> In.	<u>45.2</u> ln.	<u>77.3</u> ln.

K. Interior Head Room (center of aisle)

i. First Axle Location	<u>79.5</u> Inches
ii. Second Axle Location	79.5 Inches
iii. Third Axle Location	78 Inches

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

L. Aisle Width

i. Minimum Width on Floor Between First Axle Wheel Housings	35.5 Inches
ii. Minimum Width on Floor Between Second Axle Wheel Housings	25.0 Inches
iii. Minimum Width on Floor Between Third Axle Wheel Housings	41.5 Inches
iii. Minimum Aisle Width Between Longitudinal Seats	30.6 Inches
iv. Minimum Aisle Width Between Transverse Seats	21.75 Inches

M. Minimum Ground Clearance

i. Excluding Axles	<u>10.0</u> Inches
ii. At Axles	5.6 Inches

N. Turning Envelope

i. Outside Body Corner Turning Radius Including Bumper	528 Inches
ii. Inside Turning Radius	267.3 Inches

O. Wheel Base

 First axle to Second axle 	<u>229.0</u> Inches
i. Second axle to third axle	293.0 Inches

P. Track

 First axle measured center of tire to center of tire 	<u>87.5</u> Inches
ii. Second axle measured center of dual tires to center of dual tires	75 Inches
iii. Third axle measured center of dual tires to center of dual tires	75 Inches

Q. Overhang, Centerline of Axle Over Bumper

i. Front	<u>87.3</u> Inches
ii. Rear	120.8 Inches

R. Floor

<u>54</u> Feet	<u>5.5</u> Inches
8 Feet	<u>0</u> Inches
evel at front doors	<u>15.5</u> Inches
iv. Height of floor from ground level at center doors	
evel at rear doors	15.5 Inches
	8 Feet evel at front doors evel at center doors

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

S. Capacity

i. Total Number of Passenger Seats	53
ii. Total Number of Standing Passengers	61

2. Bus Weight	Curb Weight	Curb Weight plus Seated Load	Curb Weight plus Gross Load (GVWR)
A. First Axle	<u>9,880</u> lbs.	<u>10,867</u> lbs.	12,473 lbs.
B. Second Axle	12,220 bs.	15,384 lbs.	22,220 lbs.
B. Third Axle	21,000 bs.	24,950 lbs.	25,657 lbs.
C. Total	43,100 lbs.	51,200 lbs.	60,350 lbs.
E. Weight on the joint (+/	/-) <u>TBD</u> lbs.	TBD lbs.	TBD lbs

3. Articulation Joint

A. Manufacturer	<u>ATG</u>
B. Model Number	LIMBO II
C. Bellow Manufacturer	Hubner
D. Below Material	<u>S1</u>
E. Maximum vertical angle	10 degrees
F. Maximum lateral angle	52 degrees

4. Bicycle Rack Provision

A. Manufacturer	Sportworks	
B. Model	TSB quick Release	

5. Paint

A. Manufacturer	<u>Axalta</u>
B. Type	Imron Elite

6. Windshield Wipers and Washer

A. Manutacturer	Sprague
B. Type	Electric
C. Reservoir Capacity	<u>5 g</u> al.

3A. TECHNICAL PROPOSAL WORKSHEET **FOR** 60-FT LOW FLOOR DIESEL HYBRID COACHES

7. Bumpers

A. Manufacturer Romeo Rim B. Type 3 piece HELP

8. Floor

A. Subfloor

Thermo-Lite Board Series 2862 i. Material 0.750 in.

ii. Thickness

B. Floor Covering

i. Manufacturer Altro

ii. Thickness 2.7mm / 0.11"

9. Windows

A. Passenger Windows

i. Manufacturer Arow Global (Stormtite) ii. Number of Windows 17 (including Driver's window)

43.62in. (width) x 42.60 in. (height) iii. Dimensions of Windows

> 49.31 in. (width) x 42.60 in. (height) 62.28 in. (width) x 42.60 in. (height 62.28 in. (width) x 35.12 in. (height)

21,800 sq. in. iv. Total Window area (Street side)

v. Total Window area (Curb side)

14,900 sq. in.

B. Rear Window

i. Dimensions of Windows N/A in. (width) x N/A in. (height)

10. Door System

A. Manufacturer Vapor

B. Model

i. Front door Slide Glide

Slide Glide Activair ii. Center door iii. Rear door Slide Glide Activair

C. Open/Close Mechanism (air, electric, spring, other)

i. Front door air ii. Center door air iii. Rear door air

3A. TECHNICAL PROPOSAL WORKSHEET **FOR**

60-FT LOW FLOOR DIESEL HYBRID COACHES

11. Exterior Lighting

A. LED Lights Manufacturer J.W Speaker (headlights) & Dialight

B. Deceleration Lighting System

Manufacturer and Model Number Dialight

12. Interior Lights

A. Manufacturer **TCB** B. Type LED C. Model Number LED D. Number of Fixtures 16

E. Size of Fixtures 72 to 96 inches

F. Power Supplies (Ballasts) Not Applicable to LED

13. Heating and Ventilating Equipment

A. Heating System Capacity 210,000 B.T.U.

B. Ventilating Capacity 4800 total cfm per passenger

C. Heater Cores

i. Manufacturer & Model Thermo King

<u>2</u> ii. Number of Rows

iii. Number of Fins per Inch

iv. Outer Diameter of Tube 0.375 In. v. Fin Thickness 0.008 In.

vi. Number of Heater Cores

D. Heater Blowers

i. Manufacturer & Model N/A ii. Horsepower N/A iii. Speed(s) N/A iv. Capacity N/A cfm

E. Controls

i. Manufacturer Thermo King

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

ii. Type iii. Model Number F. Heating Equipment Location	Microprocesso IntelligAIRE III O Above Engine Under Floor	e Compt. <u>2</u> R	oof er (describe)
14. Wheelchair Ramp Equipment			
A. Manufacturer B. Type C. Model Number D. Capacity E. Dimensions i. Width of Ramp ii. Length of Ramp F. Cycle Times i. Stowed to Ground ii. Ground to Stow iii. Total Cycle G. Weight of Complete Ramp	<u>10</u> Sec. <u>10</u> Sec.	Fast Idle <u>10</u> Sec. <u>10</u> Sec. <u>20</u> Sec.	
A. Manufacturer B. Type C. Seat Material D. Seat Insert Material E. Minimum Hip-to-Knee Room F. Minimum Foot Room	American Sea Cantilever/Pec Stainless Stee Fiberglass 27 in. 10.5 in	destal	
16. Destination Signs			
A. ManufacturerB. Size i. Front Destination Sign		Rows <u>16</u>	Columns 112

3A. TECHNICAL PROPOSAL WORKSHEET FOR

60-FT LOW FLOOR DIESEL HYBRID COACHES

ii. Curb Side Destination Sign972iv. Rear Destination Sign14108v. Dash Mount Run Number Sign1440

17. Voice Annunciation System

A. Manufacturer

B. Model Number

Digital Recorders Inc.
DR600

18. Public Address System

A. Microphone Manufacturer and Model
B. Amplifier Manufacturer and Model
C. Number of Speaker(s)

Inside
8

Digital Recorders / AGC & Slealth
DRI Stealth MIC processor Type 1

Outside
1

19. Surveillance Camera System

A. Manufacturer

B. Number of Cameras

11

C. Digital Disk Storage Capacity 72 hr. minimum

20. Automatic Passenger Counter

A. Manufacturer UTA

B. Model Number <u>Smart Sensor</u>

21. Driver's Area

A. Steering Wheel

i. Manufacturerii. Model NumberVehicle Improvement ProductsBKBL1824D4V

iii. Size 18 in. diameter

B. Operator's Seat

i. Manufacturer USSC ii. Model Number 9100

3A. TECHNICAL PROPOSAL WORKSHEET FOR

60-FT LOW FLOOR DIESEL HYBRID COACHES

C. Driver Heater/Defroster

i. Manufacturer
ii. Type
iii. Model Number
iv. Capacity

Mobile Climate Control
24 V Litton Motor
12-60020
84,000 B.T.U.

v. Blower Speed(s) 3 speeds

D. Windshield

i. Dimensions (Length x Height) 49(per side) in. x 42 in.

ii. Number of Sections 2

iii. Material Laminate glass

iv. Thickness 0.232 to 0.260 Inches

E. Driver's Side Window

i. Dimensions (Length x Height) 42.16 in. x 41.78 in.

ii. Number of Sections

iii. Material <u>Laminated Glass</u>

iv. Thickness <u>6 mm</u>

F. Side Mirrors Curb Side Street Side

i. Manufacturer(s) <u>Lucerix</u> <u>Lucerix</u>

ii. Model Number(s) <u>32.602.00-01-12V</u> <u>31.757.00-01-12V</u>

G. Storage Locker

i. Number of Lockers 2

ii. Size <u>10.5 + 11.7</u> Cu. Ft.

iii. Location Above Driver and behind Driver's Seat

22. Engine

A. Manufacturer	<u>Cummins</u>
B. Type	2013 Diesel
C. Model Number	ISL9 330
D. Number of Cylinders	6 (six)
E. Bore	4.49 In.
F. Stroke	5.69 In.

3A. TECHNICAL PROPOSAL WORKSHEET FOR

60-FT LOW FLOOR DIESEL HYBRID COACHES

G. Displacement Cu. 543 In. H. Compression Ratio 16.6:1

I. Injector Size & Type Bosch Closed Nozzle

 J. Power
 330 HP
 246 (kW)
 2200 at rpm

 K. Peak Torque
 1100 lb. ft.
 1491 (Nm)
 1300 at rpm

 L. Engine Speed at
 Idle
 Fast Idle
 Govern

L. Engine Speed at Idle Fast Idle Governed 750 rpm 1000 rpm 2,800 rpm

M. Dry Weight <u>1,695</u> lbs.

N. Crankcase Oil Capacity

i. New Engine, Dry <u>6.3</u> Gals. ii. New Engine, Wet <u>6.3</u> Gals.

O. Turbo Charger

i. Manufacturer
ii. Type
iii. Maximum rpm, not at load
iv. Maximum rpm, at full load

23. Cooling System

A. Radiator

i. Manufacturer <u>EMP</u>

ii. Type Aluminum Bar-Plate

iii. Model Number XPL2

iv. Core Area

TBD in. x TBD in. = TBD in2

v. Number of Tubes

TBD in. x TBD in. = TBD in2

37rows (radiator) 15 rows (CAC)

vi. Tube Outer Diameter <u>0.098 major</u> In.

vii. Fins per Inch $\underline{8.5}$ viii. Fin Thickness $\underline{0.003}$ In.

ix. Fin Construction Non-louvered wavy

3A. TECHNICAL PROPOSAL WORKSHEET FOR

60-FT LOW FLOOR DIESEL HYBRID COACHES

B. Total Cooling System Capacity
C. Radiator Fan Speed Control Type
D. Surge Tank Capacity

23 gals.

Electronic
5 gals

E. Surge Tank Material <u>Stainless Steel</u>

F. Engine Thermostat Temperature

Settings Degrees 200 F

G. Overheat Alarm Temperature

Sending Unit Settings Degrees 225 F

H. Maximum Ambient Operating Temperature Degree 235 F

24. Propulsion Generator

A. Manufacturer Allison
B. Type In-line drive

C. Size 33 in. x 25 in. x 21 in.

D. Weight, Complete 944 lbs.

E. Power Output <u>246 kW (330 hp) @ 2300rpm</u>

25. Traction Motor

A. Manufacturer Allison

B. Type
C. Model Number

Parallel Hybrid Drive
H 50EP(Ev50)

C. Model Number H 5
F. Oil Capacity (including

heat exchanger) 13 gal.

26. Energy Storage

A. Manufacturer Allison

B. Type Nickel Metal Hydride

C. Size <u>11.14 in. x 85.96 in. x 45.21 in.</u>

D. Weight, Complete 970 lbs.

E. Power Output 432-780 Volts

F. Cooling Requirement 2 kW Freon Evaporator

3A. TECHNICAL PROPOSAL WORKSHEET FOR

60-FT LOW FLOOR DIESEL HYBRID COACHES

27. Energy Storage Controller

A. Manufacturer

Allison

28. Propulsion Control System

A. Manufacturer

Allison

B. Cooling Media

N/A

C. Cooling Requirements

N/A

29. Axle

A. First Axle

i. Manufacturer & Model Number

MAN VOK-07-F

ii. Type

Reverse Elliot cast beam, dropped center, non-driven

iii. Rating

15,873 lbs

B. Second Axle

i. Manufacturer & Model Number

ZF AVN 132

ii. Type

Non-driven

iii. Rating

25,350 lbs

C. Third Axle

i. Manufacturer & Model Number

MAN HY-1350-F

ii. Type

Single Reduction

iii. Rating

28,660 lbs

B. Drive Axle Ratio

i. Differential Ratio

4.56:1

ii. Hub Reduction Ratio (if used)

N/A

iii. Final Axle Ratio (if hub reduction is used)

4.56:1

30. Suspension

A. Air Bags

i. Manufacturer

Firestone

ii. Number of Air Bag per Wheel

2 Front

iii. Total Air Bag Volume

4 Rear

TBD Cu. In. TBD Cu. In.

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

B. Shock Absorbers

i. Manufacturer

ii. Type

iii. Number of Shock per Wheel

Koni

double-acting, telescoping type

2 Front

4 Rear

31. Brake System

A. Fundamental System Manufacturer

B. First Axle Brake Actuator Model

and Part Number

C. Second Axle Brake Actuator Model

and Part Number

D. Third Axle Brake Actuator Model

and Part Number

E. First Axle Brake Rotor

i. Manufacturer

ii. Part Number

iii. Diameter

iv. Width

F. Second Axle Brake Disc

i. Manufacturer

ii. Part Number

iii. Diameter

iv. Width

G. Third Axle Brake Disc

i. Manufacturer

ii. Part Number

iii. Diameter

iv. Width

Knorr

MGM/ 1621705, 1621706

ZF/ 0501329539

MGM/ MJB2024ET752

MAN

81.50803.0040

16.14 TBD In.

MAN

81.50803.0041

16.14 In.

TBD In.

MAN

81.50803.0041

<u>16.14</u> ln.

TBD In.

3A. TECHNICAL PROPOSAL WORKSHEET **FOR** 60-FT LOW FLOOR DIESEL HYBRID COACHES

H. Brake Pad Manufacturer	<u>Ferrodo</u>
I. First Axle Brake Pad Identification i. Forward ii. Reverse	81.50820.5104 81.50820.5104
J. Second Axle Brake Pad Identification i. Forward ii. Reverse	81.50820.5104 81.50820.5104
K. Third Axle Brake Pad Identification i. Forward ii. Reverse	81.50820.5104 81.50820.5104
I. Brake Pads	2 pads/caliper, 4 pads per axles
J. Brake Pad Size i. First Axle ii. Drive Axle	Length Width 7.09 In. TBD In. 7.09 In. TBD In.
K. Pad Thickness	<u>0.827 In.</u>
L. Pad Area per Wheel i. First Axle ii. Second Axle ii. Drive Axle	30.38 Sq. In. 30.38 Sq. In. 30.38 Sq. In.
M. Anti-Lock Brake System Manufactur	rer <u>WABCO</u>
32. Air System	
A. Air Compressor i. Manufacturer ii. Type iii. Model Number iv. Capacity at Idle v. Capacity at Maximum Speed vi. Maximum Warranted Speed vii. Idle Speed viii. Drive Type	WABCO Twin Cylinder HD 30.4 6.9 cfm 30.4 cfm 3000 rpm 750 rpm Direct

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

B. Air Reservoir Capacity

i. Supply Reservoir <u>1200/800 split</u> Cu. In.

ii. Primary Reservoir2000 Cu. In.iii. Secondary Reservoir2000 Cu. In.iv. Parking Reservoir2000 Cu. In.

v. Accessory Reservoir <u>2150/1400</u> split Cu. In.

vi. Other Reservoir 2000 Cu. In.

C. Air Dryer

i. Manufacturer Graham White

ii. Model Number <u>SludgeBreaker QBA60NX5</u>

33. Fuel System

A. Fuel Tank

i. Manufacturer New Flyer

ii. Size <u>100 usable Gallons</u>

iii. Material Cross-linked polyethylene

B. Filler

i. Manufacturer <u>EMCO Wheaten</u>

ii. Model Number <u>Posi-snap</u>

34. Hydraulic System

A. Fan Drive

i. Manufacturer
 ii. Type
 iii. Model Number
 N/A, electric Radiator
 N/A, electric Radiator
 N/A, electric Radiator

B. Power Steering

i. Steering Gear Manufacturer
 ii. Type
 iii. Relief Pressure
 iv. Power Steering Fluid Capacity
 Sheppard
 M110
 2175 psi
 20 qts.

v. Effort at Steering Wheel

(Unloaded stationary coach

on dry asphalt pavement) 9 lbs. to 10 degrees

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

35. Wheels

A. Manufacturer

B. Type

C. Size

D. Mounting

Accuride
Aluminum

22.5" x 8.25"
Hub Piloted

36. Tires

A. Manufacturer Customer Supplied Firestone

 B. Type
 Low Profile

 C. Size
 305/70R22.5

D. Load Range <u>Depends on tire manufacturer</u>

E. Inflation Pressure 1st Axle <u>Depends on tire manufacturer</u> p.s.i. Drive Axle <u>Depends on tire manufacturer</u> p.s.i.

37. Starter

A. Manufacturer

B. Model Number

C. Tank volume

N/A

38. Fire Detection/Suppression System

A. Manufacturer

B. Model Number

C. Dry Chemical Tank Capacity

Amerex
SafetyNet
25 lbs.

D. Expellant Gas Tank Capacity Not Applicable

39. Chassis Electrical

A. Multiplex System

i. Manufacturer Parker VANSCO
ii. Model Number Parker VANSCO

B. Starter Batteries

i. Manufacturer (DEKA) East Penn Manufacturing Co.

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

 ii. Model Number
 8A8DT978

 iii. Type
 AGM-8D

40. Alternator

A. Manufacturer **EMP** B. Type Air cooled C. Model Number Power 450 D. Output at Idle 280 Amps E. Output at Maximum Speed 455 Amps F. Maximum Warranted Speed 6500 rpm G. Speed at Idle 2000 rpm H. Drive Type Belt

41. Charge Air Cooler

A. Manufacturer <u>EMP</u>
B. Material (s) <u>Aluminum</u>

C. Core Area \underline{TBD} in. x \underline{TBD} in. = \underline{TBD} in2.

D. Number of tubes <u>15 rows</u>

E. Tube outer diameter <u>0.098 major</u> in.

F. Fins per inch
G. Fin thickness $\frac{8.5}{0.003} \text{ in.}$

H. Fin construction Non-louvered wavy

42. Chassis and Frame

A. Roof Structure Material High tensile steel tube

B. Roof Anti-Corrosion Material Zinc rich primer

C. Roof Skin Material Fiberglass

D. Sidewall Structure Material High tensile steel tube

E. Sidewall Anti-Corrosion Material Zinc rich primer and Corritube

F. Sidewall Skin Material <u>Fiberglass</u>

G. Skirt Material <u>Fiberglass</u>

3A. TECHNICAL PROPOSAL WORKSHEET FOR 60-FT LOW FLOOR DIESEL HYBRID COACHES

- H. Main Bus Structure/Frame Material High Tensile steel tube and plate
- I. Main Bus Structure/Frame Anti-Corrosion Material Zinc rich primer, Coritube & Corishield
 - 43. Special Tools
 - A. Tools
 - **B. Special Test Equipment**