



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
5-A	A. Mean Repair Times	Identification of the mean repair times for all routine maintenance activities, including preventative maintenance (P.M.) inspections, brake relining, small component replacement, and all other frequently required maintenance tasks.

Please refer to the attached life cycle cost spreadsheets under Section 12 and the attached XcelSior Standard Repair Time Manual.



VENDOR		MANUAL SECTION	TIME	COMPONENT / TASK DESCRIPTION	TASK
MAN	1.4	1	0.8	WHEEL STUDS, FRONT AXLE (ONE SIDE)	
	0.8		0.2	TIRE & RIM ASSEMBLY, FRONT	R&R
	0.2		0.4	BRAKE DRUM, FRONT	R&R
	0.4			WHEEL STUD (QTY. OF 10)	R&R
MAN	0.8	1	0.8	TIRE & RIM ASSEMBLY, FRONT AXLE	
	0.8			TIRE & RIM ASSEMBLY, FRONT	R&R
MAN	0.7	1	0.5	BRAKE CHAMBER ASSEMBLY, FRONT AXLE (ONE SIDE)	
	0.5		0.2	BRAKE CHAMBER, FRONT	R&R
	0.2			BRAKE ADJUSTMENT (ONE FRONT WHEEL)	ADJUSTMENT
MAN	0.9	1	0.6	BRAKE DRUM, FRONT AXLE (ONE SIDE)	
	0.6		0.3	TIRE & RIM ASSEMBLY, FRONT	R&R
	0.3			BRAKE DRUM, FRONT	R&R
MAN	1	1	0.4	STAND ALONE ITEMS	
	0.4		1.4	DRAG LINK	R&R
	1.4			WHEEL BEARINGS (INNER & OUTER)	R&R
MAN	4.5	1	0.2	FRONT AXLE & SUSPENSION (AXLE BUILD)	2 Mech. Reqd.
	0.2		0.3	LEVELING LINK BRACKETS	R&R
	0.3		0.5	BRAKE CHAMBER AIR LINES	R&R
	0.5		0.1	DRAG LINK	R&R
	0.1			SHOCK RETAINING NUTS (LOWER NUTS ONLY)	R&R



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
	0.3		STEERING DAMPER	R&R
	0.5		LATERAL ROD	R&R
	0.2		CENTER LINK (OPTIONAL)	R&R
	0.5		RADIUS RODS (AT STRUCTURE)	R&R
	0.1		A B S SENSOR ELECTRICAL CONNECTION	DISCONNECT
	0.3		TORQUE BOLTS	TORQUE
	0.1		FRONT END ALIGNMENT (MINOR)	ALIGN
	0.5		ROAD TEST	OPTIONAL
	1.0		ALIGNMENT & ROAD TEST (not added to total)	OPTIONAL
MAN	1.8	1	HUB ASSEMBLY, FRONT AXLE (ONE SIDE)	
	0.6		WHEEL ASSEMBLY	R&R
	0.1		WHEEL BEARING DUST COVER	R&R
	0.2		SLACK ADJUSTER (ADJUST FOR EASIER DRUM REMOVAL)	R&R
	0.1		BRAKE DRUM	R&R
	0.3		ADJUSTING NUT, THRUST WASHER & WHEEL BEARING	R&R
	0.5		HUB	R&R
MAN	1.1	1	BRAKE CAMSHAFT SUPPORT BEARING	
	0.1		BRAKE SHOE SPRINGS	R&R
	0.1		BRAKE CAMSHAFT	R&R
	0.1		CAMSHAFT BEARING SUPPORT BRACKET	R&R
	0.1		CAMSHAFT SEALS	R&R
	0.1		NEEDLE BEARINGS	R&R
MAN	4.2	1	STEERING KNUCKLE (With Hub in Place)	
	0.5		SLACK ADJUSTER (ADJUST FOR EASIER DRUM REMOVAL)	Adjust
	0.2		BRAKE DRUM	R&R
	0.5		BRAKE SHOE RETURN SPRING	R&R



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
	0.5		BRAKE CHAMBER	R&R
	0.2		SLACK ADJUSTER	R&R
	0.3		CAMSHAFT SUPPORT BRACKET	R&R
	0.5		TIE ROD END	R&R
	0.2		LUBRICATION LINE & GREASE NIPPLE	R&R
	0.1		SNAP RINGS	R&R
	0.1		KING PIN COVERS	R&R
	1		KING PINS	R&R
	0.1		THRUST BEARING & SHIMS	R&R
MAN 1.5 1 WHEEL STUDS, FRONT AXLE (ONE SIDE)				
	0.6		WHEEL ASSEMBLY	R&R
	0.2		BRAKE DRUM, FRONT	R&R
	0.1		BRAKE SHOE RETURN SPRING	R&R
	0.6		WHEEL STUD (QTY. OF 10)	R&R
MAN 2.8 1 BRAKE SHOES, FRONT AXLE (ONE SIDE)				
	0.6		WHEEL ASSEMBLY	R&R
	0.1		SLACK ADJUSTER (ADJUST FOR EASIER DRUM REMOVAL)	Adjust
	0.2		BRAKE DRUM	R&R
	0.1		BRAKE RETURN SPRINGS, FRONT	R&R
	0.1		LOCKING WEDGE	R&R
	0.1		BRAKE SHOE ANCHOR BOLTS	R&R
	0.2		BRAKE SHOE ANCHOR BOLT BUSHINGS	R&R
	0.2		BRAKE SHOE ROLLER BUSHINGS	R&R
	0.3		ANCHOR PIN BUSHINGS	R&R
	0.8		BRAKE SHOE LINING RIVETS OR BOLTS	R&R
	0.1		BRAKE ADJUSTMENT	R&R



VENDOR	MANUAL SECTION	TIME	COMPONENT / TASK DESCRIPTION	TASK
MAN	1	0.6	SLACK ADJUSTER, FRONT AXLE (ONE SIDE)	R&R
		0.5	SLACK ADJUSTER ASSEMBLY, FRONT	Adjust
		0.1	BRAKE ADJUSTMENT (ONE FRONT WHEEL)	
MAN	1	1.4	A B S SPEED SENSOR	R&R
		0.6	WHEEL ASSEMBLY	Adjust
		0.5	SLACK ADJUSTER (ADJUST FOR EASIER DRUM REMOVAL)	R&R
		0.2	BRAKE DRUM	R&R
		0.1	SPEED SENSOR	R&R
MAN	1	2.0	A B S PULSE GENERATING WHEEL	R&R
		1.5	HUB ASSEMBLY (Refer to Hub Section)	R&R
		0.5	PULSE WHEEL	
MAN	1	2.9	WHEEL BEARINGS & RACE	R&R
		1.5	HUB ASSEMBLY	R&R
		0.3	OUTER BEARING	R&R
		0.3	INNER BEARING	R&R
		0.2	INNER WHEEL GREASE COLLECTOR	R&R
		0.6	INNER / OUTER BEARING RACE	R&R
MAN	1	0.7	BRAKE CHAMBER ASSEMBLY, FRONT AXLE (ONE SIDE)	R&R
		0.5	BRAKE CHAMBER, FRONT	Adjust
		0.2	BRAKE ADJUSTMENT (ONE FRONT WHEEL)	
MAN	1	0.8	BRAKE DRUM, FRONT AXLE (ONE SIDE)	R&R
		0.6	TIRE & RIM ASSEMBLY, FRONT	R&R
		0.2	BRAKE DRUM, FRONT	



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
MAN	3.1 x 2	2	REAR AXLE & SUSPENSION	
	0.6		LOWER RADIUS ROD (AT COACH END)	R&R
	0.6		UPPER RADIUS ROD (AT HOUSING)	R&R
	0.6		DRIVE SHAFT	R&R
	0.6		AIR SPRINGS (LOWER BOLTS ONLY)	R&R
	0.2		SHOCKS (LOWER NUTS ONLY)	R&R
	0.3		BRAKE LINES	R&R
	0.2		LEVELING VALVE LINKS	R&R
MAN	2.7	2	AXLE & HUB ASSEMBLY REAR	
	0.3		DRAIN OIL (From Axle Ends And Housing)	DRAIN/FILL
	0.6		WHEEL ASSEMBLY, REAR	R&R
	0.2		BRAKE CHAMBER	R&R
	0.2		SLACK ADJUSTER	R&R
	0.2		BRAKE DRUM, REAR	R&R
	0.3		PLANETARY BOLTS & HEX NUT	R&R
	0.2		PLANETARY & AXLE SHAFT	R&R
	0.2		AXLE SHAFT & PLANETARY HOUSING SEPARATION	R&R
	0.1		PLANETARY GEAR LOCKING PLATE & WASHER	R&R
	0.1		RING GEAR HUB & BEARINGS	R&R
	0.1		WHEEL HUB	R&R
	0.2		SPINDLE	R&R
MAN		2	STAND ALONE ITEMS	
	1.0		REAR AIR SPRING (COMPLETE UNIT)	R&R
	0.8		LOWER RADIUS ROD (REAR)	R&R
	0.5		SHOCK ABSORBERS (REPLACEMENT)	R&R



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
	0.3		BRAKE CHAMBER, REAR	R&R
	2.0		BRAKE SHOE LINING, (One Side)	R&R
	0.5		LEVELING VALVE	R&R
	1.2		REAR RELAY VALVE	R&R
	1.5		WHEEL, DRUM, HUB, & SEAL	R&R
MAN (LF) 1.5 per 2 WHEEL STUDS				
	0.7		WHEEL ASSEMBLY	R&R
	0.1		DRUM	R&R
	0.1		BRAKE RETURN SPRINGS	R&R
	0.6		WHEEL STUDS	R&R
MAN (LF) 1.9 2 PLANETARY GEAR HOUSING				
	0.2		DRAIN OIL	Drain
	0.1		SLACK ADJUSTER (ADJUST FOR EASIER DRUM REMOVAL)	Adjust
	0.2		PLANETARY GEAR COVER	R&R
	0.2		AXLE SNAP RING & AXLE	R&R
	0.2		BRAKE DRUM	R&R
	1		PLANETARY GEAR HOUSING	R&R
MAN (LF) 3.1 2 WHEEL HUB				
	0.2		OIL	Drain
	0.2		AXLE SHAFT	R&R
	1.5		HUB REDUCTION UNIT	R&R
	0.2		LOCK WASHER & INNER NUT	R&R
	0.2		RING GEAR	R&R
	0.3		OUTER BEARING & HUB	R&R
	0.2		INNER BEARING & OIL CATCH PLATE	R&R
	0.3		AXLE SEAL COLLAR	R&R



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
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MAN	0.75	2	PLANETARY GEARING	R&R
	0.75		CHECK SERVICE MANUAL	

MAN	3.8	2	BRAKE ASSEMBLY, REAR (ONE SIDE)	R&R
	0.8		WHEEL ASSEMBLY, REAR	Adjust
	0.6		SLACK ADJUSTER (ADJUST FOR EASIER DRUM REMOVAL)	R&R
	0.1		BRAKE SHOE BACKING PLATE	R&R
	0.2		BRAKE DRUM	R&R
	0.1		BRAKE SPRINGS	R&R
	0.1		BRAKE SHOE ANCHOR BOLT (LOCKING BOLT, PLATE & BUSHINGS)	R&R
	0.3		BRAKE SHOE ANCHOR PINS	R&R
	0.3		ANCHOR PIN BUSHINGS	R&R
	0.2		BRAKE SHOE ROLLER BUSHINGSS	R&R
	0.1		BRAKE SHOE ASSEMBLY	R&R
	0.7		BRAKE SHOE LINING	R&R
	0.3		CLEAN BRAKE SHOE BODY	Clean

MAN (LF)	3.7	2	CAMSHAFT SUPPORT BEARING	Drain
	0.2		OIL	R&R
	0.7		WHEEL ASSEMBLY	Adjust
	0.1		SLACK ADJUSTER (ADJUST FOR EASIER DRUM REMOVAL)	R&R
	0.2		BRAKE DRUM	R&R
	0.1		BRAKE RETURN SPRINGS	R&R
	1.5		HUB	R&R
	0.3		SLACK ADJUSTER	R&R
	0.1		CAMSHAFT	R&R
	0.5		CAMSHAFT SEAL RETAINER, SEAL & BEARING	R&R



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
MAN	4.8	2	DIFFERENTIAL CARRIER ASSEMBLY	
	0.5		DIFFERENTIAL OIL	Drain
	1		AXLE SHAFTS	R&R
	1		PROPELLER SHAFT FLANGE & YOKE	R&R
	0.8		CARRIER MOUNTING BOLTS	R&R
	0.5		MUD FLAP	R&R
	1		GEAR SET	R&R
MAN	3	2	PINION NUT AND SEAL	R&R
SHEPARD	2.7	3	STEERING GEAR BOX	DISCONNECT
	0.5		POWER STEERING LINES	R&R
	0.2		DRAG LINK CASTLE NUT (at pitman arm)	R&R
	0.5		STEERING JOINT ASSEMBLY (at the miter box)	R&R
	0.6		STEERING BOX MOUNTING BOLTS	R&R
	1.0		PHYSICALLY REMOVE AND INSTALL STEERING BOX	R&R
	0.5		ROAD TEST (OPTIONAL) Time not added to total	TEST
MAN	2.5	3	MITER BOX	
	1.0		STEERING COLUMN " U " JOINT	R&R
	0.5		STEERING JOINT ASSEMBLY (At transfer box)	R&R
	0.5		TRANSFER GEAR BOX RETAINING BOLTS	R&R
	0.5		MITER BOX COMPONENT	R&R
ALL		3	STAND ALONE ITEMS	
	1.0		STEERING COLUMN " U " JOINT (steering joint assembly)	R&R
	0.5		STEERING WHEEL	R&R
	0.8		DRAG LINK	R&R



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
	1.5		POWER STEERING PUMP	R&R
	2.5		HYDRAULIC RESERVOIR	R&R
	0.5		FILTER, HYDRAULIC RESERVOIR	R&R
	0.8		SIGHT GLASS	R&R
ALL	5.3	4	ENGINE EXHAUST COMPONENTS	
	0.5		MUFFLER MOUNT (RUBBER ISOLATOR)	R&R
	0.2		EXHAUST CLAMP	R&R
	1		MUFFLER CLAMP ASSEMBLY (AROUND MAIN BODY)	R&R
	0.2		UPPER "U" CLAMP	R&R
	1.5		UREA TANK	R&R
	0.3		MUFFLER	R&R
	0.1		MUFFLER CLOSE OUT (ON ROOF)	R&R
	0.5		FLEX CONNECTOR & BAND CLAMPS	R&R
	1		Particulate Filter	R&R
ALL		4	ENGINE COMPONENTS (STAND ALONE ITEMS)	
	1		ENGINE MOUNTS (2)	R&R
	1		TRANSMISSION MOUNTS	R&R
	0.4		AIR FILTER	R&R
	1.3		STARTER MOTOR	R&R
	1.5		ALTERNATOR	R&R
	1		FILLER TUBE & DIPSTICK	R&R
	0.5		ENGINE OIL & FILTERS	R&R
	0.5		ALTERNATOR BELT	R&R
	0.8		ENGINE COMPARTMENT SWITCH BOX	R&R
ALL		4	STAND ALONE ITEMS	
	0.5		ENGINE MOUNT FRONT (ONE)	R&R



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
	0.3		EXHAUST MOUNTING BRACKET	R&R
	1.0		EXHAUST PIPE	R&R
	1.5		MUFFLER	R&R
	0.3		ENGINE BELT GUARD	R&R
	0.2		HINGED BELT GUARD (Swing out & remove)	R&R
CUMMINS	1.5	4	DECOMPOSITION REACTOR	
	0.3		ROOF GRILL ABOVE EXHAUST COMPONENTS	R&R
	0.2		ELECTRICAL CONNECTIONS	R&R
	0.2		DEF SUPPLY AND COOLANT LINES.	R&R
	0.3		V-CLAMP AT REACTOR INLET TUBE	R&R
	0.2		TAIL PIPE U-CLAMP	R&R
	0.2		EXHAUST SEAL CLAMP	R&R
	0.1		U-CLAMP SECURING DECOMPOSITION REACTOR	R&R
CUMMINS	1.5	4	SCR CATALYST	
	0.2		SCR ELECTRONIC CONTROL MODULE WIRING	R&R
	0.2		NOX SENSOR MOUNTING BOLTS	R&R
	0.2		NOX SENSOR MOUNTING BOLTS	R&R
	0.3		SECURING STRAPS	R&R
	0.4		W-CLAMPS (as required)	R&R
	0.2		CATALYST	R&R
CUMMINS	1.0	4	DIESEL EXHAUST FLUID (DEF)	
	0.3		TANK SENSOR HOSES AND LINES AT SENSOR	R&R
	0.1		TANK SENSOR HOSES AND LINES AT SENSOR	R&R
	0.2		FLOAT SWITCH CONNECTOR	R&R
			FLOAT SWITCH	R&R



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
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	0.4		TANK MOUNTING BOLTS	R&R
ALLISON	15.3	5	B300/400/500 TRANSMISSION (ALLISON SPECIFIC)	
	6.0		TRANSMISSION	R&R
	0.4		TRANSMISSION ECU	R&R
	1.0		FILLER TUBE & DIPSTICK	R&R
	1.5		TRANSMISSION OIL COOLER	R&R
	0.8		TRANSMISSION SUPPORT BRACKET	R&R
	0.5		SUPPORT ENGINE/TRANS REAR	PROCEDURE
	0.4		ATEC ECU (electronic control unit)	R&R
	1.0		B500-R-INSTALL-AUXILIARY FILTER UNIT	INSTALLATION
	0.4		ECU (ELECTRONIC CONTROL UNIT)	R&R
	0.2		ENGINE/INPUT/SPEED SENSOR	R&R
	0.2		OUTPUT SPEED SENSOR	R&R
	1.0		RECALIBRATE ECU	ADJUST
	0.3		SHIFTER HYD. TRANSMISSION	R&R
	0.5		STEAM CLEAN TRANSMISSION	CLEAN
	0.8		TRANSMISSION REAR SUPPOR BRACKET	R&R
	0.3		TURBINE SPEED SENSOR	R&R

ALLISON	21.2	5	EV40/50 HYBRID TRANSMISSION 9 ALLISON SPECIFIC)	
	9.1		EV 50 DRIVE UNIT OR TRACTION MOTOR	R&R
	3.5		ESS (ENERGY DTORAGE SYSTEM,BATTERY PACKS)	R&R
	3.0		DPIM (DUEL POWER INVERTER MODULE)	R&R
	0.2		EXTERNAL OIL FILTER	R&R
	0.8		TRANSMISSION REAR SUPPORT (MOUNTS)	R&R
	0.5		TRANSMISSION COOLER OIL BACK FLUSH	PROCEDURE
	0.5		OIL PAN	R&R
	0.3		SPIN ON FILTER	R&R



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
	0.1		INTERNAL FILTER	R&R
	0.5		ECU-ECM	R&R
	0.5		CONTROL VALVE BODY (control module does not include pan or int. filter)	R&R
	2.1		OUTPUT SHAFT SEAL	R&R
	0.1		SOLENOID	R&R
	1.0		RE-CALIBRATE ECU	CALIBRATE
COOLING 4.3 6 RADIATOR & CHARGE AIR COOLER				
	0.1		HEATER LINES	R&R
	0.6		DRAIN/FILL COOLANT	Drain / fill
	0.3		BELT GUARDS	R&R
	0.4		CHARGE AIR COOLER TUBES	R&R
	0.4		RAD TUBES UPPER/LOWER	R&R
	0.3		BUMPER EXTENSION	R&R
	0.2		SURGE TANK LINES	Disconnect
	0.5		HYDRAULIC OIL LINES	Disconnect
	0.2		RADIATOR SUPPORT ROD	Disconnect
	0.5		LOWER SUPPORT CHANNEL, RADIATOR	R&R
	0.8		RADIATOR SUPPORT ROD	R&R
ALL MISC. TIMES 6 STAND ALONE ITEMS				
	0.8		HYDRAULIC RESERVOIR SIGHT GLASS	R&R
	0.3		LOW COOLANT SENSOR	R&R
	2		SURGE TANK	R&R
	0.2		FAN CONTROLLER	R&R
	0.8		FAN DRIVE PUMP BELT	R&R
FUEL 3 7 FUEL SYSTEM				
	0.4		FUEL	Drain/Fill



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
	0.3		PASSENGER SEAT	R&R
	0.1		COVER PLATE	R&R
	0.2		SUPPLY LINE	Disconnect
	0.2		RETURN LINE	Disconnect
	0.2		FUEL LEVEL VENT LINE	Disconnect
	0.2		FUEL LEVEL SENDER LINE	Disconnect
	0.3		FILLER TUBE CLAMPS	Disconnect
	0.5		TANK MOUNTING HARDWARE	R&R
	0.6		FUEL TANK	R&R
CNG				
	Misc times	7	C N G FUEL (stand alone items)	
	2.5		C N G FUEL TANK (LINCOLN COMPOSITES)	R&R
	0.2		REFUELING CONNECTOR	R&R
	0.8		FUEL TANK SOLENOID VALVE	R&R
	1.5		I T T REGULATOR	R&R
	2.0		ZERO PRESSURE REGULATOR	R&R
	0.2		P R D VALVE	R&R
	0.5		C N G RECOVERY	EVACUATE
	0.2		FUEL DOOR SENSOR	R&R
	0.5		FUEL "LOW PRESSURE INDICATOR"	R&R
	0.5		FUEL "HIGH PRESSURE INDICATOR"	R&R
LNG				
	Misc. times	7	L N G FUEL (stand alone items)	
	2.5		L N G FUEL TANK	R&R
	2.5		HEAT EXCHANGER	R&R
	0.2		FUEL FILTER	R&R
	0.2		REFUELING CONNECTOR	R&R
	0.8		FUEL TANK SOLENOID VALVE	R&R



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
	2		PRESSURE REGULATOR	R&R
	0.5		L N G RECOVERY (per tank)	EVACUATE
	0.2		FUEL DOOR PROXIMITY SWITCH	R&R
	2		TANK MANIFOLD ASSEMBLY	R&R
	2		PRESSURE CONTROL MANIFOLD	R&R
ALL Misc. times 8 AIR SYSTEM COMPONENTS (stand alone items)				
	1.2		AIR DRYER	R&R
	0.2		AIR DRYER FILTER	R&R
	0.5		MUFFLER (Ping) TANK	R&R
	0.2		AIR TANK DRAIN VALVE	R&R
	0.5		GOVERNOR	R&R
	0.6		AIR PRESSURE REGULATOR (BRAKE INTERLOCK)	R&R
	1.5		APPLICATION VALVE (BRAKE TREADLE)	R&R
	1		SPRING BRAKE CONTROL VALVE	R&R
	0.6		SOLENOID VALVE	R&R
	0.2		Q. R. VALVE	R&R
	0.2		TRANSDUCER	R&R
	0.3		BRAKE INTERLOCK MAGNETIC VALVE	R&R
	0.5		OIL SEPARATOR	R&R
	0.3		OIL SEPARATOR FILTERS	R&R
	0.3		CHECK VALVE	R&R
	1		AIR BRAKE RELAY VALVE	R&R
	0.2		PRESSURE PROTECTION VALVE	R&R
ALL Misc Times 9 ELECTRICAL				
	0.2		MARKER LIGHT	R&R
	0.2		FLUORESCENT LIGHT	R&R
	0.3		BACK UP LAMPS	R&R



Xcelsior Standard Repair Times

Rev 1-nov.10/10

VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
	0.2		STEPWELL (HEADER) LIGHT	R&R
	0.3		SEALED BEAM HEADLIGHT	R&R
	1.5		BATTERIES & LEADS	R&R
	1.3		STARTER MOTOR	R&R
	0.5		BATTERY CUT OFF SWITCH	R&R
	0.3		LOW AIR PRESSURE SWITCH	R&R
	0.7		VOLTAGE EQUALIZER	R&R
	1		BATTERY TRAY	R&R
	0.5		P.A. SPEAKER	R&R
	0.3		DIMMER SWITCH	R&R
	0.5		TURN SIGNAL SWITCH	R&R
	0.2		PLC MODULES (Add access time)	R&R
	1.5		PROCESSOR	R&R
	0.4		TOUCH TAPE (Less then 2ft.)	R&R
	1		TOUCH TAPE (Coach length)	R&R

Thermo King	Misc. Times	10	HVAC SYSTEM (check back of manual for Thermo King)
	1.5		DRIVERS HEATER / DEFROSTER UNIT
	0.5		HEATER / DEFROSTER MOTOR
	0.5		HEATER / DEFROSTER COIL
	0.5		HEATER VALVE
	0.2		AIR FILTER
	0.5		FAN / MOTOR ASSEMBLY
	1		BOOSTER PUMP
	0.5		FLOOR HEATER
	1		HEATER COIL (FLOOR HEATER)
	0.2		AIR FILTER (FLOOR HEATER)
	0.5		DEFROSTER MOTOR
	0.2		AIR FILTER (REAR HEATER UNIT)



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
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	2		AUXILIARY COOLANT HEATER	R&R
	4		ENGINE AIR COMPRESSOR	R&R

ALL	Misc. Times	12	INTERIOR PANELS & APPLIED PARTS	
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	1		SIDEWALL PANEL	R&R
	2		CEILING PANEL	R&R
	0.3		REAR VIEW MIRROR	R&R
	0.3		EXIT DOOR MIRROR	R&R
	0.3		SUN VISOR	R&R

ALL	Misc. Times	13	EXTERIOR PANELS & APPLIED PARTS	
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	0.5		CURBSIDE MIRROR	R&R
	0.5		DRIVERS MIRROR	R&R
	0.8		REAR BUMPER ASSEMBLY	R&R
	1		POLYURETHANE MODULE (Section of Bumper)	R&R
	0.3		WIPER ARM	R&R
	0.8		WIPER MOTOR	R&R
	0.8		WINDSHIELD WASHER RESERVOIR	R&R
	1.25		SPLASH GUARDS / MUD FLAPS (Front or Rear)	R&R
	1.25		FRONT BUMPER	R&R
	0.3		EXIT DOOR MIRRORS	R&R
	0.3		REAR VIEW MIRROR	R&R

Exterior body panel replacement times depend on severity of damage, no definite time is assigned to this particular task

ALL	Misc. Times	14	WINDOWS	
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	3		WINDSHIELD (Left or Right)	R&R
	1		DRIVERS SIDE WINDOW	R&R
	1		PICTURE WINDOW	R&R
	1		PASSENGER WINDOW	R&R



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
	0.5		WINDOW TRIM RING	R&R
	0.5		WINDOW GLASS	R&R
	0.2		RAPID REPLACEMENT WINDOW (Tip in window)	R&R
	0.5		VANDAL SHIELD	INSTALL
ALL Misc. Times 15 ACCESS DOORS				
	1.5		REAR EXTERIOR HVAC DOOR	R&R
	0.5		TRANSMISSION ACCESS DOOR (Exterior)	R&R
	1.5		ENGINE ACCESS DOOR (Exterior)	R&R
	0.7		RADIATOR DOOR	R&R
	0.5		FUEL FILLER DOOR	R&R
	0.8		ROOF VENT	R&R
	0.7		SIDE CONSOLE EXTERIOR DOOR	R&R
	0.5		SURGE TANK ACCESS DOOR	R&R
ALL Misc. Times 16 ENTRANCE & EXIT DOOR SYSTEMS				
	0.8		DOOR PANELS	R&R
	2.2		DOOR ASSEMBLY	R&R
	0.6		BASE PLATE ASSEMBLY(Welded)	R&R
	0.5		DOOR MOTOR	R&R
	1.5		DOOR MOTOR OVERHAUL	Overhaul
	0.2		ADJUSTING RODS	R&R
	0.5		EMERGENCY RELEASE VALVE (Dump Valve)	R&R
	1.2		DOOR SHAFT & ARM ASSEMBLY	R&R
	0.3		TOUCH TAPE	R&R
	0.1		MICRO SWITCH	R&R
	0.3		SEALS & TRIM	R&R
	0.2		GRAB HANDLE	R&R
	0.5		CHIME	R&R



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
	0.8		DOOR CONTROLLER	R&R
	0.5		DOOR GLASS	R&R
	1		HALL EFFECT LOCK PAWL SWITCH	R&R
	1		REAR DOOR BEARINGS	R&R
	1		REAR DOOR SOLENOID (MAG VALVE)	R&R
	0.5		ANNUNCIATE PANEL	R&R
	1		SONIC SENSOR	R&R
VAPOR	4.6		SWING EXIT DOORS	
	1		EXIT DOOR PANELS (BOTH)	R&R
	3		EXIT DOOR ASSEMBLY	R&R
	0.6		ELECTRO-PNEUMATIC EXIT DOOR ENGINE	R&R
VAPOR	0.8		EXIT DOOR PANELS (BOTH)	R&R
	0.5		DOOR GLASS	R&R
	0.3		DOOR SHAFT LEVERS	R&R
VAOOR	1.6		EXIT DOOR ASSEMBLY (ONE)	R&R
	0.4		RUBBER BUMPERS	R&R
	0.3		SEALS & TRIM	R&R
	0.3		DOOR BRUSHES	R&R
	0.3		HANDLE	R&R
	0.3		TOUCH TAPE	R&R
VAPOR	4		EXIT DOOR BASEPLATE OVERHAUL	OVERHAUL
	2		BASE PLATE ASSEMBLY	R&R
	0.2		EXIT DOOR AIR CYLINDER	R&R
	0.2		DOOR SOLENOID & BRACKET ASSEMBLY	R&R
	0.2		HALL EFFECT LOCK PAWL SWITCH	R&R
	0.1		CAM ASSEMBLY	R&R
	0.2		MICRO / LIMIT SWITCHES	R&R
	0.5		SKINNER VALVE	R&R



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
	0.1		BASEPLATE BUSHINGS	R&R
	0.2		ELECTRIC SOLENOID	R&R
	0.1		RETURN SPRING	R&R
	0.2		CONNECTING RODS	R&R
VAPOR	1.4		EXIT DOOR SOLENOID AND BRACKET ASSEMBLY	R&R
	0.2		BRACKET ASSEMBLY	R&R
	0.3		EXTENSION SPRING	R&R
	0.2		LEVER ASSEMBLY	R&R
	0.1		END PLAY SPACER AND BUSHING	R&R
	0.1		CAM ASSEMBLY	R&R
	0.2		EMERGENCY CONNECTING ROD ASSEMBLY	R&R
	0.2		LOCK PRAWL ASSEMBLY	R&R
	0.1		SENSOR ASSEMBLY	R&R
VAPOR	5.9	16	SLIDE GLIDE ENTRANCE DOORS	
	3		SLIDE GLIDE ENTRANCE DOOR ASSEMBLY	R&R
	0.6		CONNECTING RODS, ENTRANCE DOOR	R&R
	1.5		DOOR SHAFT LEVER ASSEMBLY	R&R
	0.3		DOOR SHAFT & ARM ASSEMBLY	R&R
	0.3		DOOR PANELS (PER PANEL)	R&R
	0.2		PIVOT ASSEMBLY, ENTRANCE DOOR TOP	R&R
Vapor	2		ENTRANCE DOOR SHAFT LEVER ASSEMBLY	R&R
	1.5		LEVER ASSEMBLY, ENTRANCE DOOR	R&R
	0.5		SPACER & BALL BEARING	R&R
Vapor	2.3		ENTRANCE DOOR SHAFT & ARM ASSEMBLY	R&R
	0.3		DOOR PANELS (PER PANEL)	R&R
	1		DOOR GLASS (UPPER AND LOWER)	R&R
	0.4		PIVOT ASSEMBLY, ENTRANCE DOOR TOP	R&R
	0.3		SEALS AND TRIM, ENTRANCE DOOR	R&R



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
	0.3		BRUSHES, ENTRANCE DOOR	R&R
Vapor	3		ENTRANCE DOOR MECHANISM OVERHAUL	R&R
	1.5		DOOR CYLINDER ASSEMBLY	R&R
	0.4		DOOR MAG VALVE	R&R
	0.5		LIMIT SWITCHES	R&R
	0.6		CONNECTING RODS, ENTRANCE DOOR	R&R
VAPOR	Misc. times	16	EXIT & ENTRANCE DOOR STAND ALONE ITEMS	
	0.5		AIR FILTER, BASEPLATE	R&R
	1		EXIT DOOR ADJUSTMENT (FIT & ALIGNMENT, CHECK & ADJUST)	ADJUSTMENT
	0.3		EXIT DOOR SPEED ADJUSTMENT	ADJUSTMENT
	0.3		EXIT DOOR HALL SENSOR VANE ADJUSTMENT	ADJUSTMENT
	0.2		EXIT DOOR EMERGENCY LINKAGE ADJUSTMENT	ADJUSTMENT
	0.2		EXIT DOOR LS3 SENSOR ADJUSTMENT	ADJUSTMENT
	0.2		EXIT DOOR LOCK SOLENOID ADJUSTMENT	ADJUSTMENT
	0.2		EXIT DOOR LOCK PRAWL TO CAM CLEARANCE ADJUSTMENT	ADJUSTMENT
	0.2		EXIT DOOR PANEL SENSOR ADJUSTMENT	ADJUSTMENT
	2		EXIT DOOR COMPLETE FUNCTIONAL TEST	ADJUSTMENT
	1		ENTRANCE DOOR ADJUSTMENT FOR FIT, CHECK & ADJUST	ADJUSTMENT
	0.3		ENTRANCE DOOR SPEED ADJUSTMENT	ADJUSTMENT
	2		ENTRANCE DOOR COMPLETE FUNCTIONAL TEST	TEST
	1.2		EXIT DOOR EMERGENCY RELEASE VALVE	TEST
	1		ENTRANCE DOOR EMERGENCY RELEASE VALVE	R&R
	1		DOOR CONTROLLER	R&R
	0.5		DOOR CONTROLLER MODULE	R&R
	0.5		ENUNCIATOR PANEL	R&R
ALL	Misc times	17	SEATING	
	1		DRIVERS SEAT	R&R



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
	0.5		DRIVERS SEAT BELT	R&R
	0.8		PASSENGER SEAT (Double)	R&R
	0.1		SEAT INSERTS	R&R
	1		WHEELCHAIR FLIP SEAT	R&R
DESTINATION SIGNS				
ALL	Misc. times	18	DESTINATION SIGN ASSEMBLY (Front)	R&R
	1.2		DESTINATION SIGN ASSEMBLY (Side)	R&R
	1		REAR ROUTE SIGN	R&R
	0.5		DECODER BOARD	R&R
	0.5		DESTINATION SIGN CONTROL BOARD	R&R
	0.8		PROCESSOR BOARD	R&R
	0.8		DESTINATION SIGN GLASS (On coach)	R&R
	1			R&R
DRIVERS CONTROLS				
ALL	Misc. Times	19	DASH GAUGE	R&R
	0.5		DASH INDICATOR STRIP	R&R
	0.5		DEFROSTER SWITCH	R&R
	0.5		TURN SIGNAL SWITCH	R&R
	0.3		HORN BUTTON	R&R
	0.2		PARKING BRAKE KNOB	R&R
	0.5		DIMMER SWITCH	R&R
	0.5		DASH FAN	R&R
	0.4		DRIVERS SEAT	R&R
	1.5		INTERIOR SPEAKER	R&R
	0.5		ACCELERATOR TREADLE (Complete)	R&R
	1		DRIVERS SEAT BELT	R&R
	0.5		DRIVERS BOOSTER FAN	R&R
	0.4		DOME LIGHT	R&R
	0.5			R&R



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
	0.5		THROTTLE POSITION SENSOR	R&R
NF	3.9	20	WHEELCHAIR RAMP	
	0.8		HYD.PUMP/RESERVOIR ASSEMBLY	R&R
	0.6		MANIFOLD BLOCK	R&R
	0.6		LIFT MECHANISM ASSEMBLY	R&R
	0.5		MICRO SWITCHES/LIMIT SWITCHES	R&R
	1		RAMP PLATE	R&R
	1.5		RAMP ASSEMBLY COMPLETE	R&R
	0.5		DASH SWITCH	R&R
	0.2		RAMP COVER PLATE	R&R
	1.5		DRIVE CHAIN	R&R
ATG	7.8	21	JOINT BELLOWS	
	1		PASSENGER SEATS	R&R
	0.8		HIP BOOT COVER	R&R
	0.7		EXTERIOR BELLOW EXTRUSION (Rubber strip)	R&R
	1		UNDERSIDE HARDWARE & CLOSURE	R&R
	0.8		CABLES	R&R
	3.5		BELLOWS (Front coach, hoop assembly & rear of coach)	R&R
ATG	1	21	FLOOR PLATE ACCESS	
	0.8		JOINT PASSENGER SEATS	R&R
	0.2		FLOOR PLATES (LIFT / SECURE)	ACCESS
ATG	1.7	21	OPEN BELLOWS (underside)	
	0.8		HIP BOOT FLANGE PLATES (2)	R&R
	0.2		BUCKLE STRAPS (underside bellow fasteners)	DISCONNECT



NEW FLYER		MANUAL SECTION		COMPONENT / TASK DESCRIPTION		TASK
VENDOR	TIME	SECTION				
	0.2			RETAINING STRIP		R&R
	0.3			TURNBUCKLE ASSEMBLY		R&R
	0.2			SHOCK CORD ASSEMBLY		DISCONNECT
ATG	4	21		BELLOWS ASSEMBLY - ONE SIDE		
	0.4			HIP BOOT FLANGE (2)		R&R
	0.3			BUCKLE STRAPS		DISCONNECT
	0.3			RETAINING STRIP		R&R
	0.5			TURNBUCKLE ASSEMBLY		DISCONNECT
	0.2			SHOCK CORD ASSEMBLY		DISCONNECT
	0.3			ROOF STRUTT ASSEMBLY		DISCONNECT
	2			BELLOWS SECTION		R&R
S	7.9	21		CENTER HOOP ASSEMBLY (without the center hoop beam)		R&R
	1			HIP BOOT COVER		R&R
	0.8			LOWER HOOP MOUNTING BOLTS		DISCONNECT
	1			REMOVE ENTER SEATS		R&R
	0.8			CABLE TURNBUCKLES		R&R
	0.6			UPPER BEARING,CENTER HOOP		R&R
	1.5			CENTER HOOP		R&R
	0.4			CENTER MOUNTING BRACKET OF ROOF STRUT ASSEMBLY		R&R
	1			HOSE CLAMP ASSEMBLY		R&R
	0.8			OPEN BELLOWS AT UNDERSIDE		OPEN/CLOSE
ATG	3.5	21		WRIST JOINT ASSEMBLY		R&R
	1			OPEN FLOOR PLATES FOR SERVICE		ACCESS
	1.3			OPEN BELLOWS FOR SERVICE		ACCESS
	0.3			BOLT, 20M x80 X 2		R&R
	0.3			BOLT, 5 / 8" X 4 (quantity 8)		R&R



VENDOR		MANUAL SECTION	TIME	COMPONENT / TASK DESCRIPTION	TASK
			0.6	WRIST JOINT	R&R
ATG	3.5	21	3.5	HYDRAULIC CYLINDER ASSEMBLY	R&R
	1			OPEN FLOOR PLATES FOR SERVICE	ACCESS
	1.5			HYDRAULIC SYSTEM, COMPLETE BLEED / FILL / ADJUST	CHK / ADJ.
	0.2			CYLINDER HOSE X 2	DISCONNECT
	0.3			CYLINDER PIN	DISCONNECT
	0.3			CYLINDER YOKE PIN	DISCONNECT
	0.2			CYLINDER	R&R
ATG(HF)	8.8	21	8.8	YOKE PLATE	R&R
	1			OPEN FLOOR PLATES FOR SERVICE	ACCESS
	5.3			CENTER HOOP ASSEMBLY	R&R
	0.3			CYLINDER PIN	DISCONNECT
	0.3			CYLINDER YOKE PIN	DISCONNECT
	0.2			CYLINDER	R&R
	0.5			BOLT, M16 X 8	DISCONNECT
	0.3			BOLT, 20MM X 2	DISCONNECT
	0.3			BOLT, YOKE PLATE 5 / 8" X 6	DISCONNECT
	0.6			WRIST JOINT	R&R
ATG	3.3	21	3.3	HYDRAULIC BLOCK ASSEMBLY	S
	1			OPEN FLOOR PLATES FOR SERVICE	ACCESS
	1.5			HYD. SYSTEM COMPLETE BLEED, FILL, CHECK & ADJUST	CHK. / ADJ.
	0.2			CYLINDER HOSE X 2	DISCONNECT
	0.3			ELECTRICAL HARNESS CONNECTIONS	DISCONNECT
	0.1			PRESSURE GAUGE	DISCONNECT
	0.2			BOLT, M8 X 4	DISCONNECT



VENDOR	TIME	MANUAL SECTION	COMPONENT / TASK DESCRIPTION	TASK
ATG	3	21	ACCUMULATOR ASSEMBLY	R&R
	1		OPEN FLOOR PLATES FOR SERVICE	ACCESS
	1.5		HYDRAULIC SYSTEM, COMPLETE BLEED / FILL / ADJUST	CHK. / ADJ.
	0.1		BLEED SCREW	CHK. / ADJ.
	0.4		ACCUMULATOR ASSEMBLY	R&R

ATG	Misc. times	21	A T G STAND ALONE ITEMS	R&R
	3		HIGH PRESSURE SWITCH	R&R
	0.3		LOW PRESSURE SWITCH	R&R
	1		POSITION SENSOR	R&R
	0.5		HYD. SYSTEM PRESSURE TEST	TEST