PARAVION TECHNOLOGY, INC.
2001 AIRWAY AVENUE
FT. COLLINS, COLORADO 80524

PR-206ER-120M
INSTRUCTIONS FOR CONTINUED AIRWORTHINESS
206ER-100 ENGINE RELIGHT SYSTEM INSTALLATION

BELL MODEL 206A/B AND 206L SERIES HELICOPTERS

Paravion® Technology Inc.

THIS PAGE INTENTIONALLY LEFT BLANK

RECORD OF REVISIONS

REVISION NO.	ISSUE DATE	DATE INSERTED	BY
ORIGINAL	09/25/00		
1	12/20/00		
2	01/31/02		

REVISION CONTROL PROCEDURE

Revisions to this document are mailed to owner of record. Before inserting a change, ensure this manual is correct. Check the existing List of Effective Pages in this manual to ensure that all prior revisions are inserted. **Do not insert this revision if prior revisions are not inserted.**

Paravion® Technology Inc.

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF EFFECTIVE PAGES

PAGE NO.	REVISION	DATE
COVER	2	01/31/02
COVER (BLANK)	0	09/25/00
A	2	01/31/02
B (BLANK)	0	09/25/00
i	2	01/31/02
ii	2	01/31/02
1	1	12/20/00
2	2	01/31/02
3	2	01/31/02
4	2	01/31/02
5	2	01/31/02
6	2	01/31/02
7	2	01/31/02
8	2	01/31/02
9	2	01/31/02
10	2	01/31/02
11	2	01/31/02
12	2	01/31/02
13	2	01/31/02
14	2	01/31/02
A-0	2	01/31/02
A-1	2	01/31/02
A-2	2	01/31/02
A-3	2	01/31/02
A-4	2	01/31/02
A-5	2	01/31/02
A-6	2	01/31/02
A-7	2	01/31/02
A-8	2	01/31/02
B-0	2	01/31/02
B-1	2	01/31/02

Paravion® Technology Inc.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

AIRWORTHINESS LIMITATIONS

The Airworthiness Limitations Section is FAA approved and specifies inspections and other maintenance required under §§ 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

No airworthiness limitation associated with this type design change.

This system has no life-limited components.

REVISION	DATE	APPROVED
0	09/25/00	DTG
2	06/16/03	Roger A. Caldwell

Paravion® Technology Inc.

1.0 DESCRIPTION

The 206ER-100 Engine Relight System is entirely an electrical system that automatically initiates the Ignition Exciter Assembly by sensing a drop in engine RPM in the event of an engine shut down. The Ignition Exciter Assembly is activated when the Power Turbine Tach Generator drops below 96% and is again disabled if the gas producer drops below 55%.

The Engine Relight System has two separate configurations, denoted as the –1 Installation and –2 Installation.

The 206ER-100-1 Installation is intended to be a permanent installation with the Engine Relight Sensor Assembly mounted inside of the instrument console and the control switch and indicator light mounted directly on the instrument panel. This system is comprised of the following:

a. 206ER-300-1 Electrical Installation
b. 206ER-300-2 Electrical Installation

The 206ER-100-2 Installation is designed for easy installation and removal, with the individual components mounted in single box. This box contains the Engine Relight Sensor Assembly, control switch, and indicator light and is mounted on the enter console of the aircraft. This system is comprised of the following:

a. 206ER-350 Electrical Installation (-2 Installation)

System specifications are as follows:

WEIGHT (206ER-100-1): 0.6 Lbs.
WEIGHT (206ER-100-2): 2.8 Lbs.
ELECTRICAL POWERED REQUIRED (-1/-2): 1.80 Amp @ 28 Volts

2.0 INSPECTION AND MAINTENANCE

It is the objective of this inspection and maintenance procedure to ensure that component installations are secure and that the electrical system is airworthy. Table I, TROUBLESHOOTING PROCEDURE, refers to the most likely problems which may be encountered, and outlines the appropriate corrective actions. All loose and/or replaced fasteners should be torqued per the requirements outlined in Appendix A.

2.1 Electrical Installation (206ER-300-1, 206ER-300-2, 206ER-350-1)

2.1.1 Inspect all electrical wiring for insulation damage and chafing. Verify integrity of wiring restraints. Replace cable assemblies as necessary.

2.1.2 Check switch and Ignition Exciter Assembly by placing the switch in the test position and listening for the activation of the Ignition Exciter Assembly.

2.1.3 Verify warning light, press to test for correct operation. (This is for 206ER-300-1 and 206ER-350-1 configurations only)

2.1.4 Bring the aircraft to flight idle (Ground Idle), place the switch in the arm position. The Engine Relight Caution Light should turn on.

3.0 COMPONENT REMOVAL AND REPLACEMENT

3.1 Electrical Component Removal

3.1.1 Insure that the power is off to the Engine Relight Breaker.

3.1.2 Disconnect cable from components.

3.1.3 Disconnect fasteners from component or cable.

3.2 Electrical Component Installation

3.2.1 Insure that the power is off to the Engine Relight Breaker.

3.2.2 Connect cable to component.

3.2.3 Connect fasteners to component or cable.

Paravion® Technology Inc.

TABLE I

TROUBLESHOOTING PROCEDURE		
PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
SYSTEM FAILURE	ARM/ OFF/TEST SWITCH	REMOVE AND REPLACE.
	BREAKER	RESET, OR REMOVE AND REPLACE.
	ENGINE RELIGHT SENSOR	REMOVE AND REPLACE.
	EXCITER ASSEMBLY	SEE APPLICABLE BELL MODEL MAINTENANCE MANUAL.
	IGNITER ASSEMBLY	SEE APPLICABLE BELL MODEL MAINTENANCE MANUAL.
	ENGINE POWER TURBINE TACH GENERATOR FAILURE	SEE APPLICABLE BELL MODEL MAINTENANCE MANUAL.
	BROKEN/CHAFED WIRE, POOR CONNECTION, POOR GROUND	REMOVE AND REPLACE WIRE. CLEAN AND TIGHTEN CONNECTIONS. IMPROVE GROUNDING.
SYSTEM ACTIVATION LIGHT	BULB	REMOVE AND REPLACE.
	SOCKET	REMOVE AND REPLACE.

FIGURES

Paravion® Technology Inc.

THIS PAGE INTENTIONALLY LEFT BLANK

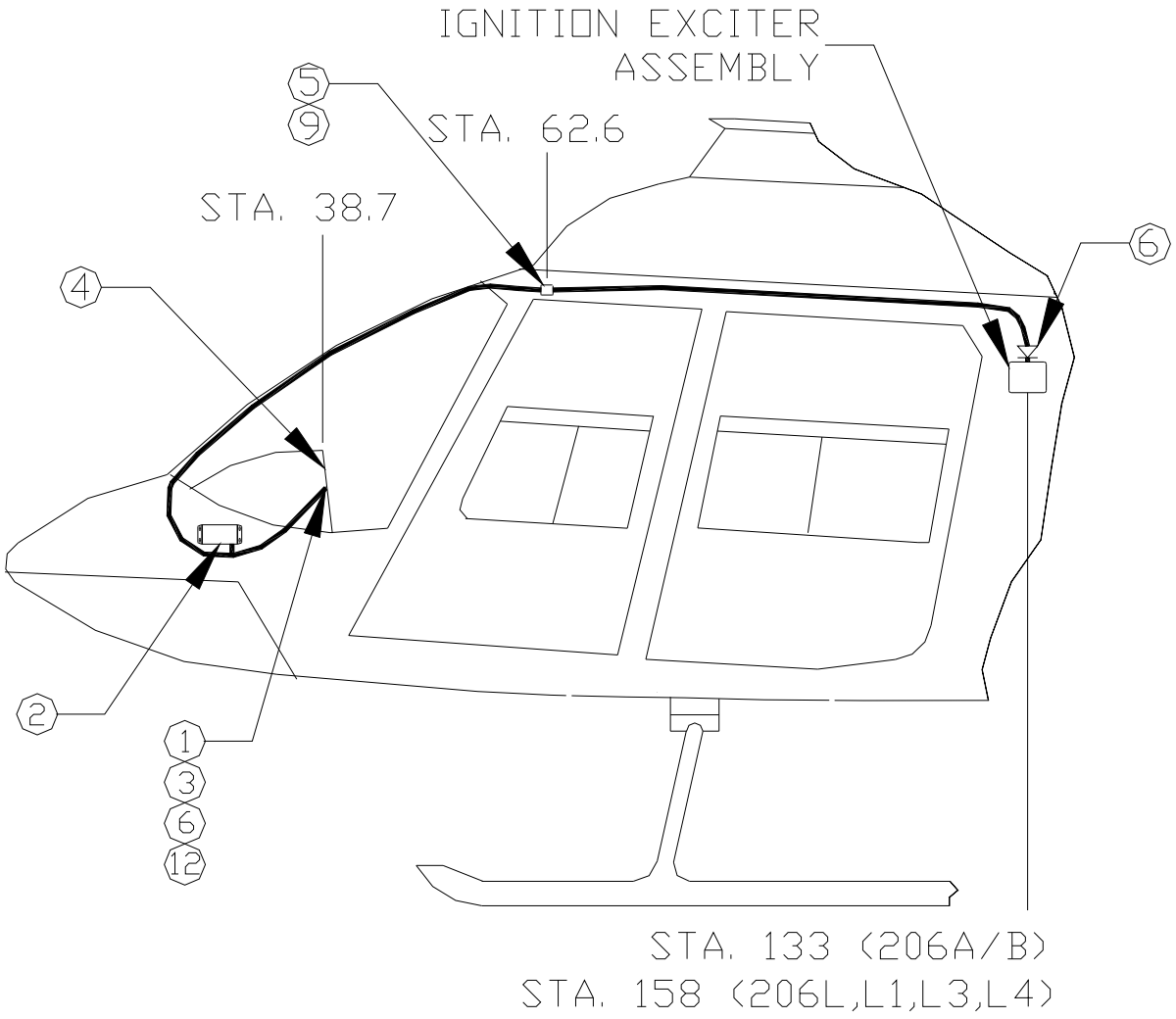

FIGURE 1

206ER-100-1 ENGINE RELIGHT INSTALLATION

Parts List
FOR PAGE 7
(206ER-300-1 Installation)

Paravion® Technology Inc.

ITEM NO	PN	DESCRIPTION	QTY	TYP
1	206ER-3000-1	LIGHT ASSEMBLY	1	EA
2	206ER-3100-1	ENGINE RELIGHT SENSOR ASSEMBLY	1	EA
3	206ER-5000-1	PLACARD	1	EA
5	206ER-5000-3	PLACARD	1	EA
6	ES50190-1	DIODE, 6 AMP, 100V	2	EA
9	MS26574-5	BREAKER (ALT: MS24510-A-5)	1	EA
12	MS35059-31	SWITCH (ALT: MS24524-31)	1	EA

Parts List
FOR PAGE 7
(206ER-300-2 Installation)

Paravion® Technology Inc.

ITEM NO	PN	DESCRIPTION	QTY	TYP
2	206ER-3100-1	ENGINE RELIGHT SENSOR ASSEMBLY	1	EA
3	206ER-5000-1	PLACARD	1	EA
4	206ER-5000-2	PLACARD	1	EA
5	206ER-5000-3	PLACARD	1	EA
6	ES50190-1	DIODE, 6 AMP, 100V	2	EA
9	MS26574-5	BREAKER (ALT: MS24510-A-5)	1	EA
12	MS35059-31	SWITCH (ALT: MS24524-31)	1	EA

Paravion® Technology Inc.

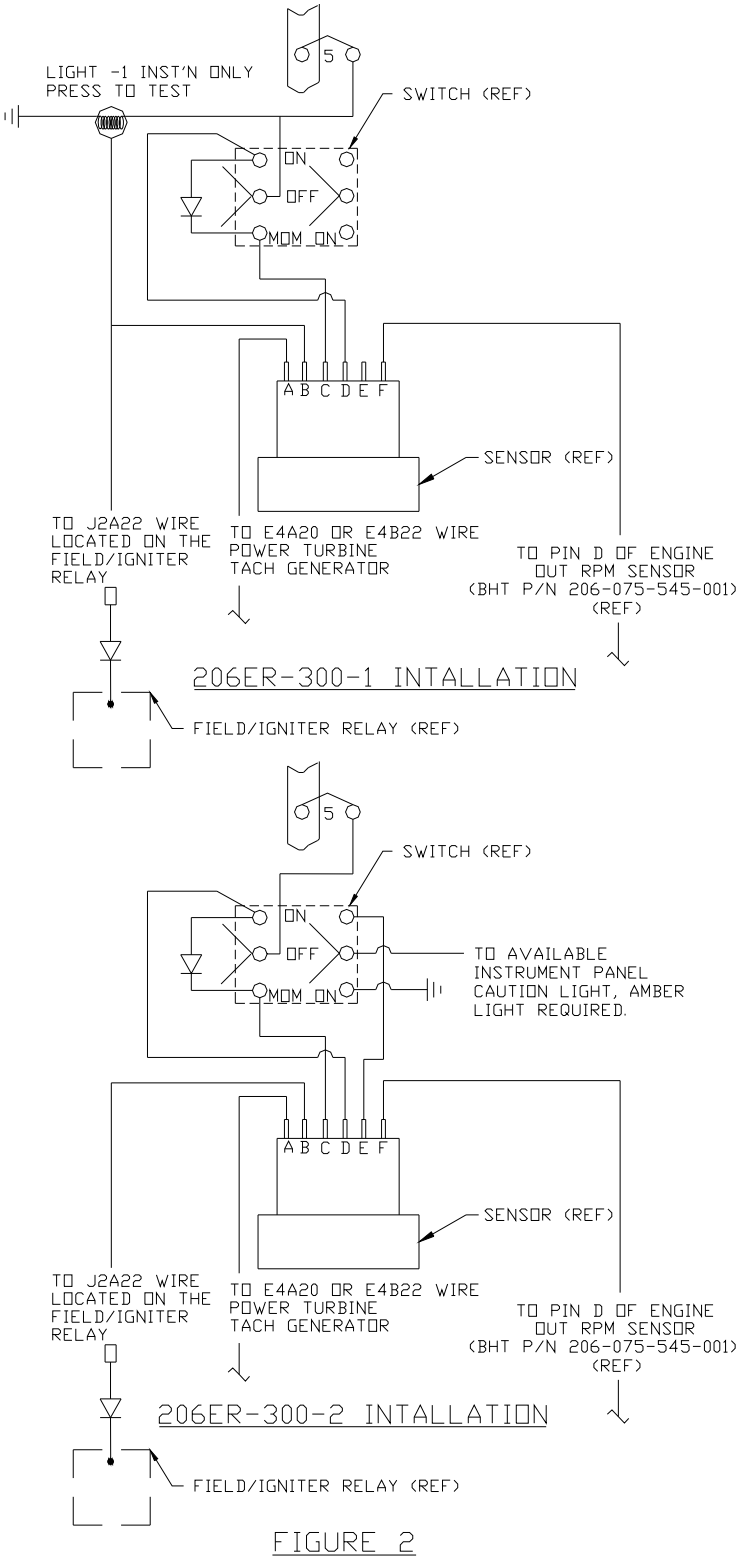

FIGURE 2
ELECTRICAL SCHEMATIC 206ER-300

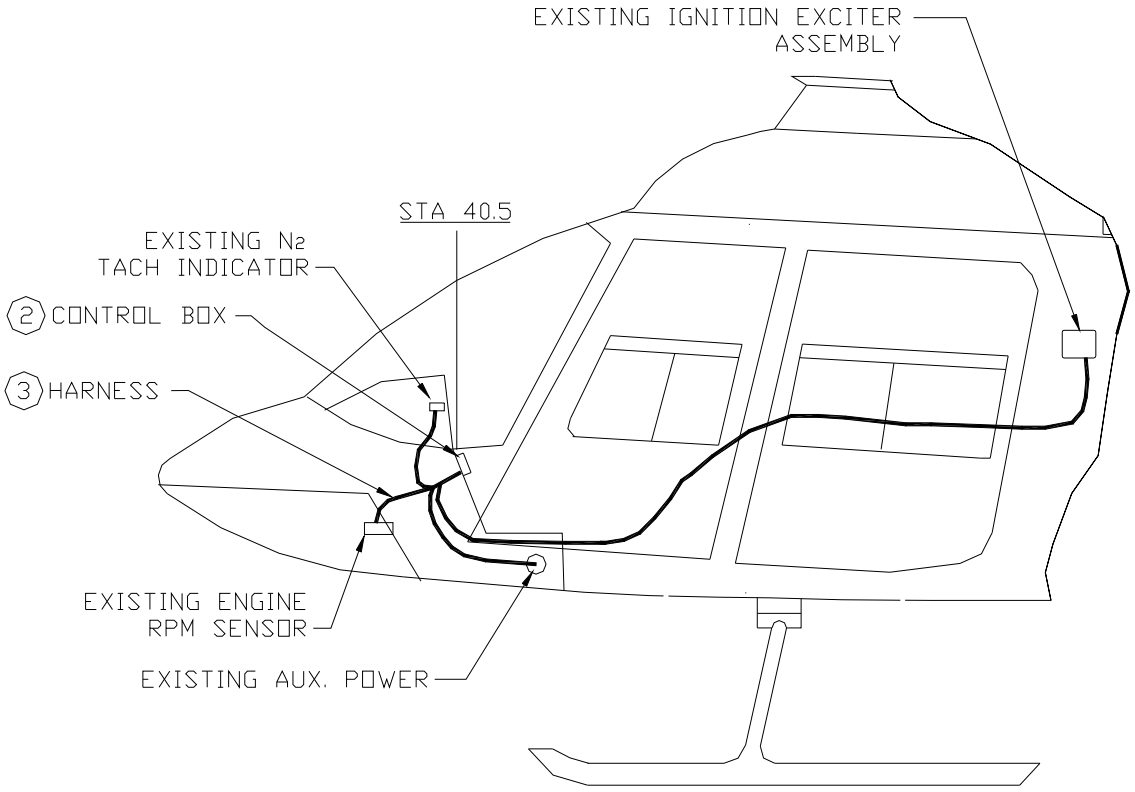

FIGURE 3

206ER-100-2 ENGINE RELIGHT INSTALLATION

Paravion® Technology Inc.

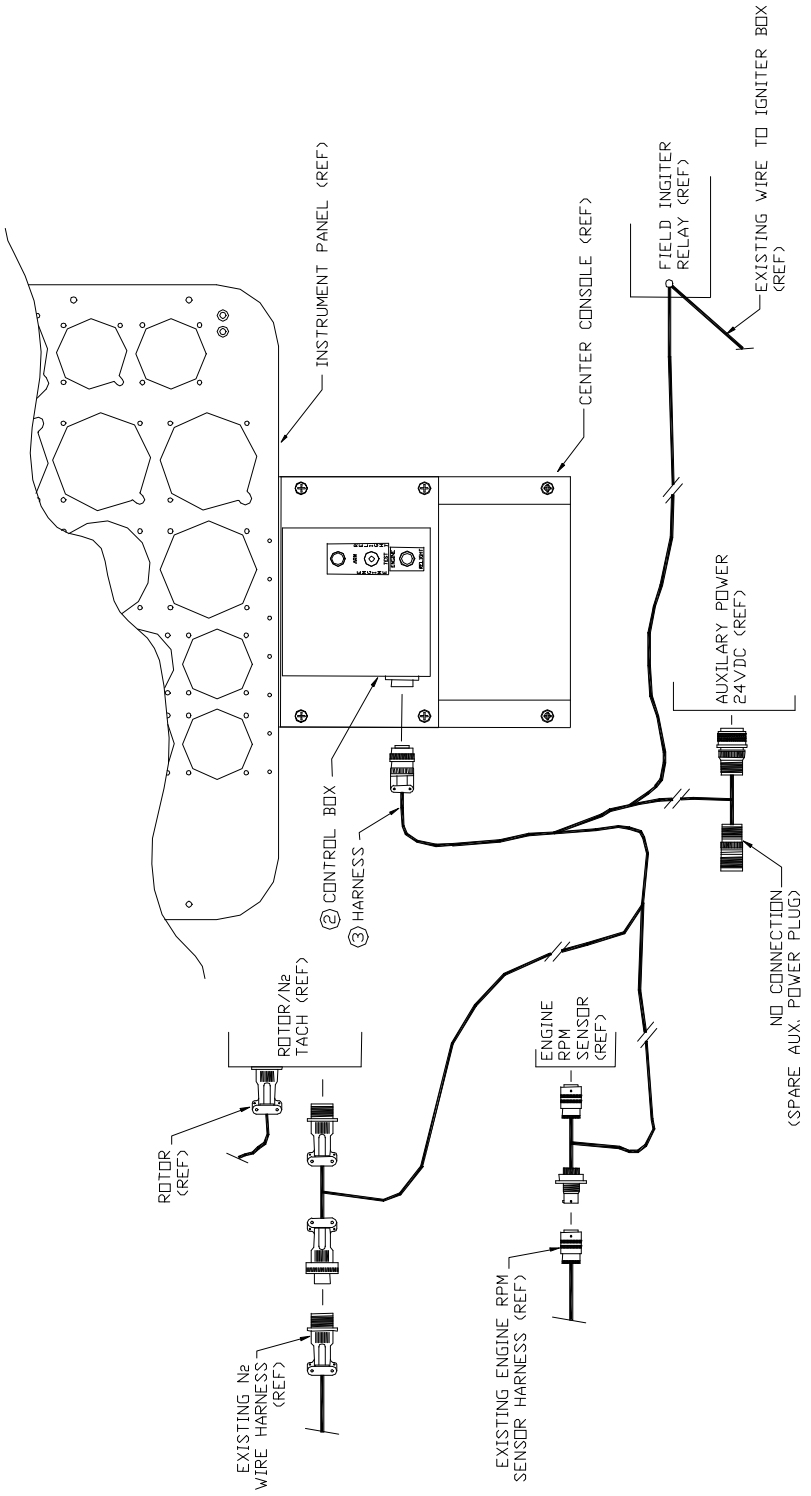

FIGURE 4
206ER-350-1 WIRING HARNESS INSTALLATION

ITEM NO	P/N	DESCRIPTION	QTY	TYP
2	206ER-3500-1	ENGINE RELIGHT CONTROL ASSEMBLY	1	EA
3	206ER-3600-1	WIRING HARNESS ASSEMBLY	1	EA

Paravion® Technology Inc.

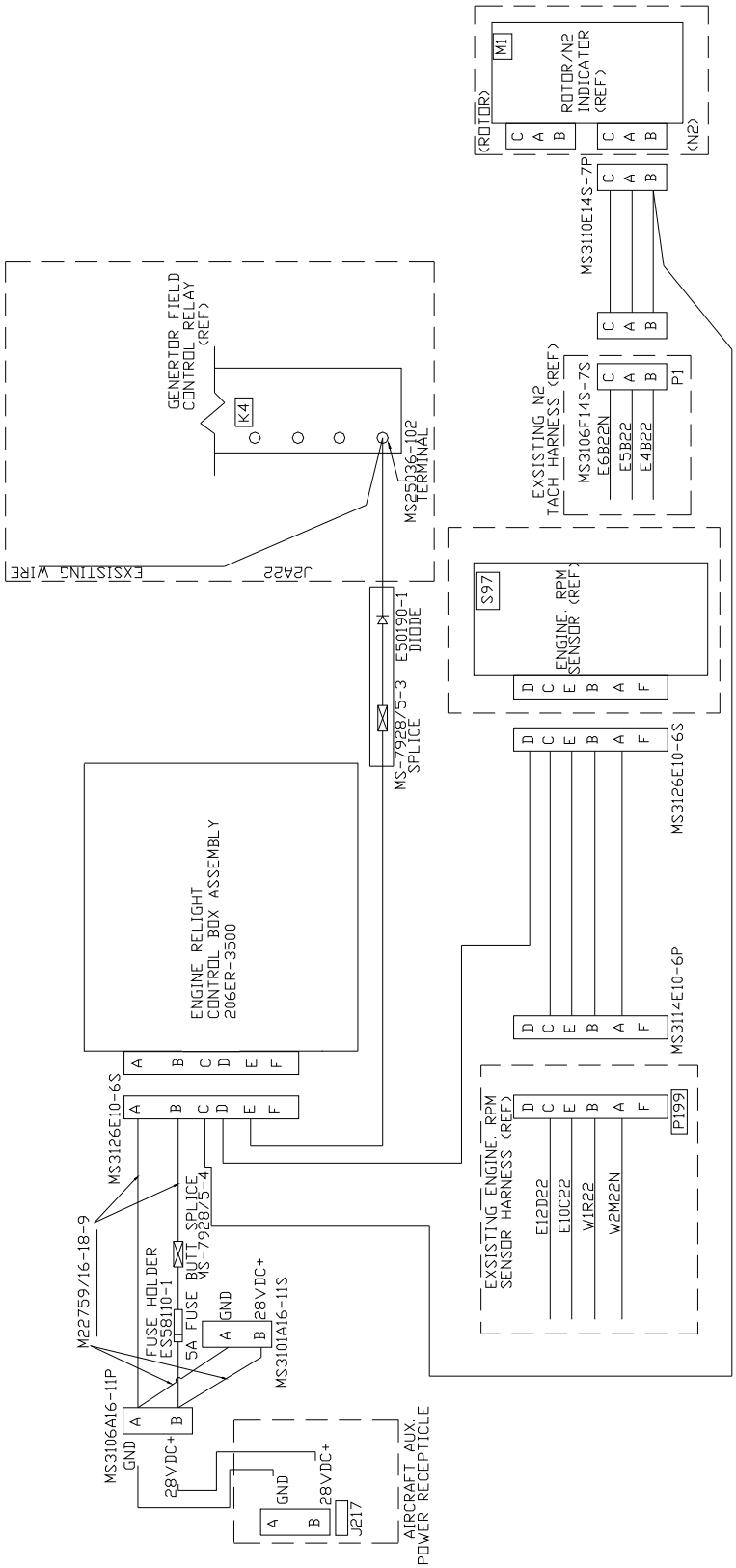

FIGURE 5
206ER-350-1 WIRING DIAGRAM

APPENDIX A

STANDARD TORQUE VALUE CHART

Appendix A

Paravion® Technology Inc.

STANDARD TORQUE VALUE CHART (DRY)			
BOLT	NUT	BOLT DIAMETER/ THREAD SIZE	RECOMMENDED INSTALLATION TORQUE RANGE
AN3 thru AN20	AN316	10 – 32	12 to 15 in. – lb.
AN42 thru AN49	AN320		
AN173 thru AN186	AN341	1/4 - 28	30 to 40 in. – lb.
AN509	AN345		
AN525	AN364	5/16 – 24	60 to 85 in. – lb.
	AN150401		
MS20004 thru MS20024	thru	3/8 – 24	95 to 110 in. – lb.
MS20033 thru MS20046	AN150425		
MS20073 thru MS20081		7/16 – 20	270 to 300 in. – lb.
MS24694	MS20341		
MS27039	MS20364	1/2 - 20	24 to 34 ft. – lb.
	MS21083		
NAS144 thru NAS158	MS25082	9/16 - 18	40 to 50 ft. – lb.
NAS220 thru NAS227	MS35650		
NAS333 thru NAS340	MS35691	5/8 – 18	55 to 65 ft. – lb.
NAS464	MS51968		
NAS517	NAS1022	3/4 - 16	108 to 125 ft. – lb.
NAS583 thru NAS590			
NAS623		7/8 –14	125 to 150 ft. – lb.
NAS1003 thru NAS1020			
NAS1202 thru NAS1210		1 – 12	183 to 275 ft. – lb.
NAS1218			
NAS1297		1 1/8 – 12	250 to 350 ft. – lb.
NAS1303 thru NAS1320			
NAS1351 (Non-Locking)		1 1/4 - 12	450 to 550 ft. – lb.
NAS1352 (Non-Locking)			
ALL THREADED STUDS			

*NOTE: The above values apply to any combination of bolt and nut shown unless otherwise specified.

STANDARD TORQUE VALUE CHART (DRY)			
BOLT	NUT	BOLT DIAMETER/ THREAD SIZE	RECOMMENDED INSTALLATION TORQUE RANGE
AN3 thru AN20	AN316	10 – 32	20 to 25 in. – lb.
AN42 thru AN49	AN320		
AN173 thru AN186	AN341	1/4 - 28	50 to 70 in. – lb.
AN509	AN345		
AN525	AN364	5/16 – 24	100 to 140 in. – lb.
	AN150401		
MS20033 thru MS20046	thru	3/8 – 24	160 to 190 in. – lb.
MS20073 thru MS20081	AN150425		
MS24694		7/16 – 20	37 to 42 ft. – lb.
MS27039	MS20341		
	MS20364	1/2 - 20	40 to 58 ft. – lb.
NAS220 thru NAS227	MS21083		
NAS333 thru NAS340	MS25082	9/16 - 18	66 to 83 ft. – lb.
NAS464	MS35650		
NAS517	MS35691	5/8 – 18	91 to 108 ft. – lb.
NAS623	MS51968		
NAS1003 thru NAS1020	NAS1022	3/4 - 16	191 to 208 ft. – lb.
NAS1202 thru NAS1210			
NAS1297		7/8 –14	208 to 250 ft. – lb.
NAS1352 (Non-Locking)			
		1 – 12	308 to 458 ft. – lb.
ALL THREADED STUDS			
		1 1/8 – 12	416 to 583 ft. – lb.
		1 1/4 - 12	750 to 916 ft. – lb.

*NOTE: The above values apply to any combination of bolt and nut shown unless otherwise specified.

STANDARD TORQUE VALUE CHART (DRY)			
BOLT	NUT	BOLT DIAMETER/ THREAD SIZE	RECOMMENDED INSTALLATION TORQUE RANGE
MS20004 thru MS20024	AN256 80-004	10 – 32	20 to 25 in. – lb.
	AN310 thru		
NAS144 thru NAS158	AN315 80-007	1/4 - 28	50 to 70 in. – lb.
NAS583 thru NAS590	AN362 80-013		
NAS1218	AN363 90-002	5/16 – 24	100 to 140 in. – lb.
NAS1303 thru NAS1320	AN365 90-003		
NAS1351 (Non-Locking)	AN366 110-061	3/8 – 24	160 to 190 in. – lb.
NAS6203 thru NAS6220	AN121576 110-062		
NAS6303 thru NAS6320	thru	7/16 – 20	37 to 42 ft. – lb.
NAS6603 thru NAS6620	AN121600		
20-057		1/2 - 20	40 to 58 ft. – lb.
MS20341	MS9358		
MS20364	MS14144	9/16 - 18	66 to 83 ft. – lb.
MS21083	MS141445		
MS25082	MS20365	5/8 – 18	91 to 108 ft. – lb.
MS35650	MS20500		
MS35691	MS21042 thru MS21045	3/4 - 16	191 to 208 ft. – lb.
MS51968	MS21047 thru MS21049		
NAS1022	MS21051 thru MS21056	7/8 –14	208 to 250 ft. – lb.
	MS21058 thru MS21062		
	MS21069 thru MS21076	1 – 12	308 to 458 ft. – lb.
	MS21083		
	MS21086	1 1/8 – 12	416 to 583 ft. – lb.
	MS21208		
	MS21209	1 1/4 - 12	750 to 916 ft. – lb.
	MS21991		
	MS124651 thru MS124850		
	MS17825		
	MS17826		
	NAS509		
	NAS671		
	NAS679 thru NAS687		
	NAS696 thru NAS698		
	NAS1021 thru NAS1023		
	NAS1031		
	NAS1033		
	NAS1067		
	NAS1068		
	NAS1291		
	NAS1329		
	NAS1330		
	NAS1473		
	NAS1474		

*NOTE: The above values apply to any combination of bolt and nut shown unless otherwise specified.

STANDARD TORQUE VALUE CHART (DRY)			
BOLT	NUT	BOLT DIAMETER/ THREAD SIZE	RECOMMENDED INSTALLATION TORQUE RANGE
MS20004 thru MS20024	MS21042	10 – 32	35 to 40 in. – lb.
NAS144 thru NAS158	NAS577	1/4 - 28	75 to 95 in. – lb.
NAS583 thru NAS590	NAS1291		
NAS1218		5/16 – 24	120 to 160 in. – lb.
NAS1303 thru NAS1320			
NAS1351 (Non-Locking)		3/8 – 24	25 to 28 ft. – lb.
NAS6203 thru NAS6220			
NAS6303 thru NAS6320		7/16 – 20	39 to 43 ft. – lb.
NAS6603 thru NAS6620			
		1/2 - 20	53 to 71 ft. – lb.
		9/16 - 18	83 to 100 ft. – lb.
		5/8 – 18	116 to 133 ft. – lb.
		3/4 - 16	200 to 216 ft. – lb.
		7/8 –14	333 to 375 ft. – lb.
		1 – 12	433 to 583 ft. – lb.
		1 1/8 – 12	691 to 858 ft. – lb.
		1 1/4 - 12	1441 to 1608 ft. – lb.

*NOTE: The above values apply to any combination of bolt and nut shown unless otherwise specified.

STANDARD TORQUE VALUE CHART (DRY)			
	BOLTS		
	AN3 thru AN20 AN42 thru AN49 AN173 thru AN186	NAS144 thru NAS158 NAS333 thru NAS340 NAS464 NAS 1003 thru NAS1020	NAS1202 thru NAS1210 NAS1297 NAS1303 thru NAS1320
	NUT		
	MS17826 NUT (THIN)		MS17825 NUT
THREAD SIZE	RECOMMENDED INSTALLATION TORQUE RANGE		RECOMMENDED INSTALLATION TORQUE RANGE
10 – 32	7 to 12 in. – lb.		12 to 15 in. – lb.
1/4 - 28	25 to 35 in. – lb.		30 to 40 in. – lb.
5/16 – 24	50 to 70 in. – lb.		60 to 85 in. – lb.
3/8 – 24	70 to 90 in. – lb.		95 to 110 in. – lb.
7/16 – 20	110 to 150 in. – lb.		270 to 300 in. – lb.
1/2 - 20	150 to 200 in. – lb.		24 to 34 ft. – lb.
9/16 - 18	200 to 300 in. – lb.		40 to 50 ft. – lb.
5/8 – 18	300 to 420 in. – lb.		55 to 65 ft. – lb.
3/4 - 16	45 to 62 ft. – lb.		108 to 125 ft. – lb.
7/8 –14	79 to 96 ft. – lb.		125 to 150 ft. – lb.
1 – 12	125 to 150 ft. – lb.		183 to 275 ft. – lb.
1 1/8 – 12	208 to 292 ft. – lb.		250 to 350 ft. – lb.
1 1/4 - 12	292 to 375 ft. – lb.		450 to 550 ft. – lb.

*NOTE: The above values apply to any combination of bolt and nut shown unless otherwise specified.

TUBE SIZE	AL. TUBING FLARE (MS33583 OR MS33584)	STEEL TUBING FLARE (MS33584)	HOSE END FITTINGS AND HOSE ASSY. (MS28740 OR MS28759)	NAS591 THRU NAS596		
				DASH NO.	STEEL TUBING	AL. TUBING
3/16	30 to 45 in. – lb.	90 to 100 in. – lb.	70 to 100 in. – lb.			
1/4	40 to 65 in. – lb.	135 to 150 in. – lb.	70 to 120 in. – lb.	4	60 to 96 in. – lb.	48 to 96 in. – lb.
5/16	60 to 80 in. – lb.	180 to 200 in. – lb.	85 to 180 in. – lb.	5	66 to 108 in. – lb.	60 to 108 in. – lb.
3/8	75 to 125 in. – lb.	270 to 300 in. – lb.	100 to 250 in. – lb.	6	72 to 120 in. – lb.	72 to 120 in. – lb.
1/2	150 to 250 in. – lb.	450 to 500 in. – lb.	210 to 420 in. – lb.	8	144 to 232 in. – lb.	120 to 216 in. – lb.
5/8	200 to 350 in. – lb.	54 to 58 ft. – lb.	300 to 480 in. – lb.	10	204 to 360 in. – lb.	144 to 360 in. – lb.
3/4	300 to 500 in. – lb.	75 to 83 ft. – lb.	54 to 58 ft. – lb.	12	300 to 540 in. – lb.	216 to 540 in. – lb.
1	41 to 58 ft. – lb.	100 to 116 ft. – lb.	41 to 70 ft. – lb.	16	42 to 58 ft. – lb.	480 to 696 in. – lb.
1 1/4	50 to 75 ft. – lb.		58 to 95 ft. – lb.	20	50 to 75 ft. – lb.	50 to 75 ft. – lb.
1 1/2	50 to 75 ft. – lb.			24	50 to 75 ft. – lb.	50 to 75 ft. – lb.
1 3/4				28	60 to 90 ft. – lb.	62 to 90 ft. – lb.
2				32	75 to 110 ft. – lb.	75 to 110 ft. – lb.
2 1/2				40	150 to 175 ft. – lb.	110 to 150 ft. – lb.
3				48	150 to 175 ft. – lb.	
4				64	200 to 225 ft. – lb.	

NOTE: Flareless tubing connections shall be tightened as follows:
Tighten the MS21921 nut 1/6 to 1/3 turn (1 to 2 flats) past point of sharp torque. Rise on all sizes and materials. The 1/6 to 1/3 turn (performed after the presetting operation) is the final installation torque.

STEPPED THREADED STUDS					STRAIGHT THREADED STUDS			
Types A and B are driven from nut end.					Types X and Y are driven from nut end.			
		Type A	Type B				Type X	Type Y
Stud Size		Torque Value Pound - Inches			Stud Size		Torque Value Pound - Inches	
Nut End*	Stud End				Nut End*	Stud End		
10 – 92	1/4 – 20	30 – 40	30 – 40		10 – 92	10 -24		30 – 40
1/4 – 28	5/16 – 18	50 – 110	50 – 80		1/4 – 28	1/4 – 20	50 – 95	50 – 70
5/16 – 24	3/8 – 16	100 – 240	100 – 160		5/16 – 24	5/16 – 18	100 – 225	100 – 130
3/8 – 24	7/16 – 14	175 – 475	175 – 325		3/8 – 24	3/8 – 16	175 – 375	175 – 250
9/16 – 20	1/2 – 13	250 – 725	250 – 525		9/16 – 20	7/16 – 14	250 – 650	250 – 400
1/2 – 20	9/16 – 12	400 – 1150	400 – 850		1/2 – 20	1/2 – 13	400 - 1000	400 – 700
9/16 - 18	5/8 – 11	600 - 1150	600 – 1150		9/16 - 18	9/16 – 12	600 – 1450	500 – 1050
5/8 – 18	11/16 – 11	900 – 2400	900 – 1700		5/8 – 18	5/8 – 11	900 – 2000	700 – 1400

* For nut torque, refer to applicable chart for type of nut used.

SHEAR		
PIN		
100 – 076	100 - 085	100-090
NUT		
MS21042	H541L	NAS1291
Thread Size	Recommended	
	Inch – Pounds	Newton - Meters
8 – 32	15 – 25	1.7 – 2.8
10 – 32	25 – 35	2.9 – 3.9
1/4 – 28	60 – 80	6.8 – 9.0
5/16 – 24	130 – 60	15 – 18
3/8 – 24	200 – 240	23 – 27
7/16 – 20	270 – 330	31 – 37
1/2 – 20	370 – 430	42 – 48

NOTE: The above values apply to any combination of pin and nut shown.

TENSION			
PIN			
100 – 047	100 - 048	100-049	100-059
NUT			
MS21042	H541L		NAS1291
Thread Size	Recommended		
	Inch – Pounds		Newton - Meters
8 – 32	30 – 40		3.4 – 4.5
10 – 32	40 – 50		4.6 – 5.6
1/4 – 28	115 – 130		13 – 14
5/16 – 24	200 – 250		23 – 28
3/8 – 24	360 – 420		41 - 47
	Foot – Pounds		Newton - Meters
7/16 – 20	44 – 56		60 – 75
1/2 – 20	61 – 83		83 – 112

NOTE: The above values apply to any combination of pin and nut shown.

Paravion® Technology Inc.

APPENDIX B

ANNUAL/100 HOUR INSPECTION CHECKLIST

ANNUAL/100 HOUR INSPECTION CHECKLIST

Inspection	Comment	Initials
Verify system operation by placing the switch in the test position and listening for activation of the Ignition Exciter Assembly.		
Verify system operation by Arming the system when the aircraft is at flight idle (Ground Idle). Caution light should activate.		
See the applicable Bell Model Maintenance Manual for Instructions to verify operation of the EXCITER ASSEMBLY and the IGNITER ASSEMBLY.		
Verify that the warning light activates and press to test function works.		