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**PR-206ER-900M
Engine Relight System
Installation Instructions
for
Bell Model 206 Series Helicopters**

REVISION HISTORY

Revision	Date	Detail of Changes	By
N/C	10/06/2000	Original	MR
A	02/11/2002	Added 206ER-100-2	GP
B	08/31/2020	Reformatted, added weight and balance, electrical load information. Expanded installation instructions, troubleshooting table, torque tables.	LS

Revision Control Procedure

Current revisions to this document are available at www.paravion.com. Before using, ensure this manual is current. **Do not use this manual if later approved revisions are available.**

LIST OF EFFECTIVE PAGES

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Cover	B	08/31/2020	3	B	08/31/2020
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1 INTRODUCTION

This document provides a step-by-step procedure for installation of the Paravion Technology Inc. 206ER-100-(X) Engine Relight System Installation on Bell 206 Series Helicopters. The instructions contained herein are intended to supplement the information contained on the installation drawings.

1.1 SYSTEM DESCRIPTION

The 206ER-100 Engine Relight System has two separate configurations, denoted as the 206ER-100-1 Installation and 206ER-100-2 Installation. The 206ER-100-1 Installation electrical system is permanently installed and powered from a 5 Amp Circuit Breaker labeled "ENGINE RELIGHT" located in the overhead panel, and through a switch located on the instrument panel.

The 206ER-100-2 Installation is designed for easy installation and removal, with the same electrical components, 5amp circuit breaker, control switch, and enunciator light mounted in a single control box located on the center avionics pedestal. Placards, markings and function are similar for the 206ER-100-1 and 206ER-100-2 Installations.

The engine relight system is armed when the toggle switch is moved to the ARM position. When in this position, the system will automatically engage the generator field/igniter relay if the Power Turbine RPM (N2) tachometer generator drops to or below 96%. By engaging the field/igniter relay, power is supplied to the engine igniter assembly to attempt an engine relight. The engine relight system will automatically disengage should the Gas Producer RPM (N1) drop below 55%.

When the engine relight system is activated, an amber annunciator light labeled ENGINE RELIGHT will illuminate indicating that it has been energized. This annunciator light is located directly above the engine relight activation switch or in an available location on the existing caution light panel. Note: annunciator lights located directly above the engine relight activation switch have dimming capability by physically turning the outer lens-retaining ring.

1.2 AREAS OF ACCESS

Per manufacturer's maintenance manuals and referencing Paravion Technology Inc. installation drawings, remove or gain access to the following:

- A. Disconnect external power sources, disconnect and remove battery.
- B. Gain access to cockpit overhead circuit breaker panel and main D.C. bus as applicable.
- C. Remove instrument panel shroud and pedestal support inspection panels at the intended sensor installation area.

1.3 SAFETY PRECAUTIONS

When working with electrical systems, follow safety precautions outlined in chapter 2 of the BHT standard practices manual, BHT-ELEC-SPM.

1.4 TOOLS, EQUIPMENT AND CONSUMABLES

Installation of an engine relight system requires the use of standard shop hand tools and the following special tools.

1.4.1 TOOLS

1. Multimeter for installation and troubleshooting.
2. Soldering equipment for connections per MIL-S-45743.
3. Ring terminal crimping tools.
4. Connector contact crimping tools.

1.4.2 CONSUMABLES

1. Solder per MIL-S-45743
2. Lacing cord or nylon zip-ties for securing wires.

2 COMPONENT INSTALLATION

It is the objective of this procedure to ensure ease of component/system installation.

- A. Reference drawing 206ER-300, locate and install sensor assembly using indicated hardware.
- B. Determine if an amber caution light location is available in the instrument panel annunciator array and install the placard per drawing.

NOTE: If no annunciator array location is available, install switch and light on instrument panel per drawing.

- C. Drill indicated holes for switch and/or light as applicable per drawing notes.
- D. Trim placard to size if required and install with component(s) in instrument panel per drawing.
- E. Route wiring from 24VDC bus to components and terminate per drawing.
- F. Install removed equipment, panels and furnishings after system test as detailed in [Section X](#).

2.1 TROUBLESHOOTING PROCEDURES

There may be a time when the system does not operate and/or perform in accordance with information contained herein. To assist in diagnosis a troubleshooting table is provided.

Table 1 - Troubleshooting Procedures

INDICATION	PROBABLE CAUSE	POSSIBLE SOLUTION
A. No system power	<ol style="list-style-type: none"> 1. Ground power not connected 2. Aircraft power switch off. 	<ol style="list-style-type: none"> 1. Plug in ground power cart 2. Energize power switch
B. Power on but system will not operate	<ol style="list-style-type: none"> 1. Engine relight circ.brkr. off 2. Engine relight circ.brkr. failed 3. Engine relight switch failed 4. Open circuit in wiring 5. Sensor assembly defective 	<ol style="list-style-type: none"> 1. Energize engine relight circ.brkr. 2. Replace engine relight circ.brkr. 3. Replace switch 4. Correct wiring open 5. Replace sensor assembly*
C. System energizes above 96% N2	<ol style="list-style-type: none"> 1. Poor tach generator signal 2. Sensor assembly defective 	<ol style="list-style-type: none"> 1. Repair wiring or replace tach generator. 2. Replace sensor assembly*
D. System energized below 55% N1 or on all the time.	<ol style="list-style-type: none"> 1. Sensor assembly defective 	<ol style="list-style-type: none"> 1. Replace sensor assembly*
E. Caution light does not illuminate	<ol style="list-style-type: none"> 1. Light bulb burned out 2. Open circuit in wiring 3. Sensor assembly defective 	<ol style="list-style-type: none"> 1. Replace light bulb 2. Correct wiring open 3. Replace sensor assembly*

*Return sensor assembly to Paravion Technology Inc. for testing and evaluation.

Contact Paravion Technology Inc. for any replacement parts needed.

3 WEIGHT AND BALANCE

The total weight of the 206ER-100-1 Engine Relight Installation is 0.6 lbs. The total weight of the 206ER-100-2 Engine Relight Installation is 2.8 lbs. Fuselage station location of either installation is determined by the installer.

- This data is generally applicable. Due to normal variation of actual components weight(s) and location(s) which vary when equipment is installed, actual aircraft weight and center-of-gravity must be verified by weighing after system installation. Refer to the appropriate aircraft manufacturer’s information/maintenance manual as applicable.

3.1 ELECTRICAL CIRCUITS & WIRING

Refer to BHT-ELEC-SPM for acceptable practices during electrical installation procedures. Follow existing wire routing when possible.

3.1.1 ELECTRICAL LOAD

The 206ER-100 -1/-2 systems draw a maximum of 1.80amp @ 28VDC.

4 SYSTEM SERVICING

4.1 SYSTEM TEST

Perform a system test as follows;

With aircraft power on and prior to starting the engine, test the Paravion Engine Relight System by moving the Engine Relight toggle switch to the TEST position. The engine relight annunciator should illuminate, and the operator should be able to audibly verify that the exciter assembly and igniter has activated. Turn the engine relight system toggle switch to the ARM position, the system should not activate. If it does activate, the system is in a continuous ON mode with exciter assembly and igniter continuously operating. Turn system OFF and do not ARM until the problem is identified and repairs are made. Follow the operating procedures in PR-206ER-120M flight manual supplement and ground run the helicopter, verify correct operation. After test, verify that the ENGINE RELIGHT circuit breaker has not tripped. Turn the Engine Relight System OFF. If system does not test properly, do not operate helicopter in falling or blowing snow. Disable system until repairs are complete.

Refer to Table 1 - Troubleshooting Procedures, if any system malfunctions occur.

5 TORQUE VALUES

Table 2 - Torque Values (in-lbs)

CAUTION THE FOLLOWING TORQUE VALUES ARE DERIVED FROM OIL FREE CADMIUM PLATED THREADS.					
		TORQUE LIMITS RECOMMENDED FOR INSTALLATION (BOLTS LOADED PRIMARILY IN SHEAR)		MAXIMUM ALLOWABLE TIGHTENING TORQUE LIMITS	
Thread Size	Tension type nuts MS20365 and AN310 (40,000 psi in bolts)	Shear type nuts MS20364 and AN320 (24,000 psi in bolts)	Nuts MS20365 and AN310 (90,000 psi in bolts)	Nuts MS20364 and AN320 (54,000 psi in bolts)	
FINE THREAD SERIES					
8-36	12-15	7-9	20	12	
10-32	20-25	12-15	40	25	
1/4-28	50-70	30-40	100	60	
5/16-24	100-140	60-85	225	140	
3/8-24	160-190	95-110	390	240	
7/16-20	450-500	270-300	840	500	
1/2-20	480-690	290-410	1100	660	
9/16-18	800-1000	480-600	1600	960	
5/8-18	1100-1300	600-780	2400	1400	
3/4-16	2300-2500	1300-1500	5000	3000	
7/8-14	2500-3000	1500-1800	7000	4200	
1-14	3700-5500	2200-3300*	10,000	6000	
1-1/8-12	5000-7000	3000-4200*	15,000	9000	
1-1/4-12	9000-11,000	5400-6600*	25,000	15,000	
COARSE THREAD SERIES					
8-32	12-15	7-9	20	12	
10-24	20-25	12-15	35	21	
1/4-20	40-50	25-30	75	45	
5/16-18	80-90	48-55	160	100	
3/8-16	160-185	95-100	275	170	
7/16-14	235-255	140-155	475	280	
1/2-13	400-480	240-290	880	520	
9/16-12	500-700	300-420	1100	650	
5/8-11	700-900	420-540	1500	900	
3/4-10	1150-1600	700-950	2500	1500	
7/8-9	2200-3000	1300-1800	4600	2700	
<p>The above torque values may be used for all cadmium-plated steel nuts of the fine or coarse thread series which have approximately equal number of threads and equal face bearing areas. * Estimated corresponding values.</p>					

Table 3 - Screw Torque Values

SCREW SIZE (IN.)	SCREW TORQUE (IN.-LB.)	
	Low Carbon Steel	Plated Brass
#4-40	4.7	4.3
#6-32	8.7	7.9

6 REFERENCES

AC43.13-1B Table 7-1 Recommended Torque Values

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The following Paravion Technology Inc. documents:

PR-206AC-910M Installation Instructions

PR-206ER-100M Flight Manual Supplement

The following Paravion Technology Inc. Installation Drawings:

206ER-100 System Configuration

206ER-300 Electrical Installation

206ER-350 Electrical Installation

Bell Helicopter Model 206A/B Series Maintenance Manuals

Bell Helicopter BHT-ALL-SPM Standard Practices Manual

Bell Helicopter BHT-ELEC-SPM Electrical Standard Practices Manual