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PR-206SC-120M

**Engine Start Counter System
Instructions for Continued Airworthiness**

Bell Model 206 Series Helicopters

REVISION HISTORY

Revision	Date	Detail of Changes	By
0	03/11/2003	Original	R.E.B.
1	6/25/2013	Full Revision	L.S.
2	7/1/2013	Incorporated FAA AEG comments	DGW

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.**

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These Instructions for Continued Airworthiness (ICA) except for the Airworthiness Limitations Section have been reviewed and found to comply with the applicable requirements of the Federal Aviation Regulations Part 27.

FAA Acceptance _____

Date _____

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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
Original	03/11/2003	David Grossman
2	07/05/2013	S. Lall

1 SYSTEM DESCRIPTION

1.1 ENGINE START COUNTER INSTALLATION: GENERAL

The 206SC-100 Start Counter System is mounted to the top panel of the baggage compartment and is wired to the existing Generator Field Control Relay, located on the equipment shelf above the baggage compartment. The Generator Field Control Relay is an electrically operated switch, which opens the starter-generator shunt field when the generator is used as a starter, simultaneously completing the igniter circuit. The counter readout is increased by one digit each time the starter motor is operated when the Igniter Circuit Breaker is energized. Thus, the number of times the engine is started is recorded. The record of engine starts can be viewed by opening the baggage compartment door and looking up, at the top of the compartment.

System specifications are as follows:

WEIGHT: P/N 206SC-2000-1 Start Counter Assembly: 0.5 lb.

Fuselage Station: 138 inches (206A/B) 165 inches (206 L-Series)

REQUIRED ELECTRICAL POWER: 1.5W (0.06-amp @ 24 Volts)

1.2 ENGINE START COUNTER: COMPONENTS

The 206SC-100 Start Counter System installation is comprised of a Start Counter Assembly consisting of an electromechanical counter, a fuse and associated wiring.

2 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. See the Troubleshooting Procedures table in this document for most likely problems which may be encountered, as it outlines the appropriate corrective actions. In the event of a damaged or malfunctioning counter, the counter must be returned to Paravion Technology Inc. for repair or replacement.

2.1 SAFETY PRECAUTIONS

Precautionary measures include but are not limited to disconnection the aircraft battery and/or an external power source before working on the system. Aircraft manufacturer's safety instructions and precautions must be observed to prevent damage to components and related systems.

2.2 SYSTEM SERVICING:

There no servicing recommendations for this system.

2.3 TOOLS, EQUIPMENT AND CONSUMABLES

Servicing of an Engine Start Counter system requires the use of certain special Tools.

2.3.1 TOOLS

1. A multi meter that reads in 28VDC, resistance and continuity functions.
2. Consumables: None are required for this system

2.4 RECOMMENDED INSPECTION & TROUBLESHOOTING PROCEDURES

It is the objective of this inspection and troubleshooting procedure to ensure that component installations are secure and that the electrical system is airworthy. The start counter should be inspected every 300 hours or annually, see Table 3.

Inspection of Start Counter Installation

Refer to the appropriate Bell Helicopter Textron (BHT) maintenance manual per helicopter model, and Paravion Technology Inc. installation drawings and gain access to system installation.

Visually inspect electrical wiring for insulation damage, chafing and integrity of wiring restraints. Replace components as necessary.

Visually inspect Start Counter for stress, corrosion, fastener or housing integrity. Replace Start Counter if housing is broken or damaged.

Visually inspect baggage compartment roof at counter attachment points, repair per FAA approved procedures if cracking is detected.

Inspect mounting hardware for proper torque and condition. Torque counter attachment hardware 3 to 6 in/lbs. Torque all other loose fasteners and fittings per standardized torque values as indicated in Table 4 or manufacturer maintenance manuals as applicable. Replace fasteners that are worn, corroded or damaged.

Verify Start Counter operation as follows:

1. Record start counter display and start the helicopter by following normal BHT flight manual procedures for the helicopter model.
2. Confirm the Start Counter display has advanced by one digit.

2.4.1 ELECTRICAL:

REQUIRED ELECTRICAL POWER: 1.5W (0.06-amp @ 24 Volts)

2.4.2 ADDITIONAL TROUBLESHOOTING

There may be a time when the system does not operate and/or perform in accordance with information contained herein. Therefore, it is necessary for the service personnel to diagnose the discrepancy by troubleshooting the system and its components. To assist in this diagnosis the following troubleshooting chart is provided.

Table 1 - Troubleshooting Procedures

INDICATION	PROBABLE CAUSE	POSSIBLE SOLUTION
A. No system power	1. Gnd power not connected 2. Aircraft power switch off	1. Plug in gnd power cart 2. Energize power switch
B. Power on but system will not register engine starts.	1. System Fuse failed 2. System wiring damaged or disconnected 3. Ignition Circ.Brkr. off 4. Ignition Circ.Brkr. failed 5. Counter failed	1. Replace Fuse 2. Repair wiring 3. Energize Ignition Circ.Brkr. 4. Replace Circ.Brkr. 5. Replace Counter assembly

3 COMPONENT REMOVAL AND REPLACEMENT

Gain Access to component location. Refer to the appropriate BHT maintenance manual per helicopter model and Paravion Technology Inc. installation drawings

Start Counter Removal

Assure that the power is off to the engine igniter circuit breaker.

Disconnect the Start Counter wires from the aircraft generator field control relay, referencing Paravion Technology Inc. installation drawings and appropriate BHT wiring diagrams per aircraft serial number.

Loosen and remove the Start Counter mounting screws located in the baggage compartment roof.

Start Counter Replacement

Assure the power is off to the engine igniter circuit breaker.

Install the Start Counter assembly on the top panel of the baggage compartment as shown in the installation drawings. Torque counter assembly attachment screws to approximately 3 to 6 in/lbs.

Route the counter wire harness to the appropriate locations per installation drawings and appropriate BHT wiring diagrams per aircraft serial number, secure wire terminals and harness.

Test counter system operation at next aircraft start procedure.

Table 2 - Weight and Balance Data

INSTALLATION	WEIGHT. (LB.)	F.S. (IN.)	B.L. (IN.)
P/N 206SC-2000-1 Start Counter Assembly	.5	144 (206A/B) 169 (206L series)	-20

- 1) This data is generally applicable. Due to normal variation of actual components weights and locations when equipment is installed, actual aircraft weight and center-of-gravity must be verified by weighing after system installation. Refer to the appropriate BHT maintenance manual as applicable.

Table 3 - Annual/300 Hour Inspection Checklist

INSPECTION	COMMENTS	INITIALS
1. Inspect electrical wiring for insulation damage and chafing. Verify integrity of wiring restraints. Replace wire and wire restraints as necessary.		
2. Check all fittings, fasteners, and components for wear and security. Replace worn fasteners. If necessary, re-torque counter fasteners to 3 to 6 in/lbs. Check all other related fasteners torque per BHT Maintenance Manuals and Table 4 of this document.		
3. Inspect baggage compartment top panel at attachment points. If cracking is detected, replace or repair panel per BHT Structural Repair Manual or other FAA acceptable method.		
4. Verify label legibility, location and condition. Label should read "Engine Start Counter" and be located per the latest approved revision of drawing 206SC-200.		
5. Verify Start Counter operation as follows: a) Record counter reading. b) Start the helicopter by following normal flight manual procedures. c) Confirm the Start Counter display has progressed by one digit.		

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

4 TORQUE VALUES

Table 4 - Torque Values (in-lbs)

CAUTION THE FOLLOWING TORQUE VALUES ARE DERIVED FROM OIL FREE CADMIUM PLATED THREADS.						
		TORQUE LIMITS RECOMMENDED FOR INSTAL- LATION (BOLTS LOADED PRIMARILY IN SHEAR)		MAXIMUM	ALLOWABLE	TIGHTENING
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)			
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		
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.						

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

5 REFERENCES

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

FAR Part 27

The following Paravion Technology Inc. Installation Documents:

Master Drawing List DL-206SC-100

Drawing 206SC-100-(X) System Configuration

Drawing 206SC-200-(X) Start Counter Installation

Bell Helicopter Textron (BHT) 206 Series Maintenance Manuals

Bell Helicopter Textron (BHT) 206 Series Standard Practices Manuals

Bell Helicopter Textron (BHT) Rotorcraft Flight Manual as appropriate per helicopter model

APPENDIX A – WIRING DIAGRAM

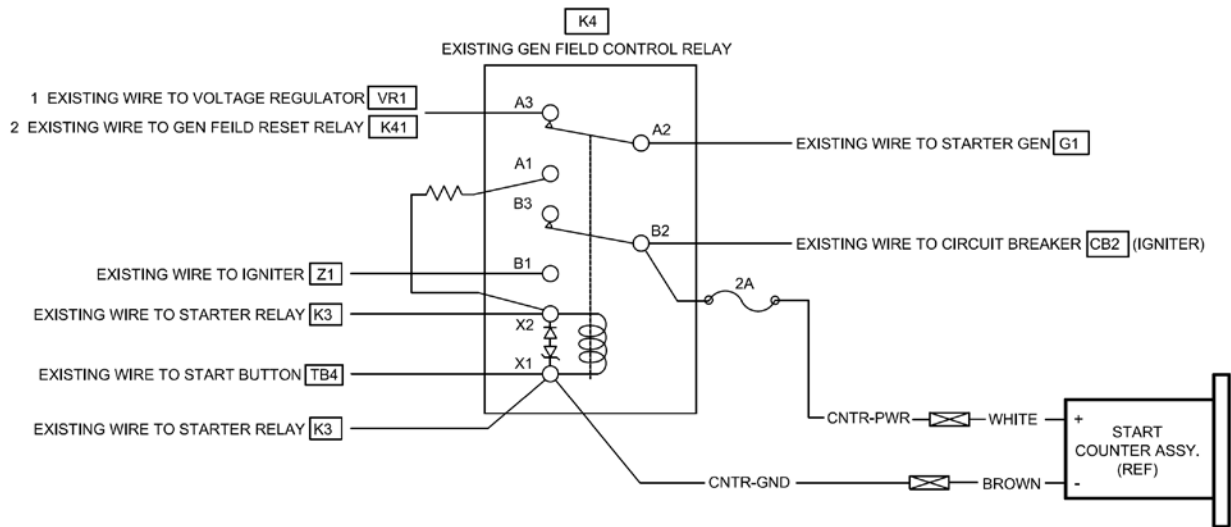


Figure 1 – 206SC-200-1 Installation 206A/B S/N 4 through 4310

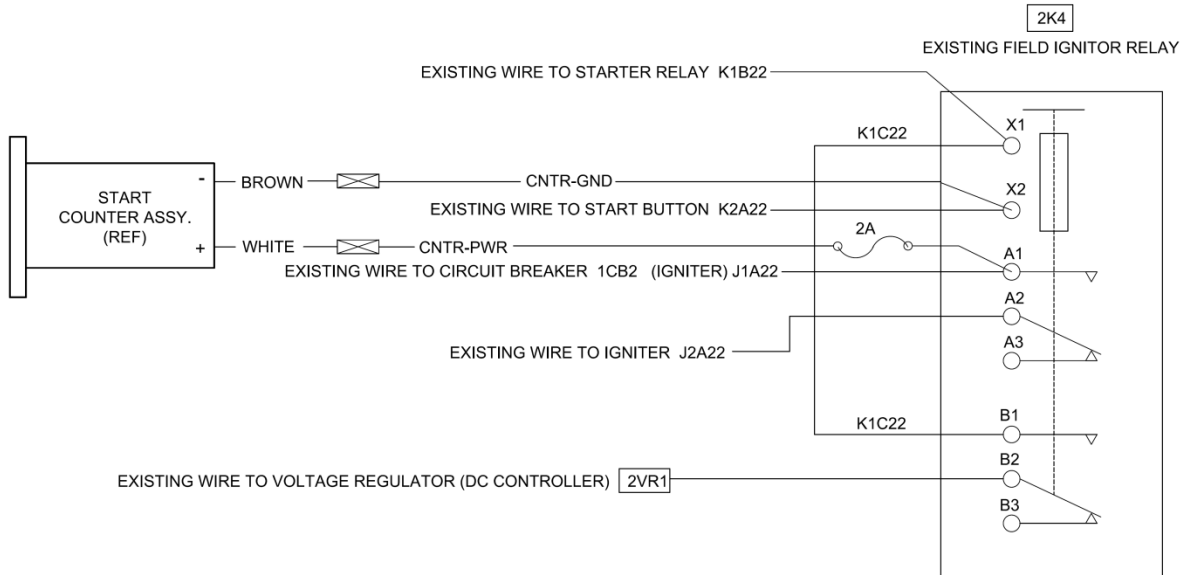


Figure 2 – 206SC-200-2 Installation 206L Series, 206A/B 4311 and Subsequent