FW-IMC407-11-BHT206
Rotorcraft Flight Manual Supplement
Immersive Camera Mount

Portland, OR
503 221-4001

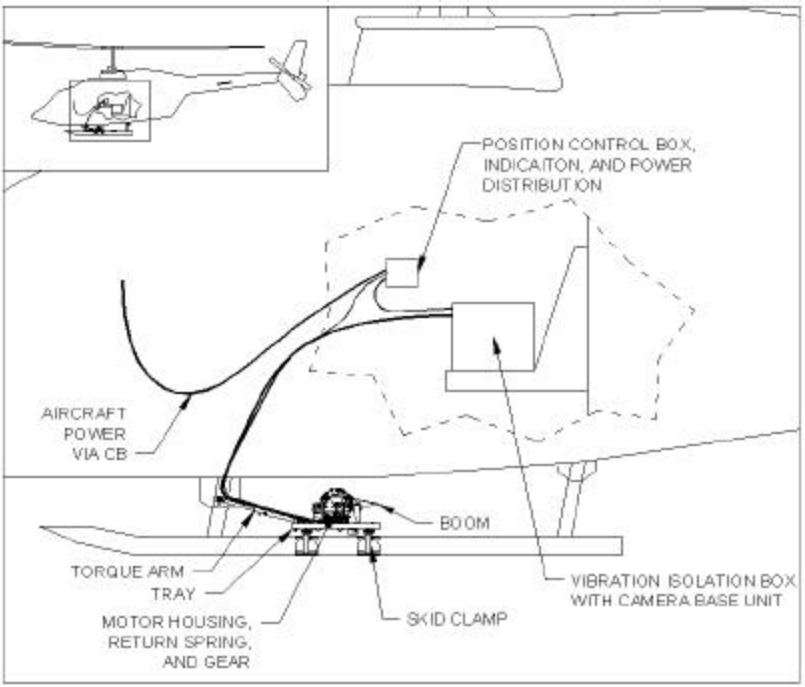
This RFMS must be followed when an Immersive Camera Mount is installed in accordance with Supplemental Type Certificate, (STC) No. _____, dated _____.
The information contained in this document supplements or supercedes the basic manual only in those areas listed herein. For limitations, procedures, and performance information not contained in this manual, consult the basic Rotorcraft Flight Manual.

Make:	Bell Helicopter Textron	Models:	206, 206A, 206A-1, 206B, 206B-1, 206L, 206L-1, 206L-3, 206L-4, 407

Note: revisions to this document are done in their entirety. Manufactures data is at the end of this document and is not FAA approved.

GENERAL INFORMATION

The Retractable Camera Mount System, IMC407-100, is a skid-mounted retractable boom that allows a camera to be extended below the skids. The Position Control Box lowers and raises the camera/boom and provides indication for camera position, motor on, and has system circuit breakers. The Camera Base Unit is contained by the Vibration Isolation Box which is attached to a passenger seat using the lap belt.



Retractable Camera Mount System Diagram

The system is thoroughly described in and is to be installed per FW-IMC407-13, Retractable Camera Mount ICA & Component Maintenance Manual , latest revision.

1. LIMITATIONS

No Change

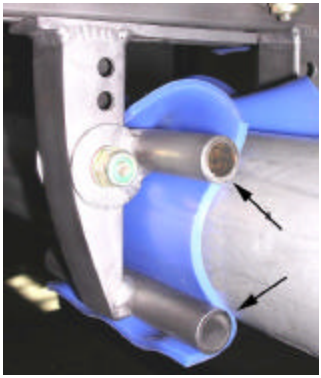
2. NORMAL PROCEDURES

This system is not complex and does not require special tools for installation. It may be installed by the pilot or a mechanic. Install the retractable camera mount per FW-IMC407-13, Retractable Camera Mount ICA & Component Maintenance Manual , latest revision.

Pre Flight Exterior Check

Add the following:

1) Verify the clamp tubes contact the skid at both locations shown.



check 1

Check 2

2) Verify the two clamp handles have no gap and zip ties on clamps are secure.

3) Verify the bracket on the cross tube is secure with 3 zip ties as shown.


Check 3.

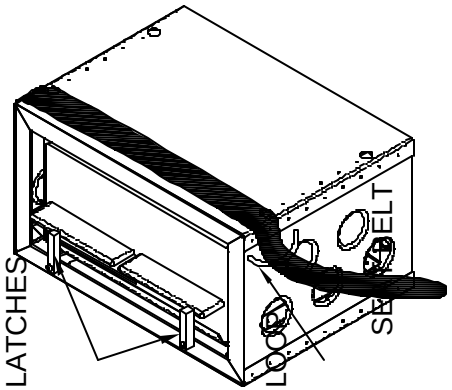
4) Verify the cables from the skid tray are secure.

Pre Flight Interior Check

Add the following:

1) Verify the Camera Base Unit is installed in the Vibration Isolation Box and the two latches are up.

2) Verify the seat belt goes through the two loops on the side of the Vibration Isolation Box and is snug.



3) Verify the cabling is adequately routed and restrained and will not interfere with flight controls.

4) Verify the camera operator has stowed any carry on equipment.

Climb

Inform Camera operator that he may lower the camera.

Cruise

NOTE:

Yawing at high speed may cause the camera to retract. The camera mount will need service before it will extend. The shear pin will require replacement.

Landing

Confirm Camera Operator has retracted the camera prior to landing.

3. EMERGENCY AND MALFUNCTION PROCEDURES

Emergency

No Change

Malfunction: Camera Mount Does Not Retract

Check Circuit Breaker

1) Instruct camera operator to put Camera Position Switch UP.
2) Reset breaker and try again.
3) If camera mount still does not retract land with unit down.

Land with unit down

1) Land normally - straight ahead with slight forward motion at touchdown

NOTE:

The retractable mount will break at the motor housing allowing the helicopter to land normally on the skids. The Boom and camera head will remain loosely attached to the skid tray via cabling. This will likely destroy the boom and camera head.

4. PERFORMANCE

No Change

5. WEIGHT AND BALANCE

Weight and Balance:

The Immersive Camera Mount may be installed in various locations. The CGs are marked on the units. Measure the physical location of the Skid Mounted item, use the corresponding passenger CG for the Vibration Isolation Box. Use the following weights:

Part Number	Item	Weight (lb)
IMC407-150	Retractable Camera Mount Assembly	15.0
IMC407-700	Vibration Isolation Box	20.3 lb

----------END FAA Approved Manual-------

MANUFACTURER'S DATA

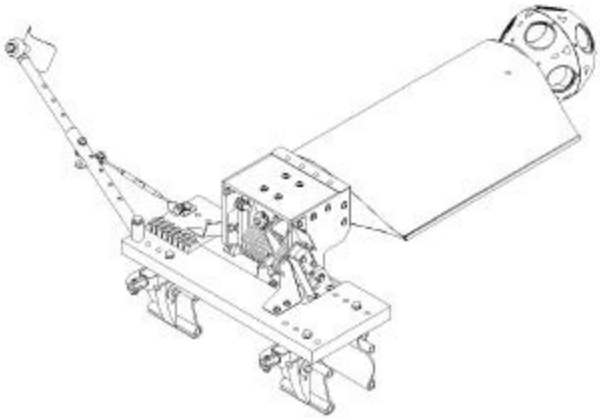
Retractable Camera Mount Description

The installation includes three main components, an immersive camera mount with attached immersive camera, (360° field of view); a Vibration Isolation Box which contains the camera base unit, (camera control and recording device); and a Position Control Box which operates the retractable camera mount and has indication. The design allows the quick attachment of the camera mount to the left or right skid between fore and aft cross-tubes and restraint of support equipment in a passenger seat. The power is taken from the existing or separately approved helicopter's electrical system. No airframe modifications are required for the attachment of this camera system.

System Components

Camera Mount

The camera mount is attached to the skid and includes the following sub-assemblies: Camera Boom, Skid Tray, motorized Tilt Mechanism, Skid Clamps, and Torque Arm.



Retractable Camera Mount – Skid Mounted Equip.

Camera boom

The camera boom is a 14 inch long rigid structure, of aerodynamic shape. Attached at one end is the camera; to the other, a motorized tilt mechanism. The tilt mechanism allows the camera to be bwered to a vertical position for camera operation, or tilted to a horizontal position for landing or when not being used.

Skid Tray

The skid tray is a plate that all the components bolt to. The tray has multiple holes for the clamps and torque arm as well as hard up and down stops. The electrical connections are rigidly attached to the skid tray.

Tilt mechanism

The tilt mechanism is a motor driven worm acting on a gear all contained in a motor housing. The boom is attached to the motor housing on the inboard end. A set of pillow blocks are bolted to the skid tray and allow the motor housing, axel and worm gear segment to rotate. Under normal conditions the axel and worm gear are fixed to the tray via a rivet that can shear under abnormal conditions. A motor attached to the motor housing drives a worm that “walks” the motor housing up or down the normally fixed gear segment.

Under abnormal conditions, the gear rivet will shear and allow the gear and motor housing to rotate. A pair of torsion springs sit over the axel and bear against the motor housing and skid tray, providing enough force to return the boom to the up position. The rivet will allow boom retraction if a side force of 48 lbs. or a pure vertical force of 348 lb. is applied at the camera. The boom also has a shear bracket, (where the boom is attached,) that fails when a rearward force of 134 lb. is applied. All of these shearing forces are higher than the flight loads.

Skid Clamps

Two Skid Clamps are bolted to the skid tray, which has multiple holes to allow the clamps to be adjusted to clear fittings on the skids. The clamps have an integral handle that tightens the clamps and shows when they are adequately tightened. (The handles tighten the clamp counter-clockwise, which is counter-intuitive.) The handles are secured with zip ties. The clamps have one fixed tube and one that can be relocated for different size skid tubes.

Torque Arm

An integral torque arm, one end of which rests against the lower end of a landing gear cross tube, provides anti-rotational leverage. It has several locations for adjustment including length adjustment, location on skid tray, and a turnbuckle that can adjust its inboard position.

Position Control Box

A small box with up-down switch and boom/camera position indicating lights is provided for control of the tilt mechanism. This box also contains the circuit breakers for the motor, indication, and camera control unit. The control box, connected electrically to the tilt motor, can be temporarily located within reach of the camera operator.

The indication shows three things – the camera mount is UP – safe for landing, DOWN – operational; and

MTR – the motor is running. The motor should only run for 15-30 seconds (based on time to raise or lower the boom – not a limitation on the motor.) If the MTR light stays illuminated for a longer period of time a failure condition likely exists. If the MTR light is on and either the UP or DWN lights are on a failure condition exists – such as a bad limit switch or motor. If no lights are on, and the switch is in the UP or DWN position, a failure condition exists – such as no power.

Vibration Isolation Box

The Camera Base Unit is housed in a Vibration Isolation Box, designed to mitigate vibration and shock and provide restraint and occupant protection from this item of mass in the cabin. The Camera Base Unit slides into the box and fits over a lip on the inner box. Two ¼ turn retaining latches prevent the Base Unit from coming out during a crash landing. Restraint of the box is provided by the available seatbelt run through loops on each side of the box. The top of the box is padded for the protection of an adjacent occupant. Attached to the housing may be a small, 1 lb. monitor.