FAA APPROVED

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT

FOR

MECHANICAL SPECIALTIES, LLC
ADVANCED DUAL EXTERNAL CARGO HOOK SYSTEM
FOR HUMAN EXTERNAL CARGO
P/N 350-430-100-100

INSTALLED ON

BELL HELICOPTERS 407

Serial Number: _____
Registration: _____

This document describes the Flight Manual content for the Mechanical Specialties, LLC 350-430-100-100 Advanced Dual External Cargo Hook (ADEC) Installation and must be attached to the appropriate FAA Approved BELL 407 Series Rotorcraft Flight Manual when the 350-430-100-100 HEC Hook Kit is installed in accordance with

STC No. **SR11869SE**

The information contained herein supplements or supersedes the basic Rotorcraft Flight Manual only in those areas listed herein. For limitations, procedures and performance information not contained in this document, consult the basic Rotorcraft Flight Manual.

Alan Wilson, FTP, AIR-713 for
Manager, Flight Test & Human Factors Branch, AIR-710
Federal Aviation Administration

Date Approved: December 31, 2024

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PART 1 FAA-APPROVED SECTIONS

LOG OF REVISIONS

REV NO	FAA APPROVAL	SUMMARY DESCRIPTION
IR	Alan Wilson FTP, AIR-713 December 31, 2024	Initial Release

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ROTORCRAFT FLIGHT MANUAL SUPPLEMENT

ADVANCED DUAL EXTERNAL CARGO HOOK SYSTEM

SECTION 1 – LIMITATIONS

NOTE

The external load equipment certification approval does not constitute operational approval; operational approval for external load operations must be granted by the local Aviation Authority.

HUMAN EXTERNAL CARGO

Kinds of Operations:
HEC operations are prohibited at night.

Load Limitations:
Human External Cargo (HEC) loads are limited to 946 lb. maximum load. The load limit includes all items below the cargo hook.

Airspeed Limitations:
Maximum HEC airspeed is 65 KIAS.

Equipment Limitations:
Operations with long lines other than approved HEC long lines (P/N: 350-430-115-###, where ### is length, in feet, 50 ft. min length, 200 ft. max length) is prohibited.

25 lb. weight must be added to end of empty line to prevent tail rotor contact.

HEC Long lines MUST connect to the cargo hook via a master link.

Operation of the external load equipment with HEC requires the use of a Personnel Carrying Device System (PCDS), which must be approved by the local aviation authority. TSO-C167 provides one such acceptable means of approval.

Communications Limitations:
This external load system does not include equipment to allow direct intercommunication among required crewmembers and external occupants. Operating this external load equipment with HEC is not authorized unless equipment to allow direct intercommunication among required crewmembers and external occupants is approved by the local Aviation Authority.

NON-HUMAN EXTERNAL CARGO

Load Limitations:
Refer to basic RFM Cargo Hook Supplement.

Equipment Limitations:
25 lb. weight must be added to end of empty line to prevent tail rotor contact.

In NHEC operations, Mechanical Specialties highly recommends master link fittings to interface within the ADEC cargo hook. Releasing NHEC loads with round rings will cause impacts between the cargo hook load beams and round ring. This may lead to damage/deformation of the hook and attaching ring. See Figure 2.

WARNING

USE OF HEC LONG LINES FOR NON HUMAN EXTERNAL CARGO GREATER THAN 946 LB. IS PROHIBITED

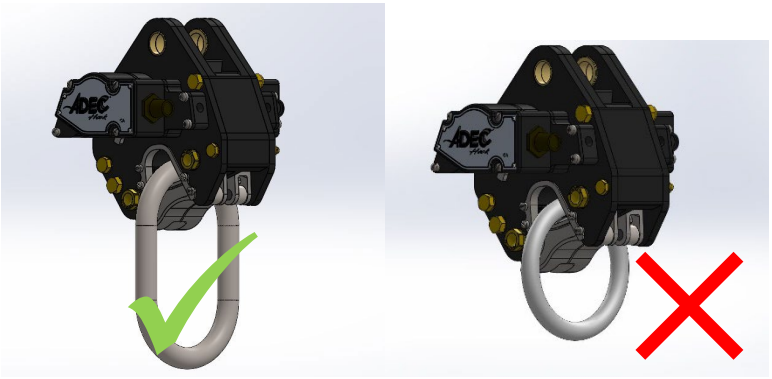


FIGURE 1: HEC Operations REQUIRE Master Link

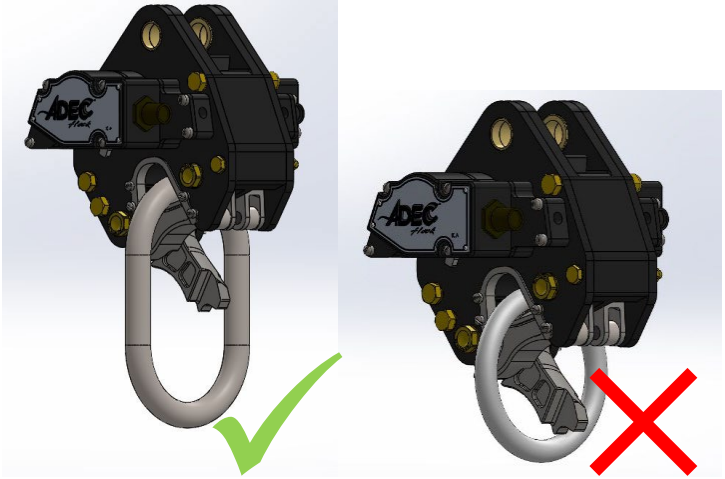


FIGURE 2: Master Links are highly recommended in NHEC Operations

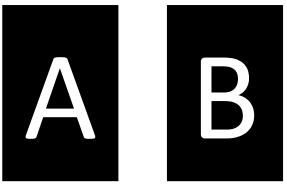
ADVANCED DUAL CARGO HOOK SYSTEM PLACARDS

The following information on placards pertaining to hook operations must be displayed:

In full view of the pilot: (See Figures 3 & 4 for Placement Locations)

A Hook Manual Release Lever on Pilot's Cyclic. (0.20" x 3.25")

B Hook Manual Release Lever on Pilot's Cyclic (0.20" x 3.25")



Hook Manual Release Body on Pilot's Cyclic (0.625" x 1")

RH Side of Release Handle Assembly near Electrical Release. (.375" x 1.25")

LH Side of Release Handle Assembly on Pilot's Cyclic. (.375" x 1.25")

Installed adjacent to Amber Caution Light on Instrument Panel. (.50" x 1.25")

Installed adjacent to Amber Caution Light on Instrument Panel. (.50" x 1.25")

A RELEASE

Installed with 5 amp circuit breaker (0.375” x 0.1.25”)

B RELEASE

Installed with 5 amp circuit breaker. (0.375” x 01.25”)

HOOK LTS

Installed with 1 amp circuit breaker. (0.375” x 1.25”)

LOAD CELL

Installed with 2 amp circuit breaker. (0.375” x 1.25”)

HEC VNE 65 KIAS

Installed on BELL Exterior Loads Flip Chart Placard (Non-interfering)(0.5” x 1.75”)

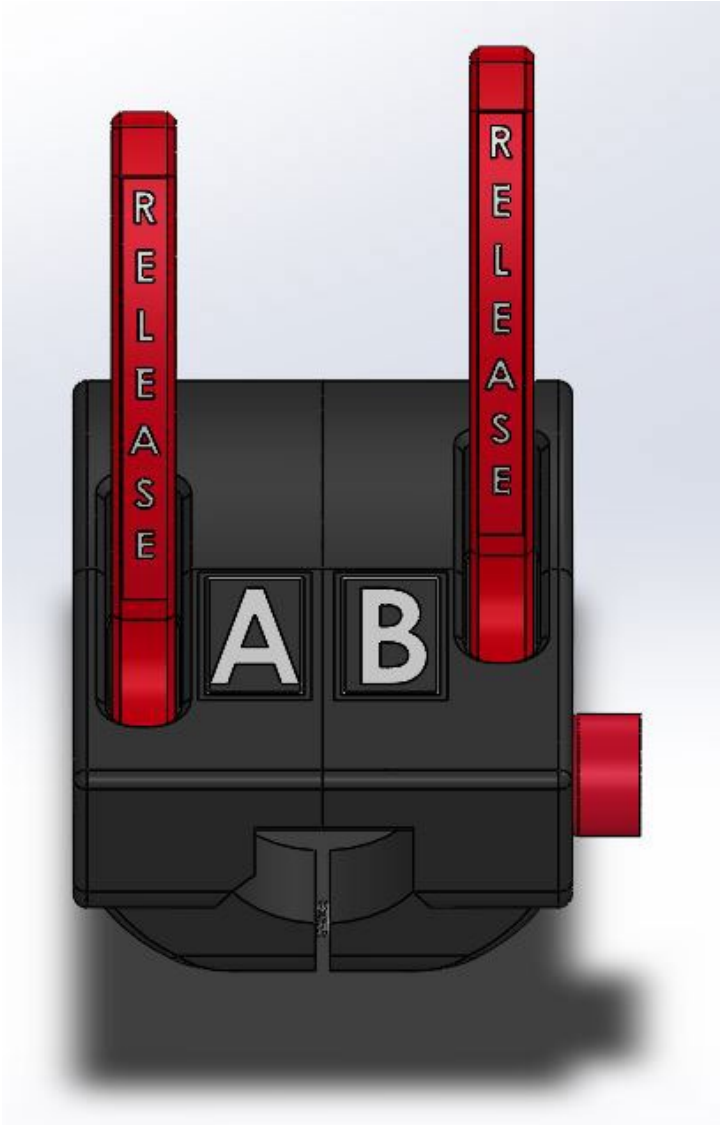


Figure 3: Manual Release Placard Placement (Pilot's View)

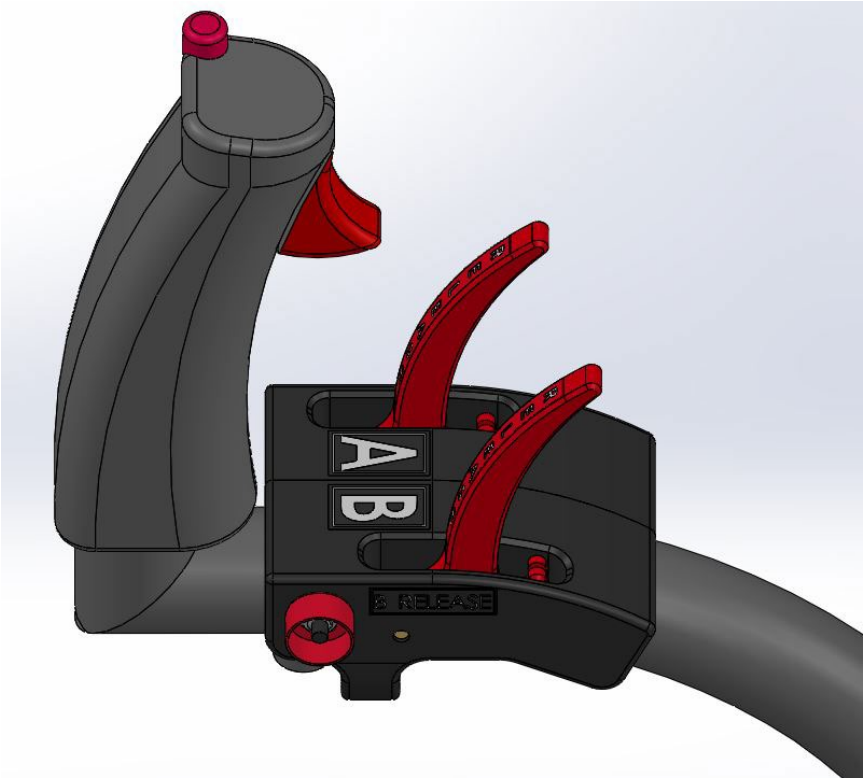


Figure 4: RH Side of Manual Release Assembly

SECTION 2 – NORMAL PROCEDURES

BEFORE ENGINE START

Perform the following checks prior to performing external load operations. If any of the following procedures are not successful do not use the equipment until the discrepancy has been resolved.

1. Visually check all mount hardware to ensure security of the cargo hook.

2. Visually check the electrical harnesses for damage and security.

3. Visually check the manual release cables and the connection to the cargo hooks for damage and security.

4. Visually check the cargo hook for damage and hardware for security.

5. Rotate cargo hook & beam assembly the full range of motion to insure there is no cable binding that can cause the cargo hook to open.

6. Perform manual release using manual release lever on the cyclic for “A” & “B” of the ADEC™ hook. Return load beams to locked position by manually pushing up on each load beam to the closed position.

7. Visually check amber lights (for systems “A” & “B”) turn on when load beams are in the open position.

8. Perform electrical release of system “B” by actuating guarded switch on manual lever assembly. Return load beam to locked position by manually pushing up on load beam.

9. Perform electrical release of system “A” by actuating primary release switch on cyclic. Return load beam to locked position by manually pushing up on load beam.

10. Ensure two-way communications system between pilot and HEC personnel functions properly.

11. Load Rigging (HEC)

The following figure shows the only approved load rigging configuration for HEC long line attachment:

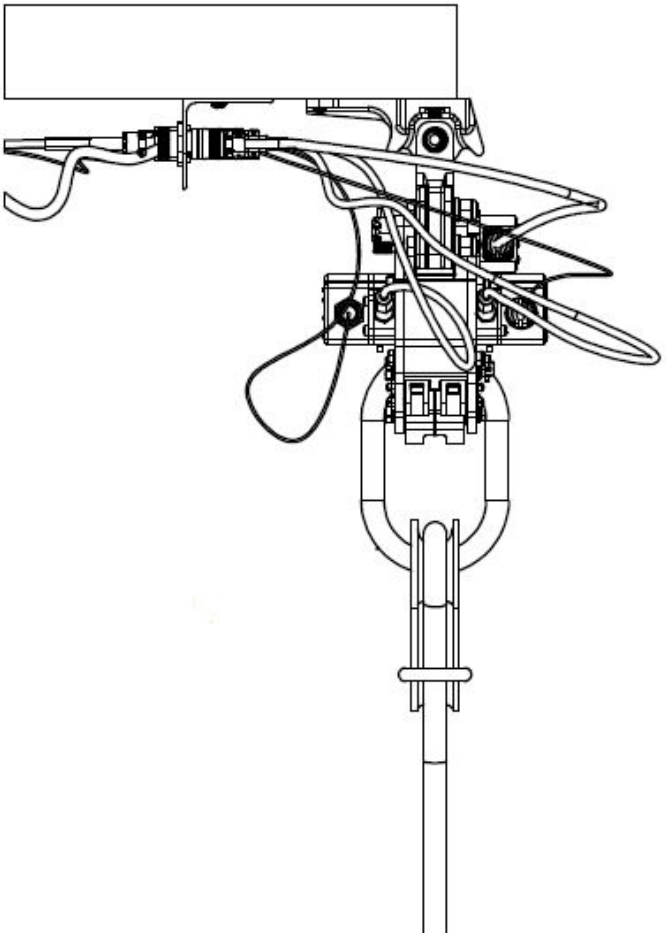


FIGURE 5: HEC CABLE INSTALLATION, LOOKING RIGHT
946 LB. MAX LOAD

12. Load Rigging (NON-HEC)

The following figure shows the only approved load rigging configurations for non-HEC long line attachment:

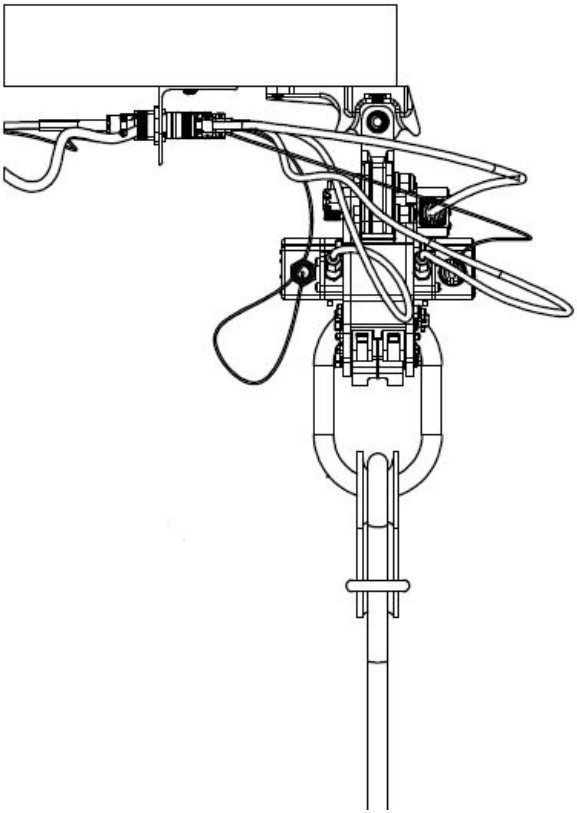


FIGURE 6: NON-HEC CABLE INSTALLATION, LOOKING RIGHT
2,650 LB. MAX LOAD

13. Normal Release Procedure – HEC Loads

a. Ensure persons attached to long line are safely on the ground or structure.

b. HEC personnel will self-release from lower end of long line.

-OR-

c. Activate "A RELEASE" cargo release electrical switch to release cargo.
Amber indicator light "A HOOK OPEN WHEN LIT" will illuminate.

d. Activate "B RELEASE" cargo release electrical switch to release cargo.
Amber indicator light "B HOOK OPEN WHEN LIT" will illuminate.

14. Normal Release Procedure – Non-HEC Loads

a. Land load.

b. Activate "A RELEASE" cargo release electrical switch.
Amber indicator light "A HOOK OPEN WHEN LIT" will illuminate.

c. Activate "B RELEASE" cargo release electrical switch on
Amber indicator light "B HOOK OPEN WHEN LIT" will illuminate.

SECTION 3 – EMERGENCY AND MALFUNCTION PROCEDURES

EMERGENCY PROCEDURES: If any aircraft emergency occurs during flight with HEC, the operations should be terminated by landing HEC in the nearest safe area. If during an emergency the aircraft must be landed immediately due to engine failure, or catastrophic control failure, HEC may need to be jettisoned.

1. Land HEC safely to the ground as soon as possible.

2. Release empty long line as required.
   a. Actuate “A RELEASE” guarded switch. (A PQRS)
      -Or-
      Pull “A” manual release lever. (A BQRS)
      Amber indicator light “A HOOK OPEN WHEN LIT” will illuminate.

   b. Actuate “B RELEASE” guarded switch. (B PQRS)
      -Or-
      Pull “B” manual release lever. (B PQRS)
      Amber indicator light “B HOOK OPEN WHEN LIT” will illuminate.

3. Refer to basic flight manual Emergency and Malfunction Procedures.

The basic Fight manual and the "Cargo Hook Kit" Rotorcraft Flight Manual Supplement issued by BELL Helicopters, Inc. remain applicable.

SECTION 4 – PERFORMANCE

No change from basic BELL 407 or Cargo Hook RFMS.

PART 2 MANUFACTURERS DATA

SECTION 1 – WEIGHT AND BALANCE

Refer to the model specific Basic Rotorcraft Flight Manual, Section IX, Cargo Hook Kit Supplement for loading data up to 2,650 lb.

Cargo Hook Loading Data:

	Weight (lb.)	Longitudinal STA (in.)	Longitudinal Moment (in-lb.)	Lateral STA (BL) (in.)	Lateral Moment (in-lb.)
ADEC System Installation	12.5	FS 121.0	1512.5	0	0
Cargo Max Weight (HEC)	946	FS121.0	117854	0	0
Cargo Max Weight (NHEC)	2650	FS121.0	320650	0	0

NOTE

The HEC System Installation weight does not include any payload attached below the cargo hooks (long line, weight bag, etc.).

Cargo Max Weight includes total weight attached to the Cargo Hook.

SECTION 2 – HANDLING, SERVICE, AND MAINTENANCE

Refer to Mechanical Specialties, LLC Document No. 407-430-105, Instructions for Continued Airworthiness, Revision IR or later.

SECTION 3 – SYSTEM DESCRIPTION

This supplement must be attached to the appropriate Bell Helicopters Rotorcraft Flight Manual when the Mechanical Specialties Model 350-430-100-100 Advanced Dual External Cargo Hook System is installed. The ADEC Hook System is for carrying Human External Cargo (HEC) loads and non-HEC loads.

This Dual Hook system meets the 14 CFR Part 27 certification requirements for Human External Cargo.

The following information supplements or supersedes the existing manual only for the areas listed in this supplement. For limitations, procedures and performance data not contained in this supplement consult the basic model specific Rotorcraft Flight Manual and the "Cargo Hook Kit" Rotorcraft Flight Manual Supplement issued by Bell Helicopters, Inc.

The Model 350-430-100-100 Advanced Dual External Cargo Hook System design technology provides two completely independent means to engage, lift, transport and release external loads, including Human External Cargo. The system consists of one cargo hook assembly that contains two independent dual actuation load carrying systems, attachment beam, mounts, and mounting hardware. See Figure 7 on page 15 for diagram. The ADEC™ Hook is unique in that no part of this system is removed during the transition between NHEC and HEC operations. Both NHEC and HEC loads are carried by the ADEC™ Hook's two load beams.

Each distinct load carrying system ("A" & "B") within the body of the ADEC cargo hook assembly have both an electrical release, as well as a manual (cable) release system, each requiring distinct and independent actions to affect release. This provides the ability to allow releases to be conducted by the Pilot-In-Charge in the cockpit under any circumstance, either electrically or manually. Additionally, an external manual release lever is located on each side of the cargo hook's exterior (one for each of the distinct load carrying systems), to allow for manual release of any load by ground crew personnel.

The Mechanical Specialties ADEC cargo hook Model 350-430-100-100 kit includes an electrical harness that interfaces with the aircraft's current electrical wiring.

When the Advanced Dual Cargo Hook System is installed, an owner or operator holding a valid Rotorcraft External Load Operator Certificate may utilize the helicopter for transportation of external cargo when operated by a qualified pilot.

WITH A HEC LOAD ATTACHED TO THE CARGO HOOK, OPERATION SHALL BE CONDUCTED IN ACCORDANCE WITH THE RESPECTIVE NATIONAL OPERATIONAL REQUIREMENTS. FOR U.S. OPERATORS, 14 CFR PART 133 ARE APPLICABLE.

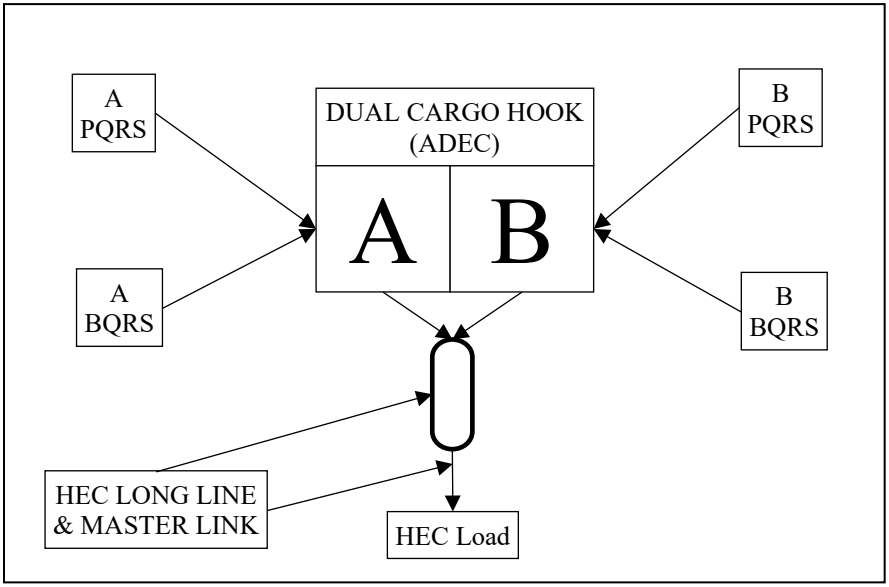


FIGURE 7: HEC RELEASE BLOCK DIAGRAM

Release Actuation Methods
The methods of release for the ADEC™ hook consists of a primary (PQRS) electrical release with a secondary back up (BQRS) lever-type manual (cable) release for both A & B load bearing systems. See Figure 8 (next page). The releases are centrally located on the pilot's cyclic control but arranged so that only one can be operated at a time and each operation requiring a separate, distinct action. The releases are independent of each other and must be operated individually to release the load from the helicopter from both hooks.

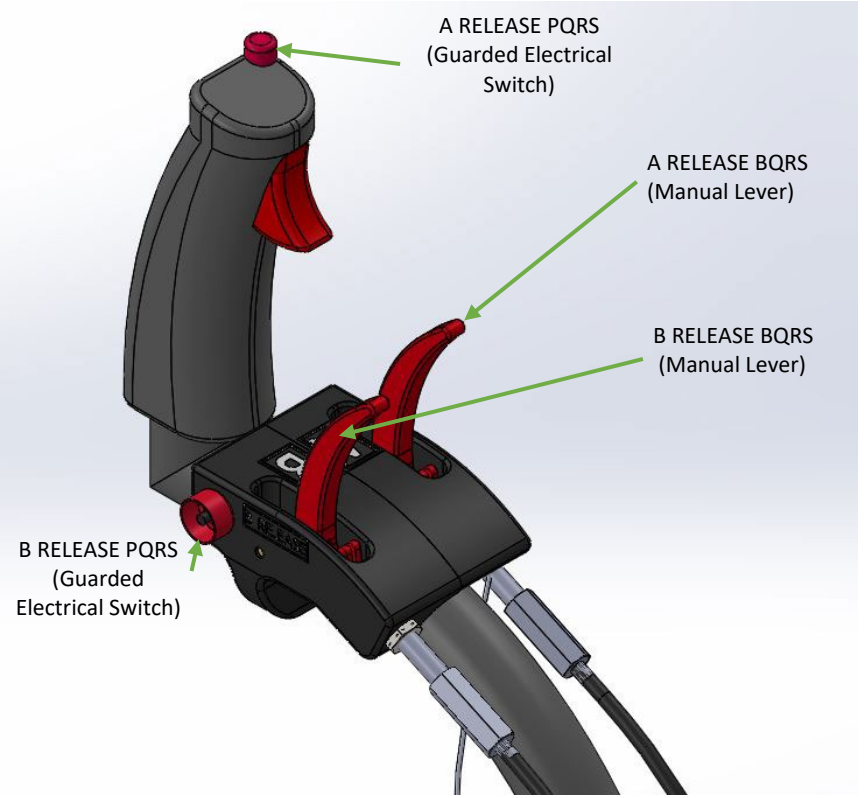


FIGURE 8: A & B PQRS/BQRS on Cyclic (Picture for Reference)