Procedure: Dielectric Strength Test

Dielectric tests are used in the industry to inspect a wide variety of products, devices, and equipment. Given this range of products, Robert Hydraulique Inc. has prepared the current document to provide you with an informative guide and specific procedures to follow when conducting periodic dielectric strength tests of RH equipment.

The objectives of dielectric strength tests are to:

- Detect manufacturing defects in electrical equipment
- Check the quality of the electrical equipment’s insulating material
- Check that an electrical system was correctly installed
- Test the insulation resistance of equipment or installations to monitor changes and aging

Factors that can influence the results include physical factors (temperature, humidity, mechanical deformation), electrical factors (e.g., voltage, direct current, alternating current), and chemical factors (e.g., impurity, oxidation), among others. Please note that in practice these factors never act alone (except in a laboratory setting), and they are therefore difficult to identify.

Note: All equipment supplied by Robert Hydraulique Inc. has been manufacturer-tested to meet the dielectric qualification requirements of CSA Standards CSA C225-00 and CSA C225-M88, Category C. Testing is performed for a duration of 3 minutes at 100 kV, 60 Hz, and the leakage current must not exceed 1 mA.
Test Preparation:

Bring the vehicle into a dry location and allow the fibreglass section to dry thoroughly. We recommend allowing the equipment to dry for 12 to 24 hours prior to testing. Tip: Place the aerial device in front of a heating unit with a vent and tip the bucket fully forward to allow the hot air to dry the fibreglass interior.

Note: Contrary to popular belief, dielectric tests must be performed on components that are completely dry. Operating the equipment in rain or other damp conditions presents no additional hazards. The tests are extreme, however, and all conditions must be ideal to ensure the validity of results.

The equipment must be washed prior to testing. If the equipment is not washed, the test can only serve as an operational spot check, providing no opportunity to monitor changes in the quality of the insulating materials. Tests performed without a prior cleaning have no real value in regard to the intended objective. At the same time, we believe that an annual washing is an efficient maintenance procedure to keep the aerial device in proper operating condition. The booms must be kept free of foreign matter such as paint (other than that of the manufacturer, Robert Hydraulique Inc.) or other greasy or adhesive substances, unless approved by Robert Hydraulique Inc.

Pay particular attention to the cleaning products used, since some are highly conductive. Use water- or ammonia-based products or volatile cleaning solutions.

Ensure that your test area is clear of all metal parts and other conductive elements (e.g., telephone wire within a wall). Allow for a clearance of at least 8 feet (2.44 meters) around the tested equipment and be sure to include the building’s structure (such as the ceiling) in your clearance calculations.

Also ensure that no vehicle part or accessory, aside from the tires, is in contact with the ground.
Test Criteria:

Note: In accordance with the following table, excerpted from CSA Standard C225-00, **RH aerial ladders are classified as Category C**. The duration of the direct current (DC) test is thus 3 minutes at 56 kV, and the leakage current shall not exceed 56 µA (micro-amperes). If you perform the test with alternating current (AC), duration is one minute at 40 kV, and the leakage current shall not exceed 40 µA.

### Table 2

**Periodic Electrical Test Values for Insulating Aerial Devices**

*(See Clauses 5.4.3.1, 5.4.3.2, and 8.2.4, and Appendix D.)*

#### Insulating Aerial Devices with a Lower Test Electrode System (Category A and Category B)

<table>
<thead>
<tr>
<th>Unit rating, kV</th>
<th>60 Hz (rms) test</th>
<th>Direct current test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Voltage, kV (rms)</td>
<td>Maximum allowable current, µA</td>
</tr>
<tr>
<td>46 and below</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>69</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>138</td>
<td>120</td>
<td>120</td>
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<tr>
<td>230</td>
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<td>300</td>
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<tr>
<td>500</td>
<td>430</td>
<td>430</td>
</tr>
<tr>
<td>765</td>
<td>660</td>
<td>660</td>
</tr>
</tbody>
</table>

#### Insulating Aerial Devices without a Lower Test Electrode System (Category C)

<table>
<thead>
<tr>
<th>Unit rating, kV</th>
<th>60 Hz (rms) test</th>
<th>Direct current test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Voltage, kV (rms)</td>
<td>Maximum allowable current, µA</td>
</tr>
<tr>
<td>46 and below</td>
<td>40</td>
<td>400</td>
</tr>
</tbody>
</table>

#### Insulating Aerial Ladders and Insulating Vertical Aerial Towers

<table>
<thead>
<tr>
<th>Unit rating, kV</th>
<th>60 Hz (rms) test</th>
<th>Direct current test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Voltage, kV (rms)</td>
<td>Maximum allowable current, µA</td>
</tr>
<tr>
<td>46 and below</td>
<td>40</td>
<td>400</td>
</tr>
<tr>
<td>20 and below</td>
<td>20</td>
<td>200</td>
</tr>
</tbody>
</table>

**Notes:**

1. These tests are assuming adequate test facilities are available. See Table 3 for in-field tests.
2. A method of calculating test voltages for units rated other than those tabulated here is as follows:
   - (a) The 60 Hz test values are equal to line to ground at the unit rating value times 1.5.
   - (b) Multiply the 60 Hz test values times 1.4 to arrive at the direct current values.

Reference: C225-00 (page 32), published in 2001 by the Canadian Standardization Association.
Connecting the Equipment:

Establish a safety perimeter around the equipment to be tested (aerial ladder and vehicle).

The control station shall be a minimum of 10 feet (3.05 meters) away to properly protect the operator. (Note: These measures pertain to the dielectric testing machine belonging to Robert Hydraulique Inc. Please read the operator’s manual provided with your dielectric test equipment to familiarize yourself with the manufacturer’s safety recommendations, which shall always take priority over this general procedure.)

Prior to connecting any equipment, ensure that all the controls are in the “OFF” position. Several models of dielectric testing devices have a fuse that operators can remove; it is always safer for them to have it in their possession so as to avoid any shock hazard when connecting the equipment.

Ensure that the vehicle is turned off (key in “OFF” position).

Connect your generator to the safety ring located near the bucket.

Then connect your load return to the last rung of the aluminum section (see diagram). Ensure that your pliers (or similar) are centered on the rung and pointed upward so there is the least amount of interference when reading the leakage current.

Install grounds on the dielectric equipment. Do not place grounds on the vehicle or the ladder.

Ensure that no one is inside the demarcated safety area.

Begin the test, adhering to the test criteria listed on the preceding page.
Wiring diagram:
Once the voltage is totally shut off, remove any residual electric charge using a pole with a metallic tip connected to the building (ground). Touch any elements that may be electrically charged, such as the HIPOT of your dielectric test device, the levelling cylinder, the bucket mounting bracket, and the aluminum sections.

Always maintain clearance when returning the pole to the grounding point.

Do not forget to have your equipment calibrated annually (or according to the manufacturer’s recommendations) by a certified company.
Report recommended by the manufacturer:

Dielectric rigidity Verification

Customer: 
Address: 

Norm: CSA C225-00
Truck (if applicable): 

VIN: 

Equipment test:

Model: RH38D RH44D RH50D
Serial #: 

Voltage applied: 40 kV ac
Duration of the test: 1 Min.
Leak (milliampere): 
Leak accept: 0.4 mA

Result: Pass Fail

Items | Yes | No | Remarks specified
--- | --- | --- | ---
238A-00L/R-J01 Filter Tubing 70” |  |  |  
239A-00L/R-J01 Filter Tubing 94” |  |  |  
238-00-J02 Handrail |  |  |  
239-00-J01 Handrail (Section 4th) |  |  |  
Others: |  |  |  

Test conducted by: ____________________ Signature: ____________________
Test verified by: ____________________ Signature: ____________________
Place of testing: Robert Hydraulique Inc. factory Date: (YYYY-MM-DD) ____________

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Procedure to Replace Rollers with Blocks

Replacing K225A-V01 rollers with 226-00-V01 blocks

2\textsuperscript{nd} section, front end:

1. Extend the aerial device to its maximum length.

2. Unbolt bracket 216-00-V02 on the side that needs the roller replaced.

3. Remove the 4 bolts from bracket 235-00-V01.

4. Slide bracket 235-00-V01 with the roller towards the front of the aerial device.

5. Replace roller K225A-V01 with block 226-00-V01.

6. Re-install bracket 235-00-V01 with the recess pointed downward.

7. Torque the 4 bolts down to 44 ft-lb. (Tighten the 2 bottom bolts to the base plate and apply Locktite; please note that these bolts do not have a washer or lock washer.)

8. Bolt on bracket 216-00-V02.
Replacing K225A-V01 rollers with 226-00-V01 blocks
2nd section, rear end:

1. Remove the 6 bolts on the side that needs the rollers replaced.

2. Slide bracket 225-00-V01 with the rollers to the rear.

3. Replace the rollers with blocks 226-00-V01.

4. Re-install bracket 225-00-V01 with the recess pointed downward.

5. Torque the 6 bolts down to 44 ft-lb.
Replacing K225A-V01 rollers with 226-00-V01 blocks
3rd section, front end:

1. Extend the aerial device to its maximum length.

2. Unbolt bracket 216-00-V02 on the side that needs the roller replaced.

3. Remove the 4 bolts from bracket 235-00-V01.

4. Slide bracket 235-00-V01 with the roller to release it from the section.

5. Replace the roller with block 226-00-V01.

6. Re-install bracket 235-00-V01 with the recess pointed downward.

7. Torque the 4 bolts down to 44 ft-lb.

8. Re-install bracket 216-00-V02 and bolt it on.
Replacing K225A-V01 rollers with 226-00-V01 blocks
3rd section, rear end:

1. Remove the 4 bolts from bracket 235-00-V01.

2. Remove the bracket with the roller toward the rear end of the ladder.

3. Replace roller K225A-V01 with block 226-00-V01.

4. Re-install the bracket with the recess pointed downward.

5. Torque the 4 bolts down to 44 ft-lb.
OMNEX Programming Procedure

- Turn the transmitter “OFF” and turn the receiver “ON”.

- 3 lights will come on:  - “Status” light  
  - “E-STOP” light  
  - Center light

- Press and hold the transmitter’s “ON” button, then simultaneously press and hold the red “E-STOP” button and the green button.

- The yellow light will come on and flash slowly.

- Press and hold the blue “Setup” button on the receiver; a yellow light will flash slowly. Continue to hold it down (approx. 5 seconds).

- Do not hold for more than 30 seconds, otherwise the procedure must be repeated.

- Press and release the green “Power” button on the transmitter. This will initiate the download. On the transmitter, a red light will come on and change to yellow. On the receiver, the “Link” light will come on and flash. When the download is completed, the red battery lights and yellow (active) light will go out. The “Link” light on the receiver will go out and the green “Status” light will begin to flash.

- Turn off the receiver and turn it back on, then repeat with the transmitter.
Procedure for Reprogramming the OMNEX

Auto shut down

1. Disconnect and reconnect the 5-pin plug on your receiver to ensure that the system is fully turned off.

2. Proceed in the following sequence:
   - Press and hold the red button
   - Press and hold the green button
   - Release the red button
   - Release the green button

   At this point, the light to the right of the green button (based on positioning depicted below) should flash.

3. Enter the following number sequence: 3 – 1 – 4 – 2; then press on the GREEN button.
   When completed, the 2 lights should flash.

5. Continue with the following number sequence: 5 – 1 – 8 – 8 – 8 – 8 – 8 – 8 – 8; then press on the GREEN button. At this time, the lights should come on for a few seconds before going out.

6. The auto-off, on your controller is now re-activated.
Cylinder Valve Adjustment Procedure

**Elevation cylinder:**

- To adjust the valve on the elevation cylinder, the aerial ladder must be fully extended.
- Raise the aerial device to 45 degrees.
- To tighten the valve, loosen the Allen screw.
- To loosen the valve, tighten the Allen screw.

Loosen the valve (tighten the screw) until the aerial device slowly lowers by itself and re-tighten the valve (loosen the screw) until the aerial device stops moving. Then tighten the valve (loosen the screw) by 1¼ turns and the valve will be adjusted.

- Secure the Allen screw with the nut.

**Extension cylinder:**

Loosen the valve (tighten the Allen screw) fully and re-tighten the valve by 1 turn (loosen the Allen screw).

**Levelling cylinder:**

Adjust the valve to the center position, or 2½ turns in one direction or the other; tighten or loosen completely.
**Stability Test for RH Aerial Device**

*This procedure is based on standard CSA C225-00. The most current standards always have priority over the following procedure.*

**Pre-Test Preparation:**
- Remove all items that are not permanently installed from the vehicle.
- Enter general vehicle and equipment information on the RH # FORM-0017 form. To do so, you will need to measure, weigh and compare the manufacturer’s tolerances with your results.
- Ensure that the tire pressure corresponds exactly to the pressure recommended by the vehicle manufacturer. Pressure that is too high or too low will skew test results. Be sure to check and adjust the pressure immediately prior to performing the stability test to avoid temperature deviations that may also cause changes in the tire pressure.

**Stability Test:**
- Position vehicle on a level surface (e.g., parking lot). The area must be free of any objects that could interfere with the test.
- Establish a safety perimeter.
- Straighten vehicle tires.
- Ensure that handbrake remains fully engaged.
- Chock the wheels.
- The aerial device must be perpendicular to the truck and fully extended. The ladder must be parallel to the ground.
- Using a chain, attach loads to the last rung of the ladder (zinc-plated bucket support), as indicated in the “Table of Equivalent Loads for Stability Test Purposes”. Ensure that the chains do not pinch the hydraulic hoses.
- Stand behind the vehicle in order to monitor the tires on the side opposite the weight, as well as the aerial device.
• Raise the load approximately 4-5 inches (10 to 12 cm) above the ground. Remember that the ladder must always remain parallel to the ground.

If the aerial device has difficulty in lifting the load, you can either retract the ladder slightly to give it greater force or adjust the Sun cartridge (valve block) located at the base, using an Allen wrench.

• Rotate the unit to 45 degrees from the rear of the vehicle and then rotate back to 45 degrees from the front of the vehicle. Perform these operations as smoothly as possible.

• Return to the starting point.

The vehicle must not lose its equilibrium point (stability). Thus, the wheels may lift off the ground but not more. If the weights touch the ground and the vehicle no longer touches the ground, the vehicle has failed the test.

You must conduct this test on each side of the vehicle, at a -5 degree angle to the axle and on a horizontal surface. A lifting ring test (647 lbs on a horizontal surface) is also required.

When performing the test, we recommend you also inspect the vehicle and equipment in order to identify any discrepancies.

Place a sticker on the bucket, indicating the certified weight.

*This test is required whenever there is a change of vehicle and/or a modification is made that could have an impact on stability.*
**Report recommended by manufacturer:**

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**CERTIFICAT D’ESSAIS DE STABILITÉ**
**STABILITY TESTS CERTIFICATE**
**(CSA-C225-00)**

<table>
<thead>
<tr>
<th>Nom du client / Customer name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numéro d’unité du véhicule / Vehicle fleet number:</td>
</tr>
<tr>
<td>Installateur / Installer:</td>
</tr>
<tr>
<td>Numéro du bon de travail de l’installateur / Installer’s work order number:</td>
</tr>
</tbody>
</table>

**Véhicule porteur / Chassis:**

<table>
<thead>
<tr>
<th>Année, marque et modèle / Year, make &amp; model:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numéro de série / Serial number:</td>
</tr>
<tr>
<td>Poids technique maximal / Gross Vehicle Weight Rating (lbs / kg):</td>
</tr>
<tr>
<td>Poids technique maximal sous essieu avant / Gross Axle Weight Rating Front (lbs / kg):</td>
</tr>
<tr>
<td>Poids technique maximal sous essieu arrière / Gross Axle Weight Rating Rear (lbs / kg):</td>
</tr>
<tr>
<td>Empattement / Wheelbase (po / m):</td>
</tr>
<tr>
<td>Distance arrière de la cabine-axe pont arrière / Cab-axle distance (po / m):</td>
</tr>
<tr>
<td>Poids total / Total Weight (lbs / kg):</td>
</tr>
<tr>
<td>Poids sous essieu avant / Axle Weight Front (lbs / kg):</td>
</tr>
<tr>
<td>Poids sous essieu arrière / Axle Weight Rear (lbs / kg):</td>
</tr>
<tr>
<td>Hauteur libre totale / Total overhead clearance (po / m):</td>
</tr>
<tr>
<td>Hauteur du sol à la base de la tourelle / Height from ground to base of turret (po / m):</td>
</tr>
<tr>
<td>Hauteur nominale / Nominal height (pi / m):</td>
</tr>
</tbody>
</table>

**Options du véhicule porteur / Chassis options:**

- Stabilisateurs / Outriggers
- Barre de torsion / Torsion bar
- Autre / Other:

**Engin élévateur / Aerial device:**

<table>
<thead>
<tr>
<th>Modèle / Model:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numéro de Série / Serial number:</td>
</tr>
</tbody>
</table>

**Essais de stabilité / Stability tests:**

1. **CSA-C225-00** : Charge à la nacelle, surface en pente 5 degrés / Load in basket, 5 degrees slope surface:
   - Charge appliquée au dernier barreau / Applied load at the last rung (lbs / kg):
   - Charge calculée d’homologation / Qualification calculated load (lbs / kg):
2. **CSA-C225-00** : Charge à la nacelle, surface horizontale / Load in basket, horizontal surface:
   - Charge appliquée au dernier barreau / Applied load at the last rung (lbs / kg):
   - Charge calculée d’homologation / Qualification calculated load (lbs / kg):
3. **CAN/CSA-Z150-98** : Charge à l’anneau de levage, surface horizontale /Load on lifting ring, horizontal surface:
   - Charge appliquée d’homologation / Applied qualification load (lbs / kg):

**Capacités nominales / Rated load capacities:**

- Capacité de la nacelle / Load capacity of the basket (lbs / kg):
- Capacité de l’anneau de levage / Load capacity of the lifting ring (lbs / kg):

**Essais vérifiés par / Tests verified by:**

Date:

---

L’installateur certifie que le groupe mobile décrit ci-dessus a subi avec succès les essais de stabilité tel que décrit dans l’article 4.2 de la norme CSA-C225-00.

The installer certifies that the mobile unit described hereon, successfully meets the stability requirement of article 4.5 of CSA-C225-00.
Bucket Heater Installation and Operating Instructions

Installation:

Before installing the heater, you must check it as described below. Once the heater is installed in the bucket, repeat the procedure to check for proper installation and operation.

1. Turn switch to “Off” position (see Diagram 1).
2. Plug heater into a 115-volt AC outlet.
3. Turn switch to “On” position (opposite to “Off” position, see Diagram 1).
4. The motor should start working and air should come out of the unit. If no air comes out, check that there is no foreign body impeding the fan’s rotation. Turn switch to “Off” position, turn the fan by hand to ensure that it turns freely and then repeat step 4.

If warm air blows out, you are now ready to install the heater. Unplug it from the 115-volt AC outlet. Install the heater with the safety screen facing the bottom of the bucket.

ONCE THE UNIT IS INSTALLED, REPEAT STEPS 1-4 LISTED ABOVE.

*** NOTE*** The heater is equipped with a temperature sensor that turns the heating element off if the unit overheats. This happens only if there is malfunction or if the airflow is blocked. Remove the obstructing item or replace the defective part. To reset the sensor to 0, remove the heater from the bucket, remove the air deflector panel from the back of the heater and press on the little red reset button (see Diagram 2 below). The heater will not blow out hot air if inflow air is warmer than 90° F (32° C).

![Diagram #1](image1)

![Diagram #2](image2)
**Operation:**

1. Turn switch to “Off” position (see Diagram 1).

2. Plug heater into a 115-volt AC outlet.

3. Turn switch to “On” position (opposite from “off” position, see Diagram 1).

4. The motor should start working and air should come out of the unit. If air does not come out, ensure that the problem is not due to an object obstructing the fan. Place the switch in the “Off” position, and turn the fan by hand to see if it turns freely and repeat step 4.

5. When the heater is no longer needed, place the switch in the “Off” position.

If warm air blows out, you are now ready to install the heater. Unplug it from the 115-volt AC outlet. Install the heater with the safety screen facing the bottom of the bucket.

**ONCE THE UNIT IS INSTALLED, REPEAT STEPS 1-4 LISTED ABOVE.**

*** NOTE*** The heater is equipped with a temperature sensor that turns the heating element off if the unit overheats. This happens only if there is malfunction or if the airflow is blocked. Remove the obstructing item or replace the defective part. To reset the sensor to 0, remove the heater from the bucket, remove the air deflector panel from the back of the heater and press on the little red reset button (see Diagram 2 below). The heater will not blow out hot air if inflow air is warmer than 90° F (32° C).
Centralizer Adjustment Procedure

1 Raise the aerial device to access the slewing ring.

2 Give a first command input to the left (approx. 1 ft.) and return to center. Check where the aerial device comes to a stop relative to the slewing ring.

3 Carry out the same command, but this time to the right.

4 If the aerial device stops at the same distance on each side of the slewing ring, you need to adjust the central positioning micro switch.
   * If the aerial device does not stop at an equal distance on each side with respect to the slewing ring, unscrew the 2 screws that hold the aluminum plate located under the centralizer’s upper base.
   * Next, move the plate toward the outside to shift the aerial device to the right, or push it toward the inside to shift the aerial device to the left.

5 Turn the aerial device to the right to free the centralizer from the base.

6 Remove the 4 Torx drive screws on the top of the central positioning micro-switch. You will find a torque screw inside.

7 Turn it counter-clockwise to bring the ladder toward the center of the slewing ring, or turn it clockwise to move it away from the center. *Note: Turn the screw ¼ rotation at a time in order to find the center.

8 Once centering is completed, put the cover back in place and reinstall the 4 screws.
### Checking Valves on Power Unit

The position of the valves on the HP02 power unit is depicted below.

![Valve Positioning](image1)

The positioning of the hydraulic hoses is depicted below; each number corresponds to the number on the hoses.

![Hose Positioning](image2)
Hydraulic Fluid Change Procedure
Models RH35 to RH50D equipped with HP02 power unit

1. Position the aerial device -5 degrees to the right (or the left) of the vehicle.

2. Attach bucket using a strap.

3. Remove the cotter pin and the pin on the bucket levelling cylinder.

4. Activate the bucket levelling function to retract the cylinder.

5. Disconnect the filter inlet hose, then turn the hose down to recover the old hydraulic fluid.

6. Fully extend the ladder.
7 Connect the 2 bucket hoses.

8 Empty the reservoir by activating the “level up” function of the bucket levelling system several times using the lower controls.

9 Fill the reservoir with HL17106 hydraulic fluid.

10 Activate the bucket’s “level up” function three times using the lower controls. The hydraulic pump will stop automatically.

11 Check the reservoir to ensure the hydraulic fluid is at the proper level.

12 Retract the aerial device as far as possible.

13 Raise as high as possible.

14 Change the hydraulic fluid filter.

15 Position aerial device at -5 degrees.

16 Check hydraulic fluid level.

17 Reconnect hoses on the bucket levelling cylinder.
18 To bleed the levelling cylinder, open the hose fitting on the cylinder and activate the “level up” function 3 times using the lower controls. Wait for the pump to stop automatically. Repeat this function while simultaneously closing the fitting.

19 Open the hose fitting on the cylinder and activate the “level down” function three times using the lower controls. Wait for the pump to stop automatically. Repeat this function while simultaneously closing the fitting.

20 Reposition cylinder on bucket. Replace the pin and cotter pin.

21 Note: be sure to actuate the “level up” function before removing strap.

22 Check the hydraulic fluid level one last time.
Steel Cable Replacement Procedure
RH35 to RH50D models (at least every 3 years!!!)

For an optimum efficiency, grease your cables regularly. Here are effective products suggested by the manufacturer of cables: Swepco 803, WRL 34041 of Jet Lube and CD 1000 of Prolab.

1. Place ladder in horizontal position.

2. Remove the 2 bolts that fasten the Catrac holder to the cable support.

3. Remove the 4 Stover nuts of the cables (2 on each side). *Be sure to count the number of threads extending past the end of the Stover nuts in order to install new cables with the same tension.*

4. Remove the 8 bolts on the 2nd rung of the 3rd section.

5. Remove the supports that secure the cables to the section.

6. Unbolt the side rollers of the second section.

7. Unbolt the 4 pulleys located at the 4 extremities of the 2nd section.
8. Remove the cables from the aerial device.

9. Install the new cables between the first and second sections, and between the second and third sections.

10. Thread cable ends through the eyelets of the cable supports. *Turn eyelets up and wait before adjusting them.

11. Install the cables in their support on the 2\textsuperscript{nd} rung of the 3\textsuperscript{rd} section.

12. Install the 4 pulleys and their accessories, and fasten with bolts. *To adjust the cables, tighten the Stover nuts based on thread count prior to disassembly. (See step 3)

13. Install the Catrac holder on the cable support.

14. Bolt the side rollers of the second section back on. Check that there is an equal space between the sections.

15. Tighten the bolts back to 44 in.-lb. of torque.

Note:
If the lower support bolt on the second rung of the 3rd section is a black torque bolt (see photo), replace it with a 3/8 x 2 in., grade 8 bolt. Do not use a flat washer or lock washer. Instead use 2 drops of red Threadlocker.
Lowering RH Aerial Device in Case of a Malfunction (Engine is Operable)

Situation: The aerial device doesn’t lower but the engine is operable.

1. Ignition on.
2. Engage the parking brake.
3. Use a screwdriver to press on the metal tip on top of the valve, depending on the functions desired, or beneath it, as required.

If the solenoid is defective, bypass the solenoid to the motor. Then repeat steps 1 to 3.

Once the ladder is in place, you can go to the service centre nearest you!

Lowering RH Aerial Device in Case of a Malfunction (Engine is Inoperable)

Using a 7/8 ratchet wrench, go to the end of the rotation motor and turn the worm screw. This will cause the ladder to rotate; turn the worm screw until the aerial device is centered with the slewing ring.

Then go the base of the extension cylinder where you will see a holding valve. Using a 9/16 wrench and an Allen wrench, slowly loosen the pressure valve. This will cause the ladder to retract by means of gravity. If for some reason, you wish to stop lowering the ladder, you just have to tighten the valve. Do not get caught between two ladder rungs during this procedure.

Lastly, go to the base of the ladder where the elevation cylinder is located. Perform the same procedures with this cylinder’s holding valve. Prior to proceeding, ensure that the ladder is properly centered with the slewing ring since this can only be done once.

Once the ladder is properly in position, you can proceed to the service center nearest you!

Crack in welding

On the aerial ladder, if a crak appears in a welding, please directly contact the manufacturer to know if it is about a critical welding.
## ELECTRICAL PROBLEMS (Model: RH35 to RH50D)

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| Vehicle battery has low voltage | Not enough voltage to charge:  
  1. The electrical motor  
  2. The electrical motor relay  
  3. The coils of the hydraulic directional valves  
  4. The main panel |
| Faulty contact on the positive and negative terminals of the vehicle battery. | No power / intermittent power for:  
  1. Main panel  
  2. Electrical motor |
| Main circuit fuse blown | Insufficient power supply for:  
  1. Main panel  
  2. Electrical motor |
| Poor contact on the electrical motor’s relay terminals | No power / intermittent power to:  
  1. Main panel  
  2. Electrical motor |

## ELECTRICAL PROBLEMS (Model: RH35 to RH50D)

<table>
<thead>
<tr>
<th>DESCRIPTION OF PROBLEM</th>
<th>POSSIBLE CAUSES</th>
</tr>
</thead>
</table>
| No command works, regardless of control box used. | If there is no power supply to the main panel, either:  
  1. Vehicle key is not in “ignition” position  
  2. Parking brake is not engaged  
  3. Main fuse is blown  
  4. There is a bad contact on the vehicle’s battery terminals  
  5. Faulty power supply connection to the main panel  
  6. Vehicle battery has low voltage  
  7. The main panel’s circuit board is defective |
| | If power is being supplied to the main panel:  
  1. Lamp |
Diagram of Printed Circuit Board  (Model: ES03-1)
Electrical System  (Model: RH35 to RH50D)
Lower controls

<table>
<thead>
<tr>
<th>Wire #</th>
<th>Color</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Red</td>
<td>Positive 1-3</td>
</tr>
<tr>
<td>2</td>
<td>Black</td>
<td>Neutral 2</td>
</tr>
<tr>
<td>3</td>
<td>Red / black</td>
<td>Positive return 4-5</td>
</tr>
<tr>
<td>4</td>
<td>Brown / black</td>
<td>Elevation</td>
</tr>
<tr>
<td>5</td>
<td>Brown</td>
<td>Lowering</td>
</tr>
<tr>
<td>6</td>
<td>Yellow / black</td>
<td>Left</td>
</tr>
<tr>
<td>7</td>
<td>Yellow</td>
<td>Right</td>
</tr>
<tr>
<td>8</td>
<td>Blue / black</td>
<td>Extension</td>
</tr>
<tr>
<td>9</td>
<td>Blue</td>
<td>Retraction</td>
</tr>
<tr>
<td>10</td>
<td>Orange / black</td>
<td>Levelling (top)</td>
</tr>
<tr>
<td>11</td>
<td>Orange</td>
<td>Levelling (bottom)</td>
</tr>
<tr>
<td>12</td>
<td>Black / red</td>
<td>Safety wire #9</td>
</tr>
</tbody>
</table>

Upper controls

<table>
<thead>
<tr>
<th>Wire #</th>
<th>Color</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Red</td>
<td>Positive 1-3</td>
</tr>
<tr>
<td>2</td>
<td>Black</td>
<td>Neutral 2</td>
</tr>
<tr>
<td>3</td>
<td>Red / black</td>
<td>Positive return 4-5</td>
</tr>
<tr>
<td>4</td>
<td>Brown / black</td>
<td>Elevation</td>
</tr>
<tr>
<td>5</td>
<td>Brown</td>
<td>Lowering</td>
</tr>
<tr>
<td>6</td>
<td>Yellow / black</td>
<td>Left</td>
</tr>
<tr>
<td>7</td>
<td>Yellow</td>
<td>Right</td>
</tr>
<tr>
<td>8</td>
<td>Blue / black</td>
<td>Extension</td>
</tr>
<tr>
<td>9</td>
<td>Blue</td>
<td>Retraction</td>
</tr>
<tr>
<td>10</td>
<td>Orange / black</td>
<td>Levelling (top)</td>
</tr>
<tr>
<td>11</td>
<td>Orange</td>
<td>Levelling (bottom)</td>
</tr>
<tr>
<td>12</td>
<td>Black / red</td>
<td>Safety wire #9</td>
</tr>
</tbody>
</table>

The “blue / red” and “orange / red” wires are not used.
Hydraulic Diagrams (Model: RH35 to RH50D)
hydraulic valves

<table>
<thead>
<tr>
<th>NO</th>
<th>description</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>HF06E-606</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>HF06E-666</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>HF06E-685</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>HF43604N-606</td>
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</tr>
<tr>
<td>19</td>
<td>HFC5105 X 6</td>
<td>4</td>
</tr>
<tr>
<td>21</td>
<td>HFC5165 X 6</td>
<td>4</td>
</tr>
</tbody>
</table>