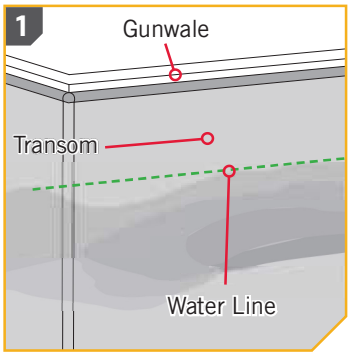
Installing Hydraulic Hoses

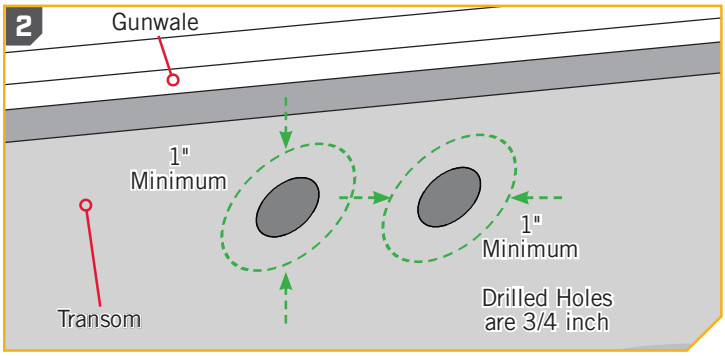
Review the Mounting Considerations at the beginning of installation and then locate the Hydraulic Hoses attached to the Raptor. There will be a green Cap on one hose, designated as the hose controlling the UP/retract function. The hose with the black cap is designated for the DOWN/deploy function. The hose with the black cap (DOWN) extends further from the Raptor due to its mounting position within the Raptor. **Determine if hydraulic hoses may be routed through an established route on the boat to the Hydraulic Pump**. The Hydraulic Hoses are 15 feet in length. If holes need to be drilled to provide a suitable routing for the installation location of the connected components, please give consideration to the following:

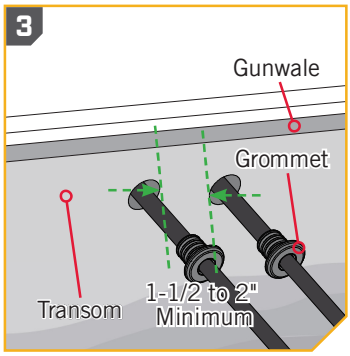
1. Above Water Line - If drilling holes to route the Hydraulic Hoses through the Hull, Transom, or other appropriate structure of the boat, make sure that the holes drilled are above the water line when the boat sits in water.

2. Minimum Clearance - It is recommended to place the holes a minimum of 1 inch from any obstruction to allow for complete installation of the Grommet. This may include structural changes to the selected location such as seams or structural supports and the presence of any existing hardware such as ladders, brackets and existing accessories.

3. Hole Spacing - Two separate holes will need to be drilled for the Hydraulic Hoses. There is a rubber Grommet on each hose. The intention is to use the Grommet to cover the space between the hose and the transom where the holes are drilled. To allows space for the hoses and a proper seal on the Grommet, drill the holes between 1-1/2 and 2 inches apart.





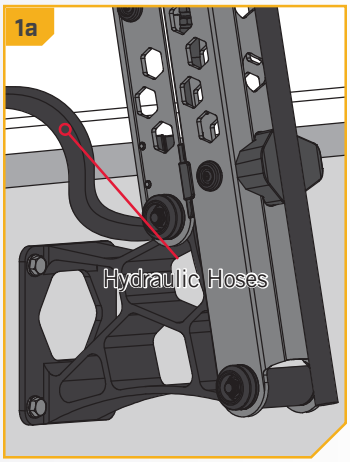


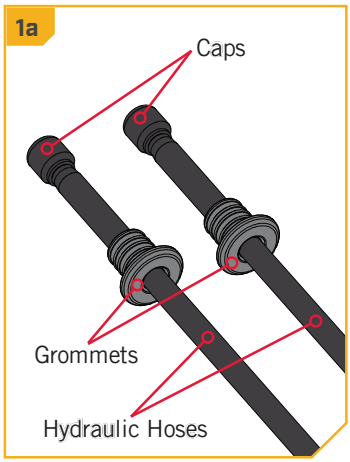
1

a. Locate the Hydraulic Hoses that exit the Raptor, and note the Grommet on each hose. If the Hydraulic Hoses are tie wrapped in a circle, it may be necessary to carefully cut the tie wrap with a scissors or similar cutting tool and unwrap the hoses. There will be a green Cap on one hose, designated as the hose controlling the UP/retract function. The hose with the black cap is designated for the DOWN/deploy function.

⚠ CAUTION

Do not remove the black and green Caps from the end of the Hydraulic Hoses until instructed to do so. Keeping the Caps in place until needed will keep the hydraulic lines clean. Dirt in the hydraulic fluid may affect hydraulic operation.



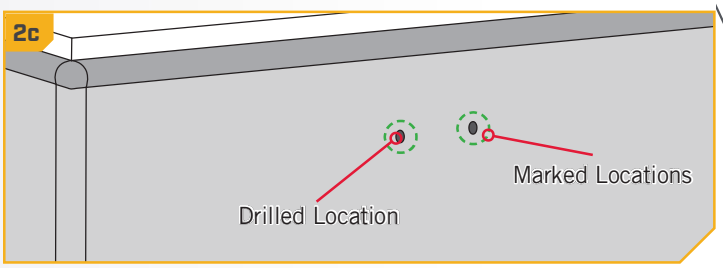


NOTICE: If routing the Hydraulic Hose through an established routing system on the boat, the Grommets may be removed.

2

b. Review the installation considerations for the hoses at the beginning of this section. Select, measure and mark the location on the boat that will be drilled for routing the Hydraulic Hoses using a measuring tool and a pen or similar marking tool.

c. Make sure that the drilled location is clear to drill holes and pull the Hydraulic Hoses aside so they do not pose an obstruction and to clear the marked location. Using a Drill with a 5/16" Drill Bit, drill Pilot Holes through the Marked Locations.

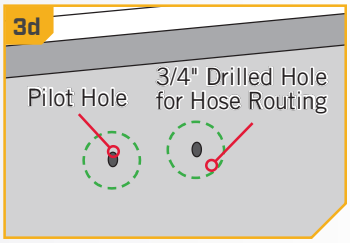


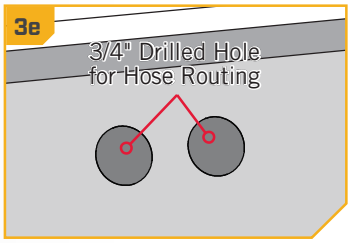
NOTICE: When drilling holes into fiberglass, it is helpful to first cover the surface with masking tape. Use a 5/16" Drill Bit when drilling into Fiberglass for the Pilot Holes. Masking Tape will help keep the boat surface unmarked and help with cleanup. Cover the surface and then mark the location to drill. Once the pilot holes are drilled, remove the masking tape before continuing installation.

3

d. Once the Pilot Holes are drilled, use a Drill with a 3/4" Drill Bit in each 5/16" Pilot Hole. The final holes for hose routing should have a diameter of 3/4" each.

e. Use a file, sand paper or an emery board to smooth the edge of the drilled hole, to smooth the edges, that contact the Hydraulic Hoses and make placement of the Grommets easier.





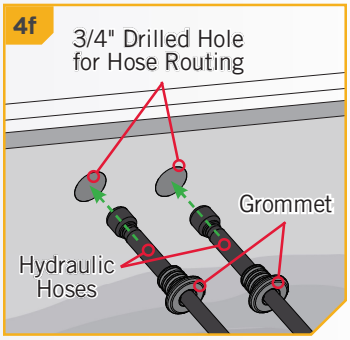
4

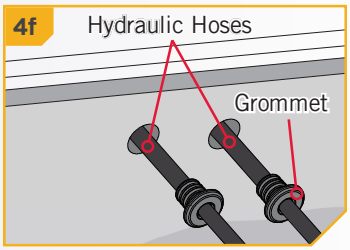
f. Take the Hydraulic Hoses with the green and black Caps still in place and insert one hose into each drilled hole. If necessary, slide the Grommets back so that the Hydraulic Hose has enough slack on the other side of the drilled location to reach the Pump Assembly.

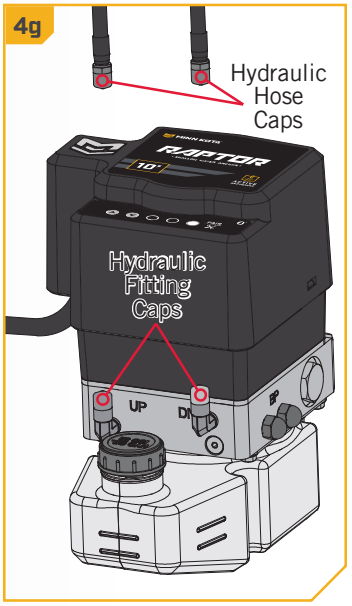
g. Route most of length of the Hydraulic Hoses into the hull so that each hose can be attached to the Hydraulic Hose Fittings on the Pump Assembly. While pulling the hoses thru the hull make sure that the hoses do not kink. Most of the hose should be routed into the boat, but leave slack outside the hull for the anchor to deploy and not pull the hose, but not excessive slack that it would cause the hoses to kink. Then return to the Hydraulic Hoses and Grommets at the Drilled Location.

⚠ CAUTION

Avoid the risk of electric shock. Do not connect the Pump Assembly to a power source when installing hoses.







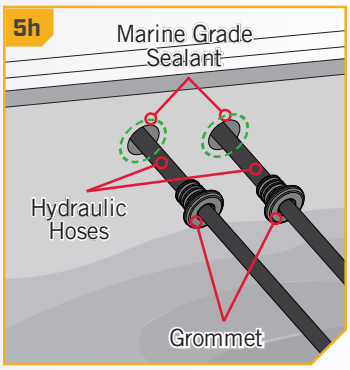
5

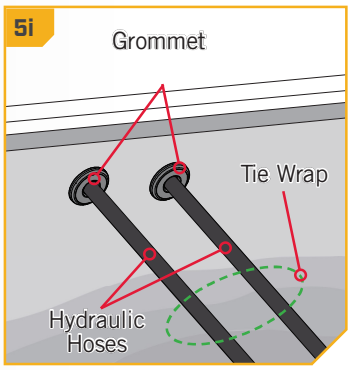
ITEM(S) NEEDED

#36 X 1

h. With the hoses routed to the Pump Assembly, the Mounting surface should be sealed. To seal the space around the grommet and finish installing it, first apply 1/8" bead of marine grade sealant around each Drilled Hole. The sealant should be reasonably close to the edge of the hole so that is will sit under the edge of the Grommet when pressed in place.

i. Once the sealant is applied, press the Grommets in place so they are seated against the mounting surface. When the hose routing is complete, it is recommended to loosely secure the Hydraulic Hoses together with a tie wrap (Item #36) between the anchor and the main entrance point on the boat to keep the hose routing clean.



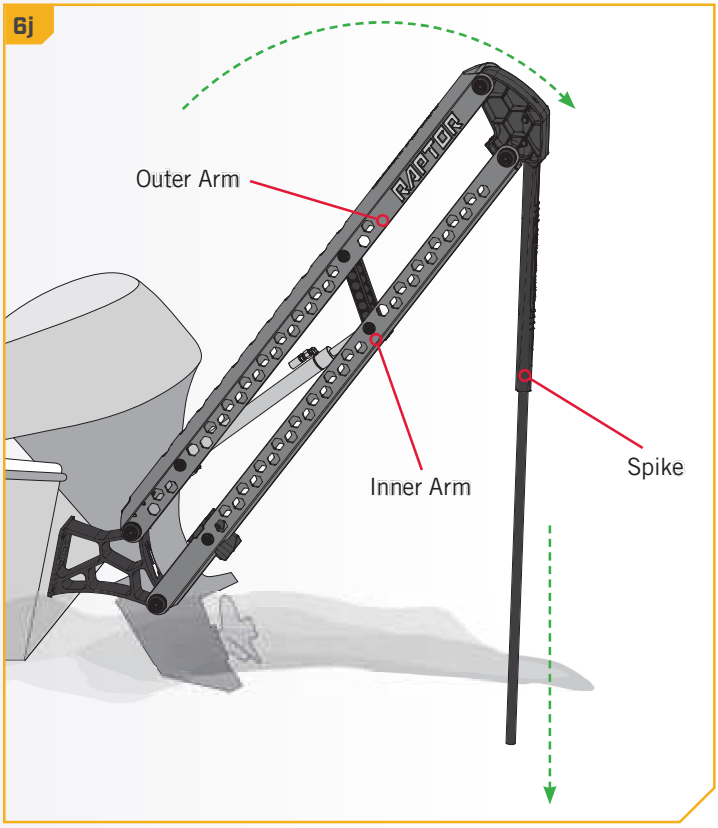


6

j. With the Hydraulic Hoses and Grommets installed, use a second person to carefully lower the Raptor so that the Spike is resting on the ground. Watch for pinch points when lowering the anchor and make sure that the anchor is clear from obstructions or persons before lowering it to the ground.

⚠ CAUTION

Be sure that the Raptor is clear of obstructions and persons while deploying or retracting. The spaces between the Outer Arm, Inner Arm, Spike and brackets of the Raptor can create a pinch point. Do not come in contact with an area of the Raptor that may cause a pinch point while it is moving in any direction to avoid the risk.

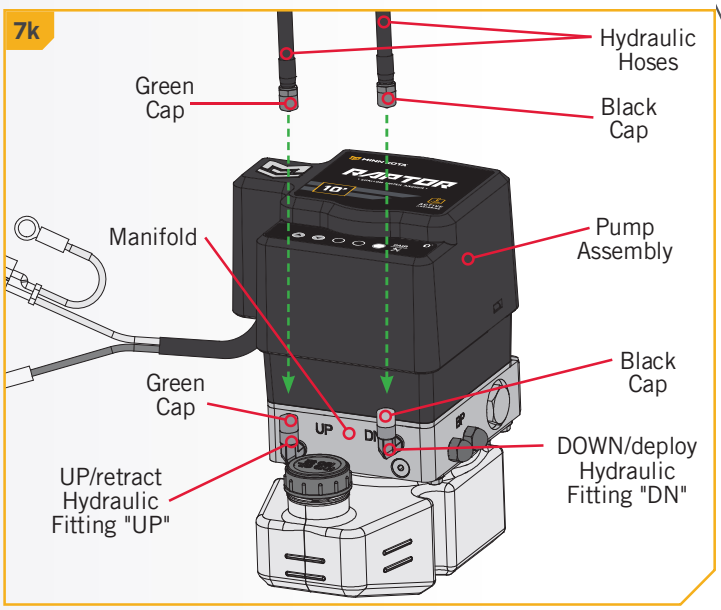


7

k. Return to the routed hoses and the Hydraulic Fittings on the Pump Assembly. The Hydraulic Fitting with the green Cap on the Manifold will correspond to the UP/retract function. It will be marked on the Manifold with "UP". The Hydraulic Fitting with the black Cap on the Manifold will correspond to the DOWN/deploy function. The Hydraulic Fitting will be marked on the Manifold with "DN". The Hydraulic Hose with the green Cap will be matched to the Hydraulic Fitting with the green Cap. The Hydraulic Hose with the black Cap will be matched to the Hydraulic Fitting with the black Cap.

⚠ CAUTION

Make sure that the Raptor anchor is deployed and the Spike is touching the ground if hydraulic pressure is not present. This includes before the Pump Assembly is filled with hydraulic fluid and any time changes to the Hydraulic Circuit are made. Changes to the Hydraulic Circuit may include adjustments to the Hydraulic Hoses, or adjustments to the bypass valves. Changes to pressure in the Hydraulic Circuit may cause the Raptor to fall and pose a striking hazard due to gravity. Rest the Spike on the ground to avoid this hazard.

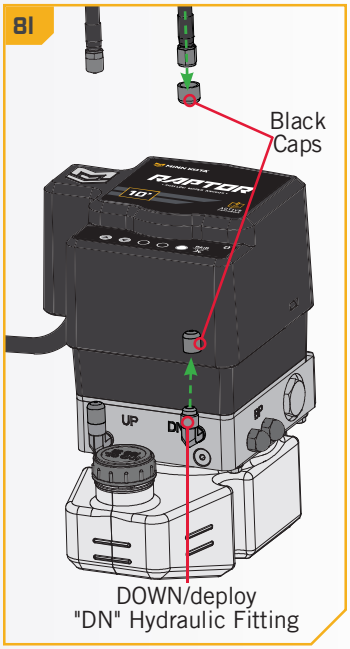


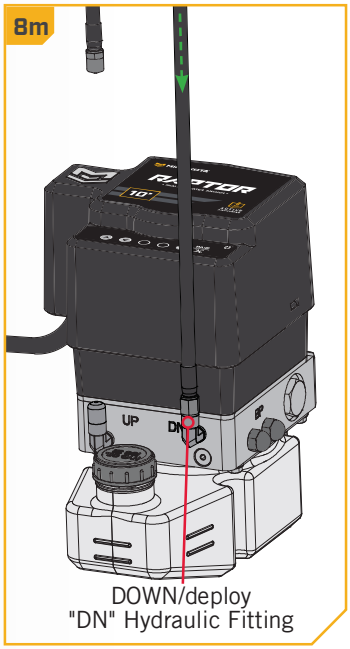
8

l. Remove the black Cap on the Hydraulic Hose and the black Cap on the "DN" Hydraulic Fitting. The Hydraulic Hose with the black Cap will be the longer of the two hoses that come from the Raptor.

m. Attach the Hydraulic Hose to the "DN" Hydraulic Fitting, by turning the threaded connection on the Hydraulic Hose onto the Hydraulic Fitting on the pump by turning 5 to 7 times by hand. If the threads are not freely turning, the threads are misaligned. Lift off and try again. Hand-tighten in a clockwise direction until seated. Then finish tightening with a 9/16" Wrench to 120 in-lbs.

NOTICE: Do not apply anything to the ends of the Hydraulic Hoses or the Hydraulic Fittings on the pump.

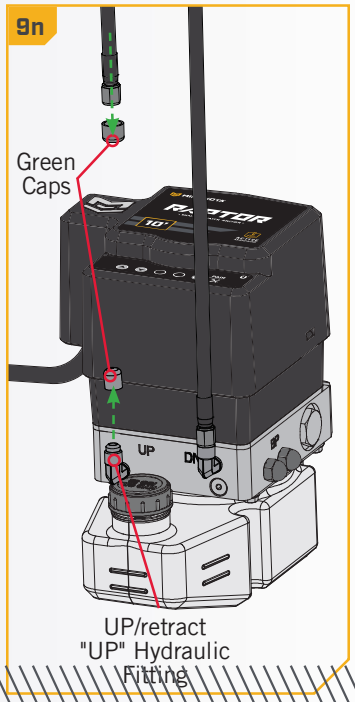


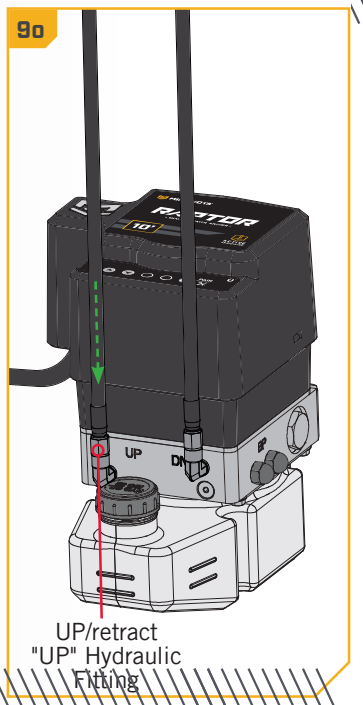


9

n. Remove the green Cap on the Hydraulic Hose and the green Cap on the "UP" Hydraulic Fitting. The Hydraulic Hose with the green Cap will be the one that has the shorter extension from the Raptor.

o. Attach the Hydraulic Hose to the "UP" Hydraulic Fitting, by turning the threaded connection on the Hydraulic Hose onto the Hydraulic Fitting on the pump by turning 5 to 7 times by hand. If the threads are not freely turning, the threads are misaligned. Lift off and try again. Hand-tighten in a clockwise direction until seated. Then finish tightening with a 9/16" Wrench.





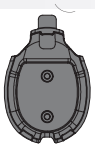
Installing the Remote Bracket

The Raptor comes with two remotes. Mounting the Remote Bracket to your boat is an option installation. The Remote Bracket is only intended to hold one remote. Mounting the Remote Bracket in the boat is based on personal preference. It is recommended to mount the Remote Bracket to a flat surface where the remote can be easily accessed for anchor control. Avoid a space where the buttons on the remote may be accidentally actuated. To mount the bracket, follow the steps below:

1

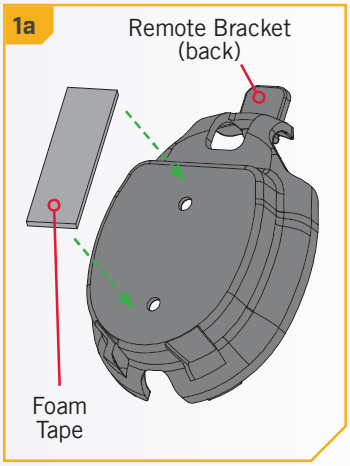
ITEM(S) NEEDED

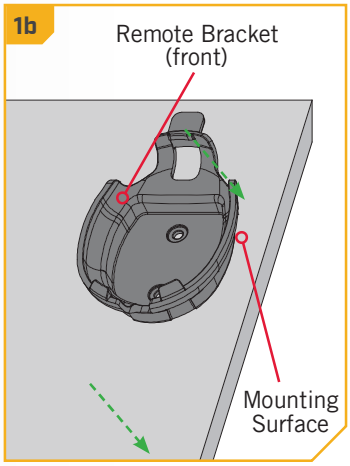
 #32 X 1

 #30 X 1

a. Select a flat mounting location for the Remote Bracket. Check the location for fit and function of the Bracket Holder. Clean and thoroughly dry the mounting surface. Once satisfied with the location, take the Foam Tape (Item #32) and pull the backing off of one side of it. Install the Foam Tape with the exposed adhesive facing toward bracket, approximately centered on the back of the Remote Bracket (Item #30). Press and hold in place for 30 seconds.

b. Remove the backing on the outside of the Foam Tape to expose the adhesive. Place the Bracket Holder to the mounting location. Firmly press and hold for 30 seconds.





2

ITEM(S) NEEDED

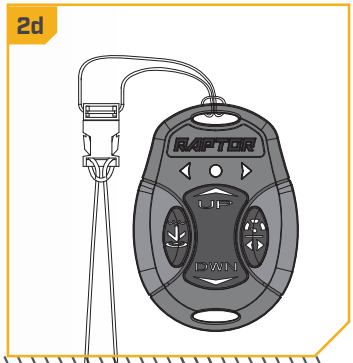
 #28 X 1

 #G X 1

c. Take one of the Raptor remotes (Assembly G) and place it in the Bracket Holder.

d. It is also optional to place the Lanyard (Item #28 X 1) on either of the Raptor remotes.

NOTICE: The two Raptor remotes that come with the Raptor from the factory are pre-paired. If the network connection between the remotes and the anchor is interrupted, please see "Pairing the Raptor" section of these instructions.



BATTERY & WIRING INSTALLATION

BOAT RIGGING & PRODUCT INSTALLATION

For safety and compliance reasons, we recommend that you follow American Boat and Yacht Council (ABYC) standards when rigging your boat. Altering boat wiring should be completed by a qualified marine technician. The following specifications are for general guidelines only.

⚠ CAUTION

Please read the following information before connecting your Raptor(s) to your battery in order to avoid damaging your product and/or voiding your warranty.

⚠ CAUTION

These guidelines apply to general rigging to support your Minn Kota product. Powering multiple Raptors or additional electrical devices from the same power circuit may impact the recommended conductor gauge and circuit breaker size. If you are using wire longer than that provided with your unit, follow the conductor gauge and circuit breaker sizing table below. If your wire extension length is more than 25 feet, we recommend that you contact a qualified marine technician.

⚠ CAUTION

An over-current protection device (circuit breaker or fuse) must be used. Coast Guard requirements dictate that each ungrounded current-carrying conductor must be protected by a manually reset, trip-free circuit breaker or fuse. The type (voltage and current rating) of the fuse or circuit breaker must be sized accordingly. The table below gives recommended guidelines for circuit breaker sizing.

CONDUCTOR GAUGE AND CIRCUIT BREAKER SIZING TABLE

This conductor and circuit breaker sizing table is only valid for the following assumptions:

1. No more than 2 conductors are bundled together inside of a sheath or conduit outside of engine spaces.
2. Each conductor has 105° C temp rated insulation.
3. No more than 5% voltage drop allowed at full power based on published product power requirements.

Max Amp Draw	Circuit Breaker	Wire Extension Length				
		5 feet	10 feet	15 feet	20 feet	25 feet
70 Amps	30 Amp @ 12 VDC	10 AWG	8 AWG	6 AWG	4 AWG	4 AWG

NOTICE: Wire Extension Length refers to the distance from the batteries to the Raptor leads. Maximum Amp Draw values only occur intermittently during select conditions and should not be used as continuous amp load ratings.

Reference

United States Code of Federal Regulations: 33 CFR 183 – Boats and Associated Equipment ABYC E-11: AC and DC Electrical Systems on Boats

SELECTING THE CORRECT BATTERIES

The Raptor will operate with any lead acid, marine 12 volt battery. For best results, Minn Kota recommends connecting to the starting battery. The Raptor may operate with a Lithium Ion battery. Maintain battery at full charge. Proper care will ensure having battery power when you need it, and will significantly improve the battery life. Failure to recharge lead-acid batteries (within 12-24 hours) is the leading cause of premature battery failure. Use a multi-stage charger to avoid overcharging. We offer a wide selection of chargers to fit your charging needs. For more information on battery selection and rigging, please visit minnkotamotors.com.

The Raptor draws a small amount of residual current from the battery even when not in use. If the Raptor will not be used for more than a month, the Raptor power leads should be disconnected from the battery. Avoid connecting the Raptor to the same batteries that a trolling motor or other accessories are connected to. It is recommended the Raptor be connected to the Starting Battery through a battery selector or power disconnect switch. This will disconnect power to the Raptor when the Power Switch is "off". If you are not using a battery selector/power disconnect switch, the Raptor may be connected directly to the Starting Battery.

⚠ WARNING

Never connect the (+) and the (–) terminals of the same battery together. Take care that no metal object can fall onto the battery and short the terminals. This would immediately lead to a short and extreme fire danger.

For proper ABYC compliance, when the factory fuse has been removed, the user must install a 30A fuse within 7" of the positive battery terminal.

NOTICE: The in-line re-settable 30A fuse is designed to protect the system. If this fuse repeatedly trips, faulty wiring could be the cause and must be corrected. If the re-settable fuse itself is suspect, Minn Kota recommends contacting customer service for a proper replacement.

CONNECTING THE BATTERIES

12 Volt Systems

1. If connecting to an optional battery selector/power disconnect switch, turn it to the "off" position prior to connecting the power cable.
2. Connect positive (+) white lead to positive (+) battery terminal, or switch positive.
3. Connect negative (–) black lead to negative (–) battery terminal, or switch negative.

⚠ WARNING

Observe proper polarity and follow instructions in your boat owner's manual regarding polarity.

4. The Pump Assembly will beep to indicate Power "on". There is NO "on/off" switch. To remove power from the Pump Assembly, the Raptor must be powered "off" by removing the leads from the battery terminals, or switch.

⚠ WARNING

Do not run the Hydraulic Pump until after hydraulic fluid has been added. Running the Hydraulic Pump without hydraulic fluid can damage the pump.

⚠ WARNING

- The Raptor draws a small amount of residual current from the battery even when not in use. If the Raptor is not be used for more than a month, or while the battery/batteries are being charged, the Raptor power leads should be disconnected from the battery. It is recommended the Raptor be connected to the Starting Battery through a battery selector or power disconnect switch. This will disconnect power to the Raptor when the Power Switch is "off". If you are not using a battery selector/switch, the Raptor may be connected directly to the starting battery.
- Keep lead wire connections tight and solid to the battery or switch terminals.
- The Starting Battery should be located in a ventilated compartment to avoid sparks from combustible materials.

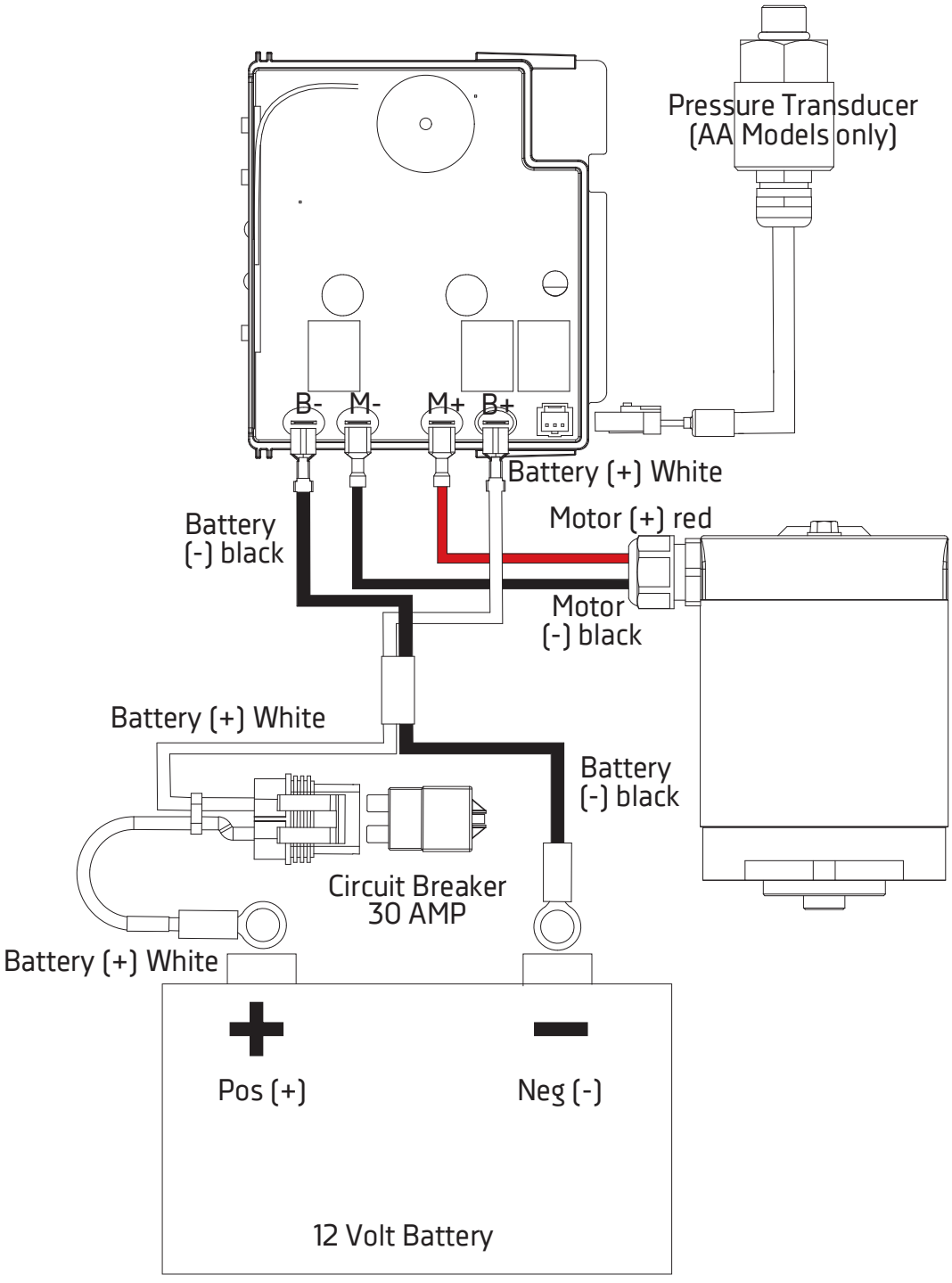
⚠ WARNING

Never disconnect hydraulic components while power is applied and bypass valves are not open

WIRING DIAGRAM

RAPTOR

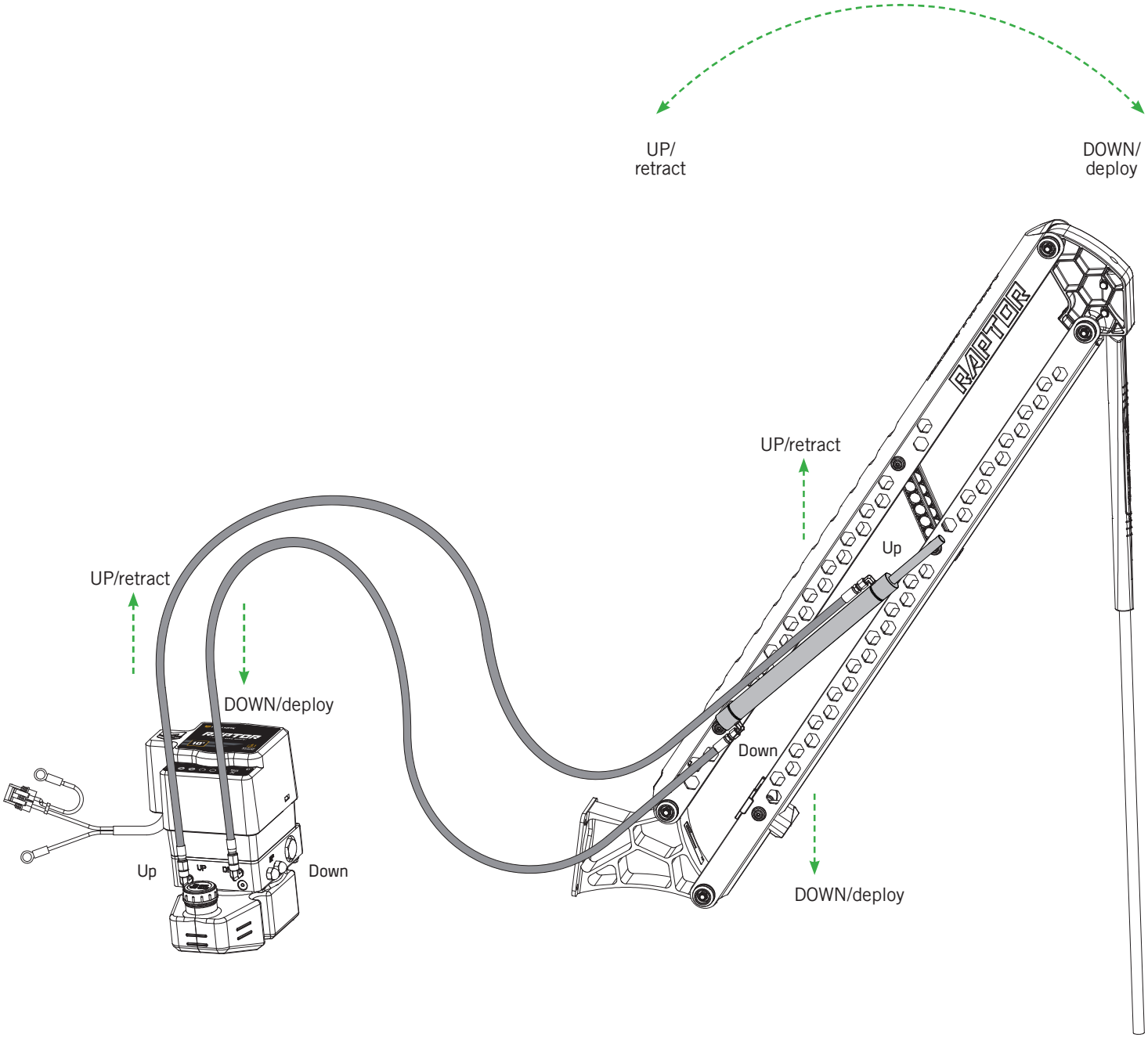
The following wiring diagram applies to the Raptor. The Pressure Transducer is included in Active Anchoring Models only.



HYDRAULIC DIAGRAM

RAPTOR

The following hydraulic diagram applies to all Raptors.



COMPLETING THE INSTALLATION

COMPLETING THE RAPTOR INSTALLATION

At this point in the installation, the Raptor anchor and Pump Assembly have been successfully mounted to the boat and connected to a power source. The Hydraulic Hoses have also been routed and connected to the Pump Assembly. Since the motion of the anchor is also controlled by the use of hydraulics, to complete the installation, the Pump Assembly needs to be filled with hydraulic fluid and go through a deploy/retract sequence to bleed the hydraulic lines. The final steps in installation will include confirming the Bluetooth connection between the remotes that come paired with the anchor from the factory and the Pump Assembly. Before using the Raptor for its intended purpose, confirm that the installation of the components is complete and then finalize the installation for successful operation.

⚠ CAUTION

Because of the mechanical pressure from the use of hydraulics, avoid injury by making sure the mechanical installation of the Raptor anchor and Pump Assembly is complete before finalizing the installation. Hydraulic pressure from unsecured components may cause unexpected operation and movement of components.

Filling the Pump with Hydraulic Fluid and Bleeding the Hydraulic Lines

In order to complete the installation, the Pump Assembly needs to be connected to a power source. If the Pump is not connected to a power source, review the "Battery & Wiring Installation" section of these instructions.

1

a. The Raptor anchor should be extended so that the Spike is resting on the ground. If the Spike is not resting on the ground from the previous installation steps, carefully lower the anchor with the help of a second person. Watch for pinch points when manually moving the Raptor.

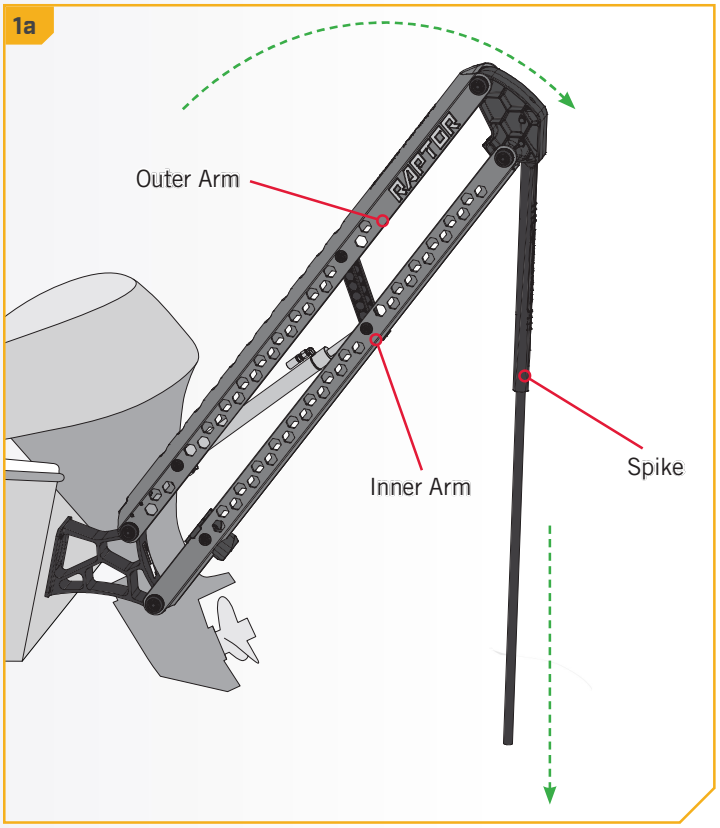
⚠ CAUTION

Be sure that the Raptor is clear of obstructions and persons while deploying or retracting. The spaces between the Outer Arm, Inner Arm, Spike and brackets of the Raptor can create a pinch point. Do not come in contact with an area of the Raptor that may cause a pinch point while it is moving in any direction to avoid the risk. Stay clear of the anchor if it is not held in place under the power of the Hydraulic Circuit or physical restraint. Not lowering the Spike before filling the Hydraulic Circuit and bleeding the hydraulic lines can result in a striking hazard created by the force of gravity on an unsecured anchor. Lower the Spike to avoid the risk.

⚠ WARNING

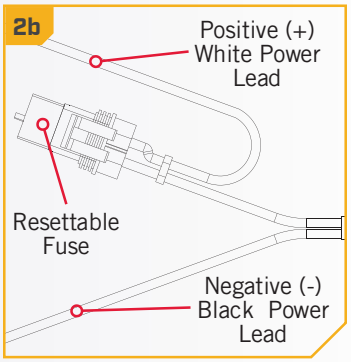
Do not run the Hydraulic Pump until after hydraulic fluid has been added. Running the Hydraulic Pump without hydraulic fluid can damage the pump.

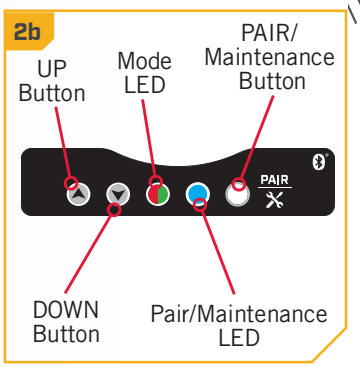
1a



2

b. When the Pump Assembly was attached to a power source, it beeped to indicate Power "on". To test that there is power to the Pump Assembly, remove the Resettable Fuse from the positive (+) white power lead and re-insert it. When Power is restored, the LED's will flash in a series and then the pump will beep. The Mode LED will flash red at the same time as the Pair/Maintenance LED flashes blue. Then the LEDs will shut off and the Mode LED will flash green. When the Mode LED turns off, the pump will beep to confirm that power is restored. The Pump Assembly is ready to be filled with Hydraulic Fluid.





⚠ CAUTION

The Pump Assembly is connected to a power source during this step of the installation. Review the "Battery & Wiring Installation" section of these instructions to become familiar with the risks involved in working with electrical currents.

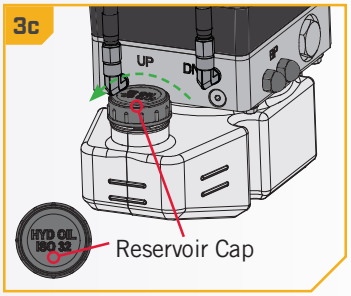
3

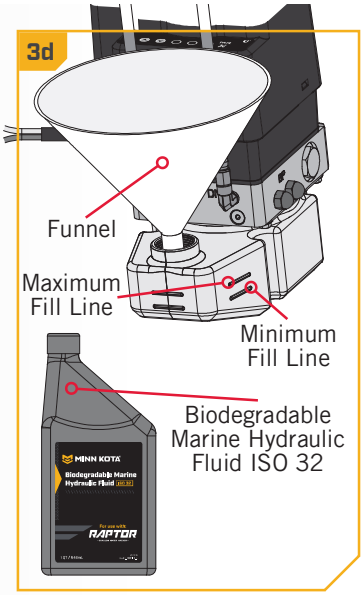
ITEM(S) NEEDED

#24 X 1

c. Remove the Reservoir Cap on the Pump Assembly by turning it counter-clockwise. Set the cap aside, making sure that it will not get dirty.

d. Place a clean Funnel or similar tool onto the Reservoir. Notice the maximum and minimum fill lines on the Reservoir. The Raptor Pump Reservoir is designed to hold 1 quart of Hydraulic Fluid. Take the Biodegradable Marine Hydraulic Fluid ISO 32 (Item #24) and fill the Reservoir with at least half of the quart until the Reservoir is filled to the Maximum Fill Line.





NOTICE: If the Reservoir Cap (Part #2350200) becomes lost or dirty, order a new one online at minnkotamotors.

⚠ CAUTION

Biodegradable Marine Hydraulic Fluid ISO 32

First Aid: Keep out of reach of children - do not induce vomiting
Eye Contact: Flush affected eyes with water for at least 15 minutes.
Skin Contact: Wash any exposed skin portion thoroughly with soap and water.

NOTICE: Minn Kota recommends using Biodegradable Marine Hydraulic Fluid ISO 32 (Part #2357700.) If additional Hydraulic Fluid is needed, order online at minnkotamotors.com or find an equivalent ISO 32 biodegradable marine grade hydraulic fluid.

4

e. Replace the Hydraulic Cap by turning it clockwise.

f. Use the Up ▲ and Down ▼ Buttons on the Hydraulic Pump to cycle through the retract (up) and deploy (down) sequence. After one to two deploy and retract cycles, check the Reservoir to make sure that the Hydraulic Fluid is not below the Minimum Fluid Line.

NOTICE: During the first few cycles it is normal for the anchor to have little movement when the Up and Down Buttons are pressed. The Hydraulic Lines and Cylinder must fill with Hydraulic Fluid before normal, smooth movements will take place.

⚠ WARNING

Take care that neither you nor other persons approach the Raptor Spike too closely while operating, neither with body parts nor with objects. The Raptor is powerful and may endanger or injure you or others. While the Raptor is operating, watch out for persons and obstructions while controlling the Raptor.

g. If the Hydraulic Fluid is below the minimum, add more, by following the procedure above. Then cycle the Raptor through a minimum of ten deploy and retract cycles.

h. Once ten cycles are completed, return to filling the Reservoir. If the Hydraulic Fluid is below the minimum, add more, by following the procedure above. Repeat five more retract and deploy cycles. Finish with the Raptor in the fully retracted state.