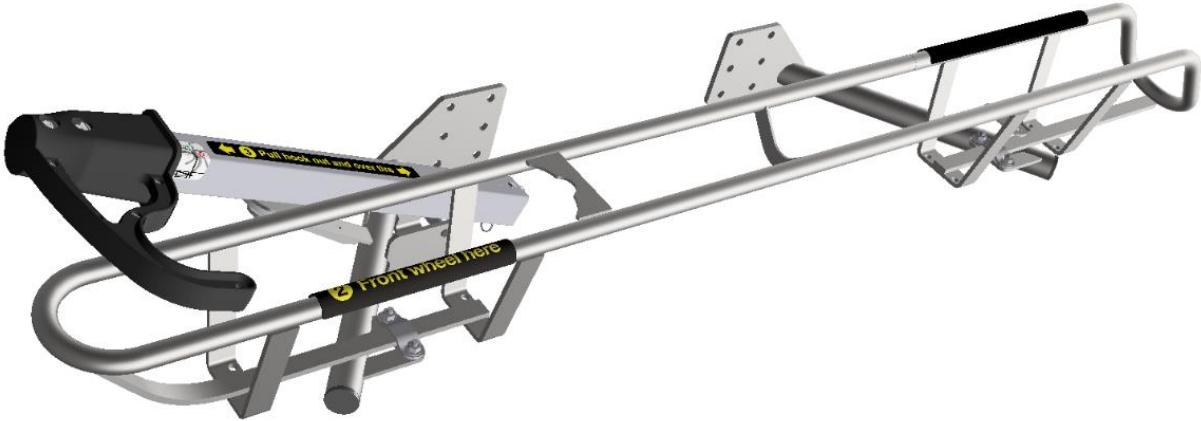


Apex 1™ 1-Position Bicycle Rack

Operation and Maintenance Instructions



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1. INTRODUCTION

This document applies to all Apex 1 bicycle racks. The Apex 1 is a 1-position bike rack with a stainless steel frame, wheel tray, and support arm. There are two main versions of the Apex 1 – one with a standard tray and support arm, and the other with a fat tire compatible wheel tray and support arm.

Figure 1, Apex 1 with Standard Wheel Tray and Support Arm



Figure 2, Apex 1 with Fat Tire Compatible Wheel Tray and Support Arm



Part Numbers:

101451-XXX	Apex 1 with standard tray and arm
101451-FAT-XXX	Apex 1 with fat tire compatible wheel tray and arm

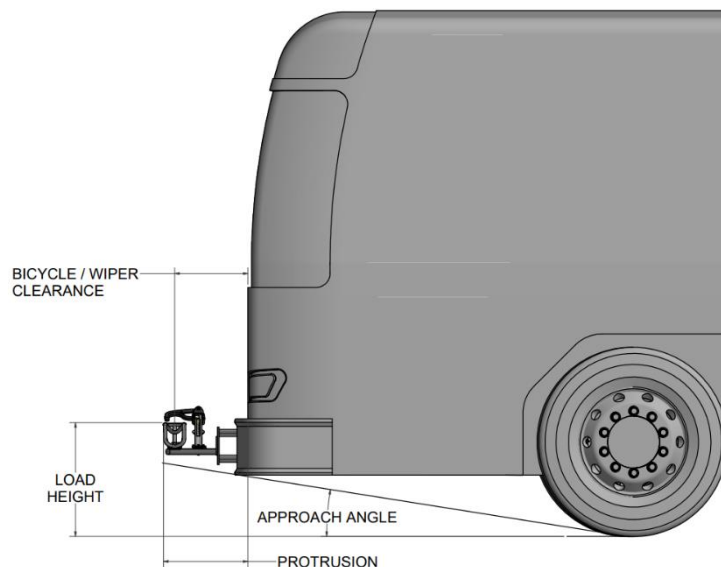
2. INSTALLATION

Proper installation is crucial to the safety and performance of the Sportworks Bike Rack system. Several factors need to be considered when mounting the rack. These factors include the:

- Load height
- Approach angle
- Protrusion
- Bicycle to wiper clearance

Carefully read and understand the following information regarding the positioning of the rack on the bus before beginning the installation process.

Figure 3, Diagram of Factors to Consider During Installation



Load Height

The load height is the vertical distance a bicycle must be lifted for placement in the bike rack. If the rack is mounted too high, some riders may have difficulty loading the rack.

Approach Angle

APTA (American Public Transportation Association) standards require a minimum approach angle of 8°, although some agencies in hilly areas may prefer 9°. The bike rack will limit the approach angle if it is installed on the bumper in a low position. The bike rack installer should be aware of this possibility and determine approach angle requirements before mounting the rack.

Protrusion

Protrusion measures the distance from the front of the bumper to the front edge of the bike rack. Once the bike rack is mounted to the vehicle, the protrusion distance is fixed. Protrusion is a measurement that needs attention for two important reasons.

1. Many State Departments of Transportation have set limits for bike rack protrusion (e.g., California, one of the most restrictive, has set a protrusion limit of 40 inches measured from the front body of the vehicle).
2. The further a rack protrudes, the more likely it will affect a coach's approach angle and turning radius. It will also influence the bicycle/wiper clearance, which could cause interference with windshield wipers or an operator's field of view.

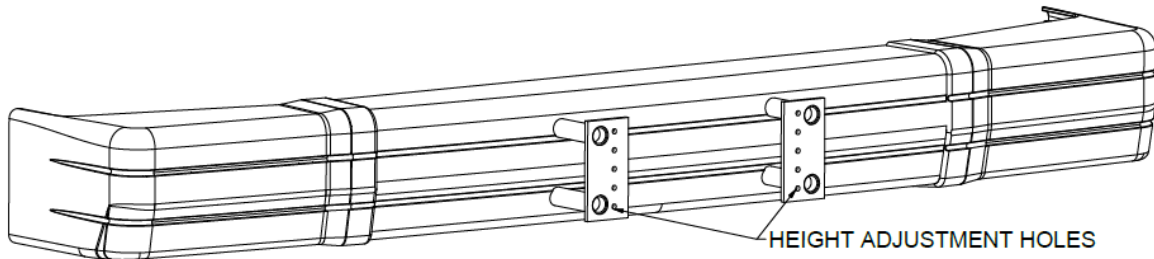
Bicycle / Wiper Clearance

It is important to ensure that the handlebars of a loaded bicycle do not interfere with windshield wipers. A minimum of sixteen inches of horizontal distance is recommended between the center of the wheel tray and the wiper arms.

Vertical Mounting

Some bracket assemblies do not have multiple height adjustment holes. If this is the case, the bracket assembly is designed for an optimum position in terms of minimal headlight interference and proper loading height for that type of vehicle. Height adjustment is not required.

Figure 4, Bracket Adjustment Holes



a) Mounting the Rack

1. Mount the Apex 1 Rack to the 14"- or 18"-hole pattern using supplied bolt kit.
2. Center the Apex 1 vertically on the Brackets. It can be raised or lower if needed for driver visibility or ease of loading bicycles.

Figure 5, Top View of Rack

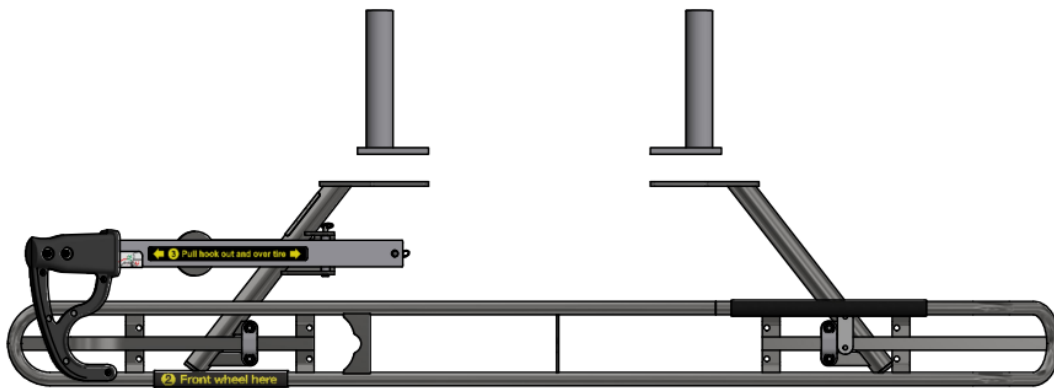
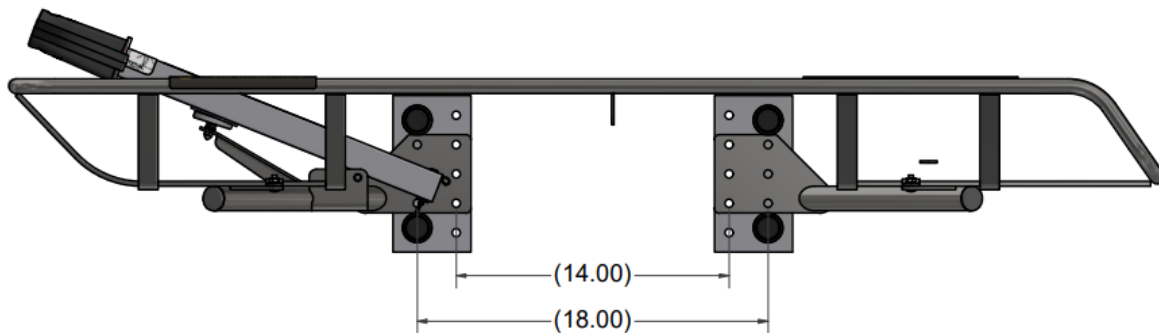


Figure 6, Front View of Rack



NOTE: Standoffs can be installed for either a 14” or 18” mounting hole pattern. The Apex 1 will mount to either the 14” or 18” hole pattern.

General Torque Specs

Most brackets are attached to the bus bumper using Grade 8 ½-13 HHCS. The frame is attached to the bracket using Grade 8 ½-13 HHCS.

Recommended torque values:

- ½-13 Grade 8 – 80-90 FT-LB
- 3/8-16 Grade 8 – 30-40 FT-LB

3. OPERATING THE BIKE RACK

All loading and unloading of bikes can be accomplished by the rider. Loading of children's bikes shall be supervised by an accompanying adult.

a) Bicycle Loading

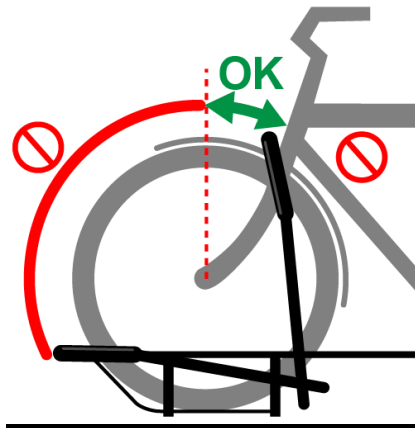
1. Prepare the bicycle by removing water bottles, pumps, panniers, bags, and other loose items that could fall while the vehicle is in motion.
2. Indicate to the operator that you will be loading your bike. Bikes should be loaded from the curbside or from in front of the vehicle. Do not step beyond the vehicle into passing traffic to load your bike.
3. Lift your bike onto the bike rack, fitting your front wheel into a wheel slot labeled for the front wheel.
4. Raise the support arm hook over the front tire. The support arm will keep the bike secure while the vehicle is in motion.

NOTE: The support arm hook must be between the highest point of the tire and the head tube. Incorrect placement may result in the bike falling from the rack, which could result in injury and/or damage to the bike, the vehicle in operation, and other vehicles.

If the bicycle has fenders, place the support arm hook over or under the fender as required to achieve the correct hook position.

Some bike accessories such as front racks and baskets with vertical support stays may preclude correct hook placement. Bikes with accessories that conflict with correct support arm placement must NOT be loaded onto the rack.

Figure 7, Proper Placement of Support Arm



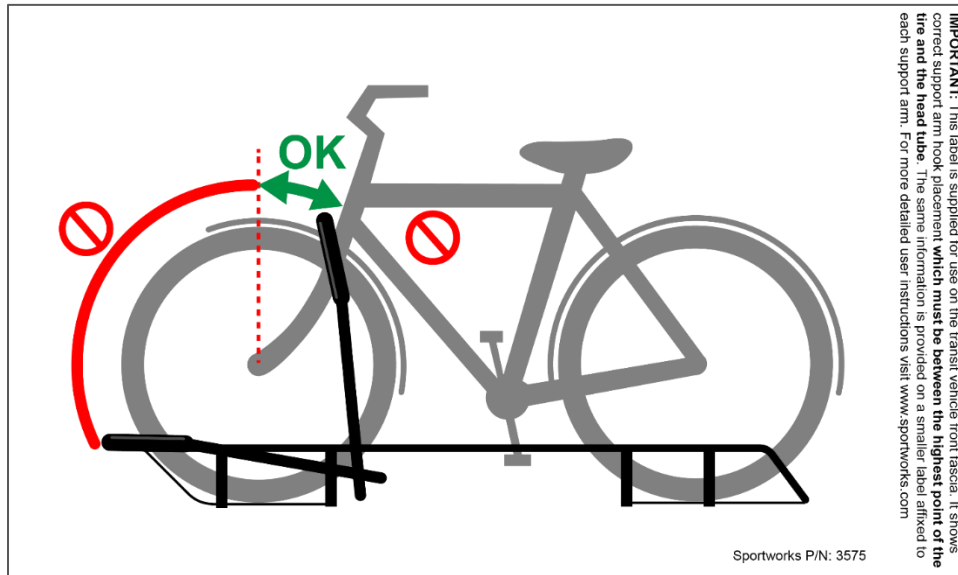
b) Bicycle Unloading

1. Indicate to the operator that you will be unloading your bike as you approach your stop. Bikes should be unloaded from the curbside or from in front of the vehicle. Do not step beyond the vehicle into passing traffic to unload your bike.
2. Raise the support arm hook off the tire and return it to its stowed position.
3. Lift the bike out of the bike rack.
4. Step away from the transit vehicle with your bike onto the curb.

NOTE: LOADING OR UNLOADING A BIKE FROM THE STREET SIDE OF THE TRANSIT VEHICLE MAY CAUSE INJURY OR DEATH.

Sportworks label #3575 depicted below is available for use on the transit vehicle front fascia. The label measures 9.5 inches by 6.0 inches. It contains the same graphic in a larger format as the label affixed to each support arm of the rack.

Figure 8, Instructional Label with Support Arm Placement Instructions



Supported Bike Dimensions and Weight Limits

To ensure safe bicycle fit in the Apex 1 rack, each bicycle must comply with the following:

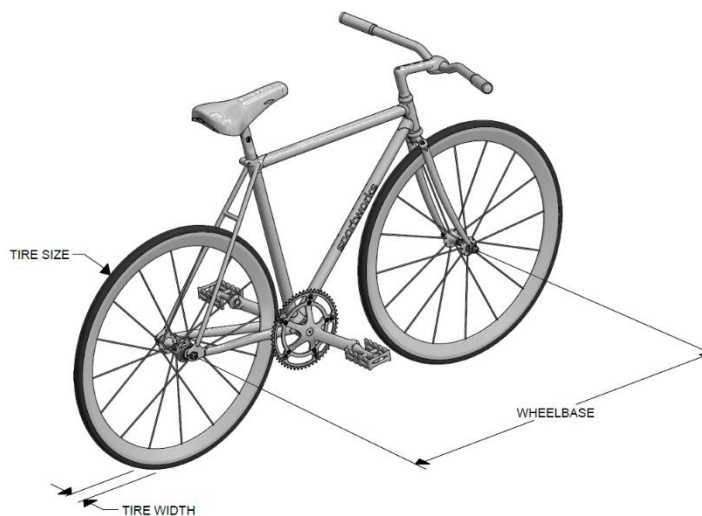
Apex 1 with standard tray and support arm:

- Wheelbase (max): 48.0in
- Tire width (max): 3.2in
- Tire size (min-max): 16-29in (incl. 700c)
- Weight (max): 75lbs

Apex 1 with fat tire compatible tray and support arm:

- Wheelbase (max): 51.0in
- Tire width (max): 5.5in
- Tire size (min-max): 24-29in (incl. 700c)
- Weight (max): 75lbs

Figure 9, Reference for Supported Bicycle Specifications



All dimensions and specifications nominal. Specifications are subject to change without notice. Copyright © 2022 Sportworks Global LLC. All rights reserved.

4. USE OF THE BUS WASH

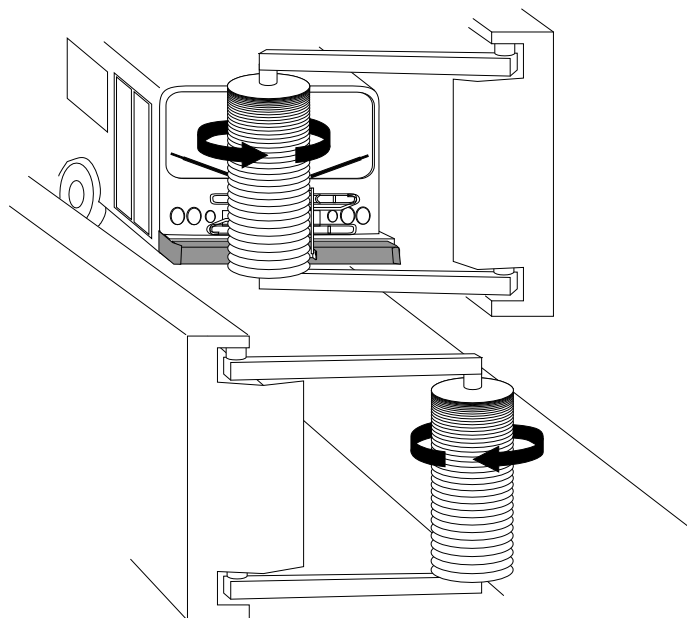
Sportworks racks have been designed to safely pass-through bus wash facilities. Before taking a newly mounted bike rack through a wash facility, the operator should check to ensure that the wash facility is properly set up for washing the bus with a rack on it.

Most wash systems use either a "top fixed" or "top and bottom fixed" spinning brush system. The Sportworks rack has been designed with round tubing and round edges so that the wash brushes contact surfaces that will not catch or tear them.

Some conditions may cause excessive wear or harm to the bike rack or the wash system. This is typically due to brush entanglement with the rack. These best practices should be followed to avoid damage:

1. Ensure brushes are spinning at an adequate RPM. If the brushes are rotating too slowly, it may cause the brushes to hook on protruding objects. If the axle of the brush assembly pushes against the rack or any part of the bus that has a crevice, it may allow bristles to become entangled.
2. Ensure the vehicle enters the wash system slowly to minimize impact between the rack and the brushes.
3. Replace and maintain brushes at recommended intervals. Low brush density can also cause entanglement.
4. Ensure proper brush rotation. Refer to Figure 1. The illustration shows the recommended rotation for the brush assemblies. If the brush assembly is fixed to the driver's side, the brush should rotate counterclockwise, as viewed from the top. If the brush assembly is mounted on the curbside, the brush assembly should rotate clockwise.

Figure 10: Bus Wash Brush Orientation



When operating as recommended, no unusual deterioration should occur. If damage occurs, take time to examine the rack installation as well as the vehicle and setup of the wash facility. Please contact Sportworks at 425-483-7000 for assistance.

5. INSPECTION AND MAINTENANCE

a) Visual Inspection Checklist (Pre-Trip Checklist)

The following is recommended to ensure an operable bike rack prior to use. These instructions are intended for use as an inspection sheet for operators.

Examine the items below before operating the vehicle. If the bike rack does not function as described, service is recommended before continuing operation. Refer to Figure 11, Location of Rack Components for the location of each item (as numbered below).

1. _____ **ENDPLUGS ARE PRESENT (2 PLACES)**
Replace plugs if missing or damaged.

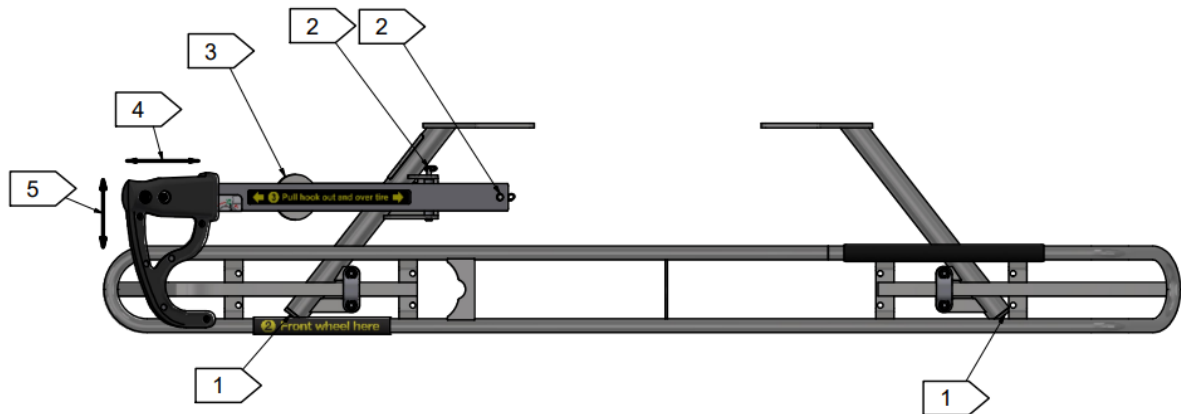
2. _____ **CLEVIS PINS AND SPLIT RINGS ARE PRESENT
SECURE ARMS TO FRAME (2 PLACES)**
Replace missing parts.

3. _____ **MAGNET IS IN PLACE**
Replace if missing. The magnet secures the support arm.

4. _____ **SUPPORT ARM SLIDES IN/ OUT**
Hooks move smoothly in/out and self-stow on the magnet. **DO NOT LUBRICATE.**

5. _____ **SUPPORT ARM SIDE PLAY NOT EXCESSIVE**
Verify that the support arm side to side play is less than 1.5" (measured at the hook with the support arm retracted, but not resting on the magnet). If play is excessive, there are several possible causes including: Broken or bent support arm bracket; Missing, bent, worn or broken hinge clevis pin - ensure clevis pin is held in place with hairpin clip; Bent or broken support arm spar; Worn or missing bushings in the support arm housing.
Missing or damaged components should be replaced.

Figure 11, Location of Rack Components



b) 30 Day General Maintenance Inspection and Service

The bike rack system requires minimal service. The following maintenance inspection and service is recommended every 30 days.

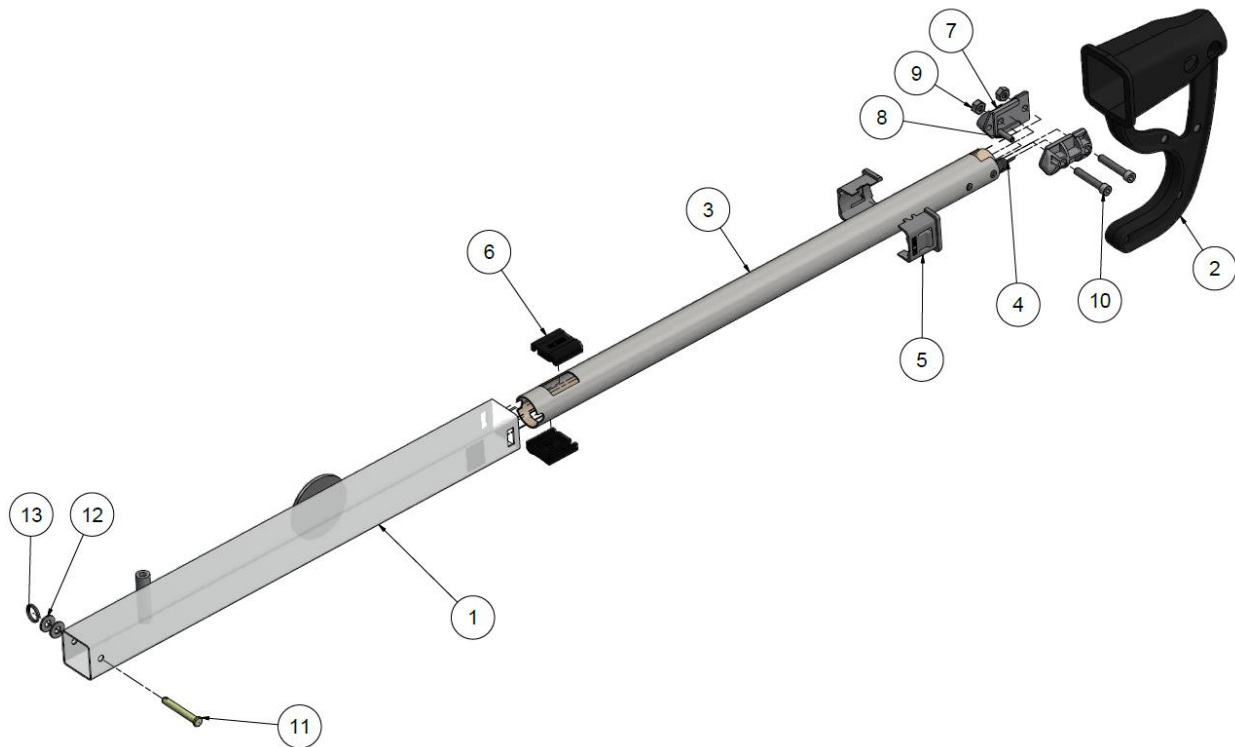
NOTE: DO NOT LUBRICATE any part of the bike rack. Lubricants may trap dirt/dust and inhibit the function of the rack.

1. Inspect the support arm clevis pin located at the lower end of the support arm. The support arm hinge allows the support arm to raise and lower and should do so without excessive resistance. Inspect the area where the pin contacts the square support arm housing and near the split ring for excessive wear. If wear is evident replace the pin, washers, and the split ring. Refer to section 6 for support arm service instructions.
2. Verify that the support arm magnet properly mates with and holds the support arm.
3. The support arm hook should extend smoothly and easily slide back into the stowed position. If excessive resistance is encountered, refer to section 6 for support arm service instructions.
4. Verify that the support arm side to side play is less than 1.5" (measured at the hook with the support arm retracted, but not resting on the magnet). If play is excessive, there are several possible causes including: Broken or bent support arm bracket; Missing, bent, worn or broken hinge clevis pin - ensure clevis pin is held in place with hairpin clip; Bent or broken support arm spar; Worn or missing bushings in the support arm housing. Missing or damaged components should be replaced.
5. Fasteners should be tightly secured on the bike rack and mounting bracket, including hardware for the tray, and brackets attached to the bumper or vehicle body.
6. Black plastic end plugs should be inserted into the two main frame tubes. Replace if missing.
7. Ensure the instruction labels on the rack are intact. Replace if worn or non-legible. Be sure to clean the rack surface thoroughly (using isopropyl alcohol) before replacing.
NOTE: The chain guard sticker typically requires more frequent replacement.
8. If rust develops on stainless steel surfaces use a rust removal product (such as "Naval Jelly").

6. SUPPORT ARM

NOTE: The standard support arm is shown, fat tire bike compatible support arm components vary. Refer to Apex 1 Parts and Options Breakdown for more information and contact Sportworks for any required replacement parts.

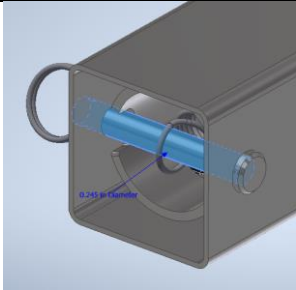
Figure 12, Location of Support Arm Components



ITEM NO.	QTY	PART DESCRIPTION
1	1	Weldment, Apex Support Arm Housing, Shot Peened
2	1	Support Arm Grip, Apex
3	1	Support Arm Spar, Apex
4	2	Support Arm Spring
5	2	Apex Upper Bushing
6	2	Apex Lower Bushing
7	2	Shank Support, Apex Support Arm Hook
8	1	Pin, Roll, 5/32 x 0.75, SS
9	2	Nut, 1/4-20 Deformed Thread, Self-Locking, SS
10	2	SHCS, .250-20 X 1.75
11	1	Pin, Clevis, 0.25 x 1.75
12	2	Washer, Flat, 1/4 SAE, SS
13	1	Ring, Split, 0.670 O.D. x 0.051 Wire Dia, SS

1. Examine the components inside of the support arm.
 - a. Remove the split ring from the clevis pin in the support arm pivot.
 - b. Remove the split ring (13) from the clevis pin (11) at the bottom of the support arm housing.
 - c. Remove the clevis pin.
 - d. Remove the fasteners (10) from the support arm grip and remove the grip from the top of the spar. Carefully slide the stainless-steel spar out the bottom of the support arm housing. Take note of how the two sets of nylon bushings (5) and (6) fit in the assembly.
 - e. Pull the shank support (7) out the top of the spar to free the support arm spring. Clean the spring and examine it for wear, overstress, and cyclical fatigue. Examine the end hooks of the spring carefully and replace the spring if necessary.
 - f. Clean the inside of the stainless-steel support arm housing (1) using a stainless-steel brush. **NOTE: Do not use a non-stainless wire brush.**
 - g. Examine the two nylon bushings (6) that are inserted in the base of the spar. Replace excessively worn or marred bushings.
 - h. Re-assemble the support arm in the reverse order of steps a-e. Use a needle nose vise-grips similar tool to pull the spring into position when re-inserting the clevis pin (11) through the base of the support arm housing and the end hook of the spring.
 - i. Re-check the operation of the support arm. Each support arm hook should pull out smoothly, easily slide back into the stored position, and properly self-stow on the magnet when it is released.
2. Replace the spar tube if it is bent. The arm may bind if bent. **NOTE: DO NOT LUBRICATE.**
3. Examine the support arm pivot. Check clevis pin for wear. Replace if damaged or worn.
4. Examine the rubber grip. Replace it if ripped, gouged, or bent.

7. WEAR LIMITS

Item/Description	Image	Design Dimension	Wear Limit	Maintenance Action
6056 – Clevis pin		Outer Diameter: Ø0.2455+/-0.0025	Ø0.242"	Replace pin

8. DOCUMENT REVISION HISTORY

02/17/2022 – Initial release

3/11/2022 – Revised weight limit to 75 lbs per position

9. CONTACT INFORMATION

Additional information can be found on Sportworks website: www.sportworks.com.

For assistance, contact Sportworks by phone: 425-483-7000 or email: salesandsupport@sportworks.com.