



Lightning Carbon Cranks/BB Installation Procedure

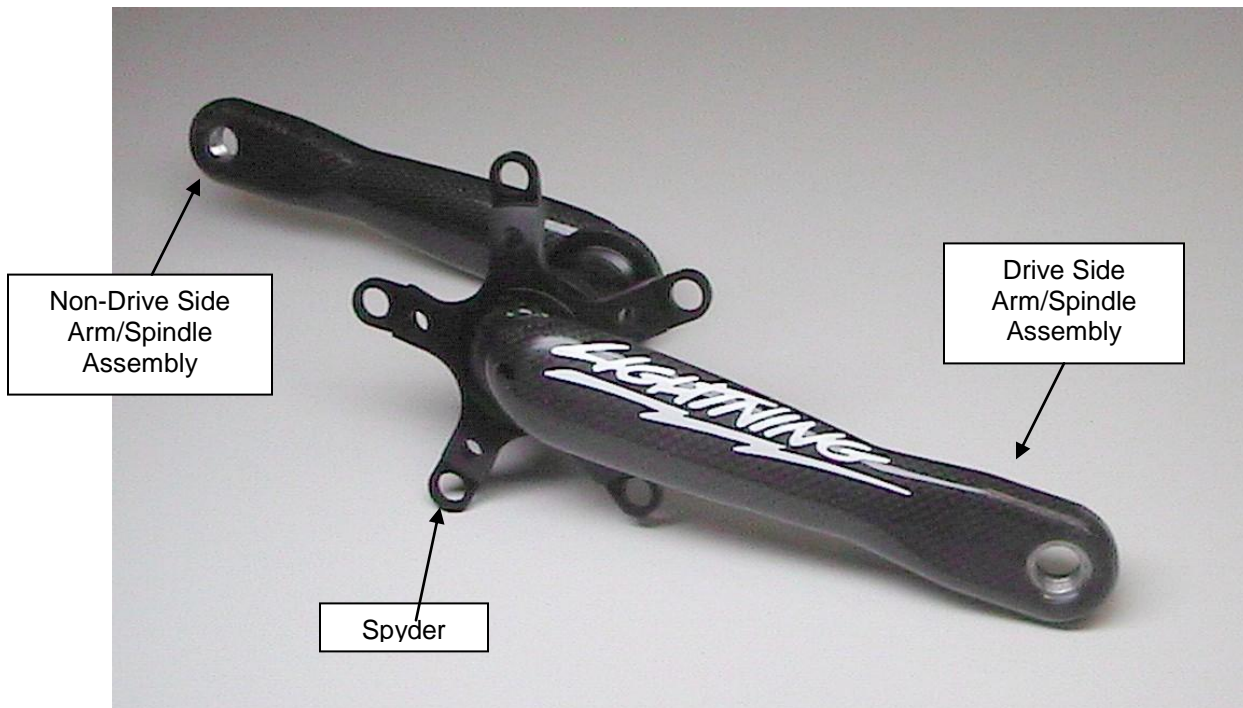
Thank you for selecting the highest performance carbon crank/BB assembly on the planet!
To maximize your enjoyment and operation of your Lightning carbon crank/BB
please thoroughly read the installation procedure that follows.
A non-compliant installation omitting these important procedures will void your warranty.

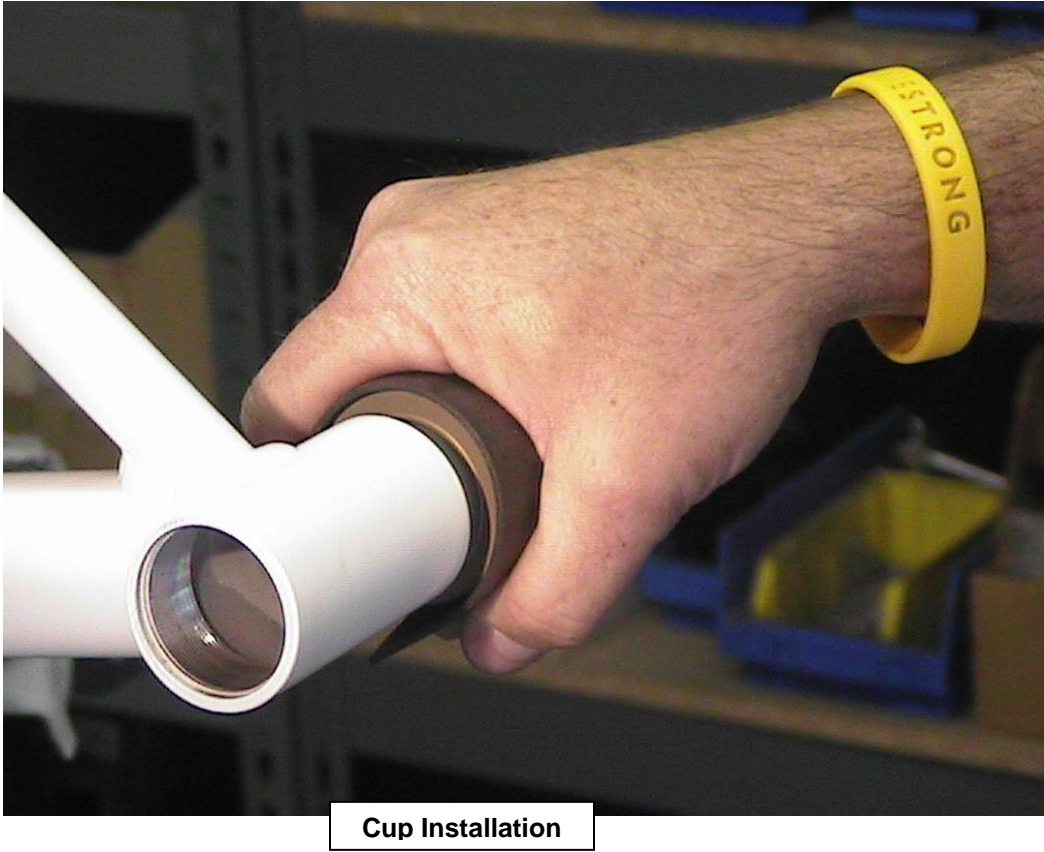
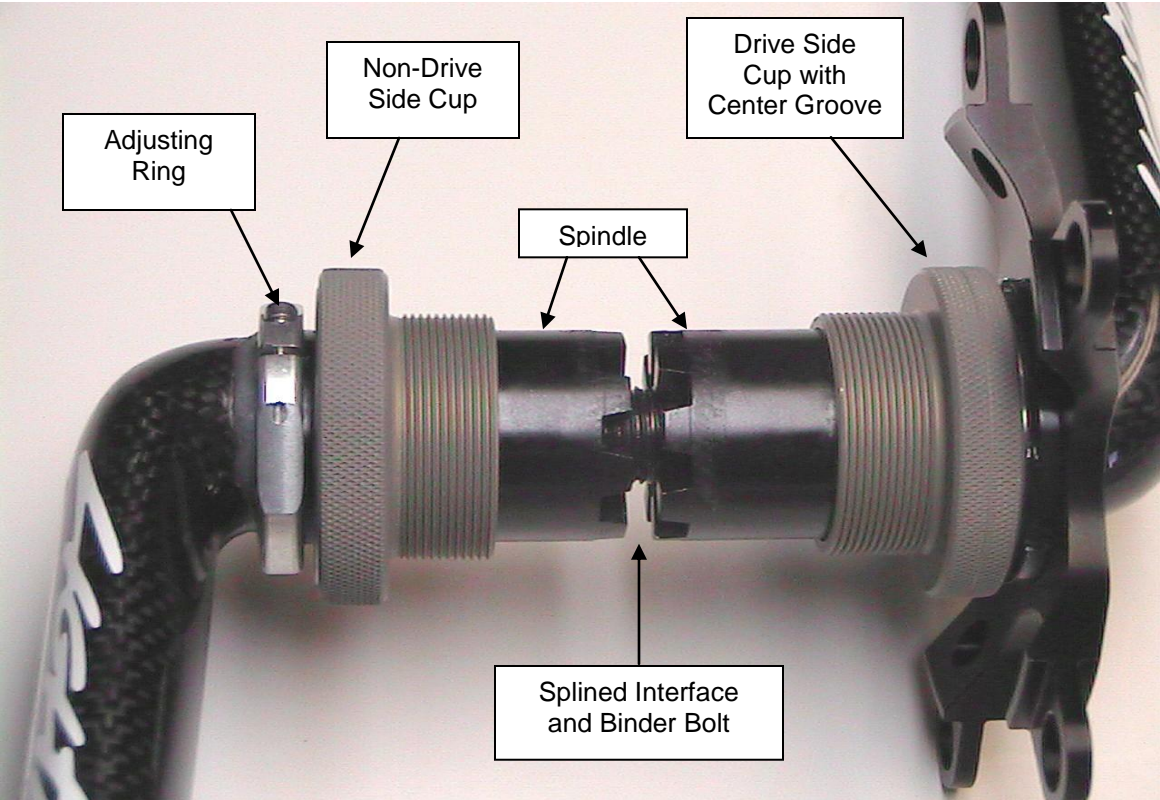
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U.S. Patent 6,443,033 B1, other patent(s) pending

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- 1) Component Familiarity: Familiarize yourself with all the components and their nomenclature





2) Threaded Cup installation:

A) Install Drive-Side Cup: Locate the drive-side cup (the cup with the center groove).

The drive-side cup has Left Handed Threads and cannot be screwed into the non-drive side of your bottom bracket shell or else the threads on the cup and the shell will be destroyed.

First lubricate the threads with high quality grease. Then gently screw the drive-side cup into the shell by rotating counterclockwise. Tighten the cup by hand and make sure it seats completely against the shell surface. The cup should easily thread into the shell by hand. Insert the supplied rubber sheet between your hand and the cup, and torque the cup against the shell as much as possible. (Do not use any wrenches for this operation, the rubber sheet will allow you to apply a torque of about 14 N-m (10 ft-lbs). Ensure that the cup is firmly seated against the shell surface.

B) Install Non-Drive Side Cup: Locate the non-drive side cup (the cup without the center groove).

The non-drive side cup has conventional Right Handed Threads and cannot be screwed into the drive side of your bottom bracket shell or else the threads on the cup and the shell will be destroyed.

Lubricate the threads with high quality grease. Gently screw the non-drive side cup into the shell by rotating clockwise. Tighten the cup by hand and make sure it seats completely against the shell surface. The cup should easily thread into the shell by hand. Insert the supplied rubber sheet between your hand and the cup and torque the cup against the shell as much as possible. (Do not use any wrenches for this operation, the rubber sheet will allow you to apply a torque of about 14 N-m (10 ft-lbs). Again, ensure that the cup is firmly seated against the shell surface.

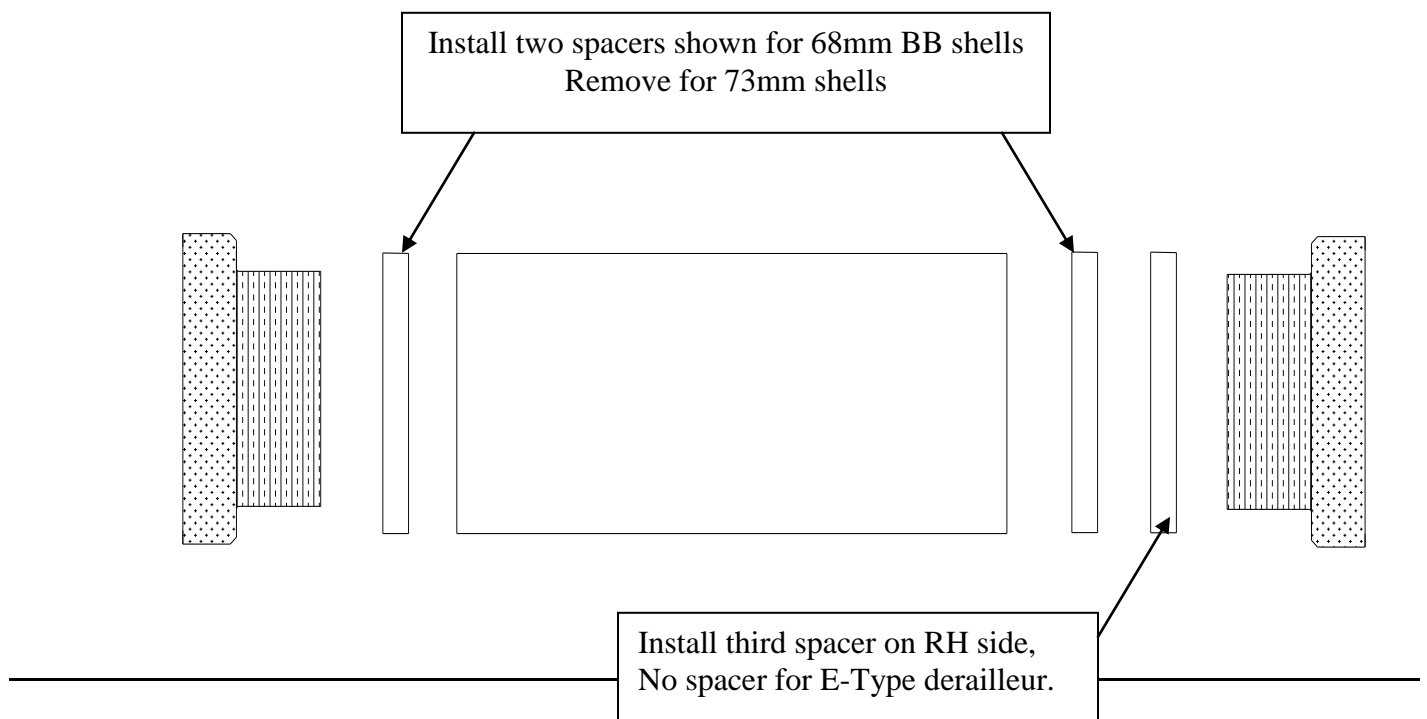
3) Press fit cup installation:

Verify/ remove existing bearings or cups from your frame, and install Lightning specific cups using tools specific to your bottom bracket type. We recommend greasing the cups or bearings to ease installation and prevent corrosion. A Park headset press tool works well for installing most press-in cup/bearings.

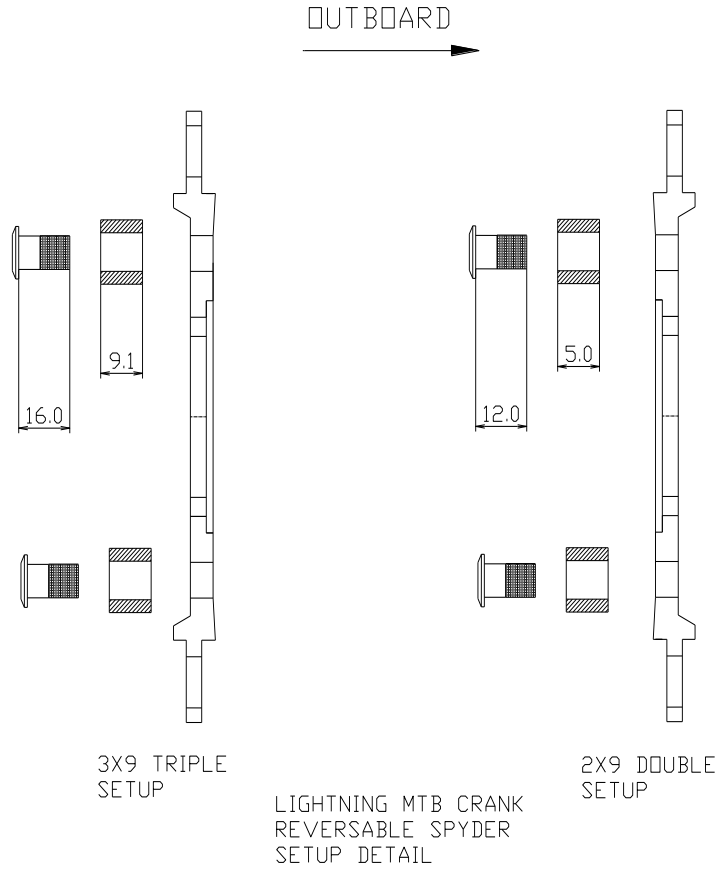
NOTES FOR MTB CRANK AND CUP INSTALLATION:

A) The MTB cranks include a spindle spacer, when shipped it is attached to the right arm/spindle assembly with Super Glue (Cyanoacrylate) to ease installation. If it comes loose for any reason it can be re-attached with Super Glue, for proper spindle alignment immediately secure the arm/spindle assemblies together after gluing.

B) Cup spacers are included with BSA cups, install the spacers as shown below:

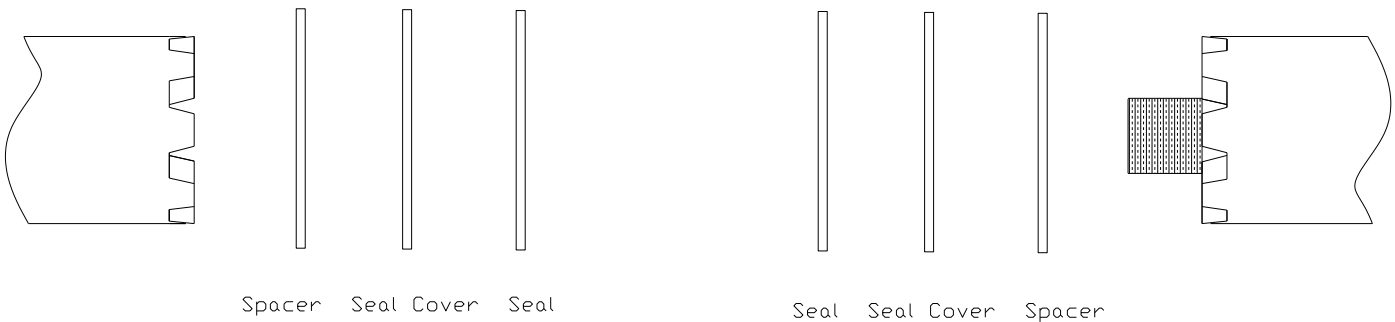


4) Install your chain wheels and properly secure their attachment bolts.



5) If you have an MTB with press fit BB, install seals and spacers per chart below:

MTB Press fit cup/bearing seal and spacer installation detail

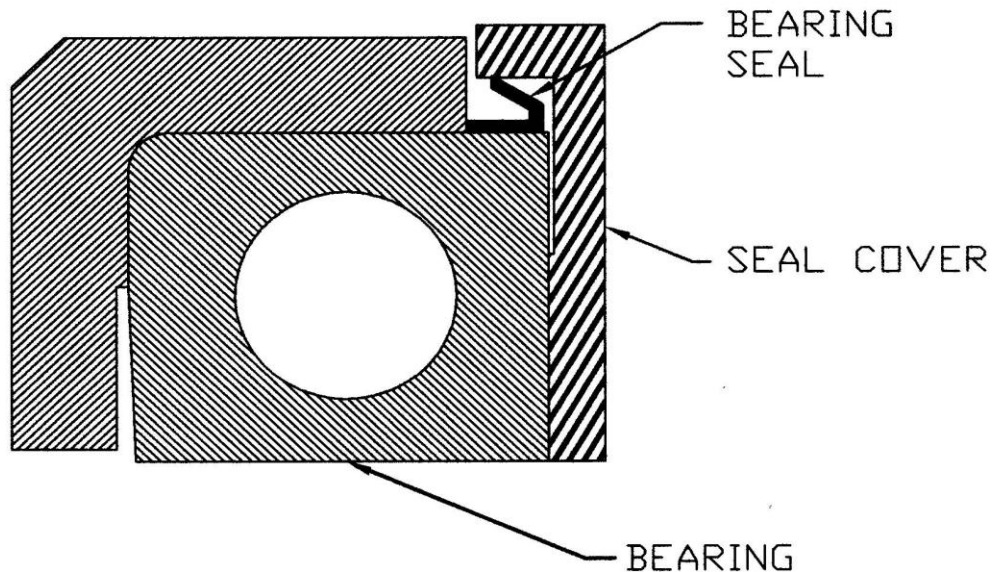


BB type	BB30 Cannondale	OSBB Specialized	BB-91 Shimano	BB-95 Trek
Seal Mfg.	Lightning	Enduro*	None	None
Seal Cover	Lightning	Enduro	None	None
RH Spacer	1.0	3.5	None	None
LH Spacer	None	3.5	None	None

*Note: Position Enduro seals with red rubber portion inboard

NOTE:

The MTB cranks with BSA and BB30 cups include seals and seal covers which go on the outside of the bearing cups. Make sure these parts are installed as shown below before installing the spindle assemblies:



- 6) Drive-Side Crank/Spindle Assembly: **Prior to installation, inspect the mating surfaces to ensure they are free from foreign debris.** If installation is made with foreign debris on any part of the mating surfaces it will damage the splines and void any warranty. Do not use any lubricant on the splines as it would attract foreign objects. The hard anodizing on the spindles acts as a lubricant. The binder bolt has already been pre-lubricated at the factory, you can also use blue locktite on the binder bolt if desired. Insert the drive-side crank/spindle assembly into the installed drive side cup.
- 7) Non-Drive Side Crank/Spindle Assembly: Loosen the Allen screw on the adjusting ring and rotate the ring towards the carbon fiber arm as much as possible, this will provide ample axial clearance for the following operation. Insert the included Allen wrench into the drive side crank/spindle assembly hole and engage the binder bolt. Insert the non-drive side crank/spindle assembly into the installed non-drive side. With both crank/spindle assemblies 180-degrees opposed, tighten the binder bolt by rotating the Allen wrench clockwise, the assemblies will begin coming together. **It is extremely important that both crank/spindle assemblies are 180-degrees opposed when the spindle splines engage,** failure to do so will damage the high tolerance mating spline surfaces and void your warranty. Torque the binder bolt with the Allen wrench to 35-50 N-m (27-37 ft-lbs).
- 8) Adjusting Ring: Rotate the ring clockwise until it seats against the inner bearing sleeve. Tighten by hand as much as possible, or use a 36mm spanner if needed (you may need to tighten, then back off approximately 1/8 turn to prevent excessive drag). **Tighten the adjusting ring Allen screw with an Allen wrench so that it is locked in place and cannot rotate.** Spin the installed crank/BB assembly to ensure that it spins freely and that there is no noticeable parasitic torque. Rotation should be smooth with no free play (axial or radial directions), and the arms should freely rotate many revolutions before coming to a stop.
- 9) Pedal Installation: First lubricate the threads with high quality grease. Then gently **thread your pedals by hand** into the crank arms until they are seated against the arm surfaces. Ensure that the right hand threaded pedal is installed on the drive side and the left hand threaded pedal is installed on the non-drive side. Failure to install the pedals to their correct sides will destroy the crank threads and will void your warranty. Finally tighten the pedals into place.
- 10) Rubber Plug: Install the tapered rubber plug into the drive side access hole. Secure into place using a rubber mallet.

Maintenance

Spyder Replacement: The Spyder and lock-ring are pre-installed at the factory. The Spyder/crank interface is Lightning specific. Any replacement of the Spyder requires a Lightning specific Spyder and lockring removal tool.

Bearings: The bearing system used is a high performance sealed cartridge-bearing set that should last a long time. If you ride in adverse conditions we recommend every 100 miles removing the bearing seals and re-greasing the bearings. In the event that your bearings need to be replaced we recommend you obtain a Lightning cup and bearing set. The bearings are pressed into the cups, if you wish to replace only the bearings a bearing press tool is needed.

Bearing Cup Removal: Normally a wrench is required to remove the threaded bearing cups. You can use soft jaw pliers to remove the bearing cups, or if you are going to dispose of the cups you can use adjustable "water pump" pliers.

Binder Bolt: Before reassembly the binder bolt threads should be cleaned and re-lubed using Ti anti-sieze compound, as the binder bolt is made from titanium. You can also use blue locktite on the binder bolt if desired.

Finish: Lightning cranks have a tough acrylic coating, wash using warm water and non-abrasive soap. Minor scratches can be polished out with rubbing compound. The entire arm can be re-coated with a top quality clear acrylic paint, Krylon is one good brand. Before re-coating clean first use acetone to assure adhesion.



Impact Protection: The arm ends can be protected with "Pliers Dip" plastic coating, or Lizard Skins leather patches.

Warranty

Lightning Carbon cranks are guaranteed to be free from defects in material and workmanship or breakage for two years from date of purchase. LCD agrees to repair or replace products it deems to be defective.

Not Covered Under Warranty:

1. Cranks that have been improperly installed or maintained
2. Cranks that have been modified or poorly maintained
3. Damage caused by crashing or impacts.
4. Any labor costs associated with removal or installation.
5. Consequential damages or personal injury.
6. Normal wear including riding through water, mud, sand, and dirt.