

# MACLEAN MANTA RAY® **INSTALLATION GUIDE**



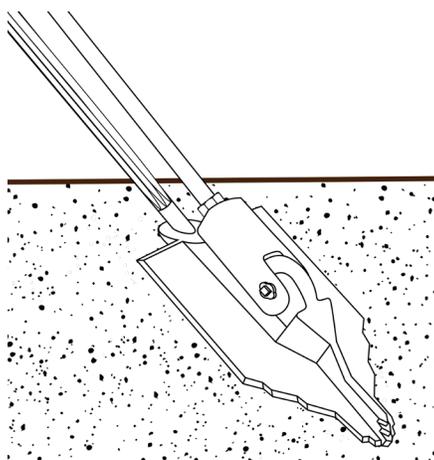
**THE UNFAIR ADVANTAGE**



# ABOUT MANTA RAY® EARTH ANCHORS

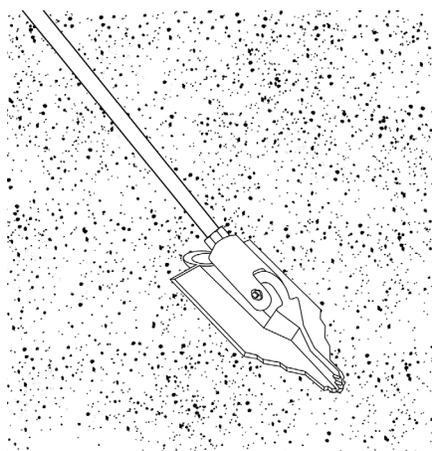
Manta Ray earth anchors are driven tipping plate anchors used to resist tensile loads up to 40 kips ultimate. Every anchor is galvanized to resist corrosion and features a chisel tipped nose to penetrate through dense or cobbled soils. After the anchor is driven to depth, the segmented drive steel is removed. The anchor is then “load locked” by pulling on the anchor rod to rotate and lock it in place while being proof tested.

## INSTALLATION STEPS



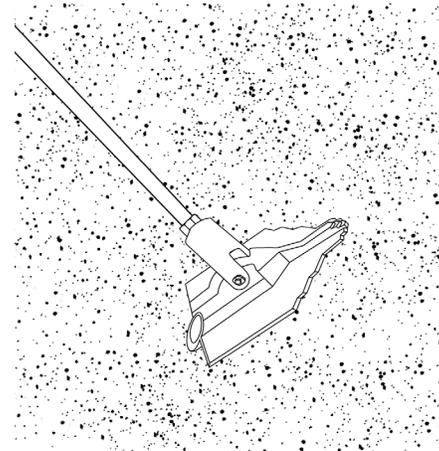
### 1. Drive the Anchor

Thread the anchor rod into the manta ray's shackle and insert the drive steel into the anchor. Using a 90lb breaker (hydraulic or pneumatic), drive the anchor to the preplanned depth.



### 2. Remove the Drive Steel

Once the manta ray anchor has been driven to the preplanned depth, remove the drive steel from the anchor. The load locker may be required in order to extract the drive steel.



### 3. Load lock the Anchor

The hydraulic lines can now be switched over to the load locker which is used to tip and proof test the manta ray anchor.

# DRIVE STEEL KIT

## Shank

#50231, #50232, #50398

The hex slides inside the breaker and is threaded on the other end to accept a coupler. Dimensions of the hex should match the chuck size of the breaker.

## Couplers

#50240, #51014, #50655

The couplers are internally threaded on both ends to connect any two pieces of drive steel together. These will move freely up and down once full thread engagement is reached.

## Extensions

#50240, #51014, #50655

The extensions are available in 30", 72", and 96" long sections. For handheld installs, it is recommended to use 30" sections. These are threaded on either end to accept couplers

## Radius Tip

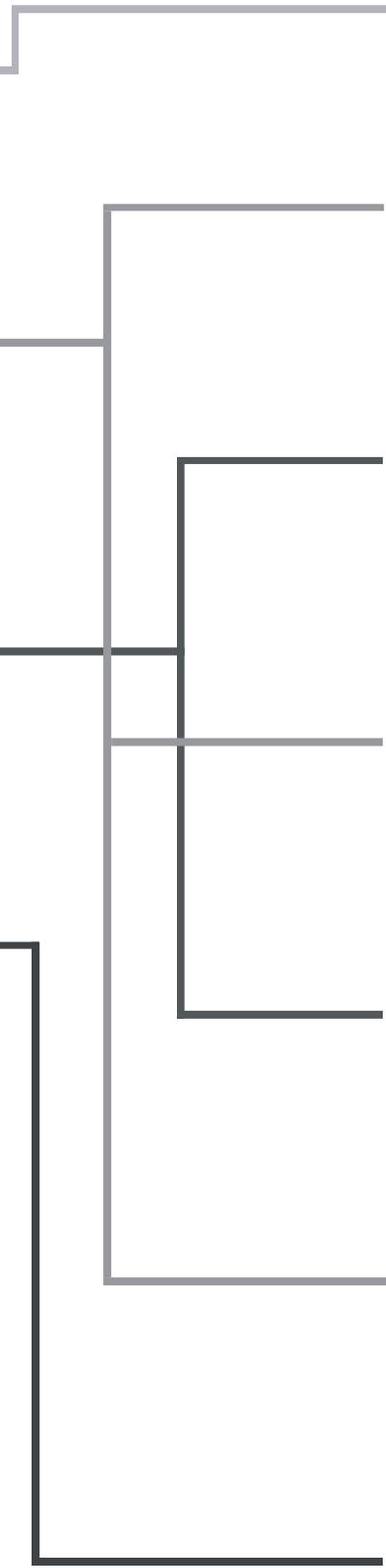
#50236, #50238, #50239

The radius tip is available in 30", 72", and 96" long sections. For handheld installs it is recommended to use 30" sections. These are threaded on one end to accept a coupler and rounded on the other to slides into the manta ray anchor.

## Manta Ray® Drive Steel Kit

#50243, #50244

Drive steel can be purchased in kits with a convenient carrying bag. Each kit contains sufficient drive steel to reach depths of 8'.



# EQUIPMENT

## Jack Hammer

#50364

90 lb class breakers are recommended for handheld installation of manta ray anchors. Using smaller breakers will lead to prolonged installation time and increased wear on the drive steel and anchor head.



## Hydraulic Power Unit

#50382

Gas powered portable hydraulic power unit (18 hp) with 5 to 8 gpm flow rate and max pressure of 2,000 psi are used to power the breaker as well as the load locker. Skid steer, digger derek trucks, and other mounted hydraulic equipment may be used in place of this if it meets these flow and pressure requirements.



## Load Locker

#50127, #50784, #50901

Each load locker kit consists of the same double action hydraulic piston with a calibrated force gauge and base reaction plate. The extractor bar and tapered jaws set which are included in these kits are compatible with specific threaded anchor rod diameters. Extractor bars and tapered jaw sets can be purchased separately and used on the same load locker.



## Hydraulic Hose

#50087

25' hydraulic hosing with aluminum quick couplings with a maximum pressure rating of 2,000 psi. These are used to connect the power unit to the breaker as well as the load locker. They can be coupled together to reach hose lengths of 50'. Care should be taken to keep the couplings clean and free of debris.



## Socket Adapter

#50882, #50883, #80884, #50885, #50886

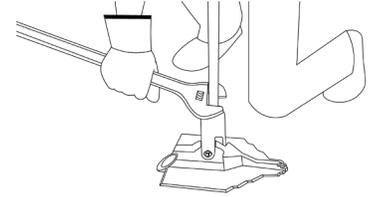
For mounted breaker installations, a socket adapter is used in place of the drive shank and threads directly to the extension or radius tip. These should be sized 0.5" above the diameter of the mounted breaker's tip. Up to 500 ft-lb impact class breakers may be used. Care should be taken to not bend long drive steel sections.



# INSTALLATION STEPS

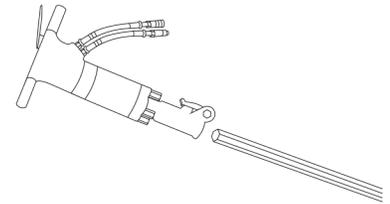
## 1. Attach The Anchor Rod

Thread anchor rod to Manta Ray shackle and tighten for full thread engagement. Remove any terminations from the top end of anchor rod.



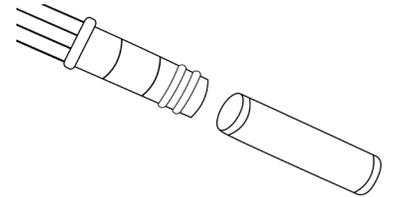
## 2. Insert Drive Steel Shank Into The Hammer

Open shank lock on drive hammer. Insert the drive steel shank fully into the drive hammer. Engage shank lock on hammer to securely hold shank in place.



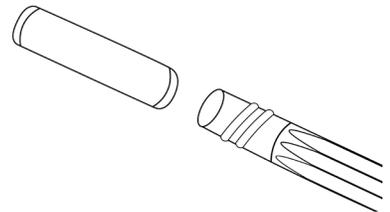
## 3. Attach a Coupler

Attach a drive coupler to drive shank by turning counterclockwise on drive shank. Rotate until all three threads are engaged. Coupler should be loose but secure.



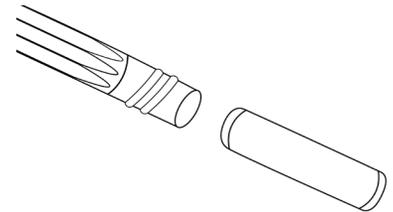
## 4. Attach Extension

Attach a drive steel extension to the coupler using a counterclockwise rotation. Rotate until all three threads are engaged. Coupler should be loose but secure.



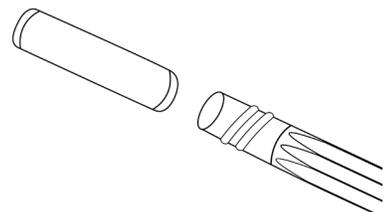
## 5. Attach Coupler and Extension As Needed

Attach a drive coupler to drive extension by turning counterclockwise on drive steel extension. Rotate until all three threads are engaged. Coupler should be loose but secure. This can be repeated with additional extensions until desired drive steel length is achieved.



## 6. Attach Radius Tip

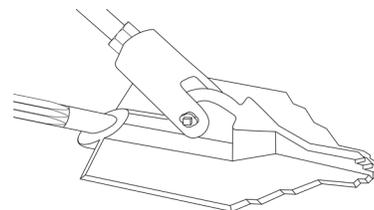
Attach drive steel radius tip to last coupler by turning counterclockwise. Remove any dirt or debris from radius tip before inserting into gap hole of the Manta Ray anchor.



# INSTALLATION STEPS

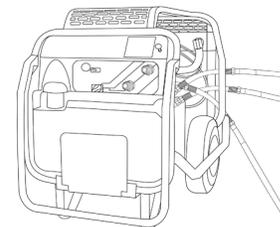
## 7. Insert Drive Steel Assembly Into The Anchor

Tap anchor on ground or hard surface to remove any dirt or debris from inside the Manta Ray anchor gad hole. Insert drive steel, radius tip, into the anchor.



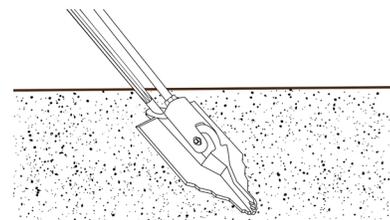
## 8. Make Hydraulic Connection

Attach hydraulic hose to drive hammer with quick disconnects. Make sure quick disconnect couplers are fully engaged to prevent air pockets or hydraulic fluid from bleeding. Move to opposite end of hydraulic hoses and make secure connections to hydraulic power pack. The power pack can be started at this point. Check to make sure there are no leaks once power pack pump is engaged.



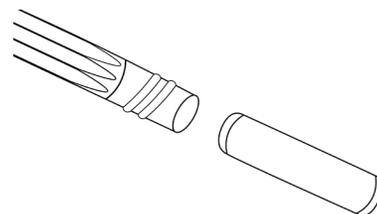
## 9. Drive The Anchor

Stand the Manta Ray anchor and drive steel assembly up with Manta Ray tip at predetermined location. The shackle and threaded rod should be pointing in direction of tension load. Angle the drive hammer to the predetermined tension load angle and begin driving anchor by pulling trigger on drive hammer. Continue driving anchor and rod assembly until rod is ground level.



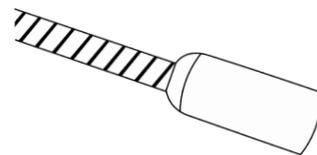
## 10. Add Drive Steel Extension if Necessary

Attach additional drive steel extensions if desired depth has not been achieved. If threaded rod is at ground level it will be necessary to extend threaded rod with a coupler and another section of threaded rod.



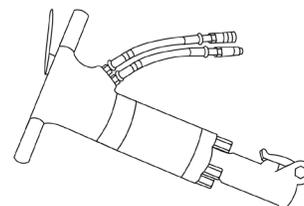
## 11. Attach Adapter Setting Bar

Thread adapter setting bar on to threaded rod. This is the rod that the load locker will pull to set the anchor.



## 12. Detach Hydraulic Power

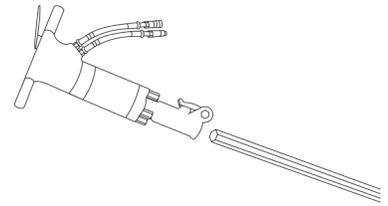
Set power pack pump to neutral, turn off power pack engine and detach hydraulic hose quick disconnects from hammer.



# INSTALLATION STEPS

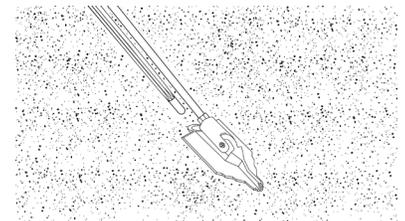
## 13. Remove Hammer From The Drive Steel

Release shank lock on hammer and remove drive steel assembly from hammer.



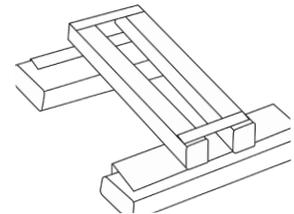
## 14. Remove The Drive Steel

Pull on drive steel assembly to remove from anchor. Remove drive steel as a full assembly, **DO NOT DISCONNECT SECTIONS UNTIL FULL ASSEMBLY IS OUT OF THE SOIL.** If the drive steel does not easily pull from the anchor, attach the drive steel extractor bar and pull with the load locker until the whole drive steel assembly can be easily removed.



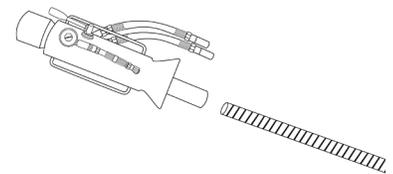
## 15. Place The Load Locker Drive

Place Load Locker Assembly over anchor rod by first placing LL-1 Base plate over the rods and seat in the soil. In weak soil situations 4X4 wood blocks can be placed under base plate to spread out the load.



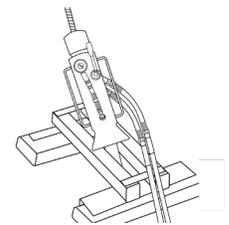
## 16. Attach The Load Locker Adapter Setting Bar

Thread load locker adapter setting bar on to the anchor rod. Slide load locker cylinder over the adapter setting bar and anchor rod. Place rod appropriately sized wedge clamps over rod near the top of the cylinder.



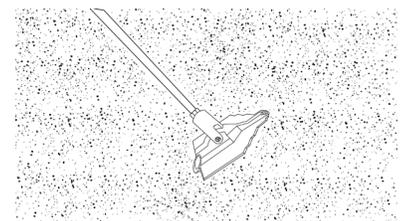
## 17. Attach Hydraulic Power to Load Locker

Attach hydraulic hoses to load locker with quick disconnects. Make sure quick disconnect couplers are fully engaged to prevent air pockets or hydraulic fluid from bleeding. Move to opposite end of hydraulic hoses and make secure connections to hydraulic power pack. The power pack can be started at this point. Check to make sure there are no leaks once power pack pump is engaged.



## 18. Set Anchor

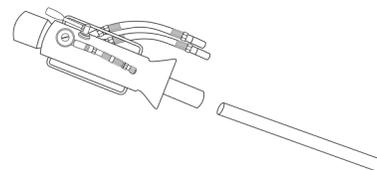
With power pack engaged pull up on the hydraulic valve handle until wedge clamps are engaged. Now pull up on handle again until the full length of the cylinder is extended. Remove wedge clamps. Push valve handle down to retract cylinder. Reset wedge clamps and repeat until desire capacity is reached and anchor is set. Anchor is set when the hydraulic gauge no longer moves.



# INSTALLATION STEPS

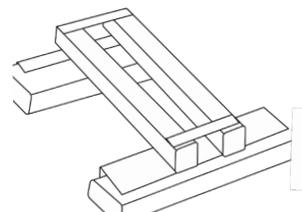
## 19. Remove The Load Locker

Move switch on power pack to the neutral position and shut off engine. Disconnect hoses from load locker assembly. Remove wedge clamps from anchor rod. Slide load locker cylinder from anchor rod and set in safe place.



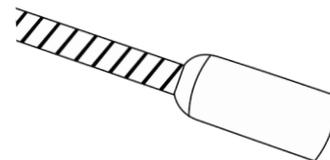
## 20. Remove The Load Locker Drive Stand

Remove baseplate from the anchor assembly by sliding over the anchor rod and adapter setting bar.



## 21. Remove The Adapter Setting Bar

Detach Adapter setting bar from anchor rod by turning counterclockwise



## 22. Attach Termination

With anchor set and load locker assembly removed now screw termination on anchor rod and tighten appropriately.

