



UNIVERSAL INSTALLATION GUIDE

THE GENERAL INSTALLATION PROCESS AND COMPONENTS WILL BE COMMON IN ALL KITS WITH THE EXCEPTION OF THE INSERT STYLE. ADDITIONAL INSTRUCTIONS ARE SUPPLIED WITH EACH KIT EXPLAINING IN MORE DETAIL, SPECIFICS FOR YOUR PARTICULAR APPLICATION, SUCH AS INSERT STYLE, INSERT DEPTHS AND DRILL & THREADING DEPTHS.

THE NS300L™ SYSTEM WAS DESIGNED TO NOT ONLY TO BE THE STRONGEST, MOST RELIABLE REPAIR ON THE MARKET, IT HAS ALSO BEEN DESIGNED FROM AN ECONOMICAL STAND POINT AS WELL. THIS WAS ACCOMPLISHED BY STANDARDIZING THE OUTSIDE THREAD SIZE OF ALL AVAILABLE INSERTS, ELIMINATING THE NEED TO PURCHASE A SEPARATE KIT FOR EVERY HEAD BOLT THREAD SIZE. A TRULY UNIVERSAL KIT.

***INSERTS ARE CURRENTLY AVAILABLE IN THE FOLLOWING THREAD SIZES:
M10X1.25, M10X1.5, M11X1.25, M11X1.5, M11X2.0, M12X1.5, M12X1.75 AND 7/16-14.***

MANY OF OUR CUSTOMERS HAVE SUCCESSFULLY USED OUR KIT FOR HIGH BOOST APPLICATIONS. FOR LIABILITY REASONS, WE DO NOT OFFER INSTRUCTIONS OR MAKE RECOMMENDATIONS FOR CUSTOM MODIFICATIONS WHEN CONVERTING TO A THREAD SIZE DIFFERENT THAN THE ORIGINAL OEM THREADS. IF YOU ARE DOING THIS TYPE OF MODIFICATION, PLEASE UNDERSTAND, YOU ARE DOING THIS AT YOUR OWN RISK.

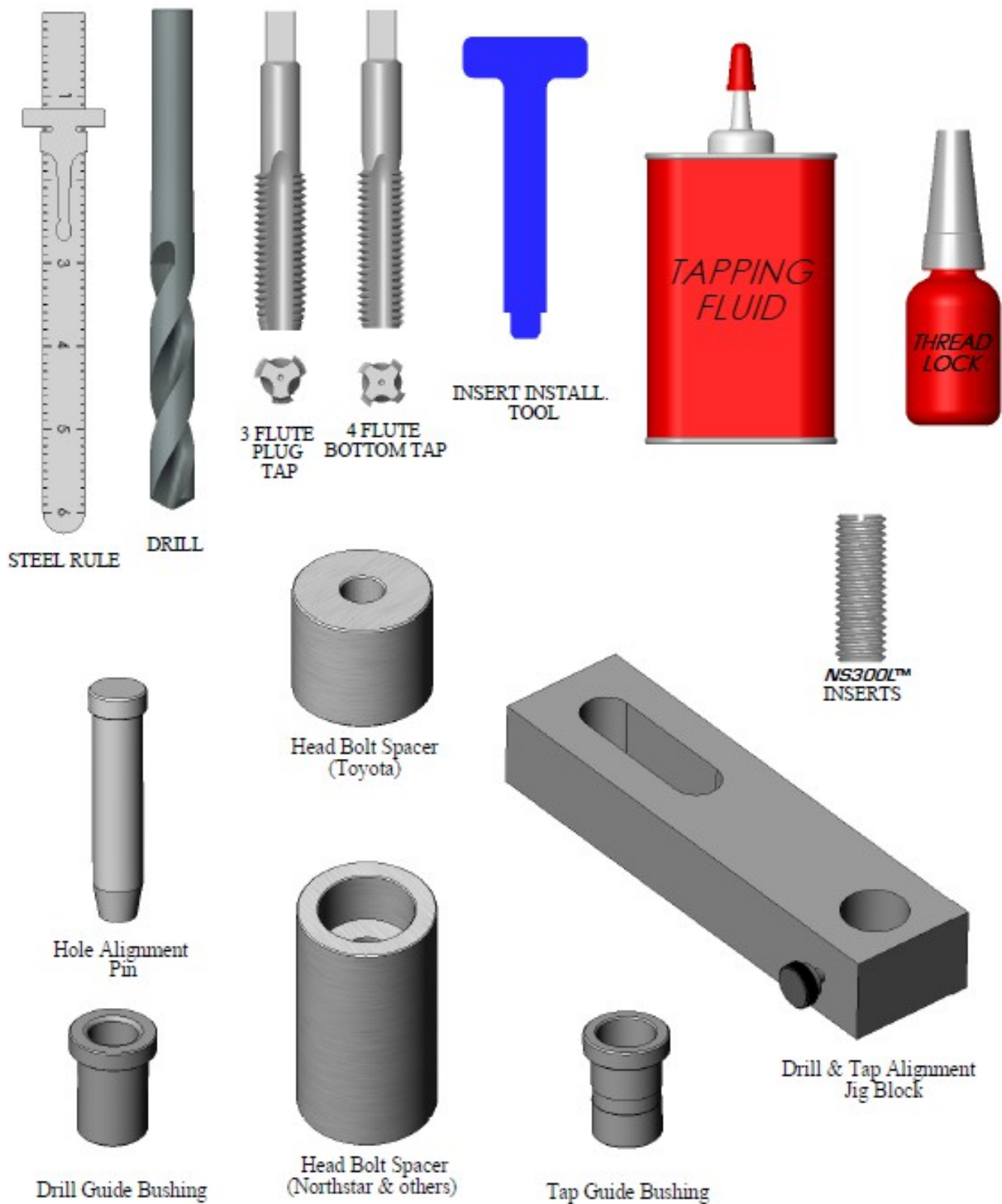
PLEASE VISIT US AT HuhnSolutions.com FOR ALL AVAILABLE KITS

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KIT CONTENTS



NS300L™ INSERT SYSTEM

WARNING Safety glasses must be worn when drilling, tapping, or removing chips from the holes. Cutting tools are made of hardened tool steel and may shatter. If removing chips with an air hose is your only option, wrap a rag around the air nozzle to help prevent chips from blowing back into your face. NEVER use power tools to drive taps in or out of a hole! Doing so may cause the tap to grab or gall up and break, severely damaging the newly cut threads!

**BEFORE STARTING, PLEASE READ THE INSTALLATION INSTRUCTIONS
IN THEIR ENTIRETY.**

Important: All measurements are taken from the deck surface, not from the top of the jig.

****** WHEN USING HEAD BOLTS, IT IS HIGHLY RECOMMENDED THAT GENUINE FACTORY OEM HEAD BOLTS BE USED WITH THE NS300L™ REPAIR, AS SOME LOW PRICED AFTERMARKET HEAD BOLTS MAY NOT BE THE SAME QUALITY. SOME AFTERMARKET HEAD BOLTS ARE MANUFACTURED WITH POORLY FORMED THREADS WHICH CAN CAUSE THEM TO SEIZE IN THE INSERT. OCCASIONALLY THEY HAVE ALSO BEEN FOUND TO BE TEMPERED IMPROPERLY, CAUSING THEM TO REACH THEIR YIELD POINT PREMATURELY.***

******NEVER INSTALL HEAD BOLTS BY POWER DRIVING THEM WITH POWER TOOLS OR FORCING TIGHT FITTING BOLTS WITH HAND TOOLS.***

**PLEASE SEE ADDITIONAL INSTRUCTIONS SUPPLIED IN THE KIT
THAT WILL SHOW INSTALLATION DEPTHS AND INSERT SIZE,
SPECIFIC FOR YOUR ENGINE.**

Success of the NS300L™ insert system is based on the inserts being installed correctly and square to the deck surface. Stability of the aluminum engine block can also play an important part for a successful repair. It is recommended that the inserts be installed by someone experienced in drilling and tapping holes. When installed correctly, customers have found that the NS300L™ insert system has exceeded their expectations.

WARNING Safety glasses must be worn when drilling, tapping or removing chips from the holes. Cutting tools are made of hardened tool steel and may shatter. If removing chips with an air hose is your only option, wrap a rag around the air nozzle to help prevent chips from blowing back into your face. NEVER use power tools to drive taps in or out of a hole! Doing so may cause the tap to grab or gall up and break, severely damaging the newly cut threads!

Caution: Many metal chips are created from the installation process. Be sure to take precautionary measures to prevent metal chips from entering the engines coolant and oil passages. It is not recommended to mount the Jig Block to a taped off deck surface, as this could prevent the friction needed to keep the Jig in place after it is tightened down, causing the Jig to shift off center when the Alignment Pin is removed. It is always best to mount the Jig Block directly to the deck surface, and then tape around it.

IT IS NOT RECOMMENDED TO USE COMPRESSED AIR TO BLOW OUT CHIPS FROM THE HOLES, BUT IF THIS IS YOUR ONLY OPTION, MAKE SURE TO WRAP A RAG AROUND THE AIR NOZZLE AT THE TOP OF THE HOLE TO PREVENT CHIPS FROM BLOWING BACK IN YOUR FACE. ALWAYS MAKE SURE TO WEAR SAFETY GOGGLES!

1. After removing the heads, remove the cylinder head alignment bushings/pins from block if repairing a hole at or near the hole being repaired.

2. **Figure 1A** – Install the Drill Bushing into the Jig Block, then snug it in place with the thumb screw located on the side of the Jig. Make sure the deck surface is clean. Mount the Jig Block in a good head bolt hole near the hole being repaired, using the spacer specified in the instructions for the engine being repaired, along with a **NEW** head bolt (**old head bolt threads are normally stretched out of pitch, causing them to seize in the new insert**). With the jig loose, center the Drill Bushing over the hole being repaired by install the Locating Pin through the Drill Bushing and into the top of the hole. Hold Locating Pin down firmly so that the tapered end of the pin centers itself into the top of the hole. Tighten the Jig in place, being careful not to over tighten. Remove the Locating Pin.

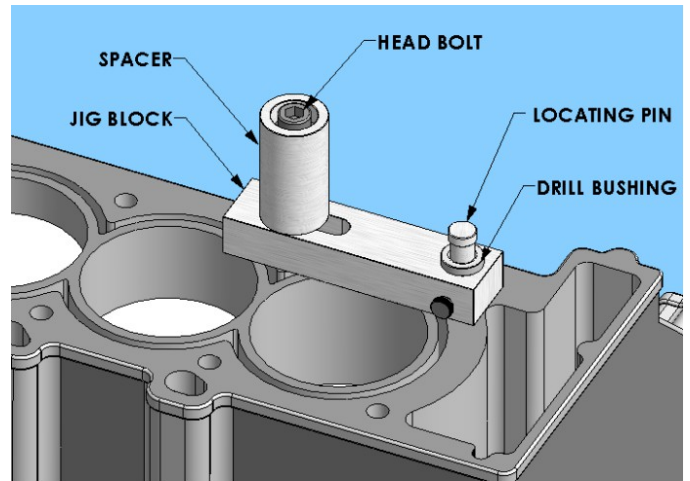


FIGURE 1A

Important: All measurements are taken from the deck surface, not from the top of the jig!

3. **Figure 2A**- Drill the holes using the 17/32" Drill Bit that comes in the kit. Use light penetrating oil to keep the drill lubricated. Retract the drill several times to clear the chips from the Drill Bits flutes. After you have drilled to the specified depth, you can remove the Drill Bushing from the Jig, then drill the remainder of the hole without it. This will allow for more chip clearance. Drill to the depths specified. Do not force the drill if it bottoms out.

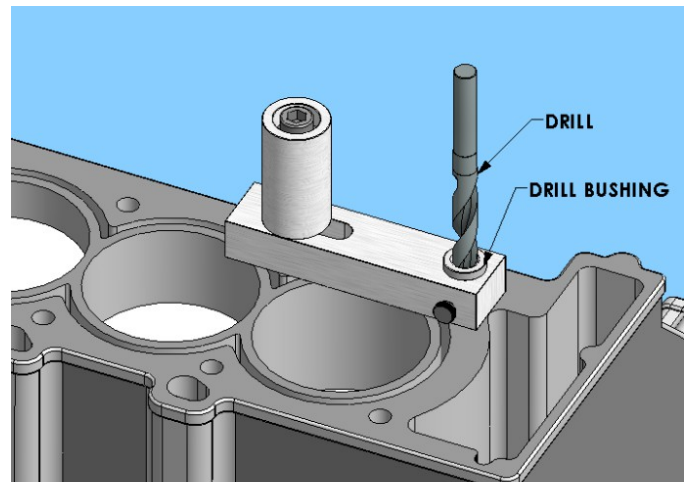


FIGURE 2A

If you drilled as deep as you can with the Jig in place, but find that you can not drill to the depths specified in the instructions, remove the Jig block to finish drilling. The Jig can now be remounted and realigned to prepare for the next step of threading the hole, by using the Alignment Pin and Drill Bushing again. Since the Alignment Pin will now be the same diameter as the drilled hole, make sure to remove all debris from the hole. Be sure to lubricate the Alignment Pin to prevent the Pin from binding up.

CAUTION: DO NOT FORCE THE DRILL WHEN DRILLING! Doing so may cause the drill to grab and break or bend. The Drill Bits cutting edges are ground to a neutral angle to help prevent it from grabbing when drilling. The tip of the Drill Bit is ground off to prevent it from drilling deeper than the original hole.

4. **Figure 3A-** Install the Tap Bushing in the jig. Using the 5/8-11 three-flute Plug Tap, TAP MAGIC® and the proper tap wrench, thread the hole about 2" deep. Then you can remove the jig. This will make it easier to clean out the chips when threading the remainder of the hole. **If the optional 6" tap is required, always thread as deep as possible with the shorter 3 flute tap first since it is stronger due to it's shorter length.** You should back out the tap often and remove the chips created by the tap so that the tap will not jam them into the bottom of the hole. Failure to do so could cause the tap to break. **NEVER use power tools to drive the taps!**

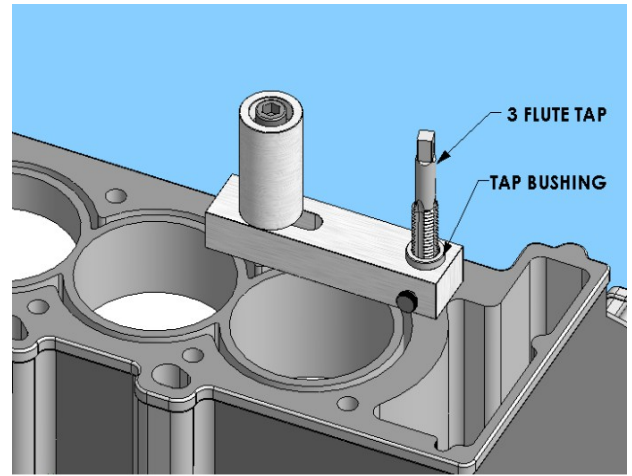


FIGURE 3A

**Note: It is normal for the tap to cut into the diameter of the head alignment bushing seats. This will not effect the fit or alignment of the locating dowels when re-installed.*

5. Use the 5/8-11 four-flute Bottom Tap to form the last couple of threads that the three-flute plug tap did not completely form due to it's tapered end. ***This tap is not designed for heavy cutting!*** This allows the insert to be installed about 1/4" deeper. **(The Bottom tap will not be used if the optional 6" extension tap is required).** Be careful not to over-tighten and break the tap at the bottom of the hole. **NEVER DRIVE THE TAPS IN OR OUT WITH POWER TOOLS!**

6. Thoroughly clean the newly threaded hole of any metal chips. Next, check to make sure the inserts will install to the correct depths, **prior** to adding Threadlock (Figure 4). **For insert depths, see provided instructions sheet specific for the engine being repaired. Note! Add a light coating of penetrating oil to the outside of the insert prior to making sure the insert will screw in to the correct depth. This will help prevent the soft aluminum from fusing to the steel insert, helping to prevent the insert from seizing up, due to any left over debris in the hole or a possible burr on the insert. Never force an insert!**

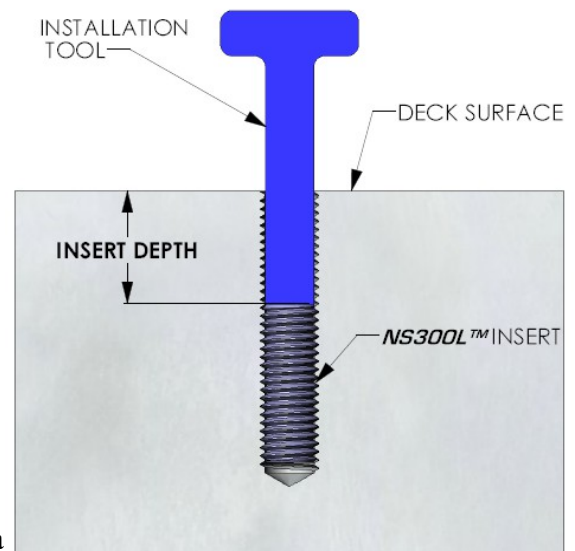


FIGURE 4

7. After insert depth is confirmed, remove the insert. Clean the threaded hole, and outside thread of the insert with Brake Cleaner to remove all oil residue. After the Brake Cleaner evaporates, add a couple drops of Threadlock to the newly threaded hole, approximately 1" from the deck surface. Add a bead of thread lock around the **outside** of the insert about half way down the length of the insert. **DO NOT GET THREADLOCK ON THE INTERNAL THREADS OF THE INSERT.** Install the insert with the installation tool, until the insert is installed to the correct depth. **Caution! Threadlock sets up fast! Once you start installing the insert, continue until it is installed to it's final depth!** Allow Threadlock to set for 1-2 hours before installing the head bolts. Make sure there are no sharp edges protruding up from the newly threaded holes before installing the head gaskets and alignment bushings.

Note: It may be necessary to use an 11mm-12 point socket or a correct fitting 6 point socket and a T-Handle Socket Wrench to drive the taps to the correct depth if there is no longer room for the tap wrench.

If using studs such as ARP®, please contact us prior to installing inserts as modified inserts may be required and may need to be installed at different depths. We will also help you determine the correct ARP® stud kit for your application.

***Time saving tip:** After the first insert has been installed to the correct depth, mark the Installation tool with take a permanent marker, flush with the deck surface. This will save time when installing the remainder of the Inserts to their correct depth.