

# READ ME FIRST!!!



## **SPEED AND SCIENCE Billet Aluminum 3-1/2" and 3-5/8" Bore SHOVELUTION Cylinders for 1985-99 Harley Davidson® "EVOLUTION"® engines**

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Revision:	Description:	DATE:

### **DISCLAIMER:**

**SPEED AND SCIENCE (SNS)** parts are designed and intended for closed course applications only. Our products must be installed by a mechanic experienced in American V-Twin engines and used by an experienced rider. Installation of SNS parts may affect or even void any other warranties if such apply to your motorcycle. Additionally, such installation may violate some federal, provincial, state and local laws, rules and ordinances. Always check federal, provincial, state and local laws prior to modifying your motorcycle. It is the sole and exclusive responsibility of the user to determine whether the product is correct for his/her use. The user shall assume all legal risks, liabilities, duties and obligations associated therewith.

**Trademark Disclaimer:** The words Harley-Davidson®, H-D®, Sportster®, Evolution® and all OEM part numbers and model designations are registered trademarks of H-D Michigan, LLC, and are used for reference only. Speed And Science is not associated with Harley-Davidson, Inc.

\*\*\*Not EPA Compliant, please check with your local Motor Vehicle Office for rules and regulations\*\*\*

### **INSTALLATION AND OPERATION SAFETY:**

It is your responsibility to read and follow these instructions thoroughly and carefully prior to attempting any work on your motorcycle. Make sure you understand all procedures completely. Contact SNS with any questions you may have regarding an installation and/or operation of any SNS product. Please make safety your priority.

1. Motorcycle fuel is extremely flammable and explosive media, also toxic when breathed/ingested. Work only in well ventilated room equipped with appropriate fire extinguishing gear. Avoid any open flames or sparks, do not smoke.
2. Exhaust fumes are toxic and must not be breathed. Run your motorcycle in a well ventilated area; also never stay in the way of the exhaust fumes.
3. Motorcycle engine and certain accessories do get very hot after even a very short run. Always allow those to cool down before attempting any work.
4. Always disconnect the motorcycle battery prior to attempting any work. Secure the battery terminals and cables to prevent any accidental re-connect and/or short-circuit.
5. Consult an appropriate service manual[s] for other procedures that may be needed in order to facilitate an installation of the SNS part[s].
6. Never work on, or operate your motorcycle while under influence of alcohol or drugs. Fatigue will affect your proper judgement ability also. Please keep yourself and others safe.
7. Always check federal, provincial, state and local laws prior to modifying your motorcycle.

#### **WARRANTY:**

1. All SNS parts are guaranteed to the original purchaser to be free of manufacturing defects in materials and workmanship for a period of 12 (twelve) months from the date of purchase.
2. SNS must be notified immediately about any of our products that do not conform to the above. After a case review, an RMA number will be issued to the purchaser and the product[s] must be returned pre-paid to us within the 12 month warranty period or 10 business days thereafter and will be replaced or repaired at SNS's option.
3. The returning parts must be packaged properly as to prevent any shipping damage.
4. The shipment must include a copy of the original purchase receipt, Invoice, etc., also a detailed note outlining the nature of the problem.
5. Upon positive case review, a repair, replacement or refund will be granted.
6. The purchaser is solely responsible for proper installation of any SNS product, using proper tools and techniques as per commonly used shop procedures and manuals.
7. SNS shall not be responsible for any part defects being result of improper installation, improper/lack of maintenance, improper use and operation, or any other abnormal misuse or mistreatment of said part.
8. SNS shall be not liable for any consequential or incidental damages resulting from the failure of a SNS part, the breach of any warranties (written or implied), the failure to deliver, etc.

#### **INSTALLATION GUIDANCE AND RECOMMENDATIONS**

##### **\*\*\*IMPORTANT – CRITICAL INFORMATION - READ FIRST!!!\*\*\***

**\* Anytime during assembly and/or while checking for clearances, under NO CIRCUMSTANCES the engine should be forced to rotate if ANY RESISTANCE is observed. Doing so, or failing to provide correct clearances may cause an engine damage and will not be covered by warranty.**

**\* The 3-5/8" Bore version of this product requires engine cases to be bored out to 3.880" in order to accept the cylinder spigots.**

1. SNS SHOVELUTION Cylinder set allows for mounting either Shovelhead or PanShovel heads on the EVO (1985-1999) bottom ends. Due to the nature of this conversion the installer will be required to perform certain modifications as specified below.
2. The cylinders are manufactured with enough length for 4-5/8" stroke. If your crankshaft stroke is shorter than the above, the cylinder bases / spigots can be carefully trimmed to fit. Best if done by an experienced engine machinist.
3. The cylinders are supplied with the bores .030" undersized and require boring / final hone to fit individually your pistons. Piston manufacturer recommendations must be followed.
4. **For the 3-5/8" Bore version** the installer must make sure that the engine cases have been bored out to 3.880" in order to accept the cylinder spigots.
5. The installer must carefully replace the OEM long cylinder studs with shorter ones (Qty. 8 supplied). Please make sure that the base studs provide appropriate thread engagement for both cases and base nuts. Trim down the top (3/8"-UNF) portion if necessary.
6. The SNS cylinders are designed for and require using the 12PT 3/8-UNF base flange-nuts (Qty. 8 supplied). Adjust the stud height if necessary. Do not use any washers.
7. The SNS cylinders are designed for and require aftermarket 12pt head bolts with 7/16" Hex, e.g. S&S P/N 93-3024 (bolt and washer set).
8. The SNS cylinders have been designed for maximum material thickness in critical areas, hence both base nuts and head bolts require a 7/16" box wrench that has its perimeter (where it goes around/behind the hex) thinned out to approx. .600" diameter:



9. The SNS cylinder oil return lines do not have cross-holes (not recommended) drilled in the liner. The builder must drill the oil return holes (use 1/4" drill and good known base gaskets for location) straight-thru the case, down towards the flywheels. **Double-check the locations BEFORE drilling!!!**
10. The break-in procedure, bolt re-torquing (heat-cycles) sequence, etc. must be done as per service manual.

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RECOMMENDED HARDWARE LIST (to be procured locally by the purchaser):

Qty. 1	EVO Base Gasket Set (Cometic recommended)
Qty. 1	Shovelhead Headgasket set (MLS by Cometic recommended)
Qty. 1	Adjustable TwinCam pushrod set (S&S TimeSaver or similar)
Qty. 1	12pt Head Bolt set with 7/16" Hex, e.g. S&S P/N 93-3024 (bolt and washer set)