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Installation Instructions and Adjustment Procedures for 1936-'84 BT & 1957-'85 XL S&S® Pushrod Kits

DISCLAIMER:
S&S parts are designed for high performance, closed course, racing applications and are intended for the very experienced rider only. The installation of S&S parts may void or adversely affect your factory warranty. In addition such installation and use may violate certain federal, state, and local laws, rules and ordinances as well as other laws when used on motor vehicles used on public highways, especially in states where pollution laws may apply. Always check federal, state, and local laws before modifying your motorcycle. It is the sole and exclusive responsibility of the user to determine the suitability of the product for his or her use, and the user shall assume all legal, personal injury risk and liability and all other obligations, duties, and risks associated therewith.

The words Harley®, Harley-Davidson®, H-D®, Sportster®, Evolution®, and all H-D part numbers and model designations are used in reference only. S&S Cycle is not associated with Harley-Davidson, Inc.

SAFE INSTALLATION AND OPERATION RULES:

Before installing your new S&S part it is your responsibility to read and follow the installation and maintenance procedures in these instructions and follow the basic rules below for your personal safety.

- Gasoline is extremely flammable and explosive under certain conditions and toxic when breathed. Do not smoke. Perform installation in a well ventilated area away from open flames or sparks.
- If motorcycle has been running, wait until engine and exhaust pipes have cooled down to avoid getting burned before performing any installation steps.
- Before performing any installation steps disconnect battery to eliminate potential sparks and inadvertent engagement of starter while working on electrical components.
- Read instructions thoroughly and carefully so all procedures are completely understood before performing any installation steps. Contact S&S with any questions you may have if any steps are unclear or any abnormalities occur during installation or operation of motorcycle with a S&S part on it.
- Consult an appropriate service manual for your motorcycle for correct disassembly and reassembly procedures for any parts that need to be removed to facilitate installation.
- Use good judgment when performing installation and operating motorcycle. Good judgment begins with a clear head. Don't let alcohol, drugs or fatigue impair your judgment. Start installation when you are fresh.
- Be sure all federal, state and local laws are obeyed with the installation.
- For optimum performance and safety and to minimize potential damage to carb or other components, use all mounting hardware that is provided and follow all installation instructions.
- Motorcycle exhaust fumes are toxic and poisonous and must not be breathed. Run motorcycle in a well ventilated area where fumes can dissipate.

- *IMPORTANT NOTICE:*

Statements in this instruction sheet preceded by the following words are of special significance.


WARNING

Means there is the possibility of injury to yourself or others.


CAUTION

Means there is the possibility of damage to the part or motorcycle.

NOTE

Other information of particular importance has been placed in italic type.

S&S recommends you take special notice of these items.

WARRANTY:
All S&S parts are guaranteed to the original purchaser to be free of manufacturing defects in materials and workmanship for a period of twelve (12) months from the date of purchase. Merchandise that fails to conform to these conditions will be repaired or replaced at S&S's option if the parts are returned to us by the purchaser within the 12 month warranty period or within 10 days thereafter.
In the event warranty service is required, the original purchaser must call or write S&S immediately with the problem. Some problems can be rectified by a telephone call and need no further course of action.
A part that is suspect of being defective must not be replaced by a Dealer without prior authorization from S&S. If it is deemed necessary for S&S to make an evaluation to determine whether the part was defective, a return authorization number must be obtained from S&S. The parts must be packaged properly so as to not cause further damage and be returned prepaid to S&S with a copy of the original invoice of purchase and a detailed letter outlining the nature of the problem, how the part was used and the circumstances at the time of failure. If after an evaluation has been made by S&S and the part was found to be defective, repair, replacement or refund will be granted.

ADDITIONAL WARRANTY PROVISIONS:
(1) S&S shall have no obligation in the event an S&S part is modified by any other person or organization.
(2) S&S shall have no obligation if an S&S part becomes defective in whole or in part as a result of improper installation, improper maintenance, improper use, abnormal operation, or any other misuse or mistreatment of the S&S part.
(3) S&S shall not be liable for any consequential or incidental damages resulting from the failure of an S&S part, the breach of any warranties, the failure to deliver, delay in delivery, delivery in non-conforming condition, or for any other breach of contract or duty between S&S and a customer.
(4) S&S parts are designed exclusively for use in Harley-Davidson® and other American v-twin motorcycles. S&S shall have no warranty or liability obligation if an S&S part is used in any other application.

NOTES:

- *If pushrod kit contains four different length pushrods, the longest pushrod is for the front exhaust, next longest is the rear exhaust. Of the two shorter pushrods, the longer one is the front intake, the shortest pushrod is the rear intake. The pushrod kits for the big twin engine have two different lengths – short for the intakes, long for the exhausts.*
- *All installation and adjustments must be made when engine is cold. Read instructions thoroughly and follow all recommended steps and procedures.*

⚠ CAUTION

Failure to follow recommended steps and procedures may result in damage to engine components.

⚠ WARNING

Installing or adjusting pushrods while engine is hot could result in burns from contact with hot engine parts.

A- PUSHROD ADJUSTMENTS FOR HARLEY-DAVIDSON® IRONHEAD SPORTSTER®, KNUCKLEHEAD AND PANHEAD ENGINES

1- **1936-'47 Knucklehead, 61" & 74"** (Part 93-5041, 93-5044, and 93-5045)
1948-'52 Panhead 61" & 74" (Part 93-5029, 93-5059, and 93-5027)
1957-'85 Ironhead Sportster® Models (Part93-5030 and 93-5035)
   a- Remove pushrod cover clips and lift cover assemblies to view lifters.
   b- Remove sparkplugs and rotate engine until the front piston is at the top of its stroke, with both front lifters at their lowest position. (TDCC - top dead center compression.)
   c- Loosen front adjusters and remove pushrods and tube assemblies.
   d- Clean & inspect pushrod tubes. Prepare top cover as per **Figure 1**, if alloy pushrods are used. Replace all cork and/or o-ring seals. Apply a light coat of engine oil to o-rings.
   e- Insert new pushrods through tube assembly and install in appropriate position.
   f- Extend lifter to remove lash in pushrod. Adjust lifter to be able to spin pushrod with fingertips with a slight drag, and tighten locknut. Recheck after tightening.
   g- Repeat the above procedure for rear cylinder, this time bringing the rear cylinder to TDCC (top dead center compression).
   h- Replace sparkplugs and pushrod tube clips. Start motorcycle and check for leaks.

NOTES:

- *1/2" diameter alloy pushrod kits, for ironhead Sportster® models & knucklehead engines, may contact the pushrod tubes. It is advisable to chamfer the lower, inside diameter of the top pushrod cover tube when installing these pushrod kits. See **Figure 1** below.*
- *The knucklehead solid lifter pushrod kit requires stock-style adjustable tappets.*
- *These kits are intended to replace the stock pushrods found in 1948-'52 engines that contain a hydraulic unit built into the pushrods. These kits require the stock 1948-'52 style adjustable lifters.*

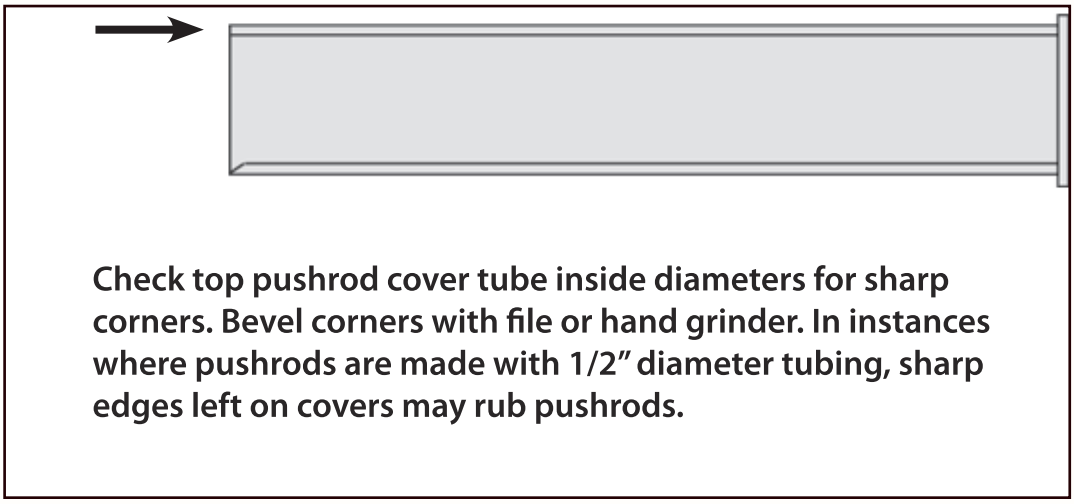

Figure 1

2- 1953-'65 Panhead Stock Replacement Hydraulic Pushrod Kit
(Part 93-5091 and 93-5092)

NOTE: *These kits are intended to replace the stock pushrods found in 1953-'65 engines. These kits require the stock-type adjusting screws, which are not included.*

a- Remove pushrod cover clips and lift cover assemblies to view lifters.
b- Remove sparkplugs and rotate engine until front piston is at the top of its stroke, with both front lifters at their lowest position (TDCC – top dead center, compression).
c- Loosen front lifter adjusters and remove pushrod and tube assemblies.
d- Clean and inspect pushrod tubes. Replace all cork and/or o-ring seals. Apply a light coat of engine oil to o-rings.
e- Install stock-style adjusting screws & locknuts into pushrods.
f- Insert new pushrods through tube assemblies and install in appropriate positions.
g- Extend adjusting screws to remove lash in pushrods. Compress hydraulic unit in exhaust lifter 4 complete turns (24 flats) and tighten locknut. Allow sufficient time for lifter to bleed down (20 to 30 minutes or when pushrod spins freely) before adjusting intake pushrod. Pushrods must spin freely with fingers.

⚠ CAUTION

Failure to allow hydraulic unit to bleed down before rotating engine or adjusting the other pushrod could result in valve-to-valve contact and serious valve train damage. Lifters are bled down when pushrod can be turned with fingertips.

h- Repeat above procedure for rear TDC cylinder.
i- Replace spark plugs and pushrod tube clips. Start motorcycle and check for leaks.

3- 1953-'65 Panhead Solid Lifter Conversion Kit.
(Part 93-5081, 93-5082, 93-5083, 93-5084, 93-5058, and 93-5028)

***NOTES*:**
- *These kits are intended for converting 1953-'65 stock style hydraulic lifters to adjustable solid lifters.*
- *Panhead engines, 1953 & later, and shovelhead engines with solid lifters, should have tappet block hydraulic lifter oil feed holes plugged to prevent excess oil escaping above lifters and filling pushrod tubes, causing potential oil leaks. Thread 8-32 tap into oil feed passage from gasket surface of tappet block until tap end just starts to enter lifter bore. Plug hole with an 8-32 x 3⁄16" set screw. Repeat for other tappet block.*
- *If hydraulic lifters are to be reinstalled, plugs must be removed.*

⚠ CAUTION

Restricted oil flow to hydraulic lifter assemblies causes lifters to operate with improper oil pressure which may damage the lifters or other valve train components.

a- Remove pushrod cover clips and lift cover assemblies to view lifters.
b- Remove sparkplugs and rotate engine until front piston is at the top of its stroke, with both front lifters at their lowest position (TDCC – top dead center, compression).
c- Loosen front lifter adjusters and remove pushrod and tube assemblies.
d- Clean & inspect pushrod tubes. Replace all cork and/or o-ring seals. Apply a light coat of engine oil to o-rings.
e- Remove tappet block, perform plugging step detailed in above note, and then reinstall tappet block and tappets.
f- Remove hydraulic units from tappets and replace with solid lifter adapter, adjusting screw, and locknut assembly.
g- Insert new pushrods through tube assemblies and install in appropriate positions.
h- Extend adjusting screws to remove lash in pushrods. Adjust to be able to spin pushrods with fingertips with a slight drag, and tighten locknuts.
i- Repeat above procedure for rear cylinder, this time bringing the rear cylinder to TDCC (top dead center compression.)
j- Replace spark plugs and pushrod tube clips. Start motorcycle and check for leaks.

B- PUSHROD KITS FOR SHOVEL ENGINES.
1- 1966-'84 With 1948-'52 Lifters.
(Part 93-5069 and 93-5026)

NOTE: *These kits are intended for use with 1948-'52 style adjustable lifters.*

a- Remove pushrod cover clips and lift cover assemblies to view lifters.
b- Remove sparkplugs and rotate engine until front piston is at the top of its stroke, with both front lifters at their lowest position (TDCC – top dead center, compression).
c- Loosen front lifter adjusters and remove pushrod and tube assemblies.

d- Clean and inspect pushrod tubes. Replace all cork and/or o-ring seals. Apply a light coat of engine oil to o-rings.
e- Remove tappet block, perform plugging step detailed in above note, and then reinstall tappet block and tappets.
f- Reinstall tappet block and tappets.
g- Insert new pushrods through tube assemblies and install in appropriate positions.
h- Extend adjusting screws to remove lash in pushrods. Adjust to be able to spin pushrods with fingertips with a slight drag, and tighten locknuts.
i- Repeat above procedures for rear cylinder, this time bringing the rear cylinder to TDCC (top dead center compression.)
j- Replace spark plugs and pushrod tube clips. Start motorcycle and check for leaks.

2- 1966-'84 With Hydraulic Lifters

(Part 93-5070 & 93-5071.)

a- Remove pushrod cover clips and lift cover assemblies to view lifters.
b- Remove sparkplugs and rotate engine until front piston is at the top of its stroke, with both front lifters at their lowest position (TDCC – top dead center, compression).
c- Loosen front lifter adjusters and remove pushrod and tube assemblies.
d- Clean and inspect pushrod tubes. Replace all cork and/or o-ring seals. Apply a light coat of engine oil to o-rings.
e- Install stock-style adjusting screws & locknuts into pushrods.
f- Insert new pushrods through tube assemblies and install in appropriate positions.
g- Extend adjusting screws to remove lash in pushrods. Compress hydraulic unit in exhaust lifter 4 complete turns (24 flats) and tighten locknut. Allow sufficient time for lifter to bleed down (20 to 30 minutes) before adjusting intake pushrod. Pushrods must spin freely with fingers.

⚠ CAUTION

Failure to allow hydraulic unit to bleed down before rotating engine or adjusting the other pushrod could result in valve-to-valve contact and serious valve train damage. Lifters are bled down when pushrod can be turned with fingertips.

h- Repeat above procedures for rear cylinder, this time bringing the rear cylinder to TDCC (top dead center, compression.)
i- Replace spark plugs and pushrod tube clips. Start motorcycle and check for leaks.

3- 1966-'84 Solid Lifter Conversion Kit – Adjustable Lifter

(Part 93-5068 and 93-5062)

NOTES:

- *These kits are intended for converting 1953-'84 stock-style hydraulic lifters to adjustable solid lifters.*
- *Shovelhead engines with solid lifters should have tappet block hydraulic lifter oil feed holes plugged to prevent excess oil escaping above lifters and filling pushrod tubes, causing potential oil leaks. Thread 8-32 tap into oil feed passage from gasket surface of tappet block until tap end just starts to enter lifter bore. Plug hole with an 8-32 x 3/16" set screw. Repeat for other tappet block.*
- *If hydraulic lifters are to be reinstalled, plugs must be removed.*

⚠ CAUTION

Restricted oil flow to hydraulic lifter assemblies causes lifters to operate with improper oil pressure which may damage the lifters or other valve train components.

a- Remove pushrod cover clips and lift cover assemblies to view lifters.
b- Remove spark plugs and rotate engine until front piston is at the top of its stroke, with both front lifters at their lowest position (TDCC – top dead center, compression).
c- Loosen front lifter adjusters and remove pushrod and tube assemblies.
d- Clean and inspect pushrod tubes. Replace all cork and/or o-ring seals. Apply a light coat of engine oil to o-rings.
e- Remove tappet block, perform plugging step detailed in above note, reinstall tappet block and tappets.
f- Remove hydraulic units from tappets and replace with solid lifter adapters, adjusting screws, and locknut assembly.
g- Insert new pushrods through tube assemblies and install in appropriate positions.
h- Extend adjusting screws to remove lash in pushrods. Adjust to be able to spin pushrods with fingertips with a slight drag, and tighten locknuts.
i- Repeat above procedures for rear cylinder.
j- Replace spark plugs and pushrod tube clips. Start motorcycle and check for leaks.

4- 1966-'84 Solid Lifter Conversion Kit – Adjustable Pushrod

(Part 93-5014, 93-5015, 93-5016, 93-5063, 93-5067, & 93-5080)

NOTE: *These kits are intended for converting 1953-'84 stock-style hydraulic lifters to non-adjustable solid lifters.*

a- Remove pushrod cover clips and lift cover assemblies to view lifters.
b- Remove spark plugs and rotate engine until front piston is at the top of its stroke, with both front lifters at their lowest position (TDCC – top dead center, compression).
c- Loosen front lifter adjusters and remove pushrod and tube assemblies.
d- Clean and inspect pushrod tubes. Replace all cork and/or o-ring seals. Apply a light coat of engine oil to o-rings.
e- Remove tappet block, perform plugging step detailed in above note, reinstall tappet block and tappets.
f- Remove hydraulic units from tappets and replace with solid lifter adapters.
g- Insert new pushrods through tube assemblies and install in appropriate positions.
h- Extend adjusting screws to remove lash in pushrods. Adjust to be able to spin pushrods with fingertips with a slight drag, and tighten locknuts.
i- Repeat above procedures for rear cylinder.
j- Replace spark plugs and pushrod tube clips. Start motorcycle and check for leaks.