



CUMMINS X12 SERIES

Sleeve Removal & Installation Manual

IRONTITE PRODUCTS INC

2525 18th Str. SW, suite D, Cedar Rapids, Iowa 52404 USA
800-553-5953 · +1-319-377-9421 · www.ironTite.com

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CUMMINS X12
STAINLESS STEEL INJECTOR SLEEVE REMOVAL & INSTALLATION KIT



The Complete CUMMINS X12 Series Kit with Toolbox - 450-6158-00

Note: For early production ISX12 SOHC (single overhead cam) versions our Cummins ISX15 SOHC Kit (450-6157-000) is used instead.

Image #	Description	Part #
1	"EA" Lube for Stainless Steel - 8 OZ (237ML)	468-9910-08
2	5/16" Hex T-Handle Wrench for Cummins	467-1612-01
3	Tube Clamp Assembly Cummins X12	416-6158-12
4	Tap Guide Bushing	416-6156-32
5	Tap	416-6158-60
6	Removal Tool Cummins X12	415-6138-00
7	Casting Cleaning Brush (Carbon Steel)	450-6951-05
8	Drive-In Tool Cummins X12	416-6158-51
9	Roll-In Tool Cummins X12	416-6158-53
TBD	Nose Punch	TBD
10	Permatex High Heat Sleeve Retainer/Sealant	468-9640-00
11	Tool Box	467-1950-50

ADDITIONAL AVAILABLE ITEMS

Description	Part #
Cummins X12 Stainless Steel injector Sleeve with O-Ring	419-6198-05

Made in USA

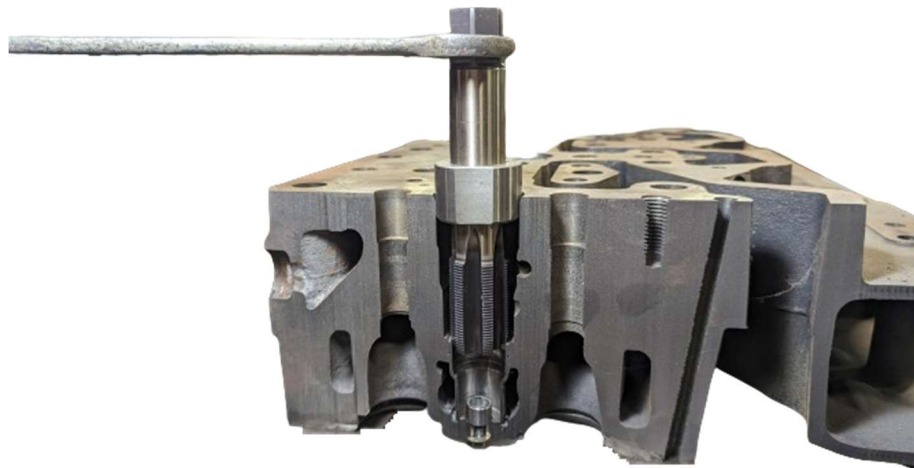
REMOVAL and INSTALLATION

Sleeve Removal

- 1) With valves removed, install the sleeve hold down clamp (416-6158-12) through the inside of the sleeve. Install washer and nut onto stud sticking out from face of head and tighten.
- 2) The clamp will keep the sleeve from turning while tapping the sleeve.

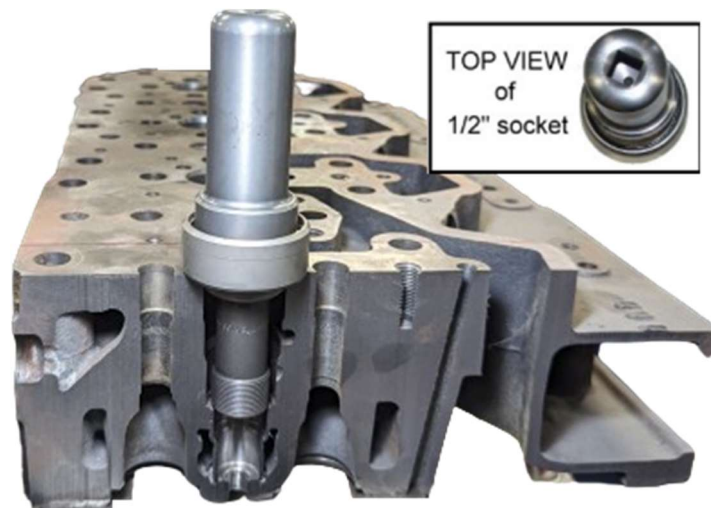
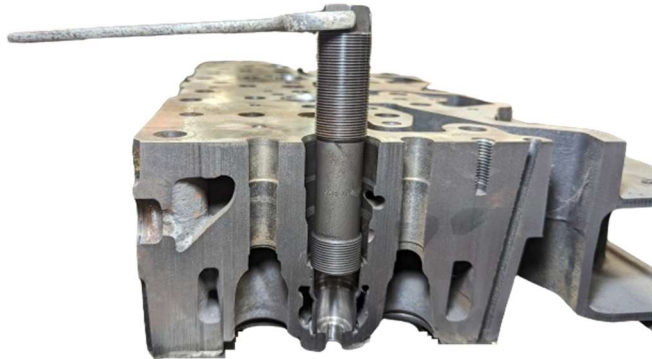


- 3) Using extended tap (416-6158-60) and tap guide bushing (4416-6156-32), lubricate the tap with "EA" Lube (468-9910-08) while tapping the injector sleeve about 3/8" to 1/2" deep.
- 4) Unbolt and remove the hold down clamp.



Sleeve Removal (Continued)

- 5) Insert the assembled sleeve remover (415-6138-00) threaded puller screw of the removal tool down into the old sleeve. Continue to torque the puller screw into the sleeve until the puller screw grips the sleeve tightly with the threads, then reverse $1/3$ to $1/2$ turn, this will relax the threads where the sleeve will be much easier to remove from tool when removed from cylinder head. (2) With the bushing in place between the puller nut and the face of the casting, and with the thrust bearing and the two thrust washers between the puller nut and the bushing, continue tightening down the puller nut and pull out the old sleeve as shown here.



Note: Due to metal fatigue there may be times when the sleeve nose will break off during the removal process. When this happens you will use the Nose Punch (PN TBD) from the cylinder side of the casting to drive the remaining nose of the sleeve out of the casting.

Sleeve Installation

1. Using the carbon steel brush (450-6951-05) clean the inside of the injector sleeve bore.



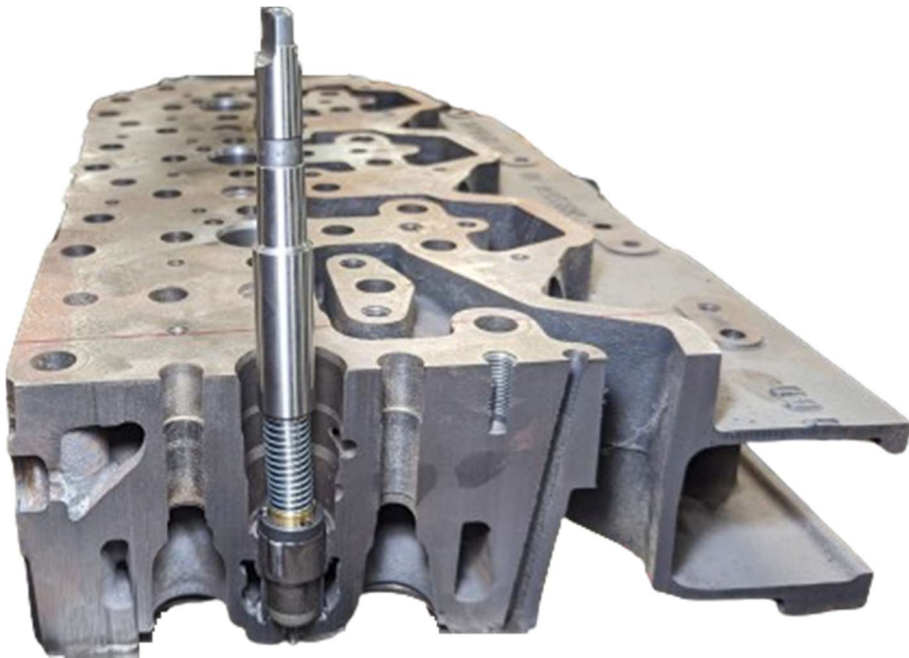
2. Prepare the new injector sleeve for installation.
 - a. Utilize a thin layer of lightweight oil to lubricate the O-rings on the sleeve. This will prevent them from shifting out of position when inserting the sleeve into the casting.
 - b. Prior to inserting the new sleeve into the casting, apply a High Heat Sleeve Retainer/Sealant (468-9640-00) to the flat nose area.

Sleeve Installation (Continued)

- 3) Use the Sleeve Drive-In Tool (416-6158-51) and a hammer to drive the Sleeve (with a new O-Ring) to the bottom of the casting.



- 4) Using the roll-in tool to roll in the upper end of the injector sleeve (416-6158-53) can be used in a Machining Center (Seat & Guide Machine). Keeping the tool lubricated with a "Quality Motor Oil" (NOT "EA" Tap & Lube), roll in the upper end of the sleeve by running the machine clockwise and letting the roll-in tool feed itself. To remove the tool, reverse the direction.



NOTE: If you observe the tool exerting more effort than expected or facing challenges while retracting after the roll-in procedure, it could be attributed to misalignment of the tool in the Machining Center or when using different adapters to secure the tool. Occasionally, an excessive amount of play in the tooling attachments can result in an inadequate roll-in.



Irontite Products Inc.
2525 18th Street SW, Suite D, Cedar Rapids, IA 52404 USA
800-423-3384
+1-319-377-9421
FAX 319-377-9101
www.irontite.com