

INSTALLATION INSTRUCTIONS

SUBJECT: FREEDOM SERIES HD CYLINDER HEAD FOR THE 6.0L POWERSTROKE

FPE-2023-110
September, 2025
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FITMENT: 2003-2007 6.0L Powerstroke equipped Ford F250/350 pickups
KIT P/N: FPE-61-10011-HD, FPE-61-10012-HD
INSTALL TIME: 12-14 Hours

KIT CONTENTS:

Item	Description	Qty
1	Powerstroke 6.0L cylinder head	1
2	Fuel return plug	1



IMPORTANT NOTES:

- Always reference the appropriate Ford factory manual for your specific engine. Variances exist among different models of engine configurations.
- Fleece Performance requires the use of all new head studs and inner row bolts for this installation. **DO NOT REUSE HEAD STUDS OR BOLTS!**

IMPORTANT APPLICATION INFORMATION:

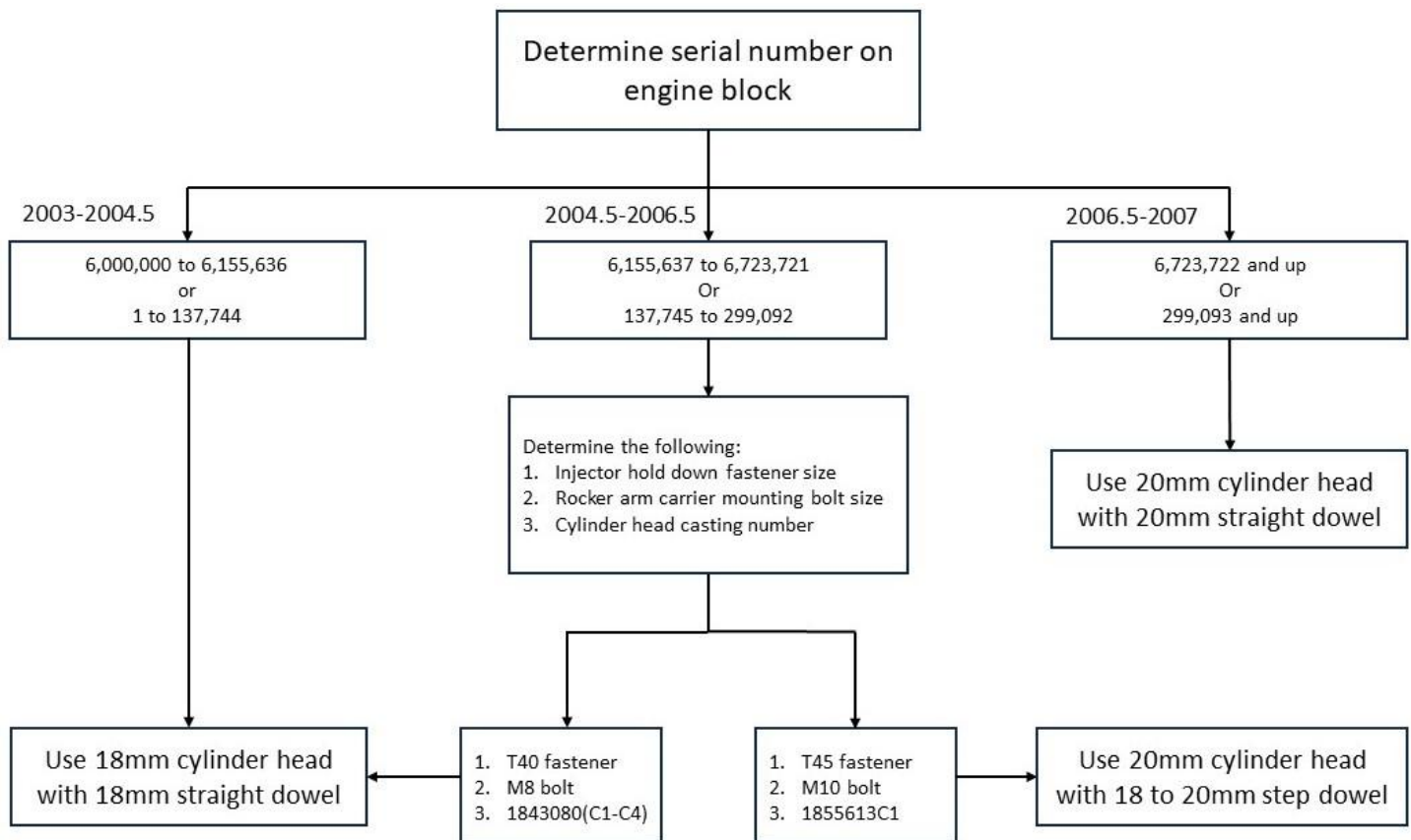
- All 18mm dowel heads are configured for use on 8-bolt rocker box configurations.
- All 20mm dowel heads are configured for 2-bolt rocker box configurations.
- Fleece Performance requires the use of 6.4L Powerstroke pushrods (Ford Part No. 8C3Z-6565-B) when installing these cylinder heads. 6.4L pushrods are 0.050" shorter in length vs. a 6.0L pushrod and will accommodate the tolerance stack ups that can be encountered with a replacement cylinder head.
- For 18mm dowel installations we recommend the use of Ford Head Gasket Part No. KC3Z-6051-A.
- For 20mm dowel installations we recommend the use of Ford Head Gasket Part No. KZ3Z-6051-B.
- All 18mm heads are configured for use with early style injector clamps with a T40 fastener. Use Ford Part No. 1838901C4.
- All 20mm heads are configured for use with late style injector clamps with a T45 fastener. Use Ford Part No. 1856237C1.

CYLINDER HEAD IDENTIFICATION

It is critical that you select the correct cylinder head for your engine. Some model years will require different cylinder heads and components in order to install a Fleece Performance 6.0L Powerstroke cylinder head. Follow the flow chart below to determine which cylinder head you will need. For 18mm dowel cylinder heads, use PN FPE-61-10011-HD. For 20mm dowel cylinder heads, use PN FPE-61-10012-HD.

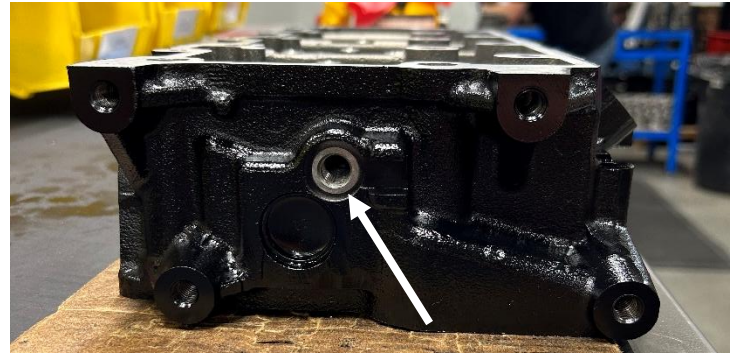
The engine serial number can be found on the rear, driver's side of the engine block. See the image below.

An alternate location for the engine serial number can be found on the identification sticker located on top of the fuel injector control module (FICM). This only applies for vehicles with their original FICM. If you are unsure if the FICM is original to the vehicle, read the serial number on the back of the engine block.



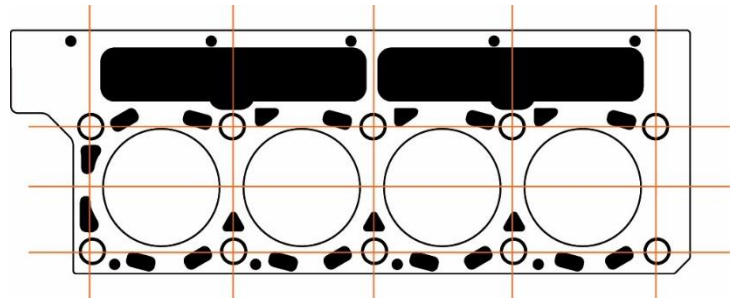
INSTALLATION PROCEDURE:

STEP 1: Install the injector return plug onto the new Fleece Performance cylinder head as required for your installation. The plug is installed into the rear-facing side of the cylinder head. This step **MUST** be performed prior to installation of the cylinder head onto the engine block.



STEP 2: With the OE cylinder head and gasket removed, check for scoring of the cylinder walls and damage on the tops of the pistons.

STEP 3: The block surface must be clean, dry, and flat. Verify the cylinder block deck for flatness using a machinist's bar such as a Matco SE6431A or Snap-On GA438A. A ruler or metal bar **IS NOT** an acceptable tool for this application. Using a 0.002" thick feeler gauge, place the bar over the gauge and gently pull. If the gauge slides out from under the bar easily, you will need to face the deck before proceeding. Place the bar in the orientations shown to the right.



STEP 4: Inspect the head stud bores and verify the thread conditions. Clean out any debris using an M14 x 2.0 bottoming tap.

STEP 5: Install the dowels onto the block. Ensure that the dowels are the proper size for your cylinder head.

STEP 6: Install the cylinder head gasket.

STEP 7: If you are installing the cylinder head with the cab of the vehicle removed from the frame, thread on one head stud in the bottom center position. If installing with the cab on, you will have to skip to step 8.

STEP 8: Install the cylinder head onto the block.

STEP 9: Ensure that a new gasket is installed onto the rocker box where it meets with the cylinder head. Install the rocker box on top of the cylinder head.

STEP 10: Install the head studs. Thread them into the block until hand tight, ensuring that they bottom out. Place the washers on the studs and thread on the nuts until hand tight.

STEP 11: Install the pushrods.

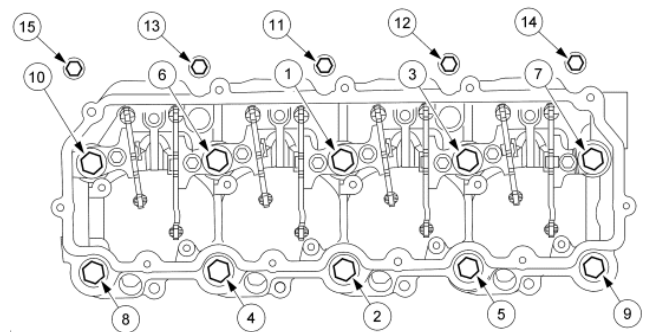
NOTE: Fleece Performance requires the use of pushrods made for 6.4L Powerstroke engines. Use Ford Part No. 8C3Z-6565-B.

STEP 12: Install the valve bridges. Install the rocker bodies and tighten the bolts to hand tight.

STEP 13: Install the inner row bolts and tighten to hand tight.

STEP 14: Torque the head stud nuts (fasteners 1-10) following the torque sequence shown to the right. Follow the torquing procedure outlined by the manufacturer of your head studs.

STEP 15: Torque the inner row bolts (fasteners 11-15) following the torquing procedure outlined by the manufacturer of your inner row bolts.



STEP 16: Torque the rocker arm bolts to 25 ftlbs.

STEP 17: Torque the rocker box bolts to 23 ftlbs.