This kit is an easy solution to convert your JIMS® 120" into a 131". It's designed to work with an existing Alpha JIMS® 120" Race Engine. Kit includes a set of 4-5/16" JIMS® cylinders, and a set of 4-5/16" JIMS® pistons. These are the same cylinders and pistons used in the new JIMS® 131" race engine and is based on the same stroke as the 120". Other parts, including the flywheel assembly, cams, etc., can still be used. A simple engine case boring, and this kit converts your 120" into an awesome 131" engine. With proper induction, exhaust and head modifications, this Big Bore kit will easily match the power output of the new JIMS® 131" race engine. This kit offers a great cost alternative for the customer that has already purchased a JIMS® 120" engine.

NOTE: PLEASE READ ALL INSTRUCTIONS COMPLETELY BEFORE PERFORMING ANY WORK!

IF YOU DO NOT KNOW WHAT YOU ARE DOING, DO NOT DO IT!

No information in this instruction sheet pertaining to motorcycle repair is represented as foolproof or even altogether safe. Even something safe, done incorrectly or incompletely can and will backfire. You and only you are responsible for the safety of your repair work and for understanding the application and use of repair equipment, components, methods and concepts. Each and every step this tool is designed to do must be carefully and systematically performed safely by you. All information listed in this instruction sheet has been tested, re-tested and used daily in JIMS® Research and Development Department.

ALWAYS WEAR SAFETY GLASSES OR OTHER FACE AND EYE PROTECTION SUCH AS FULL FACE SHIELD. JIMS® IS NOT RESPONSIBLE FOR DAMAGE, INJURY, OR YOUR WORK. JIMS® IS NOT RESPONSIBLE FOR THE QUALITY AND SAFETY OF YOUR WORK.

CAUTION: Wear safety glasses over your eyes.
Excessive force may damage parts!
See JIMS® catalog for Hundreds of top quality professional tools.
No.1000-0010 JIMS® 131 Big Bore Kit (Black) Use on Alpha only JIMS® 120” Twin Cam® Engines
No.1000-0011 JIMS® 131 Big Bore Kit (Silver) Use on Alpha only JIMS® 120” Twin Cam® Engines

Note: Please read all instructions completely and thoroughly before performing any work.

WARNING:
Prior to installation of this kit please read and follow the procedures and safety precautions to reduce the risk of personal injury. Refer to H-D Service Manual for specifications and for removal and installation of the engine for the year and model you’re working with. Read instructions completely so you understand before performing any steps. Always disconnect battery (ground cable at the battery) cable to prevent injury. Your work place must be clean and well lit. Wear safety glasses over your eyes and protective clothing when working around power tools and compressed air. If you are not sure about the procedures in these instructions, have a reputable H-D repair shop perform those procedures for you.

IMPORTANT CYLINDER PREPARATION:
Before installing cylinders with pistons onto cases, the piston bores and gasket surfaces must be scrubbed and cleaned with hot soapy water.

JIMS TOOLS NEEDED TO PERFORM THIS SERVICE
JIMS case boring tool No.1400. See JIMS catalog for a complete listing of Tools needed to perform this service for engine disassembly and case boring.

A. JIMS Leedown tester No.782 should be used before removing engine from frame. This is to determine if head repair is required. See JIMS catalog for the complete listing of head service tools, and parts. You also have the option to order a set of CNC ported 131” heads (see JIMS engine catalog) designed to be installed on the above cylinders and pistons.

B. See JIMS catalog for the complete list of tools required to safely help remove the engine from the frame.

C. Use JIMS engine stand for the year and model you are working on. See JIMS catalog for the entire listing of engine stands.

D. Use a 15” heavy-duty drill press, for the use of JIMS No.1400 case boring tool.

CAUTION: Wear safety glasses over your eyes. Excessive force may damage parts! See JIMS® catalog for hundreds of top quality professional tools.
E. Use JIMS crank disassembly (case splitter) tool No.1047-TP for JIMS 120”, 1999-2005 “A” and 2000-2006 “B” or use JIMS tool No. 995 for JIMS 120”, 2006-present “A” and 2007-present “B”. Use hard end cap JIMS No.1048 to protect the end of the flywheel shaft. See JIMS catalog for the entire list of flywheel bearing tools.

F. JIMS piston pin remover tool No.1276.

G. If after inspecting the wrist pin bushing (easier to replace with flywheels in case before case boring) it is beyond the service wear limit, replace with JIMS tool No.1051. Hold the rod with No.1284 and ream with No.1726-3, then check rod alignment with JIMS tool No. 1148.

H. See JIMS catalog for the entire cam chest service tools.

I. To reinstall flywheel use JIMS tool No.97225-55 for JIMS 120”, 1999-2005 “A” or use JIMS tool No.973 with tool No.97225-55 for JIMS 120”, 2006-present “A”.

J. Piston ring compressor JIMS No.1236.

K. A dial bore gauge capable of checking 4.540 diameter and or a good set of dial calipers or a depth mic, that is capable of checking 1.900 deep.

L. Use a H-D service manual for appropriate year and model for the motorcycle you will be repairing.

M. If you will be installing flywheels in a 2006 to present Dyna or a 2007 FL use a 2002 H-D® Service manual which has the information needed for setting up the left side Timken bearing.

N. All cleaners, assembly lubes and sealants used for a T/C engine rebuild.

Warning: Inspect all the engine and transmission mounting hardware and components to be in good serviceable condition for this upgrade in power.
Note: Use below check off list of supplied components in this kit:

- Front Cylinder 131”, Black No. 1308-1611 or Silver No. 1308-1621
- Rear Cylinder 131”, Black No. 1308-1612 or Silver No. 1308-1622
- Set of pistons No. 1886-1357 with rings, wrist pins and keepers, matched fit to the above cylinders.
- Head gaskets 131” Big Bore, Front and Rear, No. 1308-1312, (see head gasket orientation.)
- Base gaskets 131” Big Bore, Front and Rear, No. 1308-1311, (see base gasket orientation.)
- Center, top case bolt No. 1708-1553, use between the cylinders for case boring and new 131” cylinder installation.
- JIMS instruction sheet book (box) No.1 part number 1208-1351
- JIMS instruction sheet book (box) No.2 part number 1208-1352
- JIMS instruction sheet book (box) No.3 part number 1208-1353

Note: Any time an engine is repaired with new parts, the oil tank and or oil pan including oil lines, oil cooler must be removed and washed out and cleaned.

If for any reason you need assistance please call JIMS tech department. At: (805) 482-6913.

**REMOVING THE ENGINE:**

1. Secure motorcycle in an upright position with tie downs so it will not and can not fall over while removing the engine from the frame.

2. Remove engine per service manual for the year and model motorcycle you will be work-
ing on.

3. Upon disassembly of engine inspect all engine components per JIMS service wear information list found in instruction book (box) No 3. For any service wear items not listed, you will need to refer to your service manual for the year and model motorcycle you will be working on. Information for the Timken bearing H-D No. 9028, can be found in any model H-D twin cam service manuals dated 2002 or earlier.

4. See JIMS instruction books (box) 1, 2, and 3 included in this kit for engine parts replacement and service rebuilding information throughout this installation.

5. For reassembly of the lower end (flywheels and cam components being installed in case) please refer to your service manual for the year and model motorcycle you will be working on.

6. For the center case bolt torque you must refer to JIMS 120” and 131” instruction book (box) No.2 and page 6 of these instruction sheets.

**Warning:** You must refer to JIMS 120” and 131” instruction books, when reassembling the top end. This information has been included with this instruction sheet. There are some differences between a JIMS race engine and a stock T/C engine in reference to the top end assembly. Follow JIMS instruction sheets book (box) No.1 part number 1208-1351, book (box) No. 2 part number 1208-1352 and book (box) No. 3 part number 1208-1353.

**Caution:** Do not hold cases from cylinder studs.

If using JIMS case boring tool No. 1400, it’s not necessary to remove the cylinder studs. If you will be boring the cases without JIMS boring tool, it may be necessary to remove cylinder studs. Studs can be removed. Depending on how clean and how much Loctite was used in assembly, it varies how much effort will be required to remove all 8 studs. If you’re removing them, you will need to apply about 425 degrees of heat to the engine case and studs. Once heat is removed you must promptly remove studs within two minutes before too much cooling takes place. You can easily soften the case aluminum to the point that you could ruin them if too much heat is used. All studs taken out must be replaced with new ones. The case threads need to be cleaned out with a thread chaser. Do not over chase the threads (enlarge threads). Reinstall the new cylinder studs with No. 620 Loctite retaining compound. See parts list in engine assembly instruction sheet.
PREPARE CASES FOR CASE BORING:
Follow the instructions in the H-D® service manual for removal of engine for your year and model you are boring. With engine safely mounted in one of JIMS Twin Cam Alpha motor stands, follow instructions to disassemble the engine. Remove piston-oiling jets, and if in good condition keep them clean for use later.

Clean all parts thoroughly including gasket surfaces, and inspect all parts for any visible damage. Measure all parts for wear using the service wear limit section in your H-D service manual, and also follow the instruction sheets included with this kit. See JIMS No. 1208-1351, 1208-1352 and 1208-1353. Replace any worn or damaged parts with JIMS engine parts or equivalent. Mask off all bearings (if they have been deemed in good serviceable condition). Also mask oil holes to prevent chips from contaminating those areas. Check and clean both engine-case mounting surfaces (the split line). Next, bolt cases together with hardware that has been cleaned from disassembly. Before installing lightly lube all threads. It is not necessary to install, two new case dowel O-rings or the old ones at this time.

Note: You will be replacing your original 120” top center case bolt with the new modified 131” big bore kit case bolt using No. 1708-1553.

Once you have the case halves stripped down and you’re ready to machine the cylinder holes to fit the bigger bore you will need to follow “The case hardware torque sequences”, to bolt cases together shown in Fig 1.

ALPHA CASE BOLT TORQUING PROCEDURE

* DO NOT LET CASE HALVES GET DIRTY IN ANY WAY*

ALTERNATLEY TIGHTEN EACH BOLT UNTIL FINGER TIGHT.

TIGHTEN CRANKCASE BOLTS IN THE SEQUENCE SHOWN STARTING WITH #1 AND ENDING ON #8 TO 10ft-lbs.

TIGHTEN CRANKCASE BOLTS IN THE SEQUENCE SHOWN STARTING WITH #1 AND ENDING ON #8 TO 15-19ft-lbs.

TIGHTEN CRANKCASE BOLT #9 TO 35in-lbs.

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Performance Parts For Harley-Davidson Motorcycles

555 Dawson Drive, Camarillo, CA 93012  Phone 805-482-6913  Fax 805-482-9224
7. Bore your JIMS 120” race case to a diameter of 4.540” + .030/- .000 and to a depth of 1.900” + .040/ -.000”. This 1.900” is from the top of case (cylinder gasket surface) to the bottom of new bored case. See Fig 2

**Caution:** The depth of 1.900” is a must; to give the piston at least .060” of piston skirt to case clearance. See Fig 3.

**Note:** Depending on the diameter and depth you have bored to, it is possible that the cutter can break into the O-ring groove (for the cross over oil drain holes between the two case halves) in both the front and rear cylinder bores. A cutter breaking into this groove is acceptable, just remove any burrs from around O-ring groove, and oiling jet case recess area. You will also need to deburr the top center case bolt hole where it opens up to the cylinder bore. See Fig 4.

8. After case boring is complete do a dry check of both new cylinders without the base gaskets in place. There should be no no visible gap between the case deck and cylinder. If any gap is detected rebore case as needed.

9. After all work has been done and checked, deburr and clean cases of all machine material.

**Note:** If you will be reusing the same cams, and the 120” heads or JIMS new 131” heads with these new pistons and cylinders, then no further checks will be needed other then checking piston ring gap and if necessary gapping the rings to specification. If you are changing any of the engine components from the parts we have listed to fit JIMS 120” (now a 131”) i.e. flywheels, cams, cam support, oil pump, pistons or rockers, then you, the engine builder, will be responsible for checking and correcting any of these components for the correct fitment.

10. Install the flywheels and all cam chest components per H-D® Service Manual.
Note: Please see JIMS 120”/131”, hardware locations for cam support. See Fig 5.

If you’re installing flywheels in an 2006 to present Dyna or an 2007 to present FL, use a 2002 H-D® service manual having the needed information for setting up the left side Timken bearing. See page 1 and 2 for the JIMS tools needed to install all flywheel years.

11. Seal case halves and torque case bolts to the following: See Fig 6 and then See Fig 1.

12. Install top end, and follow start up procedures, tuning, run in (break in) and oil changes according to instruction sheets 1208-1351, 1208-1352, and 1208-1353 included with this kit.

1. Obtain 2 long cam support screws (JIMS #1286-1335, H-D #4740A). Apply a drop of loctite #242 (Blue) to threads and hand start screws at the locations shown. See FIG 5.

2. Obtain 4 short cam support screws (JIMS #1286-1336, H-D #4741A). Apply a drop of loctite #232 (Blue) to threads and hand start screws at the locations shown. See FIG 5.

3. Using a 3/16 allen socket, torque screws in the numerical torque sequence shown in FIG 5 to 120 in-lbs.
ALPHA ENGINE CASE SEALING PROCEDURE

- Do not let cases get dirty in any way
- Do not leave any blank spots in bead
- Use H-D No. 99650-02 case sealant or equivalent.

1. Visually inspect that the following parts have been installed:
   1. Oil Jets (JIMS No. 1286-1301 H-D No. 22307-99)
   2. Oil Jet Screws (JIMS No. 1286-1337 H-D No. 68042-99)
   3. Case Dowel O-Rings (JIMS No. 1286-1381 H-D No. 26432-76A)
   4. Inner Cam Bearings (JIMS No. 1286-1386 H-D No. 9198)
   5. Main Case Bearing (JIMS No. 1286-1321 H-D No. 24623-99B)
   6. Spiral Retaining Rings (JIMS No. 1286-1371 H-D No. 35115-99)
   7. Case Drain Plug (JIMS No. 1286-1385 H-D No. 2389)

2. Apply sealant to case (approx .06 wide) following the dark line, shown in Fig. 6

**Do not let sealant sit on case any longer than 10 minutes**

3. Gently move case to next step

Do not miss this spot:

- Oil Jets
- Oil Jet Screws
- Case Dowel O-Rings
- Inner Cam Bearings
- Main Case Bearing
- Spiral Retaining Rings one under the bearing
- Case Drain Plug
- Silicone Bead

FIG 6