

LN Engineering Retrofit Kit Instructions - Rev 20 Sept 14.

1. **WE DO NOT PROVIDE SUPPORT FOR INSTALLATIONS! IF PURCHASED THROUGH A DEALER OR RESELLER, CONTACT SOURCE FIRST. PROFESSIONAL INSTALLATION RECOMMENDED AND REQUIRED for limited 30-day warranty.** See enclosed warranty form for details.
2. Dual row retrofit kit for dual row only IMS's & classic single row or single row pro kit for single row only!
3. Use PST2, PIWIS, or equivalent tester to read live DME values for camshaft timing. If there is more than 7 degrees of deviation, do not proceed with retrofit procedure.
4. Prior to starting this repair, drain oil, remove filter and oil pan and inspect for debris. If any foreign object debris is present IMS Retrofit procedure should not be carried out. **NOT QUALIFYING A JOB PROPERLY VOIDS ANY WARRANTY**
5. Put engine at TDC, and lock out the pulley so the engine cannot turn over with lock pin.
6. Use appropriate long cam lock tool for 3-chain or short cam lock tool for 5-chain engine to lock cams prior to removing chain tensioners. Lock camshaft in head with tensioner accessed from underside of the engine, closest to flywheel.
7. Remove the IMS to crankshaft chain tensioner as well as well the chain tensioner on the cylinder head for which you have locked the cam. If tensioners are worn or were noisy at startup, replace. *NOTE: If the flange does not come off easily, the bearing is not centered, or you cannot reinstall the flange, then loosen and/or remove the third chain tensioner and verify or correct camshaft timing.*
8. Remove hub flange. You should not have to apply excess force to remove the flange!
9. If the bearing is has started to fail or is failed, STOP. You should not proceed further. Call LN Engineering.
10. **If center stud/bearing support is broken**, use LN Engineering "Easy Out" Tool.
11. If it is a single row bearing, remove the snap ring. **Retain original snap ring on single row bearing as you will re-use it.** Otherwise, for dual row bearings, proceed as the retaining wire-loc is internal and will collapse as you pull on it.
12. Thread hex bar adapter onto existing bearing support / center stud (already attached to bearing puller, sold separately). Tool kit includes 2 hex bar adapters – the one with the notches on circumference of hex is for pulling LN bearings.
13. Adjust nut until sleeve of bearing puller is resting on the face of the intermediate shaft (around bearing housing bore) and **lubricate puller** before extracting bearing. When bearing has been extracted, the bearing and puller will come away from the engine as a single unit and clean out IMS tube.
14. Remove nut from new bearing support (already pressed into new bearing in center race) and slide the aluminum bearing driver/installation tool over the stud, counter-bored side facing outside of engine. Leave spare 1.5 x 10mm o-ring at base of center stud.
15. Before installing the new bearing, make note if the old bearing has signs of movement on the outer race. If yes, measure the housing to ensure there is no ovality. Consider using a very small amount of Loctite Bearing Mount on the outside diameter of to ensure a good fit for the new bearing so the outer race cannot rotate. Loose fit can lead to premature bearing failure.
16. Place bearing and driver in freezer. When cold, holding the installation tool, use a Snap-On dead blow (red, plasticized hammer) and drive new bearing into place, ensuring that you have first pushed the intermediate shaft so the other end is resting fully on the oil pump console. **USE OF FAULTLESS IMS TOOL HIGHLY RECOMMENDED FOR BEARING INSTALL.**
17. **If bearing goes in crooked or the new has to be pulled out, do not re-use bearing. It must be replaced.**
18. Install spiro-loc on dual row or snap-ring on single row bearing (single row pro uses an internal wire lock)
19. You are now ready to install the new hub flange. **Inspect seal for damage as well as bore in the block for any imperfections that might cause the new seal or flange to leak.** Take care not to damage o-ring located in new hub flange, using an o-ring lubricant on seal to facilitate easy installation. Once new flange is started, use three (3) M6X25 bolts, tightening in a star pattern slowly to draw in the new hub flange in.
20. Once home, remove M6X25 bolts and replace with new micro-encapsulated bolts. Use flange sealant on bottom of head of the bolt. Torque specs 7.5 ft/lb (10 Nm).
21. The center bearing support 12 point nut can be installed and torqued to the factory spec (currently 7.5 ft/lb). Use flange sealant (Loctite 574 or Curil T) on bottom of head of the bolt and use wicking (green) Loctite on the exposed threads of the center bearing support/stud and 12 point nut. If the small o-ring is damaged or leaks, the use of flange and thread sealants should prevent a leak.
22. Reinstall chain tensioners with new sealing rings and torque to the factory spec of 59 ft/lb.
23. Install new cam plugs in cylinder head valve covers.
24. Replace accessible rear case perimeter bolts with new factory micro-encapsulated bolts.
25. Replace rear main seal with updated seal.
26. Engine timing should be verified after installation and re-timed if cam timing slips. If timing has changed from before to after doing the procedure or excessive deviation exists, re-time cams per factory procedure.
27. Use 5w40 or appropriate viscosity synthetic motor oil recommended - Joe Gibbs DT40, BR40, HR40, OR XP9 EVERY 6 MONTH/5,000 MI – STREET ONLY. RE-USING OLD OIL OR NOT OBSERVING PROPER INTERVALS VOIDS WARRANTY.
28. **NON-RECEIPT OF ORIGINAL BEARING AND WARRANTY FORM VOIDS WARRANTY**

LN Engineering LLC IMS Registration Worksheet

Jan 14 Rev.

*Please fill in and return **original IMS bearing** and flange **un-cleaned** in a zip lock bag to LN Engineering along with a **copy of the invoice showing professional installation** of your retrofit kit. Please place original bearing in a zip-lock bag to prevent oil from leaking out of the box as well as to prevent further contamination. Must be returned within 30 days of install date.*

Thank you for your participation in this optional registration program.

*Fields marked with an * are required. Incomplete forms or those submitted without bearing will not be accepted.*

*Shop/Dealer/Reseller Name:

*Date:

*Customer Name:

*Vehicle Year:

*Vehicle Model:

*Vehicle Vin:

***IMS serial number: place removable copy of asset tag here ---->**

*Engine Size:

*Engine Number:

*Mileage on current engine:

*Bearing conditions/observations:

**Please select IMS upgrade path chosen:*

<input type="checkbox"/>	IMS Retrofit, Single Row
<input type="checkbox"/>	IMS Retrofit, Dual Row

LN Engineering LLC Invoice No. :

How often has the oil been changed on this engine? (Time/Mileage)

What oil was used?

Please return to:

LN Engineering LLC
125 Gladiolus St.
PO Box 401
Momence, IL 60954

Questions? Please contact LN Engineering LLC at 815-472-2939 or via email at info@LNengineering.com.

LN Engineering LLC is not responsible for lost shipments. UPS Ground is recommended for return shipments. Limited warranty is valid thirty (30) days from date of purchase. *Warranty valid only on IMS retrofit kits installed as preventative maintenance only when original bearing has not started to fail or has already failed.*