



Kiwi Engines & Sub Assemblies

Kiwi Cases

Kiwi crankcases incorporate many advancements and are the best money can buy.

We do make a limited number of cases with the cam case breather machined on the backside of the crankcase (directly behind the coil, opposite of where it originally is). We do this on our own bikes and as a special order basis for our customers. It's ideally suited for those that want a nice clean looking cam cover especially for customs or show bikes. This new location allows for the breather and tube to be pretty well hidden and allows for easy cam cover removal. Please feel free to put in your special order today. We also make some specialty cases that accept cam shaft roller bearings. These are produced on a special order basis. All crankcases are CNC machined so you can rest assured every particular detail is properly accounted for. The world's finest crankcases are produced by Kiwi Indian and made in USA

Note: All Kiwi crankcases come with matching cam cover

289027 Crankcase: With matching cam cover

32-53

We also make cases with the breather tube machined into the crankcase (behind the coil) rather than in the cam cover. This allows for a nice clean cam cover look. Requires the use of our 42843R breather tube assembly, see "Cam case breather section".

289027P Polished cases: Highly polished cases and cam cover.

32-53

Note: We also offer a polishing service for your original cases. This is a nice dress up item and brings the engine alive. Original cases have different levels of porosity so they may not polish out as well as Kiwi cases.

289027L Crankcase: Loaded with races, cam & lift pin bushings, push rod guides, etc. Races & bushings not to final size. We will hone races and bushings to final size upon your request. 32-53

Note: Kiwi crankcases and cam cover are designed to mate up with either 38-47 cast iron or 48-53 aluminum pumps. Please let us know upon ordering so as we can supply you with the correct cam cover. Ensure you use the correct front camshaft to suit the oil pump you use.

86012 Cam cover

38-53

86012L Cam cover: Loaded with bushings.

38-53

Rebuilding service: We also offer rebuilding services for your crankcases in our service dept.

Kiwi Lower End Components

All engine components are of our own Kiwi exclusive brand, the only company doing so in the Indian business. This ensures all parts are designed to work in harmony with each other to our exacting specifications.

All Kiwi components have incorporated many advanced designs and improved metallurgy for superior performance and reliability. All races and housings are made from Timken bearing steel, the finest money can buy. Shaft material is a high Nickel and Chromium content for superior wear resistance and durability. You can buy cheaper components but you can't buy better. This applies to all Kiwi parts for Indian motorcycles.

Flywheels

Kiwi designed flywheels tensile strength far exceed originals and are manufactured by Truett & Osborn for the utmost in quality. Kiwi flywheels come with timing and TDC markings engraved into them.

424026FAN Flywheel balanced assembly: Includes flywheels with all 3 shafts and with rods fully assembled and balanced. Suits 74" or 80" strokes
32-53

424026FAS Flywheel balanced assembly: Suits 84" & larger strokes
32-53

Note: We will need your pistons for balancing.

424026FRN Flywheel rebuild kit: Same parts as in 424026FAN but unassembled and not balanced. Suits 74" & 80" 32-53

424026FRS Flywheel rebuild kit: Suits 84" & larger strokes
32-53

Lower End Tech

General note: Bottom end work is an extremely precision task and should be left to a professional preferably someone familiar with Indians. To give you some sort of idea as to the precision, a human hair is approx .003" thick. The honing, fitting and measuring process generally is within a 1/10th-1/20th of that of a human hair (.0001". The more time, effort and attention to even the smallest of details will dramatically increase the life of your bottom end. Do not skimp on quality and ensure all the individual parts are made from the correct materials as all of this will come back to repay you over the long haul.

Many of the following specifications have been upgraded from the factory book reflecting today's parts and riding conditions. For further updates please visit our website www.KiwiIndian.com.

V-Twin angle: 42 degree.

Cooling: Air

74" (1200cc) 3.250 bore, 4-7/16 stroke

80" (1320cc) 3.250 bore, 4-13/16 stroke

84" (1400cc) 3.250 bore, 5" stroke

88" 3.250 bore, 5-1/4 stroke

92" 3.250 bore, 5-1/2 stroke

Shaft nut torque: Kiwi and Z metal flywheels 100 ft lbs, cast iron 75 ft lbs

Housing Interference: Pinion and drive .002-.003.

Rod Race Interference: .002-.003.

Connecting Rod Side Play: Male to female and female between flywheels, .010-.020

Roller Clearance: Crank pin .0005-.001

Roller Clearance: Pinion and drive shafts .001-.002.

Flywheel End Play: Between cases, dry (no lube) with engine sprocket off .015-.020.

Flywheel End Play: With engine sprocket on, dry and no cork washer fitted .005-.010 (see Cork washer tech).

Flywheel Run Out: Maximum shaft run out is .001 per side, .0005 is preferable.

Engine sprocket cork washer: After installing cork washer into engine sprocket, sand cork on a flat surface until it is JUST proud (.001-.002) of the sprocket. This is extremely important as it will decrease flywheel end float and cause the bottom end to lock up.

Heat Cases: Whenever removing or installing anything in aluminum, it is important to ALWAYS preheat the aluminum to 250 deg F. NEVER fit or remove races in cold aluminum.

22-47 Pinion Housing: Press into case until it bottoms out against its thrust washer making sure the thrust washer is in the pinion housing counter bore. Check carefully. By using 22B19T tool to press in pinion housing it also locates the thrust washer properly.

48-53 Pinion Housing: Press in until it protrudes .020 above crankcase surface. Use 504006T tool as this allows for correct housing protrusion.

Drive Housing: 1920's models had a different drive housing with no retaining nut threads however they should be retrofitted using the later style 40871 housing and 28B161 nut as this will not allow the housing to move during service..

Original Flywheels: These come in 2 different metal variations. "Z" metal and cast iron. "Z" metal flywheels have a "Z" cast into them and are the most desirable of the original flywheels. If you have cast iron flywheels (no "Z" cast into them) it is strongly recommended to upgrade to either "Z" metal or new Kiwi flywheels. Cast iron flywheels have a tendency to break. Note that cast iron flywheel shaft nuts carry a 25 ft lbs less torque rating.

Drive Shaft Length: Before assembly double check the drive shaft length along its 7/8 diameter length (from tip of taper to tip of taper, not its overall length). Chief is approx 2.200 long while Scout is approx 2.450.

Shaft & Flywheel Tapers: Check used flywheel tapers for damage or low spots. If low spots exist it is recommended to replace the flywheels. Tapers must be lapped to their mating shafts with a fine lapping compound. No lapping is required when using new Kiwi flywheels. Upon final assembly do not use oil on tapers. Tapers must always be fitted completely dry.

Flywheel Shaft Shoulders: Make sure shaft shoulder area (area where taper and threads meet) are below the flywheel surface. If shaft shoulder protrudes through flywheel, the nut will bottom out on the shaft and it will not be held securely into its taper.

Shaft To Flywheel Keys: Ensure the keys have clearance between the shaft seat and the flywheel. If there is no clearance the shafts will become cocked and truing will not be possible.

20's Flywheel Assembly Upgrades: Late model 74" Chief flywheels, rods, pistons and valves will interchange with early models.

Non Kiwi Flywheels: Some brands usually come without timing or TDC marks. It will be necessary to place marks correctly prior to assembly. Kiwi flywheels are supplied with the correct markings.

Kiwi Flywheels: Kiwi flywheels come with the thrust washer dowel pins not installed. The reason for this is once in a great while in some old odd original cases the narrowest (.047) thrust washers cannot be used. By not having the dowel pins installed one can then you can machine the thrust washer recess in the flywheels deeper to allow for use of .047 thrust washers. We recommend doing a pre-mock up fit with the flywheel assembly WITHOUT the dowel pins installed and with the rods on the flywheel and the flywheel in the cases. Some cases maybe out of spec from the factory so for this reason it pays to take this precautionary step.

Replacing Damaged Dowel Pins: Grind old dowel pins flush with surface. Fit thrust washer into its recess and drill a new hole using the thrust washer as a template. Drill hole undersize using the drill bit provided with the 28B308T dowel pin hole reamer kit. Once drilled use reamer to final size the hole. Press in new dowel pin but 1st make sure no oil or fluid is in this blind hole otherwise dowel pin will hydraulic (stop short) and it will not budge. Dowel pin should not exceed .045" above t/w seat since the thinnest t/w is .047 (this gives .002 clearance. Make sure original flywheel dowel pins do not sit higher than the thickness of the thrust washer, check closely.

Thrust Washer Seats: Make sure thrust washer seats properly. Before end float can be measured, the flywheel thrustwasher seats must be free of any burrs, grooves and are to be perfectly flat . Sometimes the dowel pin locations are not 180 degrees apart on original flywheels therefore the thrust washer notches have to be widened. Check seating very closely.

Check Flywheel Oil Ways: After assembling the pinion shaft in the flywheel blow air through it to ensure the oil ways are properly lined up. Do likewise with the crankpin. After your lower end has been fully assembled, pump oil through the pinion shaft with an oil can and observe oil flowing from the crankpin. This will ensure that all oil ways laign up and oil flow will not be restricted.

Balancing Flywheels: There are several methods used to balance flywheels. Static or dynamic balancing. Static balancing can be done either the Indian factory method (as a complete assembly) or balancing to a percentage factor (all parts weighed individually). Dynamic balancing is done by a special balancing machine.

Aligning Flywheels: This is an acquired skill and should be left to someone with experience. Flywheel shaft alignment is to be within .001 however .0005 is preferable. When truing flywheels it requires solid hits with a lead hammer (flywheels sitting on a block of hardwood) since anything else will damage and leave marks on the flywheels. Don't even think of using other type of hammer. It does take great skill to properly fit, balance and align flywheels. Exercise caution because during operation flywheels are turning at a high rate of RPM's and extreme forces are a work. Anything overlooked or not in proper spec will have severe implications.

Aligning Flywheels Between Centers: When aligning flywheels between centers do NOT tap wheels while they are still being supported between centers. This can result in a broken or bent pinion shaft titty.

Flywheels Cork Screw: Cork screwing is when the flywheels are fitted between the case halves and are rotated, they pull to 1 side or the other. This procedure is done with the engine sprocket off. To check for cork screwing, rotate flywheel assembly in 1 direction and see if it winds towards one side of the case. Now rotate flywheel assembly in the opposite direction and see if it cork screws towards the opposite side. Repeat this procedure several times ensuring that "you" do not cause the side thrusting. During service cork screwing causes side loading (thrusting) which will cause damage to our lower end which is usually evidenced by grooved or blued thrustwashers. Possible causes are flywheel misalignment, pinion and drive housings out of alignment (possibly caused by improper installation), mismatched case halves or case halves have damaged mating surfaces (causing cocking).

Original Rods: Magnaflux (Crack detecting) original rods. The original material can develop internal fractures so check very closely especially the female rod around the big end. Also check the alignment of each rod for twist and bend.

Piston Pin Diameter: The correct diameter is .750. Pay close attention as some replacement pistons on the market come with 19mm diameter pins which is .749 (.001 smaller).

Valve Guide Added Lubrication: Some engines may require added lubrication to the pushrod guides and valve guides. The exhaust guides can do with more lubrication so it may be necessary to drill a 1/8" diameter hole in the crankcase approx 1/4" directly under the exhaust push rod guides. Some engines will require a hole to be drilled under the intake pushrods as well.

Sump Oil Scraper Pickup: This was used in 1947 and in early 1948 models. We strongly recommend to retro fit earlier sump pick up style engines with is scraper. It does require a little crankcase machining however this is easy and self explanatory if you use the scraper as a template. It is recommended to do this modification at the time of engine overhaul. The clearance between the flywheel and scraper is to be 1/32".

Magneto Hole Plug: Always replace this plug at time of overhaul. When removing this plug, support the surrounding area otherwise case damage can result. This plug must be expanded once it is fitted in order to work properly. Apply sealant before fitting plug to case otherwise an oil leak will exist.

Magnetic Drain Plug: When fitting magnetic plugs to crankcases make sure they do not bottom out against the flywheel which can happen in some rare occasions. Kiwi magnetic plugs are of a very high grade and do not degrade with heat. Not all magnetic plugs are created equal. Do not be alarmed with some light metal fuzz found during the initial engine break in as this is normal. Magnetic plugs only capture metallic particles so aluminum, carbon and other particles are left free to roam therefore a filter should be used. Use the Kiwi internal oil filter (p/n KI-10605) which fits inside the oil tank. This filter works and it will increase the life of your engine. If you have any doubts cut it open after some use and you will see 1st hand. You will be surprised as the trapped particles that you will find that have been previously roaming around freely in your engine doing plenty of damage. Indian engine oil DOES need filtering just like any other engine.

Crankcase Cylinder Spigot: Late 1946 and later (47-53) model cases have the cylinder spigot (the diameter the cylinder lip fits into) deepened all the way down to the baffles while earlier models have a step. If using .040 or larger pistons, this step will need to be removed and deepened all of the way down to the baffles otherwise the piston skirts will be damaged. These cases will have a smaller diameter step about 1/4" below the top surface. It is easy to tell if the cases are correct (or already have been modified) as they will have the one diameter (no step) all the way to the baffles.

It also pays to pre-fit cylinders to the case if they have been sleeved especially when non Kiwi sleeves have been used. The original cylinder protrusion outside diameter is approx 3.370 while most replacement sleeve outside diameter is 3.375. Kiwi sleeves are the only ones to have the lower 7/32 (the amount protruding above the base flange) properly reduced .005 smaller than the body of the rest of the sleeve in order for them to fit correctly.

Check Case For Defects: Carefully and thoroughly inspect the cases all over. In some cases the left or right cases have been changed out and become mismatched. This can create some alignment problems with the bottom end and cylinder surface area. Check the small triangular area between the cylinders where the #10 tie bolt goes through. Sometimes this hole is not centered and breaks through the sides into the cylinder spigots. When this happens an oil leak will develop. Sometimes it may be necessary to correct with a high quality type plastic steel (Devcon) or welding (if welding, be aware of distortion). In some real bad cases will be necessary to seal the #10 tie bolt and hole with a high quality sealant at the time of final assembly. Whatever the case is, check this area very closely and correct it. An oil leak here is impossible to fix afterwards.

Cleaning Glass bead: Glass beads can only be removed by scrubbing in hot soapy water with a stiff scrubbing brush. Hose off with a high pressure hose for final cleaning. Repeat these procedures several times. Solvent and parts cleaners do NOT clean glass bead. Go over every threaded hole with a tap and clean out thoroughly. Do NOT glass bead cases with housings or bushings still installed as glass beads will become lodged between the 2 parts and thorough cleaning is virtually impossible. Glass bead is the number 1 cause of engine failures especially in top ends. We have done many failure analysis on

prematurely failed engines for owners and re-builders and almost every time laboratory reports show that glass bead as the cause.

Stroking Engines: Before final assembly of your lower end make sure you do a test fit of your cylinders onto the cases to ensure the connecting rods clear all of the necessary areas. It is usually best to have the flywheel assembly sitting in 1 half of the cases and then fit 1 cylinder at a time. This way you will have a clear view of what is going on when you rotate the flywheels. Another way is to apply modeling clay around all of the areas to check the clearances. The main areas are the rods clearing the baffles near the top of the stroke and each front and back point inside the case spigots. Sometimes the lower part of the cylinders will need to be relieved.

Kiwi internal oil filter: We developed this filter during the mid 90's in order to have a filtration system that was hidden so as to retain the clean unobstructed lines of the motorcycle.. While there are skeptics that say that they don't need one they would never think of eliminating it from their car or truck!!! The fact is Indian flathead engines do need a filter due to the combustion blow by that normally occurs with flathead engines. Have you ever noticed how quickly your oil goes black after an oil change? This is caused by combustion blowby (pollutants) entering the crankcase/oil system. Magnetic plugs only capture some metal particles and do NOT capture non magnetic particles like aluminum or carbon which is very damaging. Every Indian should be fitted with an oil filter. The Kiwi internal oil filter does NOT cause any restrictions upon your pump what so ever even in weak or under performing pumps.

Another side benefit is that you can cut the filter apart after each oil change and observe the contaminants or wearing parts caught within the filter media which may alert you to an internal parts failure. Indian engine oil DOES need filtering which leads to increased engine life. See "Oil filter" section

Oil returning viewing: When the Kiwi filter is fitted, the returning oil is still clearly visible when viewed with the oil cap off. The returning oil will be clearly visible bubbling and around the outside of the filter.

