



Cams, gears & shafts

Tech

Cam bushing interference: .0015-.0025

Camshaft clearance: .001-.002

Camshaft end play: .004-.008

Cam to shaft interference: .00075-.001

Cam to shaft depth fit: Press shaft into cam until the step in the shaft is just barely below the gear face. With the 40436 rear threaded camshaft it is important to test fit it through the cam cover bushing and then fit the 101029 helical gear to the shaft. The gear should have clearance between it and the bushing. If not press the shaft through the cam (towards the cam cover) until it does have clearance. Over the years we have come across some wrongly manufactured shafts in which this shoulder is not long enough and will not allow enough protrusion through the bushing. It will then be necessary to machine down the bushing end face at the oil pump end.

Pressing on cam shafts: When pressing on the threaded cam shaft, screw a nut on until it barely sticks out above the shaft threads so the press makes contact with the nut. (the shaft will exit from the lobe side). For the worm cam shaft, do NOT press on the end of the worm otherwise you will break or chip the end of the worm as it is very brittle. This shaft has to be pressed out from the lobe side (it will exit from the flat gear face side). 48-53 shafts, press the same way as the worm shaft. Always apply oil when pressing in or out shafts.

Cam profile difference: The easiest way to tell the difference between Bonneville and STD cams is by measuring the lobe overall height. STD cams are approx 1.515 while Bonneville cams are approx 1.575. There could be some variation (+ or - .010") from these dimensions due to manufacturing tolerance and wear. The base circles are almost the same at 1.110. Chief and Scout cams can be told apart by their overall thickness of the gear and lobe. Chief is 1-1/8 while Scout is 7/8.

Quiet cam train: By fitting new gears, shafts and bushings you will have a very quiet cam train. Pay close attention to everything in this dept as it will reward you with nice quiet operation.

Pre checking cam train with cylinders removed: With the cam train installed and with the cam cover off, slowly turn engine over and inspect for any parts that make unusual contact with each other. In some cases we have come across cam followers (usually Bonneville rear exhaust) when near the top of their lift have run into original crankcases. It will be necessary to clearance the cases (or necessary parts).

Pre checking valve train with cylinders installed: With the cam cover fitted, sit the cylinders to the crankcase with the pistons left out. Adjust tappets so there is no clearance and turn the engine over slowly. By turning the engine over

slowly you are checking that all the parts have clearance and do not run into something that may have been overlooked. Pay close attention that the valve springs do not coil bind, rods clear cases, etc. Basically this is just a pre test to catch something that may have been accidentally over looked.

Mismatched cam cover: It is not uncommon to find a mismatched cam cover to its crankcase which will not allow the cam shaft bores to properly line up. Proper cam shaft sizing then becomes a problem and special line sizing of the bushings will be necessary. This should be left to a shop with the proper equipment. Proper aligning and fit will pay off handsomely with a nice quiet operating cam train therefore the more effort and care you put into the cam train the quieter and better the end result will be.

Bushing ID finish: Do not finish bushing inside diameters by reaming. Reaming leaves a very rough finish (even though it looks good to your eye) and rapid wear will result. Bushings must be honed to final size using a Sunnen type hone.

Regrinding original cams: Caution should be exercised when regrinding original cams. Some companies grind so much off the lobe that it messes up the cam and follower geometry. Also check that the cam has been reheat treated after grinding. There are some companies that legitimately do the job right but beware of some that don't.

Heat cases: Always heat cases to 250 deg F before installing or removing parts fitted into aluminum. Do NOT press anything into aluminum when it has not been preheated.

Cam Followers & Pivot

Tech

Cam follower differences: Bonneville and Stock cam followers (both male & female differ in center lengths. Stock followers center length is 1-7/16 while Bonneville followers are 1-3/8. The center length is measured from the center of the pivot hole to the center of the rivet hole.

Removing rivets: Grind riveted end of rivet off as much as possible without removing metal from the cam follower. Punch or press rivet out.

Fitting rivets: Make sure rivet is not loose in the 3/8 diameter hole end (non riveted hole) as this will only get worse during operation. Replace cam follower if this condition is present. When peening over rivet, do not get carried away as it only requires enough riveting in order for it to be held firmly into its position. Excessive peening can cause the diameter that fits through the roller to swell up and cause binding. Our rollers and rivets are very precisely fit for longigevity therefore care must be exercised during installation.

Cam follower roller: Kiwi rollers are manufactured with chamfered edges on the outside diameter. This is necessary especially when being run on used cams as it will not cause edge loading and premature wear on both the cam and lobe. It's the little things that make a huge difference.

Male/female follower: The male follower is the intake while the female follower is the exhaust.

Heat cases: Always heat cases to 250 deg F before installing or removing parts fitted into aluminum.

Original 2 piece lift pins: The original design had a bushing pressed into the crankcase and then the shaft pressed into the bushing. It is not uncommon to find the shaft has moved outwards of the bushing. If shaft has shown any signs of moving, replace it. Kiwi lift pins are manufactured as a 1 piece unit so as to avoid this common problem.

Lift pin installation: Use light pressure to press in lift pin until it rests against the flange. Do not over do otherwise the flange will be damaged

Pushrods & Adjusters Tech

Tappet clearance: Cold, intake .004-.006, exhaust .006-.008

Pushrod clearance: .In guide, .002-.003

Push rod lengths: The long push rods go to the front cylinder while the short push rods go to the rear cylinder

Pushrod or guide grooves: Originals either had vertical oil grooves in the pushrods or the pushrod guides. It makes no difference which one has the groove but as long as 1 has the groove. Newly Kiwi pushrods and pushrod guides have upgraded spiral grooves.

Tappet tightening: Do not over tighten tappet bolts or lock nuts otherwise breakage or fracturing can result. Be gentle.

35W242 wrench: These wrenches are specially made for Indians with a thin head and short arm to allow for easy tappet adjusting. 2 wrenches are required,

