

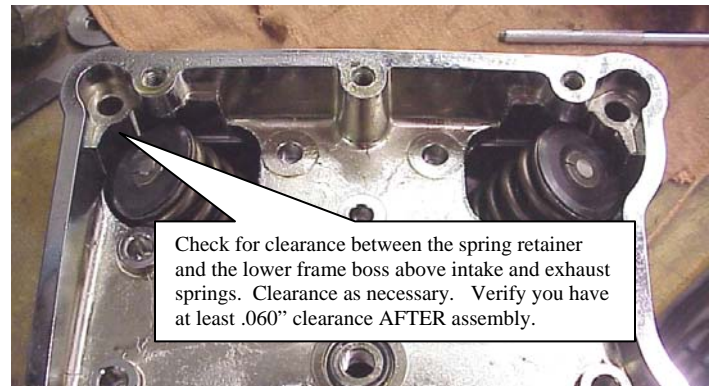


INSTALLATION INSTRUCTIONS FOR RED SHIFT TWIN CAM® CAMSHAFTS

This product is legal in California only for racing vehicles which may never be used upon a highway.

If you do not have the correct Service Manual for your model and year of H-D, get one before starting this installation. Be sure to follow all instructions and heed all cautions, warnings and danger notations.

1. Remove all components from the motorcycle that will interfere with cam chest disassembly, i.e., fuel tank, exhaust system, floorboards.
2. Remove the carburetor/fuel injection throttle body.
3. Remove the cylinder heads.
4. Following the instructions in the Service Manual, remove the camshaft support plate from the engine.
5. If you have not already released tension on the cam chain tensioners, do so now using JIMS Cam Chain Tensioner Tool, Zippers P/N 758-283 or equivalent. Be sure to install the retaining lock pins from the outside of the cam support plate.
6. Remove the stock cams from the cam support plate as described in the Service Manual.
7. Install the new camshafts in the cam support plate.
8. Reinstall the cam support plate into the cam chest. Remove the cam chain tensioner retaining lock pins, using the Cam Chain Tensioner Tool.
9. Check clearances for cam lobe swing in the cases. This clearance should be .060" or greater. On many engines, you'll find additional clearance may be required.
10. Inspect the rollers on the tappets for wear and check their free travel installed in the case at maximum lift. We recommend a minimum of .100" additional travel beyond maximum cam lift with the retaining pins and covers installed. Replace as required with aftermarket lifters or modify stock units for adequate clearance. *We've received calls from a number of our clients who have found the noise associated with cam installation to be a problem. Rather than replacing cams, we have found that installation of a quality aftermarket lifter unit has reduced noise levels, and in many cases has eliminated the clicking noise in the valve train.*
11. Check valve-to-valve clearance in each cylinder head, using specifications provided with each camshaft. With the valve springs removed, clamp the cylinder head in a vice (*Carefully*). Open the intake and exhaust valve to the specified TDC lift and measure the gap between the valves at their closest point. This measurement should be at least .040". It may be necessary to cut the valve seats to sink the valves deeper into the head to achieve this measurement.
12. Install lightweight springs in place of the valve springs.
13. Place a small ball of clay in each piston valve pocket (Oiling the tops of the clay will allow them to separate from the valves making measurement much easier) and install the cylinder heads.
14. Install adjustable pushrods but adjust only until all up and down play is removed from each pushrod with the valves fully closed.
15. With the spark plugs removed, rotate the engine several times. Remove the pushrods and cylinder heads.
16. Measure the smallest thickness of the clay to determine piston to valve clearance. This should be no less than .060"
17. If all dimensions in the cylinder heads are within tolerance, assemble the cylinder heads, using valve springs, which will allow proper valve travel and provide a seat pressure of 180-200 lbs.
18. Install the cylinder heads per instructions in the Service Manual.
19. Install the lower Rocker Frame on each cylinder head.
20. Check for proper clearance in the areas described in the image shown.



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21. Install pushrods and rocker covers. *Note: Adjustable pushrods are required for proper installation of Red Shift TC Camshafts.*

Lifter notes – Engine operation, oil pressure and valve train noise can be improved by careful set up of your lifters. We have noticed lifter bores in the factory case are sized on the loose side and can easily accept an oversize tappet to help control oil pressure loss around the tappet. Also, clearance between the tappet guide pins and machined flats on the tappet should be checked as wide clearances here (more than .004") allow the tappet to rotate an unacceptable amount in the bore. Zipper's stocks oversize tappets from Feuling and JIMS, as well as oversize tappet pins to correct these potential issues.

We prefer adjusting the pushrod with a dry lifter - disassembling the entire lifter and removing all oil will allow full compression of the lifter *without possibly damaging the valve.*

- Once the pushrod is in place and fully extended, make sure the lock nut is loose and shorten the pushrod by 4 flats or 2/3 of a full turn for the proper lash.
- Make sure to tighten the lock nut to the pushrod at the top of the adjuster.

If adjusting the lifter while fully pumped up at zero lash with no pressure on the valve:

WARNING: Lifters must be adjusted one at a time, and then allowed to bleed down before proceeding to the next lifter. Failure to do so will result in engine damage.

- Lower the adjuster 22 flats (3-2/3 turns) and stop to allow the lifter to bleed down until you can spin the pushrod freely.
- Then lower the adjuster another 20 flats (3-1/3 turns). Lifter should now be bottomed out.
- After bleeding down, if you can spin the pushrod it is not fully on the bottom. If you need to go further to reach the bottom, **proceed carefully** to avoid damage to the lifter assembly.
- From the bottom of the lifter, shorten the pushrod by 4 flats (2/3 of a turn) of the adjuster and tighten the lock nut.

Reassemble remaining engine and chassis components as described in the Service Manual.

- 22. Initial startup should be performed using a lightweight oil such as 5W-30 to ensure proper lubrication to top end components.
- 23. Adjustment to fuel curve and ignition timing will be required to take full advantage of any modification made to an engine. Proper selection of all components, where each component works together with other components selected will always result in the best, most reliable combination.
- 24. Test ride.

CAMSHAFT SPECIFICATIONS						
Cam Model		Timing @ .053" Open/Center/Close	Duration	Valve Lift	TDC at Valve	Min Seat Pressure
TWIN CAM						
557TC	Int	20 / 101 / 42	242	.557	.177"	180#
	Exh	44 / 104 / 18	242	.557"	.167"	
575TC	Int	25 / 98 / 41	246	.575"	.201"	180#
	Exh	49 / 106 / 17	246	.575"	.162"	
577TC	Int	25 / 100 / 47	252	.576"	.214"	180#
	Exh	50 / 104 / 23	253	.576"	.198"	
627TC	Int	28 / 102 / 52	260	.622"	.231"	180#
	Exh	58 / 107 / 24	262	.596"	.198"	
647TC	Int	26 / 106 / 58	264	.647"	.211"	200#
	Exh	58 / 106 / 26	264	.647"	.211"	
657TC	Int	27 / 99 / 45	252	.657"	.228"	200#
	Exh	52 / 104 / 27	259	.650"	.217"	
727TC	Int	35 / 105 / 66	281	.727"	.285"	220#
	Exh	67 / 112 / 34	281	.727"	.269"	

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