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WARNING!!
CONVERSION CAMS
Will NOT FIT 2007
or LATER ENGINES!

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Installation Instructions: Conversion cams: Roller Chain Drive to '99-'06 Twin 88 engines

Conversion cam kits Part numbers and years:	
1999-2001	288999
2002-2006	288902

We recommend that you refer to a current '06 Dyna or later factory service manual and follow factory procedures for camshaft removal and replacement.

1. Andrews Products conversion cams operate with 2006 Dyna or 2007 roller cam chain drives and use stock size lobe base circles. Therefore, unless you have modified the cylinder heads, the original stock pushrods will be the correct lengths. If the original pushrods will be reinstalled, removing the fuel tank(s) and rocker boxes will be necessary. Mark the pushrods so they can be replaced in their original locations since not all stock pushrods are the same length.
2. To save installation time by NOT removing fuel tanks and rocker boxes, the stock pushrods can be cut with bolt cutters and then removed in two pieces. EZ-install pushrods can then be installed. They are available in aluminum or chrome moly steel. Andrews Products part numbers for EZ-install pushrods are: 292188 for aluminum and 292088 for steel pushrods.
3. Remove 10 screws holding outer cam cover. When this cover is reinstalled, there is a specific tightening sequence and torque rating for all 10 screws. **VERY IMPORTANT: Overtightening cover screws can cause aluminum engine case threads to strip.**
4. Before proceeding further, put the transmission in 4th or 5th gear. Remove both spark plugs so there will be no resistance from compression pressure. Now turn the rear wheel and align camshaft timing marks. This will simplify installation of new cams.
5. Remove the crankshaft sprocket retaining bolt and the rear camshaft sprocket retaining bolt. Both the crankshaft sprocket and the rear cam drive sprocket can now be removed. They will be replaced with new sprockets for roller chain cam drive system.
6. Remove the original cams and cam support plate. All four oil pump retaining bolts must also be loosened to permit correct oil pump rotor alignment at the time of reassembly after the cam support plate is in place with the new camshafts. The old cam support plate will be replaced with the new assembly.
7. Converting 1999-2006 silent chain cam drives to the 2007 style roller chains requires new HD parts. Also required are two new Andrews conversion camshafts. **Andrews Products conversion cam kits include ALL of the required parts.** Part numbers listed, top of page.
8. A complete listing of required parts appears below.
9. "N" series camshafts from Andrews Products **must be used** for fitting roller chains to earlier engines. *Series "N" cams are similar to 2006 Andrews Dyna cams except that the inner bearing journals are .875 instead of 1.000. Roller chain conversions for '99-'06 engines require .875 diameter inner camshaft journals to fit right engine cases.*
10. The new conversion cams, inner chains and the new '06 type support plate can now be assembled as described in the '06 Dyna HD service manual.
11. Again referring to a factory parts manual, the front cam thrust washer should be 0.100 thick. Figure 2 on page 3 shows the .100 thrust washer assembled on the front camshaft **with proper end play specified.**
12. With new camshafts in place, the new cam support plate assembly can be reinstalled back into the engine.

Some HD parts are required for conversion cam installation. All of these parts are available as complete kits from Andrews. See top of this page for Andrews part numbers for complete cam kits.

HD Part#	Description	See photo on page 3
26037-06	Oil pump assembly	
25355-06	Cam support plate assembly	
4741A	Cam Support plate mounting screws; (10 pcs req'd.)	
11461	Retaining ring (for front cam)	
25683-06	Inner roller chain	
39969-06	Inner chain tensioner	
4740A	Inner chain tensioner mounting screws; (2 pcs req'd.)	
25675-06	Outer roller chain	
39968-06	Outer chain tensioner	
942	Outer chain tensioner mounting screws; (2 pcs req'd.)	
25729-06	Spacer (.100 for cam alignment; use as required)	
25731-06	Spacer (.110 for cam alignment; use as required)	
25734-06	Spacer (.120 for cam alignment; use as required)	
25736-06	Spacer (.130 for cam alignment; use as required)	
25737-06	Spacer (.140 for cam alignment; use as required)	
25738-06	Spacer (.150 for cam alignment; use as required)	
25673-06	Crankshaft pinion shaft sprocket (17 teeth)	
25244-99A	Outer cover gasket	
25728-06	Stock rear cam sprocket (34 teeth) <i>(2002-'06 only)</i>	
	<i>Use of stock '06 sprockets on '99, '00 or 2001 conversion cam installations will result in engine alarm light always ON!</i>	
	<i>Following part MUST be used with all '99, '00, '01 engines!</i>	
216015	Andrews rear cam sprocket part number (34 teeth)	

Some of the screws listed above are the same as in earlier engines and they can be used again.

WARNING! Conversion cams will not fit '06 Dynas or 2007 and later engines!

13. After a trial assembly, alignment of crankshaft sprocket and cam sprocket positions must be checked and adjusted with shims if necessary. See factory manual for proper procedure. Make sure all timing marks are aligned before proceeding!

14. Installing the new 34T sprocket requires using either the original sprocket spacer or a new spacer from HD if the original is not the correct thickness for your engine. HD makes shims and spacer washers in 6 different thicknesses.

HD Part numbers are:

25729-06	0.100 inches
25731-06	0.110 inches
25734-06	0.120 inches
25736-06	0.130 inches
25737-06	0.140 inches
25738-06	0.150 inches

VERY important: both cams must have as a **minimum**:
.008-.010 end play in cam support plate!
See figures 1 & 2 below:

15. When installing sprocket retaining bolts, use Loctite retaining compound to secure the bolt threads. Bolt torque should not exceed 25 ft-lbs for 5/16 x 18 bolts. Bolt torque for splined rear camshafts (3/8 x 24 bolt) should not exceed 35 ft-lbs. Please note that both cam retaining bolts must be rated grade 8. Grade 8 bolts have a 6 pointed star symbol on the top of the bolt heads.

16. Reinstall the outer cam cover with the 10 cover bolts. Cover bolts must be tightened to a torque specification of 90-120 in-lbs. The service manual shows the correct tightening sequence.

17. EZ-install pushrods use 2 long (exhaust), and 2 short (intake) rods. To install, adjust pushrod to shortest length, then position in engine, rocker arm end first. Swing the lower end into lifter. Lengthen pushrod adjuster until all free play is gone. Adjust pushrod 3.5-4 full turns longer (21-24 flats) and tighten locknut. Wait until hydraulic unit bleeds down and repeat procedure on next pushrod. When adjusting pushrods, make sure that cam lobe for that pushrod is on low lift point. Lifter housing covers can be temporarily removed to gain another 1/4 inch of clearance. Short pushrod cover tubes are available from HD. Short pushrod cover tubes make the pushrod adjustment easier. Part numbers are: 17938-83 and 17634-99. You will need 4 of each part number to install a complete set.

18. For engines with stock pistons and stock heads, 12N**, 21N, 26N, 31N, and 37N cams should be able to bolt in without head work. 50N cams need piston to valve clearances and valve to valve clearances checked. 50N, 54N and 55N cams need .620 minimum valve travel and .060 minimum piston to valve clearance. With Andrews Products high lift steel collars (part# 293115; includes 4 pieces), setting valve spring travel for either of these two higher lift cams will be easier. *Andrews collars fit 1999-2003, Heads for 2004-2006 engines use beehive type springs.*
***12N cams are similar in specifications and performance to stock 88 cams.*

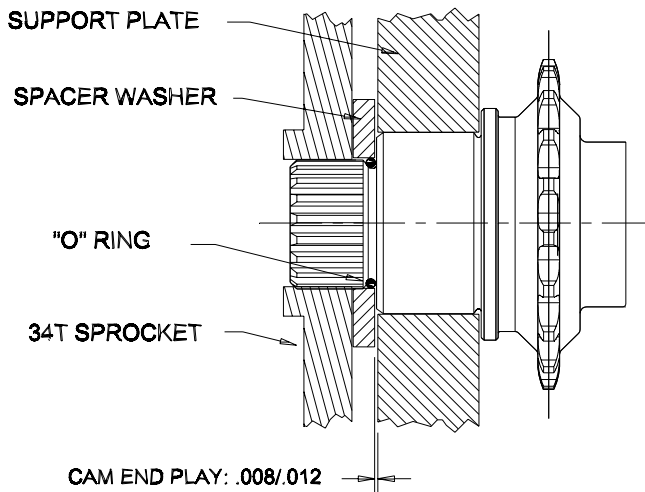


Figure 1: Rear camshaft

Rear Andrews cams manufactured after July, '06, do not use an "O" ring to align the spacer washer. To adjust alignment of 34T rear cam sprocket and 17T crankshaft sprocket, HD spacer washers are available in 6 different sizes. Cam end play should be .008/.012 minimum, as shown.

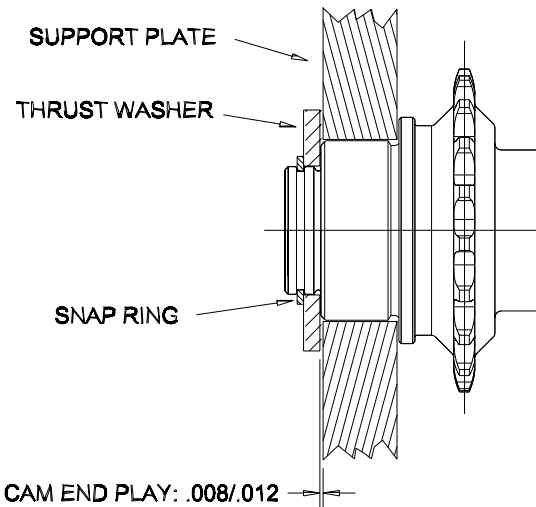


Figure 2: Front camshaft

HD service manuals for '06 Dyna and all later twin cam engines specify a .100 thick thrust washer on the outside end of the front camshaft. Front cam end play should also be .008/.012 minimum.

Conversion parts



Andrews Products: Roller Chain Conversion Camshafts

<u>Andrews#</u>	<u>Grind</u>	<u>Timing*</u>	<u>Duration*</u>	<u>Lift</u>	<u>Springs</u>	<u>TDC Lift</u>	<u>Spring Travel</u>
-----	HD Dyna (’06 fuel inj)	02/34 41/-02	216 219	.473 .473	Stock -	.087 .110	Stock Stock
216812	12N	02/34 40/02	216 220	.489 .489	Stock -	.091 .095	Stock Stock
216821	21N	10/30 40/08	220 228	.498 .498	Stock -	.134 .121	Stock Stock
216826	26N	11/35 41/09	226 230	.490 .490	Stock -	.138 .120	Stock Stock
216831	31N	10/46 52/08	236 240	.510 .510	Stock -	.131 .120	Stock Stock
216837	37N	18/38 46/14	236 240	.510 .510	Stock -	.174 .148	Stock Stock
216854	54N	16/42 43/15	238 238	.555 .555	Hi-lift -	.165 .158	Stock Stock
216850	50N	20/48 54/18	248 252	.510 .510	Stock -	.184 .168	Stock Stock
216855	55N	22/46 52/20	248 252	.550 .550	Hi-lift -	.197 .181	.620 .620
216867	67N	24/48 58/22	252 260	.570 .570	Hi-lift -	.209 .187	.620 .620

*Timing and duration listed for .053 cam lift

**IMPORTANT NOTE for 1999 engines.
If you are converting a 1999 engine to new
roller chains, please read the following page!**

IMPORTANT NOTE for 1999 twin cam engines:

When converting a 1999 engine to new roller chain cams, please note the following!

This page only applies to **early 1999 engines**. To identify the engine as an early 1999, examine the cam support plate as illustrated in the circled area. (figure 1)

If the part number on the left front face of the cam support plate reads: **H-D 25245-99**, the engine is an early 1999.

The part number used on later 1999 engines is: **25245-00**. If your engine is a late '99 (or later), disregard the rest of this page, it is not relevant.



figure 1

Early '99 engines have a different oil supply system than later engines. Note the circled area on the photo (inside engine case to the left of the pinion shaft). (figure 2)

Early '99 engines **do not have** the oil boss shown circled in the photo. For early 99's, it will be necessary to block a matching oil port on the 2007 cam support plate. See figure 3 below.



figure 2

For 2007 cam support plates to operate properly with **early** '99 engines, the circled hole in photo must be permanently blocked. A 1/4 x 20 bottoming tap can be used to cut threads. A **self-locking** socket head set screw will then seal the port. The existing hole is correctly sized for the tap. **Do not drill it larger!** We will send, no charge, set screws (1/4 x 20 x 1/2) if you call us.

After tapping new threads in the support plate, make sure to clean out all metal chips before installing the set screw.

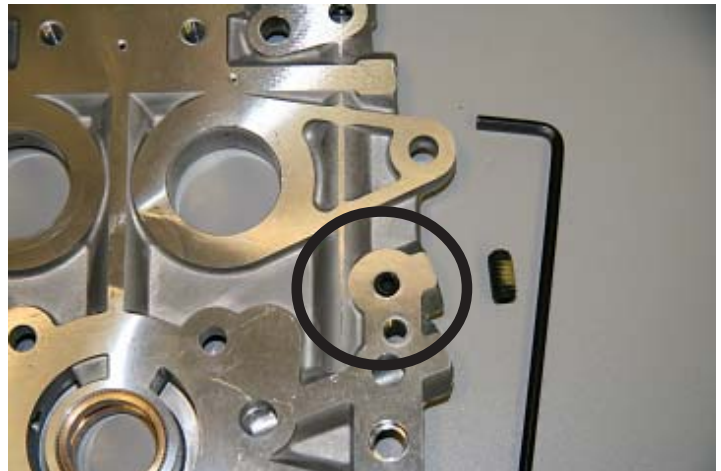


figure3