



FEULING[®]

PERFORMANCE PARTS

FOR HARLEY-DAVIDSON[®] MOTORCYCLES



FEULING



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FEULING® REAPER® SERIES CAMSHAFTS



Put the Power Band Where It Counts!

Wake up your Twin Cam® engine with a set of FEULING® Reaper® series camshafts. FEULING® uses the force of the Reaper's scythe to put the power band where it counts, creating a real seat of the pants feel. The Reaper® camshaft profiles produce more power and more torque in the riding RPM range increasing throttle response, acceleration and fuel mileage. Dyno proven and track tested. The Reaper® beats them all!

- FEULING® REAPER® camshafts have wide lobe separations producing very wide power bands
- Smooth camshaft lobe ramps are easier on valve-train components eliminating excessive valve-train noise and wear.
- Better Throttle Response
- Increased MPG
- Easy Starting
- Unique Idle Sound
- Made in U.S.A.

Better Throttle Response - Increased MPG - Easy Starting - Unique Idle Sound

GRIND	VALVE LIFT	OPEN	CLOSE	DURATION @.053°	LIFT @ TDC	LOBE CENTERLINE	FITMENT
525 INTAKE EXHAUST	525" 535"	4° 51°	42° 5°	226° 236°	.099° .112°	.109° .113°	525 Cams are a direct bolt in replacement for T/C 88", 95" 96" & 103" engines, can be used with stock valve springs, pushrods & lifters
543 INTAKE EXHAUST	543" 553"	15° 56°	43° 12°	238° 248°	.160° .140°	.104° .112°	543 Cams are a direct bolt in replacement for T/C 96", 103" & 110" engines. '99-'04 T/C 88" & 95" engines require higher lift valve springs, can be used with stock pushrods and lifters
574 INTAKE EXHAUST	574" 574"	15° 61°	45° 14°	240° 255°	.163° .143°	.105° .113.5°	574 Cams are a direct bolt in replacement for T/C 96", 103" & 110" engines. Performance pushrods and lifters are recommended but not required. '99-'04 model 88" & 95" require higher lift valve springs
594 INTAKE EXHAUST	594" 604"	19° 64°	56° 16°	255° 260°	.190° .167°	.108.5° .114°	594 Cams require performance valve springs, pushrods, lifters, clutch and Increased compression ratio.
630 INTAKE EXHAUST	630" 630"	20° 60°	58° 19°	258° 263°	.188° .171°	.109° .112.5°	630 Cams require performance valve springs, pushrods, lifters and Increased compression ratio.

525 CAMS - A real workhorse, designed to increase torque band width and increase fuel economy. Great bolt in camshaft upgrade for stock 88" & 96" engines also performs very well in 103" strokers. Produces strong low and mid range power with a linear horsepower and torque curve. Can be used with factory valve springs, pushrods and lifters. Increases throttle response and eases starting. Will also respond well to increased compression and cylinder head work. RPM 1,750 – 5,500

543 CAMS - The 'Freeway Flyer', a great camshaft for those who want more top end power than our 525 cam without sacrificing low end torque. Extremely smooth cam lobe layout maintains quiet valve-train and produces the smoothest cruise power band available. Excellent bolt in camshaft for stock to mild 96" and 103" engines and works well in 88" & 95" engines. This cam is easy starting, increases throttle response and fuel mileage. Responds well to increased compression ratio, performance exhaust and a high flow air cleaner. Performance valve springs are required on '99-'04 engines and performance pushrods and lifters are recommended but not required. RPM 1,900 - 6,000

574 CAMS - Wicked power band for modified engines and an excellent bolt in for stock 96", 103" & 110" engines. This is a great all around camshaft with solid low end performance and mind blowing mid and top end power. Extremely smooth cam lobe design creates a very smooth valve-train motion. Responds very well to modified cylinder heads, increased compression ratio, performance exhaust and intake systems. Performance valve springs are required on '99-'04 engines and performance pushrods, lifters and clutch modifications are recommended. RPM 2,100 - 6,500

594 CAMS - Fierce performing camshaft for an array of engines sizes, large displacement 103", 110" & 124" engines looking for a superior torque band with excellent horsepower gains in heavy bikes (RPM 2,200 - 6,250.) Smaller high revving displacement 95" style engines in lighter bikes looking to twist the throttle and tap into some horsepower (RPM 2,500 - 6,800). Large displacements respond well to increased compression ratio and smaller displacements will require it. 594 cams require high performance valve springs, pushrods, lifters, carburetor and or throttle body work, performance exhaust, intake and clutch.

630 CAMS - Vicious power gains, wide streetable power band from a high lift profile camshaft for high performance engines with highly modified cylinder heads and compression ratio. Carburetor and or throttle body work required along with a performance exhaust and intake system. Maintains low end performance with eye blurring mid and top end power. High performance valve springs, pushrods, lifters and clutch required. RPM 2,500 - 6,900+

FEULING® REAPER® SERIES GEAR DRIVE CAMSHAFTS

FEULING® REAPER® Series gear drive camshafts are stock replacement fit and utilize the standard cam gears offered by FEULING®, ANDREWS® and S&S®.

Twin Cam Gear Drive '99 – '06 (Except '06 Dyna)

- Part # 1004 - (525G)** 525" Intake, 535" Exhaust
- Part # 1021 - (543G)** 543" Intake, 553" Exhaust
- Part # 1007 - (574G)** 574" Intake, 574" Exhaust
- Part # 1302 - (594G)** 594" Intake, 604" Exhaust
- Part # 1010 - (630G)** 630" Intake, 630" Exhaust



Twin Cam Gear Drive '07 – '13 (Includes '06 Dyna)

- Part # 1005 - (525G)** 525" Intake, 535" Exhaust
- Part # 1022 - (543G)** 543" Intake, 553" Exhaust
- Part # 1008 - (574G)** 574" Intake, 574" Exhaust
- Part # 1304 - (594G)** 594" Intake, 604" Exhaust
- Part # 1011 - (630G)** 630" Intake, 630" Exhaust



FEULING® REAPER® SERIES GEAR DRIVE CAMSHAFTS + CAM GEAR KITS

These kits include FEULING® REAPER® Series gear drive camshafts and cam gear set. Cam gear sets includes the standard size inner and outer cam gears, key ways, crank & cam bolts & washers.

Twin Cam Gear Drive Kits '99 – '06 (Except '06 Dyna)

- Part # 1004K - (525G)** 525" Intake, 535" Exhaust
- Part # 1021K - (543G)** 543" Intake, 553" Exhaust
- Part # 1007K - (574G)** 574" Intake, 574" Exhaust
- Part # 1302K - (594G)** 594" Intake, 604" Exhaust
- Part # 1010K - (630G)** 630" Intake, 630" Exhaust



Twin Cam Gear Drive Kits '07 – '13 (Includes '06 Dyna)

- Part # 1005K - (525G)** 525" Intake, 535" Exhaust
- Part # 1022K - (543G)** 543" Intake, 553" Exhaust
- Part # 1008K - (574G)** 574" Intake, 574" Exhaust
- Part # 1304K - (594G)** 594" Intake, 604" Exhaust
- Part # 1011K - (630G)** 630" Intake, 630" Exhaust



FEULING® CAM GEAR KITS

FEULING® cam gear kits manufactured by ANDREWS® include standard size inner and outer cam gears, key ways, crank & cam bolts and washers. For use on all aftermarket gear drive camshafts.



*Gear drive cams mounted on camplate #8000

- Part #1095 -'99 – '06 (Except '06 Dyna)**
- Part #1096' -'07 – '13 (Includes '06 Dyna)**

'Gear drive cams on '07-'13 models require block off plates which are used to block off the oil holes for the hydraulic chain drive tensioner system. See Feuling #8016

FEULING® REAPER® SERIES CHAIN DRIVE CAMSHAFTS

FEULING® REAPER® Series chain drive camshafts utilize the factory chains, sprockets and tensioner systems.

Twin Cam Chain Drive '99 – '06 (Except '06 Dyna)

Part # 1001¹ - (525C) 525" Intake, 535" Exhaust

Part # 1000¹ - (543C) 543" Intake, 553" Exhaust

Part # 1002¹ - (574C) 574" Intake, 574" Exhaust

Part # 1301¹ - (594C) 594" Intake, 604" Exhaust

Part # 1003¹ - (630C) 630" Intake, 630" Exhaust



**Include Outer Cam Bearings*

'99-'01 engines with Magneti Marelli ignition require Andrews sprocket # 288015 (Feuling #1093)

Twin Cam Chain Drive '07 – '13 (Includes '06 Dyna)

Part # 1006 - (525C) 525" Intake, 535" Exhaust

Part # 1020 - (543C) 543" Intake, 553" Exhaust

Part # 1009 - (574C) 574" Intake, 574" Exhaust

Part # 1303 - (594C) 594" Intake, 604" Exhaust

Part # 1012 - (630C) 630" Intake, 630" Exhaust



FEULING® REAPER® SERIES 'CONVERSION' CHAIN DRIVE CAMSHAFTS



UPDATE YOUR OLD MECHANICAL STYLE CAMS AND TENSIONERS TO THE NEW HYDRAULIC STYLE TENSIONER SYSTEM

Conversion camshafts for '99-'06 Twin Cam engines. These camshafts utilize the '99-'06 inner cam journals with the '07-'13 outer cam journals allowing the use of the '07-'13 camplates, oil pump, hydraulic chain tensioners and chain drive system.

Twin Cam 'Conversion' Chain Drive '99 – '06 (Except '06 Dyna)

Part # 1016¹ - (525CC Conversion Cam) - 525" Intake, 535" Exhaust

Part # 1015¹ - (543CC Conversion Cam) - 543" Intake, 553" Exhaust

Part # 1017¹ - (574CC Conversion Cam) - 574" Intake, 574" Exhaust

Part # 1019¹ - (594CC Conversion Cam) - 594" Intake, 604" Exhaust

Part # 1018¹ - (630CC Conversion Cam) - 630" Intake, 630" Exhaust

'Factory hydraulic tensioners, outer cam & crank sprockets and thrust washers required, purchased separately - See #8080 & #8083

HYDRAULIC CHAIN TENSIONER/CHAINS/SPROCKET KITS - See Page #27

Feuling Part # 8080 - Includes the following H-D components

- 1 - # 25675-06 Outer chain
- 1 - # 25683-06 Inner chain
- 1 - # 25673-06 Outer crank sprocket 17 tooth
- 1 - # 25728-06 Outer cam sprocket 34 tooth
- 1 - # 39968-06 Outer hydraulic tensioner unit
- 1 - # 39969-06 Inner hydraulic tensioner unit
- 1 - #8082 Bolt kit (2 - 1/4-20 x 3/4") (2 - 1/4-20 x 1-1/4")
- 1 - Spacer Kit Includes the following spacers
 - 1-# 25729-06 Thrust washer - front cam .100
 - 1 - # 25731-06 Spacer (.110 for cam alignment; use as required)
 - 1 - #25734-06 Spacer (.120 for cam alignment; use as required)
 - 1 - #25736-06 Spacer (.130 for cam alignment; use as required)
 - 1 - #25737-06 Spacer (.140 for cam alignment; use as required)
 - 1 - #25738-06 Spacer (.150 for cam alignment; use as required)

Feuling Part #8083 - For use on '99-'01 engines with Magneti Marelli ignition. Kit Includes the above parts with exception of Andrews sprocket #216015 (Feuling #1094) replaces HD 34 tooth sprocket #25728-06.

FEULING® ECONO BEEHIVE® VALVE SPRINGS



FEULING® ECONO performance BEEHIVE® valve springs are designed to handle up to 585" lift camshafts at an economical price. These FEULING® BEEHIVE® springs are made from the same premium stress relieved conical ovate wire as our HIGH LOAD springs but are developed for economical engine budgets. They have an excellent level of fatigue life and are designed to handle the demands of performance engines with 585" and smaller lift camshafts. Dyno proven and track tested.

- FEULING® BEEHIVE® valve springs use a much smaller and lighter weight retainer which drastically reduces the valve weight creating a much quicker revving and smoother motion than comparable dual valve springs.
- FEULING® ECONO springs allow up to 585" lift cams, no rocker box clearancing required.
- Eliminate valve spring separation, maximize stability, reduce valve-train noise & harmonics!
- Available for 5/16" and 7mm valves
- FEULING® BEEHIVE® valve springs must be installed at the correct OPEN HEIGHT, matching max lift to the open height spec of the valve springs

Kits include: FEULING® ECONO BEEHIVE® valve springs, lightweight 7° steel retainers, machined heat treated chrome moly spring seats, seat shims, valve locks and a set of premium Viton® valve seals equipped with a spring loaded valve stem wiper system.

***Don't get stung by inferior valve springs!
Quicker Revving - Smoother Motion - Fit up to 585" Lift Camshafts***

SEAT Lbs. / INSTALLED HEIGHT

183 Lbs. @ 1.760" (0.510" Lift)

175 Lbs. @ 1.785" (0.535" Lift)

172 Lbs @ 1.803" (0.553" Lift)

165 Lbs @ 1.825" (0.574" Lift)

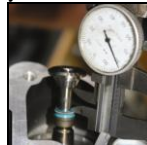
163 Lbs @ 1.835" (0.585" Lift)

380 Lbs @ 1.250" OPEN HEIGHT

Coil Bind @ 1.180"

Part # 1120 **EVO/Twin Cam Big Twin '84-'04,XL '86-'03, Buell '95-'02, 10° Std. 5/16" valve stem and keeper groove**
Part # 1121 **Twin Cam '05-'13, XL '04-'13, XR 1200 '09-'13, 7°, 7mm valve stem with stock triple keeper groove**

NOTE: Feuling® ECONO BEEHIVE® valve spring kits are direct replacement with no machining or rocker box clearance required up to .574" lift for '84-'04 Big Twin and '86-'03 XL and up to .585" lift for '05-'12 Twin Cam. Always check bottom of retainer to seal clearance as cylinder heads vary.



FEULING® ENDURANCE BEEHIVE® VALVE SPRINGS

MAXIMIZE VALVE SPRING STABILITY
REDUCE VALVE-TRAIN NOISE & HARMONICS!



FEULING® ENDURANCE BEEHIVE® valve springs are a direct bolt in replacement up to 650" lift camshafts no spring seat machining required. Machined from a premium grade Hi-tensile chrome silicon single conical ovate wire, shot-peened with a specially processed thermal heat treat and super NexTex® finish to give these valve springs the needed fatigue life to exceed the high demands of V-Twin engines from stock to performance.

- FEULING® BEEHIVE® valve springs use a much smaller and lighter weight retainer which drastically reduces the valve weight creating a much quicker revving and smoother motion than comparable dual valve springs.
- FEULING® endurance springs are a direct bolt-in replacement up to 650" cam lift no machining or rocker box clearancing required.
- Eliminate valve spring separation, maximize stability, reduce valve-train noise & harmonics!
- Available for 5/16" and 7mm valves
- FEULING® BEEHIVE® valve springs must be installed at the correct OPEN HEIGHT, matching max lift to the open height spec of the valve springs

Kits include: FEULING® ENDURANCE BEEHIVE® valve springs, lightweight 7° Titanium heat treated retainers, machined spring seats, seat shims, valve locks and a set of premium Viton® valve seals equipped with a spring loaded valve stem wiper system.

Don't get stung by inferior valve springs!

Quicker Revving - Smoother Motion - Light Weight Ti Retainers - Bolt in up to 650" Lift

SEAT Lbs. / INSTALLED HEIGHT

198 Lbs. @ 1.685" (0.535" Lift)

194 Lbs. @ 1.703" (0.553" Lift)

190 Lbs. @ 1.724" (0.574" Lift)

187 Lbs. @ 1.754" (0.604" Lift)

185 Lbs. @ 1.780" (0.630" Lift)

160 Lbs @ 1.800" (0.650" Lift)

375 Lbs @ 1.150" OPEN HEIGHT

Coil Bind @ 1.100

Part # 1100 EVO/Twin Cam Big Twin '84-'04, XL '86-'03, Buell '95-'02, 10° Std. 5/16" valve stem & keeper groove

Part # 1105 Twin Cam '05-'13, XL '04-'13, XR 1200 '09-'13, 7°, 7mm valve stem with stock triple keeper groove

Part # 1101 T/C Screamin Eagle Heads with 5/16" valve stems with std keeper grooves and .530" diameter valve guides

NOTE: Feuling® ENDURANCE BEEHIVE® valve spring kits are direct replacement with no machining or rocker box clearance required up to .574" lift for '84-'04 Big Twin and '86-'03 XL and up to .650" lift for '05-'12 Twin Cam. Always check bottom of retainer to seal clearance as cylinder heads vary.



FEULING® HIGH LOAD BEEHIVE® VALVE SPRINGS



FEULING® HIGH LOAD premium performance BEEHIVE® valve springs handle up to 750" lift camshafts. Designed for steep ramped large lift camshafts - These Feuling® valve springs are made from premium stress relieved conical ovate wire with a nitrided surface heat treatment, shot-peened surface enhancements along with a Nano Peen™ polish. They have an extremely high level of fatigue life and are designed to handle the highest demands of performance engines with high lift, steep ramped camshafts. Dyno proven and track tested.

- FEULING® BEEHIVE® valve springs use a much smaller and lighter weight retainer which drastically reduces the valve weight creating a much quicker revving and smoother motion than comparable dual valve springs.
- FEULING® HIGH LOAD springs allow up to 750" lift cams, no rocker box clearancing required.
- Eliminate valve spring separation, maximize stability, reduce valve-train noise & harmonics!
- Available for 5/16" and 7mm valves
- FEULING® BEEHIVE® valve springs must be installed at the correct OPEN HEIGHT, matching max lift to the open height spec of the valve springs.

Kits include: FEULING® HIGH LOAD BEEHIVE® valve springs, lightweight 10° Titanium retainers manufactured from Ti-17 alloy and micropolished for enhanced fatigue life, machined heat treated chrome moly spring seats, seat shims and valve locks and a set of premium Viton® valve seals equipped with a spring loaded valve stem wiper system.

Don't get stung by inferior valve springs!

Quicker Revving - Smoother Motion - Light Weight Ti Retainers - Fit up to 750" Lift Camshafts

SEAT Lbs. / INSTALLED HEIGHT

217 Lbs @ 1.789" (0.574" Lift)

215 Lbs @ 1.800" (0.585" Lift)

208 Lbs @ 1.819" (0.604" Lift)

200 Lbs @ 1.845" (0.630" Lift)

185 Lbs @ 1.900" (0.685" Lift)

170 Lbs @ 1.935" (0.720" Lift)

415 Lbs @ 1.215" OPEN HEIGHT

Coil Bind @ 1.125"

- Part # 1200** *EVO/Twin Cam Big Twin '84-'04, XL '86-'03, Buell '95-'02, 10° Std. 5/16" valve stem and keeper groove*
- Part # 1205** *Twin Cam '05-'13, XL '04-'13, XR 1200 '09-'13, 7°, 7mm valve stem with stock triple keeper groove*
- Part # 1201** *T/C Screamin Eagle Heads - Fits SE heads with 5/16" valve stems with std keeper grooves and 0.530" diameter valve guides*

VALVE RETAINER & LOCK WEIGHT COMPARISON

VALVE	YEAR	STOCK	FEULING® ENDURANCE
5/16" STD Groove	'84 - '04	28.7 g	10 g
7MM Triple Groove	'05 - '12	14.4 g	9.4 g
VALVE	YEAR	STOCK	FEULING® HIGH LOAD
5/16" STD Groove	'84 - '04	28.7 g	14.1 g W/ Ti Locks 11.4 g
7MM Triple Groove	'05 - '12	14.4 g	8.5 g

***NOTE:** FEULING® HIGH LOAD BEEHIVE® valve spring kits are direct replacement no machining or rocker box clearance required up to .574" lift for '84-'04 Big Twin, '86-'03 XL, and up to .700" lift for '05 - '12 Twin Cam. Larger lift camshafts require valve guide machining for seal to retainer clearance. Always check bottom of retainer to seal clearance as cylinder heads vary.



FEULING® VALVE LOCKS



Part # 1206



Part # 1212



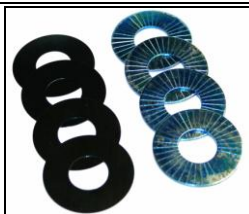
Part # 1213



Part #1214

- Part # 1206** 0.050" off-set 10° machined steel locks fit 5/16" valve stems with standard keeper groove. Raises the valve spring retainer to gain 0.050" installed height without machining the cylinder head spring seat. Also fits FEULING® HIGH LOAD BEEHIVE® springs #1200 and #1201
- Part # 1212** Machined steel locks, Standard height standard groove 5/16 valve stems, 7° degree, stock replacement EVO & T/C '84-'04, XL '86-'03
- Part # 1213** Steel Valve Locks STD. height 7mm valve stem triple groove keepers, stock replacement '05-'12 T/C
- Part # 1214** Ti – valve locks, 10° for 5/16" valve stems, standard height, also fits FEULING® HIGH LOAD BEEHIVE® springs #1200 and #1201

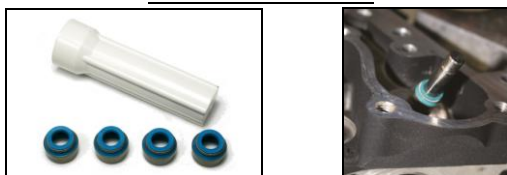
FEULING® SPRING SEAT SHIMS



Set your valve spring open height to match your camshaft lifts for optimum valve-train stability and performance. Quality machined valve spring seat shims in two thicknesses, 0.060" and 0.015" with outside 1.500" Diameter and inner 0.645" diameter. Quantity 4 of each thickness

Part # 1217

VALVE SEALS



High quality Viton valve seals designed to handle high engine temperatures with a built in spring loaded wiper to clean excess oil from valve stem with minimal friction. Includes 4 seals & 1 seal installer tool.

- Part # 1075** Fit: EVO, Sportster & T/C up to 2004, with 5/16" valves (White tool)
- Part # 1076** Fit: T/C 2005 - 2012, XL '04-'12 with 7mm valves (Black tool)
- Part # 1077** Fit: .530" O.D. Guides, 5/16" Valve stems, Fits most Screamin Eagle Heads (Black tool)
- Part # 1078** Fit: .500" O.D. Guides, 5/16" Valve stems (White tool)

FEULING® OIL FILTER COOLERS



Part #:2000, 2001, 2002, 2003



Part #:2005, 2006, 2007, 2008



Filter Cooler Cut-A-Way

Cleaner cooler oil with the Feuling® oil cooler/filtration system, this oil cooler is designed with an internal spun glass element cartridge filter which is used as an additional oil filter in conjunction with the factory spin on oil filter. The Feuling® oil cooler system drastically reduces contamination and viscosity breakdown in the oil; protecting the engine from cylinder, piston, ring and bearing wear. Preventing extreme oil temperatures, promoting engine performance, longer engine life & extended oil change intervals.

This oil cooler system makes a clean custom look, mounting between the frame rails in position to take advantage of the air flow from the front tire. Available in chrome or gloss black, the housing measures 5" long and 3-3/4" in diameter.

Kits include filter cooler housing, replaceable spun glass cartridge filter, gloss black mounting bracket, off-set oil filter adapter, braided steel lines with swivel fittings, K&N® spin-on oil filter, ARP® 12 bolt fasteners and all necessary hardware. Kits available in chrome finish with stainless lines, & black finish with black lines.



#2000 Softail Classic



#2005 Softail Std.



#2002 Bagger



#2007 Bagger



#2008 Dyna

CHROME Part # 2000 – Chrome '00 – Present Softail, non ABS models
 Part # 2001 – Chrome '99 - Present Dyna models
 Part # 2002 – Chrome '99 – Present FL models – Baggers
 Part # 2003 – Chrome '99 - Present Dyna models W/O charcoal canister

BLACK Part # 2005 – Black '00 – Present Softail, non ABS models
 Part # 2006 – Black '99 – Present Dyna models
 Part # 2007 – Black '99 – Present FL models – Baggers
 Part # 2008 –Black '99 - Present Dyna models W/O charcoal canister

FEULING® REPLACEMENT FILTER COOLER OIL FILTER



Replacement filter for the Feuling® Filter Cooler filtration system. Includes new O-ring. This filter is a glass element filter and Feuling® recommends replacing this filter with your next oil change after installation then replace every other oil change.

Part # 2020 Fits: Feuling #2000, 2001, 2002, 2003, 2005, 2006, 2007, 2008

FEULING® OFFSET OIL FILTER ADAPTER



Feuling® Offset sandwich adapters allow easy hook up of any style remote oil cooler or additional oil filter set up. These adapters are designed with a pressure relief valve vs. the standard thermostat which allows constant oil flow through your remote oil cooler with total protection from starving the engine from oil flow. 1/8" NPT ports. Available in chrome or anodized black finish. Fits '99-'12 Twin Cam and EFI EVO models.

Chrome Part # 2021

Black Part # 2022

Rebuild Kit # 2023 Includes Gasket, O-ring & Allen head hardware

FEULING® ARP® CYLINDER STUD & HEAD BOLT KIT



- *The strongest studs & bolts available!*
- *Top engine builders demand quality fasteners! Secure your engine with complete confidence*
- *Superior in strength and performance to any other cylinder stud head bolt kit on the market, this kit is designed to exceed the needs of high performance engines.*
- *Don't Risk Head Gasket Failure!*
- *Stock Cylinder studs are designed as a stretch to torque stud with a one time use only lifespan*
- *Feuling® studs are installed to a torque spec can be reused and carry a lifetime warranty*
- *Heat-treated 8740 chrome moly steel studs*
- *Precision j-form threads for optimum engagement, to prevent galling and promote more consistent torque loading.*
- *Special alloyed stainless steel head bolts*
- *Manufactured by ARP® to Feuling's® exact specifications*
- *Recommended for all V-Twin engines*
- *Stock replacement*
- *Kit includes 8 cylinder studs, 8 head bolts, moly assembly lubricant and thread sealant*
- *Made in the U.S.A.*

Part# 3000

'99 – Present TWIN CAM® ENGINES

Part# 3025

'85 – '99 Evolution® BIG TWIN ENGINES

FEULING® CYLINDER STUD KIT



Part # 3001 – Twin Cam® '99 – Present

Part # 3026 – Evolution® Big Twin '85 – '99

FEULING® HEAD BOLT KIT



Part # 3005 fits: Twin Cam® '99 – Present

Evolution® Big Twins '85 – '99

Sportster® '92 – Present

Buell® '00 - Present

FEULING® ARP® DRESS-UP FASTENER KITS



Part #: 3033



Part #: 3035



Part #: 3048



Part #: 3030 & 3031



Part #: 3040

INSTALLED IMAGES



Part # 3035



Part # 3033



Part # 3040



Bolt Close Up



- **Feuling® Dress-up fastener kits for Twin Cam® engines**
- **Quality 12-point hardened stainless steel bolts with a "SHOW" corrosion-resistant finish**
- **Feature precision rolled threads for optimum engagement, to prevent galling and promote more consistent torque loading.**
- **Wide overhead flange design provides even load distribution for optimum sealing of surfaces – preventing leaks.**
- **Top engine builders demand quality fasteners! Secure your engine with complete confidence.**
- **Eliminates thread problems associated with chromed hardware**
- **Tensile strength rated @ 170,000 psi – Superior & Stronger than OEM & stronger than grade 8 fasteners**
- **Manufactured by ARP® to Feuling's® exact specifications**
- **Kits include moly assembly lubricant for installation**
- **Made in the U.S.A.**

Twin Cam® Engines '99 – Present

Part # 3030 - Case bolts '99-'12 A Motors

Part # 3031 – Case Bolts '00-'12 B Motors

Part # 3033 - Lifter block bolts (Qty. 8)

Part # 3035 – Kit - Lifter blocks, Cam Cover, Oil filter adapter, Sensor (Qty. 22)

Part # 3040 – Rocker covers

Part # 3048 – Exhaust studs & lock nuts

FEULING® ARP® ENGINE FASTENERS



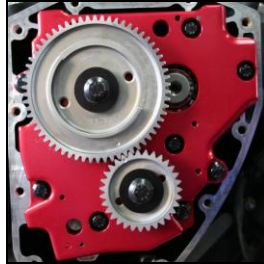
Part #: 3042



Part #: 3048



Part #: 3045, 3046



Part # 3042 Installed on a Gear Drive System



- **Top engine builders demand quality fasteners! Secure your engine with complete confidence.**
- **Feuling® engine fastener kits for Twin Cam® engines**
- **Quality 12-point heat treated 8740 chrome moly steel bolts with black oxide finish**
- **Feature precision rolled threads for optimum engagement, to prevent galling and promote more consistent torque loading.**
- **Wide underhead flange design provides even load distribution for optimum sealing of surfaces - preventing leaks.**
- **Tensile strength rated @ 170,000 psi – Superior & Stronger than OEM & stronger than grade 8 fasteners**
- **Manufactured by ARP® to Feuling's® exact specifications**
- **Kits include moly assembly lubricant for installation**
- **Made in the U.S.A.**

Twin Cam® Engines

**Part # 3042 – Cam & Pinion shaft bolts, Hardened Washers, Camshaft retaining ring, Moly lube, Loctite.
Fits: '99 – Present**

Part # 3045 - Rocker Housing Fastener Kit – Supports, Breathers, Rocker box housings ,Washers, Moly lube Fits: '99 – '00 Dyna & FLT models, '00 – '01 Softail models

Part # 3046 - Rocker Housing Fastener Kit - Supports, Breathers, Rocker box housings, Washers, Moly lube Fits: '01 – Present Dyna & FLT, '02 – Present Softail models

**Part # 3048 – Exhaust studs, lock nuts, moly lube.
Fits: T/C '99 – Present, EVO '84-'99**

FEULING® ARP® COMPLETE TIC ENGINE FASTENER KITS

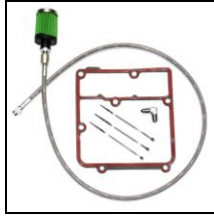


- **Complete Twin Cam engine 12-point fastener kits including dress up “special alloyed stainless” external engine fasteners and heat treated 8740 black oxide internal engine fasteners.**
- **Top engine builders demand quality fasteners! Secure your engine with complete confidence.**
- **Tensile strength rated @ 170,000 psi – Superior & Stronger than OEM & stronger than grade 8 fasteners**
- **Includes all necessary fasteners for the Twin Cam® engine under one part #: 3000 cylinder studs/head bolts, 3030 case bolts, 3035 Lifter blocks, cam cover, oil filter adapt. 3040 rocker covers, 3042 cam/pinion shaft bolts/washers, 3045 Rocker arm supports, breathers, rocker box housing bolts/washers, 3048 exhaust studs & lock nuts, Moly lubricant, Loctite, thread sealant and installation instructions**
- **Made in the U.S.A.**

**Part # 3050 '99 – '00 Dyna & FLT models, '00 – '01 Softail model
(Includes #:3000, 3031, 3035, 3040, 3042, 3045, 3048)**

**Part # 3051 '01 – Present Dyna & FLT models, '02 - Present Softail model
(Includes #:3000, 3031, 3035, 3040, 3042, 3046, 3048)**

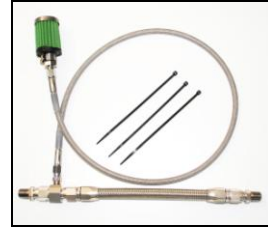
FEULING® OIL TANK BREATHER KITS



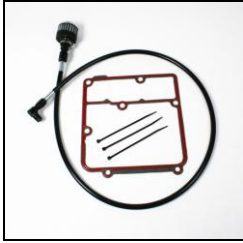
Part #: 3070



Part #: 3075



Part #: 3080



Part #:3071



Part #: 3076



Part #: 3081



Part # 3082



- **Stop dipstick blowout**
- **Releases power robbing pressures from oil tank & crank case, reduces blow - by**
- **Promotes proper oil flow and oil tank function**
- **Braided steel lines & stainless steel fittings, breather line is coated with clear pvc**
- **Lifetime warranty breather element**
- **Available in stainless or black finish**
- **Gasket, thread sealant, necessary hardware and installation instructions included**
- **Dyna models require removal of the transmission/oil tank cover. Early FLT models require removal of dipstick housing – new gaskets are supplied.**
- **Made in the U.S.A.**

Part # 3070 '99 -'05 Dyna models, stainless

Part # 3071 '99 –'05 Dyna models, black

Part # 3075 '99 –'01 FLT models, stainless

Part # 3076 '99 –'01 FLT models, black

Part # 3080 '02 – '06 FLT models, stainless

Part # 3081 '02 – '06 FLT models, black

Part # 3082 Replacement breather element

FEULING® HP+® HYDRAULIC LIFTERS



Part #: 4000



Part #: 4025



Part #: 4061

- **Performance hydraulic roller lifters**
- **Optimized oil flow to top end - valves, springs, rockers, shafts & valve guides**
- **Cooler oil and reduced wear**
- **Extends life of top end valve gear**
- **CNC machined and precision ground**
- **Drop in replacement for stock lifters**
- **Dyno developed and track tested**
- **Recommended for use with the Feuling® Oil Pump or comparable high volume oil pump**
- **Made in the U.S.A.**

Part # 4000 Std. Diameter, fits: Twin Cam® '99 – Present, Sportster & Buell '00 – '13

Part # 4025 Std. Diameter, fits: XL & Buell® '91 – '99

Part # 4061 Std. Diameter, fits: EVO® '85 – '99, XL '86 – '90

FEULING® RACE SERIES® EVO® Lifters



FEULING® EVO® RACE SERIES® Lifters are machined from a steel body and are designed with precision tolerances and a slower bleed down rate increasing valve-train stability when used with large lift camshafts and heavy valve spring pressures. Feuling® Race Series Lifters are full travel hydraulics with big axles designed to decrease valve float and promote maximum valve lift.

Part # 4062 Std. Diameter, fits: EVO® '85 – '99, XL '86 – '90

FEULING® RACE SERIES® HYDRAULIC LIFTERS



FEULING® RACE SERIES® full travel hydraulic lifters are machined from a steel body and designed to exceed the needs of large lift camshafts and higher valve spring pressures with a slower bleed down rate. RACE SERIES® lifters maintain proper oil flow to the top end, increase engine RPM, valve-train stability, decreasing valve float promoting maximum valve lift.

Feuling® recommends Race Series® lifters for engines running higher than 185Lbs. valve spring seat pressure. FEULING recommends the use of a high volume oil pump which will result in quieter, better performing lifters. Race Series® lifters are compatible with either FEULING® HP+® or Race Series® oil pumps and are designed for use with both street and strip engines. Spin-Tron dyno developed and track proven, Made in the USA.

- Available in oversized diameters – Case Savers!
- Recommended for both strip and performance street engines
- Sold in sets of 4
- Made in the U.S.A.

**Part # 4050 Std. Diameter (0.842" - 0.8425") T/C® '99 – Present, Sportster/Buell® '00 – Present
Part # 4051 Oversized Dia. (0.843" - 0.8435") T/C® '99 – Present, Sportster/Buell® '00 – Present
Part # 4052 Oversized Dia (0.8435" - 0.844") T/C® '99 – Present, Sportster/Buell® '00 – Present**

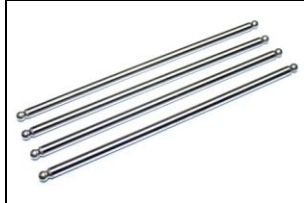
FEULING® RACE SERIES® SOLID LIFTERS



- Designed for engines with radical valve spring pressures and large lift camshafts
- Optimize valve - train stability at high RPM, decrease valve float
- Maintain maximum valve lift , Increase horsepower & torque output.
- Made from hardened steel, CNC machined and precision ground with 0.700" Diameter rollers
- Maintaining proper and critical oil flow to top end with metered oiling
- Utilizes standard pushrod seat height, Feuling recommends the use of #4070 Race Series adjustable pushrods or comparable heavy duty adjustable pushrods
- Recommended for both strip and high performance street engines
- For best results Feuling recommends the use of a high volume oil pump
- Made in the U.S.A.
-

Part # 4055 Standard diameter (0.8422" - 0.8425") fits: T/C® '99 – Present, Sportster/Buell® '00 – Present

FEULING® HP+® & RACE SERIES® ADJUSTABLE PUSHRODS



- *Maintain maximum valve lift!*
- *Increased stiffness and column rigidity maximizing valve-train stability, increasing engine RPM horsepower and torque output.*
- *Tapered 7/16" 4130 chrome moly adjustable pushrods, use a minimal adjustment parameter eliminating flex and loss of valve train-stability problems associated with most adjustable pushrods.*
- *Individual length intake & exhaust pushrods keep the adjustment extension to a minimum*
- *Designed to exceed the needs of performance engines using larger lift camshafts and high spring pressures, while maintaining proper and critical oil flow to top end valve gear.*
- *CNC machined with 32 thread per inch adjustment, Double jam nut lock system, HP+® pushrod wall thickness 0.095", RACE SERIES® wall thickness .120"- recommended when extreme valve-spring pressures are used. New style 24 threads per inch*
- *Designed for use with hydraulic or solid lifters and street or race engines*
- *These pushrods require removal of rocker covers and rocker arm supports*
- *FEULING® pushrods can be used with the factory pushrod tubes.*
- *Made in the U.S.A.*

TWIN CAM® '99 – Present

#4065 **HP+®** 0.095" Wall

#4070 **RACE SERIES®** 0.120" Wall, New style 24 threads per inch

EVO® Big Twins '84 – '99

#4077 **HP+®** 0.095" Wall

#4080 **RACE SERIES®** 0.120" Wall

SPORTSTER® '91-'03

#4085 **HP+®** Fixed Length Chrome moly one piece pushrods 3/8 tube with 0.065" wall thickness and hardened ball ends. Intake length is +0.040" and exhaust length is + 0.060" over stock

FEULING® FAST INSTALL® ADJUSTABLE PUSHRODS



FEULING® FAST INSTALL® adjustable pushrods are made from the same great design as the regular install **FEULING®** adjustable pushrods but feature a slightly shorter tapered tube and come disassembled allowing the engine builder to install the pushrods without removing the top rocker box. These pushrods feature a dual jam nut locking system and include **FEULING®** part #9012 which is a tool to hold the pushrod tubes up and out of the way while adjusting the pushrods.

FEULING® pushrods can be used with the factory pushrod tubes and are the longest **FAST INSTALL®** pushrods available on the market. **FEULING®** pushrods use separate lengths for intake and exhaust which keeps the adjustment area to a minimum creating a **FAST INSTALL®** pushrod with maximum rigidity promoting maximum valve lift.

Twin Cam® '99 – Present

#4090 **FAST INSTALL®** 0.095" Wall

Evolution® Big Twins '84 – '99

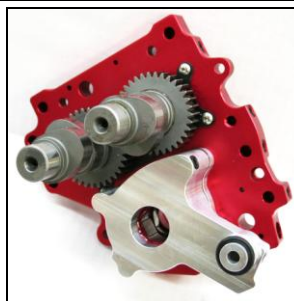
#4091 **FAST INSTALL®** 0.095 Wall

FEULING® REPLACEMENT PUSHROD NUTS

Part # 4089

Replacement pushrod nuts, fits all **FEULING®** 32 threads per inch pushrods **HP+®, FAST INSTALL® & RACE SERIES®,** new style **RACE SERIES** 24 threads per inch

FEULING® HP+® HIGH VOLUME OIL PUMPS



INSTALLED ON #8000 CAMPLATE

- Billet 6061 aluminum
 - Increases oil pressure
 - No more oily air cleaners
 - Eliminates blow by & wet sumping
 - More HP and Torque to the rear wheel
 - Fits both A and B Twin Cam engines
 - High Flow 2" Chrome Moly gerotor gears
- High Volume oil pump
 - Cooler oil & engine temperatures
 - 40% more pressure volume than stock, 16%+ more than SE
 - 60% more scavenge (return) volume than stock, 9%+ more than SE
 - Stock replacement
 - Feuling® design, tolerances & material
 - Made in the U.S.A.

Part # 7000 Fits: Twin Cam® Engines '99 – '06 Except '06 Dyna

FEULING® HP+® OIL PUMP



- Billet 6061 aluminum
 - Increases oil pressure
 - No more oily air cleaners
 - Eliminates blow by & wet sumping
 - More HP and Torque to the rear wheel
 - High Flow 2" Chrome Moly gerotor gears
 - Made in the U.S.A.
- High Volume oil pump
 - Cooler oil & engine temperatures
 - 32% more pressure volume than stock, 16%+ more than SE
 - 38% more scavenge (return) volume than stock, 9%+ more than SE
 - Stock replacement
 - Feuling® design, tolerances & material

Part # 7060 Fits: Twin Cam® '07-'13 Includes '06 Dyna models

Fits: Screamin Eagle® and other aftermarket camplates which utilize the late style '07-'13 oil pumps

FEULING® OIL PUMP FOR R&R CYCLES CAMPLATE



Part # 7068 Fits: R&R Cycles T/C engine Cam Support Plates designed for use with '06 Dyna and newer T/C style oil pump.

R&R Camplate part #'s: #12-2014B
 #12-2014C
 #12-2014R

FEULING® RACE SERIES® OIL PUMPS



Part # 7050



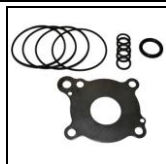
Part #: 7062

- 7075 Billet aluminum with military spec hard anodized, blue printed and designed for the racer!
- The 7075 alloy is 50% harder and stronger than 6061 aluminum and holds tighter tolerance under temperature
- More pressure volume and more oil pressure
- More scavenge volume eliminating power robbing wet sumping, blow - by and oily air cleaners
- Cooler oil and engine temperatures
- More horsepower, more torque, more oil pressure, more return volume
- High Flow 4140 heat treated Chrome Moly gerotor gears
- Stock replacement for Twin Cam® engines
- When combined with the Feuling® Camplate test results show 3 Horsepower gain and 4 ft/lbs of Torque gain to the rear wheel, while lowering engine & oil temperature. Feuling® NOT required.
- Stock replacement for Twin Cam® engines, recommended for both strip & performance street engines
- Made in the U.S.A.

Part # 7050 Twin Cam® '99 – '06 Except '06 Dyna

Part # 7062 Twin Cam® '07-'13 Including '06 Dyna

FEULING® OIL PUMP REBUILD KITS



- The Feuling® rebuild kit includes everything needed to properly rebuild the high volume Feuling® Twin Cam® Oil Pumps.
- Kit includes new O-rings, separator plate and installation instructions.
- Made in the U.S.A.

Part # 7001 Fits Feuling® oil pumps # 7000 & 7050

Part # 7061 Fits Feuling® oil pump # 7060 & 7062

FEULING® REPLACEMENT OIL PUMP HOUSINGS

FEULING® offers replacement oil pump housings, when damage occurs to either the gear set or aluminum housing the components must be replaced as a set because the inner & outer gears are matched to each other then matched to the aluminum housing within 0.0005" requiring the items be replaced as a matched set. NOTE: The best way to repair a damaged FEULING® pump is to send it in to our returns department for re-manufacturing.



Part # 7002 **HP+®** oil pump #7000, Pressure housing, Pressure gear set, Separator plate, fasteners & O-rings '99 - '06, except '06 Dyna

Part # 7003 **HP+®** oil pump #7000, Scavenge housing, Scavenge gear set, Separator plate, fasteners & O-rings '99 - '06, except '06 Dyna

Part # 7051 **RACE SERIES®** oil pump #7050, Pressure housing, Pressure gear set, Separator plate, fasteners & O-rings '99 - '06, except '06 Dyna

Part # 7052 **RACE SERIES®** oil pump #7050, Scavenge housing, Scavenge gear set, Separator plate, fasteners & O-rings '99 - '06, except '06 Dyna

Part # 7063 **HP+®** oil pump #7060, Pressure housing, Pressure gear set, Separator plate, fasteners & O-rings '07 - '12, Includes '06 Dyna

Part # 7064 **HP+®** oil pump #7060, Scavenge housing, Scavenge gear set, Separator plate, fasteners & O-rings '07 - '12, Includes '06 Dyna

Part # 7065 **RACE SERIES®** oil pump #7062, Pressure housing, Pressure gear set, Separator plate, fasteners & O-rings '07 - '12, Includes '06 Dyna

Part # 7066 **RACE SERIES®** oil pump #7062, Scavenge housing, Scavenge gear set, Separator plate, fasteners & O-rings '07 - '12, Includes '06 Dyna

FEULING® HIGH FLOW CAMPLATES



Part #: 8000



Part #: 8010



Part #: 8011



Part #8015

- **FEULING® HIGH FLOW** camplates for T/C® engines increase engine oil flow and volume by enlarging the oil pump reservoirs and critical oil passages including matching the oil port holes throughout the camplate to the port holes in the engine case increasing engine oil flow to the lifters, piston cooling jets, crankshaft and rod bearings resulting in 25-35 degree cooler engine temperatures.
- Made from 7075 billet aluminum which is 50% harder and stronger than the factory, SE® and other aftermarket camplates. The 7075 increases the strength and hardness of the camplate, holding tighter tolerances under temperature eliminating flexing and the need for bronze bushings as 7075 material has excellent bearing like properties.
- **FEULING®** camplates are blue printed and matched to the Feuling® oil pumps, which allow the Twin Cam® engine to take full advantage of the increased volume from the high flow oil pumps resulting in cooler quieter engine operation.
- Tighter cam bearing bore tolerance for improved press fit
- Camplates are pressure tested & pressure relief valve and spring are pre-set and designed for the increased volume and pressure, eliminating the need to stretch the spring or use a shim.
- When matched with the Feuling® Race Series Oil Pump rear wheel power gains of 3 Horsepower and 4 ft/lbs of Torque are achieved.
- For use ONLY with the Feuling® oil pumps
- Bolts into stock location
- Made in the U.S.A.

Part # 8000 CAMPLATE “Gear Drive” T/C® ‘99 – ‘06, Except ‘06 Dyna

Includes military spec hard anodized, bearing retainer plate & hardware, For use ONLY with FEULING® oil pumps #7000 & 7050

Part # 8010² CAMPLATE “Chain Drive” T/C® ‘99 – ‘06, Except ‘06 Dyna,

Includes military spec hard anodize, bearing retainer plate, tensioner pins & chain guide tower, For use ONLY with FEULING® oil pumps #7000 & 7050

Part # 8015¹ CAMPLATE T/C® ‘07-‘13 Includes ‘06 Dyna models. Chain and Gear Drive

For use ONLY with FEULING® oil pumps #7060 & 7062

- Tighter cam journal bore tolerance for improved cam fitment
- Added Cam journal oil groove for cold start up protection and increased cam journal lubrication
- Added oil pressure feed holes to front and back of cam journals to prevent excessive thrusting wear

Part # 8011³ ‘CONVERSION’ CAMPLATE’ for T/C® ‘99 - ‘06, Except ‘06 Dyna – has the original style ‘99 – ‘06 Twin Cam® cam bearing bores for use with the press in bearings. This camplate is designed to use the new style ‘07 – ‘13 Factory hydraulic chain tensioner system with the original ‘99 -‘06 Twin Cam® style camshafts. Great for those who have already upgraded their early style engine and like their existing camshafts. Camplate includes bearing retainer plate and hardware. Requires the purchase of ‘factory’ hydraulic chain drive tensioners. See Feuling #8081. *‘99-‘01 engines with Magneti Marell ignition utilize the OE outer silent chain and rear cam sprocket. For use ONLY with FEULING® oil pumps #7060 & 7062

¹ Gear drive cam systems require block off plates - see Feuling #8016

² Includes tensioner pins and guide hardware

³ Requires purchase of ‘factory’ hydraulic chain drive tensioners, chains, sprockets & hardware

Feuling Part #8081 Includes the following H-D components

1 - # 25675-06	Outer chain 'New style'
1 - # 25607-99	Inner chain 'Old Style'
1 - # 25673-06	Outer crank sprocket 17 tooth
1 - # 25728-06	Outer cam sprocket 34 tooth
1 - # 39968-06	Outer hydraulic tensioner unit
1 - # 39969-06	Inner hydraulic tensioner unit
1 - #25285-08	Cam spacer kit
1 - #8082 Bolt kit (2 - 1/4-20 x 3/4") (2 - 1/4-20 x 1-1/4")	

FEULING® OILING SYSTEM KITS



Part #7070



Part # 7071



Part # 7074



Part # 7076



Part # 7072



Part # 7073



Part # 7075



Part # 7077

Oil is the Life Blood of your Engine!

FEULING® oiling system kits combine all the needed components to finish your T/C® engine's oiling system under 1 Part #, available in HP+® or RACE SERIES® kits. FEULING® oiling system kits increase oil pressure, oil volume, engine oil flow and return oil scavenging, eliminating wet sumping and oily air cleaners. Test results show 25-35 degree cooler engine temperatures, 15-30 degree cooler oil temperatures, 15-30 more pounds of oil pressure and quieter smoother engine operation. Results also show a substantial increase of oil pressure and 3 H.P. and 4 Ft. Lbs of T.Q to the rear wheel.

-Both HP+® and RACE SERIES® kits include FEULING'S® HIGH FLOW billet camplate made from 7075 aluminum which is 50% harder and stronger than the factory, SE® and other aftermarket camplates. FEULING® increases oil flow and volume by enlarging the oil pump reservoirs and critical oil passages including matching the oil port holes throughout the camplate to the port holes in the engine case which increases engine oil flow to the lifters, piston cooling jets, crankshaft and rod bearings.

-**HP+® SERIES Kits** include a billet 6061 aluminum high volume oil pump, FEULING® HIGH FLOW camplate, HP+® Hydraulic roller lifters, gaskets and o-ring kit.

-**RACE SERIES® Kits** include a billet 7075 hard anodized oil pump which is 50% harder and stronger than the factory pump holding tighter tolerances under temperature. RACE SERIES® hydraulic lifters have a full .200" of total travel designed with a slower bleed down rate to handle heavy valve spring pressures, increase engine RPM before valve float and feature increased roller clearance for steep ramped camshafts. Kits include a RACE SERIES® oil pump, RACE SERIES® lifters, HIGH FLOW camplate, gaskets and o-rings.

CONVERSION CAMPLATE Kits #7076 & #7077 utilize the early style '99-'06 chain drive camshafts and upgrade the cam chain system to use the late style '07-'13 hydraulic tensioner system. 'Factory' sprockets, tensioners, chain and hardware purchased separately - see Feuling #8081
*99-'01 engines utilize the OE outer silent chain and rear cam sprocket.

HP+® SERIES

T/C '99-'06 EXCEPT '06 DYNA

#7070 ²	'99-'06 Except '06 Dyna, HP +® Series – Gear Drive	(Part #'s: 2050, 4000, 7000, 8000)
#7071 ³	'99-'06 Except '06 Dyna, HP +® Series – Chain Drive	(Part #'s: 2050, 4000, 7000, 8010)
#7076 ¹	'99-'06 Except '06 Dyna, HP +® Series – Conversion Camplate	(Part #'s: 2050, 4000, 7060, 8011)

T/C '07-'13 INCLUDES '06 DYNA

#7074 ²	'07-'12 + '06 Dyna Models HP +® Series – Gear & Chain	(Part #'s: 2050, 4000, 7060, 8015)
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RACE SERIES®

T/C '99-'06 EXCEPT '06 DYNA

#7072 ²	'99-'06 Except '06 Dyna, RACE SERIES® – Gear Drive	(Part #'s: 2050, 4050, 7050, 8000)
#7073 ³	'99-'06 Except '06 Dyna, RACE SERIES® – Chain Drive	(Part #'s: 2050, 4050, 7050, 8010)
#7077 ¹	'99-'06 Except '06 Dyna, RACE SERIES® – Conversion Camplate	(Part #'s: 2050, 4050, 7062, 8011)

T/C '07-'13 INCLUDES '06 DYNA

#7075 ²	'07-'13 + '06 Dyna Models RACE SERIES® – Gear & Chain	(Part #'s: 2050, 4050, 7062, 8015)
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¹ Conversion camplate uses '99-'06 chain drive camshafts with late style '07-'13 hydraulic chain tensioner system, purchased separately - See - Feuling # 8081

² Gear drive cams require block off plates see Feuling #8016

³ Includes bearing retainer plate & hardware



BULLETPROOF™

FEULING® CAMCHEST KITS



Part # 7201 & 7202



Part # 7222

BULLETPROOF™ CAMCHESTS!

FEULING® camchest kits include all necessary components from top to bottom of the camchest conveniently packaged under 1 part #. These combination kits not only ensure each individual part is designed to work and function together but to do so in total harmony. These camchest kits take the guess work out of the ordering process and guarantees the engine builder maximum reliability, peak performance and the coolest engine and oil temperatures obtainable.

25-35 degree cooler engine temperatures, 15-30 degree cooler oil temperatures, 15-30 more pounds of oil pressure, quieter and smoother engine operation, eliminate wet sumping, blow by and oily air cleaners.

Camchest kits are available in FEULING® HP+® and RACE SERIES® combinations and with gear drive or chain drive REAPER® camshafts. Fitments available for '99-'13 Twin Cam® engines.

Kits include: FEULING® high volume Oil pump, high flow billet Camplate, REAPER® Series Camshafts, hydraulic roller Lifters, adjustable Pushrods, TIMKEN®/KOYO® Bearings, Gaskets, O-rings, hardware, ARP® fasteners, washers, moly lube and LOCTITE®. Camchest kits are available in FEULING® HP+® and RACE SERIES® combinations and with gear drive or chain drive REAPER® camshafts. Fitments available for '99-'13 Twin Cam® engines.

CHAIN DRIVE CAMCHEST KITS

FEULING® REAPER® Series chain drive camshafts utilize the factory chains, sprockets and tensioner systems.

T/C '99-'06 EXCEPT '06 DYNA

- #7201 **HP+®** Camchest Kit, **525"** Chain Drive '99-'06 Except '06 Dyna – (Includes #1001, 2060, 4000, 4090, 7000, 8010, 8020)
- #7230 **HP+®** Camchest Kit, **543"** Chain Drive '99-'06 Except '06 Dyna – (Includes #1000, 2060, 4000, 4090, 7000, 8010, 8020)
- #7202 **HP+®** Camchest Kit, **574"** Chain Drive '99-'06 Except '06 Dyna – (Includes #1002, 2060, 4000, 4090, 7000, 8010, 8020)
- #7214 **RACE SERIES®** Camchest Kit, **574"** Chain Drive '99-'06 Except '06 Dyna – (Includes #1002, 2060, 4050, 4090, 7050, 8010, 8020)
- #7234 **RACE SERIES®** Camchest Kit, **594"** Chain Drive '99-'06 Except '06 Dyna – (Includes #1301, 2060, 4050, 4090, 7050, 8010, 8020)
- #7203 **RACE SERIES®** Camchest Kit, **630"** Chain Drive '99-'06 Except '06 Dyna – (Includes #1003, 2061, 4050, 4070, 7050, 8010, 8020)

T/C '07-'13 INCLUDES '06 DYNA

- #7206 **HP+®** Camchest Kit, **525"** Chain Drive '07-'13 Includes '06 Dyna – (Includes #1006, 2070, 4000, 4090, 7060, 8015, 8020)
- #7231 **HP+®** Camchest Kit, **543"** Chain Drive '07-'13 Includes '06 Dyna – (Includes #1020, 2070, 4000, 4090, 7060, 8015, 8020)
- #7209 **HP+®** Camchest Kit, **574"** Chain Drive '07-'13 Includes '06 Dyna – (Includes #1009, 2070, 4000, 4090, 7060, 8015, 8020)
- #7215 **RACE SERIES®** Camchest Kit, **574"** Chain Drive '07-'13 Includes '06 Dyna – (Includes #1009, 2070, 4050, 4090, 7062, 8015, 8020)
- #7235 **RACE SERIES®** Camchest Kit, **594"** Chain Drive '07-'13 Includes '06 Dyna – (Includes #1303, 2070, 4050, 4090, 7062, 8015, 8020)
- #7212 **RACE SERIES®** Camchest Kit, **630"** Chain Drive '07-'13 Includes '06 Dyna – (Includes #1012, 2071, 4050, 4070, 7062, 8015, 8020)

CONVERSION CHAIN DRIVE CAM CAMCHEST KITS

UPDATE YOUR OLD MECHANICAL STYLE CAMS AND TENSIONERS TO THE NEW HYDRAULIC STYLE TENSIONER SYSTEM

Conversion camshafts for '99-'06 Twin Cam engines. These camshafts utilize the '99-'06 inner cam journals with the '07-'13 outer cam journals allowing the use of the '07-'13 camplates, oil pump, hydraulic chain tensioners and chain drive system

T/C '99-'06 EXCEPT '06 DYNA

- #7220² **HP+®** Camchest Kit, **525"** Conversion Chain Drive cams, '99-'06 Except '06 Dyna – (#'s: 1016, 2063, 4000, 4090, 7060, 8015, 8020)
- #7224² **HP+®** Camchest Kit, **543"** Conversion Chain Drive cams, '99-'06 Except '06 Dyna – (#'s: 1015, 2063, 4000, 4090, 7060, 8015, 8020)
- #7221² **HP+®** Camchest Kit, **574"** Conversion Chain Drive cams, '99-'06 Except '06 Dyna – (#'s: 1017, 2063, 4000, 4090, 7060, 8015, 8020)
- #7222² **RACE SERIES®** Camchest Kit, **574"** Conversion Chain Drive cams, '99-'06 Except '06 Dyna – (#'s: 1017, 2063, 4050, 4090, 7062, 8015, 8020)
- #7225² **RACE SERIES®** Camchest Kit, **594"** Conversion Chain Drive cams, '99-'06 Except '06 Dyna – (#'s: 1019, 2063, 4050, 4090, 7062, 8015, 8020)
- #7223² **RACE SERIES®** Camchest Kit, **630"** Conversion Chain Drive cams, '99-'06 Except '06 Dyna – (#'s: 1018, 2064, 4050, 4070, 7062, 8015, 8020)

¹Requires cam gear set, FEULING® part #'s 1095 or 1096 or see Andrews® or S&S® gear kits

²Conversion cams use early '99-'06 style inner cam journals with late style '07-'13 outer journals requiring late style hydraulic chain tensioners, sprockets and chains - purchased separately see Feuling # 8080



BULLETPROOF™
FEULING® CAMCHEST KITS



Part # 7204, 7207 & 7232



Part # 7216K & 7236K

GEAR DRIVE CAMCHEST KITS

FEULING® REAPER® Series gear drive camshafts are stock replacement fit and utilize the standard cam gears offered by FEULING®, ANDREWS® and S&S®.

T/C '99-'06 EXCEPT '06 DYNA

- #7204' **HP+®** Camchest Kit, 525" Gear Drive '99-'06 Except '06 Dyna – (Includes #1004, 2060, 4000, 4090, 7000, 8000, 8020)
- #7232' **HP+®** Camchest Kit, 543" Gear Drive '99-'06 Except '06 Dyna – (Includes #1021, 2060, 4000, 4090, 7000, 8000, 8020)
- #7207' **HP+®** Camchest Kit, 574" Gear Drive '99-'06 Except '06 Dyna – (Includes #1007, 2060, 4000, 4090, 7000, 8000, 8020)
- #7216' **RACE SERIES®** Camchest Kit, 574" Gear Drive '99-'06 Except '06 Dyna – (Includes #1007, 2060, 4050, 4090, 7050, 8000, 8020)
- #7236' **RACE SERIES®** Camchest Kit, 594" Gear Drive '99-'06 Except '06 Dyna – (Includes #1302, 2060, 4050, 4090, 7050, 8000, 8020)
- #7210' **RACE SERIES®** Camchest Kit, 630" Gear Drive '99-'06 Except '06 Dyna – (Includes #1010, 2061, 4050, 4070, 7050, 8000, 8020)

T/C '07-'13 INCLUDES '06 DYNA

- #7205' **HP+®** Camchest Kit, 525" Gear Drive '07-'13 Includes '06 Dyna – (Includes #1005, 2065, 4000, 4090, 7060, 8015, 8016, 8020)
- #7233' **HP+®** Camchest Kit, 543" Gear Drive '07-'13 Includes '06 Dyna – (Includes #1022, 2065, 4000, 4090, 7060, 8015, 8016, 8020)
- #7208' **HP+®** Camchest Kit, 574" Gear Drive '07-'13 Includes '06 Dyna – (Includes #1008, 2065, 4000, 4090, 7060, 8015, 8016, 8020)
- #7217' **RACE SERIES®** Camchest Kit, 574" Gear Drive '07-'13 Includes '06 Dyna – (Includes #1008, 2065, 4050, 4090, 7062, 8015, 8016, 8020)
- #7237' **RACE SERIES®** Camchest Kit, 594" Gear Drive '07-'13 Includes '06 Dyna – (Includes #1304, 2065, 4050, 4090, 7062, 8015, 8016, 8020)
- #7211' **RACE SERIES®** Camchest Kit, 630" Gear Drive '07-'13 Includes '06 Dyna – (Includes #1011, 2066, 4050, 4070, 7062, 8015, 8016, 8020)

**Requires cam gear set, FEULING® part #'s 1095 or 1096 or see Andrews® or S&S® gear kits*

GEAR DRIVE CAMCHEST KITS + CAM GEAR SET (K)

These kits include FEULING® REAPER® Series gear drive camshafts and cam gear set. Cam gear sets includes the standard size inner and outer cam gears, key ways, crank & cam bolts & washers.

T/C '99-'06 EXCEPT '06 DYNA

- #7204K **HP+®** Complete Camchest Kit, 525" Gear Drive '99-'06 Except '06 Dyna - #'s: 1004, 1095, 2060, 4000, 4090, 7000, 8000, 8020
- #7232K **HP+®** Complete Camchest Kit, 543" Gear Drive '99-'06 Except '06 Dyna - #'s: 1021, 1095, 2060, 4000, 4090, 7000, 8000, 8020
- #7207K **HP+®** Complete Camchest Kit, 574" Gear Drive '99-'06 Except '06 Dyna - #'s: 1007, 1095, 2060, 4000, 4090, 7000, 8000, 8020
- #7216K **RACE SERIES®** Complete Camchest Kit, 574" Gear Drive '99-'06 Except '06 Dyna - #'s: 1007, 1095, 2060, 4050, 4090, 7050, 8000, 8020
- #7236K **RACE SERIES®** Complete Camchest Kit, 594" Gear Drive '99-'06 Except '06 Dyna - #'s: 1302, 1095, 2060, 4050, 4090, 7050, 8000, 8020
- #7210K **RACE SERIES®** Complete Camchest Kit, 630" Gear Drive '99-'06 Except '06 Dyna - #'s: 1010, 1095, 2061, 4050, 4070, 7050, 8000, 8020

T/C '07-'13 INCLUDES '06 DYNA

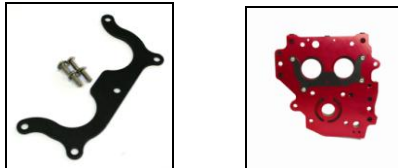
- #7205K **HP+®** Complete Camchest Kit, 525" Gear Drive '07-'13 Includes '06 Dyna - #'s: 1005, 1096, 2065, 4000, 4090, 7060, 8015, 8016, 8020
- #7233K **HP+®** Complete Camchest Kit, 543" Gear Drive '07-'13 Includes '06 Dyna - #'s: 1022, 1096, 2065, 4000, 4090, 7060, 8015, 8016, 8020
- #7208K **HP+®** Complete Camchest Kit, 574" Gear Drive '07-'13 Includes '06 Dyna - #'s: 1008, 1096, 2065, 4000, 4090, 7060, 8015, 8016, 8020
- #7217K **RACE SERIES®** Complete Camchest Kit, 574" Gear Drive '07-'13 & '06 Dyna - #'s: 1008, 1096, 2065, 4050, 4090, 7062, 8015, 8016, 8020
- #7237K **RACE SERIES®** Complete Camchest Kit, 594" Gear Drive '07-'13 & '06 Dyna - #'s: 1304, 1096, 2065, 4050, 4090, 7062, 8015, 8016, 8020
- #7211K **RACE SERIES®** Complete Camchest Kit, 630" Gear Drive '07-'13 & '06 Dyna - #'s: 1011, 1096, 2066, 4050, 4070, 7062, 8015, 8016, 8020

FEULING® CHAIN GUIDE TOWER & TENSIONER PINS



Part #7078 Adapts Feuling kit #'s 7070 & 7072 and camplate #8000 to chain drive systems. Fits '99-'06 Twin Cams, Except '06 Dyna

FEULING® BEARING RETAINER PLATE



Part # 8001 - Bearing retainer plate & hardware fits all Twin Cam model camplates '99 - '06, Except '06 Dyna, FEULING camplate #8000 Includes the bearing retainer plate.

FEULING® PLUNGER, SPRING, ROLL PIN KIT



FEULING® camplate pressure relief valve plunger, spring & roll pin. Increase the pressure relief valve pop off PSI with the Feuling spring, bench testing recommended with FEULING® camplate pressure test tool #9010 to ensure proper valve seal and valve operation.

Part # 8002 Relief valve plunger, spring & roll pin

Fits: '99 – '13 Twin Cam® Engine camplates 'All Models'

Part # 8004 Relief valve plunger 'only'

Fits: '99 – '13 Twin Cam® Engine camplates 'All Models'

FEULING® CAMPLATE CHAIN TENSIONER PINS



When changing Twin Cam chain drive camplates or replacing chain drive tensioners these FEULING® heat treated chrome moly pins ensure proper press fit.

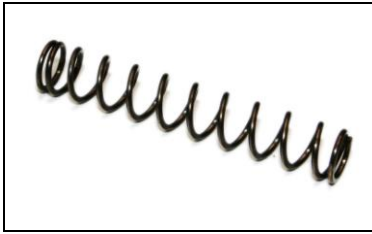
Part # 8003 Fits All: '99 – '06 (Except '06 Dyna) Twin Cam Chain Drive camplates

FEULING® BLOCK OFF PLATES



Part # 8016 - Block off plates for '07 –'13 Camplates when using gear drive camshafts, used to block off the oil holes for the hydraulic chain tensioner system. Fits all T/C model camplates '07-'12 Includes '06 Dyna. Factory, Screamin Eagle and aftermarket

FEULING® PRESSURE RELIEF SPRINGS



Increase the camplate pressure relief pop off pressure with a Feuling® spring. Our spring has the proper spring rate to control the pop off pressure and oil flow in the bypass port. Bench testing recommended with the Feuling® camplate pressure test tool (#9010) set your pop off pressure to your preference. For use with all Twin Cam® camplates

Part # 8018 Twin Cam® '99 – Present, Qty. 1

Part # 8019 Twin Cam® '99 – Present, Qty. 6

FEULING® CAMPLATE / OIL PUMP FASTENER KIT



- **Optional Feuling® camplate/oil pump fastener kit for Twin Cam® engines**
- **Quality 12-point heat treated 8740 chrome moly steel bolts with black oxide finish**
- **Feature precision rolled threads for optimum engagement, to prevent galling and promote more consistent torque loading.**
- **Wide underhead flange design provides even load distribution for optimum sealing of surfaces - preventing leaks.**
- **Quality engine builders demand quality fasteners! Secure your engine with complete confidence.**
- **Tensile strength rated @ 170,000 psi – Superior & Stronger than OEM & stronger than grade 8 fasteners**
- **Manufactured by ARP® to Feuling's® exact specifications**
- **Kits include moly assembly lubricant for installation**
- **Made in the U.S.A.**

Part # 8020 Twin Cam® Engines '99 - Present equipped with Feuling® Camplate & Oil Pump

HYDRAULIC CHAIN TENSIONER/CHAINS/SPROCKET KITS



PART # 8080



PART # 8081



PART # 8083

Part # 8080 - For use with conversion camshafts & '07-'13 oiling systems

- 1 -# 25675-06 Outer chain
- 1 -# 25683-06 Inner chain
- 1 -# 25673-06 Outer crank sprocket 17 tooth
- 1 -# 25728-06 Outer cam sprocket 34 tooth
- 1 -# 39968-06 Outer hydraulic tensioner unit
- 1 -# 39969-06 Inner hydraulic tensioner unit
- 1 -#8082 Bolt kit (2 - 1/4-20 x 3/4") (2 - 1/4-20 x 1-1/4")
- 1 - Spacer Kit Includes the following spacers
 - 1-# 25729-06 Thrust washer - front cam .100
 - 1- # 25731-06 Spacer (.110 for cam alignment; use as required)
 - 1 - #25734-06 Spacer (.120 for cam alignment; use as required)
 - 1 - #25736-06 Spacer (.130 for cam alignment; use as required)
 - 1 - #25737-06 Spacer (.140 for cam alignment; use as required)
 - 1 - #25738-06 Spacer (.150 for cam alignment; use as required)

Part #8083 - For use with conversion camshafts & '07-'13 oiling systems on '99-'01 engines W/ Magneti Marell ignition. Kit Includes the same parts as #8080 with exception of Andrews sprocket #216015 which replaces HD 34 tooth sprocket #25728-06. Includes the following

- 1 -# 25675-06 Outer chain
- 1 -# 25683-06 Inner chain
- 1 -# 25673-06 Outer crank sprocket 17 tooth
- 1- # 216015 Andrews Outer cam sprocket 34 tooth (Feuling #1094)
- 1 -# 39968-06 Outer hydraulic tensioner unit
- 1 -# 39969-06 Inner hydraulic tensioner unit
- 1 -#8082 Bolt kit (2 - 1/4-20 x 3/4") (2 - 1/4-20 x 1-1/4")
- 1 - Spacer Kit Includes the following spacers
 - 1-# 25729-06 Thrust washer - front cam .100
 - 1- # 25731-06 Spacer (.110 for cam alignment; use as required)
 - 1 - #25734-06 Spacer (.120 for cam alignment; use as required)
 - 1 - #25736-06 Spacer (.130 for cam alignment; use as required)
 - 1 - #25737-06 Spacer (.140 for cam alignment; use as required)
 - 1 - #25738-06 Spacer (.150 for cam alignment; use as required)

Feuling Part #8081 - For use with '99-'06 camshafts & conversion camplate which allows use of hydraulic tensioner system. Includes the following H-D components

- 1 -# 25675-06 Outer chain 'New style'
- 1- # 25607-99 Inner chain 'Old Style'
- 1 -# 25673-06 Outer crank sprocket 17 tooth
- 1- # 25728-06 Outer cam sprocket 34 tooth
- 1 -# 39968-06 Outer hydraulic tensioner unit
- 1 -# 39969-06 Inner hydraulic tensioner unit
- 1 -#25285-08 Cam spacer kit
- 1 -#8082 Bolt kit (2 - 1/4-20 x 3/4") (2 - 1/4-20 x 1-1/4")

FEULING® PRESSURE RELIEF SPRING/VALVE REMOVAL TOOL



This tool makes for easy removal and installation of the pressure relief spring, by-pass valve and roll pin in the Twin Cam camplate. The tool is used to hold the relief spring down and away from the roll pin. Fits all Twin Cam® engine camplates. Made in the U.S.A.

Part # 9000

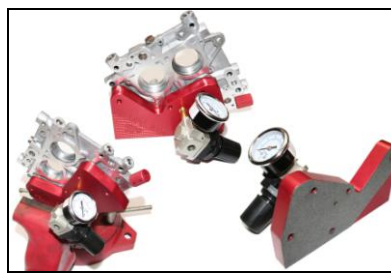
FEULING® PRESSURE RELIEF PSI TEST TOOL



Part #: 9000, 9010



Part #: 9010



Multi view #: 9000, 9010



Part # 9011

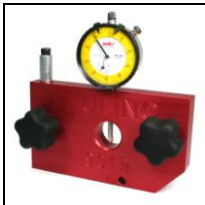
This pressure test tool is a must for any H-D® Twin Cam engine builder. Bench test each camplate before installation, cycle the pressure relief valve, testing operation and assuring the valve moves freely, seats and seals each time, any leakage at the relief valve will reduce oil pressure.

This tool allows the engine builder to know what PSI the relief valve opens; the spring tension can be adjusted to achieve the desired pop off PSI. Tool includes: air regulator, 0 – 100 psi pressure gauge, gasket & needed hardware, fits all Twin Cam engine camplates. Feuling® recommends the camplate valve be seated 0-30 psi with full pop off at 55-60 psi. Made in the U.S.A.

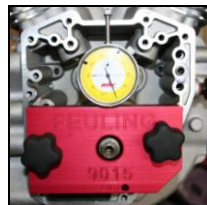
Part # 9010

Part # 9011 Replacement gasket for tool #9010

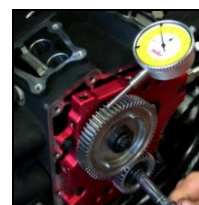
FEULING® CRANKSHAFT RUN OUT & GEAR DRIVE BACKLASH MEASURING TOOL



Part # 9015



Measuring Run Out



Measuring Back Lash



Part # 9016

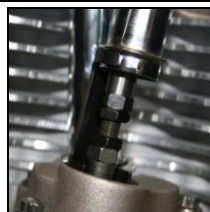
This tool simplifies and speeds the process of checking crankshaft run out on both Twin Cam® and EVO® model engines with the crankshaft installed. The tool mounts to the cam chest side of the engine case using the designated mounting holes of the tool combined with the handled thumb screws and the case cam cover bolt holes. The tool gives quick and accurate readings of the engine's crank pinion shaft run out and makes for a great display to show and explain to customers the condition of their crankshaft.

Quickly and accurately measures gear drive back lash on T/C engines, using the supplied spacer to bolt indicator to top right cam cover bolt hole.

Tool includes: tool plate, +/-0.001" dial indicator, thumb screws & hardware. MADE IN THE U.S.A.

FEULING® PART # 9015 **FITS: T/C® '99 – PRESENT, EVO® '84 – '99**
FEULING® PART # 9016 **Replacement universal 1" Dial indicator fits tool #9015. 0.001"**

PUSHROD TUBE HOLDER TOOL



Feuling® pushrod tube holder makes for easy adjustment of adjustable pushrods, holding pushrod tubes up and out of the way. Tool included in FAST INSTALL™ pushrod kits #4090 & #4091. Made in the U.S.A.

#9012 Quantity one

#9013 Quantity four

FEULING® OIL SQUIRT CAN



This tool easily pumps up hydraulic lifters, using thin 5 or 10 weight motor oil or automatic transmission fluid to pump oil into the lifter side feed hole to push all of the air out of the lifter internals. You will see air bubbles come out the top pushrod seat hole, It's best to work the oil back and forth from the side feed hole and back through the top pushrod seat hole to work all the air out. This will ensure the lifter is fully pumped up and will not run dry on initial start up.

Part # 9005 Works on all hydraulic lifters

FEULING® TIMKEN® OUTER CAM BEARINGS



TIMKEN



FEULING® supplies the best bearings available, our outer camshaft/camplate bearings are single-row deep groove bearings manufactured by Timken® Fafnir®. Timken® Fafnir® housed units are a necessity where tough applications and conditions apply.

Radial ball bearings consist of an inner and outer ring with a cage containing a complement of precision balls. The standard Conrad-type bearing has a deep-groove construction capable of handling radial and axial loads from either direction and are engineered for use in high-speed, high precision applications.

Timken® Fafnir® - Wherever there is motion, you'll find Timken® at work. Timken® is one of the world's leading producers of highly engineered antifriction bearings and related products and services. Timken® has operations in 30 countries on six continents, and their team of 21,000 employees is dedicated to improving our customers' performance in a variety of applications.

Part # 2075 Outer camshaft bearings for Twin Cam camplates, Timken® ball bearing style bearings qty. 2

Fits: T/C '99-'06 except '06 Dyna

FEULING® TORRINGTON® INNER CAM BEARINGS



**Koyo.
Torrington®**

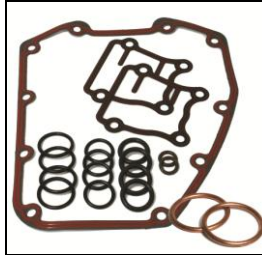
FEULING® supplies the best bearings available, our inner cam bearings are heavy duty full complement style designed to accept the higher loads and demands of performance engines. As of recent there has been a change in the labeling and packaging of our inner cam bearings due to the following acquisition.

Koyo Bearings USA LLC, was created following the acquisition of The Timken Company's Needle Roller Bearings business. The acquisition combines the strength, heritage and intellectual capital of Koyo® and Torrington® Needle Roller Bearings to create one of the world's largest needle roller bearing manufacturers.

**Part # 2076 Inner Cam Bearings - Full needle bearing, Torrington®, qty. 2,
Fits: T/C '99-'06 except '06 Dyna**

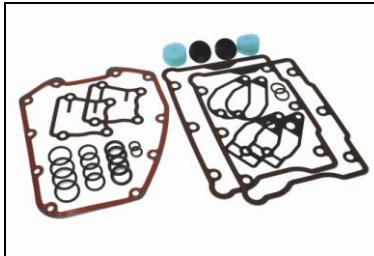
**Part # 2077 Inner Cam Bearings - Full needle bearing, Torrington®, qty. 2,
Fits: T/C '07-'12 Includes '06 Dyna**

GASKET KIT - QUICK CHANGE



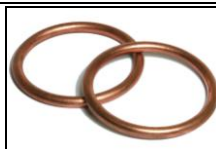
Quick cam change gasket kit – Includes cam cover, lifter block and exhaust gaskets, camplate and pushrod tube O-rings. Part #2050

GASKET KIT - QUICK CHANGE + TOP END



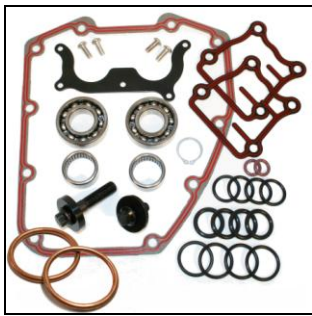
Quick change + Top End gasket kit – Includes rocker cover, cam cover, lifter block, exhaust and breather assembly gaskets. Camplate, pushrod tube, rocker assembly and factory oil pump O-rings. Breather umbrella valves and filter elements. Part #2055

EXHAUST GASKETS

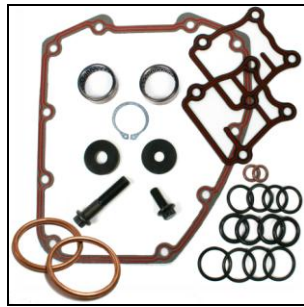


Exhaust gaskets, quantity 2, Manufactured by James Gaskets®. To get proper exhaust sealing requires proper torque of the exhaust nuts, FEULING® recommends replacing exhaust studs and nuts if necessary - See Feuling part #3048. Part #2051

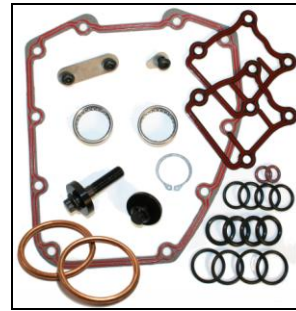
FEULING® CAMSHAFT INSTALLATION KITS



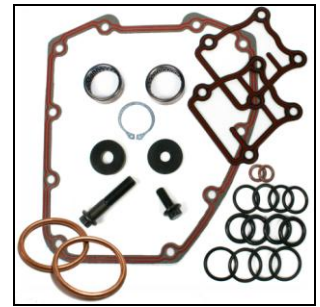
Part # 2060



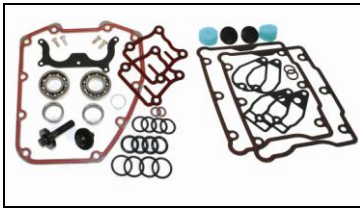
Part #2063



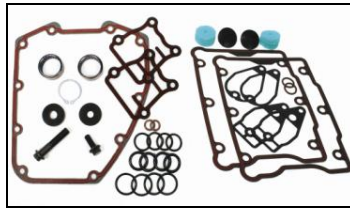
Part #2065



Part # 2070



Part # 2061



Part # 2064



Part # 2066



Part # 2071

FEULING® Quick Change Camshaft installation kits for Twin Cam® engines include Timken® camplate roller bearings, KOYO® Torrington® full roller needle inner cam bearings, 12 point ARP® camshaft and crankshaft bolts with hardened washers and camshaft retaining clip. Gaskets include cam cover, lifter blocks, exhaust, pushrod tube and camplate o-rings, ARP fastener moly paste, and Loctite thread compound.

FEULING® Quick Change + Top End kits also include rocker box cover and breather assembly gaskets, breather elements, breather umbrella valves and rocker support O-rings.

T/C '99-'06 EXCEPT '06 DYNA - GEAR DRIVE

Part # 2060 Quick Change: Gasket kit #2050, bearing retainer plate #8001, 2 camplate bearings #2075, 2 inner cam bearings #2076, bolt kit # 3042.

Part # 2061 Quick Change + Top End: Gasket kit #2055, exhaust gaskets #2051, bearing retainer plate #8001, 2 Camplate bearings #2075, 2 inner cam bearings #2076, bolt kit # 3042.

T/C '99-'06 EXCEPT '06 DYNA - CONVERSION CAMS

Part # 2063 Quick Change: Gasket kit #2050, 2 inner cam bearings #2076, bolt kit #3042

Part # 2064 Quick Change + Top End: Gasket kit #2055, exhaust gaskets #2051, 2 inner cam bearings #2076, bolt kit #3042

T/C '07-'13 INCLUDES '06 DYNA - GEAR DRIVE

Part # 2065 Quick Change: Gasket kit #2050, block off plate kit #8016, 2 inner Cam Bearings #2077, bolt kit #3042.

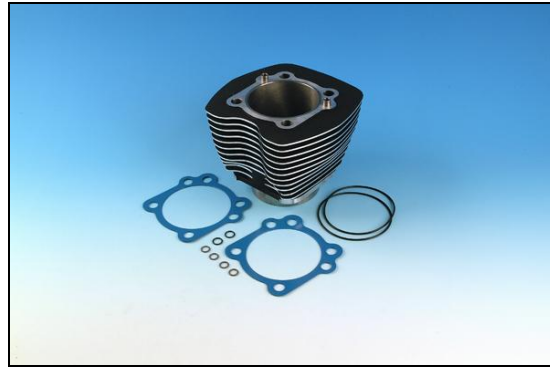
Part # 2066 Quick Change + Top End: Gasket kit # 2055, exhaust gaskets #2051, block off plate kit #8016, 2 inner cam bearings #2077, bolt kit #3042.

T/C '07-'13 INCLUDES '06 DYNA - CHAIN DRIVE

Part # 2070 Quick Change: Gasket kit #2050, 2 inner cam bearings #2077, bolt kit #3042

Part # 2071 Quick Change + Top End: Gasket kit #2055, exhaust gaskets #2051, 2 inner cam bearings #2077, bolt kit #304

JAMES GASKETS® HEAD GASKETS



TIC 88" & 96" - 3.750" Bore

#17047-98 *Graphite on steel core, fire-ring Armor, printed seal, 0.045" W/ final crush 0.042" (Factory thickness).
Kit Includes: 2 Head gaskets, 2 base gaskets & O-rings.*

#16775-99-x *Graphite on steel core, fire-ring Armor, printed seal, 0.036" W/ final crush 0.032"
Gaskets only. This part # is for a 5-pack, break up and sell individually*

TIC 95" & 103" - 3.875" Bore

#16787-99-MLS *Multi-Layered Steel Head gasket w/ Base O-rings, 0.050" W/ final crush 0.040".
Kit Includes: 2 Head gaskets, 2 base gaskets & O-rings.*

#16787-99 *Graphite on steel core, fire-ring armor, Teflon®-coated, 0.045" W/ final crush 0.042"(Factory thickness)
Kit Includes: 2 Head gaskets, 2 base gaskets & O-rings.*

#16787-99-X *Graphite on steel core, fire-ring armor, Teflon®-coated, 0.036" W/ final crush 0.032"
Kit Includes: 2 Head gaskets, 2 base gaskets & O-rings.*

TIC 110" - 4.00" Bore

#16105-07-X *Graphite on steel core, fire-ring Armor, printed seal, 0.045" W/ final crush 0.042".
Gaskets only, includes 2 head gaskets.*

FEULING® POINTS COVERS



Part # 9120



Part # 9121



Part # 9122



Part #9125



Part # 9126



Part # 9127

Dress your engine in style with a FEULING® points cover, machined from billet 6061 aluminum, bolts onto the factory cam cover, includes 5 stainless steel button head fasteners. Available in chrome or black powder coat with a contrast cut finish, made in the U.S.A.

Fit: '99-'13 Twin Cam Factory Cam Covers

CHROME

- Part # 9120** FEULING® Gear Logo
- Part # 9121** FEULING® Logo
- Part # 9122** FEULING® Tank Logo

BLACK WITH CONTRAST CUT

- Part # 9125** FEULING® Gear Logo
- Part # 9126** FEULING® Logo
- Part # 9127** FEULING® Tank Logo

FEULING® 110" CYLINDER HEAD PLATES



Replaces the factory Screamin' Eagle® 110" cylinder heads plates, bolts into the factory cutout on the special 110" cylinder heads.

Part # 9100 FEULING® 110" cylinder head plates replace the factory SE® plates, Qty. 2, Made in the U.S.A.

K&N® OIL FILTERS



K&N® spin on Oil filters - quality filters you can count on! Designed to exceed the needs of today's performance engines providing outstanding filtration without sacrificing oil flow. K&N® oil filters include the 'Must Have' anti drain back valve for Twin Cam engines, as well as a pressure by-pass valve and a 11/16" nut for quick & easy service. These stock replacement filters exceed OEM specifications, available in chrome or black finish

Part # 2010 – (K&N-171C) Chrome '99 – Present Twin Cam®

Part # 2012 – (K&N-171B) Black '99 – Present Twin Cam®

Part # 2013 – (K&N-170C) Chrome

'80 – '98 FLT, FLHT, FLHR,

'82 – '94 FXR

'84 – '98 Softail, FXRP, FLHTP

'84 – Present Sportsters

Part # 2015 – (K&N-170B) Black

'80 – '98 FLT, FLHT, FLHR,

'82 – '94 FXR

'84 – '98 Softail, FXRP, FLHTP

'84 – Present Sportsters

Part # 2016 – (K&N-173C) Chrome, '91 – '98 Dyna

Part # 2018 – (K&N-172C) Chrome

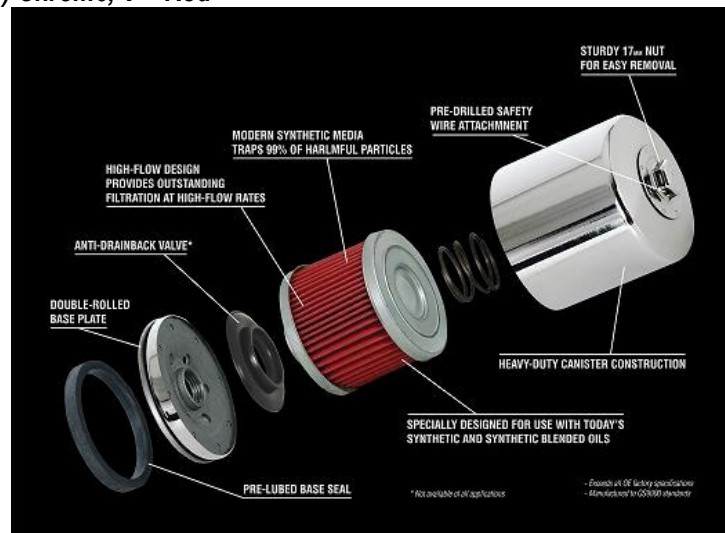
'82 – '84 FLH

'80 Classics

'82 – '84 FXWG, FXSB, FXEF

'80 – '84 XL, XLS, XLX, Sportsters

Part # 2019 - (K&N-174C) Chrome, V – Rod



CHAMPION SPARK PLUGS



Copper Plus conventional spark plug with Nickel alloy copper core center electrode which increases conductivity and allows for accurate control of heat range, optimizing performance, and longevity of the spark plug. OE replacement.

- Patented SAC-9 semi-conductor resistor for maximum EMI and RFI suppression
- Patented Ultraseal™ coated shell for rust prevention

RA8HC - Plug Specifications

- Thread Size: 12mm
- Hex Size: 5/8" (16mm)
- Reach: 19mm (3/4")
- Seat Type: Gasket
- Gap: .024" (0.61mm)
- Heat Range: 8
- Terminal Type: Removable Nut
- Resistor: Yes
- Brand: Champion

RN12YC-Plug Specifications

- Thread Size: 14mm
- Hex Size: 13/16" (20.6mm)
- Reach: 19mm (3/4")
- Seat Type: Gasket
- Heat Range: 12
- Resistor: Yes
- Brand: Champion

Center Electrode

Type: Standard
Material: Nickel
Projection: Projected Core Nose

Ground Electrode

Type: J-Gap
Material: Nickel
Quantity: 1

Part # **RA8HC** (#810)
Part # **RN12YC** (#404)

Fits: T/C '99-'13 + XL '86-'13
Fits: EVO BIG TWIN '84-'00

BOSCH YTTRIUM SPARK PLUG



- Dual ground electrode
- Heavy Duty Yttrium-Enhanced Center Electrode with Copper Core Provides Superior Reliability and Durability
- Tapered Cut Nickel Chromium Ground Electrode Assists in Cold Weather Starts and Provides Increased Ignitability
- Nickel-Plated Rolled Threads Provide Anti-Seize and Corrosion Protection
- Metal Glass Fused Resistor Gives Maximum Interference Suppression
- Angular, 5-Rib Insulator Design Prevents Flashover

Plug Specifications

- Thread Size: 12mm
- Hex Size: 5/8" (16mm)
- Reach: 19mm (3/4")
- Seat Type: Gasket
- Gap: .032" (0.8mm)
- Heat Range: 6
- Terminal Type: Solid
- Resistor: Yes
- Brand: Bosch

Center Electrode

Type: Standard
Material: Yttrium Enhanced
Projection: Projected

Ground Electrode

Type: Taper Cut
Material: Nickel
Quantity: 2

Part # **YR6LDE** Fits: T/C '99-'13 + XL '86-'13

NGK IRIIDIUM SPARK PLUG



Designed specifically for the performance enthusiast. Iridium IX® offers extreme ignitability, improved throttle response and superior anti fouling.

- Fine Iridium tip ensures high durability and a consistently stable spark
- Iridium alloy has extremely high melting point, perfect for today's high-tech, high-performance engines
- Trivalent Metal Plating - superior anti-corrosion and anti-seizing properties
- Outstanding acceleration, high fuel efficiency and durability
- Ultimate design, technology and performance

DCPR7EIX Plug Specifications

Thread Size: 12mm
Hex Size: 5/8" (16mm)
Reach: 19mm (3/4")
Seat Type: Gasket
Gap: .032" (0.8mm)
Heat Range: 7
Terminal Type: Solid
Resistor: Yes
Thread Pitch: 1.25mm
Brand: NGK

DCPR8EIX Plug Specifications

Thread Size: 12mm
Hex Size: 5/8" (16mm)
Reach: 19mm (3/4")
Seat Type: Gasket
Gap: .032" (0.8mm)
Heat Range: 8
Terminal Type: Removable Nut
Resistor: Yes
Thread Pitch: 1.25mm
Brand: NGK

BPR5EIX-11 Plug Specifications

Thread Size: 14mm
Hex Size: 13/16" (20.6mm)
Reach: 19mm (3/4")
Seat Type: Gasket
Gap: .044" (1.1mm)
Heat Range: 5
Terminal Type: Solid
Resistor: Yes
Thread Pitch: 1.25mm
Brand: NGK

Center Electrode

Type: Fine Wire
Material: Iridium
Size: 0.6mm
Projection: Projected

Ground Electrode

Type: Taper Cut
Material: Nickel
Quantity: 1

Part # DCPR7EIX (#6046) Fits: T/C '99-'13 + XL '86-'13

Part # DCPR8EIX (#6546) Fits: V-Rod '06-'13

Part # BPR5EIX-11 (#2115) Fits: EVO BIG TWIN '84-'00

DENSO SINGLE® IRIIDIUM SPARK PLUGS



Harley® Screamin' Eagle® OE factory spark plugs

- 0.4mm Iridium Tipped Laser Welded Fine Wire Center Electrode
- Tapered Cut U-Groove Ground Electrode Increases Ignitability and Decreases Quenching
- Machine Rolled Threads Prevent Seizing or Cross Threading During Installation and Removal
- 100% Pre-Fired to Assure the Highest Quality Possible
- Purified Alumina Powder Insulator Provides Exceptional Strength and Thermal Conductivity
- Five Rib Insulator Prevents Flashover
- Copper-Glass Seal Bonds Center Electrode and Insulator for a Gas-Tight Seal

IXU22 Plug Specifications

Thread Size: 12mm
Hex Size: 5/8" (16mm)
Reach: 19mm (3/4")
Seat Type: Gasket
Gap: .036" (0.9mm)
Heat Range: 22
Terminal Type: Removable Nut
Resistor: Yes

Part # IXU22 (#5308) (HD SE #32192-10)

Part # IW16 (#5305) (HD SE #32189-10)

Part # IXU24 (#5309) (HD SE #32186-10)

IW16 Plug Specifications

Thread Size: 14mm
Hex Size: 13/16" (20.6mm)
Reach: 19mm (3/4")
Seat Type: Gasket
Gap: .044" (1.1mm)
Heat Range: 16
Terminal Type: Removable Nut
Resistor: Yes

Fits: T/C '99-'13 + XL '86-'13

Fits: EVO BIG TWIN '84-'00, '75-'81 Shovelhead

Fits: V-Rod '06-'13

Center Electrode

Type: Fine Wire
Material: Iridium
Size: 0.4mm

Ground Electrode

Type: Taper Cut
material: Nickel
Quantity: 1

DENSO NICKEL SPARK PLUGS



Harley® OEM factory spark plugs

- U-Groove Ground Electrode Promotes Ignitability and Decreases Quenching
- Fully Projected Insulator Reduces Carbon Fouling
- Machine Rolled Threads Prevent Seizing or Cross Threading During Installation and Removal
- 100% Pre-Fired to Assure the Highest Quality Possible
- Purified Alumina Powder Insulator Provides Exceptional Strength and Thermal Conductivity
- Five Rib Insulator Prevents Flashover
- Copper-Glass Seal Bonds Center Electrode and Insulator for a Gas-Tight Seal

XU22EPR-U Plug Specifications

Thread Size: 12mm
Hex Size: 5/8" (16mm)
Reach: 19mm (3/4")
Seat Type: Gasket
Gap: .028" (0.7mm)
Heat Range: 22
Terminal Type: Solid
Resistor: Yes

Part # XU22EPR-U (#3179) (HD#32362-04)

Part # W16EPR-U10 (#3022)

W16EPR-U10 Plug Specifications

Thread Size: 14mm
Hex Size: 13/16" (20.6mm)
Reach: 19mm (3/4")
Seat Type: Gasket
Gap: .040" (1.0mm)
Heat Range: 16
Terminal Type: Solid
Resistor: Yes

Fits: T/C '99-'13 + XL '86-'13

Fits: EVO BIG TWIN '84-'00, '75-'81 Shovelhead

Center Electrode

Type: Standard
Material: Nickel
Projection: projected

Ground Electrode

Type: U-Groove
Material: Nickel
Quantity: 1

FEULING® PROMO ITEMS



**Part # 1037
LED Flashlight**



**Part # 1038
Click Bic Ink Pen**



**Part # 1039
Note Pad**



**Part # 1034
Magnet**

FEULING® HATS



Part #: 9080, 9081, 9082



Part #: 9085, 9086, 9087



Part #: 9090, 9091, 9092

Flex Fit hats with Feuling® gear logo on front panel

Available Styles:

Standard – Brushed twill 6 panel flex fit

Trucker – Brushed twill front panels + visor, stretchable mesh side & back, flex fit

Available Sizes:

Standard – S/M 6 ¾” – 7 ½”

L/XL 7 1/8” – 7 5/8”

Trucker – Stretchable 6 7/8” – 7 ½”

BLACK

#9085 Trucker

#9086 S/M

#9087 L/XL

BROWN

#9080 Trucker

#9081 S/M

#9082 L/XL

RED

#9090 Trucker

#9091 S/M

#9092 L/XL

Part # 1050 Logo Banner 3'

FEULING® CATALOG



*Part # 1035 2012 Catalog
Part # 1036 2012 Tech brochure*

FEULING® STICKERS



*Part # 1025 Logo Sticker
5" x 1-5/8"*



*Part # 1027 Beehive® Valvespring
Logo Sticker 5"*



*Part # 1026 Reaper® Camshaft
Logo Sticker 5"*



*Part # 1028 Bulletproof™
Logo Sticker 3"*



*Part # 1029 HP+®
Logo Sticker 3"*



*Part # 1030 RACE SERIES
Logo Sticker 3"*



*Part # 1031 Fast Install
Logo Sticker 3"*

FEULING® OIL PUMPCAMPLATE DISPLAY



Part # 1060

Hand Crank Display – FEULING® high volume high flow Twin Cam oil pump/camplate vs. stock oil pump/camplate. Turning the knobs demonstrates to the customer the friction difference between the FEULING® Oil Pump & the stock HD oil pump. Display is powder coated black with vinyl stickers and includes brochure and sticker holders stocked with 50 flyers and 50 stickers. Measures 22” x 13” x 9”

FEULING® LIFTER & PUSHROD DISPLAY



Part # 1061

FEULING® Lifter and Pushrod display - this counter display shows a set of the FEULING® HP+® adjustable pushrods and a selection of hydraulic roller lifters – HP+ Twin Cam, Sportster & EVO along with the Race Series Twin Cam lifter. Display is powder coated black with vinyl stickers and includes brochure and sticker holders stocked with 50 flyers and 50 stickers. Measures 22” x 13” x 9”

FEULING® OIL COOLER DISPLAY



Part # 1062



Part # 1063

FEULING® Oil Cooler display, show your customers the high quality and awesome appearance of the FEULING® oil cooler and filtration system. Displays are available in the chrome kit or black chrome kit. Display is powder coated black with vinyl stickers and includes brochure and sticker holders stocked with 50 flyers and 50 stickers. Measures 22” x 13” x 9”

FEULING® REAPER® CAMSHAFT & BEEHIVE® VALVE-SPRING DISPLAY



**Measures 22” x 13” x 9”
Part # 1064 FEULING® Camshaft & Valve Spring Display**

CYLINDER HEAD TOOLS

Valve Spring Seat Cutters & Cutter Pilots



Pilot



Seat Cutter

Machine valve spring seats for proper installed spring height and spring cup fitment. Cutter bodies and pilots are interchangeable, Hardened pilots fit all 3/8" and 1/2" hand drills.

		<u>I.D. x O.D.</u>
Part # 9020	Cutter	0.625" x 1.570"
Part # 9021	Cutter	0.625" x 1.635"
Part # 9022	Cutter	0.625" x 1.750"
Part # 9025	Pilot	5/16" – 8mm EVO & T/C up to 2004, EVO Sportster '86-up
Part # 9026	Pilot	7mm T/C 2005 and newer
Part # 9027	Pilot	3/8" Pan & Shovel Head 1948 – 1984

VALVE GUIDE CUTTER & PILOTS



Part # 9035 Cuts valve guide height, used to increase clearance between bottom of valve spring retainer and top of valve guide seal, uses pilots # 9036, 9037

Part # 9035	Valve guide height cutter
Part # 9036	Pilot for valve guide cutter, 5/16" - 8mm valves
Part # 9037	Pilot for valve guide cutter, 7mm valves

VALVE SPRING HEIGHT GAUGE



AVOID COIL BIND!

Measure installed valve spring height. Place tool on cylinder head in place of valve spring with spring cup and retainer in place, twist measuring tool to get accurate spring height measurement.

Part # 9030



TWIN CAM® ENGINE TECH MEMO

The TC-88 and TC-88B engines have a small, die cast, crank-speed gerotor style oil pump that utilizes a spring washer to preload the pump gears against the cam support plate and pump housing. The side loading from the spring washer can cause excessive friction and premature wear.

*The TC-88 engine uses a dry-sump lubrication system. To perform properly, the dry sump system requires a properly sized, **BALANCED SYSTEM** including a scavenge pump that is capable of removing all residual oil from the crankcase at all engine speeds and conditions. Failure of the scavenge pump to perform to these requirements causes "WET SUMPING." Instead of returning to the oil tank, the oil builds up in the crankcase and cam chest causing excessive friction/power loss and oil aeration. This can result in oil being forced out the breather, air cleaner contamination, oil leaks, loss of oil supply, lifter clatter, component wear and potential engine failure.*

TC-88 engines have piston cooling jets that are designed to squirt oil on the under side of the pistons. These jets have a check valve that opens at approximately 25-28 PSI oil pressure. Without adequate pressure pump volume this pressure regulated oil flow to the jets can short circuit critical oil flow from the lifters and top end.

Twin Cam valve springs need oil for cooling. Inadequate oil flow can cause excessive valve spring temperature causing loss of spring tension resulting in noisy valve train separation and potential engine failure. Inadequate oil supply to the rocker boxes can cause excessive rocker arm bushing wear and component failure.

The Twin Cam® crankshaft has machined "paddles" on the periphery of the left flywheel to provide a trigger for the crank position sensor (CPS). These paddles can whip up unscavenged oil in the crankcase, turning the oil into aerated frothing "peanut butter" that pushes its way up into the rocker boxes-out the breather, into the air cleaner and beyond!

*Feuling® Oil Pump Corporation has high efficiency, billet, bolt-in replacement oil pumps for T/C® engines that provide increased supply and scavenge volume over the stock oil pump. Large diameter gerotors, aerospace materials and tolerances create high efficiency pumps without the need for a high friction spring washer. The Feuling® Lifters, camplates, and pushrods are designed to optimize the Feuling® oil pumps creating a **BALANCED SYSTEM** resulting in cooler engine and oil temperatures, more HP and TQ. to the rear wheels.*

Feuling's® filter cooler is the ultimate in oil cooling and filtration technology. Combining an oil cooler and oil filter in one, used in conjunction with the stock spin on oil filter. Creating cleaner cooler oil!

The dyno-developed and track tested combination of Feuling® components will allow the Twin Cam® engine to provide maximum power, reliability and longevity.

*The Feuling® products are **THE** solution!*



FEULING® V-TWIN TROUBLE SHOOTING GUIDE

Having oiling, noise or sumping issues with your Twin Cam engine: please review the following trouble shooting guide that Feuling® has compiled over the years to help assist you.

*** ALWAYS CHECK YOUR OIL PRESSURE - WHAT IS YOUR OIL PRESSURE COLD? HOT?**

LOW OIL PRESSURE

1. Pressure gauge not reading properly – double check with another mechanical PSI gauge
2. Pressure relief valve in camplate leaking, sticking open or not seating properly – see Feuling camplate PSI test tool Part #9010
3. Pinched Oil Pump O-ring(s)
4. Camplate scored at oil pump mounting surface, pressure gears and or housing scored from debris running through oil pump
5. Camplate top plug not sealing, camplate leaking at oil passages – warped camplate
6. Excessive crankshaft pinion shaft run out causing oil cavitation
7. Intermittent oil psi loss on bagger/FL models during hard acceleration - oil tank baffle shifted & blocking oil pick up hole
8. Mis alignment of oil pump – center camplate to pinion shaft then oil pump to pinion shaft by rotating engine over while tightening bolts
9. Leaky piston cooling jets
10. Leaky camplate hydraulic tensioners ('07-'13 Including '06 Dyna models) when tightening outer tensioner push tensioner toward chain

NO OIL PRESSURE

1. Pressure relief valve stuck open in camplate – see Feuling camplate PSI test tool Part #9010
2. Missing plug in camplate face (boss vs. no boss)
3. Air lock in oiling system – fill oil filter full of oil - If this is the initial engine start up
4. Broken oil pump gears - gears & housings not lubricated properly during install, debris running through engine & or excessive run out in pinion shaft
5. Broken piston cooling jets
6. Stock oil pump installed on Feuling camplate

WET SUMPING / BLOW - BY

1. To verify if engine is wet sumping, run engine to operating temperature then shut down and pull the allen head plug from bottom of engine case. Measure oil and if more than 5oz. drains from the sump then there is a wet sumping issue.
2. Oil level too high - run oil level no more than 3/4 - 7/8 full cold, check oil level per owner's manual
3. Sub seal of oil pump mis aligned with the scavenge port hole of the engine case.
4. Piston rings not seated, causing oiling system cavitations, run a cylinder leak down test - Vent oil tank - Feuling's oil tank breather kits
5. Scavenge gears and or housing scored from debris running through oil pump causing out of tolerance scavenge side of oil pump
6. Excessive run out in pinion shaft - causing oil pump/system cavitation
7. Pinched Oil Pump O-ring(s)
8. FL/Baggers – 6 speed trans with dipstick in rear of trans can allow more oil to be added to oil tank and not show on dipstick
9. Excessive RPM on rev limiter, de-seated rings
10. Flapper valves in breathers stuck
11. Return oil passages plugged, pick-up hole in crankcase plugged

DIPSTICK BLOW OUT

1. Excessive cylinder leak down – run a cylinder leak down test
2. Oil level too high, run oil level 3/4 - 7/8 full cold
3. Rocker housing gaskets are wrong or installed improperly
4. Spark knock, piston detonation, rings not seated or coming un-seated under hard acceleration
5. Excessive RPM on rev limiter, de-seating rings
6. Vent oil tank – see Feuling oil tank breather kits

NOISY VALVE-TRAIN

1. Lifter to lifter bore clearance too large, Feuling recommends a clearance of 0.001” - 0.0015” for proper lifter performance
2. Pushrods flexing and hitting pushrod tubes - look for a shiny ring witness mark around pushrod normally seen towards the cylinder head.
3. Low oil pressure
4. Rocker arms/bushings out of tolerance
5. Valve spring to camshaft combination creating valve-train separation – See Feuling Beehive valve springs
6. Leaky/broken piston cooling jets
7. Clearance for roller rocker arms on underside of rocker box cover
8. Steep ramped camshafts, valves closing so fast the valves bounce off valve seats – See Feuling® Beehive® valve springs
9. Pushrod center oil hole plugged