



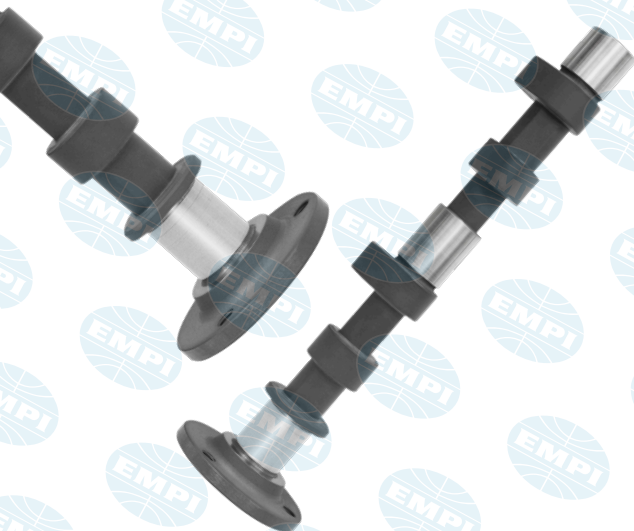
WARRANTY INFORMATION

EMPI Inc. warranties all new camshafts against excessive cam lobe wear for a period of (24) months from date of purchase to the original purchaser. This warranty covers cam lobe wear only and does not cover broken cams, lifters, tappets, rocker arms, or any other engine components.

EMPI camshafts are considered high-performance parts and as such this warranty does not cover abnormal wear due to insufficient lubrication, excessive engine heat, valve spring coil bind, and cylinder head or guide interference. Under no circumstances shall EMPI Inc. be liable for labor or service charges for the replacement, removal, installation or shipping of camshafts or related parts.

Should a warranty claim arise return it to EMPI with an RGA# and proof of purchase. EMPI will inspect the camshaft and replace it (at EMPI's discretion), under the terms of the warranty. EMPI warranties are void where the EMPI product has been physically altered and / or used or installed improperly. Parts used for racing or in motorsports competition are not covered.

PERFORMANCE CAMS ARE NOT LEGAL FOR SALE ON POLLUTION CONTROLLED VEHICLES



**PRECISION GROUND
CAMSHAFT
PERFORMANCE CAM**

THANK YOU

Please read the warranty and installation information on your enclosed timing card. If you have any questions, do not hesitate to contact us. Thank you for choosing EMPI Racing Cams and Quality Valve Train Components.

TESTED AND PROVEN ON THE INCH PITCHER

RACING



MUSCLE FOR THE BEETLE & WINNER FROM EMPI



EMPI INC
301 E. Orangethorpe Ave. Anaheim, CA 92801
(714) 446-9606
www.empius.com

PERFORMANCE CAM

PLEASE READ!

When assembling a high-performance engine, the use of aftermarket components - such as cams, pistons, heads, valves, valve guides, and springs - requires caution and clearance checks during assembly. Since these components were not designed and tested by the engine manufacturer, it is your responsibility to ensure that these high-performance parts will work together without interference! Some points to check are listed below.

CLEARANCE AND MEASUREMENTS

- 1) Check lifter clearance between the peak of the cam lobe and face of the lifter. Lifter bores in the case may need to be chamfered or cut down for min space clearance of .040".
- 2) Custom length pushrods must be properly measured and cut to length for proper valve train geometry between the rocker and valve stem.
- 3) Some hi-ratio rocker arms require the use of lash caps.
- 4) Pushrods should not rub the inside of the pushrod tube.
- 5) Rocker arms must clear head studs.
- 6) At maximum valve lift check valve spring coil bind and clearance between spring retainer to valve guide, minimum .090".
- 7) Check piston to valve clearance throughout lift. A minimum of .100" clearance needed or valve pockets should be cut in the pistons. This measurement is vital with high compression, high lift cams, and oversized valves.

MUST USE NEW LIFTERS WITH A NEW CAMSHAFT!

Be certain that you are using the proper gear flange bolts provided and torque to 18 foot pounds. The use of liquid thread locker is recommended.

Use a premium grade petroleum-based racing motor oil such as PennGrade 1® Break-In Oil SAE 30. We do not recommend any type of synthetic oil. Camshafts require special break-in procedures. (See special break in instructions)

LIABILITY RELEASE

The purchaser releases EMPI Inc. from all liabilities pertaining to the installation and use of purchased parts. Purchaser recognizes that any alteration and / or modifications to the vehicle may increase the risk of injury or accident, and may also render the vehicle illegal for use on public roads.

VOLKSWAGEN TYPE 1

ENGINE TYPE

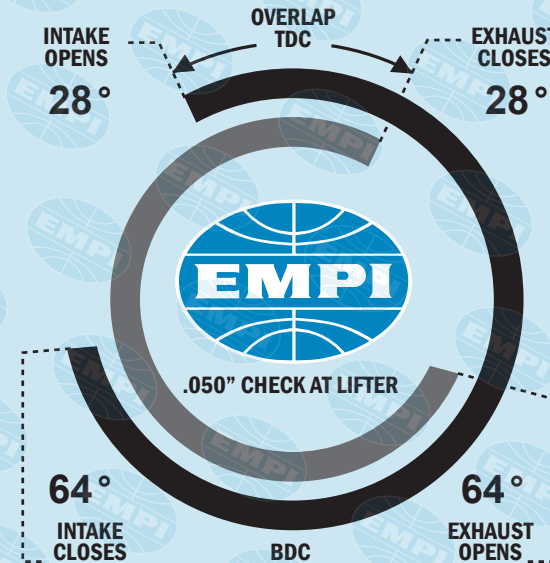
77-8603-0

PART NUMBER

GTV-86C

GRIND NUMBER

	Valve Lift @ 1.4:1	Running Duration
INTAKE	.546"	310°
EXHAUST	.546"	310°



	Gross Cam Lift	Duration @.050
INTAKE	.390"	272°
EXHAUST	.390"	272°
LOBE CENTERS	108°	

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CAMSHAFT INSTALLATION AND BREAK-IN INSTRUCTIONS

- Install the cam gear with the timing mark in line with the bolt at the top of the oil pump drive slot. Be certain that you are using the proper gear flange bolts provided and torque to 18 foot pounds. The use of liquid thread locker is recommended.
- Make sure the cam gear bolts do not hit the back of your oil pump.
- Check all clearance measurements.
- Apply assembly lube to the lifters and cam lobes.
- Don't forget the cam plug!
- When adjusting valve lash, set to .006" with aluminum pushrods. If you are using chromoly pushrods set valve last at .000" - .001" or at the point the pushrod spins freely with no space at the rocker.
- At first start-up of the engine, keep the RPMs between 1500 and 1800 for 5 to 10 minutes. At this point, Do not let the engine idle or over rev.
- Shut the engine down for a short rest and then repeat running the engine between 1500 and 1800 RPMs for 5 to 10 minutes.
- Let the engine idle and fine tune the ignition timing and carburetor adjustments.
- After the engine has cooled down completely, check and re-adjust valve lash.
- Change the break-in oil after 500 - 1000 miles with standard daily use oil and clean or replace your oil filter.



PRECISION GROUND
CAMSHAFT