

Cam timing notes

Note that cam lift numbers are sometimes specified at the valve, and sometimes at the lifter (follower/tappet), which will be the same as the lobe height. Triumph rockers generally (as far as I know) have around a 1:1.1 ratio. This means that the valve lift does not equal the lobe height - lift at the valve will be higher than the lift at the lifter.

Cam timing is sometimes quoted at 0.020" of valve clearance, sometimes with 0.040" of valve clearance, and sometimes at 0.050". 0.020 is the older way, but 0.040 is used because that's almost exactly 1mm, and modern (IE metric) cam timings are specified with 1mm of clearance.

Triumph part number conversion:

Factory cam timing numbers

These numbers are from various shop manuals (Triumph, Haynes, Clymer, etc), which most likely originally come from the Triumph manuals. I think the lift numbers quoted are measured at the tappet (IE the cam lobe height), but it's not explicitly stated.

	intake		exhaust		lift		measured clearance	tappet radius
	open	closes	opens	closes	intake	exhaust		
	btdc	abdc	bbdc	atdc				
650cc	34	55	55	34			0.002	
6T DU.101 on	25	52	60	17	0.305	0.305	0.020	
TR6 DU.101 to DU.44393	34	55	48	27	0.314	0.296	0.020	
T120 DU.101 to DU.24874	34	55	48	27	0.314	0.296	0.020	0.750 (STD)
T120 DU.24875 to DU.44393	34	55	55	34	0.314	0.314	0.020	
T100S	34	55	48	27		0.296	0.020	0.750 (STD)
T100T	40	52	61	31	0.314	0.314	0.020	1.125 (R)
5TA to H.49833	34	44	48	27			0.020	
TR5T	34	55	48	27			0.020	0.750 (STD)
T100R	40	52	61	31			0.020	1.125 (R)
Triumph 750 short rod	26.5	69.5	61.5	35.5	0.350	0.350	0.020	1.125 ? What cam ?
Triumph 750 intake (T-75)	40	74			0.345		0.020	1.125 Matches M20416 T140E intake
Jomo 15	43	74	74	43	0.355	0.355	0.020	1.125 (R)

Note: Megacycle says "When 'R' followers are specified, you can also use STD, which will produce more low RPM power".

Notes on the legendary Triumph E3134 "Q" cam

The **E3134** cam wasn't (always) a specific cam, it was a cam profile that was used on many cams for many years. There may have been a cam with the part number E3134, but there were many other cams that used the E3134 profile.

To make things more confusing, there were two E3134 cams - Tricor and Factory. The Tricor profile (34/55 55/34) is the most common.

The E3134 may have been the hot thing many years ago, but it's no longer considered a high performance profile.

This is the E3134 profile:

	intake		exhaust		lift		measured clearance	tappet radius
	open btdc	closes abdc	opens bbdc	closes atdc	intake	exhaust		
Tricor "Q" E3134	34	55	55	34	0.314	0.314	0.020	1.125 (R)
Factory "Q" E3134	34	58	58	34	0.310	0.310	0.020	1.124 (R)

Group 1 - High Performance - E3134 "Q" Cam Form

Intake opens: 34 BTDC - Intake closes: 55 ABDC
Exhaust opens: 55 BBDC - Exhaust closes: 34 ATDC

Part #	Code	Casting #	Intake/Exhaust
E3134		E3134	
E4819	X	E3134	Inlet
E5047	YCP	E5048	Exhaust
E5162	XCP	E4602	Inlet
E10040	XN	E10040	Inlet
E10041	YN	E10041	Exhaust
E4038	SG	E3838	Inlet
E4039		E3838	Exhaust
E4678		E4679	Inlet
E5044	YCP	E5045	Exhaust
E5047	Y*		Exhaust
E5163	CP	E4679	Inlet
E6965	Y	E6642	Exhaust
E10043	N	E10043	Inlet
E10047		E10050	Exhaust
E11063	N	71-0040	Inlet
E11064	N	71-0043	Inlet

E9983	YN	70-9986	Exhaust
E9984	YN	70-9987	Exhaust
E9989	YN	70-9990	Exhaust

Note: 1. Running clearance .002 in. intake and .004" exhaust.
 2. Take readings at .020 in. follower lift with "std" radius (3/4 in.) followers
 3. Lobe Center 100.5°
 4. Duration 269 °
 5. Lift .314 in.

Group 2 - High speed touring - E3325 Cam Form
 IO 27 BTDC - IC 48 ABDC - EO 48 - BBDC - EC 27 ATDC Inlet or Exhaust

Part #	Code	Casting #	Intake/Exhaust
E3325		E3325	
E4818	X	E4997	Inlet
E4848	Y	E4560	Exhaust
E4855	Y	E4561	Exhaust
E4931			Inlet
E4022	SG	E3838	Inlet
E4023		E4679	Exhaust
E4786	Y	E4679	Exhaust
E10046	YN	E10049	Exhaust

Note: 1. Running clearance .002 in. intake and .004" exhaust.
 2. Take readings at .020" follower lift with "std" radius (3/4 in.) followers
 3. Lobe center 100.5°
 4. duration 255°
 5. Lift .296 in.

Group 3 - Ramp cam form (standard) - Quieting ramps

Intake opens: 26.5 BTDC - Intake closes: 69.5 ABDC
 Exhaust opens: 61.5 BBDC - Exhaust closes: 35.5 ATDC

Part #	Code	Casting #	Intake/Exhaust
E3275		E3265	
E3838	SG	E3838	Inlet
E3839		E3838	Exhaust
E5341	Y	E5342	Exhaust

Note: 1. Running clearance .010 in Intake and Exhaust.

2. Take readings at .020" follower lift using standard followers.

Group 4 - Modified ramp form (racing)

Thruyton Bonneville

Part #	Code	Casting #	Timing
E4220		E4220	Valve lift at TDC with nil clearance 0.195/0.175" Intake or Exhaust
E6267		E4220	Valve lift at TDC with nil clearance 0.205/0.215" Intake
E6147	Y	E6146	Valve lift at TDC with nil clearance 0.165/0.175" Exhaust

Note: 1. Running clearance E4220 .008 in. E6267 & E6147 .013 in.
2. Valve timing taken in inches of VALVE lift at T.D.C. with valves set at nil clearance for checking.
3. E6267 and E6147 must be used with 3" radius cam followers and special guide blocks.

Key to Codes: X = Breather Y = Contact breaker
 CP = Copper plated SG = Spiral gear (distributor drive)
 n = nitrited

"specs for Stock Triumph 750 short rod:"
Intake: 26.5* - 69.5* 111.5* lobe center
Exhaust: 61.5* - 35.5* 103.0* lobe center
measured @ .020" tappet lift
running clearance .010" intake and exhaust
valve lift: .350" 278* duration

Random cam numbers I've run across:

M20416 - 71-288? casting - 750 intake
M20360 - 750 exhaust
E5048 - T120 exhaust - E3134 profile - use R followers
E3059R - "R" follower

E1485 in/ex 1938/9 5T
E3275 in/ex 1953-8 5T
E3325 in/ex 1955-8 TR5

E4819 - Bonneville E3134 profile intake
E4855 - Bonneville E3134 profile exhaust.

70-7016 - T140 intake

70-7017 - T140 exhaust cam
70-9990 - T120 exhaust, mate to 71-1063?
70-9986 - 1970 T100C exhaust cam
70-9989 - 67-72 T120 exhuast cam
70-9989 - 650 Exhuast cam
70-9989 - T120 exhaust cam late unit
70-9989 - Exhuast cam, half race

71-0040 - Cam, intake
71-0041 - Cam, exhaust
71-0043 - Forging blank for 71-1064, 70-9986
71-0046 - Cam, T100, exhuast
71-0046 - T100C exhaust cam
71-0049 - T100 ex cam 68 on
71-1063 - T120 intake - Nitrided E3134 profile - use R followers
71-1063 - Cam, '70 and later
71-1063 - 70-72 T120 intake cam
71-1064 - 1970 T100C intake cam
71-3011 - T140 intake - up to 1975.
71-3012 - T140 exhaust - up to 1975.
71-7016 - T140 intake cam
71-7017R - T140 spitfire exhaust cam
71-7182 - T140 exhaust cam

70-3059 - 'S' cam follower
70-3059R - 'R' cam follower
70-8801 - cam follower
71-7008 - cam follower
70-8801 - 650/750 exhaust follower oil feed

71-2297 - B50 cam

Cam forging blank numbers

These are not cam numbers, they are the part number for a blank that a cam profile is ground onto. A single blank will often be used for a number of different cam grinds, so this number doesn't actually tell you what cam you have. The forging number should have raised numbers, the cam grind number should be stamped in. Either number is sometimes omitted.

71-0040 - Forging blank for 71-1063
71-0042 - Forging blank for 71-9990
71-2887 - Forging blank for 71-3011
71-0042 - Forging blank for 71-3012

71-3012 - Forging blank for 71-3012 (really)

Someone recommends "put a T140 inlet in the exhaust using a modified rev counter nut/drive to spin a one off Boyer rotor. FWIW, I clocked up the cam and it's almost identical to Nourish's Z cam, so I used his timings of 102 degrees."

TRICOR "Q" intake cam is also named E3134-E4819:

intake 34-55 deg, exhaust 55-34 deg

cam lift .314"

duration 269

lobe center 100.5 deg

vs FACTORY "Q" E3134-E4819:

intake 34-58 deg, exhaust 58-34 deg

cam lift .310"

duration 269

lobe center 102.5 deg

Megacycle cam grinds

Triumph 650/750 twins:

CAM NUMBER	LOBE HEIGHT	DURATION AT .020"	LOBE CENTERS	TAPPET STYLE	DESCRIPTION AND APPLICATION	INTAKE OPEN/CLOSE EXHAUST OPEN/CLOSE	RUNNING CLEARANCE
510-05	.348"	282	100	"R"	Best for low-end and some mid-range increase. Street/road performance 2500 to 7000 R.P.M. Should clear stock pistons, check clearance. Uses stock springs	41 btc/61 abc 63 bbc/39 atc	.010" .010"
510-15	.355"	297	105.5	"R"	The legendary Kenny Harman #15 grind. (Also known as JOMO 15). TT, flat track, all around use. Must use modified pistons and springs.	43 btc/74 abc 74 bbc/43 atc	.007" .009"
510-x1	.401"	308	102	"STD"	Reproduction of Sifton 460. Racing Use.	52 btc/76 bbc	.008"
	.401"	308	106	only	Mid-range and top-end power.	80 bbc/48 atc	.010"
510-65	.355"	292	101	"R"	For 650 or 750. Best all around street and road cam. Broad power band, mid-range and	45 btc/67 abc 72 bbc/43 atc	.010" .010"
	.355"	295	104.5		top-end. TT style performance. Use modified pistons and springs. (Recommended by Motorcyclist Magazine)		
	TDC LIFT		.163"	in			
			.150"	ex			
510-75	.400"	326	102	"STD"	Racing use only. Must remove material from	61 btc/85 abc	.008"
	.400"	326	105	only	the tappet guide blocks to install this cam.	88 bbc/58 atc	.008"
TDC LIFT @		102LC =	.159"		High R.P.M. power. Must use racing springs		

		105LC = .146"			and pistons. Check clearances.			
510-x2	.375"	296.5	103	"R"	New race profile. Best all around road-race.	45.5 btc/71 abc	.008"	
	.375"	296.5	105		Best peak horsepower. May need to trim flywheel clearance. Use racing pistons and springs.	73.5 bbc/43 atc	.010"	
					TDC LIFT in = .174" @ 1.1 rocker ratio/with lash			
					ex = .153"			
Base circle diameter =	.812"							
510-95	.400"	340	108	"STD"	Full race only. All racing components required. High R.P.M. drag race, grass track, competition.	62 btc/98 abc	.008"-.014"	
	.400"	340	108	only		98 bbc/62 atc	.008"-.014"	
Stock	.322"	272			.322" 278	Stock for your reference.		
650	.322"	272			.322" 278	750 short rod		

Triumph 500 twins:

All cams listed below will work with "R" or "STD" tappets

CAM NUMBER	LOBE HEIGHT	DURATION AT .020"	LOBE CENTERS	DESCRIPTION AND APPLICATION	INTAKE OPEN/CLOSE EXHAUST OPEN/CLOSE	RUNNING CLEARANCE
512-05	.348"	282	100	Designed for stock pistons and springs.	41 btc/61 abc	.010"
	.348"	282	102	Good Throttle response/ all around performance.	63 bbc/39 atc	.010"
512-65	.355"	292	101	Best all-around street/road race profile.	42 btc/67 abc	.010"
	.355"	295	104.5		72 bbc/43 atc	.010"
512-x5	.293"	237		1938 Triumph 500 Twin stock reproduction.		
512-x8	.375"	296.5	103	on "R" Best competition road-race profile. Maximum peak horsepower and throttle response. Must use racing pistons and valve springs. Trim flywheel for clearance.	44.5 btc/71 abc	.008"
	.375"	296.5	105	on "R"	73.5 bbc/43 atc	.010"

Triumph and BSA triples:

CAM NUMBER	LOBE HEIGHT	DURATION AT .040"	LOBE CENTERS	TAPPET STYLE	DESCRIPTION AND APPLICATION	INTAKE OPEN/CLOSE EXHAUST OPEN/CLOSE	RUNNING CLEARANCE
511-05	.345"	282	98	"STD"	Best all around profile, road and touring.	43 btc/59 abc	.005"
	.345"	282	102		Use modified pistons and springs. This was the factory road race profile used by Dick Mann at Daytona. Smooth power band.	63 bbc/39 atc	.007"
511-x5	.375"	287	104.5	"STD"	Road race profile. Strong mid-range, top-end. All out racing. Use modified pistons and valve springs.	39 btc/68 abc	.008"
	.375"	287	107.5			71 bbc/36 atc	.010"
511-35	.346"	268	104	"STD"	Short road race where throttle response is most important. Less top-end than the 511-00. Very strong mid-range.	30 btc/58 abc	.008"
	.346"	268	104			58 bbc/30 atc	.010"
511-75	.400"	274	108	"STD"	Full race. Must trim tappet guide blocks. High R.P.M. race application.	29 btc/65 abc	.008"
	.400"	274	108			65 bbc/29 atc	.010"

511-95	.400"	288	100	Race components.		
	.400"	288	100	Special application race profile.	44 btc/64 abc	
Stock	.328"	262		For reference.	64 bbc/44 atc	

Johnson Cam Grinds

T100R Daytona

	Lift	Center	Lash	Tappet	Dur'n	Open	Close	At
Intake				R	272	40	52	.020
Exhaust				R	272	61	31	.020

T120 "E3134"

	Lift	Center	Lash	Tappet	Dur'n	Open	Close	At
Intake	.314				269	34	55	.020
Exhaust					269	55	34	.020

Triumph 750 short rod

	Lift	Center	Lash	Tappet	Dur'n	Open	Close	At
Intake	.350	111.5	.010		278	26.5	69.5	.020
Exhaust	.350	103	.010		278	61.5	35.5	.020

Q cam

Factory speed kit grind for 500's of the 50's, also used in the 650 TT Specials of the 60's.

	Lift	Center	Lash	Tappet	Dur'n	Open	Close	At
Intake	.316	105	.002	R	271	31	60	.020
Intake	.316	105	.002	R	251	21	50	.040
Exhaust	.316	105	.004	R	271	61	30	.020
Exhaust	.316	105	.004	R	251	51	20	.040

Jomo TT Cam

A little more duration than the Q cam, gives a little more top end power.

	Lift	Center	Lash	Tappet	Dur'n	Open	Close	At
Intake	.310	105	.002	R	276	33	65	.020
Intake	.310	105	.002	R	255	21	53	.040
Exhaust	.310	105	.004	R	276	62	35	.020
Exhaust	.310	105	.004	R	255	52	23	.040

Harmon&Collins 7054 Cam

A little more lift than the Q cam. For more mid-range torque.

	Lift	Center	Lash	Tappet	Dur'n	Open	Close	At
Intake	.326	105	.002	R	267	31	56	.020
Intake	.326	105	.002	R	246	20	46	.040
Exhaust	.326	105	.004	R	267	61	26	.020
Exhaust	.326	105	.004	R	246	50	16	.040

Connely #1 Cam

Lots of torque off tight corners. Tight TT, short Motocross, not good at high rpm.

	Lift	Center	Lash	Tappet	Dur'n	Open	Close	At
Intake	.353	105	.002	R	280	31	69	.020
Intake	.353	105	.002	R	261	21	59	.040
Exhaust	.353	105	.004	R	280	61	39	.020
Exhaust	.353	105	.004	R	261	51	29	.040

Johnson J360/264 Cam

Johnson designed for 750 Triple Road racing, and by coincidence is a modern version of the TH6.

	Lift	Center	Lash	Tappet	Dur'n	Open	Close	At
Intake	.353	102	.008	S	305	51	73	.020
Intake	.353	102	.008	S	277	73	60	.040
Exhaust	.353	110	.008	S	305	83	41	.020
Exhaust	.353	110	.008	S	277	69	29	.040

Triumph T-3 Cam

Stock 750 triple cam. Has always been hard to beat and works well in 500 twins also.

	Lift	Center	Lash	Tappet	Dur'n	Open	Close	At
Intake	.328	102	.006	R	393	44	69	.020
Intake	.328	102	.006	R	264	30	54	.040
Exhaust	.328	105	.008	R	293	72	41	.020
Exhaust	.328	105	.008	R	264	57	27	.040

Triumph T-65 Cam

Between a Q and a Jomo 15. Good for hot street, short track, and TT in 650 and 750 twins.

	Lift	Center	Lash	Tappet	Dur'n	Open	Close	At
Intake	.344	105	.008	R	280	36	64	.020
Intake	.344	105	.008	R	255	23	52	.040
Exhaust	.344	105	.010	R	280	66	35	.020
Exhaust	.344	105	.010	R	255	53	22	.040

Triumph T-75 Cam

Stock 750 twin intake. Use in exhaust also, for hot street motors and racing, where endurance means more than the last HP. Good to 7000rpm

with stock springs. Similiar to Nourish Z.

Intake	.345	105	.010	S	294	40	74	.020
Intake	.345	105	.010	S	270	29	61	.040
Exhaust	.345	105	.010	S	294	71	44	.020
Exhaust	.345	105	.010	S	270	59	32	.040

Jomo 15 Cam

This cam has long been considered the classic "all around" racing cam for the Triumph 650 and 750 twins.

	Lift	Center	Lash	Tappet	Dur'n	Open	Close	At
Intake	.354	106	.006	R	289	37	72	.020
Intake	.354	106	.006	R	267	28	60	.040
Exhaust	.354	106	.008	R	289	69	39	.020
Exhaust	.354	106	.008	R	267	59	29	.040

Sifton 390 Cam

This grind is an improved version of the Jomo 15. With less seat to seat timing the motor makes more torque, and runs "crisper" down low.

	Lift	Center	Lash	Tappet	Dur'n	Open	Close	At
Intake	.352	105	.008	S	290	39	71	.020
Intake	.352	105	.008	S	267	28	58	.040
Exhaust	.352	105	.008	S	290	69	41	.020
Exhaust	.352	105	.008	S	267	58	28	.040

Triumph TH6 Cam

Developed by Doug Hele for the factory 500 twin road racers of the late 60's, also used in the 750 triples of the 70's.

	Lift	Center	Lash	Tappet	Dur'n	Open	Close	At
Intake	.350	105	.006	R	305	49	77	.020
Intake	.350	105	.006	R	274	33	61	.040
Exhaust	.350	105	.008	R	305	79	47	.020
Exhaust	.350	105	.008	R	274	63	31	.040

Sifton 460 Cam

For 1/2 mile and mile flat track and real racers. NOT FOR THE FAINT OF HEART!. Must trim flywheel and tappet blocks.

	Lift	Center	Lash	Tappet	Dur'n	Open	Close	At
Intake	.400	105	.008	S	306	49	77	.020
Intake	.400	105	.008	S	283	37	65	.040
Exhaust	.400	105	.010	S	306	79	47	.020
Exhaust	.400	105	.010	S	283	67	35	.040

Johnson J 46

Johnson Design for a smoother, modern version of the Sifton 460 cam. This grind was developed to be easier on springs, tappets, etc. Must trim flywheel and tappet blocks.

	Lift	Center	Lash	Tappet	Dur'n	Open	Close	At
Intake	.410	102	.008	S	303	50	73	.020
Intake	.410	102	.008	S	279	38	61	.040
Exhaust	.410	110	.008	S	303	82	41	.020
Exhaust	.410	110	.008	S	279	70	29	.040

Johnson J481 Cam

Johnson design drag race cam. It is not recommended for anything other than drag racing. Must trim flywheel and tappet blocks.

	Lift	Center	Lash	Tappet	Dur'n	Open	Close	At
Intake	.443	102	.008	S	316	57	79	.020
Intake	.443	102	.008	S	290	44	66	.040
Exhaust	.443	110	.008	S	316	89	47	.020
Exhaust	.443	110	.008	S	290	76	35	.040