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Porsche 944 SOHC 8v

Part #:	05-121 ; 05-122
Grind:	274

IF MECH SET LASH .008 IN /.010 EX

	Intake	Exhaust
Valve Lash (Inch):	HYD	HYD
Valve Lift (Inch):	0.480	0.480
Valve Lift (mm):	12.19	12.19
Advertised Duration:	254°	254°
Duration @ 0.050":	234°	234°
Lobe Center:	112°	112°

Intake Opens	5°	Before TDC	Exhaust Opens	49°	Before BDC
Intake Closes	49°	After BDC	Exhaust Closes	5°	After TDC

Valve Timing Is Checked With Zero Valve Lash
@ 0.050 Inches Of Valve Lift.

Camshaft-Installation	Worldwide		
Engine type 944 As from Model 82	M 44. 01 - 0.4	M 44. 05 - 10	M 44. 11/12 (2.7 l)
Camshaft	944.105.155.05	944.105.155.09	944.105.155.10
Identification code between exhaust and intake cams on cylinder 2	155.05	155.09	155.10
Valve timing 1 mm stroke, zero play			
Intake opens	1° CS after TDC	1° CS after TDC	1° CS after TDC
Intake closes	49° CS after BDC	49° CS after BDC	49° CS after BDC
Exhaust opens	43° CS before BDC	47° CS before BDC	47° CS before BDC
Exhaust closes	3° CS before TDC	1° CS after TDC	1° CS after TDC

05 Cam (-01/49 - 43/-03), 12/11mm Lift

Overlap: -4.00 degrees
Intake Duration: 228.00 degrees
Exhaust Duration: 220.00 degrees
LSA: 114°
Intake Installed Centerline of 115.00 degrees ATDC.
Exhaust Installed Centerline of 113.00 degrees BTDC.

→05 Cam 4° adv. = 03/45 – 47/-07, 12/11mm Lift

Overlap: -4.00 degrees
Intake Duration: 228.00 degrees
Exhaust Duration: 220.00 degrees
Intake Installed Centerline of 111.00 degrees ATDC.
Exhaust Installed Centerline of 117.00 degrees BTDC

09 Cam (-01/49 - 47/01)→ 4° adv. = 03/45 – 51/-03, 12/12mm Lift

Overlap: 0 degrees
Intake Duration: 228.00 degrees
Exhaust Duration: 228.00 degrees
LSA: 114°
Intake Installed Centerline of 115.00 degrees ATDC.
Exhaust Installed Centerline of 113.00 degrees BTDC.

→09 Cam 4° adv. = 03/45 – 51/-03, 12/12mm Lift

Overlap: 0 degrees
Intake Duration: 228.00 degrees
Exhaust Duration: 228.00 degrees
Intake Installed Centerline of 111.00 degrees ATDC.
Exhaust Installed Centerline of 117.00 degrees BTDC.

Dbilas (2/46 - 46/2) 228° 1mm, 12/12mm Lift ≙ 272° (24/68 - 68/24) 0mm

Overlap: 4.00 degrees
Intake Duration: 228.00 degrees
Exhaust Duration: 228.00 degrees
LSA: 112°
Intake Installed Centerline of 112.00 degrees ATDC.
Exhaust Installed Centerline of 112.00 degrees BTDC.

Webcam (05/49 - 49/05) 1,27mm, 12,19/12,19mm Lift

Overlap: 10.00 degrees
Intake Duration: 234.00 degrees
Exhaust Duration: 234.00 degrees
LSA: 112°
Intake Installed Centerline of 112.00 degrees ATDC.
Exhaust Installed Centerline of 112.00 degrees BTDC. ≙ JME S3

Dbilas (7/55 – 55/7), 242°, 1mm, 12,3/12,3mm Lift ≙ 282° 0mm ≙ JME 8SR

CatCam 944 T (04/54 – 48/-2)

Overlap: 10.00 degrees
Intake Duration: 238.00 degrees
Exhaust Duration: 236.00 degrees
LSA: 115°
Intake Installed Centerline of 115.00 degrees ATDC.
Exhaust Installed Centerline of 115.00 degrees BTDC.

John Milledge

S3 - Valve lift = .475", 235 degrees @ .050, 268 seat to seat, area @ .050 = 37.3

S3-14 for 944/928Best power band 3600-6500 rpm. 900 rpm idle. .474 cam lift (In & Ex) with stock base circles for drop in performance. Uses stock or 944 Turbo valve springs for best results 12-18 bhp over stock camshaft with stock exhaust. Needs stock (37 psi.) fuel system pressure with Motronic at click 1. Tested against all comparable competitors camshafts and proven better.

PH 277-14 for 944/928

277 - Valve lift = .478, 236 degrees @ .050, 275 seat to seat, area @ .050 = 38

Best power band 4000-6600 rpm. 900 rpm idle. .474 cam lift (In & Ex) with stock base circles for drop in performance. Uses stock or 944 Turbo valve springs for best results. Motronic chip must have rev limit raised for best results. 14-20 bhp over stock camshaft with non-stock exhaust. Needs stock (37 psi.) fuel system pressure with Motronic at click 1. Tested against all competitors camshafts and proven better. None were comparable.

8SR - Valve lift = .503, 243 degrees @ .050, 280 seat to seat, area @ .050 = 40.25

P/RH 8SR-14 for 944 performance/928 race
Best power band 4000-6900 rpm. 1000 rpm idle. .503 cam lift (In & Ex) with near stock base circles. Uses 944 Turbo or race valve springs (recommended) for best results. Motronic chip must have rev limit raised for best results. 25+ bhp over stock camshaft with race exhaust. Needs custom Motronic chip or aftermarket engine management. No equivalent competitors cam. Used where lift is un-restricted but racing cam is allowed.

JME 8SR-14 Atmo
Intake 243 duration at .050"
0.5 gross lift
Ex. 243 duration at .050"
0.5 gross lift
STD base circles - No, slightly undersized.
Stock lifters - Yes
Stock timing - No, adv.
Stock springs - Maybe
LSA 114 deg.
Application - Modified to 230 bhp (944 NA).

JME 8SR/8SR-1x	Intake	243	"+19""	0.503
2V Hydraulic	Ex.	243	"+27""	0.503
	LSA(x)	112-116	deg.	

Timings 944S/S2 16V @ 1mm Lift

	944S	**944S2**
Inlet opens	4° after TDC	3° after TDC
Inlet closes	40° after BDC	47° after BDC
Exhaust opens	36° before BDC	39° before BDC
Exhaust closes	4° before TDC	7° before TDC

VARYING LOBE SEPARATION ANGLE

Tighten	Widen
Moves Torque to Lower RPM	Raise Torque to Higher RPM
Increases Maximum Torque	Reduces Maximum Torque
Narrow Powerband	Broadens Power Band
Builds Higher Cylinder Pressure	Reduce Maximum Cylinder Pressure
Increase Chance of Engine Knock	Decrease Chance of Engine Knock
Increase Cranking Compression	Decrease Cranking Compression
Increase Effective Compression	Decrease Effective Compression
Idle Vacuum is Reduced	Idle Vacuum is Increased
Idle Quality Suffers	Idle Quality Improves
Open Valve-Overlap Increases	Open Valve-Overlap Decreases
Closed Valve-Overlap Increases	Closed Valve-Overlap Decreases
Natural EGR Effect Increases	Natural EGR Effect is Reduced
Decreases Piston-to-Valve Clearance	Increases Piston-to-Valve Clearance

LOBE SEPARATION ANGLE

> 114 Deg. = Extremely Wide
114-112 Deg. = Wide
112-110 Deg. = Moderately Wide
110-108 Deg. = Moderate
108-106 Deg. = Moderately Tight
106-104 Deg. = Tight
Below 104 Deg. = Extremely Tight

ADVANCING / RETARDING CAM TIMING

ADVANCING	**RETARDING**
Begins Intake Event Sooner	Delays Intake Event Closes Intake
Open Intake Valve Sooner	Keeps Intake Valve Open Later
Builds More Low-End Torque	Builds More High-End Power
Decrease Piston-Intake Valve Clearance	Increase Piston-Intake Valve Clearance
Increase Piston-Exhaust Valve Clearance	Decrease Piston-Exhaust Valve Clearance

increase duration = move power band (peaking torque) up through revs at expense of power at lower revs. "Advertised" duration is supposed to represent the actual opening and closing duration of the cam. Please note that the valve duration may actually be longer than the cam duration due to the way a rocker or lifter moves on the cam lobe. The @0.050" duration is a standardised method of comparing cams regardless of the type of rocker, lash, etc and allows comparison between cams being the duration of the lift greater than 0.050". Rule of thumb expect 50 rpm movement of the power band for every 1° change in duration using the @0.050" standard. ;

increase LSA= lobe separation angle= good idle, high vacuum, increase power band span (wide rpm range), flatten the torque curve, delay peak torque, but can reduce peak power. A short LSA (more overlap) makes the torque peak and fall early (and rapidly) in the power band, rougher idle, less manifold vacuum, strong mid range power.

centrelines = are useful for determining cam event offsets and relationships to piston velocity and position. Advancing the intake centreline makes the peak torque occur earlier in the power band; rule of thumb expect 50 rpm movement for every 1°, but also expect more of the fuel to exit with the exhaust during overlap, so your fuel consumption will rise..

increase overlap= move power band up through the revs, makes the torque curve peaky, increases rough idling.

increase lift= increases duration at maximum flow event, increased torque at high rpms, but little benefit for stump pullers and tow vehicles. Increasing lift on narrow LSA setups can cause problems with piston interference. Other problems associated with high lift cams are spring retainer/valve guide interference, rocker arm stud interference, coil bind, rapid wear on lobes and followers. Lots of rules of thumb, but tends to be limited to the lessor of 12mm or 25% of valve diameter.

camshaft range = various sources suggest the optimum torque range of a camshaft is around 3000 engine rpm. The power peak for larger engines is expected to be about 1000 rpm after the upper range limit and around 3500 rpm after for small engines: As you shift the performance range up you need to consider increasing the final reduction gear ratio also. Your idle speed will also need to increase. The following range limits are more suited to larger engines, but illustrate the effect of "improvement" cams.
Advancing and Retarding camshafts = as mentioned previously, advancing the intake centreline tends to make the torque peak event occur earlier. Although there are always exceptions to any rules, if you advance a camshaft you can expect the torque and power curves to move to the left, with a slight drop in peak power, but a smoother curve. If you retard the cam you can expect the curves to move to the right with a lower peak torque and maybe higher peak power figure; once again the curve will be smoother. We are not talking big degrees here (e.g. 4 -6°). The way to visualise what happens is for the standard cam without any advance or retard, the rpm versus power/torque curves will not have a smooth curves. Advancing the cam will tend to smooth the curve and bias to the left side of the bumps, while retarding will smooth and bias to the right side. Retarding the cam, makes the exhaust valve open later, which raises BMEP, but also has a negative effect in raising the engine temp and exhaust valve temperature. So some care needs to be taken with the air fuel ratios to compensate.

http://dairally.net/daihard/chas/MiscCalculators/DaiCamEvents.htm

http://www.pistonheads.com/gassing/topic.asp?h=0&f=66&t=1103886&mid=294479&nmt=Ideal+Camshaft+Lobe+Centreline+Angle

http://performancetrends.com/Engine-Analyzer.htm

http://www.tildentechnologies.com/downloads/CamCalculator.xls
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