

Record every reading here, then work the formulas on the back of this sheet or enter the values at gditool.com. Enter the readings exactly as the indicator displayed them. Record the reference reading F for each setup, and do not zero part way through a set.

ENGINE OR CUSTOMER		CAMSHAFT		PUMP
VALLEY COVER <i>OEM or aftermarket</i>		PUMP FLANGE <i>thickness if altered</i>		GASKET PART NO. AND QTY
DATE	MEASURED BY	NOTES		

In-engine, camshaft installed — section 7

valley cover bolted down, no gasket under the tool flange

REFERENCE READING F <i>flat surface, no spring</i>	F RE-CHECKED AT END OF SET <i>section 5.1</i>	INDICATOR COUNTS <i>up / down</i>
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LOBE	L BC	L PL	LOBE LIFT (CALC)	PRELOAD (CALC)
1				
2				
3				
Average				

Pump, off the engine — section 8

its own reference reading; outer spring left off

REFERENCE F	R F PISTON FREE	R C END OF TRAVEL	AVAILABLE TRAVEL (CALC)

V-block, camshaft off the engine — section 9

optional; the journal is the reference, so no F is taken

JOURNAL READING J	J RE-CHECKED AFTER LOBES <i>section 5.1</i>	JOURNAL DIAMETER D J <i>micrometer, or 55.00 mm</i>
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LOBE	BASE CIRCLE B	PEAK K	LOBE LIFT (CALC)	BASE CIRCLE DIA (CALC)	PEAK LIFT DIA (CALC)
1					
2					
3					
Average					

Gasket, lash cap and limits

GASKET G <i>0.30 mm default</i>	LASH CAP C <i>0 if none fitted</i>	PRELOAD MIN <i>0.50 mm default</i>	CLEARANCE MIN <i>0.50 mm default</i>
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Results — all calculated

check the targets against the worst case, not the average

PUMP FREE LENGTH	AVAILABLE PISTON TRAVEL	LOBE LIFT
MINIMUM PRELOAD <i>lobe no.</i>	MINIMUM CLEARANCE <i>lobe no.</i>	LOBE-TO-LOBE SPREAD <i>0.05 mm limit</i>

Notes and corrections applied

section 11.2 — remeasure whatever combination you end up with

Measurement variables — section 6.1

every one is a value you measure or supply

VAR	MEASUREMENT	TAKEN DURING
F	Reference reading, tool flat on a surface	In-engine and pump setups
L BC	Depth to lifter at base circle	In-engine
L PL	Depth to lifter at peak lift	In-engine
R F	Pump reading, piston free	Pump
R C	Pump reading, piston at end of travel	Pump
J	Reading on the camshaft journal	V-block
B	Reading at lobe base circle	V-block
K	Reading at lobe peak lift	V-block
G	Gasket thickness	Measured, or 0.30 mm default
C	Lash cap thickness, 0 if none fitted	As fitted
D J	Camshaft journal diameter	Micrometer, or 55.00 mm default

Calculated results are named in words rather than letters, so any letter appearing in a formula is something you measured or supplied. The tool's two fixed dimensions are never entered: the preload constant 25.40 mm (1.000 in) and the free length constant 44.45 mm (1.750 in). Both derive from the 63.50 mm (2.500 in) standoff length S and the 19.05 mm (0.750 in) flange to spring support length E.

The reference reading rule

For the in-engine and pump measurements, each value used in a formula is the absolute value of the displayed reading minus the reference reading F for that setup. Subtract F first, then take the absolute value — the order is the whole point. Taking the absolute value of the displayed reading on its own is correct only when F happens to be zero. F belongs to one setup and the two are not interchangeable. For the V-block measurements there is no F: every value is an absolute-valued difference from the journal reading J.

Formulas — section 10.1

works in millimeters or inches, provided every value is in the same units

Lobe lift, in the engine	=	L BC – L PL
Lobe lift, on V-blocks	=	B – K
Base circle diameter	=	D J – 2 × (B – J)
Peak lift diameter	=	D J – 2 × (K – J)
Available piston travel	=	R C – R F
Pump free length	=	44.45 – R F
Preload	=	25.40 – R F – L BC + C – G
Clearance to end of travel	=	R C + L PL – 25.40 + G – C

Check: lobe lift + preload + clearance to end of travel = available piston travel

Targets — section 11.1

a published supplier specification governs over these

ITEM	VALUE	NOTE
Preload at base circle	0.50 mm (0.020 in) min	A floor, not a target
Clearance to end of travel	0.50 mm (0.020 in) min	A floor, not a target
Measurement uncertainty	±0.05 mm (0.002 in)	The floor is ~10x the noise
Lobe-to-lobe spread	0.05 mm (0.002 in)	Total spread, not ±

Minimum preload occurs at the lobe with the largest L BC. Minimum clearance occurs at the lobe with the smallest L PL. These can be different lobes, so take each figure from whichever lobe produces it. The average describes the camshaft; it does not govern whether the combination is safe to run.

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Scan the code, or go to gditool.com, and enter the values from this sheet to have the calculations done for you. The same code is on either V-block. The calculator also carries the operating instructions and a blank copy of this sheet.



These measurements are diagnostic. Interpreting them and acting on them is the installer's responsibility.

Product & Service Solutions LLC provides no warranty for damage arising from the use of this tool or from any installed height.