Chevrolet V8 Engines

1968-73 396" (402"), 400" (402"), 427", 454" V8 ENGINES

GENERAL SPECIFICATIONS

Year	Displ. Cu. Ins.	Carburetor	HP at RPM	Torque (Ft. Lbs. at RPM)	Compr. Ratio	Bore	Stroke
1968-69	396"	4-Bbl.	265 @ 4800	400 @ 2800	9.0-1	4.094"	3.76"
		4-Bbl.	325 @ 4800	410 @ 3200	10.25-1	4.094"	3.76"
		4-Bbl.	350 @ 5200	415 @ 3200	10.25-1	4.094"	3.76"
		4-Bbl.	375 @ 5600	415 @ 3600	11.0-1	4.094"	3.76"
1968-69	427"	4-Bbl.	335 @ 4800	470 @ 3200	10.25-1	4.25"	3.76"
		4-Bbl.	385 @ 5200	460 @ 3400	10.25-1	4.25"	3.76"
		4-Bbl.	390 @ 5400	460 @ 3600	10.25-1	4.25"	3.76"
		Three 2-Bbl.	400 @ 5400	460 @ 3600	10.25-1	4.25"	3.76"
		4-Bbl.	425 @ 5600	460 @ 4000	11.0-1	4.25"	3.76"
		4-Bbl.	430 @ 5200	450 @ 4400	12.0-1	4.25"	3.76"
		Three 2-Bbl.	435 @ 5800	460 @ 4000	11.0-1	4.25"	3.76"
1970	396" (402")	4-Bbl.	350 @ 5200	415 @ 3400	10.25-1	4.125"	3.76"
		4-Bbl.	375 @ 5600	415 @ 3600	11.0-1	4.125"	3.76"
	400" (402")	4-Bbl.	330 @ 4800	410 @ 3200	10.25-1	4.125"	3.76"
	454"	4-Bbl.	345 @ 4400	500 @ 3000	10.25-1	4.25"	4.00"
		4-Bbl.	360 @ 4400	500 @ 3000	10.25-1	4.25"	4.00"
		4-Bbl.	390 @ 4800	500 @ 3400	10.25-1	4.25"	4.00"
		4-Bbl.	450 @ 5600	500 @ 3600	11.25-1	4.25"	4.00"
		4-Bbl.	460 @ 5600	490 @ 3600	11.25-1	4.251"	4.00"
1971	402"	4-Bbl.	300 @ 4800	400 @ 3200	8.5-1	4.125"	3.76"
	454"	4-Bbl.	365 @ 5600	465 @ 3200	8.5-1	4.25"	4.00"
		4-Bbl.	425 @ 5600	475 @ 4000	9.0-1	4.25"	4.00"
1972	402"	4-Bbl.	210 @ 4400	320 @ 2400	8.5-1	4.126"	3.76"
		4-Bbl.	240 @ 4400	345 @ 3200	8.5-1	4.126"	3.76"
	454"	4-Bbl.	230 @ 4000	360 @ 3200	8.5-1	4.251"	4.00"
		4-Bbl.	270 @ 4000	390 @ 3200	8.5-1	4.251"	4.00"
1973	454"	4-Bbl.	215@4000	345@2400	8.5-1	4.251"	4.000"
		4-Bbl.	245@4000	375@2800	8.5-1	4.251"	4.000"
		4-Bbl.	275@4400	395@2800	8.5-1	4.251"	4.000"

► *NET HORSEPOWER & TORQUE NOTE — Horsepower and Torque figures given for 1972 and later are NET. NET Horsepower and Torque represent power at the flywheel when the engine is installed in the vehicle, with wide open throttle and all systems operating such as; air cleaner, exhaust system, water pump, generator, oil pump and air conditioning.*

ENGINE IDENTIFICATION

Engines may be identified as to CID by letter suffix of Engine Production Code. Production Code number is stamped on a pad just forward of right hand cylinder head and designates engine model as follows:

Engine Classification – Chevrolet V8 engines are classified as either Small V8 or Mark IV. The 396", 402", 427" and 454" engines are classified as the Mark IV engines, all others are classified as Small V8 engines.

1968 Models

396" ..... ED, EF, EG, EK, EL, ET, EU, IA, IG, IU, MQ, MR, MT, MW, MX, MY.
427" ..... ID, IH, IJ, IL, IM, IO, IQ, IR, IT, IU.

1969 Models

396" ..... JA, JB, JC, JD, JE, JF, JG, HG, JI, JJ, JK, JL, JM, JN, JO, JP, JQ, JR, JT, JU, JV, KA, KB, KC, KD, KE, KF, KG, KH, KI.
427" ..... LA, LB, LC, LD, LE, LF, LG, LH, LI, LJ, LK, LL, LM, LN, LO, LP, LQ, LR, LS, LT, LU, LV, LW, LX, LY, LZ, MA, MB, MC, MD.

1970 Models

396" (402") ..... CJF, CJI, CTW, CTX, CTZ, CJL, CJH, CKO, CKP, CKQ, CKT, CKU, CTY.
400" (402") ..... CKR, CKS, CTW, CTX, CTY, CKO.
454" ..... CGV, CGS, CRN, CRQ, CRT, CGT, CGU, CGW, CZU, CRI, CRR, CRS, CRV, CZL, CZN.

1971 Models

402" ..... CLB, CLL, CLP, CLA, CLR, CLS, CLC, CLD.
454" ..... CPA, CPD, CPG, CPH, CPJ, CPO, CPX, CPK, CPL, CPP, CPR.

1968-73 396" (402"), 400" (402"), 427", 454" V8 ENGINES (Cont.)

1972 Models

402" ..... CLB, CLA, CLK, CLJ, CLL, CLR, CLS.
454" ..... CPG, CPD, CPA, CPZ, CPY, CPH, CPJ, CSR, CSS.

1973 Models

454" ..... CWA, CWB, CWC, CWD, CWJ, CWK, CWL, CWM, CWR

ENGINE REMOVAL

See Engine Removal at end of ENGINE Section.

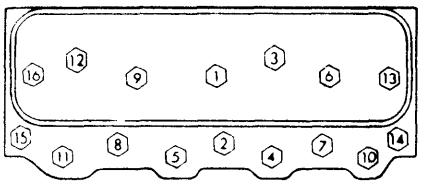
OIL PAN REMOVAL

See Oil Pan Removal at end of ENGINE Section.

CYLINDER HEAD

Remove A/C and power steering components as necessary. Remove intake manifold and carburetor as an assembly. Remove exhaust manifolds. Remove valve mechanism, drain cooling system. Remove heads.

Installation – Clean head bolt threads. Use sealer on both sides of steel gaskets. DO NOT use sealer on composition gaskets. Apply sealing compound to head bolts and install finger tight. Tighten bolts evenly, a little at a time in sequence shown on illustration until specified torque is attained. Reverse removal procedures to install manifolds, valve mechanism, and accessories.



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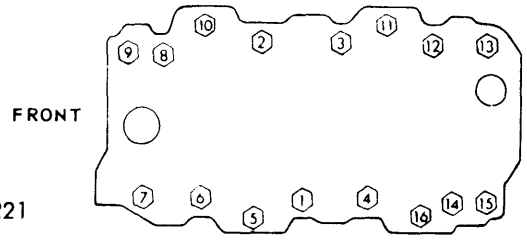
CYLINDER HEAD TIGHTENING SEQUENCE

INTAKE MANIFOLD INSTALLATION

Install end seals on block. Install side gaskets on cylinder heads using sealing compound around water passages. Install manifold being careful not to displace gaskets and seals. Tighten manifold bolts evenly in sequence shown in diagram to correct torque as listed. *NOTE - If crankshaft has been rotated while distributor was removed, time distributor again to number 1 cylinder.*



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INTAKE MANIFOLD TIGHTENING SEQUENCE

PISTONS, PINS, RINGS

Engine	PISTONS ①Clearance	PINS Piston Fit	PINS Rod Fit	RINGS Rings	RINGS End Gap	RINGS Side Clearance
1968						
396"						
(325, 350 HP)	.0007-.0013"	.00025-.00035"	.0008-.0016"	1 & 2 3	.010-.020" .010-.030"	.0017-.0032" .0005-.0065"
(375 HP)	.0036-.0042"	.0003-.0004"	.0008-.0016"	1 & 2 3	.010-.020" .010-.030"	.0017-.0032" .0005-.0065"
427"						
(385, 390, 400 HP)	.0009-.0015"	.00025-.0035"	.0008-.0016"	1 & 2 3	.010-.020" .010-.030"	.0017-.0032" .0005-.0065"
(425, 435 HP)	.0037-.0043"	.00030-.00040"	.0008-.0016"	1 2 3	.010-.020" .010-.020" .010-.030"	.0017-.0032" ① .0005-.0065"
(435 HP, 4-Bbl.)	.0054-.0063"	.0045-.00055"	.0008-.0016"	1 & 2 3	.010-.020" .010-.030"	.0017-.0032" .0005-.0065"
1969						
396"						
(265, 325, 350, 375 HP)	.0010-.0018" ④	.00025-.00035" ③	.0008-.0016"	1 & 2 3	.010-.020" .010-.030"	.0017-.0032" .0005-.0065"
427"						
(335, 390, 400 HP)	.0012-.0020"	.00025-.00035"	.0008-.0016"	1 & 2 3	.010-.020" .010-.030"	.0017-.0032" .0005-.0065"
(425 HP)	.0037-.0043"	.00030-.00040"	.0008-.0016"	1 & 2 3	.010-.020" .010-.030"	.0017-.0032" .0005-.0065"
(430 HP)	.0054-.0063"	.00045-.00055"	.0001-.0008"	1 & 2 3	.010-.020" .010-.030"	.0017-.0032" .0005-.0065"
(435 HP)	.004-.0048"	.00030-.00040"	.0008-.0016"	1 & 2 3	.010-.020" .010-.030"	.0017-.0032" .0005-.0065"

1968-73 396" (402"), 400" (402"), 427", 454" V8 ENGINES (Cont.)

PISTONS, PINS, RINGS (Cont.)

Engine	PISTONS	PINS			RINGS	
	①Clearance	Piston Fit	Rod Fit	Rings	End Gap	Side Clearance
1970						
396" (402")						
(350 HP)	.0018-.0026"	.00025-.00035"	.0008-.0016"	1 & 2 3	.010-.020" .010-.030"	.0017-.0032" .0005-.0065"
(375 HP)	.0036-.0042"	.0003-.0004"	.0008-.0016"	1 & 2 3	.010-.020" .010-.030"	.0017-.0032" .0005-.0065"
400" (402")						
(330 HP)	.0018-.0026"	.00025-.00035"	.0008-.0016"	1 & 2 3	.010-.020" .015-.0055"	.0017-.0032" .0005-.0065"
454"						
(345, 360, 390 HP)	.0024-.0034"	.00025-.00035"	.0008-.0016"	1 & 2 3	.010-.020" .015-.055"	.0017-.0032" .0005-.0065"
(450, 460 HP)	.004-.005"	.00025-.00035"	.0008-.0016"	1 & 2 3	.010-.020" .015-.055"	.0005-.0065" .0005-.0065"
1971						
402"						
(300 HP)	.0018-.0026"	.00025-.00035"	.0008-.0016"	1 & 2 3	.010-.020" .015-.055"	.0017-.0032" .0005-.0065"
454"						
(365 HP)	.0024-.0034"	.00025-.00035"	.0008-.0016"	1 & 2 3	.010-.020" .015-.055"	.0017-.0032" .0005-.0065"
(425 HP)	.004-.005"	.00025-.00035"	.0008-.0016"	1 & 3 3	.010-.020" .015-.055"	.0017-.0032" .0005-.0065"
1972						
402"	.0018-.0028"	.00025-.00035"	.0008-.0016"	1 & 2 3	.010-.020" .015-.055"	.0017-.0032" .0005-.0065"
454"	.0024-.0034"	.0003-.0004"	.0008-.0016"	1 & 2 3	.010-.020" .015-.055"	.0017-.0032" .0005-.0065"
1973						
454"	.0018-.0028"	.00025-.00035"	.0008-.0016"	1 & 2 3	.010-.020" .015-.055"	.0017-.0032" .0005-.0065"

① – Measured approx. 2 1/2" from top of piston.
② – Except 375 HP = .0036-.0042"
③ – Except 375 HP = .0003-.0004"
④ – 425 HP engine is .0012-.0032"
435 HP engine is .0017-.0032"
⑤ – Interference fit.

PISTON & ROD INSTALLATION

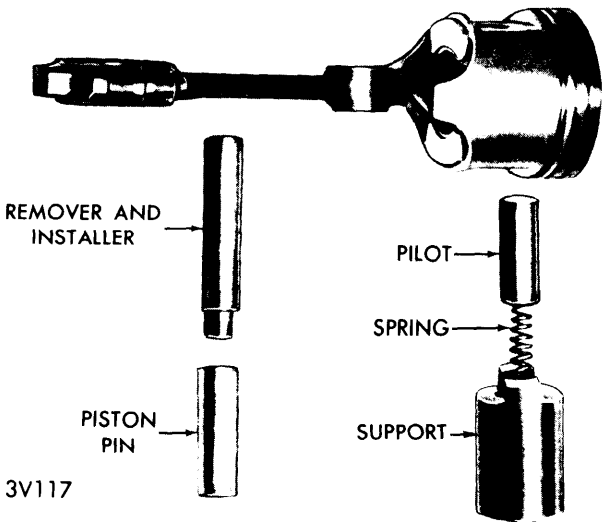
Install with connecting rod bearing tang slots on side opposite camshaft. Mark each connecting rod and bearing, from front to rear 1,3,5,7 on left bank and 2,4,6,8 on right bank, and install in correct cylinder.

PISTON PIN REPLACEMENT

Use Tool J-6994. When installing pin, press pin into piston until pilot bottoms in support. See *illustration.*

FITTING PISTONS

Measure cylinder bore diameter approximately 2½" from top of bore. Measure piston at pin centerline and see *"Pistons, Pins, Rings"* for preferable clearances.



PISTON PIN INSTALLATION

1968-73 396" (402"), 400" (402"), 427", 454" V8 ENGINES (Cont.)

VALVES

Engine & Valve		Head Diam.	Face Angle	Seat Angle	Seat Width	Stem Diameter	Stem Clearance	Valve Lift
396", 427"								
1968-69	Int.	2.065"	45°	46°	.031-.063"	.3715-.3722"	.0010-.0025"	.....
	Exh.	1.720"	45°	46°	.063-.094"	.3713-.3720"	.0012-.0027"	.....
396", 400" (402"), 454"								
1970-73	Int.	2.065"	45°	46°	.031-.063"	.3715-.3722"	.0010-.0027"	.....
	Exh.	1.720"	45°	46°	.063-.094"	.3713-.3720"	.0012-.0027"	.....

VALVE ARRANGEMENT

E-I-E-I-E-I-E-I Left bank, front to rear.
I-E-I-E-I-E-I-E Right bank, front to rear.

VALVE GUIDES

Integral with cylinder head. If valve stem clearance excessive (see *Valve Table*), ream to next oversize.

VALVE GUIDE BORES

To ream valve guide bores for oversize valves use Tool J-7049 for 396" and 427" engines.

VALVE SPRINGS

Engine	Free Length	PRESSURE (LBS.) Valve Closed	Valve Open
1968-69			
396"(325 HP)	2.11"	84-96 @ 1.88"	210-230 @ 1.46"
(350,375 HP)	2.09"	94-106 @ 1.88"	303-327 @ 1.38"
427" (385,390, 400,425 HP)	2.09"	94-106 @ 1.88"	303-327 @ 1.38"
(435 HP)	2.21"	64-81 @ 1.88"	181-205 @ 1.32"
Inner Spring	2.12"	37-45 @ 1.78"	92-110 @ 1.22"
1970			
396"(402")& 400"(402")	2.12"	69-81 @ 1.88"	228-252 @ 1.38"
454" (345 HP)	2.09"	94-106 @ 1.88"	303-327 @ 1.38"
(360,390, 450 HP)	2.12"	69-81 @ 1.88"	228-252 @ 1.38"
(460 HP)	2.12"	69-81 @ 1.88"	181-205 @ 1.32"
Inner Spring			
454"(460 HP)	.....	37-45 @ 1.78"	92-100 @ 1.22"
All Others	.....	26-34 @ 1.78"	81-99 @ 1.28"
1971			
402,454"			
Outer	2.12"	69-81 @ 1.88"	228-252 @ 1.38"
Inner	2.06"	26-34 @ 1.78"	81-99 @ 1.28"
1972			
402" & 454"			
Outer	2.12"	69-81 @ 1.875"	228-252 @ 1.375"
Inner	2.06"	26-34 @ 1.781"	81-99 @ 1.28"
1973			
454"	**2.10"**	**74-86@1.88"**	**288-312@1.38"**

VALVE SPRING INSTALLED HEIGHT

Measured from spring seat (or top of shim) to top of valve spring shield. If specifications exceeded (see *"Valve Springs" table above*), install a 1/16" spacer under spring to bring within limits. *CAUTION - Do not shim spring to give installed height less than specifications.*

VALVE LIFT SPECIFICATIONS

Year	Engine	Valve	Lift
1968	396"	Int.	.3983"
		Exh.	.3983"
	(350 HP)	Int.	.4614"
		Exh.	.4800"
	427"	Int.	.4614"
		Exh.	.4800"
	(435 HP)	Int.	.5197"
		Exh.	.5197"
1969	396"	Int.	.3983"
		Exh.	.3983"
	(350, 375 HP)	Int.	.4614"
		Exh.	.4800"
	427"	Int.	.3983"
		Exh.	.3983"
	(390, 400 HP)	Int.	.4614"
		Exh.	.4800"
	(425, 430, 435 HP)	Int.	.5197"
		Exh.	.5197"
1970	396" (402")	Int.	.4614"
		Exh.	.4800"
	400" (402")	Int.	.3983"
		Exh.	.3983"
	454"	Int.	.3983"
		Exh.	.4300"
	(360, 390 HP)	Int.	.4614"
		Exh.	.4800"
	(460 HP)	Int.	.5197"
		Exh.	.5498"
1971	402"	Int.	.3983"
		Exh.	.4300"
	454"	Int.	.4614"
		Exh.	.4800"
	(425 HP)	Int.	.5197"
		Exh.	.5197"
1972	402"	Int.	.3983"
		Exh.	.4300"
	454"	Int.	.4614"
		Exh.	.4800"
1973			①

① — Information not available at time of publication.

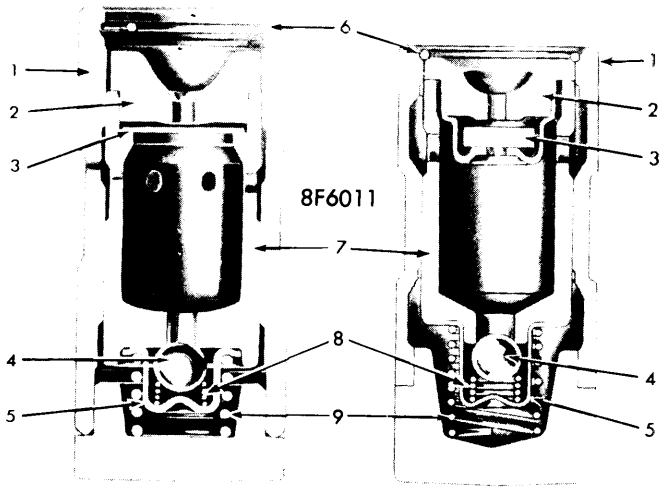
1968-73 396" (402"), 400" (402"), 427", 454" V8 ENGINES (Cont.)

ROCKER ARM STUD & PUSH ROD GUIDE REPLACEMENT

Push rod guides are attached to the cylinder head by rocker arm studs. Replace as necessary and torque studs to specification. Coat threads on cylinder head end of new stud with sealer.

HYDRAULIC VALVE LIFTERS

Two types of lifters are used. Complete lifter assemblies are interchangeable but parts from one lifter are not interchangeable with another. Type "B" uses an inertia valve and retainer instead of a metering valve as in lifter "A". This inertia valve and retainer should not be removed from the push rod seat. To check valve "B", shake the rod seat and inertia valve assembly; valve should move. Replace lifter if any parts worn or damaged. When reassembling, fill lifter with SAE 10 oil. *CAUTION - Do not force plunger or work plunger up and down during reassembly. Coat bottom of new lifters with Molykote before installing.*



LIFTER "A"
1. Lifter Body
2. Push Rod Seat
3. Metering Valve (Lifter A)
   Inertia Valve (Lifter B)
4. Check Ball

LIFTER "B"
5. Check Ball Retainer
6. Push Rod Seat Retainer
7. Plunger
8. Check Ball Spring
9. Plunger Spring

HYDRAULIC VALVE LIFTER ASSEMBLIES

HYDRAULIC LIFTER ADJUSTMENT (AT ENGINE OVERHAUL)

With No 1 cylinder at TDC firing position, adjust Exhaust Valves 1-3-4-8 and Intake Valves 1-2-5-7 as follows:

1) Back off rocker arm stud adjusting nut until there is play in pushrod, then tighten nut until pushrod-to-rocker arm clearance is removed.

2) Tighten nut **an additional 1 turn** (places lifter plunger in center of its travel).

3) Crank engine 1 complete revolution so No. 6 cylinder is at TDC firing position and adjust Exhaust Valves 2-5-6-7 and Intake Valves 3-4-6-8 in same manner.

MECHANICAL VALVE LIFTERS

CAUTION - Lifter must not be disassembled. Replace worn or damaged lifters.

MECHANICAL LIFTER ADJUSTMENT

See "Valve Tappet Clearance".

VALVE TAPPET CLEARANCE

Engine	① Intake	① Exhaust
396" (402")	.024"	.028"
427"	.024"	.028"
(430 HP)	.022"	.024"
454"	.024"	.028"

All Others (Hydraulic) – One turn down from zero lash.

① – Engine hot and running.

CRANKSHAFT MAIN & CONNECTING ROD BEARINGS

Engine	MAIN BEARINGS				CONNECTING ROD BEARINGS		
	Journal Diam.	Clearance	Thrust Bearing	Crankshaft Endplay	Journal Diam.	Clearance	①Sideplay
1968-69							
396" 325, 350 HP	②2.7489" ③2.7486" ④2.7483"	②.001-.0022" ③.0013-.0025" ④.0015-.0031"	Rear	.006-.010"	2.1995"	.0009-.0025"	.015-.021"
396" 375 HP	⑤2.7489" ⑥2.7486" ④2.7483"	⑦.0013-.0025" ④.0015-.0031"	Rear	.006-.010"	2.1995"	.0014-.003"	.019-.025"
427" 385, 390, 400 HP	⑦2.7486" ④2.7483"	⑦.0013-.0025" ④.0015-.0031"	Rear	.006-.010"	2.1995"	.0009-.0025"	.015-.021"
427" 425, 430, 435 HP	⑦2.7486" ④2.7483"	⑦.0013-.0025" ④.0015-.0031"	Rear	.006-.010"	2.1995"	.0014-.003"	.019-.025"

1968-73 396" (402"), 400" (402"), 427", 454" V8 ENGINES (Cont.)

CRANKSHAFT MAIN & CONNECTING ROD BEARINGS (Cont.)

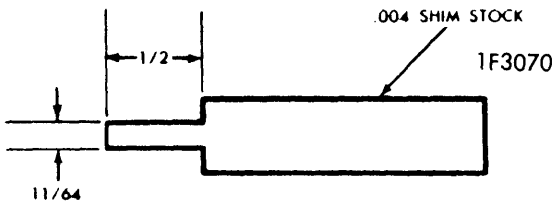
Engine	MAIN BEARINGS				CONNECTING ROD BEARINGS		
	Journal Diam.	Clearance	Thrust Bearing	Crankshaft Endplay	Journal Diam.	Clearance	①Sideplay
1970							
396" (402") 350 HP	②2.7492" ③2.7486" ④2.7483"	⑤.0007-.0019" ⑥.0013-.0025" ④.0024-.004"	Rear	.006-.010"	2.1995"	.0009-.0025"	.015-.021"
396" (402") 375 HP	⑦2.7486" ④2.7478"	⑦.0013-.0025" ④.0029-.0045"	Rear	.006-.010"	2.1990"	.0014-.0030"	.019-.025"
400" (402") 330 HP	②2.7509" ③2.7510" ④2.7505"	⑤.0007-.0019" ⑥.0013-.0025" ④.0024-.004"	Rear	.006-.010"	2.1995"	.0009-.0025"	.015-.023"
454" 345, 360 & 390 HP	⑤2.7490" ⑥2.7486" ④2.7483"	.0013-.0025"	Rear	.006-.010"	2.1995"	.0009-.0025"	.015-.023"
450, 460 HP	⑦2.7486" ④2.7483"	⑦.0013-.0025" ④.0029-.0045"	Rear	.006-.010"	2.1990"	.0014-.003"	.019-.025"
1971							
402" 300 HP	②2.7492" ③2.7486" ④2.7478"	⑤.0007-.0019" ⑥.0013-.0025" ④.0019-.0035"	Rear	.002-.006"	2.0995"	.0009-.0025"	.013-.023"
454" 365 HP	⑤2.7490" ⑥2.7486" ④2.7483"	⑦.0013-.0025" ④.0024-.004"	Rear	.006-.01"	2.1995"	.0009-.0025"	.015-.021"
454" 425 HP	⑦2.7486" ④2.7483"	⑦.0013-.0025" ④.0029-.0045"	Rear	.006-.01"	2.1990"	.0009-.0025"	.019-.025"
1972							
402"	②2.7492" ③2.7486" ④2.7478"	⑤.0007-.0019" ⑥.0013-.0025" ④.0019-.0035"	Rear	.006-.01"	2.1995"	.0009-.0025"	.013-.023"
454"	⑤2.7490" ⑥2.7486" ④2.7483"	⑦.0013-.0025" ④.0024-.004"	Rear	.006-.01"	2.1995"	.0009-.0025"	.015-.021"
1973 454"	⑤ 2.7490" ⑥ 2.7486" ④ 2.7483"	⑦ .0013-.0025" ④ .0024-.004"	Rear	.006-.01"	2.1995"	.0009-.0025"	.015-.021"

① – Total two rods. ② – No. 1-2 ③ – No.3-4 ④ – No.5 ⑤ – No.1 ⑥ – 2-3-4 ⑦ – 1-2-3-4

REAR MAIN BEARING OIL SEAL

Removal – Remove rear main bearing cap and pry out old seal. Remove upper half of seal by tapping with brass punch until end of seal protrudes enough to be removed with pliers.

Installation – Fabricate installing tool as shown in illustration. Coat seal lips and seal bead of upper seal. Keep oil off mating ends. Position tip of tool between crankshaft and seal seat in cylinder block and position seal between crankshaft and tip of tool so that seal bead contacts tip of tool. Roll seal around crankshaft using tool as a "shoehorn" to protect seal bead from sharp corner of seal seat surface. Make sure that oil-seal lip is positioned toward front of engine. *NOTE – Installation tool must remain in position until seal is positioned with both ends flush with block. Remove tool being careful not to withdraw seal.*



REAR MAIN OIL SEAL INSTALLING TOOL

Install lower half of seal in bearing cap, using tool as a "shoehorn". Feed seal into cap using light pressure with thumb and finger. Install bearing cap with sealant applied to face, being careful to keep sealant off the seal split line.

1968-73 396" (402"), 400" (402"), 427", 454" V8 ENGINES (Cont.)

VIBRATION DAMPER

Removal (All Engines) – Remove battery, fan belt, fan and pulley. Remove radiator and fan shroud. Remove pulley from damper (on Corvette, remove engine front mount bolts and raise engine for clearance to pulley bolts). Using a suitable puller, remove damper from engine. *NOTE – On vehicles equipped with automatic transmission, oil cooler lines must be removed.*

Installation (Exc. Corvette) – Coat seal contact surface on damper with engine oil and position damper on crankshaft. Using a suitable installing tool, pull damper into position on crankshaft.

Installation (Corvette) – Coat seal contact surface on damper with motor oil and position on crankshaft. On 250 and 300 HP engines, drive damper on crankshaft until it bottoms out on crank gear. On 365 and 375 HP engines, pull damper into position on crankshaft with a suitable tool.

FRONT COVER REMOVAL

Remove water pump, oil pan and vibration damper, then remove front cover.

FRONT COVER OIL SEAL REPLACEMENT

Front Cover Installed On Engine - Remove crankshaft pulley and hub or vibration damper and pry old oil seal out of cover from the front with screwdriver, install seal with open end of seal toward inside of front cover and drive into place with suitable tool.

Front Cover Removed From Engine - Pry old oil seal out of cover from the front with screwdriver. Support cover at sealing area and install new seal with open end of seal toward inside of front cover. Drive into place with suitable tool.

CAMSHAFT SPECIFICATIONS

Engine	Journal Diameter
1968-69	
396" & 427"	1.9482 – 1.9492"
1970	
396" (402"), 400" (402") & 454"	1.9487 – 1.9497"
1971-73	
402" & 454"	1.9482 – 1.9492"

CHECKING CAMSHAFT LOBE LIFT

Remove rocker arm and balls. Attach a dial indicator to rocker arm stud or rocker arm cover mounting hole and adjust dial indicator to seat in push rod cup. *NOTE – Be sure push rod is seated in lifter socket.* Rotate crankshaft slowly until lifter is on heel of cam lobe (push rod will be at lowest position). Zero dial indicator and slowly "bump" engine over until push rod is fully raised. *CAUTION – Ground primary wire on coil when cranking engine.* Compare total lift on dial indicator with specifications (see Cam Lobe Lift table). Continue to rotate engine until indicator reads zero.

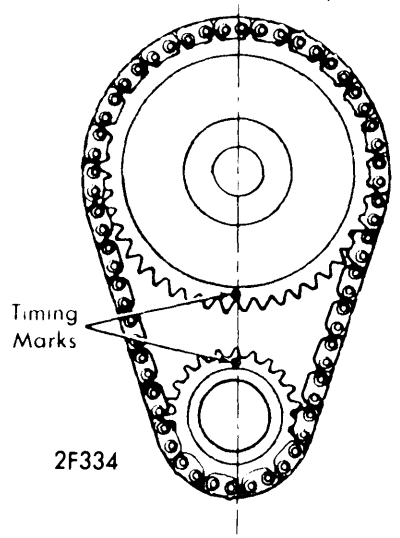
CAM LOBE LIFT

Engine & Year	LIFT Intake	LIFT Exhaust
396"		
1968-69		
(265 & 375 HP)	.2343"	.2343"
(350 HP)	.2714"	.2714"
(375 HP)	.3057"	.3057"
427"		
1968-69		
(385, 390 & 400 HP)	.2714"	.2714"
(425 HP)	.3057"	.3057"
(430 HP)	.3286"	.3412"
(435 HP)	.3057"	.3057"
396" (402")		
1970		
(350 HP)	.2714"	.2824"
(375 HP)	.3057"	.3057"
400" (402")		
1970		
(330 HP)	.2343"	.2343"
454"		
1970		
(345 HP)	.2343"	.2539"
(360 HP)	.2655"	.2824"
(390 HP)	.2714"	.2824"
(450 HP)	.3057"	.3057"
402"		
1971-72		
(300 HP)	.2343"	.2343"
454"		
1971-72		
(365 & 425 HP)	.2714"	.2824"
454"		
1973	.2590"	.2590"

CAMSHAFT REPLACEMENT

Removal – Install two bolts through camshaft bolt holes and pull camshaft through front of block. *NOTE – Support shaft to prevent damage to bearings.*

Installation – Coat lobes with Molykote and entire camshaft with lubricant. Reverse removal procedure.



VALVE TIMING MARKS

1968-73 396" (402"), 400" (402"), 427", 454" V8 ENGINES (Cont.)

CAMSHAFT BEARING REPLACEMENT

Install front and rear bearings first. Center the No. 2 and 3 bearings being pulled into place. *CAUTION - Make sure oil holes in bearings line up with oil holes in cylinder block.* When installing end plug, install flush to 1/32" deep.

ENGINE NOTES

►*1971 NEW INTAKE VALVE STEM SEALS:* Late 1971 production 402" engines have valve stem seals on all intake valves. The teflon seal is enclosed in a steel housing that seats over the valve guide. Current and past versions of the 396" and 402" engines can be fitted with these seals. *NOTE - Discard the oil deflector located in the spring cap when valve stem seals are used.*

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.
Cylinder Head	① 80
Intake Manifold	30
Exhaust Manifold	20
Oil Pan-to-Crankcase (1/4" Bolts)	80 INCH Lbs.
Oil Pan-to-Crankcase (5/16" Bolts)	135 INCH Lbs.
Main Bearing Caps	105
Flywheel	65
Connecting Rod Caps	50
Camshaft Sprocket	20
Rocker Arm Cover	50 INCH Lbs.
Rocker Arm Stud	50
Engine Front Cover	80 INCH Lbs.
Water Pump	30
Oil Pump	65
Oil Pump Cover	80 INCH Lbs.
Oil Filter	25
Flywheel Housing	7

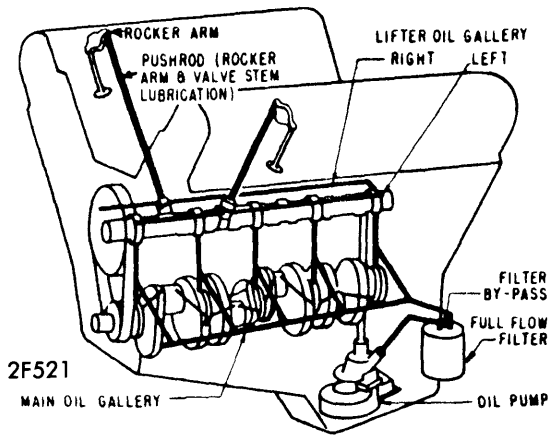
① - Aluminum head short bolts 65 Ft. Lbs., long bolts 75 Ft. Lbs.

ENGINE OILING

Crankcase Capacity - All Engines, 4 Qts. Add 1 Qt. with filter change.

Oil Pressure - 50-75 psi at 2000 RPM (1968-70). 40 psi at 2000 RPM (1971-73).

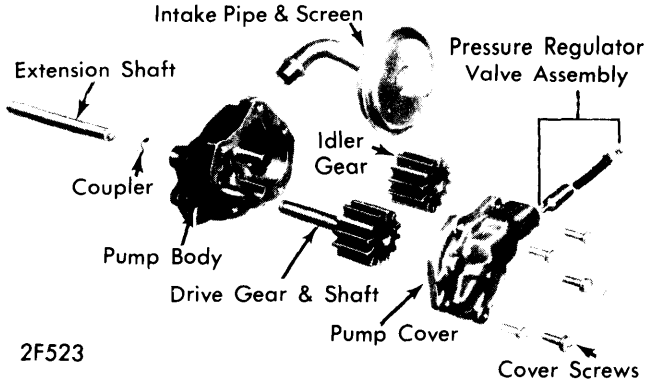
Pressure Regulator Valve - In oil pump body, nonadjustable.



ENGINE OILING SYSTEM

ENGINE OILING SYSTEM

Full pressure lubrication through a full flow oil filter is furnished by a gear-type oil pump. Main oil gallery feeds oil, through drilled passages, to camshaft and crankshaft to lubricate bearings. Valve lifter gallery feeds the valve lifters, which feed the individual rocker arms through hollow push rods.



ENGINE OIL PUMP

ENGINE OIL PUMP ASSEMBLY

Removal - Mark gears so they may be reassembled with same teeth indexing. Do not disturb pickup screen on pipe. Screen is serviced as an assembly. *NOTE - If pump gears or body are damaged or worn, replacement of entire pump assembly is necessary.*

Installation - Apply sealer to end of pipe and tap in place. Install idler gear in pump body with smooth side of gear towards cover opening. *NOTE - Bottom of screen must be parallel with bottom of pan.*