GROUP 9
ENGINE
DATA AND SPECIFICATIONS

ENGINE

Type	90° V
Number of Cylinders	8
Bore RC1 (361 cu. in. displacement)	4.125″
RC2 (383 cu. in. displacement)	4.25″
RC3, RY1 (413 cu. in. displacement)	4.19″
Stroke RC1, RC2	3.375″
RC3, RYI	3.750″
Piston Displacement RC1	361 cu. in.
RC2	383 cu. in.
RC3, RY1	413 cu. in.
Compression Ratio (Regular Fuel) 361 cu. in.	9.1 to 1
Compression Ratio 383, 413 cu. in.	10.1 to 1
Compression Pressure at 150 rpm (spark plugs removed) Wide Open Throttle	
361 cubic inch displacement	135-165 psi
383 and 413 cubic inch displacement	150-180 psi
Maximum Variation between Cylinders—Any One Engine	
361 cubic inch displacement	20 psi
383 and 413 cubic inch displacement	25 psi
Firing Order	1-8-4-3-6-5-7-2

CYLINDER NUMBERING (FRONT AND REAR)

Left Bank	1-3-5-7
Right Bank	2-4-6-8

CRANKSHAFT

Type	Fully Counter-Balanced
Bearings	Steel Backed Babbitt
Journal Diameter (RC1, RC2)	2.6245 to 2.6255″
(RC3, RY1)	2.7495 to 2.7505″
Crank Pin Diameter	2.374 to 2.375″
Maximum Out-of-Round Permissible	.001″
Number of Main Bearings	5
Clearance Desired (Bearing Installed I.D. Minus Journal O.D.)	.0005 to .0015″
Maximum Clearance Allowable Before Reconditioning	.0025″
End Play	.002 to .007″
Thrust Taken By	No. 3 Main Bearing
Finish at Rear Seal Surface	Diagonal Knurling
Interchangeability of Bearings	Upper Nos. 1, 2, 4, 5. Lower Nos. 1, 2, 4, 5.

MAIN BEARINGS (Service)

All available in standard and the following undersizes	.001, .002, .003, .010, .012″

CONNECTING RODS AND BEARINGS

Type	Drop Forged "I" Beam
Length (Center to Center) RC1, RC2	6.356 to 6.360″
RC3, RY1	6.766 to 6.770″
Weight (Less Bearing Shells) RC1, RC2	812 gms.
RC3, RY1	844 gms.

DATA AND SPECIFICATIONS—Continued

Bearings	Steel Backed Babbitt
Diameter and Length	2.376 x .927″
Clearance Desired (Bearing Installed I.D. Minus Journal O.D.)	.0005 to .0015″
Maximum Allowable Before Reconditioning	.0025″
Side Clearance	.009 to .017″
Bearings for Service	Standard .001, .002, .003, .010, .012″ Undersize
Piston Pin Bore Diameter	1.0925 to 1.0928″

CAMSHAFT

Drive	Chain
Bearings	Steel Backed Babbitt
Number	5
Thrust Taken By	Cylinder Block
Clearance Desired (Bearing Installed I.D. Minus Journal O.D.)	.001 to .003″
Maximum Allowable Before Reconditioning	.005″

CAMSHAFT BEARING JOURNALS

Diameter	
No. 1	1.998 to 1.999″
No. 2	1.982 to 1.983″
No. 3	1.967 to 1.968″
No. 4	1.951 to 1.952″
No. 5	1.748 to 1.749″

CAMSHAFT BEARINGS

Diameter (after reaming)	
No. 1	2.000 to 2.001″
No. 2	1.984 to 1.985″
No. 3	1.969 to 1.970″
No. 4	1.953 to 1.954″
No. 5	1.750 to 1.751″

TIMING CHAIN

Adjustment	None
Number of Links	50
Pitch	.50″
Width	.88″

TAPPETS

Type	Hydraulic
Clearance in Block	.0005 to .0018″
Body Diameter	.9040 to .9045″
Clearance Between Valve Stem and Rocker Arm Pad	Dry Lash .060-.210″

PISTONS

Type	Horizontal Slot w/Steel Struts
Material	Aluminum Alloy Tin Coated
Land Clearance	.031 to .037″
Clearance at Top of Skirt	.0005 to .0010″
Weight (Standard Through .040″ Oversize)	
RC1, 361 cu. in.	732 grms.
RC2, 383 cu. in.	770 grms.

DATA AND SPECIFICATIONS — Continued

RC3, RY1, 413 cu. in.	780 grms.
Piston Length (Overall) RC1, RC2	3.84 in.
RC3, RY1	3.96 in.
Ring Groove Depth	
No. 1. RC1—361 cu. in.	.214 in.
RC2—383 cu. in.	.220 in.
RC3, RY1—413 cu. in.	.216 in.
No. 2. RC1—361 cu. in.	.214 in.
RC2—383 cu. in.	.220 in.
RC3, RY1—413 cu. in.	.216 in.
No. 3. RC1—361 cu. in.	.203 in.
RC2—383 cu. in.	.208 in.
RC3, RY1—413 cu. in.	.206 in.
Pistons for Service	Standard, .005″, .020″, .040″ Oversize

PISTON PINS

Type	Press Fit in Rod
Diameter	1.0935 to 1.0937″
Length	3.555 to 3.575″
Clearance in Piston	.00045 to .00075″
Interference in Rod	.0007 to .0012″
Piston Pins for Service	Standard Only
Direction Offset in Piston	Toward Right Side of Engine

PISTON RINGS

Number of Rings per Piston	3
Compression	2
Oil	1
Width of Rings	
(Compression)	.0775 to .0780″
(Oil)	.1860 to .1865″
Piston Ring Gaps (all)	.013 to .025″

RING SIDE CLEARANCE

(Compression)	
Upper	.0015 to .0030″
Intermediate	.0015 to .0030″
(Oil)	.0010 to .0030″

VALVES—Intake

Material	1041 steel with Aluminized Faces
Head Diameter	2.08″
Length (to center of valve face)	4.79″
Stem Diameter	.372 to .373″
Stem to Guide Clearance	.001 to .003″
Maximum Allowable Before Reconditioning	.004″
Angle of Seat	45°
Adjustment	None
Lift	.389″

VALVES—Exhaust

Material	Nitrogen Treated Manganese Chromium-Nickel Steel

DATA AND SPECIFICATIONS — Continued

Head Diameter	1.60″
Length (to center of valve face)	4.79″
Stem Diameter	.371 to .372″
Stem to Guide Clearance	.002 to .004″
Maximum Allowable before Reconditioning	.006″
Angle of Seat	45°
Adjustment	None
Lift	.389″

VALVE SPRINGS

Number	16
Free Length	2.34″
Load When Compressed to (valve closed)	1.860″ @ 95-105 lbs.
Load When Compressed to (valve open)	1.470″ @ 187-203 lbs.
Valve Springs I.D.	1.010 to 1.030″

CYLINDER HEAD

Number Used	2
Combustion Chamber	Wedge Type
Valve Seat Runout (maximum)	.002″
Intake Valve Seat Angle	45°
Seat Width (finished)	.060 to .085″
Exhaust Valve Seat Angle	45°
Seat Width (finished)	.040 to .060″
Cylinder Head Gasket Compressed (thickness)	.022″

ENGINE LUBRICATION

Pump Type	Rotor Full Pressure
Capacity (qts.)	5*
Pump Drive	Camshaft
Operating Pressure at 40 to 50 mph	45 to 65 lbs.
Pressure Drop Resulting from Clogged Filter	7 to 9 lbs.

*When Filter Is Replaced, Add 1 Quart

OIL PUMP—INSPECTION LIMITS FOR REPLACEMENT

Filter Base Surface	.0015 inch or more
Outer Rotor Length	.943 inch or less
Outer Rotor Diameter	2.469 inch or less
Inner Rotor Length	.942 inch or less
Clearance over Rotor—Outer	.004 inch or more
Inner	.005 inch or more
Outer Rotor Clearance	.012 inch or more
Tip Clearance Between Rotors	.010 inch or more

TIGHTENING REFERENCE

	Torque Foot-Pounds	Thread Size
Connecting Rod Nut—Plain	45	3/8-24
Cylinder Head Bolt	70	7/16-14
Main Bearing Cap Bolt	85	1/2-13

TIGHTENING REFERENCE — Continued

	Torque Foot-Pounds	Thread Size
Spark Plug	30	14MM
Camshaft Lockbolt	35	7/16-14
Carburetor to Manifold Nut	7	5/16-24
Chain Case Cover Bolt	15	5/16-18
Torque Converter Housing Bolt	30	3/8-16
Clutch Housing Bolt	30	3/8-16
Crankshaft Rear Bearing Seal Retainer	30	3/8-16
Crankshaft Bolt	135	3/4-16
Cylinder Head Cover Stud and Nut	40 in. lbs.	1/4-28
Distributor Vacuum Line Tube Nut	95 in. lbs.	3/8-24
Distributor Clamp Bolt	15	5/16-18
Engine Front Mounting to Frame Bolt	85	1/2-20
Engine Front Mounting to Block Nut	45	7/16-20
Engine Front Mounting to Frame Stud	20	1/2-13
Exhaust Manifold Nut	30	3/8-16
Exhaust Pipe Flange Nut	40	7/16-20
Exhaust Pipe Clamp Bolt	20	3/8-24
Exhaust Pipe Support Clamp Bolt	20	3/8-24
Fan Attaching Bolt	15-18	5/16-18
Fan Belt Idler Pulley Nut	45	7/16-20
Fan Belt Idler Pulley Bracket Bolt	30	3/8-16
Fuel Pump Attaching Bolt	30	3/8-16
Alternator Bracket to Manifold Bolt	50	7/16-14
Alternator Mounting Nut	20	5/16-24
Alternator Adjusting Strap Bolt	15	5/16-18
Alternator Adjusting Strap Mounting Bolt	30	3/8-16
Intake Manifold Bolt	50	3/8-16
Manifold Heat Control Counterweight Bolt	50 in. lbs.	No. 10-32
Oil Pan Drain Plug	35	5/8-18
Oil Pan Bolt	15	5/16-18
Oil Pump Cover Bolt	10	5/16-18
Oil Pump Attaching Bolt	35	3/8-16
Oil Filter Attaching Stud	30	3/4-16
Rocker Shaft Bracket Bolt	30	3/8-16

TIGHTENING REFERENCE — Continued

	Torque Foot-Pounds	Thread Size
Starter Mounting Bolt	50	7/16-14
Vibration Damper Bolt	15	5/16-18
Valve Tappet Cover End Bolt	9	¼-20
Water Pump to Housing Bolt	30	⅜-16
Water Pump Housing to Cylinder Block Bolt	30	⅜-16
A/C Compressor to Engine Bolt	30	⅜-16

GROUP 9

ENGINE

Three V-8 engines are used for 1961. They are:

RC-1, 361 cu. in. Displacement

RC-2, 383 cu. in. Displacement

RC-3 and RY-1, 413 cu. in. Displacement

The service procedures will remain the same as outlined in the 1960 Chrysler and Imperial Service Manual except for the closed crankcase ventilation system, which follows:

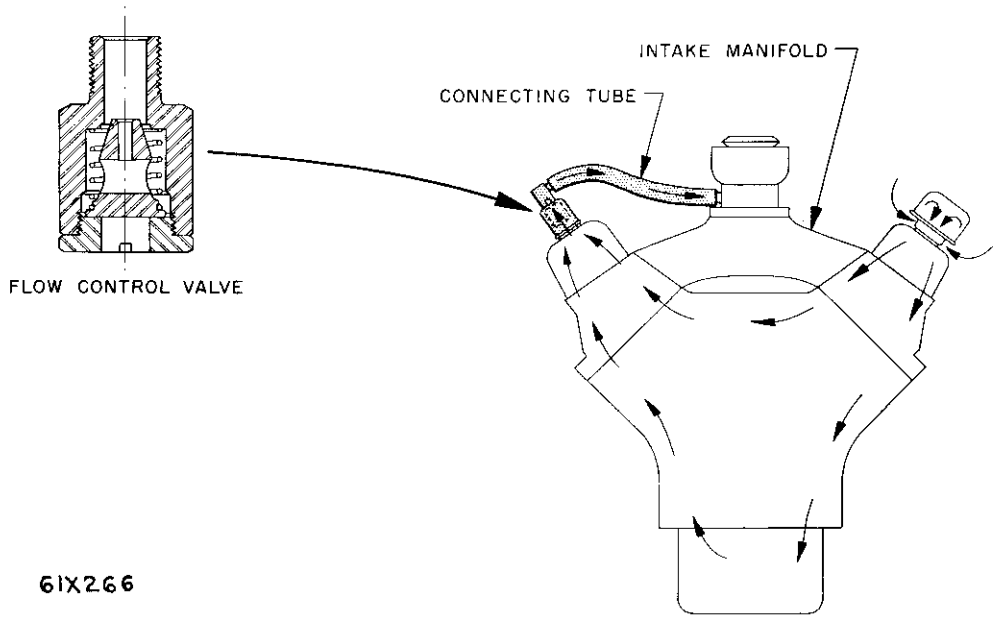

Fig. 1—Closed Crankcase Ventilating System