

# 1981 Medium & Heavy Duty Diesel

## CUMMINS

### GENERAL SPECIFICATIONS

Engine	Cycle	Displ. Cu. Ins.	Compr. Ratio	Bore	Stroke	Firing Order ②	Inj. Timing ①
V8-210	4	504"	17.0:1	4.625"	3.750"	1,5,4,8,6,3,7,2	③24.5°
V8-555	4	555"	17.0:1	4.625"	4.125"	1,5,4,8,6,3,7,2	③22.5°
NH/NT 855	4	855"	15.8:1	5.4995"	6.000"	R-1,5,3,6,2,4 L-1,4,2,6,3,5	20.0°
V/VT 903	4	903"	15.5:1	5.4995"	4.750"	1,5,4,8,6,3,7,2	21.0°
KT 1150	4	1150"	14.5:1	6.250"	6.250"	1,5,3,6,2,4	⑤.2032"

① — Unless noted otherwise, all Injection Timing is BTDC.

② — R- Right-hand rotation. L- Left-hand rotation.

③ — "H" Model is 15.5° BTDC.

④ — "H" Model is 14.5° BTDC.

⑤ — Piston travel with 0.1080" push rod travel.  
Use of special tools required.

### NORMAL OPERATING SPECIFICATIONS

Engine	Idle RPM	Max. RPM	Oil Temp.	Oil Press.	Coolant Temp.	Compression Pressure (PSI) @ RPM (Sea Level)
V8-210	525-600	3300	240°	40-58	190°	.....
V8-555	525-620	3300	225°	40-75	200°	.....
NH/NT855	600	2100	225°	40-75	200°	.....
V/VT903	600-650	2600	225°	40-65	190°	.....
KT1105	600	2100	225°	45-70	200°	.....

### VALVES & SEATS

Engine	Head Diameter	Face Angle	Seat Angle	Seat Width	Stem Diameter	Stem Clearance	Valve Seat Insert O.D.	Valve Clearance
V8-210								
Int.	.....	30°	30°	.060-.125"	.3795-.3785"	.0015-.0022"	1.690-1.691"	.010"
Exh.	.....	30°	30°	.060-.125"	.3795-.3785"	.0015-.0022"	1.690-1.691"	.020"
V8-555								
Int.	.....	30°	30°	.060-.125"	.3795-.3785"	.0015-.0020"	1.690-1.691"	.010"
Exh.	.....	30°	30°	.060-.125"	.3795-.3785"	.0015-.0020"	1.690-1.691"	.020"
NH/NT 855								
Int.	.....	30°	30°	.125"	.4500-.4510"	.0022-.0025"	2.0025-2.0035"	.014"
Exh.	.....	30°	30°	.125"	.4500-.4510"	.0022-.0025"	2.0025-2.0035"	.029"
V/VT 903								
Int.	.....	30°	30°	.060-.125"	.4500-.4510"	.0020-.0022"	2.0025-2.0035"	.012"
Exh.	.....	30°	30°	.060-.125"	.4500-.4510"	.0020-.0022"	2.0025-2.0035"	.025"
KT 1150								
Int.	.....	30°	30°	.100"	.4945-.4955"	.0005-.0016"	2.3805-2.3815"	.014"
Exh.	.....	30°	30°	.100"	.4945-.4955"	.0005-.0016"	2.3805-2.3815"	.027"

### VALVE SPRINGS

Engine	Free Length	Compressed Length	Lbs. @ Comp. Length
V8-210	1.953"	1.329"	221
V8-555	1.953"	1.329"	221
NH/NT 855	2.890"	1.765"	108
V/VT 903	2.350"	1.287"	136
KT 1150	3.349"	1.908"	266

### CAMSHAFT

Engine	Journal Diam.	Clearance	Lobe Lift
V8-210	1.997-1.998"	.....	.002-.006"
V8-555	1.997-1.998"	.....	.002-.006"
NH/NT 855	1.997-1.998"	.0020-.0025"	.010"
V/VT 903	2.496-2.497"	.0030-.0035"	.007-.011"
KT 1150	2.996-2.997"	.0035-.0040"	.009"

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ROCKER ARMS & VALVE BRIDGES						
Engine	Rocker Shaft O.D.	Rocker Arm I.D.	Rocker Arm Clearance	Bridge Guide O.D.	Bridge I.D.	Bridge Height Above Head
V8-210	1.1230-1.1240"	1.1245-1.1280"	.0015-.0040"	.3750-.3755"	.376-.378"	2.040-2.060"
V8-555	1.1230-1.1240"	1.1245-1.1280"	.0015-.0040"	.3750-.3755"	.376-.378"	2.040-2.060"
NH/NT 855	1.1230-1.1240"	1.1245-1.1275"	.0015-.0035"	.4330-.4335"	.440-.442"	1.860-1.880"
V/VT 903	1.1855-1.1865"	1.1875-1.1905"	.0020-.0040"	.4330-.4335"	.434-.436"	1.860-1.880"
KT 1150	1.3720-1.3725"	1.3755-1.3765"	.0015-.0040"	.4330-.4335"	.434-.436"	2.350-2.370"

PISTONS, PINS, RINGS						
Engine	PISTONS		PINS		RINGS	
	Clearance	Piston Fit	Rod Fit	Rings	End Gap	Side Clearance
V8-210	.0085-.0110"	.0003"	Press Fit	1	.013"	.005"
				2	.025"	.005"
				3	.010"	.005"
V8-555	.0085-.0110"	.0003"	Press Fit	1	.013"	.005"
				2	.025"	.005"
				3	.010"	.005"
NH/NT 855	.0125-.0130"	.0002"	Press Fit	1	.023"	.005"
				2	.019"	.005"
				3	.019"	.005"
				4	.010"	.005"
V/VT 903	.0095-.0120"	.0003"	Press Fit	1	.017"	.005"
				2	.013"	.005"
				3	.010"	.005"
KT 1150	.0112-.0115"	.0003"	Press Fit	1	.025"	.005"
				2	.025"	.005"
				3	.012"	.005"

CRANKSHAFT & MAIN BEARINGS						
Engine	Journal Diameter	Bearing Clearance	Crankshaft End Play	Thrust Location	Thrust Washer Thickness	Number of Main Bearings
V8-210	3.4990-3.5000"	.0015-.0045"	.004-.014"	No.5	.1490-.1510"	5
V8-555	3.4990-3.5000"	.0015-.0045"	.004-.014"	No.5	.1490-.1510"	5
NH/NT 855	4.4985-4.5000"	.0015-.0050"	.007-.022"	No.7	.2450-.2470"	7
V/VT 903	3.7490-3.7500"	.0020-.0090"	.005-.015"	Front	.1505-.1735"	5
KT 1150	5.4985-5.5000"	.0026-.0065"	.004-.016"	No.6	.1505-.1735"	7

CYLINDER LINER & BORE			
Engine	Type	Liner Bore	Liner Protrusion
V8-210	Wet	4.6245-4.6260"	.006-.009"
V8-555	Wet	4.6245-4.6260"	.006-.009"
NH/NT 855	Wet	5.4995-5.5010"	.003-.006"
V/VT 903	Wet	5.4995-5.5010"	.003-.006"
KT 1150	Wet	6.2495-6.2550"	.003-.006"

CONNECTING RODS & BEARINGS			
Engine	Journal Diameter	Bearing Clearance	Sideplay
V8-210	2.4990-2.5000"	.0015-.0045"	.008-.018"
V8-555	2.7490-2.7500"	.0015-.0045"	.008-.018"
NH/NT 855	3.1235-3.1250"	.0015-.0045"	.....
V/VT 903	3.1240-3.1250"	.0050"	.005-.020"
KT 1150	3.9985-4.0000"	.0050"	.....

## CUMMINS (Cont.)

## OIL PUMP SPECIFICATIONS

## V8-210 &amp; V8-555

Type .....	Gear
Idler Gear Bushing I.D. ....	.6195-.6205"
Pump Drive Shaft Bushing I.D. ....	.6165-.6175"
Drive Shaft Diameter .....	.6150-.6155"
Idler Shaft Diameter .....	.6180-.6185"
Driven-to-Idler Gear Backlash .....	.016-.020"

## NH/NT 855

Type .....	Gear
Bushings I.D. ....	.8400-.8405"
Idler and Drive Shaft Diameter .....	.8375-.8380"
Driven Shaft Protrusion .....	.580-.610"
Drive Shaft Protrusion .....	.050-.070"
Drive Shaft End Play .....	.004-.010"
Pressure Relief Valve Open .....	130PSI

## V903 &amp; VT903

Type .....	Gear
Shaft Bores .....	.8770-.8775"
Drive Shaft Diameter .....	.8740" min
Idler Shaft Diameter .....	.8750" min
Pump Gears .....	2.397" min
Gear Housing Diameter .....	2.415" max
Gear Housing Depth .....	1.252" max
Clearance Driven Gear From Shaft End .....	.5450-.5750"
Clearance Scavenger Drive Gear-to-Body ..	.0020-.0040"
Clearance Drive Gear From Shaft End .....	1.232-1.290"
Clearance Main Drive Gear From Shaft End .....	.0000-.0200"

## KT1150

Type .....	Gear
Bushing I.D. ....	.8765-.8775"
Idler Shaft Diameter .....	.8745-.8750"
Drive Shaft Diameter .....	.8745-.8750"
Clearance Drive Gear-to-Body .....	.1300-.1500"
Shaft Protrusion From Mounting Surface ....	1.030-1.050"
Drive Shaft End Clearance .....	.0025-.0065"

## TIGHTENING SPECIFICATIONS

## V8-210

**NOTE** — Use minimum two steps to torque all nuts and bolts.

Application	Ft. Lbs.
Cylinder Head Bolts <sup>⓪</sup> .....	110-115
Main Bearing Cap Bolts .....	175-185
Connecting Rod Cap Nuts .....	55
Flywheel Bolts .....	100-105
Pulley-to-Crankshaft .....	90-100

<sup>⓪</sup> — See cylinder head tightening sequence.

## TIGHTENING SPECIFICATIONS (Cont.)

## V8-555

**NOTE** — Use minimum two steps to torque all nuts and bolts.

Application	Ft. Lbs.
Cylinder Head Bolts <sup>⓪</sup> .....	135-140
Main Bearing Cap Bolts .....	165-175
Connecting Rod Cap Nuts .....	85-90
Flywheel Bolts .....	135-140
Vibration Damper-to-Crankshaft .....	135-140

<sup>⓪</sup> — See cylinder head tightening sequence.

## NH/NT 855

**NOTE** — Use minimum two steps to torque all nuts and bolts.

Application	Ft. Lbs.
Cylinder Head Bolts <sup>⓪</sup> .....	280-300
Main Bearing Cap Bolts .....	300-310
Connecting Rod Cap Nuts .....	140-150
Flywheel Bolts .....	200-220
Vibration Damper and Pulley-to-Crankshaft ....	180-200

<sup>⓪</sup> — See cylinder head tightening sequence.

## V903 &amp; VT903

**NOTE** — Use minimum two steps to torque all nuts and bolts.

Application	Ft. Lbs.
Cylinder Head Bolts <sup>⓪</sup> .....	280-300
Main Bearing Cap Bolts .....	340-350
Connecting Rod Cap Nuts .....	95-100
Flywheel Bolts .....	200-210
Vibration Damper and Pulley-to-Crankshaft ....	200-205

<sup>⓪</sup> — See cylinder head tightening sequence.

## KT1150

**NOTE** — Use minimum two steps to torque all nuts and bolts.

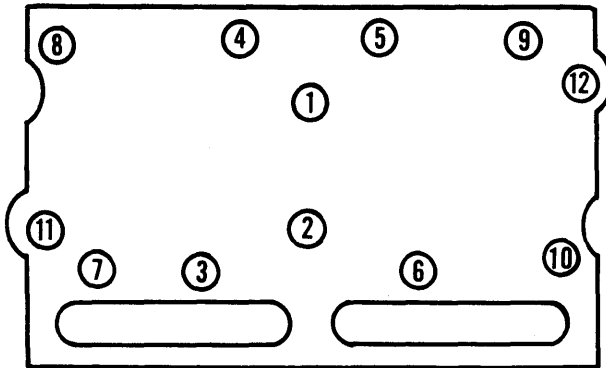
Application	Ft. Lbs.
Cylinder Head Bolts <sup>⓪</sup>	
Cadium Plated .....	250-260
Lubrited .....	350-370
Main Bearing Cap Bolts .....	440-450
Connecting Rod Cap Nuts .....	210-220
Flywheel Bolts .....	200-220
Vibration Damper and Pulley-to-Crankshaft ....	320-340

<sup>⓪</sup> — See cylinder head tightening sequence.

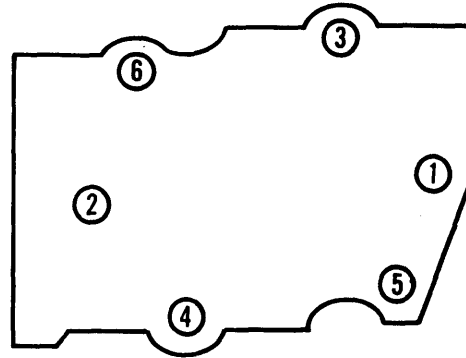
## CUMMINS (Cont.)

### CYLINDER HEAD TIGHTENING SEQUENCE

NH/NT 855



KT 1150



V8-210, V8-555, V903 & VT903

