

# Medium & Heavy Duty Diesel

## INTERNATIONAL HARVESTER

GENERAL SPECIFICATIONS							
Engine	Cycle	Displ. Cu. Ins.	Compr. Ratio	Bore	Stroke	Firing Order	Inj. Timing ①
D-150	4	461"	17.0:1	4.125"	4.313"	1,8,7,3,6,5,4,2	.207"
D-170	4	549"	17.0:1	4.500"	4.313"	1,8,7,3,6,5,4,2	.207"
D-190	4	549"	17.0:1	4.500"	4.313"	1,8,7,3,6,5,4,2	.207"
DT-466	4	466"	15.1:1	4.300"	5.350"	1,5,3,6,2,4	②13.0°
V-800	4	798"	16.0:1	5.313"	4.500"	1,8,7,3,6,5,4,2	22.0°

- ① — Unless noted otherwise, all Injection Timing is BTDC.
- ② — Timing for Model DTI-466, Intercooled is 15.0° static.

NORMAL OPERATING SPECIFICATIONS						
Engine	Idle RPM	Max. RPM	Oil Temp.	Oil Press.	Coolant Temp.	Compression Pressure (PSI) @ RPM (Sea Level)
D-150	550-600	3000	220°	45-60	190°	375-425@ ①
D-170	550-600	3000	220°	45-60	190°	375-425@ ①
D-190	550-600	3000	220°	45-60	190°	375-425@ ①
DT-466	675	2920	230°	40-65	202°	.....
DTI-466	675	2935	230°	40-60	202°	.....
V-800	625-675	2860	220°	45-65	190°	400-470@234

- ① — Cranking Speed.

VALVES & SEATS								
Engine	Head Diameter	Face Angle	Seat Angle	Seat Width	Stem Diameter	Stem Clearance	Valve Seat Insert O.D.	Valve Clearance
D-150								
Int.	1.1810"	45°	45°	.080-.090"	.3725-.3730"	.0080-.0230"	.....	.014"
Exh.	1.030"	45°	45°	.080-.090"	.3720-.3725"	.0080-.0230"	.....	.016"
D-170								
Int.	1.990"	45°	45°	.080-.090"	.3725-.3730"	.0080-.0230"	.....	.014"
Exh.	1.740"	45°	45°	.080-.090"	.3720-.3725"	.0080-.0230"	.....	.016"
D-190								
Int.	1.990"	45°	45°	.080-.090"	.3725-.3730"	.0080-.0230"	.....	.014"
Exh.	1.740"	45°	45°	.080-.090"	.3720-.3725"	.0080-.0230"	.....	.016"
DT-466								
Int.	1.965-1.975"	30°	30°	.075-.085"	.3718-.3725"	.0015-.0032"	1.996-1.997"	①.019-.021"
Exh.	1.595-1.605"	45°	45°	.075-.085"	.3718-.3725"	.0015-.0032"	1.624-1.625"	①.024-.026"
V-800								
Int.	1.500"	30°	30°	.080"	.3718-.3725"	.0015-.0032"	.....	.013"
Exh.	1.260"	30°	30°	.080"	.3718-.3725"	.0015-.0032"	.....	.025"

- ① — Clearance is with engine cold.

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## INTERNATIONAL HARVESTER (Cont.)

VALVE SPRINGS			
Engine	Free Length	Compressed Length	Lbs. @ Comp. Length
D-150	2.075"	1.397"	200
D-170	2.075"	1.397"	200
D-190	2.075"	1.397"	200
DT-466	2.340"	1.552"	156-165
V-800	1.835"	1.571"	58-62

CAMSHAFT			
Engine	Journal Diam.	Clearance	Lobe Lift
D-150, D-170 & D-190			
No.1	2.346-2.347"	.0015-.0035"	.0035-.0115"
No.2	2.315-2.316"	.0015-.0035"	.0035-.0115"
No.3	2.289-2.290"	.0015-.0035"	.0035-.0115"
No.4	2.246-2.247"	.0015-.0035"	.0035-.0115"
DT-466	2.2814-2.2825"	.0020-.0066"	.0050-.0130"
V-800	2.346-2.347"	.0020-.0065"	.0050-.0130"

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
D-150	.....	.....	.0011-.0045"	.....	.....	1.219"
D-170	.....	.....	.0011-.0045"	.....	.....	1.219"
D-190	.....	.....	.0011-.0045"	.....	.....	1.219"
DT-466	.8491-.8501"	.851-.853"	.0009-.0039"	.....	.....	.....
V-800	.9990-1.0010"	.....	.....	.....	.....	0.910"

PISTONS, PINS, RINGS						
Engine	PISTONS Clearance	PINS		RINGS		
		Piston Fit	Rod Fit	Rings	End Gap	Side Clearance
D-150	.0055-.0065"	.0009-.0015"	Press Fit	1	.013-.023"	.0035-.0050"
				2	.013-.023"	.0035-.0050"
				3	.013-.028"	.0015-.0030"
D-170	.0060-.0070"	.0009-.0015"	Press Fit	1	.013-.023"	.0035-.0050"
				2	.013-.023"	.0035-.0050"
				3	.013-.028"	.0015-.0030"
D-190	.0060-.0070"	.0009-.0015"	Press Fit	1	.013-.023"	.0035-.0050"
				2	.013-.023"	.0035-.0050"
				3	.013-.028"	.0015-.0030"
DT-466	.0045-.0065"	.0005-.0010"	.0006-.0010"	1	.016-.026"	.0000-.0280"
				2	.020-.030"	.0045-.0215"
				3	.010-.020"	.002-.004"
V-800	.0060-.0090"	.0005-.0011"	Press Fit	1	.018-.028"	.0020-.0040"
				2	.020-.030"	.0000-.0150"
				3	.008-.018"	.0015-.0035"

CRANKSHAFT & MAIN BEARINGS						
Engine	Journal Diameter	Bearing Clearance	Crankshaft End Play	Thrust Location	Thrust Washer Thickness	Number of Main Bearings
D-150	3.123-3.1240"	.0018-.0048"	.004-.010"	No.3	.....	5
D-170	3.123-3.1240"	.0018-.0048"	.004-.010"	No.3	.....	5
D-190	3.123-3.1240"	.0018-.0048"	.004-.010"	No.3	.....	5
DT-466	3.3742-3.3755"	.0018-.0051"	.006-.012"	No.7	.....	7
V-800	3.7477-3.7490"	.0026-.0059"	.003-.011"	No.5	.....	5

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CYLINDER LINER & BORE			
Engine	Type	Liner Bore	Liner Protrusion
D-150	①	.....	.....
D-170	①	.....	.....
D-190	①	.....	.....
DT-466	Wet	4.300-4.301"	.002-.005"
V-800	Wet	5.3125-5.3135"	.003-.006"

① — Liners are not used.

CONNECTING RODS & BEARINGS			
Engine	Journal Diameter	Bearing Clearance	Sideplay
D-150	2.753-2.754"	.0018-.0048"	.....
D-170	2.753-2.754"	.0018-.0048"	.....
D-190	2.753-2.754"	.0018-.0048"	.....
DT-466	2.9977-2.9990"	.0018-.0051"	.007-.015"
V-800	2.9972-2.9982"	.0026-.0059"	.....

### OIL PUMP SPECIFICATIONS

#### D-150, D-170 & D-190

Type .....	Gear
Shaft Diameter .....	.4905-.4912"
Clearance in Bore .....	.0013-.0030"
Clearance Gear-to-Housing .....	.0014-.0054"
Gear Backlash .....	.0005-.0065"

#### DT-466

Type .....	Gerotor
End clearance, outer rotor-to-housing .....	.0015-.0040"
End clearance, inner rotor-to-housing .....	.0018-.0044"
Radial clearance, outer rotor and housing .....	.0055-.0085"

#### V-800

Type .....	Gear
Drive Shaft Diameter .....	.7385-.7390"
Idler Shaft Diameter .....	.5901-.5904"
Running Clearance .....	.0020-.0035"
Clearance Gear-to-Housing .....	.0040-.0055"
Pumping Gears Backlash .....	.0080-.0120"
Idler and Crankshaft Gears Backlash .....	.0040-.0140"
Drive Shaft End Play .....	.003-.006"

### TIGHTENING SPECIFICATIONS

#### D-150, D-170 & D-190

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

Application	Ft. Lbs.
Cylinder Head Bolts① .....	110
Main Bearing Cap Bolts .....	130
Connecting Rod Cap Bolts .....	55
Crankshaft Pulley Nut .....	150
Flywheel Bolts .....	110

① — See cylinder head tightening sequence.

#### DT-466

Application	Ft. Lbs.
Cylinder Head Bolts① .....	165
Main Bearing Cap Bolts .....	115
Connecting Rod Cap Bolts .....	130
Crankshaft Pulley Bolts .....	125
Flywheel Bolts .....	125

① — See cylinder head tightening sequence and tighten in minimum of two steps.

#### V-800

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

Application	Ft. Lbs.
Cylinder Head Bolts① .....	220
Main Bearing Cap Bolts .....	390
Connecting Rod Cap Nuts .....	130
Vibration Damper-to-Crankshaft Nut .....	350
Flywheel Bolts .....	235

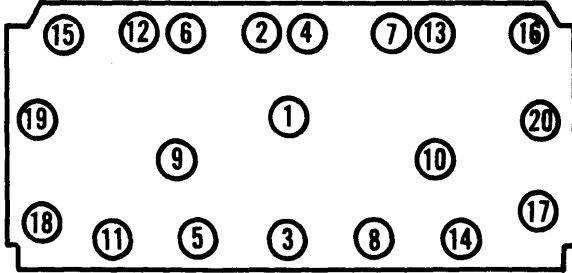
① — See cylinder head tightening sequence.

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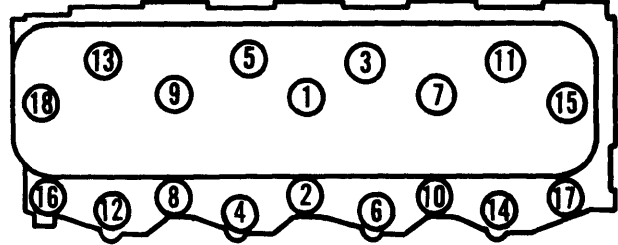
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### CYLINDER HEAD TIGHTENING SEQUENCE

D-150, D-170 & D-190



V-800



DT-466

