

Medium & Heavy Duty Diesel

DETROIT DIESEL

GENERAL SPECIFICATIONS							
Engine	Cycle	Displ. Cu. Ins.	Compr. Ratio ③	Bore	Stroke	Firing Order ②	Inj. Timing ①
4-53	2	212"	17.0:1	3.875"	4.500"	R-1,3,4,2 L-1,2,4,3	1.470"
4-53N	2	212"	21.0:1	3.875"	4.500"	R-1,3,4,2 L-1,2,4,3	1.470"
6V53	2	318"	21.0:1	3.875"	4.500"	R-1L,3R,3L,2R,2L,1R L-1L,1R,2L,2R,3L,3R	1.470"
6-71N	2	426"	18.7:1	4.250"	5.000"	1,5,3,6,2,4	④ 1.460"
6V71	2	426"	18.7:1	4.250"	5.000"	R-1L,3R,3L,2R,2L,1R L-1L,1R,2L,2R,3L,3R	1.460"
8V71	2	568"	18.7:1	4.250"	5.000"	R-1L,3R,3L,4R,4L,2R,2L,1R	1.460"
12V71	2	852"	18.7:1	4.250"	5.000"	R-1L,5L,3R,4R,3L,4L,2R,6R, 2L,6L,1R,5R L-1L,5R,1R,6L,2L,6R,2R,4L, 3L,4R,3R,5L	1.460"
6V92	2	552"	19.0:1	4.840"	5.000"	R-1L,3R,3L,2R,2L,1R L-1L,1R,2L,2R,3L,3R	1.484"
8V92	2	736"	19.0:1	4.840"	5.000"	R-1L,3R,3L,4R,4L,2R,2L,1R L-1L,1R,2L,2R,4L,4R,3L,3R	1.484"

- ① — Unless noted otherwise, all Injection Timing is BTDC.
 ② — R-Right-hand rotation. L-Left-hand rotation.
 ③ — All Turbocharged engines have a 17.0:1 compression ratio.
 ④ — Timing on all 71 series engines with advanced camshaft is 1.484".

NORMAL OPERATING SPECIFICATIONS						
Engine	Idle RPM	Max. RPM	Oil Temp.	Oil Press.	Coolant Temp.	Compression Pressure (PSI) @ RPM (Sea Level)
4-53	600	2800	240°	40-60	185°	540-590@600
4-53N	600	2800	240°	40-60	185°	540-590@600
6V53	600	2800	240°	40-60	185°	430-480@600
6-71N	600	2100	225°	40-60	185°	515-565@600
V71	600	2300	235°	50-70	185°	425-475@600
8V71	600	2300	235°	50-70	185°	425-475@600
12V71	600	2300	235°	50-70	185°	425-475@600
6V92	600	2100	235°	50-70	185°	430-480@600
8V92	600	2100	235°	50-70	185°	430-480@600

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
4-53	.8735-.8740"	.8750-.8760"	.0010-.0025"	.....	.....	.....
4-53N	.8735-.8740"	.8750-.8760"	.0010-.0025"	.....	.....	.....
6V53	.8735-.8740"	.8750-.8760"	.0010-.0025"	.....	.....	.....
6-71N	.8735-.8740"	.8750-.8760"	.0010-.0025"	.....	.....	2.040"
6V71	.8735-.8740"	.8750-.8760"	.0010-.0025"	.....	.....	2.040"
8V71	.8735-.8740"	.8750-.8760"	.0015-.0025"	.....	.....	2.040"
12V71	.8735-.8740"	.8750-.8760"	.0010-.0025"	.....	.....	2.040"
6V92	.8735-.8740"	.8750-.8760"	.0010-.0025"	.....	.....	2.040"
8V92	.8735-.8740"	.8750-.8760"	.0010-.0025"	.....	.....	2.040"

DETROIT DIESEL (Cont.)

VALVES & SEATS								
Engine ①	Head Diameter	Face Angle	Seat Angle	Seat Width	Stem Diameter	Stem Clearance	Valve Seat Insert O.D.	Valve Clearance
4-53	0.910"	30°	30°	.0468-.0781"	.2480-.2488"	.0017-.0035"	1.1615"	.025"
4-53N	0.910"	30°	30°	.0468-.0781"	.2480-.2488"	.0017-.0035"	1.1615"	.025"
6V53	0.910"	30°	30°	.0468-.0781"	.2480-.2488"	.0017-.0035"	1.1615"	.025"
6-71N								
2V	1.180"	30°	30°	.0625-.0937"	.3417-.3425"	.0002-.0038"	1.6260-1.6270"	.013"
4V	1.180"	30°	30°	.0468-.0937"	.3100-.3105"	.0002-.0035"	1.2600-1.2610"	.013"
6V71								
2V	0.980"	30°	30°	.0630-.0940"	.3417-.3425"	.0020-.0038"	1.6260-1.6270"	.011"
4V	0.980"	30°	30°	.0470-.0940"	.3100-.3105"	.0020-.0035"	1.2600-1.2610"	.015"
8V71								
2V	0.980"	30°	30°	.0630-.0940"	.3417-.3425"	.0020-.0038"	1.6260-1.6270"	.011"
4V	0.980"	30°	30°	.0470-.0940"	.3100-.3105"	.0020-.0035"	1.2600-1.2610"	.015"
12V71								
2V	0.980"	30°	30°	.0630-.0940"	.3417-.3425"	.0020-.0038"	1.6260-1.6270"	.011"
4V	0.980"	30°	30°	.0470-.0490"	.3100-.3105"	.0020-.0035"	1.2600-1.2610"	.015"
6V92	1.300"	30°	31°	.078"	.3100-.3108"	.0017-.0035"	1.4420"	.015"
8V92	1.300"	30°	31°	.078"	.3100-.3108"	.0017-.0035"	1.4420"	.015"

① — Detroit Diesel engines do not use intake valves, specifications given are for exhaust valves only.

VALVE SPRINGS			
Engine	Free Length	Compressed Length	Lbs. @ Comp. Length
4-53	1.930"	25
4-53N	1.930"	25
6V53	1.930"	25
6-71N			
2V	2.200"	25
4V	1.800"	25
6V71			
2V	2.200"	25
4V	1.800"	25
8V71			
2V	2.200"	25
4V	1.800"	25
12V71			
2V	2.200"	25
4V	1.800"	25
6V92	1.800"	25
8V92	1.800"	25

CAMSHAFT			
Engine	Journal Diam.	Clearance	Lobe Lift
4-53	2.1820-2.1825"	.0045-.0060"	.005-.015"
4-53N	2.1820-2.1825"	.0045-.0060"	.005-.015"
6V53	2.1820-2.1825"	.0045-.0060"	.005-.015"
6-71N			
No.1-5	1.4970-1.4975"	.0025-.0040"	.004-.012"
No.2-3-4	1.4980-1.4985"	.0025-.0050"	
6V71			
No.1-5	1.4970-1.4975"	.0025-.0040"	.004-.012"
No.2-3-4	1.4980-1.4985"	.0025-.0050"	
8V71			
No.1-5	1.4960-1.4965"	.0035-.0050"	.004-.012"
No.2-3-4	1.4980-1.4985"	.0025-.0050"	
12V71			
No.1-5	1.4970-1.4975"	.0025-.0040"	.004-.012"
No.2-3-4	1.4980-1.4985"	.0025-.0050"	
6V92			
No.1-5	1.4970-1.4975"	.0025-.0040"	.004-.012"
No.2-3-4	1.4980-1.4985"	.0025-.0050"	
8V92			
No.1-5	1.4960-1.4965"	.0035-.0050"	.004-.012"
No.2-3-4	1.4980-1.4985"	.0025-.0050"	

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DETROIT DIESEL (Cont.)

PISTONS, PINS, RINGS						
Engine	PISTONS	PINS		RINGS		
	Clearance	Piston Fit	Rod Fit	Rings	End Gap	Side Clearance
4-53	.0031-.0068"	.0025-.0034"	.0010-.0019"	Chrome		
				1	.020-.046"	.0030-.0060"
				2	.020-.046"	.0070-.0100"
				3	.020-.046"	.0050-.0080"
				4	.020-.046"	.0050-.0080"
				5	.010-.025"	.0015-.0055"
				6	.010-.025"	.0015-.0055"
				Iron		
				1	.020-.036"	.0030-.0060"
				2	.020-.036"	.0070-.0100"
				3	.020-.036"	.0050-.0080"
				4-53N	.0031-.0068"	.0025-.0034"	.0010-.0019"	Chrome
1	.020-.046"	.0030-.0060"				
2	.020-.046"	.0070-.0100"				
3	.020-.046"	.0050-.0080"				
4	.020-.046"	.0050-.0080"				
5	.010-.025"	.0015-.0055"				
6	.010-.025"	.0015-.0055"				
Iron						
1	.020-.036"	.0030-.0060"				
2	.020-.036"	.0070-.0100"				
3	.020-.036"	.0050-.0080"				
6V53	.0031-.0068"	.0025-.0034"	.0010-.0019"					Chrome
				1	.020-.046"	.0030-.0060"
				2	.020-.046"	.0070-.0100"
				3	.020-.046"	.0050-.0080"
				4	.020-.046"	.0050-.0080"
				5	.010-.025"	.0015-.0055"
				6	.010-.025"	.0015-.0055"
				Iron		
				1	.020-.036"	.0030-.0060"
				2	.020-.036"	.0070-.0100"
				3	.020-.036"	.0050-.0080"
				6-71N Trunk Type	.0040-.0078"	.0025-.0034"	.0015-.0024"	1	.023-.038"	.0040-.0060"
2	.018-.043"	.0100-.0130"				
3	.018-.043"	.0040-.0070"				
4	.018-.043"	.0040-.0070"				
5	.008-.023"	.0015-.0055"				
6	.008-.023"	.0015-.0055"				
Crosshead Type	.0045-.0083"	①.0870-.0880"	.....	1	.023-.038"	.0010-.0050"
				2	.018-.043"	.0100-.0130"
				3	.018-.043"	.0040-.0070"
				4	.002-.021"	.0005-.0030"
				②5	.008-.023"	.0010-.0035"
				②6	.008-.023"	.0015-.0055"

① — Thickness of slipper bushing at center on all Crosshead type pistons.

② — Ring end gap for rings 5 and 6 on turbocharged engines is .005-.014".

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DETROIT DIESEL (Cont.)

PISTONS, PINS, RINGS						
Engine	PISTONS Clearance	PINS		RINGS		
		Piston Fit	Rod Fit	Rings	End Gap	Side Clearance
6V71 Trunk Type	⊙ .0040-.0078"	.0025-.0034"	.0015-.0024"	1	.023-.038"	.0040-.0070"
				2	.018-.043"	.0095-.0130"
				3	.018-.043"	.0075-.0110"
				4	.018-.043"	.0055-.0090"
				5	.008-.023"	.0015-.0055"
				6	.008-.023"	.0015-.0055"
6V71N Trunk Type	⊙ .0040-.0078"	.0025-.0034"	.0015-.0024"	1	.023-.038"	.0040-.0070"
				2	.018-.043"	.0100-.0130"
				3	.018-.043"	.0040-.0070"
				4	.018-.043"	.0040-.0070"
				5	.008-.023"	.0015-.0055"
				6	.008-.023"	.0015-.0055"
6V71N&T Crosshead Type	.0045-.0083"	⓪ .0870-.0880"	.....	1	.023-.038"	.0010-.0050"
				2	.018-.043"	.0100-.0130"
				3	.018-.043"	.0040-.0070"
				4	.002-.021"	.0005-.0030"
				5	.008-.023"	.0010-.0035"
				6	.008-.023"	.0015-.0055"
8V71 Trunk Type	⓪ .0040-.0078"	.0025-.0034"	.0015-.0024"	1	.023-.038"	.0040-.0070"
				2	.018-.043"	.0095-.0130"
				3	.018-.043"	.0075-.0110"
				4	.018-.043"	.0055-.0090"
				5	.008-.023"	.0015-.0055"
				6	.008-.023"	.0015-.0055"
8V71N Trunk Type	⊙ .0040-.0078"	.0025-.0034"	.0015-.0024"	1	.023-.038"	.0040-.0070"
				2	.018-.043"	.0100-.0130"
				3	.018-.043"	.0040-.0070"
				4	.018-.043"	.0040-.0070"
				5	.008-.023"	.0015-.0055"
				6	.008-.023"	.0015-.0055"
8V71N&T Crosshead Type	.0045-.0083"	⓪ .0870-.0880"	.....	1	.023-.038"	.0010-.0050"
				2	.018-.043"	.0100-.0130"
				3	.018-.043"	.0040-.0070"
				4	.002-.021"	.0005-.0030"
				5	.008-.023"	.0010-.0035"
				6	.008-.023"	.0015-.0055"
12V71 Trunk Type	⓪ .0040-.0078"	.0025-.0034"	.0015-.0024"	1	.023-.038"	.0040-.0070"
				2	.018-.043"	.0095-.0130"
				3	.018-.043"	.0075-.0110"
				4	.018-.043"	.0055-.0090"
				5	.008-.023"	.0015-.0055"
				6	.008-.023"	.0015-.0055"
12V71N Trunk Type	⓪ .0040-.0078"	.0025-.0034"	.0015-.0024"	1	.023-.038"	.0040-.0070"
				2	.018-.043"	.0100-.0130"
				3	.018-.043"	.0040-.0130"
				4	.018-.043"	.0040-.0130"
				5	.008-.023"	.0015-.0055"
				6	.008-.023"	.0015-.0055"

⓪ — Thickness of slipper bushing at center on all Crosshead type pistons.

⓪ — With 70 mm injectors, clearance is .0045-.0083".

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DETROIT DIESEL (Cont.)

PISTONS, PINS, RINGS						
Engine	PISTONS Clearance	PINS		RINGS		
		Piston Fit	Rod Fit	Rings	End Gap	Side Clearance
12V71N&T Crosshead Type	.0045-.0083"	⓪.0870-.0880"	.....	1	.023-.038"	.0010-.0050"
				2	.018-.043"	.0100-.0130"
				3	.018-.043"	.0040-.0070"
				4	.002-.021"	.0005-.0030"
				5	.008-.023"	.0010-.0035"
				6	.008-.023"	.0015-.0055"
6V92	.0120"	⓪.0870-.0880"	.....	1	.025-.040"	.0010-.0050"
				2	.025-.040"	.0100-.0130"
				3	.025-.040"	.0040-.0070"
				4	.002-.017"	.0005-.0030"
				5	.010-.020"	.0010-.0040"
				6	.010-.020"	.0015-.0055"
8V92	.0120"	⓪.0870-.0880"	.....	1	.025-.040"	.0010-.0050"
				2	.025-.040"	.0100-.0130"
				3	.025-.040"	.0040-.0070"
				4	.002-.017"	.0005-.0030"
				5	.010-.020"	.0010-.0040"
				6	.010-.020"	.0015-.0055"

⓪ — Thickness of slipper bushing at center on all Crosshead type pistons.

CRANKSHAFT & MAIN BEARINGS						
Engine	Journal Diameter	Bearing Clearance	Crankshaft End Play	Thrust Location	Thrust Washer Thickness	Number of Main Bearings
4-53	2.9990-3.0000"	.0010-.0040"	.004-.011"	No.5	.119-.122"	5
4-53N	2.9990-3.0000"	.0010-.0040"	.004-.011"	No.5	.119-.122"	5
6V53	3.4990-3.5000"	.0010-.0040"	.004-.011"	No.4	.119-.122"	4
6-71N	3.4990-3.5000"	.0014-.0044"	.004-.014"	No.7	.119-.122"	7
6V71	4.4990-4.5000"	.0016-.0050"	.004-.014"	No.4	.119-.122"	4
8V71	4.4990-4.5000"	.0016-.0050"	.004-.014"	No.5	.119-.122"	5
12V71	4.4990-4.5000"	.0016-.0050"	.004-.014"	No.7	.119-.122"	7
6V92	4.4990-4.5000"	.0016-.0050"	.004-.011"	No.4	.119-.122"	4
8V92	4.4990-4.5000"	.0016-.0050"	.004-.011"	No.5	.119-.122"	5

CONNECTING RODS & BEARINGS			
Engine	Journal Diameter	Bearing Clearance	Sideplay
4-53	2.4990-2.5000"	.0015-.0045"	.006-.012"
4-53N	2.4990-2.5000"	.0015-.0045"	.006-.012"
6V53	2.7490-2.7500"	.0011-.0041"	.008-.016"
6-71N	2.7514-2.7534"	.0014-.0044"	.006-.012"
6V71	2.9990-3.0000"	.0014-.0044"	.008-.016"
8V71	2.9990-3.0000"	.0014-.0044"	.008-.016"
12V71	2.9990-3.0000"	.0014-.0044"	.008-.016"
6V92	2.9990-3.0000"	.0010-.0040"	.004-.011"
8V92	2.9990-3.0000"	.0010-.0040"	.004-.011"

CYLINDER LINER & BORE			
Engine	Type	Liner Bore	Liner Protrusion ⓪
4-53	Wet	3.8752-3.8767"	.0465-.0500"
4-53N	Wet	3.8752-3.8767"	.0465-.0500"
6V53	Wet	3.8752-3.8767"	.0465-.0500"
6-71N	Wet	4.2495-4.2511"	.0450-.0500"
6V71	Wet	4.2495-4.2511"	.0450-.0500"
8V71	Wet	4.2495-4.2511"	.0450-.0500"
12V71	Wet	4.2495-4.2511"	.0450-.0500"
6V92	Wet	4.8395-4.8411"	.0418-.0482"
8V92	Wet	4.8395-4.8411"	.0418-.0482"

⓪ — All measurements are DEPTH BELOW block surface.

DETROIT DIESEL (Cont.)

OIL PUMP SPECIFICATIONS

4-53, 4-53N & 6V53

Type	Rotary
Clearance Between Inner and Outer Rotors at Each Lobe .....	.0040-.0110"
Depth Between Face and Rotors .....	.0010-.0035"
Pressure Relief Valve Opening	52psi

6-71N

Type	Gear
Shaft Bore .....	.6213-.6225"
Shaft Diameter .....	.6230"
Clearance Body Bushing .....	.0008-.0025"
Clearance Cover Bushing .....	.0010-.0027"
Distance Gear From Shaft End	6.4690"
Clearance Driven Gear-to-Housing .....	.0050"
Pressure Relief Regulator Opening	50psi
Pressure Relief Valve Opening	105psi

6V71 & 8V71

Type	Gear
Clearance Drive Shaft-to-Bushing .....	.0010-.0025"
Shaft Shoulder Below Front Cover .....	.0000-.0200"
Pressure Relief Valve Opening	100psi

12V71

Type	Gear
Shaft Bore .....	.8787-.8799"
Shaft Diameter .....	.8781"
Clearance Shaft-to-Bushing .....	.0015-.0032"
Gear Backlash .....	.0060-.0120"
Pressure Regulator Valve Opening	50psi
Pressure Relief Valve Opening	120psi

6V92 & 8V92

Type	Gear
Clearance Drive Shaft-to-Bushing .....	.0010-.0025"
Shaft Shoulder Below Front Cover .....	.0000-.0200"
Pressure Relief Valve Opening	100psi

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs.
Cylinder Head Bolts ^①	170-180
Main Bearing Bolts	120-130
Flywheel Bolts	110-120
Crankshaft End Bolt	200-220
Camshaft and Balance Shaft Nut	300-325
Connecting Rod Nuts	40-45

① — See cylinder head tightening sequence.

TIGHTENING SPECIFICATIONS (Cont.)

6-71N

NOTE — Aluminum engine only.

Application	Ft. Lbs.
Cylinder Head Nuts ^①	140-160
Main Bearing Nuts	120-140
Flywheel Bolts	150-160
Crankshaft End Bolt	290-310
Camshaft and Balance Shaft Nut	300-325
Connecting Rod Nuts	60-70

① — See cylinder head tightening sequence.

6-71N

NOTE — Cast iron engine only.

Application	Ft. Lbs.
Cylinder Head Bolts ^①	175-185
Main Bearing Bolts	180-190
Main Bearing Nuts	155-185
Flywheel Bolts	180-190
Crankshaft End Bolt	290-310
Connecting Rod Nut	60-70
Crosshead Piston Pin to Connecting Rod Bolt	55-60

① — See cylinder head tightening sequence.

6V71, 8V71 & 12V71

Application	Ft. Lbs.
Cylinder Head Bolts ^①	175-185
Main Bearing Bolts	180-190
Flywheel Bolts	180-190
Crankshaft End Bolt	290-310
Camshaft and Balance Shaft Nut	300-325
Connecting Rod Nuts	60-70
Crosshead Piston Pin to Connecting Rod Bolt	55-60

① — See cylinder head tightening sequence.

6V92 & 8V92

Application	Ft. Lbs.
Cylinder Head Bolts ^①	230-240
Main Bearing Bolts	230-240
Flywheel Bolts	180-190
Crankshaft End Bolt	290-310
Camshaft Nut	300-325
Connecting Rod Nut	60-70
Crosshead Piston Pin to Connecting Rod Bolt	55-60

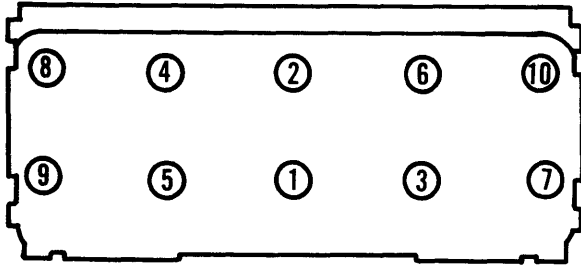
① — See cylinder head tightening sequence.

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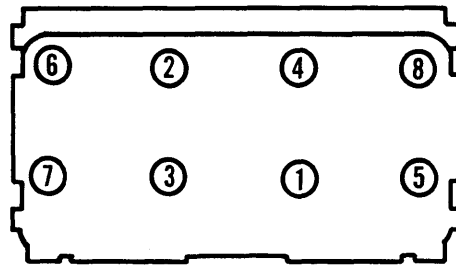
DETROIT DIESEL (Cont.)

CYLINDER HEAD TIGHTENING SEQUENCE

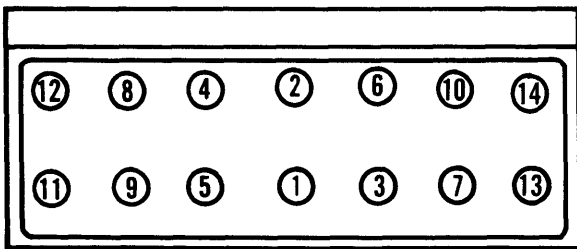
4-53 & 4-53N



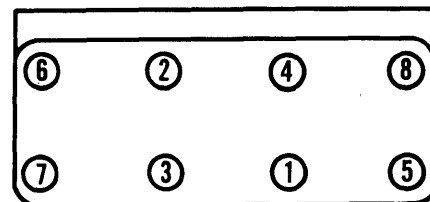
6V53



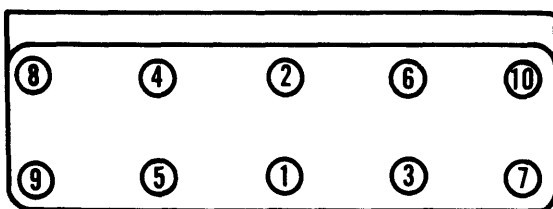
6-71N



6V71 & 6V92



8V71 & 8V92



12V71

