SERVICE MANUAL

Loader

W36
PIN 17754000
and After

8-70000

1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

SERVICE MANUAL

Loader

W36
PIN 17754000
and After

8-70000

1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

SERVICE MANUAL

Loader

W36
PIN 17754000
and After

8-70000

1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

SERVICE MANUAL

Loader

W36
PIN 17754000
and After

8-70000

1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

W36 LOADER
PIN 17754000 and After
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CASE CORPORATION
Bur 8-71580
Printed in U.S.A.
Issued May 1988

SECTION CONTENTS FOR SECTION 1

Section Title **Section Number**

1001

STANDARD TORQUE SPECIFICATIONS

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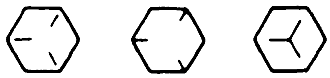
TORQUE SPECIFICATIONS - DECIMAL HARDWARE

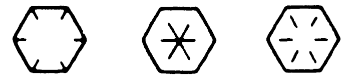
Use the torques in this chart when special torques are not given. These torques apply to fasteners with both UNC and UNF threads as received from suppliers, dry, or when lubricated with engine oil. Not applicable if special graphites, molydisulfide greases, or other extreme pressure lubricants are used.

Grade 5 Bolts, Nuts, and Studs



Size	Pound-Feet	Newton metres
1/4 in	9-11	12-15
5/16 in	17-21	23-28
3/8 in	35-42	48-57
7/16 in	54-64	73-87
1/2 in	80-96	109-130
9/16 in	110-132	149-179
5/8 in	150-180	203-244
3/4 in	270-324	366-439
7/8 in	400-480	542-651
1.0 in	580-696	787-944
1-1/8 in	800-880	1085-1193
1-1/4 in	1120-1240	1519-1681
1-3/8 in	1460-1680	1980-2278
1-1/2 in	1940-2200	2631-2983

Grade 8 Bolts, Nuts, and Studs



Size	Pound-Feet	Newton metres
1/4 in	12-15	16-20
5/16 in	24-29	33-39
3/8 in	45-54	61-73
7/16 in	70-84	95-114
1/2 in	110-132	149-179
9/16 in	160-192	217-260
5/8 in	220-264	298-358
3/4 in	380-456	515-618
7/8 in	600-720	814-976
1.0 in	900-1080	1220-1465
1-1/8 in	1280-1440	1736-1953
1-1/4 in	1820-2000	2468-2712
1-3/8 in	2380-2720	3227-3688
1-1/2 in	3160-3560	4285-4827

NOTE: *Use thick nuts with Grade 8 bolts.*

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TORQUE SPECIFICATIONS - METRIC HARDWARE

Use the following toques when special torques are not given.

These values apply to fasteners with coarse threads as received from supplier, plated or un-plated, or when lubricated with engine oil. These values do not apply if graphite or molydisulfide grease or oil if used.

Grade 8.8 Bolts, Nuts, and Studs

8.8

Size	Pound-Feet	Newton metres
M4	2-3	3-4
M5	5-6	6.5-8
M6	8-9	10.5-12
M8	19-23	26-31
M10	38-45	52-61
M12	66-79	90-107
M14	106-127	144-172
M16	160-200	217-271
M20	320-380	434-515
M24	500-600	675-815
M30	920-1100	1250-1500
M36	1600-1950	2175-2600

Grade 10.9 Bolts, Nuts, and Studs

10.9

Size	Pound-Feet	Newton metres
M4	3-4	4-5
M5	7-8	9.5-11
M6	11-13	15-17.5
M8	27-32	37-43
M10	54-64	73-87
M12	93-112	125-15
M14	149-179	200-245
M16	230-280	310-380
M20	450-540	610-730
M24	780-940	1050-1275
M30	1470-1770	2000-2400
M36	2580-3090	3500-4200

Grade 12.9 Bolts, Nuts, and Studs

12.9

Usually the torque values specified for grade 10.9 fasteners can be used satisfactorily on grade 12.9 fasteners.

TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

Tube OD Hose ID	Thread Size	Pound-Feet	Newton metres
37 Degree Flare Fittings			
1/4 in 6.4 mm	7/16-20	6-12	8-16
5/16 in 7.9 mm	1/2-20	8-16	11-21
3/8 in 9.5 mm	9/16-18	10-25	14-33
1/2 in 12.7 mm	3/4-16	15-42	20-56
5/8 in 15.9 mm	7/8-14	25-58	34-78
3/4 in 19.0 mm	1-1/16-12	40-80	54-108
7/8 in 22.2 mm	1-3/16-12	60-100	81-135
1.0 in 25.4 mm	1-5/16-12	75-117	102-158
1-1/4 in 31.8 mm	1-5/8-12	125-165	169-223
1-1/2 in 38.1 mm	1-7/8-12	210-250	285-338

Tube OD Hose ID	Thread Size	Pound-Feet	Newton metres
Straight Threads with O-ring			
1/4 in 6.4 mm	7/16-20	12-19	16-25
5/16 in 7.9 mm	1/2-20	16-25	22-23
3/8 in 9.5 mm	9/16-18	25-40	34-54
1/2 in 12.7 mm	3/4-16	42-67	57-90
5/8 in 15.9 mm	7/8-14	58-92	79-124
3/4 in 19.0 mm	1-1/16-12	80-128	108-174
7/8 in 22.2 mm	1-3/16-12	100-160	136-216
1.0 in 25.4 mm	1-5/16-12	117-187	159-253
1-1/4 in 31.8 mm	1-5/8-12	165-264	224-357
1-1/2 in 38.1 mm	1-7/8-12	250-400	339-542

Split Flange Mounting Bolts

Size	Pound-Feet	Newton metres
5/16-18	15-20	20-27
3/8-16	20-25	26-33
7/16-14	35-45	47-61
1/2-13	55-65	74-88
5/8-11	140-150	190-203

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TORQUE SPECIFICATIONS - O-RING FACE SEAL FITTING

Nom. SAE Dash Size	Tube OD	Thread Size	Pound-Feet	Newton Metres	Thread Size	Pound-Feet	Newton Metres
		O-ring Face Seal End			**O-ring Boss End Fitting or Locknut**		
-4	**1/4 In** 6.4 mm	9/16-18	10-12	14-16	7/16-20	17-20	23-27
-6	**3/8 in** 9.5 mm	11/16-16	18-20	24-27	9/16-18	25-30	33-40
-8	**1/2 in** 12.7 mm	13/16-16	32-40	43-54	3/4-16	45-50	61-68
-10	**5/8 in** 15.9 mm	1-14	46-56	60-75	7/8-14	60-65	81-88
-12	**3/4 in** 19.0 mm	1-3/16-12	65-80	90-110	1-1/16-12	85-90	115-122
-14	**7/8 in** 22.2 mm	1-3/16-12	65-80	90-110	1-3/16-12	95-100	129-136
-16	**1.0 in** 25.4 mm	1-7/16-12	92-105	125-140	1-5/16-12	115-125	156-169
-20	**1-1/4 in** 31.8 mm	1-11/16-12	125-140	170-190	1-5/8-12	150-160	203-217
-24	**1-1/2 in** 38.1 mm	2-12	150-180	200-254	1-7/8-12	190-200	258-271

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FLUIDS AND LUBRICANTS

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FLUIDS AND LUBRICANTS

FUEL TANK

Capacity .... 73.4 U.S. gallons (278 litres)
Type of fuel .... See Diesel Fuel Specifications on page 1002-5

ENGINE OIL CAPACITY

Capacity with filter change .... 23.7 U.S. quarts (22.4 litres)
Type of oil .... See Engine Oil Recommendations on page 1002-4

HYDRAULIC SYSTEM

Reservoir refill capacity .... 36.5 U.S. gallons (138 litres)
Type of fluid .... Case TCH fluid
Alternate .... Type C-3 hydraulic fluid (SAE 10W)

TRANSMISSION

Refill capacity .... 4.5 U.S. gallons (17 litres)
Type of fluid .... Dexron or Dexron II transmission fluid
Alternate .... None

AXLES

Each center bowl .... 22 U.S. quarts (21 litres)
Each planetary end .... 3 U.S. quarts (2.8 litres)
Type of fluid .... Case IH 135-H EP gear lube
Alternate .... API-GL-5, SAE 85-140 above 0°F (-18°C)
SAE 80 below 0°F (-18°C)

BRAKE MASTER CYLINDERS

Capacity .... As required
Type of fluid .... SAE J1703 (DOT 3) brake fluid
Alternate .... None

GREASE FITTINGS

Type of lubricant .... Case Molydisulfide grease

ALCOHOL EVAPORATOR

Capacity .... 1 pint (0.5 litres)
Type of fluid .... Methyl alcohol

BATTERIES

Capacity .... As required
Type of fluid .... Use drinking or distilled water only

ENGINE COOLING SYSTEM

Capacity	39 U.S. quarts (37 litres)
Type of coolant	Ethylene glycol type antifreeze and water that is mixed 50% ethylene glycol and 50% water

NOTE: *When you drain, flush, and refill the cooling system, replace the A77544 coolant filter and add one container (1 pint) of 331-509 cooling system additive.*

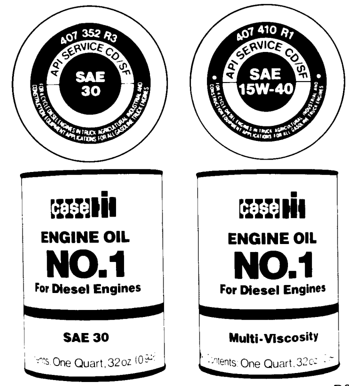
Use a good grade ethylene glycol type antifreeze that has less than 0.1% silicate. Do not use Alugard antifreeze or an antifreeze that is used for aluminum cooling systems.

Engine Oil Recommendations

Case IH No. 1 Engine Oil is recommended for use in your Case engine. To select the viscosity of oil, determine the temperature until the next oil change, then see the oil viscosity chart below.

If Case IH multi-viscosity engine oil is not available, Case IH single viscosity engine oil can be used.

Use API CC/CD or CD oil.



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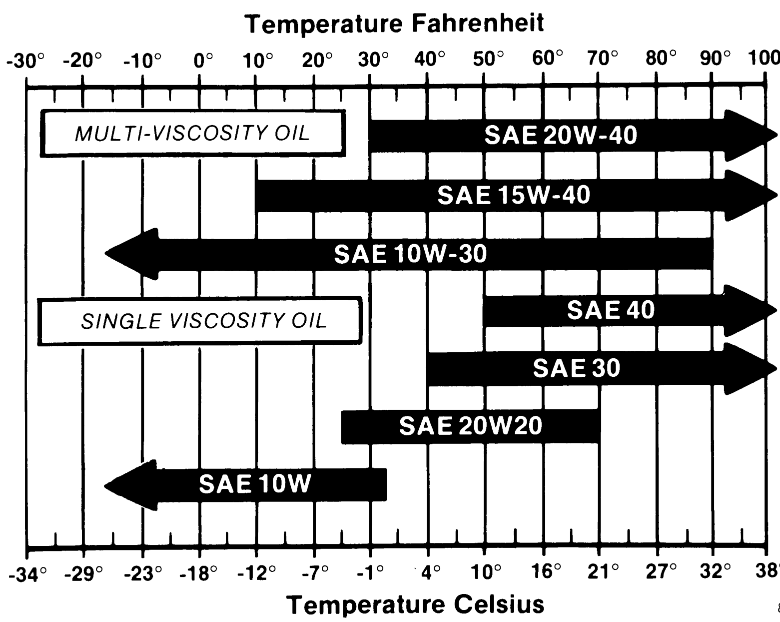
NOTE: *Do not put "Performance Additives" or other oil additive products in the engine crankcase. The oil change interval given in this manual is according to tests with Case lubricants.*

Recommended Engine Oil Viscosity



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NOTE: *When the temperature is below -10° F (-25° C), use the optional oil pan heater and the optional engine coolant heater to increase the temperature of the engine before starting.*

DIESEL FUEL

Use No. 2 diesel fuel in the engine of this machine. The use of other fuels can cause the loss of engine power and high fuel consumption.

In very cold temperatures, a mixture of No. 1 and No. 2 diesel fuels is temporarily permitted. See the following Note.

NOTE: *See your fuel dealer for winter fuel requirements in your area. If the temperature of the fuel lowers below the cloud point (wax appearance point), wax crystals in the fuel will cause the engine to lose power or not start.*

The diesel fuel used in this machine must meet the specifications in the chart below or Specification D975-81 of the American Society for Testing and Materials.

Fuel Storage

If you keep fuel in storage for a period of time, you can get foreign material or water in the fuel storage tank. Many engine problems are caused by water in the fuel.

Keep the fuel storage tank outside and keep the fuel as cool as possible. Remove water from the storage container at regular periods of time.

Fill the fuel tank at the end of the daily operating period to prevent condensation in the fuel tank.

Specifications for Acceptable No. 2 Diesel Fuel

API gravity, minimum	34
Flash point, minimum	140°F (60°C)
Cloud point (wax appearance point), maximum	-5°F (-20°C) See Note above.
Pour point, maximum	-15°F (-26°C) See Note above.
Distillation temperature, 90% point	540 to 640°F (282 to 338°C)
Viscosity, at 100°F (38°C)	
Centistokes	2.0 to 4.3
Saybolt Seconds Universal	32 to 40
Cetane number, minimum	43 (45 to 55 for winter or high altitudes)
Water and sediment, by volume, maximum	.05 of 1%
Sulfur, by weight, maximum	.50 of 1%
Copper strip corrosion, maximum	No. 2
Ash, by weight, maximum	.01 of 1%

Engine fuel is flammable and can cause a fire or an explosion. Do not fill the fuel tank or service the fuel system near open flame, welding, burning cigars, cigarettes, etc. 84-100-A

Section

1426

SPECIFICATION DETAILS

1426

IMPORTANT: *This engine was made using the metric measurement system. All measurements and checks must be made with metric tools to make sure of an accurate reading when inspecting parts.*

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RUN-IN INSTRUCTIONS

Engine Lubrication

Fill the 6-830 engine crankcase with CC, CD or CE service classification oil that has the correct viscosity rating for the ambient air temperature. Install new oil filters, after the engine has been rebuilt.

Fill the 6T830 and the 6TA830 engine crankcase with CD or CE service classification oil that has the correct viscosity rating for the ambient air temperature. Install new oil filters, after the engine has been rebuilt.

Run-In Procedure For Rebuilt Engine

Step 1 Disconnect the wire to the electric shut-off on the injection pump so that the engine will not start. Crank the engine for 30 seconds until there is oil pressure, then reconnect the wire.

Step 2 Make sure the cooling system is at the correct level.

Step 3 Run the engine at 1000 RPM minimum load for 5 minutes and check for oil leaks.

Step 4 During the Run-In, continue to check the oil pressure, coolant level, and coolant temperature.

Run-In Procedure For Rebuilt Engine (With A Dynamometer)

The following procedure must be followed when using a PTO dynamometer to Run-Inthe engine. The dynamometer will control the engine load at each speed and will remove stress on new parts during Run-In.

During the Run-In, continue to check the oil pressure, coolant level and coolant temperature.

STEP	TIME	ENGINE SPEED	DYNAMOMETER SCALE LOAD
1	5 Minutes	1000 RPM	50
2	5 Minutes	1100 RPM	1/2
3	5 Minutes	2200 RPM	Full

Run-In Procedure for Rebuilt Engines (Without A Dynamometer)

STEP	TIME	ENGINE SPEED	LOAD
1	5 Minutes	1000 RPM	No Load
2	5 Minutes	1100 RPM	Light Load
3	5 Minutes	2200 RPM	Full

Run-In Procedure (Agriculture Tractors)

For the first 8 hours of field operation stay one gear lower than normal. For the next 12 hours DO NOT "lug" the engine. Prevent "lugging" by moving the lever to a lower gear. The engine must not be "lugged" below the rated engine RPM during early hours of life.

Run-In Procedure (Construction Equipment)

For the first 8 hours, operate the engine at full throttle maintaining a normal load. Do not "baby" the engine, but avoid converter or hydraulic stall. The engine must not be "lugged" below the Rated Engine RPM (Do not stall the engine more than 10 seconds).

ENGINE SPECIFICATION DETAILS

Metric Value

Cylinder Block

Type	Wet Sleeved
Material	Cast Iron
Main Bearing Bore	104.987 to 105.013 mm
Maximum Service Limit	105.013 mm
Camshaft Bore	63.987 to 64.013 mm
Maximum Service Limit	64.013 mm
Lifter Bore	16.000 to 16.030 mm
Maximum Service Limit	16.055 mm
Cylinder Bore	132.900 to 132.950 mm
Maximum Service Limit	132.950 mm
Cylinder Counterbore	132.938 to 132.958 mm
Maximum Service Limit	132.958 mm

Cylinder Sleeve

Type	Wet, Can Be Replaced
Material	Cast Iron
ID of Cylinder	114.000 to 114.040mm
Maximum Service Limit	114.117 mm
Maximum Out of Round (Installed in Block)	0.04 mm
Maximum Taper (Installed in Block)	0.04 mm
Sleeve Protrusion	0.013 to 0.109 mm

Piston

Type	Cam Ground
Material	Aluminum Alloy
OD at 12 mm From the Bottom, 90 Degrees From Piston Pin	
Standard Size Piston	113.833 to 113.847
Minimum Service limit	113.776 mm
ID of Piston Pin Bore	45.006 to 45.012 mm
Maximum Service Limit	45.025 mm
Width of 1st Ring Groove (Top)	3.50 mm
Width of 2nd Ring Groove (Intermediate)	3.08 to 3.10 mm
Width of 3rd Ring Groove (Oil Ring)	4.040 to 4.060 mm
Protrusion Above Cylinder Block (Maximum)	0.018 to 0.380 mm

Piston Pin

Type	Full Float
OD of Pin	44.997 to 45.003 mm
Minimum Service Limit	44.993 mm

Piston Rings

No. 1 Compression 6T830 and 6TA830 .... Key Stone Type (Barrel Face)
  End Gap in 114.020 ID .... 0.40 to 0.70 mm
No. 1 Compression 6-830 Engine .... Key Stone Type Barrel Face
  End Gap in 114.020 ID .... 0.40 to 0.70 mm
    Maximum Service Limit .... 0.70 mm
No. 2 Compression .... Rectangular Type (Taper Face)
  End Gap in 114.020 ID .... 0.40 to 0.70 mm
    Maximum Service Limit .... 0.70 mm
  Side Clearance .... 0.70 to 0.125 mm
No. 3 Oil Control Rings .... Two Piece
  End Gap in 114.020 ID .... 0.30 to 0.60 mm
    Maximum Service Limit .... 0.60 mm
  Side Clearance .... 0.020 to 0.065 mm

Cylinder Head

Warpage (Maximum) .... 0.20 mm
Valve Guide Bore .... 15.931 to 15.971 mm
  Maximum Service Limit .... 15.971 mm
Insert Bore (Intake) .... 53.897 to 53.927 mm
  Maximum Service Limit .... 53.927 mm
Insert Bore Depth (Intake) .... 12.00 to 12.20 mm
  Maximum Service Limit .... 12.20 mm
Insert Bore (Exhaust) .... 46.997 to 47.027 mm
  Maximum Service Limit .... 47.027 mm
Insert Bore Depth (Exhaust) .... 9.63 to 9.83 mm
  Maximum Service Limit .... 9.83 mm

Lifters

Material .... Hardened Iron
  ID of Lifter .... 15.929 to 15.980 mm
    Minimum Service Limit .... 15.925 mm
Bore Diameter in Block .... 16.000 to 16.030 mm
    Maximum Service Limit .... 16.055 mm

Connecting Rod

Bushing .... Steel Backed Leaded Bronze
Bushing ID Installed (Ream to Size) .... 45.023 to 45.035 mm
  Maximum Service Limit .... 45.035 mm
Bearing Liners .... Replaceable
Journal ID Without Bearing Liners .... 80.987 to 81.013 mm
  Maximum Service Limit .... 81.013 mm
Bearing Oil Clearance .... 0.033 to 0.117 mm
  Maximum Service Limit .... 0.117 mm
Side Clearance .... 0.100 to 0.300 mm
  Maximum Service Limit .... 0.330 mm
Connecting Rod Bend (Maximum)
  Without Bushing .... 0.200 mm
  With Bushing .... 0.150 mm
Connecting Rod Twist (Maximum)
  Without Bushing .... 0.500 mm
  With Bushing .... 0.300 mm

Crankshaft

Type.. Hardened Steel, Balanced
Main Bearing Liners ....Replaceable
Crankshaft End Clearance ....0.157 to 0.334 mm
Maximum Service Limit.. 0.381 mm
Center Main Bearing Thrust Surface Thickness ....3.447 to 3.530 mm
Connecting Rod Journal
OD Standard ....75.987 to 76.013 mm
Maximum Service Limit.. 75.962 mm
0.25 mm OD Undersize, Grind to ....75.737 to 75.763 mm
Maximum Service Limit.. 75.712 mm
0.50 mm OD Undersize, Grind to ....75.487 to 75.513 mm
Maximum Service Limit.. 75.462 mm
0.75 mm OD Undersize, Guide to ....75.237 to 75.263 mm
Maximum Service Limit.. 75.212 mm
1.00 mm OD Undersize, Grind to ....74.987 to 75.013 mm
Maximum Service Limit.. 74.962 mm
Connecting Rod Journal Maximum Taper.. 0.013 mm
Journals Out of Round Maximum.. 0.050 mm
Undersize Main Bearing Liners For Service .... 0.25,0.50, 0.75 and 1.00 mm
Main Bearing Oil Clearance...0.66 to 0.134 mm
Maximum Service Limit .... 0.134 mm
Main Bearing Journal
OD, Standard ....97.987 to 98.013 mm
Maximum Service Limit.. 97.962 mm
0.25 mm OD Undersize, Grind to ....97.737 to 97.763 mm
Maximum Service Limit.. 97.712 mm
0.50 mm OD Undersize, Grind to ....97.487 to 97.513 mm
Maximum Service Limit.. 97.462 mm
0.75 mm OD Undersize, Grind to ....97.237 to 97.263 mm
Maximum Service Limit.. 97.212 mm
1.00 mm OD Undersize, Grind to..96.987 to 97.013 mm
Maximum Service Limit.. 96.972 mm
Main Bearing Journal Bore ID No Liners...104.987 to 105.013 mm
Main Journal Width:
1st, 2nd, 3rd, 5th and 6th ....42.924 to 43.076 mm
4th...42.975 to 43.025 mm
Connecting Rod Journals Width..45.950 to 46.050 mm

Camshaft

Type .... Chilled Iron
Bushings .... 7, Replaceable
Bushing Lubrication:
  Bushing Lubrication .... Pressure Lubricated
Oil Clearance .... 0.045 to 0.123 mm
ID of Bushings (Installed) .... 60.058 to 60.110 mm
  Maximum Service Limit .... 60.122 mm
Width of Bushing .... 24.75 to 25.25 mm
Camshaft Journal OD .... 59.987 to 60.013 mm
  Minimum Serviceable Limit .... 59.962 mm
Camshaft Bore Diameter in Block Bushing Bore .... 63.987 to 64.013 mm
Camshaft Thrust Thickness .... 9.42 to 9.58 mm
  Minimum Service Limit .... 9.34 mm
Camshaft Thrust Clearance .... 0.120 to 0.340 mm
  Maximum Service Limit .... 0.470 mm

Turbocharger

Horizontal Travel of Turbine Shaft .... 0.03 to 0.08 mm

Gear Train

Backlash:
  Crankshaft Gear to Camshaft Gear .... 0.152 to 0.254 mm
  Crankshaft Gear to Idler Gear .... 0.08 to 0.33 mm
  Camshaft to Fuel Pump Gear .... 0.152 to 0.254 mm
    Maximum Service Limit (Fuel Pump Gear) .... 0.38 mm
  Idler Gear to Oil Pump .... 0.152 to 0.254 mm
  Camshaft to Auxiliary .... 0.152 to 0.254 mm
    Maximum Service Limit (All Gears) .... 0.45 mm

Rocker Arm Assembly

OD of Shaft .... 22.219 to 22.231 mm
  Minimum Service Limit .... 22.199 mm
ID of Arm Bore .... 22.256 to 22.282 mm
  Maximum Service Limit .... 22.301 mm
Lubrication .... Pressure From Oil Gallery

Intake Valve

Tappet Clearance (Cold) .... 0.30 mm
Face Angle .... 30 Degrees
Face Run-Out .... 0.038 mm
Valve Head Edge Thickness, Minimum .... 1.50 mm
Length .... 150.65 to 151.21 mm
OD of Stem .... 9.48 to 9.50 mm
  Minimum Service Limit .... 9.46 mm
OD of Head .... 53.897 to 53.927 mm
Seat Angle .... 30 Degrees
Seat Contact Width .... 1.38 to 1.98 mm
Seat Run-Out .... 0.05 mm
Insert Height .... 8.06 to 8.32 mm
OD of Insert .... 53.992 to 54.008 mm
ID of Insert .... 44.37 to 44.63 mm
Valve Recession Below Head Surface .... 0.89 to 1.42 mm
  Maximum Service Limit .... 1.42 mm
ID of Valve Guide Bore .... 9.539 to 9.559 mm
  Maximum Service Limit .... 9.559 mm
  Valve Guide Installed Height .... 20.65 to 21.16 mm

Exhaust Valve

Tappet Clearance (Cold) .... 0.60 mm
Face Angle .... 45 Degrees
Face Run-Out .... 0.038 mm
Valve Head Edge Thickness, Minimum .... 1.50 mm
OD of Head .... 45.87 to 46.13 mm
OD of Stem .... 9.48 to 9.50 mm
  Minimum Service Limit .... 9.46 mm
Length .... 150.60 to 151.16 mm
Insert Seat Angle .... 45 Degrees
Seat Contact Width .... 1.92 to 2.68 mm
Seat Run-Out .... 0.038 mm
Insert Height .... 6.20 to 6.46 mm
OD of Insert .... 47.092 to 47.108 mm
ID of Insert .... 39.87 to 40.13 mm
Valve Recession Below Head Surface .... 0.89 to 1.42 mm
  Maximum Service Limit .... 1.42 mm
ID of Valve Guide Bore .... 9.539 to 9.559 mm
  Maximum Service Limit .... 9.559 mm
Valve Guide Installed Height .... 22.50 to 23.01 mm

Valve Springs

Free length .... 65.66 mm
Total Coils 7.50
Wire Diameter .... 4.830 to 4.930 mm
Compressed to 37.90 mm .... (Valve Open) 959.5 to 1060.5 N
  Maximum Service Limit .... 940 N
Compressed to 50.80 mm .... (Valve Closed) 464.5 to 513.5 N
  Minimum Service Limit .... 450 N

Oil Pressure Regulator Spring:

Free Length .... 86.61 mm
Wire Diameter .... 2.29 to 2.39 mm
Outside Diameter .... 18.87 mm
Total Coils 13
Compress to 60.3 mm .... 172.6 N

SPECIAL TORQUES

	Decimal Value	Metric Value
After Cooler Bolts	18 lb ft	24 Nm
Alternator Bracket Bolts (Lower)	18 lb ft	24 Nm
Alternator Bracket Bolts (Upper)	18 lb ft	24 Nm
Alternator Retaining Bolt	18 lb ft	24 Nm
Belt Tensioner Bracket Bolts	18 lb ft	24 Nm
Belt Tensioner Retaining Bolt	32 lb ft	43 Nm
Camshaft Retaining Bolts	18 lb ft	24 Nm
Connection Rod Bolts (Lubricate Threads With Engine Oil)	88 lb ft	120 Nm
Exhaust Manifold Bolts	32 lb ft	43 Nm
Fan Pulley Bracket Bolts	18 lb ft	24 Nm
Fan Pulley Bolts	32 lb ft	43 Nm
Flywheel Housing Bolts	45 lb ft	60 Nm
Flywheel Retaining Bolts	101 lb ft	137 Nm
Flywheel Housing Cover Bolts	18 lb ft	24 Nm
Fuel Filter Inlet Bolt	24 lb ft	32 Nm
Fuel Air Removal Bolt	6 lb ft	8 Nm
Fuel Filter Inlet Nut	11 lb ft	15 Nm
Fuel Line Fitting (High Pressure)	18 lb ft	24 Nm
Fuel Line Fitting (Low Pressure)	11 lb ft	15 Nm
Front Cover Bolts	18 lb ft	24 Nm
Crankshaft Dampener Pulley	148 lb ft	200 Nm
Cylinder Head Bolts (Lubricate the Threads with Engine Oil)	148 lb ft	200 Nm
Injection Pump (Type A) Drive Gear Nut	60 lb ft	81 Nm
Injection Pump (Type MW) Drive Gear Nut	66 lb ft	90 Nm
Injection Pump Retaining Nuts	32 lb ft	43 Nm
Injector Leak Off Bolt	7 lb ft	9 Nm
Injector Retaining Bolt	18 lb ft	24 Nm
Intake Manifold Bolts	18 lb ft	24 Nm
Intake Manifold Plug	92 lb ft	125 Nm
Engine Lift Bracket Bolts	57 lb ft	77 Nm
Main Bearing Bolts (Lubricate the Threads with Engine Oil)	129 lb ft	176 Nm
Oil Pan Drain Plug	60 lb ft	80 Nm
Oil Pan Heater Plug	60 lb ft	80 Nm
Oil Pan Retaining Bolts	18 lb ft	24 Nm
Oil Pump Retaining Bolts	18 lb ft	24 Nm
Oil Inlet Tube Bolts	7 lb ft	9 Nm
Oil Inlet Tube Brace Bolts	7 lb ft	9 Nm
Oil Filter Housing Bolts	18 lb ft	24 Nm
Rear Seal Retaining Bolts	7 lb ft	9 Nm
Rocker Arm Bolts	32 lb ft	43 Nm
Starter Retaining Bolts	57 lb ft	77 Nm
Thermostat Housing Bolts	18 lb ft	24 Nm
Timing Pin Retaining Bolts	4 lb ft	5 Nm

SPECIAL TORQUES (CONT'D)

	Decimal Value	Metric Value
Fuel Shutoff Solenoid Bolts	7 lb ft	9 Nm
Turbocharger Mounting Bolts	24 lb	32 Nm
Turbocharger Drain Tube Bolts	18 lb ft	24 Nm
Turbocharger Oil Supply (Both Ends)	18 lb ft	24 Nm
Turbine Housing Bolts	96 lb inch	11 Nm
Center Housing to Back Plate Bolts	48 lb inch	6 Nm
Compressor Housing Bolts	48 lb inch	6 Nm
Compressor Lock Nut	120 lb inch	14 Nm
Thrust Bearing Screws (Torx Head)	36 lb inch	5 Nm
Water Pump Mounting Bolts	18 lb ft	24 Nm
Coolant Outlet Bolts	18 lb ft	24 Nm
Valve Cover Bolts	18 lb ft	24 Nm
Primer Pump Bolts	18 lb ft	24 Nm
Timing Pin Cover (Injection Pump)	11 lb ft	15 Nm
Oil Pressure Plug	60 lb ft	80 Nm

SECTION CONTENTS FOR SECTION 2

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