3200 and 4200 Series Tractors

Service Manual Don 7-69134

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*** Found in Schematic Sets Only**

CASE CORPORATION
700 State Street
Racine, WI 53404 U.S.A.

CASE CANADA CORPORATION
450 Sherman Avenue
Hamilton, ON L8N 4C4 CANADA

Don 7-69114

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Section

1001

SAFETY, GENERAL INFORMATION

AND TORQUE SPECIFICATIONS

CASE CORPORATION

Don 8-86530

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SAFETY

This symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED. The message that follows the symbol contains important information about safety. Carefully read the message. Make sure you fully understand the causes of possible injury or death. 1-1-C

To prevent injury always follow the Warning, Caution and Danger notes in this section and throughout the manual.

Put the warning tag shown below on the key for the keyswitch when servicing or repairing the machine. One warning tag is supplied with each machine. Additional tags Part Number 331-4614 are available from your service parts supplier.

B004

WARNING: Read the operator's manual to familiarize yourself with the correct control functions. 46 27

WARNING: Operate the machine and equipment controls from the seat position only. Any other method could result in serious injury. 48 55

WARNING: This is one man machine, no riders allowed. 35 8

WARNING: Before starting engine, study Operator's Manual safety messages. Read all safety signs on machine. Clear the area of other persons. Learn and practice safe use of controls before operating.
It is your responsibilty to understand and follow manufacturers instructions on machine operation, service, and to observe pertinant laws and regulations. Operator's and Service Manuals may be obtained from your J.I.Case dealer 45 2

WARNING: If you wear clothing that is too loose or do not use the correct safety equipment for your job, you can be injured. Always wear clothing that will not catch on objects. Extra safety equipment that can be required includes hard hat, safety shoes, ear protection, eye or face protection, heavy gloves and reflector clothing 45 3 A

WARNING: When working in the area of the fan belt with the engine running, avoid loose clothing if possible, and use extreme caution. 35 4

WARNING: When doing checks and tests on the equipment hydraulics, follow the procedures as they are written. DO NOT change the procedure. 47 44

WARNING: When putting the hydraulic cylinders on this machine through the necessary cycles to check operation or to remove air from a circuit, make sure all people are out of the way. 47 45

WARNING: Use insulated gloves or mittens when working with hot parts.

CAUTION: Lower all attachments to the ground or use stands to safely support the attachments before you do any maintenance or service.

CAUTION: Pin sized and smaller streams of hydraulic oil under pressure can penetrate the skin and result in serious infection. If hydraulic oil under pressure does penetrate the skin, seek medical treatment immediately. Maintain all hoses and tubes in good condition. Make sure all connections are tight. Make a replacement of any tube or hose that is damaged or thought to be damaged. DO NOT use your hand to check for leaks, use a piece of cardboard or wood.

CAUTION: When removing hardened pins such as a pivot pin, or a hardened shaft, use a soft head (brass or bronze) hammer or use a driver made from brass or bronze and a steel head hammer.

CAUTION: When using a hammer to remove and install pivot pins or seperate parts using compressed air or using a grinder, wear eye protection that completely encloses the eyes (approved goggles or other approved eye protectors).

CAUTION: Use suitable floor (service) jacks or chain hoist to raise wheels or tracks off the floor. Always block machine in place with suitable safety stands.

CAUTION: When servicing or repairing the machine. Keep the shop floor and operator's compartment and steps free of oil, water, grease, tools, etc. Use an oil absorbing material and or shop cloths as required. Use safe practices at all times.

CAUTION: Some components of this machine are very heavy. Use suitable lifting equipment or additional help as instructed in this Service Manual.

DANGER: Engine exhaust fumes can cause death. If it is necessary to start the engine in a closed place, remove the exhaust fumes from the area with an exhaust pipe extension. Open the doors and get outside air into the area.

DANGER: When the battery electrolyte is frozen, the battery can explode if (1), you try to charge the battery, or (2), you try to jump start and run the engine. To prevent the battery electrolyte from freezing, try to keep the battery at full charge. If you do not follow these instructions, you or others in the area can be injured.

DANGER: Batteries contain acid and explosive gas. Explosions can result from sparks, flames or wrong cable connections. To connect the jumper cables correctly to the battery of this machine see the Operator's Manual. Failure to follow these instructions can cause serious injury or death.

GENERAL INFORMATION

CLEANING

Clean all metal parts except bearings, in mineral spirits or by steam cleaning. Do not use caustic soda for steam cleaning. After cleaning dry, and put oil on all parts. Clean oil passages with compressed air. Clean bearings in kerosene, dry the bearings completely and put oil on the bearings.

INSPECTION

Check all parts when the parts are disassembled. Replace all parts that have wear or damage. Small scoring or grooves can be removed with a hone or crocus cloth. Complete visual inspection for indications of wear, pitting and the replacement of parts necessary will prevent early failures.

BEARINGS

Check bearings for easy action. If bearings have a loose fit or rough action replace the bearing. Wash bearings with a good solvent or kerosene and permit to air dry. DO NOT DRY BEARINGS WITH COMPRESSED AIR.

NEEDLE BEARINGS

Before you press needle bearings in a bore always remove any metal protrusions in the bore or edge of the bore. Before you press bearings into position put petroleum jelly on the inside and outside diameter of the bearings.

GEARS

Check all gears for wear and damage. Replace gears that have wear or damage.

OIL SEALS, O-RINGS AND GASKETS

Always install new oil seals, o-rings and gaskets. Put petroleum jelly on seals and o-rings.

SHAFTS

Check all shafts that have wear or damage. Check the bearing and oil seal surfaces of the shafts for damage.

SERVICE PARTS

Always install genuine Case service parts, when ordering refer to the Parts Catolog for the correct part number of the genuine Case replacement items. Failures due to the use of other than genuine Case replacement parts are not covered by warranty.

LUBRICATION

Only use the oils and lubricants specified in the Operator's or Service Manual. Failures due to the use of non specified oils and lubricants are not covered by warranty.

STANDARD TORQUE DATA FOR NUTS AND BOLTS

Where no special torque data is specified, the following torque figures should be applied. Threads should be lubricated with engine oil or chassis grease.

TORQUE SPECIFICATIONS ± 10%									
SIZE	GRADE 8.8			GRADE 10.9			GRADE 12.9		
	lb-ft	Nm	kg/m	lb-ft	Nm	kg/m	lb-ft	Nm	kg/m
5 mm	4	5.5	0.56	5.5	7.5	0.76	6.6	9	0.92
6 mm	6.6	9	0.92	9.2	12.5	1.27	11	15	1.53
8 mm	16.5	22.5	2.3	23	31.5	3.2	26.5	36	3.67
10 mm	32	44	4.5	45	62	6.3	55	75	7.65
12 mm	57	77.5	7.9	81	110	11.2	95	130	13.2
14 mm	88	120	12.2	125	170	17.3	155	210	21.4
16 mm	140	190	19.4	195	265	27	236	320	32.6
18 mm	192	260	26.5	269	365	37.2	320	435	44.3
20 mm	273	370	37.7	383	520	53	457	620	63.2
22 mm	369	500	51	516	700	71.4	619	840	85.6
24 mm	471	640	65.2	665	900	92	796	1080	110
27 mm	702	950	97	996	1350	137.7	1195	1620	165.2
30 mm	955	1300	132.5	1328	1800	183.6	1593	2160	220.3

TORQUE DATA FOR HYDRAULIC FITTINGS

FITTINGS, CONNECTIONS AND PLUGS

Diameter x Pitch	Newton / Metres	Pounds / Feet	Kilogram / Metres
10 mm x 1	20	14.5	2
12 mm x 1.5	35	26	3.6
14 mm x 1.5	45	33.2	4.6
16 mm x 1.5	60	44	6.1
18 mm x 1.5	70	51	7.1
22 mm x 1.5	100	73	10.2
27 mm x 2	200	147	20.4
33 mm x 2	280	207	28.6
42 mm x 2	380	281	38.8

NUTS FOR TUBES AND HOSES

Diameter x Pitch	Newton / Metres	Pounds / Feet	Kilogram / Metres
16 mm x 1.5	20	14.5	2
18 mm x 1.5	35	26	3.6
20 mm x 1.45	45	33.2	4.6
24 mm x 1.5	60	44	6.1

FLANGES

Diameter x Pitch	Newton / Metres	Pounds / Feet	Kilogram / Metres
8 mm x 1.5	28	21	2.9
10 mm x 1.5	55	41	5.6
12 mm x 1.75	90	67	9.2
14 mm x 2	145	107	14.8
16 mm x 2	230	170	23.5

Section

1002

GENERAL SPECIFICATIONS AND TORQUES

CASE CORPORATION
700 State Street
Racine, Wi 53404 U.S.A.

CASE CANADA CORPORATION
3350 South Service Road
Burlington, ONL7N 3M6 CANADA

Don 7-39231

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GENERAL SPECIFICATIONS

Capacities

Coolant Capacity		
3 Cylinder Engines	11.4 litres	3.0 U.S. gal
4 Cylinder Engines	13.7 litres	3.6 U.S. gal
Engine Oil Capacity		
D-155, D-179 Engine	Without filter change 7.0 litres	1.8 U.S. gal
	With filter change 7.5 litres	2.0 U.S. gal
D-206 Engine	Without filter change 9.0 litres	2.4 U.S. gal
	With filter change 9.5 litres	2.5 U.S. gal
D-239, D-246, D-268, DT-268 Engine	Without filter change 9.3 litres	2.5 U.S. gal
	With filter change 9.8 litres	2.6 U.S. gal
Transmission/Hydraulic System Capacity		
2WD	34 litres	9.0 U.S. gal
MFD	36.5 litres	9.6 U.S. gal
MFD Axle		
Differential	5.0 litres	1.3 U.S. gal
Planetaries	0.6 litres	0.2 U.S. gal
Fuel Tank		
Tractor with Cab	112 litres	29.6 U.S. gal
Tractor without Cab	77 litres	20.3 U.S. gal
Front PTO	0.65 litres	0.2 U.S. gal

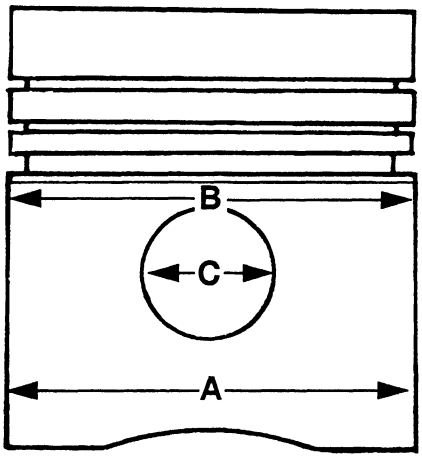
Engine Specifications

CYLINDER HEAD		
Cylinder Head Maximum Warpage	0.12 mm	0.0047 inch
Cylinder Head Thickness		
New	98.81 to 99.31 mm	3.8902 to 3.9098 inch
Minimum After Machining	98.54 mm	3.8795 inch

NOTE: *The maximum amount of material that can be machined from the cylinder head face is 0.77 mm (0.030 inch).*

Inlet Valve Stem Diameter	9.935 to 9.945 mm	0.3912 to 0.3915 inch
Exhaust Valve Stem Diameter	9.995 to 9.965 mm	0.3920 to 0.3924 inch
Maximum Stem Clearance in Guide Before Reconditioning	0.15 mm	0.006 inch
Valve Clearance (Engine Warm) Inlet and Exhaust	0.30 mm	0.012 inch
Valve Seat Angle		45°
Distance of Cylinder Head Face to Valve Face		
Inlet	1.00 to 1.40 mm	0.04 to 0.05 inch
Exhaust	1.20 to 1.60 mm	0.047 to 0.06 inch
Valve Guides		
Outside Diameter	16.060 to 16.078 mm	0.6323 to 0.6330 inch
Inside Diameter	9.865 to 9.901 mm	0.3883 to 0.3893 inch
Inside Diameter (Reamed)	10.00 to 10.02 mm	0.3940 to 0.3945 inch
Distance from Top of Valve Guide to the		
Seat in Cylinder for Valve Rotator	28.0 mm	1.102 inch
Valve Seat Insert Thickness	8.75 mm	0.344 inch
Valve Seat Outside Diameter		
Standard	42.07 to 42.09 mm	1.656 to 1.657 inch
0.006 inch (0.15 mm) Oversize	42.22 to 42.24 mm	1.662 to 1.663 inch
0.016 inch (0.40 mm) Oversize	42.47 to 42.49 mm	1.672 to 1.673 inch
Minimum Valve Seat Contact Width	1.50 mm	0.059 inch
Cylinder Head Counterbore Diameter for Valve Seat Insert		
Standard	42.000 to 42.020 mm	1.653 to 1.654 inch
0.006 inch (0.15 mm) Oversize	42.150 to 42.170 mm	1.659 to 1.660 inch
0.016 inch (0.40 mm) Oversize	42.400 to 42.420 mm	1.669 to 1.670 inch
Counterbore Depth from Cylinder Head Face	12.24 to 12.29 mm	0.482 to 0.484 inch
Valve Springs		
Free Length	54.00 +/- 1.50 mm	2.125 +/- 0.059 inch
Rocker Shaft Outside Diameter	21.56 to 21.59 mm	0.848 to 0.850 inch
Rocker Arm Bushing Diameter	21.62 to 21.64 mm	0.851 to 0.852 inch
Rocker Shaft Spring	21.671 to 21.63 mm	0.850 to 0.851 inch
Free Length	37.70 mm	1.484 inch
Push Rods Effective Length		
D-155, D-206	176.50 to 177.00 mm	6.949 to 6.968 inch
D-179, D-239, D-246	211.00 to 211.50 mm	8.307 to 8.326 inch
D-268, DT-268	216.50 to 217.00 mm	8.524 to 8.543 inch

PISTONS



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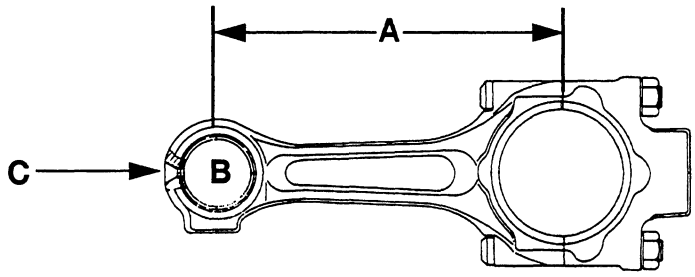
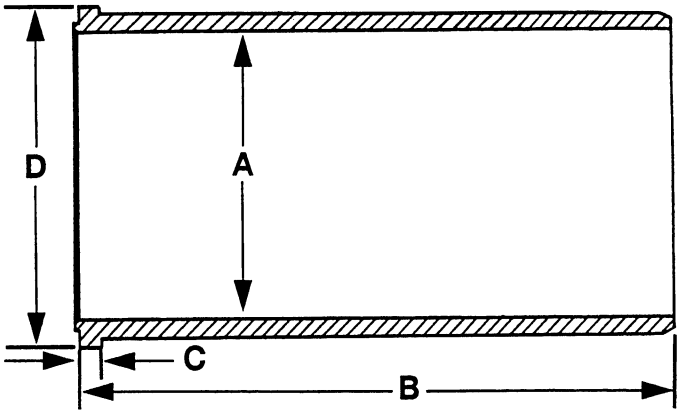
Piston Clearance in Cylinder Liner measured 90° degrees to Piston Pin Hole		
Diameter A measured at a Height of 4.0 mm (0.157 inch)	0.09 to 0.13 mm	0.0035 to 0.0050 inch
Diameter B measured at a Height of 50.0 mm (1.968 inch)	0.15 to 0.20 mm	0.0059 to 0.0079 inch
Diameter of Piston Pin Hole C		
D-155, D-179, D-206, D-239, D-246, D-268	35.997 to 36.002 mm	1.4172 to 1.4174 inch
DT-268	38.00 mm (+ 0.002 - 0.003)	1.4960 inch(+ 0.00007 - 0.0001)
Piston Ring Gap		
Compression Rings	0.35 to 0.55 mm	0.014 to 0.022 inch
Oil Control Ring	0.25 to 0.40 mm	0.010 to 0.016 inch
Piston Pin Diameter		
D-155, D-179, D-206,D-239, D-246, D-268	35.987 to 35.991 mm	1.4168 to 1.4170 inch
DT-268	37.987 to 37.991 mm	1.4955 to 1.4957 inch
Protrusion of Pistons		
D-155, D-206 Engines (with a 111.1 mm Stroke)	0.32 to 0.70 mm	0.0126 to 0.027 inch
D-179, D-239 Engines (with a 128.52 mm Stroke)	0.36 to 0.74 mm	0.0141 to 0.029 inch
D-268, DT-268 Engines (with a 139.77 mm Stroke)	0.36 to 0.74 mm	0.0141 to 0.029 inch

CONNECTING RODS



Dimension A		
D-155, D-206	187.96 to 188.01 mm	7.400 to 7.402 inch
D-179, D-239, D-246, D-268, DT-268	213.84 to 213.89 mm	8.419 to 8.421 inch
Dimension B		
D-155, D-179, D-206, D-239, D-246, D-268	36.012 to 36.022 mm	1.4178 to 1.4182 inch
DT-268	38.026 to 38.036 mm	1.4970 to 1.4974 inch
Dimension C	4.0 mm	0.16 inch
Connecting Rod to Crankshaft Side Clearance	0.16 to 0.25 mm	0.006 to 0.010 inch

CYLINDER LINERS



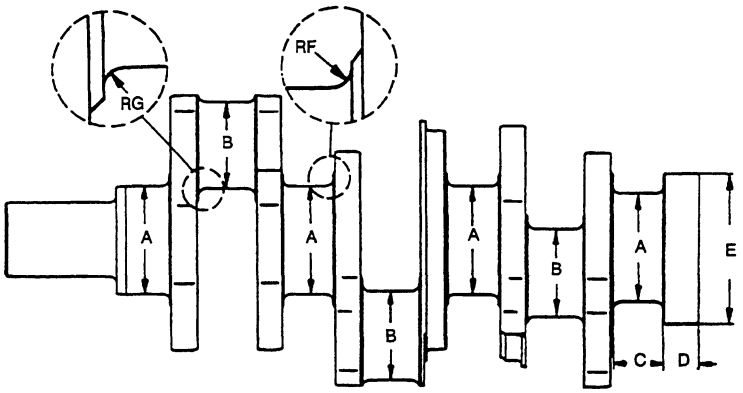
Dimension A		
D-155, D-179, D-206, D-239	98.425 to 98.449 mm	3.8750 to 3.8759 inch
D-246, D-268, DT-268	100.00 to 100.24 mm	3.9370 to 3.9379 inch
Dimension B		
D-155, D-206	200 mm	7.874 inch
D-179, D-239, D-246, D-268, DT-268	215 mm	8.464 inch
Dimension C	7.700 to 7.715 mm	0.3031 to 0.3037 inch
Dimension D	119 mm	4.685 inch
Cylinder Liner Protrusion	0.08 to 0.12 mm	0.0031 to 0.0047 inch
Maximum Warpage of Surface	0.04 mm	0.0016 inch
O-Ring Groove Diameter		
(New) Golden Tracers	118.32 to 118.58 mm	4.658 to 4.668 inch
(Old) Red Tracers	118.54 to 118.80 mm	4.667 to 4.677 inch

BALANCER (4 Cylinder Engines only)		
Backlash Balancer Drive Gear to Crankshaft Gear		
D-206, D-239, D-246	0.25 to 0.40 mm	0.010 to 0.016 inch
D-268, DT-268	0.23 to 0.50 mm	0.009 to 0.020 inch
Backlash Balancer Gear	0.18 to 0.23 mm	0.007 to 0.009 inch

CYLINDER BLOCK		
Cylinder Block Surface Maximum Warpage	0.12 mm	0.0047 inch
Cylinder Block Surface Height from Centerline of Crankshaft		
D-155, D-206	309.842 to 309.908 mm	12.198 to 12.201 inch
D-179, D-239, D-246	344.386 to 344.462 mm	13.558 to 13.561 inch
D-268, DT-268	353.386 to 353.462 mm	13.912 to 13.915 inch

CRANKSHAFT		
Crankshaft Journals and Crankpins		
Maximum Out of Round per 25mm (1 inch)	0.004 mm	0.00015 inch
Maximum Taper per 25 mm (1 inch)	0.004 mm	0.00015 inch
Crankshaft Rear Sealing Flange		
Permitted Run-out	0.050 mm	0.002 inch
Permitted Out of True	0.020 mm	0.00078 inch
Crankshaft Main Bearing Clearance (New Inserts)	0.070 to 0.14 mm	0.00275 to 0.00551 inch
Crankshaft End Float	0.15 to 0.23 mm	0.006 to 0.009 inch
Connecting Rod Bearing Clearance (New Inserts)	0.06 to 0.12 mm	0.0023 to 0.0047 inch
Crankshaft Balancer Ring Gear to Drive Weight Gear Backlash		
D-206, D-239, D-246	0.25 to 0.40 mm	0.010 to 0.016 inch
D-268, DT-268	0.23 to 0.50 mm	0.009 to 0.020 inch

CRANKSHAFT RECONDITIONING DIMENSIONS



SEE ILLUSTRATION ABOVE	LIMITS FOR UNDERSIZE CRANKSHAFT GRINDING									
	A		B		C		D		E	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
1st Undersize 0.25 mm (0.010 inch)	79.740 79.721	3.1393 3.1386	63.740 63.721	2.5094 2.5087	36.90 36.94	1.4528 1.4543	25.875	1.0187		
2nd Undersize 0.50 mm (0.020 inch)	79.490 79.471	3.1295 3.1287	63.490 63.471	2.4996 2.4998	37.15 37.19	1.4626 1.4642	25.750	1.0137	110.00 109.98	4.3307 4.3299
3rd Undersize 0.75 mm (0.030 inch)	79.240 79.221	3.1197 3.1189	63.240 63.221	2.4898 2.4890	37.40 37.44	1.4724 1.4740	25.625	1.0088		

Radius RF (Journals).....5 mm (+ 0.5 or - 0.1 mm) 0.20 inch (+ 0.020 or - 0.004 inch)
Radius RG (Crankpins) ..... 5.7 mm (+ 0.6 or - 0 mm) 0.224 inch (+ 0.023 or - 0 inch)

General information for reconditioning crankshafts :

It is recommended that crankshaft reconditioning be carried out in specialised workshops where equipment and experience can produce the high standard of work required.
When grinding the crankshaft the following points must be observed:

1. Inspect the crankshaft for hairline cracks. If cracks are present do not recondition the crankshaft, a new crankshaft must be installed.
2. Do not grind the crankshaft beyond the limits specified.
3. After reconditioning make sure the crankshaft is thoroughly cleaned and that the lubrication passages are clear.

HARDENING CRANKSHAFT AFTER RECONDITIONING

There are three different methods of hardening current production crankshafts and depending on type different rules apply.

DEEP NITROC HARDENED CRANKSHAFTS

Identifiable by the "N" stamped on the first web. These crankshafts require hardening after the second reconditioning.

TUFFTRIDING (Bath Nitriding Process)

Crankshafts hardened by this process may be reconditioned to the second undersize only.

INDUCTION HARDENDED CRANKSHAFTS

Crankshafts hardened by this method may be reconditioned to the third undersize without need to harden.

IMPORTANT: *Tufftrided and induction hardened crankshafts have no identification marks and must be identified by a hardness test on a crankshaft web. DO NOT hardness test on a journal.*

CAMSHAFT		
Cam Lobe Lift	8.10 mm	0.318 inch
Journals, OD	57.97 to 58 mm	2.2823 to 2.2835 inch
Bushings, ID	58.024 to 58.054 mm	2.2844 to 2.2856 inch
Camshaft Running Clearance in Bushings	0.25 to 0.084 mm	0.0010 to 0.0033 inch
Camshaft End Float	0.10 to 0.45 mm	0.004 to 0.018 inch
CAMSHAFT GEAR		
Bore Diameter	41.275 to 41.300 mm	1.6250 to 1.6259 inch
Gear Seat Diameter	41.317 to 41.333 mm	1.6260 to 1.6270 inch
Camshaft Gear to Idler Backlash	0.09 to 0.27 mm	0.0035 to 0.0106 inch
CAMSHAFT LIFTERS		
Diameter	19.970 to 19.985 mm	0.7865 to 0.7868 inch
Bore in Crankcase	19.997 to 20.030 mm	0.7873 to 0.7885 inch
Effective Length	47.700 to 48.100 mm	1.8779 to 1.8937 inch
Clearance in Crankcase	0.012 to 0.060 mm	0.004 to 0.0023 inch
THRUST PLATE		
Thrust Plate Thickness	6.96 to 7.01 mm	0.274 to 0.276 inch
IDLER GEAR		
Bore Diameter	42.022 to 42.038 mm	1.6543 to 1.6550 inch
Running Clearance	0.010 to 0.040 mm	0.0004 to 0.0016 inch
End Float	0.20 to 0.33 mm	0.008 to 0.013 inch
Idler Gear Carrier OD	34.989 to 35.000 mm	1.3775 to 1.3779 inch
Idler Gear to Crankshaft Gear Backlash	0.18 to 0.38 mm	0.007 to 0.015 inch
LINE BORING CAMSHAFT BUSHINGS		
Bushings after Line Boring	58.024 to 58.054 mm	2.2844 to 2.2856 inch
Idler Gear to Camshaft Bushing Radius	146.787 to 146.858 mm	5.7789 to 5.7818 inch
Camshaft Bushing Run-out	0.025 mm	0.001 inch
OIL PUMP		
Pressure Relief Valve Spring Free Length	72.4 mm	2.85 inch
Idler Gear End Play	0 to 0.5 mm	0 to 0.002 inch
Drive Gear End Play	0.1 mm	0.004 inch
Idler Gear Backlash	0.15 to 0.38 mm	0.006 to 0.015 inch
Oil Pressure with Oil Temperature at 90 to 100°C (194 to 212° F)		
New Engine at Rated Engine Speed	2.8 bar	40 psi
New Engine at Low Idle Speed	0.9 bar	13 psi
Worn Engine at Rated Engine Speed	2.5 bar	36 psi
Engine Oil Pressure Warning Light comes on at	0.3 to 0.6 bar	4 to 8 psi
WATER PUMP		
Water Pump Impeller to Housing Clearance	0.3 to 0.5 mm	0.012 to 0.20 inch
THERMOSTAT		
Starts to Open	84°C	183°F
Fully Open	95°C	283°F

Fuel System Specifications

FUEL INJECTION PUMP

Type ..... Single Plunger With Rotary Distributor
Rotation ..... Counterclockwise (When Looking At Drive Gear)
Drive ..... Gear Drive At 1/2 Engine Speed
Governor ..... Centrifugal
Lubrication ..... Self Lubricating

Engine Type/ Identification Number	Injection Pump Identification Number
D-155 3 Cylinder	1329 101 C91
D-179 3 Cylinder	1329 100 C91
D-206 4 Cylinder	1329 137 C1
D-239 4 Cylinder	1329 128 C1
D-246 4 Cylinder	1329 163 C1
D-268 4 Cylinder	1329 107 C91
D-268 4 Cylinder (Turbocharged)	1967 018 C1 1967 078 C1 (NAO)

INJECTION PUMP 1329 101 C91

Static Timing ..... 8° BTC
Plunger Travel For Static Timing ..... 1.0 mm ..... 0.039 inch
Total Plunger Travel ..... 2.49 to 2.51 mm ..... 0.098 to 0.099 inch

INJECTION PUMP 1329 100 C91

Static Timing ..... 8° BTC
Plunger Travel For Static Timing ..... 1.0 mm ..... 0.039 inch
Total Plunger Travel ..... 2.19 to 2.21 mm ..... 0.086 to 0.087 inch

INJECTION PUMP 1329 137 C1

Static Timing ..... 8° BTC
Plunger Travel For Static Timing ..... 1.0 mm ..... 0.039 inch
Total Plunger Travel ..... 2.79 to 2.81 mm ..... 0.110 to 0.111 inch

INJECTION PUMP 1329 128 C1

Static Timing ..... 8° BTC
Plunger Travel For Static Timing ..... 1.0 mm ..... 0.039 inch
Total Plunger Travel ..... 2.79 to 2.81 mm ..... 0.110 to 0.111 inch

INJECTION PUMP 1329 163 C1

Static Timing ..... 4° BTC
Plunger Travel For Static Timing ..... 1.0 mm ..... 0.039 inch
Total Plunger Travel ..... 2.49 to 2.51 mm ..... 0.098 to 0.099 inch

INJECTION PUMP 1329 107 C91

Static Timing ..... 8° BTC
Plunger Travel For Static Timing ..... 1.0 mm ..... 0.039 inch
Total Plunger Travel ..... 2.49 to 2.51 mm ..... 0.098 to 0.099 inch

INJECTION PUMP 1967 018 C1 or 1967 078 C1 (NAO)

Static Timing ..... 12 to 14° BTC
Plunger Travel For Static Timing ..... 1.0 mm ..... 0.039 inch
Total Plunger Travel ..... 2.5 mm ..... 0.098 inch

FUEL INJECTORS

D-155, D-179, D-206 Engines

Nozzle	Bosch DLLA 150S 836 (3218 248 R2)	
Nozzle Holder	Bosch KBEL 84S 4/13 (3218 247 R92)	
Opening Pressure	225 to 233 bar	3263 to 3379 psi
Sac-Hole Diameter	1.00 mm	0.0393 inch
Orifice Holes Diameter	0.27 mm	0.0106 inch

D-239, D-246, D-268, DT-268 Engines

Nozzle	Bosch DLLA 150S 815 (3218 251 R2)	
Nozzle Holder	Bosch KBEL 84S 4/13 (3218 247 R92)	
Opening Pressure	225 to 233 bar	3263 to 3379 psi
Sac-Hole Diameter	1.00 mm	0.0393 inch
Orifice Holes Diameter	0.29 mm	0.0114 inch

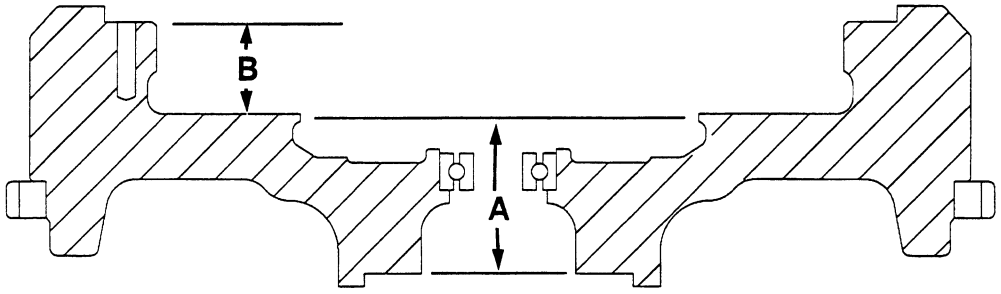
Steering Specifications

TRACK ADJUSTMENT

Toe-in 2WD Axle	0 to 5 mm	0 to 0.20 inch
Toe-in MFD Axle	0 to 2 mm	0 to 0.08 inch

Transmission Specifications

FLYWHEEL



SM1247.1

For Tractors equipped with Rockford 12 inch Clutch

Dimension A (New Flywheel) maximum	55.55 mm	2.19 inch
Dimension A (Refaced Flywheel) minimum	52.38 mm	2.06 inch
Maximum Flywheel Refacing	3.17 mm	0.125 inch
Dimension B	35.55 mm	1.40 inch

For Tractors equipped with Laycock 11 inch Clutch

Dimension A (New Flywheel) maximum	63.34 mm	2.49 inch
Dimension A (Refaced Flywheel) minimum	60.17 mm	2.37 inch
Maximum Flywheel Refacing	3.17 mm	0.125 inch
Dimension B	36.65 mm	1.44 inch

FLYWHEEL RING GEAR

Number of Teeth

3210 (Europe Only)	126
3220/3230 and 4210	126
4220 (Europe Only)	126
4230 and 4240	128

RANGE TRANSMISSION		
Range Transmission Synchronizer Running Clearance	0.4 to 0.6 mm	0.016 to 0.024 inch
Pinion Bearing End Play (Maximum)	0.076 mm	0.003 inch
Synchronizer Running Clearance	0.4 to 0.6 mm	0.016 to 0.024 inch
Selector Fork Running Clearance		
Standard Transmission	0.45 mm	0.018 inch
Forward/Reverse Transmission	0.05 mm	0.002 inch
SPEED TRANSMISSION		
Main Shaft End Play		
Between 1st/2nd Gear	0.102 to 0.94 mm	0.0004 to 0.037 inch
Between 3rd/4th Gear	0 to 1.93 mm	0.076 inch
MFD Drive Shaft Deflection (below the center line of the shaft)		
(measured at Center Support Bearing)	0.50 to 0.55 mm	0.019 to 0.021 inch
MFD CLUTCH		
Friction Plate Thickness (New)	2.25 to 2.35 mm	0.089 to 0.092 inch
Friction Plate Thickness (Minimum)	2.00 mm	0.079 inch
PARKING BRAKE		
Front and Rear Brake Pads (New)	10.70 to 10.90 mm	0.42 to 0.43 inch
Front and Rear Brake Pads (Minimum)	10.50 mm	0.41 inch
Central Brake Pads (New)	4.00 to 4.10 mm	0.157 to 0.161 inch
Central Brake Pads (Minimum)	3.50 mm	0.138 inch
Output Shaft Bearing Preload (without oil seals)	20 to 40 N	4.50 to 9.00 lb
REAR AXLES		
Planetary Gear/Planetary Gear Carrier Shimming	refer to Section 6012, Page 3	
DIFFERENTIAL		
Differential Lock Selector Ring Clearance (Engaged Position)	0.025 to 0.9 mm	0.001 to 0.035 inch
Ring Gear/Pinion Gear Backlash	0.15 to 0.31 mm	0.006 to 0.012 inch
PTO CLUTCH		
Standard Clutch		
Number of Friction Plates	5	
Number of Steel Separator Plates (2 between each Friction Plate)	8	
Heavy Duty Clutch		
Number of Friction Plates	6	
Number of Steel Separator Plates	5	

Brake Specifications

PARKING BRAKE		
Number of Friction Discs	3	
Number of Stationary Discs	3	
Friction Disc Thickness (New)	2.90 mm	0.116 inch
Stationary Disc Thickness (New)	1.80 mm	0.070 inch
REAR BRAKES		
Type	Hydraulically Operated Oil Cooled Disc	
Brake Piston Test Pressure		
Low Pressure Test	4 Steps of 3.4 bar (50 psi) up to 13.8 bar (200 psi)	
High Pressure Test	27.6 bar	400 psi
Inner Brake Ring Backlash	0.005 to 0.025 inch	0.127 to 0.635 mm