



bobcat

TECHNICAL DATA

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**TECHNICAL
DATA**

**SPECIFICATIONS
(Perkins)**

**SPECIFICATIONS
(200 Series Perkins)**

**SPECIFICATIONS
(Isuzu)**

**GENERAL
SPECIFICATIONS**



GENERAL SPECIFICATIONS

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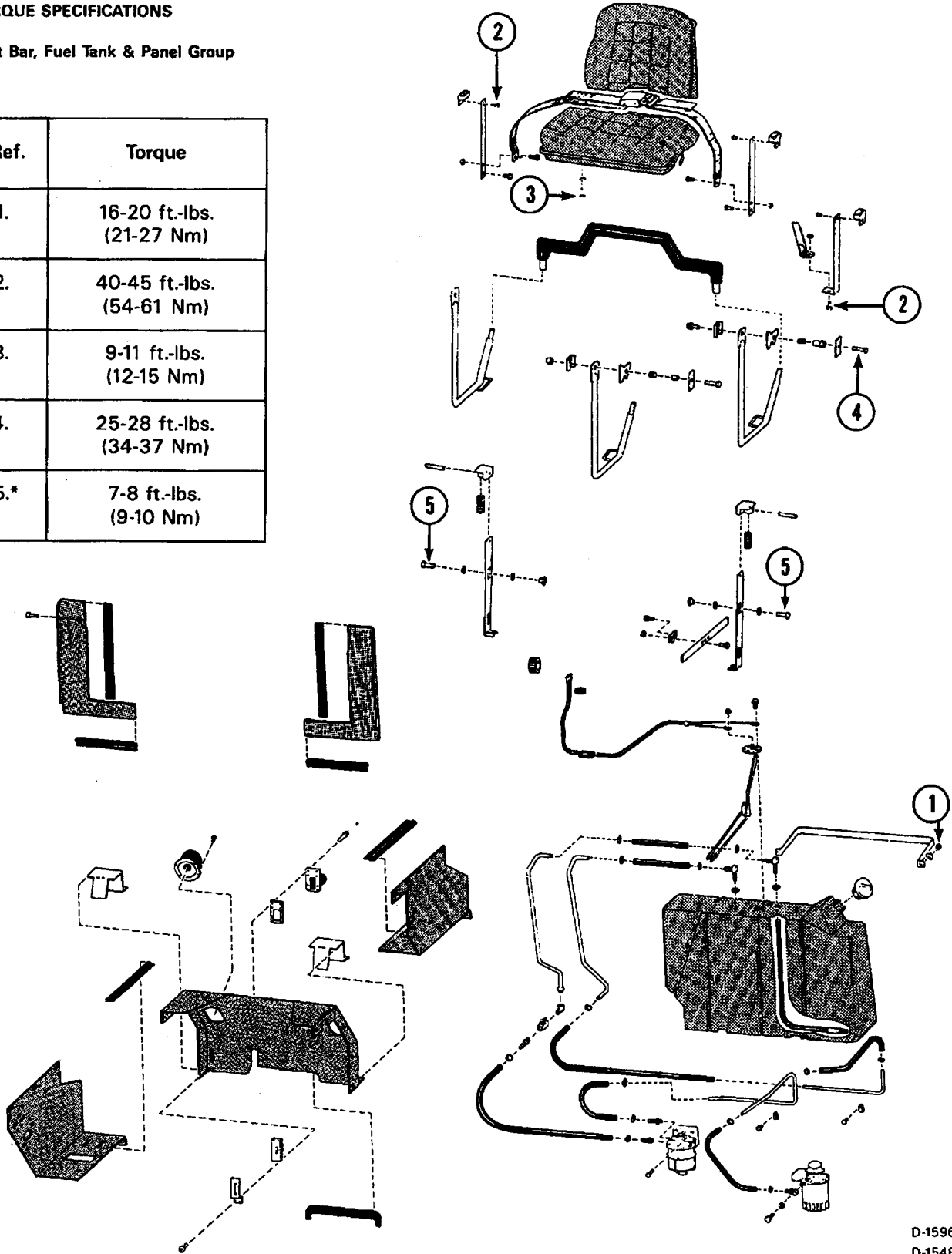


bobcat

TORQUE SPECIFICATIONS

Seat Bar, Fuel Tank & Panel Group

Ref.	Torque
1.	16-20 ft.-lbs. (21-27 Nm)
2.	40-45 ft.-lbs. (54-61 Nm)
3.	9-11 ft.-lbs. (12-15 Nm)
4.	25-28 ft.-lbs. (34-37 Nm)
5.*	7-8 ft.-lbs. (9-10 Nm)



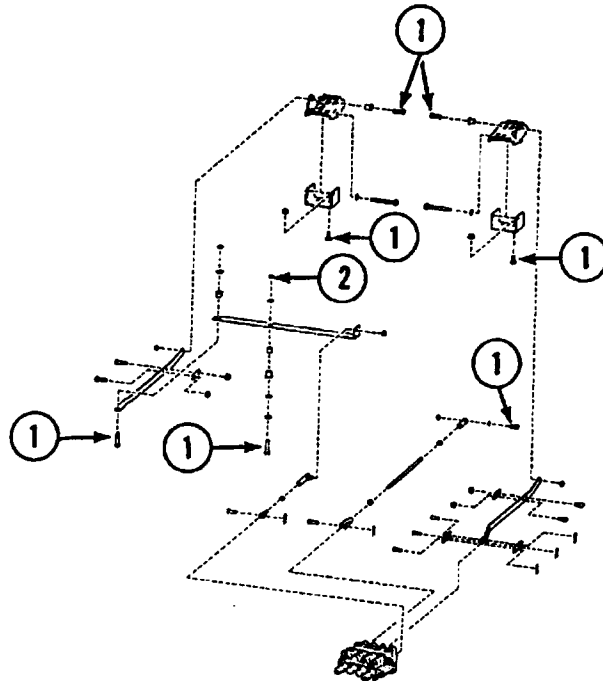
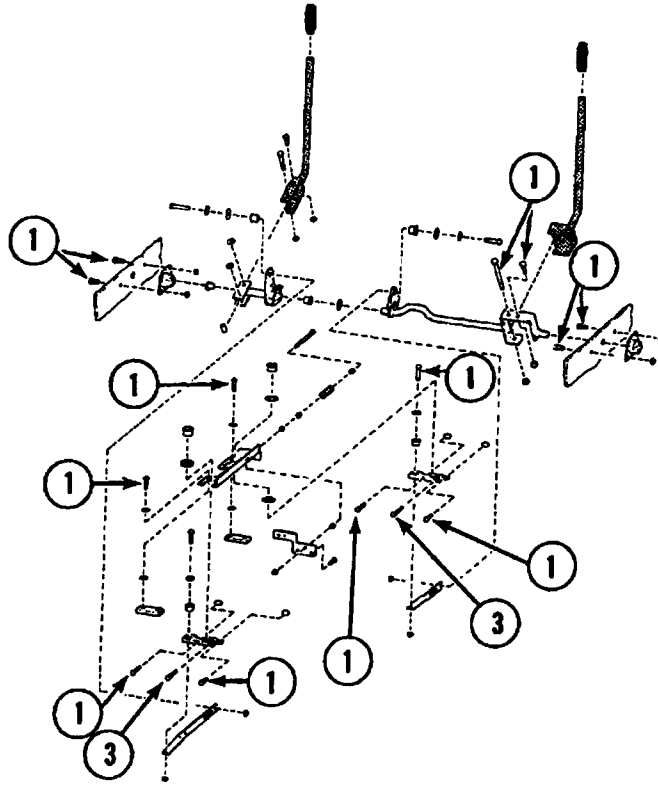
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D-1596
D-1548
D-1696

TORQUE SPECIFICATIONS (Cont'd)

Steering Levers, Linkage & Pedal Group

Ref.	Torque
1.	25-28 ft.-lbs. (34-38 Nm)
2.	11-13 ft.-lbs. (15-18 Nm)
3.	18-20 ft.-lbs. (24-27 Nm)



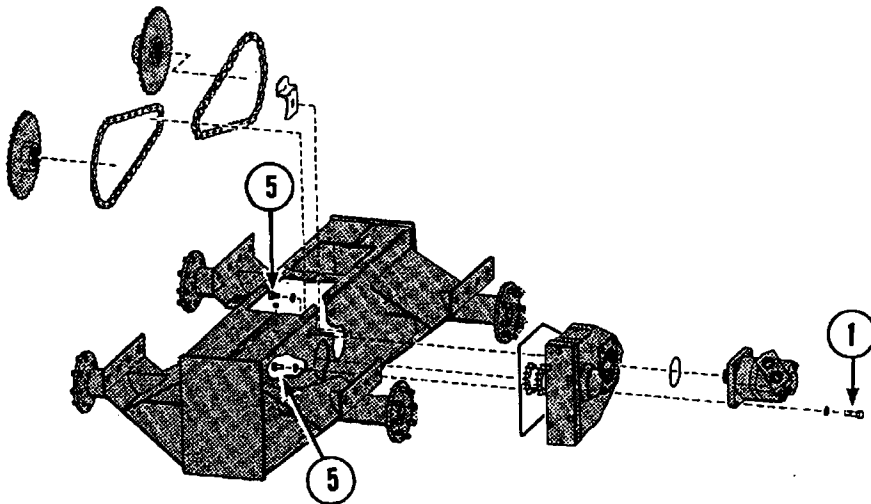
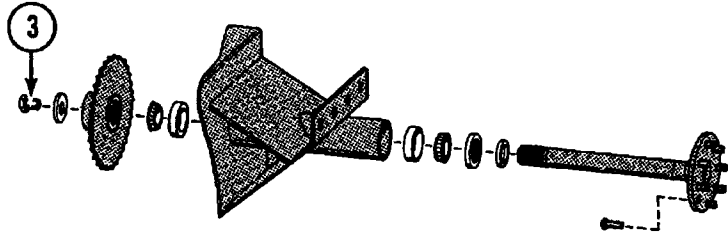
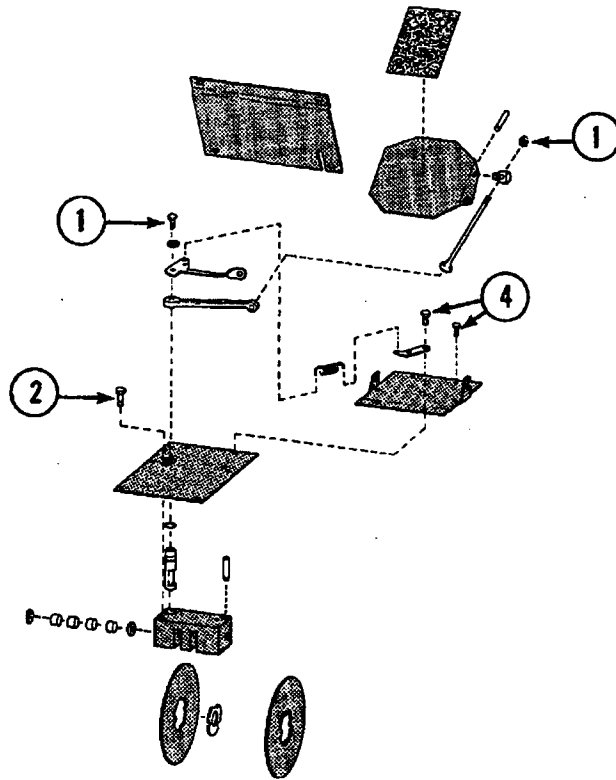
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E-1525
E-1617

TORQUE SPECIFICATIONS (Cont'd)

Brake, Axle & Chaincase Group

Ref.	Torque
1.	65-70 ft.-lbs. (88-95 Nm)
2.*	65-70 ft.-lbs. (88-95 Nm)
3.*	475-525 ft.-lbs. (645-710 Nm)
4.	16-20 ft.-lbs. (21-27 Nm)
5.	220-234 ft.-lbs. (300-330 Nm)



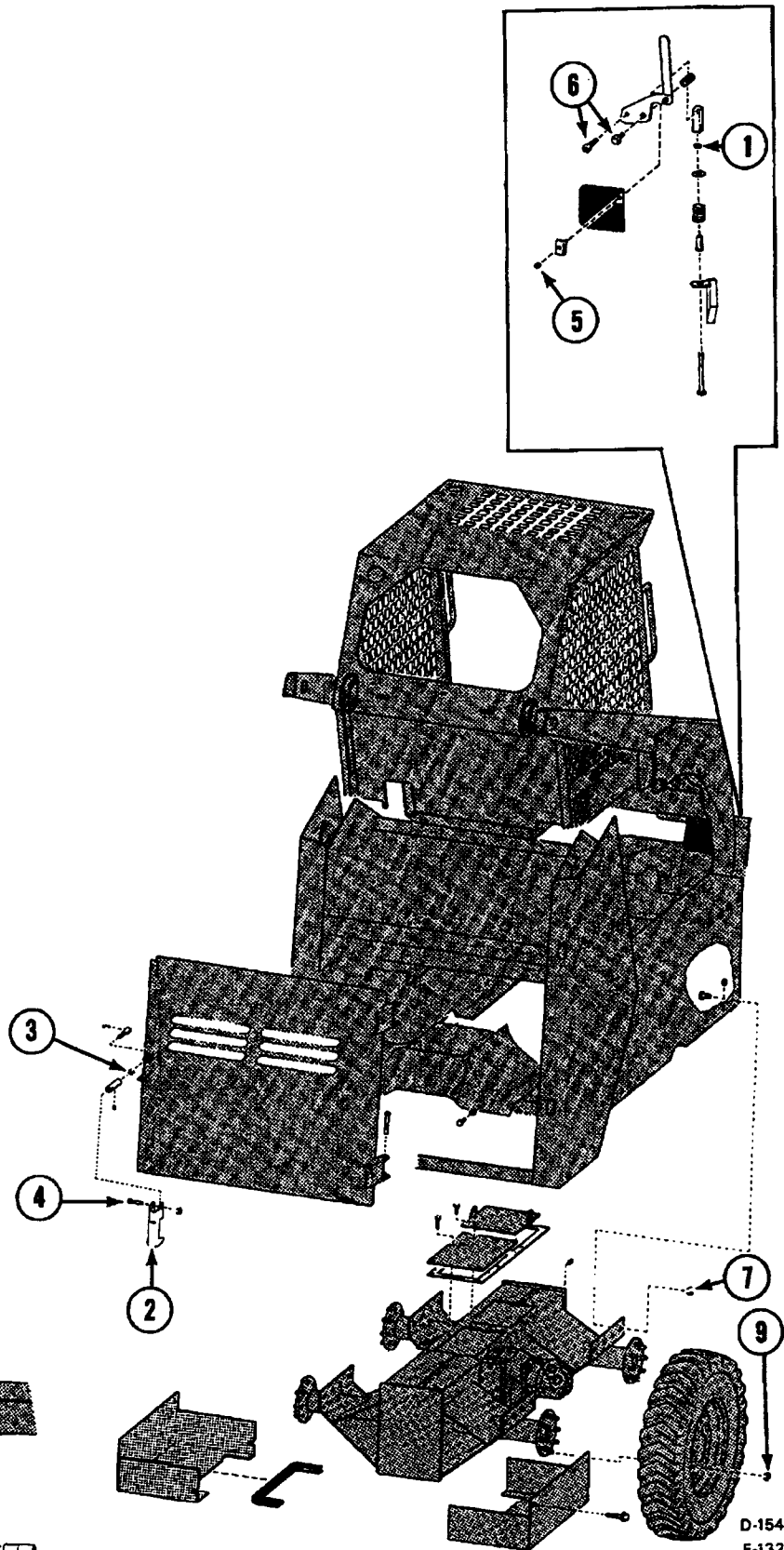
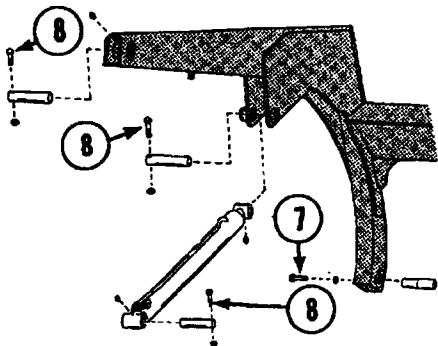
* Put Lock-Tite on the Treads

D-1553
C-2528
D-1524

TORQUE SPECIFICATIONS (Cont'd)

Operator Guard, Lift Arm & Main Frame Group

Ref.	Torque
1.	65-70 ft.-lbs. (88-95 Nm)
2.	20-40 ft.-lbs. (27-55 Nm) Required to push the handle into lock position
3.	55-70 ft.-lbs. (75-95 Nm)
4.	15-17 ft.-lbs. (21-23 Nm)
5.	15-20 ft.-lbs. (21-27 Nm)
6.	25-28 ft.-lbs. (34-38 Nm)
7.	220-245 ft.-lbs. (300-330 Nm)
8.	18-20 ft.-lbs. (24-27 Nm)
9.	105-115 ft.-lbs. (142-156 Nm)

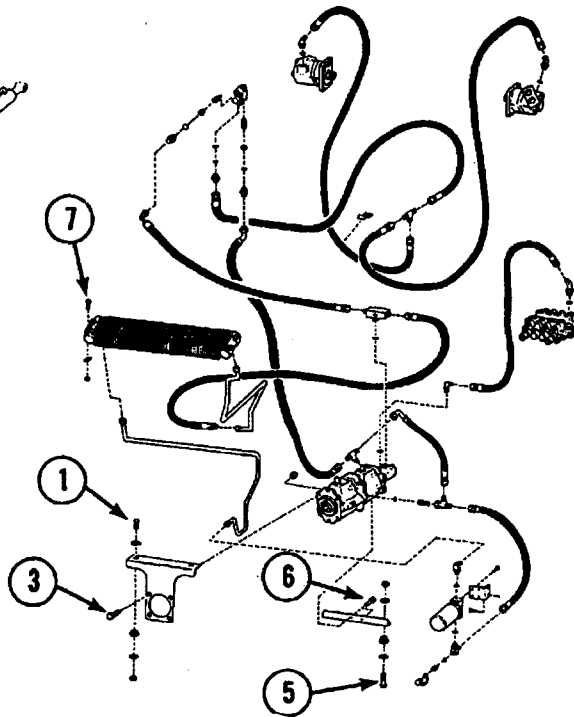
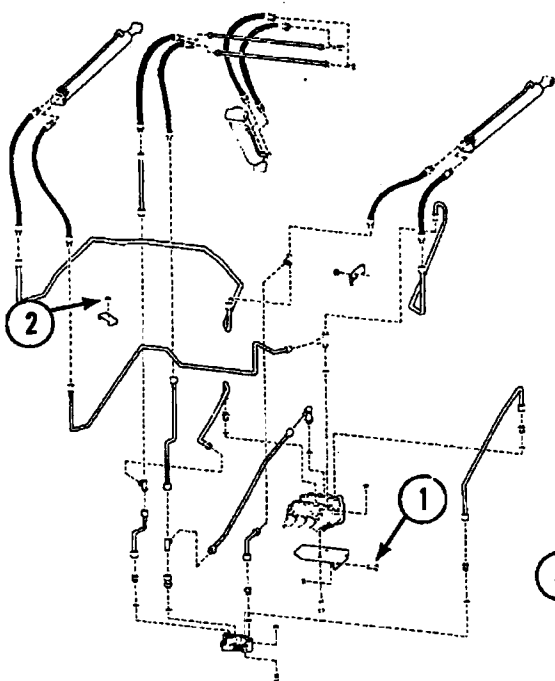
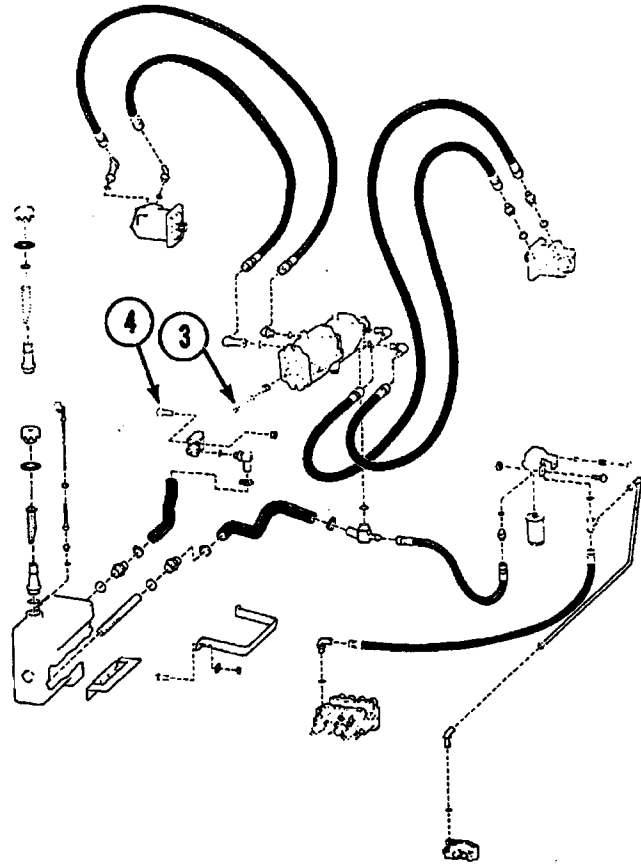


D-1547
E-1322
E-1618
D-1522

TORQUE SPECIFICATIONS (Cont'd)

Hydraulic/Hydrostatic Group

Ref.	Torque
1.	65-70 ft.-lbs. (88-95 Nm)
2.	12-15 ft.-lbs. (16-20 Nm)
3.	25-28 ft.-lbs. (34-38 Nm)
4.	16-20 ft.-lbs. (21-27 Nm)
5.	40-50 ft.-lbs. (54-68 Nm)
6.	40-45 ft.-lbs. (54-61 Nm)
7.	15-17 ft.-lbs. (21-23 Nm)

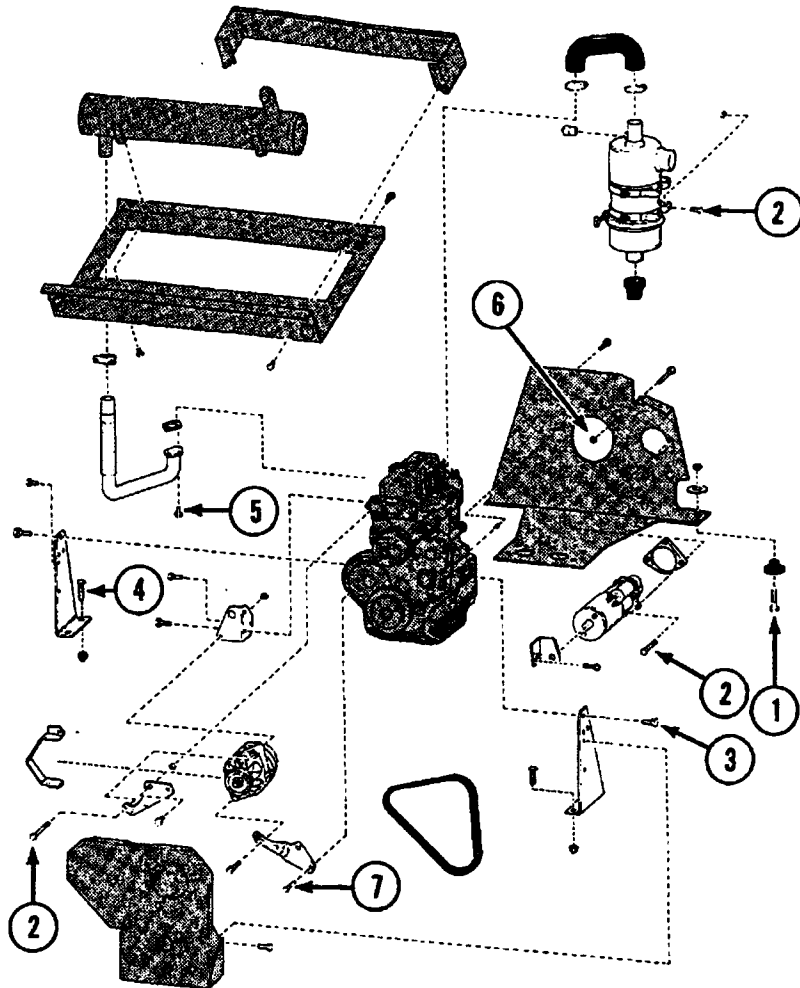


E-1726
E-1806
E-1725

TORQUE SPECIFICATIONS (Cont'd)

Engine Group (Perkins)

Ref.	Torque
1.	125-140 ft.-lbs. (169-190 Nm)
2.	25-28 ft.-lbs. (34-38 Nm)
3.*	40-45 ft.-lbs. (51-54 Nm)
4.	75-80 ft.-lbs. (102-108 Nm)
5.	16-20 ft.-lbs. (21-27 Nm)
6.	65-70 ft.-lbs. (88-95 Nm)
7.	15-17 ft.-lbs. (21-23 Nm)



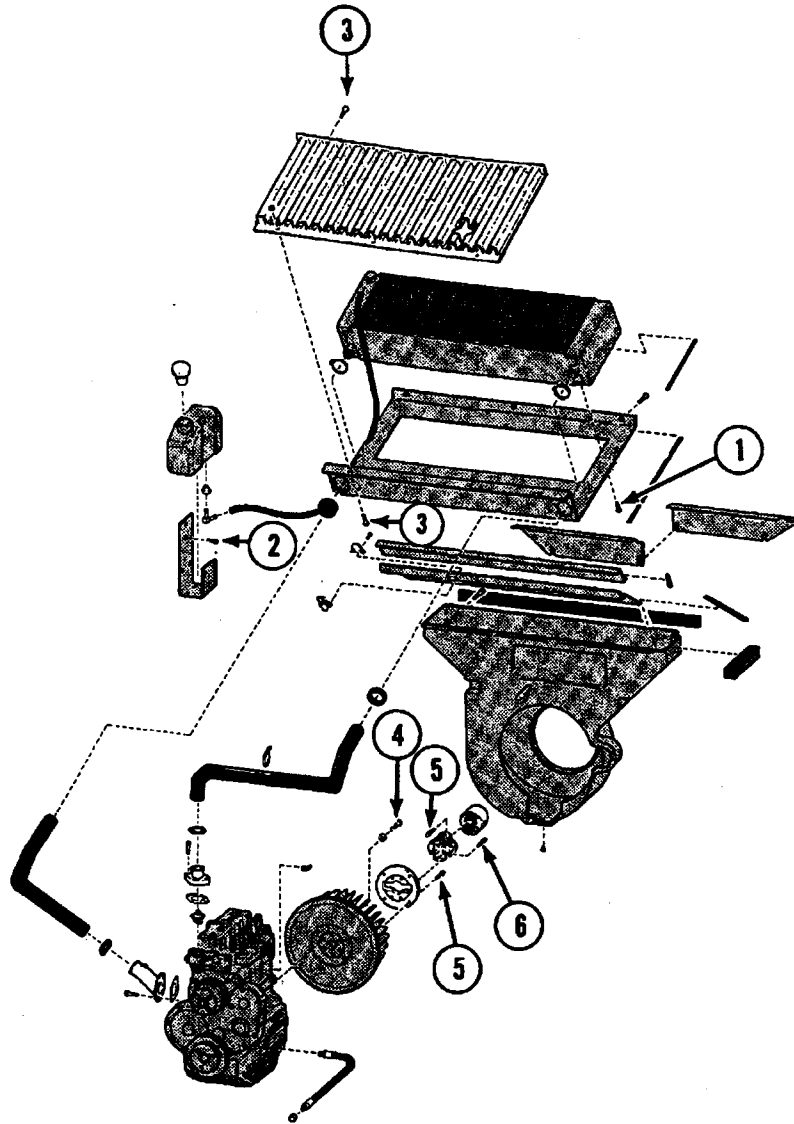
* Put Lock-Tite on the Treads

E-1252

TORQUE SPECIFICATIONS (Cont'd)

Engine Group (Perkins)

Ref.	Torque
1.	15-17 ft.-lbs. (21-23 Nm)
2.	25-28 ft.-lbs. (34-38 Nm)
3.	16-20 ft.-lbs. (21-27 Nm)
4.	75-80 ft.-lbs. (102-108 Nm)
5.*	25-28 ft.-lbs. (34-38 Nm)
6.*	23-25 ft.-lbs. (31-34 Nm)



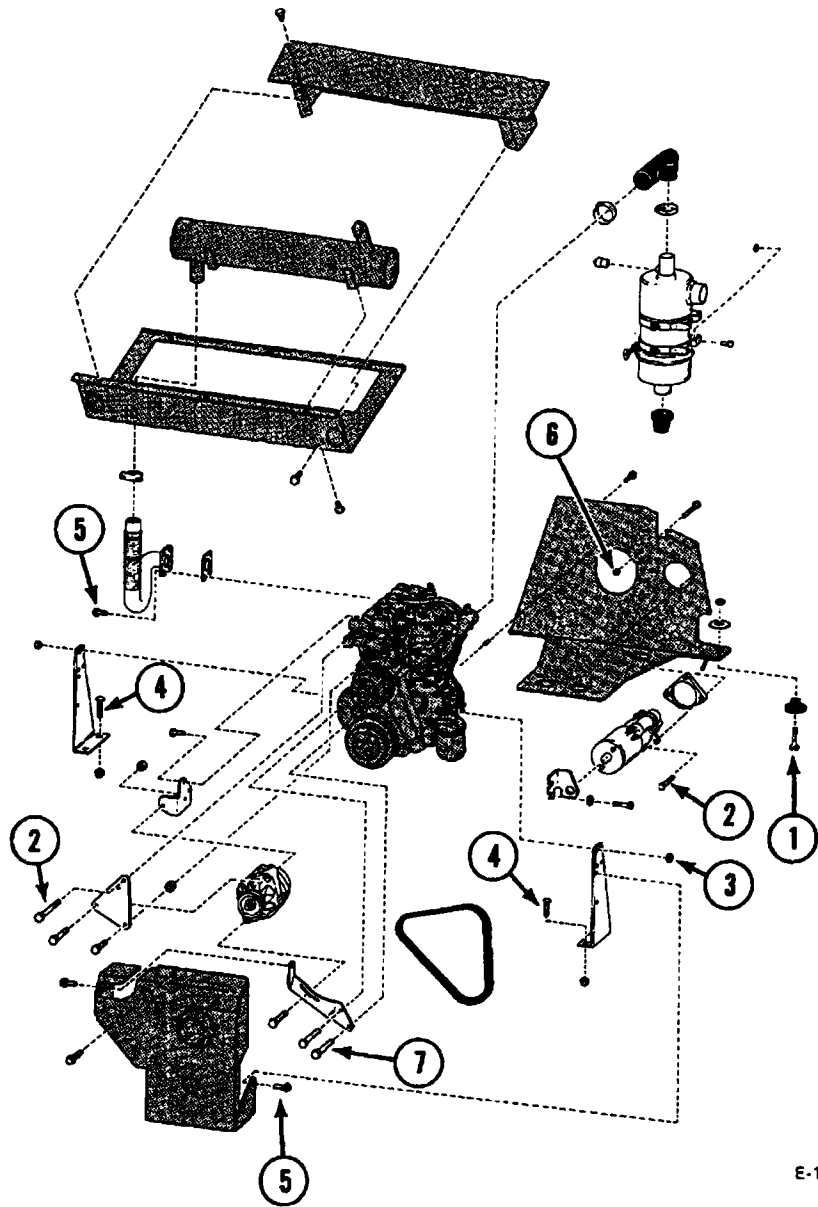
* Put Lock-Tite on the Treads

E-1339

TORQUE SPECIFICATIONS (Cont'd)

Engine Group (200 Series Perkins)

Ref.	Torque
1.	125-140 ft.-lbs. (169-190 Nm)
2.	25-28 ft.-lbs. (34-38 Nm)
3.*	40-45 ft.-lbs. (51-54 Nm)
4.	75-80 ft.-lbs. (102-108 Nm)
5.	16-20 ft.-lbs. (21-27 Nm)
6.	65-70 ft.-lbs. (88-95 Nm)
7.	15-17 ft.-lbs. (21-23 Nm)



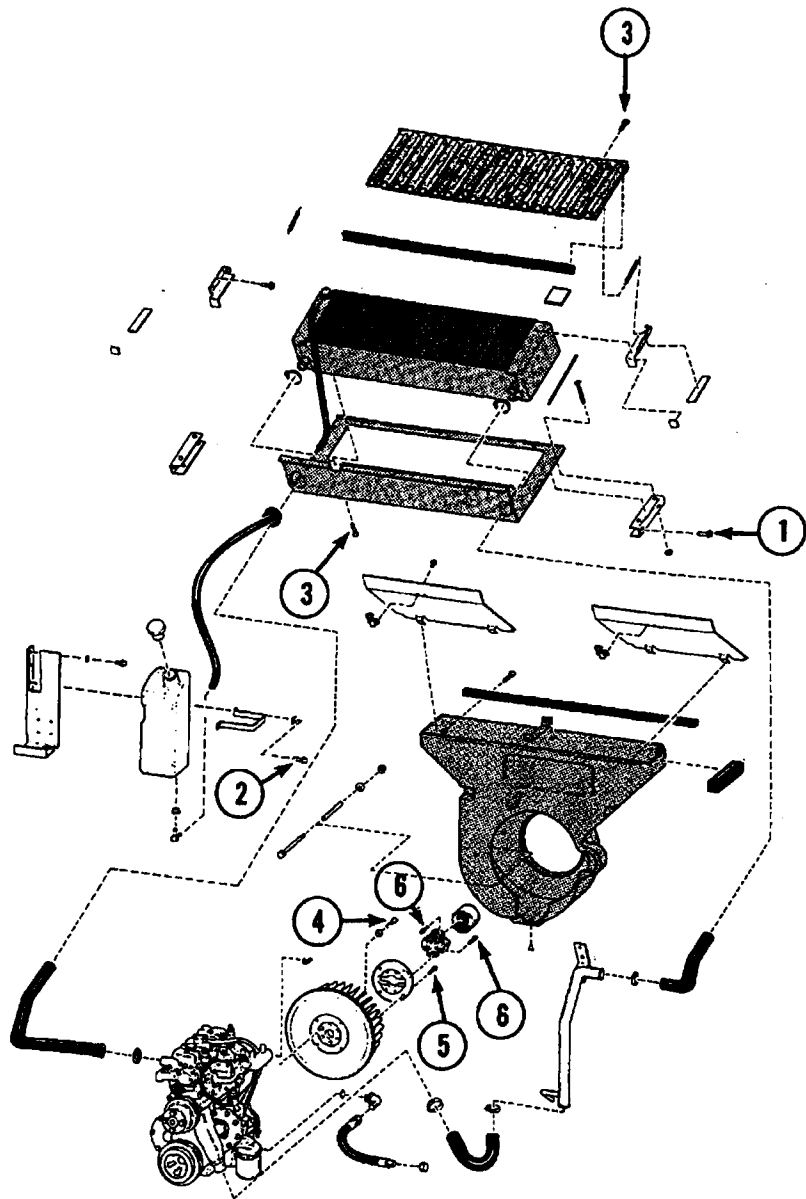
* Put Lock-Tite on the Treads

E-1626

TORQUE SPECIFICATIONS (Cont'd)

Engine Group (200 Series Perkins)

Ref.	Torque
1.	15-17 ft.-lbs. (21-23 Nm)
2.	25-28 ft.-lbs. (34-38 Nm)
3.	16-20 ft.-lbs. (21-27 Nm)
4.	75-80 ft.-lbs. (102-108 Nm)
5.*	25-28 ft.-lbs. (34-38 Nm)
6.*	23-25 ft.-lbs. (31-34 Nm)



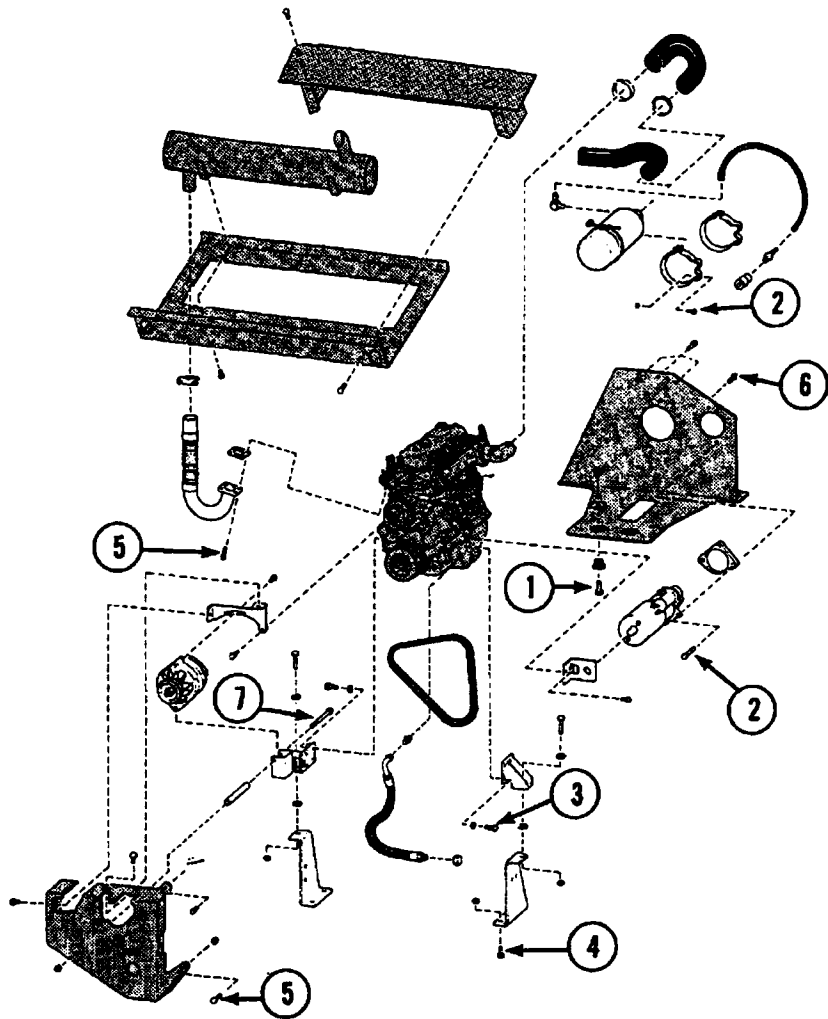
* Put Lock-Tite on the Treads

E-1627

TORQUE SPECIFICATIONS (Cont'd)

Engine Group (Isuzu)

Ref.	Torque
1.	125-140 ft.-lbs. (169-190 Nm)
2.	25-28 ft.-lbs. (34-38 Nm)
3.*	40-45 ft.-lbs. (51-54 Nm)
4.	75-80 ft.-lbs. (102-108 Nm)
5.	16-20 ft.-lbs. (21-27 Nm)
6.	65-70 ft.-lbs. (88-95 Nm)
7.	15-17 ft.-lbs. (21-23 Nm)



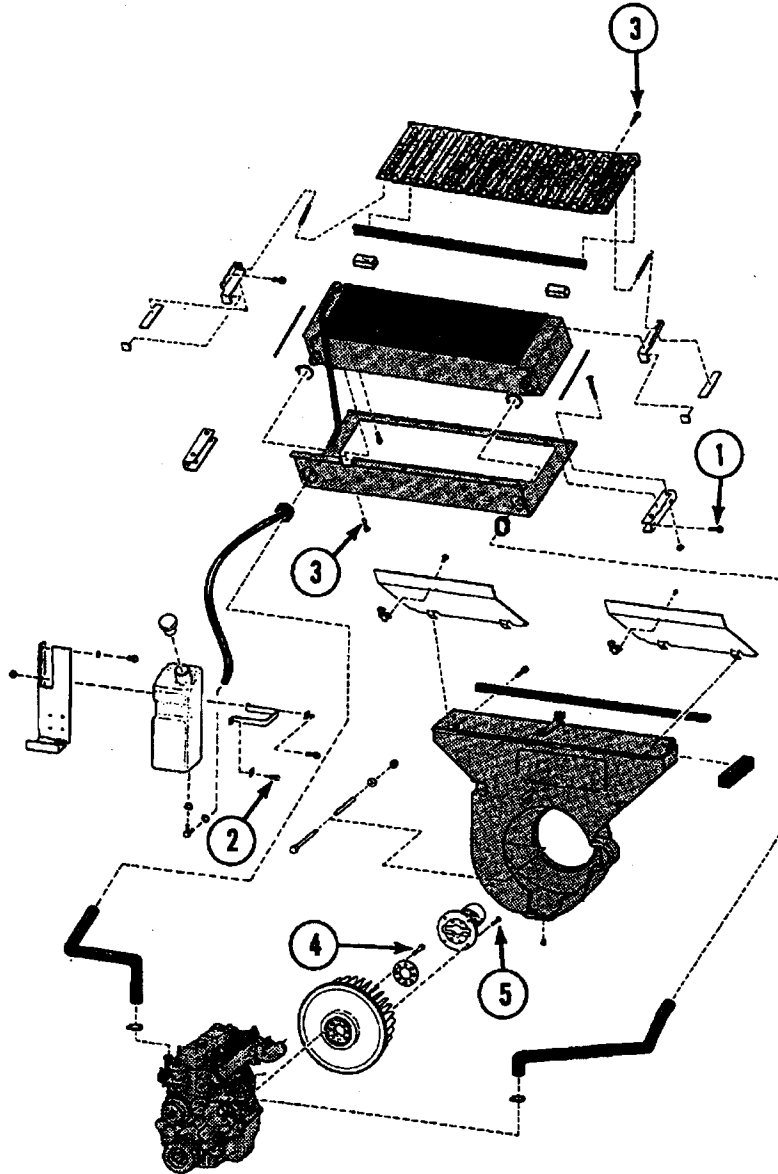
* Put Lock-Tite on the Treads

E-1686

TORQUE SPECIFICATIONS (Cont'd)

Engine Group (Isuzu)

Ref.	Torque
1.	15-17 ft.-lbs. (21-23 Nm)
2.	25-28 ft.-lbs. (34-38 Nm)
3.	16-20 ft.-lbs. (21-27 Nm)
4.	75-80 ft.-lbs. (102-108 Nm)
5.*	25-28 ft.-lbs. (34-38 Nm)



* Put Lock-Tite on the Treads


E-1701

HYDRAULIC/HYDROSTATIC FLUID SPECIFICATIONS

Specifications

Use Melroe hydraulic/hydrostatic transmission fluid (P/N 6563328). If this fluid is not available, use 10W-30 or 10W-40 SAE Motor Oil (5W-30 for 0°F [-18°C] and Below).

DO NOT use automatic transmission fluids in the loader or permanent damage to the transmission will result.

	WARNING	Avoid contact with leaking hydraulic fluid which under pressure can be forced through the skin. Never check for leaks in a hydraulic system with your bare hands. Use a piece of wood or cardboard. If your skin is penetrated by a fluid under pressure, consult a qualified medical service.
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Where temperatures below zero are common, the loader must be kept in a warm building. Extra warm-up time must be used each time the loader is started during cold temperature conditions. Cold fluid will not flow easily and it makes action of the hydraulic function slower. Loss of fluid flow to the hydrostatic transmission pump (indicated by "TRANS" light "ON") will cause transmission damage in less than 60 seconds time.

IMPORTANT	Stop the engine if the "TRANS" light comes "ON" and stays "ON". The light indicates the loss of fluid flow to the hydrostatic pumps which will cause transmission damage in less than 60 seconds time.
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NOTES

DECIMAL AND MILLIMETER EQUIVALENTS

FRACTIONS	DECIMALS	MM	FRACTIONS	DECIMALS	MM
	1/64	0.015625	—	0.397	
	1/32	0.03125	—	0.794	
	3/64	0.046875	—	1.191	
1/16		0.0625	—	1.588	
	5/64	0.078125	—	1.984	
	3/32	0.09375	—	2.381	
	7/64	0.109375	—	2.778	
1/8		0.1250	—	3.175	
	9/64	0.140625	—	3.572	
	5/32	0.15625	—	3.969	
	11/64	0.171875	—	4.366	
3/16		0.1875	—	4.762	
	13/64	0.203125	—	5.159	
	7/32	0.21875	—	5.556	
	15/64	0.234375	—	5.953	
1/4		0.2500	—	6.350	
	17/64	0.265625	—	6.747	
	9/32	0.28125	—	7.144	
	19/64	0.296875	—	7.541	
5/16		0.3125	—	7.938	
	21/64	0.328125	—	8.334	
	11/32	0.34375	—	8.731	
	23/64	0.359375	—	9.128	
3/8		0.3750	—	9.525	
	25/64	0.390625	—	9.922	
	13/32	0.40625	—	10.319	
	27/64	0.421875	—	10.716	
7/16		0.4375	—	11.112	
	29/64	0.453125	—	11.509	
	15/32	0.46875	—	11.906	
	31/64	0.484375	—	12.303	
1/2		0.5000	—	12.700	
			1		

1 mm = 0.03937"
0.001" = 0.0254 mm

NOTES _____

U.S. TO METRIC CONVERSION

TO CONVERT	INTO	MULTIPLY BY
LINEAR MEASUREMENT	Miles	Kilometers
	Yards	Meters
	Feet	Meters
	Feet	Centimeters
	Inches	Meters
	Inches	Centimeters
	Inches	Millimeters
AREA	Square Miles	Square Kilometers
	Square Feet	Square Meters
	Square Inches	Square Centimeters
	Acre	Hectare
VOLUME	Cubic Yards	Cubic Meters
	Cubic Feet	Cubic Meters
	Cubic Inches	Cubic Centimeters
WEIGHT	Tons (Short)	Metric Tons
	Pounds	Kilograms
	Ounces (Avdp.)	Grams
PRESSURE	Pounds/Sq. In.	Kilopascal
WORK	Foot-pounds	Newton-Metre
LIQUID VOLUME	Quarts	Liters
	Gallons	Liters
LIQUID FLOW	Gallons/Minute	Liters/Minute
TEMPERATURE	Fahrenheit	Celsius
		1. Subtract 32° 2. Multiply by 5/9

STANDARD TORQUE SPECIFICATIONS FOR BOLTS

The following table shows standard torque specifications for bolts with zinc phosphate coating. Bolts purchased from Clark that have zinc phosphate coating are specified by the letter "H" following the part number.

THREAD SIZE		SAE GRADE 5	SAE GRADE 8
INCH. LBS. (Nm)	.250	80-90 (9-10)	110-120 (13-14)
	.3125	180-200 (21-23)	215-240 (24-27)
FOOT LBS. (Nm)	.375	25-28 (34-38)	35-40 (48-54)
	.4375	40-45 (54-61)	60-65 (82-88)
	.500	65-70 (88-95)	90-100 (125-135)
	.5625	90-100 (125-135)	125-140 (170-190)
	.625	125-140 (170-190)	175-190 (240-260)
	.750	220-245 (300-330)	300-330 (410-450)
	.875	330-360 (450-490)	475-525 (645-710)
	1.000	475-525 (645-710)	725-800 (985-1085)
	1.125	650-720 (880-975)	1050-1175 (1425-1600)
	1.250	900-1000 (1200-1360)	1475-1625 (2000-2200)
	1.375	1200-1350 (1630-1830)	2000-2200 (2720-2980)
	1.500	1500-1650 (2040-2240)	2600-2850 (3530-3870)
	1.625	2000-2800 (2720-2980)	3450-3800 (4680-5150)
	1.750	2500-2750 (3390-3730)	4300-4800 (5830-6500)
1.875	3150-3500 (4270-4750)	5500-6100 (7450-8300)	
2.000	3800-4200 (5150-5700)	6500-7200 (8800-9800)	

NOTES _____

TECHNICAL DATA

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SPECIFICATIONS
(Perkins)



TECHNICAL DATA (Isuzu)

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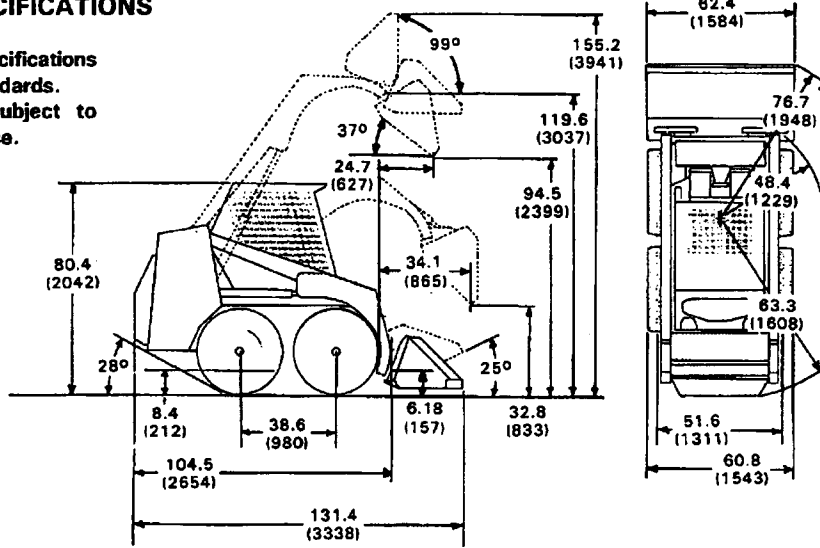
SPECIFICATIONS
(Isuzu)



bobcat

8C LOADER SPECIFICATIONS

Where applicable, specifications conform to SAE standards. Specifications are subject to change without notice.



Dimensions are given for a loader equipped with standard tires and dirt bucket. Dimensions may vary with other bucket types. All dimensions are shown in inches. Respective metric dimensions are given in millimeters enclosed by parentheses.

PI-2585

This loader was designed without counterweights or ballasts. Changes of structure or weight distribution of the loader can cause changes in control and steering response and can cause failure of the loader parts.

OPERATION AND PERFORMANCE

Weights

- Operating Weight 6480 lbs. (2939 kg)
- Rated Operating Capacity 1700 lbs. (772 kg)
- Bucket Capacity (SAE) (60" Dirt) 12.5 cu.-ft. (0,35 m³)
- Travel Speed Infinitely variable 0-6.3 MPH (10 km/hr.)

Controls

- Vehicle Direction & speed controlled by two hand levers.
- Loader Function Lift & tilt function controlled by separate foot pedals.
Auxiliary function controlled by the right steering lever.
- Engine Hand lever throttle & key type starter switch.
- Main Drive Hydrostatic
- Parking Brake Mechanical disc, foot operated.

ENGINE

- Make Isuzu
- Model 4JB1-PK01
- Fuel Diesel
- Horsepower 54 HP (40.3 kW) @ 2600 RPM
- Torque 120 ft.-lbs. (163 Nm) Maximum @ 1600 RPM
- Maximum Governed RPM 2600 RPM
- Number of Cylinders Four
- Bore/Stroke 3.66 (93)/4.016 (102)
- Displacement 169 CID (2,8 L)
- Cooling System Liquid
- Lubrication Pressure System W/Filter
- Crankcase Ventilation Open
- Air Cleaner Dry replaceable cartridge (W/Safety Element)
- Low Idle 1150 RPM
- High Idle 2725-2750 RPM

NOTES _____

ENGINE SPECIFICATIONS

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Cylinder Head

Distortion	Std. 0.002 (0,05)
	Limit 0.008 (0,20)
Re-Grind	Limit 0.012 (0,30)
Valve Seat Angle	45 degrees

Valve, Valve Guide & Seat Insert

Valve Seat Width	
Intake	Std. 0.067 (1,7)
	Limit 0.087 (2,2)
Exhaust	Std. 0.029 (2,0)
	Limit 0.079 (2,0)
Valve Head Depth	
Intake	Std. 0.029 (0,73)
	Limit 0.05 (1,28)
Exhaust	Std. 0.028 (0,70)
	Limit 0.047 (1,2)
Valve Seat Angle	45 degrees
Valve Head Thickness	Std. 0.07 (1,8)
	Limit 0.059 (1,5)
Valve Stem Diameter	
Intake	Std. 0.3128-0.3134 (7,946-7,961)
	Limit 0.310 (7,88)
Exhaust	Std. 0.3119-0.3124 (7,921-7,936)
	Limit 0.310 (7,88)
Valve & Valve Guide Clearance	
Intake	Std. 0.0015-0.0027 (0,039-0,068)
	Limit 0.008 (0,2)
Exhaust	Std. 0.0025-0.0038 (0,064-0,096)
	Limit 0.010 (0,25)
Valve Guide Height	0.51 (13)

Valve Springs

Free Length	
Inner	Std. 1.783 (45,3)
	Limit 1.748 (44,4)
Outer	Std. 1.957 (49,7)
	Limit 1.898 (48,2)
Inclination	
Inner	Limit 0.118 (3,0)
Outer	Limit 0.126 (3,2)
Tension	
Inner—Set Length	1.46 (37) Std. 13 lbs. (5,9 kg)
	Limit 11 lbs. (5,02 kg)
Outer—Set Length	1.54 (39) Std. 46 lbs. (20,9 kg)
	Limit 40 lbs. (18,1 kg)

Rocker Arm

Shaft Diameter	Std. 0.7478-0.7486 (18,98-19,0)
	Limit 0.7427 (18,85)
Rocker Arm I.D.	Std. 0.7489-0.7497 (19,01-19,03)
	Limit 0.7505 (19,05)
Clearance between Rocker Arm & Shaft	Std. 0.0003-0.0020 (0,01-0,05)
	Limit 0.0078 (0,2)
Push Rod Run-Out	Limit 0.012 (0,3)

NOTES

ENGINE SPECIFICATIONS (Cont'd)

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Tappets

Diameter.....	Std. 0.511-0.5114 (12,98-12,99)
	Limit 0.510 (12,95)
Clearance.....	Std. 0.0012 (0,03)
	Limit 0.0039 (0,10)

Piston, Pin & Rings

Piston O.D.	
Piston Grade A.....	3.6608-3.6616 (92,985-93,004)
Piston Grade C.....	3.6616-3.6624 (93,005-93,024)
Clearance in Bore.....	Std. 0.001-0.0018 (0,025-0,04)
Clearance Between Ring & Piston Groove	
1st. Compression.....	Std. 0.0035-0.0049 (0,09-0,125)
	Limit 0.006 (0,15)
2nd Compression.....	Std. 0.002-0.0033 (0,05-0,085)
	Limit 0.006 (0,15)
Oil.....	Std. 0.001-0.003 (0,03-0,07)
	Limit 0.006 (0,15)
Piston Ring Gap	
Compression.....	Std. 0.008-0.0016 (0,2-0,4)
	Limit 0.059 (1,5)
Oil.....	Std. 0.004-0.012 (0,1-0,3)
	Limit 0.0059 (1,5)
Piston Pin O.D.....	Std. 1.220 (31)
	Limit 1.219 (30,97)
Interference Fit Clearance.....	0.00008-0.0006 (0,002-0,015)

Connecting Rod & Bearing

Connecting Rod Misalignment.....	Std. 0.002 (0,05 or less)
	Limit 0.0079 (0,2)
Small End Bushing I.D.....	Std. 1.2208-1.2211 (31,008-31,015)
Clearance Between Piston Pin & Small End Bushing.....	Std. 0.0003-0.00079 (0,008-0,20)
	Limit 0.0002 (0,05)
Clearance Between Crankshaft Journal & Bearing.....	Std. 0.001-0.0026 (0,029-0,066)
	Limit 0.004 (0,10)

Cylinder Liners

Cylinder Liner I.D.....	Std. 3.6622-3.6638 (93,021-93,06)
	Limit 3.6653 (93,10)
Interference Fit in Block.....	0.00004-0.00075 (0,001-0,019)
Projection above Block.....	0.0-0.0039 (0,0-0,01)
Cylinder Liner Bore I.D.	
Piston Grade A.....	Min. Dia. 3.6622-3.6630 (93,021-93,04)
Piston Grade C.....	Min. Dia. 3.6630-3.6638 (93,041-93,060)

Camshaft

Gear Backlash.....	Std. 0.004-0.007 (0,10-0,17)
	Limit 0.012 (0,3)
End Play.....	Std. 0.0002-0.0045 (0,05-0,114)
	Limit 0.0079 (0,2)
Journal Diameter.....	Std. 1.9663-1.9675 (49,945-49,975)
	Limit 1.9528 (49,60)
Camshaft Bearing I.D.....	Std. 1.9685-1.9697 (50,0-50,03)

NOTES _____

ENGINE SPECIFICATIONS (Cont'd)

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Camshaft (Cont'd)

Clearance Camshaft Run-Out..... Cam Lobe Height.....	Std. 0.0020 (0,05) Limit 0.0047 (0,12) Limit 0.0039 (0,1) Std. 1.654 (42,02) Limit 1.640 (41,65)
--	--

NOTE: Crankshaft is Tuffride coated and cannot be re-ground.

Crankshaft

End Play Connecting Rod Journal O.D. Main Bearing Journal O.D. Clearance Between Journal & Main Bearing Crankshaft Run-Out	Std. 0.004 (0,1) Limit 0.012 (0,31) Std. 2.0833-2.0839 (52,915-52,930) Limit 2.0829 (52,906) Std. 2.7526-2.7532 (69,917-69,932) Limit 2.7524 (69,910) Std. 0.0014-0.0041 (0,035-0,080) Limit 0.0043 (0,11) Std. 0.002 (0,05) or less Limit 0.003 (0,08)
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Idler Gear

End Play Backlash..... Idler Gear Hub O.D. Clearance Between Hub & Gear..... Bearing Replacement Projection..... Height.....	Std. 0.003 (0,07) Limit 0.008 (0,2) Std. 0.004-0.007 (0,10-0,017) Limit 0.012 (0,3) Std. 1.7695-1.7707 (44,945-44,975) Limit 1.7656 (44,845) Std. 0.0009-0.003 (0,025-0,085) Limit 0.0079 (0,2) 0.016-0.024 (0,4-0,6) 0.933-0.945 (23,7-24,0)
---	--

Oil Pump

End Play Between Vane & Body Clearance Between Rotor & Vane Clearance Between Vane & Body Clearance Between Rotor Shaft & Body Oil Pump Pressure.....	Std. 0.0008-0.0028 (0,02-0,07) Limit 0.0059 (0,15) Std. 0.0055 (0,14) or less Std. 0.0079-0.0105 (0,2-0,27) Std. 0.0016 (0,04) Limit 0.0079 (0,2) 57-71 PSI (393-490 kPa) @ 1400 RPM 21 PSI (145 kPa) @ Idle RPM
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Fuel System

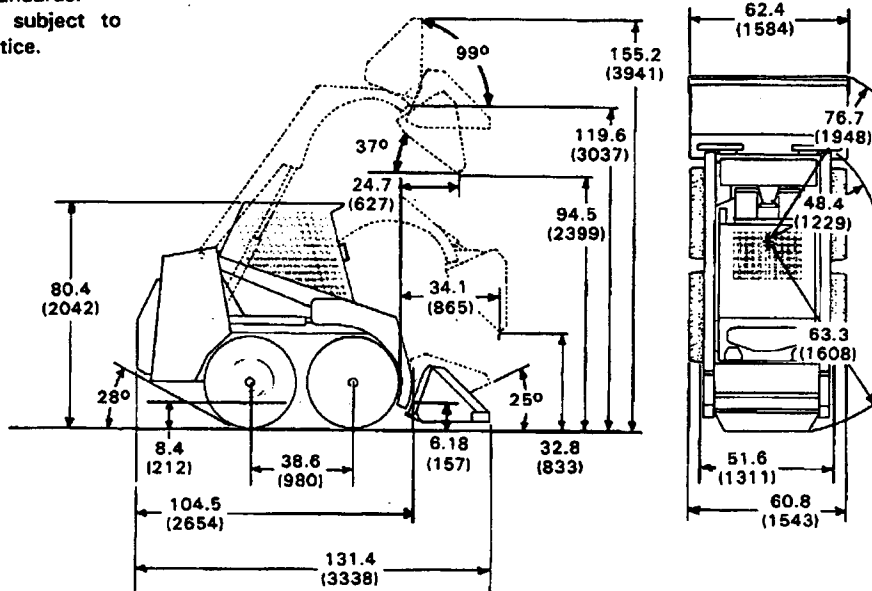
Pump Type Nozzles Injector Pressure (Opening) Supply Pump Pressure Idle RPM High Idle RPM Injection Pump Timing.....	Bosch VE Bosch Multi-hole (4 orifices) 2630 PSI (18134 kPa) 37 PSI (255 kPa) 71 PSI (490 kPa) 17° BTDC
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NOTES



8A LOADER SPECIFICATIONS

Where applicable, specifications conform to SAE standards. Specifications are subject to change without notice.



PI-2585

Dimensions are given for a loader equipped with standard tires and dirt bucket. Dimensions may vary with other bucket types. All dimensions are shown in inches. Respective metric dimensions are given in millimeters enclosed by parentheses.

SPECIFICATIONS

Weights

Operating Weight	6500 lbs. (2951 kg)
Rated Operating Capacity	1700 lbs. (772 kg)
Tipping Load (SAE)	3400 lbs. (1544 kg)
Travel Speed	0.0 to 6.3 MPH (10.1 km/hr.)

Controls

Vehicle	Direction and speed controlled by two hand-operated levers.
Loader Function	Lift, tilt functions controlled by separate foot pedals. Auxiliary function controlled by the right steering lever.

Engine	Hand lever throttle; key type starter switch
Main Drive	Hydrostatic
Brakes	Mechanical disc, foot-operated pedal.

ENGINE

Make	Perkins
Model	4.154
Fuel	Diesel
Horsepower	54 HP (40.3 kW)
Maximum Governed RPM	2600 RPM
Torque	113 ft.-lbs. (153 Nm) @ 1800 RPM
Number of Cylinders	4
Bore/Stroke	3.50 (88.9)/4.00 (101.6)
Displacement	153.9 cu. in. (2522 cm ³)
Cooling System	Liquid
Crankcase Ventilation	Open PCV System
Air Cleaner	Dry replaceable paper element, dual element
Low Idle	1150 RPM
High Idle	2725-2775 RPM

NOTES

LOADER SPECIFICATIONS (Cont'd)

LOADER HYDRAULICS

Pump Gear type
Pump Capacity 15.4 GPM (58,3 L/min.) @ 2720 RPM
System Relief Pressure ... 2325-2500 PSI (16030-17238 kPa) @ Aux. Couplers
Hydraulic Fluid Filter Replaceable cartridge 10 micron paper element
& 40 micron metal filter
Hydraulic Cylinders Doubleacting
Bore Diameter:
Lift Cylinder (2) 2.25 (57,2)
Tilt Cylinder (2) 3.25 (82,6)
Rod Diameter:
Lift Cylinder (2) 1.50 (38,1)
Tilt Cylinder (2) 1.50 (38,1)
Stroke:
Lift Cylinder (2) 33.50 (850,9)
Tilt Cylinder (2) 17.95 (455,9)
Control Valve 3-spool, open center type W/float detent on lift,
detent on auxiliary and self leveling on tilt.
Fluid Lines SAE standard tubes, hoses & fittings
Hydraulic Function Time:
Raise Lift Arms to Maximum Height 4.8 Seconds
Lower Lift Arms from Maximum Height 3.8 Seconds
Move Bucket to Dump Position 2.2 Seconds
Move Bucket to Retracted Position 2.1 Seconds

ELECTRICAL

Alternator Belt driven, 37 amps. @ 2750 RPM open
Battery Two (2) batteries, in parallel @ 12 volt, 370 cold crank amps.
@ 0°F (-17,8°C) 106 min. reserve capacity
Starter 12 volt gear drive

DRIVE SYSTEM

Transmission Hydrostatic infinitely variable fully reversing (2)
Final Drive Gear reduction with #100 roller chain, operating in
sealed chaincase with oil lubrication.
Total Engine to Wheel Reduction:
Gear Reduction 3.54:1
Chain Reduction 31.11:1
Fluid Type Clark Bobcat Fluid (P/N 6563328 [5 gal. Package]). If the fluid
is not available, use 10W-30 or 10W-40 Class SE Motor Oil.

CAPACITIES

Cooling System 22 qts. (21 L)
Fuel 22 gals. (83 L)
Engine Lubrication W/Filter 9.5 qts. (9 L)
Chaincase 9 gals. (34 L)
Hydraulic/Hydrostatic Reservoir 15.5 qts. (14,7 L)

TIRES

Standard 8.25 x 15, 6 Ply Rating, Nylon W/Bar Lug
Pressure 45-50 PSI (310-345 kPa)
Flotation 12 x 16.5, 6 Ply Rating
Pressure 45-50 PSI (310-345 kPa)

NOTES _____

ENGINE SPECIFICATIONS

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Cylinder Head Dimensions

- Cylinder Head:**
 Overall Depth 3.248/3.252 (82,5/82,6)
 Grinding Allowance DO NOT GRIND
 Valve Seat Angle 45°
 Bore for Valve Guide 0.500/0.501 (12,7/12,73)
 Bore for Combustion Chamber Insert 1.375/1.3766 (34,92/34,96)
 Depth of Bore for Inserts 0.424/0.4281 (10,80/10,87)

- Combustion Chamber Inserts:**
 Outside Diameter 1.3724/1.374 (34,86/34,9)
 Clearance Fit in Bore 0.001/0.0042 (0,025/0,106)
 Insert Thickness 0.4252/0.426 (10,80/10,82)
 Height of Insert in Relation to Cylinder Head Face 0.0029 (0,07) Below

- Valve Guide, Inlet & Exhaust:**
 Outside Diameter 0.501/0.50175 (12,73/12,74)
 Interference Fit in Bore 0.00025/0.00175 (0,0063/0,0444)
 Overall Length 2.13 (54,10)
 Guide Height Above Cylinder Head 0.638/0.662 (16,20/16,81)
 Valve Guide Bore Diameter 0.3145/0.3155 (7,99/8,01)

- Valves, Inlet:**
 Valve Stem Diameter 0.312/0.313 (7,92/7,95)
 Clearance Fit of Stem in Guide 0.0015/0.0035 (0,038/0,089)
 Valve Head Diameter 1.59/1.598 (40,41/40,59)
 Valve Face Angle 45°
 Valve Depth into Cylinder Head 0.027/0.040 (0,69/1,02) (Production)
 0.060 (1,52) (Service)
 Overall Length 4.503/4.521 (114,38/114,83)
 Valve Stem Seal Synthetic Rubber Deflector

- Valves, Exhaust:**
 Valve Stem Diameter 0.312/0.313 (7,92/7,95)
 Clearance Fit of Stem in Guide 0.0015/0.0035 (0,038/0,089)
 Valve Head Diameter 1.3937/1.4016 (35,4/35,6)
 Valve Face Angle 45°
 Valve Depth into Cylinder Head 0.027/0.040 (0,69/1,02) (Production)
 0.060 (1,52) (Service)
 Overall Length 4,503/4.521 (114,38/114,83)
 Valve Stem Seal None

- Valve Springs, Inner:**
 Fitted Length 1.49 (37,85)
 Load at Fitted Length 28 lbs. ± 1.4 lbs. (12,7 kg ± 0,635 kg)
 Free Length 1.74 (44,20)

- Valve Springs, Outer:**
 Fitted Length 1.59 (40,39)
 Load at Fitted Length 40 lbs. ± 2.0 lbs. (18,1 kg ± 0,908 kg)
 Free Length 1.81 (45,97)

- Rocker Arms:**
 Bore Diameter 0.7188/0.7196 (18,26/18,28)
 Outside Diameter of Bushing 0.7199/0.7207 (18,29/18,30)
 Interference Fit of Bushing 0.0003/0.0019 (0,008/0,048)
 Inside Diameter of Bushing (Fitting) 0.625/0.6528 (15,88/15,90)

NOTES _____

ENGINE SPECIFICATIONS (Cont'd)

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Cylinder Head Dimensions (Cont'd)

Rocker Arm Shaft:

Outside	0.6234/0.6244	(15,83/15,86)
Clearance Fit of Rocker Arm	0.0006/0.0024	(0,01/0,06)
Lubrication	No. 1 Bracket Through Shaft	

Push Rods:

Overall Length	8.5102/8.5412	(216,16/216,94)
Outside Diameter	0.246/0.25	(6,27/6,35)

Piston and Connecting Rod Dimensions

Piston:

Type	Flat Top	
Piston Height to Cylinder Block Face	0.000/0.004	(0,00/0,102)
Piston Pin Bore Diameter	1.2495/1.250	(31,74/31,75)
Transition Fit of Pin in Bore	0.00024 in clearance/0.00046 interference (0,006/0,012)	
Ring Groove Width (Top, 2nd & 3rd)	0.096/0.097	(2,44/2,46)
Ring Groove Width (4th & 5th)	0.1895/0.1906	(4,81/4,84)

Pistons Rings:

Compression (Top)	Chrome Plated	
Compression (2nd & 3rd)	Internally Stepped	
Scraper (4th)	Chrome Plated, Slotted	
Scraper (5th)	Slotted	
Ring Width (Top, 2nd & 3rd)	0.093/0.0938	(2,36/2,38)
Ring Clearance in Groove	0.0022/0.004	(0,056/0,102)
Ring Width (4th)	0.1868/0.1875	(4,74/4,76)
Ring Clearance in Groove	0.002/0.0038	(0,05/0,097)
Ring Width (5th)	0.1865/0.1875	(4,74/4,76)
Ring Clearance in Groove	0.002/0.004	(0,05/0,102)
Ring Gap (Top)	0.014/0.019	(0,36/0,48)
Ring Gap (2nd & 3rd)	0.011/0.016	(0,28/0,41)
Ring Gap (4th)	0.014/0.019	(0,36/0,48)
Ring Gap (5th)	0.011/0.016	(0,28/0,41)

NOTE: The ring gaps which are given are measured in a 3.501 (88,93) diameter bore. If the gaps are measured in a larger bore, you must add 0.003 (0,08) for every 0.001 (0,025) above 3.501 (88,93).

Piston Pins:

Type	Fully Floating	
Outside Diameter	1.24976/1.24996	(31,74/31,75)
Clearance in Rod End	0.00054/0.00175	(0,014/0,044)

Connecting Rods:

Type	"H" Section	
Big End Bore	2.395/2.3955	(60,83/60,85)
Small End Bore	1.375/1.376	(34,93/34,95)
Big End Width	1.361/1.363	(34,57/34,62)
Length from Center Line of Big End to Center Line of Small End	6.8115/6.8135	(173,01/173,06)
Rod End Play	0.0095/0.0131	(0,24/0,33)
Big End Bolt Size	7/16 (11,11)	
Thread of Bolt	U.N.F.	
Type of Nut	Self-Locking	

Small End Bushing:

Type	Steel Backed, Bronze Lined	
Length of Bushing	1.047/1.055	(26,59/26,80)
Outside Diameter	1.3785/1.380	(35,01/35,05)
Interference Fit of Bushing in Rod	0.0025/0.005	(0,064/0,127)
Inside Diameter (Bushing in Position After Reaming)	1.2505/1.2515	(31,76/31,79)

NOTES _____

ENGINE SPECIFICATIONS (Cont'd)

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Piston and Connecting Rod Dimensions (Cont'd)

Connecting Rod Bearings:

Table with 2 columns: Dimension Name and Value. Includes Type (Steel Backed, Aluminum Tin Lined), Width (1.1208/1.1280), Outside Diameter (2.3955), Inside Diameter (2.2504/2.2515), and Bearing Running Clearance (0.0014/0.003).

Cylinder Block and Liners Dimensions

Cylinder Block:

Table with 2 columns: Dimension Name and Value. Includes Total Height of Cylinder Block (11.177/11.181), Bore Diameter for Cylinder Liner (3.8125/3.8135), Liner Flange Depth in Block (0.150/0.152), Cylinder Block Recess Bore (3.990/3.995), Main Bearing Bore (2.916/2.917), and various bore diameters for camshafts and tappets.

Cylinder Liners:

Table with 2 columns: Dimension Name and Value. Includes Type (Dry Interference Fit), Outside Diameter (3.8145/3.8155), Interference Fit of Liner into Cylinder Block Bore (0.001/0.003), Liner Finish Bore (3.501/3.502), Liner Flange Thickness (0.148/0.150), and various depth and clearance measurements.

Crankshaft and Main Bearings Dimensions

Crankshaft:

Table with 2 columns: Dimension Name and Value. Includes Main Journal Diameter (2.7485/2.749), Main Journal Width (1.391/1.421), Main Journal Width for Nos. 2, 4 & 5 (1.4335/1.4415), Main Journal Width for No. 3 (1.4365/1.4385), Main Journal Fillet Radius (9/64 - 5/32), Crankshaft Pin Diameter (2.2485/2.248), Crankshaft Pin Width (1.3725/1.3741), Crankshaft Pin Fillet Radius (1/8 - 9/64), Surface Finish (15 micro. max.), Crankshaft Journals & Pins Grinding (0.010, 0.020 & 0.030 Undersizes), Oil Seal Helix Diameter (2.211/2.212), Oil Seal Helix Width (0.050/0.080), Oil Seal Helix Depth (0.004/0.008), Crankshaft Flange Diameter (3.9985/3.9995), Crankshaft Flange Width (0.5), and Crankshaft End Play (0.001/0.015).

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ENGINE SPECIFICATIONS (Cont'd)

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Crankshaft and Main Bearings Dimensions (Cont'd)

Type	Steel Backed, Aluminum Tin Lined
Shell Width for all Journals	1.122/1.130 (28,5/28,7)
Outside Diameter	2.917 (74,09)
Inside Diameter	2.75/2.753 (69,89/69,93)
Bearing Running Clearance	0.0025/0.0045 (0,064/0,114)

Crankshaft Thrust Washer:

Type	Steel Backed, Aluminum Tin Lined
Position on the Crankshaft	Center Main Bearing
Thrust Washer Thickness (STD)	0.0896/0.0915 (2,28/2,32)
Thrust Washer Thickness (O/S)	0.0966/0.0985 (2,45/2,50)
Thrust Washer Diameter	3.744/3.756 (95,09/95,4)

Timing Case, Camshaft and Drive Dimensions

Camshaft:

Journal Length, No. 1	1.18 (29,97)
Journal Diameter, No. 1	2.0437/2.0448 (51,91/51,94)
Journal Clearance Fit, No. 1	0.0024/0.0047 (0,06/0,119)
Journal Length, No. 2	1.0 (25,4)
Journal Diameter, No. 2	2.0339/2.035 (51,66/51,69)
Journal Clearance Fit, No. 2	0.0024/0.0047 (0,06/0,119)
Journal Length, No. 3	1.0 (25,4)
Journal Diameter, No. 3	2.0241/2.0252 (51,41/51,44)
Journal Clearance Fit, No. 3	0.0024/0.0047 (0,06/0,119)
Journal Length, No. 4	1.0 (25,4)
Journal Diameter, No. 4	2.0142/2.0154 (51,16/51,19)
Journal Clearance Fit, No. 4	0.0024/0.0047 (0,06/0,119)
Cam Lift	0.280/0.282 (7,11/7,16)
Lift Pump Cam	0.095/0.098 (2,41/2,49)
Camshaft Flange for Gear	1.1251/1.1257 (28,58/28,59)
Camshaft Flange Width for Thrust Washer	0.2374/0.2401 (6,03/6,09)
Lubrication for Rocker Arms	No. 1 Journal

Camshaft Thrust Plate:

Type	Oil-Impregnated
Inside Diameter of Bore	1.4 (35,6)
Thrust Plate Thickness	0.233/0.2362 (5,92/6,00)
Camshaft End Play	0.0012/0.0071 (0,625/0,18)

Camshaft Gear:

Inside Diameter of Gear	1.1251/1.126 (28,58/28,60)
Gear Fit on Camshaft Flange	0.0007 interference/0.0009 clearance (0,018/0,023)

Fuel Injection Pump Gear:

Inside Diameter of Gear for Fuel Injection Pump Flange	1.750/1.751 (44,45/44,48)
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Idler Gear and Hub:

Idler Gear Bore Diameter	1.8898/1.8908 (48,00/48,02)
Idler Gear Bushing Outside Diameter	1.8915/1.8924 (48,04/48,07)
Interference Fit of Bushing	0.0007/0.0027 (0,017/0,068)
Idler Gear Bushing Bore	1.7327/1.7337 (44,01/44,04)
Outside Diameter of Hub	1.7303/1.7313 (43,95/43,98)
Clearance Fit of Bushing in Gear on the Hub	0.0014/0.0034 (0,035/0,086)
Idler Gear Width	1.1320/1.1340 (28,75/28,80)
Hub Width	1.140/1.144 (28,96/29,06)

NOTES

ENGINE SPECIFICATIONS (Cont'd)

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Timing Case, Camshaft and Drive Dimensions (Cont'd)

Idler Gear & Hub Cont'd):

- Idler Gear End Play 0.006/0.012 (0,25/0,30)
- Cylinder Block Idler Hub Bore 1.732/1.733 (43,99/44,02)
- Idler Gear Hub Flange Diameter for the Block 1.731/1.732 (43,97/43,99)
- Size & Clearance Fit of Flange in
 - Cylinder Block Bore 0.000/0.002 (0,00/0,05)
- Timing Case Idler Hub Bore 2.3228/2.3240 (58,99/59,03)
- Diameter of Flange for Timing Case 2.3217/2.3229 (58,97/59,00)
- Transition Fit of Flange in Timing Case Bore ... 0.0001/0.0023 (0,0025/0,058)

Crankshaft Gear:

- Inside Diameter of Gear 1.2496/1.2505 (31,74/31,76)
- Crankshaft Flange for Gear Diameter 1.2494/1.250 (31,73/31,75)
- Transition Fit for Gear on Shaft 0.0004 interference/0.0011 clearance (0,01/0,03)

Timing Gear Backlash:

- All Gears 0.004 (0,102) Minimum

Oil Pump Dimensions

- Oil Pump Pressure 30 - 60 PSI (207 - 414 kPa)

Oil Pump:

- Type Rotor
- Number of Lobes - Inner Rotor Four
- Number of Lobes - Outer Rotor Five
- Method of Drive Spiral Gear from the Camshaft
- Bore in Cylinder Block 1.375/1.376 (34,93/34,95)
- Oil Pump Body Outside Diameter 1.374/1.3746 (34,90/34,91)
- Clearance Fit of Pump in Bore 0.0004/0.002 (0,01/0,05)

Oil Pump Clearance:

- Inner Rotor to Outer Rotor 0.002/0.006 (0,05/0,15)
- Outer Rotor to Pump Body 0.005/0.010 (0,13/0,25)
- Rotor End Play 0.001/0.005 (0,025/0,13)
- Body Bore for Drive Shaft 0.625/0.626 (15,87/15,90)
- Outside Diameter of Shaft 0.623/0.6235 (15,82/15,84)
- Running Clearance of Shaft in Bore 0.0015/0.003 (0,04/0,08)

Oil Pump Drive Gear:

- Inside Diameter of Gear Bore 0.4965/0.4968 (12,61/12,62)
- Outside Diameter of Drive Shaft 0.4983/0.4988 (12,66/12,67)
- Interference Fit of Gear on Shaft 0.0013/0.0021 (0,03/0,05)
- Drive Gear Backlash 0.0155/0.0019 (0,39/0,48)

Oil Pump Relief Valve:

- Type Spring-Loaded Plunger
- Pressure Setting 36/44 PSI (248/303 kPa)
- Relief Valve Bore 0.5605/0.5621 (14,24/14,28)
- Outside Diameter of Plunger 0.5585/0.5595 (14,18/14,21)
- Clearance of Plunger in Bore 0.001/0.0036 (0,025/0,09)
- Length of Plunger 0.78125 (19,84)
- Outside Diameter of Spring 0.398/0.405 (10,1/10,29)
- Spring, Free Length 1.5625 (39,69)
- Spring, Solid Length 0.812 (20,62)

NOTES

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ENGINE SPECIFICATIONS (Cont'd)

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Cooling System and Water Pump Dimensions

Water Pump:
 Type Centrifugal
 Outside Diameter of Shaft for Pulley Hub 0.7873/0.7876 (19,99/20,01)
 Inside Diameter of Pulley Hub Bore 0.7849/0.7857 (19,94/19,96)
 Interference Fit of Pulley Hub on the Shaft 0.0016/0.0027 (0,04/0,068)
 Inside Diameter of Water Pump Pulley Assembly 1.613/1.616 (40,97/41,05)
 Outside Diameter of Hub for Pulley Assembly 1.611/1.613 (40,92/40,97)
 Clearance Fit of Pulley to Hub 0.000/0.005 (0,00/0,13)
 Impeller Bore 0.497/0.4975 (12,62/12,64)
 Outside Diameter of Shaft for Impeller 0.498/0.499 (12,65/12,67)
 Interference Fit of Impeller on Shaft 0.0005/0.002 (0,013/0,051)
 Impeller to Body Running Clearance 0.015/0.030 (0,38/0,76)
 Water Pump Seal, Type Synthetic Rubber-Carbon Faced
 Counter Face Rotating Ceramic

Thermostat:
 Opening Temperature 175 - 181°F (79.5 - 83.5°C)
 Fully Open at 208°F (97.5°C)
 Travel at Fully Open 0.562 (14,27)

Fuel System Specifications

Fuel Lift Pump:
 Method of Drive Eccentric on Camshaft
 Delivery Pressure 5 - 8 PSI (34 - 55 kPa)

Fuel Filter:
 Element Type Paper
 Valve Type Ball Check Valve

Fuel Injection Pump:
 Manufacture C.A.V.
 Type D.P.A.
 Pump Rotation Clockwise (from drive end)
 Timing Letter, Mechanically Governed "C"
 No. 1 Cylinder Outlet "W"

Static Timing:
 Mechanically Governed 18° B.T.D.C.
 0.125 (3,18) Piston Displacement

Fuel Injectors:
 Manufacture C.A.V.
 Injector Body BKB35SD5247
 Injector Nozzle BDN4SD6346
 Working Pressure 1980 PSI (13,652 kPa)
 Setting Pressure 2200 PSI (15,169 kPa)
 Identification Code Letter CJ

Starting Aid:
 Manufacture C.A.V.
 Type Thermostart Type 357
 Voltage 12 Volt
 Maximum Current 12.9 amps. @ 11.5 volts

NOTES _____

ENGINE SPECIFICATIONS (Cont'd)

De-Rating for Altitude

The following is given as a general guide, which may be used on a percentage basis, where specific figures for an engine rating which are not available.

Altitude	Maximum Fuel Delivery De-Rating Measured at 800 RPM Pump Speed
0 - 2,000 ft. (600 Meters)	No Charge
2,000 - 4,000 ft. (1200 Meters)	6%
4,000 - 6,000 ft. (1800 Meters)	12%
6,000 - 8,000 ft. (2400 Meters)	18%
8,000 - 10,000 ft. (3000 Meters)	24%
10,000 - 12,000 ft. (3600 Meters)	30%

Any necessary adjustments for the fuel injection pump must be done by Trained Service Personnel.

Engine Torque

The following figures will apply with the bolts and/or nuts having a light coat of oil before assembly.

	Ft.-Lbs.	Nm	Page
Rear Main Seal Mounting Bolts	4-6	5-8	7A-37
U-Joint Mounting Bolts	25-28	34-38	7A-21
Engine Mounting Bolt & Nuts	125-140	169-190	7A-15, 7A-16
Cylinder Head Bolts (Also Rocker Arm Brackets)	85	115	7A-23
Main Bearing Bolts	85	115	7A-34
Connecting Rod Nuts*	45	61	7A-31
Flywheel Bolts	83-90	113-122	7A-21
Crankshaft Pulley Retaining Bolt	123	167	7A-38
Camshaft Gear Bolt	40-50	54-68	7A-41
Idler Gear Hub to Cylinder Block Nuts	21	28	7A-40
Fuel Injector Nuts	12	16	7A-11
Fuel Pump Drive Gear Bolt	19-21	26-28	7A-40, 7A-42
High Pressure Fuel Line Fittings	15	20	7A-6, 7A-7

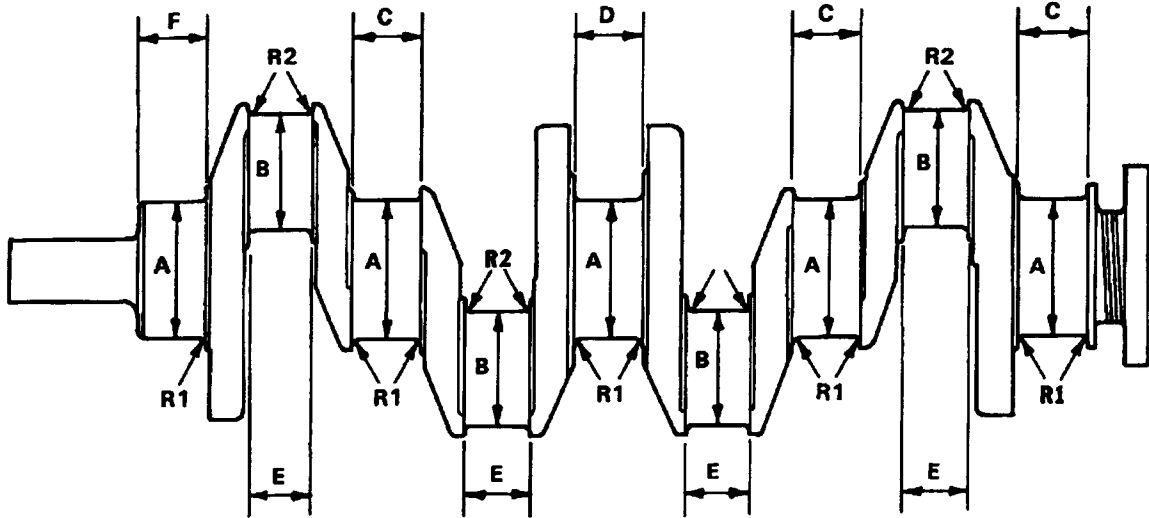
* Once the Connecting Rod Nuts are removed, they must be replaced.

NOTES

ENGINE SPECIFICATIONS (Cont'd)

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Grinding Specifications for Crankshaft



PI-2598

	0.010 (0,25) Undersize	0.020 (0,51) Undersize	0.030 (0,76) Undersize
A	2.7395/2.739 (69,56/69,57)	2.7285/2.729 (69,30/69,32)	2.7185/1.719 (69,04/69,06)
B	2.2385/2.239 (56,86/56,87)	2.2285/2.229 (56,60/56,62)	2.2185/2.219 (56,35/56,36)
C	1.4459 (36,73) Maximum		
D	1.4416/1.4445 (36,62/36,69)	1.4466/1.4495 (36,74/36,82)	1.4516/1.4545 (36,87/36,94)
E	1.3806 (35,07) Maximum		
F	1.4045 (35,67) Maximum		
R1	0.146/0.157 (3,71/3,99) All Journals		
R2	0.126/0.142 (3,20/3,61) All Crankpins		

Surface finish of crankpins, journals and fillet radii 8 micro inches (0,2 microns) C.L.A.

Magnetic Crack Detection

D.C. Flow — 2.5 Amps.

A.C. Current — 1300 Amps.

Limits of taper and out-of-round for pins and journals:

Taper 0.00025 (0,006)

Out-of-Round 0.00025 (0,006)

Maximum Run-out with the crankshaft mounted on the end main journals.

Independent Readings:

Crankshaft Pulley
Diameter T.I.R.
0.002 (0,05)

Rear Oil Seal
Diameter T.I.R.
0.002 (0,05)

Flywheel Flange
Diameter T.I.R.
0.002 (0,05)

Journals T.I.R. — Run-out must not be opposed.

Number 1
Mounting

Number 2
0.003 (0,08)

Number 3
0.006 (0,15)

Number 4
0.003 (0,08)

Number 5
Mounting

TECHNICAL DATA (200 Series Perkins)

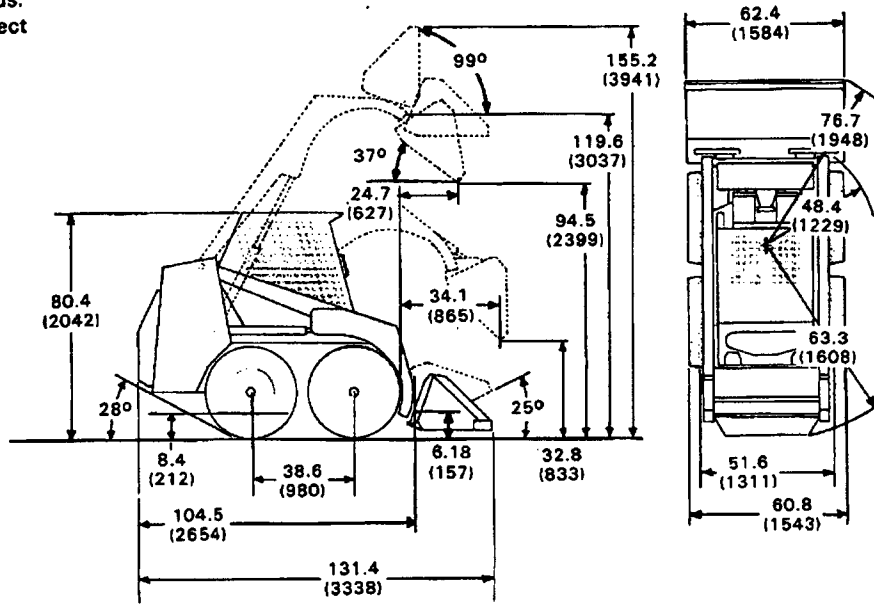
	Page Number
ENGINE SPECIFICATIONS	
Cooling System & Water Pump Dimensions.....	8B-5
Crankshaft & Main Bearing Dimensions.....	8B-4
Cylinder Block & Liner Dimensions.....	8B-4
Cylinder Head Dimensions.....	8B-3
De-Rating for Altitude.....	8B-6
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Fuel System Specifications.....	8B-6
Grinding Specifications for Crankshaft.....	8B-7
Oil Pump Dimensions.....	8B-5
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LOADER SPECIFICATIONS	
Capacities.....	8B-2
Drive System.....	8B-2
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SPECIFICATIONS
(200 Series Perkins)



8B LOADER SPECIFICATIONS

Where applicable, specifications conform to SAE standards. Specifications are subject change without notice.



PI-2585

Dimensions are given for a loader equipped with standard tires and dirt bucket. Dimensions may vary with other bucket types. All dimensions are shown in inches. Respective metric dimensions are given in millimeters enclosed by parentheses.

SPECIFICATIONS

Weights

- Operating Weight 6500 lbs. (2951 kg)
- Rated Operating Capacity 1700 lbs. (772 kg)
- Tipping Load (SAE Rating) 3420 lbs. (1551 kg)

Travel Speed Infinitely Variable 6.3 MPH (10.1 km/hr.)

Controls

- Vehicle Direction and speed controlled by two hand-operated levers.
- Loader Function Lift, tilt functions controlled by separate foot pedals.
Front auxiliary function controlled by the right steering lever.
Rear auxiliary function controlled by left steering lever.
- Engine Hand lever throttle; key type starter switch & shutdown
- Main Drive Hydrostatic
- Brakes Mechanical disc, foot-operated pedal.

ENGINE

- Make Perkins (200 Series)
- Model 4.154
- Fuel Diesel
- Horsepower 54 HP (40.3 kW)
- Maximum Governed RPM 2600 RPM
- Torque 113 ft.-lbs. (153 Nm) @ 1800 RPM
- Number of Cylinders 4
- Bore/Stroke 3.50 (88.9)/4.00 (101.6)
- Displacement 153.9 cu. in. (2522 cm³)
- Cooling System Liquid
- Crankcase Ventilation Open PCV System
- Air Cleaner Dry replaceable paper element, dual element
- Low Idle 1150 RPM
- High Idle 2720 RPM

NOTES _____

LOADER SPECIFICATIONS (Cont'd)

LOADER HYDRAULICS

Pump Gear type
Pump Capacity (S/N 15000 & Below) 16 GPM (61,3 L/min.) @ 2700 RPM
(S/N 14999 & Below) 15.5 GPM (58,7 L/min.) @ 2750 RPM
System Relief Pressure 2325-2500 PSI (16031-17238 kPa) @ Aux. Couplers
Hydraulic Fluid Filter Replaceable #3 micron paper element in charge line
Replaceable #10 micron paper element in return line

Hydraulic Cylinders Doubleacting
Bore Diameter:
Lift Cylinder (2) 2.25 (57,2)
Tilt Cylinder (1) 3.25 (82,6)
Rod Diameter:
Lift Cylinder (2) 1.50 (38,1)
Tilt Cylinder (1) 1.50 (38,1)
Stroke:
Lift Cylinder (2) 33.50 (850,9)
Tilt Cylinder (1) 17.95 (455,9)

Control Valve 4-spool, open center series type W/float detent on lift,
detent on auxiliary and self leveling on tilt.

Fluid Lines SAE standard tubes, hoses & fittings

Hydraulic Function Time:
Raise Lift Arms to Maximum Height 4.3 Seconds
Lower Lift Arms from Maximum Height 2.9 Seconds
Move Bucket to Dump Position 2.3 Seconds
Move Bucket to Retracted Position 2.0 Seconds

ELECTRICAL

Alternator Belt driven, 37 amps. open
Battery Two (2) batteries, in parallel @ 12 volt, 370 cold crank amps.
@ 0°F (-17,8°C) 106 min. reserve capacity
Starter 12 volt gear drive

DRIVE SYSTEM

Transmission Two hydrostatic piston pumps driving fully reversing
hydrostatic motors. Seperate gear type charge pump
Final Drive Gear reduction with #100 HS roller chain & sprockets in
sealed chaincase with oil lubrication.
Total Engine to Wheel Reduction 39.4:1
Fluid Type Clark Bobcat Fluid (P/N 6563328 [5 gal. Package]). If the fluid
is not available, use 10W-30 or 10W-40 Class SE Motor Oil.

CAPACITIES

Cooling System 22 qts. (21 L)
Fuel 22 gals. (83 L)
Engine Lubrication W/Filter 7.5 qts. (7 L)
Chaincase 36 qts. (34 L)
Hydraulic/Hydrostatic Reservoir (Steel) 15.5 qts. (14,7 L)
(Nylon) 18 qts. (17,02 L)

TIRES

Standard 8.25 x 15, 6 Ply Rating, Nylon W/Chevron Tread
Pressure 45-50 PSI (310-345 kPa)
Flotation 12 x 16.5, 6 Ply Rating
Pressure 45-50 PSI (310-345 kPa)

NOTES

ENGINE SPECIFICATIONS (Cont'd)

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Piston and Connecting Rod Dimensions (Cont'd)

Pistons Rings:

Compression (Top)	Chrome Inlay
Compression (2nd)	Internally stepped chrome faced
Scraper (3rd)	Coil Spring Loaded, Oil Control
Maximum Clearance in Groove	0.012 (0,30)
*Ring Gap (New Rings)	0.014 - 0.022 (0,356 - 0,559)
(Maximum)	0.060 (1,52)

* The ring gap is measured in a clean un-worn part of the cylinder bore.

Piston Pins:

Type	Fully Floating
Clearance Fit in Small End Bushing	0.0006/0.0016 (0,015/0,04)
Maximum Worn Clearance	0.002 (0,05)

Connecting Rods:

Type	"H" Section
Maximum Side Play at Big End	0.016 (0,41)
Small End Bushing	Steel Backed, Bronze Lined

Connecting Rod Bearings:

Type	Steel Backed, Aluminum Tin Lined
Rod Bearing Running Clearance	0.0014/0.003 (0,035/0,08)
Maximum Clearance	0.004 (0,102)

Cylinder Block and Liner Dimensions

Cylinder Block:

Bore Diameter of Cylinder Liner	3.8125/3.8135 (96,84/96,86)
Main Bearing Bore	2.916/2.917 (74,97/74,09)
No. 1 Bore for Camshaft	2.0472/2.0484 (52,0/52,03)
No. 2 Bore for Camshaft	2.0374/2.0386 (51,75/51,78)
No. 3 Bore for Camshaft	2.0275/2.0287 (51,5/51,53)
No. 4 Bore for Camshaft	2.0177/2.0189 (51,25/51,28)
Cylinder Block Surface Distortion	
Limit — Longitudinal	0.010 (0,25)
— Transverse	0.004 (0,102)

Cylinder Liners:

Type	Dry Interference Fit
Cylinder Liner Finished Bore	3.501/3.502 (88,93/88,95)
Maximum Worn Bore Diameter	3.509 (89,13)
Depth of Flange BELOW Top Face of Cylinder Block	0.000/0.004 (0,00/0,102)
Height of Collar ABOVE Top Face of Cylinder Block	0.026/0.031 (0,66/0,79)

Crankshaft and Main Bearings Dimensions

Crankshaft:

Main Journal Diameter	2.7485/2.7491 (69,81/69,83)
Minimum Journal Diameter	2.7466 (69,76)
Crankshaft Rod Journal Diameter	2.2485/2.2491 (57,11/57,13)
Minimum Rod Journal Diameter	2.2466 (57,06)
Main Journal & Rod Journal Diameter Out-of-Round Permitted	0.0005 (0,013)
Crankshaft End Play	0.003/0.015 (0,080/0,038)
Maximum End Play	0.016 (0,41)

Main Bearing:

Type	Steel Backed, Aluminum Tin Lined
Main Bearing Running Clearance	0.0025/0.0045 (0,06/0,11)
Maximum Clearance	0.005 (0,13)

NOTES

ENGINE SPECIFICATIONS (Cont'd)

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Crankshaft and Main Bearings Dimensions (Cont'd)

Crankshaft Thrust Washer:

Type	Steel Backed, Aluminum Tin
Position in Cylinder Block	Center Main Bearing
Thrust Washer Oversize	0.007 (0,18)

Timing Case, Camshaft and Drive Dimensions

Camshaft:

Journal Diameter, No. 1	2.0437/2.0448 (51,91/51,94)
Minimum Journal Diameter, No. 1	2.0434 (51,90)
Journal Diameter, No. 2	2.0339/2.035 (51,66/51,69)
Minimum Journal Diameter, No. 2	2.0336 (51,65)
Journal Diameter, No. 3	2.0241/2.0252 (51,41/51,44)
Minimum Journal Diameter, No. 3	2.0237 (51,40)
Journal Diameter, No. 4	2.0142/2.0154 (51,16/51,19)
Minimum Journal Diameter, No. 4	2.0139 (51,15)
Maximum Journal Running Clearance	0.006 (0,15)
Maximum Camshaft Runout	0.003 (0,08)
Minimum Cam Height	1.6727 (42,49)
Camshaft End Play	0.0012/0.0071 (0,03/0,18)
Maximum End Play	0.010 (0,25)

Idle Gear and Hub:

Clearance Fit of Gear Bushing on Hub	0.0014/0.0034 (0,04/0,09)
Idle Gear End Play	0.008/0.012 (0,020/0,30)
Maximum End Play	0.015 (0,38)

Timing Gears:

All Gears Backlash	0.004 (0,102) minimum
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Oil Pump Dimensions

Oil Pump Pressure 30-60 PSI (207-414 kPa)

Oil Pump:

Type	Rotor
Number of Lobes-Inner Rotor	Four
Number of Lobes-Outer Rotor	Five
Method of Drive	Spiral Gear on Camshaft
Clearance of Inner to Outer Rotor	0.012 (0,30)
Clearance of Outer Rotor to Pump Housing	0.012 (0,30)
Rotor End Play	0.006 (0,15)

Oil Pump Relief Valve:

Type	Spring-Loaded Plunger
Spring, Free Length	1.6 (40,1)

Cooling System and Water Pump Dimensions

Water Pump:

Type	Centrifugal
Water Pump Seal, Type	Synthetic Rubber-Carbon Faced
Counter Face	Rotating Ceramic

Thermostat:

Type	Wax By-Pass Blanking
Opening Temperature	166°/173°F (74.5°/78.5°C)
Fully Open Temperature	194°F (90°C)
Minimum Travel at Full Open	0.3 (7,6)

NOTES _____

ENGINE SPECIFICATIONS (Cont'd)

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Fuel System Specifications

Fuel Filter
Type Spin on canister element. Printing pump in filter housing.

Fuel Injection Pump
Manufacturer Diesel Kiki
Type VE
Rotation Clockwise (from drive end)
Plunger Diameter 0.394 (10)
Cam Lift 0.09 (2,3)
Static Timing 0.039 (1,0) cam lift at TDC

Fuel Injectors
Type Pintle
Operating Pressure 1990 PSI (13721 kPa)

Starting Aid-Glow Plugs
Type Sheathed
Voltage and Current 10.5 volt - 6.5 amps.

De-Rating for Altitude

The following is given as a general guide, which may be used on a percentage basis, where specific figures for an engine rating are not available.

Altitude	Maximum Fuel Delivery De-Rating Measured at 800 RPM Pump Speed
0 - 2,000 ft. (600 Meters)	No Charge
2,000 - 4,000 ft. (1200 Meters)	6%
4,000 - 6,000 ft. (1800 Meters)	12%
6,000 - 8,000 ft. (2400 Meters)	18%
8,000 - 10,000 ft. (3000 Meters)	24%
10,000 - 12,000 ft. (3600 Meters)	30%

Any necessary adjustments for the fuel injection pump must be done by Trained Service Personnel.

Engine Torques

The following figures will apply with the bolts and/or nuts having a light coat of oil before assembly.

	Ft.-Lbs.	Nm	Page
Engine Mounting Bolts & Nuts	125-140	169-190	7B-16
U-Joint Mounting Bolts	25-28	34-38	7B-22
Cylinder Head Bolts (Also Rocker Arm Brackets)	85	115	7B-24
Main Bearing Bolts	85	115	7B-35
Connecting Rod Nuts*	60	82	7B-32
Flywheel Bolts	83-90	113-122	7B-22
Crankshaft Pulley Retaining Bolt	180	244	7B-39
Camshaft Gear Bolt	40-50	54-68	7B-43, 7B-42
Idler Gear Hub to Cylinder Block Nuts	21	28	7B-42
Fuel Injection Pump Drive Gear Nut	50	58	7B-8, 7B-42, 7B-44
Fuel Injector Nuts	12	16	7B-11
High Pressure Tubeline Fittings	15	20	7B-5
Glow Plugs	11	15	7B-13

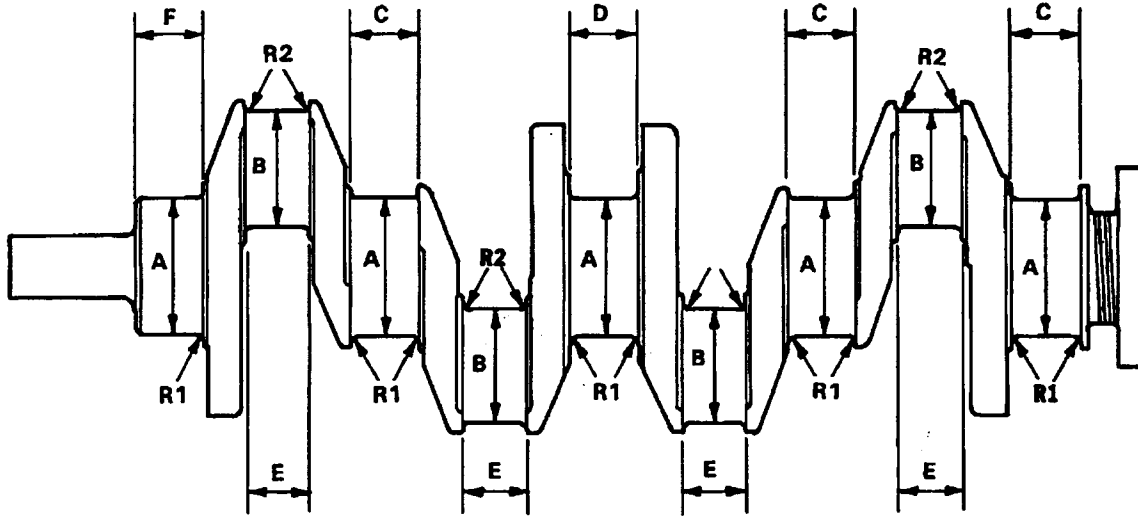
* Once the Connecting Rod Nuts are removed, they must be replaced.

NOTES _____

ENGINE SPECIFICATIONS (Cont'd)

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parenthesis.

Grinding Specifications for Crankshaft



PI-2598

	0.010 (0,25) Undersize	0.020 (0,51) Undersize	0.030 (0,76) Undersize
A	2.7385/2.739 (69,56/69,57)	2.7285/2.729 (69,30/69,32)	2.7185/1.719 (69,05/69,06)
B	2.2385/2.239 (56,86/56,87)	2.2285/2.229 (56,60/56,62)	2.2185/2.219 (56,35/56,36)
C	1.4459 (36,73) Maximum		
D	1.4416/1.4445 (36,62/36,69)	1.4466/1.4495 (36,74/36,82)	1.4516/1.4545 (36,87/36,94)
E	1.3806 (35,07) Maximum		
F	1.4045 (35,67) Maximum		
R1	0.146/0.157 (3,71/3,99) All Journals		
R2	0.126/0.142 (3,20/3,61) All Crankpins		

Surface finish of crankpins, journals and fillet radii 8 micro inches (0,2 microns) C.L.A.

Magnetic Crack Detection

D.C. Flow — 2.5 Amps.

A.C. Current — 1300 Amps.

Limits of taper and out-of-round for pins and journals:

Taper 0.00025 (0,006)

Out-of-Round 0.00025 (0,006)

Maximum Run-out with the crankshaft mounted on the end main journals.

Independent Readings:

Crankshaft Pulley

Diameter T.I.R.

0.002 (0,05)

Rear Oil Seal

Diameter T.I.R.

0.002 (0,05)

Flywheel Flange

Diameter T.I.R.

0.002 (0,05)

Journals T.I.R. — Run-out must not be opposed.

Number 1

Mounting

Number 2

0.003 (0,08)

Number 3

0.006 (0,15)

Number 4

0.003 (0,08)

Number 5

Mounting

(200 Series)

-8B-7-

843 Loader
Service Manual

ENGINE SPECIFICATIONS (Cont'd)

Engine Torque

	Ft.-Lbs.	Nm	Page
Valve Cover Nuts.....	6-13	8-18	7C-29
Rocker Arm Bracket Bolts.....	36-43	49-58	7C-29
Rocker Arm Adjustment Nut.....	12-14	16-19	
Cylinder Head Bolts.....	New 57-67	77-91	7C-29
	Used 72-80	98-108	7C-29
Exhaust Manifold Bolts.....	10-17	14-23	7C-30
Intake Manifold Bolts.....	10-17	14-23	
Intake Manifold Pipe Bolts.....	20-35	27-47	
Thermostat Housing Bolts.....	10-17	14-23	7C-66
Water Jacket Tube (Outside).....	10-17	14-23	
Exhaust Pipe to Exhaust Manifold.....	20-35	27-47	
Main Bearing Cap Bolts.....	116-130	157-176	7C-44, 7C-46 7C-39
Oil Pan Nuts & Bolts.....	14-19	19-26	
Oil Filter Housing Bolts.....	10-17	14-23	
Water Pump Bolts.....	11-18	15-24	7C-63
Oil Pump Mounting Bolts.....	10-17	14-23	7C-60
Camshaft Gear Bolt.....	72-87	98-118	7C-54
Camshaft Retainer Plate Bolts.....	11-17	15-23	7C-54
Flywheel Bolts.....	*83-90	113-122	7C-26
Connecting Rod Bolts.....	58-65	79-88	7C-40
Crankshaft Pulley Bolt.....	123-152	167-206	7C-48, 7C-49
Fuel Injector Holddown Nut.....	23-32	31-43	7C-12
High Pressure Tubeline Fittings.....	14-29	19-39	7C-7, 7C-11 7C-8
Injection Pump Mounting Bolts & Nuts.....	10-17	14-23	
Injection Pump Gear Bolt.....	43-51	58-69	7C-50
Timing Case Cover Bolts.....	11-17	15-23	7C-26
U-Joint Mounting Bolts.....	25-28	34-38	7C-28
Engine Rear Mounting Bracket Bolts (Large).....	56-62	75-85	7C-28
Engine Rear Mounting Bracket Bolts (Small).....	31-35	43-47	7C-28
Engine Front Mounting Bracket Bolts.....	25-28	34-38	7C-28
Idler Gear Bolts.....	10-12	14-16	7C-51
Injection Pump Idler Gear Bolt.....	72-87	98-118	7C-53
Timing Case Bolts.....	11-17	15-23	7C-55
Oil Pump Bolts (Hollow).....	9-12	12-16	-

*Lubricate Thread with Oil

NOTES



843-1
Revision Number
12 March 1986
Date

SERVICE MANUAL REVISION

AFFECTING:

Product BOBCAT LOADER

Model 843

Manual No. 6566091 (12-85)

ROUTE TO ATTENTION	
PARTS MANAGER	<input type="checkbox"/>
SERVICE MANAGER	<input checked="" type="checkbox"/>
SALES MANAGER	<input type="checkbox"/>

The attached sheets are a revision to the 843 Service Manual (P/N 6566091). The revision includes information on checking the Melroe alternator and checking the Delco starter.

Remove the following pages from the Service Manual and replace them with the revised pages as follows.

TAKE OUT

6-7, 6-8

6-13, 6-14, 6-15

PUT IN

6-7, 6-8 (Revised Mar. 86)

6-8.1 (Added Mar. 86), 6-8.2 (Revised Mar. 86)

6-13, 6-14, 6-15 (Revised Mar. 86)