



Service Bulletin

LOCATION Charles City
 SUBJECT 2050 and 2150 Tractor Specifications
 NUMBER 430 208
 DATE 4-9-68
 FILE A General Information

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This bulletin contains 2050 and 2150 Tractor service specifications. For components not covered herein, refer to 1850-1950 Tractor Shop Manual Number 432 515.

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Service Department
 DW:DDH:her

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ENGINE

GENERAL

Engine Serial Number Location	Left side of crankcase beneath rear inspection plate
Weight of Engine	1500 lbs. (est)
Number of Cylinders	6
Firing Order	1-5-3-6-2-4
Bore	4.56
Stroke	4.87
Piston Displacement	478 cu. in.
Engine Speed (rpm)	
Low Idle	600 ± 25
Rated	2400
High No-Load	2650
Compression Ratio	18:1
Cranking Speed	150-180 rpm
Compression Pressure at Cranking Speed	300-350 psi
Allowable Compression Pressure Variation Between Cylinders	25 psi
Engine Operating Temperature	180°-200° F.

LUBRICATION

Type	Pressure
Main Oil Gallery Pressure Relief Valve Setting	65 psi
Oil Filter Type	Full flow
Recommended Oil	Refer to operator's manual
Minimum Oil Pressure @ Engine Operating Temperature	
Main Gallery - Idle Speed	15 psi
2400 RPM	50-65 psi
Oil Change Period	Every 100 hours
Filter Change Period	Every oil change
Crankcase Capacity - Without Filters	18 quarts
With Filters	22 quarts
Full Flow Filter	Oil Cooler
Bypass Valve	Bypass Valve
Oil Pressure Relief	Piston Cooling
or Bypass Valve Springs	Relief Valve
Free Length	Oil Pressure
Compressed Length	Regulator Valve
Oil Pressure Relief or	
Bypass Valve Plunger	
Diameter	

1.6200
 1.380 @ 7.7 ± .7 lbs.
 2.2800
 1.750 @ 27.5 ± 3 lbs.
 0.801-0.800

CAMSHAFT

Material	Carbon steel - forged
End Play	0.006-0.015
Thrust Plate Thickness	0.242-0.240
Type of Drive	Gear driven
Method of Checking Misalignment	V blocks
Maximum Misalignment	0.002
Cam Lift - Intake & Exhaust	0.324
Journal Diameters - Front	2.4295-2.4285
- Second	2.3670-2.3660
- Third	2.3045-2.3035
- Rear	1.9920-1.9910

CAMSHAFT BUSHING AND BORE

Type	Steel backed, copper alloy
Bushing Bore	
Front	2.5620-2.5630
Second	2.4995-2.5005
Third	2.4370-2.4380
Rear	2.1245-2.1255
Bushing Inside Diameter (In Place)	
Front	2.4315-2.4325
Maximum	2.4355
Second	2.3690-2.3700
Maximum	2.3730
Third	2.3065-2.3075
Maximum	2.3105
Rear	1.9940 - 1.9950
Maximum	1.9980
Bushing Width	
Front	1.12
Second	1.00
Third	1.00
Rear	1.26
Running Clearance	
Standard	0.001-0.003
Maximum	0.006

CONNECTING RODS

Material	SAE 1045H steel forging
Rod Misalignment	Allowable twist - 0.001 per inch of bearing length
Length from Center of Small End to Center of Large End	8.750
Connecting Rod Side Clearance	
Standard	0.007-0.013
Diameter of Piston Pin Bushing Bore	1.749-1.750
Diameter of Rod Bearing Bore	3.251-3.252
Weight Variation Between Lightest and Heaviest Rod In Set	0.25 ounces
Number of Connecting Rod Cap Bolts	2
Bolt Thread Size	9/16-18 UNF-3A

CONNECTING ROD BEARINGS

Type	Replaceable shell, precision bearings
Material	Steel backed, copper-lead base, tin plate
Manner of Adjustment	None
Running Clearance	
Standard	0.0020-0.0055
Maximum	0.0075
Bearing Width	1.443-1.453
Undersize	0.010 0.020

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CRANKSHAFT

Type	Dynamically balanced
Material	Steel forging
End Play Controlled By	Center main bearing
End Play	
Standard	0.010-0.014
Maximum	0.018
Number of Main Bearings	7
Main Bearing Journal Diameter	3.6210-3.6200
Connecting Rod Journal Diameter	2.9970-2.9960
Maximum Journal Out-of-Round or Taper	0.0005
Maximum Main Bearing Journal Length	
1st, 2nd, 3rd, 5th, 6th, 7th	1.608-1.618
4th	2.137-2.139
Maximum Connecting Rod Journal Length	1.778-1.782
Main Bearing Cap Bolt Thread Size	9/16-12 UNC
Maximum Allowable Shaft Misalignment	0.003 @ No. 4 main bearing journal 0.002 remaining main journals
Flywheel Mounting Flange Runout	0.002

CRANKSHAFT MAIN BEARINGS

Type	Replaceable shell, precision
Material	Steel backed, trimetal lined, plated
Manner of Adjustment	None
Running Clearance	
Standard	0.0020-0.0055
Maximum	0.0075
Undersize	0.010 0.020
Bearing Shell Width	1.220-1.230
Thrust Bearing Width	2.124-2.127
Crankcase Bore	3.937-3.938

CYLINDER HEADS (2)

Type	Overhead valve
Material	Cast iron
Stud Thread Size	9/16-12 NC x 9/16-18 UNF-3A
Number of Studs (Each Head)	14
Maximum Cylinder Head Run-Out	0.003 across, 0.005 lengthwise
Valve Port Diameters	
Intake	1.70
Exhaust	1.56
Valve Seat Angle	
Intake & Exhaust	45°
Valve Seat Width	
Intake	1/8
Exhaust	7/64
Maximum Valve Seat Runout	0.002
Injector Bore Diameter	0.831-0.834

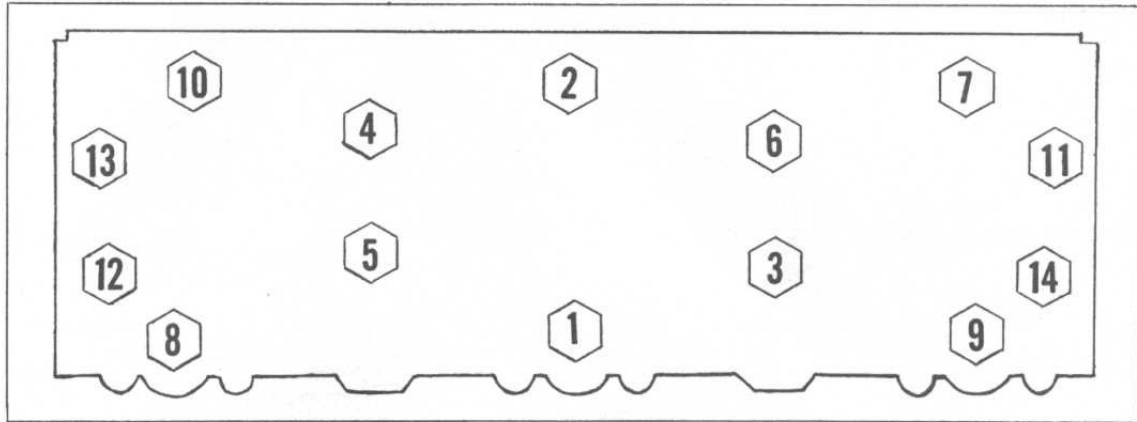


Fig. 1 Cylinder Head Nut Tightening Sequence

FLYWHEEL WITH RING GEAR

Maximum Runout	0,008
Diameter	15,875
Ring Gear Teeth (Number)	126

IDLER GEAR

Shaft Diameter	0,7873-0,7869
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OIL PUMP

Type	Gear
Relief Valve Setting	140-190 psi
Relief Valve Spring	
Free Length	2,340
Compressed Length	2,1 @ 51 ± 5 lb.
Relief Valve Plunger Diameter	0,812-0,811
Drive & Driven Gear Clearance	
Standard	0,0020-0,0055
Maximum	0,0080
Drive Shaft Running Clearance in Pressure Pump & Scavenger Pump Housing	
Standard	0,001-0,003
Maximum	0,005
Drive Shaft Running Clearance in Scavenger Oil Pump Housing Cover Bushing	
Standard	0,0005-0,0020
Maximum	0,0040
Driven Shaft Running Clearance in Bushings	
Standard	0,0010-0,0025
Maximum	0,0045

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PISTONS

Material	Aluminum alloy
Surface Treatment	Tin plated
Pistons Removed from	Top
Length	5.520
Skirt Diameter	4.5580-4.5570
Maximum Allowance Out-of-Round	0.0005
Piston Ring Groove Width	
Top and 2nd	0.097-0.098
Oil Ring	0.1880-0.1890
Piston Pin Bore Diameter	
Standard	1.6251-1.6253
Maximum	1.6263
New Piston Fit in New Sleeve	0.0060-0.0085

PISTON PINS

Type	Full floating
Installation	Fit pin at room temperature with thumb pressure
Pin Held in Position by	Retaining rings
Outside Diameter	
Standard	1.6249-1.6247
Minimum	1.6243
Running Clearance in Pistons	
Standard	0.0002-0.0006
Maximum	0.002
Running Clearance in Rod	
Standard	0.0016-0.0020
Maximum	0.0030
Rockwell "C" Hardness	58-62

PISTON PIN BUSHING

Type	Slotted and split
Material	Steel backed bronze
Inside Diameter	
Reamed in Place	1.6265-1.6267
Length	1.60

PISTON RINGS

Material	Cast iron - chrome faced
Compression Rings per Piston	2
Compression Ring Width	0.0935-0.0925
Compression Ring Side Clearance	
Top & 2nd	0.0035-0.0055
Oil Ring Side Clearance	0.0010-0.0025
Compression Ring End Gap	
Standard	0.016-0.026
Maximum	0.050
Oil Ring End Gap	
Standard	0.016-0.028
Maximum	0.052

PUSH RODS

Length	14.744 ± 0.015
Maximum Runout	0.020

ROCKER ARMS

Rocker Arm Shaft Spring	
Free Length	3.500
Compressed Length	2 @ 8.8 ± 1 lb.
Rocker Arm Running Clearance	
Standard	0.0002-0.0024
Maximum	0.0050

ROCKER ARM SHAFT

Shaft Diameter	
Standard	1.0005-0.9998
Minimum	0.9978

SLEEVES

Type	Dry
Material	Cast iron
Brinnell Hardness	229-269
Bore	
Standard	4.5630-4.5645
Maximum (Measured One Inch from Flange)	4.5665
Out-of-Round	
Maximum (Not Installed)	0.012
Taper	
Maximum	0.0005
Overall Length	9.670
Projection above Crankcase (for Gasket Crush)	0.0005-0.0050
Crankcase Sleeve Bore	4.7511-4.7520
Crankcase Sleeve Counterbore	5.010-5.015
Sleeve Counterbore Depth in Crankcase	0.184-0.186
Sleeve Flange Thickness	0.1880-0.1865
Sleeve Outer Diameter	
Upper Flange	5.005-5.000
Body	4.7531-4.7520
Sleeve Upper Flange Clearance in Crankcase	0.005-0.015

TIMING GEARS

Type	Helical
Material	Alloy steel
Back Lash	
Idler Gear to Crankshaft Gear	0.004-0.006
Maximum for Wear	0.007
Camshaft Gear to Crankshaft Gear	0.002-0.004
Maximum for Wear	0.005