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UNIVERSITY OF NEBRASKA
LINCOLN
DEPARTMENT OF AGRICULTURAL ENGINEERING

INSTRUCTIONS TO APPLICANT FOR TRACTOR TEST

Three copies are required of each application and all exhibits attached thereto.

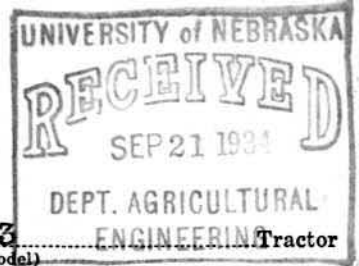
Mail three copies to the Agricultural Engineering Department, College of Agriculture, University of Nebraska, Lincoln, Nebraska, together with draft for \$500.00; priority of test is determined by our date of receipt.

Specifications will include no equipment except that supplied with stock tractors. It may include items (such as extension wheel rims) for which an extra charge is made but such items must be offered for sale by the tractor manufacturer as a part of the tractor and must not be attachments for which the tractor manufacturer is not directly responsible.

If the customer has choice of two or more makes or types of any item of equipment (such as wheel lugs) description will be given of each make or type. All of these makes or types will be sent with the tractor submitted for test.

In filling out specification sheets, if the blanks provided are not suitable for describing some part of the tractor, specifications on that part should be given on a separate sheet.

APPLICATION FOR THE TEST OF THE



Caterpillar
(Name)

R-3
(Model)

Peoria, Illinois Sept. 19 1934
P. O. Date

Department of Agricultural Engineering,
College of Agriculture,
University of Nebraska,
Lincoln, Nebraska.
Gentlemen:

Caterpillar Tractor Co.
(Applicant)

hereby applies for test

as provided by Nebraska law, of the Caterpillar R-3
(Trade Name)

Not rated
(Model, H. P. Rating) Tractor. Specifications of this tractor

are given on sheets attached hereto and marked exhibits A, B, C, D, E, F, H.
(A, B, C, Etc.)

(Each loose sheet and each set of sheets permanently bound together to be marked as an exhibit.)

All of the claims made regarding the construction and performance of this tractor by the applicant either directly or thru his selling agents are covered in sheets and catalogs attached hereto and marked exhibits.

None issued (Each loose sheet and each catalog to be marked as an exhibit.)

All printed operating instructions furnished to purchasers of this tractor are enclosed herewith and marked exhibits.

None issued

Mr. L. H. WITT
J. M. Davies
By J. M. Davies
(Name) Chief Experimental Engineer
(Position with Applicant)

will be the official representative of the applicant during the test, and will carry proper credentials.

Caterpillar Tractor Co. hereby agrees that no claim for the tractor in excess of
(Applicant)

those declared herewith will be made by the applicant either directly or thru his agents; and that no tractor will be offered for sale either by the applicant or his agents under permit based on this test, which does not correspond exactly with description given herewith; excepting such changes in claims made for the tractor or in construction of the tractor as may from time to time be approved in writing by the Board of Tractor Test Engineers and the State Railway Commission.

Respectfully submitted,

(Signature)

(Name typewritten) C. PARKER HOLT

(Position) VICE-PRESIDENT

(TO BE SIGNED BY AN OFFICER HAVING POWER TO MAKE CONTRACTS FOR THE APPLICANT)

SPECIFICATIONS OF Caterpillar (Name) R-3 (Model) TRACTOR

1. Manufacturer: Caterpillar Tractor Co.
 Address Peoria, Illinois
 Tractor submitted for test by Caterpillar Tractor Co.
 Horsepower rating: Drawbar Not rated Belt Not rated Fuel Gasoline Is this tractor to
 be advertised or sold for operation on kerosene? No

ENGINE

2. Manufacturer: Caterpillar Tractor Co.
 Name Caterpillar Model R-3 4 cycle. bore 4 1/2 in.
 Stroke 5 1/2 in. Crankshaft r. p. m. rated load 1100 Engine weight 1595 lbs. (Specify equipment
 included) Fan to flywheel including magneto, carburetor & air cleaner
 Engine mounted with crankshaft lengthwise Yes crosswise of tractor frame.
3. Cylinders:
 Number 4 Type of cylinder castings In pairs Material Cast iron Vertical Yes
 Horizontal Opposed Clearance Volume 27.2 cu. in. Compression
 pressure lbs. per sq. in. gage at 1100 r.p.m. L. I. or T. head I Head detachable Yes
 Are cylinders ground to dimension? Ground & honed
4. Valves:
 Type Poppet Location In head
 Inlet: No. per cyl. 1 O. D. 2 7/32 in. Port diam. 1 5/8 in. Lift .375 in. Seat angle 45°
 Material: Head Chrome Nickel Steel Stem Chrome Nickel Steel
 Exhaust: No. per cyl. 1 O. D. 2 in. Port diam. 1 7/16 in. Seat angle 45°
 Material: Head Chrome Silicon Steel Stem Chrome Silicon Steel
 Timing: Inlet opens 10 ° after T. C. Closes 40 ° after L. C. Exhaust opens 35 ° before L. C.
 closes 10 ° after T. C.
5. Pistons:
 Weight of one with rings and pin 7.2 lbs. oz. Length 5 1/4 in. Material Cast Iron
 Piston clearance (for diameters). First land .0139 in. Second land .0117 in. Third land .010 in.
 Skirt .006 in. Are pistons ground to dimensions? Yes
6. Piston Rings:
 Make or type Cast Iron - Plain Compression
 Number per piston 5 Width 1/8 in.
7. Piston Pin:
 Length 3 13/16 in. Diameter 1 1/2 in. Solid or hollow hollow Material SAE 1020 C.F. Seam-
less steel tubing Heat treatment Carburized & hardened Ground to dimension Yes
 Method of holding piston pin Full floating-plug in piston boss limits endwise
motion.

SPECIFICATIONS OF Caterpillar
(Name)R-3 TRACTOR
(Model)

8. Piston Pin Bearings:

a. Bearing in piston bosses Yes Total length 2 3/16 in. Removable bushing No
Material Cast Iron

b. Bearing in connecting rod end Yes Length 1 7/16 in. Removable bushing Yes
Material SAE #64 Bronze

9. Connecting Rod:

Type "H" Section Length c. to c. 11 1/2 in. Material SAE #1040 Steel Forging
Heat treatment SAE VII

Weight complete with all bolts, nuts and bearings in place 5 lbs. 7 oz.

Bearing cap bolts: No. 2 Length 3 3/16 in. Material SAE #3135 Steel
Crank bearing: Diam. 2 1/2 in. Length 2 1/2 in. Material Babbitt

10. Crankshaft:

Weight 83# Material SAE 1045 steel forging Heat Treatment SAE VII
Counter balanced No Main crankshaft bearings. Number 3
Type Four Throw in one plane - Drop Forged

DIMENSIONS OF EACH BEARING

	Diameter		Length		Material				
Front Main	2 1/2	in.	2 25/32	in.	Babbitt Lined-Forged Steel				
#1 Crank Pin	2 1/2	in.	2 1/2	in.	"	"	"	"	Cap "
#2 Crank Pin	2 1/2	in.	2 1/2	in.	"	"	"	"	"
Center Main	2 1/2	in.	4 3/16	in.	"	"	"	"	"
#3 Crank Pin	2 1/2	in.	2 1/2	in.	"	"	"	"	"
#4 Crank Pin	2 1/2	in.	2 1/2	in.	"	"	"	"	"
* Rear Main	2 1/2	in.	3 1/32	in.	"	"	"	"	"

* Rear is flywheel end.

11. Flywheel:

Diameter 17 1/2 in. Weight 120 lbs. Solid or spokes Solid Method of attaching
(mark x): Flange X Taper _____ Straight _____

12. Camshaft:

Material SAE 1020 Steel Heat treatment Carburized & Hardened
Cams: Integral Yes Separate _____ Camshaft bearings. Number 3

SPECIFICATIONS OF Caterpillar
(Name)R-3
(Model)

TRACTOR

DIMENSIONS OF EACH BEARING

	Diameter		Length		Material
Front	2 1/4	in.	3 1/8	in.	Cast Iron
		in.		in.	
		in.		in.	
Center	2 1/4	in.	3 9/16	in.	Cast Iron
		in.		in.	
		in.		in.	
Rear	2 1/4	in.	2 3/4	in.	Cast Iron

Camshaft drive: Spur gear..... Helical gear ☒ Chain..... Crankshaft gear material SAE 1045 Steel forging
 Camshaft gear material SAE #1045 steel forging

13. Lubricating System (mark x):

(a) Circulating ☒ (b) Non-circulating..... (c) Pressure feed ☒ (d) Gravity feed.....
 (e) Splash..... (f) Drilled crankshaft ☒
 (g) Mechanical lubricator..... Make..... Capacity.....gals.

Camshaft lubrication (mark x):

Bearings: Independent lead..... Pressure..... Splash ☒Gears: Independent lead ☒ Pressure ☒ Splash.....Piston lubrication (mark x): Independent lead..... Pressure..... Splash ☒

14. Lubricating Oil:

Capacity 2 3/4 gals. to fill crank case to proper operating level.

Oils recommended (give trade names and grades for summer and winter operation).

See exhibit marked "B"

15. Oil-pump Type:

Type Gear Location In sump

16. Governor:

Make Own Type Centrifugal Fly Ball Enclosed Yes

SPECIFICATIONS OF Caterpillar
(Name)R-3
(Model)

TRACTOR

Is governor independent of hand throttle? No Regulation: Increase in final speed not over 200 r.p.m. from rated load speed to no load, with carburetor set for maximum fuel economy.

17. Ignition System: (Give information for all makes or types supplied on stock tractors of this model).

Magneto Yes H. T. X L. T. Make Eisemann Model CT4
 Impulse coupling Yes Make Eisemann
 Magneto H. T. L. T. Make Model
 Impulse coupling Make
 Magneto H. T. L. T. Make Model
 Impulse coupling Make
 Battery System Make Model
 Battery System Make Model
 Battery Make Type Volts Amp. Hours
 Battery Make Type Volts Amp. Hours
 Firing order 1-3-4-2 Maximum spark advance 30 Fixed spark before top center Maximum re-
 tard 35° When impulse starter is working Spark plugs: Make or makes Champion - Truck Special A
 Size and thread 7/8-18 N. Thd. Type
 Location Right side of cyl. head .025 in.

18. Starting Device:

Electrical Make Model Volts
 Air Pressure: Make Model Pressure

19. Carburetion System:

Carburetor (Give information for all carburetors supplied on stock tractors):

Make Ensign Size 1 1/4 Model Ke Fuels Gasoline
 Make Size Model Fuels
 Make Size Model Fuels

20. Exhaust Heat used for:

Air Fuel Mixture in carburetor Mixture in manifold X

21. Hot-water Jacket on:

Carburetor No Manifold No

22. Enclose Cut or Blue Print (Size 8 1/2"x11" or 11"x17") and explanation showing shape and dimensions of intake manifold and application of exhaust heat to air, fuel, or mixture if so used.
See exhibits marked "C", "D", "E", "F".

23. Is Water Injected With Fuel? No Describe control valve

SPECIFICATIONS OF Caterpillar R-3 TRACTOR
 (Name) (Model)

24. Fuel Tanks:

Number 1 Capacity of each in gals. 25 Location Behind engine -
Front of Tank serves as rear hood support.

25. Air Cleaner:

Make Own-Under Vortex Pats. Size _____ (Mark x) (a) Dry centrifugal _____ (b) Strained
 thru cloth or screen _____ (c) Water _____ (d) Oil (specify kind) _____
 (e) Other type (describe) Centrifugal and oil combination-Labyrinth consists of
matted wire.

26. Cooling System:

Cooling fluid Water If oil, give specification of oil _____
 Capacity of system 6 gals.
 Radiator: Make Own Type Flat tubes & fins Important dimensions 23 7/16 high x
24 1/16 wide x 3 1/4 thick
 Circulation of cooling fluid: Thermosyphon _____ Pump x Type of pump Centrifugal
 Pump delivery gal. per min. at rated speed of engine 18

27. Air Circulation:

By exhaust nozzle _____ By fan x Fan diameter 20 in. Number of blades 6
 Speed at rated speed of engine 1584 r.p.m. Type drive Gear

28. Belt Pulley:

Hub-Cast Iron
 Diameter 11 7/8 in. Face 6 1/2 in. Material Rim-Paper or fibre Is face of pulley lagged? _____
 If so, with what material? _____ Speed (at rated speed of engine) 836 r.p.m.
 If gear drive, give gear ratio crank shaft to pulley shaft 1.31 to 1 Belt pulley shaft bearings: (De-
 scribe each bearing.)

Type	Make	Size	Material
<u>Roller</u>	<u>Hyatt</u>	<u>RA310</u>	
<u>Ball</u>	<u>Fafnir</u>	<u>309W or</u>	
	<u>Gurney</u>	<u>309R</u>	

CHASSIS

29. Clutches:

Friction disc-
 .156 thick x
 Size 4 0.D. x 7 I.D.
 For transmission: Type Single plate-Dry Make Own
 On differential (if used) type _____ Make _____ Size _____
 For belt pulley (if separate clutch):
 Type _____ Make _____ Size _____

30. Brakes: (Describe each brake.)

(a) Type 2 external contracting bands on steering clutches.
 (Contracting band or shoe)
 When gears are in neutral, does brake control belt pulley or traction wheel? Tracks are held-not
pulley.

SPECIFICATIONS OF Caterpillar

R-3

TRACTOR

(Name)

(Model)

By which lever or pedal is brake operated? By foot pedals on right and left of Gear Shift Lever.(b) Type Contracting Band

(Contracting band or shoe)

When gears are in neutral does brake control belt pulley

or traction wheels? Tracks are held - not Pulley

(c) Differential brake (if used). Type.....

How controlled.....

Can both differential brakes be set at once?.....

31. Transmission:

Manufacturer OwnType Selective sliding gearEnclosed to what extent COMPLETELY

Reduction (pairs of gears) engine to drive wheels or tracks.

Speed	Type of gear with number of teeth and in their pairs of contact, from engine, to drive wheel or track					Gear ratio from engine to drive wheels or tracks
Type	Spur	Spur	Bevel	Spur		
1st low	15 with 33	with	13 with 53	12 with 66	with	49.3 to 1
2nd low	19 " 29	"	13 " 53	12 " 66	"	34.2 to 1
3rd low	23 " 25	"	13 " 53	12 " 66	"	24.4 to 1
4th low	"	"	"	"	"	
Reverse	19 " 17	13 " 29	13 " 53	12 " 66		44.7 to 1

Give following information for each gear wheel: See exhibit marked "H"

* Location	Type Gear	Pitch Diameter	No. of Teeth	Face Inches	Finish	Material	Heat Treatment
(1)	Spur	3.800	19	1 1/8	Machined	2345	SAE VIII
(2)	Spur	4.600	23	1	Machined	2345	SAE VIII
(3)	Spur	3.000	15	1 1/8	Machined	2345	SAE VIII
(4)	Spur	5.800	29	1 1/8	Machined	2345	SAE VIII
(5)	Spur	5.000	25	1	Machined	2345	SAE VIII
(6)	Spur	6.600	33	1 1/8	Machined	2345	SAE VIII
(7)	Spur	3.400	17	3/4	Machined	2345	SAE VIII
(8)	Spur	2.600	13	3/4	Machined	2345	SAE VIII
(9)	Bevel	2.883	13	1 1/2	Machined	2345	SAE VIII
(10)	Bevel	11.778	53	1 1/2	Machined	2345	SAE VIII
(11)	Spur	2.585	12	2 15/16	Machined	2345	SAE VIII
(12)	Spur	14.215	66	2 1/2	Machined	2345	SAE VIII

Shaft bearings: (Give information for each bearing used in transmission and rear axle.)

* Location	Type	Make	Size	Material
A	Ball	Fafnir	308W	
B	Ball	Fafnir	308W	
C	Ball	Fafnir	406W or Gurney 406R	
D	Ball	Gurney	410R	
E	Plain	Own	1.375	SAE #64 bronze
F	Roller	Timken	557S-552A	
G	Ball	Fafnir	310W	
H	Roller	Timken	52637-52387	
J	Roller	Timken	572-580	

* Location may be given by reference to cut or blue print attached hereto if desired.

SPECIFICATIONS OF Caterpillar
(Name)R-3
(Model)

TRACTOR

32. Differential:

Make Type

Open or enclosed Can it be locked?

If chain drive is used, give make and description of chain

33. Rate of Travel at Rated Engine Speed:

Also mark by (x) speed normally used for plowing.

Speed	Calculated Speed in Miles per Hour (No slippage allowance)	Advertised Miles per Hour on Rated Load
1st (Low)	<u>1.777</u>	<u>1.8</u>
2nd	<u>2.558</u> x	<u>2.6</u>
3rd	<u>3.592</u>	<u>3.6</u>
4th		
Reverse	<u>1.956</u>	<u>2.0</u>

34. Drive Wheels:

Number Cast solid Section of spoke sq. in. Shape of

Spoke section Spokes cast in or built up Diameter

..... in. Face in. Extension rims width in. Lugs: Give descrip-
tions and dimensions of each type of lug furnished on stock tractors in Nebraska

How is power transmitted to the rim?

Drive wheel axle: Live Stationary Diameter

Material:

35. If Track-laying Type:

No of tracks 2 No. shoes per track 29 Length of track bearing on ground 56 7/8..... in. Width of each track 16 in. Length of each track shoe c. to c. of pins 6.135 in.

36. Non-driving Wheels:

No. Cast solid Section of spoke sq. in.

Shape of spoke section Spokes cast in or built up Diameter in.

Face in. Bearings of non-drive wheels (describe each bearing).

Location	Type	Make	Size	Material

SPECIFICATIONS OF Caterpillar R-3 TRACTOR
(Name) (Model)

37. Steering Arrangement:

Knuckle type.....Swinging axle..... Other type (describe) Independent Clutch
and Brake Controlling each track.

38. Static Weight on each wheel or track. (Tanks and radiator full, wheel lugs attached.)

Wheel	Weight, Lbs.
<u>R. H. Track</u>	<u>4968</u>
<u>L. H. Track</u>	<u>4950</u>

Total weight (as above) 9918

39. Frame:

Cast Material.....

Built up Material.....

Hot riveted..... Cold riveted..... Bolted.....

Description Frameless Type - Unit Construction

Frame mounting (mark x):

To drive wheels. Spring..... Rigid.....

To non-drive wheels. Spring..... Rigid.....

40. Drawbar:

Height 13 5/8 from lower face of standard track shoe. in. Vertical adjustment (give limits) Other clevis positions at in.
Lateral adjustment 15 3/4 at pin in. 8 5/16 and 18 15/16

Swiveled..... Yes..... Point of swivel how far forward or back of rear axle..... in.

41. General Dimensions:

Wheel base c. to c. front and rear wheels. 56 7/8 in. Tread c. to c.: front wheels..... in.

rear wheels or tracks..... 55 in. Width over all 74 1/2 in. Length over all 120 5/8 in.

Height over all 60 5/8 in. Diameter of circle wholly within which tractor may be turned 154 3/4

42. The Following Items of Equipment Included in the Above Specifications Are Supplied at an Extra Charge:

Belt Pulley Drive