

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 \$250.00; 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

~~Allis-Chalmers~~
(Name)

~~20-35~~
(Model)

Tractor

~~Milwaukee, Wisconsin~~

~~May 2~~ 19 ~~28~~
Date

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

~~Allis-Chalmers Manufacturing Company~~
(Applicant)

hereby applies for test

as provided by Nebraska law, of the

~~Allis-Chalmers~~

(Trade Name)

~~20-35~~

(Model, H. P. Rating)

Tractor. Specifications of this tractor

are given on sheets attached hereto and marked exhibits.

~~A - B - C - D - E~~

(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.

~~B - C~~

~~D - E~~

(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.

Mr. ~~Walter F. Strehlow~~

(Name)

~~Engineer~~

(Position with Applicant)

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

~~Allis-Chalmers Mfg. Company~~

(Applicant)

hereby agrees that no claim for the tractor in excess of

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)

H. C. Merritt

(Position)

Manager Tractor Division

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

SPECIFICATIONS OF Allis-Chalmers 20-35 TRACTOR
(Name) (Model)

1. Manufacturer: Allis-Chalmers Manufacturing Company
Address Milwaukee, Wisconsin
Tractor submitted for test by Allis-Chalmers Manufacturing Company
Horsepower rating: Drawbar 20 Belt 35 Fuel Gasoline Is this tractor to
be advertised or sold for operation on kerosene? No

ENGINE

2. Manufacturer: Allis-Chalmers Manufacturing Company
Name Allis-Chalmers Model 4.75" x 6.5 4 cycle. bore 4.75 in.
Stroke 6.5 in. Crankshaft r. p. m. rated load 930 Engine weight 1710 lbs. (Specify equipment
included) Carburetor, Magneto, Governor, Oil cleaner and Air cleaner. No fan
Engine mounted with crankshaft lengthwise Yes crosswise No of tractor frame.
3. Cylinders: Removable
Number 4 Type of cylinder castings liners Material C. I. Vertical Yes
Horizontal No Opposed No Clearance Volume 29.8 cu. in. Compression
pressure 90 lbs. per sq. in. gage at 930 r.p.m. L. I. or T. head in head Head detachable Yes
Are cylinders ground to dimension? Yes and Lapped
4. Valves:
Type Poppet Location in head
Inlet: No. per cyl. 1 O. D. 2 7/32 in. Port diam. 2 in. Lift .352 in. Seat angle 45
Material: Head Steel Stem steel
Exhaust: No. per cyl. 1 O. D. 2 7/32 in. Port diam. 2 in. Seat angle 45
Material: Head Steel Stem Steel
Timing: Inlet opens 15 ° after T. C. Closes 30 ° after L. C. Exhaust opens 44 ° before L. C.
closes 9 ° after T. C.
5. Pistons:
Weight of one with rings and pin 6 lbs. 14 oz. Length 6 7/8 in. Material C. I.
Piston clearance (for diameters). First land .020 in. Second land .014 in. Third land .010 in.
Skirt .006 in. Are pistons ground to dimensions? Yes
6. Piston Rings:
Make or type Angle cut
Number per piston 4 Width 1/4 in.
7. Piston Pin:
Length 4 3/8 in. Diameter 1 1/2 in. Solid or hollow Hollow Material S. A. E. 3120
Heat treatment to 75 scleroscope Ground to dimension Yes
Method of holding piston pin Set screw

SPECIFICATIONS OF Allis-Chalmers 20-35 TRACTOR
(Name) (Model)

8. Piston Pin Bearings:

a. Bearing in piston bosses No Total length in. Removable bushing
Material
b. Bearing in connecting rod end Yes Length 2 3/8 in. Removable bushing Yes
Material Bronze

9. Connecting Rod:

Type I Length c. to c. 13 in. Material Drop Forge Steel
Heat treatment See dwg. AM-70359
Weight complete with all bolts, nuts and bearings in place 11 lbs. 14 oz.
Bearing cap bolts: No. 4 Length 3 3/8 in. Material S. A. E. 3140
Crank bearing: Diam. 2 1/2 in. Length 3 1/4 in. Material Babbitt--Br. backed

10. Crankshaft:

Weight 117 Material S. A. E. 1045 Heat Treatment See dwg. AM-90131
Counter balanced No Main crankshaft bearings. Number 3
Type Babbitt bronze backed

DIMENSIONS OF EACH BEARING

	Diameter		Length		Material
Front	<u>2 1/2</u>	in.	<u>3 15/16</u>	in.	<u>Babbitt--Br. backed</u>
		in.		in.	
Center	<u>"</u>	in.	<u>"</u>	in.	<u>"</u>
		in.		in.	
		in.		in.	
		in.		in.	
* Rear	<u>2 1/2</u>	in.	<u>4 3/4</u>	in.	<u>"</u>

* Rear is flywheel end.

11. Flywheel:

Diameter 20 3/8 in. Weight 176 lbs. Solid or spokes Solid Method of attaching
(mark x): Flange X Taper Straight

12. Camshaft:

Material S. A. E. 1020 Heat treatment See dwg. AM-70360
Cams: Integral Yes Separate No Camshaft bearings. Number 3

SPECIFICATIONS OF Willis-Chalmers 20-35 TRACTOR
 (Name) (Model)

DIMENSIONS OF EACH BEARING

	Diameter		Length		Material
Front	2 1/8	in.	2 1/4	in.	Brass
		in.		in.	
Center	2 1/8	in.	2 1/2	in.	"
		in.		in.	
		in.		in.	
		in.		in.	
Rear	2 1/8	in.	2 3/8	in.	"

Camshaft drive: Spur gear Yes Helical gear No Chain No Crankshaft gear material S.A.E. 7
1020
 Camshaft gear material C. I.

13. Lubricating System (mark x):

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

Camshaft lubrication (mark x):

Bearings: Independent lead..... Pressure..... Splash X

Gears: Independent lead X Pressure..... Splash.....

Piston lubrication (mark x): Independent lead..... Pressure..... Splash X

14. Lubricating Oil:

Capacity 3 gals. to fill crank case to proper operating level.

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

Mobile oil 88 for summer and Mobil oil A for winter or other similar grade.

15. Oil-pump Type:

Type Gear Location in oil sump

16. Governor:

Make Own Type Centrifugal Enclosed Yes

SPECIFICATIONS OF Allis-Chalmers (Name) 20-25 (Model) TRACTOR

Is governor independent of hand throttle? No Regulation: Increase in final speed not over 150 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 Hisemann H. T. X L. T. Make Hisemann Model 33-4
 Impulse coupling Hisemann 13-5 Make Hisemann
 Magneto H. T. L. T. Make Model
 Impulse coupling Make
 Magneto H. T. L. T. Make Model
 Impulse coupling Make
 Battery System No 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 25 ° before top center 5° after Maximum re-
 tard A-C Spark plugs: Make or makes A-C
 Size and thread 7/8 - 18 Type
 Location Cyl. Head Gap .03 in.

18. Starting Device:

Electrical None Make Model Volts
 Air Pressure: Make Model Pressure

19. Carburetion System:

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

Make Kingston Size 1 1/2 Model 1 Fuels Gasoline
 Make Size Model Fuels
 Make Size Model Fuels

20. Exhaust Heat used for:

Air No Fuel No Mixture in carburetor No Mixture in manifold No

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.

23. Is Water Injected With Fuel? No Describe control valve None

SPECIFICATIONS OF Ellis-Chalmers 20-35 TRACTOR
(Name) (Model)

24. Fuel Tanks:

Number 1 Capacity of each in gals. 32 Location Back
of motor

25. Air Cleaner:

Make Own Size _____ (Mark x) (a) Dry centrifugal _____ (b) Strained
thru cloth or screen _____ (c) Water _____ (d) Oil (specify kind) _____
(e) Other type (describe) Combined centrifugal and oiled steel wool.

26. Cooling System:

Cooling fluid water If oil, give specification of oil _____
Capacity of system 10 gals.
Radiator: Make Racine Type pin and tube Important dimensions _____
35 3/4 high 27 1/8 wide
Circulation of cooling fluid: Thermosyphon No Pump Yes Type of pump Centrifugal
Pump delivery gal. per min. at rated speed of engine _____

27. Air Circulation:

By exhaust nozzle No By fan Yes Fan diameter 22 in. Number of blades 4
Speed at rated speed of engine 1860 r.p.m. Type drive Belt

28. Belt Pulley:

Diameter 13 in. Face 8 1/2 in. Material G. I. Is face of pulley lagged? No
If so, with what material? _____ Speed (at rated speed of engine) 930 r.p.m.
If gear drive, give gear ratio crank shaft to pulley shaft 1 to 1 Belt pulley shaft bearings: (De-
scribe each bearing.)

Type	Make	Size	Material
<u>Roller</u>	<u>Timken</u>	<u>532-A-537</u>	
<u>"</u>	<u>"</u>	<u>532-A-535</u>	

CHASSIS

29. Clutches:

For transmission: Type Shoe Expanding Make Own Size 16" dia.
On differential (if used) type None Make _____ Size _____
For belt pulley (if separate clutch):
Type None Make _____ Size _____

30. Brakes: (Describe each brake.)

(a) Type Band
(Contracting band or shoe)

When gears are in neutral, does brake control belt pulley or traction wheel? traction wheels

SPECIFICATIONS OF Allis-Chalmers (Name) 20-35 (Model) TRACTOR

By which lever or pedal is brake operated? foot pedal

(b) Type Band (Contracting band or shoe) When gears are in neutral does brake control belt pulley or traction wheels? Traction wheels

(c) Differential brake (if used). Type None

How controlled? Can both differential brakes be set at once?

31. Transmission:

Manufacturer Own Type Selective

Enclosed to what extent? Entirely

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	Mitre with	Spur with	Spur with	Internal Spur with					
1st low	31 " 31	14 " 32	15 " 69	13 " 66					53.4 to 1
2nd low	31 " 31	16 " 30	15 " 69	13 " 66					43.8 to 1
3rd low	" "	" "	" "	" "					
4th low	" "	" "	" "	" "					
Reverse	31 " 31	16 " 14	14 " 30	15 " 69	13	66			43.8 to 1

Give following information for each gear wheel:

* Location	Type Gear	Pitch Diameter	No. of Teeth	Face Inches	Finish	Material	Heat Treatment
	See attached sheet						

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

* Location	Type	Make	Size	Material
Clutch shaft	Ball	H. D.	#1213	
Pulley shaft	Roller	Timken	537-532-A	and 535-532-A
Brake shaft	Plain	Own	2 1/4 x 3 5/8	babblitt
Drive Pinion	Roller	Hyatt	#27185	
Differential Brg.	Plain		3 1/4 x 4 1/8	babblitt
Rear Wheel Axle	Roller	Hyatt	49705	

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

SPECIFICATIONS OF Allis-Chalmers 20-25 TRACTOR
 (Name) (Model)

32. Differential:

Make Own Type Bevel gear

Open or enclosed Enclosed Can it be locked? No

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>2.58</u>	<u>2 1/2 to 3 1/4</u>
2nd	<u>3.16</u>	
3rd <u>X</u>		
4th		
Reverse	<u>3.16</u>	

34. Drive Wheels:

Number 2 Cast solid No Section of spoke .562 sq. in. Shape of

Spoke section 3/8 x 1 1/2 Spokes cast in or built up Built up Diameter 50

in. Face 12 1/4 in. Extension rims width 8 1/8 in. Lugs: Give descrip-

tions and dimensions of each type of lug furnished on stock tractors in Nebraska.

Spade lug 3" x 4 3/4" high

How is power transmitted to the rim? Drive members in wheel

Drive wheel axle: Live Yes Stationary No Diameter 2 15/16"

Material: Steel

35. If Track-laying Type:

No of tracks No No. shoes per track Length of track bearing on ground

in. Width of each track in. Length of each track shoe c. to c. of pins in.

36. Non-driving Wheels:

No. 2 Cast solid No Section of spoke .47 sq. in.

Shape of spoke section 3/8 x 1 1/4 Spokes cast in or built up Built up Diameter 36 in.

Face 6 in. Bearings of non-drive wheels (describe each bearing).

Location	Type	Make	Size	Material
<u>In Hub</u>	<u>Roller</u>	<u>Timken</u>	<u>3720-375</u>	
<u>"</u>	<u>"</u>	<u>"</u>	<u>336-3320</u>	

SPECIFICATIONS OF Allis-Chalmers 20-35 TRACTOR
 (Name) (Model)

37. Steering Arrangement:

 Knuckle type ☒ Swinging axle. Other type (describe) worm and gear

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

Wheel	Weight, Lbs.
<u>Both Rear</u>	<u>4065</u>
<u>" Front</u>	<u>2335</u>

 Total weight (as above) 6400

39. Frame:

 Cast Material cast iron

Built up Material

Hot riveted Cold riveted Bolted

 Description engine and transmission housing are bolted together making frame of tractor.

Frame mounting (mark x):

 To drive wheels. Spring Rigid ☒

 To non-drive wheels. Spring Rigid ☒

40. Drawbar:

 Height 14 in. Verticle adjustment (give limits) None in.

 Lateral adjustment 15 in.

 Swiveled Yes Point of swivel how far forward or back of rear axle 17 in.

41. General Dimensions:

 Wheel base c. to c. front and rear wheels 90 1/2 in. Tread c. to c.: front wheels 60 in.

 rear wheels or tracks 61 in. Width over all 75 in. Length over all 140 1/2 in.

 Height over all 73 in. Diameter of circle wholly within which tractor may be turned 31 ft.

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

Extension wheel ring