

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

Monarch Tractors Corporation

(Name)

"H"

(Model)

Tractor

Springfield, Ill. Nov. 8, 1927
P. O. Date

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

Gentlemen:

Monarch Tractors Corporation

(Applicant)

hereby applies for test

as provided by Nebraska law, of the 6-Ton Monarch

(Trade Name)

Model "H" 40 Drawbar H.P.

(Model, H. P. Rating)

Tractor. Specifications of this tractor

are given on sheets attached hereto and marked exhibits "A" and "B"

(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 A

(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 C

Mr. (Name)

(Position with Applicant)

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

Monarch Tractors Corporation

(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) R. W. Gotshall

(Name typewritten) R. W. Gotshall

(Position) President

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

SPECIFICATIONS OF Monarch 6-Ton Model "H" (Name) TRACTOR (Model)

1. **Manufacturer:** Monarch Tractors Corporation
 Address Springfield, Illinois.
 Tractor submitted for test by Monarch Tractors Corporation
 Horsepower rating: Drawbar 40 Belt - Fuel Gasoline Is this tractor to
 be advertised or sold for operation on kerosene? No

ENGINE

2. **Manufacturer:** Stearns Motor Manufacturing Company
 Name Stearns Model D.U. 4 cycle. bore 5-1/8 in.
 Stroke 6-1/2 in. Crankshaft r. p. m. rated load 1000 Engine weight 1532 lbs. (Specify equipment
 included) _____
 Engine mounted with crankshaft lengthwise X crosswise - of tractor frame.
3. **Cylinders:**
 Number 4 Type of cylinder castings En Block Material C.I. Vertical X
 Horizontal - Opposed - Clearance Volume 43.143 cu. in. Compression
 pressure 64 lbs. per sq. in. gage at 1000 r.p.m. L. I. or T. head I Head detachable Yes
 Are cylinders ground to dimension? Yes
4. **Valves:**
 Type Poppet Location in Head
 Inlet: No. per cyl. 1 O. D. 2-7/16 in. Port. diam. 2-1/4 in. Lift 7/16 in. Seat angle 45°
 Material: Head Low Tungsten Stem Low Tungsten
 Exhaust: No. per cyl. 1 O. D. 2-7/16 in. Port. diam. 2-1/4 in. Seat angle 45°
 Material: Head Silcrome Stem Silcrome
 Timing. Inlet opens 5 ° past T. C. Closes 40 ° after L. C. Exhaust opens 45 ° before L. C.
 closes 8 ° past T. C.
5. **Pistons:**
 Weight of one with rings and pin 7 lbs. 5 oz. Length 6 in. Material Cast Iron
 Piston clearance (for diameters). First land 5.100 in. Second land 5.100 in. Third land 5.121 in.
 Skirt 5.121 in. Are pistons ground to dimensions? Yes
6. **Piston Rings:**
 Make or type Muskegon - concentric
 Number per piston 4 Width 3/16 in.
7. **Piston Pin:**
 Length - in. Diameter 1-5/8 in. Solid or hollow Hollow Material S.A.E. 1020
 Heat treatment S.A.E. 1020-II Ground to dimension Yes
 Method of holding piston pin Key

SPECIFICATIONS OF Monarch 6-Ton Model "H" (Name) (Model) TRACTOR

8. Piston Pin Bearings:

a. Bearing in piston bosses - Total length - in. Removable bushing -

Material -

b. Bearing in connecting rod end Yes Length 2-1/4 in. Removable bushing Yes

Material Bronze

9. Connecting Rod:

Type I Length c. to c. - in. Material Duraluminum

Heat treatment -

Weight complete with all bolts, nuts and bearings in place 7 lbs. 8 oz.

Bearing cap bolts: No. 4 Length 3-7/16 in. Material S.A.E. 3135

Crank Bearing: Diam. 2-3/4 in. Length 3-1/2 in. Material Babbitt spun in

10. Crankshaft:

Weight 124-1/2 Material S.A.E. 1045 Heat Treatment S.A.E. 1045-VI

Counter balanced No Main crankshaft bearings. Number 3

Type Babbitt, Bronze back - removable

DIMENSIONS OF EACH BEARING

	Diameter		Length		Material
Front	<u>2-7/8</u>	in.	<u>3-1/2</u>	in.	<u>Babbitt - bronze back</u>
Center	<u>2-7/8</u>	in.	<u>4-1/2</u>	in.	<u>" " "</u>
		in.		in.	
		in.		in.	
		in.		in.	
		in.		in.	
* Rear	<u>2-7/8</u>	in.	<u>4-1/2</u>	in.	<u>" " "</u>

* Rear is flywheel end.

11. Flywheel:

Diameter 19-1/2 in. Weight 190 lbs. Solid or spokes Solid Method of attaching

(mark x): Flange X Taper - Straight -

12. Camshaft:

Material S.A.E. 1020 Heat treatment 1020-II

Cams: Integral X Separate - Camshaft bearings. Number 3

SPECIFICATIONS OF Monarch 6-Ton Model "H" TRACTOR
(Name) (Model)

DIMENSIONS OF EACH BEARING

	Diameter		Length		Material
Front	2	in.	3-3/8	in.	#64 S.A.E. Bronze
Center	2-1/2	in.	3-1/4	in.	" " "
		in.		in.	
		in.		in.	
		in.		in.	
		in.		in.	
Rear	2	in.	2-1/4	in.	" " "

Camshaft drive: Spur gear ☐ Helical gear ☒ Chain ☐ Crankshaft gear material S.A.E. 1020
Camshaft gear material S.A.E. 1020

13. Lubricating System (mark x):

(a) Circulating ☐ (b) Non-circulating ☐ (c) Pressure feed ☒ (d) Gravity feed ☐
(e) Splash ☐ (f) Drilled crankshaft ☒ Yes
(g) Mechanical lubricator ☒ No 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 5 gals. to fill crank case to proper operating level.

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

No special trade names recommended. Minimum flash 400° F.

Minimum fire 475° F. Low cold test and a viscosity of 65-80 seconds at 210° F. for winter and 80-100 seconds for summer.

Nothing but a pure mineral oil is recommended.

15. Oil-pump Type:

Type Gear pump Location Rear bottom of oil pan.

16. Governor:

Make Pierce Type Centrifugal Enclosed ☒ Yes

SPECIFICATIONS OF Monarch 6-Ton Model "H" TRACTOR
 (Name) (Model)

Is governor independent of hand throttle? Yes Regulation: Increase in final speed not over - 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..... H. T. X L. T. - Make American Bosch Model ZR-4
 Impulse coupling..... Yes Make " "
 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 35 ° before top center 0 Maximum re-
 tard..... Spark plugs: Make or makes A.C.
 Size and thread 7/8-18-S.A.E. Type Long
 Location In head-Right side Gap - in.

18. Starting Device:

Electrical..... X Make Auto-Light Model Type MI-4123 Volts 12
 Air Pressure: Make - Model - Pressure -

19. Carburetion System:

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

Make Zenith Size 1-3/4 Model 77 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 -

SPECIFICATIONS OF Monarch 6-Ton Model "H" TRACTOR
(Name) (Model)

24. Fuel Tanks:

Number 1 Capacity of each in gals. 30 Location At rear
of engine and above flywheel

25. Air Cleaner:

Make United Size 5-1/2" (Mark x) (a) Dry centrifugal x (b) Strained
 thru cloth or screen - (c) Water - (d) Oil (specify kind) -
 (e) Other type (describe) -

26. Cooling System:

Cooling fluid Water If oil, give specification of oil -
 Capacity of system 9-1/4 gals.
 Radiator: Make Modine Type Tubular Important dimensions -
 Circulation of cooling fluid: Thermosyphon - Pump x Type of pump -
 Pump delivery gal. per min. at rated speed of engine 42

27. Air Circulation:

By exhaust nozzle - By fan x Fan diameter 24 in. Number of blades 4
 Speed at rated speed of engine 1421 r.p.m. Type drive Silent chain

28. Belt Pulley:

Diameter - in. Face - in. Material - Is face of pulley lagged? -
 If so, with what material - Speed (at rated speed of engine) - r.p.m.
 If gear drive, give gear ratio crank shaft to pulley shaft - Belt pulley shaft bearings: (Describe each bearing.) -

Type	Make	Size	Material

CHASSIS

29. Clutches:

For transmission: Type Plate Make Twin Disc Size 5-1/2 x 11-1/2
 On differential (if used) type - Make - Size -
 For belt pulley (if separate clutch):
 Type - Make - Size -

30. Brakes: (Describe each brake.)

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

SPECIFICATIONS OF **Monarch 6-Ton Model "H"** **TRACTOR**
 (Name) (Model)

By which lever or pedal is brake operated? **Foot Pedal**

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

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

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

31. Transmission:

Manufacturer **own** Type **Selective sliding gear**

Enclosed to what extent **complete**

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	Chain		
1st low	15 with 42	with	13 with 63	9 with 27	with	40.7
2nd low	20 " 37	"	13 " 63	9 " 27	"	26.89
3rd low	25 " 32	"	13 " 63	9 " 27	"	18.6
4th low	"	"	"	"	"	
Reverse	25 " 20	16 " 32	13 " 63	9 " 27		23.26

Give following information for each gear wheel:

* Location	Type Gear	Pitch Diameter	No. of Teeth	Face Inches	Finish	Material	Heat Treatment
Sliding Gear	Spur	3.75	15	1-3/8	Cut		
Shaft		5.00	20	1-3/16	"	S.A.E.	S.A.E.
Bevel Pinion	"	6.25	25	1-3/16	"	2320	2320-IV
Shaft	"	10.50	42	1-3/8	"	S.A.E. 1020	S.A.E. 1020 IV
Steering Clutch Spkt. Shaft	Bevel	9.25	37	1-3/16	"	"	"
	"	8.00	32	1-3/16	"	S.A.E. 1020	S.A.E. 1020 IV
	"	3.714	13	3	"	S.A.E. 2512	S.A.E. 2512 IV
	"	18.000	63	3	"	S.A.E. 2320	S.A.E. 2320 IV
	Spkt.	6.579	9	1.301	"	S.A.E. 2320	S.A.E. 2320 IV
	"	19.387	27	1.301	"	S.A.E. 1020	S.A.E. 1020 IV

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

* Location	Type	Make	Size	Material
Sliding Gear Front	Ball	New Departure	1309	
Bevel Pinion Rear	"	"	1412	
Bevel Gear Left	"	"	5307	
Steering Clutch Inner	Roller	Hyatt	1315	
Clutch Throwout Outer	Ball	New Departure	215	
	"	"	210	
	"	"	1414	
Rear Sprocket	Roller	Hyatt	5304	
Front Sprocket	"	Timken	W-212	
Truck Wheel	"	Hyatt	537-532-A	
			309	

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

SPECIFICATIONS OF Monarch 6-Ton Model "H" TRACTOR
 (Name) (Model)

32. Differential:

Make None Type -

Open or enclosed - Can it be locked? -

If chain drive is used, give make and description of chain Baldwin #67-S

Roller chain 2-1/4 pitch 44 pitches

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)	1.86	1.86
2nd	2.82	2.82
3rd	4.07	4.07
4th		
Reverse	3.26	3.26

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 31 Length of track bearing on ground 84
 in. Width of each track 13 in. Length of each track shoe c. to c. of pins 8 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 Monarch 6-Ton Model "H" TRACTOR
 (Name) (Model)

37. Steering Arrangement:

Knuckle type.....Swinging axle..... Other type (describe) Separate Steering
clutches controlling each side of tractor

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

Wheel	Weight, Lbs.
	<u>6,125</u>

Total weight (as above) 12,250

39. Frame:

Cast - Material -
 Built up Structural Material -
 Hot riveted Yes Cold riveted - Bolted -
 Description Angle cords with plate web

Frame mounting (mark x):

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

40. Drawbar:

Height 15-7/8 in. Verticle adjustment (give limits) None in.
 Lateral adjustment Swinging in.
 Swiveled - Point of swivel how far forward or back of rear axle - in.

41. General Dimensions:

Wheel base c. to c. front and rear wheels..... in. Tread c. to c.: front wheels..... in.
 rear wheels or tracks 57 in. Width over all 75-1/2 in. Length over all 125 in.
 Height over all 84 in. Diameter of circle wholly within which tractor may be turned 184 inches

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