

UNIVERSITY OF NEBRASKA

LINCOLN

DEPARTMENT OF AGRICULTURAL ENGINEERING

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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

Lauson Model S-10  
(Name)

20-35  
(Model)

Tractor

P. O.

19  
Date

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

The John Lauson Mfg. Co. hereby applies for test  
(Applicant)  
as provided by Nebraska law, of the Lauson  
(Trade Name)  
Model S-10 20-35 Tractor. Specifications of this tractor  
(Model, H. P. Rating)  
are given on sheets attached hereto and marked exhibits A, B, C and D  
(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.

(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 E and F

Mr. O. R. Mueller Engineer  
(Name) (Position with Applicant)

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

The John Lauson Mfg. Co. hereby agrees that no claims 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)

(Position)

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



SPECIFICATIONS OF Lauson Model S-12 TRACTOR  
(Name) (Model)

1. **Manufacturer:** The John Lauson Mfg. Co.  
**Address** New Holstein, Wisconsin  
**Tractor submitted for test by** The John Lauson Mfg. Co.  
**Horsepower rating: Drawbar** 20 **Belt** 35 **Fuel** gasoline **Is this tractor to**  
**be advertised or sold for operation on kerosene?** No

## ENGINE

2. **Manufacturer:** LeRoi Motors  
**Name** LeRoi **Model** JA-1 **4 cycle bore** 4 1/2 in.  
**Stroke** 6 in. **Crankshaft r. p. m. rated load** 1100 **Engine weight** 1100 lbs. (Specify equipment included)  
**Engine mounted with crankshaft lengthwise** X **crosswise** \_\_\_\_\_ **of tractor frame.**
3. **Cylinders:**  
**Number** 4 **Type of cylinder castings** Twin Block **Material** Finest close grained grey iron **Vertical** X  
**Horizontal** \_\_\_\_\_ **Opposed** \_\_\_\_\_ **Clearance Volume** 27.825 cu. in. **Compression pressure** 80 lbs. per sq. in. gage at 1100 r.p.m. **L. I. or T. head** I **Head detachable** yes  
**Are cylinders ground to dimension?** Yes and Honed
4. **Valves:**  
**Type** Poppet **Location** In head  
**Inlet: No. per cyl.** 1 **O. D.** 2 3/16 in. **Port diam.** 1 15/16 in. **Lift** 3/8 in. **Seat angle** 45°  
**Material: Head** Special chrome silicon **Stem** Same as head  
**Exhaust: No. per cyl.** 1 **O. D.** 2 3/16 in. **Port diam.** 1 15/16 in. **Seat angle** 45°  
**Material: Head** Special chrome silicon **Stem** Same as head  
**Timing. Inlet opens** 12° **after T. C. Closes** 42° **after L. C. Exhaust opens** 45° **before L. C. closes** 7° **after T. C.**
5. **Pistons:**  
**Weight of one with rings and pin** 5 lbs. 8 oz. **Length** 5 5/16 in. **Material** Close grained grey iron  
**Piston clearance (for diameters). First land** .015 in. **Second land** .012 in. **Third land** .009 in.  
**Skirt** .005 in. **Are pistons ground to dimensions?** Yes
6. **Piston Rings:**  
**Make or type** Eccentric ring with step cut joint  
**Number per piston** 3 **Width** 1/4 in.
7. **Piston Pin:**  
**Length** 4" in. **Diameter** 1 1/2 in. **Solid or hollow** Hollow **Material** 1020 SAE steel  
**Heat treatment** Case hardened **Ground to dimension** 1.500 ±.0000  
**Method of holding piston pin** Clamped in conn. rod and held endwise by conn. rod screw



SPECIFICATIONS OF Lauson Model S-12 TRACTOR  
(Name) (Model)

## 8. Piston Pin Bearings:

a. Bearing in piston bosses Yes Total length 2 5/8 in. Removable bushing YesMaterial Bronzeb. Bearing in connecting rod end None Length        in. Removable bushing       Material       

## 9. Connecting Rod:

Type Drop forged Length c. to c. 12 1/2 in. Material 1040 SAE steelHeat treatment HWeight complete with all bolts, nuts and bearings in place 8 lbs. 2 oz.Bearing cap bolts: No. 4 Length 2 3/4 in. Material Steel heat treated10. Crankshaft: Crank Bearing: Diam. 2 1/2 in. Length 2 3/4 in. Material Babbit with in.bronze back removableWeight 87 1/2 lbs Material 2330 SAE steel Heat Treatment SAE 3140 VI231-269 Brinell Counter balanced No Main crankshaft bearings. Number 3Type Inlaid bronze backed babbit liners

DIMENSIONS OF EACH BEARING

	Diameter		Length		Material
Front	<u>2.625</u>	in.	<u>3 1/2</u>	in.	
		in.		in.	
Middle	<u>2.625</u>	in.	<u>3 1/2</u>	in.	
		in.		in.	
Pins	<u>2.500</u>	in.	<u>2.750</u>	in.	
		in.		in.	
* Rear	<u>2.625</u>	in.	<u>4 1/2</u>	in.	

\* Rear is flywheel end.

## 11. Flywheel:

Diameter 16 in. Weight 87 lbs. Solid or spokes Solid Method of attaching(mark x): Flange X Taper        Straight       

## 12. Camshaft:

Material 1035 SAE steel Heat treatment Case hardened Solero 65-75Cams: Integral X Separate        Camshaft bearings. Number 3



SPECIFICATIONS OF Lauson Model S-12 TRACTOR  
(Name) (Model)

## DIMENSIONS OF EACH BEARING

	Diameter		Length		Material
Front	1 3/4	in.	3	in.	
		in.		in.	
		in.		in.	
Middle	2 1/2	in.	3 1/8	in.	
		in.		in.	
		in.		in.	
Rear	2	in.	2 5/16	in.	

Camshaft drive: Spur gear..... Helical gear X..... Chain..... Crankshaft gear material Steel  
Case hardened..... Camshaft gear material Steel Heat treated.....

## 13. Lubricating System (mark x):

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

## Camshaft lubrication (mark x):

Bearings: Independent lead No..... Pressure X..... Splash X.....  
Gears: Independent lead No..... Pressure X..... Splash.....  
Piston lubrication (mark x): Independent lead..... Pressure..... Splash X.....

## 14. Lubricating Oil:

Capacity 2..... gals. to fill crank case to proper operating level.

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

Gargoyle Mobiloil BB in summer

Gargoyle Mobiloil A in winter

Gargoyle Mobiloil arctic in below zero F

## 15. Oil-pump Type:

Type Gear type..... Location In bottom of crankcase, rear

## 16. Governor:

Make Taco..... Type Flyball..... Enclosed Yes



SPECIFICATIONS OF Lauson Model S-12 TRACTOR  
(Name) (Model)

Is governor independent of hand throttle? No Regulation: Increase in final speed not over 100 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 American Bosch Model ZB4-ED26  
Impulse coupling Yes Make Bosch automatic  
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 Maximum spark advance \* before top center Maximum re-  
tard Spark plugs: Make or makes Champion #6  
Size and thread 7/8" X 18 SAE Type Two piece long skirt  
Location In head Gap .020 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 Zenith Size 1 1/4 Model T5W Fuels gasoline  
Make Tillotson Size 1 1/4 Model R2 Fuels gasoline  
Make Size Model Fuels

20. Exhaust Heat used for:

Air Fuel Mixture in carburetor Mixture in manifold

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 Lauson  
(Name)Model S-12  
(Model)

TRACTOR

## 24. Fuel Tanks:

Number 1 Capacity of each in gals. 22 gal Location Under hood over transmission

## 25. Air Cleaner:

Make Taco syphon Size #2 (Mark x) (a) Dry centrifugal (b) Strained  
thru cloth or screen (c) Water X (d) Oil (specify kind)  
(e) Other type (describe)

## 26. Cooling System:

Cooling fluid Water If oil, give specification of oil  
Capacity of system 8 1/2 gals.  
Radiator: Make Young Type Tubular Important dimensions 20 1/2" X 23" X 3"  
Circulation of cooling fluid: Thermosyphon Pump X Type of pump Centrifugal  
Pump delivery gal. per min. at rated speed of engine

## 27. Air Circulation:

By exhaust nozzle By fan X Fan diameter 20 in. Number of blades 4  
Speed at rated speed of engine 2350 r.p.m. Type drive Belt

## 28. Belt Pulley:

Diameter 16 in. Face 8 in. Material cast iron Is face of pulley lagged? No  
If so, with what material Speed (at rated speed of engine) 697 r.p.m.  
If gear drive, give gear ratio crank shaft to pulley shaft 19-39 Belt pulley shaft bearings: (Describe each bearing.)

Type	Make	Size	Material

## CHASSIS

## 29. Clutches:

For transmission: Type Dry plate Make twin disc Size C-1-11 1/2"  
On differential (if used) type Make Size  
For belt pulley (if separate clutch):  
Type No separate clutch Make Size

## 30. Brakes: (Describe each brake.)

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



SPECIFICATIONS OF Lauson (Name) Model S-19 (Model) TRACTOR

By which lever or pedal is brake operated? Operated together with clutch

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

(c) Differential brake (if used). Type Internal expanding shoe

How controlled Dual pedals Can both differential brakes be set at once? Yes

31. Transmission:

Manufacturer The John Lauson Mfg. Co Type Selective sliding gear

Enclosed to what extent Fully enclosed

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

Speed	No. Gear Reductions	Gear Ratio		
		Wheeled Drive Engine to Drive Wheels	Track Layer Type Engine to Drive Sprockets	Engine to Tracks
1st (Low)	3	74.6 to 1		
2nd	3	51 to 1		
3rd				
4th				
Reverse	4	70 to 1		

Give following information for each gear wheel:

* Location	Type Gear	Pitch Diameter	No. of Teeth	Face Inches	Finish	Material	Heat Treatment
See Exhibit						2335 SAE	

B-----g	Spur	4.000"	12	2 11/16"	Mach.	2335 SAE Nickel	H or K SAE
B-----h	Spur	27.333"	82	2 3/4"	Mach.	Nickel alloy cast iron	None
B-----i	Spur	3.250"	13	1 3/8"	Mach.	2335 SAE Nickel	H or K SAE
B-----j	Spur	4.500"	18	1 3/8"	Mach.	"	H or K SAE

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

* Location	Type	Make	Size	Material
See Exhibit B-----m	Roller	Hyatt	2 1/2" X 4.876" X 5" X .9375"	#49655
B-----n	Roller	Hyatt	2" X 4.750" X 3" X .9375"	#27182
B-----o	Roller	Hyatt	2" X 4.750" X 1.500" X .9375"	#27132
B-----p	Roller	Hyatt	1.625" X 4.125" X 1.750" X .875"	#27126
B-----q	Roller	Hyatt	1.625" X 4.125" X 3.125" X .875"	#27176
C-----r	Roller	Hyatt	1.875" X 4.375" X 1.375" X .875"	#27030
C-----s			1" X 1 1/8" X 1 1/8"	Bronze

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



SPECIFICATIONS OF Lauson Model S-12 TRACTOR  
(Name) (Model)

## 32. Differential:

Make Own Type Bevel

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>2.12</u>	<u>2 1/4 to 2 1/2</u>
2nd	<u>3.10</u>	<u>3 1/4 to 3 1/2</u>
3rd		
4th		
Reverse	<u>2.24</u>	<u>2</u>

## 34. Drive Wheels:

Number 2 Cast solid No Section of spoke .750 sq. in. Shape of

spoke section 2" X 3/8" Spokes cast in or built up Cast in Diameter 48

in. Face 12 in. Extension rims width 6 in. Lugs: Give descrip-

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

Forged steel, hard point 5" high, 3 1/2" wide, with 3" base

How is power transmitted to the rim? From bull gear through hub and spokes

Drive wheel axle: Live but not driving stationary Diameter 2 3/4

Material: 1035 SAE cold drawn steel

## 35. If Track-laying Type:

No of tracks 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 .468 sq. in.

Shape of spoke section 1 1/2" X 5/16" Spokes cast in or built up Cast in Diameter 32 in.

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

Location	Type	Make	Size	Material
<u>Outer</u>	<u>Tapered roller</u>	<u>Timken</u>	<u>1 5/16"</u>	<u>43130 cup 43196 cone</u>
<u>Inner</u>	<u>Tapered roller</u>	<u>Timken</u>	<u>1 3/4"</u>	<u>43520 cup 43554</u>



SPECIFICATIONS OF Lauson Model S-12 TRACTOR  
 (Name) (Model)

## 37. Steering Arrangement:

Knuckle type.....X.....Swinging axle..... Other type (describe).....

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

Wheel	Weight, Lbs.
Right rear	1880
Left rear	1790
Right front	970
Left front	980

Total weight (as above) 5720 actual weight 5600

## 39. Frame:

Cast ..... Material .....  
 Built up.....X..... Material 5"-9" structural steel channel  
 Hot riveted.....Yes..... Cold riveted..... Bolted.....  
 Description Semi-steel front end, semi-steel rear axle housing, with steel  
 Frame mounting (mark x): channel side members  
 To drive wheels. Spring..... Rigid.....X  
 To non-drive wheels. Spring..... Rigid.....X

## 40. Drawbar:

Height 14 in. Verticle adjustment (give limits) 12 to 16 in.  
 Lateral adjustment 24 in.  
 Swiveled Yes Point of swivel how far forward or back of rear axle 1 1/4" back in.

## 41. General Dimensions:

Wheel base c. to c. front and rear wheels 84 1/2 in. Tread c. to c.: front wheels 51 in.  
 rear wheels or tracks 56 in. Width over all 72 in. Length over all 142 in.  
 Height over all 62 in. Diameter of circle wholly within which tractor may be turned 30 ft

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

Extension rims

*Change Model number from S10 to S12  
 and wheel base from 86 to 84 1/2 - D/P Mueller*



# Exhibit B.

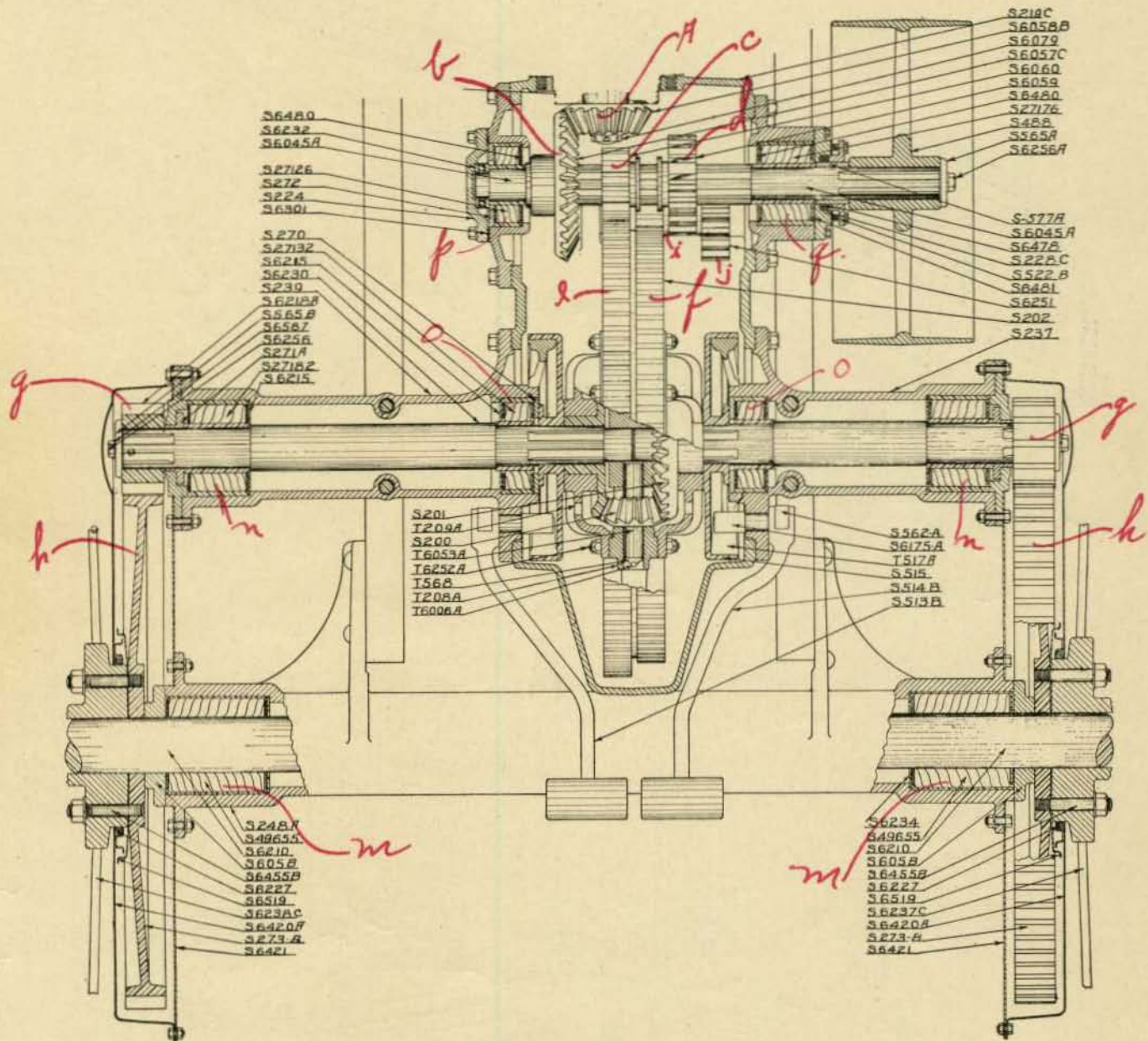
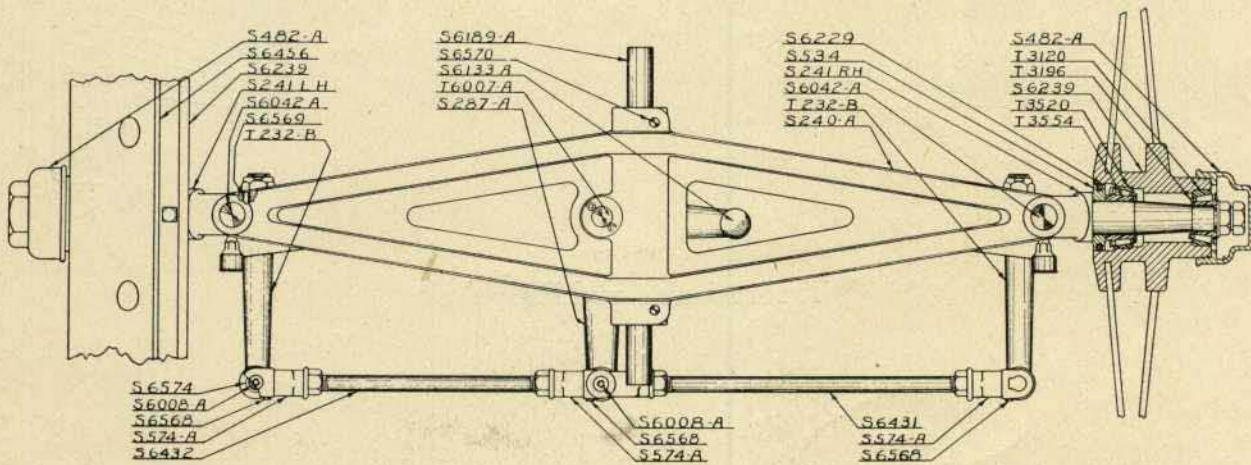
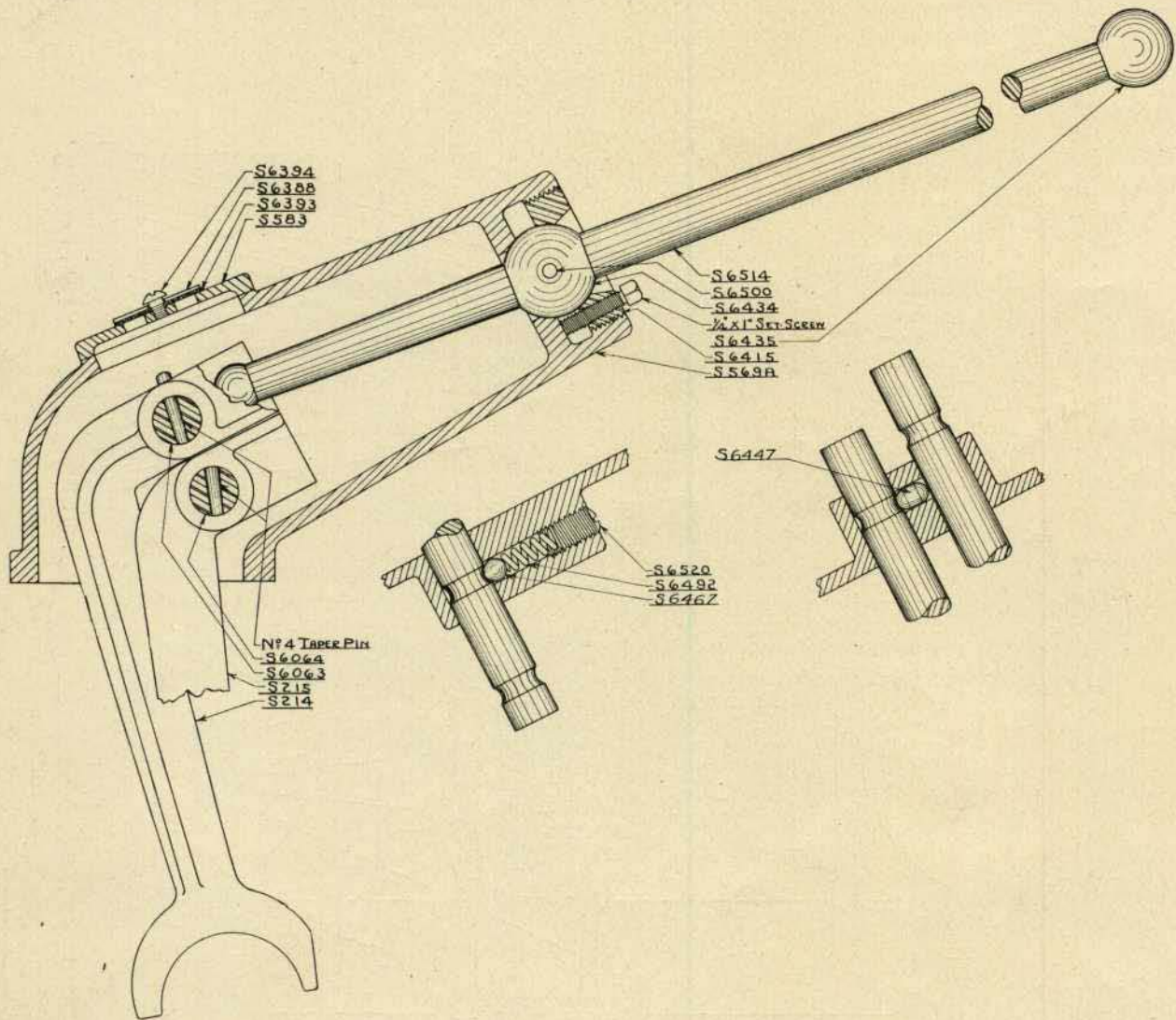


Fig. 18  
Transmission and Rear Axle







*Exhibit C.*

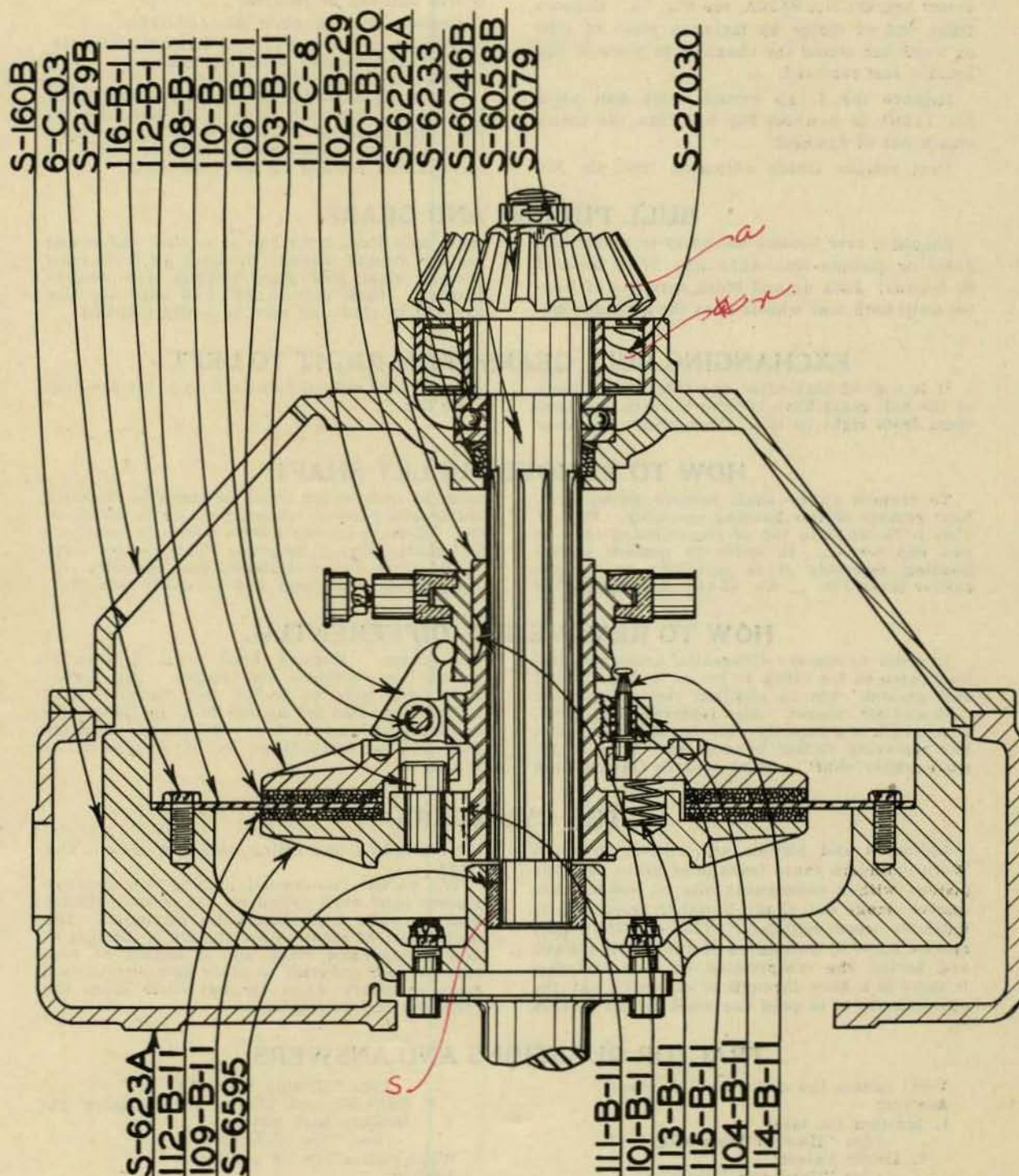


Fig. 8



plate. Raise up front end of motor and remove motor bracket No. S620A, see Fig. 15. Support front end of motor by laying a piece of pipe or wood bar across the channels in place of the bracket just removed.

Remove the 8 cap screws which bolt plate No. 116B1 to flywheel Fig 8. Take the entire clutch out of flywheel.

Next release clutch adjusting lock pin No.

114B29 until adjusting yoke assembly is entirely free and can be removed.

Remove floating plate No. 108B11.

Remove old lining from driving plate No. 116B11 and replace with new lining.

Re-assemble in reverse order.

When re-assembling be careful that the clutch fork S246D does not catch or is held back by the cone collar No. 117C8 as this may bend it or damage other parts and later result in binding and heating of the cone collar.

## BULL PINIONS AND GEARS

Should it ever become necessary to renew bull gears or pinions Nos. 6218 and 273A proceed as follows: Jack up and block rear end of tractor until both rear wheels clear the ground. Re-

move nuts from inner hub of ground wheels and remove ground wheels. Remove all bolts from pressed steel bull gear housing and remove housing. Both pinions and bull gear are now exposed to view and may be easily renewed.

## EXCHANGING BULL GEARS FROM RIGHT TO LEFT

It is a good plan after one side of the teeth of the bull gears have become worn to exchange them from right to left. This places the wear

on the other side of the teeth and this prolongs their life.

## HOW TO REMOVE PULLEY SHAFT

To remove pulley shaft remove pulley first. Next remove shifter housing assembly. Fig. ... This is fastened to top of transmission case by two cap screws. In order to remove shifter housing assembly it is necessary to remove shifter lever Fig. ... No. 6514. Remove shifter

lever by unscrewing small set screw in retaining collar and remove retaining collar by unscrewing. Remove all cap screws from left hand pulley shaft bearing housing. This is the large round plate on transmission case opposite pulley. Pulley shaft may now be easily removed.

## HOW TO REMOVE THE DIFFERENTIAL

In order to remove differential assembly, proceed same as for "How to get at bull gears and bull pinions" but in addition remove gasoline tank and air cleaner. Also remove pipes, wires, etc., which are directly over transmission case. For removing shifter housing see "How to remove pulley shaft". Next remove transmission

case cover. Remove bolts from differential sleeve, and remove end plates. Differential shaft may now be pulled out on each side. When doing this pry up and hold up differential assembly with a crow bar. Differential assembly may now be easily lifted out for inspection or repair.

## THE CYLINDERS

Cylinders and pistons are subject to wear. Worn cylinders cause leakage of gases past the pistons with a consequent loss of power. Excessive smoke out of the breather pipes usually indicates worn cylinders. This condition may also be noted by pulling up on the starting crank and noting the compression of each cylinder. If there is a blow through or excessive leak the only remedy is to send the block to the factory

for regrounding and fitting with new pistons and rings.

We do not recommend putting new oversize pistons into worn cylinders. It is the cylinder that is worn and should be reground. The major part of repairs on cylinders is the cost of new pistons and rings and it should be considered poor economy to place new pistons into worn cylinders when for but little more the cylinders can be reground.

## TRACTOR QUESTIONS AND ANSWERS

What causes the motor to lack power?

Answer:

1. Ignition too late:

(See "How to Time Magneto".)

2. Leaky Valves:

(See "Head and Valves".)

3. Push Rods adjusted incorrectly:

(See "Push Rod Adjustment".)

4. Clogged Air Washer:

(See "Clean Air Washer".)

5. Motor may not fire in all cylinders:

(See "Missing Motor".)

6. Cylinder and piston worn causing gas leakage past pistons:

(See "The Cylinders".)

What causes low oil pressure?

Answer:

1. Bearings too loose:

(See "How to Adjust Bearings".)

2. Leak in the oil line.

3. Screw No. 5447 may need screwing up:  
(See Fig. 1.)