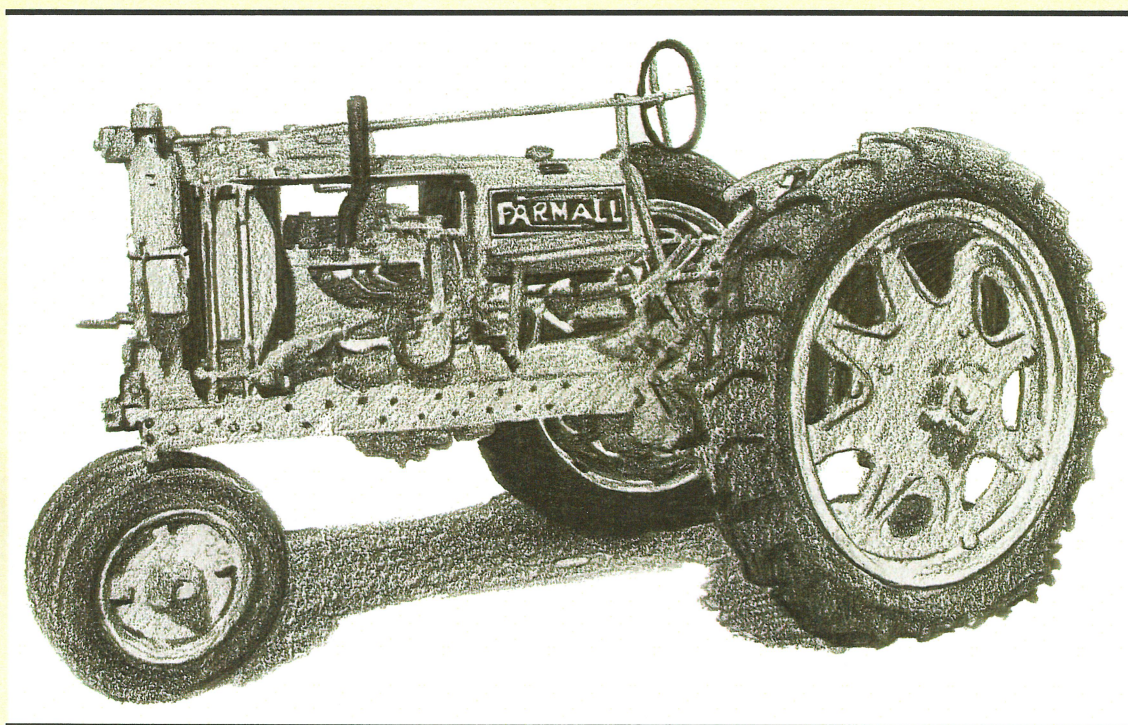




INTERNATIONAL HARVESTER

SHOP MANUAL



- The preferred line of tractor repair manuals since 1948
- Written for the experienced mechanic by professionals
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- Includes numerous photos, illustrations and exploded views

TIMELESS COLLECTION EDITION



Information and Instructions

This shop manual contains several sections each covering a specific group of wheel type tractors. The Tab Index on the preceding page can be used to locate the section pertaining to each group of tractors. Each section contains the necessary specifications and the brief but terse procedural data needed by a mechanic when repairing a tractor on which he has had no previous actual experience.

Within each section, the material is arranged in a systematic order beginning with an index which is followed immediately by a Table of Condensed Service Specifications. These specifications include dimensions, fits, clearances and timing instructions. Next in order of arrangement is the procedures paragraphs.

In the procedures paragraphs, the order of presentation starts with the front axle system and steering and proceeding toward the rear axle. The last paragraphs are devoted to the power take-off and power lift sys-

tems. Interspersed where needed are additional tabular specifications pertaining to wear limits, torquing, etc.

HOW TO USE THE INDEX

Suppose you want to know the procedure for R&R (remove and reinstall) of the engine camshaft. Your first step is to look in the index under the main heading of ENGINE until you find the entry "Camshaft." Now read to the right where under the column covering the tractor you are repairing, you will find a number which indicates the beginning paragraph pertaining to the camshaft. To locate this wanted paragraph in the manual, turn the pages until the running index appearing on the top outside corner of each page contains the number you are seeking. In this paragraph you will find the information concerning the removal of the camshaft.

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All instructions and diagrams have been checked for accuracy and ease of application; however, success and safety in working with tools depend to a great extent upon individual accuracy, skill and caution. For this reason the publishers are not able to guarantee the result of any procedure contained herein. Nor can they assume responsibility for any damage to property or injury to persons occasioned from the procedures. Persons engaging in the procedures do so entirely at their own risk.

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SHOP MANUAL

INTERNATIONAL HARVESTER

MODELS F12-F14-O12-O14-W12-W14-F20-F30-1020-W30-W40

LOCATION OF SERIAL NUMBERS

ENGINE. Engine serial number is stamped on engine name plate or side of crankcase.

TRACTOR. Models F12, F14, 1020 and W40 tractor serial number plate is located on hood sheet. Models O12, O14, W12 and W14 tractor serial number plate is located on fuel tank front support. Models F20 and F30 tractor serial number plate is located on tool box. Model W30 tractor serial number plate is located on fuel tank rear support.

IDENTIFICATION

Tractor Models	Production		Versions Built	Tractor Models	Production		Versions Built
	Serial No.	Year			Serial No.	Year	
F12	FS81837-117517	1937	1, 2, 3, 4	F30†	FB18684-up	1937	1, 3
F12	FS117518-123942	1938	1, 2, 3, 4				
F14	FS124000-139606	1938	1, 2, 3, 4	1020†	KC210235-212424	1937	1
F14*	FS139607-155902	1939	1, 2, 3, 4	1020†	KC212425-214885	1938	1
				1020†	KC214886-215973	1939	1
O12-O14			1				
W12	WS2768-3798	1937	1	W30†	WB15095-15105	1937	1
W12	WS3799-4133	1938	1	W30†	WB15970-23833	1937	1
W14	WS4134-4609	1938	1	W30†	WB23834-29921	1938	1
W14	WS4610-5296	1939	1	W30†	WB29922-32481	1939	1
				W30†	WB32482-up	1940	1
F20†	FA68749-105596	1937	1, 2, 3				
F20†	FA105597-130864	1938	1, 2, 3	W40†	WKC5120-7664	1937	1
F20†	FA130865-148810	1939	1, 2, 3	W40†	WKC7665-up	1938	1

1. Non-adjustable axle
2. Adjustable axle
3. Dual wheel tricycle
4. Single wheel tricycle

*Name plates bearing FS155402 to 155902 were assigned field change-over packages for converting F12 to F14 tractors.

†On models F20, F30, 1020, W30 and W40, the coded suffix letters of serial number are explained below.

CNW	Cane tractor narrow tread wide front axle
D	With engine serial number . . . distillate
F	Fairway tractor (Narrow tread type)
H	Differential lock
HA	High altitude piston
M	Modified (F20-F30 use suffix "S")
N or NT	Narrow tread
NW	Wide front axle narrow tread
P	Pneumatic tires
S	Special attachment (On F20-F30 "S" denotes Modified)
SL	Lower low gear
SP	4 Speed transmission (W30 after 45106 use suffix "T")
U	Special transmission
W	Regular tractor with wide front axle

INDEX (By Starting Paragraph)

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	F14	014	W14					
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10. PITMAN ARM SHAFT END PLAY. Adjustment is controlled by shims (20—Fig. IH12 or IH13) located between worm wheel shaft inner bearing (21) and outer bearing (17) to provide zero play to worm wheel shaft and yet permit same to rotate freely. Remove shims to decrease end play which is taken on thrust washer (19).

11. GEAR MESH (W30 ONLY). This model has a backlash or mesh adjustment controlled by the eccentrically bored inner bearing (21—Fig. IH13). Disconnect the drag link before adjusting backlash. To reduce backlash, remove bearing-to-housing cap screws and rotate bearing until backlash is removed but not so far as to cause binding at any point in rotation of steering wheel. Reinstall cap screws.

12. WORM CENTERING. On models 012-014-W12-W14 and W30, shims (26—Fig. IH12 or IH13) located between inner bearing and gear housing are for centering the worm on the worm wheel and when once centered no further adjustment is required except when the affected parts are renewed due to wear or damage.

Model 1020

On this model the steering gear is of the worm and worm wheel type mounted in the top of transmission case and cover. The need and procedure for removal, overhaul and reinstallation is self evident after an examination of the unit and reference to Fig. IH14.

15. ADJUST WORM SHAFT END PLAY. This adjustment is controlled by worm retaining nut (6—Fig. IH14). To adjust remove steering shaft (20), worm (5) and column (3) as an assembly. Tighten nut (6) sufficiently to remove all end play and yet permit shaft to rotate freely. Relock nut and reinstall assembly.

16. ADJUST WORM WHEEL END PLAY. End play is controlled by position of Pitman arm (9) on worm wheel shaft (13). To adjust, loosen bolts that lock steering gear arm to shaft and

move arm toward steering gear housing until all end play is removed. Check to be certain that gears do not bind.

17. ADJUST GEAR MESH. Backlash or mesh adjustment is controlled by the eccentrically bored steering shaft bearing (7—Fig. IH14). Disconnect the drag link before adjusting backlash. To reduce backlash remove bearing-to-housing cap screws and rotate bearing until backlash is removed but not so far as to cause binding at any point in rotation of steering wheel. Reinstall cap screws.

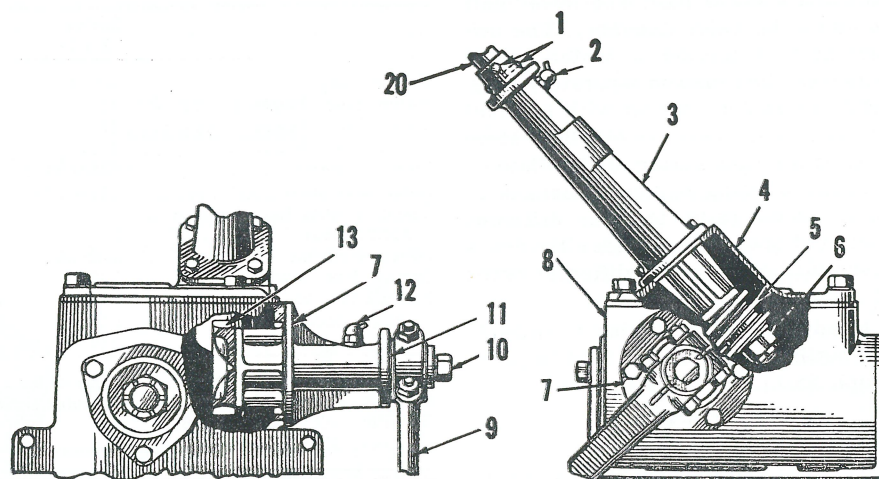


Fig. IH14—Model 1020 steering gear assembly.

1. Thrust collar pin
2. Lubricator
3. Steering column
4. Transmission cover
5. Steering worm

6. Steering worm nut
7. Steering shaft bearing
8. Transmission case

9. Pitman arm
10. Arm cap screw
11. Thrust washer
12. Lubricator
13. Worm wheel and shaft

ENGINE AND COMPONENTS

R&R ENGINE WITH CLUTCH

Models F12-F14

20. Remove the hood, clutch universal joint, clutch pedal connections and connections to air cleaner and radiator. Support engine with a hoist, remove engine mounting bolts and lift out of tractor with clutch and clutch housing attached.

Models 012-014-W12-W14

21. Remove the hood, fuel tank, steering assembly from over clutch housing, radiator and clutch shifter shaft. Support engine with a hoist, remove engine mounting bolts and lift out of tractor with clutch attached.

Models F20-F30

22. Remove the hood, fuel tank assembly and radiator; disconnect clutch universal joint. Support engine with a hoist, remove engine mounting bolts, and lift out of tractor with clutch and clutch housing attached.

Note: Removal of radiator requires the following preliminary work. On F20, remove air cleaner and fan housing sheet metal. On F30, remove air cleaner, loosen radiator mounting, tip radiator forward and remove water pump. The fan housing sheet metal can also be removed on F30 to facilitate radiator reinstallation.

Models 1020-W30-W40

23. Remove the hood, radiator, fuel tanks, air cleaner and the belt pulley carrier assembly. Disconnect the clutch shaft to transmission coupling. Remove mounting bolts and the rear mount threaded dowels (dowels can be removed by screwing a nut down on them). Support engine with a hoist and lift out of tractor with clutch attached.

CYLINDER HEAD

On the series 12, 14, F20, F30, 1020 and W30 same cylinder head is used on both gasoline and kerosene burning engines. Changes in compression ratio for the use of the different fuels or operation at different altitudes is accomplished by the use of different length pistons.

Series 12-14

24. To remove the head, remove hood, fuel lines, air cleaner connections and disconnect the combination fan bracket and water outlet from front of cylinder head. Loosen both ends of upper hose when disconnecting water outlet to facilitate alignment when reinstalling. Remove the valve cover, valve levers (rocker arms) assembly and push rods. Remove cylinder head nuts and lift off head, manifold and carburetor as a unit.



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Models F12, F14, F20, F30, W12, W30, W40

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