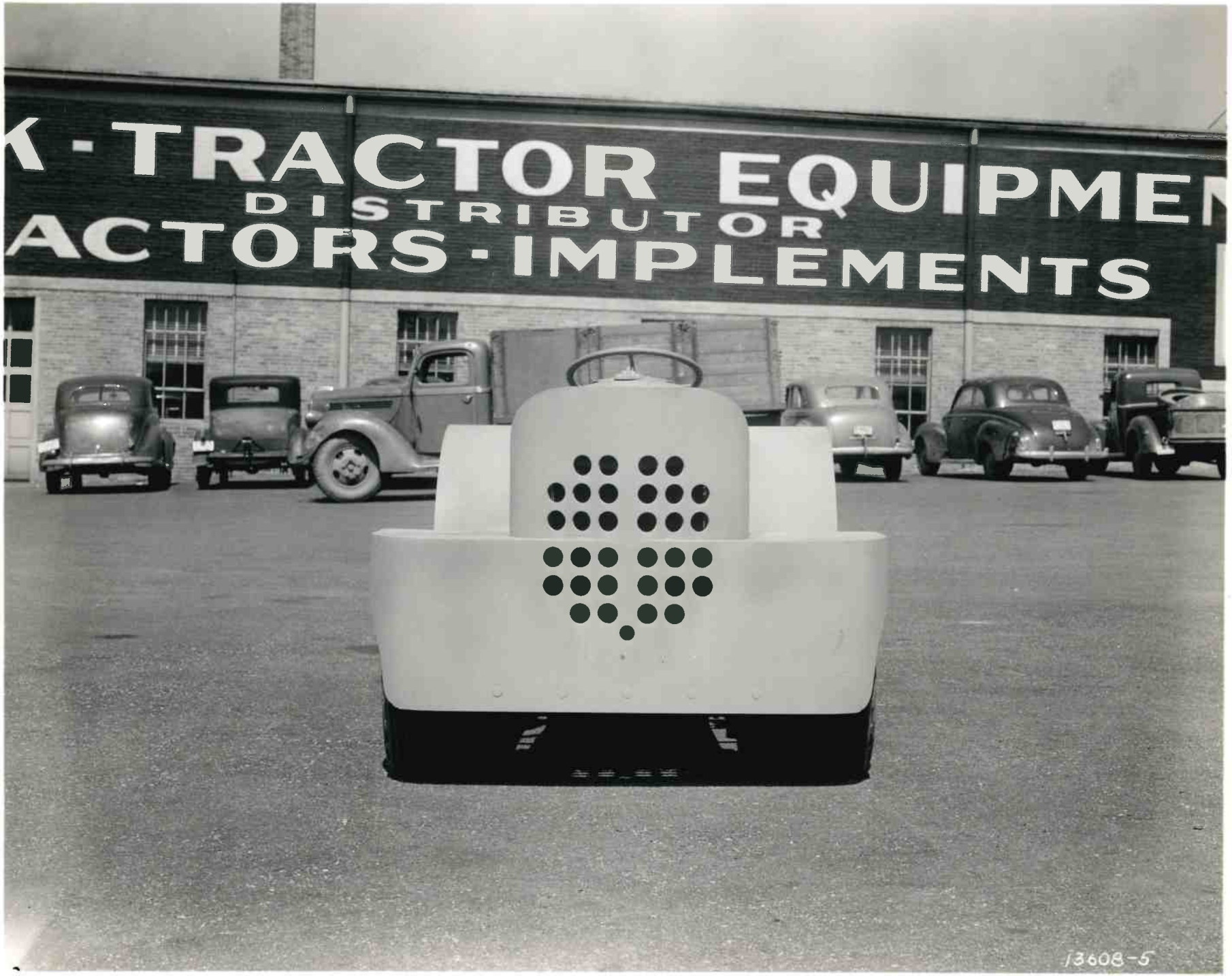
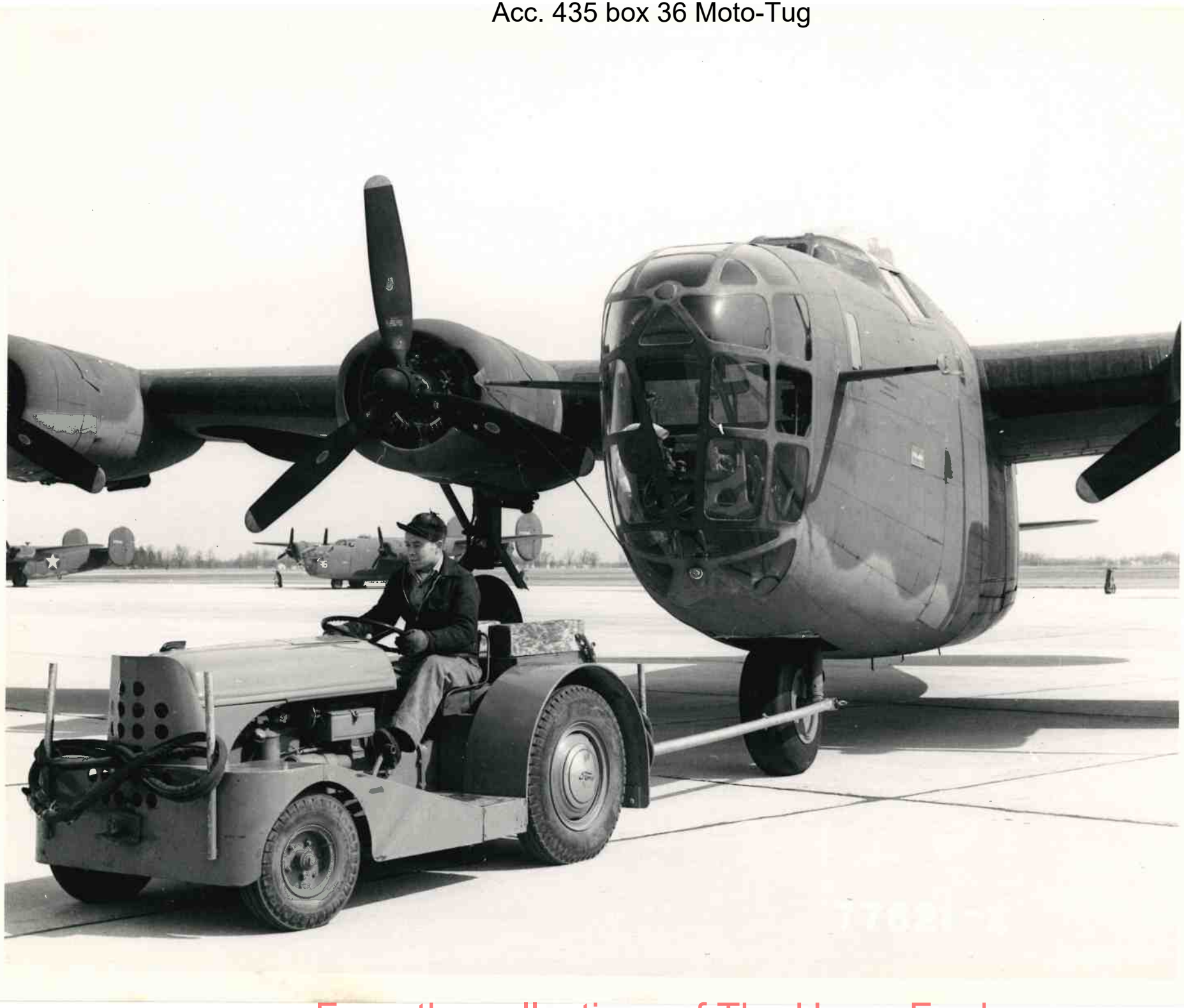
THE MOTO-TUG.



The Moto-Tug story ...

13608--5

A front view of the Moto - Tug showing its armor plate front bumper. The Moto-Tug , lower and narrower , than the standard industrial Ford-Ferguson tractor was developed for use in industrial plants , airports , docks and shipyards , and on aircraft carriers.



Michigan Manufacture & Financial Record July 24, 1943

Ford to Make Tractors in August

Ford Motor Co. farm tractor production lines will resume operation in August, Harry Ferguson, Inc., the tractor organization at Ford's, said. These production lines, idle since March, are now being set up for the resumption.

Tractor production, regulated by a limitation order of the WPB's Farm Machinery and Equipment Branch, will be 25 per cent of the Ford-Ferguson 1941 production which was used as a base. Either 1940 or 1941 output, whichever was larger, was the industry base, and at Ford's, the 1941 figure, which was larger, was used.

From last October through March, nearly 20 per cent of the 25 per cent quota of tractors was completed. The remainder of the 25 per cent will be built in August and September.

Production is expected to be continuous through next March, however, for the 1943-44 quota, effective as of July 1, will go into production Oct. 1, the Ferguson organization revealed.

The new quota, for which materials and regulations will not be ready until October, calls for 41 per cent of the 1941 base production.

The tractor production announcement may be significant in view of persistent rumors that lines that are being set up at Ford's would produce automobiles for the military.

Ford's Armored Mule Helps Yanks To Invade

Meet the armor-plated mule, the latest mechanized warfare development of the Ford Motor Company and Harry Ferguson, Inc.

It's a small, compact, highly-maneuverable industrial "mule," designed primarily to pull and haul material aboard aircraft carriers, on beach-heads and at Navy airfields scattered throughout the globe.

Actually, it is an offspring of the Ford tractor developed by engineers of the Harry Ferguson, Inc., organization at the Rouge plant in response to a Navy request for a compact mechanical mule. They called it the "Moto-Tug" and made the front and rear bumpers of armor plate so that its brute strength could be used to buck and push at either end.

Tooling up for the Motor-Tug was completed and the new contribution to the war effort put into production in 60 days. Today it is in use in shipyards, docks, airfields and on aircraft carriers.

To develop the Moto-Tug, Ford-Ferguson engineers took a standard tractor and built it narrower and lower so that it could make shorter turns and scoot under an airplane wing.

Special weights were added to provide more traction in sand, ice, snow and mud.

Michigan Manufacturer & Financial Record 5-22-43

Michigan Manufacture & Financial Record, May 22, 1943

Ford to Make Tractors in August

Ford Motor Co. farm tractor production lines will resume operation in August, Harry Ferguson, Inc., the tractor organization at Ford's, said. These production lines, idle since March, are now being set up for the resumption.

Tractor production, regulated by a limitation order of the WPB's Farm Machinery and Equipment Branch, will be 25 per cent of the Ford-Ferguson 1941 production which was used as a base. Either 1940 or 1941 output, whichever was larger, was the industry base, and at

of a specified group.

The Guffey Coal Act was to have expired in April, but the House and Senate extended it for thirty days on the ground that Congress should have time to consider its renewal.

In spite of the fact that a majority of coal operators have been virtually subsidized to the point of acquiescence in this legislation, against their better judgment as to its soundness as an economic principle, there is an undercurrent in Congress that it may be better to eliminate it entirely before our republic reaches that stage arrived at by Diocletian in 300 A. D. when sons were compelled to follow the vocations of their fathers under penalty of death. Diocletian formulated a complex and vast system of price fixing, labor relations, and a scheme of government that constricted liberty to the point of making his subjects thoroughly miserable. It broke down.

If it were sound to set up a selling monopoly for the coal industry, so that it can raise prices against he public in order to pay miners high wages, then it would be equally sound to turn other industries into selling monopolies so that they could boost the price of their prod-

of paper.

When business men plead for adequate corporate reserves for reconversion of industry to peacetime production, they are pleading not for themselves but for the millions who must be employed by industry when the war is over. If taxes prohibit the accumulation of adequate corporate reserves, it is not the business man who will suffer most. It will be the people looking for jobs—jobs that only

The new quota, for which materials and regulations will not be ready until October, calls for 41 per cent of the 1941 base production.

The tractor production announcement may be significant in view of persistent rumors that lines that are being set up at Ford's would produce automobiles for the military.

Michigan Manufacture & Financial
Record, May 22, 1943

DEPARTMENTAL COMMUNICATION

April 20, 1942.

TO: Mr. R. M. KYES. - Ferguson-Sherman Div. - Rouge

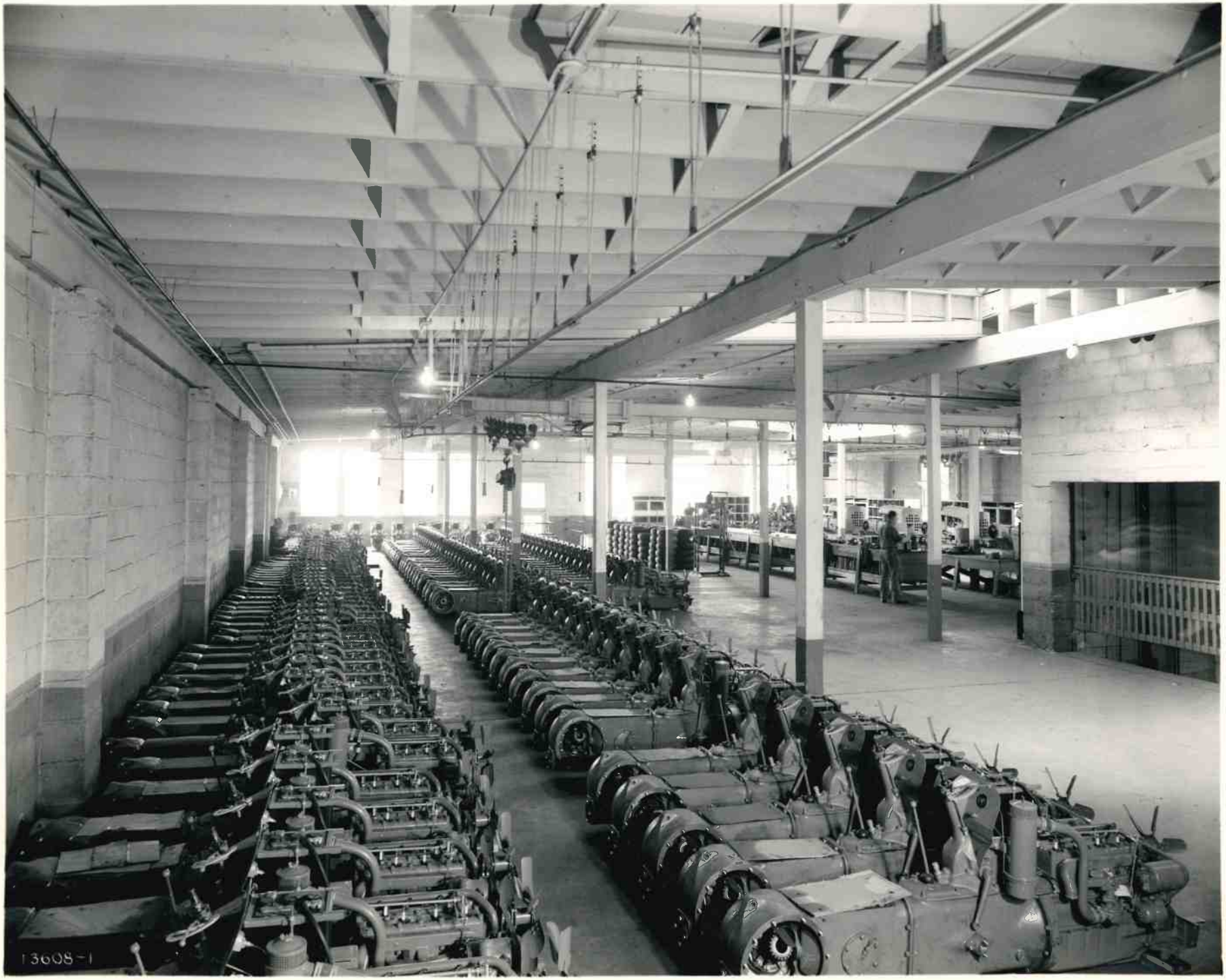
CC: Mr. A. G. Coulton - Pres Office - Rouge
Mr. Frank Campbell - Dearborn

RE: Industrial Tractor

There is no objection, from a patent standpoint, to our making tractors especially suitable for easy conversion to the Mercury type of industrial tractor and selling these special tractors to the Mercury Manufacturing Company of Chicago. The tractor so produced should bear our standard patent plate, together with the Ford- Ferguson system trade-mark. As far as our trade-mark is involved, we need not be concerned with what the Mercury people call the tractor after it is converted by them. It is only necessary that we sell the tractor to them with the mark in place.

If, however, there is any chance of our building a tractor having the appearance of the unit submitted by the Mercury Manufacturing Company and selling it independently of the Mercury people, we should obtain a letter from the Mercury Manufacturing Company stating that they have no objections to our building such design for others. This letter should be obtained now as part of the consideration for our supplying them with these special units. If, as you state, the Mercury people are primarily interested only in the manufacture of the trailer, then it is possible that they will give us any rights that they may have in this design in consideration of our increasing the market for their particular trailer. In any event, we should obtain from them a statement in writing as to their position.

E C McRAE - Dbn
Patent Department



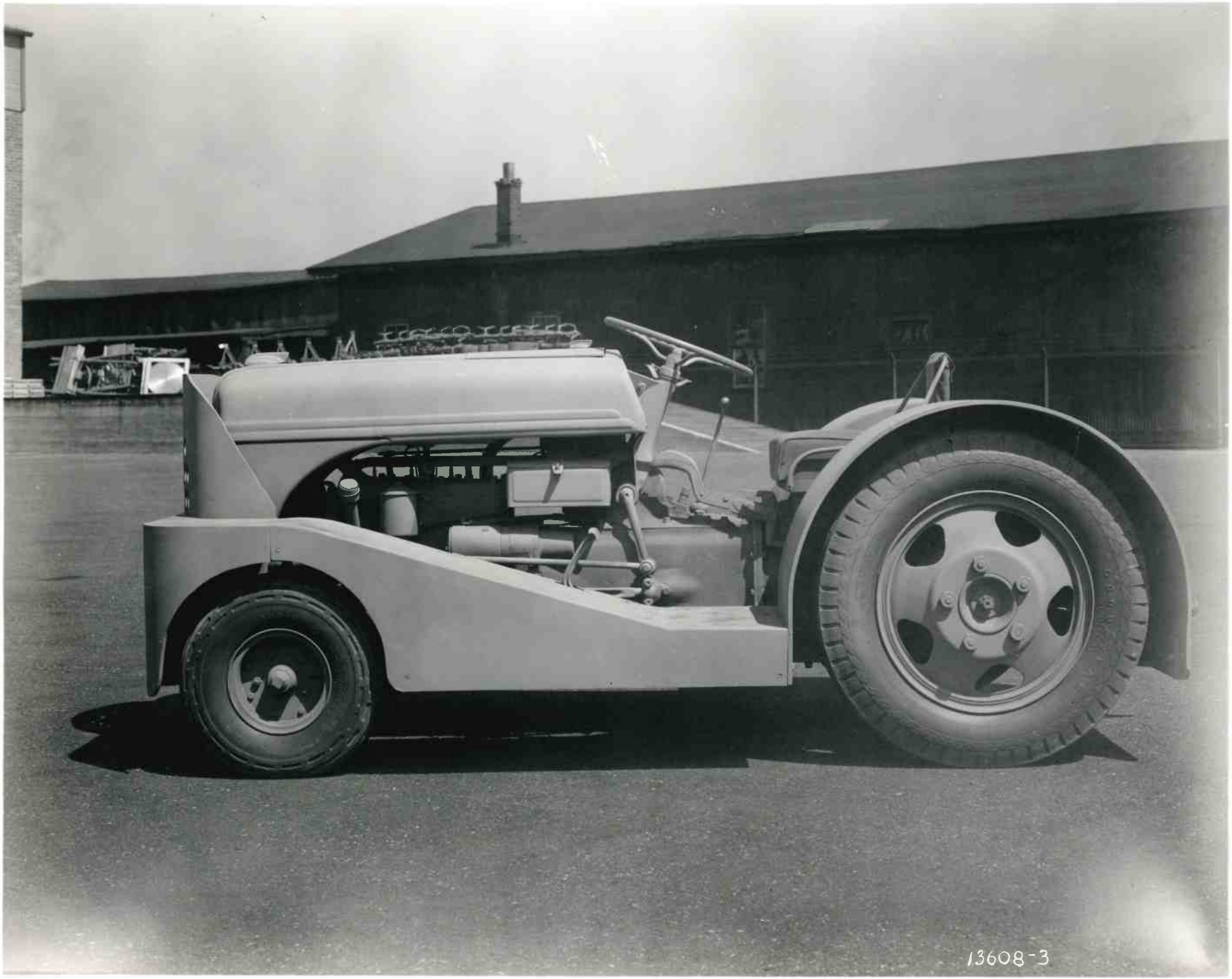
Engines , transmissions , and center housings , of the Ford tractor with the Ferguson System , await their assembly to the chassis of a new Ford-Ferguson industrial tractor [redacted] the Moto-Tug.

Final assembly work on the Moto-Tug was farmed out to a distributor in Columbus , Ohio. This is a picture of the interior of his shop.

The Moto-Tug story ....

13608--3

A view of the Moto-Tug showing driver controls and the padded coil spring seat. The heavy duty model is equipped with heavy cast-iron wheels , and weights built in under the front fenders to add extra poundage to the vehicle for greater traction. A ten gallon gasoline tank is concealed in the hood.



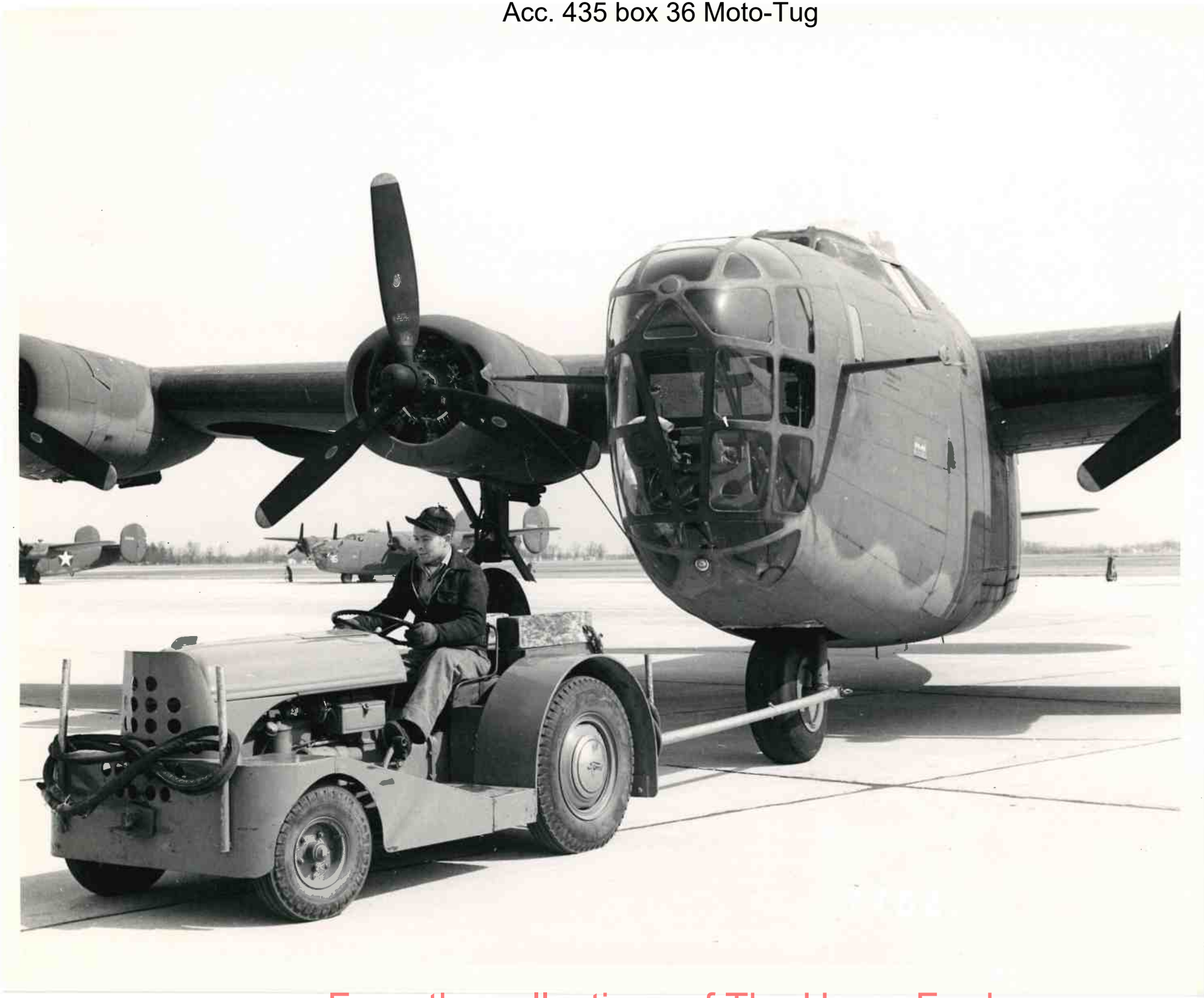
The Moto Tug story ....

77621-2

Testing the Moto-Tug at Willow Run. This is the Model purchased from the Mercury Manufacturing Company , Chicago. To obtain greater traction , the unit was equipped with a 300 pound cast-iron weight which was set in box back of the driver's seat.

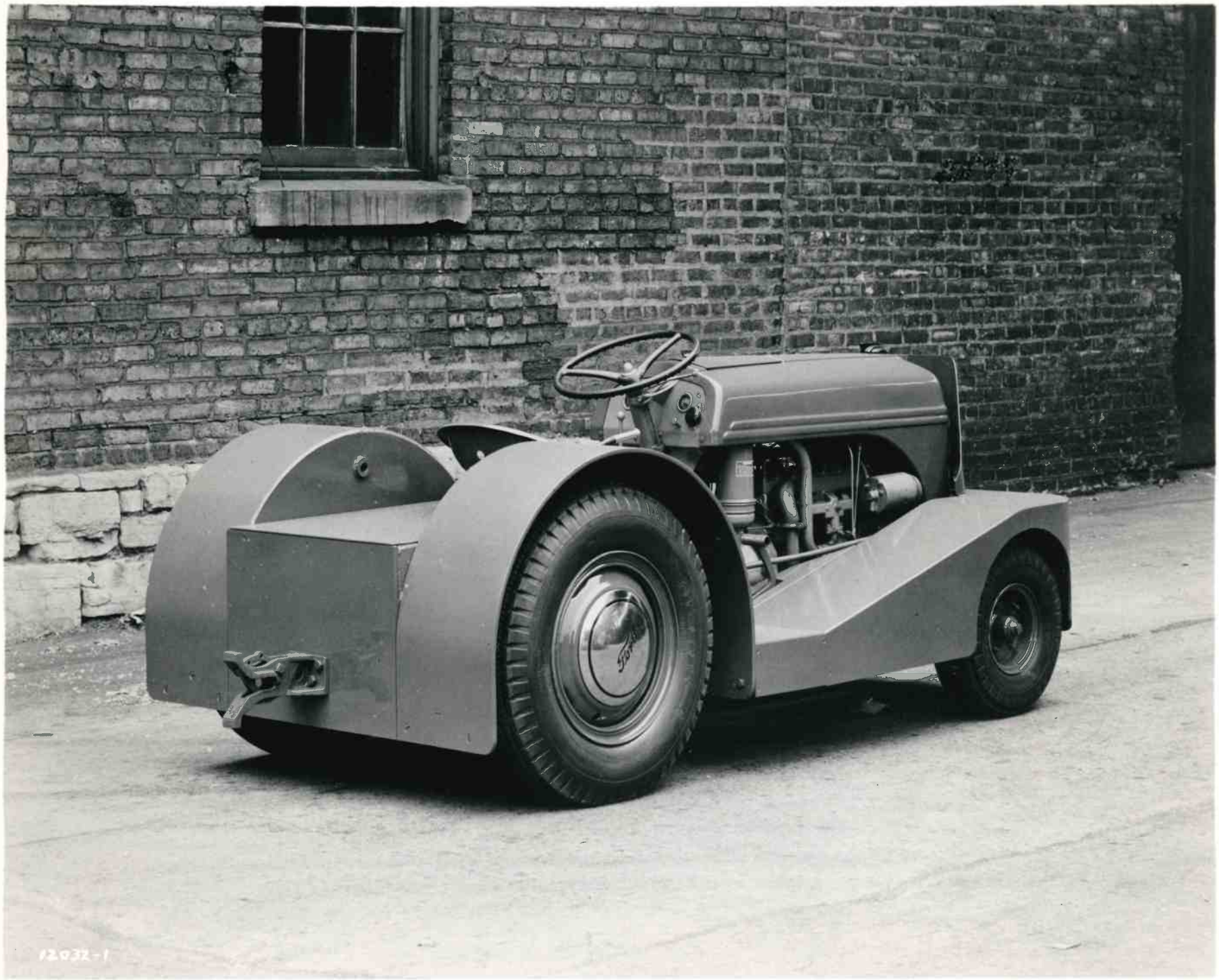
Here it's uasge about an airport is well illustrated.

-30-



This is the Model of the Moto-Tug purchased by the Ford-Ferguson from the Mercury Manufacturing Company , of Chicago , Illinois. After the unit was tested at Willow Run , several changes were made before it went into production. Government specifications received with a Navy Department contract , called for other minor modifications.

The lubrication of the rear axles was changed , and a new rear hitch that could be uncoupled from the driver's seat was installed , The standard tractor type muffler was replaced by a spark arrester type and a comfort seat of padded coil spring construction , replaced the standard steet tractor seat.



A supplement to the
Tractor Story.....
The Moto-Tug story

T I M E T A B L E .

1941	The Mercury Manufacturing Company , Chicago , Illinois , makers of industrial tractors , see the possibilities of producing a small , industrial tractor, from major assemblies of the Ford tractor with the Ferguson System. They approach the Ford Motor Company to negotiate for the purchase of engines and transmissions used in [redacted] the Ford tractor. Mercury people when told the prices of the assemblies , decide the cost of producing the tractor is too high. Meanwhile the Ford-Ferguson interests investigate the possibilities of building the tractor themselves.
April 20 , 1942	The Ford-Ferguson interests are advised by the Ford Motor Company patent department that they can build tractors for [redacted] conversion to the tractor the Mercury people desire to build. The patent department cautions Ford-Ferguson that if they build a tractor similar to the Mercury unit , they must first obtain their permission.
November 1942	Ford-Ferguson purchase the patents rights and a model of the industrial tractor from the Mercury people.
January 1943	The U.S.Navy Department awards Ford-Ferguson a contract for a "pilot run " of 50 units of the new industrial tractor , now called the Moto-Tug.
February 1 , 1943	The tool-up on the Moto-Tug is started. It is finished 60 days later at a cost of $25,000. Ford-Ferguson begins the purchase of materials for the Moto-Tugs.
April 8 , 1943	First Moto-Tug completed and shipped.
Spring of 1943	Navy Department increases the order to about 500. Ten units are diverted from the order for Willow Run bomber plant.

THE FORD-FERGUSON MOTO-TUG.

One of the more recent developments of the Harry Ferguson , Inc., at the Rouge Plant , Dearborn , is a small industrial tractor called the Moto-Tug. Although it is not an original creation of the Ford-Ferguson interests , it has the possibilities of becoming a popular vehicle designed for varied uses in industrial plants , shipyards , docks , airports, and aircraft carriers.

The beginning of the Moto-Tug sometimes refered to as "the Mule" , occurred in 1941 at the Mercury Manufacturing Company , Chicago , Illinois , makers of " Trackless Train" and industrial tractors. Seeing the possibilities of adding another industrial tractor to their line , representatives of this firm approached the Ford-Ferguson interests and expressed the desire that they would like to purchase tractor engines and transmissions for an industrial tractor they wished to build.

The Harry Ferguson Inc., occupied a part of the second floor of "B" Building , in the Rouge Plant; renting the space from the Ford Motor Company. They had been quartered there since the first Ford tractor with the Ferguson System was produced in 1939.

However after the Mercury people had talked things over with the representatives of Ford-Ferguson , they found that prices of the assemblies would be prohibitive. Meanwhile Ford-Ferguson decided they would like to build the tractor themselves.

First they conferred with the Ford Motor Company's patent department to see if such a thing would be possible. In a communication dated April 20,1942, (a copy of the letter is included herein), the patent department stated that from a patent standpoint , there was no objection to the Ford-Ferguson interests making

tractors for easy conversion to tractors built by the Merchry Manufacturing Company and selling them to that firm.

The patent department added that if Ford-Ferguson built a tractor similar to the one submitted by the Mercury people and handled it for sale imdependently , the Ford Motor Company would need a letter from the Mercury Company permitting them to do so.

Ford-Ferguson then approached the Mercury people and persuaded themk to sell a model of their industrial tractor with all patent rights. The sale was made November 1942.

In January 1943 , Ford-Ferguson contacted the Navy Department and interested them in the use of the Moto-Tug which they had then named Their new tractor , for shipyards , docks , airports and aircraft carriers. The Navy Department liked the Moto-Tug and awarded Ford-Ferguson a contract for a "pilot run" of 50 units. In the contract which was # NX SA -21315 , the Navy was given the privilege of increasing their order ~~if they deserved.~~

February 1st , Ford-Ferguson began purchasing materials for the units and on April 8th, shipped the first completed Moto-Tug.

Meanwhile the Navy Department had increased their order to about 500 and 10 tractors were diverted from this number for the Willow Run bomber plant. In April 1943 , when this story was written , Ford-Ferguson had no other orders than the Navy Department's contract. The Moto-Tug production set-up had reached capacity and the Navy contract dead-line was May 1. However other Governmental Departments who desired Moto-Tugs , dealt with the Navy first and were allotted units from the original order.

Four Moto-Tug models were developed after experimental work was done on the Mercury model at Willow Run. The Navy contract called for units of each of the models. Some were to be equipped with pneumatic(oversize)

tires , others with solid rubber tires , and still others with rear duo-wheels.

While testing the Moto-Tug at Willow Run , engineers found that the original model was too light for some jobs. So they developed a heavy duty model. The light model was called the BNO-25 , and the heavy unit , the BNO-40.

The BNO-25 weighed 3,600 pounds and had a drawbar pull of 2,500 pounds. The BNO-40 weighed 5,700 pounds and had a drawbar pull of 4,000 pounds. The transmission recommended for use with solid rubber tires , was a low ratio kerosene transmission having a low , creeping speed. The standard tractor transmission was used with the unit equipped with pneumatic tires.

The BNO-40 was developed in February. Meanwhile during the experimentation at Willow Run with the Mercury model , a series of weights to add poundage were developed. The added weight provided greater traction. On the BNO-40, heavy cast-iron wheels were used and built-in weights were installed under the front fenders.

A 300 pound weight was developed for the light model , and when used , was placed in a box in the rear of the driver's seat. On the heavy duty unit , three weights were installed behind the driver's seat. These weighed 300 , 600 and 1,000 pounds respectively.

Several changes were made on the Moto-Tug after the Willow Run test and in accord with Governmental specifications. One of these had to do with the lubrication of the rear axle. Ford-Ferguson engineers soon discovered that the rear axles of the Mercury unit were not properly lubricated and so a series of Zerk fittings were installed around the rear axle.

A spark arrester type muffler instead of the standard type was installed , and the regular steel tractor seat was replaced by a special comfort seat to increase driver efficiency. The seat construction was padded coil spring and the back rest , padded curled hair.

The welded steel ten gallon gasoline tank carried in the engine hood was fitted with a Protectoseal filler cap and the rear hitch was changed to the Universal type safety pintle hook coupler. The hitch could be opened from the driver's seat for uncoupling.

The Moto-Tug was built lower and narrower than the Ford-Ferguson tractor. Thus it was more maneuverable and low enough so that it could be driven under aircraft wings. It was as long as the tractor however.

The tractor engine , transmission , center housing and steering assembly were used in the Moto-Tug. Other parts such as front axles shafts , rear axle housings , front and rear wheels , front and rear fenders , and front and rear bumpers were purchased from vendors. The front and rear bumpers were made of armor plate in order that they could withstand the usage to which they would be subjected.

The tool-up began February 1 , 1943 , and was finished in 60 days at a cost of $25,000. This included all the tools , dies and fixtures. The final assembly work on the Moto-Tug was farmed out to Mr. E.E.Schatz, of Columbus , Ohio. He had been a Ford tractor dealer for 20 years and had shop facilities to do the work. The final line was set-up in a building next door to Mr. Schatz's distributorship where he had previously stored tractors and implements. Here Moto-Tugs were assembled at the rate of ten a day,

From Columbus the small tractors were shipped by freightcar , 14 units to a car in a special double-decked arrangement. Government inspection was carried out along the assembly line and on the parts and assemblies before they were shipped to Columbus. One of the final checkups was a dynomometer test for drawbar pull.

The Moto-Tugs were painted a lusterless grey according to Governmental specifications.

Information Sources; Additional information on the Moto-Tug may be obtained from Mr. Frank Grapentine , Ford-Ferguson , "B" Building , second floor , Rouge Plant.

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