


# **Super M/MV Tractors**

## **Operators Manual**

1004296R1

Reprinted




**CASE III**

	<p><i>THIS SAFETY ALERT SYMBOL INDICATES IMPORTANT SAFETY MESSAGES IN THIS MANUAL. WHEN YOU SEE THIS SYMBOL, CAREFULLY READ THE MESSAGE THAT FOLLOWS AND BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY OR DEATH.</i></p> <p>M171B</p>
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If Safety Decals on this machine use the words **Danger, Warning or Caution**, which are defined as follows:

- **DANGER:** Indicates an immediate hazardous situation which if not avoided, will result in death or serious injury. The color associated with Danger is RED.
- **WARNING:** Indicates an potentially hazardous situation which if not avoided, will result in serious injury. The color associated with Warning is ORANGE.
- **CAUTION:** Indicates an potentially hazardous situation which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. The color associated with Caution is YELLOW.

If Safety Decals on this machine are ISO two panel Pictorial, decals are defined as follows:

- The first panel indicates the nature of the hazard.
- The second panel indicates the appropriate avoidance of the hazard.
- Background color is YELLOW.
- Prohibition symbols such as   and  if used, are RED.



# WARNING

IMPROPER OPERATION OF THIS MACHINE CAN CAUSE INJURY OR DEATH. BEFORE USING THIS MACHINE, MAKE CERTAIN THAT EVERY OPERATOR:

- Is instructed in safe and proper use of the machine.
- Reads and understands the Manual(s) pertaining to the machine.
- Reads and understands ALL Safety Decals on the machine.
- Clears the area of other persons.
- Learns and practices safe use of machine controls in a safe, clear area before operating this machine on a job site.

It is your responsibility to observe pertinent laws and regulations and follow Case Corporation instructions on machine operation and maintenance.

# Accidents can be prevented with your help

No accident-prevention program can be successful without the wholehearted co-operation of the person who is directly responsible for the operation of equipment.

To read accident reports from all over the country is to be convinced that a large number of accidents can be prevented only by the operator anticipating the result before the accident is caused and doing something about it. No power-driven equipment, whether it be transportation or processing, whether it be on the highway, in the harvest field or in the

industrial plant, can be safer than the man who is at the controls. If accidents are to be prevented—and they can be prevented—it will be done by the operators who accept a full measure of their responsibility.

It is true that the designer, the manufacturer, the safety engineer can help; and they will help, but their combined efforts can be wiped out by a single careless act of the operator.

It is said that "*the best kind of a safety device is a careful operator.*" We ask you to be that kind of an operator.

International Harvester has developed a new gasoline cap designed to improve vapor venting and to inhibit the sudden eruption of liquid fuel if the safety precautions against cap removal are not observed.

New caps will be exchanged **free of charge** with owners of certain models of International Harvester farm tractors. To see whether your tractor already has the new cap or to arrange to obtain one, simply contact your local International Harvester dealer. Also ask him for a free International Harvester brochure "New Facts About Fuels" and for free "Warning" decals for all gasoline equipment.

Gasoline Tractor Models Included in Cap Exchange Program (See Note)			
A	100	*504	2404
AV	130	F-544 Only	2424
B	140	560	2444
BN	200	600	2504
C	230	*606	2544
H	240	650	*2606
HV	300	F-656 Only	2706
M	330	660	2756
MV	340	666	2806
O	350	686	2826
OS	400	706	2856
W	404	756	
WR	424	766	
70	444	806	
86	450	826	
	460	856	

**NOTE:** New cap **will not** fit on any of these tractors.

B-275	I-434
B-276	I-544
I -284	I-656
I -354	I-2656
B-414	

\* New cap **will not** fit on these tractors above serial numbers shown.

F-504 above serial No. 13400
I -504 above serial No. 14272
I -606 above serial No. 6879
I -2606 above serial No. 6879

New cap **will not** fit on any lawn and garden tractor in the Cadet model series or on any tractor with the gasoline tank behind the operator's seat.

**IMPORTANT FUEL SYSTEM SAFETY WARNING  
AND  
ANNOUNCEMENT OF FREE, REPLACEMENT GASOLINE CAP**



**CAUTION!** The following information pertains to personal safety. Be sure to read and follow these instructions.

**PROBLEM — Gasoline vapors can build up pressure in your gasoline tank.**

All gasoline fuels are more volatile today than ever before. They vaporize and build up pressure in your gasoline tank more easily than in the past. Winter grade gasoline is especially subject to vaporization and pressure build-up when used on hot Spring or Fall days. If you have a tractor which is out of tune or not properly maintained, it can run hotter and increase vaporization.

**DANGER — Fire and personal injury.**

If the fuel cap is removed when the gasoline tank is hot and vapor pressure has, under certain circumstances, built up in the tank, this sudden release of pressure could force gasoline out of the tank. If the gas cap is not fully secured and tightened, it could come off the tank, and again, gasoline could escape. This sudden eruption of gasoline exposes the operator to, and may cover him with, liquid fuel and vapors and is a clear fire hazard if a source of ignition is present. A running engine is a source of ignition, as are cigarettes, open flames, sparks or a poorly maintained exhaust system. **An immediate fire could occur.** The operator or anyone in the area could be burned and suffer serious injury or even death.

**PRECAUTIONS — Observe the following steps for safe operation:**

- Always tighten gas caps securely.
- Never, under any circumstances, take the gas cap off a hot or running tractor.
- Never hold over Winter gasoline for use in the Spring. Remove any equipment unnecessary for warm weather operations, such as comfort covers, heat housers, or radiator covers.
- Maintain equipment properly and pay particular attention to electrical, exhaust, fuel, and cooling systems. Repair or replace frayed electrical wires; leaky exhaust manifolds, gaskets, pipes and mufflers; damaged carburetors, sediment bowls and fuel lines. Be sure radiators are clean inside and out. Clean off any accumulation of trash, oil or grease.
- Make sure that fuel cap vent holes are not plugged, gaskets are in good condition, and that cap tangs are firmly riveted. Repair worn, bent, or deformed filler necks and damaged heat shields or shield insulation. If your tractor is not equipped with a heat shield or insulation, install such equipment on applicable models.
- Be alert to any unusual sights and sounds during operation. If you suspect overheating or pressure build-up in the fuel system, do not touch the cap. Turn off the engine and allow the tractor to cool before you touch the cap.

## Starting the LP Gas Engine

1. Put the gearshift lever in neutral position.
2. Advance the engine speed control lever one-half.
3. Pull out the ignition switch button.
4. Slowly open the vapor valve "D" (*Illust. 7*).

It is important that the vapor valve or liquid valve be opened slowly, otherwise the excess flow valve may be "slugged" or automatically closed, requiring up to about 50 seconds for the excess flow valve to relieve itself.

5. Pull the choke control button "G" (*Illust. 7*) all the way out. Never set the choke in an intermediate position. The choke must close completely, because the carburetor has a separate set of gas and air orifices for starting.

6. Disengage the engine clutch by pressing down on the clutch pedal. Pull out on the starting switch control rod "J" (*Illust. 7*) and release as soon as the engine starts. However, do not operate the cranking motor for more than thirty seconds at any one time. If the engine does not start within a reasonable time, check the plugs for icing (in cold weather), gap setting, and correctness of carburetor starting adjustment. Then try starting again. Slowly release the clutch pedal after the engine starts.

7. After the engine is running and warmed up, push the choke control button all the way in, slowly open the liquid valve "E" (*Illust. 7*) and close the vapor valve "D".

## Stopping the Engine

To stop the engine close the liquid valve "E" (*Illust. 7*) and allow the engine to consume the fuel in the lines, then push the ignition switch button all the way in. Never allow the liquid valve "E" or vapor valve "D" to remain open after the engine is stopped.

Refer to the Tractor Operator's Manual for additional operating and maintenance instructions.

**IMPORTANT:** Due to various State laws and regulations your dealer should be consulted whenever any service on the fuel system is required.

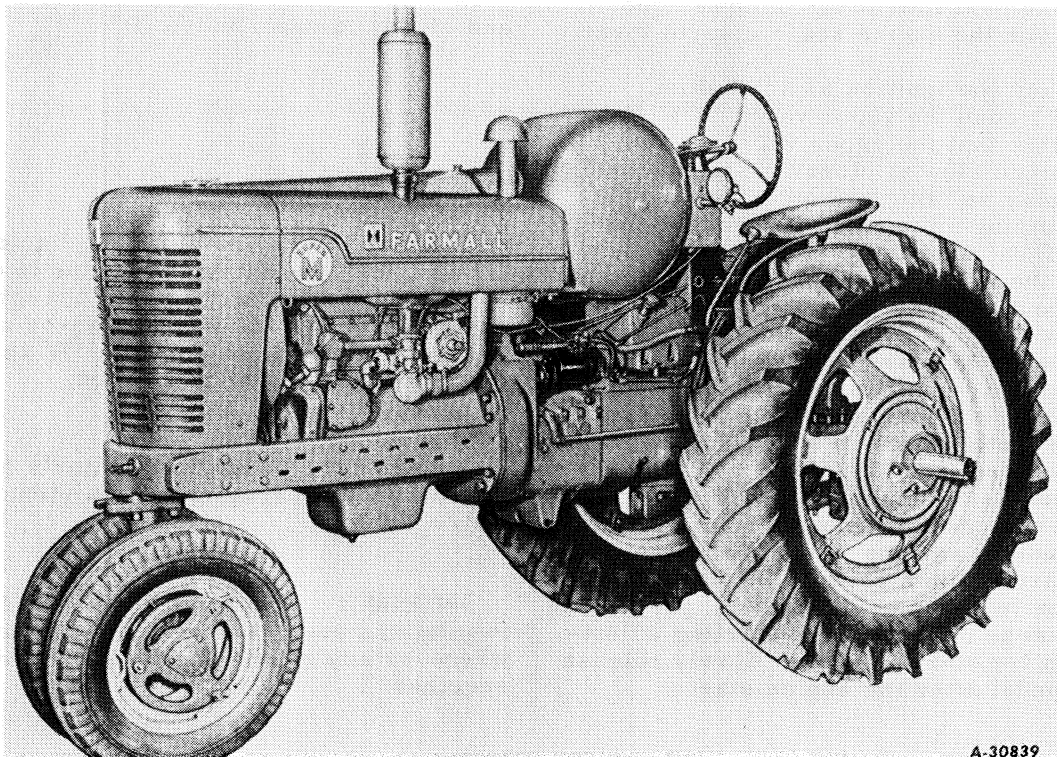
*A Careful Operator*

**IS THE BEST INSURANCE**

**AGAINST AN ACCIDENT**

—National Safety Council,

All illustrations and descriptive matter in this publication apply to International Harvester products sold under the McCormick, McCormick-International, McCormick-Deering, or McCormick-Deering International trade name.



Illust. 1

## General Information

The application of this LP (liquefied petroleum--Butane-Propane) gas attachment to your tractor and the parts used in the attachment with the exception of the pistons, cranking motor, and carburetor have been tested and listed by the Underwriters Laboratories and comply with the requirements of the National Board of Fire Underwriters Pamphlet No. 58.

Liquefied petroleum gas is not unduly hazardous but its characteristics being somewhat different than more commonplace fuels such as gasoline or natural gas, require that a somewhat different method of handling and care be taken to insure against accidents. Under normal temperature range the gas in the tank will be under pressures of from a few pounds up to almost 250 pounds, at which the safety relief valve will operate. The pressure in the LP gas tank is determined by the temperature of the liquid and the type of liquid--propane, butane, or a mixture of the two. As an example, normal butane boils at  $+31^{\circ}\text{F}$ . and propane boils at  $-44^{\circ}\text{F}$ . Mixtures of the two gases have boiling points between these values. As the temperature of the tank and the contents are raised in temperature, the pressure in the tank also increases. Both propane and butane are heavier than air and will tend to settle in a low quiet spot if they should leak out of the tanks. Care should be

taken to see that these spots are ventilated thoroughly, if the unit is used near such a location, before any spark or flame is produced. The safety relief valve protects the tank should it be exposed to excessively high temperatures or to fire. When a tank is subjected to fire, and the tank pressure rises above approximately 250 pounds per square inch, the relief valve opens, allowing the high pressure fuel to escape and burn. The fuel burns very fiercely as a torch, but since no air can enter the tank there is no explosion. Nevertheless, one should not smoke or light a match around a butane-propane tank that is being filled, any more than doing so while filling a gasoline tank. Safety precautions in the handling of any volatile fuel cannot be over emphasized. Complete instructions for handling this type of fuel should be obtained from the dealer distributing the fuel in your community.

The liquid and vapor service valves on this tank are fitted with automatic check valves which close instantly whenever the flow exceeds the normal amount used to operate the tractor. If a fuel line should be accidentally broken or a valve torn off of the tank, the check valves which are located on the valve, ahead of the pipe thread on the valve, will close and stop the flow of gas. **NOTE:** Never remove a valve assembly or gauge assembly from the fuel tank without first emptying the tank.

## How the Engine for LP Gas Differs from the Gasoline Engine

The LP gas equipped engine will develop the same power as the gasoline engine. The engineering tests were made on 100 percent propane, which has a lower BTU value than butane. If a mixture of butane and propane is used, the power will be slightly higher.

Principal elements of this attachment include the fuel tank assembly with valves and gauges, pipes and connections, carburetor, fuel regulator and vaporizer unit, fuel filter, radiator outlet pipe, high altitude piston attachment, and gear-reduction cranking motor. These elements are specifically designed and installed to assure efficient, economical operation on LP gas as described at the right.

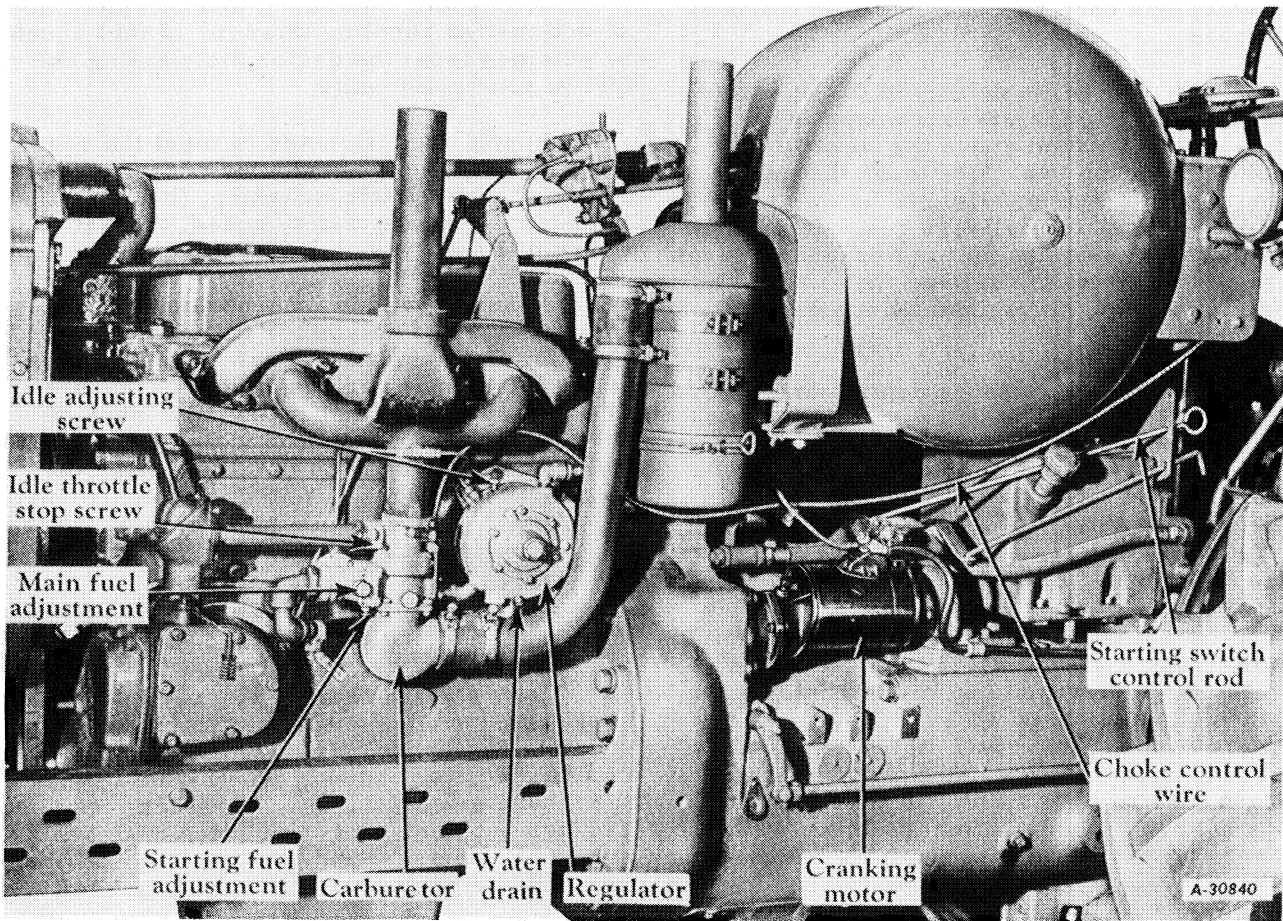
1. The fuel tank is of heavy, welded steel construction complete with valves and gauges. This tank is built and hydrostatically tested to withstand a pressure of 400 pounds per square inch. This strong tank is necessary because the LP gas fuel is stored in a liquid state under pressure varying with temperature.

2. The regulator-vaporizer unit is supplied to change the liquid fuel at tank pressure to a dry gas at slightly below atmospheric pressure.

3. The carburetor is especially designed for LP gas fuel.

4. The cranking motor has a gear reduction unit for powerful cranking action.

5. Compression ratio is increased to 6.75:1, compared with 5.7:1 with cast iron pistons and 5.9:1 with aluminum pistons in the gasoline engine.



Illust. 2  
LP gas fuel system.



## How the LP Gas Fuel System Operates

A LP gas engine is essentially the same as a gasoline engine except that the fuel to the engine is metered in the gaseous stage and delivered to the cylinders mixed in the proper proportions with air. Since the fuel is in the gaseous stage there are no problems of distribution and since the fuel has a high octane rating the compression pressure may be increased over that possible with gasoline.

In order to properly meter the fuel to the engine load demands, the effect of this variation in pressure must be eliminated. This is done by dropping the pressure through a regulating valve to approximately 4 pounds, which is less than the tank pressure. The LP gas fuel used must always have a boiling point temperature below that of the surrounding atmosphere. Since it is difficult to meter a mixture of liquid fuel and gaseous fuel, heat is applied to the fuel after the pressure is reduced, to vaporize all the liquid fuel. With fuel in the gaseous state the fuel may be metered the same as natural gas, which has been successfully used for several years.

The gaseous fuel is delivered to the carburetor according to the pressure drop in the venturi or the vacuum above the throttle or a combination of the two. Whenever the pressure in the carburetor or manifold is below atmospheric, the regulator delivers gas, and as soon as this pressure comes up to atmospheric level the regulator ceases to deliver fuel. When the engine is stopped, no vacuum exists and no fuel is delivered.

All of the above pressure control and vaporizing is handled in the regulator vaporizer unit.

### Filling the Fuel Tank

Be sure that the vapor service valve "D" and the liquid service valve "E" (*Illust. 7*) on the tractor fuel tank are closed.

The recommended method for filling the fuel tank is to use a fuel transfer pump connected from the main storage tank to the tractor tank. The tank can also be filled by gravity, if the pressure in the tractor tank is the same as, or less than, in the storage tank. A vapor-balancing hose may be used. The filler valve is spring-loaded. It automatically closes when the pressure from the transfer pump is released. The vapor-balancing connection also has a valve which is pushed off its seat when the hose connection is made. The dial gauge on the tank shows in percent the amount of fuel to which the tank should be filled. The tank has a 38 gallon water capacity but is never filled 100% full; 10 to 20 percent vapor space must be allowed

for expansion. The gauge includes a chart which shows the level to which the tank should be filled with butane, propane, or a mixture of the two at different atmospheric temperatures.

Should this gauge become inoperative, the outage valve "C" (*Illust. 7*) is used to determine when the fuel tank is filled to the maximum permitted level.

Open the outage valve by turning the stem counterclockwise, to allow gas to be vented through the bleeder valve during the filling operation. The moment that liquid is ejected from the bleeder valve, the maximum permitted filling level has been reached and the filling operation should be stopped and the outage valve closed.

One of the outstanding features of this tank is its large fuel capacity. This is important because a tractor usually has to be driven to a main storage tank for refilling.

Fuel transfer equipment and complete instructions for handling this type of fuel should be obtained from the dealer distributing the fuel in your community.

The tank is constructed to meet the regulations of the States having laws covering the design of tanks, their mounting, fittings, etc. In States not having safety codes, the National Board of Fire Underwriters' Regulations apply.

The tank assembly incorporates the necessary fittings and valves for filling, a gauge for checking fuel level, and a safety relief valve set at 250 pounds per square inch pressure. The fuel tank also includes a vapor shut-off valve which is opened when starting the tractor, and a liquid valve which is opened after the tractor is running.

### Fuel Filter

The Ensign Fuel Filter is provided to stop the passage of scale, rust, or other foreign matter that may be carried by the liquid fuel as it flows from the tank. The filter is of cast brass and designed for a working pressure of 250 pounds. Liquid fuel from the tank enters the filter and flows down and through the felt filter cartridge to the outlet passage. Foreign substances accumulating in the filter sump may be drawn out by removing the drain plug. By removing the nut and filter bowl, the filter cartridge may be removed for cleaning or replacement.

This filter operates until it becomes clogged up sufficiently to restrict the flow of fuel. The filter may be blown down by removing the

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