INDUSTRIAL TRUCK DIVISION

MAINTENANCE MANUAL

FOR

MACHINE SERIAL NUMBER

Clarklift 30 (C30-1-EQ-177 thru 70-305)
Clarklift 40 (C40-1-EQ-178-thru 125-306)
Clarklift 50 (C50-1-EQ-179 thru 70-307)

Code 81

CLARK EQUIPMENT COMPANY

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SAFETY INSTRUCTIONS FOR MAINTAINING INDUSTRIAL TRUCKS

Powered industrial trucks may become hazardous if adequate maintenance is neglected. Therefore, adequate maintenance facilities, personnel and procedures should be provided.

Maintenance and inspection of all powered industrial trucks should be performed in conformance with the recommendation in this manual and the following practices.

1. A scheduled preventive maintenance, lubrication, and inspection system should be followed.

2. Only qualified and authorized personnel should be permitted to maintain, repair, adjust, and inspect industrial trucks.

3. Before Leaving The Truck:

   A. Stop truck.

   B. Fully lower the load engaging means.

   C. Place directional controls in neutral.

   D. Apply the parking brake.

   E. Stop the engine or turn off power.

   F. Lock the control or ignition circuit.

   G. Block the wheels if truck is on a ramp, or being worked on.

4. Before Working On Truck:

   A. Raise wheels free of floor or disconnect power source.

   B. Use chocks or other positive truck positioning devices.

   C. Block load engaging means, innermast(s), or chassis before working under them.

   Before working on engine fuel system of gasoline powered trucks with gravity feed fuel systems, be sure fuel shutoff valve is closed.

   Before working on engine fuel system of LP gas powered trucks, close LP gas cylinder valve and run engine until fuel in system is depleted and engine stops running.

   Operation to check performance of the truck or attachments should be conducted in an authorized, safe clearance area.

5. Before Starting To Operate The Truck:

   A. Be in operating position.

   B. Depress clutch (or brake pedal on automatic transmission and electric trucks).

   C. Place directional controls in neutral.

   D. Start engine or turn on power.

   E. Before operating truck, check functioning of lift and tilt systems, directional and speed controls, steering, warning devices, brakes, and any attachment. (If used)

   F. Release parking brake.

- continued -

OPERATING INSTRUCTIONS

It is not essential that the prospective operator have experience with this type machine, but it is important that he have sound practical knowledge of machinery and its care. An operator with previous experience on automotive equipment should readily become acquainted with construction and operation of the lift truck.

BEFORE STARTING

Before putting machine into service there are a few preventive maintenance instructions that should be followed:

1. Check fuel supply and fuel system lines and connections.
2. Check cooling system: add water or anti-freeze as required.
3. Check service brake and parking brake.
4. Check air cleaner.
5. Check crankcase oil level
6. Check transmission oil level.
7. Check hydraulic system oil supply.

STARTING

Place direction control lever in 'neutral'. The machine is equipped with a neutral starting switch and will not start unless transmission is in 'neutral'. Pull out on choke button and turn ignition switch key. The starter is engaged when the key is turned. *CAUTION: Do not engage the starter longer than 15 seconds*

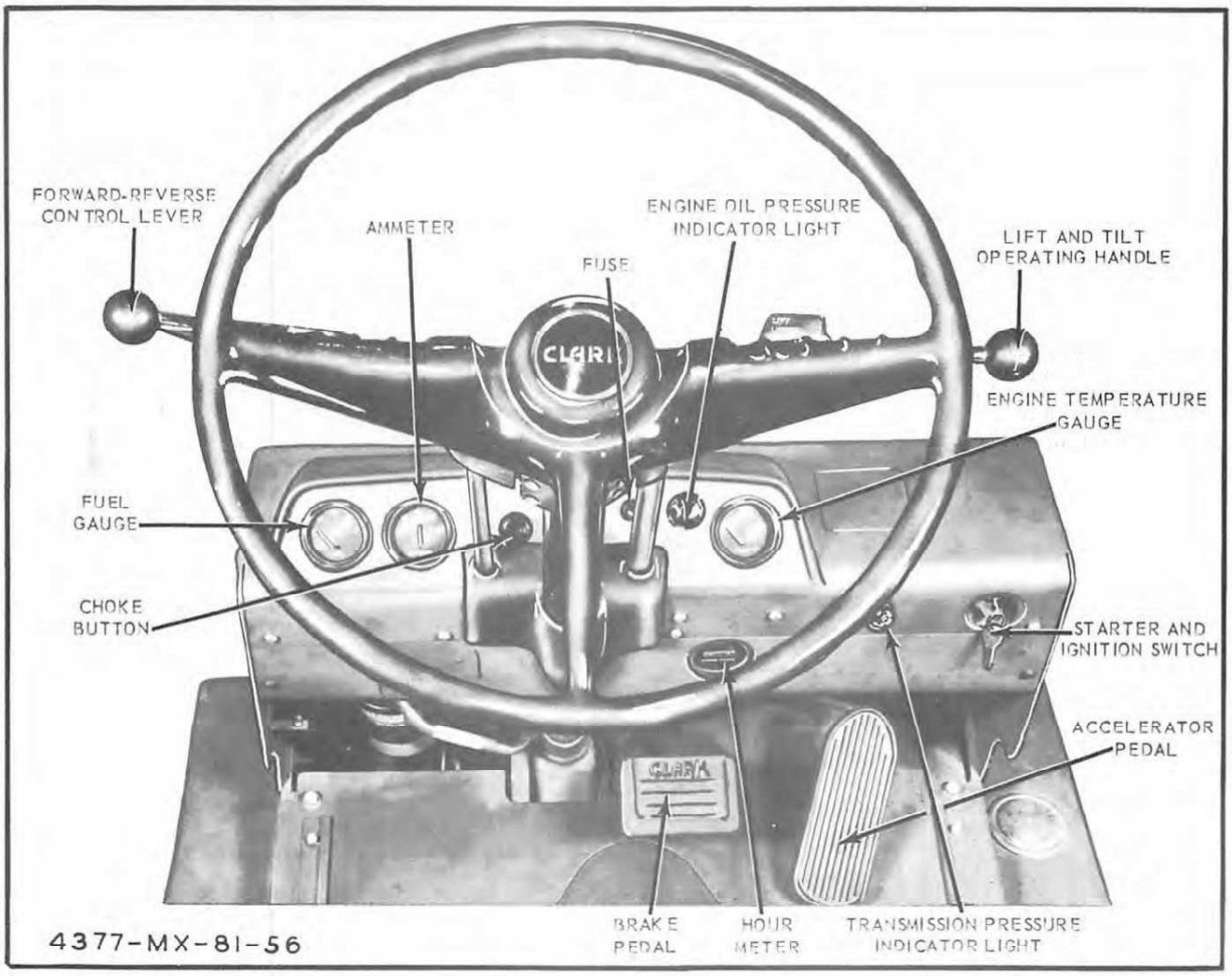

Fig. 1 Location of Controls

"CAUTION" Standard Gas Fuel Systems Only "CAUTION"

without a minute or so interval between trials. If the engine becomes overchoked or flooded, push choke button in, depress accelerator fully and engage starter. If all necessary equipment is in correct working order the engine will start.

After the engine has started check the instrument panel gauges and controls. The ammeter should be charging; if not refer to "Electrical System", Section V, Trouble Shooting guide to aid in correcting difficulty. Check the engine temperature gauge frequently during operation making certain the engine is not over-heating. Allowing a reasonable time for oil pressure to build up check the transmission oil and engine oil indicator lights. The engine oil indicator light should not be lit and the transmission light should not be lit when the machine is in drive position. If there is sufficient oil pressure let the engine run a few minutes before operation to allow oil to warm, especially in colder operating conditions.

PURPOSE AND LOCATION OF CONTROLS

A direction control lever on the steering column provides finger tip control of 'forward' 'reverse' and 'neutral'. Movement of the lever forward will give forward direction and backward or towards the driver gives reverse direction.

The hydraulic control lever, mounted on the right side of steering column, controls the lift and tilt operation. See Figure 2. Movement away from driver will give forward tilt; movement toward driver will give backward tilt; movement toward steering wheel will lift forks, and movement away from steering wheel will lower the forks.

The accelerator and brake pedals are located by the drivers right foot where pivoting on the driver's heel may operate both pedals without lifting the foot. The brake pedal may be operated by the left foot if 'inching' movement is desired or to hold the truck in position on a slope while operating the lift or tilt. Brake pedal linkage is not only connected to the hydraulic brakes but also to the transmission control cover. When the brake pedal is depressed hydraulic pressure is reduced at the direction selecters by the inching control valve in the control cover. As the oil pressure is reduced power to the drive axle is reduced resulting in an 'inching' movement.

INSTRUMENTS

The instrument panel contains the fuel gauge ammeter, engine temperature gauge, choke button, fuse holder and engine oil pressure indicator light.

The combination ignition and key switch, hour meter and transmission oil pressure indicator light are located on the lower cowl assembly.

PARKING BRAKE

The machine is equipped with a 'Dead Man' type parking brake and is actuated when the driver leaves the seat. When the seat is occupied the brake is fully released.

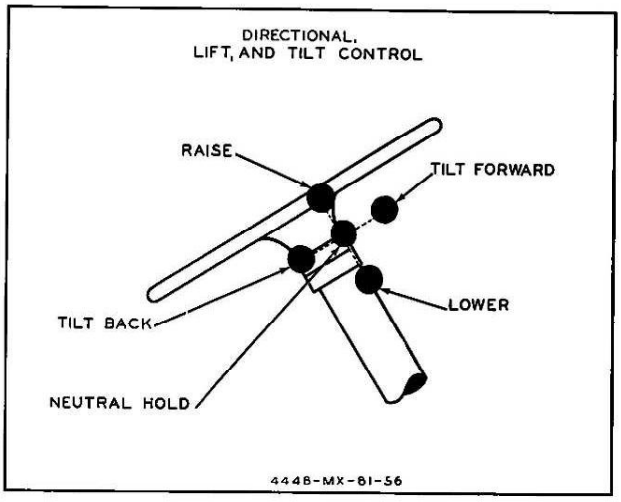

Fig. 2. Lift and Tilt Lever

TO OPERATE FORK LIFT TRUCK

With engine idling, position lift forks two to three inches from floor. Place directional selector lever in either forward or reverse position and accelerate machine as required. To change direction, simply move the direction control lever in either 'forward' or 'reverse'.

TO MOVE A LOAD

The forks should be adjusted sidewise on fork bars to obtain maximum balance in proportion to width of load. Raise (or lower) forks to proper level and center the load as nearly as possible on forks. Tilt load backward to prevent falling, accelerating engine slightly at the same time. Back machine away from stack.

Adjust fork (and load) height so that it is close to floor or ground but high enough to avoid hitting obstructions. The operator should have clear vision ahead when moving in a forward direction. When this is not possible, the operator should drive in reverse and sufficiently turn in his seat to obtain clear vision backward.

When the load is to be deposited, enter the area squarely, especially when placing one load on top of another in order that all piles will be square and secure. Place load directly over desired area and slowly lower to the floor.

NOTE: Never hold tilt or lift levers in extreme 'in' or 'out' positions if a load has reached its limits. A high oil pressure will result.

TIRE AND RIM MAINTANANCE

Inspect tires and wheels regularly for cuts, breaks, alignment, proper inflation, security of wheel clamp bolts (on machines using split rims), and lug nuts or bolts. (See attached charts for proper inflation and clamp bolt torque).

(1) Even with the best of maintenance practices, cuts will still be a source of tire trouble. The correct procedure for handling and repairing tires should be given careful attention. Close inspection of all tires should be made at the time of inflation check, and all tires having cuts that penetrate into the cord body should be taken off for proper repair.

Failure to make regular inspections and repairs when needed will result in further deterioration of the cord body and eventually a blowout.

Small rocks and dirt will get into shallow cuts in the tread and if neglected will gradually be pounded through the cord body.

One simple method for forestalling this action is to clean out the cut with an awl or similar tool to remove any stones or other matter which may be lodged in the cut. Use a sharp, narrow-bladed knife and cut away the rubber around the cut to form a cone-shaped cavity extending to the bottom of the injury. The sides of the cavity should be slanted enough to prevent stones from wedging into it. Tires with cuts treated in this manner may be continued in service without danger of further growth of these injuries. If a tire has at least one deep cut that requires a repair, then all smaller cuts may be quickly and economically repaired and vulcanized by the steam kettle method.

NOTE

IT IS NOT RECOMMENDED THAT TIRES WITH BREAKS BE USED AGAIN.

(2) If uneven tire wear is evident wheel alignment should be checked.

(3) On split rim wheels make certain before inflating tires that the wheel nuts are tightened to proper torque.

(4) In all cases when removing tires from truck for repair or periodic rotation completely deflate tires. This may be accomplished by removing the valve core.

(5) On machines using split rims make periodic checks for noises in the wheel, as it is possible for damage to occur to the wheel bolts, if the wheel bolts are not securely tightened when tires are changed. If bolts are loose or have been sheared off as a result of being loose, a grinding or scraping noise will be present when wheels are turned. Should this condition exist, it will be necessary to immediately remove the rim and tire from the machine and determine the cause of noise.

NOTE

BEFORE REMOVING TIRE AND RIM RELEASE ALL AIR FROM TIRE BY REMOVING VALVE CORE.

"CAUTION" Standard Gas Fuel Systems Only "CAUTION"

To Move A Load.

The forks should be adjusted sidewise on the fork bars to obtain firm support and maximum balance of the load. Raise or lower the forks to the proper level and engage the load by driving forward. Tilt the upright backward sufficiently to adequately cradle the load, and raise load sufficiently to clear obstructions, accelerating engine slightly at the same time. Back away from stack.

The operator should have clear vision ahead when moving in a forward direction. When this is not possible, the operator should drive in reverse and turn in his seat to obtain clear vision backward.

When the load is to be deposited, enter the area squarely, especially when placing one load on top of another, in order that all piles will be square and secure. Place load directly over desired area and slowly lower into position. Disengage forks from the load by using necessary lift-tilt and then back away.

Loads will vary in size, shape, method of packaging, stacking procedures, etc. The best way to handle a load will depend on these factors. If in doubt, consult with your supervisor.

I M P O R T A N T

EVERY 8 OPERATING HOURS (OR EVERY SHIFT) ELEVATE

UPRIGHT TO THE UPPER LIMIT. THIS WILL PROVIDE

LUBRICATION TO THE TOP PORTION OF THE LIFT

CYLINDER. CHECK FOR NORMAL SEQUENCE OF OPERATION.

OPERATING SAFETY RULES AND PRACTICES.

1. Operators of powered industrial trucks should be physically qualified. An examination should be made on an annual basis and include such things as field of vision, hearing, depth perception and reaction timing.

2. Only trained and authorized operators should be permitted to operate a powered industrial truck. Methods should be devised to train operators in the safe operation of powered industrial trucks. It is recommended that badges or other visual indication of the operator's authorization should be displayed at all times during work period.

GENERAL.

1. Safeguard the pedestrians at all times. Do not drive a truck up to anyone standing in front of a bench or other fixed object.

2. Do not allow anyone to stand or pass under the elevated portion of any truck, whether loaded or empty.

3. Unauthorized personnel should not be permitted to ride on powered industrial trucks. A safe place to ride should be provided where riding of trucks is authorized.

4. Do not put arms or legs between the uprights of the mast or outside the running lines of the truck.

5. When leaving a powered industrial truck unattended, load engaging means should be fully lowered, controls should be neutralized, power shut off, brakes set, key or connector plug removed. Block wheels if truck is parked on an incline.

6. Maintain a safe distance from the edge of ramps or platforms and do not, while on any elevated dock or platform, push freight cars. Do not use trucks for opening or closing freight doors.

7. Have brakes set and wheel blocks in place to prevent movement of trucks, trailers, or railroad cars while loading or unloading. Fixed jacks may be necessary to support a semi-trailer during loading or unloading when the trailer is not coupled to a tractor. Check the flooring of trucks, trailers, and railroad cars for breaks and weakness before driving onto them.

8. Be sure of sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc.

9. Use an Overhead Guard and Load Backrest Extension unless conditions prevent their use.

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x                                               x
x                  W A R N I N G                x
x                                               x
x  AN OVERHEAD GUARD IS INTENDED TO OFFER       x
x                                               x
x  PROTECTION FROM THE IMPACT OF SMALL          x
x                                               x
x  PACKAGES, BOXES, BAGGED MATERIAL, ETC.,      x
x                                               x
x  REPRESENTATIVE OF THE JOB APPLICATION,       x
x                                               x
x  BUT NOT TO WITHSTAND THE IMPACT OF A         x
x                                               x
x  FALLING CAPACITY LOAD.                       x
x                                               x
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10. Use only approved industrial trucks in hazardous locations.

FUEL HANDLING AND STORAGE SAFETY

Liquefied Petroleum Gas Fuel (LPG Powered Trucks)

1. The storage and handling of liquefied petroleum gas (LP-Gas) should be in accordance with the Standard for Storage and Handling of Liquefied Petroleum Gases (NFPA No. 58, USA Standard Z106.1-1965).

2. Trucks using LP-Gas should be refueled only at locations designated for that purpose. Safe outdoor locations are preferable to indoor. Trucks should be refueled as provided in the Standard for the Storage and Handling of Liquefied Petroleum Gases (NFPA No. 58, USA Standard Z106.1-1965.)

3. Reasonable care should be exercised in handling of LP-Gas containers to avoid damage. Do not drop, throw, roll, or drag LP-Gas containers or any associated parts of the containers or fuel systems.

4. Do not over-fill LP-Gas containers.

5. Engine should be stopped and operator off the truck during refueling.

6. Trained and designated personnel should recharge or exchange LP-Gas containers.

7. Personnel engaged in recharging of LP-Gas containers should wear protective clothing such as face shield, long sleeves, and gauntlet gloves.

8. Never use a match or flame to check for leaks, use a soap solution.

9. LP-Gas powered trucks should not be refueled nor stored near underground entrances, elevator shafts nor any other place where LP-Gas could collect in a pocket causing a potentially dangerous condition.

10. Trucks equipped with permanently mounted LP-Gas containers should be refueled outdoors.

11. Exchange of removable LP-Gas containers preferably should be done outdoors, but may be done indoors. Means should be provided in the fuel system to minimize the escape of fuel when the containers are exchanged. This should be accomplished by either of the following methods:

A. Using an automatic quick closing coupling (a type closing in both directions when uncoupled) in the fuel line, or.....

B. Closing the valve at the LP-Gas container and allowing the engine to run until the fuel in the line is consumed.

12. When installing removable LP-Gas containers they should be so located on the truck that the safety pressure relief valve opening is always in contact with the vapor space (top) of the cylinder. This is accomplished by an indexing pin which, when the tank is properly installed, positions the container.

13. All reserve LP-Gas containers should be stored and transported with the service valve closed. Safety relief valves should have direct communication with the vapor space of the container at all times.

14. The careless handling of LP-Gas containers can result in a serious accident. Extreme care should be exercised when transporting containers so that they are not accidentally dropped or physically damaged. When it is necessary to move more than one container at one time, a proper carrying device should be provided.

15. Physical damage such as dents, scrapes, or gouges, may materially weaken the structure of the LP-Gas container and render it unsafe for use. All LP-Gas containers should be examined before recharging and again before reuse, for the following defects or damage:

A. Dents, scrapes, and gouges of the pressure vessel.

B. Damage to the various valves and liquid level gage.

C. Debris in the relief valve.

D. Indications of leakage at valves or threaded connections.

E. Deterioration damage or loss of flexible seals in the fill or servicing connections.

All defective or damaged LP-Gas containers should be removed from service.

16. Smoking should be prohibited in the refueling area.

17. Whenever vehicles using LP-Gas as a fuel are parked overnight or stored for protracted periods of time indoors, with the fuel container in place, the service valve on the fuel container should be closed.

When checking or adjusting L.P. Gas equipment be sure to:

1. Properly ventilate work area.

2. Eliminate ignition sources (sparks, pilot lights etc.).

3. Prohibit smoking.

4. Have fire fighting equipment present.

5. Check all equipment, lines, connections with soapy water. NEVER USE A MATCH OR FLAME WHEN CHECKING FOR LEAKS.

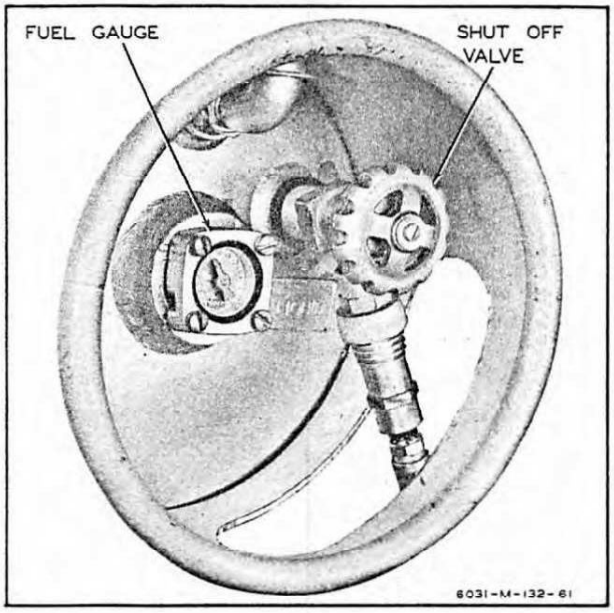

Plate 6031. Typical L.P. Gas Container

6. Check cylinder (container) for security of mounting.

7. Inspect hoses, grommets or whatever means is used to protect hoses from damage where they run through sheet metal etc. Replace any component that is unfit for further service.

8. Check all equipment for security of mounting.

9. Check the Solenoid Lock-Off Valve to be sure it is working. Upon turning off the ignition switch there should be an audible click indicating the valve has actuated shutting off the fuel flow at the valve. The valve should not open again until the ignition switch is turned on and the engine cranked. Cranking the engine provides oil pressure to the engine oil pressure sending unit which actuates completing an electrical circuit to the solenoid lock-off valve. The valve then opens allowing the L.P. Gas to pass through.

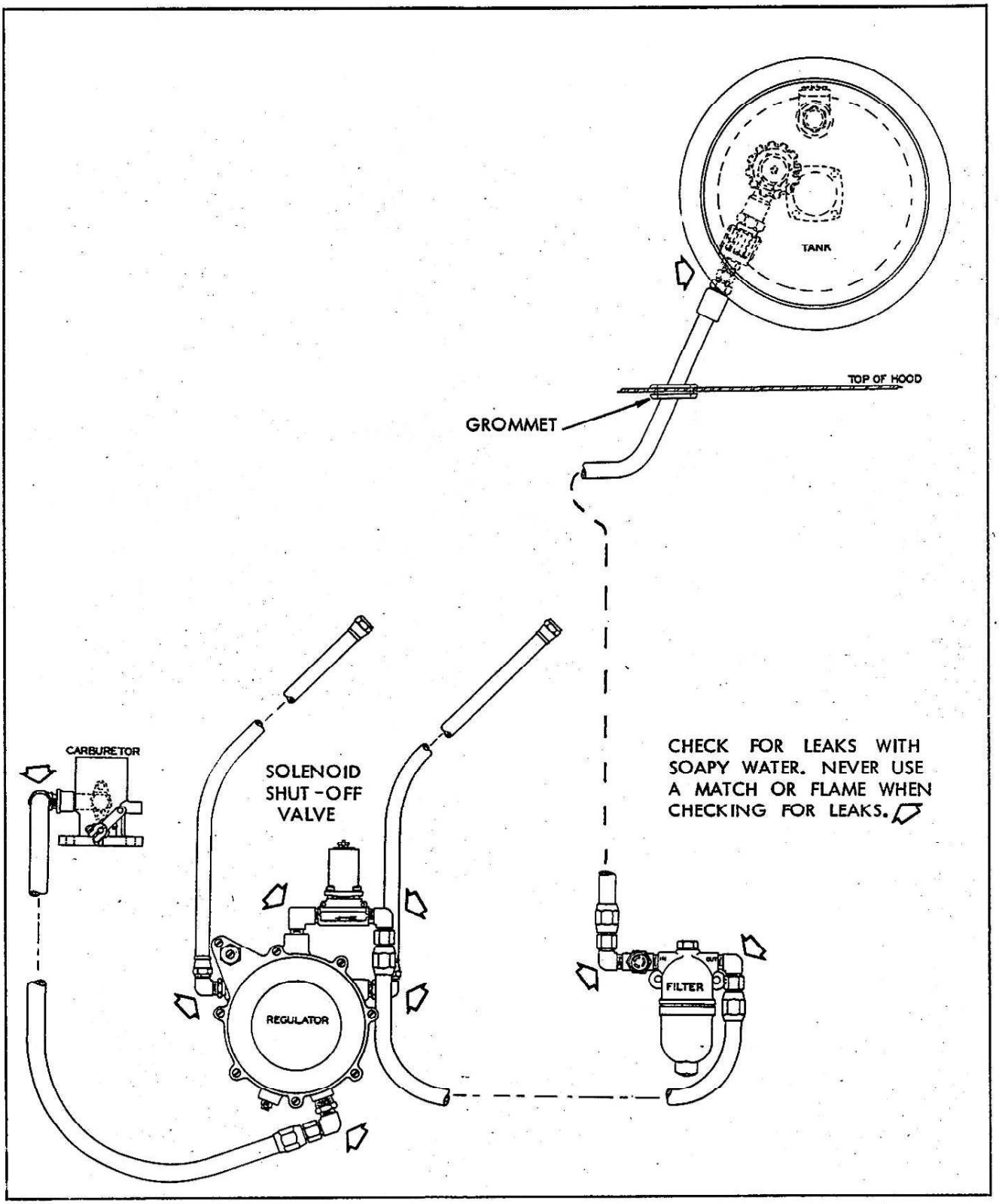

Plate 7405. Typical L.P. GAS Installation

depress the brake pedal slowly, tighten screw and allow pedal to return to the "off" position. Repeat this operation approximately ten times. Which provides a pumping action to force fluid through the line expelling all air. This operation must be repeated on the cylinder of both wheels, "bleeding" the longest line first.

Watch flow from "bleeder" screw carefully. When bubbles cease to appear, or when the stream is clean solid mass, close bleeder connection.

Fluid withdrawn from system during "bleeding" operation should not be used again.

Keep master cylinder filled with clean fluid during "bleeding" operation.

NOTE: On this model the service brakes are mounted so that the wheel cylinder bores are not parallel to the road. Therefore the bleeder screw port is not the highest point on the wheel cylinder. It may be necessary to "Surge" bleed these cylinders to force out the air trapped above the bleeder screw. The following steps should be taken to accomplish this action.

1. Bleed brakes at all wheels in the regular manner.

2. At each wheel, in turn, open bleeder screw and kick brake pedal down sharpely several times. Close bleeder screw.

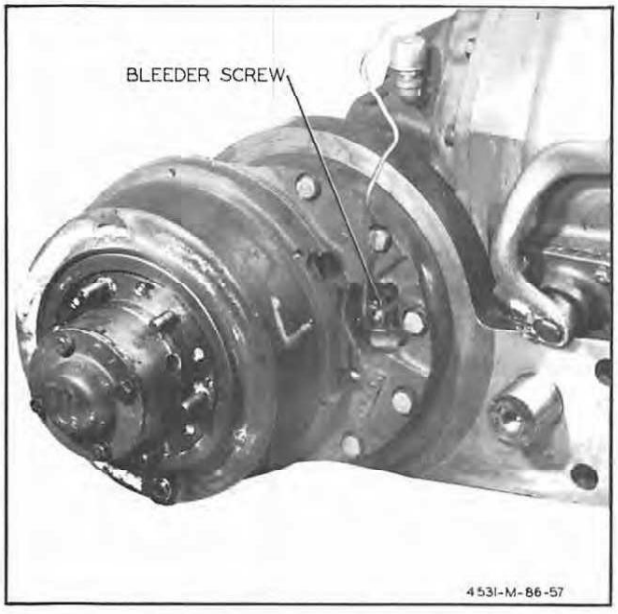

Fig. 2. Bleeder Screw

BRAKE PEDAL ADJUSTMENT
Refer to Fig. 3.

Proper pedal adjustment is important, otherwise the compensating feature of the master cylinder cannot function. Fluid cannot return from the lines. Brakes will drag after several applications if master cylinder by-pass port is blocked.

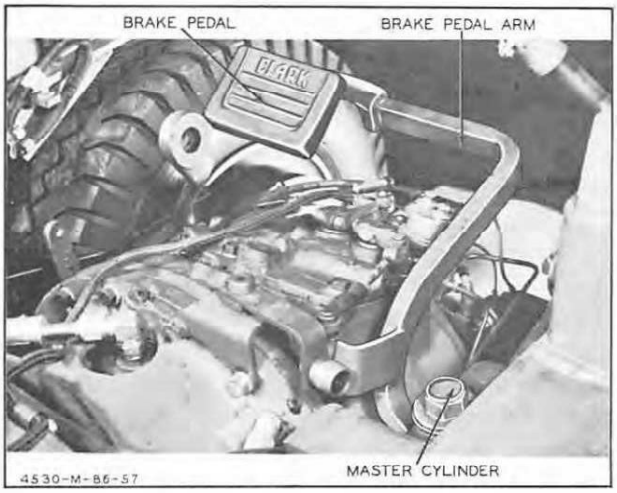

Fig. 3. Brake Pedal Adjustment

BRAKE PEDAL ADJUSTMENT
Refer to Fig. 3.

The sensitive inching valve is directly connected to the master cylinder free play. The sensitive inching valve linkage should be adjusted to stop the brake pedal arm 1/8 to 1/4 inch below the floor board. From this point the brake pedal arm must have 1/4 inch free play before it comes in contact with the master cylinder.

After the brakes have been properly bled, apply the brakes, measuring the pedal travel. There should be at least 1 3/4 inch pedal travel before any drag is evident in the brake pedal. If the pedal travel is less than 1 3/4 inch more master cylinder clearance is required.

Loosen the yoke lock nut and turn the brake pedal adjusting rod clockwise into the brake pedal yoke until the 1 3/4 inch travel is acquired.

This adjustment is necessary to allow correct function of the sensitive inching valve.