

CENTURY LPG SYSTEM

INTERNATIONAL HARVESTER

Application

Century Model No.
(Carburetor)

1965-71

304" 8 Cyl. 3C-705DTL-2101
345" 8 Cyl. 3C-G705DTL-2090

SAFETY PRECAUTIONS

► **LAWS, ORDINANCES AND REGULATIONS** — State, county and city laws and regulations covering the utilization of liquid petroleum gas must be adhered to when servicing a vehicle equipped with an LPG system.

► **SHOP SAFETY PRACTICES** — Working area should be well ventilated with no open flame devices in area. "DANGER" signs should be displayed and a fire extinguisher (dry powder or CO-2) should be placed close by. DO NOT use LPG for cleaning parts, blowing horns or any other compressed air use.

► **VEHICLE SAFETY PRACTICES** — Before performing any work on vehicle, exhaust fuel system by closing main valves at tank and allowing engine to run, or by bleeding the fuel system outside the shop area. Remove or store vehicle outside of shop when work is not being performed. After completing servicing, raise hood allowing air to circulate to remove possi-

ble accumulated gas before starting engine. All threaded fittings should be treated with an insoluble sealer and checked for leaks with a soap lather. Pay particular attention to short rubber hoses used in the system which relieve stress and vibration.

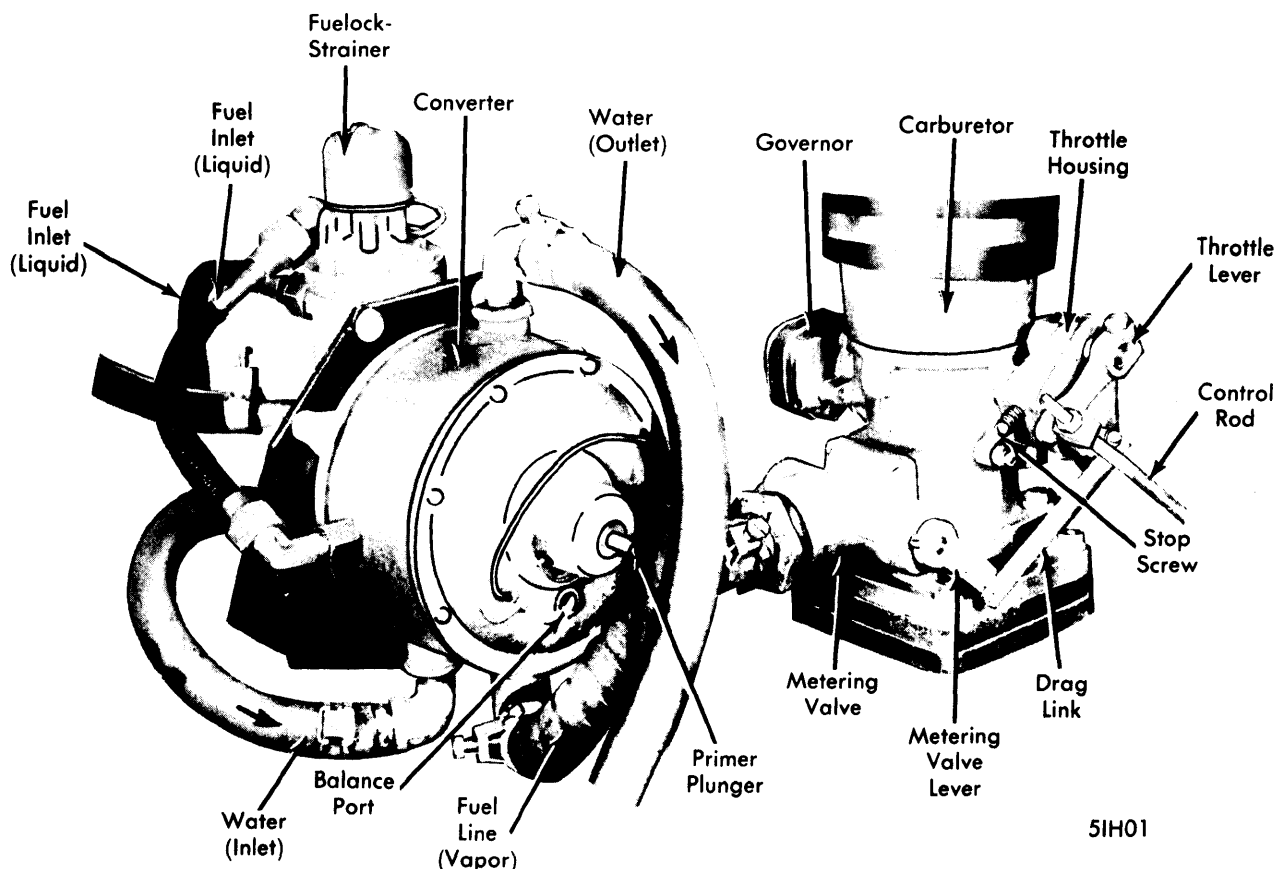
► **NOTE** — In case of LPG fire, shut off source of gas, if possible, before extinguishing fire. If shut off is not accomplished, an explosion may result.

► **NOTE** — DO NOT perform work on LPG fuel tanks. All necessary work on fuel tanks should be performed by qualified concerns normally servicing such containers.

DESCRIPTION

Major components in this system are as follows: Fuel tank, fuellock-strainer assembly, converter (or regulator) and carburetor.

The liquid fuel, stored in the tank under pressure, flows through the fuellock-strainer and on to the converter. Here the pressure is lowered, the liquid is exposed to heat and the heat vaporizes the liquid. The vapor is then drawn to the metering valve type carburetor where it is mixed with air in the correct proportions for maximum engine efficiency.



LPG CARBURETION EQUIPMENT

CENTURY LPG SYSTEM (Cont.)

OPERATION

FUELOCK-STRAINER ASSEMBLY

Fuel from the tank enters through lower hose. Solenoid actuated plunger blocks fuel passage when ignition is "OFF". When ignition is "ON", the plunger is lifted by the solenoid and fuel is allowed to pass through the filter pack, from the strainer body and out the upper hose to the converter. The filter pack keeps foreign material from entering high and low pressure valves in converter.

CONVERTER (REGULATOR)

Liquid fuel enters converter from strainer at high pressure jet (fuel inlet), passing through high pressure valve and into the surge chamber. When incoming fuel pressure is approximately 6 psi against the high pressure diaphragm, the diaphragm lifts closing the high pressure valve. The fuel then progresses from the surge chamber through the fuel passages, where heat from the water within the water passages expands the liquid fuel changing it to a vapor. This vapor then passes through the low pressure valve and into the low pressure chamber when the converter diaphragm activates the low pressure valve lever in one of the following ways: (1) Engine vacuum draws diaphragm down; (2) Solenoid primer activates diaphragm electrically (push button on instrument panel); or (3) When solenoid primer plunger is manually depressed at solenoid. From the low pressure chamber the vapor is drawn through the fuel outlet and into the carburetor.

CARBURETOR

Vaporized fuel enters the carburetor below the throttle plate through a metering valve. Operation of valve is through a direct link with throttle blade, meaning a precise air/fuel ratio at all times. The 345" engine uses a governor to limit high engine speed by controlling the throttle blade and in turn, the metering valve.

FUEL TANK

All tanks conform to national pressure vessel codes, are inspected, and bear the code stamp. All valves and fittings are Underwriters approved. See illustration for related valves and lines.

CAUTION — Engine must be OFF when checking the fuel tanks.

SAFETY VALVES

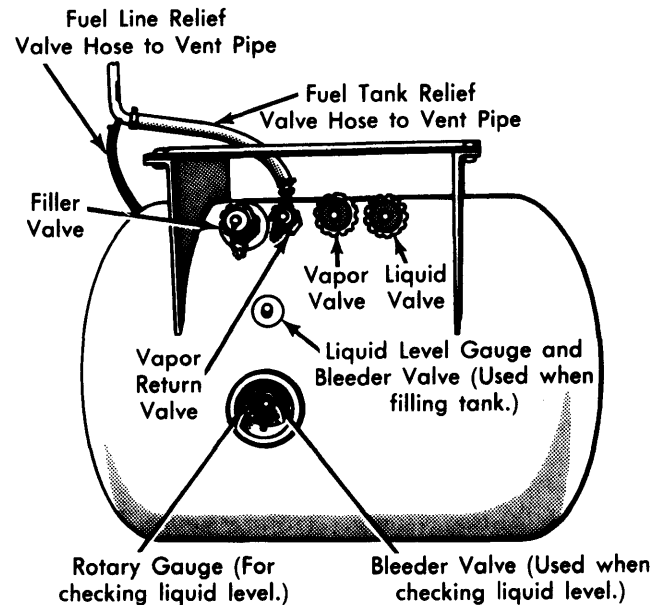
Excess Flow Valve — Located in fuel supply line to engine. When fuel flow through this valve exceeds a pre-determined rate, valve automatically shuts off further fuel flow. About 50 seconds are required for valve to relieve pressure.

Fuel Line Relief Valve — Located at a point within the fuel supply line where it can sense the pressure from all tanks. When pressure exceeds a given amount, valve automatically exhausts pressure through valve and out vent pipe.

Tank Relief Valve — Located in top of each tank. When tank pressure exceeds a given amount, valve automatically bleeds pressure off through valve and out vent pipe.

SUPPLY VALVES

Vapor Valve and Liquid Valve — Located on the fuel tank and specially designed to incorporate an excess flow valve. In case of valve damage or line or tubing failure, the excess flow valve will automatically close to prevent an excess of gas from escaping into the atmosphere.



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FUEL TANK, LINES, & VALVES

ADJUSTMENTS

HOT (SLOW) IDLE RPM

See appropriate article in JUNE-UP Section.

SYNCHRONIZING THROTTLE PLATE AND METERING VALVE

Proper adjustment of idle speed will also synchronize the throttle plate and metering valve. The air/fuel ratio should be 13.0 on gasoline scale or 14.4 on propane scale. **NOTE** — Check air/fuel ratio at wide open throttle and engine under load.

GOVERNOR

See appropriate article in TUNE-UP Section.

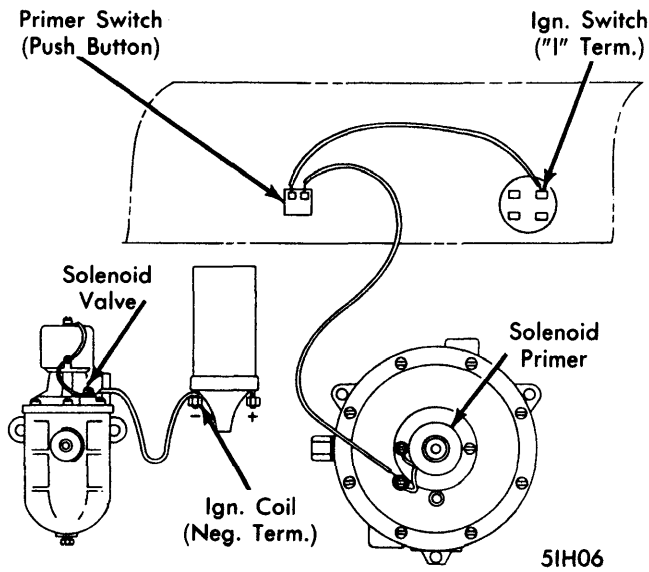
OVERHAUL

CAUTION — Before performing any work on system, shut off main valves at fuel tank and allow engine to run until all fuel between tank and engine is exhausted. If engine is not running, shut off main valves at tank and bleed fuel from all lines and components between tank and engine.

ELECTRICAL UNITS

Fuellock-strainer solenoid, converter solenoid primer, and converter solenoid primer switch (on instrument panel) cannot be overhauled. Replace these components as a unit.

CENTURY LPG SYSTEM (Cont.)



LPG WIRING DIAGRAM

FUEL TANK(S), VALVES & LINES

All necessary work on fuel tanks should be performed by qualified concerns normally servicing such containers. All valves and lines should be replaced (if required) with Underwriters Approved components.

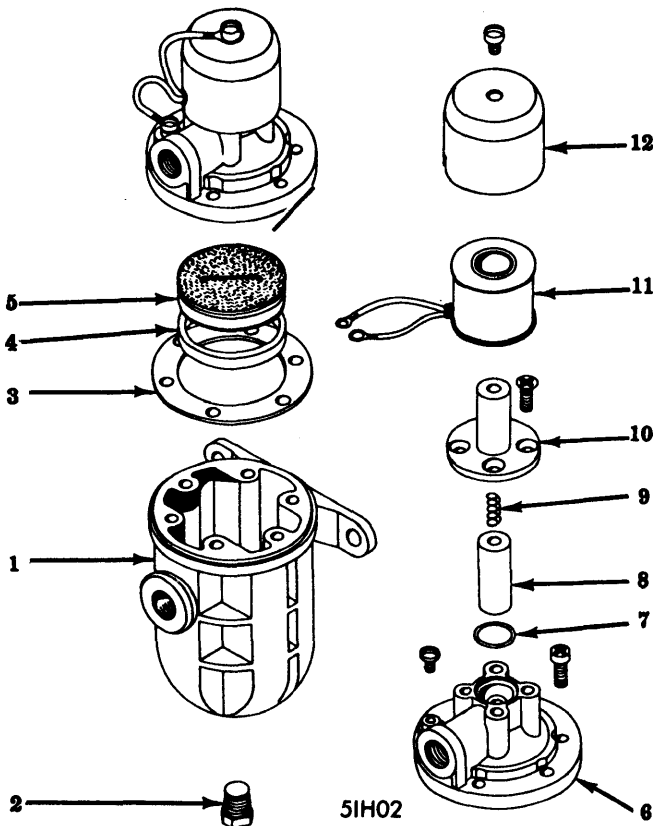
FUELOCK-STRAINER

Disassembly - 1) Remove unit from engine by disconnecting electrical lead, removing fuel lines and two mounting bolts. Separate base and cover assembly from strainer body by removing six cover-to-strainer screws.

2) Remove filter pack and retaining ring only if replacement is required as damage will occur when removed.

3) Remove solenoid and case by removing the two screws which attach electrical leads. Remove plunger housing from base by removing the four attaching screws, and from base, remove plunger, spring and "O" ring.

Reassembly - Reverse disassembly procedure, and install a new filter pack and retaining ring if required.



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|---------------------------|----------------------|
| 1 - Strainer Body | 7 - "O" Ring |
| 2 - Drain Plug | 8 - Plunger |
| 3 - Gasket | 9 - Plunger Spring |
| 4 - Retaining Ring | 10 - Plunger Housing |
| 5 - Filter Pack | 11 - Solenoid |
| 6 - Base & Cover Assembly | 12 - Case |

FUELOCK-STRAINER ASSEMBLY

CONVERTER (REGULATOR)

Disassembly - 1) Remove unit from engine by disconnecting electrical lead, removing fuel lines and mounting bolts. Scribe alignment marks on cover and main body (for reassembly) and remove eight cover-to-body screws and remove cover. Take out diaphragm, backing plate and gasket.

2) Disassemble diaphragm (if required) by removing nut from diaphragm button and separating small and large diaphragm plate from diaphragm.

3) Remove high pressure valve from main body along with washers, spring and jet. Take out four high pressure valve cover screws and remove cover, diaphragm spring and high pressure diaphragm.

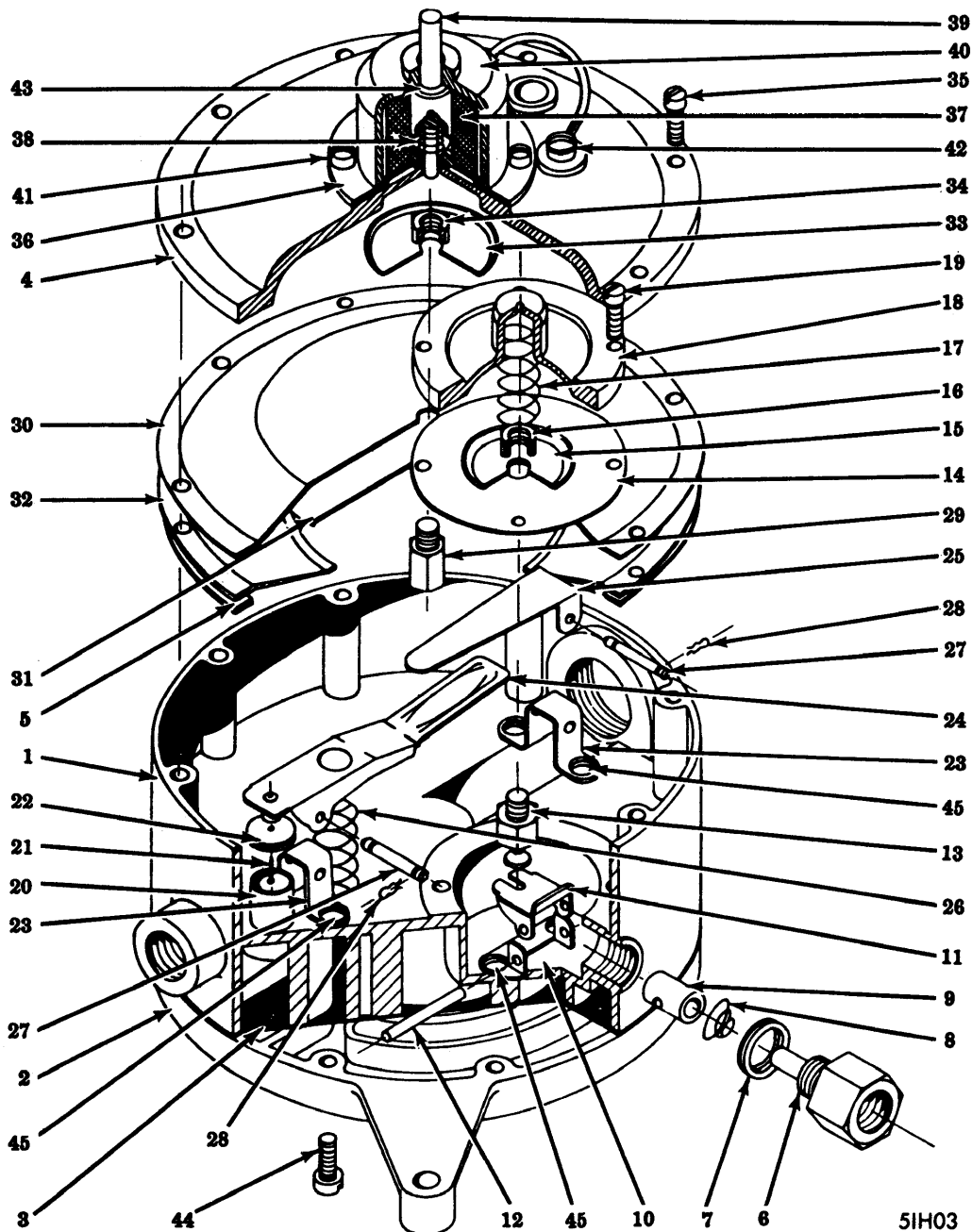
4) Disassemble diaphragm (if required) by removing link nut from diaphragm link and separating diaphragm from plate.

5) Remove low pressure valve lever pin clip and pin, and remove low pressure valve lever, and seat assembly along with valve lever spring. Remove valve seat by straightening valve seat pin.

6) Remove secondary low pressure valve lever by removing pin clip and pin, and remove back cover and gasket by removing nine cover retaining screws.

Reassembly - Reverse disassembly procedure, and install new parts as required.

CENTURY LPG SYSTEM (Cont.)



- 1 - Main Body
- 2 - Back Cover
- 3 - Gasket
- 4 - Front Cover
- 5 - Diaphragm Plate Gasket
- 6 - High Pressure Valve Jet
- 7 - Gasket
- 8 - Valve Spring
- 9 - High Pressure Valve
- 10 - Lever Perch
- 11 - High Pressure Valve Lever
- 12 - Lever Pin
- 13 - Diaphragm Link
- 14 - High Pressure Diaphragm
- 15 - Diaphragm Plate

- 16 - Diaphragm Link Nut
- 17 - Diaphragm Spring
- 18 - High Pressure Valve Cover
- 19 - Valve Cover Screw
- 20 - Low Pressure Valve Body
- 21 - Low Pressure Seat Pin
- 22 - Low Pressure Valve Seat
- 23 - Lever Perch
- 24 - Low Pressure Valve Lever
- 25 - Secondary Lever
- 26 - Valve Lever Spring
- 27 - Lever Pin
- 28 - Lever Pin Clip
- 29 - Diaphragm Button
- 30 - Diaphragm

- 31 - Large Diaphragm Plate
- 32 - Diaphragm Backing Plate
- 33 - Small Diaphragm Plate
- 34 - Diaphragm Button Nut
- 35 - Cover-to-Body Screw
- 36 - Base Washer
- 37 - Coil
- 38 - Plunger Spring
- 39 - Solenoid Plunger
- 40 - Solenoid Case
- 41 - Solenoid-to-Cover Screws
- 42 - Terminal Screw
- 43 - "O" Ring
- 44 - Main Body Screws
- 45 - Lever Perch Screws

CONVERTER ASSEMBLY

CENTURY LPG SYSTEM (Cont.)

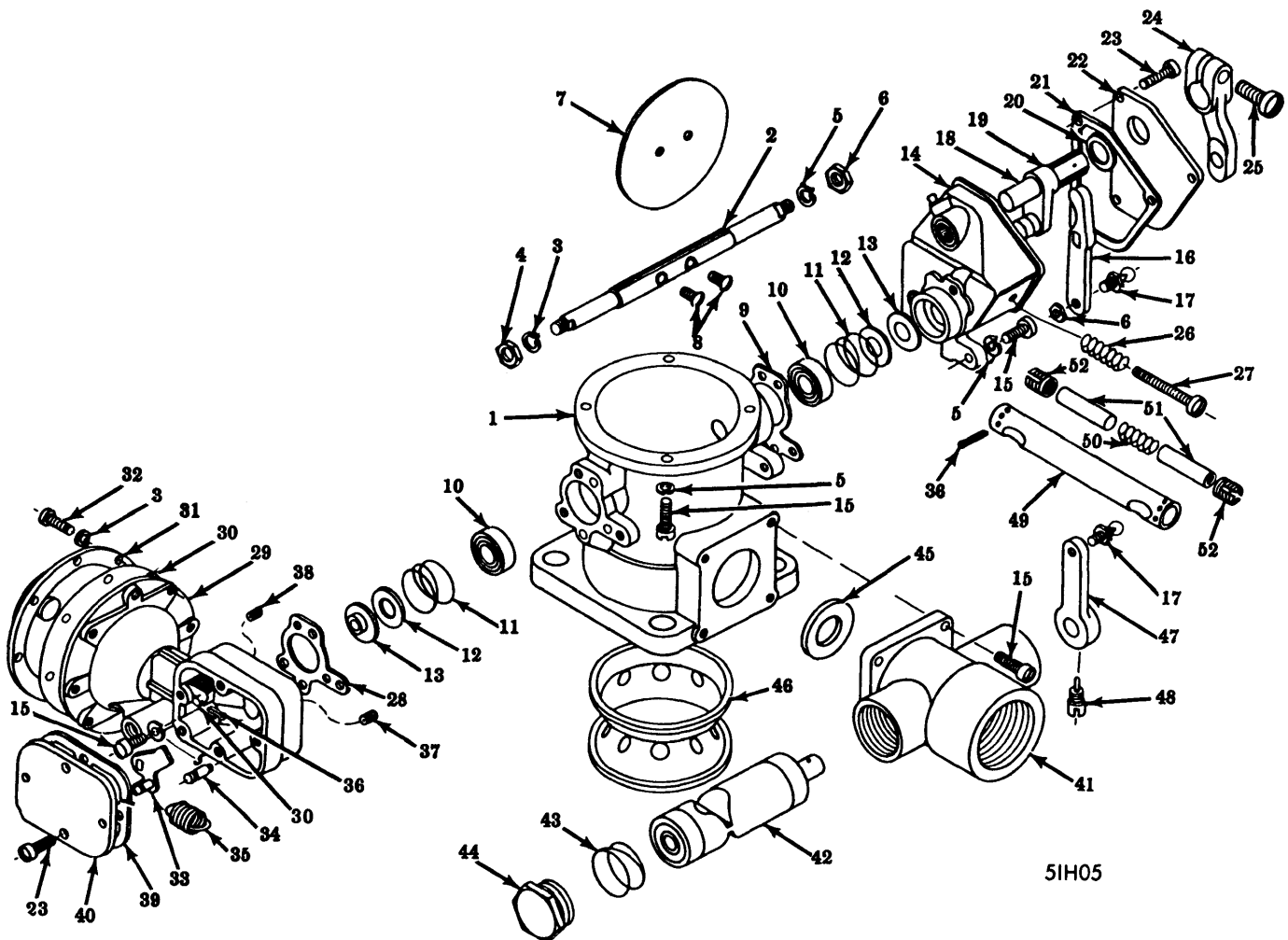
CARBURETOR

Disassembly - 1) Remove throttle lever screw and throttle lever. Remove drag link cotter pins, loosen idle adjusting screws (both ends) and remove drag link. Remove throttle lever housing cover, gasket and throttle shaft operating lever seal by removing three housing cover screws, and with housing removed, lift out throttle lever shaft.

2) Remove throttle shaft nut and lock washer and three throttle shaft lever housing screws and lock washers. Pull throttle shaft lever housing and throttle shaft clutch outer lever from throttle body and shaft.

3) Remove and disassemble governor by removing four housing cover screws, housing cover and gasket. Unhook governor spring and remove from housing. Remove cotter pin, throttle shaft nut and lock washer and lift out governor lever assembly. Remove three governor housing screws and remove governor housing assembly, then throttle body gasket, throttle shaft seal, retainer and spring.

4) Remove two throttle plate screws and then throttle plate, tap lightly on one end of shaft to push ball bearing from one side of throttle body, then tap other end of shaft to push bearing out of other side.



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| 1 - Throttle Body | 14 - Lever Housing | 27 - Throttle Stop Screw | 40 - Cover |
| 2 - Throttle Shaft | 15 - Screw | 28 - Gasket | 41 - Housing |
| 3 - Lock Washer | 16 - Throttle Shaft Clutch Lever | 29 - Governor Housing | 42 - Metering Valve |
| 4 - Nut | 17 - Ball Stud | 30 - Diaphragm with Rod | 43 - Spring |
| 5 - Lock Washer | 18 - Throttle Lever Shaft | 31 - Diaphragm Cover | 44 - Plug |
| 6 - Nut | 19 - Throttle Operating Lever | 32 - Screw | 45 - Metering Valve Jet |
| 7 - Throttle Plate | 20 - Seal | 33 - Lever | 46 - Spray Ring |
| 8 - Screw | 21 - Gasket | 34 - Spring Anchor Pin | 47 - Lever |
| 9 - Gasket | 22 - Housing Cover | 35 - Governor Spring | 48 - Screw Pin |
| 10 - Bearing | 23 - Screw | 36 - Cotter Pin | 49 - Drag Link |
| 11 - Spring | 24 - Throttle Lever | 37 - By-pass Jet "A" | 50 - Spring |
| 12 - Seal Retainer | 25 - Screw | 38 - By-pass Jet "B" | 51 - Spacer |
| 13 - Seal | 26 - Stop Screw Spring | 39 - Gasket | 52 - Idle Adjusting Screw |

LPG CARBURETOR ASSEMBLY

CENTURY LPG SYSTEM (Cont.)

5) Remove four metering valve housing screws and remove housing from throttle body. Clamp housing in a soft jawed vise and remove screw plug, spring and valve from housing. Tap shaft end of metering valve lightly using a wood block to slide metering valve with bearing assembly out of housing.

NOTE — Metering valve and spray ring are integral with housing and are not to be removed.

Reassembly — Reverse disassembly procedure and note the following:

- 1) Metering valve must be free of nicks or burrs and must rotate freely in bearings.
- 2) Throttle shaft must operate freely and throttle plate must be aligned exactly in bore. Throttle stop screw must strike throttle lever just before throttle is completely closed.
- 3) After governor housing and all levers have been installed, manually operate carburetor to insure throttle plate and metering valve operate simultaneously.

SPECIFICATIONS

Converter

Model.....	M4
Type.....	Two Stage (Built in Lockoff)
Capacity (Horsepower).....	.250
Working Pressure.....	.250 lbs.
Water Capacity.....	.309 lbs.

Carburetor

Model	
304".....	3C-705DTL-2101
345".....	3C-G705DTL-2090
Type.....	Metering Valve
Spray Ring (Venturi) Size.....	1 $\frac{3}{16}$ "
Throttle Orifice.....	#17
Metering Valve Size	
304".....	F-6, X-3
345".....	X4

Governor (345" Only)

Spring Color Code.....	Green
Spring Anchor Position.....	#2 Post
Hole Below Fly.....	.052"
Hole Above Fly.....	None
Bleed Orifice.....	.038"

Fuellock-Strainer

Model.....	STF-020A3
Capacity.....	120 gal. in one hour at 30 psi tank pressure.
Orifice.....	.141"
Lift on Plunger.....	.034"
Strainer Element.....	Chamois Skin

TROUBLE SHOOTING

SLOW STARTING

Check ignition system, tune-up items, battery and starter.

SLOW CRANKING SPEED

1) Check starter current draw. 2) Check lubrication oil to see if it has become too heavy. 3) Check for freeze-up in fuel system caused by the following: Coolant level too low; Air lock in converter water jacket — Bleed off air by loosening water hose at top of converter; Defect in cooling system — Check hoses, water pump, thermostat, etc.; Reversed water circulation

— Inlet water hose should be at bottom of converter; Converter piped in series with cab — Converter should be piped independent of engine. 4) Accelerating engine before it is warmed up.

FROST ON FUELOCK-STRAINER ASSEMBLY

1) Opening liquid outlet valve on tank too rapidly — Close valve until click is heard, then open slowly until hiss can no longer be heard, then turn valve to full open position. 2) Water in tank — Purge filler hose of gas, then pour one pint of alcohol in hose and attach hose to tank. Open valve on hose to inject alcohol into tank. Alcohol will act as antifreeze and will dissipate water through engine.

POWER LOSS

1) Check ignition system and all tune-up items. 2) Check liquid level in tank — If liquid is up but does not flow through liquid valve, dip tube on liquid outlet is ruptured or broken. 3) Check entire fuel system for proper valve operation, fuel delivery and vaporization. 4) Check operation of governor and throttle. 5) Check for overheated manifold or restricted exhaust.

POOR ECONOMY

1) Check all items under Power Loss. 2) Check calibration of fuel tank gauge. 3) At time of refueling, check for proper refueling procedure and that metering device at fuel supply pump is accurate.

ROUGH IDLE

1) Check ignition system and all tune-up items. 2) Check all points of vacuum for vacuum leaks. 3) Mixture too lean from converter.

FLAT SPOT OFF IDLE

1) Idle set too slow. 2) Air leaks in vapor line or punctured low pressure diaphragm. 3) Lean mixture caused by reduced hoses or fittings. 4) Lean mixture caused by incorrect carburetor calibration.

LACK OF FUEL AT CARBURETOR

Stop engine, turn ignition "ON", hold throttle open and press primer. A hiss should be heard if fuel is flowing. If hiss is not heard check system as outlined under Power Loss.

ENGINE DIES WHEN TRUCK IS BROUGHT TO STOP

1) Check fuel flow through vapor hose. 2) Check low pressure regulator parts. 3) Check ignition system and all tune-up items. 4) Check all points of vacuum for vacuum leaks.

OVER-HEATING

1) Check cooling system and all related components. 2) Check for lean air/fuel mixture.

SLUGGISH METERING VALVE ON CARBURETOR

Remove pin screw on metering valve and brass plug from opposite side. Remove and clean metering valve, and using a suitable lubricant (Lubriplate) on ends of metering valve, reassemble metering valve in housing.

DEFECTIVE SOLENOID PRIMER

Connect jumper from hot side of battery to insulated post on solenoid primer. With ignition "ON" and throttle wide open, solenoid should react. If solenoid reacts with jumper installed, trouble is in wiring or primer switch.