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PISTONS AND CYLINDER SLEEVES

Inspection

1. Using a micrometer, measure the diameter of the piston across the thrust faces at the bottom of the pistons, perpendicular to the piston pin hole, Figure 17. If this measurement is less than 3.9340" (201G), 3.8090" (188G), 3.4983" (159G) or 3.3735" (148G), replace the pistons.

![Figure 17]

**IMPORTANT**: When checking the measurements of the pistons and sleeves, the parts should be at or close to 70° Fahrenheit.

2. Using an inside micrometer or a cylinder bore gauge, Figure 18, check the sleeve bore for out of roundness. Check crosswise and lengthwise to the engine block just below the top ring location at its upper most travel. If the out of roundness exceeds .005", the sleeves should be replaced.

![Figure 18]

3. Using an inside micrometer, cylinder bore gauge or a taper gauge, Figure 20, check the sleeve diameter just below the top ring location at its upper most travel and at several points down the length of the sleeve. Subtracting the smallest reading from the largest reading will give the amount of taper. If the taper is more than .001", replace sleeve.

![Figure 19]

**Figure 19**

Check the cylinder sleeves for wear. If the sleeve I.D. is greater than 3.9445" (201G), 3.8195" (188G), 3.5078" (159G) or 3.3815" (148G), when checked at any point in the sleeve, it must be replaced.
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**SPECIAL TOOLS**

- **FOOT POUND TORQUE WRENCH**
- **FILTER WRENCH** A64761
- **SPRING TESTER**
- **SLEEVE TOOL CD322**
- **DIAL INDICATOR**
- **SEAL COMPRESSION TOOL CD331**
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1. Usually the nozzle valve can easily be pulled out of the nozzle body with the fingers, Figure 1-15. In some cases, however, it may be necessary to soak the nozzle assembly in carbon solvent, such as Bendix Speed Clene, Figure 1-16, before removal is possible. Place clean soft rag or felt pad in the bottom of the solvent container to prevent the polished surfaces of the nozzle from coming into contact with the metal container. Do not place any other parts in the container.

2. Do not Attempt to Drive the Valve out or Pull it out with Pliers. You will damage it beyond repair. Prevent the polished surfaces of the nozzle body from coming into contact with any hard substances.

Nozzles that cannot be readily disassembled after soaking in carbon solvent should be placed in the CD-534 Hydraulic Nozzle Extractor, Figure 1-17. The CD-534 Hydraulic Nozzle Extractor can be installed on either the Bacharach or American Bosch Nozzle test stand. The nozzle extractor utilizes the hydraulic pressure developed by the nozzle test stand to force the nozzle valve out of the nozzle body.

To use the CD-534 Nozzle Extractor on a Bacharach Test Stand:

a. Remove N-1 connector tube and N-7 Nut from test stand.

b. Install the stuck nozzle assembly in the extractor, Figure 1-17.

c. Install the nozzle extractor on the test stand, Figure 1-18.

d. Operate the test stand hand lever and build up pressure in the nozzle extractor to free stuck nozzle valve. A free nozzle will be indicated by a sudden pressure drop on the test stand pressure gauge.
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INTRODUCTION

The remote hydraulic control valves are located on the top of the torque tube cover. The "stack up" of two valves can be used with two double acting, one double acting or one single acting and one double acting cylinders. The single acting cylinder can only be used with the bottom valve by removing a plug from the manifold as described under oil flow on Page D-8. When a single acting cylinder is used the upper valve must always be in the neutral position to allow the return oil to return to sump for the lower valve and cylinder to operate.

If two hydraulic remote valves are used with the Draft-O-Matic Valve, the oil supply is always through the lower valve to the upper valve and then to the Draft-O-Matic valve, back through the filter and into the reservoir. Therefore, each system works independently with the oil demands of the remote valve with the least resistance at the portable cylinder being filled first. The remote valve with the greater resistance second and Draft-O-Matic third.

The valves are made up of two major components:

The valve bodies are cast in one piece and are cored and drilled to provide for both inlet and return oil. Cored and drilled passages also direct the oil to and from the cylinders and back to the reservoir.

The valve spools contain lands and grooves to obtain metering control of the load. The spools control and direct the flow of pressurized oil to and from the portable cylinders as well as redirecting the oil back to the reservoir. The spools are three position spools, Extend, Neutral and Retract. The spools are moved manually by the operator to either the extend or retract positions and are automatically returned to neutral by a centering spring.

The Drop Check Valve function is to prevent hydraulic oil from flowing back to the pump as the spools are moved from or through the neutral positions.

The Hydraulic Pump is located under and mounted to the torque tube cover. The pump operates continuously when the engine is running and is driven by the power train. For servicing of the pump refer to Section "R" Draft-O-Matic.

OIL FLOW

(Refer to Figure D-1)

Hand Levers Neutral-Spools Neutral

With both valve spools in the neutral positions, the oil from the pump comes up through the torque tube cover, into the lower valve. The oil then flows around the groove in the lower spool to the upper valve. The oil coming into the upper valve flows around the groove in the upper spool into the valve cover. From the valve cover the oil flows out through the Draft-O-Matic system, back through the oil filter into the reservoir.
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## SPECIAL TOOLS

The special clutch adjusting tool G15048 is used with the special splined gauge, with 21 splines.

- **A37956 GAUGE**
- **G15048 TOOL**

This special sleeve, A38461, is used to protect the seal when installing the bearing carrier.

- **A38461 TOOL**

These tools and the gauge are available through service parts supply, J I Case Co.
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INTRODUCTION

Section F contains the specifications and wiring diagrams necessary to diagnose and make
minor adjustments on the electrical components on the Case Wheel Tractors.

All major adjustments and overhaul of electrical components should be performed by an
Authorized Electrical Service Station (Delco-United Motors Service or Auto-Lite Service
Stations) where specialized equipment and trained personnel are available.

DO NOT ATTEMPT EVEN MINOR ELECTRICAL ADJUSTMENTS WITHOUT THE AID OF
PROPER TEST EQUIPMENT

NOTE Gas engines before Serial No. 8233766 and Diesel engines before Serial No. 8232882
used a positive grounded system. These Serial Numbers and after use a negative
grounded system.

BATTERY SERVICE AND INSPECTION

IMPORTANT Working with storage batteries all exposed metal surfaces are "live". Never
lay a metal object on top of a battery as a short circuit may result. Sparks or open flame must
be kept away from batteries due to the presence of explosive gas in and around the batteries
while they are being charged or in use.

The sulfuric acid or electrolyte present in a battery is very harmful to your eyes, skin and
clothing. If contact is made with it, wash it with a weak solution or baking soda and water. This
will neutralize the acid.

Visual Inspection

Check the battery terminals and cables for dirty or corroded conditions which will cause
high resistance, resulting in undercharged batteries and very poor cranking speed.

The battery tray, holdown terminals and cable ends must be cleaned when contaminated with
baking soda and water. This will help to prevent self discharge of batteries. After cleaning and
drying a thin coating of vasoline, light cup grease or paint will help prevent contamination.

A cracked or leaking battery case will let the electrolyte leak out and cause damage to the
equipment, a battery in this condition should be replaced. When just the top sealing compound
is leaking the battery can be resealed.

Vent holes in the filler caps should always be kept open to let the battery gases escape. Never
remove battery caps except to add water.

The electrolyte level should be checked each week. Never let the level drop to a point where
the plates are exposed. Pure or distilled water should only be added when the electrolyte level
is low. DO NOT OVERFILL, refer to Figure F-1.

Normal water consumption would be approximately 1 oz. every 60 hours of operation. If it is
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