

# 9030 BIDIRECTIONAL™ TRACTOR SERVICE MANUAL CONTENTS

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SERIAL NUMBER INFORMATION

This service manual refers to serial number breaks at various times throughout the text. It is important to understand the order in which 9030 Bidirectional tractors were built. The following chart shows how 9030 tractors were built in the following ranges based on year of production:

## SERIAL NUMBER RANGE YEAR OF PRODUCTION

0470100 - 0479999	1991
0487501 - 0489999	1992
0932000 - 0939999	1993
0200000 - AND ABOVE	1994 AND ON

An example of correctly identifying a unit follows:

The text reads "units built after *S/N* 0200234 ..... " The tractor being repaired is *S/N* 0487698. 0487698 is a tractor built **before** *S/N* 0200234 and will not *have* the component or feature described in the text.

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# **SECTION 1**

## **ENGINE SYSTEMS**

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# SECTION 1

## ENGINE SYSTEMS

### DIESEL ENGINE

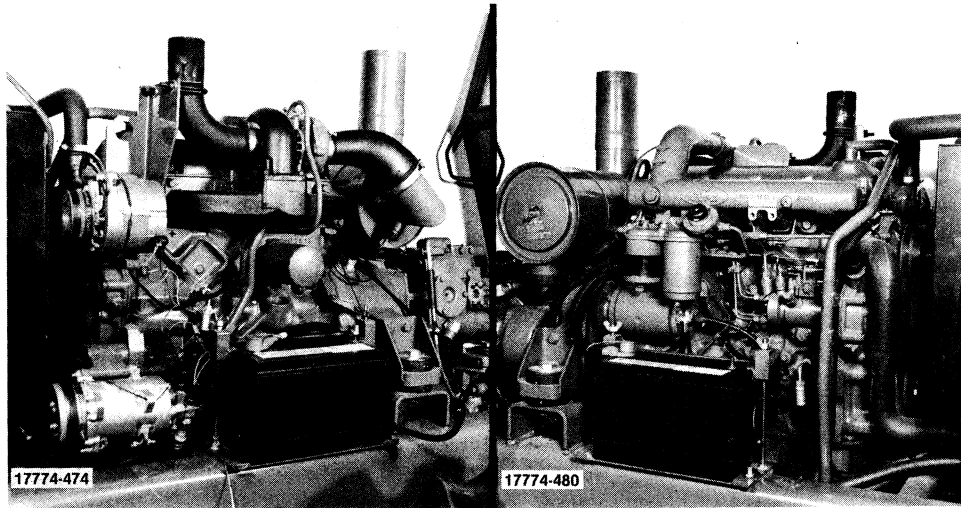


Figure 1-1

**Four Cylinder Engine — Left Side**  
*SHIELDS REMOVED FOR CLARITY*

**Four Cylinder Engine — Right Side**  
*SHIELDS REMOVED FOR CLARITY*

#### DESCRIPTION AND OPERATION

This section describes the overhaul and repair of the 4-cylinder direct injection diesel engine.

**NOTE:** The engine used in the 9030 tractor is of special manufacture. A “BSD” engine is NOT to be used in a 9030. See S/B 4/92-G12 for further information on engine differences between a 9030 and a BSD engine.

The engine, Figure 1-1, features a cross flow cylinder head with the inlet and exhaust manifolds on opposite sides of the head. The combustion chamber is formed in the crown of the piston which has two compression and one oil control ring all located above the piston pin.

The cylinder head assembly incorporates the valves, valve springs, and the spring retainers. Valve guides are an integral part of the cylinder head with replaceable valve seats pressed into the valve ports. Valve guides are not replaceable.

#### Cylinder Head Assembly

The cylinder head assembly incorporates the valves, valve springs, and rotators. The valve rocker arm shaft assembly is bolted to the cylinder block, through the head. The intake and exhaust manifolds are bolted to the head, the intake on the right side, and the exhaust on the left. The water outlet connection and thermostat are attached to the front of the cylinder head.

Valve guides are integral with the cylinder head, and valves with oversize stems are available for service. Special replaceable cast alloy valve seats are pressed into each valve port, and exhaust valves are fitted with positive valve rotators. The valves use umbrella-type seals.

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