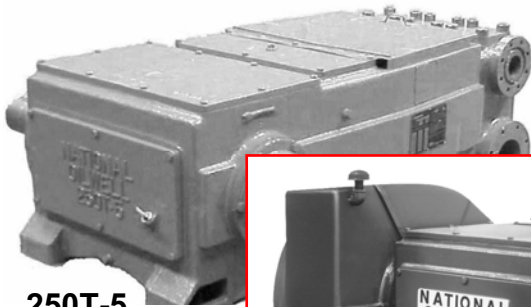


# Reciprocating Plunger Pumps

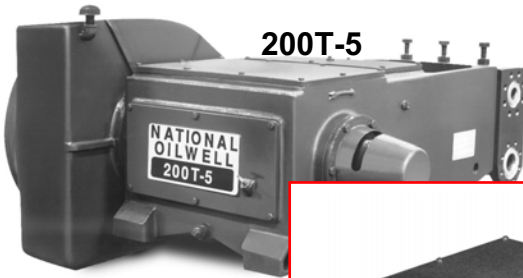
## Installation, Care and Operation Manual



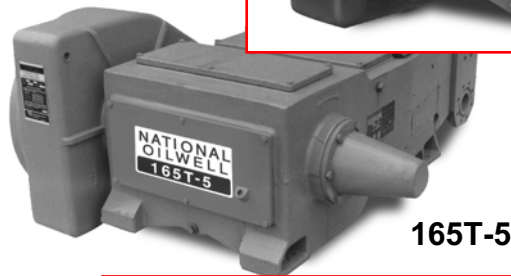
**300Q-5**



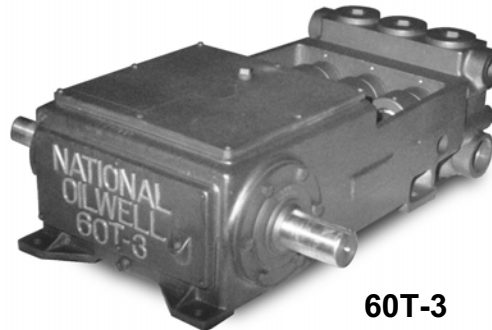
**250T-5**



**200T-5**



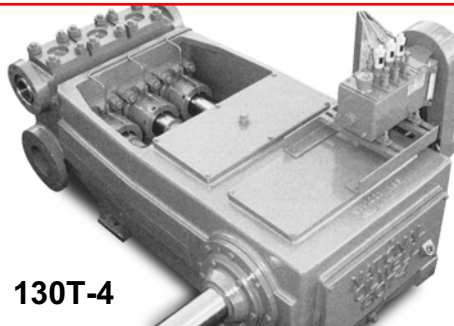
**165T-5**



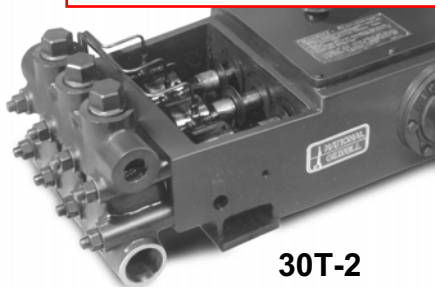
**60T-3**



**80T-3**



**130T-4**



**30T-2**



**100T-4**

Covering the following pumps:

- 30T-2**
- 60T-3**
- 80T-3 Atex Certified**
- 100T-4**
- 130T-4**
- 165T-5**
- 200T-5 Atex Certified**
- 250T-5**
- 300Q-5 Atex Certified**

Sales / Technical Information

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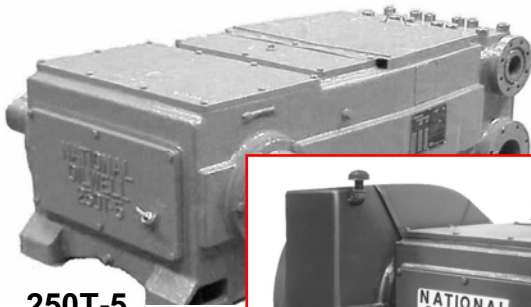
REVISED: August 27, 2010

# Reciprocating Plunger Pumps

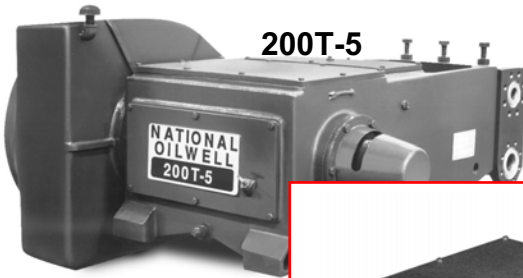
## Installation, Care and Operation Manual



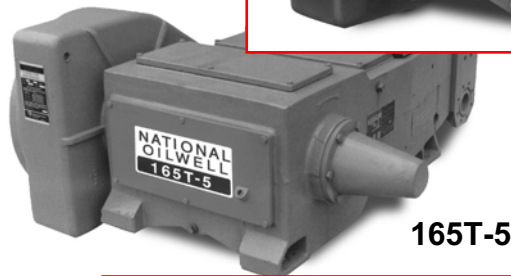
**300Q-5**



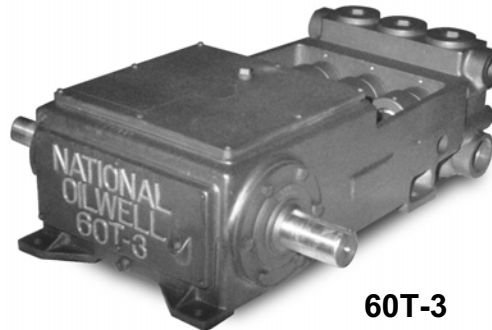
**250T-5**



**200T-5**



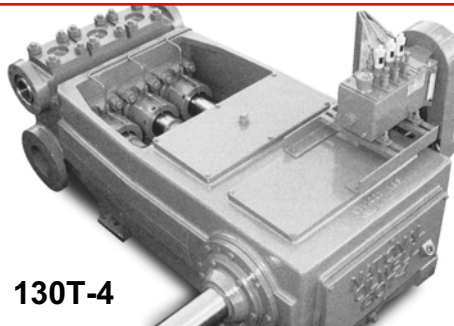
**165T-5**



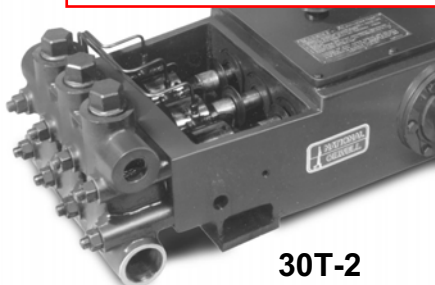
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REVISED: August 27, 2010

**! WARNING !**

**PRESSURE**

**RELIEF**

**VALVES**

**! NOTICE !**

Our technical publications relative to reciprocating pumps state that pressure relief valves must be installed in the discharge systems from these units. This supplement is issued to emphasize the importance of relieving the discharge system of all pressure which exceeds the rated working pressure applied by the manufacturer to the specific pistons and liners (or plungers and packing) in any particular unit.



## **! WARNING !**



For the protection of persons and property the discharge system from each Reciprocating Pump must be equipped with a device which relieves the system of all pressures which exceed the pressure rating applied by the manufacturer to each particular piston or plunger diameter. Allowances will be made for pressure surges which are inherent with the reciprocating action of piston and plunger pumps. The percentage of pressure allowance appears later in this publication and in the "Standards of the Hydraulic Institute" (13<sup>th</sup> edition).

The relieving device must provide for instantaneous pressure relief, it may be a valve designed for automatic or manual resetting; however, if preferred, rupture discs or burst discs may be installed.

FAILURE to comply with the procedures outlined in the Warning may result in damage to the pump and related equipment and more importantly may cause serious bodily injury or death!

### THE PRESSURE RELIEF VALVE:

1. This valve must be a full opening type.
2. It must have a working pressure rating, equal to or greater than, the maximum working pressure of the pump.
3. The through capacity of the valve, when fully opened, must be sufficient to relieve the full capacity of the pump without excessive overpressure.
3. The relief valve must be between the pump fluid end and any valve in the discharge system.
4. There must be no restricting device(s) between the relief valve and the pump fluid end.

### RUPTURE DISC OR BURST DISC:

1. These discs must have a diameter which is not less than the pipe size of the pressure relief flange.
2. These discs must have a rupture or burst pressure rating consistent with the specifications tabulated later in this publication.
1. The relief valve discharge line should not terminate in the pump suction line.
2. The line should terminate in the supply tank, if possible.
3. The line must be securely anchored.
4. The line must be the same pipe size as, or may be larger than, the discharge connection on the relief valve.
5. If the line is of great length, this must be taken into consideration in sizing the relief valve.
6. There must be no restrictions or valves in the relief valve discharge line.

### LOCATION OF THE RELIEF VALVE:

1. The relief valve must be placed in the discharge line as close as possible to the pump fluid end or it may be mounted on the pump discharge manifold.
2. The relief valve must be on the pump side of any discharge strainer.

NOTE: Follow the foregoing instructions if rupture discs or burst discs are installed.

### SUGGESTED SET PRESSURES FOR THE PUMP RELIEF VALVES:

#### PUMP TYPE:

Double Acting – Duplex  
 Double Acting – Triplex  
 Double Acting – Quintuplex  
 Single Acting – Triplex  
 Single Acting – Simplex  
 Single Acting – Duplex  
 Single Acting – Triplex  
 Single Acting – Quintuplex  
 Single Acting – Septuplex

Note: The above set pressures are to be observed when installing rupture discs or burst discs.

#### OPERATING PUMP PRESSURE:

Piston Pressure Rating – Plus 25%  
 Piston Pressure Rating – Plus 10%  
 Piston Pressure Rating – Plus 10%  
 Piston Pressure Rating – Plus 10%  
 Plunger Pressure Rating – Plus 25%  
 Plunger Pressure Rating – Plus 20%  
 Plunger Pressure Rating – Plus 10%  
 Plunger Pressure Rating – Plus 10%  
 Plunger Pressure Rating – Plus 10%

## Foreword...

This manual is published as a guide for the normal operation of your **NATIONAL OILWELL VARCO** equipment. Because of the many factors which contribute to the function or malfunction of this machinery, and not having complete knowledge of each factor or combination of factors, we cannot detail all facets of this subject. We must therefore confine the scope of this presentation and when situations encountered are not fully encompassed by complete, understandable instructions, these situations must be referred to the manufacturer.

When other than routine servicing is necessary, it can be most efficiently performed if the unit is removed to an area of adequate space where an over-head crane, hydraulic lift, bearing pullers, impact tools, etc., are accessible.

The dimension and tolerances specified in this publication are those desirable for the most efficient operations of the equipment. When components become worn or when new parts are introduced into a worn unit, it may not be possible or economically feasible to reestablish such strict alignment and correct all dimensional deviations.

Improvements in design, engineering, materials, production methods, etc., may necessitate changes in these products and result in inconsistencies between the content of this publication and the physical equipment. We reserve the right to make these changes without incurring any liability or obligation beyond that which is stipulated in the purchase contract.

*The pictures, photographs, charts, diagrams, drawings, verbal contents and specifications are not to be construed as giving rise to any warranty on the part of NATIONAL OILWELL VARCO. National Oilwell Varco makes no warranty, either expressed or implied beyond that which is stipulated in the purchase contract.*

**NATIONAL OILWELL VARCO** pumps are manufactured by National Oilwell Varco at the McAlester, Oklahoma plant. The serial number, assigned each pump is stamped on the power end. Please refer to this serial number when ordering parts for the pump.

The right and left sides of the pump are determined by viewing the pump from the back of the power end, looking toward the fluid end. This position is also used to identify the plungers and their related parts as being number one, two and three, beginning at the left side of the pump.

 **! CAUTION ! CAUTION ! CAUTION !** 

EXERCISE SAFETY IN ALL PERFORMANCES: DO NOT IGNORE ANY WARNINGS; USE ONLY APPROVED METHODS, MATERIALS AND TOOLS. DO NOT PERMIT ANY FUNCTION OF QUESTIONABLE SAFETY; ACCIDENTS ARE CAUSED BY UNSAFE ACTS AND UNSAFE CONDITIONS. SAFETY IS YOUR BUSINESS AND YOU ARE INVOLVED.

 **! WARNING ! WARNING ! WARNING !** 

*BEFORE PERFORMING ANY SERVICE FUNCTION, BE CERTAIN THAT THE UNIT IS SEPARATED FROM ITS POWER SOURCE OR THAT THE POWER SOURCE IS LOCKED-OUT TO PREVENT ANY FORM OF ENERGY FROM ENTERING THE EQUIPMENT. THIS WOULD INCLUDE ELECTRICAL OR MECHANICAL ENERGY INTO OR FROM THE PRIME MOVER(S), PNEUMATIC ENERGY FROM THE COMPRESSOR/AIR SYSTEM, ETC.*

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