NACOL Hydraulic Accumulators

Quality Assurance Guaranteed by ISO 9001 Certification

Manufactured to meet A.S.M.E. and other worldwide standards.

Unique design covered by 82 worldwide patents.

The accumulator that is designed and made to last longer.

The only complete line of "Top Loading" accumulators from 5 cubic inches to 40 Gallons.

Wilkes & McLean Ltd.
600 Estes Avenue
Schaumburg, IL 60193
Voice: 847-534-2000
Fax: 847-534-2016
NACOL Accumulators - designed and made to last longer.

NACOL's commitment to the U.S.A. Accumulator market:
"All 3000 PSI accumulator sizes up to 15 gallons will always be in stock for immediate delivery." NACOL guarantees that Wilkes & McLean Ltd., their master distributor in the U.S.A., will stock all accumulator sizes in the 3000 P.S.I. line from 5 cubic inches to 15 gallons. In addition all replacement parts for all sizes will be readily available for shipment.

Please call Wilkes & McLean at 1-708-860-0260 for free technical assistance for any accumulator application or problem.

7 Reasons to Choose NACOL's Exclusive Patented Design:

1. Fire Fuse
2. Top Loading
3. Safety Vent
4. One Piece Pleated Bladder
5. Acrylic Coated Shell
6. Cushion Cup
7. High Flow Spring

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Definitions and illustrations of accumulator industry terms.
Terms you should know if you use accumulators.

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Dimensions and Sizes

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</table>
"Top Loading" means the bladder can be taken out from the top of the accumulator if bladder repair is ever necessary.

Changing a bladder is as easy as 1, 2, 3, with "Top Loading" accumulators.

1. Remove Top

2. Take out bladder

3. Replace bladder

"Top Loading" is an accumulator specification that will save you the most maintenance time and money.

Changing a NACOL "Top Loading" accumulator bladder is as easy as the three pictures shown at the left.

However with "Bottom Loading" accumulators, the entire accumulator must first be removed from the system. The larger size accumulators weigh over 300 lbs., so removing the accumulator from the system is no easy matter.

In addition to the weight of the accumulator to consider, it is also often necessary to drain the entire hydraulic system so all of the oil does not leak out of the tank once the accumulator is removed.

After all of that is done, the difficult job of removing the bladder from the bottom of the accumulator has just begun.
"Top Loading" for Small Accumulators

NACOL is the only company that makes "Top Loading" accumulators in these small sizes. (In addition to 2½ Gallon to 40 Gallon)

3000 PSI Accumulators
"Top Loading" Small Sizes:
⅛ Pint, 1 Pint, 1 Quart, ½ Gallon, 1 Gallon, 1½ Gallon.

5000 PSI Accumulators
"Top Loading" Small Sizes:
1 Quart, ½ Gallon, 1 Gallon, 1½ Gallon.

400 PSI Mobile Type Accumulators
"Top Loading" Sizes:
½ Pint, 1 Pint, 1 Quart.
"Pinched Bladder"

One of the major causes of accumulator failure.

Competitor's design

What causes "Pinched Bladder"?
As oil flows out of the accumulator, the bladder comes in contact with the poppet at the bottom of the accumulator. The bladder starts to close the poppet which is being held open by a spring.

This photograph illustrates how the bladder can flow under the poppet while fluid is flowing out of the accumulator.

The bladder wraps around the poppet and forces the poppet down. Then the poppet closes on the bladder, pinching the bladder, causing a cut which results in accumulator failure.

NACOL'S design

Why "Pinched Bladder" will never occur on a NACOL accumulator.
When oil flows out of the NACOL accumulator, the bladder expands and comes in contact with the large rubber cushion cup riveted to the top of the poppet.

This is a photograph of the oil port housing removed from the accumulator. Here it is possible to see the large piece of rubber on top of the poppet called the Cushion Cup.

Flexing of the large rubber cushion cup prevents the bladder from bulging around and under the poppet. Therefore, the NACOL bladder can never be pinched by the poppet. This patented feature eliminates one of the major causes of accumulator failure.
"Preclosure" happens when an accumulator shuts itself off, trapping oil inside the accumulator, resulting in decreased oil volume out of the accumulator.

How "Preclosure" happens.

As oil starts to discharge from the accumulator, there is a pressure drop across the poppet at the bottom of the accumulator. The flow results in a greater pressure on the top of the poppet. The higher pressure on top the poppet combined with the oil flow around the poppet tends to slam the poppet shut before all of the oil has discharged from the accumulator. This is called "Preclosure". The result is that much of the oil is trapped inside the accumulator.

The NACOL accumulator uses a much stronger poppet spring to hold the poppet open. So even though there is a pressure drop across the poppet, the spring holds the poppet open until all of the oil has been discharged from the accumulator. The net result is that you get full oil discharge from the NACOL accumulator.
NACOL'S "Fire Fuse" prevents accumulator explosions in the event of fire or high heat, protecting your investment and your business.

A fire safety fuse, built into the NACOL charging valve, melts in case of fire and vents the accumulator gas charge.

The patented NACOL charging valve contains a fire fuse which melts to vent the nitrogen gas in case of a fire or extreme heat. Accumulator users always fear an accumulator explosion in case of fire because the gas pressure builds up as the temperature increases. If the nitrogen is not vented, the high pressure gas could cause an explosion.

Some of the latest code regulations state that all accumulators must have some form of fire protection. NACOL meets all fire safety standards.

Trapped expanding Nitrogen gas, due to heat, can cause an explosion in an accumulator that has no fire safety protection.
"Pleated Bladder"

Longitudinal pleats in the NACOL bladder cause it to compress "Star Shaped", which gives you longer bladder life.

**NACOL'S design**

The NACOL Bladder is never subject to uncontrolled deformation and twisting during compression. The patented bladder compresses star shaped while in the center of the accumulator. The bladder does not rub the inside of the shell, and therefore has much longer life.

**Competitor's design**

The bladder in conventional accumulators is subject to uncontrolled twisting and turning while it is being compressed toward the top of the accumulator. The twisting and turning can cause the bladder seams to rupture. The bladder also rubs on the inside of the accumulator during compression, thus causing bladder wear.
"Horizontal Mounting"

Most accumulators are mounted vertically. Here is why you can mount NACOL horizontally.

When mounted horizontally, the conventional accumulator bladder elongates and falls to the bottom of the accumulator. During discharge the distorted bladder rubs against the bottom of the tubing.

The picture to the left is of the inside of a competitor's accumulator tube. The rough spots that are evident will cause excessive bladder wear, especially if the accumulator is mounted horizontally.

The interior tube of the NACOL accumulator is ground, heat treated, shot blasted and then coated with a white acrylic resin for a smooth surface. The picture to the left is of the interior of the NACOL accumulator. This smooth acrylic coating is standard on all NACOL accumulators 1½ gallon and larger. Less friction increases bladder life, under all operating conditions especially when the accumulator is mounted horizontally.

The Cushion Cup and stronger poppet spring also play an important role in the ability of the NACOL accumulator to operate when mounted horizontal.

Accumulators are usually mounted horizontally because of space limitations. Other times it is just more economical to mount the accumulator horizontal. NACOL's design features mentioned above make it the obvious choice when horizontal mounting is necessary.
"Bladder Failure"

Many bladders fail in the seams. That is why NACOL makes a seamless bladder.

Most large accumulator bladders are made of three or four pieces that are vulcanized together. Often pin hole leaks develop at the seams, causing loss of the entire nitrogen charge. The entire bladder can even separate at these seams. Most accumulator users are familiar with this type of failure.

The NACOL bladder is moulded in one piece to prevent seam leakage and bladder failure at the seams. In some sizes the very bottom of the bladder is moulded as a second piece in order to make the bottom much thicker. By eliminating the three or four piece bladder, NACOL has eliminated a major cause of accumulator failure.
“Accumulator Specifications”

Specifying "Top Loading" can cause maintenance problems, because not all "Top Loading" accumulators are equal.

**Typical Competitors Design**

At the top of the accumulator there are two nuts.

Remove one nut and the bladder falls into the accumulator.

Or, remove the second nut and the entire assembly falls into the accumulator.

**NACOL's Design**

The NACOL accumulator top is held in place by one nut.

The nut and top cover are larger than the opening, so it is impossible for them to fall into the accumulator.

The bladder is held in place by a shoulder that keeps it from falling once the top is removed.

The basic idea behind the design of the top loading accumulator is that the bladder can be replaced without removing the accumulator from the hydraulic line. That saves maintenance time. However, many accumulator users have discovered that some top loading accumulators actually cause additional maintenance time because the bladder and the top parts fall into the accumulator during repair time. Once the parts fall into the accumulator, the unit must be removed from the hydraulic line in order to retrieve the parts.

The bladder in the NACOL sits on a large shoulder that makes it impossible for it to fall into the accumulator once the top is removed.

Another important feature of the NACOL accumulator top assembly is the "Safety Vent". The "Safety Vent" will vent any remaining nitrogen precharge as the top nut is loosened.

The more you know about internal accumulator design, the more reasons you have to specify NACOL.
# 3000 P.S.I. Accumulators

## ½ Pint to 40 Gallons

### Water Service Construction:
For a wide selection of water service accumulators see NACOL’s bulletin on stainless steel accumulators.

![Diagram of Internal Designs]

### Design Details:
The internal designs illustrate the following construction features:
- The cushion cup is only used on the ½ gallon and larger.
- The oil port housing is part of the accumulator shell on the ½ pint to 1 gallon.
- Accumulator shells are uncoated on sizes ½ pint to 1 gallon, and have a heat hardened acrylic resin coating on sizes ½ gallon to 40 gallon.

### 3000 P.S.I. Accumulators: ½ Pint to 40 Gallons

<table>
<thead>
<tr>
<th>Internal Design #</th>
<th>Nominal Size</th>
<th>Model Number</th>
<th>Actual Size Gallons</th>
<th>Actual Size Cu. In</th>
<th>Weight Lbs.</th>
<th>Dimensions: Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>½ Pint</td>
<td>J250-01D</td>
<td>0.02</td>
<td>4.9</td>
<td>4.4</td>
<td>A: 1.26 C: 2.84 D: 3/8” NPT X: 1⅛”-12</td>
</tr>
<tr>
<td>1</td>
<td>1 Pint</td>
<td>J250-05D</td>
<td>0.12</td>
<td>28</td>
<td>12</td>
<td>A: 1.73 C: 3.80 D: ½” NPT X: 1⅝”-12</td>
</tr>
<tr>
<td>2</td>
<td>1 Quart</td>
<td>R210-1D</td>
<td>0.28</td>
<td>64</td>
<td>15</td>
<td>A: 2.40 C: 4.50 D: 1⅛” NPT X: 1⅜”-12</td>
</tr>
<tr>
<td>½ Gal.</td>
<td>R210-2.5D</td>
<td>0.71</td>
<td>163</td>
<td>29</td>
<td>37</td>
<td>A: 2.40 C: 5.51 D: 1¼” NPT X: 1½”-12</td>
</tr>
<tr>
<td>1 Gal.</td>
<td>R210-4D</td>
<td>1.08</td>
<td>250</td>
<td>37</td>
<td>56</td>
<td>A: 2.40 C: 5.51 D: 1¼” NPT X: 1½”-12</td>
</tr>
<tr>
<td>4</td>
<td>5 Gal.</td>
<td>N210-20D</td>
<td>5.68</td>
<td>1312</td>
<td>187</td>
<td>A: 3.03 C: 10.54 D: 2” NPT X: 1½”-12</td>
</tr>
<tr>
<td>4</td>
<td>7½ Gal.</td>
<td>N210-30D</td>
<td>7.27</td>
<td>1678</td>
<td>248</td>
<td>A: 3.03 C: 10.54 D: 2” NPT X: 1½”-12</td>
</tr>
<tr>
<td>4</td>
<td>10 Gal.</td>
<td>N210-40D</td>
<td>9.54</td>
<td>2227</td>
<td>308</td>
<td>A: 3.03 C: 10.54 D: 2” NPT X: 1½”-12</td>
</tr>
<tr>
<td>4</td>
<td>12½ Gal.</td>
<td>N210-50D</td>
<td>12.97</td>
<td>2996</td>
<td>395</td>
<td>A: 3.03 C: 10.54 D: 2” NPT X: 1½”-12</td>
</tr>
<tr>
<td>4</td>
<td>15 Gal.</td>
<td>N210-60D</td>
<td>14.32</td>
<td>3307</td>
<td>419</td>
<td>A: 3.03 C: 10.54 D: 2” NPT X: 1½”-12</td>
</tr>
<tr>
<td>4</td>
<td>30 Gal.</td>
<td>N210-120D</td>
<td>28.51</td>
<td>6884</td>
<td>794</td>
<td>A: 3.42 C: 14.01 D: 2½” NPT N.A.</td>
</tr>
<tr>
<td>4</td>
<td>40 Gal.</td>
<td>N210-160D</td>
<td>40.24</td>
<td>9294</td>
<td>1090</td>
<td>A: 4.69 C: 16.01 D: 3” NPT N.A.</td>
</tr>
</tbody>
</table>

**Max. Flow**

**Charging valve thread on top of accumulator is ½”-20. A .305-32 UNF type thread available on request. A NV-3 type charging valve is necessary for charging std. accumulators, see page 15 for details. Actual size is the internal volume of the shell less the volume occupied by the bladder.**

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*Max. flow based on vertical installation.

**X alternate port SAE O-Ring type.
5000 P.S.I. Accumulators
1 Quart to 15 Gallons

Construction Details:
The internal designs illustrate the following construction features:
- The cushion cup is only used on the 1½ gallon and larger.
- The oil port housing is part of the accumulator shell on the 1 quart to 1 gallon.
- Accumulator shells are uncoated on the 1 quart to 1 gallon, and have a heat hardened acrylic resin coating on sizes 1½ gallon to 15 gallon.

5000 P.S.I. Accumulators: 1 Quart to 15 Gallons

<table>
<thead>
<tr>
<th>Internal Design #</th>
<th>Nominal Size</th>
<th>Model Number</th>
<th>Actual Size Gallons</th>
<th>Actual Size Cu. In.</th>
<th>Weight Lbs.</th>
<th>DIMENSIONS - Inches</th>
<th>Max Flow*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1 Quart</td>
<td>R350-1D</td>
<td>0.28</td>
<td>67</td>
<td>13.04</td>
<td>A 2.60 B 5.00 C 1½ D E 1½-12</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>½ Gal.</td>
<td>R350-2.5D</td>
<td>0.69</td>
<td>159</td>
<td>17.21</td>
<td>A 2.60 B 6.00 C 1½ D E 1½-12</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>1 Gal.</td>
<td>R350-4D</td>
<td>1.11</td>
<td>256</td>
<td>22.85</td>
<td>A 2.60 B 6.00 C 1½ D E 1½-12</td>
<td>32</td>
</tr>
<tr>
<td>3</td>
<td>1½ Gal.</td>
<td>A350-6.3D</td>
<td>1.82</td>
<td>421</td>
<td>22.77</td>
<td>A 2.25 B 2.25 C 8.52 D E 1½-12</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>2½ Gal.</td>
<td>A350-10D</td>
<td>2.65</td>
<td>659</td>
<td>29.47</td>
<td>A 2.25 B 2.25 C 8.52 D E 1½-12</td>
<td>75</td>
</tr>
<tr>
<td>4</td>
<td>5 Gal.</td>
<td>N350-20D</td>
<td>5.36</td>
<td>1239</td>
<td>31.59</td>
<td>A 3.15 B 3.03 C 11.76 D E 1½-12</td>
<td>159</td>
</tr>
<tr>
<td></td>
<td>7½ Gal.</td>
<td>N350-30D</td>
<td>8.03</td>
<td>1855</td>
<td>41.25</td>
<td>A 3.15 B 3.03 C 11.76 D E 1½-12</td>
<td>159</td>
</tr>
<tr>
<td></td>
<td>10 Gal.</td>
<td>N350-40D</td>
<td>10.49</td>
<td>2423</td>
<td>49.72</td>
<td>A 3.15 B 3.03 C 11.76 D E 1½-12</td>
<td>159</td>
</tr>
<tr>
<td></td>
<td>12½ Gal.</td>
<td>N350-50D</td>
<td>14.03</td>
<td>3241</td>
<td>62.40</td>
<td>A 3.15 B 3.03 C 11.76 D E 1½-12</td>
<td>159</td>
</tr>
<tr>
<td></td>
<td>15 Gal.</td>
<td>N350-60D</td>
<td>15.67</td>
<td>3619</td>
<td>67.84</td>
<td>A 3.15 B 3.03 C 11.76 D E 1½-12</td>
<td>159</td>
</tr>
</tbody>
</table>

*Max. flow based on vertical installation.

Charging valve thread on top of accumulator is G¾-150.
A NV-5 type charging valve is necessary for charging std. accumulators, see page 15 for details.
Actual size is the internal volume of the shell less the volume occupied by the bladder.
400 P.S.I. Accumulators

1/2 Pint, 1 Pint, 1 Quart.

Guaranteed to last longer than any other accumulator. A top repairable accumulator priced at below "throw away accumulator" prices.

- Immediate delivery on any quantity in all sizes.
- Priced lower than "throw away" accumulator prices.
- Light weight, no supports required.
- Standard bladder has a wide temperature range for outdoor applications.
- Free test samples available to qualified users for comparison testing.

Quality features include:
1. Cold drawn aluminum body gives a smooth surface for bladder contact.
2. Heavy duty, thick bladder to lessen nitrogen permeability.
3. Diaphragm type design gives maximum displacement with very little bladder flex.
4. Poppet moulded in bladder prevents bladder extrusion at both bottom and top.
5. Straight thread oil port.
6. O-ring seal prevents nitrogen leakage.
7. Safety vent automatically vents nitrogen during disassembly.
8. One-piece moulded bladder to prevent bladder seam problems.
9. Top repairable for easy maintenance.
10. Can operate without Nitrogen precharge and not damage the bladder.

400 P.S.I. Accumulators: 1/2 Pint, 1 Pint, 1 Quart

<table>
<thead>
<tr>
<th>Nominal Size</th>
<th>Model Number</th>
<th>Actual Cu. In.</th>
<th>Weight Lbs.</th>
<th>Dimensions A x D x E</th>
<th>Max. Flow GPM In/Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 Pint</td>
<td>D30-03</td>
<td>18.18</td>
<td>3.0</td>
<td>5.15 x 4.56 x 7/8-14</td>
<td>11</td>
</tr>
<tr>
<td>1 Pint</td>
<td>D30-05</td>
<td>26.54</td>
<td>4.0</td>
<td>5.98 x 5.11 x 11/16-12</td>
<td>18</td>
</tr>
<tr>
<td>1 Quart</td>
<td>D30-1</td>
<td>60</td>
<td>6.0</td>
<td>22.85 x 5.11 x 11/16-12</td>
<td>18</td>
</tr>
</tbody>
</table>
Mounting Clamps

![Image of mounting clamp]

### Accumulator model number & how to order

**Bladder Material**

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Pressure Rating</th>
<th>Size</th>
<th>Oil Port Thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>210</td>
<td>60</td>
<td>D</td>
</tr>
</tbody>
</table>

#### Bladder Materials

- **F**
  - For Petroleum Based Hydraulic Fluid:
    - Prefix | Bladder Material | Operating Temp. |
    - None (std.) | Buna N (std.) | 0°F to 158°F |
    - H | High Temp. Buna N | 0°F to 230°F |
    - L | Low Temp. Buna N | -40°F to +158°F |
  - For Synthetic or Phosphate Ester Fluid:
    - Prefix | Bladder Material | Operating Temp. |
    - F | Butyl | 0°F to 158°F |
    - E | Ethylene Propylene | 0°F to 158°F |

- A special bladder material is required if a special bladder material is required.

#### DIMENSIONS

<table>
<thead>
<tr>
<th>Accumulator Size</th>
<th>Accumulator Pressure</th>
<th>Accumulator Model #</th>
<th>Clamp Model #</th>
<th>D</th>
<th>H</th>
<th>L</th>
<th>Lo</th>
<th>W</th>
<th># Clamps per Acc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Quart</td>
<td>3000 P.S.I.</td>
<td>R210-1</td>
<td>C114</td>
<td>4.49</td>
<td>2.60</td>
<td>3.94</td>
<td>5.24</td>
<td>7.01</td>
<td>1</td>
</tr>
<tr>
<td>1 Quart</td>
<td>5000 P.S.I.</td>
<td>R350-1</td>
<td>C128</td>
<td>5.04</td>
<td>2.83</td>
<td>5.35</td>
<td>6.18</td>
<td>7.64</td>
<td>1</td>
</tr>
<tr>
<td>½ Gal. &amp; 1 Gal.</td>
<td>3000 P.S.I.</td>
<td>R210-2.5 to R210-4</td>
<td>C140</td>
<td>5.51</td>
<td>3.07</td>
<td>5.35</td>
<td>6.34</td>
<td>7.80</td>
<td>1</td>
</tr>
<tr>
<td>½ Gal. &amp; 1 Gal.</td>
<td>5000 P.S.I.</td>
<td>R350-2.5 to R350-4</td>
<td>C152</td>
<td>5.98</td>
<td>3.31</td>
<td>5.83</td>
<td>7.09</td>
<td>8.43</td>
<td>1</td>
</tr>
<tr>
<td>1½ Gal. to 4 Gal.</td>
<td>3000 P.S.I.</td>
<td>A210-6.3 to A210-16</td>
<td>C191</td>
<td>7.52</td>
<td>4.09</td>
<td>5.83</td>
<td>7.28</td>
<td>9.88</td>
<td>2</td>
</tr>
<tr>
<td>5 Gal. to 15 Gal.</td>
<td>3000 P.S.I.</td>
<td>N210-20 to N210-60</td>
<td>C267</td>
<td>10.51</td>
<td>5.59</td>
<td>9.76</td>
<td>11.65</td>
<td>12.91</td>
<td>2</td>
</tr>
<tr>
<td>40 Gal.</td>
<td>3000 P.S.I.</td>
<td>N210-160</td>
<td>C406</td>
<td>15.98</td>
<td>8.30</td>
<td>15.12</td>
<td>18.03</td>
<td>18.43</td>
<td>3</td>
</tr>
</tbody>
</table>

- The prefix indicates the type of accumulator.
- The pressure rating is stated in kgs/cm².
- The conversion to P.S.I. is shown above.
- The model number gives the accumulator size in liters. The conversion to gallons is shown above and also in the accumulator dimensional tables.
- The last letters D or DX indicate the thread in the oil port.
Nitrogen Charging Valves, Hose & Gauge

The NV3 valve and the H10 hose are used for the 3000 P.S.I. accumulators. The NV5 and H50 hose are used for the 5000 P.S.I. accumulators.

The SV1 and the H10 hose are used for the low pressure D30 accumulators and they are also used to charge the 3000 P.S.I. accumulators when the 305-32 UNF type charging valve option is specified.

Pressure Gauge
Model G2.5
(3000 PSI Accumulators)
Model G5.0
(5000 PSI Accumulators)

Charging Valve
Model NV3
(3000 PSI Accumulators)
Model NV5
(5000 PSI Accumulators)
Model G 1/4
(Japan & Europe)

Charging Valve
Model SV1 (D30-450 P.S.I. Accumulators)

Charging Valve Specifications

<table>
<thead>
<tr>
<th>Charging Valve Model Number</th>
<th>NV3</th>
<th>NV5</th>
<th>SV1</th>
<th>G 1/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>U.S.A.</td>
<td>U.S.A.</td>
<td>U.S.A.</td>
<td>Japan &amp; Europe</td>
</tr>
<tr>
<td>Pressure Rating of Accumulator</td>
<td>3000 P.S.I.</td>
<td>5000 P.S.I.</td>
<td>450 P.S.I.</td>
<td>350 kg/cm</td>
</tr>
<tr>
<td>Accumulator Model Series</td>
<td>J250</td>
<td>R350</td>
<td>D30</td>
<td>J50 to J250</td>
</tr>
<tr>
<td></td>
<td>A210</td>
<td>A350</td>
<td></td>
<td>A &amp; R 210 &amp; 230</td>
</tr>
<tr>
<td></td>
<td>R210</td>
<td>N350</td>
<td></td>
<td>N150 to N230</td>
</tr>
<tr>
<td>Charging Valve Thd. on top of Acc.</td>
<td>1/2-20 UNF</td>
<td>G 1/4 ISO</td>
<td>305-32 UNEF</td>
<td>G 1/4</td>
</tr>
<tr>
<td>Gauge Port</td>
<td>1/4&quot; N.P.T.</td>
<td>1/4&quot; N.P.T.</td>
<td>1/4&quot; N.P.T.</td>
<td>1/4&quot; N.P.T.</td>
</tr>
<tr>
<td>Gas Charging Port in Valve</td>
<td>1/4&quot; N.P.T.</td>
<td>1/4&quot; N.P.T.</td>
<td>1/4&quot; N.P.T.</td>
<td>1/4&quot; N.P.T.</td>
</tr>
<tr>
<td>Model Number of Charging Hose</td>
<td>H-10</td>
<td>H-50</td>
<td>H-10</td>
<td>H-10</td>
</tr>
<tr>
<td>Nitrogen Bottle Connection on Hose</td>
<td>CGA - 580</td>
<td>CGA - 680</td>
<td>CGA - 580</td>
<td>V22</td>
</tr>
</tbody>
</table>
Charging an Accumulator

Nitrogen pre-charge pressure
The usual nitrogen pre-charge pressure is 80% of the minimum circuit pressure. As the nitrogen pre-charge percentage increases, more volume will be displaced from the accumulator. It should not be increased above 90% on vertical installations or 85% on horizontal installations. If these recommendations are exceeded then the bladder life is reduced. Bladder damage can occur if nitrogen pre-charge pressure falls below 35% of the maximum working pressure.

Caution!
Never turn the pump on without first pre-charging the accumulator. If the accumulator is pressurized with hydraulic pressure before it is pre-charged with nitrogen, the hydraulic pressure will extrude the bladder out of the hole in the top of the accumulator used for the nitrogen pre-charge.

Charging an accumulator
The NV-3 valve and the H-10 hose are used for the 3000 P.S.I. accumulator. The NV-5 valve and the H-50 hose are used for the 5000 P.S.I. accumulator.

The NV-3 and the NV-5 charging valves thread onto the dynac charging valve in the top of the accumulator. The connection can be made hand tight. Do not use a wrench. A leak proof seal is formed by the compression of the O-ring between the two valves.

The charging hose connects the charging valve to the nitrogen bottle. Turning the "T" handle at the top of the charging valve, pushes the poppet in the dynac valve off of its seat and nitrogen can flow into the accumulator. The nitrogen charge is read on the gauge in the charging valve.

After the accumulator is charged reverse the "T" handle to allow the dynac valve to close.

Now close the shut off valve on the nitrogen bottle. The bleeder valve on the charging valve is now opened to exhaust the nitrogen trapped in the hose. The charging valve should now be removed from the accumulator.

Do not leave the charging valve on the accumulator in an attempt to constantly monitor the pressure because the charging valve in not intended to be a leakproof connection and this practice could result in a pre-charge loss.

Checking the pre-charge.
When checking the pre-charge follow the procedure outlined above only be sure not to have the hose connected to the charging valve. The hose connection on the valve should be capped off. Needlessly filling the hose with nitrogen could reduce the pre-charge pressure.

Charging Procedure
1. Connect hose to charging valve and nitrogen bottle.
2. Hand tighten charging valve to top of accumulator.
3. Open valve on top of nitrogen bottle.
4. Turn T-handle on top of charging valve clockwise to open Dynac valve in accumulator.
5. Read nitrogen pressure on gauge.
6. Reverse T-handle when gauge reads desired pressure.
7. Wait several minutes for nitrogen pressure to stabilize, then repeat steps 4, 5, and 6.
8. After T-handle is completely reversed, close valve at the nitrogen bottle.
10. Remove charging valve and replace gas valve guard on Dynac valve.
NACOL Accumulator Spare Parts

TO ORDER:
Specify model number, part number and name.
For bladders also specify bladder material
(see P.19).

The model numbers to the right require a prefix and a suffix. The prefix specifies special bladder material required if other than standard. The suffix indicates oil port thread type. See page 15 for more information on the accumulator model number and how to order.
Model Number | Nominal Size
---|---
R210-6.3 or R350-6.3 | 11/2 Gallon
R210-10 or R350-10 | 21/2 Gallon
R210-16 | 4 Gallon

Model Number | Nominal Size
---|---
N210-20 or N350-20 | 5 Gallon
N210-30 or N350-30 | 71/2 Gallon
N210-40 or N350-40 | 10 Gallon
N210-50 or N350-50 | 121/2 Gallon
N210-60 or N350-60 | 15 Gallon
N210-120 | 30 Gallon
N210-160 | 40 Gallon

Part | Part Name
---|---
3 | Gas Valve Guard
4 | Gas Valve O-Ring
6 | Top Cover Assembly
7 | Top Cover O-Ring
Part 7 supplied with 10 (bladder)
10 | Bladder
11 | Accumulator Shell

3A | Fuse Packing
4 | Gas Valve O-Ring
4A | Dynac Gas Valve
4B | Dynac Gas Valve Stem
4C | Dynac Gas Valve Spring
4D | Dynac Gas Valve Spring Nut

Part # | Part Name
---|---
1 | Valve Cover
2 | Dirt Cover
3 | Gas Valve Guard
4 | Gas Valve O-Ring
5 | Top Cover Nut
6 | Top Cover Assembly
7 | Top Cover O-Ring
8 | Teflon Seat Ring
9 | Bladder Cap
Part 8 and 9 supplied with 10 (bladder)
10 | Bladder
11 | Accumulator Shell

Bladder Materials
For Petroleum Based Hydraulic Fluid:
Prefix Bladder Material
None (std.) Buna N (std.)
H High Temp. Buna N
L Low Temp. Buna N

For Synthetic or Phosphate Ester Fluid:
Prefix Bladder Material
F Butyl
E Ethylene Propylene

Specify the letter indicating a special bladder material before the accumulator model number.

Oil Port Thread
Suffix Thread Type
D = N.P.T. Port
DX = S.A.E. Straight Thread Port

Specify the letter indicating an oil port thread type after the accumulator model number.
Product Safety is a major concern when buying hydraulic accumulators.

Here is NACOL's formula for a safe accumulator:

Unique Design that Stresses Product Safety + Made to Meet National and Worldwide Safety Standards (see below) + Certified Quality Control (ISO 9001 Certification) = Recognized Worldwide as a Safe, Reliable Accumulator

- 82 Worldwide patents
- ISO 9001 Certification
- Manufactured to A.S.M.E. Code
- Meets German T.U.V. Standard

- Ministry of Transport of Japan
- Ministry of International Trade and Industry of Japan
- American Bureau of Shipping
- Lloyds Register of Shipping
- Sweden's Tryckkarisnomer Standard
- Can meet 13 other standards

Wilkes & McLean Ltd.
600 Estes Avenue
Schaumburg, IL 60193
Voice: 847-534-2000
Fax: 847-534-2016