Compressor Replacement
What is the correct oil amount?
The goal is to maintain the new OEM amount

Common Questions
- Does the new compressor come with Oil?
- Should I add more oil when installing the replacement compressor?

Before we answer these questions let's talk about
- Effect of too little or too much oil
- How oil flows through the system
To much oil will restrict flow through condenser = High pressure reduced cooling
To little oil will decrease lubrication

These images show how small condenser tube passage are, too much oil will greatly restrict refrigerant flow through the tubes.
Not to Much and Not to Little
New System Never Charged With Refrigerant

When the compressor is delivered to the vehicle assembly plant all the oil is contained in the compressor. 10 ounces in this example. The other system components are dry, no oil.

10 ounces of oil (grey area)
Now let's charge the system and start the compressor.

The compressor is lubricated in two ways.
1) By the oil and refrigerant mixture flowing through the compressor.
2) Retained oil inside the compressor that coats the moving parts.

I would like an animation of the oil level dropping by 70% and show refrigerant flowing through the system with gray bubbles representing oil.
Now lets turn off the compressor

3 ounces of oil (grey area)

In this animation the flow through the system stops and the oil falls to the low spots.

At shut down oil settles throughout the system. (7 ounces)
The goal is to maintain the new OEM amount of oil.

In this example the removed compressor contains 3 ounces so the new compressor should have 3 ounces as well. This way we maintain the original 10 ounce oil charge consistent with the new system.

At shut down oil settles throughout the system. (7 ounces)
How do we identify how much oil is in the removed compressor?

Drain and measure the oil amount contained in the old compressor. This amount is what the replacement should contain.

Need a photo of the old dirty compressor
Lets circle back to one of the early questions. Does the new compressor contain oil?

Many compressors builders list the oil amount on the label, but not all. Some may show it on the under hood label.

The best way to determine the amount in the compressor is to drain the new compressor.
Now that we have drained the new compressor and it’s empty. Let’s add oil back to the new compressor in an amount equal to the amount drained from the old compressor.

In our example today we drained 3 ounces from the removed compressor.
Lets look at another example

Typically you’ll want to change the receiver dryer along with the compressor. The dryer cannot be drained of oil, so you have to make an assumption that 2 ounces are held in side the dryer.

3 ounces of oil (grey area)

3 ounce from old compressor plus 2 ounces from dryer is 5 ounces that need to be in the replacement compressor.
There will be instances where other components will require replacement and this table will assist in estimating the oil amounts contained each component.

<table>
<thead>
<tr>
<th>Component</th>
<th>Typical oil amount dual evaporator system</th>
<th>Typical oil amount single evaporator system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor</td>
<td>Equal to amount drained from original compressor</td>
<td></td>
</tr>
<tr>
<td>Suction Line to Front Evaporator</td>
<td>1 oz (30 cc)</td>
<td>½ oz (15 cc)</td>
</tr>
<tr>
<td>Suction Line to Rear Evaporator</td>
<td>3 oz (88 cc)</td>
<td>1 ½ oz (44 cc)</td>
</tr>
<tr>
<td>Receiver Drier</td>
<td>1 oz (30 cc)</td>
<td>½ oz (15 cc)</td>
</tr>
<tr>
<td>Accumulator</td>
<td>3 oz (88 cc)</td>
<td>1 ½ oz (44 cc)</td>
</tr>
<tr>
<td>Evaporator</td>
<td>2 oz (60)</td>
<td>1 oz (30)</td>
</tr>
<tr>
<td>Condenser</td>
<td>2 oz (60)</td>
<td>1 oz (30)</td>
</tr>
<tr>
<td>Other Hoses and Hard Lines</td>
<td>1 oz (30 cc)</td>
<td>½ oz (15 cc)</td>
</tr>
<tr>
<td>Major System Leak</td>
<td>3 oz (88 cc)</td>
<td>1 ½ oz (44 cc)</td>
</tr>
<tr>
<td>Minor System Leak</td>
<td>1 oz (30 cc)</td>
<td>½ oz (15 cc)</td>
</tr>
</tbody>
</table>

At shut down oil settles throughout the system. (7 ounces)
Review

1. The goal is to maintain the original factory oil amount.
2. Either drain and measure removed oil or estimate oil removed.
3. Drain new compressor completely.
4. Fill new compressor with oil amount calculated from step #2.