

Step 2 - Installing the Compression Rings:

The sleeve containing the rings has pockets that are numbered according to which groove they go in starting from the top of the piston and going down. The **Top Ring** (Sleeve #1) is a chrome compression ring (see **Fig. 8**), the **Middle Ring** (Sleeve #2) is a scraper-type compression ring, which has a chamfered (beveled) inner edge, which must be installed facing the **BOTTOM** of the piston.

NOTE: *The Top & Middle Rings Are Different!*

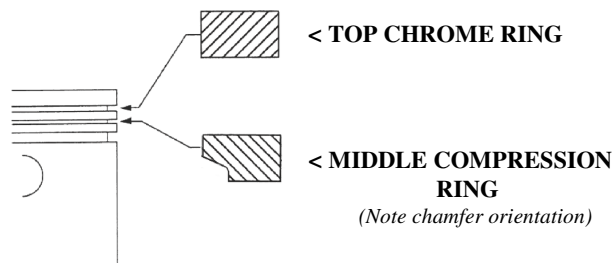


Fig. 8 - Compression Ring Profiles

- Using the Ring Expander Tool, install the **Middle Compression Ring**, *chamfer down*, into the **Middle Groove**.
- Using the Ring Expander Tool, install the chrome **Top Compression Ring** into the **Top Groove**.

Step 3 - Final Ring Alignment:

When complete, the final alignment of the rings should be as shown below in **FIGURE 9**.

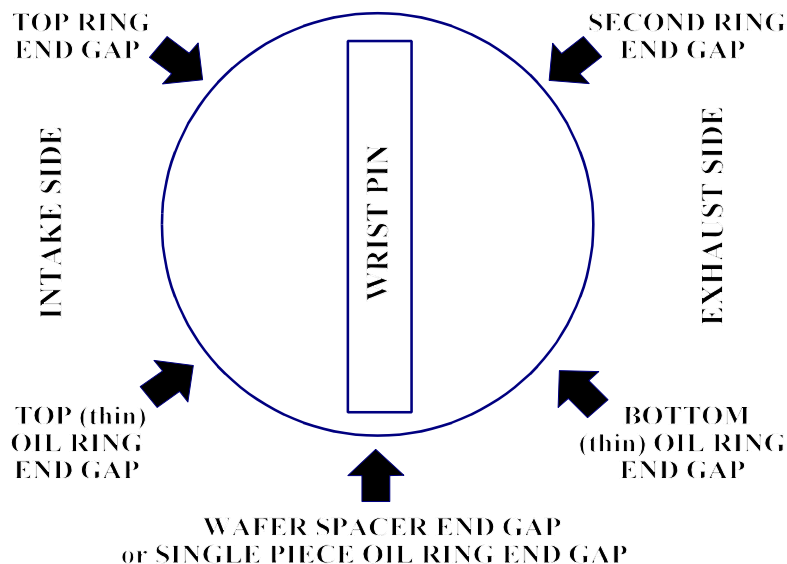


Fig. 9 - Ring End Gap Locations



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PISTON RING INSTALLATION INSTRUCTIONS

for Gravely® 5, 6.6, & 7.6-hp Engines

Thank you for purchasing this set of rings for your Gravely® 5, 6.6, or 7.6-hp engine. These rings are made precisely to factory specifications, and are 100% compatible with vintage or new pistons used in these machines. The following instructions are provided to assist you in the proper installation of your new rings. **Please read them carefully before attempting install them.**

This package contains three sleeves that comprise an engineered set of rings designed to work properly in your Gravely® 5, 6.6, or 7.6-hp engine. Each sleeve is numbered, which indicates the groove on the piston that the ring is supposed to be installed into.

I. CHECKING THE RING GAP:



PLEASE NOTE: Differences in machining techniques, wear, and other factors make it necessary for **EVERY** ring set to be custom fitted to the cylinder it is installed in. **Failure to do so can result in loss of compression, improper wear of the cylinder walls and piston, and even engine failure!** It is **IMPERATIVE**,

therefore, that you follow the steps below to assure that the rings are properly fitted to your cylinder.

RING GAP SPECIFICATION CHART

- #1 - Top Compression Ring = .012" to .020"
- #2 - Middle Compression Ring = .008" to .016"
- #3 - 3-Piece Oil Ring Set = .015" to .055"
- #3 - 1-Piece Oil Ring Set = .008" to .016"

Step 1 - Secure the cylinder in an upright position in a vise, taking care not to overtighten and, thus, damage the cylinder skirt.

Step 2 - Take the **Top Compression Ring** (#1) out of its sleeve and carefully insert it into the top of the cylinder. Push the ring down into the cylinder about 1". If the ring ends touch, proceed to **Step 7**. If not, proceed to **Step 3**.

Step 3 - Invert the piston and place its flat top onto the ring.

Step 4 - Gently push the inverted piston down into the cylinder until the 3rd (bottom) groove is even with the top of the cylinder all the way around. If it is not, raise the ring back up towards the top and repeat until it is square.

Step 5 - Remove the piston and measure the gap between the ring ends, as show in **Figure 1**, right. The gap must fall within the range given for the particular ring you are measuring, as shown in the **Ring Gap Specification Chart**, above. If it is smaller than the specified measurement, proceed to **Steps 6-9**. If it is larger than the largest measurement, you have the wrong ring set and must get the correct one before you can proceed.

Step 6 - Carefully remove the ring from the cylinder.

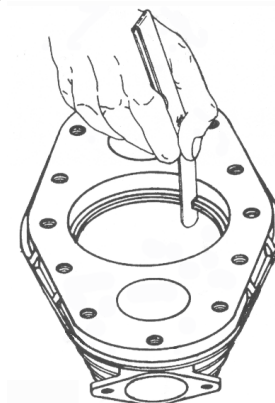


Fig. 1 - Checking The End Gap

Step 7 - Use a Ring Filer (also called a Ring Grinder) to remove a *tiny* amount of the end of one side of the ring. Refer to the Ring Filer's instructions for the proper method of performing this his task. *Please Note: We cannot accept returns on rings that have been filed.*

Step 8 - Re-insert the ring into the cylinder and follow **Steps 3-7**, as necessary, until the end gap of the ring until it falls within the specified range. **NOTE: Do not attempt to remove all of the end of the ring at one time - taking small amounts off in multiple passes, then re-checking the end gap in the cylinder will reduce the possibility of making the gap too large, and thus rendering the ring useless.**

Step 9 - Once you have achieved the correct end gap for the Top Compression Ring, place it back into its sleeve and proceed to **Step 10**.

Step 10 - Take the **Middle Compression Ring (#2)** out of its sleeve and carefully insert it into the top of the cylinder. Push it down into the cylinder about 1". If the ring ends touch, then proceed to **Step 7**. If not, go back through **Steps 3-8**, then on to **Step 11**.

Step 11 - Once you have achieved the correct end gap for the Middle Compression Ring, place it back into its sleeve and proceed to **Step 12**.

Step 12 - Take the **Oil Scraper Ring (#3)** out of its sleeve and carefully insert it into the top of the cylinder. **NOTE: Most sets are supplied with a 3-piece Oil Scraper Ring Set, but some are supplied with a 1-piece Oil Scraper Ring.** If you have the 3-piece set, take one of the flat rings and push it down into the cylinder about 1". If the ring ends touch, then proceed to **Step 7**. If not, go back through **Steps 3-8**. Repeat this step for the second flat Oil Scraper Ring, then proceed to **Step 13**.

NOTE: If you have the single Oil Scraper Ring, push it down into the cylinder about 1". If the ring ends touch, then proceed to **Step 7**. If not, go back through **Steps 3-8**, then on to **Step 13**.

Step 13 - Once you have achieved the correct end gap for the Oil Scraper Ring(s), place it back into its sleeve.

You have now successfully set the end gap for your rings and may proceed to Section II.

II. CHECKING THE PISTON:

It is important that you have a piston that is in good condition. If you are going to be installing your new rings on a used piston, make sure that it is not too badly worn to be re-used, or unsatisfactory results will occur. **Check the piston for:**

- * Uneven wear on the outside or scarring on the top edge of the piston, particularly on the exhaust side.
- * An enlarged wrist pin hole (use an oversized wrist pin if the hole is not out of round).
- * Worn ring grooves - both top grooves should be checked. This can be done quickly and easily by holding the Top Compression Ring flush with the ring land in the top groove and inserting a feeler gauge between the upper side of the ring and the groove (see **Fig. 2**). **If the clearance is greater than .006", the groove has excessive wear and the piston must be replaced.** Repeat this process for the second groove using the Middle Compression Ring. If you have the 1-piece Oil Ring, follow this procedure for the third groove, also.

III. INSTALLING THE RINGS:

Always use a ring expander so as to avoid distorting the rings (see **Fig. 3**).

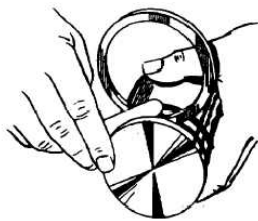


Fig. 2 - Checking Ring Side Clearance

Step 1 - Install the oil ring(s) first. For sets with a 1-piece oil ring, use the Ring Expander to install it in the bottom groove.

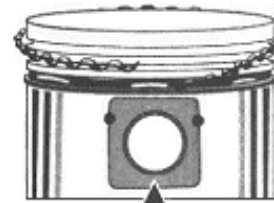
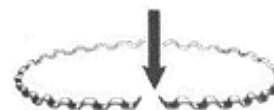


For sets with 3-piece oil rings, use the following procedure. Failure to follow them exactly **WILL** result in failure of the oil rings:

- A. Place **Wafer Spacer** in the bottom groove above the Bottom Oil Ring. Install in spiral motion (see **Fig. 4**). **Make sure the ends of the Wafer Spacer butt against one another and DO NOT overlap.**
- B. Place a thin **Bottom Oil Ring** into the bottom edge of the bottom groove. Install in spiral motion (see **Fig. 5**).
- C. Place the other thin **Top Oil Ring** into the top edge of the bottom groove. Install in spiral motion (see **Fig.6**).

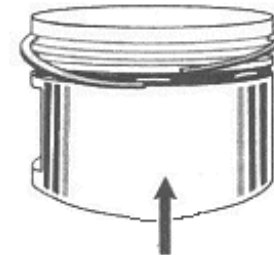


Fig. 3 - Using Ring Expander



< Install Wafer Spacer First

Fig. 4



< Install Bottom Oil Ring In Bottom Groove Second

Fig. 5

Install Top Oil Ring > In Groove Above Wafer Spacer Third

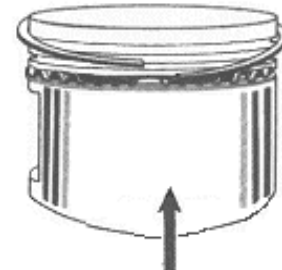
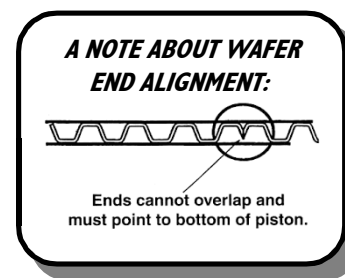


Fig. 6



Taking The Time To Gap And Install Your Rings Correctly Will Result In A Happy Engine...
.....And A Happy YOU!