



## ASSEMBLY INSTRUCTION MANUAL FOR THE 1 1/2" BELT OPTIMIZER

The following assembly instructions contain a **description** of the **Belt Optimizer** and the **procedures for installation and maintenance**.

Please read these assembly instructions very carefully before installing the **Belt Optimizer**.

The assembly instructions have been prepared with the latest product specifications at the time of publication. Any further product specification changes may result in minor differences between assembly instructions and the present product.

The visual detail illustrations are used to show only basic principles for assembly and maintenance operations. The visual illustrations are not an exact detailed representation of the **Belt Optimizer** unit parts

The assembly instructions have been written for individuals who have all the necessary knowledge, skills and tools, including the recommended Rai Part special tools, required for the installation and maintenance of the **Belt Optimizer**.

### DESCRIPTION

The **Belt Optimizer**, manufactured by Rai Parts, is an optimized belt pulley system, "Open Belt", for V-Twin engine motorcycles. The integrated rubber cushions of the 1 1/2" **Belt Optimizer** pulley are shock compensating which improve driving on rigid pulley "Open Belt" systems. The **Belt Optimizer** provides a feeling of driving with the character of the original system of the motorcycle, taking it easy on the belt when accelerating hard, when riding slow in high gear or when downshifting. Having a great advantage over solid pulleys, the smooth performance will extend the service life of the primary belt and make you feel more comfortable on your motorcycle.

### KIT CONTENTS

<b>Part A</b> - Pulley with bearing	<b>Part B</b> - Crankshaft star
<b>Part C</b> - Rubbers (six units)	<b>Part D</b> - Disc stainless steel
<b>Part E</b> - Nut 46mm	<b>Part F</b> - Extractor disc
<b>Part G</b> - Screws (1 unit M10 and 3 units M6)	

## PROCEDURES FOR INSTALLATION AND MAINTENANCE OF THE 1 1/2" BELT OPTIMIZER

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### 1. WARNINGS / CAUTION / NOTES:

Read and follow all of the assembly instructions carefully.

Please pay special attention to the symbols: **WARNING** / **CAUTION** / **NOTES**, as these symbols signify important points or messages.

**WARNINGS** = Indicate a potential hazard that could result in death or injury.

**CAUTION** = Indicates a potential hazard which may result in damage to the motorcycle.

**NOTES** = Identifies special information to make instructions clearer or operations easier.

**Please note:** the warnings and cautions contained in these assembly instructions cannot cover all potential hazards associated with the installation, or lack of maintenance, of the motorcycle. Along with the warnings and precautions, mechanical security measures should always be taken into account. If you are unsure of how to perform any of the operations then contact an experienced mechanic.

### WARNING

The mechanical inexperienced, or mechanical without the proper tools and equipment, cannot properly perform the operations described in these assembly instructions.

Improper installation, or maintenance, could result in injury to the mechanic and could make the motorcycle unsafe for the driver and passenger.

The Open Belt system must be protected with a protective cover to protect the moving parts of the engine.

The installation of these parts may affect, or void, the motorcycle's factory warranty.

During all of the installation and maintenance operations, follow the safety measures in mechanics.

Do not use gasoline or solvents for cleaning.

After performing the installation, or maintenance operations, always perform safety checks of all motorcycle systems.

### CAUTION

When replacing any part of the Belt Optimizer, it is necessary to use only the original parts manufactured by Rai Parts.

When removing parts, which need to be reassembled, then they must be mounted in the correct order and orientation.

Use only the recommended tools and special tools when instructed.

Make sure that all parts and surfaces are clean.

Lubricate when specified.

Protect the environment and natural resources by recycling or disposing of any parts at an authorized depot.

### 2. TOOLS:

The assembly facility is complex and requires several specialized tools for correct installation.

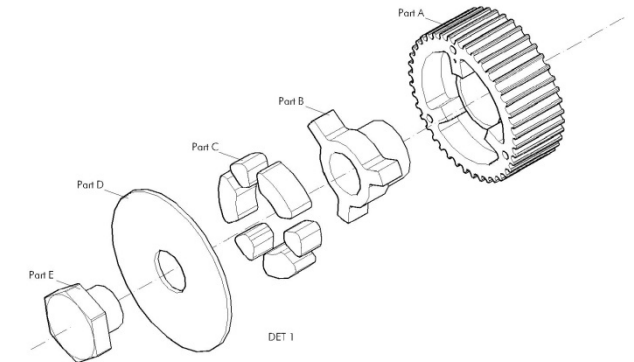
The necessary tools for mounting the 1 1/2" **Belt Optimizer** unit components are:

- a. Torque wrench
- b. Rai Parts blocker (available from **Rai Parts**)
- c. Rai Parts extractor (available from **Rai Parts**)

### CAUTION

These instructions describe replacing the traditional Open Belt pulley and should not be used for any other purposes.

### 3. INSTALLATION:



### WARNING

Measurement of the pulley and clutch housing must be correlated in thickness.

For the installation of a 1 1/2" **Belt Optimizer**, the existing pulley must be dismantled. After removing the pulley:

1. Clean the crankshaft, the crankshaft thread and any fat particles.
2. Position part B on the crankshaft, ensuring that the part B makes the contact with the magnetic plate.

### CAUTION

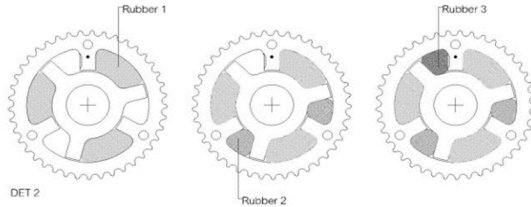
The unit parts should be placed and removed without shock to the parts or to the crankshaft.

- Remove part B.
- Place part A and part B together on the crankshaft.
- Place part A and part B together on the crankshaft, place Part D nut and tighten the screw with torque 50 N / m.

### CAUTION

Ensure proper movement between Part A star and Part B pulley without friction.

- Remove Part D nut.
- Part C, rubbers must be placed in the unit as shown in Detail 2 visual diagram. Place Rubber 1 (large Rubbers x 3) into the unit as shown. Next, place Rubber 2 (small Rubbers x 2) into the unit, as indicated. Finally, place Rubber 3 (small Rubber with a slight raised bump) into the unit.



### WARNING

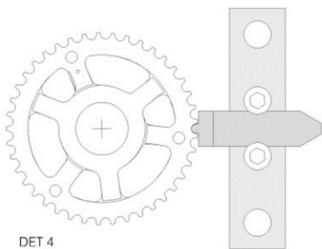
The Rubbers must be placed into the unit in the order as specified.

- Position and place parts C and D, as shown in Detail 1, thread all the way by hand, without using torque for Part D.

### CAUTION

Check that part B is in its right place by properly adjusting the striatum to the contact with the magnetic plate.

- Place Rai Parts Blocker in-line with screw holes.
- Place screws into the threads with torque 45N / m.
- Place and secure the lock piece of the blocker into pulley teeth, as shown in Detail 4.



### NOTE

The locking in position required for the pulley will be set.

- Place part C and part D Nut and drive it with your hand until the end of the thread.
- Tighten part D, nut with torque 245N / m.

### CAUTION

Part D Nut is tightened to the correct torque with a torque wrench.

### WARNING

Do not use an Impact wrench to tighten the screws. Using an impact wrench could mark the screw heads and could also release the magnets of the magnetic plate.

- Remove locking piece and the Rai Parts blocker support.
- Place and tighten belt.

### CAUTION

Testing should be performed for the alignment of the belt between the pulley and the clutch.

The belt tension should be the recommended by the belt manufacturer.

### 4. PULLEY REMOVAL

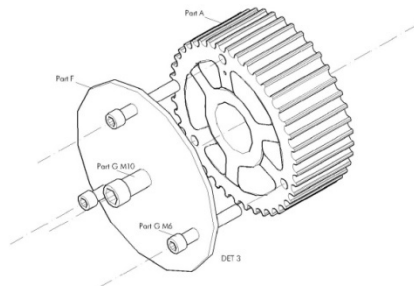
To remove parts C and D, follow the installation instructions in reverse.

- Use the Pulley Extractor Tool (available from Rai Parts) and position three M6 thread screws into the threads of the pulley, until the end of the thread; as shown in Detail 3.
- Support the central axis on the end crankshaft properly.
- Screw the central axis of the extractor gently to release streak crankshaft.

### CAUTION

The set will be free of fixing.

- Remove the three M6 screw threads from the pulley.



### 5. MAINTENANCE

The table below illustrates the recommended distance intervals, in kilometers and miles, required for the maintenance of the Belt Optimizer and of which are important for both proper operation and durability.

### NOTE

More maintenance is necessary under severe or extreme driving conditions.

PART TO REVIEW	miles	600	3000	6000	9000	12000
	km	1000	5000	10000	15000	20000
	month	2	6	12	24	36
Pulley – Bearing		I	I	I	I	I
Rubber		–	I	I	I	R
Star		–	–	I	–	I
Disk		–	I	I	I	I
Screw		T	T	T	T	T

I-Inspect, clean, lubricate or replace if necessary, R-Replacement, T- Tighten

### NOTE

The pulley is a component of the engine which is subjected to contact with the air, natural elements and foreign objects. If you detect any loss of material in the teeth or any cracks or breaks, then remove and replace the pulley.

### 6. WARRANTY

Rai Parts warranty only cover the original parts to this Belt Optimizer are free from defects in materials and manufacturing workmanship for a period of one year from the date of purchase. If you need a warranty service, you must contact Rai Parts immediately with a description of the problem.

If deemed necessary by Rai Parts, an evaluation will be carried out to determine if a part is defective. Rai Parts will provide an authorization number. The part should be properly packaged, to avoid any damage, and sent direct to Rai Parts with the original purchase invoice and a written statement describing the nature of the problem. If after an evaluation by Rai Parts, any original purchased parts are found to be defective, Rai Parts would repair defective parts or replace it at no cost to the buyer. If a substitution is agreed, then it would be replaced with the same design.

Rai Parts is not liable for consequential or incidental damages resulting from the failure of a part of Rai Parts.

Rai Parts will have no obligation if a part becomes defective due to improper installation or misuse of the product.

The installation or use of the Belt Optimizer accepts the warranty conditions.