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Top End Maintenance Manual

This Manual provides instructions on how to remove, inspect and reinstall the engine cylinder, cylinder head and piston assembly.

The motorcycle shown in the pictures is an in-service 2001 2.9, the same principles apply for the 1999 – 2003, 1.25 through 2.5 models, also.

Some of the measurements require specialized tools and may need to be done by a reliable machinists.

Your local Sherco dealer should be able to perform any or all of these services.

If you have any questions about the procedure, please call Ryan Young Products at 1-800-607-8742.

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This manual is divide into 4 sections.

- **Preparation**
- **Disassembly**
- **Cleaning and Inspection**
- **Reassembly**

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Preparation

- Wash the bike
- Place the bike on a suitable stand
- Remove the rear fender
- Remove the fuel tank
- Remove the airbox (not required but recommended, the airbox should be thoroughly cleaned before it is reinstalled)
- Remove the carburetor (also not required but recommended, this is a good time to clean and inspect the carburetor)

For complete step by step instructions on how to remove the carburetor see the "Sherco Carb Jetting Instructions Manual"

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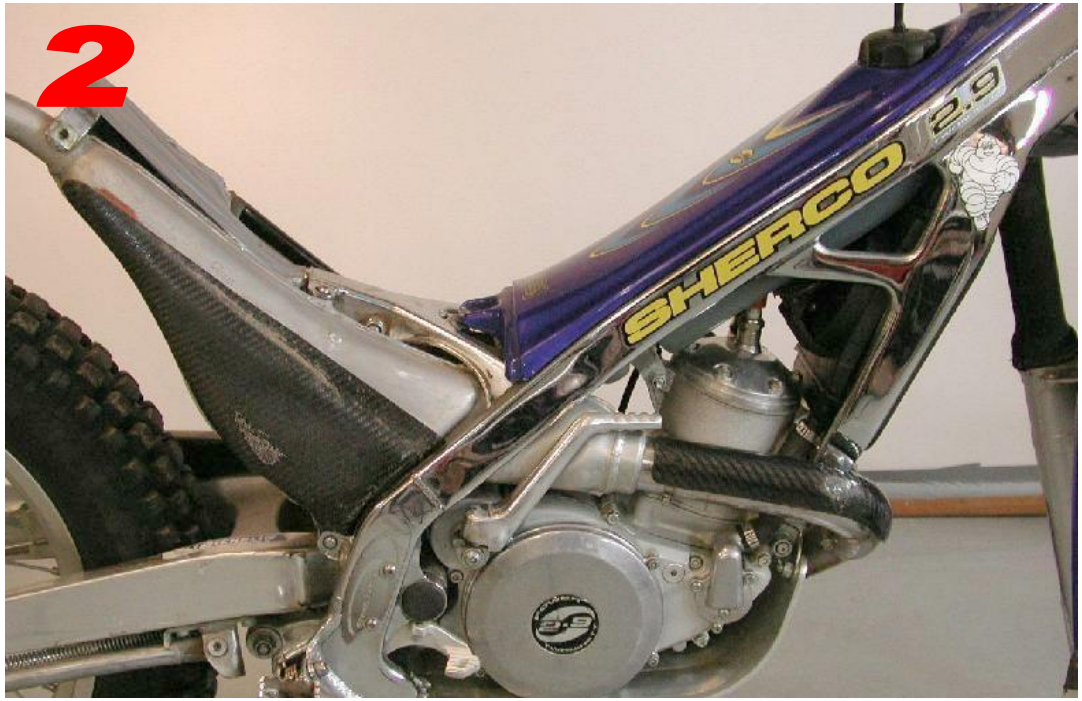
Preparation

➔ **Place the washed bike on a suitable stand.**



➔ **Remove the rear fender.**

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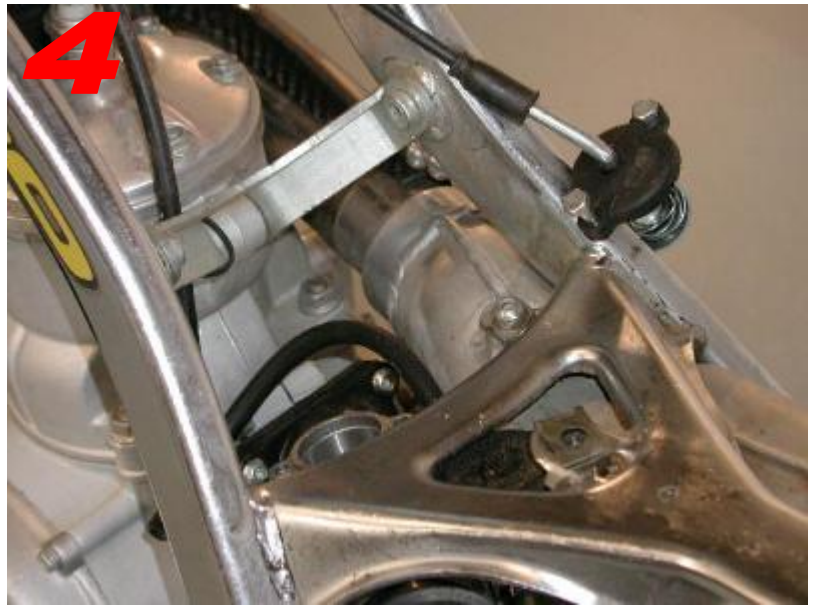

➔ **Remove the fuel tank and the air box.**

The air box and carburetor do not have to be removed to perform this service. It is recommended that they be removed and thoroughly cleaned, prior to reassembly.

➔ **Remove the carburetor slide and hang it out of the way.**

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Remove the carburetor. Not required but recommended.

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Disassembly

- Remove the upper engine mounting bracket
- Remove the exhaust pipe
- Remove the electrical components
- Remove the radiator cap (Caution! Insure that the engine is cool, Hot coolant can cause burns)
- Drain the coolant
- Remove the radiator hoses
- Remove the radiator mounting bracket
- Slide the radiator up in the frame
- Remove the cylinder
    - The cylinder can be removed with the head on or with the head removed, the advantage of removing the cylinder with the head on is that the seals remain undisturbed and do not have to be replaced.
- Remove the piston

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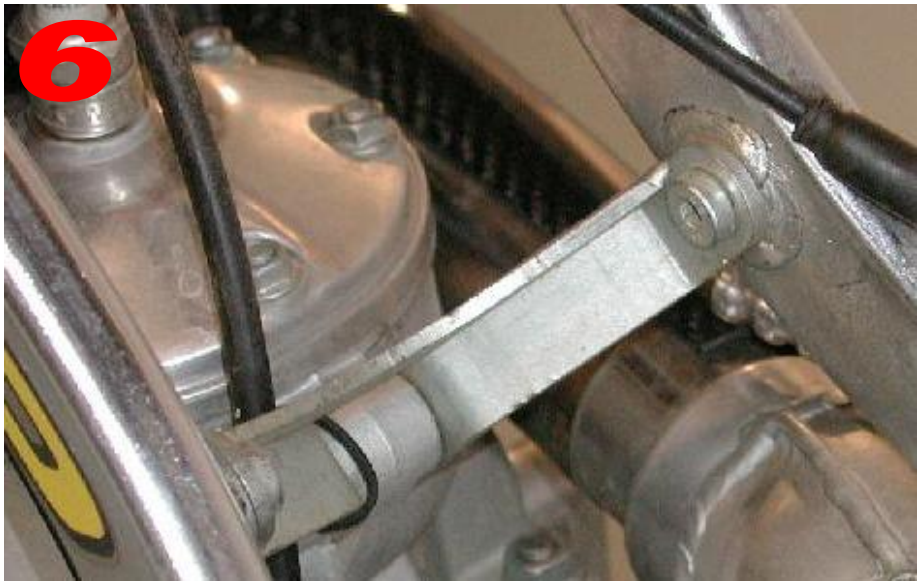
Disassembly



➔ **Using a 5mm Allen wrench remove the 2 bolts that retain the upper engine bracket to the frame.**

➔ **Using a 13mm box end wrench and a 6mm Allen wrench remove the bolt that retains the bracket to the cylinder.**

➔ **Remove the bracket.**

➔ **Using a 5mm Allen wrench remove the 2 bolts that retain the exhaust pipe to the cylinder.**

➔ **Remove the exhaust pipe.**

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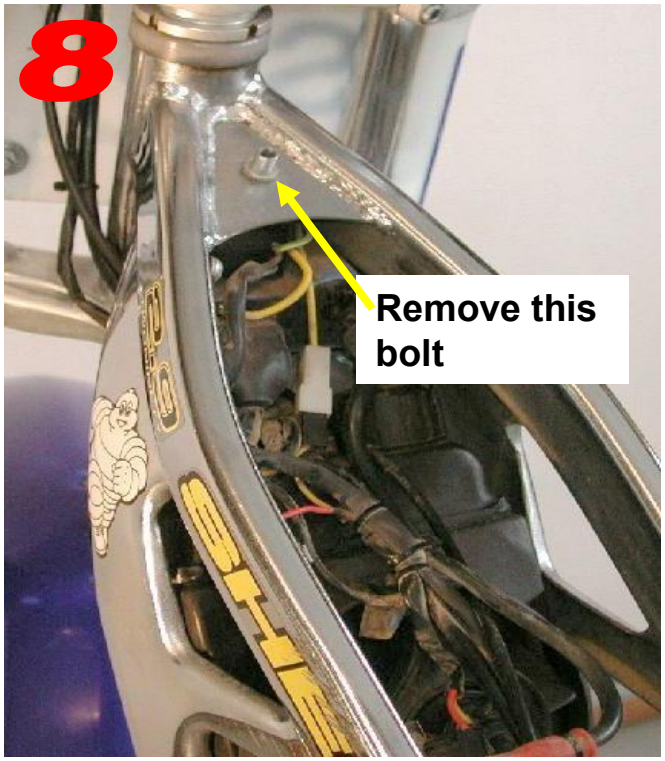
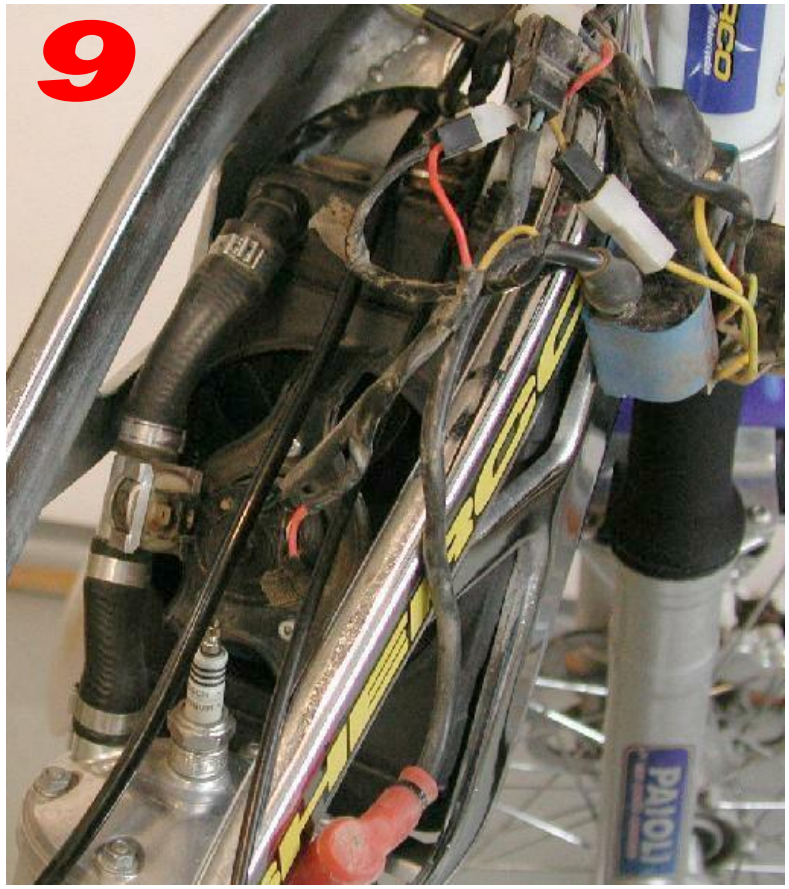


➔ **Using a 12mm socket or box end wrench remove the bolt that holds the coil assembly to the frame.**



➔ **Move the electrical components out of the way.**

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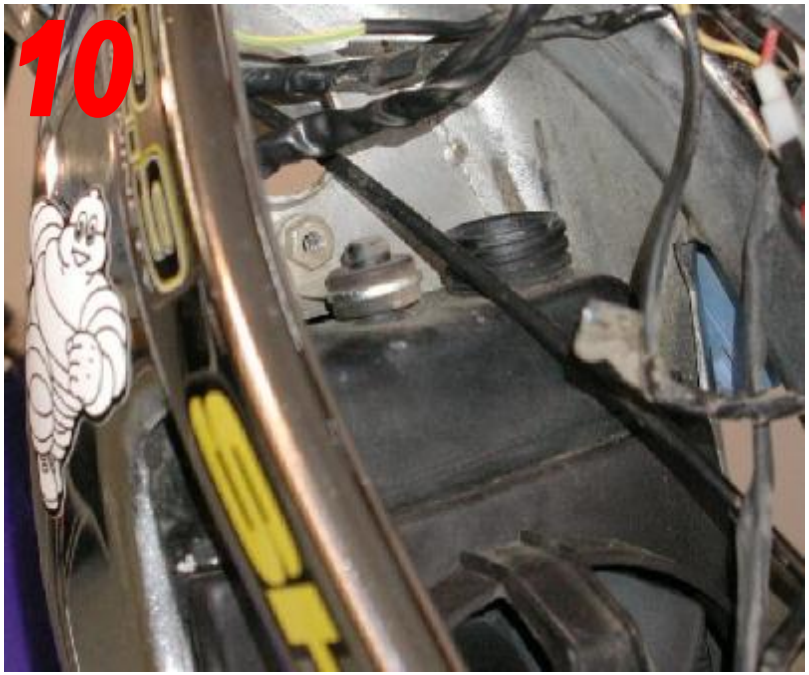

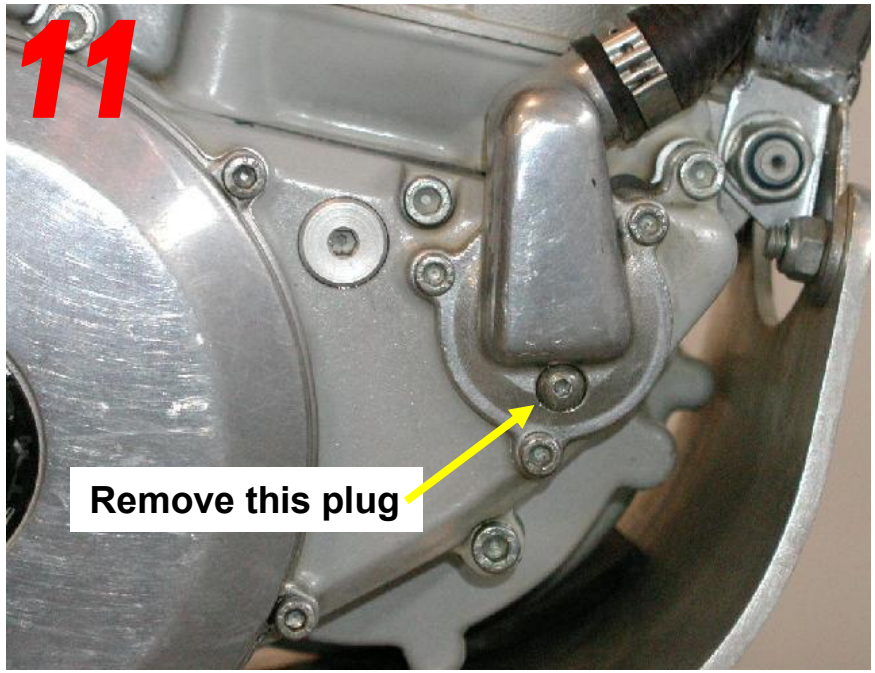

➔ **Remove the radiator cap. Use extreme caution removing the cap, make sure that the cooling system is cool before removing the cap.**

➔ **Using a 3mm Allen Wrench (the "03" bikes require a 4mm wrench) remove the water pump drain plug. Drain the coolant into a suitable container. Dispose of it according to local regulations.**

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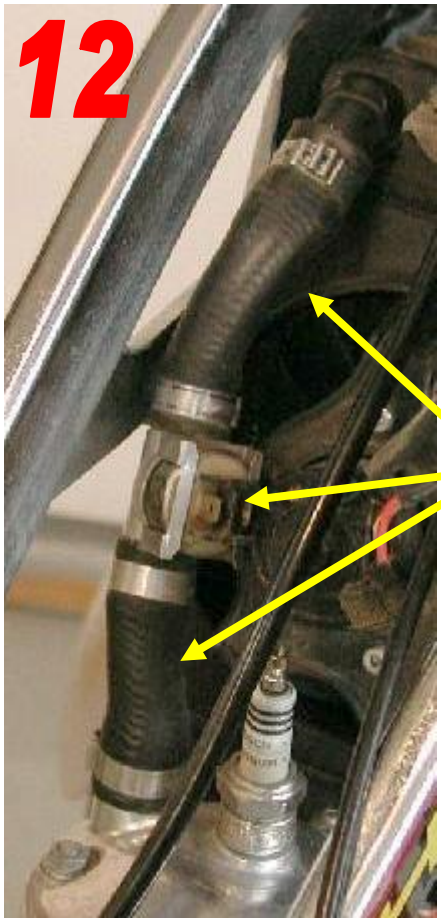

➔ **Using a pair of pliers release the hose clamps on the radiator hoses.**

➔ **Remove the radiator hoses.**

Remove this assembly

Remove this hose.

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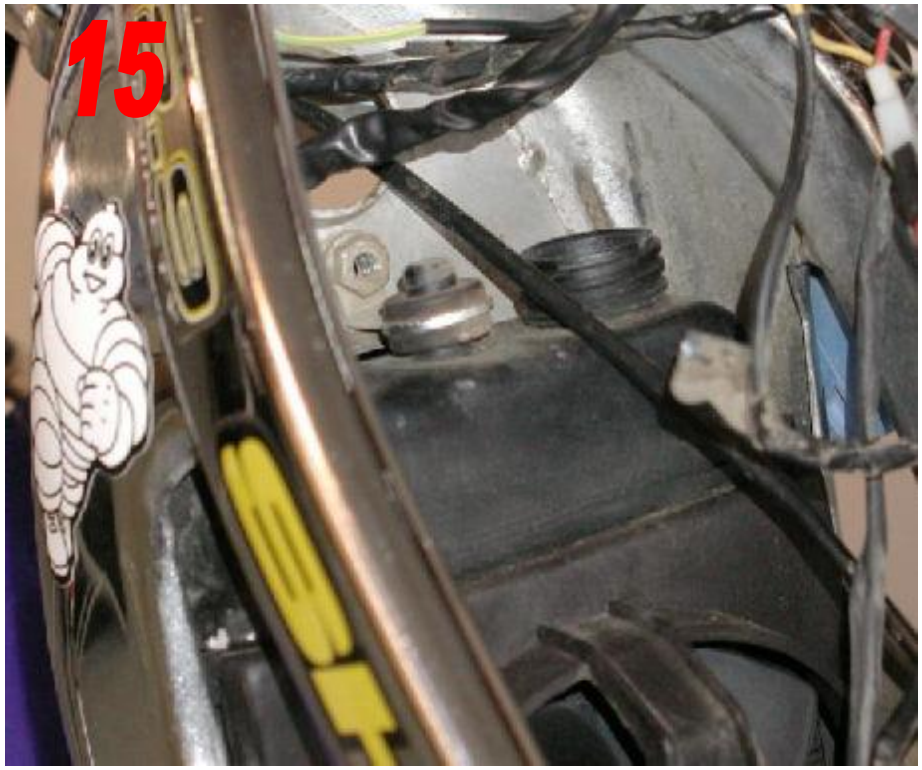
➔ **Using a 4mm Allen Wrench remove the radiator mounting bracket bolt.**



➔ **Remove the radiator mounting bracket.**

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➔ **Slide the radiator up in the frame. This provides clearance to remove the cylinder.**

➔ **Using a zip tie attach the clutch line to the frame.**

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Removing the Cylinder with the Cylinder Head on the Cylinder

➔ **Using a 13mm socket or box end wrench remove the 4 bolts that retain the cylinder to the case.**

➔ **Carefully lift the cylinder assembly away from the case. A light tap on the cylinder with a plastic hammer may be required to separate the cylinder from the case.**

➔ **The photo shows the spark plug in the head, removing the spark plug makes removing the cylinder from the frame easier.**

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➔ **This photo shows the cylinder removed and the piston exposed.**

➔ **Note the shop towels in the case area to protect it from foreign objects.**

➔ **This photo shows the piston removed from the connecting rod.**

➔ **To remove the piston from the connecting rod, carefully remove 1 circlip and then push the piston pin out of the piston**

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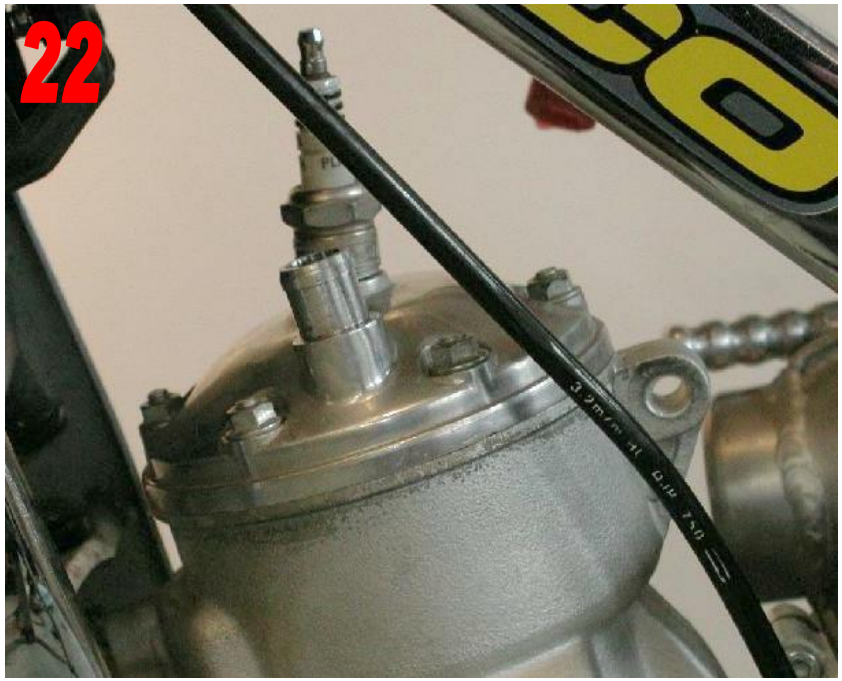
Removing the Cylinder Head Before Removing the Cylinder



➔ **This photo shows the cylinder head and the nuts that must be removed.**

➔ **Remove the spark plug.**

➔ **Using a 10mm socket remove the 6 nuts.**

➔ **Remove the Cylinder Head.**

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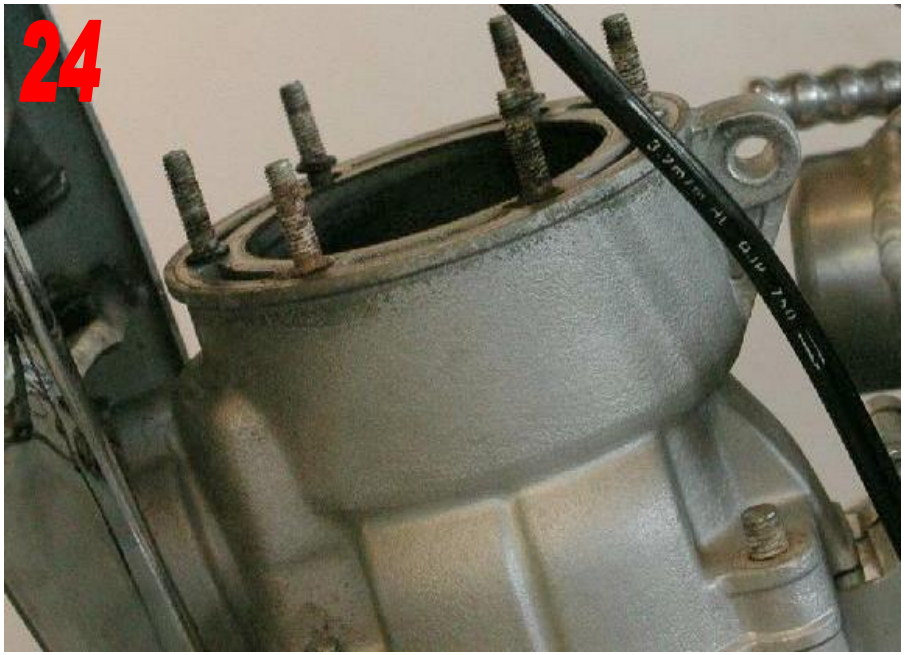

➔ **Using a 13mm Socket remove the 4 nuts that hold the cylinder to the case.**

➔ **Carefully lift the cylinder assembly away from the case. A light tap on the cylinder with a plastic hammer may be required to separate the cylinder from the case.**

➔ **This photo shows the inside of the cylinder head and the 2 O-ring seals. There is a light coating of carbon that needs to be removed.**

Cleaning and Inspection

- **Remove all carbon deposits from:**
  - **The exhaust port in the cylinder**
  - **The piston head and the piston ring grooves**
  - **The combustion chamber in the cylinder head**
  - **NOTICE: Take care not to damage any of these components**
- **Thoroughly wash the cylinder, piston and head in hot soapy water.**
- **Remove any rust from the studs in the case and the cylinder head.**
- **Remove all of the old gasket from the cylinder base and the engine case mounting surfaces. These surfaces must be cleaned thoroughly.**
- **Check the cylinder, piston and cylinder head for wear or damage**
- **Measure the cylinder I.D. and the piston O.D. check the table on page 19 to determine if they are within tolerance.**
- **If the cylinder shows wear a new larger piston can be installed, A,B,C and D pistons are available, the difference between the next size piston is .000394” (0.01mm).**

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Piston / Cylinder Tolerances

	1.25	2.0	2.5	2.9
2003	------	0,0225mm	0,0350 mm (.00138 in)	0,0270mm (.00106 in)
2002	------	------	0,0350 mm - 0,0400 mm (.00138 in - .00158 in)	0,0270 mm – 0,0325 mm (.00106 in - .00128 in)
2001	------	------	0,0350 mm - 0,0400 mm (.00138 in - .00158 in)	0,0270 mm – 0,0325 mm (.00106 in - .00128 in)
2000	------	------	0,0350 mm - 0,0400 mm (.00138 in - .00158 in)	0,0270 mm – 0,0325 mm (.00106 in - .00128 in)
1999	------	------	0,0350 mm - 0,0400 mm (.00138 in - .00158 in)	------

These are the tolerances that are shown on the Sherco Website, for additional information contact your local Sherco dealer or Ryan Young Products.

The factory measures the cylinders and pistons in a controlled environment that has a temperature of 24 degrees C (75 degrees F)

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Cleaning and Inspection

This photo shows the cleaned cylinder, cleaned piston (new in this case) and the cleaned cylinder head. The threads on the cylinder head mounting studs have had the rust removed.

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➔ **This photo shows the cylinder base cleaned and ready to be reinstalled.**

➔ **This photo shows the engine case cleaned and ready for the cylinder to be reinstalled. The threads on the cylinder mounting studs have had the rust removed.**

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➔ **Using an outside Micrometer carefully measure and record the diameter of the piston.**

➔ **The piston and micrometer should be held as shown, the measurement should be taken across the skirt of the piston 3/4” (19mm) from the bottom of the piston.**

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➔ **Use a telescoping gage to measure the cylinder bore.**

➔ **Use the exact same micrometer that was used to measure the piston O.D., measure the telescoping gage to determine the actual cylinder I.D.**

➔ **Compare these dimensions to the table on page 19 to see if the parts are in spec.**

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Reassembly

- Install the rings on the piston (The end gap is factory set and normally does not need to be adjusted)
- Install one circlip into the piston
- Install the piston pin part way into the piston
- Install the cylinder base gasket
- Install the piston onto the connecting rod
- Install the cylinder
- Install the cylinder head
- Reassembly the rest of the bike in the reverse order of the disassembly

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➔ **Apply 2-stroke engine oil to the rings and install them with the letter “O” facing up. Note the ring stoppers in the piston and locate the ring ends over them.**

➔ **Install one circlip into the piston.**

➔ **Apply 2-stroke engine oil to the piston pin and partially insert it as shown.**

➔ **This photo shows the piston ready to be installed, note the arrow on the top of the piston goes toward the front of the bike.**

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➔ **Install a new base gasket onto the engine case. Handle the base gasket by the edges and do not allow your fingers to transfer oil to the gasket, this will help insure a good seal.**

➔ **Install the piston onto the connecting rod, make sure that the arrow is facing forward. Push the piston pin all the way into the piston and install the remaining circlip.**

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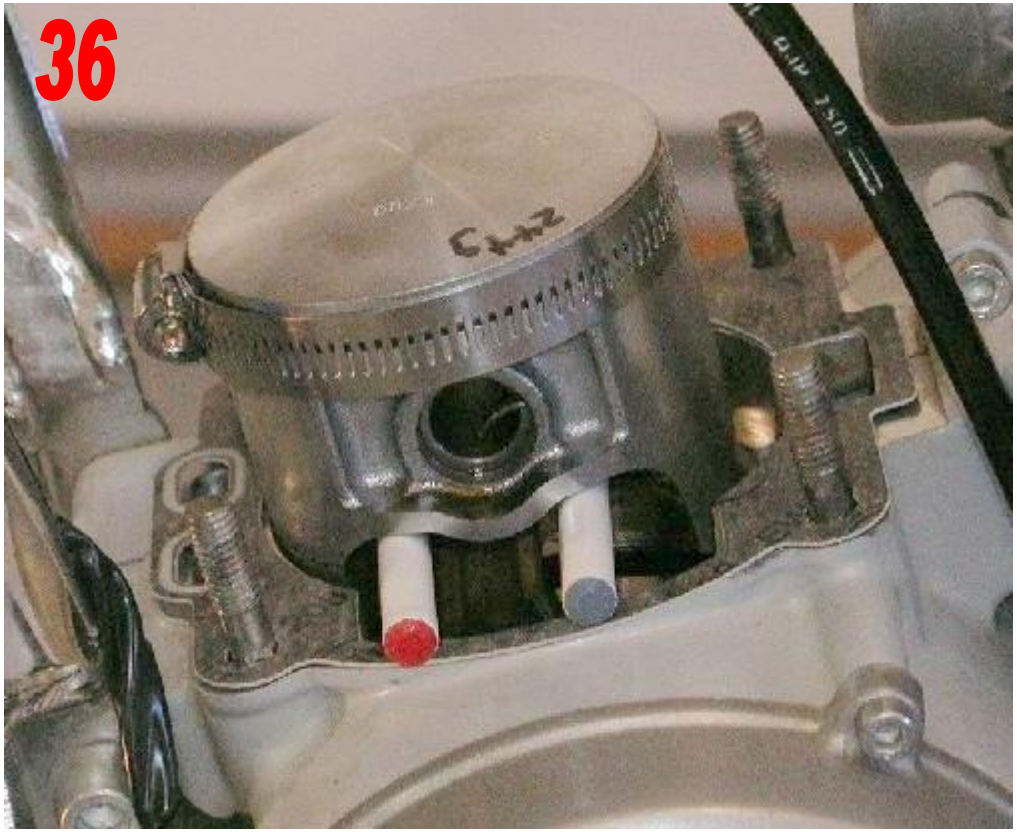
There is usually more than one way to do something, the method shown here is one that has proven to be simple and effective.



➡ **With the piston installed, use an automotive radiator hose clamp as a ring compressor to compress the rings onto the piston. Make certain that the open end of the rings are in alignment with stoppers on the piston.**

➡ **Place two 5/16” (8mm) diameter plastic or wooden dowels across the engine case to retain the piston assembly while the cylinder is slid over it.**

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➔ **Lubricate the inside of the cylinder with 2-stroke oil and slide it over the piston.**

➔ **Continue to slide the cylinder over the piston and loosen the hose clamp to allow the cylinder to slide over the rings.**

➔ **Loosen and remove the radiator hose clamp.**

➔ **Remove the two dowels and slide the cylinder completely over the piston and down onto the engine case.**

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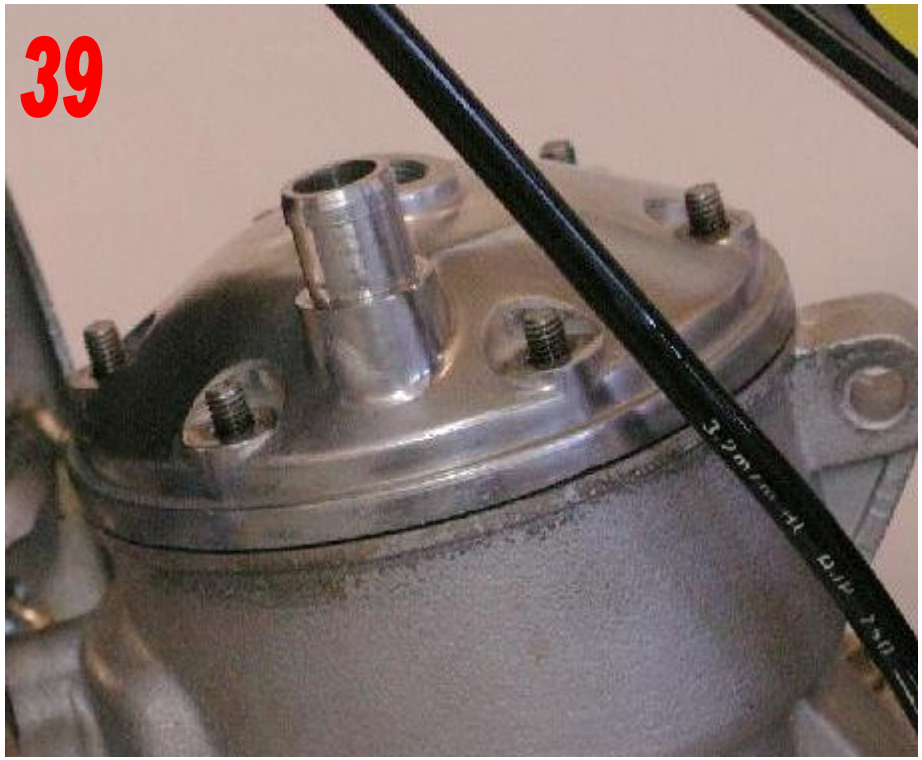
➔ **Seat the cylinder onto the engine case and install the 4 nuts. Tighten these nuts to 16 ft lbs (2,2m/kg)**



➔ **Install new O-rings into the two grooves in the head (a little grease applied to the O-rings will help hold them in place.**

➔ **Install the head onto the cylinder and install the 6 nuts. Tighten these nuts to 7 ft lbs (1 m/kg) using a crisscross pattern in 2 – 3 steps.**

- **Reassemble the rest of the bike in the reverse order of the disassembly, refer to the disassembly instructions for additional help.**
- **Take the time to break the engine in properly, section riding is an excellent way to break in a rebuilt engine.**
- **Avoid lugging and sustained high speed operation for at least 10 hours of operation.**