



Sherco Engine Teardown and Assembly Manual

This Manual is provided as a guide for:

- **Removing the engine from the frame**
- **Splitting the cases**
- **Complete Disassembly of the engine**
- **Reassembly of the engine**
- **Reinstallation back in the frame**

The text and pictures in this manual were provided by a Team Sherco Rider who recorded the process as he performed these operations on a 2001, 2.9.

For additional information see the following manuals that can be downloaded from the www.shercousa.com and the www.sherco-moto.com sites.

- **Water Pump Seal Replacement**
- **Sherco Ignition Timing Guide**
- **Sherco Setup and Lubrication Guide**
- **Sherco Top End Maintenance Manual**
- **Sherco Bike Assembly Manual**

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

By Bill Ibsen 3/03



Engine Removal and Case Splitting

Preparation

1. Wash the bike and engine thoroughly.
2. Drain transmission oil by removing drain bolt and copper washer with 5mm Allen.
3. Drain coolant by removing 3 bolts of water pump cover and lifting off engine side case.
4. Remove:
 - a. **rear fender**- two bolts plus one long with washer using 4mm Allen
 - b. **fuel tank hose** from petcock
 - c. **fuel tank**- one short bolt and washer using 4mm Allen
 - d. **chain master link and chain** from front sprocket
 - e. **kick starter**- one large button head bolt and washer
 - f. **rear brake**- one bolt/washer using 13mm wrench
 - g. **rear brake master cylinder**- 2 button head bolts
 - h. **gear shifter**- one bolt
 - i. **flywheel cover** – 3 bolts
 - j. **clutch slave cylinder**- two button head bolts using 4mm Allen
 - k. **clutch actuating rod** by pulling it out of the case
 - l. **airbox** three 4mm Allen bolts and loosening Phillips head carb hose clamp
 - m. **carburetor cap/slide assembly**
 - n. **carburetor** by loosening Phillips head manifold hose clamp
 - o. **spark plug cap**
 - p. **spark plug**
 - q. **header pipe** 2 bolts into cylinder head
 - r. **silencer**- 3 bolts (one with washer and nut using 10mm wrench)
 - s. **cylinder head coolant hose clamp** and hose
 - t. **rear shock upper bolt**
 - u. **radiator plastic cover bolt**, then lever up the radiator with screwdriver until the radiator “legs” pop out of frame retaining holes
5. Remove **flywheel** using flywheel puller tool, taking care not to lose the small Woodruff key by placing it inside of the magnetic flywheel for safe storage.
6. Remove **ignition** (3 bolts) and slide rubber grommet and ignition wiring assembly out of the case and out of the way, taking special note of the ignition timing marks.
7. Remove **front sprocket** and 2 retaining circlips.
8. Remove **clutch side case** and its 10 bolts using 5mm Allen, being careful not to lose to lose the 2 aluminum alignment pins (dowel pins). Insert the dowel pins into their holes within the Right Crankcase.



9. Remove **water pump impeller** using 12mm long socket Remove water pump axle, taking care not to lose the washer between the case and the impeller axle inspect axle and seals for damage (scratches) and wear.
10. Remove 6 ea. **clutch** 8mm bolts/washers/springs. Check the clutch springs for fatigue and replace them if necessary.
11. Remove **clutch pressure plate** and inspect each friction disc for burning, wear, or any other damage, and replace damaged discs. Check the clutch metal plates for face runout. Warped or damaged plates may cause the clutch to slip when engaged.
12. Remove **crankshaft primary gear nut** and washer using 19mm socket, holding clutch basket with special clutch basket tool.
13. Remove **clutch outer basket nut** and washer with 24mm socket while holding the basket with special clutch basket holder tool. Check the clutch outer basket for stepping and replace it if necessary.
14. Remove **crankshaft primary gear** and tiny Woodruff key, being careful not to lose the key.

Engine Removal from Frame

1. Remove shock top mounting bolt, nut, and washer using 17mm wrench and Allen, then slide the shock out of the sub-frame shock mounting bracket.
2. Remove **top cylinder head "U" shaped bracket assembly** (bolt, washer, nut) and frame bolts.
3. Remove two front **skid plate** frame bolts and nuts.
4. Loosen **front engine/frame** bolt and nut.
5. Remove **swingarm axle/bolt black covers** by prying them off.
6. Loosen **swingarm "axle" and nut**.
7. Loosen **bottom engine** bolt and nut.
8. Remove **front engine/frame bolt** and nut and other engine/frame/swingarm bolts.
9. Wiggle/pull **swingarm assembly** away from engine mounts to allow space for engine removal.
10. Rotate **engine** upwards, then swing rear towards rear brake, and twist engine out of frame on throttle side of frame.



Engine Disassembly

1. Pinch front engine Crankcase mounting ears into a vise to hold engine stable and upright.
2. Remove 4 bolts (with 4mm Allen) and pull out rubber carburetor manifold.
3. Remove reed valve cage (just pull it out of cases by hand)
4. Remove 4 cylinder head base nuts with 13 mm wrench
5. Remove cylinder and cylinder head assembly as a single unit.
6. Place a clean cloth over the bore in the crankcase.
7. Remove piston by removing one circlip, then pushing/tapping the wrist pin & wrist pin bearing cage out enough to remove it from the connecting rod.
8. Inspect the piston, piston rings, and cylinder for wear, damage, or sticking rings.
9. Decarbonize piston head with razor edge, noting whether its an A, B, or C size piston.
10. Decarbonize cylinder head and exhaust port using a scraper of soft material such as wood or plastic to prevent damage to the parts. Carbon deposit build up will decrease engine performance.
11. Remove/replace new rings, installing new rings with machined "dot" marking facing upwards. Place the rings in the ring grooves and turn the rings to check for smooth movement. Decarbonize the ring grooves if necessary. Note: Discard the piston pin clip removed. Use a new clip.
12. Check crankshaft bearings by alternately pulling up and down on the crankshaft ends. If free-play exists, then replace the crankshaft main bearings and seals housed inside the center cases.
13. Press in the ratchet pawl spring assembly to release it from the "wheel carousel" and pull the gear shift axle assembly through the motor and out of the engine.
14. Remove the engine oil drain bolt
15. Remove the four upper, equal length 5mm Allen engine case bolts holding the side cases together. 2 are located at the intake manifold, and the other 2 are located at the top and bottom of the front sprocket.
16. Remove another longer 5mm Allen engine case bolt located on the topside of the case, utilizing the aluminum case alignment pin, furthest back on the case towards the swing arm.
17. Remove the five 5mm Allen crankcase bolts located behind the flywheel.
18. Lay engine on a pile of rags on the floor, and holding one of the side cases, using a rubber mallet split the cases, alternating soft blows on one end of the case to another.
19. When the cases are split about an inch, lay it on the clutch side and alternate blows to the crankshaft and gear axle to carefully and slowly remove the cases, ensuring that the gear drum and two gear assemblies do not fall out or get dislodged. (A long rubber band can be used to hold the transmission in place during handling). Be careful not to lose the two thin washers at the ends of the adjacent transmission shafts.



Engine Disassembly Contd.

20. If not removing the transmission, place a long rubber band around the engine in such a way to secure the mainshaft and countershaft assemblies from falling out of the Right Crankcase.
21. Using a screwdriver, push out the crankshaft main bearing seals out of each case side, and then using a large socket, tap out the main bearing cages.
22. Inspect freeplay and free movement of connecting rod in and around crankshaft lobes. If a problem exists, a machine shop will be required to press the parts apart and back together again after repair.
23. With a razor, *thoroughly* clean off all residue of all gaskets on inside and outsides of cases and the bottom of the cylinder, but especially around the intake manifold area of the cases.
24. Using parts washer and contact cleaner on a rag, clean cases
25. Wire brush rusty cylinder studs, spray with WD40
26. Clean all bolts before reinstallation

Reinstallation, General Tips

1. As a general rule, when reassembling any motorcycle, always replace all gaskets, O-rings, cotter pins, piston pin clips, lock washers, snap rings, etc..
2. When torquing bolts, nuts or screws, start with the larger-diameter or inner fasteners, and tighten them to the specified torque using a criss-cross (star) pattern.
3. Clean all parts after dismantling, and when reassembling, coat all sliding surfaces with the same type of lubricant that will be used during the operation of the engine.
4. After reassembling, check to be sure that each part is securely tightened.



Reassembly Steps

1. First, install main bearings in cases by placing the clutch side center case with transmission installed on a rag at an angle, and tap the right crankshaft main bearing seal with a wooden hammer into the case.
2. Next, install crankshaft assembly into the above assembly, oiling the crankshaft seal surfaces contacting the crankshaft.
3. Next, install center case gasket, checking multiple times for perfect alignment (not positioned above or below case edge, but centered on the case edge).
4. Next, install flywheel side center case using 4 or 5 bolts around the perimeter of the case, tightening them in a criss-cross (star) pattern, while constantly confirming that perfect gasket alignment between both center cases (especially at intake manifold area). Do not tighten these first case bolts end to end; use a criss-cross (star) pattern to progressively and evenly tighten the two center cases together.
5. Reinstall the five flywheel bolts (Step 14 above).
6. In general, reassemble in the reverse order of disassembly, beginning at Step 13 above, using new gaskets and piston pin clips. Coat the cylinder wall with oil before lowering the cylinder over the piston, taking care not to damage the cylinder.
7. Install the piston with “=->” arrow mark on the piston crown facing towards exhaust port.
8. When reinstalling the engine within the bike's frame, place it in the frame sideways at an angle, then tip the cylinder head upwards while swinging the rear of the motor around into its mounting position within the frame, and then lower the front of the motor into its normal mounting position.
9. Regrease the swing arm bolt.
10. Install a new spark plug.
11. Add 450cc of transmission oil and distilled water/coolant mixture to radiator.

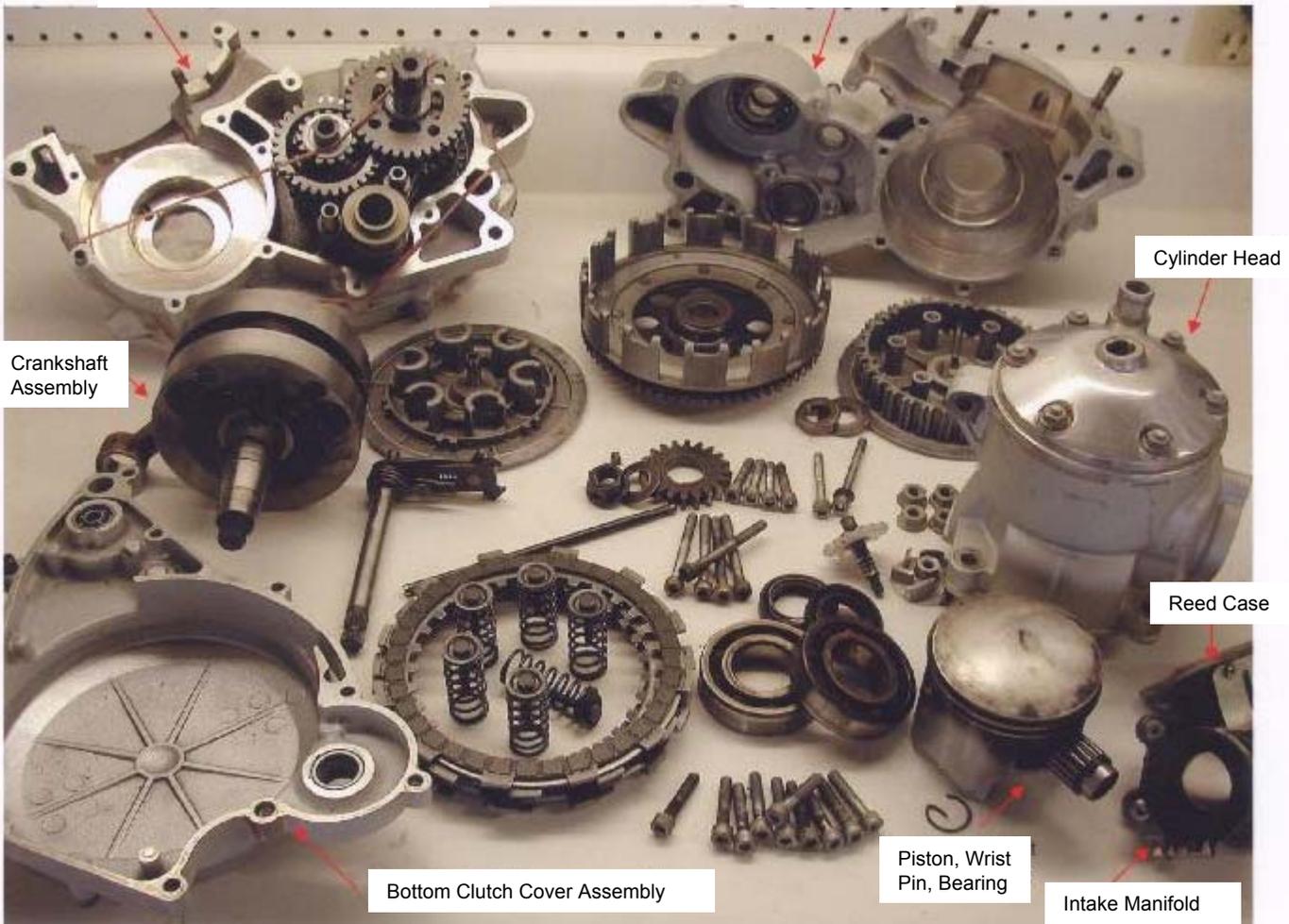


Pictorial Aid to Frame & Engine Bolt Identification

Unassembled Engine:

Right Crankcase with Transmission

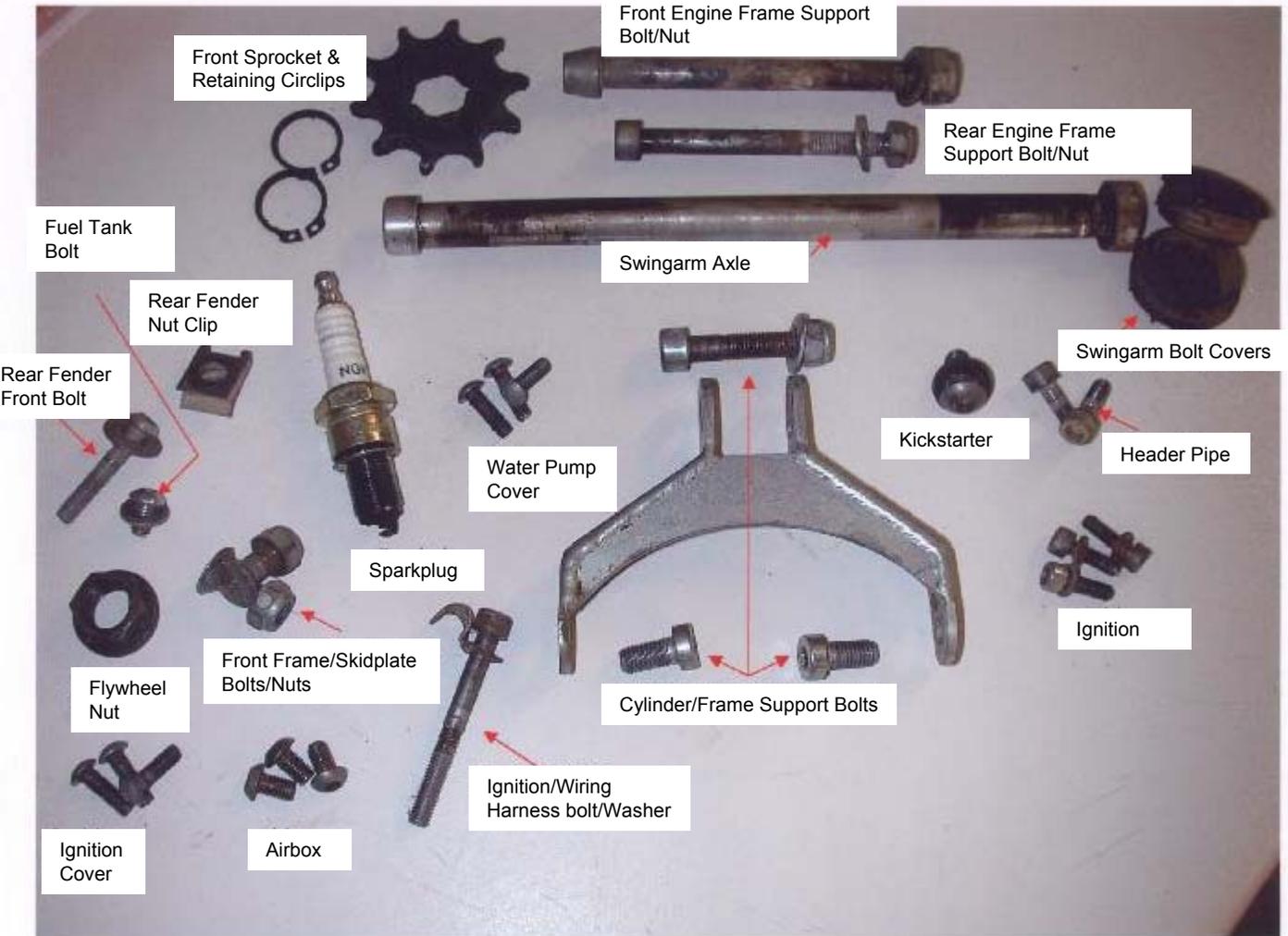
Left Crankcase





Pictorial Aid to Frame & Engine Bolt Identification Contd.

Frame:



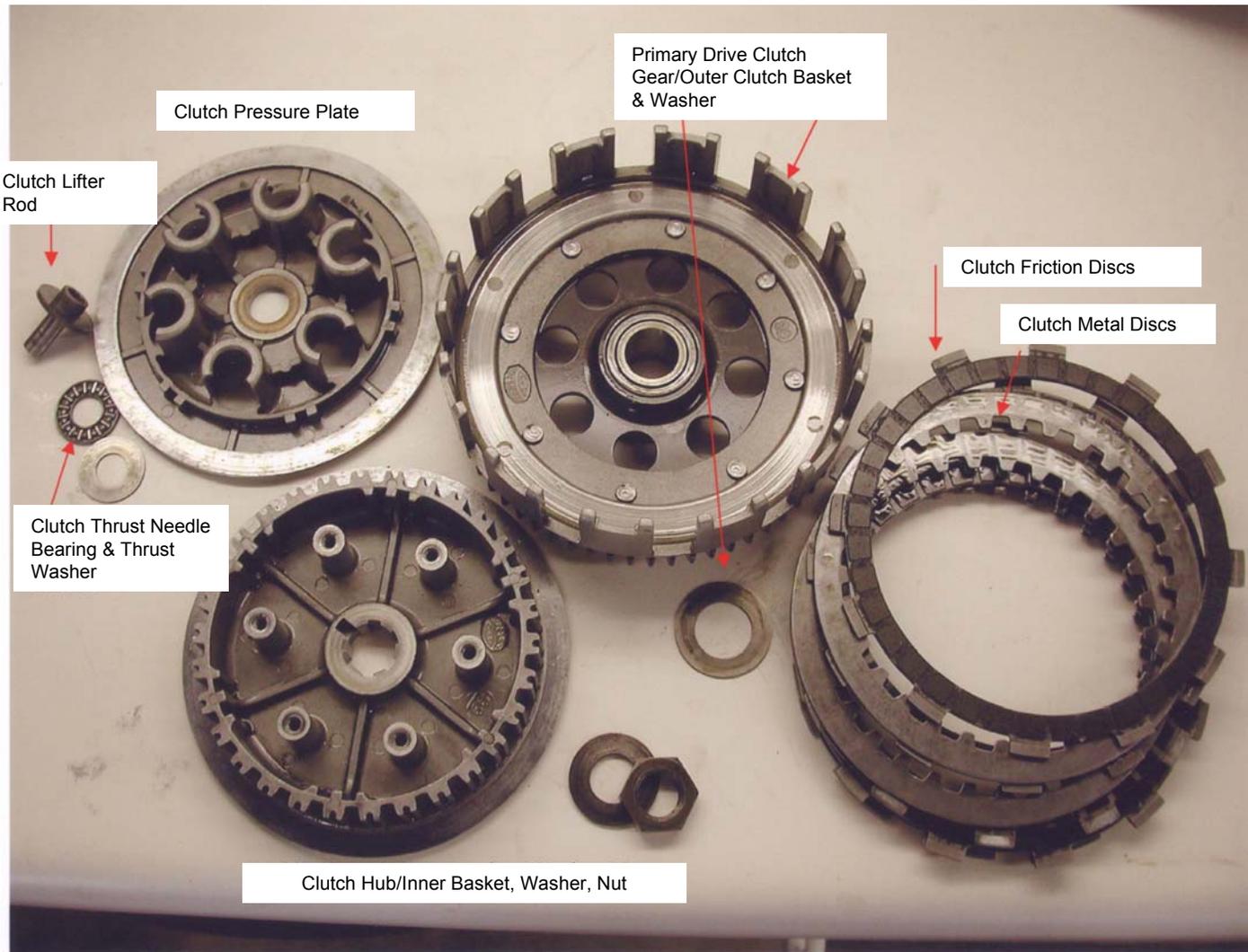


Internal Engine Components & Bolts





Clutch Components:





Large Component Removal

Misc. Parts:



Leave bolts in brake pedal, shift lever, and silencer. Place flywheel/crankshaft Woodruff Key inside magnetic flywheel for safe storage until reassembly

Frame:

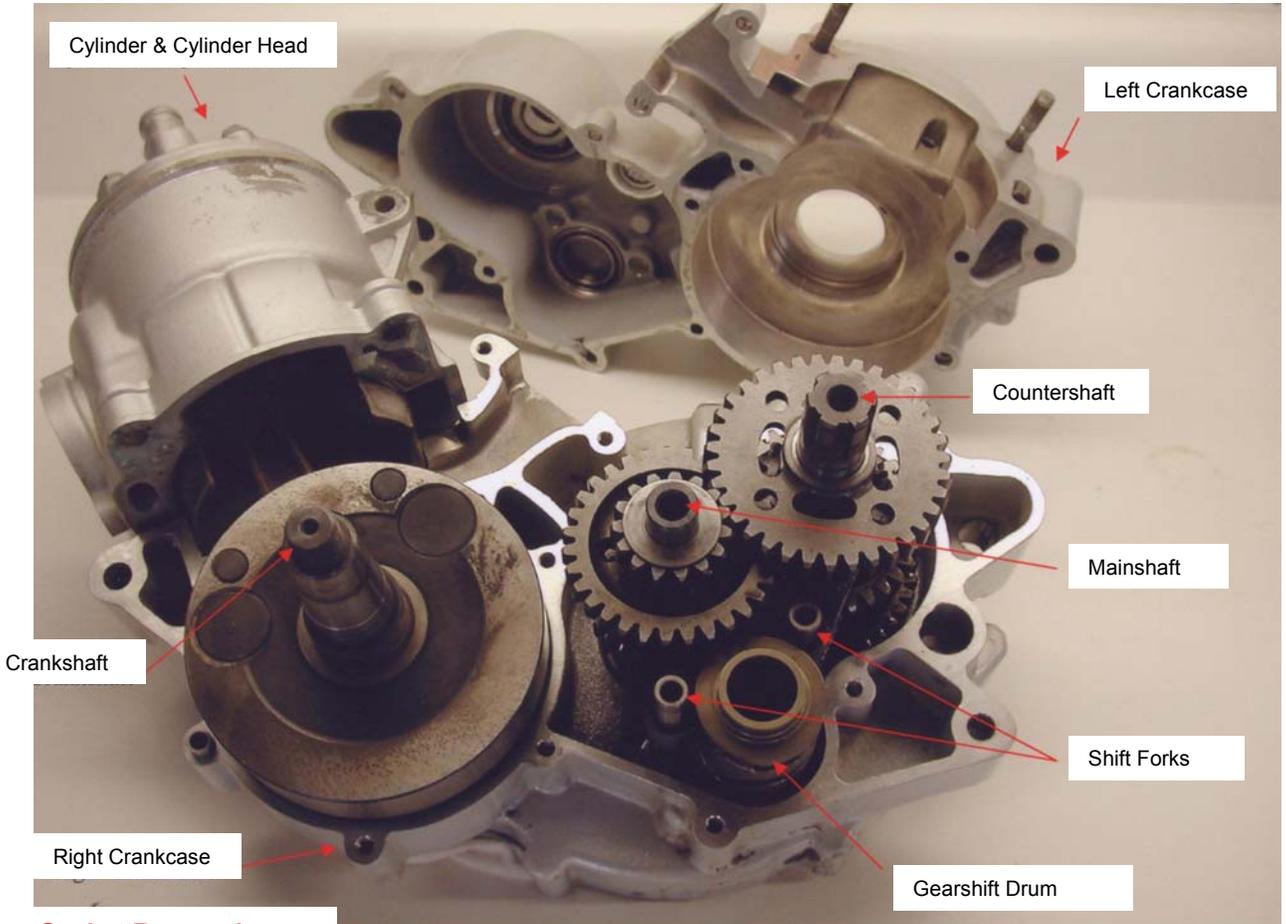


After engine removal with swingarm pulled back.

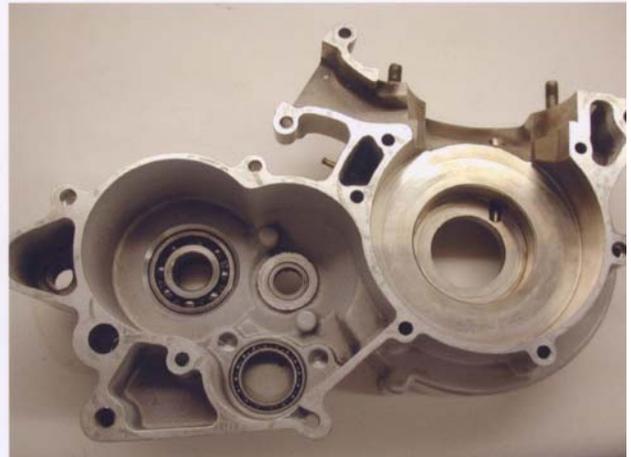
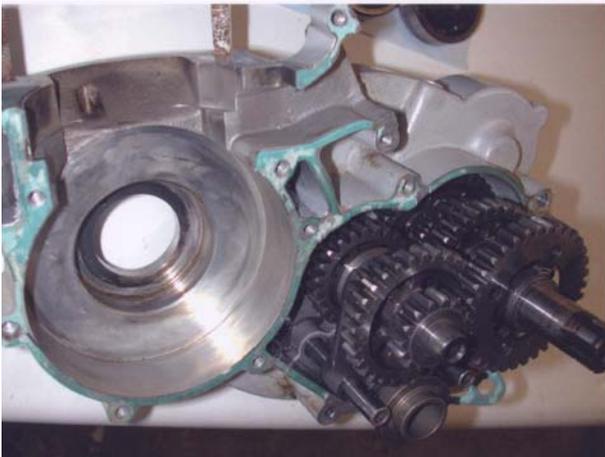
Leave bolts in rear brake master cylinder and shock.



Engine Assembly Overview



Gasket Removal



Clean all gasket surfaces using a razor blade.

Gasket surfaces should be cleaned like new.



Other Details

Ignition:



Piston Markings:

