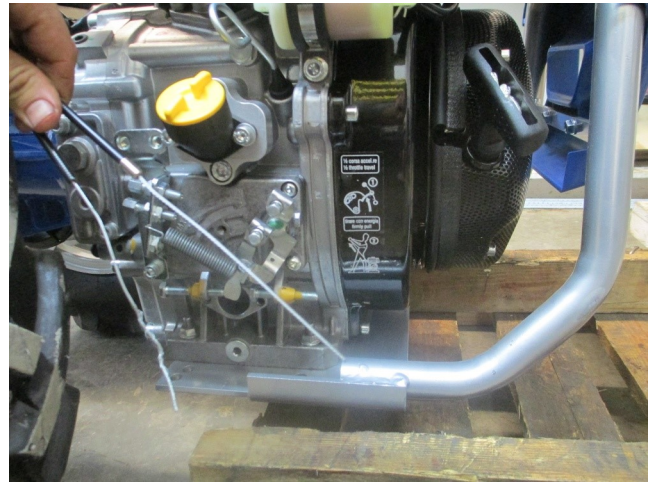
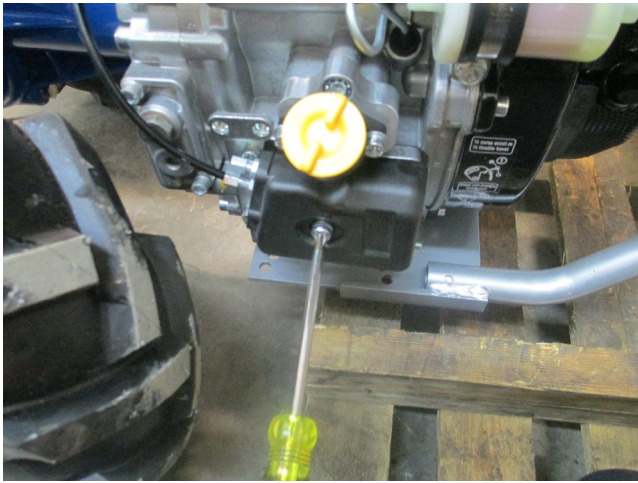
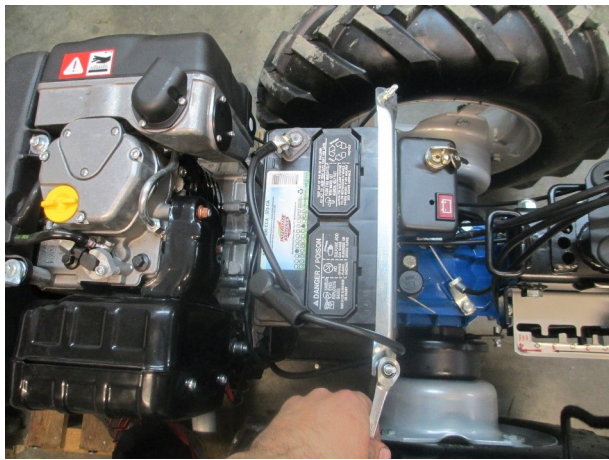


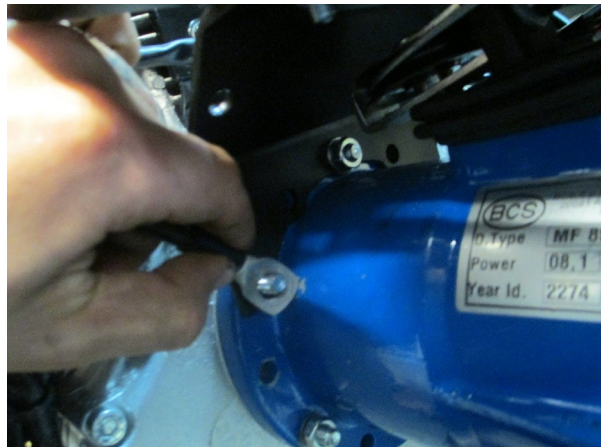
# 853 Diesel - Engine and clutch removal / installation: (With Euro Taper Crankshaft..Engine spec #2A33E0)



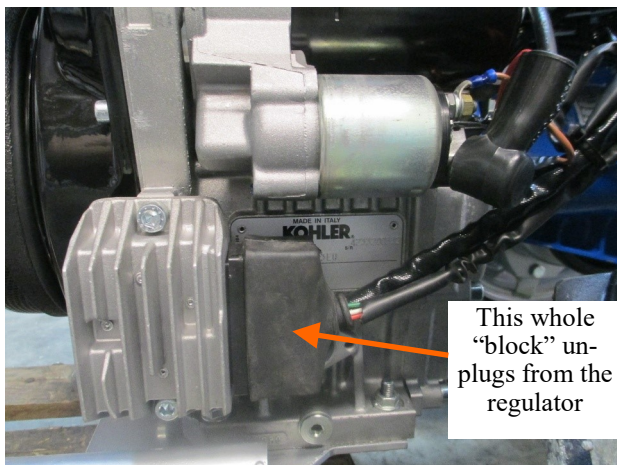
1. Remove throttle cable and operator presence control cable (OPC cable). Tag them, for proper re-assembly!! (NOTE the support under engine for ease of removal throughout process...a milk crate, cement block, or similar-sized object can be used)



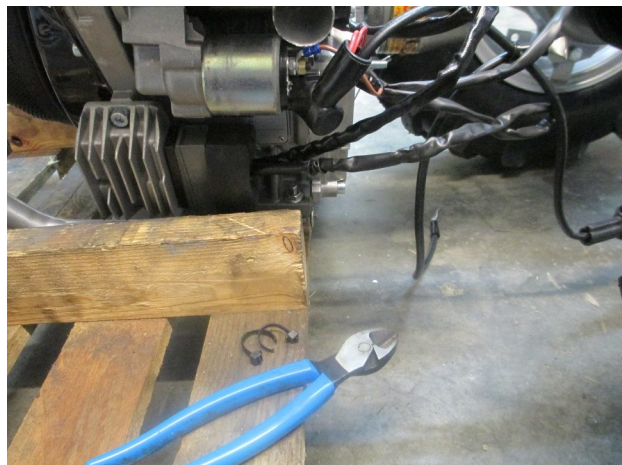
2. Remove battery retainer and cables with 10mm wrenches to remove battery from holding box. Remove negative cable FIRST!



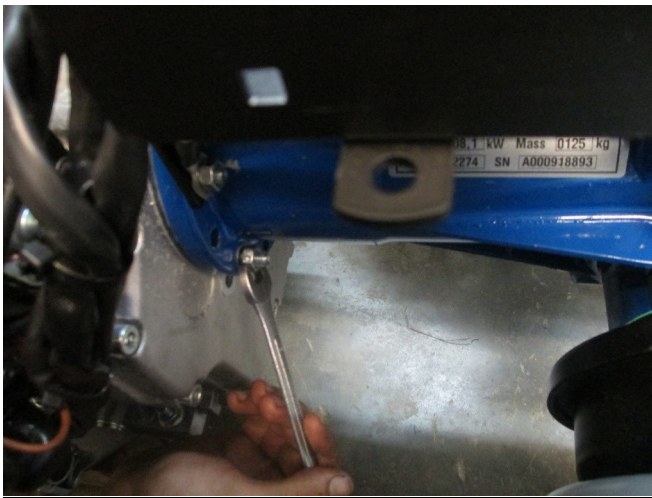
3. Negative side cable is fastened to an engine stud by a nut (13mm wrench) and requires removal (all these nuts have to come off anyway).



This whole "block" unplugs from the regulator



4. The voltage regulator can be unplugged to allow for more flexibility in removing the engine, OR the zip ties that bundle the wires together can be cut and then replaced later. This allows the engine to be "mostly free" of the tractor and give ample "slack" to maneuver the engine/tractor while removing the clutch. COMPLETE removal of the engine can be achieved by removing a few more wires, if you want. (if you do this, make sure you make notes on where they go!!)



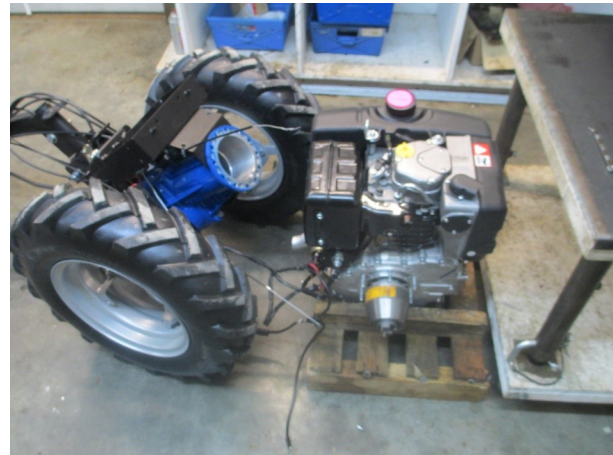
5. Proceed to remove the six nuts that hold the transmission flange to the engine's rear cover.



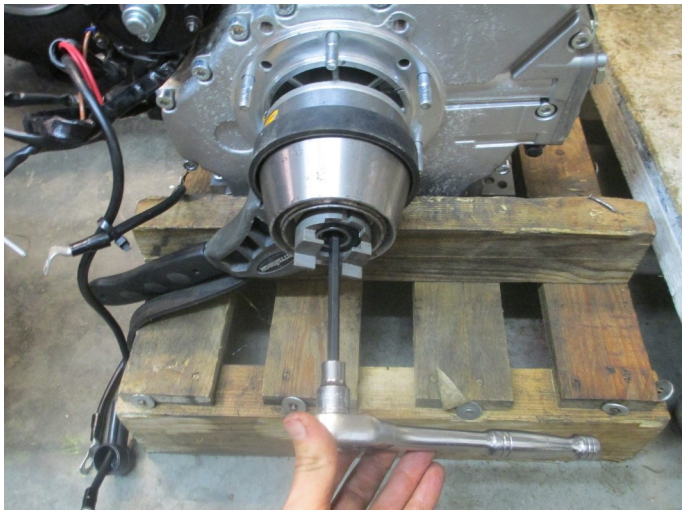
6. To remove the engine: 2 OPTIONS:  
 6A. With the engine resting on a support, the tractor can be wiggled and pulled slightly to release from the engine. (If there is no implement on the tractor, this may be the best option)



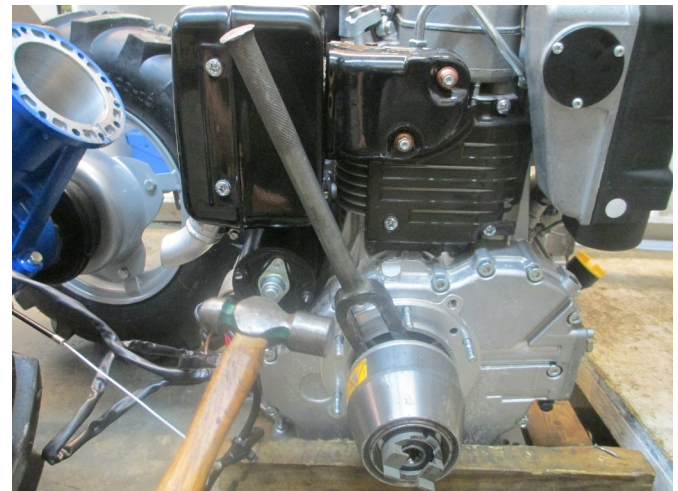
6B: If there is an implement on the tractor to "steady" the tractor, you can simply wiggle and slide the engine off the tractor, onto the support. (Gas engine pictured here...sorry, "stock" photo!



7. Engine & clutch removed from tractor. Note there are still a few wires hooked up. As long as you're careful, this works fine.



8. Holding the clutch with a strap wrench, large pipe wrench or Channel-locks, use a 6mm Allen wrench to remove the clutch. The bolt is waaay down in the hole inside the clutch. It is standard RH thread. (If you only have a typical Allen "L-shaped" wrench, put the long end of the "L" down the hole, and put a piece of pipe or a vise-grips, etc. on the "short" end to increase your leverage.) The bolt will loosen several turns, and **stop**. DO NOT FORCE IT!! (NOTE: **DO NOT USE AN ALLEN WRENCH WITH A "BALL END" AT THE TIP!!!**)



9. The clutch is not loose yet...because it is still stuck on the "tapered" crankshaft. To break the "taper-lock" loose, you will need to drive a "wedge" in between the engine casing and the back of the clutch. The tool shown above is a ball-joint separator (also known as a "pickle fork")... essentially a tapered fork. It is driven in by hitting the end with a hammer, until the taper breaks free. Another method is to use two metal-cutting "cold" chisels (which are like little wedges ...drive one in on each side of the shaft. **SEE FIGURE 10!!!**



10. Now, even though the taper broke free, the clutch wiggles around, but it doesn't want to come off!! This is because there are still a few threads of the bolt holding. Put your Allen wrench back in the hole and unscrew the bolt.

11. Yay! You got the clutch off!

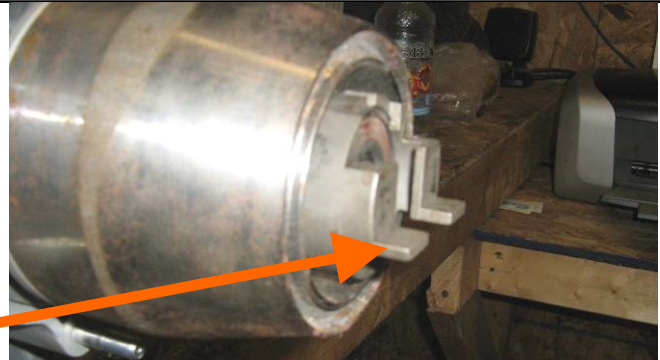
**ONCE CLUTCH IS REMOVED, IF CLUTCH IS REPAIRABLE, BOX UP CLUTCH WITH ADEQUATE PACKING MATERIAL (TO KEEP IT FROM GETTING DAMAGED IN SHIPMENT), AND SEND TO EARTH TOOLS FOR REBUILDING. IT IS NOT RECOMMENDED TO DISASSEMBLE THE CLUTCH WITHOUT PROPER EQUIPMENT, OR SERIOUS INJURY MAY OCCUR FROM THE HIGHLY CHARGED SPRING INSIDE IT.**

THESE CLUTCHES FIT VERY WELL, WITH ADEQUATE PADDING, IN A "PRIORITY MAIL MEDIUM (8.5x11x5.5") FLAT RATE BOX, WHICH WILL GET HERE FOR ABOUT \$12 IN 2-4 DAYS FROM ANYWHERE IN THE CONTINENTAL USA. OR, YOU CAN SHIP BY UPS OR FEDEX IF YOU PREFER.

Our shipping address: Earth Tools Inc. 1525 Kays Branch Rd., Owenton KY 40359

OUR TURNAROUND TIME FOR CLUTCH REPAIRS IS USUALLY 1 TO 4 DAYS (PLUS SHIPPING TIME) Depending on our backlog.

RE-INSTALL CLUTCH TO ENGINE CRANKSHAFT AND ENGINE BACK TO TRACTOR IN THE REVERSE ORDER THEY WERE REMOVED TIGHTENING THE CLUTCH BOLT TO APPROXIMATELY 18FT/LBS. (DARN GOOD AND TIGHT!!). **IMPORTANT NOTE:** WHEN RE-INSTALLING ENGINE ONTO TRACTOR, MAKE SURE THROWOUT BEARING SHIELD IS ARRANGED AS PICTURED: WITH TABS AT BOTTOM!! THESE TABS SLIDE UNDER CLUTCH FORK IN TRANSMISSION TO KEEP BEARING SHIELD FROM TURNING. WHEN SLIDING ENGINE BACK ONTO TRANSMISSION, IT MAY TAKE A FEW TRIES TO GET THE GROOVES ON THE SHAFT (THE "SPLINES") LINED UP PROPERLY WITH THE SPLINES IN THE CLUTCH...IT IS A GOOD IDEA TO "SIGHT" THIS IN ADVANCE. ALSO, BE CAREFUL NOT TO BUMP THE THROWOUT BEARING SHEILD (MENTIONED ABOVE) OUT OF PROPER ALIGNMENT WHILE PUTTING THE ENGINE ON. THIS MAY TAKE A FEW TRIES TO GET IT RIGHT, BUT IT'S REALLY NOT THAT HARD.



AFTER INSTALLING A CLUTCH, THE CLUTCH CABLE MAY NEED TO BE RE-ADJUSTED. PROPER ADJUSTMENT IS: SET CABLE WITH MINIMUM AMOUNT OF TENSION NECESSARY SO THAT WHEN CLUTCH HANDLE IS FULLY SQUEEZED, TRACTOR COMES TO A FULL STOP. ESSENTIALLY, YOU WANT THE MOST CABLE "FREE PLAY" YOU CAN GET WITH THE CLUTCH HANDLE IN THE "RELAXED" POSITION, WHILE STILL HAVING THE CLUTCH DISENGAGE POWER WHEN CLUTCH HANDLE FULLY SQUEEZED. ADJUST CABLE TENSION **USING HOLLOW BOLT / JAMNUT NEAR CLUTCH HANDLE** (BACKING OUT [so more threads are exposed on the bolt] INCREASES TENSION, SCREWING IN INCREASES FREE PLAY)... DON'T FOOL WITH CABLE CLAMP DOWN BY CLUTCH FORK / ENGINE UNLESS YOU RUN OUT OF ADJUSTMENT AT THE "TOP END". You can view our Clutch Adjustment VIDEO by copying this URL into your browser: <http://www.youtube.com/watch?v=SAv8eE7ytiY&list=UUnEPLYReFF1UIPuQmJlqGow&index=1&feature=plcp>