

# Removal of engine & clutch—older BCS machines with ACME or Lombardini engines (tapered crankshaft type)



#1. USING 13MM WRENCH, REMOVE NUTS AND WASHERS SECURING ACME ENGINE TO TRANSMISSION. (On SEP/Mainline machines, these are BOLTS instead)



#2. LOOSEN THROTTLE CABLE CLAMP ON ACME ENGINE (MAY HAVE TO HOLD BOTTOM PART OF CABLE WITH A PLIERS) (Acme gas engine pictured)



#3. PULL CABLE & SHEATH UP & OUT



#4. REMOVE ENGINE FROM TRANSMISSION (MAY HAVE TO WIGGLE A BIT TO GET LOOSE) CONE CLUTCH ASSY. (PICTURED) COMES OFF WITH ENGINE (NOTE: SOME BCS TRACTORS HAVE A DISK CLUTCH...IN THIS CASE THE CLUTCH CARRIER COMES OFF WITH THE ENGINE. IF YOU HAVE TROUBLE GETTING THE CARRIER OFF THE ENGINE, CALL US FOR INSTRUCTIONS AT 502-484-3988.)



#5. INSERT A 6MM ALLEN WRENCH INTO THE HOLE IN THE CLUTCH; FEEL AROUND FOR THE BOLT-HEAD. (NOTE: On SEP/Mainline units, remove center bearing assy. from clutch [just slides out] and use a 13mm socket to remove center bolt)



#6. USING A LARGE CHANNEL-LOCK PLIERS, STRAP-WRENCH, PIPE-WRENCH, ETC. HOLD THE OUTER HOUSING OF THE CLUTCH TO KEEP IT FROM TURNING WHILE LOOSENING THE BOLT INSIDE THE CLUTCH. NOTE: I HAVE A PIPE ON THE "SHORT" END OF THE ALLEN WRENCH FOR EXTRA LEVERAGE. BOLT IS "STANDARD" RH THREAD (NOT LH).



**#7. NOW THAT THE BOLT IS LOOSE, THE CLUTCH MUST BE BROKEN FREE FROM THE TAPER-LOCK ON THE CRANKSHAFT. THIS CAN BE DONE BY WEDGING TWO LARGE COLD-CHISELS (METAL-CUTTING CHISELS) BETWEEN THE CLUTCH HOUSING AND THE ENGINE CRANKCASE —ONE ON EITHER SIDE OF THE CRANKSHAFT— AND HITTING ONE...**



**#8. ...AND THEN THE OTHER, EVENLY, UNTIL THE CLUTCH POPS OFF THE TAPER. (THE BOLT INSIDE THE CLUTCH IS “TRAPPED” INSIDE, IT WILL NOT COME OUT)**



**#8A. ANOTHER OPTION, IF YOU HAVE ACCESS TO ONE, IS A LARGE BALL-JOINT SEPERATOR FOR AUTOMOTIVE USE. THIS IS LIKE A BIG TAPERED FORK, AND CAN BE DRIVEN IN JUST LIKE THE CHISELS (BUT BEING ONE PIECE, IT IS EASIER TO USE)**



**#9. REMOVE CLUTCH FROM CRANKSHAFT. CLUTCH CAN NOW BE SERVICED, “BROKEN LOOSE” (IF IT IS “STUCK”), OR REPLACED, AS NEEDED. SEE LINKS IN BOX BELOW FOR VARIOUS CLUTCH SERVICE PROCEDURES.**

**RE-ASSEMBLY OF THE CLUTCH TO THE ENGINE IS IN REVERSE ORDER, EXCEPT THAT OF COURSE YOU DON'T HAVE TO “BREAK THE CLUTCH FREE OF THE TAPER” ON THE CRANKSHAFT. RE-TIGHTEN THE ALLEN-HEAD BOLT (OR THE 13MM HEX BOLT, IF IT IS AN SEP MACHINE) TO 18 FOOT-POUNDS (215 INCH-POUNDS).**

Clutch “Rebuild” video: [https://www.youtube.com/watch?v=5t\\_N7U4LZ64](https://www.youtube.com/watch?v=5t_N7U4LZ64)  
 Clutch cable adjustment video: <https://www.youtube.com/watch?v=SAv8eE7ytiY>  
 Breaking a stuck clutch free– PDF: [https://www.earthtools.com/pdf/freeing\\_stuck\\_bcs\\_cone\\_clutch.pdf](https://www.earthtools.com/pdf/freeing_stuck_bcs_cone_clutch.pdf)  
 Breaking a stuck clutch free—VIDEO: [https://youtu.be/\\_Yn8mP4Ag1E](https://youtu.be/_Yn8mP4Ag1E)

**IF YOU HAVE ADDITIONAL QUESTIONS, PLEASE CONTACT US AT EARTH TOOLS INC.  
 502-484-3988 OR [service@earthtools.com](mailto:service@earthtools.com)**