



Soft Lok Clutch Instruction

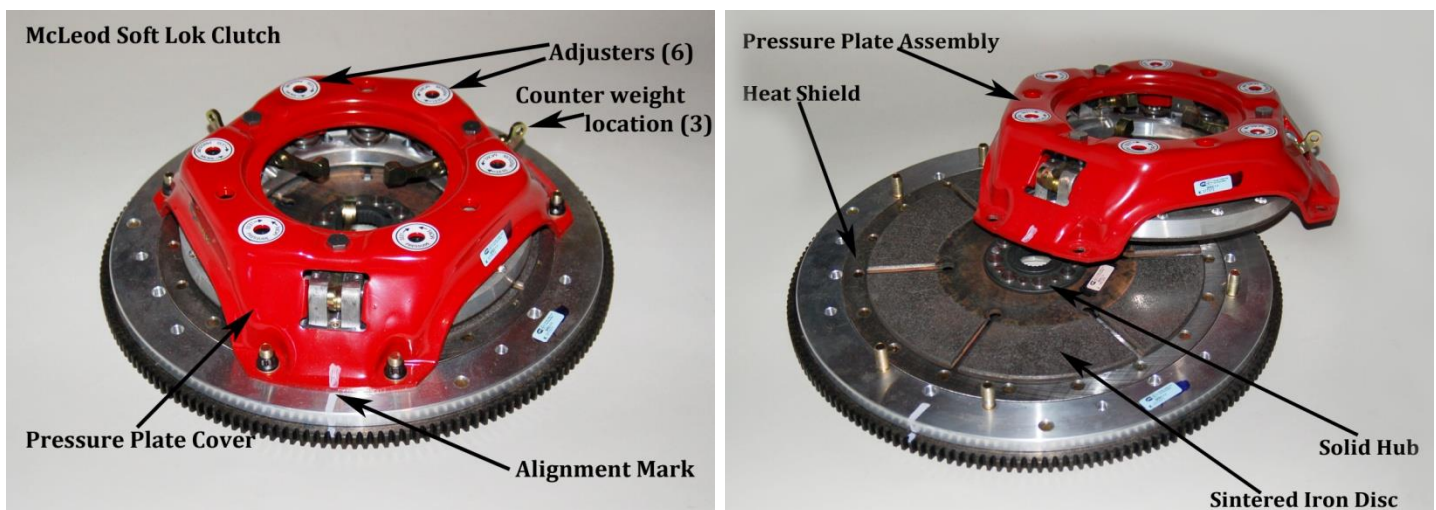
Warning: DO NOT USE SOFT LOK ON ANY DYNO!!

BASICS:

The Soft Lok clutch assemblies consist of an adjustable Ford Long style pressure plate, sintered iron disc and flywheel. Steel flywheels are normally used on engines that are under 450hp and typically not heavier than 22 lbs. Engines over 450hp use an aluminum flywheel with a steel insert. Car weight, tire size and gearing do play into this decision. Call the McLeod Tech Line if you need a recommendation.

The McLeod Ford Long style pressure plate has an aluminum pressure ring inside with a steel face riveted to it. It has nine springs, six are adjustable. Most Soft Lok clutches have 200 lbs of base pressure. Each of the six adjusters are found on either side of the levers. The adjusters are tear drop shaped to prevent them from locking if they are turned from base the wrong direction. The levers are fully machined steel billet, heat treated and balanced to each other. They have been machined so there will be no binding in them down to zero pressure. It is important to have steel surfaces on either side of the disc to keep the same coefficient of friction.

The disc is sintered iron and is very aggressive. In order to control the aggression, McLeod reduced the pressure in the pressure plate. When we reduce the pressure then we give up reaction time, so we assemble the disc with a solid hub, so there is no loss of reaction time as there might be in a sprung hub disc. This disc has a special characteristic and is expressed as: "The hotter it gets, the harder it bites". This will be explained further in these instructions.



Soft Lok Assembly shown with aluminum flywheel

PREPARATION:

When you receive your Soft Lok assembly, bolt it up to the engine. Get yourself a T-Handle Allen wrench that fits the six adjusters. (Helpful Hint: mark one of the "T" by painting, striping or taping it). Put the T-Handle in one of the adjusters and move it back and forth ½ turn. Get used to the feel of what base pressure feels like. If you have to close your eyes to feel I then do so. You need to know how it feels because most often times you will make the adjustment to the clutch through a hole in the bellhousing; this will be covered in Phase 1. Once you are use to the feel we will make the initial adjustment to the pressure. We want to have the clutch high enough so there is no slippage in any gear. A good rule of thumb is to start at 8 – 10 turns. The adjuster turns just the opposite of what one might think, counterclockwise adds pressure and clockwise take it out. If needed, mark the bellhousing hole to reflect this. Start turning your T-Handle CCW until you feel tension on the Allen screw. Check to see where the marked end is on the T-Handle and turn it 360 degrees for at least 8 – 10 turns. There will be a counterweight kit with your assembly. It has aluminum nuts, steel nuts and bolts and steel weights. Put it in the toolbox until we get to the section on adjusting the clutch.

CONCEPT:

Most clutches are high-pressure lockup types and will have steel flywheel. When you launch the car with these, the high spring pressure and the stored energy of the steel flywheel will shock the car like pulling the trigger on a shotgun and feel like someone hitting the back of the seat with a baseball bat. The trouble is it breaks parts and sometimes will cause the tires to spin and get the car out of shape. The steel flywheel will get you to 60 feet faster but after that the steel flywheel becomes an anchor and will rob you of horsepower. Using the Soft Lok your ET and MPH will improve. You will have little to no breakage because we are causing a controlled slip in the clutch that takes out all of the shock and violence. With its lower spring pressure and lighter weight, it will not hit the tires or chassis as hard and tire spin can be controlled so traction is better and the lighter weight will let the engine rev quicker and pull harder through mid range and top end.

Phase 1 What you have to do to run the Soft Lok.

First, you need to get yourself a logbook. It can be just a paper one you can carry with you in your toolbox. It will help you in keeping track of all you do with the car, clutch and chassis. Second, get a six inch ruler and a felt marker. Place the ruler flat on top of the red pressure plate cover; slide the end of the ruler to the center of the cover. Measure from the center of the cover out to the center of one of the adjusters; mark it down in your logbook for future reference. Now take the ruler and felt marker over to the bell housing, place the ruler on the transmission surface of the bell housing; slide the end of the ruler to the center of the center bore. Measure out to the same amount as the spring adjuster; mark the bell housing with the felt marker anywhere on the face of the housing that is easily accessible with a t-Handle once the transmission is installed. Now take one of the transmission bolts and measure the threads, get a drill bit about that same size and drill your bell housing where you marked it. You have now put a hole in the bell housing just like any other transmission bolt pattern so tech inspectors cannot disqualify you because you can have multiple transmission patterns on this surface. Put on your bell housing and line up one of the adjusters under the hole. Put your T-Handle in just to make sure it lines up. Go to the front

pulley; find the reference spot on the pulley you can see all the time. Mark your pulley number one at that reference spot, and then mark the pulley one through six around the pulley at equal distance. (This equals 60 degrees for each number.) This will make it easy to locate each of the 6 adjusters with you T-Handle.

Phase II How to use the Soft Lok Clutch.

Driving habits are sometimes very hard to break, but if you will follow two very simple instructions then the Soft Lok Clutch will be very consistent for you. First understand that the Long style clutch is sensitive to RPM. Once you understand there is a certain RPM range this clutch works best in then it will be easy for you to adjust you driving habits to accommodate it.

First, all stick cars must spin the tire on launch, 1 – 2 revolutions is ideal. Paint a white strip on the side of the slick and have someone video tape the launch. Play it back in slow motion and count the number of revolutions that took place. If you don't turn the tire you are going to over-heat the clutch and burn it up, also you are putting undue stress on your cars drive train. i.e.: Trans, u-joints and rear end.

You don't want to bog the engine on the starting line, keep it in the power band. The ideal situation is to find out at what RPM your engine makes peak torque. If it's 4500 RPM then you need to launch the car 1000 – 1500 RPM above that. i.e.: 5500 or 6000...Why, because the engine will usually pull down 1000 – 1500 RPM when you drop the clutch. By leaving at above peak torque, the engine does not bog but pulls cleanly from the bottom and then drives into peak horsepower, which is where your shift points should be.

Of course, traction is the limiting factor, so you will have to tune your chassis to get proper traction to leave at this RPM. If you have no chassis adjustment, then you will have to adjust tire pressure and lower your RPM some to help gain traction. Lowering RPM though is not going to give you the best run the car is capable of, because you're not using the engine in its power band. The main thing to remember is: always turn the tire on the starting line and never bog the engine by launching too low in the RPM range. Second, "THE HOTTER IT GETS THE HARDER IT BITES".

As the disc gets hotter, the material it is made of becomes more aggressive. It is important when doing the burnout that you don't drive out of the water onto the dry pavement and let the tire hook-up, this will slip the clutch and glaze the facings causing little or no bite. As soon as you hear the engine start to pull down during the burnout, press in the clutch pedal, pull up to the starting line and stage the car. The tires are as hot as they need to be from the burnout and the more time you waste the tire is starting to cool back down. Ideally, you want that hot sticky slick to vulcanize itself to the rubber that is already at the starting line. Dry hops do not develop enough tire spin to heat the tire or keep its temperature up.

PHASE III

Always remember, as a rule, spring pressure controls the launch of the car and counter weight helps lock it up in the higher gears. RPM plays a big part in determining if you use the counterweight and how much. Lower RPM engines can use more counter weight and less spring pressure to help get the car off the starting line. The reason for this is counterweight is trying to engage the clutch when you raise the

RPM. At 5500 or 6000 RPM counterweight doesn't push back on the pedal flexing the linkage and chassis like it tries to do at 7500 – 8000RPM. Your car will dictate how much counterweight is too much. If you can't stage the car with the line lock off, bring it to launch RPM and have the car sit there and not creep, then you have too much counterweight or a weak chassis and /or clutch linkage. If the car creeps when staging, then you are burning up the clutch, because it is trying to engage itself. You would have to remove some counterweight or increase the clutch release (air gap). This would be done by making an adjustment to the pedal stop, allowing the pedal to travel further. You do have a pedal stop, right? Without it your car will never be consistent because you are not releasing the clutch the same amount each pass.

Remember, how much release or air gap you have controls how far the pressure plate ring travels before it hits the disc. The more air gap, the harder the clutch hits. The slower your reaction time will be also, and the less air gap you run the softer the clutch hits, and the quicker the reaction time. If you try to quicken your reaction times by running less air gap, you will also be building more heat in the clutch. Heat is wear and more maintenance, so there is a trade off. But if you have little or no chassis adjustment and you are blowing the tire off the car on the starting line, and you can't launch any lower in the RPM range without the motor bogging, then you can reduce the air gap, to gain traction on the starting line. Just don't overdo it! .050 to .080" air gap is the normal range to be within. Air gap is measured between the disc and pressure plate with the clutch pedal depressed to the stop.

With 8 – 10 turns counter clockwise of adjustment on each spring adjuster, the clutch should not slip during your pass. If you are launching at or below 6500 you should be able to use the long steel bolt and steel nut on each lever. Remember, the car will dictate what the limit is. If you are launching at 7000 and over, use the small steel bolt and steel nut.

Let's make a pass. You must listen to the engine. If during the gear change, clutch slippage is noticed, then you will need to add more clutch. Normally with at least 8 turns in the clutch there will be no slippage anywhere, but if in high gear the engine starts to run away, then abort the run, go back to the pits and add 2 more turns.

Make sure you have the correct amount of free play at your throw out bearing. 1/4" gap between the throw out bearing face and the clutch fingertips is all that is needed. If you run the bearing too close the clutch can slip due to the clutch fingers rising with the RPM and contacting the throw out bearing. If the tires are spinning on the gear change, normally they will only spin right at the moment of the gear change then the tires will re-hook. If the clutch is slipping the engine will run away at the gear change and on in to the next gear. Please pay attention here, and possibly have somebody video the pass to help you diagnose the run. If the clutch is violent all the way down the track on each gear change then that is good. The clutch is locking up and not slipping. After 2 passes like this you can now take 1 turn clockwise out of the clutch adjusters, at a time, per run, until the clutch slips in high gear only. If you get it to slip then you are too low on the spring pressure and you will need to add $\frac{1}{2}$ - $\frac{3}{4}$ turn back in counter clockwise to make the clutch recover in high gear and not slip. At this point, you're done. The car now should only require adjustment if the track conditions should change drastically, or over time as the clutch is wearing out. You will need to add pressure to compensate for wear.

Normally a national caliber car will run two seasons on a pressure plate and disc before it will need servicing. At that time, contact us in regards to our rebuild procedure. The good news is once you

establish how much counterweight you can handle: you won't need to readjust it unless you change the drive train or horsepower drastically. Keep notes, don't make but one adjustment at a time (chassis, or clutch or tire pressure, etc) and remember, there is no substitute for testing, it is how we learn.

OTHER ADJUSTMENTS

Keeping track of adjustments with a logbook is critical if you want to be consistent and learn about your car. We suggest three places you can adjust the car.

1. Chassis- adjust it stiffer and make a pass, loosen it up and make a pass, always log the results of each pass. Money spent on a good double adjustable (compression and rebound) shock, its money well spent.
2. Shocks- adjust them tighter and make a pass, make them looser and make a pass.
3. Tire pressure- adjust for more air, make a pass, then less pressure and make a pass.

By looking at your logbook you should be able to see if the car ran faster with any of those adjustments. We cannot stress enough; do not make more than one adjustment at a time! This clutch is a low to no maintenance; it is made to put fun back into drag racing. So all you have to do now is go out and have fun.

Warning: Do not use the Soft Lok on any dyno!!

Do not drive the car onto the trailer or car hauler!!

Soft Lok Assembly with six adjusters

and a .280" thick Disc

Base Pressure = 200#

1 turn of all (6) adjusters increases total pressure to 330#
2 turns of all (6) adjusters increases total pressure to 460#
3 turns of all (6) adjusters increases total pressure to 590#
4 turns of all (6) adjusters increases total pressure to 720#
5 turns of all (6) adjusters increases total pressure to 850#
6 turns of all (6) adjusters increases total pressure to 980#
7 turns of all (6) adjusters increases total pressure to 1110#
8 turns of all (6) adjusters increases total pressure to 1240#
9 turns of all (6) adjusters increases total pressure to 1370#
10 turns of all (6) adjusters increases total pressure to 1500#
11 turns of all (6) adjusters increases total pressure to 1630#
12 turns of all (6) adjusters increases total pressure to 1760#
13 turns of all (6) adjusters increases total pressure to 1890#

Important Clutch Installation Hints

The following check list is a reminder of the necessary inspection points and precautions required to insure a trouble-free clutch installation.

Installation / Do's

- 1) Determine cause of original clutch failure. Cause of first clutch failure (if not wear) MUST be found and corrected. If oil is present on clutch plate, cause of leak MUST be corrected before installation of new clutch unit.

- 2) Check splines on transmission input shaft for signs of abnormal wear or twisting. Slide new disc on spline by hand gently to check fit. Disc should move FREELY on splines.
- 3) Remove ALL oil or grease from friction surfaces on flywheel and cover assembly. Surfaces **MUST** be clean and dry. Also clean input shaft spline with a wire brush. Lubricate with dry graphite spray if needed.
- 4) To insure proper operation, friction surface of flywheel **MUST** be resurfaced. Check dowel pins, they must be smooth and straight.
- 5) If throw-out bearing is worn, replace it, better now than later.
- 6) Closely inspect pilot bearing or bushing for excessive wear to avoid transmission shaft misalignment. Replace it if any doubts.
- 7) Use clutch alignment tool to insure disc and cover are properly aligned with pilot bearing.
- 8) If using an aftermarket scatter shield/bell housing, checking center hole run-out is highly recommended.
- 9) Be sure all special type bolts, if any, are replaced in their proper locations.
- 10) Torque all clutch cover bolts evenly, to factory recommended spec, using a progressive "criss-cross" tightening pattern.
- 11) Before completing installation, inspect all clutch linkage parts (fork, clevis, pins, etc.) for signs of wear and replace ALL worn pieces. Grease all pivot points in linkage system.
- 12) Adjust clutch pedal "free play" to correct specifications. Throw-out bearing should not be tight against clutch fingers. 1/8" - 1/4" is recommended, except cable linkage.

Installation / Don'ts

- 1) Don't let any grease or oil contact ANY friction Surface.
- 2) Don't use an impact (air gun) to tighten cover bolts.
- 3) Don't let transmission weight rest on input shaft during installation.

Torque Specs

5/16-18 Grade 8	25 Ft/Lbs
3/8-16 Grade 8	35 Ft/Lbs
7/16-20 Grade 8	65 Ft/Lbs
1/2-20 Grade 8	75 Ft/Lbs

Limited Warranty

McLeod Racing LLC, products are warranted to be free from defects in material and workmanship for the period of ninety (90) days, from the date of purchase. McLeod does not warrant or make any representations concerning its products when not installed and/or used strictly in accordance with the manufacturer's instructions for such; installation and operation, and in accordance with good installation and maintenance practices of the automotive industry. Products purchased used do not carry a warranty. This warranty is to the original purchaser and is non-transferable.

McLeod Racing LLC will not be held liable for the labor charges and other intangible or consequent losses that might be claimed as a result of the failure of any part, nor shall it be liable for damages or injury to persons or property resulting from the misuse or improper installation of any part subject to this warranty.

No merchandise may be returned for any reason unless prior return merchandise authorization number (RMA) has been obtained from McLeod. An RMA number may be obtained via www.mcleodracing.com or by calling McLeod directly.

McLeod Racing LLC reserves the right to examine all parts returned for warranty claim to determine whether or not any such part has failed because of a defect in material or workmanship. McLeod's obligation under this warranty shall be limited to repairing, replacing or crediting, at its option, any part found to be defective. All products returned to McLeod for warranty inspection must be prepaid by the customer under this warranty.

In a racing environment, the type of stress placed on automotive parts can vary dramatically by the type of use, driving style, track preparation, differing tire style and other variables that are out of McLeod's control. For this reason, any parts used in a racing environment shall be void of any warranty either expressed or implied.

There are no other warranties, either expressed or implied including, but not limited to, warranty of merchantability, and warranty of fitness for a particular purpose which extend beyond those set forth in the preceding paragraphs. This warranty shall be interpreted and applied in accordance with California law.

For any changes or updated versions of the warrant described above, please refer to www.mcleodracing.com before installation of product.