



JP FIRE CONTROL KIT

Installation and Setup Procedure

Version 02.12

PACKAGE CONTENTS

- JP trigger (with disconnecter spring installed)
- Two (2) 1/2" engagement set screws (one spare)
- Two (2) 3/8" overtravel set screws (one spare)
- Disconnecter
- Reduced power trigger return spring
- Tactical reduced power hammer spring (red)
- Competition reduced power hammer spring (yellow)
- .050 long hex key
- DVD instructional video
- Instruction manual



The installation of the JP Fire Control Kit will also require you to supply the following items:

- padded vice
- plastic mallet
- drift pin / slave pin
- Rydol® gun grease
- lacquer thinner or acetone
- compressed air
- protective eyewear
- Loctite® 271

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JP high performance firearm components represent the state of the art in their respective product categories. However, be aware that any change to the original design of the firearm may yield performance improvement in one area but usually at the expense of something else. It is your responsibility to determine if any aftermarket component is suited to your application. When in doubt, call our technical support line for guidance: 651-426-9196

NOTICE

No liability is expressed or implied for damage, injury or death resulting from the improper installation or use/misuse of this product.

Like skydiving or rock climbing, the handling and use of firearms carries with it certain unavoidable risks. In you are not willing to accept the responsibility for your own actions, firearm ownership is not for you.

The use of any custom parts or modifications may void the warranty from the manufacturer of your firearm.

We strongly recommend that a qualified gunsmith check the safety and function of your modified firearm.

Before performing any work or modification on your firearm, make sure it is clear. Remove any magazines, open the action and visually check the chamber to ensure that your firearm is completely unloaded.

INTRODUCTION

Thank you for purchasing a JP Fire Control product for your gas gun application. Before beginning, be aware that the installation of these components is not for everyone. If you do not have a thorough understanding of the AR-15 trigger system, the purpose and function of the disconnecter or cannot verify proper function of the disconnecter, do not attempt the following installation. Have the work performed by an experienced gunsmith, or reference our website for shipping instructions if you would like us to perform the installation. We offer a quick turnaround and will install the trigger system for a nominal fee. If you do opt to install these parts yourself and irretrievably damage the trigger in the process, we offer a special “bail out” price so you will not have to pay the full cost to replace parts that may have been ruined during installation. Call or email for details.

JP Fire Control components are designed and intended for semi-automatic use only and will not function in a full-auto application. ***Attempting to use these components in a full-auto application will place you in violation of federal law.*** You may install our components in an M16 lower receiver but it will yield only a semi-auto trigger setup.

If your firearm is a Colt with large trigger pins (.169 OD), you will need the appropriate JPFC-2 Fire Control Kit. If you have ordered or received the wrong kit by mistake, do not attempt to alter it. Return it to us, and we will exchange it for the correct kit, no

matter where you purchased it. All receivers other than Colt will use small trigger pins (.154 OD pins).

If you are installing this kit in an AR-10-type rifle or your rifle will be used for military/police duty or home defense applications, make sure to use the supplied heavier red tactical hammer spring or your original full power hammer spring for full ignition reliability with any type of ammunition. NATO spec. ammo and some foreign-made ammo have very low-sensitivity primers making higher hammer velocity necessary for full ignition reliability. In particular, .308 rifles should have a finished pull weight of about 4 pounds to prevent the “finger bounce” doubling effect. See the back inside cover of this manual for additional trigger/hammer spring sets available from JP.

USING THREAD LOCKER

The purpose of the adjustments on the JP trigger is to optimize the engagement and overtravel for a particular receiver. If this is done properly the first time, it should not have to be readjusted or tuned. To complete the final setup, thread locker must be used and will never loosen once cured unless heat is applied to the screw collars. Do not use Loctite® 242 (blue) or substitute products like nail polish.

When using the included thread locker, be aware that you will have somewhere between a few minutes to an hour of working time, depending on humidity and heat. Because of this, make

sure to practice the adjustment steps at least once before committing to the thread locker. If it sets before you obtain the correct setting, you will have to apply heat to the set screw collar to degrade the thread locker and remove the set screw, then clean the screw and collar for another run. Make sure also not to apply excess thread locker. If the thread locker bleeds into the pin bearings or between the trigger and the receiver, it will lock up the entire mechanism.

For the Loctite® to function properly, it is important that the set screw threads and the threaded collars of the trigger are thoroughly cleaned with lacquer thinner or acetone; simply soaking the parts in solvent will loosen the oils but may not carry them out of the threads. Follow the soaking with a blasting of compressed air. A can of aerosol brake cleaner may be employed to this end, but be sure to wear eye protection during use.

RIFLE PREPARATION

CAUTION: REMOVE MAGAZINE AND VISUALLY CHECK CHAMBER TO ENSURE THAT THE FIREARM IS UNLOADED.

Before beginning the installation of your trigger kit, read these instructions thoroughly and review the instructional video on the DVD video included in the packaging and on our website. This video details our professional in-house installation procedure as a visual aid for the process.

To begin the preparation of your rifle, first verify that the weapon is clear. Then, proceed by removing the takedown pins and separating the upper and lower assemblies. Support the lower receiver assembly in a padded vice while removing and installing the new trigger system. A plastic mallet and a drift pin will also be helpful for installing and removing the trigger pins without damaging the receiver. These pins will be removed and installed a number of times during the setup process.

The JP trigger will be compatible with your original hammer if it has not been altered in any way and has been made to spec. ***If you know or suspect that your hammer has been altered in a previous “trigger job,” call us to order a replacement hammer or the JP Speed Hammer for improved lock time and ignition reliability.*** Save all your original parts in case you want

to convert back at some point. If you are using JP Oversize Anti-Walk Pins, they will be a press fit to most receivers and will not require the receiver pin holes to be reamed. Also, the J-spring in the hammer is no longer needed to retain the pivot pin in the receiver and can be removed. The JP Speed Hammer does not have a J-spring so it will not have to be removed. If you are using a JP Speed Hammer with standard grooved pins, be sure to use the supplied D-clip to retain the pin. If you are using a stock hammer, you may want to cut the hood feature back with a Dremel tool cutting wheel (as shown at right) to prevent the tip of the hood from impacting the disconnecter as it is reset by the bolt carrier during live fire. This modification will also improve lock time.



To prepare for the installation, you'll want to support the lower assembly in the vice giving easy access to the trigger pins. Remove the trigger pins, hammer and trigger subassemblies. If you are using the original hammer, replace the hammer spring



from your hammer with the supplied spring. Remove and degrease the engagement and overtravel set screws as well as the threaded collars on the trigger if you haven't already done so. Do not reinstall the set screws at this point. If not already

done, install the disconnecter return spring included in the kit by pressing the slightly wider end of the spring into in the rear of the JP trigger. Then, install the supplied trigger spring on the JP trigger as shown above. Place the safety in the “FIRE” position.

4.5-LB. DCM LEGAL SETUP

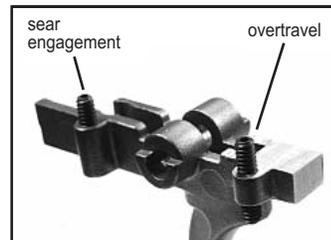
If you wish to achieve a 4.5-lb. trigger for service rifle high-power competition, use your original trigger return spring and hammer spring rather than those supplied. Due to the minimal hammer camming effect from our improved sear geometry, it may still be necessary to increase the tension on the trigger return spring to achieve the 4.5-lb. weight. You can do this by bending the two legs of the spring further down (about 20° to 25° as shown at right) to apply more return tension. By “tuning” the trigger return spring and slightly increasing engagement, you should be able to accurately tune the finished trigger weight to meet your requirement. If you would like an extra set of springs pre-balanced for the 4.5-lb. weight, see the JP Spring Kits section inside the back cover of these instructions.



SETUP PROCEDURE

Begin by installing the trigger and hammer assemblies without the disconnecter at this time. Put a drop of Loctite® 271 on the 3/8” overtravel set screw and install it into the front collar until it reaches the bottom of the receiver. Ensure that the right leg of the trigger spring is not underneath the overtravel screw. The spring is formed to push against the right wall of the receiver to clear the set screw.

Back off the overtravel setting while pulling the trigger until you reach the sear release point (zero engagement point) and the hammer falls. Then, back it off another quarter turn to half turn, making sure the hammer clears the top of the trigger when it swings through its arc. More overtravel will allow for greater dirt tolerance with reliable function. We recommend the higher setting for duty rifles. Less overtravel results in a more refined feel and shorter fire-to-reset travel, but the mechanism will be less tolerant of dirt and require more frequent cleaning of the fire control cavity in the lower receiver. How you set this is a personal preference based on the application of the rifle.



Place a piece of soft material in front of the hammer to break its fall against the receiver, as repeated hammering will damage the

receiver. We recommend our hammer block device, which will allow for repeated dry fire without damaging the lower receiver (or your thumb).



Re-cock the hammer. Place a drop of Loctite® 271 on the 1/2" engagement set screw and install it in the rear collar until it touches the floor of the receiver. Turn the engagement adjustment at the rear of the trigger inward (down) until the hammer drops off the sear. This is the sear release point (zero engagement point). Now, back it off about three quarters of a turn for adequate engagement. This will make the remainder of the process much easier.

Do not attempt to minimize the engagement beyond half a turn from the release point, as that is the absolute minimum required engagement. Reducing the engagement further will make it very difficult to time the disconnecter, and you will not have a safe and durable trigger setup.

The hammer should now be in the forward or released position. Drift the trigger pin to the left until it just clears the disconnecter recess. Try not to push it out all the way, as this makes for more work in repositioning the trigger each time. Install the disconnecter and insert the pin while making sure that you have the disconnecter return spring in place.

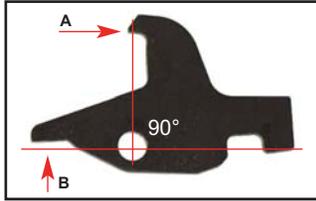
TIMING THE DISCONNECTOR

The purpose of the disconnecter is to prevent more than one round from firing with each pull of the trigger. It catches and holds (or disconnects) the hammer from the trigger until the trigger is reset or allowed to return by the shooter. When we refer to "disconnecter timing," we mean that point at which the disconnecter releases the hammer back to the sear surface relative to the reset travel of the trigger.

While holding the trigger to the rear, cock the hammer, which should be retained by the disconnecter at this point. Next, as slowly as you can, allow the trigger to travel forward and observe if and when the hammer reconnects to the sear. In most cases, it will not function properly at this point, the most likely cause of which is a failure to reset due to late disconnecter timing. In other words, the hammer is remaining attached to the disconnecter, which may require the modification described below. In some setups, the hammer may drop all the way down without connecting to the sear due to premature disconnecter timing. This results in more than one round being fired with one pull of the trigger, which is definitely unacceptable. The hammer should release from the disconnecter as close to the end of the reset travel of the trigger as possible, giving the impression that the hammer resets when the trigger stops at its forward most position. Repeat this test at least eight to ten times. You may manually release the hammer by pressing down on the back of the disconnecter with a punch if needed. If you find that the hammer won't release and reconnect, there are two solutions—the right one and the easy one.

The easy fix is to back off the engagement screw until the hammer is released by the disconnector and reconnects to the sear. This results in a functional trigger but compromises the optimal engagement setting. Still, it will be a vast improvement over the original parts. The better fix is to stay with the correct engagement setting while advancing the disconnector timing as described in the next section. If your hammer releases, misses the sear and travels all the way forward, it will be necessary to retard the timing of the disconnector.

If the hammer will not release from the disconnector when you release the trigger (at the proper engagement setting), the nose on the disconnector may be too long, and the release point timing must be advanced slightly. Stone or



grind the very tip of the disconnector (Figure-A in the diagram) back at 90° from the horizontal plane. Carefully remove about .005", and then try it in the gun again. If you use a grinding wheel or a belt sander with a support plate, ensure that the plate is square to the wheel or belt. It may be necessary to remove as much as .020" from the tip of the disconnector. If necessary, continue to remove a small amount of material, testing the disconnector in the assembly each time before removing more. If you do remove too much material we can supply you with a new disconnector.

If the hammer drops all the way when the trigger is released and misses the sear, the disconnector release timing is too early and must be retarded. If you do not have proper disconnector function, disconnector timing can be retarded by removing material from the pad on the disconnector (Figure-B in the diagram). **You have only one chance at this modification to "recover" an overtimed disconnector.** This will allow the "at rest" position of the engagement hook to come forward slightly. The hammer should release from the disconnector as close as possible to the end of the reset travel of the trigger. If this fails, you should start again with a new disconnector. If you still do not have reliable disconnect and reset function, your hammer may have been altered or is out of specification, or the trigger/hammer pin holes in the particular receiver may be slightly off in their positioning. This is more common than one might think, as there is considerable runout in pin hole placement in all the various receivers on the market. This doesn't matter with stock parts but can be a real problem with after-market fire control parts.

Because there can be significant variations in the hole geometry of the various lower receivers on the market, it is possible that you have a receiver that is not compatible with our parts. Our trigger assumes reasonably close geometry and in-spec hammers in order to achieve such a refined function, allowing for .020" variance in the hole spacing of various receivers. If you cannot achieve proper function at this point, call us with the problem. If necessary, you can make arrangements to have us install the components. We have the equipment necessary to alter sear geometry, custom tuning it to match hole spacing problems for any receiver.

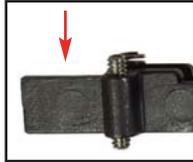
Go no further if the trigger system is not functioning properly. ***If your trigger system does not pass the disconnecter test, do not attempt use, as it may “double” or fire on release.***

LUBRICATING THE TRIGGER AND HAMMER

We recommend applying Rydol® boron nitride sear prep or some high film strength lube to the sear and disconnecter engagement surfaces. You may wish to further dress and polish the sear or hammer notch, but be careful not to remove any significant material or change the angle of the notch. The parts are prepped prior to packaging and don't require any further attention.

SAFETY SETUP

If the trigger is functioning correctly, place the hammer in the cocked position. Try to engage the safety, but ***do not force it***. If the safety engages, pull the trigger and watch for any movement. ***It is essential that the safety block nearly all movement of the trigger.*** At this point, the safety will likely not engage, and the trigger will have to be fitted to it. We have already removed .025” from this area (shown at right), which will be very close to a hard fit on most guns.



First, remove the hammer. Now, remove the trigger and lower the safety engagement pad incrementally, reinstalling the trigger and testing the safety until you reach a hard fit. Without the hammer installed, the safety should hold the trigger against the engagement screw so that you cannot move the trigger when you press it. Make sure that your setting is correct. The selector should rotate to the safe position without noticeable resistance while blocking nearly all movement of the trigger in the cocked position. Forcing it may damage the trigger or drive the engagement set screw into the floor of the receiver. Take care not to ruin the trigger by removing too much material. No refunds will be made for parts that have been modified.

Note: The safety selector will not engage with the hammer down in the locked position. Do not attempt to force the safety into the “on” position with the hammer in the down (fired) position. Doing so may damage the trigger and receiver.

JP ADJUSTABLE/REVERSIBLE SELECTOR (JPFC-SA)

Another option to eliminate the safety fit process is to purchase the JP Adjustable/Reversible Selector. This allows for the proper safety engagement setting to be quickly achieved by merely adjusting the safety selector and locking it in place. The selector comes with two reversible levers making it ambidextrous to favor right- or left-handed operators.



FINAL VERIFICATION

Reassemble the upper and lower assemblies and test the disconnecter function as follows. With the safety in the “off” position, cycle the bolt with the charging handle, and then squeeze the trigger. Do not release the trigger, but hold it to the rear while cycling the action again. Release the trigger, and listen for the click of proper reconnect of the hammer. Repeat this several times. If the hammer drops all the way forward at any time, do not attempt to fire the rifle. Cycle the rifle, and then switch the safety to the “SAFE” position. Pull the trigger hard while making sure that the hammer does not fall. Then, release the safety again while making sure that the hammer does not fall on safety release. If your installation passes these tests, it is ready for live fire.

If it fails to reconnect, the system is out of adjustment or the disconnecter needs further work. Call us if you have a problem. Allow 24 hours for Loctite® to set up before actual firing of the rifle. Before firing, verify that the set screws are solid and will not move while in use. If it is necessary to redo the setup, you will have to apply heat to the set screw collars to break down the thread locker.

Caution: Never attempt to engage the safety selector if the hammer is in the down or “fired” position. This may cause damage to the hammer/sear interface and possibly crack the trigger. A properly fitted trigger/safety selector relationship will not allow the selector to be engaged (with hammer down) without forcing it.

Again, if you do not feel comfortable attempting the installation after reading these instructions, reference our website for shipping instructions for your lower and allow us to perform the installation for you.

USING YOUR RIFLE

Before firing or allowing anyone else to fire your rifle, the user should dry-fire it first to get accustomed to the refined trigger. While using your firearm, always remember the following rules:

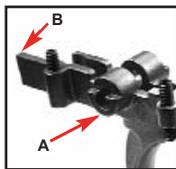
- 1. Handle all guns as if they were always loaded.**
- 2. Never sweep yourself or anyone else with the muzzle.**
- 3. Keep your finger out of the trigger guard until ready to fire.**
- 4. Be certain of your backstop and your target.**

This fire control system is intended for use only by experienced competitive shooters and professionals. You must take responsibility for your own actions. JP Enterprises will not be responsible for any injury, death or property damage resulting from the use or misuse of these parts.

TROUBLESHOOTING

Problem: The trigger will not even fit into lower receiver.

Solution: The trigger is slightly too wide for your lower. Remove a little material from the sides of the trigger pin-bosses (Figure-A) until the trigger will slide into the lower with no resistance.



Problem: The trigger slides into the receiver but will not clear the safety and fall into place.

Solution: Radius the rear upper corner (Figure-B) of the trigger until it just clears the safety.

Problem: The trigger feels like a two-stage trigger and is still over a 5-lb. test weight.

Solution: The top of the disconnecter nose is hitting the disconnecter spur on the hammer just before the sear releases the hammer, which causes it to stop like a two-stage trigger and adds the weight of the disconnecter return spring to the overall weight of the trigger. This causes a false “two-stage” effect. Stone the flat on top of the nose of the disconnecter back or dress the bottom of the disconnecter hook on the hammer at the contact point as discussed above until the trigger releases the hammer without stopping.

Problem: Hammer reset is not reliable even though the disconnecter seems to be properly timed.

Solution: The engagement surfaces of the disconnecter and hammer are not properly lubricated, or there may be a burr on one or the other. The reset feel should be quite smooth. If it feels rough, check the tip of the disconnecter for burrs and the surface of the hammer spur for machine marks. The hole spacing of your receiver may also be out-of-spec, so the geometry of the hammer notch must be altered for your receiver. Arrange for us to install your trigger components, and we will custom tune the parts to work in your receiver.

Problem: Rifle occasionally “doubles” (fires more than one round with a single trigger pull) under live-fire conditions.

Solution: This is a potentially dangerous problem and must be solved before further use of the rifle. It may also get you in trouble with the authorities. More than a few people have been prosecuted for attempting to “manufacture” a machine gun.

There are several causes of doubling in live fire. The first is mechanical. If you have just completed the installation, and the rifle is malfunctioning, you have not achieved proper disconnecter timing. What is actually happening is a “fire on release” situation. Specifically, the weapon fires when the trigger is

pulled and fires again when the trigger is released because the hammer is released by the disconnecter before the sear is there to receive it. If the rifle has worked properly for some period of time and suddenly develops this problem, your disconnecter has probably worn back at the tip and should be replaced. All M15-type rifles will develop this problem given enough use. Still, a properly timed disconnecter will last many thousands of cycles before failure.

The second common cause of doubling is the “finger bounce” effect. There are even devices on the market specifically designed to enhance this effect resulting in mock full-auto fire. This problem can be caused by a combination of improper trigger control technique and a trigger release weight that is too light. As the rifle moves in and out from your shoulder under the recoil impulse, the trigger is bouncing against your finger. If the trigger weight is too light, your finger will trip the sear under the recoil impulse resulting in multiple shots. This technique is not appropriate with self-loading rifles. For a demonstration of proper trigger control technique as it relates to semi-automatic rifles, watch the DVD *GasGunBasics* produced by JP Enterprise, Inc. It has a wealth of information regarding all aspects of use, maintenance, loading, optics selection and proper bench technique including trigger control.

The doubling effect is also most common when the finished weight of the trigger is below 3 lbs. Weigh the trigger with a weight or spring gauge to verify that your finished trigger weight is at least 3.0 to 3.5 lbs. If it is much below 3 lbs., you should increase the pull weight. This can be done without redoing the set screws by increasing the hammer and/or trigger spring tension, assuming that you have proper engagement setting in the first place. People who are accustomed to shooting bolt guns with very light triggers and use “bench rest” techniques are particularly prone to experiencing this condition, as they have a very light grasp of the rifle and feather the trigger. This is also not an appropriate technique for a self-loader. Additionally, rifles not equipped with a muzzle brake—short-barreled carbines in particular—require a heavier trigger setup to avoid the finger bounce problem. Remove the JP trigger spring and replace it with the original. This will add about six ounces to the pull weight. If that is insufficient, bend the legs down about 25° (see page 6) to further increase the trigger reset tension. If you approach 3.5 lbs. and still experience the problem, you may have some other problem that needs professional attention, which we can help to diagnose.

The final cause of firing more than one round per pull of the trigger is the “slam-fire” effect. This is caused by the firing pin striking the primer as the

bolt carrier assembly comes forward into battery at high velocity. The inertia is imparted to the firing pin, and as the bolt closes, the firing pin continues forward at speed to strike the primer. You will notice that, when unloaded, the last round in the chamber will always show a firing pin witness mark due to this effect. If the primer is sufficiently sensitive and the firing pin velocity high enough, you may have a slam fire. Always use appropriate primers (small rifle or small rifle magnum) for a semi-auto rifle. Use of certain operating system components that speed up the bolt velocity or over-gassed operating system can exacerbate this problem. If the double occurs so fast that it is almost indistinguishable, then it is probably a slam fire. The sure fix for a constantly slam firing rifle is to switch to a titanium firing pin. The lower mass of the titanium firing pin makes it impossible for the pin to transfer enough kinetic energy to cause ignition.

Problem: Repeated ignition failures are occurring.

Solution: Our custom springs (color-coded yellow) are balanced to give a 3- to 3.5-lb. pull weight and give reliable ignition using domestic (US-manufactured) ammunition and primers for recreational or competitive shooting use. If your rifle's intended use is for military, police or home defense, or if you intend to use foreign-manufactured ammunition, you

must use a full power Mil-spec hammer spring. This will solve any ignition problems and give "duty" ignition reliability, which should be the criterion if lives may depend on the function of the weapon. If you are using reloaded ammo, you may also have high primers. Box the ammo with the case head up and examine the primers making sure that all primers are below flush.

Problem: Nothing happens when the trigger is pulled. The hammer drops, but there is no movement in the trigger regardless of pressure.

Solution: This is probably failure to reset. The hammer is not resetting to sear. This is usually due to debris from firing falling into the bottom of the receiver and lodging under the overtravel set screw, which will not allow the trigger to come all the way forward, releasing the hammer from the disconnecter for normal reset. Use solvent to clean out the receiver followed by blowing it out with compressed air while manipulating the trigger to clear dirt from underneath the screw.

Failure to reset can also be caused by lack of lubricant on the disconnecter hook of the hammer. A dry disconnecter engagement surface may cause the disconnecter to stick on the hammer resulting in the failure to release. Grease the disconnecter engagement surfaces.

NOTES

JP SPRING KITS

Our standard springs are yellow-coded and are specially balanced to give a 3- to 3.5-lb. finished trigger weight and provide good ignition reliability when used with domestic ammunition and components for AR-15 type rifles in 5.56 NATO/.223 Rem., or AR-10 type rifles in 7.62 NATO/.308 Win. If you intend to use foreign-manufactured or NATO specification ammo, use the included red tactical hammer spring because the primer sensitivity of these ammunitions is very low. For a heavier release or for a simple upgrade of your existing fire control springs, JP offers a number of complete spring sets for various applications.

JPS3.5 - competition and recreational use spring kit (3-3.5 lb.)

(Yellow trigger return, yellow hammer)

JPS3.5T - full ignition reliability kit with moderate release weight increase (3.5-4 lb.)

(Yellow trigger return, red hammer)

JPS4.0 - tactical use or .308 rifle spring kit (4-4.5 lb.)

(Yellow trigger return, gray hammer)

JPS4.5 - CMP competition rifle spring kit (4.5 lb.)

(Gray trigger return, full-power gray hammer)

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