Hyskore®

BENCH BEAST® JOYSTICK COMPETITION SHOOTING REST



The Hyskore[®] Bench Beast[™] Joystick Competition Rest is designed for serious shooters. It provides all of the features that competition shooters look for in a front rest. In addition it can be attached to the #30196 Hyskore[®] Universal Rear Rest to form a fully integrated competition shooting platform.

The high bench clearance makes this an excellent shooting platform for modern guns with extended magazines and pistol grips.

Introduction

IT WOULD BE A GOOD IDEA TO READ THIS ENTIRE MANUAL BEFORE USING THE REST

ALWAYS WEAR APPROVED EYE AND HEARING PROTECTION WHEN USING THIS PRODUCT!

The Hyskore[®] Bench Beast[™] Joystick Competition Rest is a full featured competition bench rest that is designed for precision, long range bench rest, and F class shooters. If you know what shooter's want in a rest you will find everything you need in this product. In addition, this rest is designed to integrate with the Hyskore[®] #30196 Universal Rest, which (depending upon the type of competition you are participating in) can attach directly to the front rest to form a unified, fully integrated shooting platform. The key features of the Hyskore[®] Bench Beast[™] Joystick Competition Rest are as follows:

- Positive Non-Slip Primary Elevation That Rides On Linear Motion Bearings.
- A Liquid Smooth Joystick That Rides On Linear Motion Bearings With A Full 120 M.O.A. Range In Both Horizontal And Vertical Planes.
- Adjustable Ammunition Tray That Can Be Mounted To Either Side.
- Adjustable Forend Stop To Ensure The Gun Is Positioned In Exactly The Same Place For Every Shot.
- A Vise That Permits Adjustable Rest Bag Side Tension.
- Factory Filled Leather Rest Bag Included.
- Magnetic Spirit Level Included.
- Weighs 25 Lbs.
- Precise 3 Point Leveling.

The #30195-16 Rest Bag is supplied with the rest.

For wider forends part # 30195-18 is available as an extra cost option (see replacement parts).

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TOOLS YOU WILL NEED



A.) 2 Adjustable Wrenches B.) 5mm Hex Key Wrench STEP 1 IMPORTANT!!!



DO THIS FIRST The lock up has been set at the factory to reduce movement in shipping. Back it off 2- 3 turns to free up the gun platform. Failure to do this step first can result in damage to your rest.

STEP 2



Install the 3 levelers. You may have to elevate the upper base to gain enough clearance to install the 2 forward units.

If you are shooting on a soft surface, soft surface levelers (part #30195-17) are available as an optional purchase see replacement parts.

STEP 3



Slide on both tension plate carriers by engaging the slots on the platform as shown - you may need to move the platform to one side to gain enough clearance. Use a 5mm allen wrench / hex key to fix in place as desired. Tighten enough to hold in place (1-2 lbs ft torque) - Do Not Over Tighten. These only need to be tightened enough to keep the vise halves from moving.



Attach the ammo shelf arm as shown and lock in place with the hex nut and lock washer - The base is drilled and tapped on both sides so that the shelf can be fixed to either side of the rest.

STEP 5



Right Side Installation

STEP 6



Left Side Installation The arm goes <u>UNDER</u> the shelf.

STEP 8



Attach the forend stop support rod as shown and lock in place with the hex nut.



Thread the forend stop on to the support rod as shown. When it is at your preferred location, lock it in place with the hex nut.

The top of the stop can be moved upward by turning counterclockwise. This way perfect contact can be achieved.

IMPORTANT ! STEP 9 YOU WILL NEED 2 (two)

WRENCHES FOR THIS STEP



Install the joystick by placing a lock washer on the threaded rod then thread the joystick on to the male thread. When the angle suits your preference, hand tighten the hex nut and lock washer, then with one wrench, HOLD BACK ON THE JOYSTICK. Use the other wrench to tighten the free hex nut. Failure to hold back can cause damage to the mechanism.

STEP 10



You can use light acid free machine oil to lubricate the <u>thread</u> of the lock up -Do not lubricate the friction disk!

STEP 11



You can use light machine oil to lubricate the male thread of the primary elevation assembly and the joints (6 on each side) of the scissor mechanism. **STEP 12**



If you choose to use this rest as part of the Hyskore integrated shooting platform, you will need to purchase (optional - not included) the #30201 connecting rails and the #30196 universal rest and install them as shown.



The height of the rest makes it desirable to use either the Hyskore #30196 universal rest (not included) or a substantial rest bag (not included) to support the rear of the gun.

* In the photo we are using the Hyskore® #30173 Rest Bag supported by 4 x 4 wood blocks.

** Gun, Scope, Ammo, etc. (obviously) are not included.



The joy stick allows up to 120 MOA of liquid smooth movement in both the horizontal and vertical planes.



The primary elevation is a compound scissor mechanism that is opposed at 90° to the vertical travel of the rest. It will stay fixed in place without any creep or drift. And no additional lock up is necessary.

REST BAG TRACTION

Different competition rules specify how a rest bag may or may not be anchored. If a rest bag is allowed to be anchored, shooters have a range of ideas on the best way to accomplish this. With that thought in mind the #30195 Rest has a smooth platform surface, but the bottom of the rest bag supplied is rough suede leather. Our suggestion for increasing the traction between the rest bag and the rest is to use plumbers emery cloth (this is readily available at home improvement centers in the plumbing section, and it is typically 1.5" wide by several yards long and it has a durable cloth backing), and rubber cement. Any type of contact cement will do, but we choose rubber cement because it is easy to work with, easy to clean up, and provides an excellent result. The common brand is Elmer's and it is available at any stationery supply store. There are 2 ways to apply rubber cement: The first, which we <u>do not</u> recommend, is to apply it to one surface, put it on the other surface, press them together and wait for it to dry. The other way, which we recommend, is to coat both surfaces, this means the back side of the emery cloth and the top deck of the rest with rubber cement and *allow it to completely dry*. After it is dry simply place the emery cloth in the exact location that you want, press it in place and it will stay. If, some how you have located the emery cloth incorrectly you can simply peel it off and relocate it.



This is the result after the application of the emery cloth. It provides excellent traction. Of course, you can use any type of sandpaper, but it would not be as durable.



These are your basic raw materials: Elmer's Rubber Cement, and Oatey or Lenox Plumber's Emery Cloth.



The # 30195-16 Rest Bag supplied with the set will fit guns with sporter width forends and guns with up to 1 1/2" wide forends.



For guns with wide (1 1/2"-3") forends the # 30195-18 Rest Bag can be purchased - See the replacement parts section.

IMPORTANT



The drag / thrust screws must be properly adjusted in order to maintain zero when the lock up knob is engaged (refer to step #10). Tighten the lock up knob until it just makes contact with the gun platform face. Now tighten the drag / thrust screws until they make contact and then back them off 1/8 to 1/16 turn. If you do not make this adjustment the gun platform will move when



Use this forend stop to insure that the gun is positioned at the exact same point for releasing each shot.



The ammo shelf provides a convenient perch for cartridges. It can be fixed to either side of the rest. Use velcro or double face tape (not supplied) to anchor your cartridge box to the shelf.

A WORD ABOUT ACCURACY

When it comes to shooting, the word "accuracy" really refers to group size. Once the group is established, adjusting the sights to move the point of impact to the point of aim is a simple task. A gun/ammunition combination that shoots to 1, 3, or 5 MOA is just that. No matter what device you use to support the gun <u>that group size will not change</u>, not to mention extraneous factors such as sighting device, wind, stability of the shooting platform, trigger pull, parallax and/or the shooter. There is a long list of factors that can affect group size. Below we have attempted to briefly address a few of the more common ones. All comments are made with the "all things being equal" and "under perfect conditions" provisos. Please consider this a general guide that might point out a few things that might not have come to mind. Our #30185 Black Gun™ Machine Rest, #30003 Precision Rifle Rest and #30088 DLX Precision Rifle Rest are designed to produce repeatable results. If the rests are properly assembled, securely anchored to a bench that is rock solid and does not shift under the stress of recoil, you will be able to maximize repeatability. Each rest will consistently repeat well under 3 MOA. What this means is that if the gun/ammunition combination is capable of shooting groups of less than 3 inches at 100 yards (nominal 3 MOA), you will be able to realize this degree of repeatability with either rest. The big word in the previous sentence is "IF". No rest will make a 3 MOA gun place all of the bullets in one hole. The group will still be 3 MOA. If your bullets are not all forming a tight group, there is a high probability that the problem is a result of the gun, ammunition and/or the sight.

* MOA – Minute of arc – A circle has 360°, each degree has 60 minutes, i.e. 1/60th degree. 1.0 MOA is exactly 1.047 inches at 100 yards.

CENTER FIRE ACCURACY

A large percentage of the rifles, old and new, in the hands of American sportsmen will not shoot much better than 2.5 MOA with exceptional guns shooting 1.0 – 1.5 MOA, (assuming the ammunition is correctly matched to the gun). The average deer rifle, using popular brand, off the shelf ammunition is probably capable of 2.5-3.0 MOA because the gun and ammunition manufacturers know that a typical white tail is statistically harvested at a range of less than 100 yards, and a gun that places the bullets within 3 MOA will easily place all of them within the kill zone. Manufacturing guns and ammunition that will shoot under 1 MOA is, of course, done every day, but there are only a few manufacturers that guarantee that result, and then only with ammunition that they specify. The costs associated with the manufacturing, quality control, and attention to detail, price these guns out of reach of a large part of the market. With that being said, a gun/ammunition combination with 3 MOA accuracy, properly sighted in, will usually get the job done and nobody will know the difference. The target is dead –end of story. The point here is that if your gun is shooting at or beyond 3 MOA, the issue is, in all probability, a combination, of factors that can affect accuracy. We have prepared a short list of issues you may want to consider in examining the group size of your rifle.

- A. Bolt action sporting rifles are by nature and design typically more accurate than pump, lever, or semi-automatic rifles. The reason for this is the bolt action tends to be much more rigid, and therefore flexes less. In addition, a bolt action usually has a larger and stronger extraction mechanism, which means the chamber can be made to closer tolerances than other types of actions. Believe it or not, not all ammunition in the same caliber is made to the exact same dimensions by all manufacturers. For example, SAAMI (Sporting Arms and Ammunition Manufacturers Institute, www.saami.org publication ANSI/SAAMI Z299-1992) allows a variance of up to -.008 under the standard for diameter, and up to -.007 under for the standard distance from the base to the shoulder (this determines headspacing) for center fire 30-06 ammunition. (Variances across most calibers are similar.) The extraction mechanism in pump, lever, and especially in semi-automatic weapons must be able to consistently and effectively extract cartridge cases at a rate equal to the cyclic rate of the weapon using the entire range of commercially available ammunition. This can be problematic if the cartridge fits too tight in the chamber. As a result manufacturers tend to make these chambers more tolerant of ammunition that may tend towards the larger end of the size range. Conversely, if ammunition manufacturers want their product to function in guns typically in the hands of sportsmen, they must also consider how easily the cartridge seats and extracts. Needless to say, there are exceptions to this, but as a rule as you move away from a precise cartridge chamber fit accuracy suffers. This is especially apparent in military weapons because they must chamber ammunition from various sources (therefore with various tolerances) and must function even if the ammunition is corroded or dirty. Reliability, not pinpoint accuracy is the primary criteria.
- B. Match the correct bullet weight to the twist of the rifling. This is one of the most commonly overlooked factors that determines group size. If the bullet length and twist rate of the barrel are not synchronized, accuracy will suffer. A 110 grain .308 bullet is, of necessity, shorter than a 220 grain .308 bullet. For proper stabilization the heavier, and hence longer bullet, requires a faster rate of rifling twist than a short, light bullet. Further to this point, different guns respond differently to ammunition from different manufacturers. The point here is that you should test fire ammunition from several manufacturers and select bullet weights that are compatible with the rate of twist of the gun's rifling. Generally speaking, twist rate is stamped on the barrel or the information is available from the manufacturer. You need to test different bullet weights to optimize results.) The following websites will give you more information regarding this issue:

www.snipercountry.com/hotlips/twistrate.html www.uslink.net

kwk.us/twist.html en.wilkipedia.org/wiki/rifling www.gsgroup.co.za/cip.html Legend: BL = Bullet Length BD = Bullet Diameter C = 150 constant for muzzle velocity 1500-2800 FPS C = 180 constant for muzzle velocity over 2800 FPS (choose the correct constant for the ammunition you are using)

<u>Formula:</u> <u>C</u> x BD

<u>_____</u> X E __<u>___BL</u> _______BD

First divide the bullet diameter (for example .224) into the bullet length (for example .712). Divide the result into the correct constant (150 or 180) and multiply the result by the BD (for example .224). The results is the **approximate minimum** twist rate necessary to stabilize the bullet - Remember a 1:9 rate is faster than a 1:14 rate.

Example A:.223 (5.56 x 45) @ 3200 FPS, 52 Grain, BL= .712 BD=.224180 = 180 = 180 = 56.64 x BD = 56.64 x .224 = 12.7BL.712BD.224

12.7 is the optimum rate of twist

Example B:.223 (5.56 x 45) @ 2500 FPS, 75 Grain, BL= 1.095 BD=.224150 = 150 = 150 $= 30.6 \times BD = 30.6 \times .224 = 6.86$ BL1.0954.9BD.224

6.9 is the optimum rate of twist

If you use the 52 grain bullets in a 7.0 twist barrel the result will be fairly accurate. If you use the 75 grain bullet in a 12.0 or 13.0 twist barrel your group will probably be all over the target.

Diameters of Popular Bullets .204204 7mm284. .223224 .308308 .243243 .338338	Note: 7.5:1 is about the fastest you will find in any barrel. Even though calculated results may indicate a faster rate, too fast will cause the bullet to disintergrate. At 3000 FPS in a slow 1:12 twist barrel a bullet spins at about 90,000 RPM.
270 - 277 375 - 375	twist barrel a bullet spins at about 90,000 RPM.

Bullet length varies by manufacturer and style. For this information check with the manufacturer or take an actual measurement.

- C. A perfectly formed muzzle crown allows the gas to escape in a uniform pattern around the base of the bullet as it exits. Through improper cleaning and handling the crown of the muzzle can be easily damaged. Even a small ding, which may not necessarily be visible to the naked eye, can cause an uneven release of gas, which can heel the bullet over slightly, producing a yaw attitude. This will affect the bullet's stability and accuracy, as the long axis of the bullet will no longer be coincidental with the path of travel.
- D. The quality of the ammunition you use can have a direct result on repeatable group size; the more consistent the ammunition, and the components from which it is manufactured, the more consistent the results. Several manufactures make match grade ammunition where the components are carefully selected and screened for consistency and conformance to specification. (One of the manufacturers that are best known for achieving the most consistent results is Black Hills <u>www.black-hills.com</u>). There are several other manufacturers that make acceptable match grade ammunition, and there are other options. If you are a re-loader, you are already aware of the range of quality components available and in all probability you are able to produce consistent, high quality ammunition.
- E. Vertical Grouping See Rim Fire section point D.
- F. Check Your Scope and Mounting With older and especially inexpensive scopes it is not uncommon for the reticle to stick or shift, especially under heavy recoil and/or temperature extremes. If this happens your muzzle could end up pointing in a slightly different direction after each shot. To check for this condition, lock the gun in a vise that doesn't move and sight the reticle on a set point/target then use a piece of wood or other object (that will not do damage), to tap the scope tube to imitate recoil. If the reticle moves from the original point of aim, you have a problem with the scope. Also check the scope mounting using the same procedure. Mounts and rings frequently become loose due to recoil and heat. In addition to properly mounting a scope the rings must be lapped and centered otherwise there may not be sufficient contact to secure the scope. Even Locktite doesn't insure that mounts and rings will not shift.

- G. Parallax is the apparent shift of the target relative to the reticle due to the horizontal movement of the observer. Scopes with parallax adjustments must be correctly adjusted. Scopes without a parallax adjustment are generally range specific for parallax free sighting. If you have made the adjustments to eliminate parallax you are good to go.If not, it is important to make sure that the longitudinal optical axis of the scope that runs through the center of the crosshairs is directly aligned with the pupil of your eye. If you have an inconsistent cheek weld to your stock or fail in any other way to address parallax your groups will suffer from horizontal dispersion, i.e.: open up left to right. This will happen because your view of the target in the horizontal plane will vary with each shot.
- H. Barrel temperature plays a major role in maintaining group size. As a barrel heats up torsional stress will cause the barrel to twist. Bench rest shooters wait several minutes between each shot to keep the barrel from overheating. If you fire 10 or 12 shots in rapid succession from a sporter weight barrel your groups will expand.
- I. Other factors, which we will not explore here include: Free floating barrels, bedding, barrel harmonics, etc.... -Not to mention the shooter!

RIM FIRE ACCURACY

(Some of this applies to center fire rifles also.)

Accuracy in a rim fire rifle is to a large degree more dependent upon the ammunition as opposed to the equipment. Center fire ammunition can be loaded and/or reloaded to precise and consistent specifications. Rim fire ammunition can only be loaded at the factory level. Since rim fire ammunition is not re-loadable, it is necessary to use whatever is commercially available. Factors affecting rim fire accuracy are:

- A. As with a center fire cartridge there is a SAAMI specification (ANSI/SAAMI Z 299.1-1992) and variance for the dimensional aspects of rim fire ammunition that allows up to -.004 under the standard diameter for .22 long rifle match or sporting ammunition. Consequently, manufacturers make ammunition within the entire range of this variance. As a direct result a gun that is expected to perform reliably must be able to accept the full range of available ammunition. What this has led to are guns that are match chambered which are invariably bolt action. (The chambers in these guns have a tight precise cartridge fit and the guns perform best with match grade ammunition that is made to close tolerance), and then we have most other guns that have sporting chambers, many of which are auto loaders. The chambers in these guns must be made large enough so that the gun will cycle correctly with any off the shelf brand of ammunition which could be manufactured to any size within the allowable range of tolerance. i.e., This means the cartridge may fit loosely in the chamber. Due to gravity the cartridge settles into the lowest portion of the chamber. The result is that the center axis of the chamber, and hence the center axis of the barrel is not aligned with the center axis of the bullet. This means that the bullet will engage the rifling off center and will travel down the barrel and exit the muzzle at an angle resulting in a loss of stability and accuracy.
- B. Concentricity If the long axis of the bullet is not concentric with the long axis of the case it will also not be concentric with the long axis of the bore, as above the bullet will travel down the barrel and exit the muzzle at an angle with similar results. As little as .002"-.003" off center will cause a noticeable enlargement of the grouping.
- C. Head Spacing is the distance the bullet must move from the casing until it engages the rifling. In a rim fire this is controlled by the thickness of the rim. According to SAAMI standards rim thicknesses may vary from as little as .036" to as much as .043". A gun may perform much better with one rim thickness as opposed to others. It therefore important to test your gun with a wide range of ammunition. Typically in a box of inexpensive ammunition is you will find a considerable variance in rim thicknesses. This will usually result in expanding the group size; consistency of rim thickness will result in smaller, consistent group sizes. Both concentricity and rim thickness can be measured by using the HYSKORE[®] #30075 Ammo Analyzer.
- D. If the group spread is more vertical than horizontal it is usually the fault of the ammunition. At a known distance, a faster bullet reaches the target quicker and drops less, i.e. gravity has less time to act. As you may appreciate, the small quantities of primer and propellant used in a rim fire cartridge must be precisely and accurately measured in order to produce consistent velocity. Only a small variance in absolute terms translates to a significant percentage variation and by extension, variation in velocity. Maintaining this type of consistency across large production runs is incompatible with maintaining low cost. Primer compound has an explosive force in the magnitude of 25 to 50 times that of the propellant. As little as 1/10 grain (1/70,000 lb.) deviation will cause a velocity differential. With these thoughts in mind, the culprit in groups that open top to bottom is almost always inconsistent velocity. The faster bullets strike higher and the slower ones lower.
- E. Scope Problems See "F" and "G" under Center Fire.

The aforementioned issues represent a brief synopsis of various conditions that may affect accuracy. There are numerous in depth studies that can provide detailed analysis of each situation. We are not experts and do not intend to be. Our comments and suggestions are the result of studying and compiling data from a wide range of sources. Furthermore, we have only touched on the more significant factors that affect accuracy. If you elect to make adjustments to your gun/ammunition combination to increase accuracy, we suggest that you address each issue <u>one at a time</u>. Do not try to make multiple corrections at the same time as you may contaminate the results, and possibly obscure important issues that need further attention.

CALCULATING RECOIL

There are two ways to do this.

- A. The easy way go to one of the websites listed in this pamphlet or go to one of the links listed on our website: www.hyskore.com
- B. If you like playing with numbers, use the following formula. While Isaac Newton or Albert Einstein might take us to task for being off by 2 or 3 %, this will get you into the ballpark. We have divided the process into 2 steps. First, calculate the recoil velocity then use this information to calculate the recoil energy in ft/lbs.

Legend:

- PW Weight of powder charge
- BW Weight of bullet (grains)
- MV Muzzle Velocity
- GW Weight of loaded gun/w scope
- RV Recoil Velocity
- RE Recoil Energy

Run the calculation like this:

- A. Multiply the weight of the powder charge PW x 1.75
- B. Add the bullet weight (BW) to this number (result from A)
- C. Multiply this number (result from B) by the bullet velocity (MV) Hold this number aside
- D. Multiply the weight of the gun (GW) x 7000
- E. Take the calculation from D (GW x 7000) and divide it into the number you held aside in C (above) This is the velocity of the recoil.

2. RE=
$$\frac{\text{RV}^2 \times \text{GW}}{64.4}$$

Run the calculation like this:

- F. Square the recoil velocity and multiply it by the weight of the gun
- G. Divide this number (result from F) by 64.4. This is the recoil energy in ft./lbs.

Example: Actual data for .308 Winchester model 70 with 24" barrel & scope.

PW = 40 Grains

BW = 180 Grain (sierra match king)

BV = 2,500 Fps

GW = 8.2 lbs.

RV =
$$\frac{[(1.75 \times 40) + 180] \times 2,500}{7,000 \times 8.2}$$
 = $\frac{625,000}{57,400}$ = 10.89 fps

RE = $\frac{10.89 \times 10.89 \times 8.2}{64.4}$ = $\frac{972}{64.4}$ = 15.10 ft./lbs.

The Recoil Velocity (RV) is 10.89 fps The Recoil Energy (RE) is 15.10 ft/lbs

A few pointers

- A. The weight of the gun (GW) should always be in pounds. eg. 7.3, 8.2, etc....
- B. The weight of the powder charge has a very small influence on the recoil velocity (RV) or recoil energy (RE). If you do not know the exact number, use the flowing guidelines:

.219 - .223- 25 grains.22 - 25 - .257- 38 grains.264 - .28 - 55 grains.308 - 30'06- 45 grains.300 & 7mm mag- 62 grains.338- 70 grains.375- 85 grains.416 - .458- 110 grains

Do your calculations with 2 or 3 different powder weights and you will see that the recoil energy (RE) only varies slightly. The 64.4 Number is a constant and the 7000 number is the number of grains in one pound.

If you do something dumb, bad things can happen.

For more detailed recoil data (as of this writing) there are several good websites that you can reference:

- 1. www.zknives.com/bali/brecoil.shtml
- 2. www.realguns.com/calculators/recoil.html
- 3. www.huntamerica.com/recoil_calculator/
- 4. www.handloads.com/calc/recoil.asp

or go to our website (www.hyskore.com) click on the image of the **DLX** then click on the link to the recoil calculator.

The recoil that you feel is a function of the action-reaction created as the bullet moves forward in the barrel and, shortly thereafter, gas exiting the muzzle (Rocket Effect). Therefore, *the quantity of propellant in addition to* gun weight, bullet weight and muzzle velocity is an important factor in determining recoil. Make certain that this is part of your calculation.

PARALLAX

When attempting to achieve the highest degree of repeatability i.e. smallest group size, with any HYSKORE® shooting rest, it is important to have a clear understanding of parallax. Even experienced, good shots can improve their group size by up to 30% by paying close attention to parallax. Parallax is the difference in apparent position of an object viewed along two different lines of sight. To experience parallax extend one of your arms, hold an index finger up, close your left eye, and align the index finger with an object on the distant wall. Now close your right eye and open your left. The object has appeared to have moved. What has actually happened is that you are now viewing the object along a different line of sight. This is exactly what happens inside a rifle scope. We have prepared three diagrams to show you the various conditions that may develop in sighting with a scope.

- A. This is a parallax free focusing arrangement. The image of the target is focused on the reticle. (The reticle is the optical element inside the scope on which the cross hairs are inscribed.)
- B. The image focuses in front of the reticle and in this case you would experience parallax.
- C. The image focuses behind the reticle and also in this instance you could experience parallax.

The correction in diagrams B and C is to adjust the objective lens of the scope so the image focuses on the reticle. On better scopes there is usually an adjustment on the objective bell (this is the end of the scope facing the target) with yardage markings. By turning this you can approximate the correct adjustment. However, since parallax is magnification and range variable, it is a good idea to clamp the rifle in a solid vise on the bench top (The HYSKORE® #30022 Parallax Cleaning and Sighting Vise is perfect for this.) Look at the target through the scope and shift your eye left to right, if the cross hairs remain dead center on the target you are parallax free, if not, you need to do additional adjustment. Inexpensive and low magnification scopes are usually parallax free at a specific range, and do not have parallax adjustments.

Keeping the pupil of your eye concentric with the optical axis of the scope is critical to eliminating parallax. If you can keep your eye positioned on the axis every time you will experience parallax free shooting. Of course, this is almost impossible to do and repeat shot after shot. Moving your eye even a few thousandths of an inch off dead center, when parallax is present, will influence your visual alignment and cause you to change your point of aim, resulting in expanding your group. Therefore, you must make the appropriate adjustments at the designated range to remove parallax. Unfortunately, most scope manufacturers assume that all shooters have a working knowledge of parallax. As a result, the instructions they provide give little or incomplete details regarding this optic condition.



REPLACEMENT PARTS

These are replacement parts for purchase. Pictures do not represent contents of set.



30195 - 15	Filinary Lievalion Knob - 2 pcs	φ 10.00
30195 - 16	Leather Rest Bag For Sporter Forends	\$ 20.00
30201	M-20 x 60 cm Connecting Rods - 2 pcs	\$ 50.00
30088 - 6	Magnetic Level	\$ 7.50
30195 - 17	Soft Surface Leveling Jacks - 3 pcs	\$ 15.00
30195 - 18	Leather Rest Bag For 3" Wide Forend	\$ 20.00
30195 - 19	Pressure Plate & Pin	\$ 7.50
30195 - 20	Socket Head Cap Screw Set - 24 pcs	\$ 7.50

. (8) M5 x 10 & (16) x M5 x 20

These are replacement parts for purchase. Pictures do not represent contents of set.

Visit Our Website For More Information or to Check Out Our Other Great Shooting Accessories: www.hyskore.com

Send Check or Money Order with Phone Number to: **Power Aisle, Inc.** P.O. Box 983 Middleburgh, NY 12122

NYS Resident add appropriate Sales Tax

** \$10.00 Shipping & Handling to Lower 48 States**
** \$25.00 Shipping & Handling to

Alaska, Hawaii, Puerto Rico**

BENCH BEAST® JOYSTICK COMPETITION SHOOTING REST

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