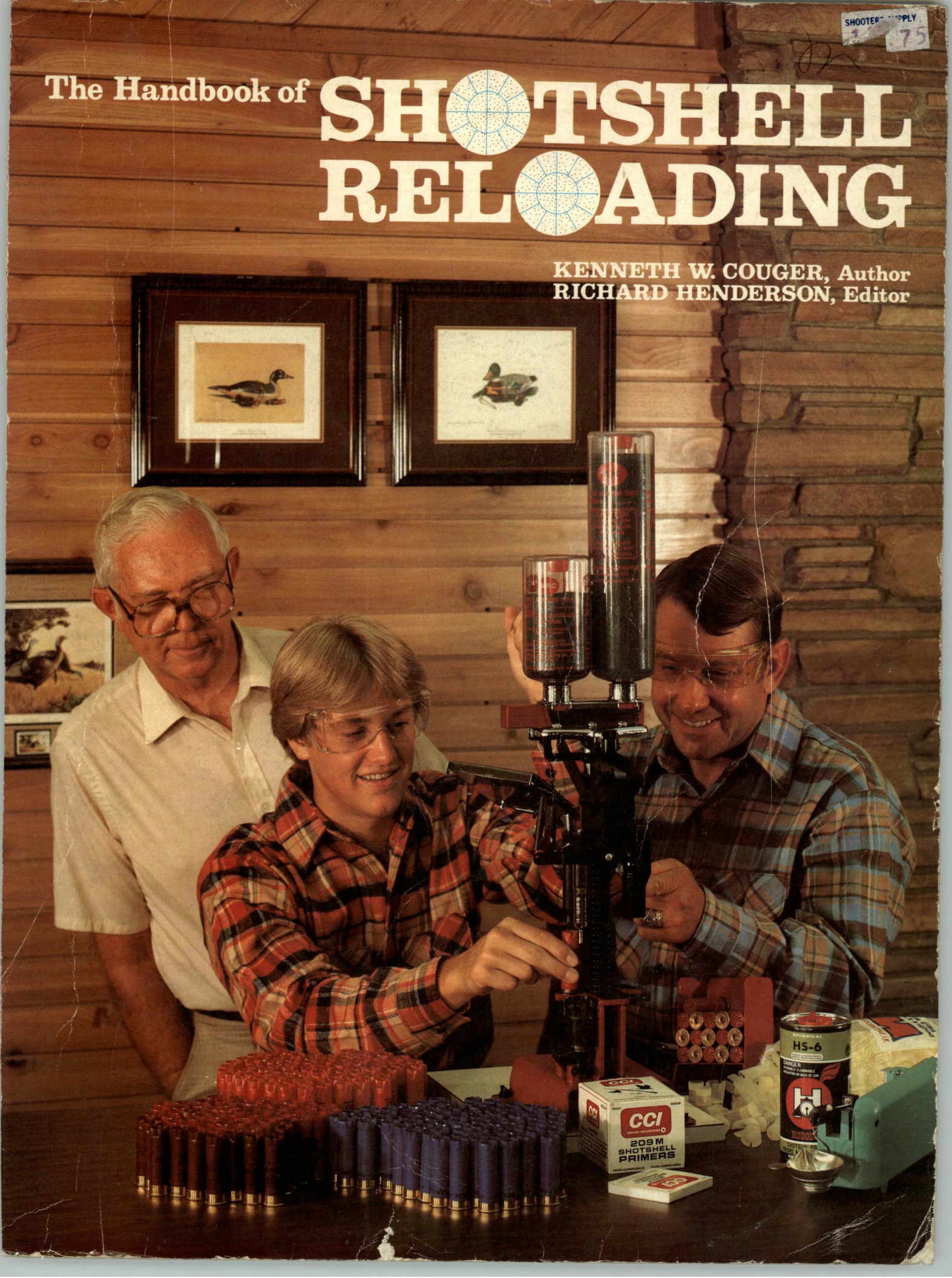
The Handbook of SHOTSHELL RELOADING

KENNETH W. COUGER, Author
RICHARD HENDERSON, Editor



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IMPORTANT! INFORMATION
Please see and read page 3.

The Handbook of SHOTSHELL RELOADING

Kenneth W. Couger, Author

Richard Henderson, Editor

SKR Industries, Inc.

San Angelo, Texas 76902

FRONT COVER: A grandfather, father and son show that reloading is a rewarding hobby enjoyed by all generations. In the background are two limited edition prints of still life paintings of duck decoys by James Harvey Johnson, DVM, Texas State Artist of 1983-84, and a 1978 Wild Turkey Stamp and framed print by Richard Amundsen.

BACK COVER: Dub Pearson, owner of Tri-State Sports Center in Bryan, Texas, shows a mother and son the features of MEC's GRABBER. Everyone in the family is interested in the many safety features of all the MEC Reloading Tool models.

Photography by Brazos Graphics.

Project Coordinator
E. Wayne Schmidt
Production Manager
Kelly McFarland
Art Director
Jim Raatz

Produced by BRAZOS GRAPHICS
P. O. Box 9990
College Station, TX 77840
(409) 693-8784

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KENNETH W. COUGER, AUTHOR
RICHARD HENDERSON, EDITOR
SKR INDUSTRIES, INC., PUBLISHER
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IMPORTANT INFORMATION PLEASE READ

NEW ACTIV RELOADING DATA—There are many new reloading recipes listed for this hull. ACTIV INDUSTRIES, INC., is now producing factory loaded ammunition as well as new and unfired (component) hulls. Reloading data is the same for both. Please see the new data beginning on page 178.

FOREIGN (IMPORTED) AMMUNITION—Many new brands of foreign ammunition have been introduced to the American market in recent months. Some brands are so new they haven't been reviewed in the major outdoor magazines. At the present time reloading data is not available from the major powder manufacturers for these hulls. Perhaps in the future some data will be available. Handloaders are encouraged to write to the importer or distributor for information regarding reloadability and/or reloading data for the hull(s) in question.

DOMESTIC AMMUNITION CHANGES—There have been recent changes in hull design specifications by domestic manufacturers. Some brands have one name on the product but have been produced by other manufacturers (Private Branded). Positive identification is essential. Please follow the instructions regarding "Hull Indentification" at the beginning of Chapter 9. HULLS THAT CANNOT BE POSITIVELY IDENTIFIED SHOULD NOT BE RELOADED. WRITE TO THE MANUFACTURER AND REQUEST ADDITIONAL IDENTIFYING INFORMATION AND/OR RELOADING DATA INFORMATION.

RELOADING STEEL SHOT—New information and data is becoming available for reloading steel shot. Please use the "Reader Service Cards" on page 249 to request the latest information.

HANDLOADERS—Should post the "Ten Commandments of Reloading" chart in their reloading area.

SKR INDUSTRIES, INC. MAKES NO WARRANTIES EXPRESSED OR IMPLIED, LIMITED OR FULL; SPECIFICALLY DISCLAIM ANY AND ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE; AND SPECIFICALLY DISCLAIM ANY AND ALL LIABILITY FOR CONSEQUENTIAL DAMAGES OF ANY KIND WHATSOEVER. FAILURE TO COMPLY WITH THESE WARNINGS OR TO USE THE DATA IN THE HANDBOOK EXACTLY AS SHOWN MAY RESULT IN ACCIDENTS WITH SERIOUS INJURY AND/OR DEATH TO THE SHOOTER AND/OR BYSTANDERS.

DEDICATION

This book is dedicated to the wives and families of all independent manufacturers' sales representatives, who sacrifice while we are away—"on the road" selling reloading equipment and components.

TABLE OF CONTENTS

FOREWORD

Thank you for purchasing The Handbook of Shotshell Reloading.

You are about to embark on a fascinating hobby, and we believe no other handbook on shotshell reloading offers so much useful and accurate information in such great detail.

The Handbook of Shotshell Reloading is written for handloaders by handloaders. It familiarizes handloaders, and would-be handloaders, with present-day methods and techniques, while providing the most complete and up-to-date advice possible on today's reloading equipment and components. Details of basic instruction and more advanced techniques are found in the pages ahead.

Although shotgun ballistics are no different than they have been for more than two centuries, there have been changes in equipment and components — and more, undoubtedly, are on the way. Basic principles are updated and explained in simple language in this book, since we believe knowing "why" as well as "what" should help you become a better reloader and shooter.

It is our hope that this handbook will add to your knowledge and enjoyment as you participate in shotgun sports. Your comments, criticisms and suggestions are welcome.

Now, settle back, and read on to find the answers to your questions. In the meantime, we strongly recommend that every reader join The National Rifle Association (1600 Rhode Island Avenue N.W., Washington, D.C. 20036) and support its efforts to protect the rights of all sportsmen, collectors and homeowners to legally possess and use firearms. The right to bear arms is an important part of our American heritage and is vital to our individual rights today. Don't let our legislators take our guns away from us.

Ken Couger
Buzzard Roost
Runnels County, Texas
January 1984

ACKNOWLEDGEMENTS

We are indebted to many shooting friends and professional people within the reloading industry. This book would not have been possible without their advice, support and contributions.

Many thanks to Robert Bachhuber, Jim Hurlbert and Sheila Weymier at Mayville Engineering Company. These people are truly reloading experts.

Thank you, too, to D. E. Wenner at DuPont, Donald Burton at Hercules, Bruce Hodgdon, J. B. Hodgdon, Bob Hodgdon and Tom Shepherd at Hodgdon Powder Company and Jan Shrader and David D. Towbridge at Winchester. We acknowledge the cooperation and gracious consent to reprint reloading data developed by each powder manufacturer, who obviously, is in the best position to prepare information and data for its products.

Thanks to Arlen Chaney, Dave Andrews and Doug Wright at Omark Industries, Ron Ives at Federal, Joe Callahan and Ken Green at Remington, Russ Hodges at RSR and Paul Moore at Taracorp for your contributions of photographs and products. Thanks to Harry Hampton at SAAMI, Rick Grozik at Ducks Unlimited and A. H. "Rock" Rohlfing at NSSF for sharing camera ready art.

Very special thanks to Wayne Schmidt and his staff at Brazos Graphics who made this book beautiful and managed it under deadlines that only true professionals could meet.

Personal thanks to my two sons—Michael and Gregory Couger who let me use "their" home computer and assisted in many revisions.

It is almost insulting to acknowledge Richard Henderson because this book is as much his as it is mine. More than once he pushed me back within the "fence rows" and I thank him.

A final note of thanks to our other business associates—Bill Cervenka (who was once a gunsmith in West Texas) and Art Emery. The experience, energy and inspiration of these men must be emphasized. We all found out what data proof-reading is all about.

The following list contains names and addresses of companies that contributed information, products, materials and support that made this book possible. By using the postcard in the back of the book the reader can write for information and catalogs on reloading equipment and components.

Ken Couger

DIRECTORY OF MANUFACTURERS

Ballistic Products, Inc.
P.O. Box 488
Long Lake, Minn. 55356
Attn: Mr. Dave Fackler

Ducks Unlimited
1 Waterfowl Way at Gilmer Rd.
Long Grove, Ill. 60047
Attn: Mr. Richard S. Grozik

E.I. DuPont De Nemours & Co. (Inc.)
Explosives Products Division
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Attn: Mr. Larry Werner
Mr. D.E. Wenner

Federal Cartride Corporation
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Attn: Mr. Ronald L. Ives

G.S. Supply, Hawk Brand Shot
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Attn: Mr. Geno Sears

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Attn: Mr. Donald H. Burton

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Shawnee Mission, Kansas 66201
Attn: Mr. R.E. Hodgdon
Mr. J.B. Hodgdon

Mayville Engineering Company, Inc.
P.O. Box 267
Mayville, Wisc. 53050
Attn: Mr. Robert Bachhuber
Mrs. Sheila Weymier

NSSF
1075 Post Road
Riverside, Conn. 06878
Attn: Mr. A.H. Rohlfing

Omark Industries
P.O. Box 4000
Lewiston, Idaho 83501
Attn: Mr. Dave Andrews

Remington Arms Company, Inc.
Bridgeport, Conn. 06602
Attn: Mr. Joe Callahan
Mr. Ken Green

RSR Corporation
1111 W. Mockingbird Lane
Dallas, Texas 75247
Attn: Mr. Russ Hodges

SAAMI
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Attn: Mr. H.L. Hampton, Jr.

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Winchester Group, Olin Corporation
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Attn: Mr. Mike Jordan

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Chapter 1

WHY RELOAD?—WHY NOT!

WHY RELOAD YOUR OWN SHOTSHELLS?

For folks who love shotgunning, shotshell reloading is a rewarding hobby. Perhaps the greatest argument for reloading is to save money. The savings is from half to three-fourths the cost of factory ammunition—a substantial amount indeed! This is incentive enough for many people to start reloading. For most people reloading also is just plain fun. The satisfaction of breaking a clay target, downing a game bird, or scoring a hit on small game with a shell that you "rolled your own" is a rewarding accomplishment.

Usually, though, the irresistible reason for reloading is the desire of people to do things their own way and to be independent of the limitations of factory-loaded ammunition.

You probably have some questions, or you wouldn't be reading this book, so let's get the easy ones answered first.

THE SIX SO-CALLED MYSTERIES OF SHOTSHELL RELOADING UNVEILED.

A lot has been written about shotshell reloading, but to many it is still a subject of mystery.

There seem to be six common questions that nearly every beginning reloader has on his mind. We'd like to answer these questions first, and then get on with a step-by-step description of how it's done.

When you finish, you'll understand how simple reloading is and why more than 4 million gunowners are hooked on this exciting hobby.

MYSTERY #1: HOW SAFE IS RELOADING?

Very.

Today's smokeless gun powders are a lot different than the old black powders of our ancestors. In fact, modern smokeless powders are classified as propellants, not explosives, which means when properly used, these powders burn only when ignited.

MYSTERY #2: HOW GOOD IS RELOADED AMMO?

The truth is, carefully reloaded shells are usually better than factory loaded, because they can be custom-tailored for a particular shotgun.

Each gun shoots a little differently than the next, even two guns of the same gauge, choke, style and make. Reloading makes it easy to fine-tune shells to a certain gun and purpose, and to a certain type of shooting. You can learn to do this within a very short time.

MYSTERY #3: HOW COMPLICATED IS RELOADING?

It's downright simple.

Reloading is simply the replacement of those parts of a shell that are used up when that shell is fired. There are just five components to a shotgun shell: The primer, the plastic case or hull, the powder, the plastic wad and the shot. When the shell is fired, the primer ignites the powder which then propels the wad, shot and itself out the barrel. The hull and the spent primer are all that's left.

Most hulls can be reloaded several times. You just push out the fired primer, insert a new one, add the desired amount of powder, seat a plastic wad, drop a charge of shot and crimp. (We'll show you more details on the following pages.)

Besides not being complicated, any reloader will be quick to tell you it's just plain fun. For some this is the best reason of all to "roll your own" ammo. It makes the whole experience of gun ownership twice as much fun, and twice as rewarding.

MYSTERY #4: HOW MUCH MONEY DOES RELOADING SAVE?

That all depends. The more you shoot, the more you save.

For instance, 12 gauge high-velocity game loads cost around 35 cents each off the shelf. Of that, the primer, powder, wad and shot account for 12 cents, and the hull accounts for the remaining 23 cents.

When you reload that hull, you save 23 cents each time. This is more than $5.00 per box at average 1984 discount store prices. This helps explain why most reloaders consistently outscore non-reloaders in target shooting and hunting. They not only have custom-tailored ammo, but they also can afford to practice more.

Now admittedly, you need some equipment to get into reloading, but, as we are about to reveal, the equipment pays for itself rather quickly.

MYSTERY #5: HOW MUCH EQUIPMENT DOES IT TAKE?

Surprisingly little. Many beginners estimate it will cost several hundred dollars to get into reloading properly. Generally, you can buy a reloading press and all the components it takes to reload two cases of shotshells for less than the cost of two cases of factory-loaded shells. With proper care, the press will last for many years and reload thousands of shells.

MYSTERY #6: HOW MANY KINDS OF SHELLS CAN BE RELOADED?

You can reload just about any gauge and brand of shell, providing it is in good condition. The brand and quality of the fired hull and the powder charge will determine the number of times the hull can be reloaded. Many reloaders recognize early that quality hulls will be the least expensive in the long run.

These are the facts about that very "mysterious" thing called reloading. It is a very simple and very rewarding hobby that can double the fun of owning a shotgun.

Chapter 2

RELOADING HABITS AND SAFETY

All it takes to make reloading safe is common sense and the ability to read and follow the directions of component and equipment manufacturers. Considering the number of reloaders and the great quantity of ammunition reloaded and fired, the safety record of reloading is excellent.

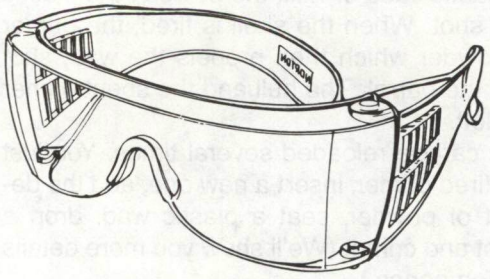
Throughout this book the instructions for using reloading components and equipment have been developed and extensively tested in research laboratories. When a manufacturer instructs you to use a particular set of components (recipe) in a shell, he means precisely that. In shotshell reloading, you cannot indiscriminately experiment with or substitute components without experiencing problems. At best, you will get a shell that fails to give the performance you expect. At worst, you may inflict serious injury upon yourself, a bystander, or someone else who fires your reloaded shells. The recipes in the "Data Section" of this book were developed by the powder manufacturers. ALWAYS FOLLOW THESE RECIPES EXACTLY! Grandma taught Mom the first commandment of baking—"If you want chocolate cake, you've gotta follow the chocolate cake recipe"; you have to heed the same advice.

GETTING STARTED—While reloading is a very enjoyable and rewarding hobby, you will get your best results when you give it your undivided attention. Good organization and work habits will pay handsome dividends in the efficiency and performance of your reloads.

Whether you work in your garage, on the kitchen table or on the coffee table in the den (until you spill shot on the shag carpet), good lighting, neatness and functional arrangement of your reloader and components will reduce the probability of error.

PRIVACY—You will work much better if you eliminate distractions while you are reloading. We mention this because it is important to do your reloading in an atmosphere where you can concentrate on "rolling your own" in safety.

PERSONAL SAFETY—We will not reload without wearing safety glasses. Our favorite brand is manufactured by NORTON. Their ALLAROUNDS are state of the art in protective eyewear where maximum eye protection, field of vision, fit and fashion are combined in a unique wrap-around design.



Reloading is an enjoyable and rewarding hobby that can be conducted easily and safely. By observing these few rules, the chance of problems will be extremely remote.

THE TEN COMMANDMENTS OF SHOTSHELL RELOADING

1 Exercise care and common sense at all times and always wear eye protection. It is an unnecessary risk to reload without safety glasses.

2 Do not reload without an instruction manual for the machine you are using whether it be a MEC or any other brand. (In almost all cases these instruction manuals are free.) Do not take shortcuts. Use your reloader according to its instruction manual.

3 Reload only when you can give it your undivided attention. Develop a reloading routine to avoid mistakes. Don't become distracted, avoid haste and reload at a leisurely pace.

4 Carefully examine each empty shotshell hull. Do not reload hulls that are defective or excessively worn.

5 Observe "good housekeeping" in your reloading area. Keep your equipment and components neat, clean and orderly.

6 Observe and heed all warnings in the "Introduction" section to the reloading data.

7 Double check. Take a second look at the recipe in the "Data Section" and be sure you are using the proper components in the proper amount. Do not substitute components and never exceed recommended loads. Check the "dropped" powder charge with a powder scale to be sure it conforms to the recipe and "check-weigh" dropped charges frequently.

8 Keep only the powder and primers you are using handy. Keep no more than needed in an open container. When not actually using powder or primers, store them out of the way in their original factory containers. Do not repackage powder or primers. This will preserve identity and shelf life. Only use powder and primers of a known identity. Scrap those of uncertain or unknown identity.

9 Store powder and primers beyond the reach of children and away from heat and open flames in accordance with SAAMI recommendations. Do not store primers in bulk! Do not force primers! Take care in filling automatic primer feeds. Do not smoke when reloading. Keep a fire extinguisher within reach of your reloading bench.

10 Keep complete records of your reloads. Apply a descriptive label to each box of shells. Then, when you find a reload that performs well, you'll have the recipe at hand.

In summary, KNOW YOUR DATA, do not rely on memory or guesstimates. Safety in reloading, as in most human endeavors, depends on the human involved and can be simple and fun. Details of basic instruction and more advanced techniques are found in the following pages. Our purpose in writing this book is to provide a foundation beginning with the basics. You're going to start in the first grade, and we'll take you through the whole course.

We hope that reloading will offer you both enjoyment and the rewarding experience that was ours when we started so many years ago. We welcome you to the great fraternity of reloaders throughout the nation and world.

Chapter 3

RESPONSIBILITIES OF THE SPORTSMAN

HUNTING ETHICS*

Hunting has two kinds of law.

One is the written law that is enforced by the game warden. The other is unwritten. It is an ethical code or code of honor that the true sportsman places on himself.

Most hunters obey the game laws, but that alone isn't enough. Without ethics, a man can be a licensed, law-abiding hunter and still be a poor sportsman.

There is nothing illegal about shooting at a running deer over 600 yards away or trying to down a duck winging 100 yards high. But it is certainly unethical, and only a poor sportsman would try it.

The ethical hunter knows both the limits of his gun and of his shooting ability and always tries for a clean kill. In addition to the game laws, the ethical sportsman obeys all laws when hunting. He acts as a goodwill ambassador for his sport and for all other hunters.

He knows that the town whose road signs are used for target practice quickly removes the welcome mat for hunters. And that the farmer whose property or livestock are abused will post his land and forbid further hunting.

A real sportsman does all he can to grow in hunting skills. If he is not a crack shot, he works hard at his shooting and gets all the practice he can. He learns about the game he hunts and how it lives. He studies the game range in which he hunts.

In other words, he has respect for his quarry and hunts it only in fair and sporting ways. As an ethical hunter, a real hunter, he believes in "fair chase," and he never takes unfair advantage of the game he hunts. This principle of fair chase is often part of the law. For instance, it is unlawful to shoot deer under jacklights or to hunt from an airplane.

On the other hand, it may not be against the law to shoot a pheasant on the ground or a duck swimming in the water but the ethical sportsman will never do it.

A man who takes pride in his hunting and in himself as a hunter always hunts in such a way that neither he nor the game he hunts is ever shamed. He treats his quarry with respect, both before and after he shoots it.

That is why the ethical birdhunter—if he can possibly afford and keep one—uses a trained bird dog. He has the dog not just to find birds but to recover them after they are downed.

The big game hunter also makes every possible effort to avoid wounding game, and if he does, he stops further hunting and combs the countryside to find it. He will even abandon his own hunting to help another hunter find wounded game.

A real trophy hunter may make a long and costly hunting trip and never fire a shot. His opportunities for legally taking game may have been many, but the ethical trophy hunter exercises strong and selective restraint. His code demands that he shoot only a fully mature specimen, and he knows that the removal from the herd of such an animal, almost always a bull or buck beyond breeding age, benefits others of the species in the area.

The ethical hunter never takes more than his limit. But more important still, he never takes more game than he can use.

His game is cleaned quickly and skillfully, and he brings it to the kitchen in prime condition. It is never wasted, and he takes real pride in this because it is a sure sign of his skill and knowledge. It also shows that respect for game is part of his self respect as a seasoned hunter.

There are two main kinds of people in the world, the givers and the takers. The ethical hunter is a giver. The unethical hunter—the poacher, the man who breaks game laws and sets no standard for his conduct as a hunter—is a taker.

It is the ethical hunter who gives a friend the advantage for getting a good shot and who likes the odds in his hunting slanted in favor of the game he pursues. He takes pleasure in sharing the game he has taken with the man on whose land he has hunted.

And it is the ethical hunter who is most apt to give generously of his time and outdoor knowledge to introduce a youngster to the enjoyment of the hunting experience.

The unethical hunter, the taker, never gives his companions an even break. He is the claimer who brags about his success when he fills his limit and makes excuses if he does not. He will hunt private property without permission and show no respect for the land on which he trespasses. His concern is never for how he hunts, only for how much game he can shoot.

Abusing the hospitality of landowners and rousing the anger of the public, the unethical hunter risks not only his own chances for hunting but those of all other hunters and of future generations as well. He is one of the greatest enemies of hunting today, posing a threat to the sport equal to that of any anti-hunting movement.

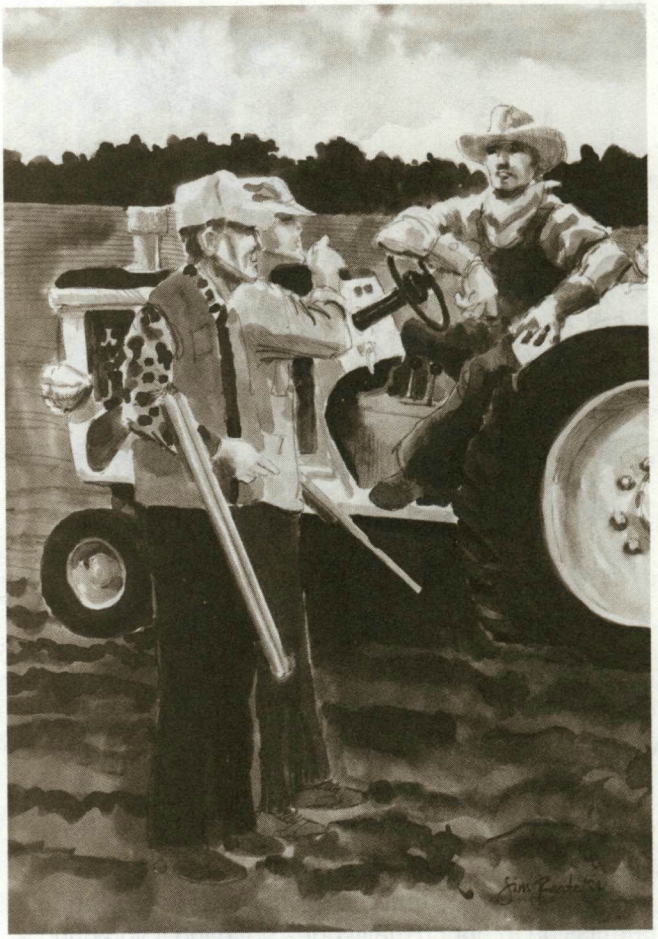
While even the ethical hunter may never enjoy the full approval of the non-hunting public, the public may at least tolerate him. And as public awareness of the hunter's significant role in conservation increases, anti-hunting sentiment may recede.

But the public will no longer tolerate the unethical hunter, and as long as he is allowed to remain on the scene, ethical sportsmen will suffer by association.

Conservation laws and hunting ethics are two sides of the same coin. Do away with either, and we will do away with hunting.

HUNTER—LANDOWNER RELATIONS*

Precious few hunters are lucky enough personally to own land that abounds with game. So, for the most part, when today's hunter enters the field, he becomes someone's guest, welcome or unwelcome. His host may be an individual farmer living just down the road or a giant timber company whose offices are a thousand miles away.



But no matter who the host is, the "welcome" aspect is important to hunters because it helps determine how much land will remain open for hunting.

Sportsmen have suffered a harsh blow as suburbs, shopping centers and highways have spilled over millions of acres of once prime hunting ground. But an even greater tragedy has been the posting of "No Hunting" signs on still productive game lands throughout the country.

These signs go up only when hunters fail to recognize that they are guests, abuse the land upon which they hunt and, in doing so, wear out their welcome.

There are three separate approaches which you, as a hunter, can take to cope with this problem. One is

preventive, the second is protective, and the third is corrective.

The preventive approach involves nothing more than doing your best not to harm the welcome you now have to hunt on someone else's property. On farmland especially, this means to ask permission every time you hunt.

Even the farmer who says, "You can hunt here any time," appreciates your dropping by beforehand to say hello and to let him know you will be on his land.

Remember, too, that the farmer who has given you permission to hunt usually does not mind if you bring a friend or two along but you may destroy your welcome if you arrive with a carload of companions.

Once on a farmer's land, be sure to hunt only where he wants you to, keep safely away from his house, barns and livestock and respect his crops. Be careful never to stretch or break any fences you cross and latch farm gates securely after you have passed through them.

On municipal, state or federally owned land, the preventive approach means respecting the fields, forests and facilities that are there for all of the public—not just hunters—to enjoy. And on land owned by large corporations such as lumber and paper companies, open to multiple use through their cooperation and generosity, it means being doubly careful with fire and respecting the trees which are their crop.

The most difficult aspect of the preventive approach calls for the law-abiding hunter who respects private property to report those hunters who damage it to the landowner, to the game warden or local law enforcement official. No man enjoys such a task, but a lot of the future of hunting is up to the sportsman who hunts by the rules, working to bar from hunting the poacher and the selfish individual who abuses his "guest" privileges.

The protective approach means making sure that the landowner knows you appreciate his letting you hunt. It means sharing your game with him, sending him a Christmas card and now and then taking time from your hunting to help him out with his chores.

The last approach, the corrective one, can be the most difficult because it involves changing a landowner's mind. When you find a good hunting area that is posted, look up the owner, ask him for permission to hunt and promise him you will treat his property as you treat your own.

Such sincerity may well open the gate for both you and your fellow hunters.

CONSERVATION FACTS*

Every man who likes to hunt and hopes to hunt in years ahead should be aware that his sport is in danger. It is threatened by large, organized numbers of the public who may be well-meaning but are sadly uninformed or misinformed about the hunter's relationship to conservation.

Concerned outdoorsmen who should like to insure a safe future for hunting can take positive action now. They can arm themselves with true conservation facts and pass them along to as many non-hunters and anti-hunters as possible.

Here they are:

Contrary to posing any threat to wildlife, hunters have done—and are doing right now—more to aid and protect wildlife than any other group in the country. If it were not for hunters, many game species would probably have disappeared years ago.

Hunters were the first to demand an end to commercial market hunting. They were the first to work for regulated hunting seasons and bag limits to insure healthy and continuing game populations. In most instances, hunters today harvest only surplus game to prevent winter starvation and disease which result from overcrowded game habitat.

If more of the public realized that hunting is a vital part of successful, scientific game management, much anti-hunting sentiment would subside. However, if hunters themselves fail to carry that message, no one else will, and the future of hunting will suffer.

The public is largely ignorant of the fact that hunters have contributed—and are still contributing—more

money for conservation than any other group in the country.

In less than 50 years, they have provided a massive $3 billion for conservation and for wildlife development. Every concerned hunter should know how this money has been raised and make sure he tells other people about it. Here's How:

License Fees

As a hunter, you are contributing to conservation every time you buy a hunting license. Your license fees, along with those of other hunters, go to support state game departments which are responsible for the well-being of all wildlife. It is your hunting license money which is spent to improve wildlife habitat and game management, to finance conservation education and to enforce conservation laws.

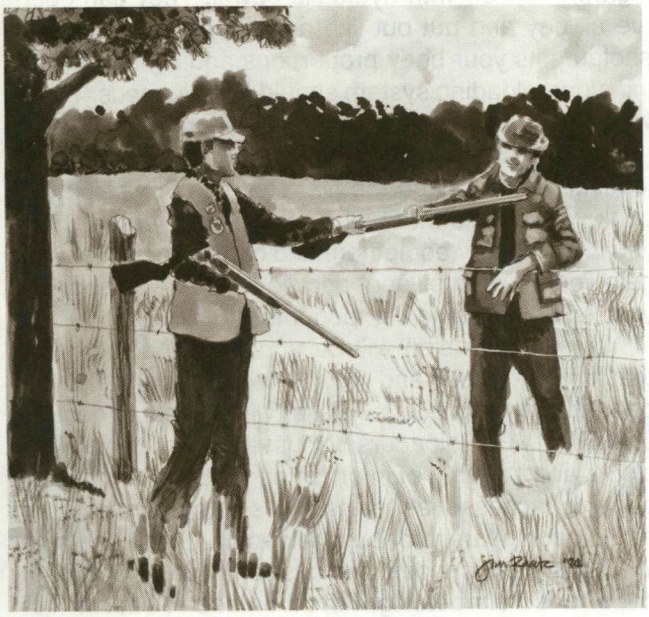
In explaining this to people who oppose hunting, it should be emphasized that hundreds of types of birds and animals other than game species benefit from hunters' license fees. In other words, hunters are paying the bills not just for themselves but for everyone.

Hunters' license fees are currently providing state game departments with over $154 million a year for conservation, and going back as far as 1923 in some states, hunting license revenue has raised $2.1 billion for conservation.

Excise Taxes

Every time you buy ammunition or a new gun, you are contributing still more money for conservation. When the Pittman-Robertson Act of 1937 was passed with strong hunter support, it specified that an 11 per cent excise tax on sporting arms and on ammunition was to be spent for conservation. The money, which is prorated to the states, enables them to set aside and improve millions of acres for wildlife.

You and other hunters are now contributing nearly $51 million a year for conservation through such taxes which, since 1937, have raised over $687 million.



Federal Duck Stamps

Hunters contribute again to conservation through their purchase of federal duck stamps. The money you pay for a duck stamp is used to buy or lease wetlands for waterfowl and for waterfowl production. these programs benefit not only ducks and geese but also the many other types of birds and animals that dwell in our marshlands and coastal areas.

Hunters presently contribute almost $11 million a year through their duck stamp purchases, and duck stamp revenue has provided $165 million in total for waterfowl conservation since 1934.

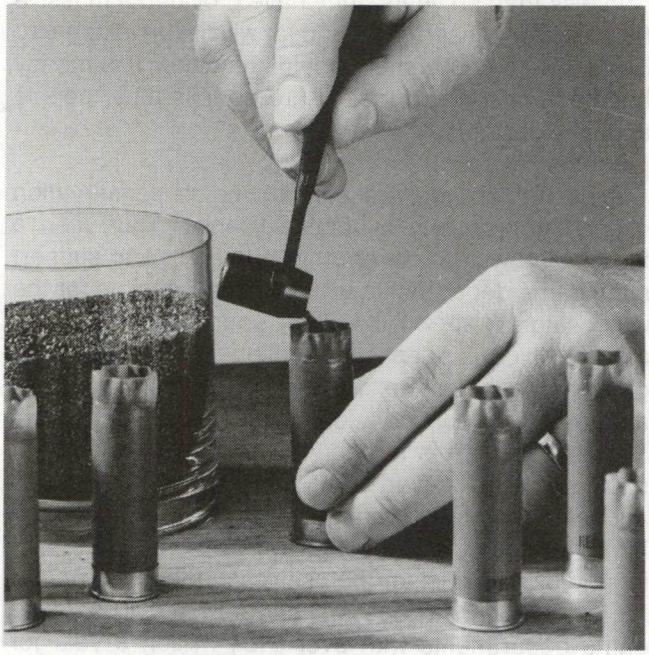
People who oppose hunting usually have no idea that the hunter's contributions to conservation benefit the entire public. The millions of acres developed and maintained by hunters' money provide year-round recreational areas for everyone to use and enjoy. People who look forward to leisure time spent camping, hiking or simply sightseeing rarely realize All hunters have footed the bill for much of the land they use.

Every hunter owes it to himself, his fellow hunters and to tomorrow's outdoorsmen to tell these facts to as many people as he can.

** Hunting Ethics, Hunter-Landowner Relations and Conservation Facts were reprinted by permission from the National Shooting Sports Foundation's (NSSF) Hunters Pocket Guide*

Chapter 4

CHOOSING THE RIGHT RELOADING TOOL



Hand-Measuring Powder

There are three basic types of reloading tools—manual, semi-automatic single stage, and semi-automatic progressive. The type you choose will be governed by three considerations: The money you have to spend; the convenience you want; and the speed at which you want to reload.

If low price is your overriding consideration, you can "make do" with a manual reloader. This kit is available in almost any gauge for less than $20, and it produces good shells. Davy Crockett would have loved owning one! At that price, you can't afford not to reload. With a manual reloader, however, you are giving up convenience, speed, and (depending on how careful you are) accuracy and uniformity as well.

With a manual reloader, you must carefully and accurately hand-measure and pour the exact amount of powder and shot. Too much of either can produce a reload that not only fails to perform as expected, but also can be dangerous to the shooter and bystanders.

The choice of equipment is a matter of personal preference and price. We recommend MEC reloaders. These are semi-automatic tools, and will cost a little more. What will you get for the extra expense? Convenience, simple operation, greater speed and more uniform performance.

Every MEC tool will reload shotshells with great precision and a minimum of effort. Whether you're a sometime shooter or own a shooting range, MEC has a reloading system in a range to fit your budget and needs. Some systems are simple but let you upgrade and add accessories whenever you want. Some are for high production with hydraulic power. They can operate all day and put out like a factory. Just as a good shotgun fits your body proportions and style of shooting, your reloading system should fit your needs. That's why MEC has such a wide choice of models.

You need some basic equipment before you start reloading. You've taken the first step by purchasing this book. You should thoroughly read each chapter before you invest in any equipment and components. This will help you make intelligent decisions when you shop for your equipment and components.

Your first decision will be about a reloading press that fits your needs and requirements. Your local, independent sporting goods retailer will be able to demonstrate the MEC reloaders discussed in this book. He is also a good source of information for equipment, components, accessories, parts and service. Some of the sales people are probably reloaders. They can give you advice and suggestions based on their own experiences and from dealing with other local reloaders.

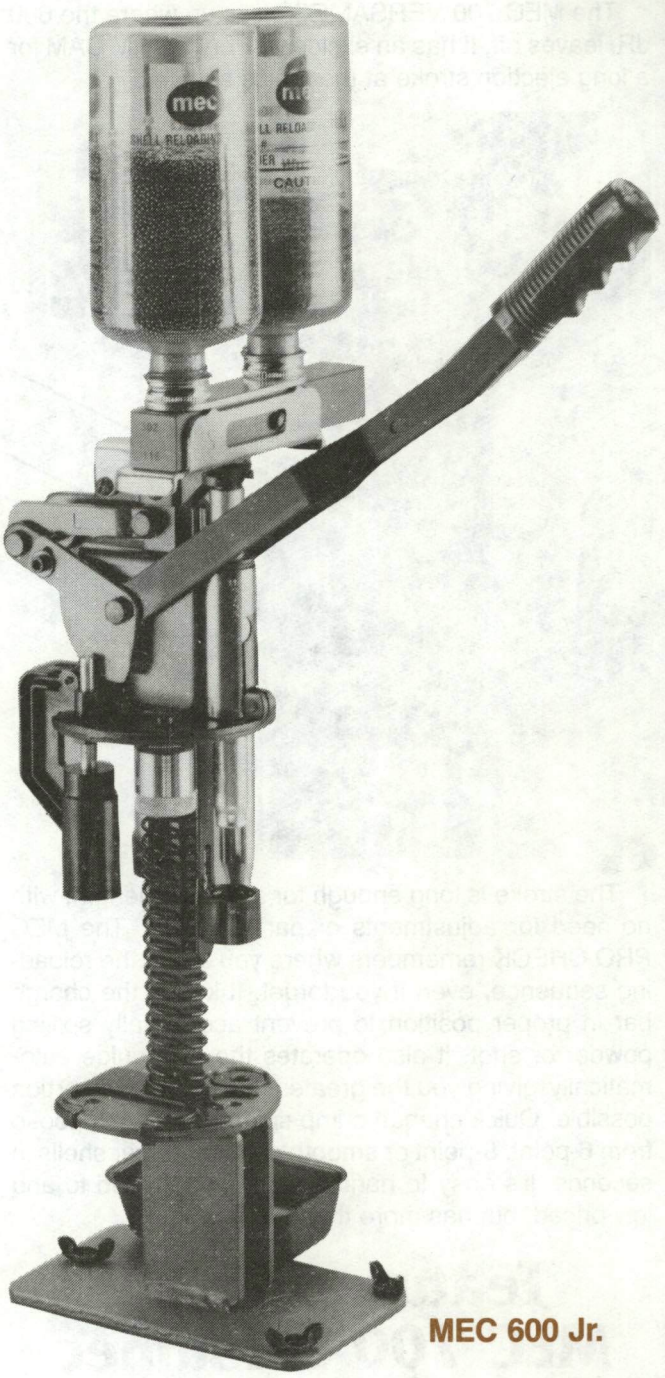
A typical semi-automatic reloader performs all the basic reloading steps automatically when the handle is pulled—depriming, resizing the metal base, repriming, measuring the correct amount of powder, firmly seating the wad column, dropping a desired amount of shot, and forming a tight crimp.

As mentioned earlier, there are two basic types of semi-automatic reloaders—single stage and progressive.

With a single-stage reloader, you manually move the hull from one station to the next as you go through the reloading cycle. There are five stations on the MEC single stage tools. Each reload is processed singly and finished before a new one starts through the cycle. The single-stage reloader is usually the best choice for the hunter and occasional clay bird shooter who doesn't require high volume and maximum speed. Six to eight boxes per hour is not unusual with a MEC 600 JR., 700 VERSAMEC, or SIZEMASTER 77.

The MEC 600 JR. is the world's best-selling, single-stage reloader. It gives rapid operation with a minimum of motion. MEC's exclusive shell holder positions and holds each shell firmly at every station without a transfer die. Powerful cam-action dies at both the resizing and crimping stations return each shell to factory form. You load wads quickly and easily with the ADJUSTA-GUIDE WAD FEED. Located in line with the rammer tube, the vertically adjustable wad feed permits easy insertion of the wad column. It allows additional room when needed between the rammer tube and the wad guide and assures accurate wad column placement. The SPINDEX crimp starter aligns itself with the original shell creases for the perfect crimp—everytime. With the charge bar window, it's easy to see the powder bushing you're using.

The MEC 600 JR. is slick and simple. It is budget priced, easy to use and precision made. You can upgrade it later with any of several accessories. There probably have been more 600 JR. tools made than all the other models and brands combined.



MEC 600 Jr.

The world's best selling single-stage reloader. Budget priced, precision made and simple to operate. The hunters' all-time favorite!

Features of the MEC 600 Jr.

SINGLE-STAGE

PRECISION SHELL HOLDER—No wasted motions—Easy in, easy out—Proper alignment at each station—No transfer die needed.

CAM-ACTUATED RECONDITIONING DIE—Powerful—Fully adjustable—Positive ejection.

POSITIVE REPRIMING—Eliminates dished heads.

CHARGE BAR WINDOW—Powder bushing is always visible.

ADJUSTA-GUIDE WAD FEED—Permits rapid wad insertion—Insures accurate wad placement—Vertical adjustment.

WAD PRESSURE GAUGE—Reads exact wad pressure directly—Easily adjusted.

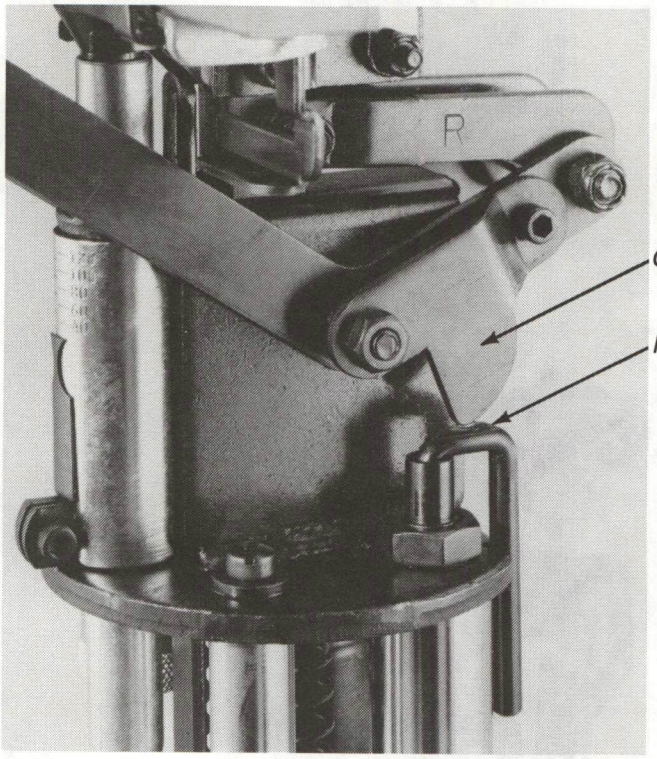
WAD HEIGHT GAUGE—Indicates improper height instantly.

SPINDEX CRIMP STARTER—Self-aligning with swivel action—Changes inserts in seconds.

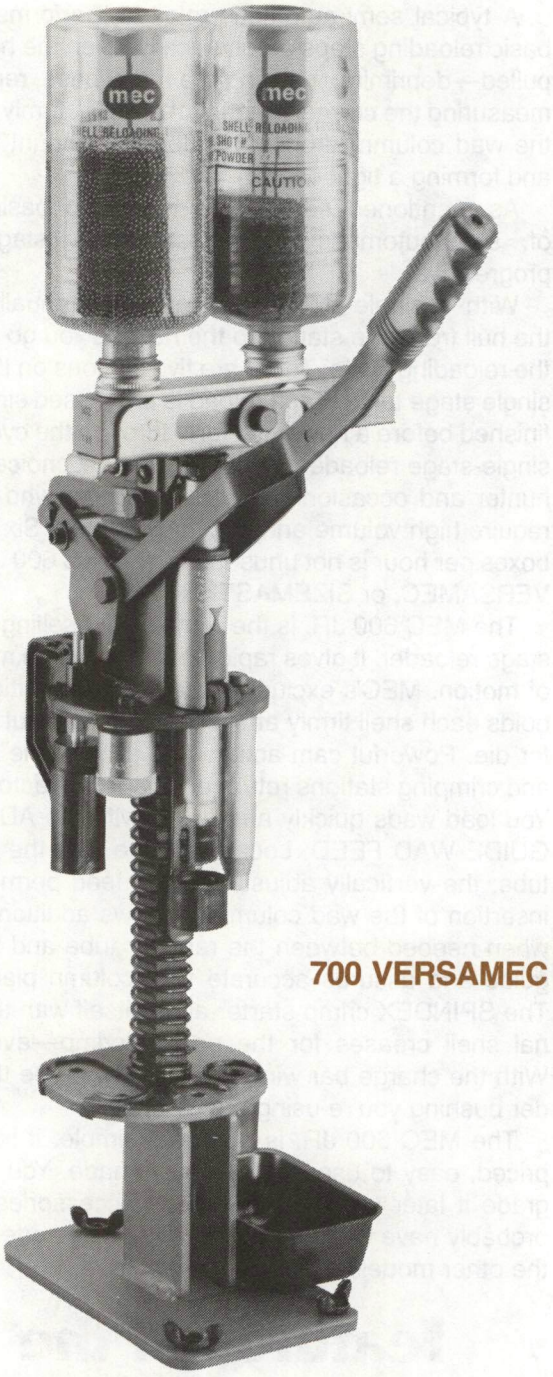
CAM-ACTUATED CRIMPING STATION—Progressive crimp formation—Easy shell release—Fully adjustable.

UPGRADEABLE—Add other features any time.

The MEC 700 VERSAMEC picks up where the 600 JR. leaves off. It has an exclusive PLATFORM CAM for a long ejection stroke at the resize station.



The stroke is long enough for any brass length, with no need for adjustments or part changes. The MEC PRO CHECK remembers where you are in the reloading sequence, even if you forget. It keeps the charge bar in proper position to prevent accidentally spilling powder or shot. It also operates the wad guide automatically, giving you the greatest ease of wad insertion possible. Quick change crimp spinners let you choose from 6-point, 8-point or smooth cone for paper shells in seconds. It's easy to handle, easy to get used to and low priced, but has more than the basics.



700 VERSAMEC

Features of the MEC 700 Versamec

SINGLE-STAGE

PRECISION SHELL HOLDER—No wasted motions—Easy in, easy out—Proper alignment at each station—No transfer die needed.

CAM-ACTUATED RECONDITIONING DIE—Powerful—Fully adjustable—Positive ejection.

POSITIVE REPRIMING—Eliminates dished heads.

CHARGE BAR WINDOW—Powder bushing is always visible.

ADJUSTA-GUIDE WAD FEED—Permits rapid wad insertion—Insures accurate wad placement—Vertical adjustment.

WAD PRESSURE GAGE—Reads exact wad pressure directly—Easily adjusted.

WAD HEIGHT GAUGE—Indicates improper height instantly.

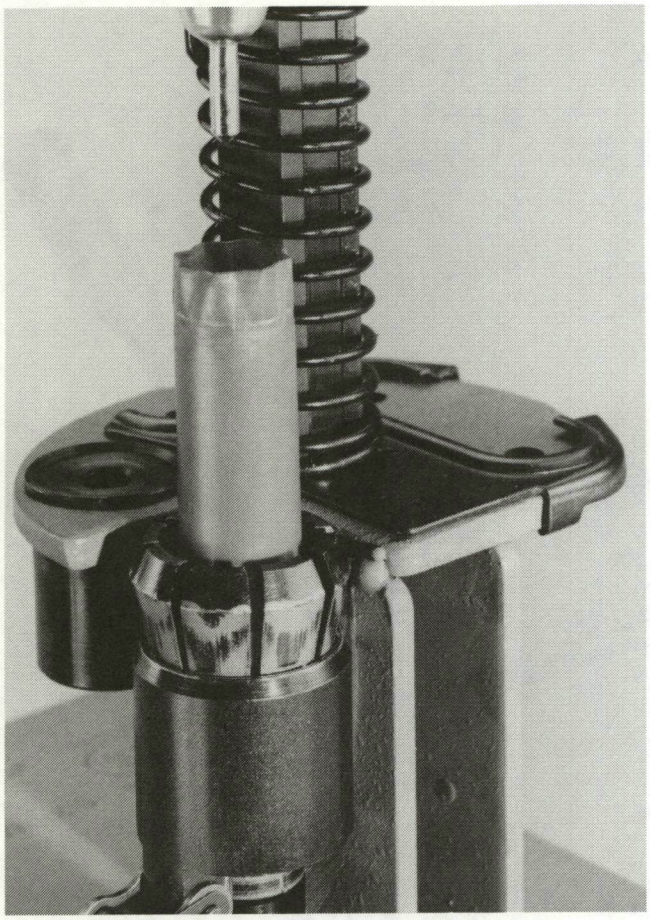
SPINDEX CRIMP STARTER—Self-aligning with swivel action—Changes inserts in seconds.

CAM-ACTUATED CRIMPING STATION—Progressive crimp formation—Easy shell release—Fully adjustable.

PLATFORM CAM—Provides extra-long stroke for reconditioning high base shells—Interchange high and low base shells with no parts changes or readjustments.

PRO-CHECK—Keeps charge bar in proper sequence to prevent spilling—Operates wad guide for ease of entry.

UPGRADEABLE—Add other features any time.



The MEC SIZEMASTER gives you simplicity without sacrifice. It's a single-stage beauty that's loaded with features. MEC's new generation resizing chamber handles brass or steel heads, both high and low.

The E-Z PRIME auto primer feed is standard equipment. Load it and the machine dispenses primers all by itself. The MEC PRO CHECK is built-in, too. It remembers the loading sequence for you. This is MEC's top-of-the-line single-stage reloader.

SIZEMASTER

Features of the MEC Sizemaster

SINGLE-STAGE

PRECISION SHELL HOLDER—No wasted motions—Easy in, easy out—Proper alignment at each station—No transfer die needed.

EXCLUSIVE RESIZING CHAMBER—Unmatched precision in sequence without slowing down—Brass or steel heads—High or low base—Easy ejection.

AUTOMATIC PRIMER FEED—Dispenses primers as they're needed by the machine. You never touch them.

POSITIVE REPRIMING—Eliminates dished heads.

CHARGE BAR WINDOW—Powder bushing is always visible.

PRO-CHECK—Keeps charge bar in proper sequence to prevent spilling—Operates wad guide for ease of entry.

ADJUSTA-GUIDE WAD FEED—Permits rapid wad insertion—Insures accurate wad placement—Vertical adjustment.

WAD PRESSURE GAUGE—Reads exact wad pressure directly—Easily adjusted.

WAD HEIGHT GAUGE—Indicates improper height instantly.

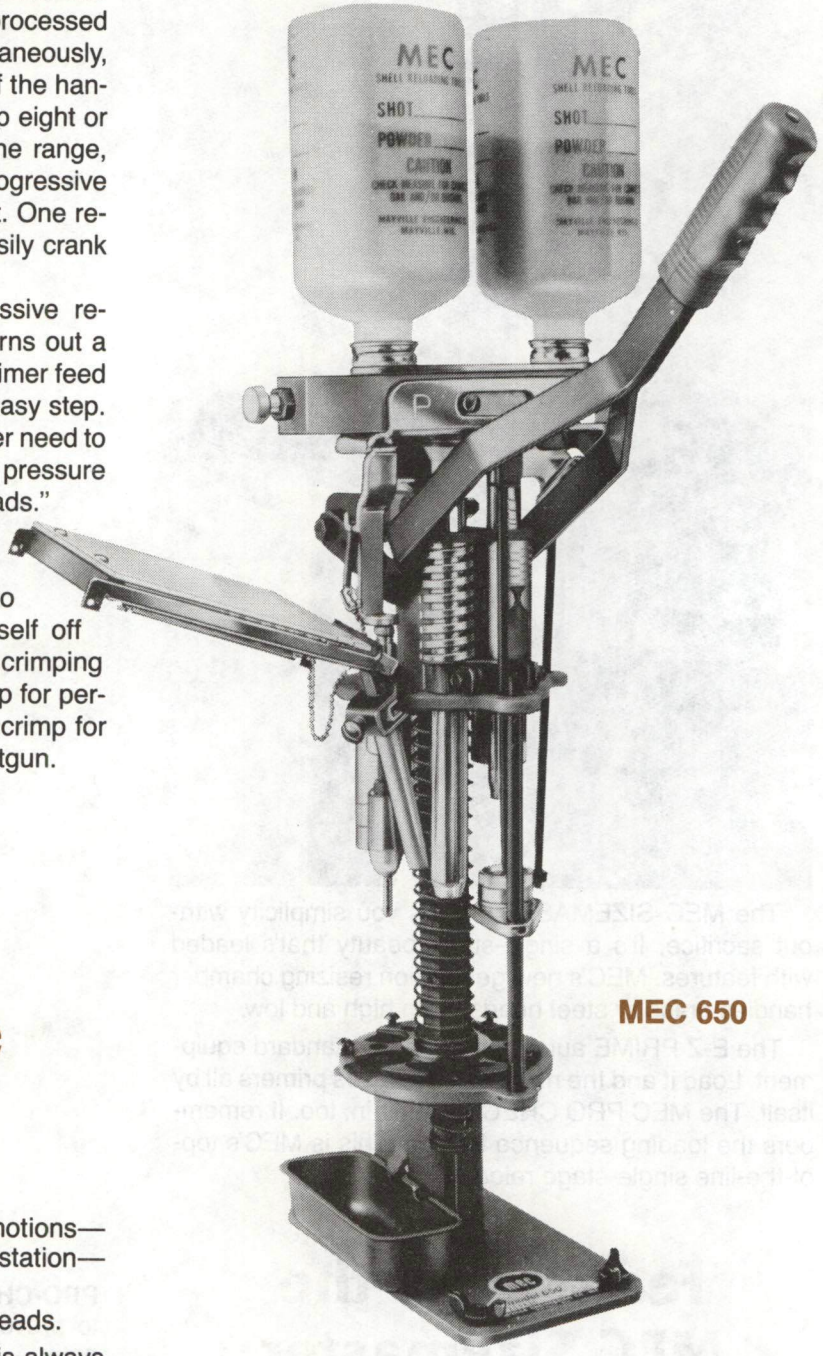
EXTRA CAPACITY SHOT CONTAINER—Refill less often.

SPINDEX CRIMP STARTER—Self-aligning with swivel action—changes in seconds.

CAM-ACTUATED CRIMPING STATION—Progressive crimp formation—Easy shell release—Fully adjustable.

With a progressive reloader such as the MEC 650 and GRABBER models, six shells are processed through the several reloading steps simultaneously, completing a finished reload with each pull of the handle. Skeet and trap enthusiasts may shoot up eight or more boxes of shells in one afternoon on the range, and these target shooters generally prefer progressive models to reload a high volume of shells fast. One reloader using a MEC progressive tool can easily crank out a case of ammo (20 boxes) per hour.

The 650 is MEC's lowest-priced progressive reloader. It works on six shells at once and turns out a finished reload with every stroke. The auto-primer feed holds a full box of primers and loads in one easy step. Primers drop as they're needed, and you never need to touch them. Primers are seated in place with pressure from inside the hull to eliminate "dished heads." The MEC 650 also features AUTO-CYCLE charging. This makes sure no powder is dropped until the hull is at the correct station to receive powder. It turns itself on and turns itself off when you are finished. The 650 has three crimping stations to start, develop and finish the crimp for perfect control. The third, and last, die tapers the crimp for effortless fit in your pump or autoloading shotgun.



MEC 650

Features of the MEC 650

PRECISION SHELL HOLDER—No wasted motions—Easy in, easy out—Proper alignment at each station—No transfer die needed.

POSITIVE REPRIMING—Eliminates dished heads.

CHARGE BAR WINDOW—Powder bushing is always visible.

ADJUSTA-GUIDE WAD FEED—Permits rapid wad insertion—Insures accurate wad placement—Vertical adjustment.

WAD PRESSURE GAUGE—Reads exact wad pressure directly—Easily adjusted.

WAD HEIGHT GAUGE—Indicates improper height instantly.

SPINDEX CRIMP STARTER—Self-aligning with swivel action—Charges inserts in seconds.

CAM-ACTUATED CRIMPING STATION—Progressive crimp formation—Easy shell release—Fully adjustable.

PROGRESSIVE ACTION—12 operations on 6 shells are performed with every pull.

ROTATING SHELL CARRIER—Automatically positions each shell at the proper station.

AUTOMATIC PRIMER FEED—Dispenses primers as they're needed by the machine. You never touch them.

AUTO-CYCLE CHARGING—Automatically maintains the correct operating sequence of the charge bar.

THREE-STAGE CRIMP—Crimp is formed at one station, developed at another, then sealed and tapered at a third for perfect control.

MEC's GRABBER is the top-of-the-line progressive reloader. It has all the features for high-speed, efficient operation, plus it has MEC's exclusive POWER RING collet resizer. Twelve different operations at all six stations combine to produce a finished shell with every stroke of the handle. The MEC E-Z PRIME auto primer feed is standard. So is AUTO-CYCLE charging and MEC's exclusive three-stage crimp. The collet resizing chamber works in sequence with the machine and doesn't slow you down. You put in wads and hulls and get unequaled precision as fast as you can pull the handle.

Features of the MEC Grabber

PRECISION SHELL HOLDER—No wasted motions—Easy in, easy out—Proper alignment at each station—No transfer die needed.

EXCLUSIVE RESIZING CHAMBER—Unmatched precision in sequence without slowing down—Brass or steel heads—High or low base—Easy ejection.

AUTOMATIC PRIMER FEED—Dispenses primers as they're needed by the machine. You never touch them.

POSITIVE REPRIMING—Eliminates dished heads.

CHARGE BAR WINDOW—Powder bushing is always visible.

ADJUSTA-GUIDE WAD FEED—Permits rapid wad insertion—Insures accurate wad placement—Vertical adjustment.

WAD PRESSURE GAUGE—Reads exact wad pressure directly—Easily adjusted.

WAD HEIGHT GAUGE—Indicates improper height instantly.

EXTRA CAPACITY SHOT CONTAINER—Refill less often.

SPINDEX CRIMP STARTER—Self-aligning with swivel action—changes in seconds.

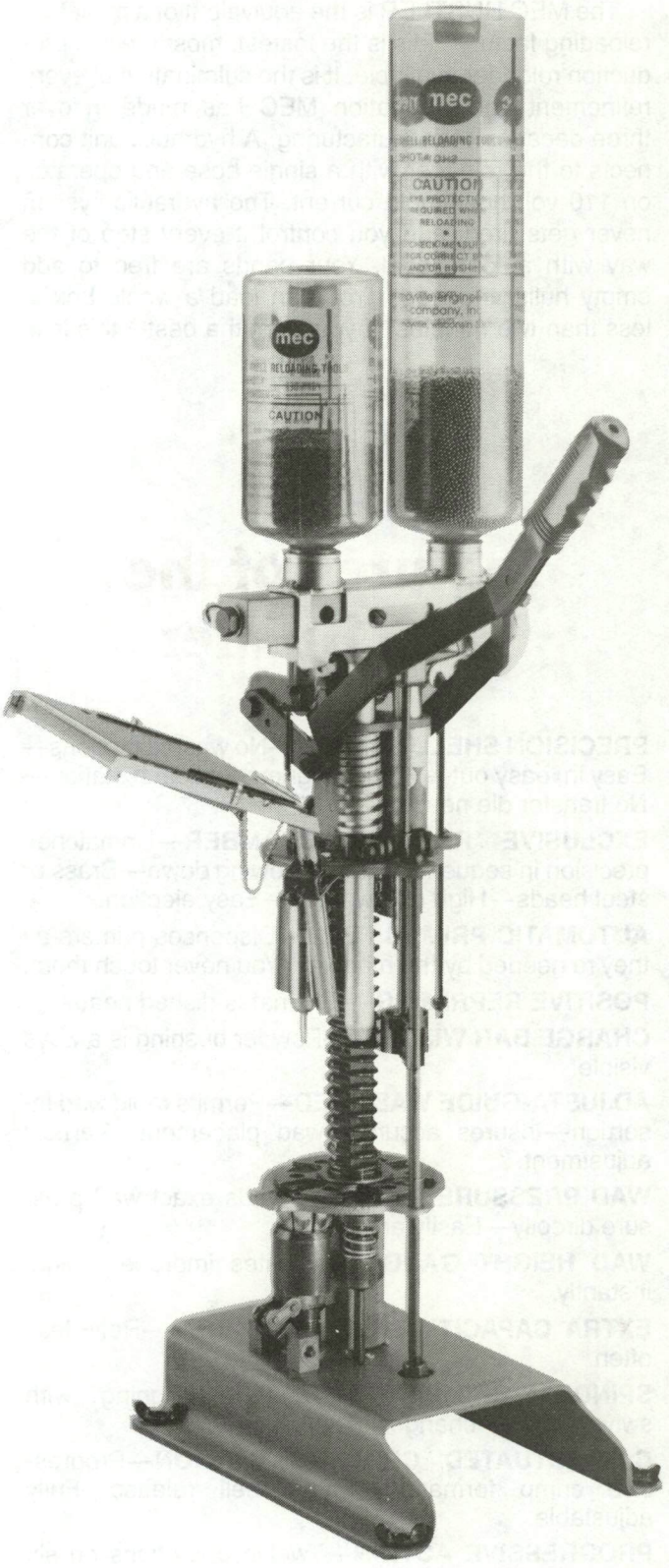
CAM-ACTUATED CRIMPING STATION—Progressive crimp formation—Easy shell release—Fully adjustable.

PROGRESSIVE ACTION—Twelve operations on six shells are performed with every pull.

ROTATING SHELL CARRIER—Automatically positions each shell at the proper station.

AUTO-CYCLE CHARGING—Automatically maintains the correct operating sequence of the charge bar.

THREE-STAGE CRIMP—Crimp is formed at one station, developed at another, then sealed and tapered at a third for perfect control. 2¾" shells only.



GRABBER

Top of the MEC line. Progressive action. Automatic primer feed. "Power Ring" collet resizer. Automatic charge bar cycling. Exclusive three-step crimp. It's got them all for high-speed, efficient operation. 2¾" shells only.

The MEC HUSTLER is the equivalent of a miniature reloading factory. This is the fastest, most precise production reloader available. It is the culmination of every refinement and innovation MEC has made in over three decades of manufacturing. A hydraulic unit connects to the reloader with a single hose and operates on 110 volt household current. The hydraulic system never gets tired, and you control it every step of the way with a foot pedal. Your hands are free to add empty hulls and wads. You can load a whole box in less than two minutes. If you want the best—this is it!

Features of the MEC Hustler

PRECISION SHELL HOLDER—No wasted motions—Easy in, easy out—Proper alignment at each station—No transfer die needed.

EXCLUSIVE RESIZING CHAMBER—Unmatched precision in sequence without slowing down—Brass or steel heads—High or low base—Easy ejection.

AUTOMATIC PRIMER FEED—Dispenses primers as they're needed by the machine. You never touch them.

POSITIVE REPRIMING—Eliminates dished heads.

CHARGE BAR WINDOW—Powder bushing is always visible.

ADJUSTA-GUIDE WAD FEED—Permits rapid wad insertion—Insures accurate wad placement—Vertical adjustment.

WAD PRESSURE GAUGE—Reads exact wad pressure directly—Easily adjusted.

WAD HEIGHT GAUGE—Indicates improper height instantly.

EXTRA CAPACITY SHOT CONTAINER—Refill less often.

SPINDEX CRIMP STARTER—Self-aligning with swivel action—changes in seconds.

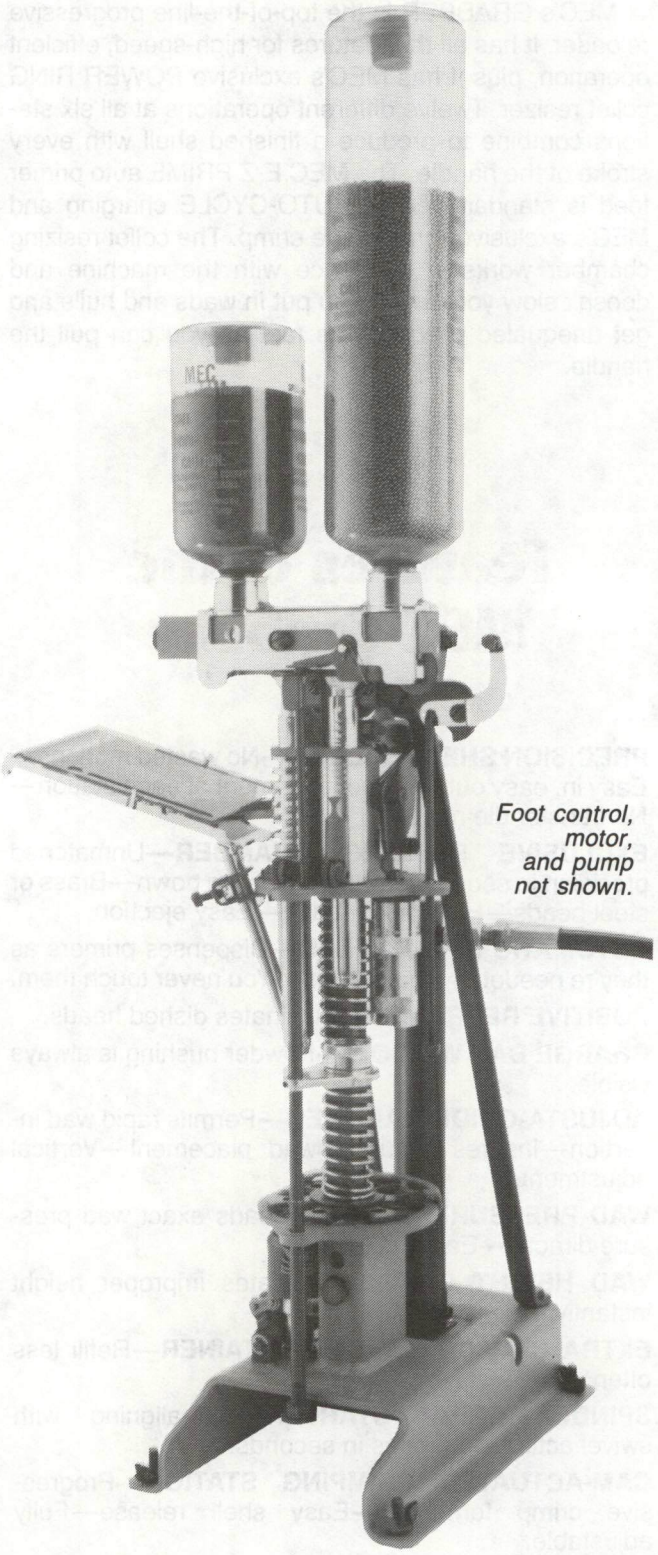
CAM-ACTUATED CRIMPING STATION—Progressive crimp formation—Easy shell release—Fully adjustable.

PROGRESSIVE ACTION—Twelve operations on six shells are performed with every pull.

ROTATING SHELL CARRIER—Automatically positions each shell at the proper station.

AUTO-CYCLE CHARGING—Automatically maintains the correct operating sequence of the charge bar.

THREE-STAGE CRIMP—Crimp is formed at one station, developed at another, then sealed and tapered at a third for perfect control. 2¾″ shells only.



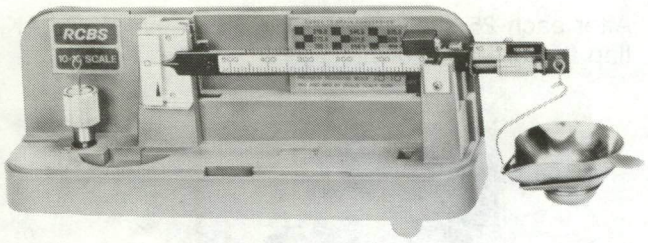
Foot control, motor, and pump not shown.

HYDRAULIC POWER—This compact unit connects to the reloader with a single hose and operates on 110 volt household current. You control it with a foot pedal. The system is synchronized for continuous action through the entire machine cycle. Your hands are free to add empty shells and wads. You can load a whole box in less than two minutes. 2¾″ shells only.

After you have chosen the MEC press that best fits your needs and requirements, there are a few other choices and considerations to make.

THE HANDBOOK OF SHOTSHELL RELOADING—FEATURING MEC RELOADERS—This one! You've got it.

POWDER SCALE—A reloader needs a powder scale to check and verify the accuracy of the charge bar and powder bushing. We personally prefer the Omark Industries, RCBS Model 10-10. Normal capacity of this scale is 510 grains. This can be increased, without loss of sensitivity, to 1010 grains by attaching the included extra weight. Some features include: Micrometer poise for quick, precise weighing; special approach-to-weight indicator; easy to read graduations; magnetic dampener; agate bearings; anti-tip pan; and a dustproof storage lid that snaps on to cover the scale.

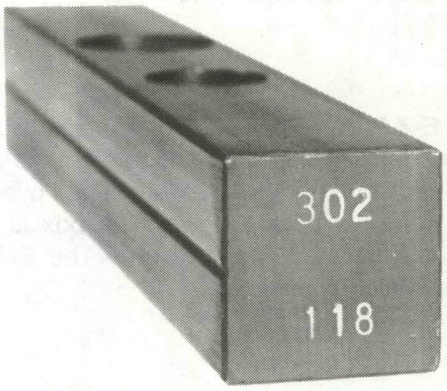


There is an easily read chart on the front of the scale housing that gives ounce-to-grain conversions from ½ to 2½ ounces. This is especially helpful to those of us who can only remember that there are 7000 grains per pound. Since the conversion amounts are right there in front of us, we don't have to go back into the house to get our trusty calculator. . . (You see, some of us have been banished to the garage, forever, for spilling shot in the shag carpet. Every time the bride passes the vacuum cleaner over "that" spot a few pellets make it half-way up the tube and rattle. Can you imagine half a bag of #7 ½ shot spilled on deep-shag carpet? Well, we missed the touchdown run and were trying to catch it on instant replay. . . Most of the problems we've had, in our 25 plus years of reloading experiences, we created ourselves. Remember, a few pages back we discussed eliminating distractions and concentrating on our work at hand. We're human—but, if we give reloading our undivided attention, we eliminate these types of problems.)

BARS AND BUSHINGS

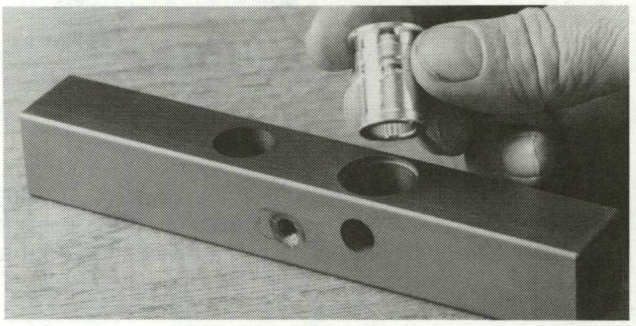
A complete assortment of "quick change" charging bars is available for any load or gauge. There are two holes bored in the bar. One is precisely bored to measure shot in amounts from ½ oz. through 2¼ oz. There are 16 bars for the single-stage tools and 14 bars for the progressive tools. Part # 302 denotes the bar for the single-stage machines and Part # 502 is for the progressive models.

This information is stamped on one end of the MEC bar:



You will see two numbers stamped on the bar. The top number (302) tells us the bar is manufactured to fit the MEC single-stage reloaders—the 600 JR., 700 VERSAMEC and the SIZEMASTER. The number on the bottom of the bar (118) designates the amount of shot, in ounces, the bar will drop (in this instance 1⅛ oz). A 1⅛ oz. bar could be used in 12 gauge trap and skeet reloads, light or medium field loads, 16 gauge medium field loads and 3" 20 gauge medium loads. MEC bars are versatile.

This same bar is also bored to accept interchangeable "powder bushings." MEC makes a total of 47 bushings to measure powder, for the smallest .410 through the largest 10 gauge 3½" magnum.



MEC makes the following statement concerning volumetric measuring of powder on the back of the bushing chart.

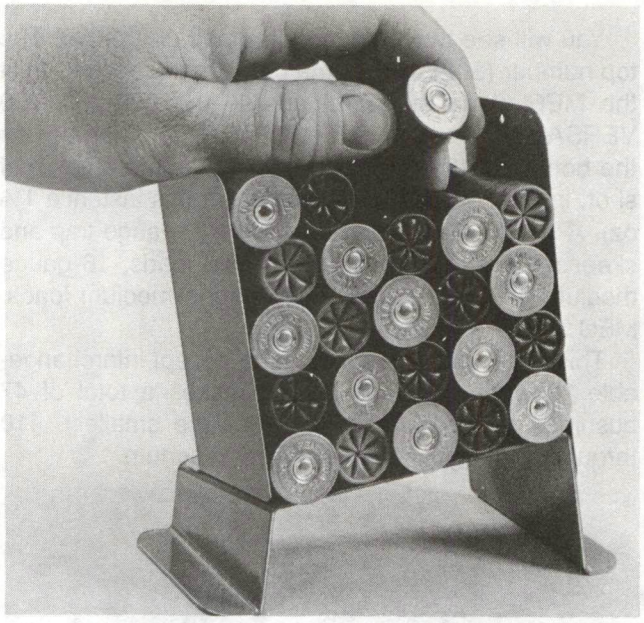
IMPORTANT!!

"The charges may vary slightly from the weights listed for many reasons: density and moisture content, undue agitation and inconsistent manipulation of the charge bar are some of the factors.

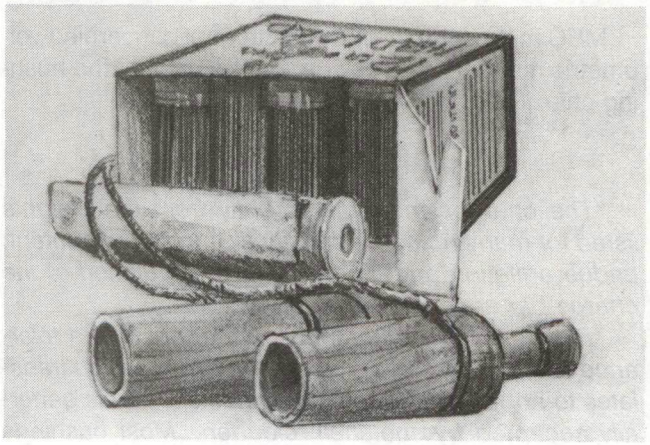
"Powder is manufactured to an approximate tolerance of .025 grams per cubic centimeter, which translates to approximately plus or minus 5% and is generally accepted by shotshell reloaders. Most bushings

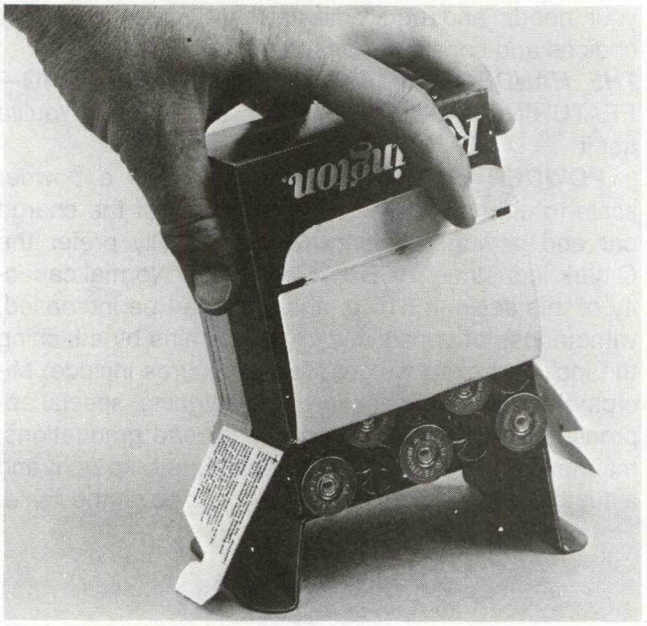
are graduated in increments of .007 and, therefore, could drop as light as the preceding number or as heavy as the following and remain within the manufacturer's tolerance. We endorse the use of a scale to confirm the charge and aid in selecting the appropriate bushing for those lots of powder manufactured to the high or low side of the tolerance."

MEC E-Z PAK—The E-Z PAK enables you to stack your reloaded shells neatly and lets you fill an entire box in one easy step. Fill it up, slip a box over the E-Z PAK, and turn it upside down. The box is full, and you're ready to start the next one. The E-Z PAK is available in all gauges.

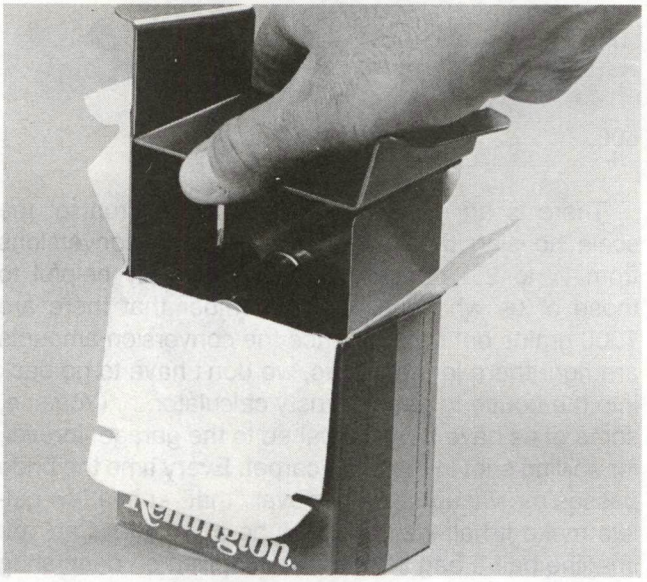


As each shell is reloaded, place in E-Z PAK starting at lower corner...one shell with base toward you—one with base away from you. The E-Z PAK is tilted so that each shell automatically "falls" in place.



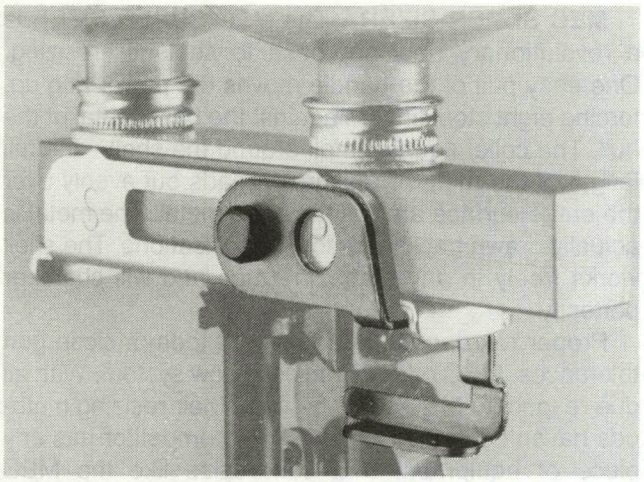


After each 25 shells, slip original box over E-Z PAK, flap forward as shown.



Turn upside-down and pull E-Z PAK out.

MEC PRO CHECK—The PRO CHECK is an accessory for the 600 JR. that gives increased speed and convenience. This standard feature on the 700 VERSAMEC and the SIZEMASTER is a welcome accessory for the 600 JR. It is easily attached to the charge bar. Remove the bar stop screw, place the PRO CHECK in position, insert the hex-head bolt that comes with the kit and tighten.



The position of the wad guide is controlled by the PRO CHECK through the action of the charge bar. Upon charging the shell with powder, the wad guide fingers are inserted into the shell, and the fingers remain in position to accept the wads. The PRO CHECK actually programs the measure assembly to position the charge bar in the correct sequence and renders the bar inoperative until the handle is depressed.

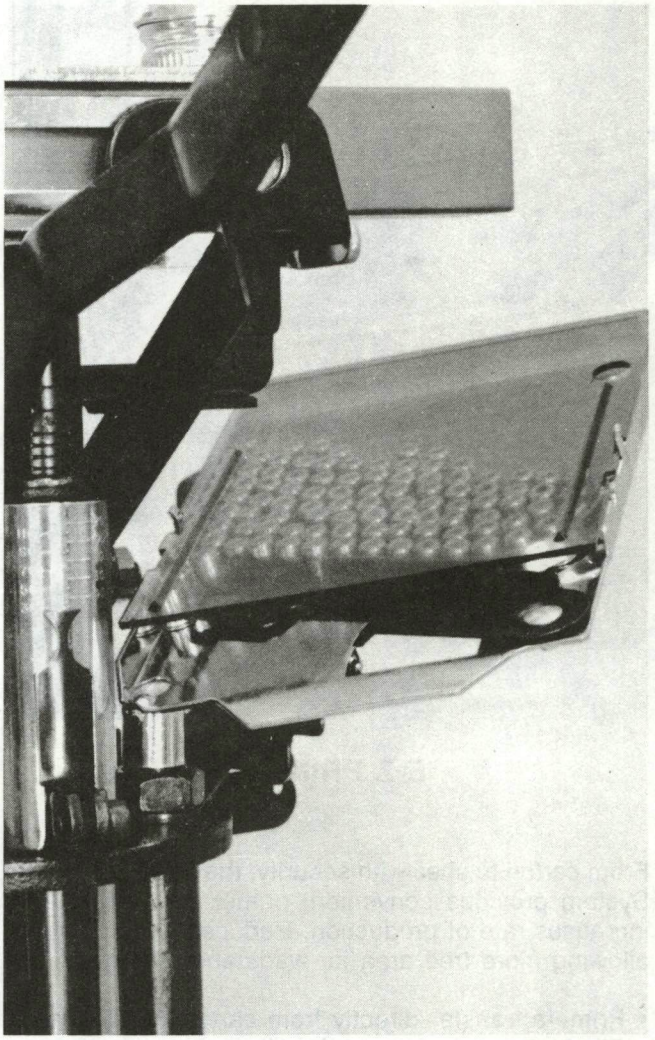
The MEC PRO CHECK is well worth the nominal cost and results in increased speed and convenience.

MEC 73 KIT—This kit is another modification for the 600 JR. By installing the 73 Kit and a PRO CHECK, a MEC 600 JR. is upgraded to a 700 VERSAMEC. Installation instructions are packed with the parts. This kit comes in the gauge of your reloader and is available from your local sporting goods dealer.

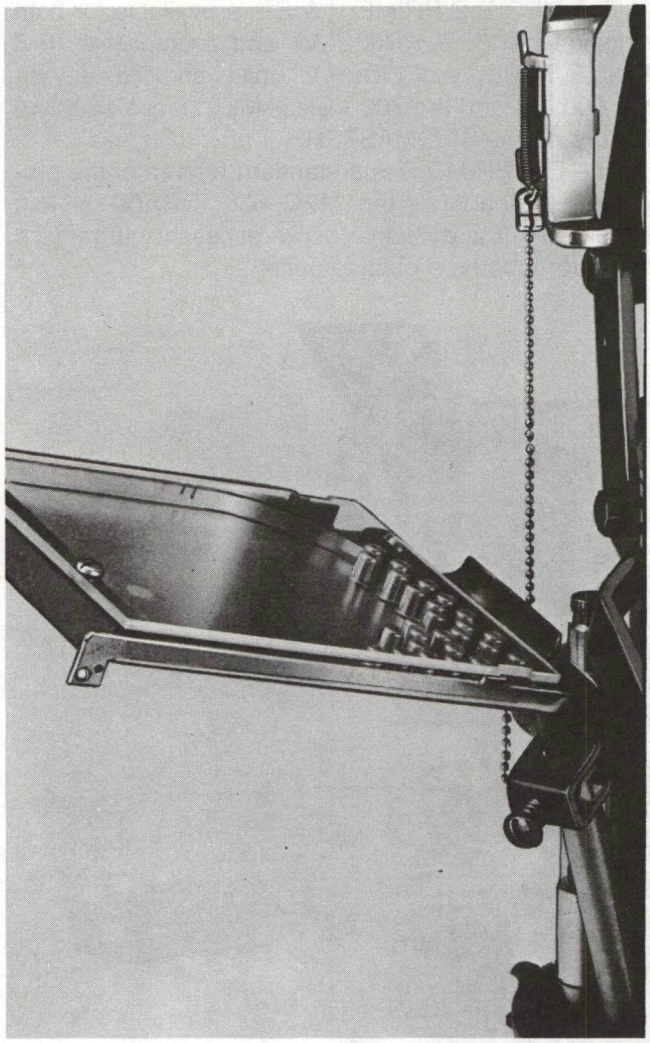
MEC AUTOMATIC PRIMER FEED—These primer feeds are completely automatic. They hold a full box of primers and load in one easy step. Primers drop one at a time into the machine as they're needed, and the supply is always visible. You never touch them. The E-Z PRIME speeds up production and reduces bench clutter.

The MEC E-Z PRIME V & S are available for both single-stage (E-Z PRIME V) and progressive (E-Z PRIME S) MEC tools. The "V" unit is an accessory for the 600 JR. and the 700 VERSAMEC. It is a standard feature on the SIZEMASTER.

The E-Z PRIME S is a standard feature of the progressive reloaders—the MEC 650, GRABBER and HUSTLER. It is available as an accessory to replace the older tube type priming units.



E-Z PRIME V



E-Z PRIME S

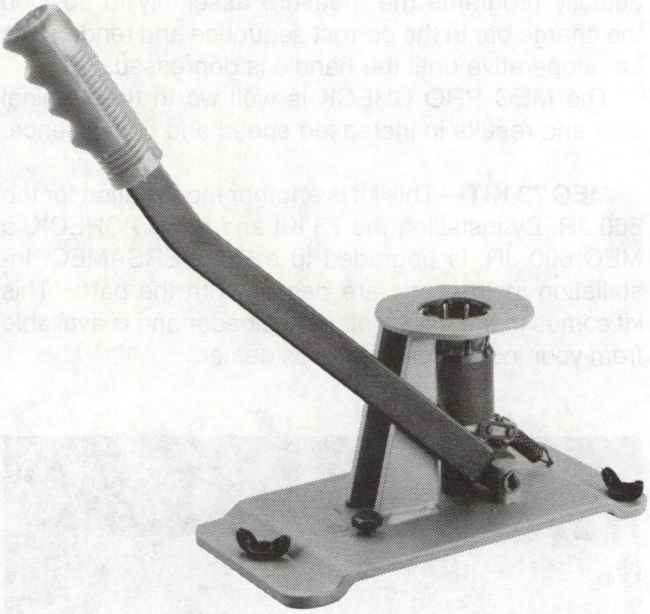
From carton to shell with security, the MEC E-Z Prime System provides convenient primer positioning and increases rate of production. Reduces bench clutter, allowing more free area for wads and shells.

- Primers transfer directly from carton to reloader—Eliminating tubes and tube fillers.
- Positive mechanical feed (not dependent upon agitation of press)
- Visible supply
- Easily disengaged to interrupt, or engaged to start delivery primers
- Automatic—Eliminates hand motion
- Less susceptible to damage
- Adapts to all domestic and most foreign primers with adjustment of the cover
- May be purchased separately to replace tube type primer feed or to update your present reloader.

WARNING: PRIMERS DEMAND THE RESPECT DUE ANY HIGH EXPLOSIVE.

MEC SUPER SIZER—The MEC SUPER SIZER is a revolutionary new approach to shotshell resizing. One easy pull of the handle moves the power ring up, forcing eight steel fingers against the base metal of the hull. The collet squeezes all around the shell—the full length of the metal. Pressure spreads out evenly over the entire surface area of the base metal. The metal is actually drawn back to factory specifications. The shell works freely in any magazine tube and will chamber perfectly.

Proper resizing is important with today's close gun tolerances. MEC offers a radically new system. With all due respect to MEC's competition, their resizing methods haven't changed in years. No competitor has any piece of equipment that can resize like the MEC SUPER SIZER. It is available in the gauge of your choice as an accessory to any reloader that doesn't have MEC's exclusive POWER RING collet resizer.



MEC SUPER SIZER

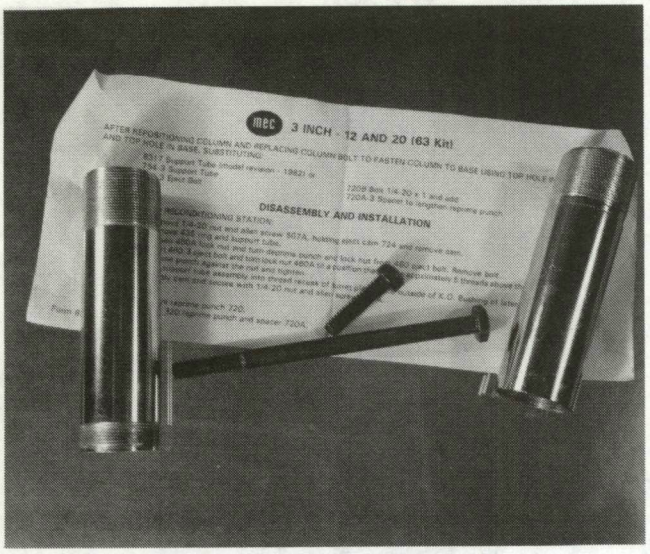
Exclusive MEC "Power Ring" collet resizer. May be used with any make of reloader not equipped with the built-in MEC collet resizer. Returns every base to a factory perfect fit.

MEC DIE SETS—Conversion die sets are available in any gauge for the single-stage reloaders. Generally, most people will have the tools necessary to make the conversion.

3" CONVERSIONS—MEC single-stage reloaders do not require a die change to convert from 2¾" to 3" shells. Instructions for making this change are outlined in the instruction manual. A MEC 700 VERSAMEC, for

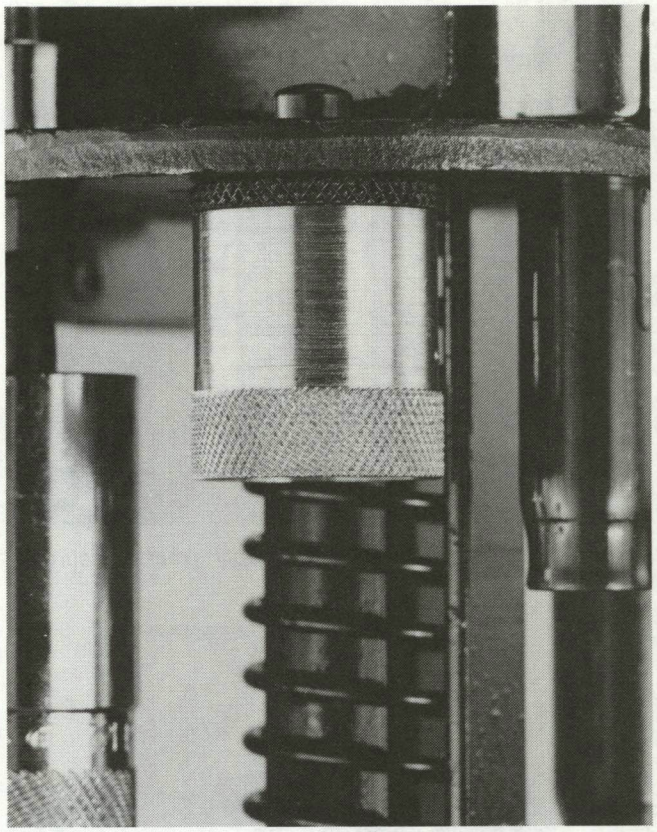
example, shipped from the factory as a 2½" .410 can be converted to reload 3" shells with the parts and instructions included with the machine. 12 and 20 gauge machines can be converted from 2¾" to 3" by following the instructions. Die sets are required, however, when you change from one gauge to another.

MEC 63 KIT—Reloading 3" shells on the 600 JR. requires a longer support tube and eject bolt. These, and a few other parts, make up the 63 Kit.

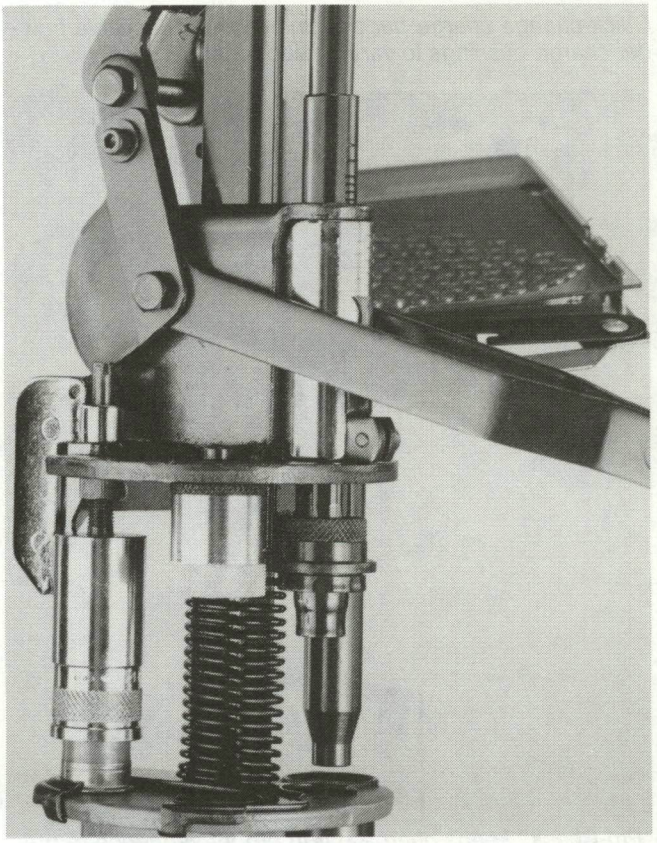


MEC became the world's leading producer of shotshell reloaders because of many patented and exclusive features developed through the years. For example. . .

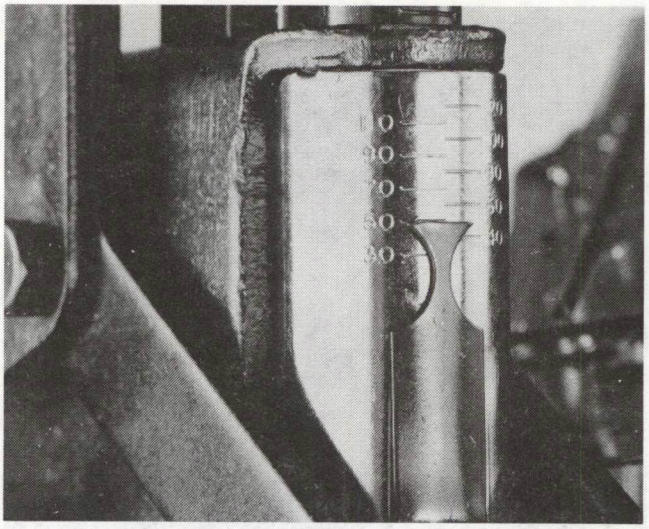
Flip-top measure permits the measuring assembly to be flipped so that the powder and shot containers are inserted and removed in the upright position to avoid spilling.



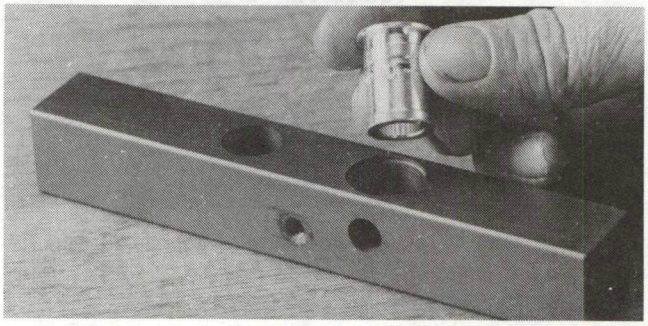
"Spindex" crimp starter automatically adjusts to original shell mouth creases.



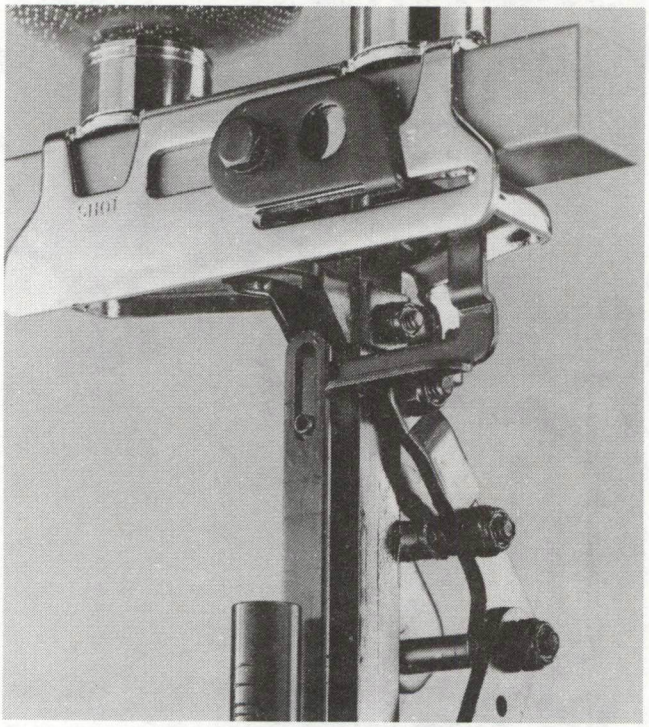
Cam operated crimp mechanism adjusts for correct crimping and closing pressures.



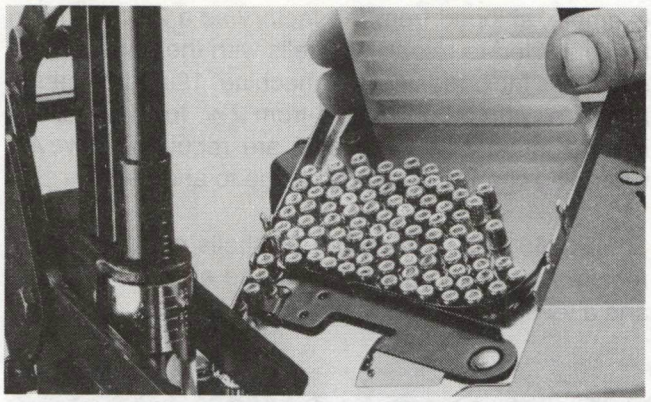
Rammer tube manually adjusts to apply exact pressure to wad column.



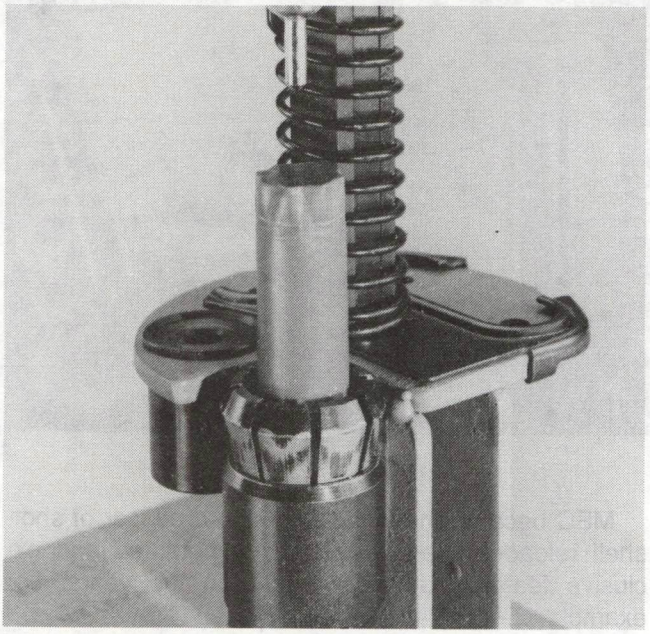
Quick-change charge bar accommodates removable powder charge bushings to vary powder charges.



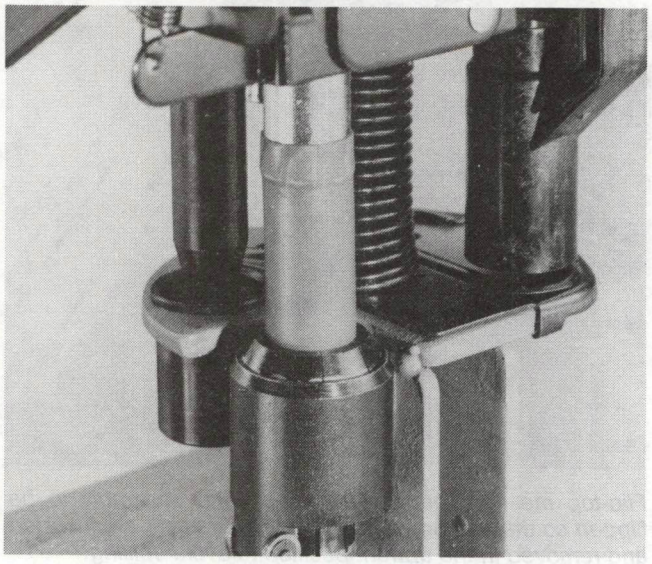
"Pro-Check" keeps charge bar in proper sequence to prevent spilling powder or shot. (Charge tube removed to show detail.)



Automatic primer feed eliminates handling of individual primers. It is standard on some MEC models; an optional accessory on others.



On the MEC "Sizemaster", "Grabber" and "Hustler" models, resizing of the metal base is performed by an exclusive "Power Ring" collet resizer. On these models, an eight-fingered collet squeezes the base back to original dimensions, then opens to freely release the shell.




jim Rack '84

Chapter 5

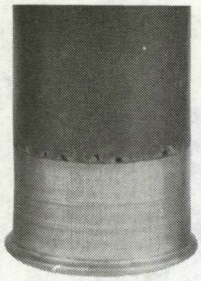
RELOADING BASICS—NOW LET'S START RELOADING

On the next pages you will find a general description of the steps involved in shotshell reloading. This discussion is not intended as a substitute for the instructions provided with your reloader. Always read the instructions included with your reloader very carefully. ***FREE CATALOGS AND INSTRUCTION MANUALS THAT CONTAIN APPROPRIATE ADVICE FOR THE USE OF MEC RELOADERS ARE AVAILABLE FROM THE FACTORY UPON REQUEST.***

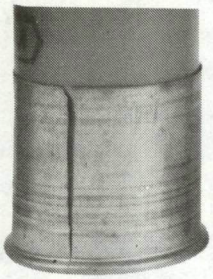
INSPECT THE HULL—The first step in reloading is to examine your empty hulls to see that they are clean and dry, have no split ends, no cracked or split metal bases, and have no other visible damage. Watch for feathers, leaves, twigs, dirt dobber nests, etc., on the inside. Discard those that are obviously damaged. Look for pinholes at the junction of the metal base and the hull body. Paper cases are especially prone to develop these "pinhole burns" after being reloaded and fired two or three times. Separate the hulls by brand and base wad height. Look each hull over carefully and properly segregate and classify them. ***DO NOT MIX DIFFERENT BRANDS—COMMON SENSE MUST PREVAIL HERE. REMEMBER, WE WILL RELOAD ACCORDING TO A LABORATORY-TESTED RECIPE—IF YOU WANT CHOCOLATE CAKE, THEN FOLLOW THE CHOCOLATE CAKE RECIPE.***

Inspect hulls for damage or foreign objects such as feathers, leaves, twigs, etc., on inside.

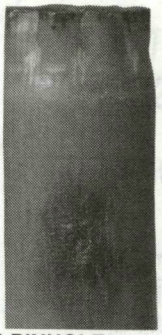
FAILURES OR DEFECTS TO WATCH FOR WHEN INSPECTING HULLS



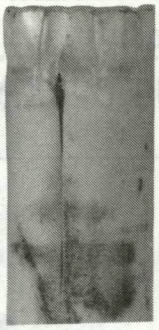
PAPER FATIGUE
Pinhole burn-through occurs at the edge of metal heads. Ejectors will sometimes pull metal heads off, leaving the paper tube in the chamber. May also occur with plastic hulls. Discard hull.



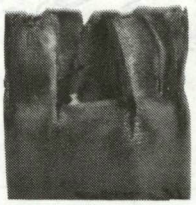
METAL HEAD SPLIT
May be caused by metal fatigue, defective material or workmanship, or from metal being too hard or incompletely annealed during manufacturing. Discard hull.



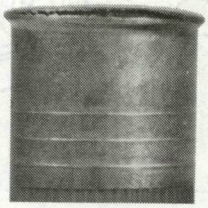
TUBE PINHOLE BURN-THROUGH
Possibly caused by defective plastic material. Burned or discolored plastic will be apparent. Discard hull.



BODY SPLIT
May be caused by defective plastic material or workmanship. Burned or discolored plastic will be apparent. Discard hull.



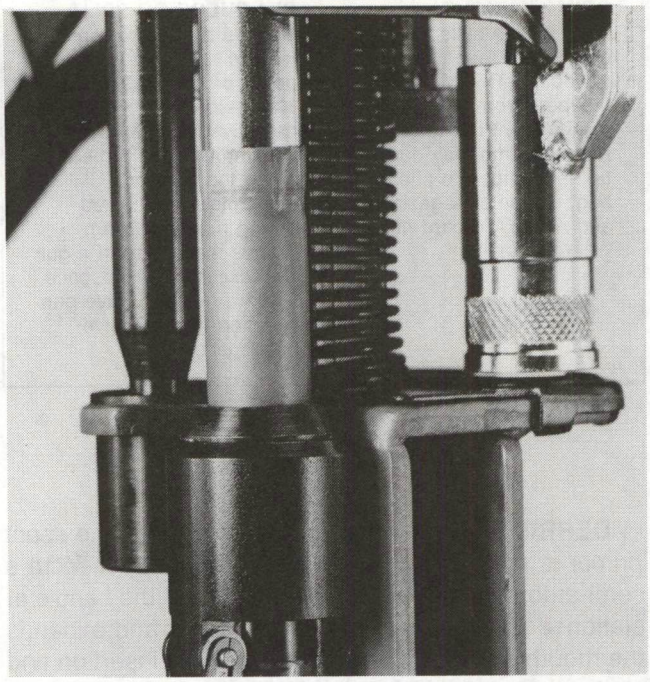
CRIMP FATIGUE
Most plastic hulls fail at the crimp from repeated reloading. This may cause bloopers from lack of crimp resistance. Prior to failure, a weak crimp may open up, leak shot into shell bag, or gun's magazine and action. Discard hull.



RIM BULGE OR SPLIT
Caused by gas pressure leaking around a loose paper or fiber basewad. May be caused by defective material or workmanship from metal being too hard or incompletely annealed during manufacturing. Bulges may occur in a gun with excessive headspace. Discard hull and have gun checked for excessive headspace.

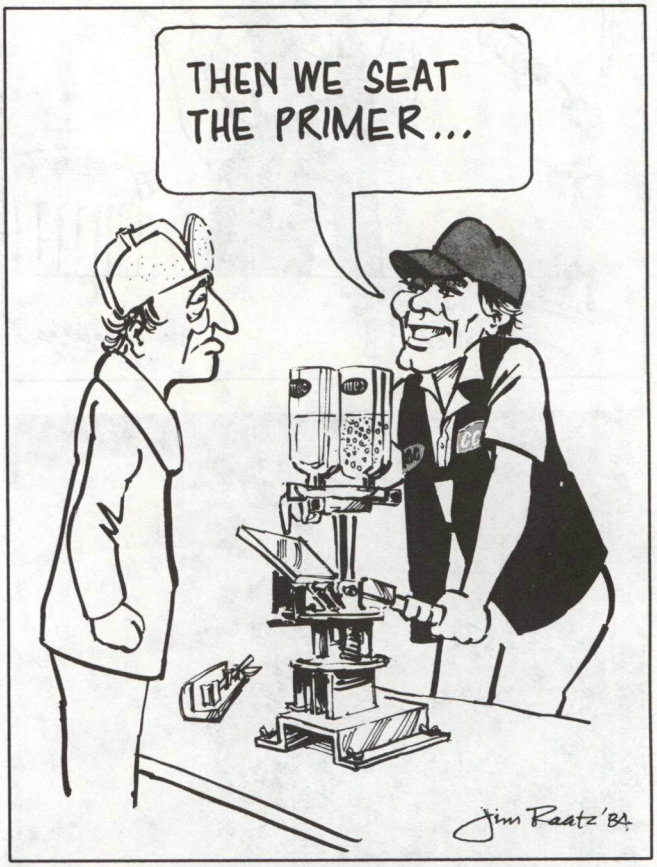
DEPRIME—With manual reloading tools, the spent primer is removed with a punch and hammer. With a semi-automatic reloader, the initial pull of the handle at station #1 pushes out the spent primer and expands the mouth of the hull to permit easy wad insertion and seating. On all MEC reloaders except the 650, the same pull of the handle resizes the metal base.

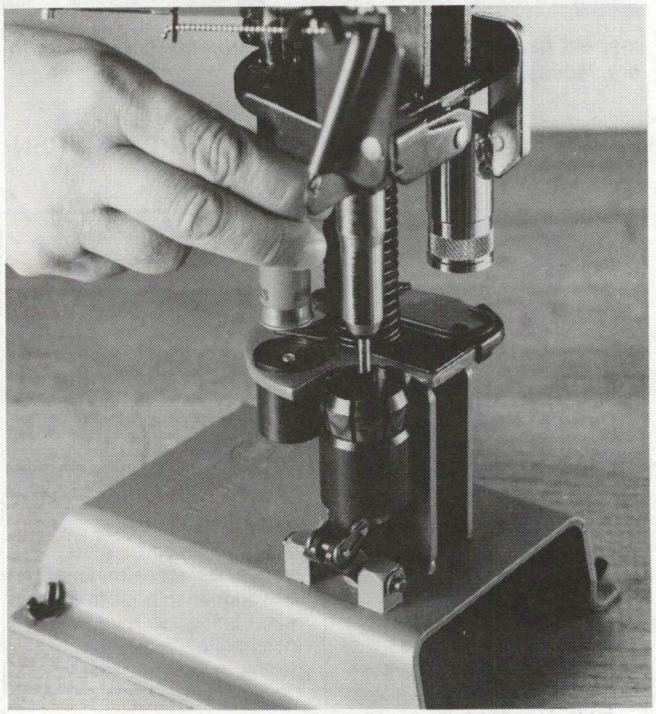
RESIZING—Nearly all shotshell heads are made of brass or brass-plated steel. When the shotshell is fired, the head tends to expand to the size of the chamber in which it is fired. If the shell is continually fired in the same gun, resizing probably will be unnecessary, but if the fired shells are from a different gun, you will most likely have to resize the metal.



Depriming, sizing, mouth expanding on Sizemaster at Sta. #1.

The most common resizing method is to force a hardened steel ring of the proper diameter down over the metal base, forcing it back to the original factory size. This method of sizing is used on the MEC 600 JR. and the 700 VERSAMEC. As noted earlier, the newest resizing method is the POWER RING collet resizer, found only on the MEC SIZEMASTER, GRABBER, HUSTLER and SUPER SIZER models. The advantages of this method are that you never scratch the metal base, you don't increase the rim diameter, and you don't have to force the resized base out of a resizing ring (the collet fingers open so the shell may be removed freely). It also takes far less effort for





Seating new primer on Sizemaster at Station #2.

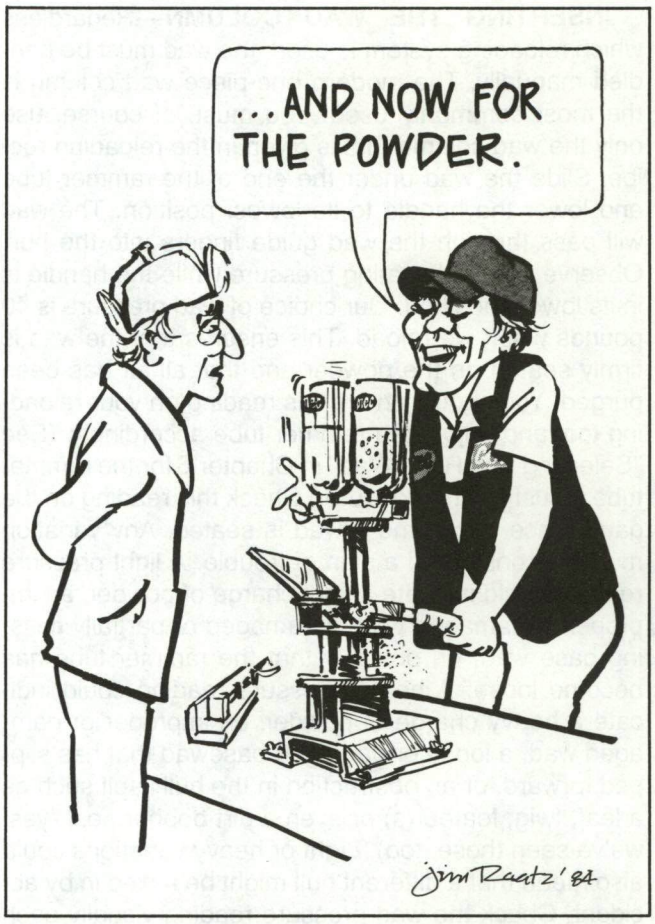
the collet to resize a hull with a brass-plated, steel head. Although hull sides usually do not require resizing, paper hulls occasionally will be oversized. They must be brought back to size by drying them out before reloading.

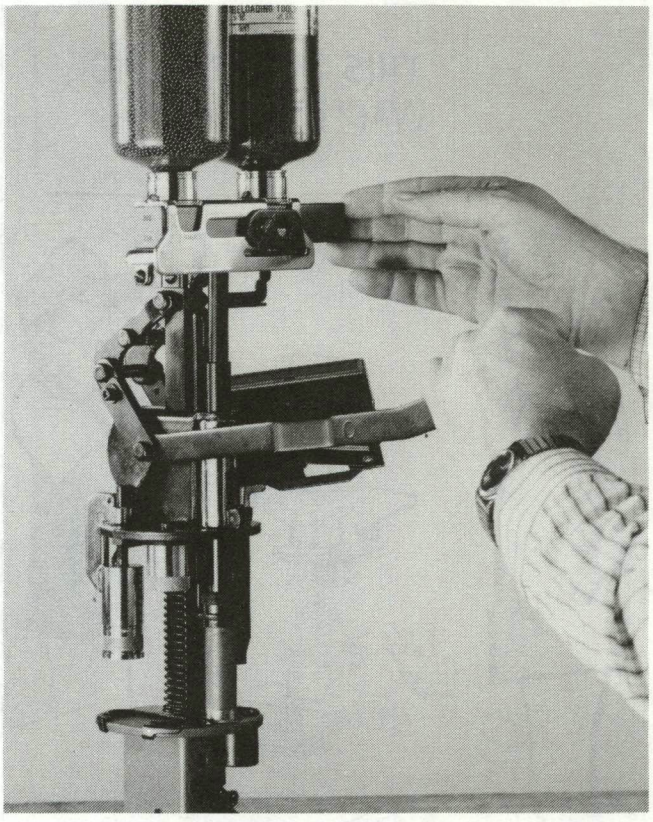
REPRIMING—After the spent primer has been removed, a new one must be inserted in the primer pocket. With a manual tool, this must be done by hand. With most semi-automatic reloaders, a pull of the handle at station #2 forces the shell down over the new primer. On MEC reloaders, primers are seated in place with pressure from inside the hull. This eliminates dished heads. Not all primers are interchangeable; only the CCI 109 and the CCI 209 Trap and Skeet primer can be interchanged safely. If reloading with other primers, follow the recipe selected from the data section exactly.

CHARGING THE POWDER—Your next step is to put powder into the primed, empty shell. There are several ways to measure powder. The least accurate is hand dipping, as with a manual reloading kit. Hand dipping relies completely on the ability of the operator to measure uniform charges and pour the powder without spilling.

The standard volumetric measure is the way the factory loaded the shell originally, and this is the method used by the MEC tool. The volumetric measure common to all MEC, and most other semi-automatic, reloaders consists of a bar containing a bushing of a given volume. Powder falls into the bushing and, at station #3, is then dropped into the hull. This is the quickest method of measuring powder, and is also much more accurate than hand dipping. The disadvantage is that it measures volume, which may cause slight variations in the load due to differences in various powder densities. Undue agitation of the reloader also causes the powder to compact, resulting in heavier powder loads. By following your instruction manual, you should always get uniform loads and good performance.

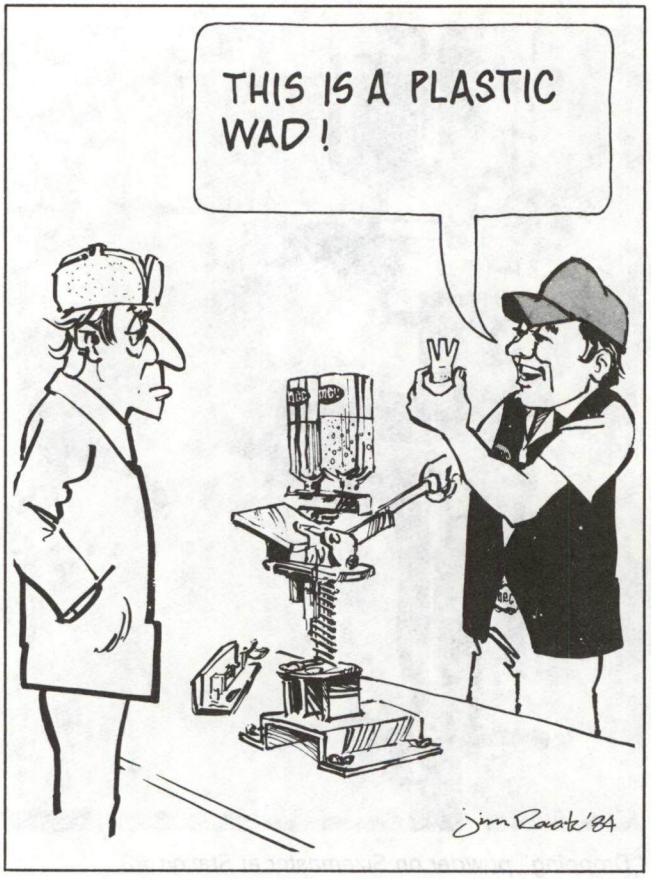
Of course, weighing each individual charge is the most accurate method. Obviously, it is also the slowest of the three methods. We do recommend, however, that you periodically check your charges on an accurate powder scale when reloading. After reloading two or three hulls you should verify the powder charge in the following manner. After "dropping" the powder, remove the hull from the reloader, and weigh and record the powder charge. Return the powder charge to the hull and continue the reloading sequence. By repeating this weighing procedure four or five times you can determine the average weight. If the average weight isn't the amount given in the loading recipe, remove the powder bushing from the bar and install the next smaller or larger bushing. As previously mentioned, we personally use and prefer the OMARK INDUSTRIES, RCBS Model 10-10 for our reloading.

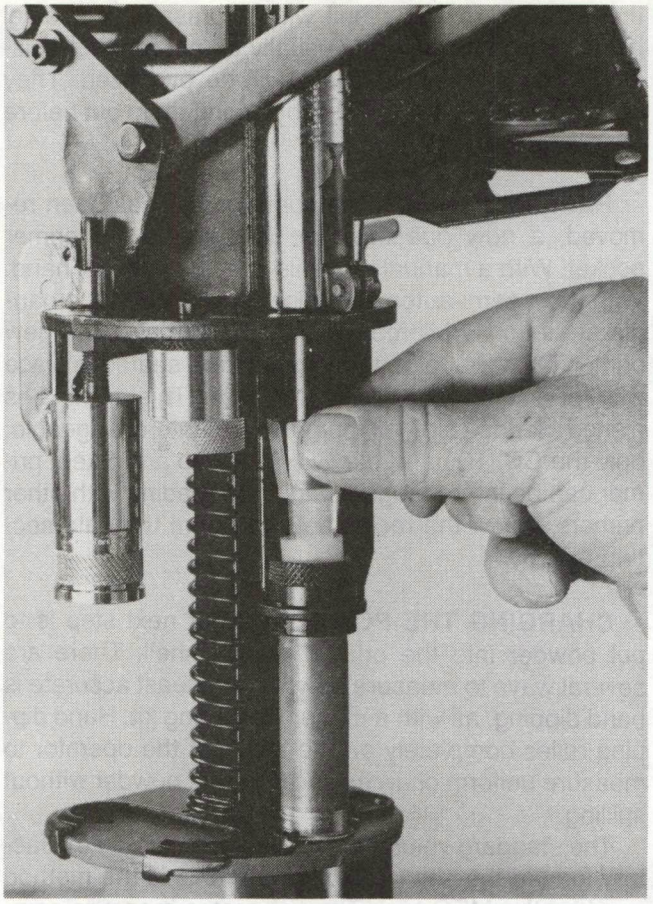




"Dropping" powder on Sizemaster at Station #3.

INSERTING THE WAD COLUMN—Regardless which reloading system is used, the wad must be handled manually. The modern one-piece wad column is the most commonly used. You must, of course, use only the wad column that is given in the reloading recipe. Slide the wad under the end of the rammer tube and lower the handle to its lowest position. The wad will pass through the wad guide fingers into the hull. Observe the wad seating pressure while the handle is in its lowest position. Our choice of wad pressure is 40 pounds when we reload. This ensures that the wad is firmly seated on the powder and that all air has been purged. You should check this reading on your reloading tool and adjust the rammer tube accordingly. (See "Selecting The Right Wad" in Chapter 6 for the rammer tube adjustment procedure.) Check this reading on the gauge face each time a wad is seated. Any variation must be considered a sign of trouble. A light pressure reading could indicate a light charge of powder, an improper or damaged wad, a damaged or partially missing base wad, or, possibly that the rammer tube has become loose. A heavy pressure reading could indicate a heavy charge of powder, an improper or damaged wad, a loose or damaged basewad that has slipped forward, or an obstruction in the hull itself such as a leaf, twig, feather(s) or even a dirt dobber nest (yes, we've seen those, too). Light or heavy variations could also mean that a different hull might be mixed in by accident. Check the wad pressure reading visually each time a wad is seated.

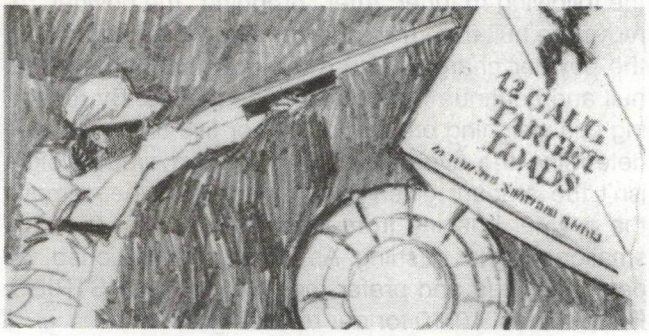


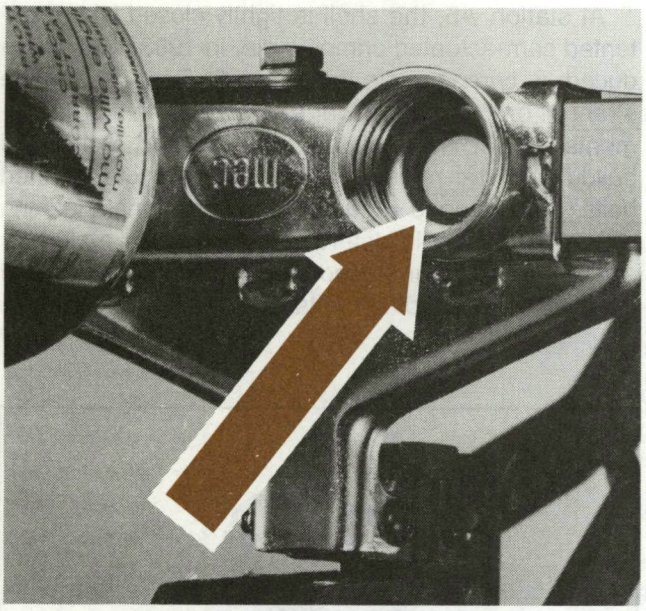


Seating plastic wad on Sizemaster at Station #3.

ADDING THE SHOT—The last item to be added to the shell is the shot. This can be done several ways. With a manual reloader, the shot must be carefully dipped, measured and poured (without spilling). Most semi-automatic reloaders use a built-in volumetric measure or "charge bar." This bar contains two holes, one for powder (discussed previously), and one for shot. Shot is "dropped" at station # 3.

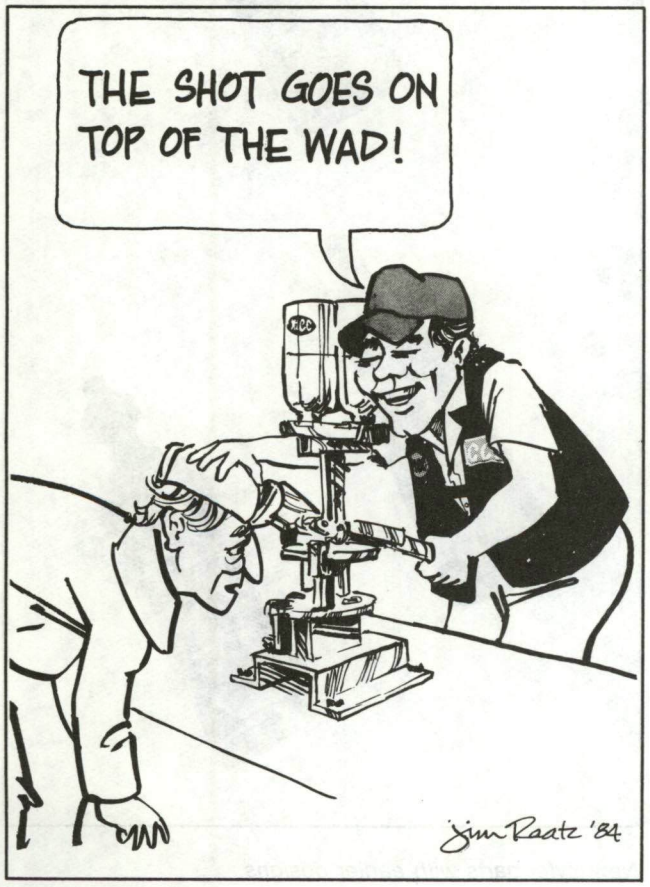
Most of the volumetric charge bars work very well on shot sizes up to #6. When using larger sizes, some jamming, sticking and shearing of shot may occur. This problem is minimized on MEC reloaders by using neoprene grommets between the shot bottle and charge bar.

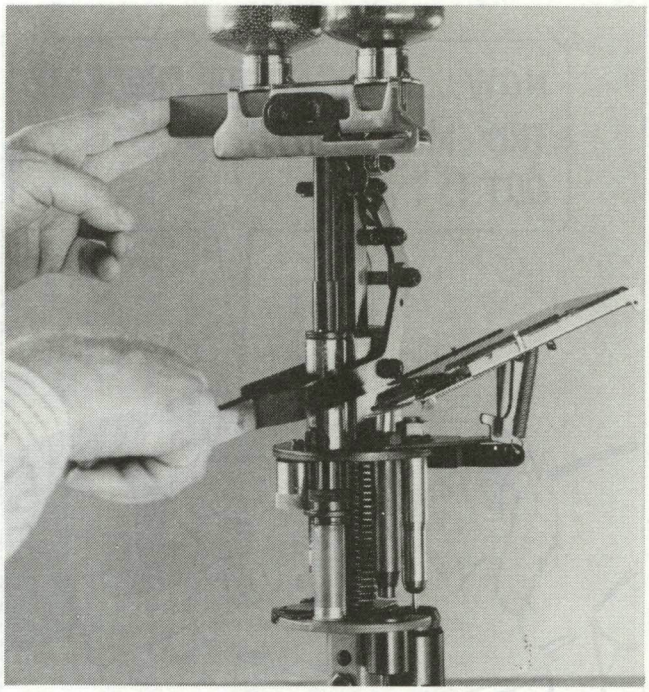




MEC charge bars contain rubber grommet to help avoid jamming of larger shot sizes.

As the shot size increases, so does the difficulty of moving the bar to drop same. Number 2 and BB size are the most difficult. Obviously, buck shot will not load and "drop" through a charge bar and must be counted out and inserted by hand. We recommend that when using shot larger than #6 with progressive reloaders, you disengage the automatic charge bar mechanism and operate the charge bar manually.

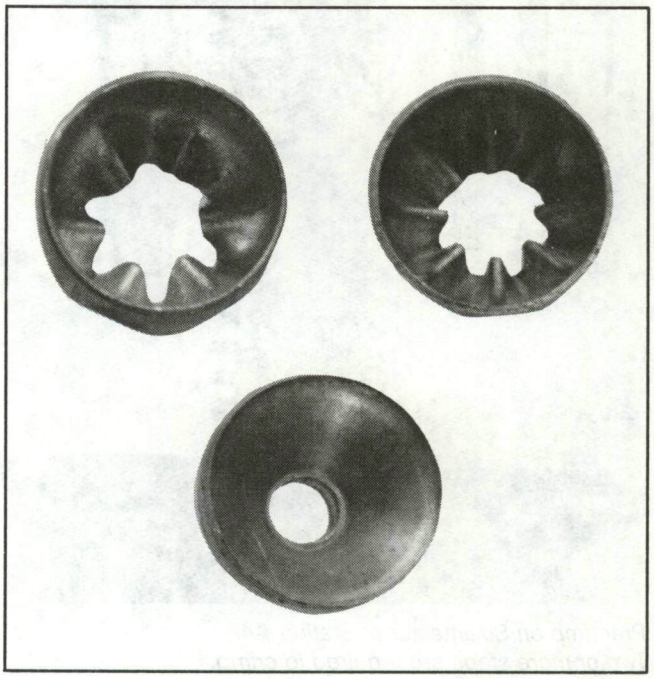


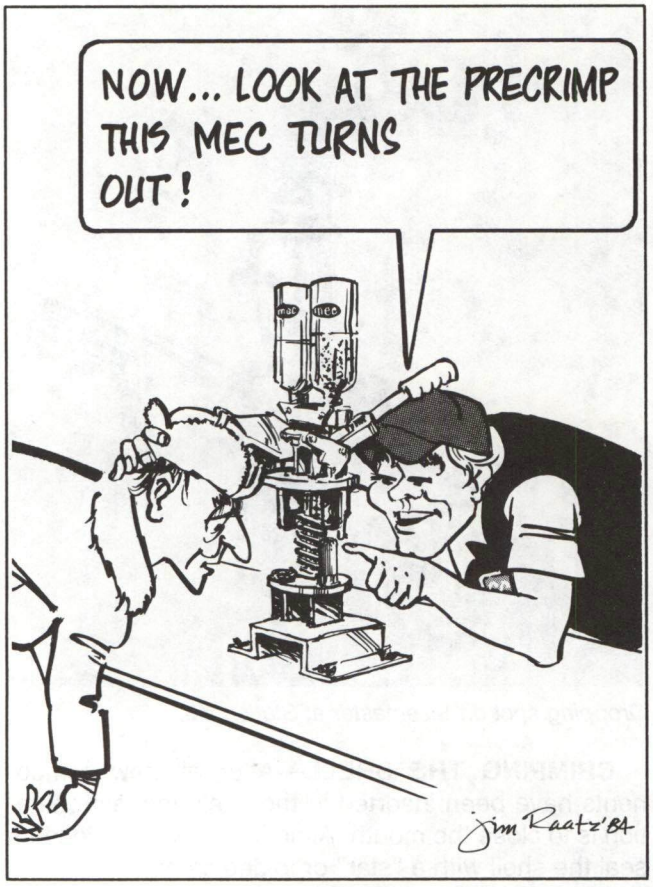


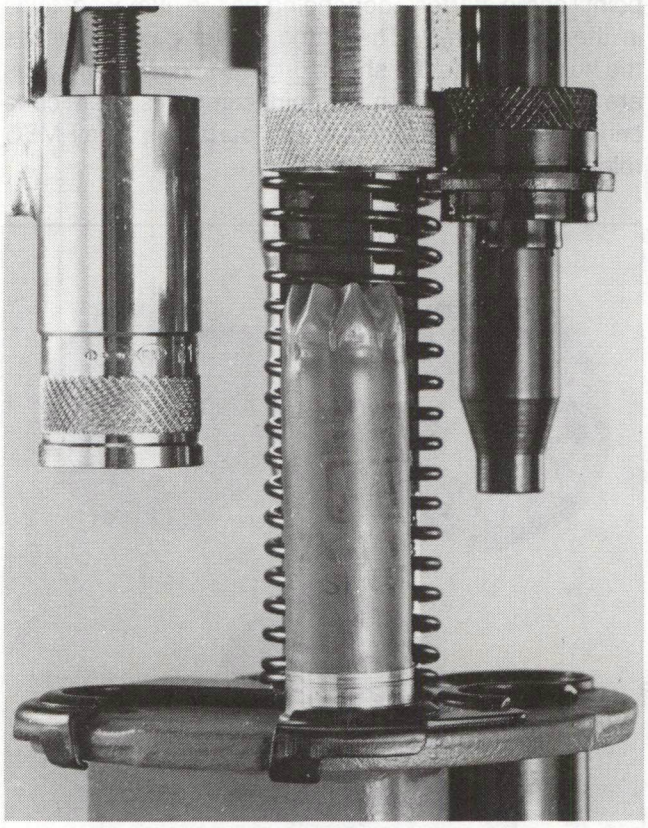
Dropping shot on Sizemaster at Station #3.

CRIMPING THE SHELL—After all new components have been inserted in the shell, the last operation is to close the mouth. Almost all modern reloaders seal the shell with a "star" or folded crimp.

This is a two stage operation on a MEC reloader. At station #4 we will pre-crimp our shell with a 6- or 8-point "crimp starter", depending on the number of folds in the original hull. The crimp starter partially closes the hull, following the shell's original folds. Paper cases are usually closed with a 6-point crimp. A smooth cone crimp starter is included in the parts bag of all MEC reloaders.

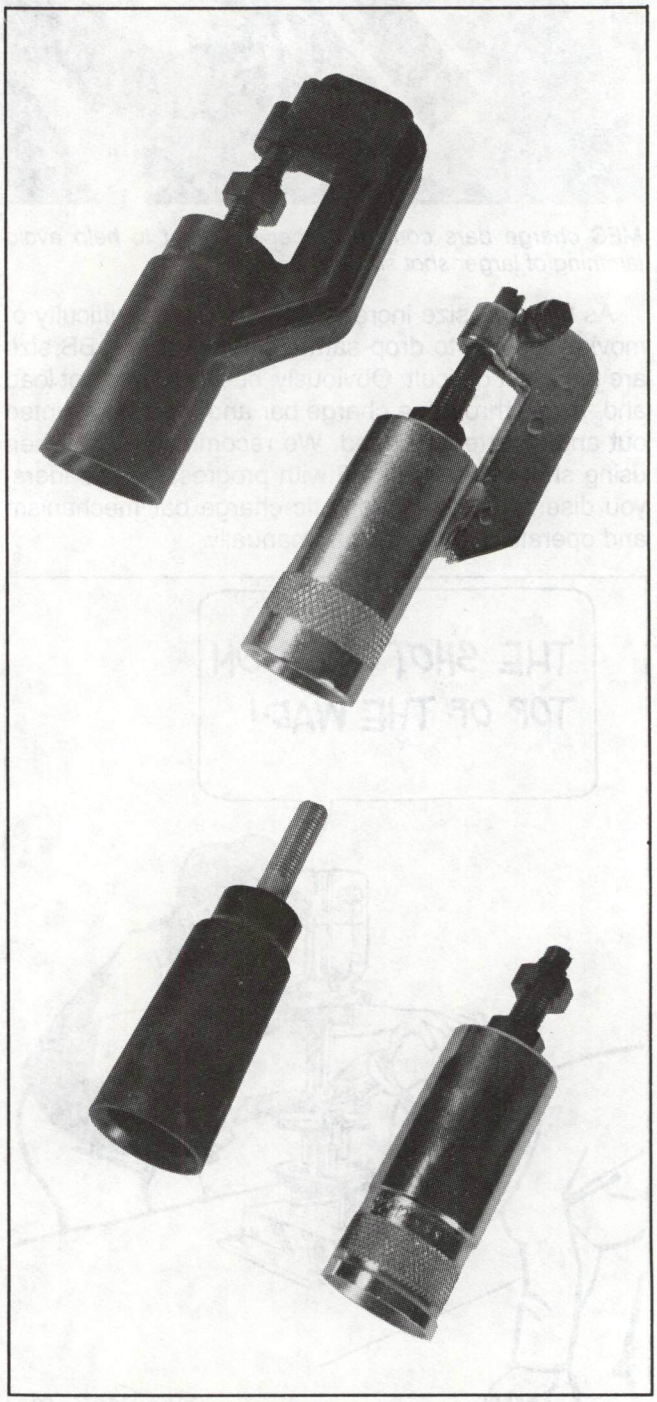




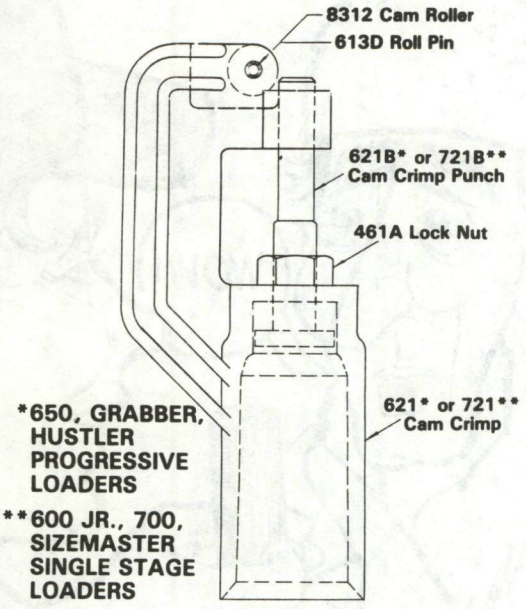


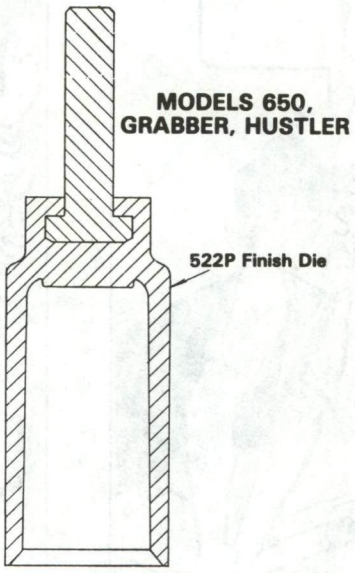
Precrimp on Sizemaster at Station #4. Two or more steps are required to crimp.

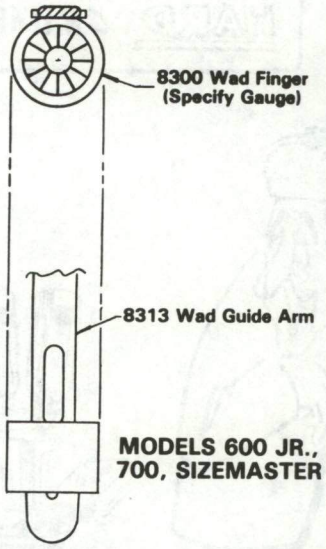
At station #5, the shell is tightly closed with a patented cam-actuated crimping die. In 1983, MEC introduced a crimping die made of DuPont Zytel. The strength of this material far exceeds crimping requirements, and it is absolutely rust-free and resists the build-up of the residue carried into the die on fired hulls. Maintenance requires only occasional cleaning with any household detergent applied with a cloth or swab. It can be purchased as a replacement part and interchanges with older units.



New Zytel parts with earlier designs.







NEW

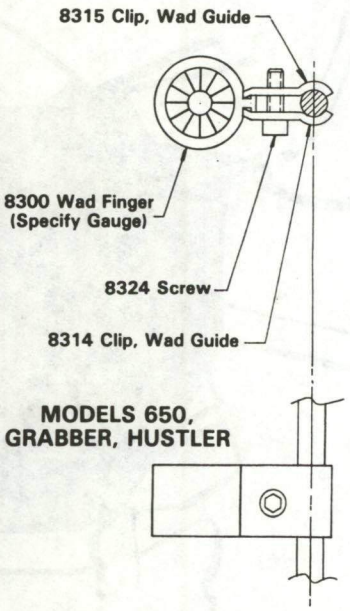
CRIMP DIE
Manufactured of Dupont Zytel. Strength far in excess of the requirements. Absolutely rust free and resists the build up of the residue carried into the die on fired shells. Maintainance requires only cleaning occasionally with any household detergent applied to cloth or swab. Lubricate roller with heavy oil. Offered as a replacement part, interchanges with older units, order by part number and specify gauge.

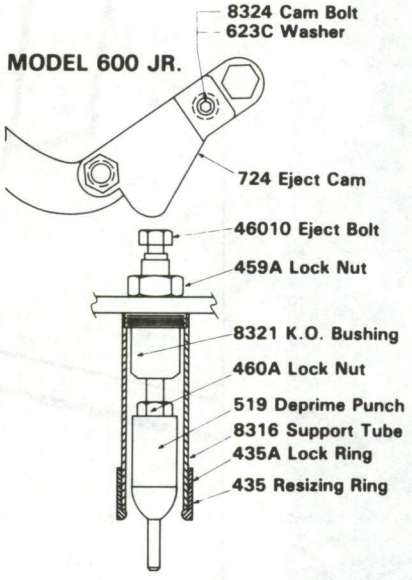
FINISH DIE
Strength and material same as Crimp Die. Offered as a replacement part for progressive models only, order part 522P and specify gauge.

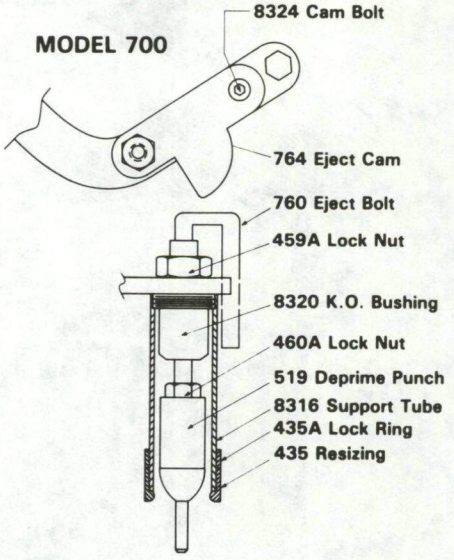
WAD GUIDE
One piece, easily replaced, improved design. Offered as a replacement part, interchanges with older units but requires appropriate holder. Order by part number 8300 and specify gauge.

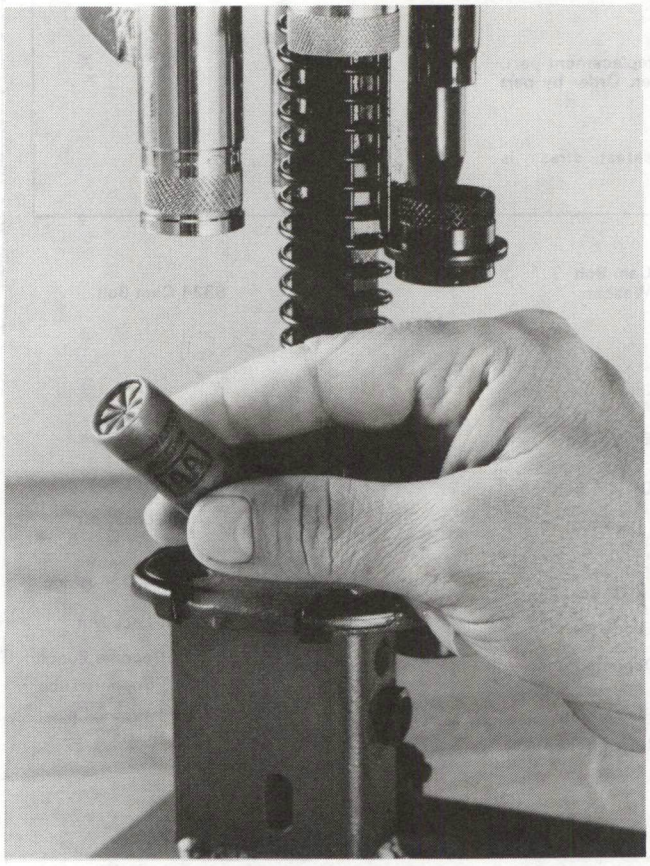
K.O. BUSHING AND SUPPORT TUBE
More positive alignment, add strength where the greatest stress is encountered. Not interchangeable.

	600 Jr.	700	SizeMaster	650	Grabber
CRIMP DIE	X	X	X	X	X
FINISH DIE				X	X
WAD GUIDE	X	X	X	X	X
K.O. BUSHING AND SUPPORT TUBE	X	X		X	

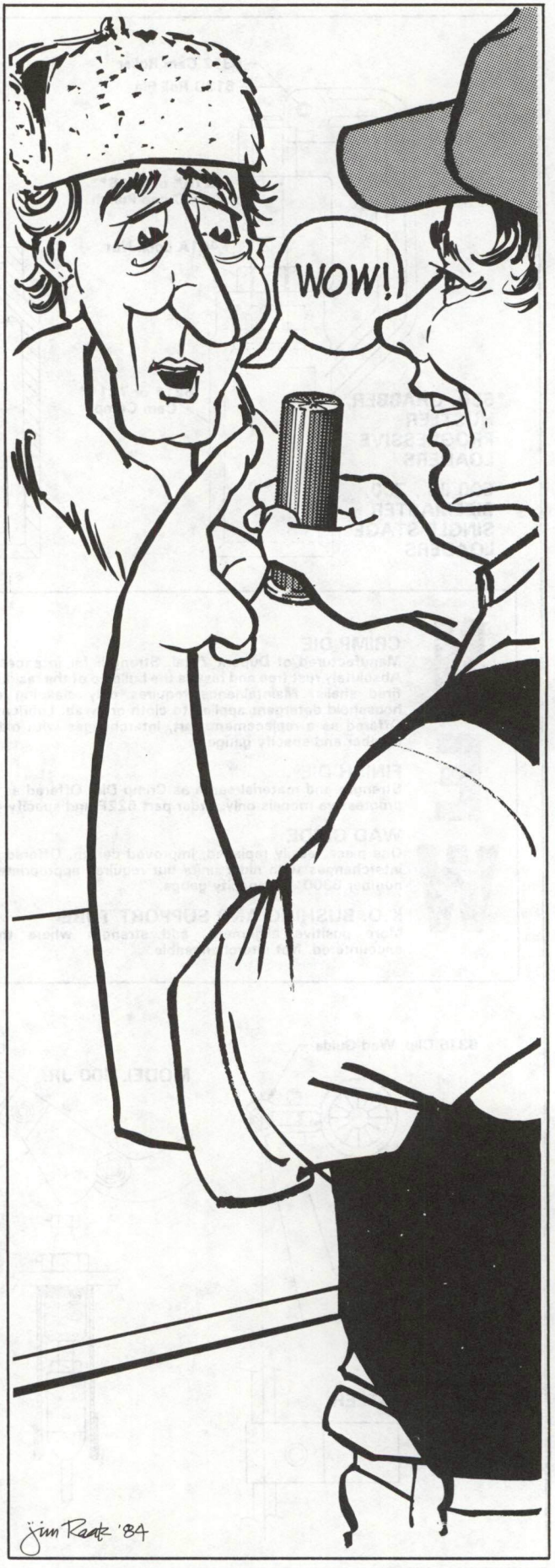


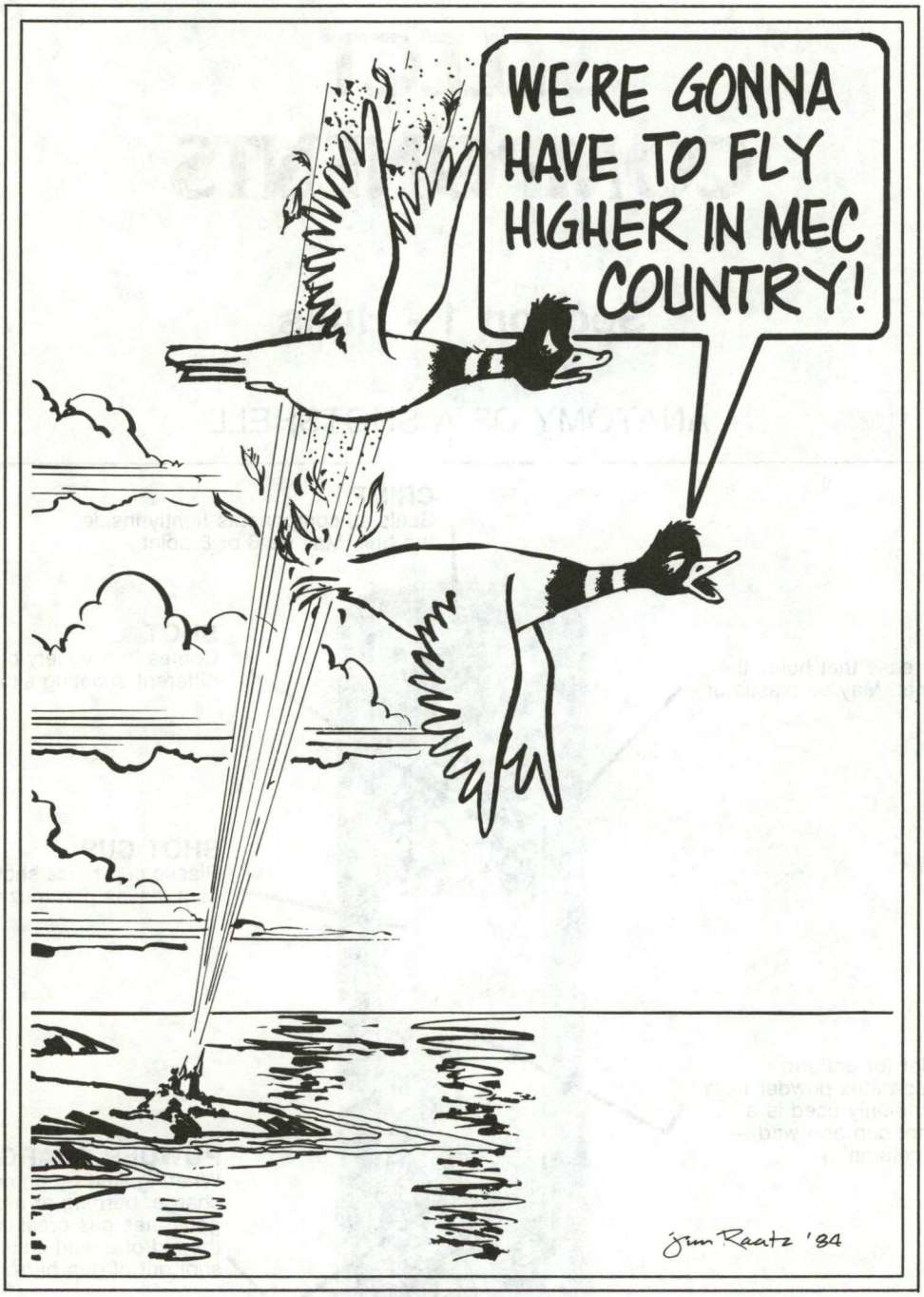






Finish crimp on Sizemaster at Station #5.



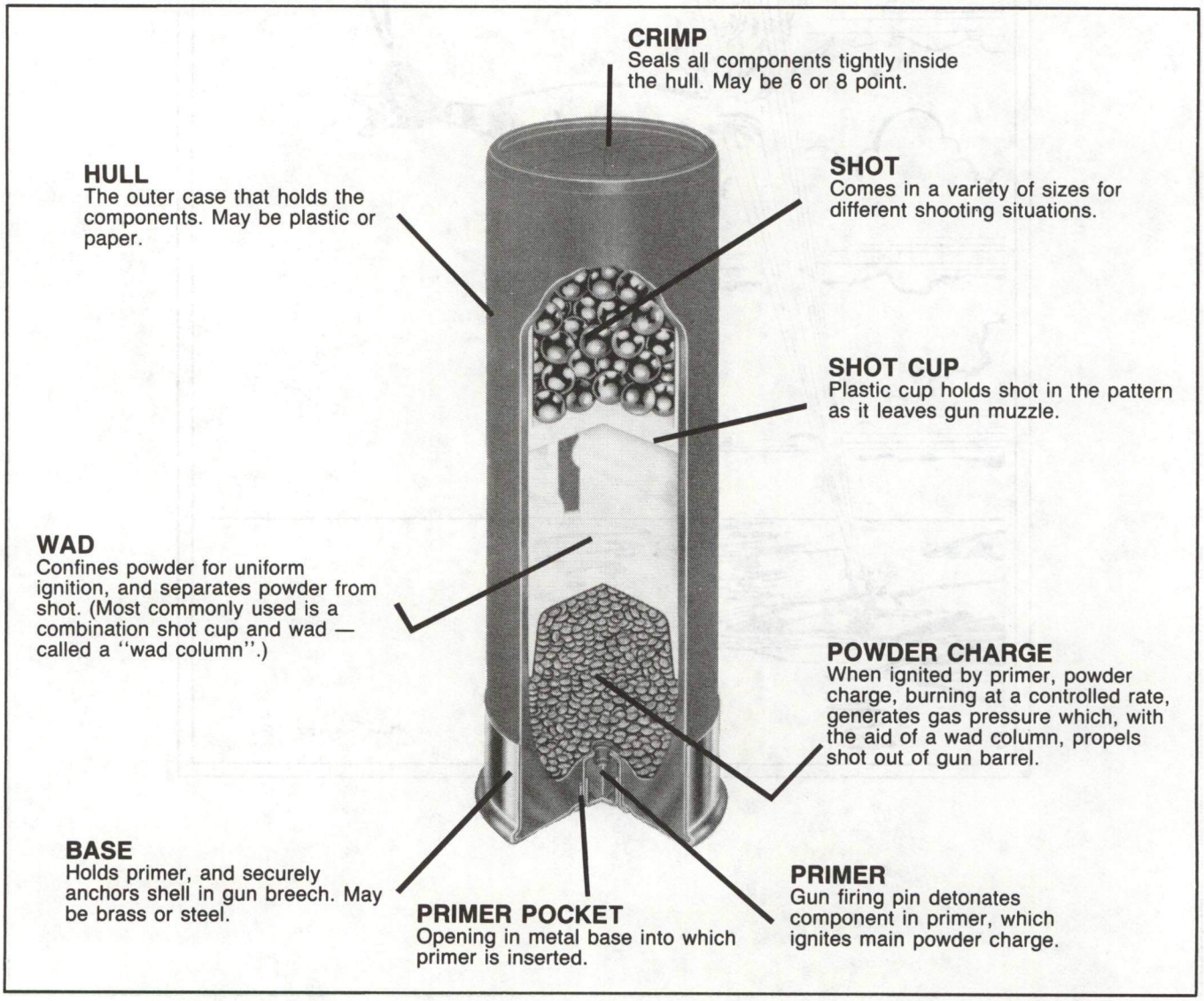

WE'RE GONNA HAVE TO FLY HIGHER IN MEC COUNTRY!
Jim Raatz '84

Chapter 6

HOW TO SELECT COMPONENTS

Section 1 - Hulls

ANATOMY OF A SHOTSHELL



A shotshell is made up of several different components, each of which may have many different variations. We'll thoroughly discuss each part of both the hull and the components required to reload this hull.

U.S.-made, factory-loaded shotshells are marvels of design and construction. They will resist handling and weather extremes. We carry them around in the trunk of our cars for countless miles, then we walk them for more miles in the field. Sometimes they get cold and wet with us in a goose blind in a northern marsh, or just wet, and sometimes cold, too, in a pickle barrel on a southern rice field. Out west they get hot during the early white wing dove season along the Mexican border. We drop them in the snow, mud, dirt and water, yet we're always convinced that they will stand up to the slam-bang forces of feeding, go "BANG" when we pull the trigger, then extract and eject. That's a lot to ask from a factory-made product. Despite all this, some of us then pick up the fired hulls from the snow, mud, dirt and water, take them home with the firm conviction that we can "stuff-em" full of new components, and go right back out and do it again tomorrow, next week or next month. And you know, they seem to always go "BANG", over and over again. . . .

It wasn't always like this. Many people will remember some of the older paper cases with high-brass base metal heads that ran halfway up the side of the shell. Well, those "bullets" were marvels in their day, too, but they swelled when they got damp and wouldn't chamber. Get them wet and they wouldn't fire at all. I even tried, to the horror of mother, to dry-out damp, swollen shells in the kitchen oven! That project didn't last long, as dad put a stop to it real quick. As I remember, the "finished products" still wouldn't go "BANG" when I pulled the trigger.

I really don't remember who it was that encouraged me to get into "handloading"—and I don't believe I did at first. Maybe it had something to do with miserable failures in trying to make "black powder" during my junior high school years. Never could get it to go "BANG", but I did become a master at making "stink bombs" that were tested with great success during my two sisters' slumber parties.

During the mid-50's, a gunsmith moved from West Texas to our fair little town. Now this feller knew answers to questions that we didn't even know how to ask! He probably arrived in the knick of time, as we "handloaders," out of ignorance, had been violating most, if not all, of the rules and accepted practices. We were young and innocent and much more interested in the really serious things of life—shooting, hunting and "handloading"—than the little red-headed cheerleader that lived three doors down. A few years later all things changed, but that's another story. . .

Meanwhile, this wise sage from the west taught us the importance of following instructions and that a person just can't make up for being a poor shot by being an excellent reloader. The former, we were; the latter, we thought we were! Time and practice cured the shooting problem, and a Lachmiller "Super-Jet" (long discontinued) helped to make us better reloaders. Bill (the gunsmith) taught us how to resurrect those paper hulls we had been throwing away by melting paraffin, dipping the hull in it and "ironing" the hull with an electrically heated "shell ironer." This added two or three more reloads to our hulls, and we enjoyed many successes that previously were unknown to us.

Times, people, equipment and components change, mostly for the better. Some of those old components we've tried to forget. Today's equipment, like the MEC line of shotshell reloaders and reloading components, isn't going to change as much in the next few years as it has in the past. In fact, it's going to be hard to improve on most components.

When you pull the trigger, your shotgun's firing pin dents the primer cup inward, forcing some of the primer mix against the point of the anvil. This causes lead styphnate crystals to fracture. The crystals react to this by exploding. Since they are evenly distributed throughout the mix, they ignite more powerful secondary ignition constituents, which, in turn, ignite fuel particles and agents, releasing oxygen needed for fuel-burning. Instantly the whole primer mixture is consumed, sending a jet of white-hot gas and incandescent particles through the flash hole to ignite the powder granules. Large quantities of gas are produced by the burning powder; the plastic wad obturates (seals against the inside walls of the hull) and begins moving forward, pushing the shot in front. This, in turn, pushes the crimp open, and, in just microseconds from the trigger pull, the shotgun is "fired." You are left with an empty hull that can be reloaded many times. "How many?" you ask. Well, many of today's plastic hulls can be reloaded from 5 to 15 or more times. So, SAVE THOSE FIRED HULLS!

CHOOSING THE HULL—THE HULL TRUTH

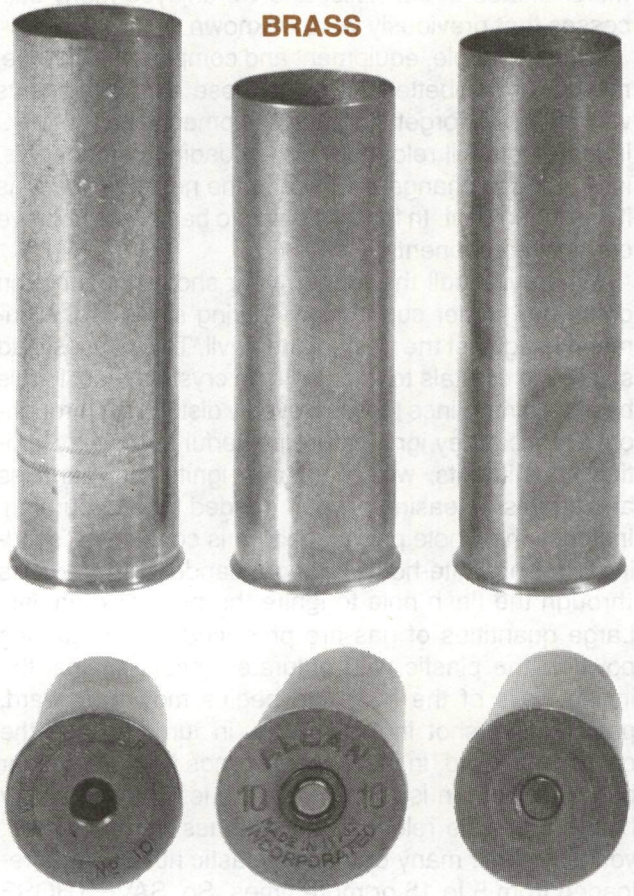
The hull is the heart of the shotshell. Proper choice of empty hulls is one of the most important choices you must make to keep your reloading simple.

The hull contains and ties together all of the other components so the reload will withstand all the handling, feeding and weather to which we will subject it. Not all hulls have the same internal volume. Each time you use a hull with a different capacity (internal dimensions), you must assemble a different set of components to reload it properly. The old chocolate cake "commandment" again.

Shotshell hulls are generally classified by the material from which they are constructed. Usually we refer to hulls as paper, plastic or metal. Metal shotshell cases are almost relics of the past. There could possibly be some factory research going on, but we don't know of any at this time. In addition to the all brass

cases we have seen hulls made from zinc and aluminum in the last few years. Paper, while still being used, is slowly disappearing in favor of cases made from superior types of plastic.

METAL CASES—Not much going on here. The picture below shows some of the metal shotshell cases from the past. If you have any of these, put them up on the mantle and think up a good "Grandpa told me" story to tell people when they ask, "What's that?"



Old Brass Cases

ZINC **ALUMINUM**

Recent Metal Cases

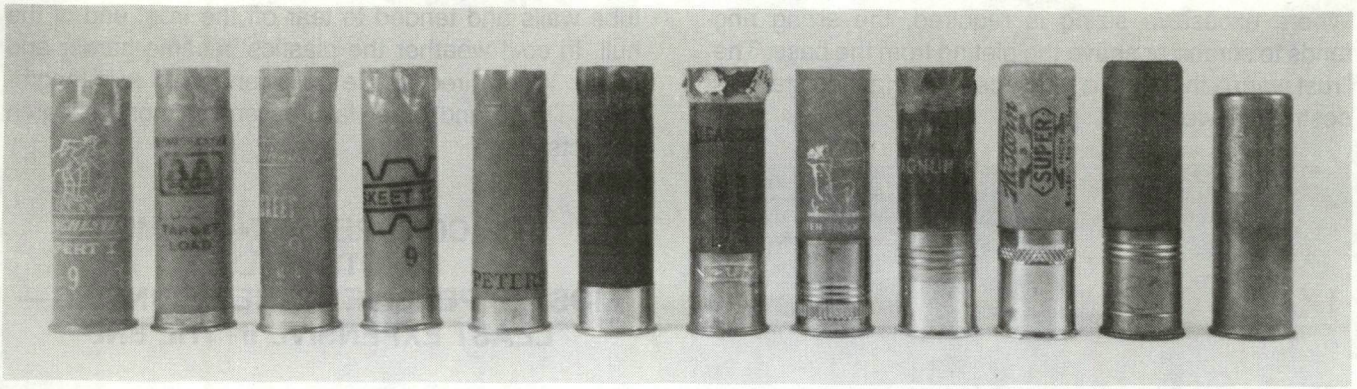
PAPER HULLS—For the most part, paper hulls are all constructed in the same way. A tube is made from a thin, glue-coated sheet of paper wound around a mandril. A wax or paraffin coating is then applied for waterproofing. One end of this tube is plugged with a "base wad" of tightly rolled paper. Some manufacturers made their base wads of a composition material—mostly asbestos (and no telling what else) was made into a papier mâché with glue and then molded in the tube. This was covered by a crimped-on metal (usually brass) head.

Paper cases differ in the length of the paper tube, the height of the base metal head (brass), and the construction of the internal base wad. As with any material, these differences affect the volumetric capacity and, therefore, the reloading recipe.

The hull itself is referred to as having a high base or low base; this describes the height of the inside base wad which determines the hull's volumetric capacity. The terms high brass and low brass are also used; these refer to the height of the metal head of the hull. High brass traditionally means a high velocity field load and low brass a light field or target load. Actually, the brass and base wad height of today's plastic hulls isn't a significant factor in case strength at all. The actual use of a particular case is limited by the internal capacity, not the strength consideration. Today's popular low brass plastic hulls used in trap and skeet loads have more than ample strength and are ideally suited for field loads because of their reloadability.

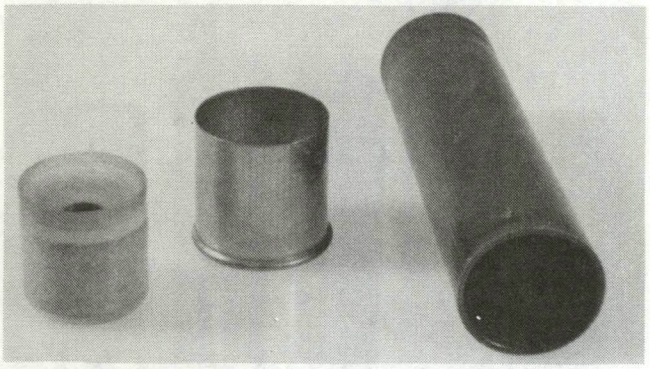
The upshot of this is very important, because we still live with the results of a decision that applied only to the paper tube hulls. Paper tube hulls are weak where the paper and metal are joined. When light field loads were manufactured, the paper to metal joint didn't require much "brass" for strength. Heavy field loads required more strength and the manufacturers used what is now called "high brass." Somewhere along the line this difference in brass height "took hold" in shooters' minds and is carried over today. High brass hulls do look really tough and add sales appeal, and the manufacturer tacks on a couple more bucks for this "macho" image. Perhaps it reassures the uninformed to believe that todays high brass plastic hull is stronger than the low brass type.

I have met many people in years past who knew without a doubt that a "low brass" load could not be a duck load. Only "high brass" loads were duck loads. Some people have called it "the high brass duck load theory." This understanding undoubtedly had a parallel with the "long tom barrel theory"—"The longer the barrel, the further it'll shoot." Yet to this day it endures. Look at the photograph on the next page. You will notice a wide range of "brass height."



PLASTIC HULLS—MORE, HULL TRUTH—THE POLY-FORMED HULL

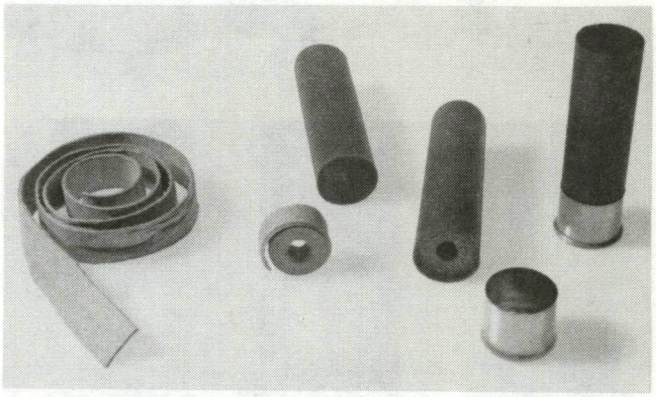
In the late 1950's, Remington introduced plastic shotshells using a polyethylene tube that had been strengthened. The basic parts of this design and construction included a molded plastic base wad with a thin lip around the radial edge that mated to the inside of the specially strengthened polyethylene tube. The extruded tube contained a number of fine grooves on the outside and was smooth inside. It was also fairly translucent so the contents were visible to the shooter. The tube was cut to a required length, the molded plastic base wad inserted, and a permanent assembly was made by adding a brass-plated steel head that was swaged and grooved, thus locking the parts together.



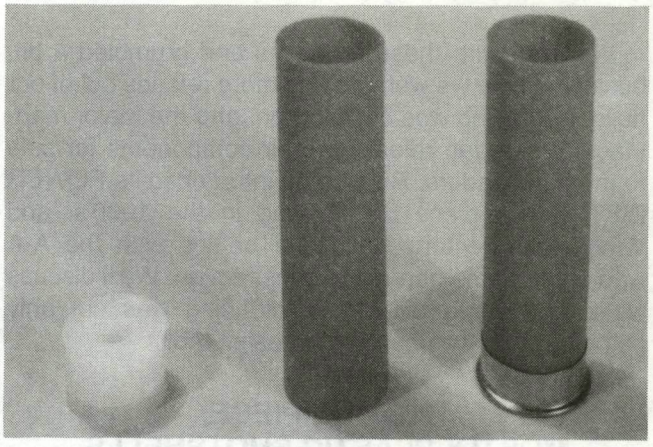
Basic Parts—Remington

Winchester-Western introduced plastic shotshells manufactured by this process in the early 1960's. Federal made the transition in the early 1970's. The manufacturing process used in making the specially strengthened plastic tubing is a German technique called "The Reifenhauser process". The various brands used different construction and material for the base wad, different colors for the plastic tube, and varied the type and height of the base metal. Most of us usually call hulls made by this type of construction "poly-formed" hulls.

Base wads were made of the same materials and techniques used in the paper tube type hulls. Paper, molded plastic and composition materials of mainly asbestos and glue were used. The typical parts required to make a poly-formed hull are pictured.



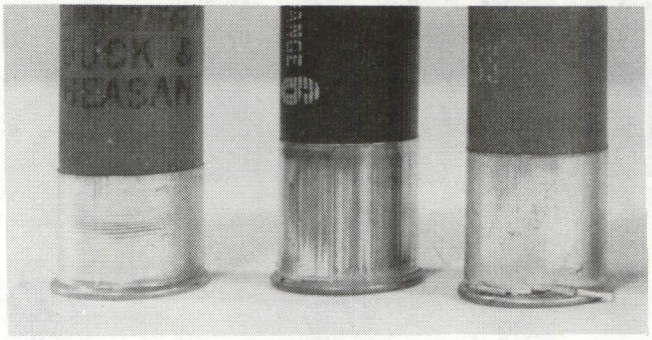
Basic Parts—Federal

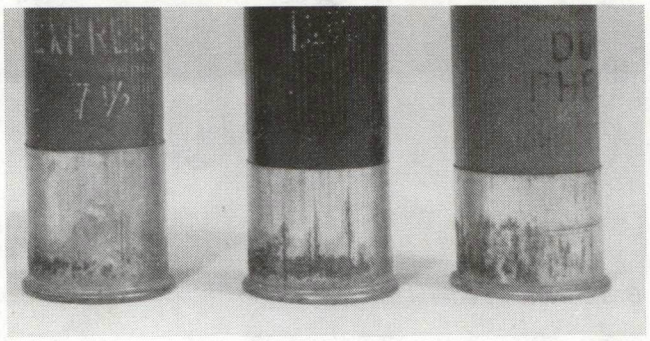


Basic Parts—Winchester, Polyformed

Brass and brass-plated steel were used as base metals. Brass is the superior metal in this application but is more expensive. Brass sizes easier in the hardened steel ring sizers of the MEC 600 JR., and 700 VERSAMEC. When the shell is fired, the metal expands and then springs back somewhat as pressure subsides. Brass springs back much more than steel. Hulls with brass-plated steel heads will require more "sizing." Another advantage is that brass only tarnishes where steel rusts. In the dry, arid regions of the west the "SP" (steel plastic) hulls weathered much better than in areas of high humidity and moisture. Those of us who live where it's "wetter" continually fight a battle with rust, not only on our firearms but also on everything else made of steel, including our hulls. The brass plating holds up fairly well, all things being considered.

Where excessive sizing is required, the sizing ring tends to scrape or shave the plating from the base. The "rust worm" then has a much better surface to start his destructive work.





We lived with these problems and grumbled a bit, but all the time we were getting more reloads out of our hulls. Reloading was catching on, and the major manufacturers began releasing their components for sale to the handloaders. Remington introduced its POWER PISTON one-piece plastic wad in the 1960's, and Winchester-Western wasn't far behind with the A-A wad of the same one-piece construction. We'll discuss wads in more detail later. Reloading was not only catching on; it was becoming easier, too.

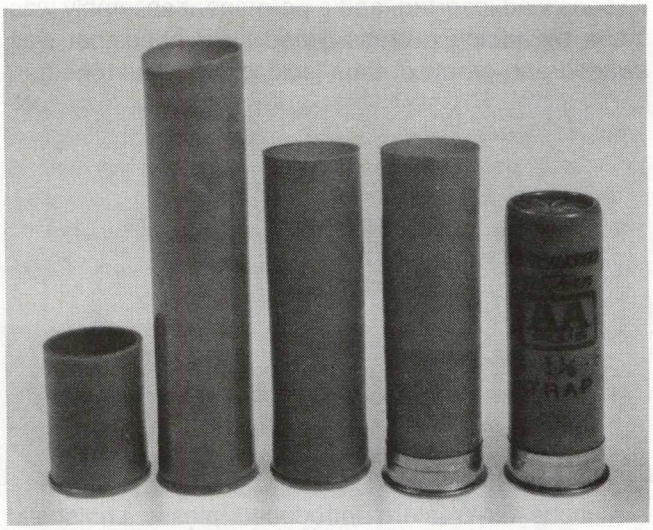
THE-ONE PIECE, MOSTLY PLASTIC SHOTSHELLS

The intense competition among manufacturers of shotshell ammunition continued and sparked considerable research and development for better shotshells. The shotshell market of the 1950's and 60's represented big dollars, and during this time, most major manufacturers experimented with injection molding using various types of plastics—ethyl cellulose, polyethylene and other thermo-plastic materials. Injection molding processes use a closed die that has the exact shape of the part being molded. Hot, melted plastic is injected into the die under thousands of pounds of pressure. After the die cools, the finished parts are complete.

No matter what kind of plastic was used, the end results of the tests were all the same. With the high temperatures of hot weather, the shot charge dug into the tube walls and tended to tear off the front end of the hull. In cold weather the plastics became harder and brittle. When fired, these hulls tended to split lengthwise. These and other failures ended most research projects.

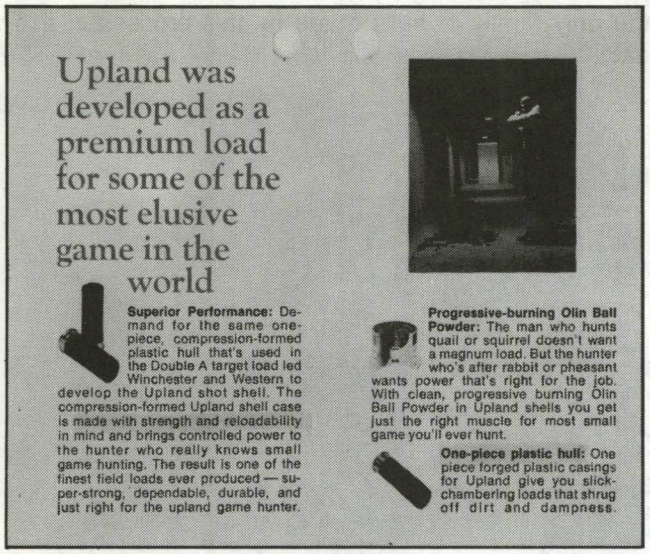
THE COMPRESSION-FORMED SHOTSHELLS: MOST EXPENSIVE IN THE BEGINNING— LEAST EXPENSIVE IN THE END

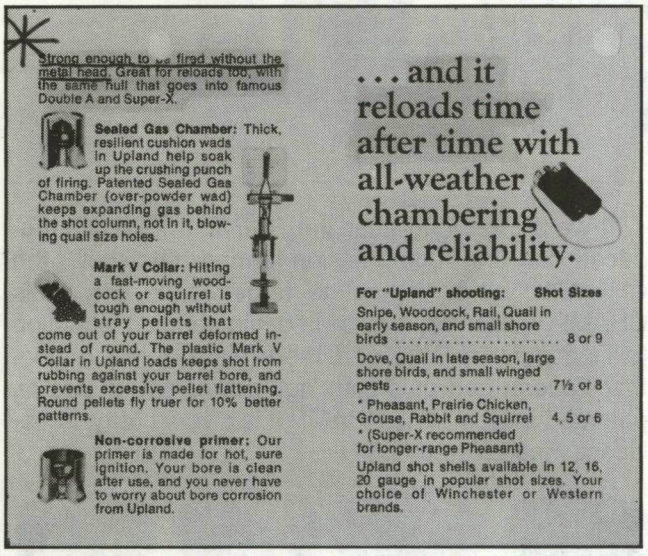
One major manufacturer, Winchester-Western, didn't give up, and research led to the "compression-formed" shotshell. This process blended injection molding with a metalworking operation known as "impact extrusion." A short, stubby "preform" was injection molded. These preforms, looking something like a shotshell, were then heated almost to the melting temperature and placed into another die where a punch was driven into the polyethylene material, causing it to flow upwards into the space between the die and the punch. When removed and trimmed, we have, generally, the plastic portion of today's compression-formed hull.



The walls of this hull received a great amount of "working." This process made the plastic strength about six times greater than the injection process alone. Extensive tests showed the metal base was not even needed. It was decided to manufacture and market these shells in Europe. This project was short lived because European and American sportsmen share something in common—both believe that if shotshell hulls don't have brass heads, they won't work. Remember the "If it doesn't have 'high brass' it can't be a duck load theory." What do you think these sportsmen thought when they saw a hull without brass? Stop and think yourself—have you ever been told anything different by the major manufacturers? Not much if any.

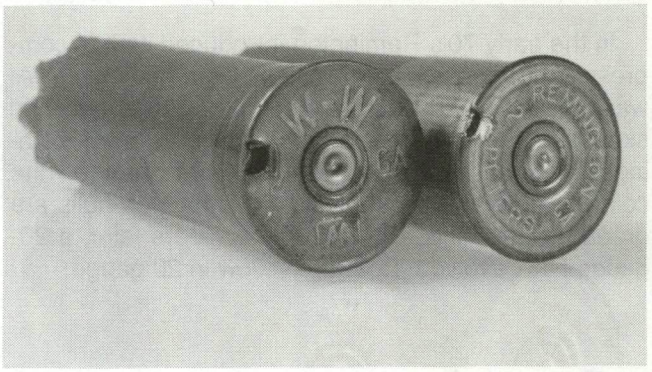
Below is a picture of an ad from the middle 1970's. It said, ". . .strong enough to be fired without the metal head. . ." Granted, this information is almost buried, but it's there just the same. Perhaps this is Winchester's way of planting a seed in the back of shooters' minds because with today's technology, it is possible to manufacture an excellent all-plastic hull. Time will tell.

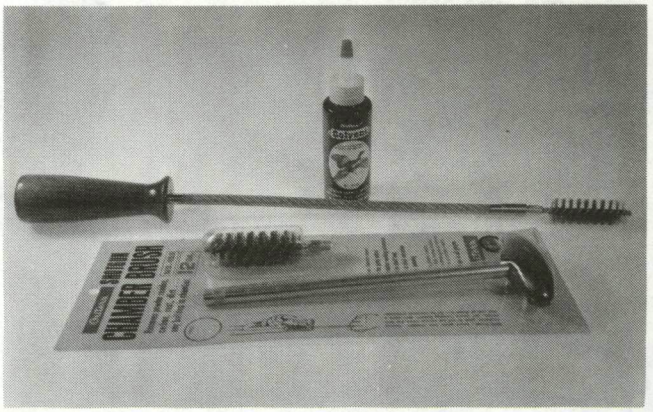




During the course of my work I conduct between 25 to 35 reloading clinics each year at various retail sporting goods stores. For more than ten years my partners, others all over the country and I have been on a campaign to promote reloading. During the hundreds of clinics that we each have conducted, one of the hardest things to communicate to a prospective reloader is that ***YOU DON'T HAVE TO HAVE A HIGH BRASS HULL TO RELOAD DUCK LOADS—MUCH LESS THAT YOU DON'T EVEN HAVE TO HAVE BRASS AT ALL.*** I have shown the above ad to thousands of people. Then I follow up by showing a fired one-piece, plastic, compression-formed hull made by Winchester-Western for the European market. This little jewel is shown below.

"Did it really work?" they ask. "Do ducks like water?" I answer. "Do they reload?" they ask next. "Just like a DOUBLE-A," I answer. O.K., for you readers who are wanting to tell me how a hull must have a metal rim for trouble-free extraction, I'll concede a little ground. Then I'll ask if you keep your chamber clean. "Sure" is the answer I'll probably get. The next picture will save at least a thousand words. Below you will see a picture of two hulls that had a bad trip coming out of a dirty, rusty chamber. Yes, I'll concede that if metal doesn't always work we're sure to have a problem with plastic. With that I'll leave the rim hardening of all plastic hulls up to the experts, and I'll give you the solution to the chamber problem by showing you another picture.

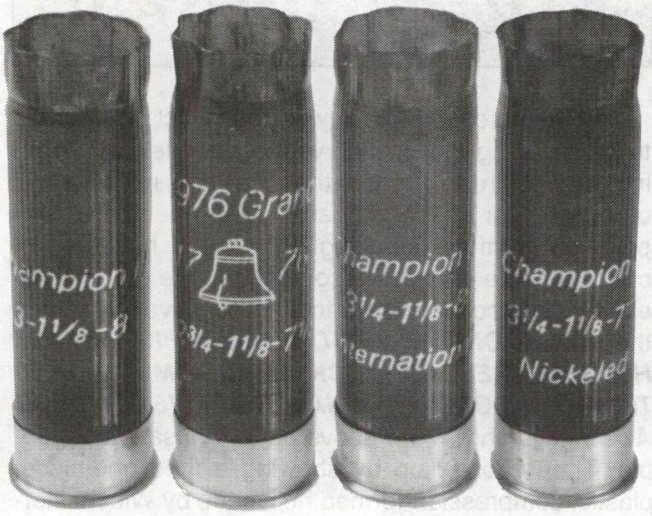




During the late 60's and all of the 70's the use of compression-formed hulls was expanded, and our garages started filling up with boxes of hulls. It was Winchester-Western's introduction of the A-A Target Loads for trap and skeet that started it all. Gradually its field loads were converted and the same type of hull was introduced in the UPLAND, SUPER-X and SUPER-SPEED lines in all gauges. Our hulls were lasting longer, and there was a rumor on the reloading grapevine that these new hulls were lasting so long that reloading was starting to cut into the factory-loaded production. So, we hoarded all of the new fangled hulls we could for fear that the factories would discontinue their production. Just the opposite was true, but our garages are still full, according to our wives, just in case.. . In the picture below you will see Winchester-Western's family of compression-formed hulls in 12, 16, 20 and 28 gauge and .410 bore. This is the only family of hulls made by this process at this date.

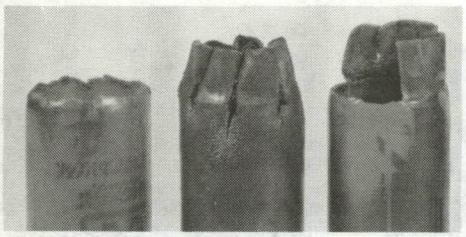
In the early 70's Remington introduced its first compression-formed shotshell, the RXP. It, like the A-A, was introduced as a target load in 12-gauge trap and skeet loads. The Peters Ammunition division of Remington introduced the same loads, but changed the color in the plastic. In 12-gauge, Remington hulls are green, Peters hulls are blue. A few years later, a 20-gauge RXP evolved. Both are yellow in 20 gauge.

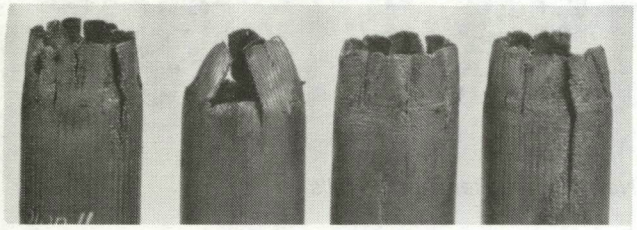
It wasn't too long after the RXP that Federal introduced its first compression-formed shotshell, the CHAMPION II in 12-gauge target loads only. This CHAMP II was very similar in design and construction to Remington's RXP, and there were a few rumors that Federal had paid Remington a royalty to use its patented system. The CHAMP II is a very pretty, translucent wine-colored hull.



Unfortunately, both the 12-gauge RXP and CHAMPION II factory loadings have been discontinued in the last few years. All is not lost, though, and we'll discuss the new introductions of each company shortly.

Maybe the reloading life had something to do with the demise of the RXP and the CHAMP II. In our work we continually are asked, "Do the red hulls last longer than the green, or blue or wine-colored ones?" Quite frankly, we always thought it was a matter of the factory's quality control of their plastic. We have used them all, and they are excellent. From time to time, however, we have encountered different "lots" of all brands that gave less-than-desired results. On one occasion, we tested a group of all colors at the local range. We reloaded on the spot with a MEC 700 VERSAMEC and shot them over and over. Would you believe that with several hulls of each color we lost count of how many times we reloaded them! It's true. Regardless of color, they all lasted a long time, and the reloading life of that group averaged over 20 reloads. We used a light trap load using Hercules RED DOT powder, as I remember. Pictured below are some of the hulls. You will notice that we reloaded some of them until the crimp shot off.

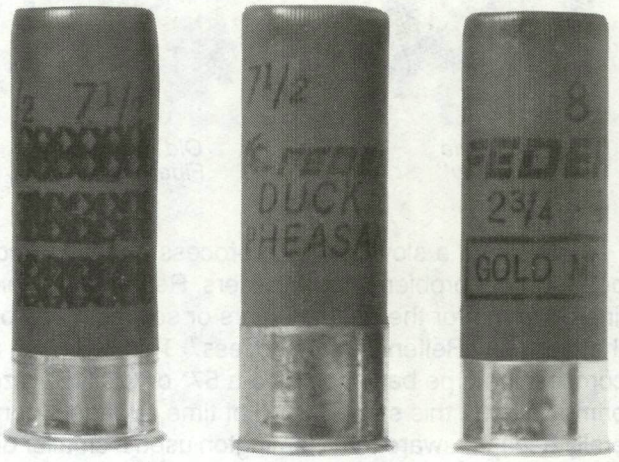




One of the reasons we hated to see these hulls discontinued was the use we had been making of them. We "color coded" our reloads. The red ones were our duck loads, green ones goose loads, blue ones dove loads and wine ones our quail loads. Sometimes there were variations in shot size, of course, but generally that was our scheme of "color coding." All is not lost, however, as there are new introductions from both Remington and Federal.

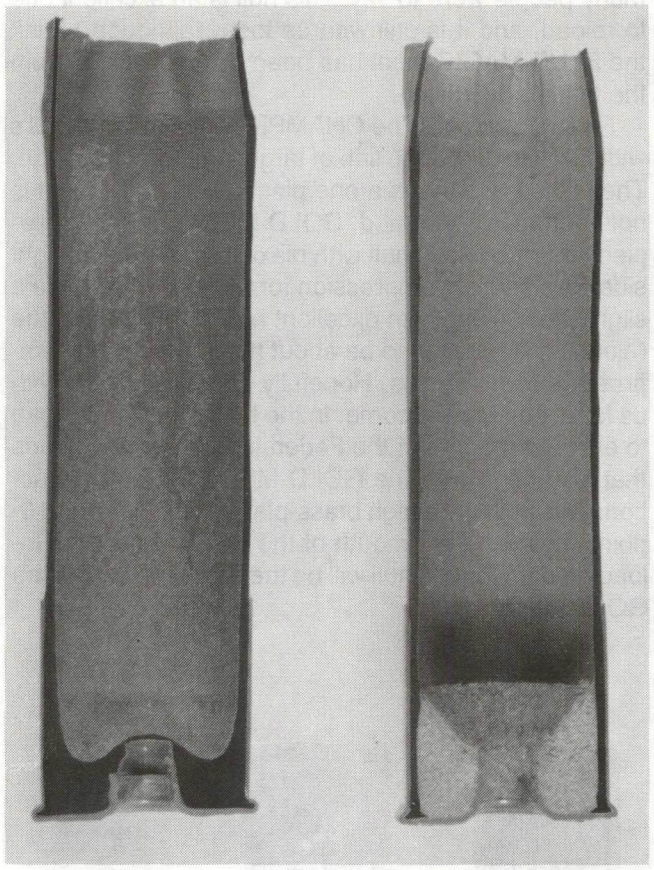
In the late 70's, Remington introduced its BLUE MAGIC in 12-gauge under its Peters brand. It was said to be new and improved with a longer reloading life. This load was blue in color and had a smooth outside body. "Looks just like a 'DOUBLE-A' 'cept it's blue," many people were to say. This hull is an excellent one to reload, and it is still with us today, although I think the BLUE MAGIC label has been quietly missing from the latest advertising.

Federal replaced the CHAMPION II in the early 80's with its GOLD MEDAL line of target ammo in 12 gauge. The GOLD MEDAL is a one piece plastic hull, but it is not compression-formed. GOLD MEDAL has a single-piece thermoplastic hull with biaxially oriented, straight sidewalls, unlike compression formed hulls that have a slight taper. This is an excellent hull to reload, and the reloading life seems to be about the same as the compression-formed hulls. Hopefully, this hull will be with us for a long time to come. In the fall of 1982 we began to encounter some of the Federal 12-gauge field loads that are made with the GOLD MEDAL type construction. This hull has a high brass-plated steel head and 6-point crimp and the mouth of the hull is unskived. Reloading data for this hull will be the same recipes as the GOLD MEDAL hull.



During the same time, Remington quietly began introducing a UNIBODY type compression-formed hull in its field loads. It is of one-piece plastic construction with a brass-plated steel metal head. UNIBODY hulls will be encountered in both high and low brass and in green, blue and black colors. There is a difference, however slight, in the capacity of the RXP and the UNIBODY hulls and reloading data should be chosen accordingly.

SECTIONED REMINGTON HULLS

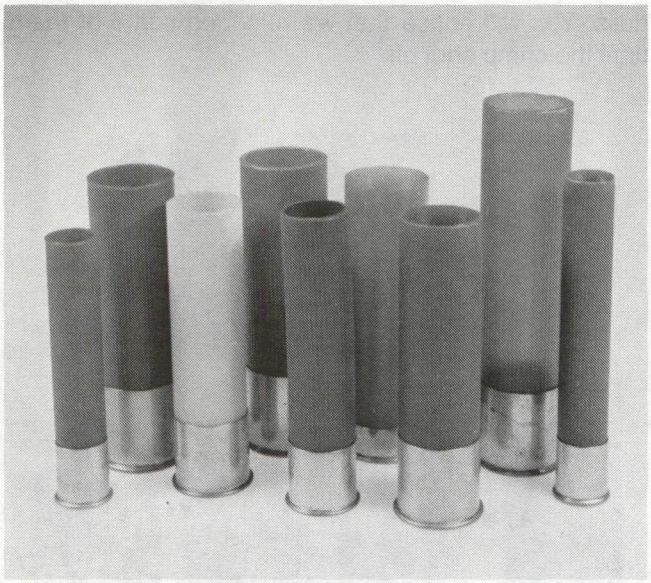


New Style "Unibody" *Old Style With Fiber Basewad*

It has been a slow phase-in process and it has not been without problems for reloaders. Remington's field line of ammo for the past 20 years or so was made by the German "Reifenhauser Process." This hull used a composition type base wad and a 57* or CCI 157 size primer. During this same period of time reloaders generally became aware that Remington used a smaller diameter primer than everyone else. When these new UNIBODY hulls began showing up, it didn't take long for reloaders to find out their supply of the 57* or CCI 157 primers wouldn't work. Why not? Well, this new UNIBODY hull used the larger CCI 109 or 209 size. On top of that, the loading recipe changed, too. You see, this new compression-formed hull has less internal volume than the older poly-formed type.

It would be interesting to know exactly how many reloaders actually became aware of these changes and changed their recipe accordingly. It would have been easy enough for manufacturers to convey this information by printing a statement of changes on the ammo box. However, some of the latest boxes now have a drawing showing the plastic portion of the hull to be one piece. Fortunately, at this writing, we are aware of no problems. Yet, during promotional reloading clinics this year we will be asked several times, "Why do about half of my primers fall out when I reload Remington hulls?"

So far we've discussed hulls that are originally factory loaded and have to be fired before they are reloaded. There are hulls available that are new and unfired. Most major manufacturers at one time offered new and unfired hulls for shotshell reloaders. Remington and Federal seem to be the only ones available during the last few years. The only problem occasionally encountered when reloading these hulls is in the final crimp. MEC and other reloading presses are designed to reload, and in this new and unfired hull we will be performing a loading operation with a reloader. After a factory shell is fired, the crimp area of the hull will have a "memory" of the original crimp. We can determine by sight whether the original was a 6 or 8-point crimp, and we can set up our MEC press accordingly. Sometimes when "loading" these new hulls we have to make some trial and error adjustments of our crimping die to get a good final crimp. After the shell is fired a couple of times, the crimp takes a "memory" and isn't any more trouble. As with any hull, always be certain of its identity and use the correct reloading recipe.



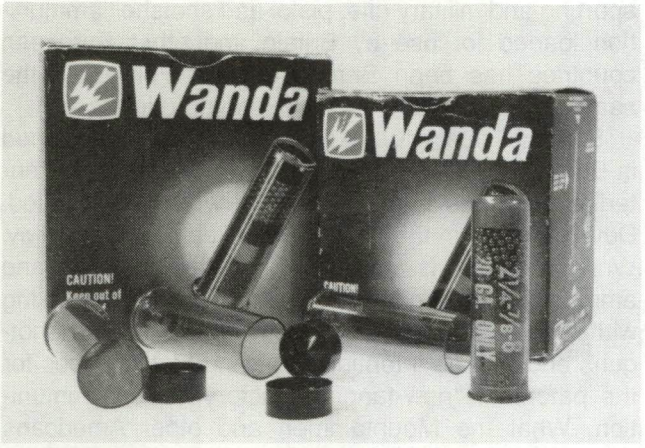
New Unfired Remington Hulls

ONE-PIECE PLASTIC HULLS

There have been some other manufacturers, both domestic and foreign, who have produced one-piece plastic shotgun shells in the last twenty years. Since we are not able to get reloading information from the powder manufacturers, we will cover these products only briefly.

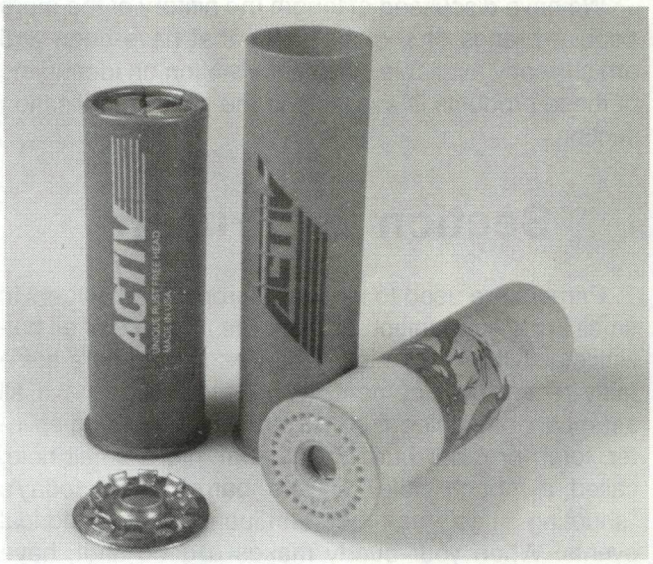
Wanda shotshells were manufactured for less than ten years. They were made by the injection molding process, using General Electric's LEXAN in 12- and 20-gauge. Many people who should know say that the design and materials were good, and it was manufacturing quality control problems that resulted in Wanda's demise. The Wanda shell did not have the conventional folded crimp we are familiar with but rather a

novel plastic over shot wad. Below are some of the Wanda shells and components.

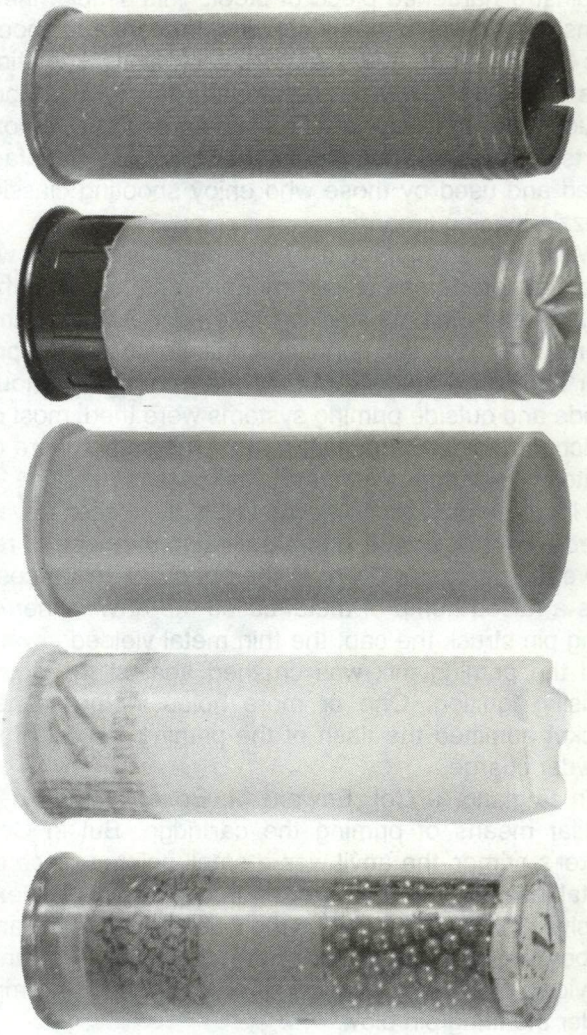


A California company, Eclipse, manufactured a one-piece injection-molded plastic shotshell for a couple of years. Their first offerings were in trap and skeet 12-gauge loads. A field load followed in 20 round boxes rather than 25. According to the information that we have at this time, ONLY wads made by Eclipse should be used to reload their hulls. WARNING—IF YOU DON'T HAVE A RECIPE AND CORRECT COMPONENTS TO USE, DO NOT RELOAD THESE HULLS! No reloading data is available from the powder manufacturers, and therefore, no recipes are included in this book. It is our understanding that Eclipse has just recently sold its production equipment to the Government of Venezuela.

Just recently, a new and innovative all-plastic hull is being distributed by Rainel de Puerto Rico, Inc. It is unique among hulls today. Named ACTIV, it is manufactured by the Reiwelin process, a process whereby the tube and head are separately made then fused together forming a one-piece hull. The head encloses a perforated steel reinforcement plate which prevents extractors ripping the hull rim and insures positive ejection. Reloading data is not available from the powder manufacturers at this time. Hopefully, it will be in the future.



The only other one-piece plastic hulls that we are aware of are shown below. The HERTERS, WHITNEY, and G&H were available in this country and have been discontinued. The JET came from Mexico and the R. PINTO from Italy. There undoubtedly are others, and maybe we'll have information on these in a future edition.



We have discussed at length the history of the more popular brands of shotshell hulls that have been and are currently available. More information on identifying of these products is available in the case identification section.

Section 2 - Primers

Primers are used to ignite the propellant powders in small arms ammunition and are the initiators of all ballistics activity. In the history of firearms, primers are a fairly recent development. In the movies we have all seen cannons being fired by thrusting a glowing splinter, torch or other burning material into a small hole, called a "touch hole," in the barrel. Even today's "shooting lingo" has been influenced by historical events. When your buddy makes a good shot, have you ever heard someone else say, "He sure 'touched off' a good-un then." It probably wasn't a cannon that your buddy pulled the trigger on, but it all started when the primer was "touched off."

After touch holes there were wheel locks and flint locks. The latter produced a shower of sparks when the cock (hammer) holding a chip of flint was struck against a hardened piece of steel. This simple, inexpensive lock was used by soldiers, hunters and shooters for more than 200 years. Actually, flintlock ignition has never been totally abandoned. Its use has continued right up to modern times in some more remote parts of the world. Even today the flintlock is manufactured and used by those who enjoy shooting classic, muzzle-loading firearms.

With the development of the percussion cap, we had the forerunner of our modern primers. But the sought-after ultimate was to make each round of ammunition a fixed, self-contained unit. To do this the primer had to be made a part of the cartridge. Various inside and outside priming systems were tried, most of which did not lend themselves to reloading or were of limited power due to inherent weaknesses.

Hiram Berdan, an American ordnance officer, developed a cartridge case with a pocket in the head to receive the percussion cap. In the bottom of this recess was a raised hump of metal called the anvil. When a firing pin struck the cap, the thin metal yielded inward and the priming mix was crushed against the anvil, causing ignition. One or more holes in the primer pocket admitted the flash of the priming mix into the powder charge.

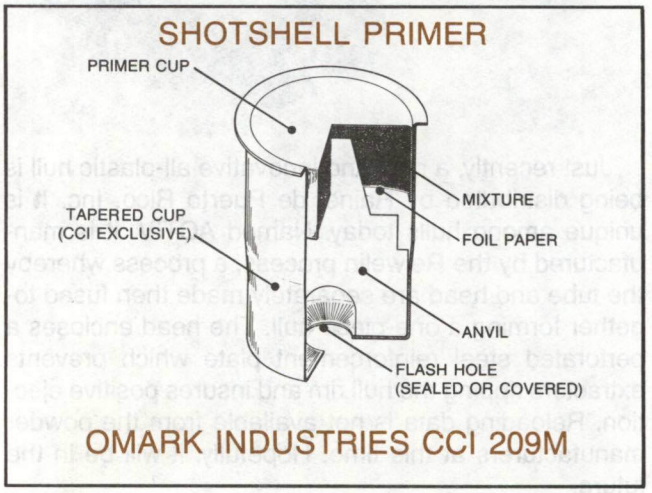
In England, a Col. Edward M. Boxer employed a similar means of priming the cartridge. But in Col. Boxer's primer, the anvil was a small pointed piece of metal inserted into the percussion cap against the explosive mix. When seated in the cartridge case the anvil bore against the bottom of the primer pocket and provided necessary support to crush the priming mix under the firing pin blow.

Strangely, we adopted the English Boxer system and the English adopted the American-developed Berdan system. For the past century, virtually all centerfire sporting and military rifle, pistol and shotshell ammunition loaded for use by Britain and other European countries has been Berdan primed. For about the same period we have used Boxer type primers.

Shotshells using centerfire primers were developed in Europe in the mid-1850's, and, ten years later, centerfire shotguns and ammunition were widely used. Developments in the United States came more slowly. While everyone is interested in better shotguns and ammunition, Americans were quite used to working with loose components in their muzzle-loading shotguns and had no intention of paying higher prices for the patented, "new-fangled" factory-loaded ammunition. What the Mountainmen and other Americans wanted were rugged cartridge cases that could be easily reloaded in the evening for tomorrow's shooting. The all-brass metallic shotshell was already in use and, with black-powder's low chamber pressure, good shotshell cases would last almost indefinitely. American hunters now had a combination that worked in any weather and allowed for easy reloading.

But there were two problems. First, the primers were corrosive and American sportsmen wanted to get away from black powder. Apparently, they were sick and tired of coming home from a day's shooting only to be faced with the endless chore of cleaning, drying and oiling their guns—sound familiar? Smokeless powder cured part of the problem and created another. Some of the new powder was hard to ignite. Black powder, on the other hand, was easy to ignite so the same primers were used in centerfire rifles, pistols and shotshells.

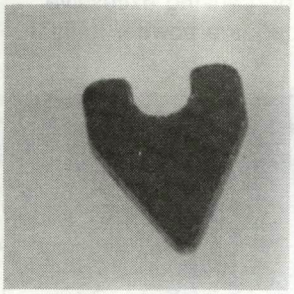
The problem of igniting the new smokeless powder was solved by using a larger primer with a larger priming charge. The shotshell's relatively soft paper, fiber or plastic basewad and thin brass head cannot provide the support and confinement necessary for the boxer-type primer used in metallic shotshells. Therefore, all modern shotshells use what is called a "battery cup" primer.



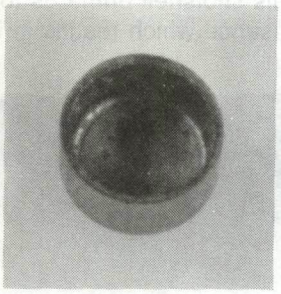
The battery cup primer consists of a strong flanged cup, open at the end to accept a cap. The "cap" is identical to the cup of a metallic cartridge primer and it contains the explosive compound. Sandwiched vertically between the cap and battery cup is a flat, sheet metal anvil. A small hole is pierced in the lower end of the battery cup. This is the "flash hole" and most currently produced primers have a seal applied to the flash hole to prevent powder granules from entering the cup.

Battery Cup With Anvil in Place

Battery Cup

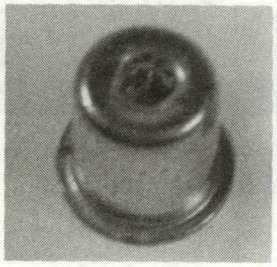


Anvil

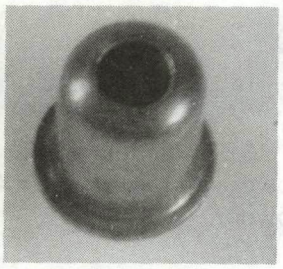


Primer Cup

Powder manufacturers do not recommend using any primer with an open flash hole when reloading with SPHERICAL or BALL Powder. The finer granules of powder can enter the battery cup and cause an increase in pressure that can leak gas around the primer and enlarge the primer pocket. WARNING—DO NOT USE REMINGTON PRIMERS WITH OPEN FLASH HOLES WHEN RELOADING SPHERICAL OR BALL POWDER!



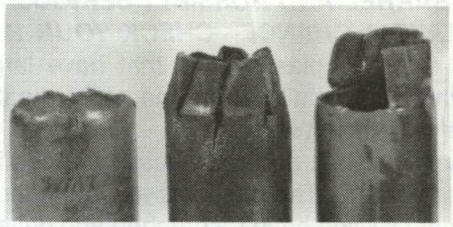
Sealed CCI Primer

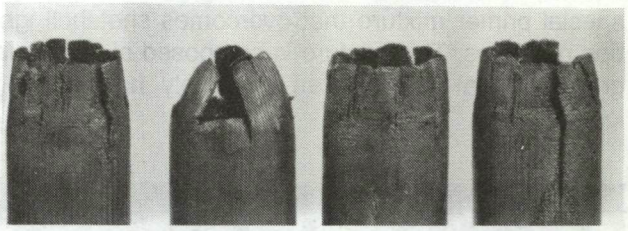


Remington Primer With Open Flash Hole

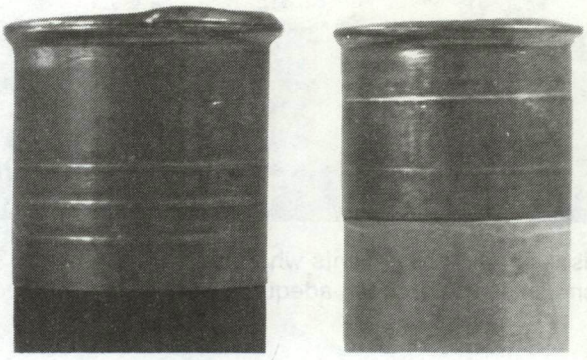
The three parts of the primer are pressed together and held by friction, with the anvil resting on the bottom of the battery cup and its other end pressing against the priming compound. When the trigger is pulled, the firing pin strikes the primer cup, a portion of the cup is dented inward, forcing some of the primer mix against the point of the anvil to ignite it, and the flash of hot flame blows through the flash hole seal to ignite the powder charge.

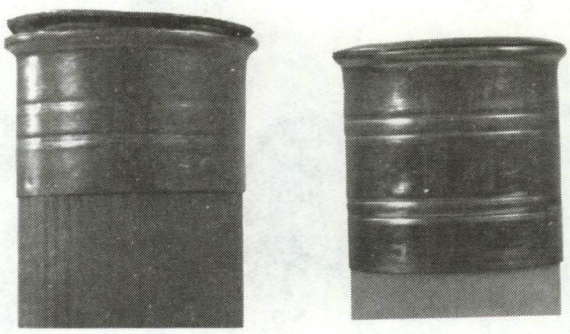
Shotshell reloading presents some special ignition problems, primarily because of the changing characteristics of the mouth of the hull. Both the old paper and the modern plastic hulls become worn, split or otherwise weakened at the mouth with repeated crimping. This is precisely where most of today's hulls wear out. Some of the more popular 12-gauge hulls with worn-out mouths, are pictured below.





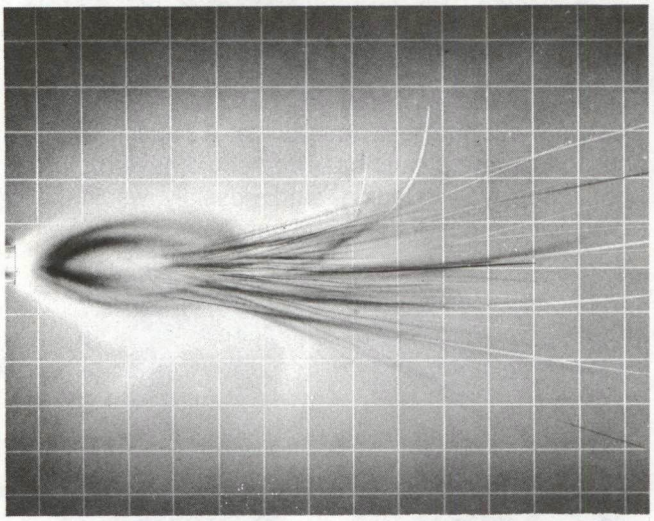
The basewad (integral) and head of these hulls are also worn but nowhere near failing. A paper, composition or separate plastic basewad could have ruptured, from extensive reloading, and possibly would have blown out the rim of the metal head.



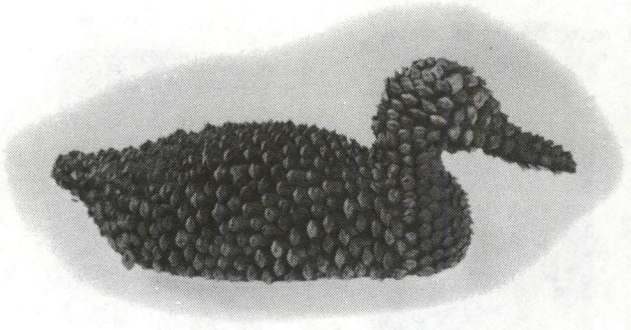


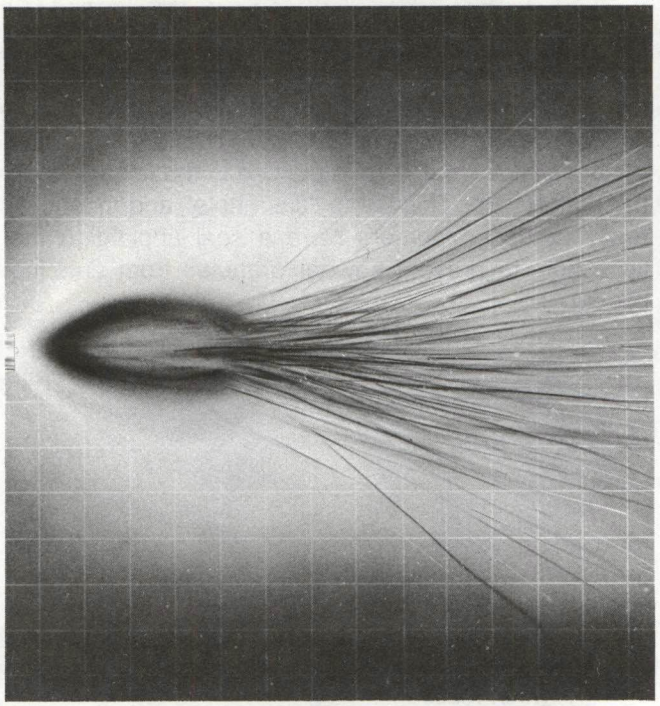
We could reload and crimp these hulls again but they would possibly open up during our hunt, leak the shot to the bottom of our game bag and go "PUFFFFFFF" if we mistakenly try to shoot them during the heat of a covey-rise. We are all guilty at one time or another of trying to get one more load out of our hulls. And we have all heard "Joe," who isn't a reloader, holler as loud as possible, for the whole world to hear, "PULL THE *TRIGGER* HARDER!" ***WARNING—WHEN YOU HEAR AN "OFF-NOTE" SOUND, INSTEAD OF A NORMAL REPORT, CHECK THE BORE OF YOUR SHOTGUN FOR A "LODGED" WAD. IF THERE IS AN OBSTRUCTION THE NEXT SHOT COULD CAUSE A BURST BARREL AND POSSIBLY SERIOUS INJURY. DON'T TAKE A CHANCE—CHECK YOUR BARREL!*** Anyway, the new plastic hulls that have largely replaced the paper hulls are remarkably durable, but their useful life is not unlimited.

Modern shotshell powders must have confinement for proper burning. The chemists at Omark Industries, CCI Primer Division have researched and developed a special primer mixture that overcomes shotshell ignition problems. This mixture is composed of unique ingredients that result in an extremely hot, yet soft, ignition.

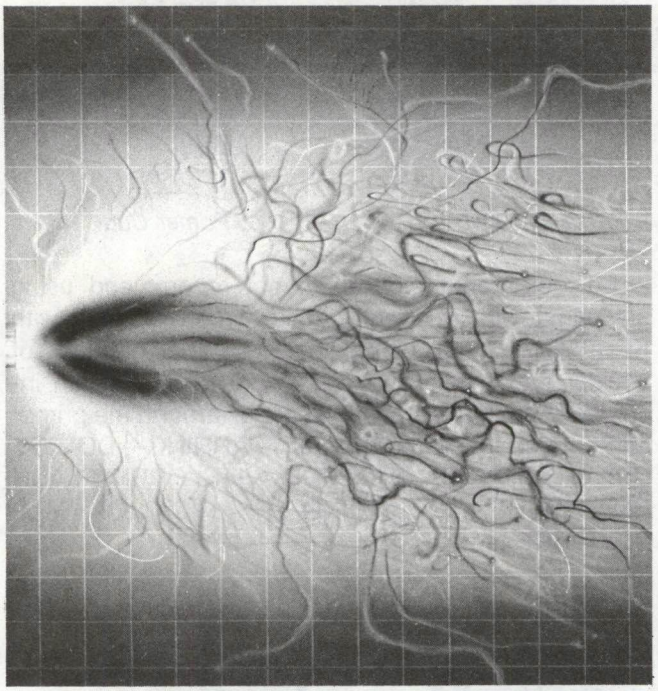


This illustration represents what happens when a shotshell primer lacks adequate heat generation.





This shotshell primer is too hot, causing excessive brisance which results in inadequate powder ignition.



A CCI Shotshell Primer achieves optimal ignition power with swirling hot fuel particles which engulf powder.

CCI makes four shotshell primers especially for reloaders. The CCI 157 is a special size for Remington-Peters SP plastic and early paper tube shells. This primer will be discontinued shortly as Remington-Peters is now in the process of phasing out the smaller 57* size primer. Eventually, all shells will use the CCI 109

or 209 size. From a size and performance standpoint, the CCI 109 and 209 Trap and Skeet primers are the same. Both contain the same metal parts and same quantity and formulation of primer mix. The difference is the plating of the 109 primer cup. It is a more expensive type for maximum protection from corrosion by outside elements. The CCI 109 should be used for hunting loads that may get damp, as often happens when waterfowl hunting. The clay bird shooter seldom exposes his reloads to moisture. Thus, the 209 Trap and Skeet primer is made with less expensive plating and the cost saving is passed on to the shooter. When necessary, the CCI 109 primers can be used interchangeably. ***THIS IS THE ONLY SAFE INTERCHANGE OF ANY PRIMERS.***

CCI's newest introduction is the 209M primer. It fits the same as the 109 or 209 Trap and Skeet, but is a truly hotter primer, with a heavier pellet weight and improved anvil, that requires up to a 10 percent powder reduction and allows for more sensitive, uniform reloads. This primer is not interchangable with the CCI 109 or the CCI 209 TRAP AND SKEET primer. WARNING—DO NOT INTERCHANGE DIFFERENT BRANDS OF PRIMERS. USE THE COMPONENTS IN THE LOADING RECIPE EXACTLY.

All CCI shotshell primers have an exclusive "Tapered Battery Cup" and the surface finish on CCI primers is very smooth and shiny. This is important when using reloaders with automatic priming feeds and allows for easier primer alignment during seating.

The following information is extremely important to all reloaders. *Sporting Ammunition Primers: Properties, Handling, & Storage for Handloading* is published by the Sporting Arms and Ammunitions Manufacturers' Institute (SAAMI). It is reprinted here with the permission of SAAMI, whose cooperation in providing this material is greatly appreciated.

SPORTING AMMUNITION PRIMERS:

Properties, Handling, & Storage For Handloading

This leaflet has been prepared by the Sporting Arms and Ammunition Manufacturers' Institute, based upon information currently available to it. It is furnished to interested persons as a courtesy and in the interests of safety. It is not intended to be comprehensive or to modify or supersede safety suggestions, standards, or regulations made by designated authorities, public or private. It is subject to revision as additional knowledge and experience are gained. SAAMI expressly disclaims any warranty, obligation, or liability whatsoever in connection with the information contained herein or its use.

Ammunition handloading has become increasingly popular in recent years. This leaflet summarizes information which has been promulgated or which is generally known by experienced handloaders, and provides general information for persons interested in handloading. It discusses the properties of sporting ammunition primers and offers recommendations for their safe use, handling, and storage.

This leaflet is intended only to increase the knowledge of all concerned individuals and groups regarding sporting ammunition primers. The statements and recommendations made do not supersede local, state, or Federal regulations. Proper authorities should be consulted on regulations for storage, transportation, and use of sporting ammunition primers in each specific community. Other leaflets on Smokeless Powder and Sporting Ammunition supplement this folder.

PROPERTIES OF PRIMERS

Sporting ammunition primers contain carefully engineered mixtures of chemical ingredients. Primers are designed to explode and produce the heat, gas, and hot particles necessary to ignite propellant powders in sporting ammunition when the firing pin of a firearm strikes them properly.

Properties of particular importance to the dealer and user of primers are as follows:

1. Primers may explode if subjected to mishandling. Explosions may be caused by friction and by percussion, such as hammering, pounding, dropping, or bullet impact. Heating by fire, static electricity, sparks, hot tobacco ashes, or other unspecified abuses may also cause primers to explode.
2. If primers are loose or in bulk, having contact one with another, one primer exploding can, and usually will, cause a violent simultaneous explosion of all primers so situated. In other words, one primer exploding for any reason under these conditions will normally cause all of the primers to explode in one violent blast.
3. Primers may "dust." Small particles of priming compound may separate from the primers in the

form of dust, especially when they are subjected to shaking or jolting. Accumulation of this dust in primer feed tubes, loading machines, and loading areas is extremely hazardous as it might cause explosions or fires.

4. Primers exposed to water or any organic solvent, such as paint thinner, gasoline, kerosene, oil, grease, etc., may deteriorate, resulting in misfires or poor ignition.

5. Modern sporting ammunition primers will not absorb moisture under normal or even severe conditions of atmospheric humidity. There is no advantage to be gained from air-tight containers. The factory containers in which they are packaged need only normal conditions of storage. They should be kept dry and not exposed to high temperatures. If exposed to wet conditions or high temperatures, they may deteriorate, giving misfires or poor ignition of the propellant powder.

HANDLING OF PRIMERS

Primers do explode. This is the purpose for which they have been designed. They demand the respect and careful handling due any device containing explosives.

Primers should never be handled, used, or stored in bulk, since primers in bulk can explode simultaneously.

The manufacturers of primers do not recommend the use of primer feeds for reloading unless adequate protection from the hazard of explosion is provided. The placing of primers in tubes or columns, or using other bulk systems in which the explosion of any one primer may cause the explosion of all primers, is a potentially hazardous condition. It is the responsibility of the manufacturers of primer handling systems to provide safety and protective features for their equipment. It is recommended that primers be handled individually unless adequate safeguards are provided and used.

Care must always be exercised in any handloading operation to avoid rough handling and undue force where a primer is involved, since the primer may fire. Any malfunction of equipment must be cleared with extreme caution. The decapping of shells or cases containing live primers is to be avoided.

Precautions should be taken to avoid buildup of static electricity on the person when handling primers or conducting handloading procedures. Loading equipment should be electrically grounded.

All loading equipment and adjacent areas must be kept scrupulously clean and free of primer dust and powder accumulations. Work areas and loading equipment must be cleaned by wiping with a damp cloth or sponge which should be thoroughly rinsed after each use. Fired primers, primer cups, anvils, or other bits of hard, abrasive material are a hazard during loading operations as contact with them may cause primers to fire.

Accidentally spilled primers should be picked up immediately as they may explode when stepped upon.

An absolute minimum of primers should be maintained at the loading operation. Only one packing tray at a time should be removed from the primer storage. When a priming operation is completed, any remaining primers should be returned to the package in which they were originally contained. These packages have been specifically designed to protect primers during shipment and storage and also to protect the consumer.

Primers available to children, household pets, or persons not recognizing them as potentially hazardous, are an unnecessary risk to all concerned.

Never have an open flame, sources of sparks, or hot particles in the vicinity of primers or any ammunition loading operation.

Do not smoke near primers.

Safety glasses must be worn when performing any and all handloading operations. Additional protection such as face shields or machine guards are strongly recommended.

RECOMMENDED STORAGE OF PRIMERS

Storage cabinets containing only primers are recommended. These cabinets should be ruggedly constructed of lumber at least 1″ nominal thickness, to delay or minimize the transmission of heat in the event of fire.

Keep your storage and use areas clean. Make sure the surrounding area is free of trash or other readily combustible materials.

Be sure the storage area selected is free from any possible sources of excessive heat and is isolated from open flame, furnaces, water heaters, etc. Do not store primers where they will be exposed to the direct rays of the sun. Avoid storage in areas where mechanical or electrical equipment is in operation.

Do not store primers in the same area with solvents, flammable gases, or highly combustible materials.

Store primers only in their original factory containers. Do not transfer the primers from this approved container into one which is not approved. The use of glass bottles, fruit jars, plastic or metal containers, or other bulk containers for primer storage is extremely hazardous.

Do not smoke in areas where primers are stored. Place appropriate "No Smoking" signs in these areas.

Do not store primers in any area where they might be exposed to gun fire, bullet impact, or ricochets.

Do not store primers with propellant powders or any other highly combustible materials so as to avoid as much as possible involving primers in a fire.

Observe all regulations regarding quantity and methods of storing primers.

KNOW THE FOLLOWING RECOMMENDATIONS ON STORAGE AND HANDLING ISSUED BY THE NATIONAL FIRE PROTECTION ASSOCIATION BATTERYMARCH PARK, QUINCY, MA 02269 AND REPRINTED WITH THEIR PERMISSION:

CODE FOR THE MANUFACTURE, TRANSPORTATION, STORAGE, AND USE OF EXPLOSIVE MATERIALS

NFPA No. 495

CHAPTER 9. SMALL ARMS AMMUNITION, SMALL ARMS PRIMERS, SMOKELESS PROPELLANTS AND BLACK POWDER PROPELLANTS

95. SMALL ARMS AMMUNITION PRIMERS

951. Small arms ammunition primers shall not be transported or stored except in the original shipping containers approved by the U.S. Department of Transportation.

952. Truck or rail transportation of small arms ammunition primers shall be in accordance with U.S. Department of Transportation regulations.

953. Not more than 25,000 small arms ammunition primers shall be transported in a passenger vehicle.

954. Not more than 10,000 small arms ammunition primers may be stored in residences.

955. Not more than 10,000 small arms ammunition primers may be displayed in commercial establishments.

956. Small arms ammunition primers shall be separated from flammable liquids, flammable solids (as classified by the U.S. Department of Transportation), and oxidizing materials by a fire-resistive wall of one-hour rating or by a distance of 25 feet.

957. Commercial stocks of small arms ammunition primers shall be stored as follows:

a. Quantities up to 750,000 small arms ammunition primers may be stored in a building if not more than 100,000 are stored in any one pile and piles are at least 15 feet apart.

b. Quantities in excess of 750,000 small arms ammunition primers may be stored in a building if the following conditions are met:

1. The warehouse or storage room is not accessible to unauthorized personnel.
2. The primers shall be stored in cabinets.
3. Shelves of storage cabinets shall not have more than a 2-foot vertical separation.
4. Not more than 200,000 primers shall be stored in one cabinet.
5. Cabinets shall be located only against walls of the warehouse or storage room with a minimum distance between cabinets of 40 feet.
6. Separation distance between cabinets may be reduced to 20 feet if barricades are attached to the wall and are at least twice the height of cabinets. Barricades shall be centered between cabinets and shall extend at least 10 feet beyond the wall toward the center of the room. They are to be constructed of at least 2-inch-thick lumber, brick, concrete block, or of boiler plate at least ¼-inch-thick, or of equivalent materials. Barricades shall be firmly attached to the buidling structure at both ends.
7. Small arms ammunition primers shall be separated by a fire-resistive wall of 1-hour rating or by a distance of 25 feet from materials classified by the U.S Department of Transportation as flammable liquids, flammable solids, and oxidizing materials.
8. The building is equipped with an automatic sprinkler system installed in compliance with NFPA No. 13, Standard for the Installation of Sprinkler Systems.

c. Commercial stocks of small arms ammunition primers not in accordance with a or b of this section, whichever applies, shall be stored in a magazine constructed as specified in Chapter 3.

8/83

OTHER FACTORS INFLUENCING PRIMER PERFORMANCE

In addition to the problem of misfires there are several common occurrences that can hinder proper primer ignition. Before putting the blame on the primer for the misfire, make the following checks:

1) Did the gun deliver an adequate firing pin blow? Is the firing pin tip hemispherical and not flat or chipped?
2) Was the primer free from contamination such as oil or grease?
3) Had the hull been damp or wet prior to reloading?
4) Is the firing pin strike reasonably well centered on the primer?
5) Was there powder in the case?
6) Had the primer been fired previously and not deprimed?

Even experienced, careful reloaders will slip up and overlook these last two important reloading steps.

Proper firing pin fall can be hindered when too much fouling is allowed to accumulate in the percussion mechanism of the gun. Here more frequent cleaning is the simple cure. Oil or grease in the percussion mechanism will congeal in very cold weather. This can greatly reduce the speed of firing pin fall and, in extreme cases, prevent it.

Off-center firing pin strikes account for a share of misfires. In order to effect proper ignition, the firing pin must strike very near to the center of the primer cup since the point of the anvil lies under this portion. Some eccentricity can be tolerated if the firing pin delivers a firm, solid blow to the primer. But in cases where the firing pin blow tends to be both light and off center, sooner or later one is certain to experience a misfire. Unless appropriate corrective action is taken, more may occur.

Contamination is another cause of primer failures. A quantity of oil, grease or solvents too small to detect is enough to render a primer insensitive if it gets into the primer pellet. In recent years some aerosol lubricants have appeared on the market. Used as intended, they are excellent products for lubricating and preventing rust of firearms and have great penetrating qualities. This feature can be a disadvantage if the lube gets on ammunition. It will easily penetrate the case around the primer and contaminate the pellet and/or powder, rendering them inert. Lubricants must be kept away from ammunition. When sprayed on a firearm or reloader in routine maintenance, all excess must be carefully wiped off before use. Oil is the arch-enemy of all primers. Make sure no oil is on your fingers when handling them. Never use oil on the automatic primer feed mechanism of the reloader. Use dry graphite if lubrication becomes necessary.

Remember, different primers have different characteristics depending on their purpose. Use only the primer that is shown in the reloading recipe. If you want chocolate cake. . .

Section 3 - Powder

HISTORY—The first discovery of a fuel that would burn without atmospheric oxygen was a mixture of charcoal, sulphur and niter (potassium nitrate or saltpeter). This invention has been credited to the Chinese and was used by them hundreds of years ago.

Two basic types of powder are in use today. They are designated as black powder and smokeless powder. Black powder is a low explosive and can be ignited by shock from a sudden jar. Remember in the cowboy movies that a keg of black powder, when thrown over the cliff, exploded! Smokeless powder is not an explosive. It is classified as a propellant, which means it is a chemical mixture designed to burn under controlled conditions, and to propel a shot charge or projectile. Smokeless powder cannot be ignited by shock. If our cowboy threw a keg of smokeless powder over the cliff, the keg would probably break, spilling the powder on the canyon floor. The grass would be green there in years to come because smokeless powder, with its high nitrogen content, is a good fertilizer.

Smokeless powders were invented in Europe in the late 1800's and were first used there. A French chemist named Vieille is credited with the discovery of a process that became single base powder. A few years later Alfred Nobel, a Swedish chemist, invented double based powders. Nobel made a huge fortune from his discovery and, apparently appalled at the thought of what he had invented, left his fortune to benefit mankind by what we know today as the Nobel Prizes.

Smokeless powder has two advantages: (1) Heavy bore residue and smoke of black powder is eliminated; and (2) smokeless powder has more energy than black powder and ballistics were substantially improved. Probably no one enjoys cleaning their firearms but cleaning black powder residue is a real chore. Although black powder is man's oldest explosive and gunpowder it is not only still in use today, but flourishing among shooters of muzzle loading firearms. PYRODEX, a replica black powder produced and marketed by The Hodgdon Powder Company, has solved the explosive and residue problem but left the smoke for tradition.

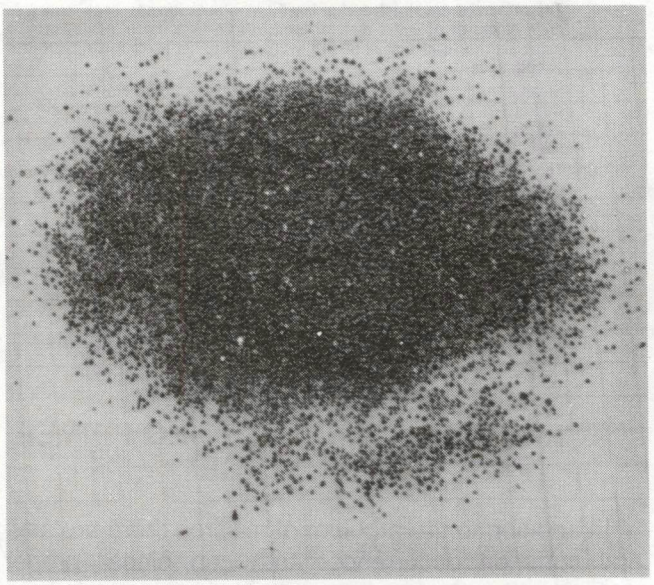
Time was, however, when the smoke was a pain. A bird hunter had to step around the smoke cloud to see if his shot were true. If it wasn't, he had no idea if it went high or low. Soldiers had a worse problem. Can you imagine fighting a battle through a cloud of smoke? How about an Indian with intentions of "lifting your hair" making an instant appearance from a cloud of smoke. Muzzle loading is kinda fun now, but for Davy and Daniel it was not only a pain but very serious business. Yes sir! Smokeless powder solved many problems.

The biggest problem of modern day reloaders happened during and right after World War II. Not only powder, but handloading components of every kind became almost impossible to obtain. The war effort had required the combined production of all ammunition manufacturers and the supply of powders and other handloading components had not resumed. During that time manufacturers preferred to apply their total effort to the production of factory loaded sporting ammunition. "This is modern day," the manufacturers said. "Handloading is dangerous—no one handloads today, here, use these factory ready-rolls".

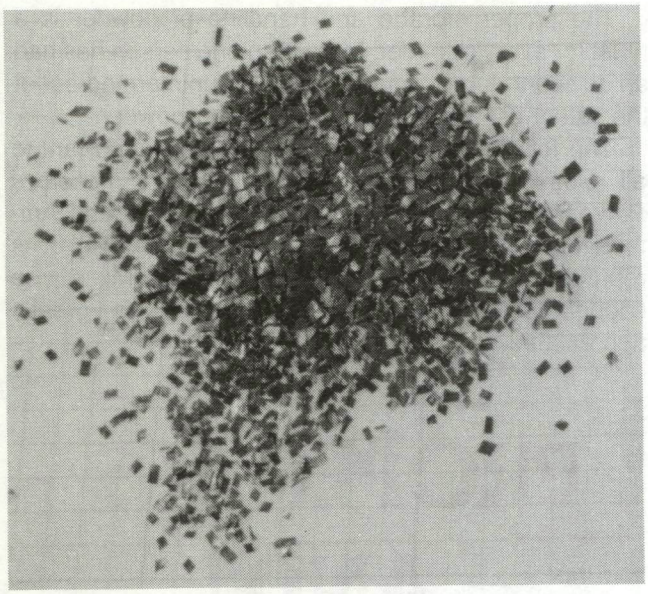
Thankfully for all reloaders then and to come, a few men bowed their back and went against the grain of the manufacturers. In 1946, one of these men, Bruce Hodgdon, of Merriam, Kansas, began marketing military surplus powders, a step that had a very important and lasting effect on handloading. The excellent quality and moderately priced Hodgdon powders enabled many individuals to resume handloading and many others to take it up for the first time. All handloaders of yesterday, today and tomorrow owe Mr. Hodgdon a great deal of thanks and support.

TYPES AND COMPOSITION—The modern smokeless powder available today is neither smokeless nor powder. Gunpowder, by definition, is an explosive. If you don't believe it look up what Mr. Webster has to say about gunpowder. And smokeless it is when compared to black powder, but a little, thin, white puff is still there every time we pull the trigger. We will, however, refer to our modern "propellant" as smokeless powder.

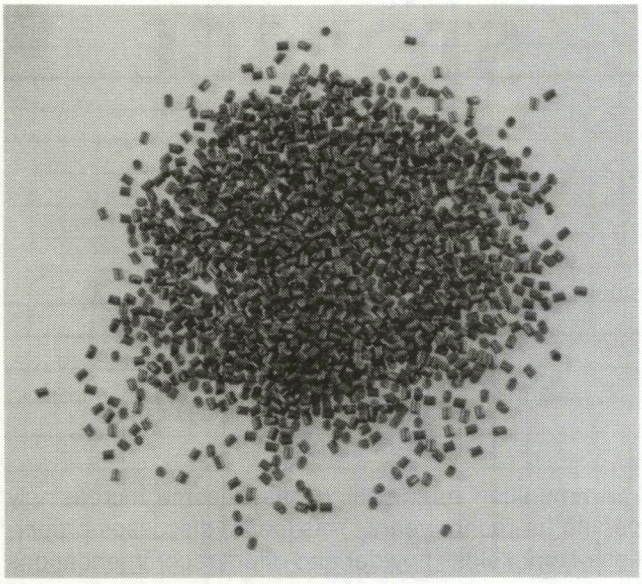
There are three types of smokeless powder: SPHERICAL or BALL, flake, and tubular or extruded.



SPHERICAL or BALL Powder



Flake Powder



Tubular or Extruded Powder

Powders that use nitrocellulose as an energy source are called "single base" powders. When nitroglycerine is added to the nitrocellulose for a higher energy content we then have "double base" powders. Both have advantages and disadvantages. Double base powders have a long shelf life and higher energy content per unit volume. Single base powders are less temperamental at high pressure levels and will not attack the plastic hoppers in powder measures as will double base powders.

SPHERICAL or BALL powder was developed to use left over quantities of WW I cannon powder as raw material for new propellant. There are three advantages for handloaders: (1) It goes through a powder measure uniformly and smoothly; (2) its density permits loading more energy per unit volume than other powders; and (3) it has a low rate of bore erosion.

All Hodgdon (SPHERICAL powders), Hercules and Winchester powders are double base. All DuPont powders, with the exception of HI-SKOR 700X and 800X, are single base.

BURNING RATES—Powder is the least variable of all handloading components. Using one powder to reload shotshells, pistols and rifle ammo is like planting one kind of seed to grow all kinds of vegetables. There may be one or two combinations that would suffice but optimum loads, generally, couldn't be worked up. However, powder can be made to fit any combination of guns and ammunition by controlling the shape, size, porosity and density of the granules as well as its chemical composition. Burning rate is controlled by the size of the granules and by the amount of surface exposed. The greater the surface, the faster it will burn. Take a piece of wood, for example, and cut it up into kindling. The kindling will burn much faster than the log would have if left whole.

The same thing happens with smokeless powder. If the granules are perforated, the burning rate is increased. The outside surface is ignited at the same time that the inside surface begins to burn. The outside surface area burns smaller as the inside surface area increases. Therefore the surface burning area remains about the same in size until the granule is burned out. The size and number of perforations can increase in area as burning proceeds. A powder that will build pressure rapidly, start the projectile moving, and then maintain that pressure all the way to the muzzle is called "progressive" burning powder.

As a SPHERICAL or BALL granule burns from the outside it gets smaller and smaller and the amount of gas given off is less because of the reduced surface area. This is called "degressive" burning powder. To achieve specified burning characteristics, the burning rate of SPHERICAL or BALL powder can be controlled during manufacturing by rolling the granules into little flats like pancakes. They can be rolled thick or thin or left in a SPHERICAL shape. SPHERICAL and BALL powder is also coated to retard burning. This is done by treating the granule's surface with a deterrent, which slows the rate of burning until the coating is burned through. Most powders are tumbled in graphite prior to packaging. This also has some deterrent effect, but graphiting primarily improves the flow of powder in measuring and carries off static electricity charges. It is interesting to note that the color of powder varies from white to straw yellow prior to the application of deterrents and graphite. The finished gray color is mostly due to the graphite.

LOT UNIFORMITY—The term "canistered" is used to describe a powder that is sold at retail for reloading. Powder is made in batches called "lots." Every canister (can) has a lot number written somewhere on the can.

A finished lot may or may not turn out to be what the manufacturer intended. If it doesn't, it is given a commercial number and sold to one of the ammunition loading companies, which, in turn, will experiment with this powder and use it in one of their batches of ammunition. This practice assures that canister lots for reloading will be the same yesterday, today and tomorrow.

IDENTIFICATION—Many powders look alike but their burning rates are different. Identification cannot be made by visual inspection. If a question of identity arises, the powder should be discarded. The only reliable identification is the label on the can and nothing can be learned (uses, burning rate, etc.) about the powder by its name or number alone. Some powders even have a few colored flakes mixed in for identification. Still, it must be regarded as impossible to identify any powder by appearance alone. There is only one thing to do with canisters that are unlabeled or illegible-DISCARD THAT CANISTER OF POWDER. Do not purchase any powder unless it is in the manufacturer's original container.

STORAGE AND STORAGE LIFE—Smokeless powders, correctly stored, have a very long life; even several decades if kept cool. SPHERICAL and BALL powder are usually considered to have a much longer shelf life than other types. It is known, however, that the Hercules plant in New Jersey has some flake propellant, stored under water since the late 1800's, that burns as if it were a recent lot when it is dried out. For proper storage, powder should be kept in the manufacturer's original container, tightly closed, in a cool, dry location. Powder should never be transferred to glass or plastic jars, as light will speed-up deterioration. The storage and use of powder is safer than handling gasoline, solvents, fingernail polish remover, aerosols or even lighter fluid.

Powder should be kept in a locked wooden box or cabinet, out of the reach of children and away from open flame, furnaces, hot water heaters and other electrical or mechanical equipment. A fire extinguisher should be kept at each location where powder is stored, including on the loading bench itself.

Powder canisters (cans) are designed to yield before pressure inside can rise to a dangerous level. If you were to place a filled canister of powder in a fire the container would soon split open and the powder would burn but not explode. This writer has had the dubious pleasure of seeing the aftermath of a 40-foot truckload of powder shortly after a wreck with another truck and a resultant fire. THERE WAS NO EXPLOSION! Not all of the powder burned, either. There were several cases of an extremely fast-burning pistol powder that didn't catch fire at all although most of the trailer was a melted blob of aluminum!

The proper storage and handling of powder is a must for every reloader. More than one person has had an accident due to ignoring or being uninformed about the safety aspects of handling canister powder.

The following information is extremely important to all reloaders. *Properties and Storage of Smokeless Powder* is published by the Sporting Arms and Ammunition Manufacturers' Institute, Inc. (SAAMI). It is reprinted here with the permission of SAAMI, whose cooperation in providing this material is greatly appreciated.

PROPERTIES AND STORAGE OF SMOKELESS POWDER

Ammunition handloading has become increasingly popular in recent years. This leaflet discusses properties of smokeless powder and offers recommendations for its storage.

This leaflet is intended to increase the knowledge of all concerned individuals and groups regarding smokeless powder. The statements and recommendaions made are not intended to supersede local, state or Federal regulations. Proper authorities should be consulted on regulations for storage and use of smokeless powder in each specific community. A second leaflet entitled "SPORTING AMMUNITION PRIMERS: PROPERTIES, HANDLING & STORAGE FOR HANDLOADING" supplements this leaflet on smokeless powder.

PROPERTIES OF SMOKELESS POWDER

Smokeless powders, or propellants, are essentially mixtures of chemicals designed to burn under controlled conditions at the proper rate to propel a projectile from a gun.

Smokeless powders are made in three forms:

1. Thin, circular flakes or wafers
2. Small cylinders
3. Small spheres

Single-base smokeless powders derive their main source of energy from nitrocellulose.

The energy released from double-base smokeless powders is derived from both nitrocellulose and nitroglycerin.

All smokeless powders are extremely flammable; by design, they are intended to burn rapidly and vigorously when ignited.

Oxygen from the air is not necessary for the combustion of smokeless powders since they contain sufficient built-in oxygen to burn completely, even in an enclosed space such as the chamber of a firearm.

In effect, ignition occurs when the powder granules are heated above their ignition temperature. This can occur by exposing powder to:

1. A flame such as a match or primer flash.

2. An electrical spark or the sparks from welding, grinding, etc.

3. Heat from an electric hot plate or a fire directed against or near a closed container even if the powder itself is not exposed to the flame.

When smokeless powder burns, a great deal of gas at high temperature is formed. If the powder is confined, this gas will create pressure in the surrounding structure. The rate of gas generation is such, however, that the pressure can be kept at a low level if sufficient space is available or if the gas can escape.

In this respect smokeless powder differs from blasting agents or high explosives such as dynamite or blasting gelatin, although smckeless powder may contain chemical ingredients common to some of these products.

High explosives such as dynamite are made to detonate, that is, to change from solid state to gaseous state with evolution of intense heat at such a rapid rate that shock waves are propagated through any medium in contact with them. Such shock waves exert pressure on anything they contact, and, as a matter of practical consideration, it is almost impossible to satisfactorily vent away the effects of a detonation involving any appreciable quantity of dynamite.

Smokeless powder differs considerably in its burning characteristics from common "black powder."

Black powder burns essentially at the same rate out in the open (unconfined) as when in a gun.

When ignited in an unconfined state, smokeless powder burns inefficiently with an orange-colored flame. It produces a considerable amount of light brown noxious smelling smoke. It leaves a residue of ash and partially burned powder. The flame is hot enough to cause severe burns.

The opposite is true when it burns under pressure as a cartridge fired in a gun. Then it produces very little smoke, a small glow, and leaves very little or no residue. The burning rate of smokeless powder increases with increased pressure.

If burning smokeless powder is confined, gas pressure will rise and eventually can cause the container to burst. Under such circumstances, the bursting of a strong container creates effects similar to an explosion.

For this reason, the Department of Transportation (formerly Interstate Commerce Commission) sets specifications for shipping containers for propellants and requires tests of loaded containers—under actual fire conditions—before approving them for use.

When smokeless powder in D.O.T.-approved containers is ignited during such tests, container seams split open or lids pop off—to release gases and powder from confinement at low pressure.

HOW TO CHECK SMOKELESS POWDER FOR DETERIORATION

Although modern smokeless powders are basically free from deterioration under proper storage conditions, safe practices require a recognition of the signs of deterioration and its possible effects.

Powder deterioration can be checked by opening the cap on the container and smelling the contents. Powder undergoing deterioration has an irritating acidic odor. (Don't confuse this with common solvent odors such as alcohol, ether and acetone.)

Check to make certain that powder is not exposed to extreme heat as this may cause deterioration. Such exposure produces an acidity which accelerates further reaction and has been known, because of the heat generated by the reaction, to cause spontaneous combustion.

Never salvage powder from old cartridges and do not attempt to blend salvaged powder with new powder. Don't accumulate old powder stocks.

The best way to dispose of deteriorated smokeless powder is to burn it out in the open at an isolated location in small shallow piles (not over 1" deep). *The quantity burned in any one pile should never exceed one pound.* Use an ignition train of slow burning combustible material so that the person may retreat to a safe distance before powder is ignited.

CONSIDERATIONS FOR STORAGE OF SMOKELESS POWDER

Smokeless powder is intended to function by burning, so it must be protected against accidental exposure to flame, sparks or high temperatures.

For these reasons, it is desirable that storage enclosures be made of insulating materials to protect the powder from external heat sources.

Once smokeless powder begins to burn, it will normally continue to burn (and generate gas pressure) until it is consumed.

D.O.T.-approved containers are constructed to open up at low internal pressures to avoid the effects normally produced by the rupture or bursting of a strong container.

Storage enclosures for smokeless powder should be constructed in a similar manner:

1. Of fire-resistant and heat-insulating materials to protect contents from external heat.
2. Sufficiently large to satisfactorily vent the gaseous products of combustion which would result if the quantity of smokeless powder within the enclosure accidentally ignited.

If a small, tightly enclosed storage enclosure is loaded to capacity with containers of smokeless powder, the walls of the enclosure will expand or move outwards to release the gas pressure—if the powder in storage is accidentally ignited.

Under such conditions, the effects of the release of gas pressure are similar or identical to the effects produced by an explosion.

Hence, only the smallest practical quantities of smokeless powder should be kept in storage, and then in strict compliance with all applicable regulations and recommendations of the National Fire Protection Association (reprinted at end of leaflet).

RECOMMENDATIONS FOR STORAGE OF SMOKELESS POWDER

STORE IN A COOL, DRY PLACE. Be sure the storage area selected is free from any possible sources of excess heat and is isolated from open flame, furnaces, hot water heaters, etc. Do not store smokeless powder where it will be exposed to the sun's rays. Avoid storage in areas where mechanical or electrical equipment is in operation. Restrict from the storage areas heat or sparks which may result from improper, defective or overloaded electrical circuits.

DO NOT STORE SMOKELESS POWDER IN THE SAME AREA WITH SOLVENTS, FLAMMABLE GASES OR HIGHLY COMBUSTIBLE MATERIALS.

STORE ONLY IN DEPARTMENT OF TRANSPORTATION APPROVED CONTAINERS. Do not transfer the powder from an approved container into one which is not approved.

DO NOT SMOKE IN AREAS WHERE POWDER IS STORED OR USED. Place appropriate "No Smoking" signs in these areas.

DO NOT SUBJECT THE STORAGE CABINETS TO CLOSE CONFINEMENTS.

STORAGE CABINETS SHOULD BE CONSTRUCTED OF INSULATING MATERIALS AND WITH A WEAK WALL, SEAMS OR JOINTS TO PROVIDE AN EASY MEANS OF SELF-VENTING.

DO NOT KEEP OLD OR SALVAGED POWDERS. Check old powders for deterioration regularly. Destroy deteriorated powders immediately.

OBEY ALL REGULATIONS REGARDING QUANTITY AND METHODS OF STORING. Do not store *all* your powders in one place. If you can, maintain separate storage locations. Many small containers are safer than one or more large containers.

KEEP YOUR STORAGE AND USE AREA CLEAN. Clean up spilled powder promptly. Make sure the surrounding area is free of trash or other readily combustible materials.

KNOW THE FOLLOWING RECOMMENDATIONS ON STORAGE AND HANDLING ISSUED BY THE NATIONAL FIRE PROTECTION ASSOCIATION BATTERYMARCH PARK, QUINCY, MA 02269 AND REPRINTED WITH THEIR PERMISSION:

CODE FOR THE MANUFACTURE, TRANSPORTATION, STORAGE, AND USE OF EXPLOSIVE MATERIALS
NFPA No. 495

CHAPTER 9. SMALL ARMS AMMUNITION, SMALL ARMS PRIMERS, SMOKELESS PROPELLANTS AND BLACK POWDER PROPELLANTS

93. SMOKELESS PROPELLANTS

931. Quantities of smokeless propellants in shipping containers approved by the U.S. Department of Transportation not in excess of 25 pounds may be transported in a passenger vehicle.

932. Quantities in excess of 25 pounds but not exceeding 50 pounds in a passenger vehicle shall be transported in a portable magazine having wooden walls of at least 1-inch nominal thickness.

933. Transportation of quantities in excess of 50 pounds is prohibited in passenger vehicles.

934. Commercial shipments of smokeless propellant for small arms in quantities not exceeding 100 pounds are classified for transportation purposes as a flammable solid when approved by the Bureau of Explosives and when packaged in accordance with the U.S. Department of Transportation Hazardous Materials Regulations, Title 49 CFR, Transportation, Section 173.197a. Shipments of quantities of smokeless propellant for small arms in excess of 100 pounds or in packages not in accordance with Title 49 CFR, Transportation, Section 173.197a, shall be in compliance with U.S. Department of Transportation regulations for Propellant Explosives Class B.

935. All smokeless propellants shall be stored in shipping containers specified by the U.S. Department of Transportation.

936. Smokeless propellants intended for personal use in quantities not to exceed 20 pounds may be stored in original containers in residences; quantities over 20 pounds but not to exceed 50 pounds may be stored in residences in a wooden box or cabinet having walls of at least 1-inch nominal thickness.

937. Not more than 20 pounds of smokeless propellants, in containers of 1-pound maximum capacity, shall be displayed in commercial establishments.

938. Commercial stocks of smokeless propellants shall be stored as follows:

a. In quantities over 20 pounds and not more than 100 pounds, they shall be stored in portable wooden boxes having walls of at least 1-inch thickness.

b. In quantities over 100 pounds and not more than 800 pounds, they shall be stored in nonportable storage cabinets having wooden walls of at least 1-inch thickness. Not more than 400 pounds shall be permitted in any one cabinet and the cabinets shall be separated by a wall having a minimum one-hour fire resistance rating, as determined by NFPA 251-1972, Standard Methods of Fire Tests of Building Construction and Materials, or by a distance of no less than 25 feet.

c. Commercial stocks in excess of 800 pounds and not more than 5,000 pounds may be stored in a building if the following requirements are met:

1. The warehouse or storage room is not accessible to unauthorized personnel.
2. The smokeless propellant stocks are stored in nonportable storage cabinets having wooden walls at least 1-inch thick and having shelves with not more than a 3-foot separation between shelves.
3. Not more than 400 pounds is permitted in any one cabinet.
4. Cabinets are located only against walls of the storage room or warehouse with a minimum distance between cabinets of 40 feet.

5. Separation distance between cabinets may be reduced to 20 feet if barricades: 1, are attached to the wall and are at least twice the height of the cabinet; 2, are centered between cabinets and extend at least 10 feet beyond the wall toward the center of the room; 3, are constructed of at least 2-inch-thick lumber, brick, or concrete block or of boiler plate at least ¼-inch thick, or of equivalent materials; and 4, are firmly attached to the building structure at both ends.
6. Smokeless propellant is separated by a fire-resistant wall of 1-hour rating or by a distance of 25 feet from materials classified by the U.S. Department of Transportation as flammable liquids, flammable solids and oxidizing materials.
7. The building is equipped with an automatic sprinkler system installed in compliance with NFPA No. 13, Standard for the Installation of Sprinkler Systems.

d. Commercial stocks of smokeless propellant not stored in accordance with a, b, and c of this Section, whichever applies, shall be stored in a Type 4 magazine constructed and located as specified in Chapter 3.

8/83

CHECKING FOR DETERIORATION—When we open a can of single based powder, we have all noticed the characteristic "hospital or doctor's office" odor. The odor released comes from alcohol, ether or acetone intentionally left in by the manufacturer for strength and toughness of the powder granules. Therefore, cans of single based powders should be kept tightly closed to prevent the loss of volatiles and moisture. Heat is the main cause of deterioration in single base powder as it drives off moisture and volatiles. Double base powders have less odor, since fewer solvents are required in their manufacture. They are affected comparatively little by ordinary storage conditions.

Each canister of powder should be inspected annually. If that "hospital" odor is missing, the smell is acrid and irritates your nose, and if the powder looks rusty, it should be discarded.

SELECTION—I have often been ask questions as to whether a certain powder is clean or dirty burning. There are some powders that burn "cleaner" than others, but none burn as dirty as black powder. Generally, all slow-burning powders leave an ash residue in the barrel. This residue does not result from incomplete combustion, but is a by-product of the deterrent coatings used to regulate burning speed. The ash does not accumulate and there is no more after 100 shots than there was from the first.

Bruce Hodgdon likes to tell the story of a trap shooter who had broken 100 straight. Seems that this feller was complaining about dirty burning powder. Mr. Hodgdon ask him if he wanted to break clay pigeons or come home with a clean barrel. . . Of course, he wanted to break the clay birds. Anyway, a few patches soaked in OUTERS BORE SOLVENT will remove the residue during cleaning.

Depending on who you talk to powder selection is easy, difficult, confusing or almost impossible. At this writing there are more than 50 canister powders on the retail market and the most difficult question for the would-be handloader is determining which powder to use in a given load. The answer is simple—use reliable data from the powder manufacturers and follow the recipe of your choice. We'll discuss this more in detail later in this handbook. Consideration of all these powders should impress any thoughtful handloader. We're all fortunate to have these choices. The recreational hobby of reloading is alive and well in this country today. It is interesting to know that reloaders consume more than 4 million pounds of canister powder a year in this country. That is a lot (no pun intended) of powder.

WINCHESTER BALL POWDER PROPELLANT

296—Best choice for the .410, allowing ample room for wad and shot with good crimping.

452AA—Same powder used in 12 gauge Double A factory loads. Our most popular shot shell powder for a variety of target and field loads.

473AA—Same powder used in 20 gauge Double A factory loads. Exceptional uniformity. For many 12 and 20 gauge shot shell loads.

540—Ideal powder for 12 gauge high velocity loads and heavy 20 gauge loads. Also popular for 28 gauge shot shells.

571—Magnum powder for heaviest 12 and 20 gauge loads. Recommended for 3″ cases.

Symbol	Type	Container Net Wt.
296	Shotshell	1 lb. 3 lbs. 8 lbs.
452AA	Shotshell	1 lb. 3 lbs. 6 lbs. 10 lbs.
473AA	Shotshell	1 lb. 3 lbs. 6 lbs. 10 lbs.
540	Shotshell	1 lb. 3 lbs. 8 lbs. 12 lbs.
571	Shotshell	1 lb. 3 lbs. 8 lbs. 12 lbs.

DU PONT HANDLOADING POWDER SELECTION GUIDE

The following table lists the Du Pont Handloading Powders and the general area of use for each powder.

POWDER DESIGNATION	SHOTSHELL (GAUGE)						CONTAINER NET WEIGHT LBS.		
	10	12	16	20	28	410	CANISTER	CADDY	KEG
"HI-SKOR" 700-X	x	x	x	x			½	5	12
"HI-SKOR" 800-X	x	x	x	x	x		½	5	12
PB	x	x	x	x	x		½	5	12
SR 7625	x	x	x	x	x		½	5	12
SR 4756	x	x	x	x	x		½	5	12
IMR 4227				x		x	1	8	20

HODGDON SHOTGUN POWDERS

TRAP 100 Trap 100 is a spherical trap, skeet, and light field load powder. Mild recoil. Great performance!

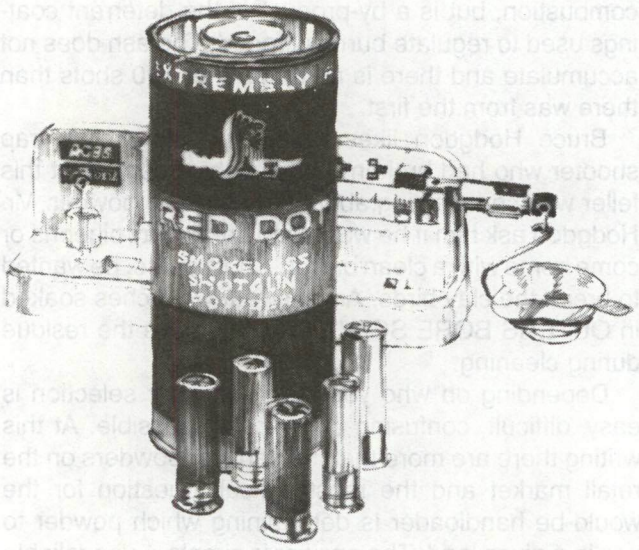
HS6 & HS7 HS-6 and HS-7 are unsurpassed for field and magnum loads. They deliver uniform charges and are dense to allow sufficient wad column space for best patterns and crimps.

H110 A spherical powder for .410 Skeet Loads. That allows for ample room for wad and shot with a good crimp.

		Container Net Weight
Trap 100	Shotshell Powder	8 oz.
		5 lb.
HS-6	Shotshell Powder	1 lb.
		5 lb.
HS-7	Shotshell Powder	1 lb.
		5 lb.
H110	Shotshell Powder	1 lb.
		5 lb.

HERCULES® SMOKELESS POWDERS FOR RELOADING

Hercules currently offers seven powders for use in shotshell reloading. These are listed in the order of decreasing burning rates. Each powder listed is "slower" than those preceding it and "faster" than those following it. For example, Red Dot® burns more slowly than Bullseye®, but faster than Green Dot®.



Powder	Principal Use	Can Also be Used in
1. **Bullseye®**	Handgun Loads	12-gauge 1-oz Target Loads
2. **Red Dot ®**	Light and Standard Shotshell Loads, 12-, 16-, and 20-gauge	Handgun Loads
3. **Green Dot®**	Standard and Medium Shotshell Loads, 12-, 16-, and 20-gauge	Handgun Loads
4. **Unique®**	All-Around Shotshell Powder, 12-, 16-, 20-, and 28-gauge	Handgun Loads and Reduced Rifle Loads
5. **Herco®**	Heavy Shotshell Loads, 10-, 12-, 16, 20-, and 28-gauge	Heavy Handgun Loads
6. **Blue Dot®**	Magnum Shotshell Loads, 10-, 12-, 16-, 20-, and 28-gauge	Magnum Handgun Loads and Reduced Rifle Loads
7. **Hercules 2400®**	Magnum Handgun Loads	Some Rifle and Shotshell Loads

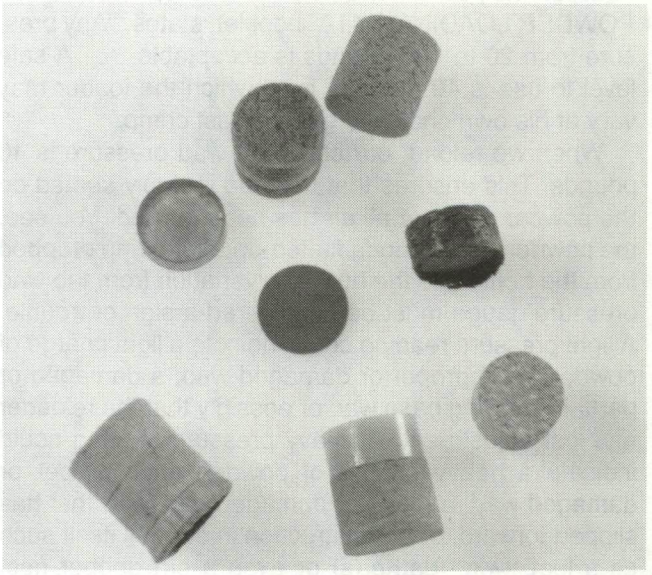
PACKAGING

Powder	1-lb Canister	4-lb Canister	5-lb Canister	8-lb Keg	15-lb Keg
Bullseye	X	X		X	X
Red Dot	X	X		X	X
Green Dot	X	X		X	X
Unique	X	X		X	X
Herco	X	X		X	X
Blue Dot	X		X		
Hercules 2400	X	X		X	X

Section 4 - Wads

SELECTING THE RIGHT WAD: A WAD IS A WAD, IS A WAD—OR IS IT?

The wad is that part of the shotshell that goes between the powder and shot. Not too long ago wads were made of paper, cork, felt and other materials. Prior to the plastic wads we have today, felt and paper were the materials that were most widely used. Felt was readily available in varying thicknesses and gauges and was used as "filler wads." Compressed paper "nitro cards" were used between the filler wads and powder.



Various Nitro Cards, Cork and Felt Wads

Then along came the age of plastic, and wads changed for the better. Essentially a modern plastic wad consists of three parts: (1) A molded cup serves to contain and seal the gas pressure developed by the burning powder. This sealing is called "obturation." (2) Above this cup, different types of ribs, posts and arch supports are formed to act as springs or a cushioning section to give a more gentle acceleration to the shot charge during ignition. (3) The upper section is a shot cup with a series of vertical slits. The cup protects the shot charge from rubbing against the bore and pellet deformation is drastically reduced. The slits in the cup allow cup petals to peel back as the shot leaves the muzzle and not interfere with the shot string. Shot cups also eliminate barrel leading, improve patterns and prolong the life of the hull.

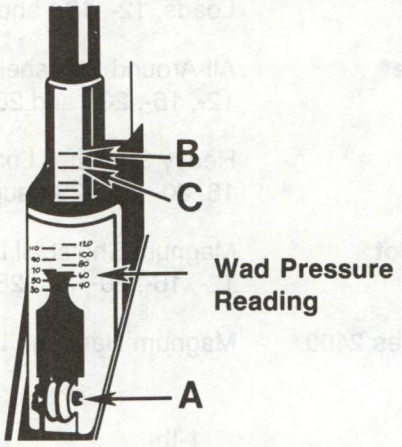
There are literally dozens of different wads on the market. There are different gauges, colors, heights and designs of all configurations. All are an attempt to build a better mousetrap and, although their job is similar in the many different hulls, each is different. The mere substitution of one plastic wad for another can cause chamber pressure to vary plus or minus 1,000 L.U.P. (lead units of pressure). This pressure variation can range upwards to the point of danger or downwards where bloopers and erratic performance occur.

Ample recipes are available in the data section of this handbook. ***DO NOT SUBSTITUTE COMPONENTS. INDISCRIMINATE COMPONENT SWITCHING CAN ALTER BOTH BALLISTICS AND PERFORMANCE.*** Remember the first commandment of baking —If you want chocolate cake—you've got to follow the chocolate cake recipe. Play it safe. Use only the recipes, as stated, in the data section.

WAD SEATING PRESSURE—Wad seating pressure, generally, is not critical when using plastic wads. Wads must be seated on the powder with no airspace between the powder and wad. Winchester, in its "BALL POWDER LOADING DATA" booklet, states, "Any pressure from 20 to 100 pounds is acceptable. . . . A safe level to use is 40 pounds, from which the loader may vary at his own choice to get the best crimp."

When we reload, our choice of wad pressure is 40 pounds. This ensures that the wad is firmly seated on the powder and that all air has been purged. You see, the powder can be kinda fluffed-up after being dropped from the bottle into the hull. Any variation from the wad pressure gauge must be considered a sign of trouble. A light pressure reading could indicate a light charge of powder, an improper or damaged wad, a damaged or partially missing base wad or possibly that the reloader has lost adjustment. A heavy pressure reading could indicate a heavy charge of powder, an improper or damaged wad, a loose or damaged basewad that has slipped forward, or an obstruction in the hull itself such as a leaf, twig, feather(s) or even a dirt dobber nest (yes, we've seen those too). Light or heavy variation could also mean that a different hull could be mixed in by accident. Check the wad pressure reading visually each time a wad is seated.

On all MEC reloaders plastic wads are seated by pressure from the "rammer tube". In order to set this pressure, the following excerpt is from MEC's instruction booklet that comes with the reloader:



Rammer Tube and Wad Pressure Gauge

TO ADJUST THE RAMMER TUBE—"The rammer tube is designed to provide any wad pressure from 30 to 120 pounds. Using the hex wrench provided, loosen adjusting clamp "A". Set rammer tube to desired pressure (lower it to increase pressure—raise it to decrease). Tube can be easily moved if clamp is spread slightly. When tightening clamp, do not overtighten. You may collapse the rammer tube or strip the screw threads."

Indicator marks "B" should be used as a visual aid in making the adjustment. Check your setting by reading actual pressure on gauge face while applying pressure on correct wad column, with handle in full lowered position. This will always be the actual pressure being applied to wad. MEC also advises that while reloaders have been pre-set at the factory for the average pressure required, the operator may find it desirable to increase or decrease the amount of pressure to the wad manufacturer's recommendation.

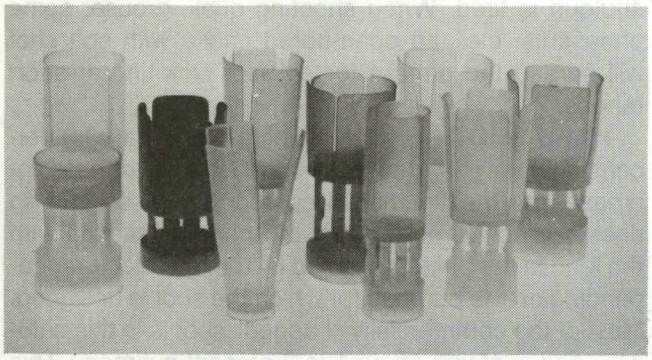
Sometimes, after dropping the shot, we find that there isn't enough room to allow for a good crimp. In double checking the recipe we find that everything is right. When this situation occurs, adjust your rammer tube down for an increase in wad pressure. This will compress the wad shock-absorbing section somewhat and allow more room for the shot and crimp. Use the minimum pressure required to do this job.

MEC reloaders have plastic wad guide fingers to speed wad insertion. If worn or damaged, the fingers may cause the wad cup to catch on a point of the hull, causing the cup to be cut or deformed, breaking the gas seal, and possibly causing soft, squib or blooper loads. ***WARNING—WHEN YOU HEAR AN "OFF-NOTE" SOUND INSTEAD OF A NORMAL REPORT, CHECK THE BORE OF YOUR SHOTGUN FOR A***

"LODGED" WAD. IF THERE IS AN OBSTRUCTION THE NEXT SHOT COULD CAUSE A BURST BARREL AND POSSIBLY SERIOUS INJURY. DON'T TAKE A CHANCE—CHECK YOUR BARREL. To eliminate this problem, replace the worn or damaged wad guide fingers. Replacements are available in the gauge of your choice from your local independent sporting goods retailer.

Old Style *New Style*

The following section will help you to recognize wads, by sight, that are used in the data section recipes.



Winchester Wads

WAA12F1—Pink one-piece wad designed for reloading 1 ounce of shot in a range of target and field load applications.

WAA12—white one-piece wad for use in trap, skeet and field loads.

WAA12F114—Yellow one-piece flared petal A-A type wad designed specifically for 12-gauge field loads with 1 ¼ ounce and 1 ⅜ ounce shot charges.

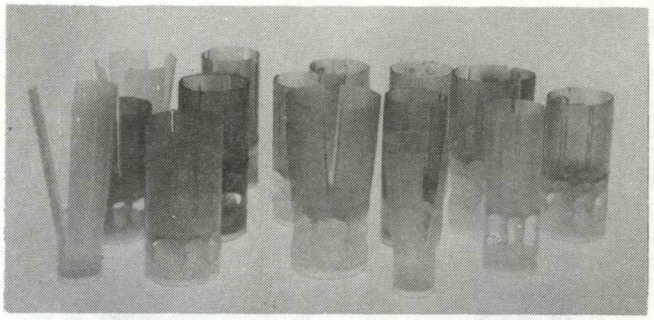
WAA12R—Red one-piece wad for use in a wide variety of hulls for heavy field and duck loads.

WAA20—White one-piece wad for use in 20-gauge hulls for skeet and field loads.

WAA20F1—Yellow one-piece flared petal A-A type wad designed specifically for 20-gauge field loads with 1 ounce and 1 ⅛ ounce shot charges.

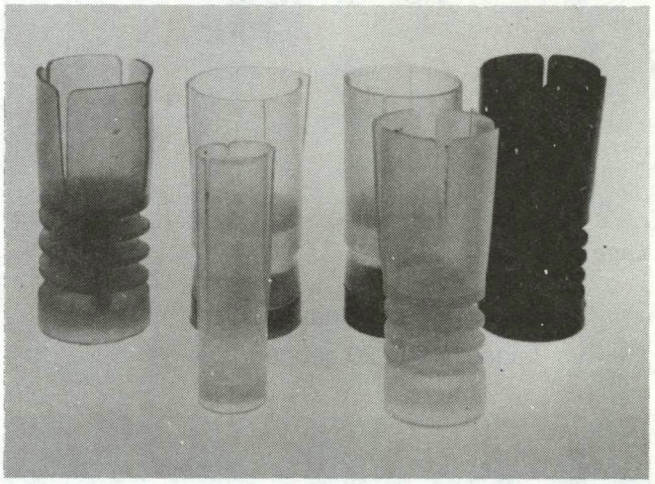
WAA28—Pink one-piece wad for use in 28-gauge skeet and field loads.

WAA41—White one-piece wad for use in .410 bore skeet and field loads.



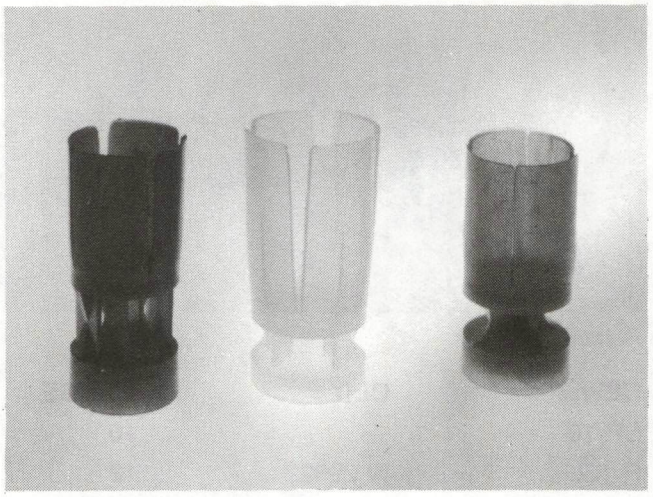
Remington Wads

NEW #	OLD #	GAUGE
SP 10	—	10
R 12L	W 29922	12
R 12H	W 29924	12
RP 12	W 29926	12
SP 12	W 29928	12
RXP 12	W 29930	12
RPA 12	W 23694	12
R 16	W 29932	16
SP 16	W 29934	16
SP 20	W 29944	20
RP 20	W 23678	20
RXP 20	W 29942	20
SP 28	W 23680	28
SP 410	W 23668	.410 BORE
SP 4103	W 23670	.410 BORE



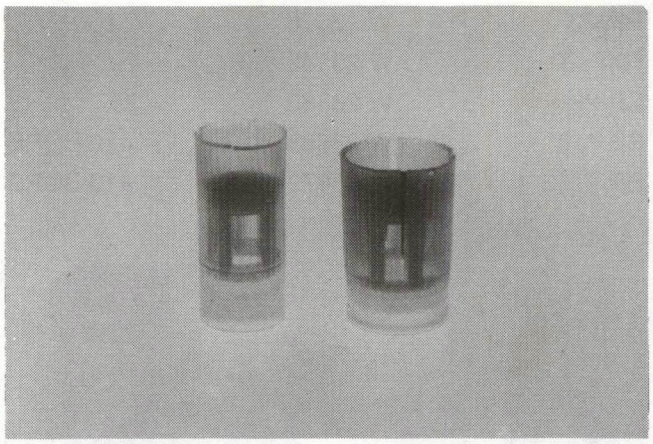
Federal Wads

12S3—Pink 12 gauge
12S0—White 12 gauge
12S4—Brown 12 gauge
12C1—Red Base 12 gauge
20S1—White 20 gauge
28S1—White 28 gauge
410SC—White .410 bore



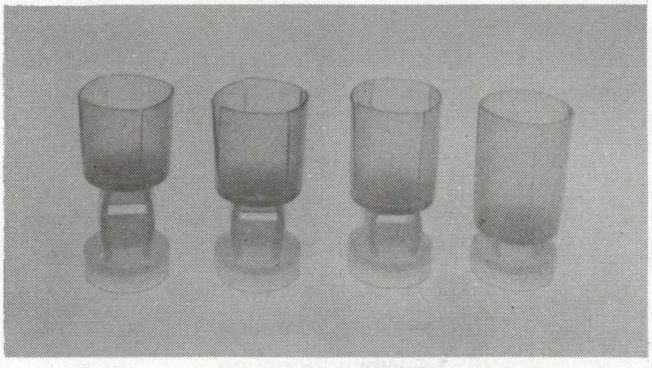
Pacific Wads

480052—White Versalite 10 gauge
480050—Red Versalite 12 gauge
480025—Green Verelite 12 gauge
480027—Blue Verelite 12 gauge
480051—White Versalite 20 gauge



Lage Uniwads

Lage Uniwad 12 gauge
Lage Uniwad 20 gauge



Activ Wads, left to right; Activ T-28, Activ T-32, Activ T-35, Activ T-42

Section 5 - Shot

SELECTING SHOT— NO LONGER A SHOT IN THE DARK

There are two kinds of shot—lead and steel. At the time of this writing, little information is available regarding the use of steel shot. Bear in mind that steel shot is not interchangeable with lead shot. The factory-loaded steel shot loads that are available use high breech pressures to get the shot moving at high speeds to compensate for the lighter pellet weight.

UNTIL MAJOR COMPONENT MANUFACTURERS START RECOMMENDING COMPONENTS FOR USE WITH STEEL SHOT, WE SAY DON'T DO IT.

Lead shot is available in several types.

SOFT SHOT—Soft shot contains up to 0.5 percent antimony alloyed with the lead and is the softest shot available. Soft shot performs best for skeet and close range shooting. For any targets under 20 to 25 yards this shot provides a distinct advantage. The softer the shot, the more each pellet will deform when when the shotgun is fired. When shooting quail, grouse, some pheasants, etc., an open-bored choke with soft shot will spread the pattern for efficient shooting at short ranges.

HARD SHOT—Shot containing more than 0.5 percent antimony is known as hard shot. Hardness increases as the antimonial content increases and so does the cost. The amount of antimony alloyed with the lead in the pellets is varied by the manufacturer depending on the purpose for which the shot is designed. Most of the commercially "bagged" shot is in this category and contains about 1 to 2 percent antimony. This shot performs best at medium ranges from 25 to 40 yards. Factory loads (first-line ammo) will have shot in this hardness range.

EXTRA-HARD SHOT—Current top-of-the-line target ammunition made by Federal, Remington and Winchester in 7 ½ and 8 shot size has an antimonial content between 5 ½ and 6 ½ percent. If a reloader desires to duplicate this level of shot hardness in his reloads, he will have to buy All-American's High Antimony Magnum Shot, Lawrence's Magnum Brand or Remington's RXP Grade shot. All of these particular brands have 6 percent antimonial lead in 7 ½ and 8 shot size. Extra-hard shot is used for shooting that demands tight patterns at long range. Typical uses are trap, especially handicap trap and live-pigeon shooting. This shot is perfect for pass shooting at ducks and geese and on those occasions when upland-birds are flushing at great distances. Complete specifications of both All-American and Lawrence brands of shot follow in this section.

PLATED LEAD SHOT—Plated shot is usually (check the "Spec" sheets) extra-hard lead shot electroplated with copper or nickel to resist bore deformities better and to enhance penetration of game. This shot is just amazing. It just doesn't pull feathers into game. It is by far the best secret weapon for long-range performance available.

The most important thing is to know how to buy whatever hardness of shot you desire. SAAMI, the Sporting Arms and Ammunition Manufacturers Institute set the standard of antimony percentages in "soft" and "hard" shot. The problem is that not every arms and ammunition manufacturer belongs to SAAMI. In fact, the only shot makers that belong to SAAMI are Remington and Winchester. Shot manufacturers have marketed their products with names like "chilled lead shot," "American standard hard shot," "hard lead shot," "extra-hard lead shot," "hard chilled shot," etc. Years ago shot which that did not contain any antimony was called soft or drop shot, while shot containing antimony was called chilled shot. "Soft" and "hard" have clear meanings on a common sense level but beware of these same words of a bag of of shot. The solution to our problem is for shot manufacturers to stamp the actual antimonial content on the bag. Perhaps this will happen in the future. For now, we have specification sheets from some manufacturers that give the antimony percentages so we can make our choice.

Most of today's shot is produced by pouring molten lead through a perforated pan. As the lead passes through the holes, it free falls through the air into a water tank where it cools and is collected. The total amount of fall may be from 160 to 195 feet in a "shot tower."

Once the shot has cooled, it is transported by conveyors on a journey where it is graded, sorted by size and polished by a tumbling action in graphite. Any shot that is out of round or does not fall in the size tolerances is automatically rejected and returned to the melting pot.

Although the process is the same for all, some shot is harder to produce than others. Cold weather is an advantage in producing the larger sizes of alloyed shot. Buckshot cannot easily be made by the drop method. It is usually swaged on automatic machinery from lead wire.

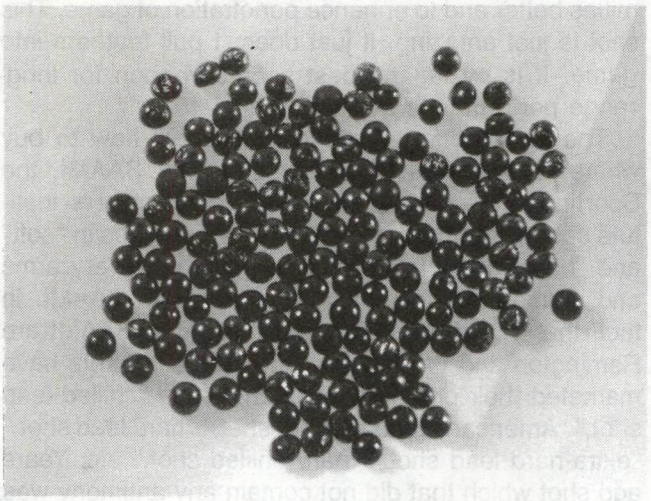
Carefully graded shot is usually selected for plating purposes whether it is copper or nickel plated. Plated shot is expensive. Where most shot is packaged in cloth bags of 25 pounds each, plated shot is bagged in amounts of 10-11 pounds and is just recently being packaged in plastic jars of 5 pound amounts. The extra-hard or plated shot should be used when you need the absolute maximum in range and pattern performance.

Shot deformation occurs in several ways. If shot is allowed to touch the barrel, the scrubbing action produces a flat surface on the pellet. This pellet tends to have an erratic flight and will have a greater than normal loss of velocity. Deformation is also caused by acceleration of the bottom layers of shot crowding together, being crunched into the forcing cone and, finally, the squeeze of the choke.

Shot deformation can be reduced three ways. (1) Hard or plated shot resists deformation. (2) The petals of the plastic cup around the shot charge will greatly reduce flats caused by bore scrubbing. (3) A cushion type wad will tend to collapse gradually under force of the powder gasses and will transmit less impact to the shot.

Nothing is more important to a shooter than his shotgun, the pattern it shoots, and the downrange performance of his reloads. If factory-loaded shells are assembled using hard shot and the other components are up to par, the gun should shoot top quality patterns. Any compromise will result in inferior patterns and downrange performance. This happened in the early 1970's when the cost of lead and alloys used to harden lead took a dramatic jump in price. We heard the Russians bought up most of the lead supply on the world market. Then, after the Three Mile Island incident, we heard that all nuclear reactors had to have another layer of lead bricks added. Whatever happened, the net result was that a bag of shot doubled, tripled, then quadrupled in price. Gone forever was the $5.00 25-pound bag of shot.

What happened then? Well, the ammunition manufacturers cut the percentages of the expensive alloys in certain types of shot. Many factory loads, such as the promotional Dove and Quail, Duck and Pheasant, Rabbit and Squirrel, Sparrow and Crow, Skunk and Coyote, etc., were introduced to the market. These loads are inexpensive compared to the others, and if ever there is a perfect example of the buyer getting what he paid for, this is it. If this seems like throwing a brick at the shotshell industry, it is not. Ammunition manufacturers were caught in a crunch and all companies were faced with the same problem. Rising costs from inflation of raw materials had already made shotshells so expensive that many shooters were in danger of being priced out of the market. To prevent more drastic price increases, antimony percentages dropped when the price of lead and antimony skyrocketed. These new "promotional" loads contained relatively soft shot, in reduced amounts, which wasn't graded very close sizewise. Reloadability suffered too, because the manufacturers cut as many corners as possible to keep the cost low. In many areas of the country the traditional field load for doves and quail was once a 3 1/4 dram and 1 1/4 ounce load. The amount of shot gradually was cut to 1 1/8 ounce, and now to 1 ounce. Many people believe that a 1 ounce load of shot belongs in a 20-gauge field load. In the picture below you will see lead pellets that I removed from a well-known manufacturer's promotional load during the middle 70's.



These pellets haven't even been down the barrel yet. If they aren't round and true to start with, what will they look like after the shock of acceleration, the crunch of the forcing cone and the squeeze of the choke. Well, probably they'll look like a bunch of frisbees—and fly like frisbees do, too.

It seemed like a price war was going on at the same time. The red "bullets" cost about the same as the black and wine colored ones did. All manufacturers were trying to get their product to the market place at the lowest price. While this is a prime example of the free enterprise system in action the quality of the product suffered. Many of us will remember the gasoline wars of the '50's and '60's; it seems like that fuel always knocked more, too.

Some information such as the amount of shot, is written on the box label, but some of it isn't, such as the alloy content of the lead. Similarly, the bags of shot didn't show the hardness, or it was misleading or overstated. To top it off, some outdoor writers failed to mention it, didn't know, or glossed it over. Choosing shot was somewhat of a shot in the dark.

After reading Bob Brister's book *Shotgunning, The Art And The Science* published in 1976, many people, for the first time, learned, and then understood, the score on shot hardness and pattern efficiency. During this time, some knowledgeable shooters turned to the target loads as a source for empty hulls because of the reloadability problem. And, low and behold, did they make a startling discovery. The lowly trap load that so many sportsmen think is barely enough to break a clay pigeon was a deadly dove and quail load. And, they had the best of all hulls to reload.

This writer, on several occasions, has seen money change hands when this lesson was learned. The 3 dram 1 ⅛ ounce trap load (which has a high, about 6 percent antimonial content as well as almost perfectly

round pellets) just shot rings around the high brass 1 ¼ oz. "rocket" loads that you "have to use when the birds fly high." Remember "Joe" who doesn't reload? Well, Joe paid for his lessons and yours truly made some good buys on once-fired hulls from him when he began to use and wager on the lowly trap loads. Oh yes, as I remember, Joe finished a winner before word got around about what he was doing. No, Joe still doesn't reload, but he is still a good source of once-fired compression formed hulls.

It is a mystery why no major manufacturer has introduced these high-quality "target" loads in a new package with a different name like Super Dove and Quail. I have discussed this possibility with a sales representative of a major manufacturer. He agreed that the concept would make for an excellent load, but went on to say that it probably would never happen as the promotional loads were selling without any problems. "Anyway," he said, "the Super Dove and Quail load would be so good that the hunter success ratio would be higher." When I asked what would be wrong with that, he replied, "We wouldn't sell near as much ammunition as we do now if the loads were that good!" Well, I didn't waste much more time with that manufacturer's hero.

Gradually, the value of antimony was being realized and some changes began. In the late 70's and early 80's, shot manufacturers began to improve their shot products and advertise in words that we could understand. Now we reloaders and shooters have clear choices of the shot products that will fit our reloading needs and requirements.

Charts from the ALL AMERICAN and LAWRENCE Brands of shot products are reprinted below. They show the different types, sizes, counts and alloys of shot with a down-to-earth description of each. As a point of interest, it can be observed from the shot size chart that shot diameter is equal to 17 minus the shot size number, e.g., #4 shot is .13" in diameter, #6 is .11", etc.

GRAPHITE-COATED ALL-AMERICAN CHILLED SHOT (American Standard)

Shot Name or Number	Diameter (inches)	Pellets/Oz. (approx.)	Weight/ Cu. Ft. (lb.)
No. 10	.07	848	434
No. 9	.08 (skeet)	568	426
No. 8½	.085	485	436
No. 8	.09 (trap)	399	436
No. 7½	.095 (game, trap)	359	438
No. 7	.10	291	438
No. 6	.11 (game)	218	435
No. 5	.12 (game)	170	437
No. 4	.13 (game)	132	439
No. 2	.15 (game)	86	
Air Rifle	.175	55	
BB	.18 (game)	50	

HIGH-PERFORMANCE ALL-AMERICAN COPPER-PLATED LEAD SHOT (American Standard)

Shot Name or Number	Diameter (inches)	Pellets/Oz. (approx.)	Weight/ Cu. Ft. (lb.)
No. 8	.09	399	436
No. 7½	.095	359	438
No. 6	.11	218	435
No. 5	.12	170	437
No. 4	.13	132	439
No. 2	.15	86	
BB	.18	50	

HIGH-PERFORMANCE ALL-AMERICAN NICKEL-PLATED LEAD SHOT (American Standard)

Shot Name or Number	Diameter (inches)	Pellets/Oz. (approx.)	Weight/ Cu. Ft. (lb.)
No. 8	.09	399	436
No. 7½	.095	359	438
No. 6	.11	218	435

GRAPHITE-COATED ALL-AMERICAN HIGH ANTIMONY MAGNUM SHOT (American Standard)

High Antimony Magnum Shot matches the performance of premier factory round ammunition, resulting in tight patterns, shorter strings, maximum density and greater range.

Shot Name or Number	Diameter (inches)	Pellets/Oz. (approx.)	Weight/ Cu. Ft. (lb.)
No. 9	.08	585	426
No. 8	.09	410	436
No. 7½	.095	350	436
No. 6	.11	220	435
No. 5	.12	170	437

GRAPHITE-COATED ALL-AMERICAN BUCK SHOT (American Standard)

Composition — 100% Lead

Shot Name or Number	Diameter (inches)	Balls/ Pound (approx.)	Weight/ Cu.Ft. (lb.)
No. 4	.24	340	424
No. 3	.25	299	426
No. 2	.27	238	428
No. 1	.30	152	437
No. 0	.32	144	437
No. 00	.33	128	437
No. 000	.36	112	437
No. T	.21	544	426

ALL-AMERICAN SHOT OF CHAMPIONS

...All-American shot is tested and proven by the experts who know. 100% accuracy depends on hard lead shot that consistently holds its shape and pattern. Shoot with the accuracy your gun was designed to deliver. Load with All-American and shoot to win.

LOADS AND SHOT SIZES

GAME	SHELL	SHOT SIZE	RECOMMENDED LOADS
DUCKS	Express	4, 5, 6	No. 4 for long range. For normal range — No. 5 or No. 6. No. 7½ for closer range over decoys.
GEESE	Express	BB, 2, 4	Goose hunters use the big loads with large shot. No. 4 shot for a denser pattern at shorter ranges.
PHEASANTS	Express	5, 6	For long shots use No. 5. On normal rise over dogs and all around, No. 6 is the favorite.
GROUSE OR PARTRIDGE	Express or Regular	5, 6 7½, 8	On the smaller birds such as ruffed grouse or Hungarian Partridge use the smaller shot. The big western grouse (sage, sooty, and blue) call for heavier loads and large shot.
QUAIL	Regular	7½, 8, 9	For early season shooting on bob-whites — when feathers are light use No. 9 shot. Later switch to No. 7½ or No. 8. On the running and wild flushing type quail, larger shot is sometimes used.
DOVES AND PIGEONS	Regular or Express	6, 7½, 8	On mourning doves at normal ranges regular No. 7½ or No. 8 shot — but for larger ranges use Express No. 6 or No. 7½. Same load on band-tailed pigeons and white wings.
WOODCOCK	Regular	7½, 8, 9	Choice depends on ranges at which game is shot. For fast shooting in the alder thickets, No. 8 shot is a good choice.
RABBITS	Regular or Express	4, 5, 6	For cottontail rabbits at normal range. Use regular for jack-rabbits and express for snow shoe rabbits.
SQUIRRELS RAIL	Express or Regular	5, 6, 7½, 8, 9	Most hunters use 5's or 6's and prefer the heavy loads in the tall timber. For the little sora rail No. 8 or No. 9. Many hunters use No. 7½ on the marsh hen or clapper rail.
TURKEY	Express	BB, 2, 4	Choice depends on range. If you're a good caller use No. 4; BB's and No. 2's are best for long shots.
FOX	Express	BB, 2	It's a toss-up between BB's and No. 2 shot. But remember — the smaller the shot, the denser the pattern.

MISCELLANEOUS SHOT SHELL LOADING INFORMATION

SHOT			STANDARD SHOT		
Oz. of Shot Per Shell	Grain Weight	Shells From 25 Lb.	Shot Size	Diameter	Approx. No. Per Oz.
3/8	164	1067	No. 10	.07	850
1/2	218	872	No. 9	.08	570
5/8	273	640	No. 8	.09	400
3/4	328	533	No. 7½	.095	340
7/8	382	457	No. 6	.11	220
1	437	400	No. 5	.12	170
1-1/16	464	376	No. 4	.13	135
1-1/8	492	355	No. 3	.14	105
1-3/16	519	336	No. 2	.15	85
1-1/4	546	320			
1-3/8	601	291			
1-1/2	656	266			
1-5/8	710	246			
1-3/4	765	228			
1-7/8	821	213			
2	874	200			
2-1/4	984	178			

In speaking of shotgun ballistics, the term "shot pattern" is usually the prime consideration. That is, the percentage of pellets within a 30" circle from a 40 yard range. Of course pattern is an important consideration, but not the only one. Pattern is only one dimension of a shot charge in flight. Of equal importance is the shot "string." String refers to the length of the shot group, from the first pellet to strike the target to the last.

For optimum shot pattern and string, pellets in shot charge must be of uniform size, density and roundness. To prevent shot distortion at the instant of firing, the lead must be hardened by the addition of alloy metals.

All-American lead shot is quality engineered for maximum hardness, precision roundness and consistent size through an exclusive patented process. So load with All-American. It's your best shot.

BUCKSHOT SIZES

This chart gives a cross-reference between American Standard and Western Standard shot sizes. There are slight specification variations between the two.

AMERICAN STANDARD SIZES

#4 Buck	.24''
#3 Buck	.25''
#2 Buck	.27''
#1 Buck	.30''
0 Buck	.32''
00 Buck	.33''
000 Buck	.36''

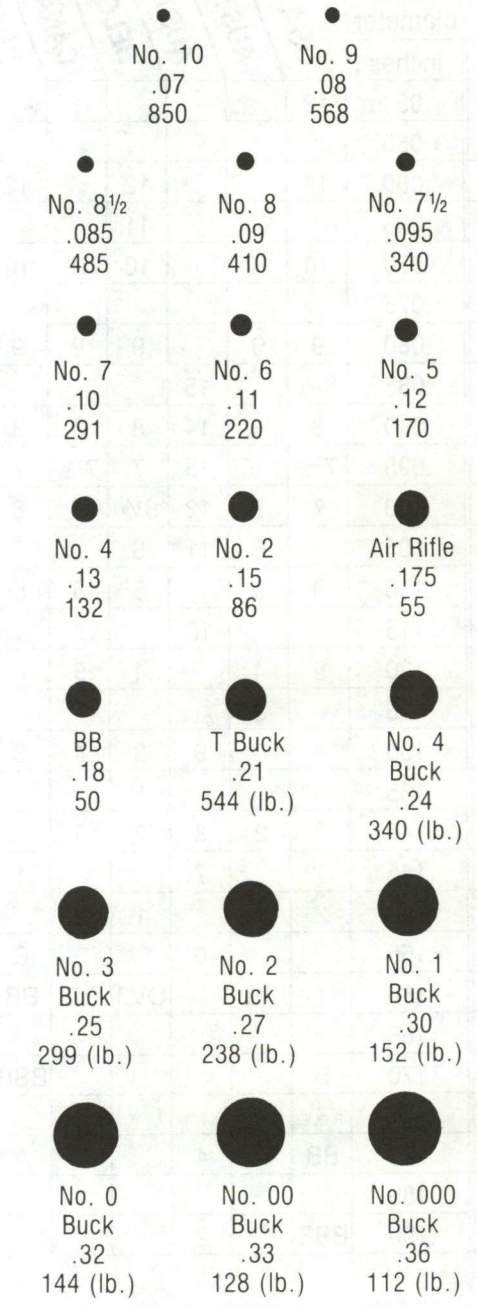
WESTERN STANDARD SIZES

Western	American	Diameter
—	#4	.24''
9	#3	.25''
8	—	.26''
7½	#2	.27''
7	—	.28''
6	—	.29''
5	#1	.30''
4	0	.32''
3	00	.33''
2	000	.36''
1	—	.38''

ALL-AMERICAN

SHOT SIZES

The circles printed here enable you to accurately check sizes of lead shot from No. 10 through 000 Buck. As you well know, the diameter increases by .01" for each number size from 2 through 10. Half sizes, like No. 7½, increase by .005" over the diameter of the full number (No. 7) preceding it.



COMPARISON OF WORLD SHOT SIZES (APPROXIMATIONS ONLY)

diameter		USA*	AUSTRALIA	AUSTRIA	BELGIUM	CANADA	ENGLAND	FINLAND	FRANCE (PARIS)	GERMANY	HOLLAND	ITALY	POLAND	RUSSIA	SPAIN	SWEDEN	SWITZERLAND	TURKEY
mm	inches																	
1.27	.05	12																
1.397	.055																	
1.524	.060	11			12		12	0	11	11	12	12			12	0000		12
1.651	.065				11													
1.778	.070	10	10		10	10	10	1	10	10	10	11		10	10		10	11
1.905	.075											10						
2.032	.080	9	9		9	9	9	2	9	9	9	9½		9	9	000	9	10
2.159	.085	8½		15					8½			9						
2.286	.090	8	8	14	8	8	8	3	8	8	8	8	14	8	8	00		9
2.413	.095	7½		13	7	7½	7		7½	T7	7	7½	13			0		
2.54	.100	7	7	12	6½	7	6	4	7	7	6	7	12	7	7	2	8	8
2.667	.105		6	11	6							6						
2.794	.110	6	5		5	6	5	5	6	6	5		S11	6	6	3	7	7
2.921	.115			10								5						
3.048	.120	5	4		4	5	4	6	5	5	4		10	5	5			6
3.175	.125		3									4						
3.302	.130	4		9	3	4	3	7	4	4	3	3	9	4	4	5	6	5
3.429	.135																	
3.556	.140	3	2	8	2	3		8	3	3		2	8	3	3		5	4
3.683	.145			7			1											
3.810	.150	2	1		1	2			2	2	1	1		2	2	7	4	3
3.937	.155			6			B					0						
4.064	.160	1	BB		OV3	BB	BB		1	1	OV3		6	1	1	9	3	2
4.191	.165											2/0						
4.318	.170	B					BBB		0	0		3/0		0				1
4.445	.175	AIR RIFLE				AIR RIFLE												
4.572	.180	BB		4			A		00	2/0		4/0	4	2/0				0
4.699	.185															10		
4.826	.190	BBB		2					000				2		3/0			T

*U.S.A. sizes are standard in this chart. The sizes and diameters shown for other countries are approximate.

Lawrence Brand™ Shot

Chilled, Drop, and Buck Shot. Highly polished, uniformly round, accurately sized, and consistently dense. Graphite coated.

Type of Shot	Shot Name or Number	Diameter (in.)	Pellets/Ounce (approx.) Std. Chill Alloy	Pellets/Ounce (approx.) High Antimony Magnum Alloy	Weight/ Cu. Ft. (lb.)	Specific Gravity
Graphite-Coated LAWRENCE BRAND™ CHILL SHOT (American Standard)	Fine Dust	.03 and finer			445	10.90-11.00
	Dust	.04	4565	4715	439	
	No. 12	.05	2335	2459	435	
	No. 11	.06	1350	1422	435	
Equivalent Hardness Factor:	No. 10	.07	850	895	434	
Game Sizes	No. 9	.08 (skeet)	570	605	426	
BB, 2, 4, 5, 6–1% Antimonial Lead Alloy	No. 8	.09 (trap)	400	422	436	
	No. 7½	.095 (game, trap)	340	359		
Target Sizes	No. 6	.11 (game)	220	231	435	
7½, 8, 9 — 2% Antimonial Lead Alloy	No. 5	.12 (game)	168	172		
	No. 4	.13 (game)	132	135	439	
	No. 2	.15 (game)	86	90		

Type of Shot	Shot Name or Number	Diameter (in.)	Pellets/Ounce (approx.)	Weight/ Cu. Ft. (lb.)	Specific Gravity
Graphite-Coated LAWRENCE BRAND™ DROP SHOT (American Standard)	Fine Dust	.03 and finer		445	10.90-11.00
	Dust	.04	4565	439	
	No. 12	.05	2326	435	
	No. 11	.06	1346	435	
	No. 10	.07	848	434	
Equivalent Hardness Factor:	No. 9	.08 (skeet)	568	426	
½% Antimonial Lead Alloy	No. 8	.09 (trap)	399	436	
	No. 7½	.095 (game, trap)	359	438	
	No. 6	.11 (game)	218	435	
	No. 5	.12 (game)	168		
	No. 4	.13 (game)	132	439	
	No. 3	.14 (game)	106	439	
	No. 2	.15 (game)	86		
	No. 1	.16 (game)	71	437	
	No. B	.17 (game)	59	434	
	Air Rifle	.175	55		
	No. BB	.18 (game)	50		
	No. BBB	.19 (game)	42	440	

Type of Shot	Shot Name or Number	Diameter (in.)	Balls/Pound (approx.)	Weight/Cu. Ft. (lb.)
Graphite-Coated LAWRENCE BRAND™ COMPRESSED BUCK SHOT (Western Standard)	No. 9	.25	299	426
	No. 8	.26	263	436
	No. 7½	.27	238	
	No. 7	.28	232	438
	No. 6	.29	186	435
Composition: 100% Pure Lead (ASTM B29-55)	No. 5	.30	152	
	No. 4	.32	144	439
	No. 3	.34	128	437
	No. 2	.36	112	
	No. 1	.38	96	437

Type of Shot	Shot Name or Number	Diameter (in.)	Balls/Pound (approx.)	Weight/Cu. Ft. (lb.)
Graphite-Coated LAWRENCE BRAND™ BUCK SHOT (American Standard)	No. 4	.24	340	424
	No. 3	.25	299	426
	No. 2	.27	238	428
	No. 1	.30	152	437
	No. 0	.32	144	437
Composition: 100% Lead	No. 00	.34	128	437
	No. 000	.36	112	437
	No. T	.20	544	426

High-Antimony Magnum Shot. Matches the performance of premier factory round ammunition, resulting in tight patterns, shorter strings, maximum density, and greater range. Graphite coated.

Type of Shot	Shot Name or Number	Diameter (in.)	Pellets/ Ounce (approx.)	Weight/ Cu. Ft. (lb.)	Specific Gravity
Graphite-Coated LAWRENCE BRAND™ HIGH ANTIMONY MAGNUM SHOT (American Standard)	No. 9	.08	585	426	10.90-11.00
	No. 8	.09	410	436	
	No. 7½	.095	350	436	
Equivalent Hardness Factor:	No. 6	.11	225	435	
Game/Target Sizes	No. 5	.12	170	437	
BB, 2 — 2% Antimonial Lead Alloy	No. 4	.13	135	439	
4, 5 — 3% Antimonial Lead Alloy	No. 2	.15	87	440	
6, 9 — 4% Antimonial Lead Alloy	No. BB	.18	50	442	
7½, 8 — 6% Antimonial Lead Alloy					

Copper-Plated Magnum Shot. Retains more shot with less deformation, in shorter shot strings, at maximum velocity and penetration. Results: uniformly superior patterns required for long-range hunting. Wax coated.

Type of Shot	Shot Name or Number	Diameter (in.)	Pellets/ Ounce (approx.)	Weight/ Cu. Ft. (lb.)	Specific Gravity
Wax-Coated LAWRENCE BRAND™ HIGH ANTIMONY COPPER-PLATED MAGNUM SHOT (American Standard)	No. 9	.08	605	435	10.90-11.00
	No. 8	.09	422	435	
	No. 7½	.095	359	435	
Equivalent Hardness Factor:	No. 6	.11	226	435	
Game/Target Sizes	No. 5	.12	172	437	
BB, 2 — 2% Antimonial Lead Alloy	No. 4	.13	135	439	
4, 5 — 3% Antimonial Lead Alloy	No. 2	.15	88	440	
6, 9 — 4% Antimonial Lead Alloy	No. BB	.18	52	442	
7½, 8 — 6% Antimonial Lead Alloy					

BUCKSHOT AND SLUGS—Buckshot and rifle slugs can be used in reloading shotshells. We can think of only two reasons why someone would want to do this specialized type of reloading: To say that you have done it; or to have a much greater appreciation for those cute little "five-paks" of buckshot and slugs that the factory loads. If you must persist, some reloading information for buckshot is included in the data section.

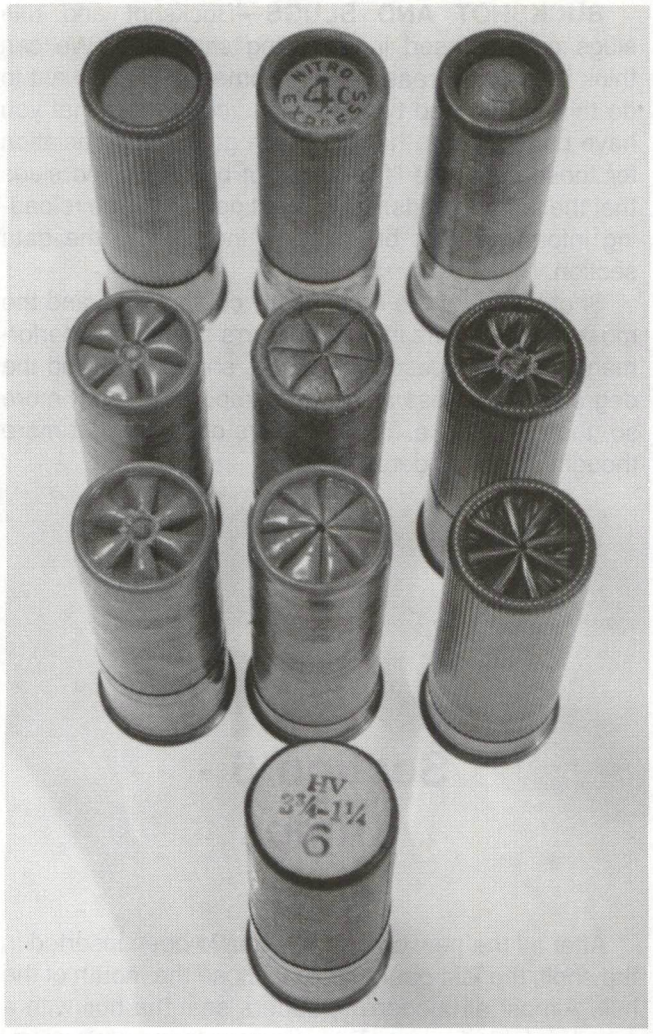
Shot is one of the most costly components and the most critical factors in our shotgun's downrange performance. In most cases the brand, shape, size and the degree of hardness are just as important, if not more so, than the choke. These factors deserve a lot more thought and consideration.

Section 6 - Crimps

After all the new components have been inserted in the shell, the last operation is to close the mouth of the hull. Almost all modern reloaders seal the hull with a "star" or folded crimp. The crimp performs several important functions. It seals out dirt and moisture and keeps shot from leaking out of the hull. The crimp also helps confine powder gasses to ensure efficient combustion.

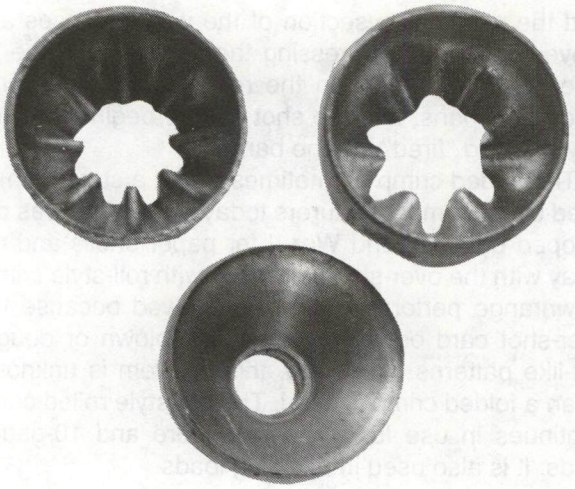
You can't have top quality reloads without a good crimp. With one-piece plastic wads, the quality and resistance from the crimp is absolutely essential to proper and uniform combustion. Before the crimp opens, there is a split second when the powder begins to burn well, the gas seal of the plastic wad obturates, and the cushioning section of the wad collapses and moves forward, compressing the shot against the inside of the crimp. Then the resistance of the crimp gives up, opens, and the shot charge begins the journey of being "fired" out the barrel.

The folded crimp (sometimes called a star crimp) is used by most manufacturers today. This crimp was developed before World War II for paper shells and did away with the over-shot card used with roll-style crimp. Downrange performance was improved because the over-shot card occasionally caused blown or doughnut-like patterns. Generally, this problem is unknown when a folded crimp is used. The old-style rolled crimp continues in use for some .410 bore and 10-gauge loads. It is also used in rifle slug loads.

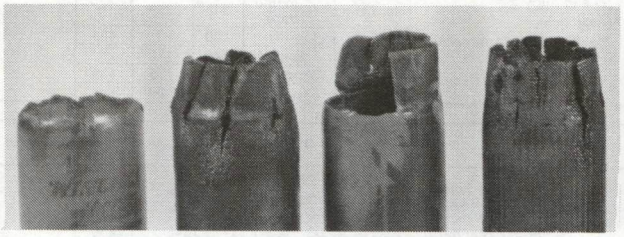


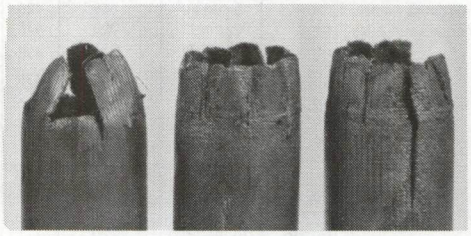
Different Types of Crimps

Today's factory-folded crimps come in two types—8-point and 6-point. Both are satisfactory. For best results, the crimp of your reloaded shell should duplicate the original hull mouth creases. For this reason MEC includes 6 and 8-point crimp starters for plastic hulls and a smooth cone crimp starter for paper hulls.



Shotshell reloading presents some special ignition problems, primarily because of the changing characteristics of the mouth of the hull. Both the old paper and the modern plastic hulls become worn, split or otherwise weakened at the mouth with repeated crimping. This is precisely where most of today's hulls wear out. Some of the more popular 12-gauge hulls with worn-out mouths are pictured.





We could reload and crimp these hulls again but they could possibly open up during our hunt, leak the shot to the bottom of our shell bag and go "PUFFFFFFFFF" if we mistakenly try to shoot them during the heat of a covey-rise. We are all guilty at one time or another of trying to get one more load out of our hulls. And remember, every time Joe hears a blooper he'll holler as loud as he can, "PULL THE TRIGGER HARDER!"

WARNING—IF YOU HEAR AN "OFF-NOTE" SOUND INSTEAD OF A NORMAL REPORT, CHECK THE BORE OF YOUR SHOTGUN FOR A "LODGED" WAD. IF THERE IS AN OBSTRUCTION THE NEXT SHOT COULD CAUSE A BURST BARREL AND POSSIBLY SERIOUS INJURY. DON'T TAKE A CHANCE—CHECK YOUR BARREL!

Without a good crimp you can't have top quality reloads. Anything less will reduce performance and can be a cause of bloopers. Uniform ignition requires confinement of the powder. Loosely confined powder results in muzzle flash, a off-note report, light recoil and little velocity. The problems of worn and weakened crimps are compounded when using a slow burning powder and/or firing these loads in colder weather. Cold weather can reduce the burning rate of powders to the point of actually stopping ignition. A firm crimp is a must for cold weather performance.

Using a slow-burning powder with a light shot charge will sometimes give dubious results. A firm deep crimp is required on a relatively light loading, because it resists immediate shot and wad movement and traps the powder gases to develop its pressure curve reliably. If

the mouth of the hull is weakened from repeated reloading, initial energy from the primer and early gases can push a light load forward before the desired burning takes place, and the result is erratic performance. Uniform performance usually results when using a fast-burning powder with light shot charges, a medium-speed powder with intermediate weight charges and a slow-burning powder with heavy loads. Strong, firm crimps are most important when using slow-burning powders.

It is interesting to note that most ballistic engineers will not use a load with a pressure less than 9,000LUP (lead units of pressure) and prefer those around l0,500LUP. For our serious shooting and hunting activities, we use, and suggest using, once- or twice-fired hulls. This practice will go a long way in solving defective crimping problems. Hulls with worn-out mouths simply cannot accommodate a firm crimp. A defective crimp can open and leak shot—either in your shell bag, or worse, in the magazine of your gun. No damage may result but your shooting will be shut down until the shot is cleaned out. If a crimp opens in the barrel, shot can leak out and a blooper might result.

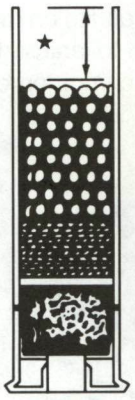
Always remember, the finish crimp that we get from our reloader will, to a great extent, depend on the condition of the hull's mouth and the adjustment and condition of our crimping die. The bore of this die is made to exacting tolerances and should be protected between periods of reloading. A light coating of a good quality oil such as OUTERS GUN OIL is suggested on the chrome-plated steel die as a rust and corrosion preventive. OUTERS GUN OIL is polarized so that it naturally attracts to and bonds with the metal, forming a barrier to rust and corrosion. Be sure to remove all oil and check for possible rust and residue before actual use. If rust or residue is found, a fine grade of steel wool and a good measure of elbow grease should solve the problem. The new crimping die made of DuPont ZYTEL is absolutely rust-free and resists the build-up of of the residue carried into the die on fired hulls. Maintenance requires only an occasional cleaning with any household detergent applied with a cloth or swab.

With single stage MEC reloaders, closing the hull is a two-step operation—"crimp start" at station #4 and "finish crimp" at station #5. First, a self-aligning SPINDEX crimp starter automatically adjusts to the original shell mouth creases and partially closes the hull. Then the hull is tightly closed and tapered with MEC's patented cam-actuated crimping die. On MEC progressive reloaders, a third and final die tapers the crimp.

Most MEC reloaders are shipped from the factory set up, adjusted and tested to crimp 8-point hulls. In 16-gauge, 28-gauge and .410 bore, the reloader is set up to crimp 6-point hulls. Of course, we must make a change if we reload anything that doesn't match the factory set-up. For example, if we are going to reload 12-gauge Federal GAME hulls, we most likely will have to change out the 8-point crimp starter and use the 6-point one because the majority of the Federal GAME hulls were originally factory crimped with a 6-point folded crimp.

When a factory shell is fired, the crimp area of the hull will have a "memory" of the original crimp. We can visually determine whether the original was a 6- or 8-point crimp, and we can set up our MEC press accordingly. Final crimping will bring these folds together neatly in the center, then recess the center of the folded area to lock the folds in place. When all adjustments are correct, the folds of both paper and plastic hulls will meet perfectly in the center with no spiral overlap of the hull (called "swirl") or a hole that might leak shot.

While the wad is primarily concerned with sealing and cushioning the rapidly expanding gases given off by the burning powder, an important secondary function is performed. It is in connection with the volumetric capacity of the empty hull itself and that of the powder and shot charge used.

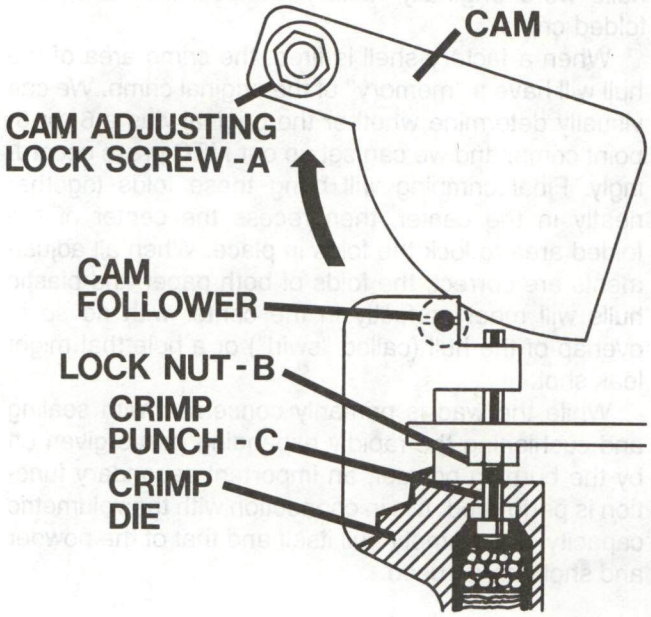


CRIMP SPACE REQUIRED

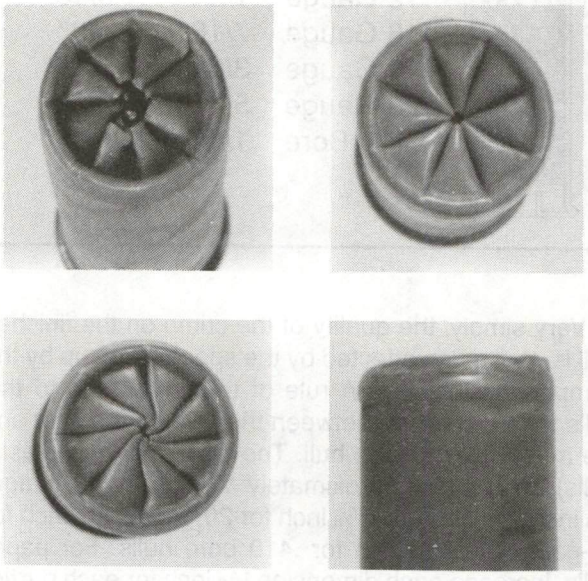
Size	Plastic★	Paper★
12 Gauge	1/2″	9/16″
16 Gauge	7/16″	1/2″
20 Gauge	3/8″	7/16″
28 Gauge	5/16″	3/8″
.410 Bore	1/4″	5/16″

Very simply, the quality of the crimp on the finished hull is very much affected by the space taken up by the components column. A rule of thumb relating to this calls for a difference between the level of the shot and the mouth of the open hull. The dimension (for plastic hulls) should be approximately ½ inch for 12-gauge, 7/16 inch for 16-gauge, 3/8 inch for 20-gauge, 5/16 inch for 28-gauge and ¼ inch for .410 bore hulls. For paper hulls, increase each dimension 1/16 inch for each particular gauge. Remember that this is an approximate dimension that may have to be adjusted slightly to suit the method of crimping used on your particular reloader.

TO ADJUST THE CAM-OPERATED CRIMP DIE—



The cam-operated crimp die on MEC reloaders is adjusted at the factory to give best overall results on most varieties of hulls. It may be necessary to adjust the cam slightly to obtain the best possible crimps on certain types of hulls.



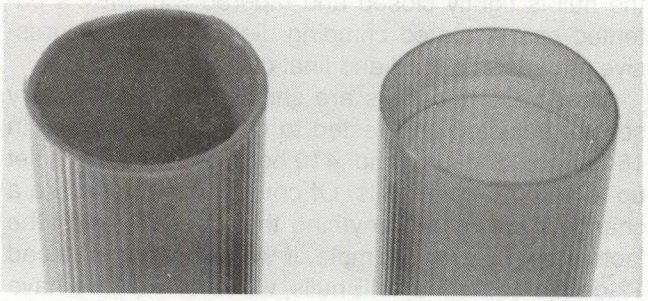
Four Reloads Showing: Hole, Correct Crimp, Spiral Crimp, and Wrinkled Crimp.

If the crimp is not centered, or if crimp has a spiral configuration, loosen cam adjusting lock screw "A" and rotate the cam upward in the direction of the arrow. If an opening at the center of the crimp is evident, rotate the cam in the opposite direction. If a wrinkled crimp is evident, rotate the cam upward in the direction of the arrow. NOTE: When adjusting, move cam only a fraction of an inch at a time, testing frequently. A 1/32 inch move may be sufficient. To increase or decrease the depth of the crimp, loosen locknut "B" and screw crimping punch "C" down or up.

Some plastic hull factory loads are unskived (skived hulls are thinned and tapered at the mouth) and required a friction or heat seal to close the opening at the center of the crimp. This heat seal will bond the folds of the crimp together and this bonded spot will blow out when fired. When reloaded, these hulls will often show a small hole in the center of the crimp. Usually the hole isn't large enough to leak shot and will cause no harm. The hole can be closed with a few drops of candle wax if desired.

Factory Shell With Heat Sealed Crimp , Reloaded Shell Showing "Hole" and Shell with "Hole" Closed With Candle Wax.

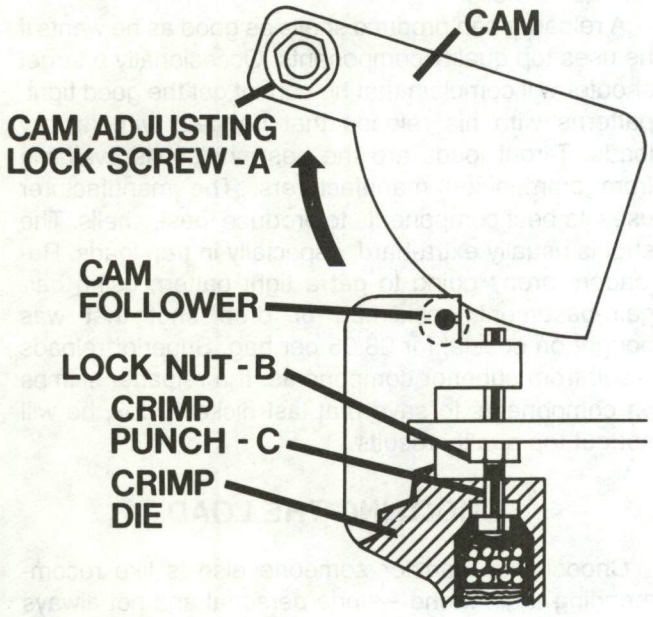
Most factory 8-point crimps have skived mouths and usually are easy to crimp. The skiving process is an additional expense during manufacturing and is usually lacking in the promotional loads. Remember manufacturers have to cut corners to get the cost down on these promotional loads and it is at the expense of the reloadability. The following picture shows the mouth of skived and unskived hulls. Notice the thickness of the unskived hull. The thick and tough mouth doesn't contribute to the reloadability of this type of hull.



The thickness of unskived hulls does contribute resistance required to get optimum ignition, however. Adequate crimp resistance is obtained with a shallower crimp than on hulls with skived mouths. Sometimes problems are created unless the cam-operated crimp die is adjusted accordingly. In the following picture two reloads are shown that have a crushed or bulged tube just ahead of the metal head.

While this condition can be caused by using a wad that is too tall, it usually results in the crimp die being set to apply a firm (deeper) crimp on a skived mouth hull. MEC reloaders are adjusted and tested at the factory to give a firm crimp on skived, compression formed, once-fired hulls.

If you plan to reload non-skived hulls such as the Federal GAME, FIELD or similar hulls or the new Winchester Dove & Quail or Duck & Pheasant hulls with plastic base wads you will have to readjust the cam-operated crimp die as follows:

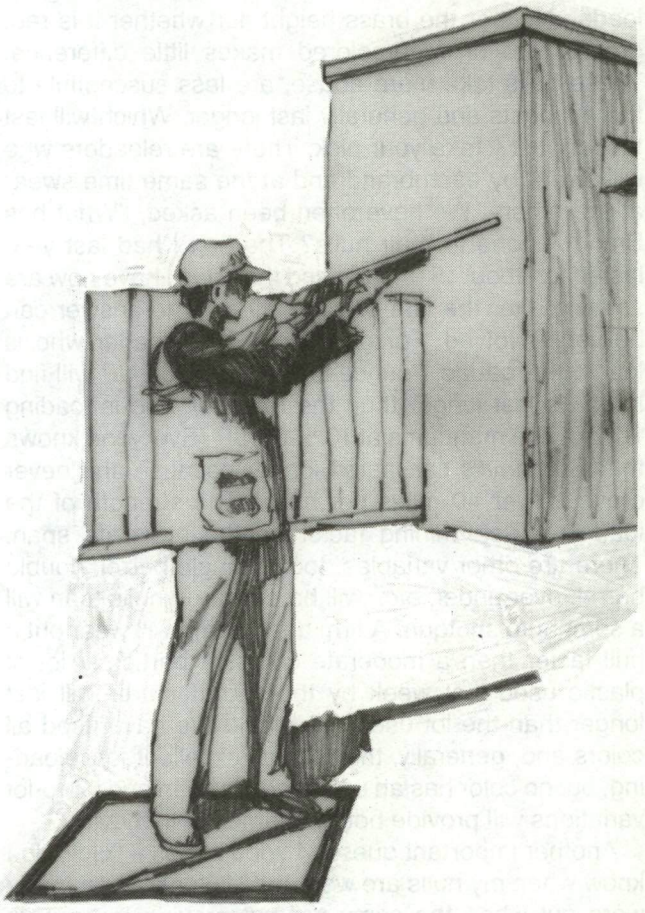


Loosen lock nut "B" and screw crimping punch "C" up 1 or 2 full turns. Loosen allen head screw "A" and raise the cam slightly (1/32-1/16 inch). Usually this will be sufficient. Tighten locknut "B" and test this setting. If the crushing or bulging problem continues, check the inside of the die for rust or residue build-up. If this is found, clean the inside of the die as described earlier.

Crimp variations can occur within the same brand and type of hulls. When a reloader buys, saves or scrounges hulls from different sources and mixes them together crimp variances can occur. Take 12-gauge compression formed hulls for instance. While the SUPER-X, SUPER-PIGEON, UPLAND and the DOUBLE-A are essentially identical, there can be slight internal volumetric differences. Usually the differences aren't critical but the finished crimps on a mixture of these hulls can be different.

The trend among shotshell manufacturers is to standardize the hulls used in their production. That trend is toward using one-piece plastic hulls (with a metal head of course—at least for now. . .)

Changes are coming. When oddball crimps start showing up from your favorite hull and recipe, don't blame your reloader. You could be dealing with an unannounced design change or component variation from the particular lot of hulls and wads that are being reloaded. As with any hull, always be certain of its identity and use the correct reloading recipe.



Chapter 7

CHOOSING A LOAD (RECIPE)

SOME GENERAL THOUGHTS ON RELOADING SHOTSHELLS

Generally it has been our observation that the one-piece, mostly plastic hull is best for the beginning reloader. Neither the brass height nor whether it is red, green, blue or wine-colored makes little difference. These hulls take more abuse, are less susceptible to the elements and generally last longer. Which will last the longest? Take your pick. There are reloaders who will swear by each brand and at the same time swear at the others. We have often been asked, "What has Brand-X done to their hulls? The box I had last year lasted for about 15 reloads and the ones I have now are splitting after the fifth or sixth firing." The answer can be very involved. For one thing, the reloader who is loading 12 gauge 1 ounce loads at 6,500 LUP will find his hulls last longer than the reloader who is loading 1-1/2 ounce magnums at 10,500 LUP. (Everyone knows that Grandma's car lasted longer because she never drove it over 40 miles per hour.) The strength of the load is a determining factor on the hull's life span. There are other variables, too. A single barrel, double barrel, over-under, etc., will be easier on hulls than will a semi-auto shotgun. A firm deep crimp will wear out a hull faster than a moderate crimp. A particular lot of plastic used last week by the manufacturer will last longer than the lot used this week. We have used all colors and, generally, they are all excellent for reloading, but no color has an unlimited life span and lot-to-lot variations will provide both extremes of longevity.

Another important question soon arises—"How do I know when my hulls are worn out?" Generally, a hull is worn out when the crimp will not provide the proper resistance for efficient powder combustion. In earlier chapters we discussed reloading hulls too many times and the problems that resulted. We have often heard reloaders say that their nearly "worn-out" hulls are used for heavy hunting loads and the "good" hulls are saved for target shooting. Remember that after a hull is reloaded several times the crimp area becomes weak. When the reloader uses a heavy high speed or magnum load the recipe will call for a slow burning powder that needs good crimp resistance to be ignited properly. If "worn-out" hulls are used in this situation, the reloader risks the chance of poor ignition, especially in cold weather, and, at the least, is not getting the desired results that could have been obtained by using his "good" hulls.

A reloader can produce shells as good as he wants if he uses top quality components. Occasionally a target shooter will complain that he cannot get the good tight patterns with his reloads that he gets with factory loads. Target loads are the best shotshells available from ammunition manufacturers. The manufacturer uses its best components to produce these shells. The shot is usually extra-hard, especially in trap loads. Reloaders aren't going to get a tight pattern using bargain-basement, reclaimed or drop shot that was bought on special for $8.95 per bag. Superior reloads result from superior components. If a reloader skimps on components to save that last nickel a box, he will not get top quality results.

CHOOSING THE LOAD

Choosing a load for someone else is like recommending a girl friend—kinda personal and not always

successful. After a shooter is sold on the concept of reloading the first major question is "What do I load?"—meaning "Which recipe do I use?" This was an easy problem several years ago during reloading clinics. I just suggested the recipe that I used for whatever purpose being considered. Gradually the same locations were visited again in later years and I got an ear full from a few people. The conversation went something like—"Those weak loads wouldn't. . .!"

The answer was not to recommend what worked for me but to ask the novice reloader what box of factory loads he would purchase if he weren't going to reload. For the majority of shooters, this is easy. The shooter would then identify the brand and type of factory load that had been used successfully in the past.

What we now do is duplicate the factory load. First, we determine the specifications of this factory load. Some of the information is on the box and some of it isn't. Let's pick a load and use it as an example of how to identify the "specs."

Our beginning handloader wants a dove hunting load, and, in the past, has always purchased factory loads in 12 gauge 3-1/4 dram equivalent with 1-1/8 ounce of shot. This load is manufactured by Federal (Field Load), Remington (Shurshot Load) and Winchester (Upland Load).

Let's look at the information on the box and analyze the factory loading. Most shooters are generally familiar with the shot size, which is a personal choice. The amount of shot loaded into each shell in our example is 1-1/8 ounces. The only other information guide is the 3-1/4 dram equivalent listing.

DRAM EQUIVALENT

A dram is a measure for black powder. When smokeless powder began to replace black powder, shooters wanted to be able to compare their smokeless powder loads with their original black powder loads. The term "dram equivalent" evolved. Dram equivalent is an indication of the velocity of a given amount of shot in a shell loaded with smokeless powder. A scheme was devised to relate the velocity and shot weights of commercial loads to the dram system that had been used with black powder.

The dram system has, for the most part, outlived its usefulness. Most shooters do not know what it means, pay little attention to it or care. Those who actually do know, have no use for the term dram equivalent at all. The knowledgeable shooter thinks in terms of a given weight of shot and the velocity required to attain satisfactory results at a given range. The manufacturers would do every shooter a favor by devising a new system.

Browning Arms Co. attempted to do this in the early 70's when its line of shotshell ammunition was introduced. Browning took in consideration both velocity and weight of the shot charge and rated each load accordingly. The following chart from a box of Browning factory loads gives a cross reference of its "Power Rating" and the dram equivalent system.

Browning's new Power Rating System is based on shot shell energy, taking into consideration both velocity and weight of the shot charge. And, depending upon shot size and choke, this Power Rating can be translated into effective range.

For example, with No. 4 shot you can expect better long range effectiveness from a 55 Power than from a 45 Power shot shell and so on down the Power scale. On the other hand, a lower Power Rating does less damage to the game, is more pleasant to shoot, costs less, and is often more ideal for smaller game and birds taken over dogs or at close ranges.

A hunter may often find it desirable to use a lower Power shell for his first shot and higher Power shells for his follow-up. The chart below identifies popular loads according to their Power Rating.

POWER RATING INDEX
Each load below is identified by drams equivalent and ounces of shot

GAUGE	60	55	50	45	40	35
12 Gauge	Max. x 1⅞*	Max. x 1½**	Max. x 1¼	3¼ x 1⅛	3¼ x 1	
12 Gauge	Max. x 1⅜*					
16 Gauge			Max. x 1¼**	3¼ x 1⅛	2¾ x 1⅛	
20 Gauge				Max. x 1¼*	Max. x 1	2½ x 1
20 Gauge				Max. x 1⅛**		2½ x ⅞
28 Gauge						All Loads
410 Gauge						All Loads

*3" Magnum Loads **2¾" Magnum Loads

The following chart shows the dram equivalent table according to industry standards and the velocity of each load. Included is a listing of the brands that Federal, Remington and Winchester load within each dram equivalent category. Check this chart and locate your favorite target or field load, then make a note of the velocity and amount of shot in ounces.

Let's find our 3-1/4 dram equivalent—1-1/8 ounce example load in this chart:

INDUSTRY STANDARDS OF FACTORY SHOTSHELL LOADINGS

GAUGE	SHELL LENGTH	DRAM EQUIV.	SHOT WT. OZ.	VELOCITY +—90 FPS.
10 ga.	2-7/8"	4-1/4 Dram equiv.	1-5/8 oz. shot	1285 fps
Remington: Express Winchester: Super-X				
10 ga.	3-1/2" mag.	4-1/4 dram equiv.	2 oz. shot	1210 fps
Federal: Hi-Power Remington: Express Winchester: Super-X				
10 ga.	3-1/2" mag.	4-1/2 dram equiv.	2-1/4 oz. shot	1210 fps
Federal: Premium Winchester: Super Double-X				

GAUGE	SHELL LENGTH	DRAM EQUIV.	SHOT WT. OZ.	VELOCITY +−90 FPS.
12 ga.	2-3/4″	2-3/4 dram equiv.	1 oz. shot	1180 fps
Federal: Gold Medal Target Remington: Peters Target Winchester: A-A Target				
12 ga.	2-3/4″	2-3/4 dram equiv.	1-1/8 oz. shot	1145 fps
Federal: Gold Medal Target, Champion Target Remington: Peters Target Winchester: A-A Target, Super Target				
12 ga.	2-3/4″	3 dram equiv.	1-1/8 oz. shot	1200 fps
Federal: Gold Medal Target, Champion Target Remington: Peters Target Winchester: A-A Target, Super Target				
12 ga.	2-3/4″	3 dram equiv.	1-1/4 oz. shot	1165 fps
No Factory Loadings At Present				
12 ga.	2-3/4″	3-1/4 dram equiv.	1 oz. shot	1290 fps
Federal: Game Remington: Dove & Quail, Rabbit & Squirrel Winchester: Dove & Quail, Rabbit & Squirrel				
12 ga.	2-3/4″	3-1/4 dram equiv.	1-1/8 oz. shot	1255 fps
Federal: International Premium Target, Premium Field, Field Remington: Peters International Target, Premier Field, Shurshot Winchester: A-A International Target, Upland				

GAUGE	SHELL LENGTH	DRAM EQUIV.	SHOT WT. OZ.	VELOCITY +−90 FPS.
12 ga.	2-3/4″	3-1/4 dram equiv.	1-1/4 oz. shot	1220 fps
Federal: Super Field, Premium Field, Field Remington: Premier Field Winchester: Super Pigeon, Upland				
12 ga.	2-3/4″	3-1/2 dram equiv.	1-1/8 oz. shot	1310 fps
Winchester: A-A International				
12 ga.	2-3/4″	3-1/2 dram equiv.	1-1/4 oz. shot	1275 fps
No Factory Loadings At Present				
12 ga.	2-3/4″	3-3/4 dram equiv.	1-1/4 oz. shot	1330 fps
Federal: Premium, Hi-Power, Duck & Pheasant Remington: Premier, Express, Duck & Pheasant Winchester: Super-X, Duck & Pheasant				
12 ga.	2-3/4″ mag.	3-3/4 dram equiv.	1-1/2 oz. shot	1260 fps
Federal: Premium, Hi-Power Remington: Premier, Nitro Magnum Winchester: Super Double-X, Super-X				
12 ga.	3″	3-3/4 dram equiv.	1-3/8 oz. shot	1295 fps
No Factory Loadings At Present				

GAUGE	SHELL LENGTH	DRAM EQUIV.	SHOT WT. OZ.	VELOCITY +−90 FPS.
12 ga.	3″	4 dram equiv.	1-5/8 oz. shot	1280 fps
Federal: Premium, Hi-Power Remington: Premier, Nitro Magnum Winchester: Super Double-X, Super-X				
12 ga.	3″	4 dram equiv.	1-7/8 oz. shot	1210 fps
Federal: Premium, Hi-Power Remington: Premier, Nitro Magnum Winchester: Super Double-X, Super-X				
16 ga.	2-3/4″	2-1/2 dram equiv.	1 oz. shot	1165 fps
Federal: Game Winchester: Dove & Quail				
16 ga.	2-3/4″	2-3/4 dram equiv.	1 oz. shot	1220 fps
No Factory Loadings At Present				
16 ga.	2-3/4″	2-3/4 dram equiv.	1-1/8 oz. shot	1185 fps
Federal: Field Remington: Shurshot Winchester: Upland				
16 ga.	2-3/4″	3 dram equiv.	1-1/8 oz. shot	1240 fps
No Factory Loadings At Present				
16 ga.	2-3/4″	3-1/4 dram equiv.	1-1/8 oz. shot	1295 fps
Federal: Hi-Power, Duck & Pheasant Remington: Express Winchester: Super-X, Duck & Pheasant				

GAUGE	SHELL LENGTH	DRAM EQUIV.	SHOT WT. OZ.	VELOCITY +−90 FPS.
16 ga.	2-3/4″ mag.	3-1/4 dram equiv.	1-1/4 oz. shot	1260 fps
Federal: Hi-Power Remington: Express Winchester: Super-X				
20 ga.	2-3/4″	2-1/2 dram equiv.	7/8 oz. shot	1200 fps
Federal: Champion Target Remington: RXP Target Winchester: A-A Target				
20 ga.	2-3/4″	2-1/2 dram equiv.	7/8 oz. shot	1210 fps
Federal: Game Winchester: Dove & Quail				
20 ga.	2-3/4″	2-1/2 dram equiv.	1 oz. shot	1165 fps
Federal: Premium Field, Field Remington: Premier Field, Shurshot Winchester: Upland				
20 ga.	2-3/4″	2-3/4 dram equiv.	1 oz. shot	1220 fps
Federal: Premium, Hi-Power, Duck & Pheasant Remington: Premier, Express Winchester: Super-X, Duck & Pheasant				
20 ga.	2-3/4″ mag.	2-3/4 dram equiv.	1-1/8 oz. shot	1175 fps
Federal: Premium, Hi-Power Remington: Premier, Nitro Magnum Winchester: Super-X				
20 ga.	3″ mag.	3-1/4 dram equiv.	1-1/8 oz. shot	1285 fps
No Factory Loadings At Present				

GAUGE	SHELL LENGTH	DRAM EQUIV.	SHOT WT. OZ.	VELOCITY +−90 FPS.
20 ga.	3″ mag.	3-1/2 dram equiv.	1-3/16 oz. shot	1295 fps
No Factory Loadings At Present				
20 ga.	3″ mag.	3 dram equiv.	1-1/4 oz. shot	1185 fps
Federal: Premium, Hi-Power Remington: Premier, Nitro Magnum Winchester: Super Double-X, Super-X				
28 ga.	2-3/4″	1-3/4 dram equiv.	5/8 oz. shot	1160 fps
No Factory Loadings At Present				
28 ga.	2-3/4″	2 dram equiv.	3/4 oz. shot	1200 fps
Federal: Champion Target Remington: Skeet Winchester: A-A Target				
28 ga.	2-3/4″	2-1/4 dram equiv.	3/4 oz. shot	1295 fps
Federal: Hi-Power Remington: Express Winchester: Super-X				
28 ga.	2-3/4″	2-1/4 dram equiv.	7/8 oz. shot	1250 fps
No Factory Loadings At Present				
28 ga.	2-3/4″ mag.	2-1/4 dram equiv.	1 oz. shot	1205 fps
No Factory Loadings At Present				
410 bore	2-1/2″	— dram equiv.	1/2 oz. shot	1200 fps
Federal: Champion Target, Hi-Power Remington: Skeet, Express Winchester: A-A Target, Super-X				
410 bore	3″	— dram equiv.	11/16 oz. shot	1135 fps
Federal: Hi-Power Remington: Express Winchester: Super-X				

From the chart we located our example in the following group:

12 ga.	2-3/4″	3-1/4 dram equiv.	1-1/8 oz. shot	1255 fps
Federal: International Premium Target, Premium Field, Field Remington: Peters International Target, Premier Field, Shurshot Winchester: A-A International, Upland				

We note that the shot weight in our example is 1-1/8 ounces and the velocity is 1255 fps. This is our load reference for the recipe. Now we can reference the desired load in the data section, but first we must identify the hull we are going to reload since we have recipes for Federal, Remington and Winchester hulls that will give us a 1255 fps—1-1/8 oz., load. Recipes for different brands of hulls are not interchangeable. For example, depending on how we might reload three different hulls, we could choose any of the following recipes:

Using a Double-A hull we might choose: (Page 137, *Data Section)*
1-1/8 oz. CCI 109 24.5 gr. 473AA Win WAA12(white) 1255 fps 9400 lup

Using a Blue Magic hull we might choose: (Page 153, *Data Section)*
1-1/8 oz. Win 209 25.0 gr. SR7625 Win WAA12(white) 1255 fps 8100 lup

Using a Federal Gold Medal hull we might choose: (Page 165, *Data Section)*
1-1/8 oz. Fed 209 22.5 gr. Green Dot Fed 12S3 1255 fps 9800 psi

We aren't limited to these three recipes. The data section lists several combinations, depending not only on which hull we reload but also which brands of primers, powder and plastic wads we choose to use.

Our choice of components usually is affected by what is available in our local area. Check with your local sporting goods dealer and discuss your requirements with him. Generally, handloaders will choose components that are readily available on a continuing basis.

Before we reload let's double-check our reloader, components and recipe.

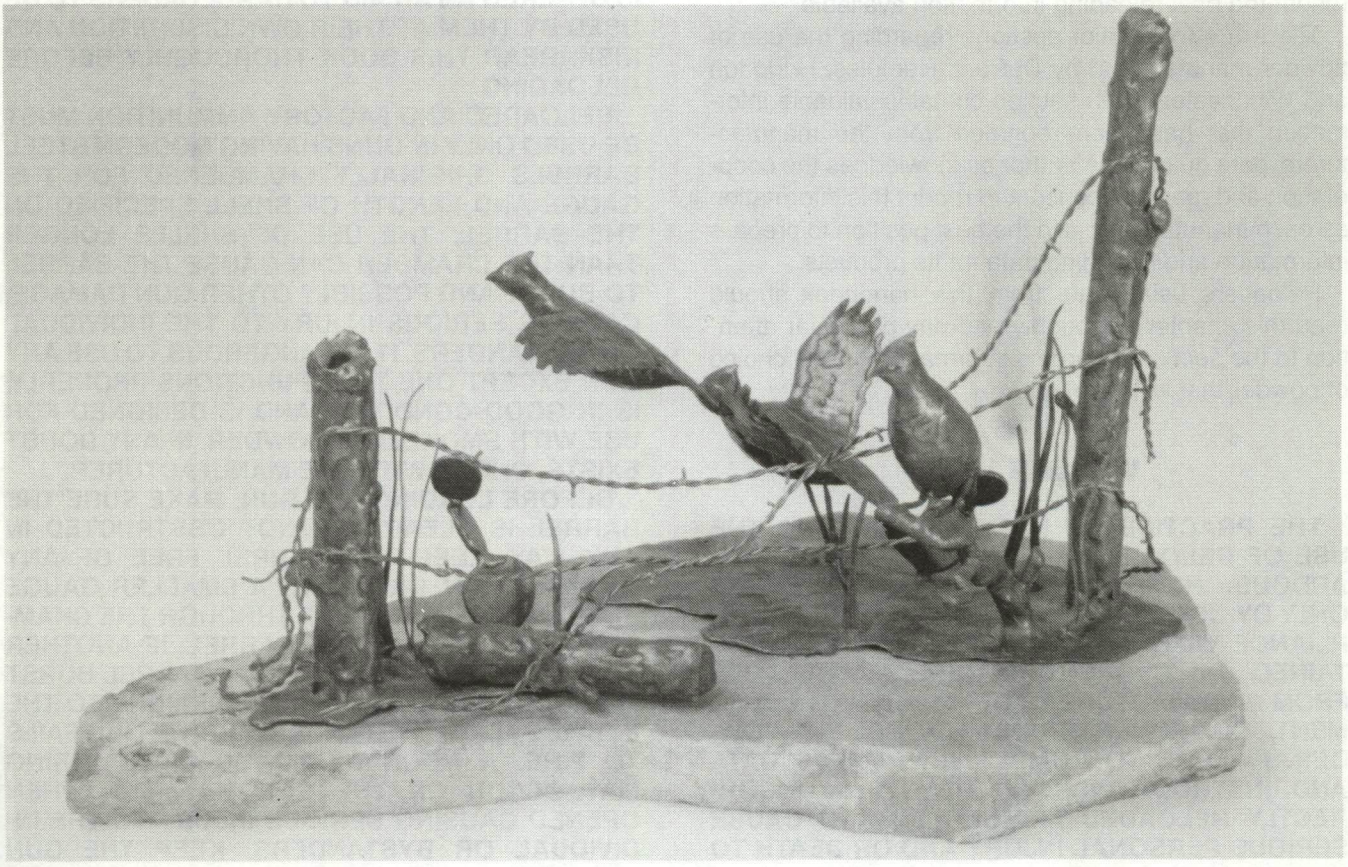
DOUBLE CHECK LIST

Before any actual reloading the handloader should be able to answer the following questions "YES."

1. Have the hulls to be reloaded been positively identified?
2. Have all hulls been checked for defects and found to be in good condition with no foreign material inside?
3. Have components been assembled, with no substitutions, according to the chosen recipe? (primers, powder, wads and shot.)
4. Has the correct starting powder bushing been selected from the MEC bushing chart (inside back cover)? ("Check weights" of thrown powder charges will be taken during the reloading sequence.)
5. Has the correct charge bar been selected?
6. Has the correct crimp starter been installed in the reloader?
7. Has the "TEN COMMANDMENTS OF SHOTSHELL RELOADING" chart been posted in the reloading area?
8. Has the handloader complied with the "TEN COMMANDMENTS OF SHOTSHELL RELOADING?"
9. Are safety glasses available to wear during actual reloading?

If the answer to each question is YES, then read the instruction manual for your reloader and follow the instructions for set-up and reloading procedures.

GOOD LUCK AND GOOD SHOOTING!



Chapter 8

INTRODUCTION TO THE LOADING DATA

All shotshell loading data in this book have been supplied by the major powder manufacturers and represent the best reloading information available.

There are four major sections regarding the use of powder manufactured by DuPont, Hercules, Hodgdon and Winchester. Each section contains valuable information that has been reprinted from the manufacturers' data guide. The author acknowledges the cooperation and gracious consent to reprint this information as each manufacturer is in the best position to prepare information and reloading data for its products.

Reloaders using data from this handbook should read this chapter thoroughly and pay particular attention to the section regarding information on the choice of powder that will be used.

WARNING

THE PRACTICE OF HANDLOADING AND THE USE OF RELOADED AMMUNITION CAN BE HAZARDOUS. HANDLOADING SHOULD BE DONE ONLY BY COMPETENT PERSONS IN STRICT COMPLIANCE WITH INSTRUCTIONS AND DATA CONTAINED IN CURRENT MANUALS AVAILABLE FROM MANUFACTURERS OF RELOADING EQUIPMENT, COMPONENTS AND SMOKELESS POWDER. FAILURE TO COMPLY WITH THESE DATA AND INSTRUCTIONS MAY RESULT IN INCORRECTLY RELOADED AMMUNITION AND CAUSE SERIOUS PERSONAL INJURY AND/OR DEATH TO THE INDIVIDUAL OR BYSTANDERS. THIS BOOK, "THE HANDBOOK OF SHOTSHELL RELOADING," IS OFFERED AS AN AID TO HANDLOADERS TO BE USED BY THEM AT THEIR OWN DISCRETION AND RISK. READ THIS BOOK THOROUGHLY BEFORE RELOADING.

RELOADED AND FACTORY AMMUNITION MUST BE USED ONLY IN GUNS HAVING MODERN STEEL BARRELS ORIGINALLY CHAMBERED FOR THE GAUGE AND LENGTH OF SHELL SPECIFIED ON THE BARREL. THE USE OF SHELLS LONGER THAN THE CHAMBER CAN CAUSE THE BARREL TO BURST AND POSSIBLY OTHER GUN DAMAGE, CAUSING SERIOUS INJURY TO THE INDIVIDUAL OR BYSTANDERS. IT IS DANGEROUS TO USE ANY GUN EXCEPT ONE THAT FUNCTIONS PROPERLY, IS IN GOOD CONDITION AND IS DESIGNED FOR USE WITH SMOKELESS POWDER. IF ANY DOUBT EXISTS, CHECK WITH THE MANUFACTURER.

BEFORE LOADING THE GUN, MAKE SURE THE BARREL IS CLEAR AND NOT OBSTRUCTED IN ANY WAY. KEEP THE BARREL FREE OF ANY OBSTRUCTION, INCLUDING A SMALLER GAUGE SHELL, WHICH CAN DROP THROUGH THE CHAMBER AND LODGE IN THE BARREL. IF ANOTHER SHELL IS FIRED, A DANGEROUS BARREL BURST MAY OCCUR CAUSING SERIOUS INJURY TO THE INDIVIDUAL OR BYSTANDERS. IF THE GUN FAILS TO FIRE, A MECHANICALLY DELAYED FIRING MAY OCCUR OR THE GUN MAY FIRE WHEN OPENED CAUSING SERIOUS INJURY TO THE INDIVIDUAL OR BYSTANDERS. KEEP THE GUN

POINTED IN A SAFE DIRECTION, WAIT 30 SECONDS, AND CAREFULLY UNLOAD, AVOIDING EXPOSURE TO BREECH.

WEAR PROPER HEARING PROTECTION, AS REPEATED EXPOSURE TO GUNFIRE CAN DAMAGE HEARING. WEAR SHOOTING GLASSES TO PROTECT EYES FROM FLYING PARTICLES.

ALL LOADING DATA (RECIPES) AND RELATED INFORMATION IN THIS HANDBOOK ARE BASED ON RESULTS OBTAINED IN THE DUPONT, HERCULES, HODGDON AND WINCHESTER BALLISTICS LABORATORIES USING THE COMPONENTS AS LISTED. THIS DATA AND INFORMATION ARE OFFERED AS AN AID TO HANDLOADERS TO BE USED BY THEM AT THEIR OWN DISCRETION AND RISK WHILE OBSERVING SAFE RELOADING PRACTICES AT ALL TIMES. ALL DATA AND INFORMATION IN THIS HANDBOOK ARE DEEMED TO BE ACCURATE AND RELIABLE. SINCE SKR INDUSTRIES, INC., ITS OFFICERS, EMPLOYEES AND AGENTS, OR KENNETH W. COUGER AND RICHARD HENDERSON HAVE NO CONTROL OVER THE MANUFACTURING OF RELOADING EQUIPMENT, COMPONENTS AND SMOKELESS PROPELLANTS, THE CHOICE AND CONDITION OF EQUIPMENT, COMPONENTS AND SMOKELESS PROPELLANTS, THE CIRCUMSTANCES UNDER WHICH THE EQUIPMENT, COMPONENTS AND SMOKELESS PROPELLANTS ARE USED AND ASSEMBLED, THE FIREARMS IN WHICH RESULTING AMMUNITION IS USED, AND RESULTS OBTAINED THROUGH ITS USE, NO WARRANTIES ARE EXPRESSED OR IMPLIED FOR ANY ERRORS AND / OR OMISSIONS IN DATA AND INFORMATION. WE SPECIFICALLY DISCLAIM ANY AND ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE, AND ANY AND ALL LIABILITY FOR CONSEQUENTIAL DAMAGES OF ANY KIND WHATSOEVER. THE INDIVIDUAL ASSUMES THE RISK OF SAFE HANDLOADING PRACTICES. FAILURE TO DO SO MAY RESULT IN SERIOUS PERSONAL INJURY AND/OR DEATH TO THE INDIVIDUAL OR BYSTANDERS.

Section 1 - Du Pont

INFORMATION REGARDING THE USE OF DU PONT POWDER
BALLISTIC NOTES
from DON WENNER
Editor, Du Pont Handloader's Guide
DU PONT COMPANY
EXPLOSIVES PRODUCTS DIVISION
WILMINGTON, DELAWARE 19898

"The information presented in this booklet is based upon results obtained in the Du Pont ballistics laboratory, and is offered without charge as an aid to handloaders, to be employed at their own discretion and risk. Safe loading practices should be observed at all times. Since Du Pont has no control over the circumstances of loading, Du Pont assumes no liability for the results obtained and Du Pont guarantees only that their powder meets their manufacturing standards."

DANGER! Smokeless powder is an extremely flammable solid and can be dangerous if improperly handled. It should not be exposed to heat, sparks, or open flame. In accordance with good handloading practices, all reloading components including smokeless powder should be kept out of reach of children at all times.

INTRODUCTION

This Du Pont Handloader's Guide presents revised and updated information on the use of Du Pont powders to reload shotshell ammunition. This Guide is not intended to be a "how to" manual for reloading, and we strongly recommend that all handloaders carefully read one or more of the reloading manuals which cover the subject in detail. This Guide is offered to be used at your own discretion and risk. Since we have no control over the circumstances of use, we assume no liability for the results obtained. And we guarantee only that our powders meet our manufacturing standards.

With the exception of the smokeless powder, none of the components listed is manufactured by Du Pont. It is possible that changes in components which could affect their ballistic performance could occur without our knowledge. The components used and specified in all our data were those that were commercially available to the handloader at the time our tests were conducted. It is the responsibility of the handloader to check each of his components to insure that they are the same as specified in our data.

Improper modifications and/or alterations can render any type of firearm unsafe. All work should be conducted by the manufacturer or a qualified gunsmith. It is highly recommended that a shooter have his guns checked periodically by a qualified gunsmith to insure that they are in safe operating condition. Treat all guns as being loaded and read and practice all the rules of safe gun handling and shooting.

The future of handloading is dependent upon the safe handling and storage of powder and primers and the safe use of all ammunition. In this regard, read and follow the recommendations of the Sporting Arms and Ammunition Manufacturers' Institute, Inc., as published in "Properties and Storage of Smokeless Powder." A copy of this pamphlet is reprinted in Chapter 6, Components—Powder.

SHOTSHELL

The shotshell data section offers a wide selection of target and field loads. There have been a number of changes and modifications in shotshell components which make it increasingly important that the handloader carefully check all of the components being used to insure that they are the same as shown. If you

have reason to question any of your components, contact the manufacturer.

Our goal in developing this shotshell data was to offer a selection of "factory duplication" loads, specifying the average velocity and chamber pressure of the rounds tested. However, not all factory loads can be duplicated because the components utilized are not available to the handloader. All of the ballistics data specified were obtained using once-fired cases and components available to the handloaders at the time our tests were performed.

All of the shotshell data presented were developed using lead shot. Do not attempt to reload any of the loads listed using steel shot. Substituting steel shot in any load developed for lead shot could be very dangerous.

To obtain a reasonable duplication of the ballistic results listed, you must reload exactly as shown. Substitution of components and/or alteration in powder charge weight or type of powder could result in dangerous reloads.

Good, uniform, efficient reloads result only from careful reloading procedures. Always check powder and shot weights on a reliable scale, use the exact components specified, seat wads properly and use only cases that are in good condition. Never leave to chance the powder type and/or weight and the lead shot weight that you are loading in a shell. Inspect all reloaded shells to insure that crimp closely duplicates that of factory loads.

Unfortunately, time and space do not permit publication of loads utilizing all of the many components available. Loading data utilizing Du Pont powders for wads not listed in this guide can be obtained by contacting the wad manufacturer.

Data shown were obtained under controlled conditions; to achieve the ballistic results as listed in this Guide, you must comply, exactly, with each and every listed condition that produced these results. In effect, these data as presented in the shotshell section are a "recipe", to be followed without deviation to achieve the stated ballistic level. The values shown may vary substantially if different component combinations and/or techniques are employed.

Section 2 - Hercules

INFORMATION REGARDING THE USE OF HERCULES POWDER
HERCULES
Hercules Incorporated
Hercules Plaza
Wilmington, DE 19899, U.S.A.
WARNING: THE SHOTGUN SHELL LOADING DATA IN THIS BOOKLET ARE FOR LEAD SHOT ONLY. STEEL SHOT CANNOT BE SUBSTITUTED.
CAUTION

Millions of men and women reload ammunition as a hobby or because the cost savings allow them to do more shooting. In order to become or to continue as a safe reloader, you must be cautious and careful. You become a "miniature" manufacturer working with powder, primers, and tools that have specific hazards. You are the production department and the quality control department. Later, when you shoot the ammunition that only you produced and checked, you are the person closest to the gun if it malfunctions because of faulty ammunition—yours.

Please read and study one or more good books that describe reloading techniques in detail. When using Hercules powders, use only the exact type and quantity recommended herein. Store and use our powders—your powders—according to the safety rules listed in this booklet. Reload for quality, so that the safest and most accurate loads on the shooting line will be yours.

Ballistics

The ballistic data shown in this booklet were obtained in our laboratory under strictly controlled conditions. You should load only those exact combinations that are listed. Even then, differing reloading techniques, plus industrial tolerances of each component, likely will cause your ammunition, or ammunition loaded by other competent laboratories, to yield slightly different ballistic data. Therefore, our charge recommendations should never be exceeded. Smart shooters and hunters know that accuracy, not maximum power, is their key to success.

We cannot anticipate all conditions under which this information and our products, or the products of other manufacturers in combination with our products, may be used. We accept no responsibility for results obtained by the application of this information or the safety and suitability of our products, either alone or in combination with other products. Unless otherwise agreed in writing, we sell the products without warranty, and buyers and users assume all responsibility and liability for loss or damage arising from the handling and use of our products, whether used alone or in combination with other products.

Powder Warnings

The following warnings are extremely important:

1. NEVER substitute any Hercules smokeless powder for Black Powder, or for Pyrodex, or for any other smokeless powder.

2. NEVER mix together any two powders, regardless of type, brand, style, or source.

3. NEVER use the data in the Reloaders' Guide for any other powders, even if advertised "similar to Hercules Bullseye" or "burns same as Hercules Red Dot", etc.

Violation of any of the above could result in gun damage and severe personal injury.

Powder Information

All Hercules powders are produced only in the U.S.A. at our Kenvil, New Jersey, plant by a skilled team of men and women. Our formulations are double-base type to minimize charge weights and moisture absorption. Each powder grade is shaped into circular flakes or tubes by precision dies and cutters for best combustion efficiency and shot accuracy.

Each of our powder grades has a different burning speed, either by formulation or by size of the granules. So, do not blend or mix different powders, and use only the grade and quantity recommended in this Reloaders' Guide.

Many of our powder grades have a chemical coating on the surfaces of the granules to control the burning rate. All grades have a graphite glaze that allows the granules to flow smoothly from powder measures.

All powders burn with great precision and rapidity inside the gun chamber, generating the hot, high-pressure gas that accelerates the shot and drives it toward the target. It is critically important for safety that the powder used is matched to the shot weight and other factors, otherwise the gun parts may be deformed or may even burst. Shot-to-shot accuracy can also be degraded by deviations from recommended loads. Even after 70 years of producing and testing powders, Hercules ballisticians are unable to calculate and predict exact ballistic results; we have to test-fire our powders with each set of components and record the results. Therefore, the ballistic values and recommended combinations listed in this booklet should be followed without deviation.

Dram Equivalent

Prior to the commercialization of Smokeless Powder, shotgun shells were loaded with Black Powder. The weight measurement system used for Black Powder was "Drams". Compared to Black Powder, Smokeless Powder is more dense and MUCH more energetic, so it can not safely be measured and used like Black Powder. Indeed, a different weight system was selected; "Grains", wherein 7,000 Grains equals 1 Pound.

Since many shooters still wanted to be able to compare their Smokeless Powder loads to the original Black Powder loads, the term DRAM EQUIVALENT evolved. Simply stated, the Dram Equivalent is an indicator of the velocity of a particular shot load. But note that the charge and weight of smokeless Powder should not be calculated from the Dram Equivalent.

Ballistic Data

The velocity and pressure obtained with the specific combinations of shell, wad, primer, shot weight, powder, and powder weight provided in this booklet were obtained in a laboratory, where considerable effort is made to control the load and test conditions. Velocity was measured with a chronograph (electronic stopwatch). Pressure was measured either by compressing lead or copper cylinders, or electronically, by use of a piezo-electric transducer.

Guns are designed to take a considerable amount of internal pressure, but if this is exceeded, they burst. Be alert to signs of excess pressure, such as heavy recoil, flattened primers, or blown primers. Don't make changes in the suggested loads.

Every reloader needs a good quality scale for weighing each powder charge, or for checking the weight of powder thrown by volumetric loaders.

Special Notes Regarding Components Other Than Powder

A. Shotgun Shells Manufacturers may sell ammunition under different brand names which for reloading purposes are identical. Following are popular variations. When in doubt, consult the ammunition producer.

* Federal Hi Power Plastic same as Federal League Target, Duck and Pheasant, Field, Game, Dove and Quail, and Premium.

(Author's note—There have been some Duck and Pheasant hulls that are manufactured by the GOLD MEDAL process. These hulls must be reloaded with the GOLD MEDAL loading data. Identify all hulls—do not take anything for granted.)

* Remington-Peters-See loading tables for specific shell descriptions.

* Winchester-Western AA-Type (Compression Formed) same as AA Target, AA Plus Target, Upland, Super Pigeon, Super X and Super Double X.

B. Primers

* CCI 109 and CCI 209 are ballistically identical and can be interchanged.

* CCI 209 M (Magnum) is "hotter" and cannot be substituted for CCI 109 or CCI 209. Use CCI 209 M only as listed.

* Rem. 57* are not interchangeable with 209 size primers.

C. Wads Do not interchange wads.

D. Shot Use only clean lead shot. Steel shot requires special components to protect the barrel and to control gun pressures. After extensive testing we have not yet found combinations that give safe, reliable performance using steel shot.

E. Shot Buffers Hercules recommends against adding any buffers or fillers of any kind to shotshell loads listed in this Guide.

Black Powder

Black Powder is entirely different than smokeless powder. Never substitute one for the other. Smokeless powders have much more energy than black powder. Never attempt to use smokeless powder in black powder guns or saluting cannon; they may blow up disastrously.

Safety and Health Precautions

To perform in a gun, powders must ignite easily and burn rapidly. These characteristics require use of com-

mon sense to avoid accidents. It should be obvious that one would:

1. Not smoke when reloading.
2. Not use spark-producing tools.
3. Not mix powders of different kinds.
4. Not leave powder where children can get it.
5. Not try to load when distracted.
6. Avoid an open fire or working near spark-producing machinery.
7. Pour out only the amount of powder needed for immediate work.
8. Check the powder measure each time it is used. Make sure the settings have not been accidentally changed. Check-weigh "thrown charges" frequently.
9. Clean up any spilled powders. Use a brush and dustpan; do not use vacuum cleaner.
10. Store powder only in its original Hercules container, which was carefully designed for this usage. Do not repackage. Do not purchase or accept any Hercules powder not in its original, factory-sealed container.
11. Be sure the powder container is completely empty before discarding. Do not use the container to store other powders or materials, or for any other purpose.
12. Keep always in mind that Hercules smokeless powder is an explosive material and highly flammable. It should always be stored and handled in such a way as to avoid impact, friction, heat, sparks, or open flame.

This material contains nitroglycerin, which could enter the body through ingestion or absorption, or by breathing the vapors. Symptoms can include headaches. Therefore, the following precautions should be observed when handling Hercules powders:

1. Do not take internally. In case of ingestion, cause vomiting by putting finger down throat. Call physician.
2. Prevent contact with food, chewing material, and smoking material.
3. Have adequate ventilation during handling.
4. Wash hands and face thoroughly after handling.
5. Do not carry powder in clothing.

Other recommendations:

1. Establish a routine for reloading. It will result in more uniform loads and less chance of errors.
2. Some primers are more powerful than others (they produce more gas at a higher temperature). Use only the primers specified herein.
3. Shotshell wads differ in their sealing ability. Use only the load combinations specified herein.
4. The shotshell loads in this booklet are for use with lead shot only!
5. Use only the brands of powder and components shown in our tables. Do not substitute other types.

Section 3 - Hodgdon

INFORMATION REGARDING THE USE OF HODGDON POWDER
HODGDON POWDERS
THE FAVORITE OF HANDLOADERS SINCE 1946
HODGDON POWDER COMPANY, INC.
BALLISTICS LABORATORY
6231 ROBINSON
SHAWNEE MISSION, KANSAS 66202
SHOTSHELL LOADING DATA

This booklet gives loading data for most popular shotshells.

It is intended as a basic guide to increase the knowledge of all concerned individuals and groups regarding smokeless powder. The statements and recommendations made are not intended to supersede local, state or Federal regulations. Proper authorities should be consulted on regulations for storage and use of smokeless powder in each specific community.

-FORWARD-

There are many good handbooks available giving the basics of reloading and the beginner should study one or more of them before embarking upon his new hobby. We are assuming that the user of our data manual knows the mechanics of reloading and simply needs a supplement to help him find a good load using the components available to him. We try to do nothing more with our data than to make this fascinating hobby more interesting by adding knowledge.

By revising our shotshell data often, we hope to keep fairly well up-to-date with the rapidly changing array of components offered by today's consumer-oriented manufacturers.

IMPORTANT! READ THIS BEFORE USING DATA

There are many variables in shotshell loading which the average reloader ignores or shrugs off as unimportant. However, to get good reloads and to assure absolute safety, please heed the following information:

1. Loading tool bars and bushings ordinarily have a small safety factor, but we suggest checking the exact powder charge a bar throws in YOUR TOOL, using an avoirdupois powder scale. Consistent operation of the tool is essential for uniform results shell to shell. In NO CASE EXCEED the weight of charges shown.
2. The use of plastic wads instead of card wads greatly increases the efficiency of burning powder, which raises breech pressure. This variable alone can cause a 25% difference in breech pressure. FOR THIS REASON IT IS IMPERATIVE OUR DATA BE USED STRICTLY AS SHOWN. DO NOT CHANGE COMPONENTS BY GUESS.
3. Inspect the inside base wad to be sure it is not loose or in bad condition.

4. Always use primers with covered flash hole.

5. The length of brass on the outside of the base has absolutely nothing to do with the strength of the case. Low brass shells are as strong as high brass.

6. NEVER INCREASE POWDER OR SHOT CHARGES ABOVE THOSE SHOWN. FOLLOW DATA EXACTLY.

7. Before each loading session, double check to be certain your tool has the proper powder and shot bushings and to be sure proper powder is in tool hopper.

WARNING

Ballistic data shown in this manual was obtained in our Lab under strictly supervised and controlled conditions and circumstances.

Ballistic data may vary considerably depending on many factors including components used, how such components are assembled, the type of firearm used, and the reloading techniques and safety precautions utilized by the individual.

Since we have no control over how powder is stored, handled, loaded or used by the individual,

WE MAKE NO WARRANTIES EXPRESSED OR IMPLIED, SPECIFICALLY DISCLAIM ANY AND ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND SPECIFICALLY DISCLAIM ANY AND ALL LIABILITY FOR CONSEQUENTIAL DAMAGES OF ANY KIND WHATSOEVER.

THE INDIVIDUAL ASSUMES THE RISK OF SAFE LOADING PRACTICES. FAILURE TO DO SO MAY RESULT IN SERIOUS PERSONAL INJURY AND/OR DEATH TO THE INDIVIDUAL OR BYSTANDERS.

"The information presented in this booklet is based upon results obtained in our ballistics laboratory, and is offered as an aid to handloaders, to be employed at their own discretion and risk. Safe loading practices should be observed at all times. Since we have no control over the circumstances of loading, we assume no liability for the results obtained, and we guarantee only that our powder meets our exacting standards."

DANGER! Smokeless powder is an extremely flammable solid and can be dangerous if improperly handled. It should not be exposed to heat, sparks, or to open flame. In accordance with good handloading practices, all reloading components including smokeless powder should be kept out of reach of children at all times.

Section 4 - Winchester

INFORMATION REGARDING THE USE OF WINCHESTER POWDER
WINCHESTER BALL POWDER LOADING DATA—SEVENTH EDITION
WINCHESTER GROUP, OLIN CORPORATION
RELOADING COMPONENTS DEPARTMENT
EAST ALTON, ILLINOIS 62024

"Reproduced by Permission of Winchester Group, Olin Corporation"

This tabulation is presented to furnish the reloader with up-to-date data for reloading shotshell ammunition. It is not a textbook or treatise on how to reload, but rather a useful reference list of recommended loads using Winchester Western Ball Powder smokeless propellants.

Winchester Western is the only powder manufacturer that backs up their data with over 100 years of experience in manufacturing rifle, pistol and shotshell ammunition. The data in this handbook was obtained under rigorous controls and tests. This data has been tested for pressure, velocity and uniformity.

The data in this booklet is the culmination of very extensive testing which insures the reloader the best possible results.

The shot shell data in this booklet supersedes all previous data published for Winchester Western Ball Powder smokeless propellants.

The data shown in this booklet have been verified by tests fired in our laboratory under controlled conditions, and found to produce safe cartridges. Since we have no control over the actual loading procedures and methods used, or on the condition or choice of firearms and components used, no responsibility for the use or safety in use of this data is assumed or implied.

Where data contained in this booklet lists specific components no changes or substitutions for these components can be made.

All smokeless powders are extremely flammable. Keep them stored in their original containers in locked cabinets, out of the reach of children, incompetent persons, and away from exposure to the sun's rays, heating equipment, electrical equipment, or any source of heat, flame or sparks.

Failure to comply with these warnings or to use this data exactly as shown may result in accidents with serious injury to the shooter and bystanders.

RELOADING PRECAUTIONS

Follow these precautions to help assure maximum enjoyment and safety in reloading and to assure uniform performance of your reloads. Remember that you can be badly injured or suffer severe burns if the strictest safety precautions and housekeeping rules are not enforced.

1. Exercise care at all times and wear safety glasses while reloading.

2. Never smoke while handling powder or primers or during any reloading operation.

3. Keep powder and primers away from heat, sparks and open flames.

4. Store powder in a cool, dry place at all times.

5. Never use a powder unless you are certain of its identity.

6. Do not mix powders.

7. Devote full attention to reloading operations—avoid distractions.

8. Keep powder and primers out of reach of children.

9. Use components as recommended; don't take shortcuts.

10. Never exceed maximum recommended loads.

11. Develop a loading routine to guard against mistakes.

12. Examine every shell before loading to insure good condition.

13. Double check every operation for safety and uniformity.

14. Always watch for indications of excessive pressure.

15. Do not decap live primers; it is safer to destroy them by firing the empty shell or cartridge in a firearm.

16. Do not substitute components, it could result in a significant change in ballistics, and could result in an unsatisfactory or even dangerous load.

17. Observe all local fire regulations and codes with respect to quantities of powders and primers stored and conditions of storage.

18. Store powder only in its original container. Never transfer it from one storage container to another since this increases the possibility that it may become mislabeled.

19. Do not use the shotshell data contained in this handbook with steel shot; to do so would cause an extremely dangerous condition. Steel shot requires the use of special data, wads and Powders. At this time such components are not available. When such components become available, Winchester will develop data specifically for steel shot.

Shot Shell Loading Instructions

CAUTION: Carefully read the information on the powder can label and follow the recommended loading instructions and precautions contained herein, before using the reloading data.

Winchester suggested loads are based on results obtained in our laboratory under carefully controlled conditions. They are offered as an aid to handloaders, to be employed at their own discretion and risk. Since we have no control over the circumstances of loading, we assume no liability for the results obtained.

The handloading of shot shells should be undertaken only by those who are familiar with all safety precautions and who observe conservative practices in reloading operations. The powder charges shown are maximum and must not be exceeded.

Cases

Exercise extreme care in determining that you are using the exact case listed in the data. Substitution could be dangerous. When in doubt contact the manufacturer of the case.

Winchester Western does not sell empty shotshell cases as a component. All Winchester cases used in shotshell loading are obtained as a result of the first firing of factory loaded ammunition. The demands on our manufacturing equipment for factory ammunition eliminates the possibility of making runs of these cases to be sold as components.

In a great many instances, once-fired Double A cases and other Winchester shotshells can be purchased from local skeet and trap ranges, gun clubs, and dealers catering to the shotshell reloaders. In case this service is not available, the only means of obtaining these cases would be as the result of firing factory ammunition.

Primers

Use only those primers which are specifically shown in the data; do not substitute one primer for another. To do so could result in a significant change in ballistics, and could result in an unsatisfactory or even dangerous load. Never use shotshell primers having uncovered flash holes with Ball Powder smokeless propellants. To do so could be dangerous.

Powder

Check all powder charges with a scale. It is a good idea to check about 10 shells to determine the average weight of the charges thrown and the uniformity of the charge. A powder bushing chart is shown in this book to assist you in the selection of bushings. The information contained in this chart has been supplied by the manufacturer of the bushings.

Such charts do not represent loading tables and list only the approximate powder charge dropped by the listed bushing. Variations in how the loading tool is handled, in the bushings themselves and in the specific components used, will alter the charges thrown. It is essential that you check your charge weight with a scale and go to the next larger or smaller bushing when and where required.

Powder Bushings and Scales

Shotshell reloading tool powder bushings do not throw the exact charge specification in many cases. The reasons are many and some include:

1. Variations in gravimetric density of powders from lot to lot. The tolerance is plus or minus .025 grams per cubic centimeter. This tolerance applies to most canister powders.

2. Usually a bushing chart lists the nominal weight of a powder charge based on normal packing as a result of free flow and gravimetric density of a powder or on bushing volume and the nominal gravimetric powder density at 100% packing.

3. Various operators of a tool will get various powder weights from an identical tool and bushing. This is due to the change in force of operation and amount of vibration transmitted to the tool with resultant amount of packing of powder.

4. The amount of sizing force required on cases being loaded can cause a change in powder drop due to the change in tool vibration.

5. Bushing manufacturing tolerances.
6. Tool manufacturing tolerances.
7. Mismarked bushings.

As you see, a bushing listing chart cannot be interpreted as an absolute. They simply can represent what the manufacturer believes to be the nominal charge thrown with the listed bushing and powder.

A reloading scale is an absolute must and charges thrown must be carefully checked and changes in bushing sizes made where required.

Do not try to determine the powder charge thrown by simply metering the powder bar back and forth and weighing charges.

The tool must be cycled through the complete loading cycle to insure the same amount of vibration and powder packing as will take place in a normal loading cycle. Powder charges measured under these two conditions could vary as much as several grains.

Wad Seating Pressure

Wad pressure, when using Ball Powder, is not critical. Any pressure from 20 to 100 pounds is acceptable. The only criterion is that enough pressure must be used to insure a good crimp. A safe level to use is 40 pounds, from which the loader may vary at his own choice to get the best crimp. Wads must be seated on the powder (no air space should exist between wad and powder).

Wads

Use only those wads as specifically shown in the data; do not substitute one wad for another. To do so could result in a significant change in ballistics and could result in an unsatisfactory or even a dangerous load.

Pressure

When gases expand in a confined space they exert pressure. When smokeless powder burns it forms gases which occupy many times the volume of the solid propellant. And the heat of burning expands these gases even more.

When a cartridge is fired in a rifle or shotgun the gas pressure is exerted equally in all directions. The area where this pressure most easily results in expansion of the gas volume is on the base of the bullet or wad column. The bullet or shot is free to move and the expanding gases rapidly push it down the barrel and out the muzzle.

If pressure is too low, non-uniform ignition will result, and with it non-uniform velocities and poor accuracy. In extreme cases, there will not be enough gas pressure to push the bullet or shot out the barrel. An obstruction will be left that will result in damage to the barrel on the next shot. Shot shell pressures should be maintained at a minimum average of 7500 LUP.

If pressure is too high, gas pressure builds up to a point that damage to the firearm and/or personal injury can result.

Follow the loading data given and avoid trouble.

Pressures are designated by "CUPS" and "LUPS," meaning "Copper Units of Pressure" and "Lead Units of Pressure." The actual numbers are identical with those designated in the past as P.S.I. (pounds per square inch).

Velocity

Velocities quoted in the data are averages of a series of shots fired in accordance with equipment and techniques used throughout the American arms and ammunition industry. Listed loads have given uniform velocity results in our tests.

Shot shell velocity barrels used conformed to the following lengths as approved by SAAMI (Sporting Arms and Ammunition Manufacturers Institute, Inc.).

12 ga—3 in. full choke 30″
12 ga—2-3/4 in. full choke 30″
16 ga—2-3/4 in. full choke 28″
20 ga—3 in. full choke 30″
20 ga—2-3/4 in. full choke 26″
28 ga—2-3/4 in. full choke 26″
410 bore—2-1/2 or 3 in. full choke 26″

Dram Equivalent of Shot Shells

A dram is a measure used for black powder. A certain dram charge of black powder imparts a certain velocity to a given weight of shot. For example, three drams of black powder with 1-1/8 oz. shot in 12 gauge gives about 1200 ft./sec. muzzle velocity. When the change to smokeless powder was made, the dram equivalent designation was used as a measure of the approximate velocity of the load regardless of the actual powder charge. For example, in 12 gauge, a 3 dram equivalent load with 1-1/8 oz. shot give a muzzle velocity of about 1200 ft./sec. A scheme was devised to relate velocity and shot weight of commercial loads to the dram equivalent system, but modern loadings depart from the system in a number of instances.

Some shooters mistakenly believe a low dram equivalent is synonymous with low pressure. This is not so, as all modern shot shells regardless of dram equivalent marking, gauge, brand, powder or shot charge are loaded to approximately the same pressure level. Therefore, those who attach significance to the term "dram equivalent" in respect to chamber pressure are in error.

The main problem is that people still confuse a "dram equivalent" designation with a "dram measure" of powder and this may be serious in the case of modern fast burning shot shell powders.

Ballistics

Ballistics of shot shells are affected not only by the type and amount of powder, but also by the pellet size and charge weight of shot, the type of crimp, the type

of shot shell case, and the type of wads used. Follow loading data instructions and do not deviate from recommended combinations.

It should be noted that low chamber pressures do not necessarily mean low recoil. Recoil is a function of the velocity of the ejecta from the muzzle and the weight of the ejecta. It is basic physics that for every action there is an equal and opposite reaction.

Selection of Shot Shell Loads

Shot shell loads in this data reference are listed in order of gauge, shell length, case type and shot weight.

For the reloader, no further explanation of his gauge or shell length is actually necessary. If you have progressed as far as wanting to reload, you undoubtedly are familiar with what gauge and length of shells you are using.

Be certain to select the data for the exact case you are loading. Data is not interchangeable from one case type to another.

The desired shot weight is readily referenced from the factory ammunition you have been using for various purposes.

The load velocity may require some additional explanation in that factory ammunition packages normally make no reference to velocity but rather to dram equivalent.

Slow Burning Shot Shell Powders

Slow burning powders always leave more residue than fast burning powders, all other things being equal. This can be verified by comparing the results of firing a box of factory target loads with a box of factory 1-1/2 ounce loads. The heavier loads will leave behind considerably more residue. The reloader can take certain steps to help eliminate as much as possible the amount of residue left in his firearm.

The first step would be with the case itself. Do not use cases that have been loaded more than two or three times for such loads. You need a good firm crimp to offer the proper amount of resistance to the initial burning of slow powders and a case that has been loaded a number of times simply does not afford the firm crimping required.

Secondly, the selection of primers is limited. But be sure to use the specific primer listed for the load and do not make substitutions from data listings.

The third item is wad pressure. A wad pressure of 60 to 70 lbs. seems to help. Great care must be taken to insure that the lips of the over powder cup section are not damaged or torn when seating the wad. (Wad guide fingers should be in good condition.) Do not substitute wads, use data only as listed.

Fourth, powder charges and shot weights must be checked with a scale. Do this while the loading machine is being cycled. This is very important.

Fifth, every effort must be made to make as firm a crimp as practical. It is important that the finished shell length not exceed a factory loaded round and that the depth of crimp be as deep as a factory round. It also is of help to put a good bevel on the case mouth when crimping as this tends to strengthen the crimp. No sealers should be used on the crimp.

If you get the maximum of each of the foregoing points built into your heavy reloads, you will reduce the amount of fouling to a minimum. However, heavy reloads will always leave some fouling. Automatics are prone to the most fouling. Clean guns carefully after each hunting trip if more than 25 rounds have been fired. Most firearms will function with a good amount of fouling present but a good cleaning after each trip is proper maintenance to insure the maximum in reliability from the firearm.

Buffered Loads

The use of any buffering material in a shot column will significantly alter the ballistics for any given shotshell load and can, if not carefully tested, produce dangerously high pressures. The development of loading data for any buffered load requires extensive pressure and velocity testing to insure that the proper speed propellant powder and propellant charge weight are being used for the specific buffering material.

The use of talc, flour, and similar non-compressible materials should not be considered as buffering material as they can produce dangerously high, erratic pressures in an unpredictable manner.

The rate with which a shotshell propellant burns within a shotshell is governed to a great extent by the uniform compressibility of the wadding and the shot itself. Changes in the compressibility, such as is the case with buffering materials, can drastically change the burn rate of the propellant. Careful testing is required to assure that the load will not result in a damaged gun, or worse, personal injury. We therefore do not suggest the use of buffered shot reloads, without lab testing.

Do not substitute components.

Use only combinations as listed in the data.

The data herein supersedes all previous WW tabulations. All data was obtained in once fired cases.

CAUTION: Shotshell Ball Powder smokeless propellants should always be used with Primers having covered flash holes.

Do not use the shotshell data contained in this handbook with steel shot; to do so would cause an extremely dangerous condition.

Steel Shot

With reference to the repeated inquiries on the reloading of steel shot shells loads, Winchester's advice, at this time, is:

"DON'T DO IT!"

Wait until suitable components and tested data are available from the ammunition makers.

At this time, key components, for acceptable steel shot loads, are not available to reloaders. This includes "soft" steel shot, the special plastic wads, and shot sleeves designed for use with such shot, and the special powder that will be required.

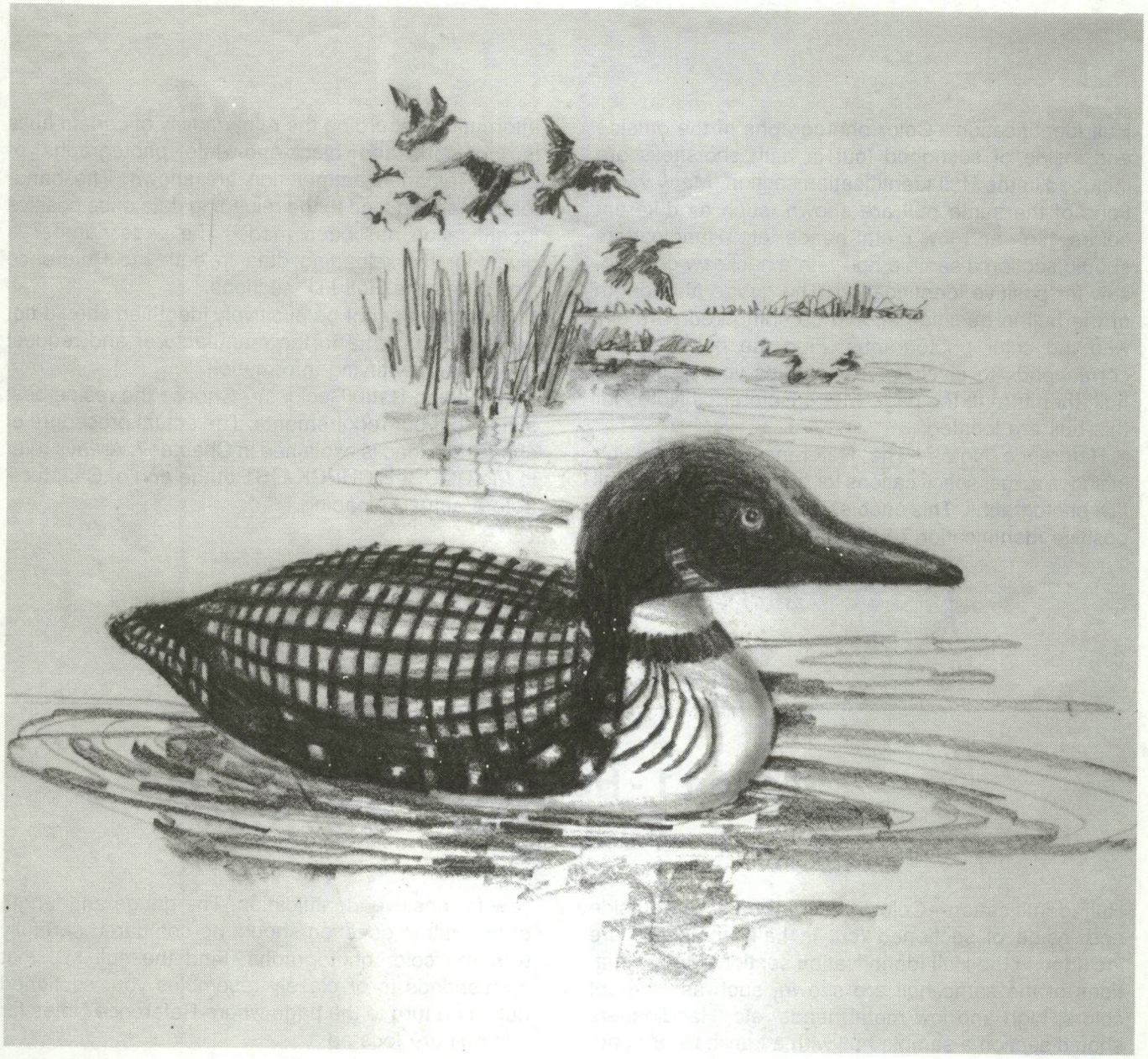
Some steel shot pellets have been brought to our attention that have a diamond pyramid hardness of up to 270, as compared to the required DPH of about 90 for the soft steel shot being used in commercial shot loads.

In some cases, available steel pellets are harder than the gun barrel in which they would be fired and can badly score barrel walls and distort barrel chokes.

Commercial steel shot loads have special wads and thick plastic shot sleeves that help shield the barrel wall from the shot pellets. The shot sleeves, used in lead shot loads, are not sufficient to protect gun barrels from damage due to steel shot.

The reloading of steel shot loads, an entirely different undertaking than loading lead shot ammunition, requires all new components and data. The attempt to load steel shot loads, with current components, would damage your gun and could injure the shooter or bystander.

Steel shot components are not currently available from Winchester Western.



Chapter 9

RELOADING DATA RECIPES

Hull Identification—Color photographs of the outside and inside of sectioned (cut in half) shotshells are included in the Hull Identification section. Many variations of the same hull are shown, such as different colors, high and low metal heads, etc. Handloaders should section a sample hull with a hacksaw or bandsaw for positive identification. The gauge and length of the hull in question should be compared carefully with the color photographs. Find the hull I.D. that corresponds to or closely resembles your sectioned hull, then turn to the page where Reference Notes for this hull are located.

Reference Notes—The Reference Notes section includes actual specifications for hulls shown in the Hull I.D. photographs. This enables the handloader to make positive identification of the hull in question. Special information regarding the reloadability of certain hulls is included, and black-and-white photographs of factory-reloaded ammunition are shown. The handloader can proceed to the reloading data once positive identification has been made. The page number is given for the reloading data in both the Reference Notes and the Hull I.D. sections.

Hulls that cannot be positively identified should not be reloaded. Write to the manufacturer and request additional identifying information.

Reloading Data (Recipes)—Choose the recipe best suited for your requirements. The actual procedure of choosing a load is explained in Chapter 7. Always refer to the DOUBLE CHECK LIST at the end of Chapter 7 before actual reloading.

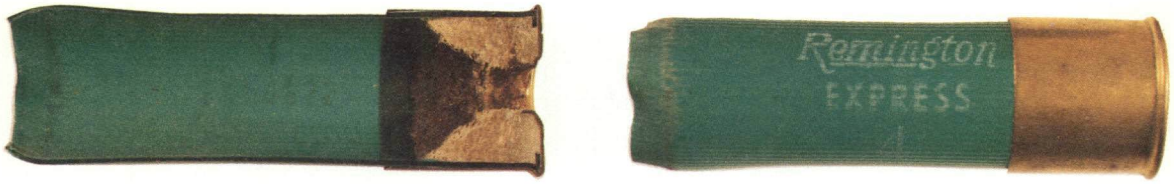
Section 1 - Hull Identification (Full Color)

Hull Identification—Color photographs of the outside and inside of sectioned (cut in half) shotshells are included in the Hull Identification section. Many variations of the same hull are shown, such as different colors, high and low metal heads, etc. Handloaders should section a sample hull with a hacksaw or bandsaw for positive identification. The gauge and length of the hull in question should be compared carefully with the color photographs. Find the hull I.D. that corresponds to or closely resembles your sectioned hull, then turn to the page where Reference Notes for this hull are located.

Hull I.D. #1
10 Gauge 2-7/8″
Reloading Data Page 133
Reference Notes Page 113

Remington S.P. Plastic Shell
(With Fiber Basewad)

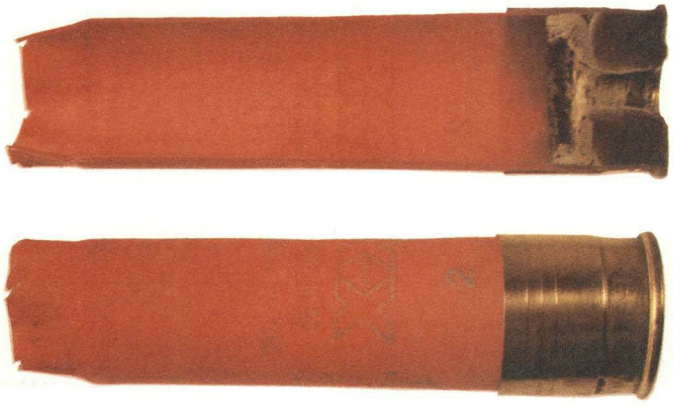
10
10 Gauge 2-7/8″



Hull I.D. #2
10 Gauge 3½″
Reloading Data Page 133
Reference Notes Page 113

Winchester-Western Polyformed Plastic Shell
(With Paper Basewad)

10
10 Gauge 3½″



Hull I.D. #3
10 Gauge 3½″
Reloading Data Page 134
Reference Notes Page 114

Remington S.P. Plastic Shell
(With Fiber Basewad)

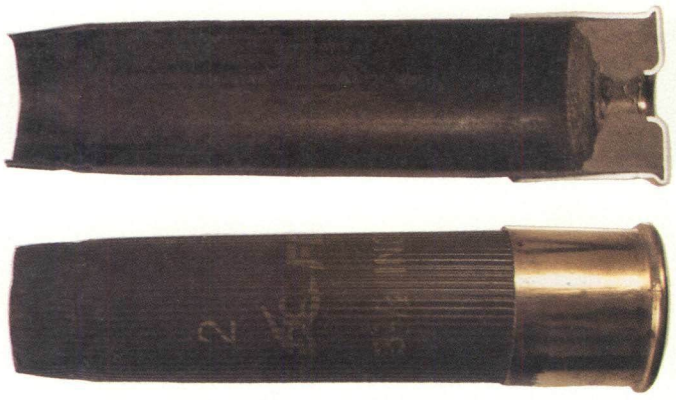
10
10 Gauge 3½″

10

10 Gauge 3½"

Federal Plastic Shell

Hull I.D. #4
10 Gauge 3½"
Reloading Data Page 134
Reference Notes Page 114

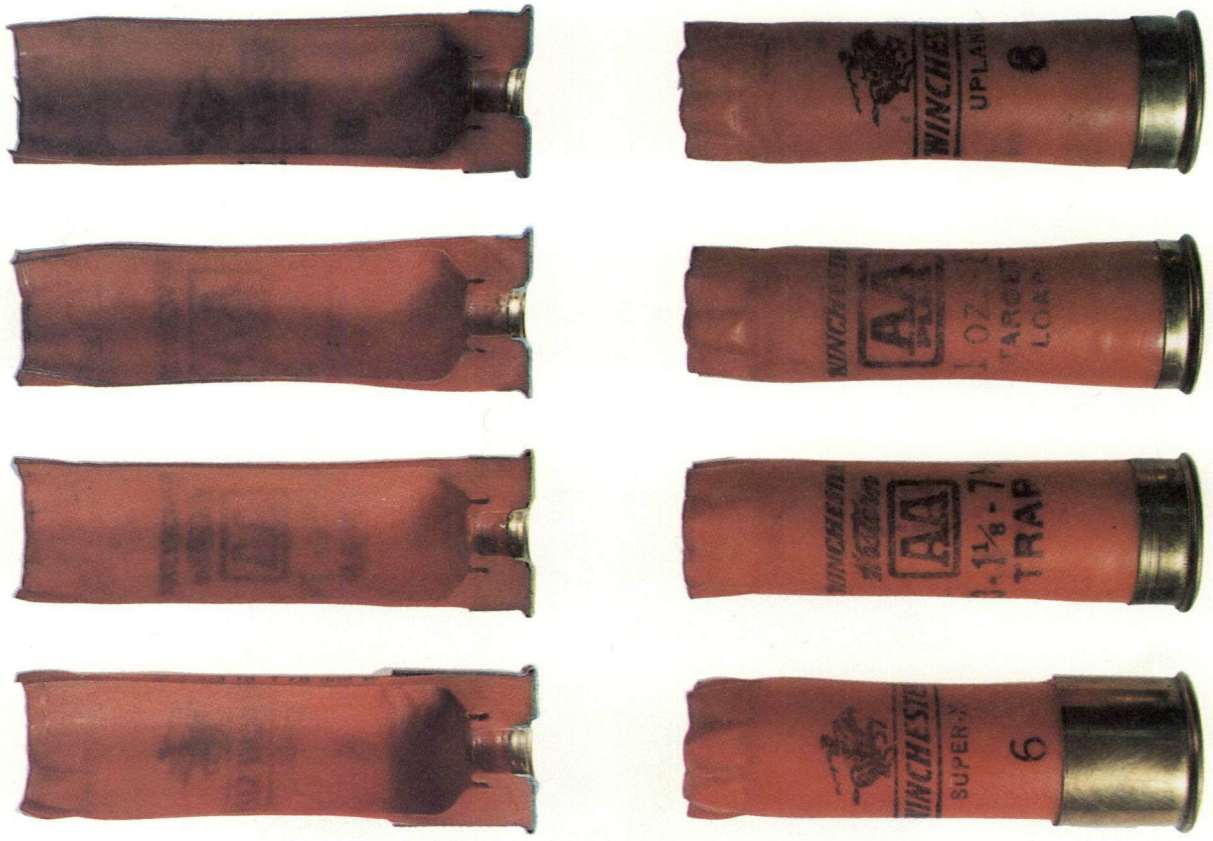


12

12 Gauge 2¾"

Winchester-Western Compression-Formed Plastic Shell

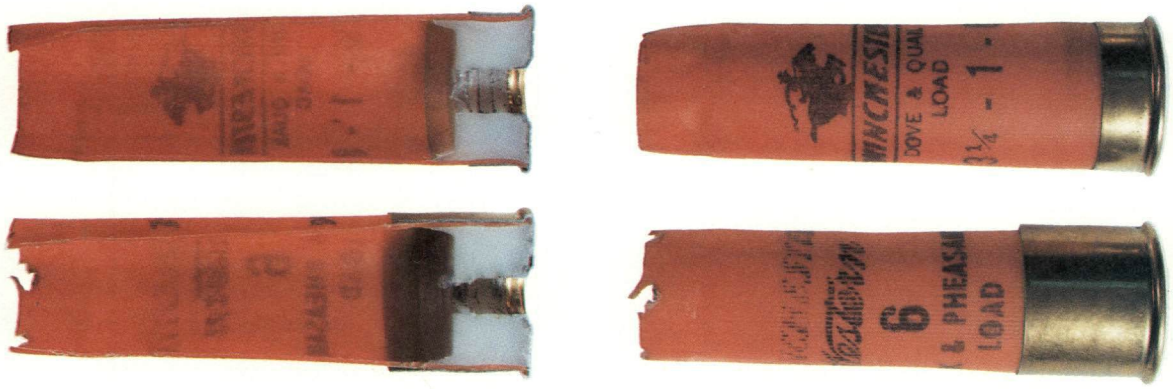
Hull I.D. #5
12 Gauge 2¾"
Reloading Data Page 134
Reference Notes Page 114



Hull I.D. #6
12 Gauge 2¾"
Reloading Data Page 146
Reference Notes Page 115

Winchester-Western Polyformed Plastic Shell *(With Plastic Basewad)*

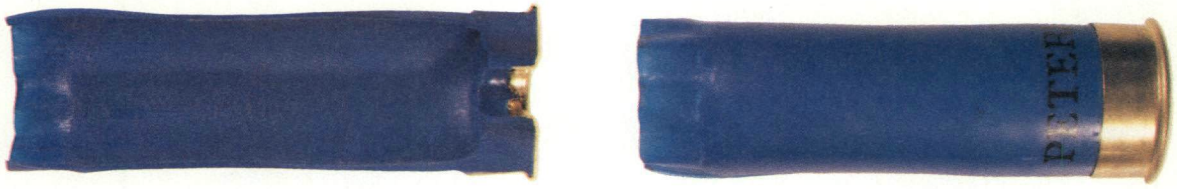
12
12 Gauge 2¾"



Hull I.D. #7
12 Gauge 2¾"
Reloading Data Page 147
Reference Notes Page 116

Peters Plastic Target Shell ("Blue Magic")

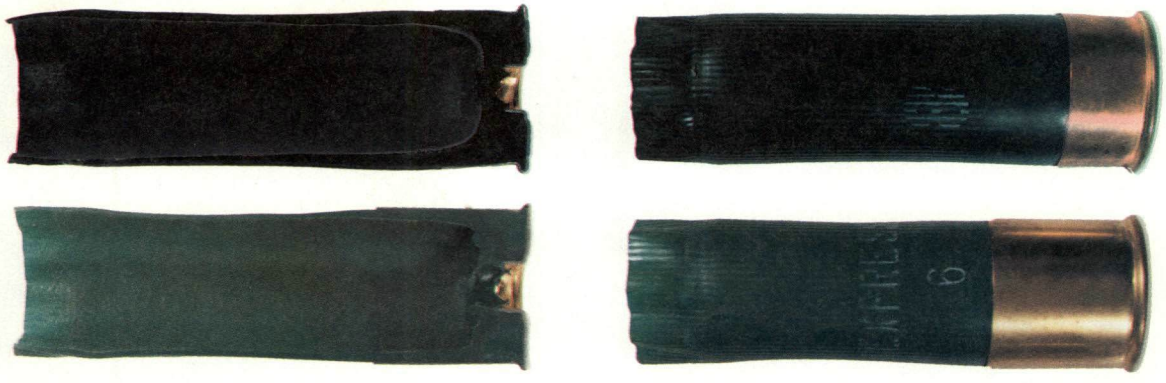
12
12 Gauge 2¾"



Hull I.D. #8
12 Gauge 2¾"
Reloading Data Page 156
Reference Notes Page 117

Remington Unibody Plastic Shell *(With Integral Basewad)*

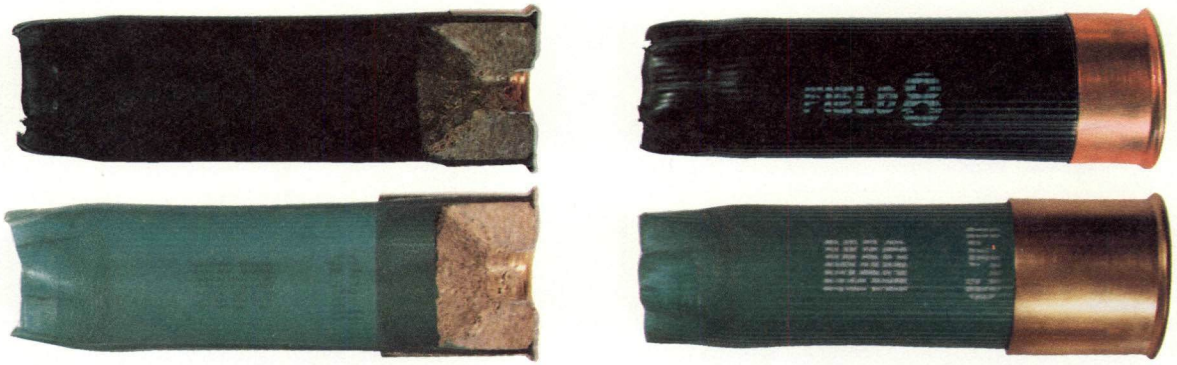
12
12 Gauge 2¾"



12
12 Gauge 2¾"

Remington S.P. Plastic Shell
(With Fiber Basewad)

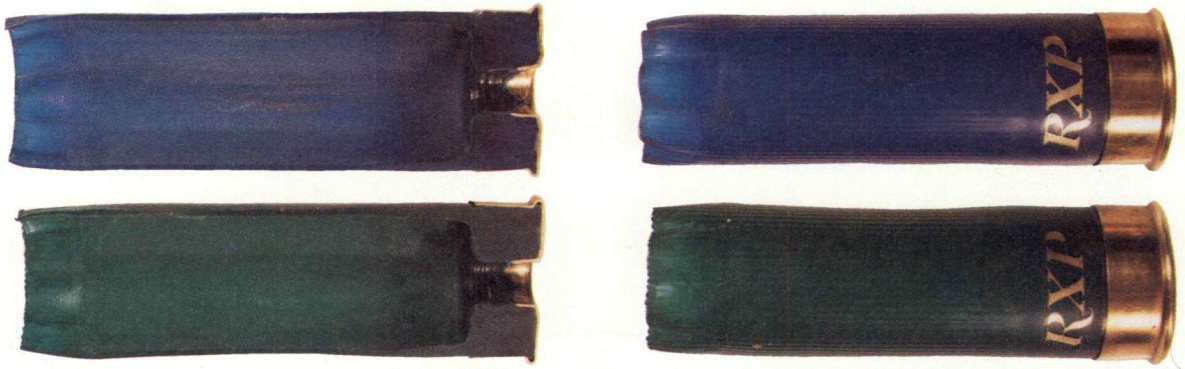
Hull I.D. #9
12 Gauge 2¾"
Reloading Data Page 159
Reference Notes Page 118



12
12 Gauge 2¾"

Remington RXP Plastic Target Shell

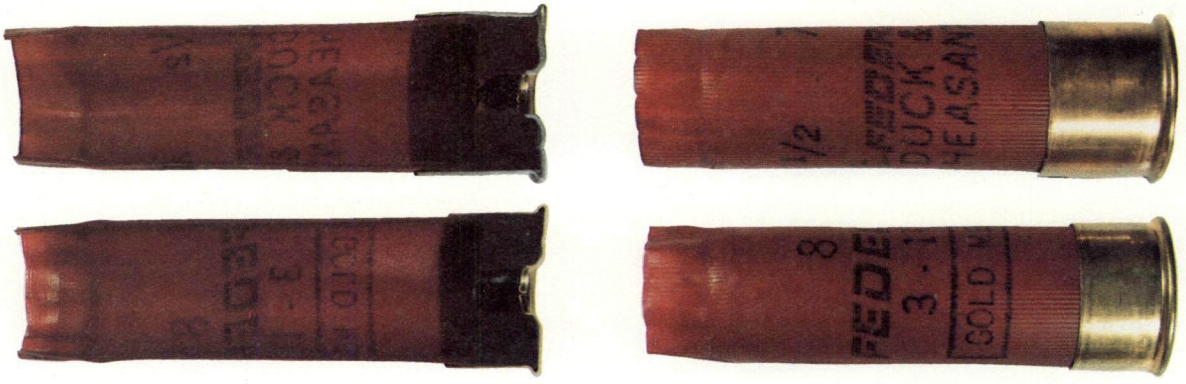
Hull I.D. #10
12 Gauge 2¾"
Reloading Data Page 160
Reference Notes Page 118



12
12 Gauge 2¾"

Federal Gold Medal Plastic Target Shell

Hull I.D. #11
12 Gauge 2¾"
Reloading Data Page 164
Reference Notes Page 119



Hull I.D. #12
12 Gauge 2¾"

Reloading Data Page 170
Reference Notes Page 120

Federal Paper Target Shell

12
12 Gauge 2¾"

Hull I.D. #13
12 Gauge 2¾"

Reloading Data Page 174
Reference Notes Page 120

Federal Hi-Power Plastic Shell

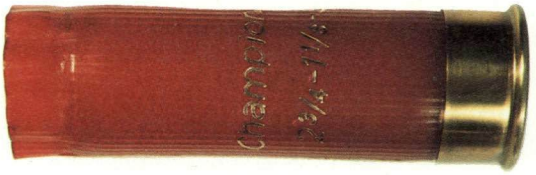
12
12 Gauge 2¾"

Hull I.D. #14
12 Gauge 2¾"

Reloading Data Page 178
Reference Notes Page 121

Federal Champion II Plastic Target Shell

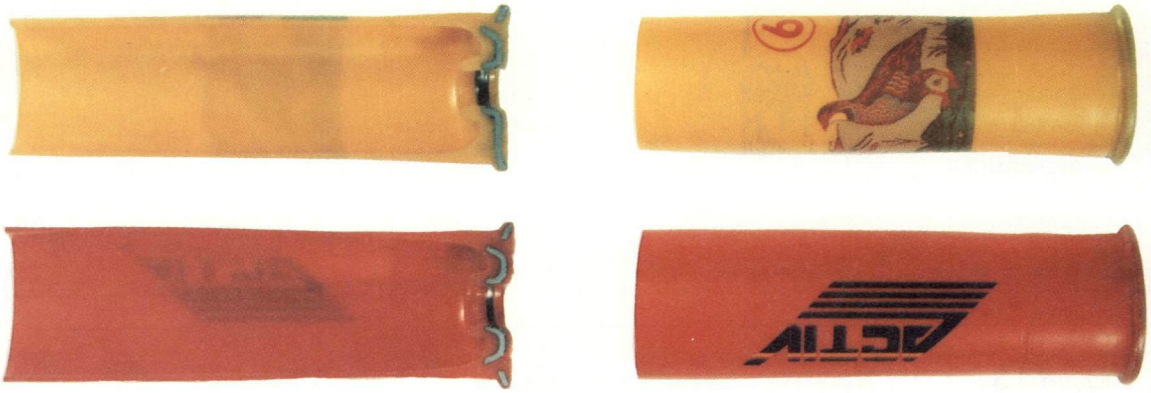
12
12 Gauge 2¾"



12
12 Gauge 2¾″

ACTIV Plastic Hull (Component Hull)

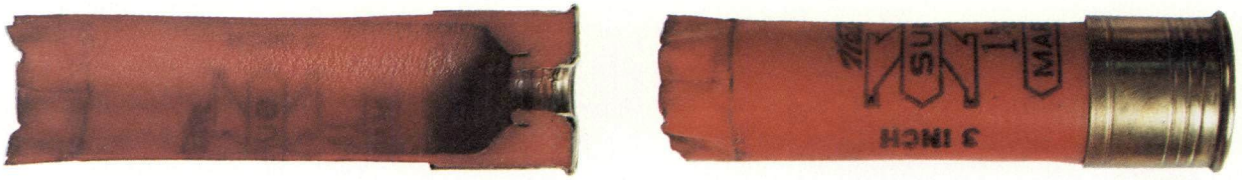
Hull I.D. #15
12 Gauge 2¾″
Reloading Data Page 178
Reference Notes Page 121



12
12 Gauge 3″

Winchester-Western Compression-Formed Plastic Shell

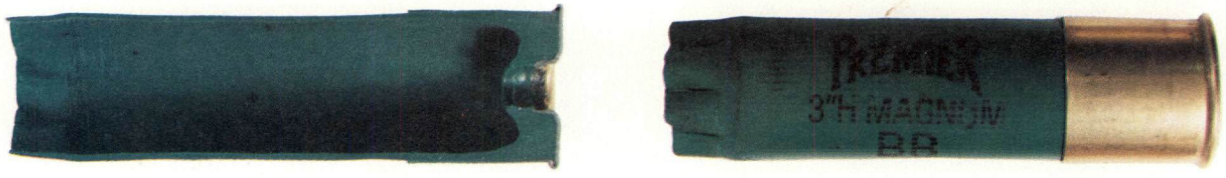
Hull I.D. #16
12 Gauge 3″
Reloading Data Page 183
Reference Notes Page 122



12
12 Gauge 3″

Remington Unibody Plastic Shell *(With Integral Basewad)*

Hull I.D. #17
12 Gauge 3″
Reference Notes Page 122



Hull I.D. #18
12 Gauge 3″
Reloading Data Page 183
Reference Notes Page 123

Remington S.P. Plastic Shell
(With Fiber Basewad)

12
12 Gauge 3″

Hull I.D. #19
12 Gauge 3″
Reloading Data Page 184
Reference Notes Page 123

Federal Hi-Power Plastic Shell

12
12 Gauge 3″

Hull I.D. #20
16 Gauge 2¾″
Reloading Data Page 185
Reference Notes Page 123

Winchester-Western Compression-Formed Shell

16
16 Gauge 2¾″

Hull I.D. #21
16 Gauge 2¾″
Reloading Data Page 187
Reference Notes Page 123

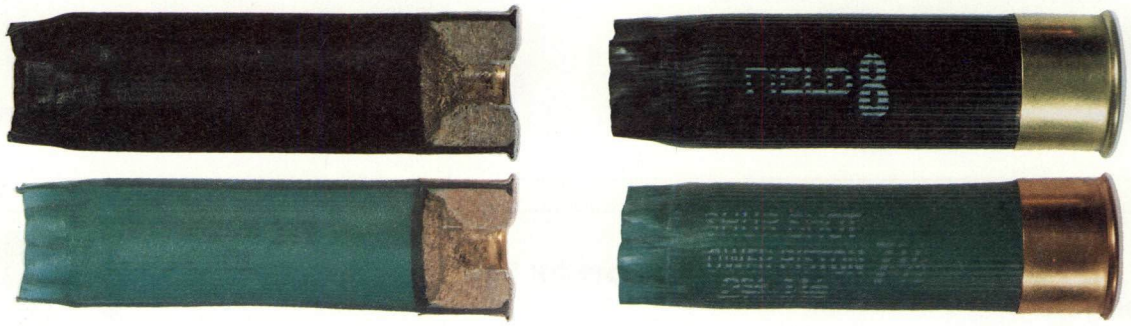
Remington S.P. Plastic Shell—Express
(With Fiber Basewad)

16
16 Gauge 2¾″

16
16 Gauge 2¾"

Remington S.P. Plastic Shell—Shurshot-Victor
(With Fiber Basewad)

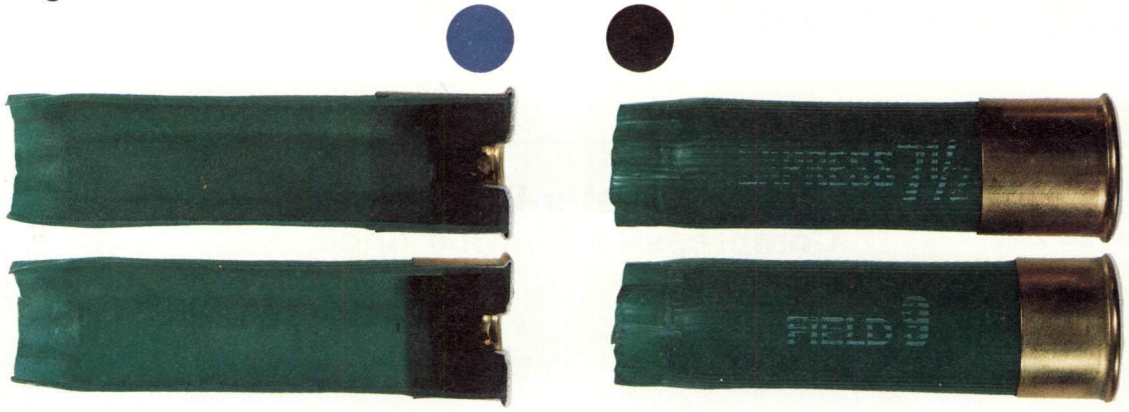
Hull I.D. #22
16 Gauge 2¾"
Reloading Data Page 188
Reference Notes Page 124



16
16 Gauge 2¾"

Remington S.P. Plastic Shell—Express
(With Plastic Basewad)

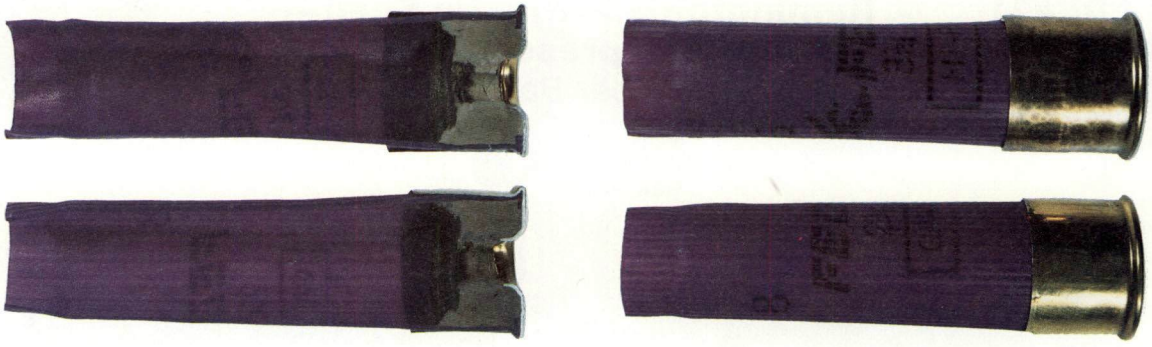
Hull I.D. #23
16 Gauge 2¾"
Reference Notes Page 124



16
16 Gauge 2¾"

Federal Hi-Power Plastic Shell

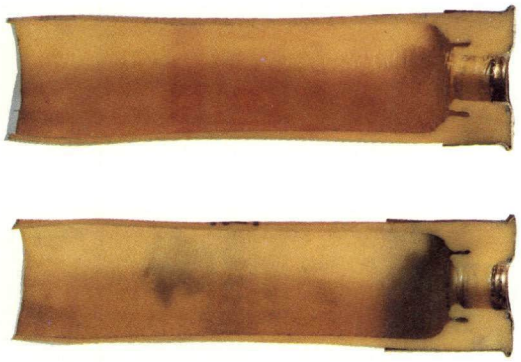
Hull I.D. #24
16 Gauge 2¾"
Reloading Data Page 189
Reference Notes Page 124



Hull I.D. #25
20 Gauge 2¾″
Reloading Data Page 191
Reference Notes Page 125

Winchester-Western Compression-Formed Plastic Shell

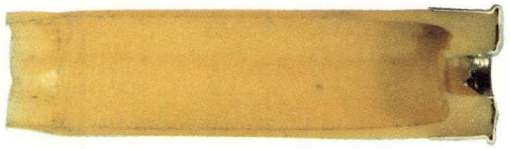
20
20 Gauge 2¾″




Hull I.D. #26
20 Gauge 2¾″
Reloading Data Page 194
Reference Notes Page 125

Remington RXP Plastic Target Shell

20
20 Gauge 2¾″




Hull I.D. #27
20 Gauge 2¾″
Reloading Data Page 197
Reference Notes Page 126

Remington S.P. Plastic Shell—Express *(With Plastic Basewad)*

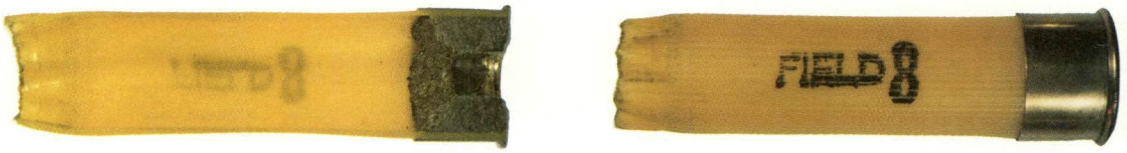
20
20 Gauge 2¾″



20
20 Gauge 2¾"

Remington S.P. Plastic Shell—Shurshot-Victor
(With Fiber Basewad)

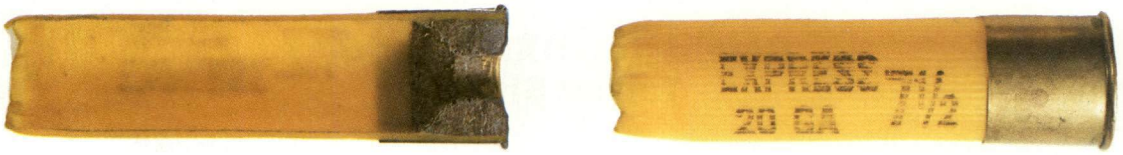
Hull I.D. #28
20 Gauge 2¾"
Reloading Data Page 198
Reference Notes Page 126



20
20 Gauge 2¾"

Remington S.P. Plastic Shell—Express
(With Fiber Basewad)

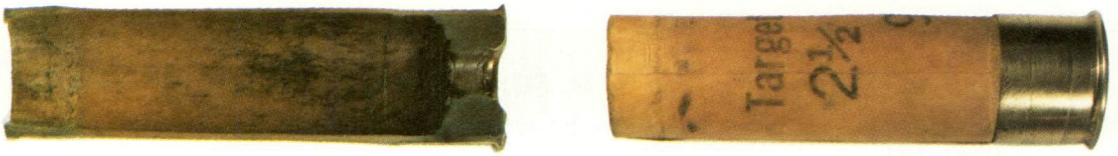
Hull I.D. #29
20 Gauge 2¾"
Reloading Data Page 199
Reference Notes Page 126



20
20 Gauge 2¾"

Federal Paper Target Shell

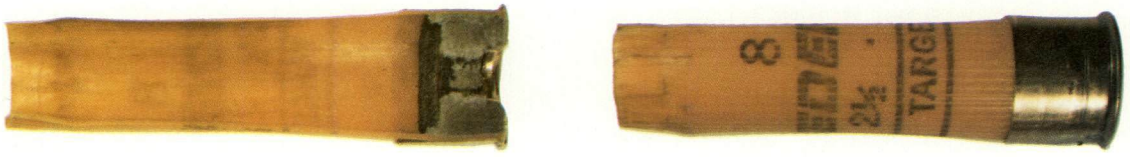
Hull I.D. #30
20 Gauge 2¾"
Reloading Data Page 200
Reference Notes Page 127



20
20 Gauge 2¾"

Federal Plastic Target Shell

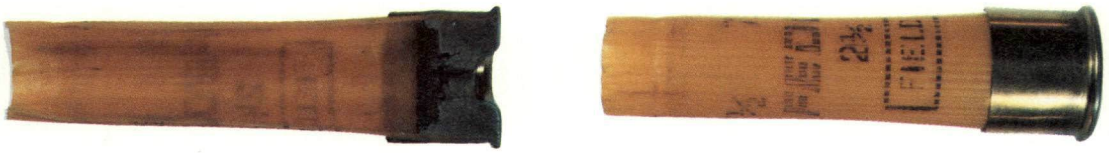
Hull I.D. #31
20 Gauge 2¾"
Reloading Data Page 202
Reference Notes Page 127



Hull I.D. #32
20 Gauge 2¾″
Reloading Data Page 204
Reference Notes Page 127

Federal Hi-Power Plastic Shell

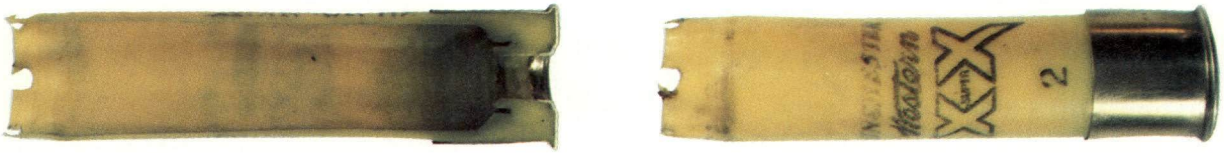
20
20 Gauge 2¾″



Hull I.D. #33
20 Gauge 3″
Reloading Data Page 206
Reference Notes Page 128

Winchester-Western Compression-Formed Plastic Shell

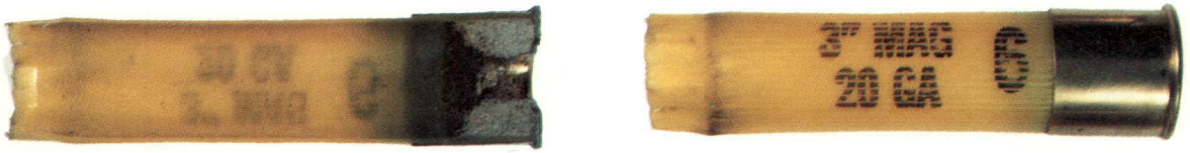
20
20 Gauge 3″



Hull I.D. #34
20 Gauge 3″
Reloading Data Page 207
Reference Notes Page 128

Remington S.P. Plastic Shell
(With Fiber Basewad)

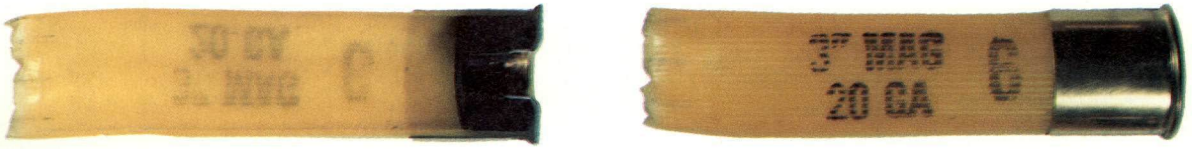
20
20 Gauge 3″



Hull I.D. #35
20 Gauge 3″
Reloading Data Page 207
Reference Notes Page 128

Remington S.P. Plastic Shell
(With Plastic Basewad)

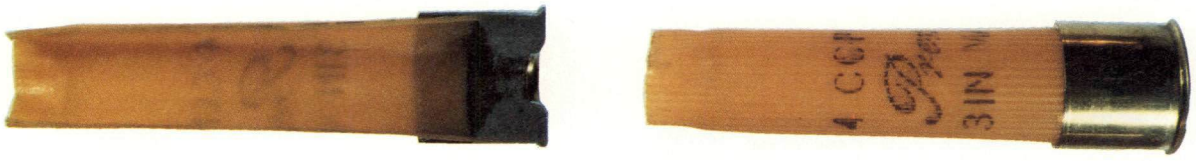
20
20 Gauge 3″



20
20 Gauge 3″

Federal Hi-Power Plastic Shell

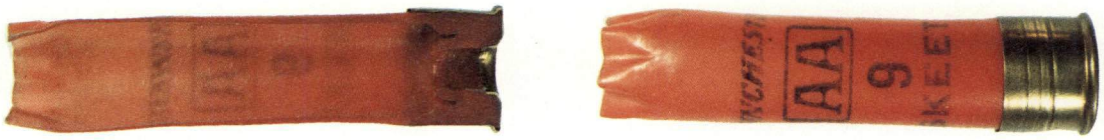
Hull I.D. #36
20 Gauge 3″
Reloading Data Page 208
Reference Notes Page 129



28
28 Gauge 2¾″

Winchester-Western Compression-Formed Plastic Shell

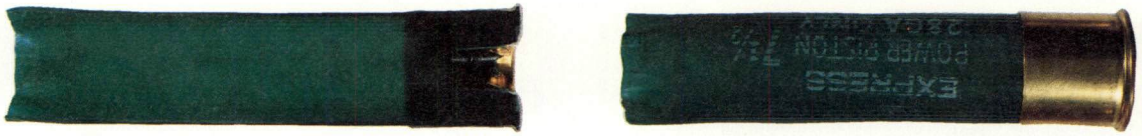
Hull I.D. #37
28 Gauge 2¾″
Reloading Data Page 209
Reference Notes Page 129



28
28 Gauge 2¾″

Remington S.P. Plastic Shell *(With Plastic Basewad)*

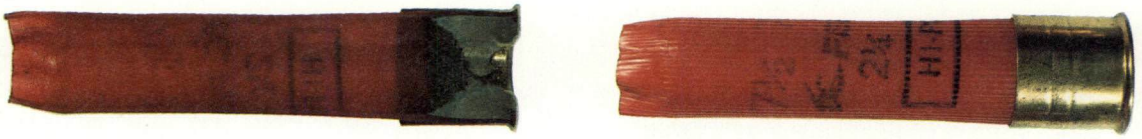
Hull I.D. #38
28 Gauge 2¾″
Reloading Data Page 211
Reference Notes Page 129



28
28 Gauge 2¾″

Federal Hi-Power Plastic Shell

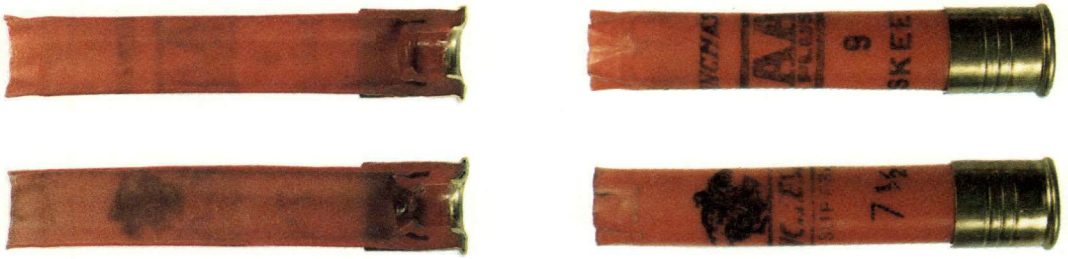
Hull I.D. #39
28 Gauge 2¾″
Reloading Data Page 213
Reference Notes Page 130



Hull I.D. #40
.410 Bore 2½"
Reloading Data Page 215
Reference Notes Page 130

Winchester-Western Compression-Formed Plastic Shell

.410
.410 Bore 2½"



Hull I.D. #41
.410 Bore 2½"
Reloading Data Page 216
Reference Notes Page 130

Remington S.P. Plastic Shell
(With Plastic Basewad)

.410
.410 Bore 2½"

Hull I.D. #42
.410 Bore 2½"
Reloading Data Page 217
Reference Notes Page 131

Federal Plastic Shell

.410
.410 Bore 2½"

Hull I.D. #43
.410 Bore 3"
Reloading Data Page 218
Reference Notes Page 131

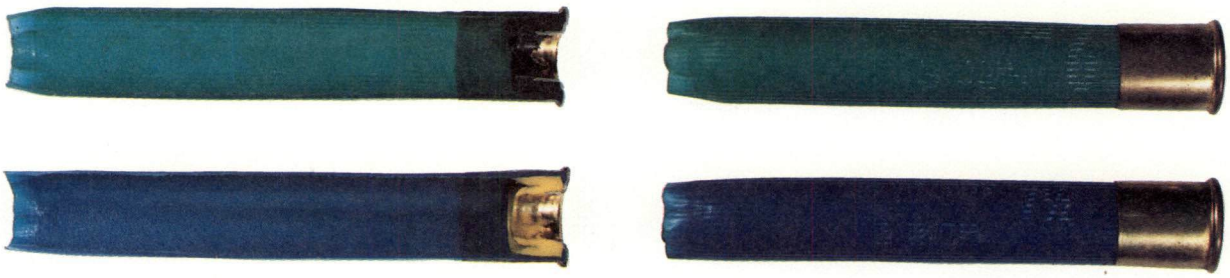
Winchester-Western Compression-Formed Plastic Shell

.410
.410 Bore 3"

.410
.410 Bore 3″

Remington S.P. Plastic Shell
(With Plastic Basewad)

Hull I.D. #44
.410 Bore 3″
Reloading Data Page 219
Reference Notes Page 132



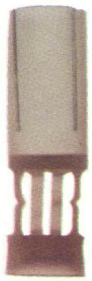
.410
.410 Bore 3″

Federal Plastic Shell

Hull I.D. #45
.410 Bore 3″
Reloading Data Page 220
Reference Notes Page 132

WADS

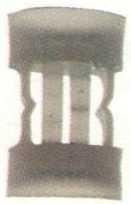
Winchester
WAA41



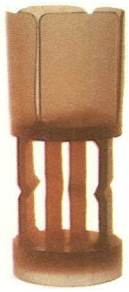
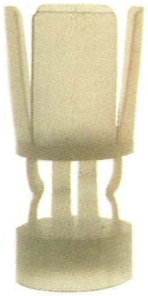
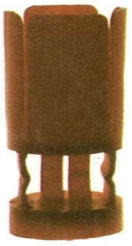
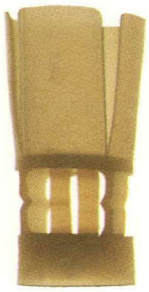
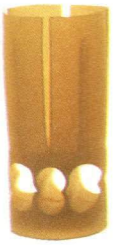
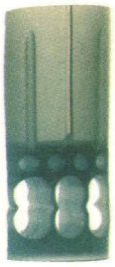
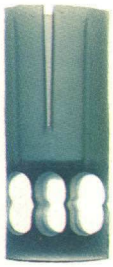
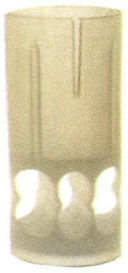
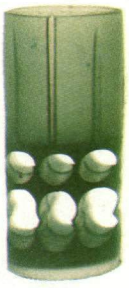
Winchester
WAA28

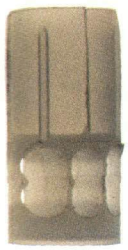
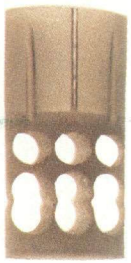
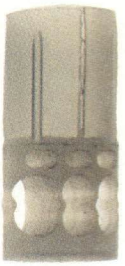
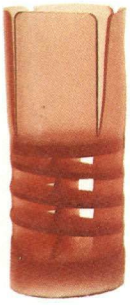
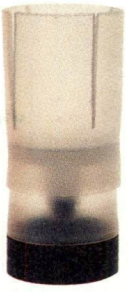
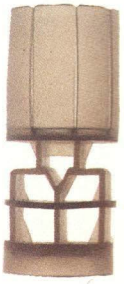
Winchester
WAA20F1

Winchester
WAA20



Winchester
Special Skeet
(Factory Load)

 Winchester WAA12F1	 Winchester WAA12	 Winchester WAA12R	 Winchester WAA12XW
 Winchester WAA12F114	 Remington SP 410	 Remington SP 4103	 Remington SP 28
 Remington RXP 20	 Remington RP 20 (Also White)	 Remington SP 20 (Also White)	 Remington RP 16 (Also White)
 Remington SP 16 (Also White)	 Remington RP 12	 Remington SP 12	 Remington RXP 12 (Also White)

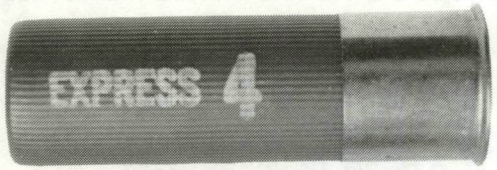
 Remington RPA 12	 Remington R 12 L	 Remington 12 Gauge, 1 oz. (Factory Load)	 Remington R 12 H
 Remington SP 10	 Federal 410SC	 Federal 20S1	 Federal 12S4
 Federal 12S3	 Federal 12C2	 Federal 12C1	 Windjammer 12 Gauge
 Pacific 12 Gauge Verelite	 Pacific 12 Gauge Versalite	 Pacific 10 Gauge Versalite	 Lage 12 Gauge Uniwad

Section 2 - Reference Notes

Reference Notes—The Reference Notes section includes actual specifications for hulls shown in the Hull I.D. photographs. This enables the handloader to make positive identification of the hull in question. Special information regarding the reloadability of certain hulls is included, and black-and-white photographs of factory-loaded ammunition are shown. The handloader can proceed to the reloading data once positive identification has been made. The page number is given for the reloading data in both the Reference Notes and the Hull I.D. sections.

Hulls that cannot be positively identified should not be reloaded. Write to the manufacturer and request additional identifying information.

Remington S.P. Plastic Shell
(With Fiber Basewad)



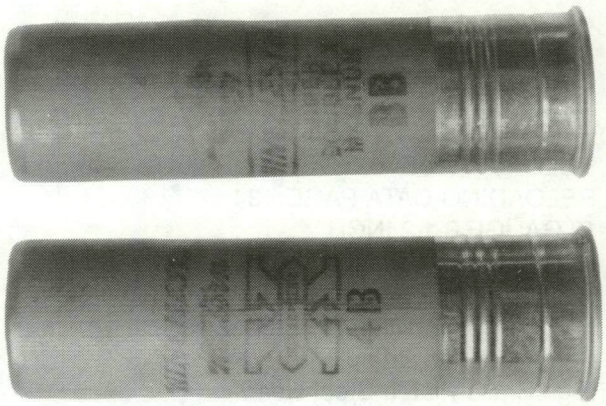
REFERENCE NOTES # 1

HULL I.D. PAGE 97
RELOADING DATA PAGE 133
10 GAUGE 2-7/8 INCH
Remington S.P. Plastic Shell
Reifenhauser Process Hull Construction
Molded Composition Fiber Basewad
Roll Crimp
High Brass-Plated Steel Head
Rem. 57* Size Primer
Ribbed, Green Plastic Tube

This three-piece Remington shell has a plastic tube, molded composition fiber basewad and a brass-plated steel head. The original factory load has a roll crimp. The handloader may change this by using a six-point crimp starter during the reloading process. When the factory load is fired the mouth of this hull has a tendency to shrink. The handloader may find it necessary to make a tapered mouth expander from a wooden broom handle or dowel rod to open the mouth up to facilitate seating the plastic wad.

Be sure to inspect the base wad carefully and determine if it is in good condition prior to reloading. Before reloading this hull, read Reference Notes # 9 for "Special Information" regarding this design.

Winchester-Western Polyformed Plastic Shell
(With Paper Basewad)



REFERENCE NOTES # 2

HULL I.D. PAGE 97
RELOADING DATA PAGE 133
10 GAUGE 3-1/2 INCH
Winchester-Western Polyformed Plastic Shell
Reifenhauser Process Hull Construction
Rolled Paper Basewad With Paper Over Cup
6-Point Folded Crimp
High Brass Or Brass-Plated Steel Head
209 Size Primer
Ribbed, Red Plastic Tube

The Winchester polyformed shell consists of four parts: a plastic tube, rolled paper base wad, a paper cup wad riveted to the base wad and a crimped-on head of either brass or brass-plated steel. The factory shell has a 6-point folded crimp with a heat seal in the center. The handloader will find a small hole in the center of the reloaded shell where the heat seal has been blown away. Generally this hole is not large enough to leak shot, but a drop or two of candle wax will seal it if desired.

This hull has a tendency to crush and form a bulge just above the brass when reloaded. If this happens read the "Crimp" section in the Components chapter on how to set the cam-operated crimp die if you are using a MEC reloader, or check with the manufacturer of your reloader on how to eliminate this problem.

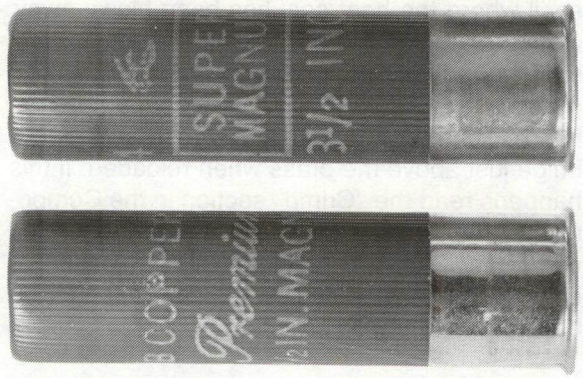
Remington S.P. Plastic Shell *(With Fiber Basewad)*

REFERENCE NOTES # 3

HULL I.D. PAGE 97
RELOADING DATA PAGE 134
10 GAUGE 3-1/2 INCH
Remington S.P. Plastic Shell
Reifenhauser Process Hull Construction
Molded Composition Fiber Basewad
6-Point Folded Crimp
High Brass-Plated Steel Head
Rem 57* Size Primer
Ribbed, Green Plastic Tube

This three-piece Remington shell has a plastic tube, molded composition fiber basewad and a brass-plated steel head. The factory load has a 6-point folded crimp. When fired, the mouth of this hull has a tendency to shrink. The handloader may find it necessary to make a tapered mouth expander from a wooden broom handle or dowel rod to open the mouth up to facilitate seating the plastic wad. Be sure to inspect the base wad carefully and determine if it is in good condition prior to reloading. Before reloading this hull, read Reference Notes # 9 for "Special Information" regarding this design.

Federal Plastic Shell



REFERENCE NOTES # 4

HULL I.D. PAGE 98
RELOADING DATA PAGE 134
10 GAUGE 3-1/2 INCH
Federal Plastic Shell
Reifenhauser Process Hull Construction
Rolled Paper Basewad
6-Point Folded Crimp
High Brass-Plated Steel Head
209 Size Primer
Ribbed, Brown Plastic Tube

Federal's plastic 10 gauge shell consists of three parts: a brown plastic tube, a rolled paper basewad and a brass-plated steel head. The factory crimp is a folded 6-point type closure. This is probably the best of the 10 gauge 3-1/2 inch hulls for the handloader. It has a large internal volume and produces a very good velocity-to-pressure ratio when reloaded with either 2 or 2-1/8 ounces of shot. The 2 ounce load is the best all around load and is easier to reload.

Winchester-Western Compression-Formed Plastic Shell

REFERENCE NOTES # 5

HULL I.D. PAGE 98
RELOADING DATA PAGE 134
12 GAUGE 2-3/4 INCH
Winchester-Western Compression-Formed Plastic Shell (A-A Type)
Compression-Formed Hull Construction
Integral Plastic Basewad
6 Or 8-Point Folded Crimp
Low Or High Brass Or Brass-Plated Steel Head
209 Size Primer
Smooth, Red Plastic Tube

This is Winchester's famous "compression-formed" shell to which handloaders compare all other hulls. It is the one that made modern shotshell reloading easy to do. The hull is red in color and is factory loaded in many different brands. The Double A, Double A Handicap, Upland, Super Pigeon, Super-X and Super Double-X hulls—all of which are compression-formed—are made of one piece of plastic without a separate basewad. The hull may have either a low or high brass or brass-plated steel head. The internal dimensions of this hull are identical and all of the reloading recipes listed may be used regardless of the brass height.

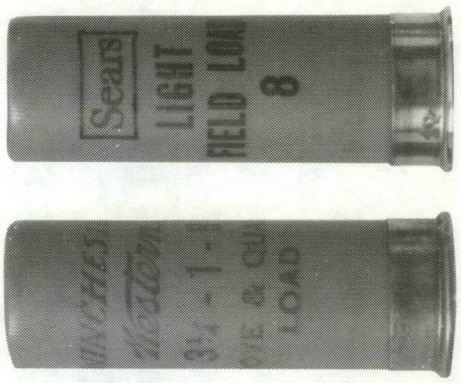
The handloader may encounter some factory-loaded hulls that were closed with a 6- or 8-point crimp. The 6-point crimps were heat sealed but are still an excellent hull to reload. The heat seal will be blown away on the initial firing and, when reloaded, the small hole in the center of the crimp can be closed with one or two drops of candle wax if desired. All of these hulls now have 8-point folded crimps for improved reloadability.

In the past all compression-formed hulls had a brass head. Some factory loads are now being produced with a brass-plated steel head that should cause no problems for the handloader. As with any hull, inspect the metal head for cracks.

Winchester-Western does not sell empty hulls as a component at this time. Other designs of hulls were sold to the handloading market in the past. One of the component hulls that was available is pictured below.

Perhaps this will change in the future as there is a substantial market for new and unfired component hulls. The author has had the unique opportunity to load new, unfired and uncrimped Double A hulls on a MEC reloader. They loaded without any problems and the finished crimp was excellent. This hull would make an excellent component for the reloading market. It's just a matter of time before some manufacturer fills this void—perhaps it will be Winchester's Double A. Time will tell.

Winchester-Western Polyformed Plastic Shell *(With Plastic Basewad)*



REFERENCE NOTES # 6

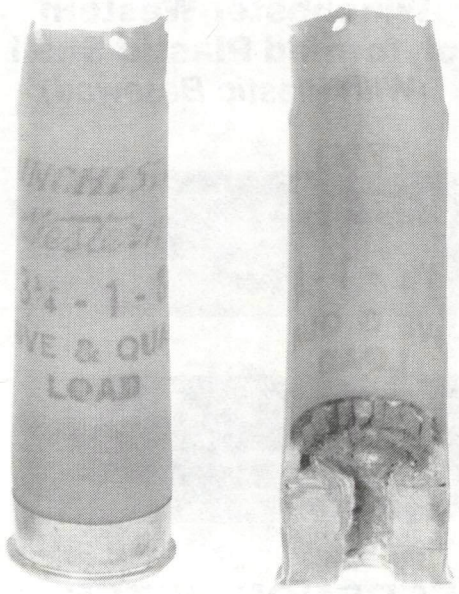
HULL I.D. PAGE 99
RELOADING DATA PAGE 146
12 GAUGE 2-3/4 INCH
Winchester-Western Polyformed Plastic Shell
Reifenhauser Process Hull Construction
Injection Molded Plastic Basewad
6-Point Folded Crimp
Low Or High Brass Or Brass-Plated Steel Head
209 Size Primer
Ribbed, Red Plastic Tube

This hull is at the opposite end of the spectrum from the Double A type. It is Winchester's promotional loading and is made to be sold at a low price, fired and forgotten. It is generally found under one of three different brand names: Dove & Quail, Rabbit & Squirrel and Duck & Pheasant. This hull is also loaded for a couple of large retail operations and private branded with their name.

The ribbed, plastic hull is red in color and may be found with a low or high brass or brass-plated steel head. It has a separate white, translucent plastic basewad. This basewad has a very small flash hole and, when depriming, there may be a tendency for the deprime punch to stick in the

flash hole. Be careful that the plastic basewad does not come loose as the deprime punch is removed. If it does and is pulled up in the tube, the hull should be discarded.

Prior to 1983 these promotional loadings were in a hull that had a separate paper basewad (with over paper cup). The low brass hull had a high internal paper basewad and the high brass hull had a low internal paper basewad. These two hull constructions are shown in the picture below. Both types are now discontinued in 12 gauge.



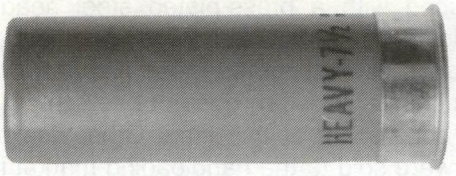
Low-brass with high paper basewad.

High-brass with low paper basewad.

It is this author's opinion that the older paper base wad hulls should not be reloaded and no data (recipes) are included in this handbook.

The new style hulls (with separate plastic basewad) can be reloaded one or two times, but care must be taken in adjusting the final cam-operated crimp die to prevent the hull from crushing and forming a bulge in the plastic just above the metal head. Prior to reloading this hull the handloader should read the "Crimp" section in the Components chapter on how to set the cam-operated crimp die if you are using a MEC reloader, or check with the manufacturer of your reloader on how to eliminate this problem.

Peters Plastic Target Shell ("Blue Magic")

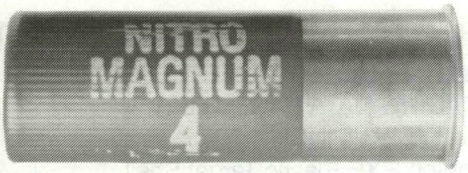


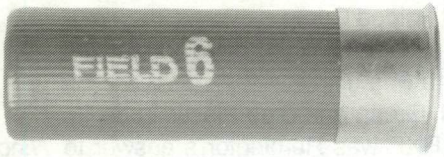
REFERENCE NOTES # 7

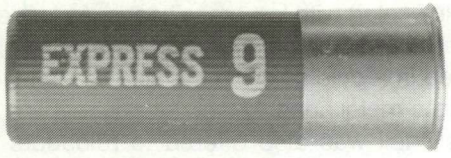
HULL I.D. PAGE 99
RELOADING DATA PAGE 147
12 GAUGE 2-3/4 INCH
Peters Plastic Target Shell ("Blue Magic")
Unibody Process Plastic Construction
Integral Plastic Basewad
Low Brass Metal Head
8-Point Folded Crimp
209 Size Primer
Smooth, Blue Plastic Tube

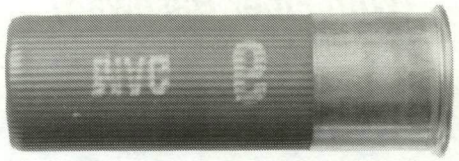
The Peters Target Shell, formerly called "Blue Magic," is Remington's current target load. It is a very good hull for reloading and is generally available in all areas of the country. The internal capacity is close to that of the Double A hull, but there is enough difference that the powder manufacturers have developed separate reloading data for each hull.

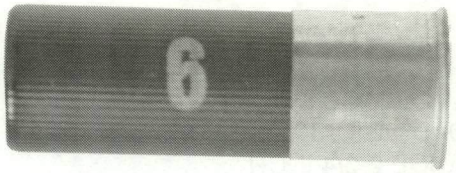
Remington Unibody Plastic Shell
(With Integral Basewad)











REFERENCE NOTES # 8

HULL I.D. PAGE 99
RELOADING DATA PAGE 156
12 GAUGE 2-3/4 INCH
Remington Unibody Plastic Shell
Unibody Process Plastic Construction
Integral Plastic Basewad
8-Point Folded Crimp
Low Or High Brass-Plated Or Copper-Plated Steel Head
209 Size Primer
Ribbed, Green, Blue or Black Plastic Tube

The "Unibody Style" shell is being loaded by Remington under a number of different names. This hull is similar to the RXP (now discontinued), but according to Remington there are some differences. According to Remington, if the hull is of one-piece plastic construction and is not a Peters Target Shell (Blue Magic) or does not have the RXP name heat stamped on the side of the tube, then it is a Unibody constructed hull.

This hull is of one-piece plastic construction and can be found in green, blue and black colors and with a low or high copper-plated or brass-plated steel head.

It is a very good hull for the reloader and is a great improvement over the old style molded fiber basewad hull. Its only drawback is being new; there is not a lot of reloading data available at this time in the heavier 1-3/8 and 1-1/2 ounce loads.

Some of the brand names include: Mohawk, Dove & Quail, Duck & Pheasant, Field, Express, Nitro Mag and Premier. Regardless of whether the Unibody has low or high outside brass, it can be used for data listed for this hull.

Remington S.P. Plastic Shell *(With Fiber Basewad)*

REFERENCE NOTES # 9

HULL I.D. PAGE 100
RELOADING DATA PAGE 159
12 GAUGE 2-3/4 INCH
Remington S.P. Plastic Shell
Reifenhauser Process Hull Construction
Molded Composition Fiber Basewad
8-Point Folded Crimp
Low Or High Copper Or Brass-Plated Steel Head
Rem. 57* Size Primer And Some 209 Size Primers
Ribbed, Green, Blue and Black Plastic Tubes

SPECIAL NOTES REGARDING RELOADING COMPOSITION FIBER BASEWAD HULLS IN ALL GAUGES

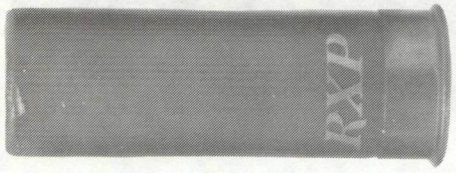
This is Remington's S.P. (Steel-Plastic) shell that started the plastic revolution in shotgun shells. The design was a great step forward from paper tube hulls. The hull consists of three parts: a plastic tube, a molded composition fiber basewad and a steel metal head that is either copper- or brass-plated. Hulls can be found with low or high metal heads and in green, blue, black and red (very old hulls) colors.

Generally in all gauges except .410 bore, the shell was factory loaded with the Rem. 57* Size primer and all reloading data in this handbook uses the Rem. 57* or the CCI 157 Size Primer. Composition fiber basewad hulls, in all gauges, are in the process of being discontinued. Remington is moving toward a line of all plastic hulls (with metal heads) using the "Unibody" design. The smaller diameter 57* primer is also being discontinued and handloaders may find it difficult in the future to locate these primers. There have been some factory loads, with fiber basewads, that use the larger 97* (209 Size) primer. If the handloader finds that the 57* primer is loose or has a tendency to fall out of the hull it may have been factory loaded with the larger 97* primer. Discard any hull that has a loose primer. **WARNING: DO NOT ARBITRARILY USE THE LARGER 109-209 SIZE PRIMER TO RELOAD THIS HULL.** The extra force required to seat the larger primer can weaken or destroy the composition fiber basewad and produce a reload that could be dangerous.

Inspect these hulls before reloading to be sure the basewad is in good condition and is not partly missing or crumbly. This basewad has a tendency to attract moisture. When the hull is left out-of-doors for one or more days the basewad loses strength and can crumble. If this condition is found, discard all suspect hulls.

If the hull crushes and bulges just above the metal head during the crimping process, read the section on adjusting the cam-operated crimp die on your MEC reloader in the "Crimp" section of Chapter 6—Components. When using another brand of reloader, contact the manufacturer for instructions to eliminate this problem.

Remington RXP Plastic Target Shell



REFERENCE NOTES # 10

HULL I.D. PAGE 100
RELOADING DATA PAGE 160
12 GAUGE 2-3/4 INCH
Remington RXP Plastic Target Shell
Unibody Process Plastic Construction
Integral Plastic Basewad
8-Point Folded Crimp
Low Brass Head
209 Size Primer
Ribbed, Green and Blue Plastic Tube

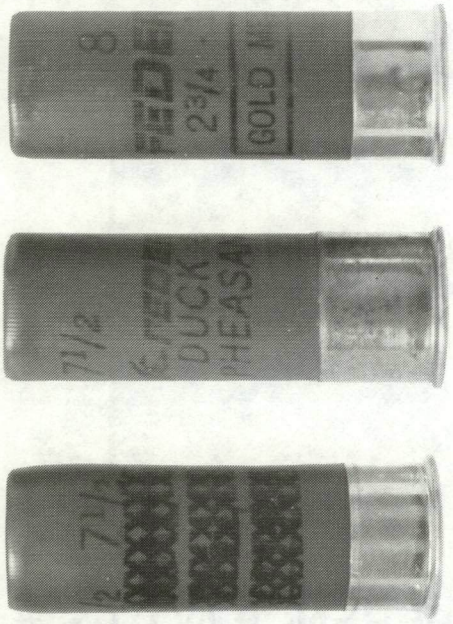
The RXP was Remington's answer to Winchester's Double A Type shell. The shell was offered in "target loads" by Remington (green color) and Peters (blue color) with low brass heads. As loaded by the factory both brands will have RXP heat stamped in a gold color on the side of the hull just above the metal head.

This shell was also offered to reloaders new and unfired in boxes of 100. No markings were on these hulls and the first group did not have skived mouths. Any hull without a skived mouth is diffi-

cult to crimp and new hulls that had never been loaded presented an additional problem. Usually the edge of the crimp would be wavey and the folds had a tendency to open-up after a few hours. This problem could be solved by barely touching the tip of the hull with the crimp starter and then follow with a deep, firm crimp. After one or two reloads the crimp would take a "memory" and be easier to reload. Later lots of hulls did have a skived mouth and many of the crimping problems were solved. It was also determined that these new unfired hulls crimped better when using a 6-point crimp rather than the 8-point style.

The RXP hulls have been discontinued for a few years and were followed by the Blue Magic load under the Peters brand.

Federal Gold Medal Plastic Target Shell



REFERENCE NOTES # 11

HULL I.D. PAGE 100
RELOADING DATA PAGE 164
12 GAUGE 2-3/4 INCH
Federal Gold Medal Plastic Target Shell
Special (Patent Pending) One Piece Plastic Construction
Integral Plastic Basewad
8-Point Folded Crimp—Some in 6-Point Folded Crimp (Field Loads)
Low Brass Metal Head—Some With A High Brass-Plated Steel Head (Field Loads)
209 Size Primer
Ribbed, Burgundy Plastic Tube

Gold Medal is Federal's new one-piece plastic shell with a brass metal head. It is different from other one-piece plastic hulls in that the tube is not tapered on the inside. This design offers the greatest internal capacity of all one-piece plastic hulls. This is a plus for handloaders as heavier loads are available without maximum pressures.

Its only drawback is in the light one-ounce loads, where special wads must be used to take up the extra space. Use only the wads listed in the recipes.

Many handloaders feel that Gold Medal may be the best reloadable hull on the market today. Some hunting loads have been offered by Federal but these loads are non-catalogued. One field load using the Gold Medal type construction is the "American Eagle" Dove Load. The author has had an opportunity to use this load while dove hunting, and it is excellent! A box of "American Eagle" Dove loads is pictured below.

There have been a few Duck & Pheasant factory loads that have the Gold Medal type of plastic construction, but the loads do not have skived mouths and use 6-point crimps. This hull also has a high brass-plated steel head. **CAUTION—INSPECT YOUR FEDERAL HULLS TO SEE IF THEY HAVE A PLASTIC OR PAPER BASEWAD.** In the past Federal has offered one other all-plastic tubed shell, the Champion II. This hull has Champion II heat stamped in gold on the side of the tube and should not be confused with the Gold Medal.

There is a substantial market for new and unfired hulls. All handloaders would like to see the Gold Medal hull made available as a component for reloading. Federal has offered new and unfired hulls in the past and time will tell if a Gold Medal hull will be available as a component.

Federal Paper Target Shell

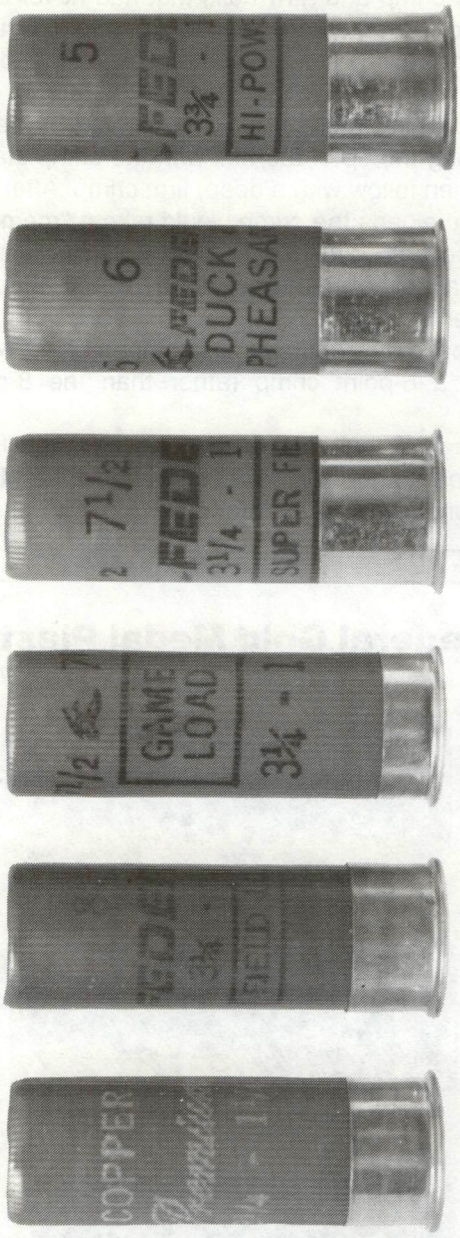
REFERENCE NOTES # 12

HULL I.D. PAGE 101
RELOADING DATA PAGE 170
12 GAUGE 2-3/4 INCH
Federal Paper Target Shell
Paper Hull Construction
Rolled Paper Basewad
6-Point Folded Crimp
Medium Brass Head
209 Size Primer
Smooth, Burgundy Paper Tube

Federal's wine-colored paper shell has a large following with target shooters. They are generally available as a once-fired component at trap and skeet ranges. Compared to some other once-fired hulls these paper "Champs" are inexpensive. Many handloaders reload this hull once or twice for practice target shooting. Paper tube hulls are susceptible to swelling if they get damp. Care must be taken to keep them dry and to inspect fired hulls for pinhole burn throughs just above the metal head in the paper tube. High pressure reloads will also shorten a paper hull's life span. Crimp disintegration and burn throughs are the main cause of failures in this hull. Discard any hulls with these problems.

MEC offers a special smooth cone crimp starter for paper hulls and it should be used in place of the 6 or 8-point crimp starter. When crimping paper hulls, the cam on the final crimp die must be moved to the full up position to keep from crushing. See the "Crimp" section of Chapter 6 — Components for instruction on adjusting the cam operated crimp die.

Federal Hi-Power Plastic Shell



REFERENCE NOTES # 13

HULL I.D. PAGE 101
RELOADING DATA PAGE 174
12 GAUGE 2-3/4 INCH
Federal Hi-Power Plastic Shell
Reifenhauser Process Hull Construction
Rolled, Paper Basewad
6 Or 8-Point Folded Crimp
Low Or High Brass-Plated Steel Head
209 Size Primer
Ribbed, Burgundy Plastic Tube

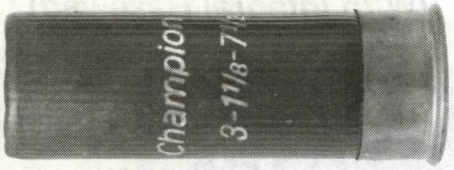
Federal's standard field hull consists of three parts: a wine-colored plastic tube, a rolled paper

basewad and a brass-plated steel head. Most factory loads are non-skived and crimped with a 6-point folded closure. In the past, a "smear" of wax was applied on the crimp for waterproofing purposes. In the past couple of years this has been missing and it is questionable if the wax actually performed any waterproofing at all.

In years past Federal has loaded this shell for several large retail outlets with the retailer's private brand label. Some brands are: Montgomery Wards (Reliance), Western Auto (Revelation) and Gambles (Hiawatha). Federal's brand names include Game, Field, Super Field, International Premium Target, League, Premium Field, Duck & Pheasant and Hi-Power. Regardless of whether these loads have low or high metal heads, the internal dimensions are the same and all hulls can be used with reloading data (recipes) listed for this hull.

Care must be taken during crimping to prevent the hull from crushing just above the metal head. Prior to reloading this hull, the handloader should read the "Crimp" section in Chapter 6—Components on how to adjust the cam-operated crimp die on MEC reloaders. If another brand of reloader is used, check with the manufacturer for instructions to eliminate this problem.

Federal Champion II Plastic Target Shell



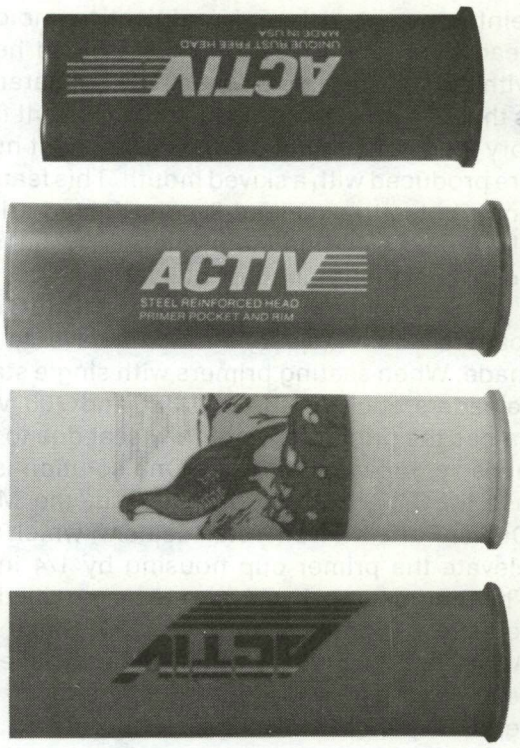
REFERENCE NOTES # 14

HULL I.D. PAGE 101
RELOADING DATA PAGE 178
12 GAUGE 2-3/4 INCH
Federal Champion II Plastic Target Shell
Compression Formed Process Hull Construction
Integral Plastic Basewad
8-Point Folded Crimp
Low Brass Head
209 Size Primer
Ribbed, Burgundy Plastic Tube

Federal introduced the Champion II Target load to compete with Winchester's Double A and Remington's RXP. The Champ II is similar to the RXP but the plastic tube is slightly thicker. While similar, the internal capacity is different and the reloading data is not interchangeable. This is a good hull but the thick, tough plastic turned some handloaders off. It was discontinued a few years ago but may still be encountered. Champion II is heat stamped in gold color on this very pretty hull.

Champion II hulls should not be confused with the newer Gold Medal hull that is manufactured by a different process.

ACTIV Plastic Hull



REFERENCE NOTES #15

HULL I.D. PAGE 102
RELOADING DATA PAGE 178
12 GAUGE 2-3/4 INCH
Activ Plastic Shell
Reiwelin Process Hull Construction
Integral Plastic Basewad
8-Point Folded Crimp (Factory Ammunition)
Component Hull--Skived, Uncrimped Tube
Internal Steel Reinforcement Disk
209 Size Primer
Smooth, Plastic Tube in Several Colors

ACTIV Industries, Inc., is the company that is manufacturing the ACTIV hull, both in factory loaded ammunition and as a component hull. ACTIV also produces its own line of component plastic wads. The ACTIV hull is unique among shotshell hulls today. It has no outside

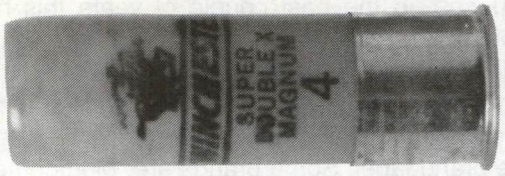
metal head, but rather an internal perforated steel reinforcement disk to prevent the extractor from tearing the hull rim while ensuring positive ejection. There is no need for resizing because there is no high or low metal head. Knowledgeable handloaders are not mislead by the absence of a metal head as this is a very strong hull that will withstand pressures far in excess of the maximum accepted 11,000 PSI or LUP ceiling.

ACTIV hulls are actually made in three pieces: an extruded tube, the perforated steel reinforcement disk and an injection molded head. The tube is fused to the molded head with the steel disk in between. The appearance is that of a one-piece plastic hull. Current factory loaded ammunition and component hulls are produced with a skived mouth. This feature contributes to excellent 8-point folded crimp closures. Reloading life of the ACTIV hulls is equal or better than most hulls.

When reloading ACTIV hulls on MEC reloaders some adjustments will have to be made. When seating primers with single stage reloaders such as the 600 Jr., and 700 Versamec the primer may not fully seat due to the hulls very low inside base. One solution is to use MEC part #8111 (available in the MEC Dealer Parts Kit from retail dealers) which will elevate the primer cup housing by 1/4 inch. The reprime punch will have to be modified on reloaders produced prior to 1985. Since the ACTIV hull has an elevated primer pocket in relation to the base there is a tendency of the reprime punch to wedge stubbornly to the hulls base protuberance that forms the primer pocket following primer seating. Opening the bottom end of the reprime punch to .380" dia., and to a depth of .280" will prevent the wedging problem. MEC reloaders produced after 1984 such as the new 600 Jr. MARK-5™ will have the modified reprime punch. When using MEC progressive reloaders such as the 650, Grabber and Hustler the reprime tube must be lowered approximately 1/4 inch to adequately seat new primers. Final cam-operated crimp die adjustments may be necessary on all reloaders. Please see pages 78 and 79 for instructions.

There is a substantial market for component hulls, and there has been a shortage of once-fired, factory hulls in the past few years. ACTIV will fill this void, and perhaps start a general availability of component hulls. ACTIV products appear to have bright future. All shotshell handloaders hope so.

Winchester-Western Compression-Formed Plastic Shell



REFERENCE NOTES # 16

HULL I.D. PAGE 102
RELOADING DATA PAGE 183
12 GAUGE 3 INCH
Winchester-Western Compression-Formed Plastic Shell
Compression-Formed Process Hull Construction
Integral Plastic Basewad
6 Or 8-Point Folded Crimp
High Brass Or Brass-Plated Metal Head
209 Size Primer
Smooth, Red Plastic Tube

This is the Winchester Double A type hull in 3-inch length. Everything written about the 2-3/4-inch Double A in Reference Notes # 5 applies to the 3-inch length hull. Read Reference Notes # 5 for additional information.

Remington Unibody Plastic Shell *(With Integral Basewad)*

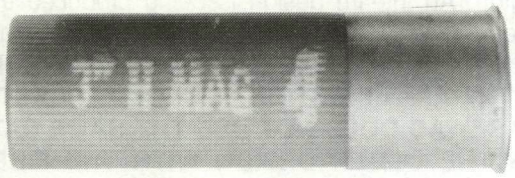
REFERENCE NOTES # 17

HULL I.D. PAGE 102
RELOADING DATA PAGE—NO DATA AVAILABLE
12 GUAGE 3 INCH
Remington Unibody Plastic Shell
Unibody Process Plastic Construction
Integral Plastic Basewad
8-Point Folded Crimp
High Brass-Plated Steel Head
209 Size Primer
Ribbed, Green Plastic Tube

Remington's Unibody hulls have a one-piece plastic tube with a crimped-on metal head. This is the 3-inch version of the new design. It is a very

good hull for the reloader and is a great improvement over the old style molded fiber basewad hull. Its only drawback is being new; there is no reloading data available at this time. If the handloader acquires a group of these new hulls and wants to load them, he will have to check with the powder manufacturers for reloading data.

Remington S.P. Plastic Shell *(With Fiber Basewad)*

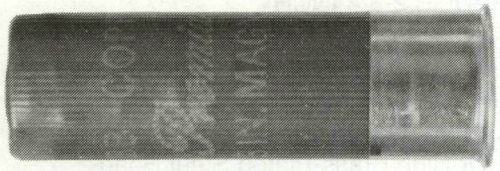


REFERENCE NOTES # 18

HULL I.D. PAGE 103
RELOADING DATA PAGE 183
12 GAUGE 3 INCH
Remington S.P. Plastic Shell
Reifenhauser Process Hull Construction
Molded Composition Fiber Basewad
8-Point Folded Crimp
High Brass-Plated Steel Head
Rem. 57* Size Primer And Some 209 Size Primers
Ribbed, Green And Blue Plastic Tube

This is the Remington S.P. hull in 3-inch length. All information written about the 2-3/4-inch S.P. hull in Reference Notes # 9 applies to the 3-inch hull. Before reloading this hull, read Reference Notes # 9 for "Special Information" regarding this hull design.

Federal Hi-Power Plastic Shell



REFERENCE NOTES # 19

HULL I.D. PAGE 103
RELOADING DATA PAGE 184
12 GAUGE 3 INCH
Federal Hi-Power Plastic Shell
Reifenhauser Process Hull Construction
Rolled Paper Basewad
6-Point Folded Crimp
High Brass-Plated Steel Head
209 Size Primer
Ribbed, Burgundy Plastic Tube

This is the 3-inch version of the 2-3/4-inch Hi-Power. All information written about the 2-3/4-inch Hi-Power applies to the 3-inch hull. For more information read Reference Notes # 13.

Winchester-Western Compression-Formed Shell

REFERENCE NOTES # 20

HULL I.D. PAGE 103
RELOADING DATA PAGE 185
16 GAUGE 2-3/4 INCH
Winchester-Western Compression-Formed Plastic Shell
Compression-Formed Process Hull Construction
Integral Plastic Basewad
6 Or 8-Point Folded Crimp
Low Or High Brass Or Brass-Plated Steel Head
209 Size Primer
Smooth, Red Plastic Tube

This is the Double A type hull in 16 gauge. It is a red plastic hull with a one-piece body and a brass or brass-plated steel head. The Upland brand has a low metal head and the Super-X brand has a high metal head. There are both 6- and 8-point crimps in each brand.

For more information on this design read Reference Notes # 5 on the 12 gauge 2-3/4 inch compression-formed version.

Remington S.P. Plastic Shell—Express *(With Fiber Basewad)*

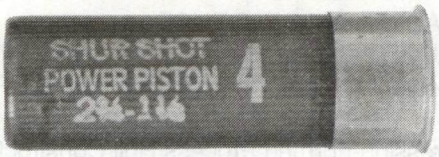
REFERENCE NOTES # 21

HULL I.D. PAGE 103
RELOADING DATA PAGE 187
16 GAUGE 2-3/4 INCH
Remington S.P. Plastic Shell—Express
Reifenhauser Process Hull Construction

Molded Composition Fiber Basewad
8-Point Folded Crimp
High Brass-Plated Steel Head
Rem. 57* Size Primer
Ribbed, Green, Blue Or Black Plastic Tube

This hull is similar to the 16 gauge Shurshot-Victor, but when the powder manufacturers were developing reloading data they noticed a difference in the pressures generated between the "high" and "low-brass" versions and therefore different reloading data (recipes) apply to each. Before reloading this hull, read Reference Notes # 9 for "Special Information" regarding this design.

Remington S.P. Plastic Shell—Shurshot-Victor *(With Fiber Basewad)*

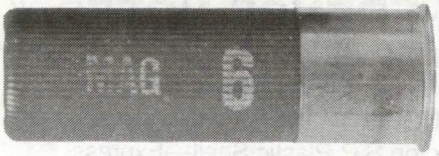


REFERENCE NOTES # 22

HULL I.D. PAGE 104
RELOADING DATA PAGE 188
16 GAUGE 2-3/4 INCH
Remington S.P. Plastic Shell—Shurshot-Victor
Reifenhauser Process Hull Construction
Molded Composition Fiber Basewad
8-Point Folded Crimp
Low Brass-Plated Steel Head
Rem. 57* Size Primer
Ribbed, Green Or Blue Plastic Tube

This hull is similar to the 16 gauge Express, but when powder manufacturers were developing reloading data they noticed a difference in the pressures generated between the "low" and "high brass" versions and therefore different reloading data (recipes) apply to each. Before reloading this hull, read Reference Notes # 9 for "Special Information" regarding this design.

Remington S.P. Plastic Shell—Express *(With Plastic Basewad)*



REFERENCE NOTES # 23

HULL I.D. PAGE 104
RELOADING DATA PAGE—NO DATA AVAILABLE
16 GAUGE 2-3/4 INCH
Remington S.P. Plastic Shell—Express
Reifenhauser Process Hull Construction
Injection Molded Plastic Basewad
8-Point Crimp
Low Or High Brass-Plated Steel Head
Rem 97* Size Primer (209 Size)
Ribbed, Green Or Blue Plastic Tube

The 16 gauge loading with the molded composition fiber basewad is being discontinued by Remington. An interim design is being produced that uses an injection molded plastic basewad in place of the fiber one. **WARNING: THIS NEW HULL WITH AN INJECTION MOLDED PLASTIC BASEWAD DOES NOT USE THE SAME DATA AS THE OLDER DESIGN WITH THE FIBER BASEWAD.** If the handloader acquires a group of these new plastic basewad hulls and wants to load them, he will have to check with the powder manufacturers for reloading data. At this time the hull is very new and no reloading data has been developed and no data is available in this handbook.

The plastic basewad may be found in green, black and yellow colors.

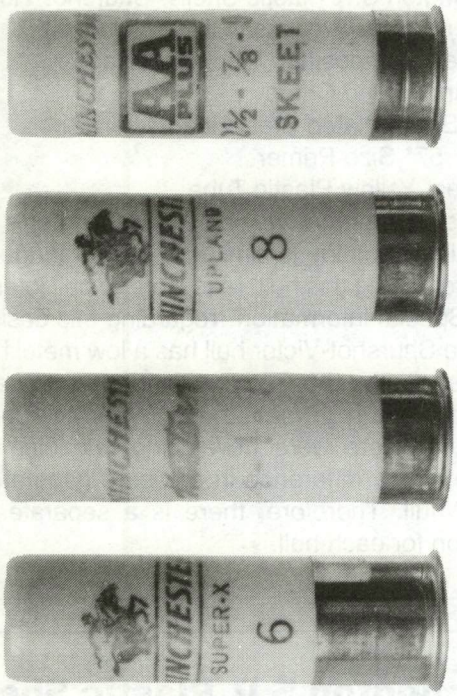
Federal Hi-Power Plastic Shell

REFERENCE NOTES # 24

HULL I.D. PAGE 104
RELOADING DATA PAGE 189
16 GAUGE 2-3/4 INCH
Federal Hi-Power Plastic Shell
Reifenhauser Process Hull Construction
Rolled Paper Basewad
6-Point Folded Crimp
Low Or High Brass-Plated Steel Head
209 Size Primer
Ribbed, Purple Plastic Tube

This is Federal's standard three-piece hull in 16 gauge loadings. It consists of a purple plastic tube, a rolled paper basewad and a brass-plated steel head. A straight-walled hull with a low internal basewad, this hull is a good choice for the reloader who wants to load heavier loads in 16 gauge. For more information on this hull design, read Reference Notes # 13, which is the 12 gauge version.

Winchester-Western Compression-Formed Plastic Shell



REFERENCE NOTES # 25

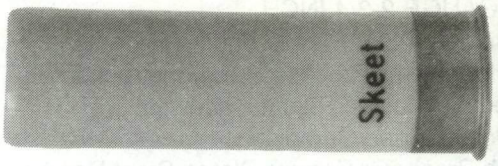
HULL I.D. PAGE 105
RELOADING DATA PAGE 191
20 GAUGE 2-3/4 INCH
Winchester-Western Compression-Formed Plastic Shell
Compression-Formed Process Hull Construction
Integral Plastic Basewad
6 Or 8-Point Folded Crimp
Low Or High Brass Or Brass-Plated Steel Head
209 Size Primer
Smooth, Yellow Plastic Tubes (Early Tubes Were Red)

The 20 gauge version of the Double A hull is an excellent choice for the handloader. It has good life and produces fine reloads. All that has been said about the 12 gauge Double A pertains to the 20 gauge. Read Reference Notes # 5 for more information on this hull design.

The original 20 gauge factory-loaded shells were red. The current color is yellow and has been for many years. Winchester factory loads this hull in Double A, Upland and Super-X Brands. A few "Q" loads are produced on special order for some of Winchester's wholesale accounts. The most popular "Q" load is a one-ounce load with trap-grade extra hard shot in a low brass Double A hull with an 8-point folded crimp.

CAUTION: DO NOT CONFUSE THE ALL-PLASTIC TUBE DOUBLE A HULL WITH THE PROMOTIONAL DOVE & QUAIL HULL. THIS HULL IS OF FOUR-PIECE CONSTRUCTION WITH A YELLOW PLASTIC TUBE, ROLLED PAPER BASEWAD WITH PAPER OVER CUP AND METAL HEAD. THERE ARE NO RELOADING DATA FOR THIS PROMOTIONAL HULL IN THIS HANDBOOK AND IT IS BEST TO DISCARD ANY OF THESE HULLS.

Remington RXP Plastic Target Shell



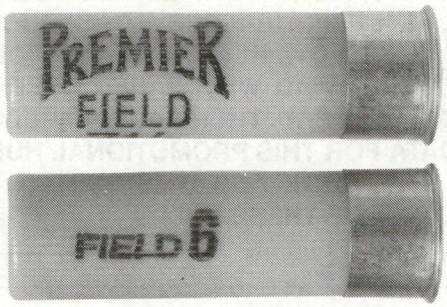
REFERENCE NOTES # 26

HULL I.D. PAGE 105
RELOADING DATA PAGE 194
20 GAUGE 2-3/4 INCH
Remington RXP Plastic Target Shell
Unibody RXP Process Hull Construction
Integral Plastic Basewad
8-Point Folded Crimp
Low Brass Head
209 Size Primer
Ribbed, Yellow Plastic Tube

This is the current 20 gauge target load produced by Remington. The one-piece yellow plastic tube has a low brass head and will have the name Remington or Peters on one side of the hull and Skeet on the other side just above the metal head. Some of these hulls sold as a component in boxes of 100 a few years ago. There was no name or other information imprinted on the component hulls. The 20 gauge RXP does not have quite the internal capacity of the Winchester Double A but is still a very good hull for the handloader.

CAUTION: THERE ARE SOME REMINGTON S.P. YELLOW PLASTIC HULLS WITH INJECTION MOLDED PLASTIC BASEWADS. THIS IS A TOTALLY DIFFERENT HULL THAN THE RXP AND THE HANDLOADER MUST BE CAREFUL NOT TO MIX THEM UP AS RELOADING DATA ARE NOT INTERCHANGEABLE.

Remington S.P. Plastic Shell—Express
(With Plastic Basewad)



REFERENCE NOTES # 27

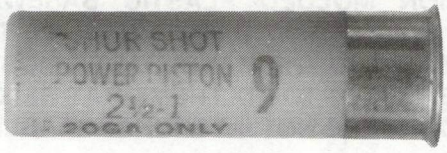
HULL I.D. PAGE 105
RELOADING DATA PAGE 197
20 GAUGE 2-3/4 INCH
Remington S.P. Plastic Shell—Express
Reifenhauser Process Hull Construction
Injection Molded Plastic basewad
8-Point Folded Crimp
High Brass- Or Copper-Plated Steel Head
209 Size Primer
Ribbed, Yellow Plastic Tube

Remington has discontinued the molded composition fiber basewad and the interim design for the S.P. hull consists of three parts: a yellow plastic tube, an injection molded plastic basewad and a brass-plated steel head. The plastic basewad may be found in the following colors: black, yellow or green.

This hull has a tendency to crush and form a bulge just above the metal head when reloaded. If this happens, read the "Crimp" section in Chapter 6—Components on how to set the cam-operated crimp die if you are using a MEC reloader, or check with the manufacturer of your reloader on how to eliminate this problem.

CAUTION: DO NOT CONFUSE THIS HULL WITH THE REMINGTON 20 GAUGE RXP TARGET HULL.

Remington S.P. Plastic Shell—Shurshot-Victor
(With Fiber Basewad)



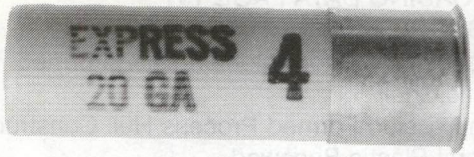
REFERENCE NOTES # 28

HULL I.D. PAGE 106
RELOADING DATA PAGE 198
20 GAUGE 2-3/4 INCH
Remington S.P. Plastic Shell—Shurshot-Victor
Reifenhauser Process Hull Construction
Molded Composition Fiber Basewad
8-Point Folded Crimp
Low Brass-Plated Steel Head
Rem. 57* Size Primer
Ribbed, Yellow Plastic Tube

The 20 gauge version of Remington's S.P. (steel-plastic) line is similar to the 12 gauge. Before reloading this hull, read Reference Notes # 9 for "Special Information" regarding this design.

The Shurshot-Victor hull has a low metal head. It is similar to the Express version in 20 gauge, which has a high metal head. When the powder manufacturers were developing reloading data there was a difference in pressure generated in each hull. Therefore, there is a separate data section for each hull.

Remington S.P. Plastic Shell—Express
(With Fiber Basewad)



REFERENCE NOTES # 29

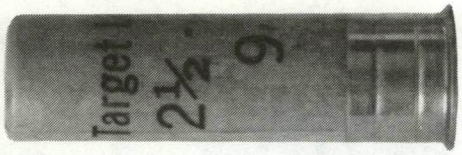
HULL I.D. PAGE 106
RELOADING DATA PAGE 199
20 GAUGE 2-3/4 INCH
Remington S.P. Plastic Shell—Express
Reifenhauser Process Hull Construction
Molded Composition Fiber Basewad
8-Point Folded Crimp
High Brass-Plated Steel Head
Rem. 57* Size Primer
Ribbed, Yellow Plastic Tube

The 20 gauge version of Remington's S.P. (steel-plastic) line is similar to the 12 gauge. Before reloading this hull, read Reference Notes # 9 for "Special Information" regarding this design.

The Express hull has a high metal head. It is similar to the Shurshot-Victor version in 20 gauge, which has a low metal head. When the

powder manufacturers were developing reloading data there was a difference in pressure generated in each hull. Therefore, there is a separate data section for each hull.

Federal Paper Target Shell



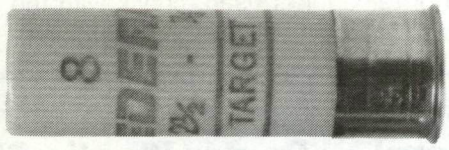
REFERENCE NOTES # 30

HULL I.D. PAGE 106
RELOADING DATA PAGE 200
20 GAUGE 2-3/4 INCH
Federal Paper Target Shell
Paper Hull Construction
Rolled Paper Basewad
8-Point Folded Crimp
Low Brass Head
209 Size Primer
Smooth, Yellow Paper Tube

Federal's 20 gauge paper target load is a favorite for 20 gauge competition skeet shooters. It consists of three parts: a yellow paper tube, rolled paper basewad and a brass head. As with any paper hull, it will not last as long as plastic. The handloader must inspect these hulls carefully to be sure that there are no pinhole burn throughs and that the mouth is not torn.

The handloader should read Reference Notes # 12 on the 12 gauge paper hull for more information on this hull design.

Federal Plastic Target Shell



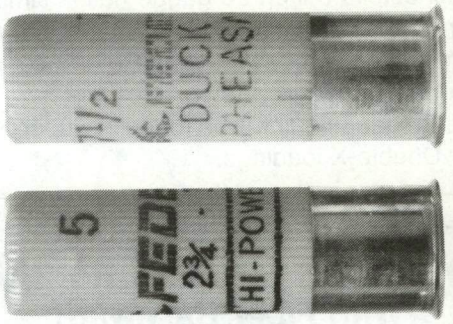
REFERENCE NOTES # 31

HULL I.D. PAGE 106
RELOADING DATA PAGE 202
20 GAUGE 2-3/4 INCH
Federal Plastic Target Shell
Reifenhauser Process Hull Construction
Rolled Paper Basewad
8-Point Folded Crimp
Low Brass Head
209 Size Primer
Ribbed, Yellow Plastic Tube

Federal's 20 gauge plastic target hull is very similar to the 20 gauge Hi-Power hull. The powder manufacturers have found a difference in the pressures generated in the two hulls during reloading data development and, therefore, two different reloading data listings are made. The plastic target hull has an 8-point skived crimp and the High-Power hull has a 6-point unskived crimp.

For more information on this type of hull design, read Reference Notes # 13 on the 12 gauge version of Federal's plastic hulls.

Federal Hi-Power Plastic Shell



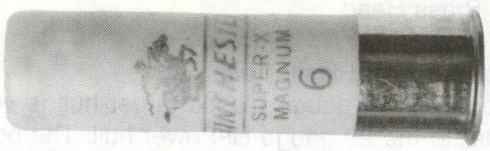
REFERENCE NOTES # 32

HULL I.D. PAGE 107
RELOADING DATA PAGE 204
20 GAUGE 2-3/4 INCH
Federal Hi-Power Plastic Shell
Reifenhauser Process Hull Construction
Rolled Paper Basewad
6-Point Folded Crimp
Low Or High Brass-Plated Steel Head
209 Size Primer
Ribbed, Yellow Plastic Tube

This is Federal's standard three-piece hull in 20 gauge loadings. It consists of a yellow plastic tube, a rolled paper basewad and a brass-plated steel head. A straight-walled hull with a low internal basewad, this hull is a good choice for the reloader who wants to load heavier loads in 20 gauge.

For more information on this hull design, read Reference Notes # 13, which is the 12 gauge version.

Winchester-Western Compression-Formed Plastic Shell



REFERENCE NOTES # 33

HULL I.D. PAGE 107
RELOADING DATA PAGE 206
20 GAUGE 3 INCH
Winchester-Western Compression-Formed Plastic Shell
Compression-Formed Process Hull Construction
Integral Plastic Basewad
6 Or 8-Point Folded Crimps
High Brass Or Brass-Plated Steel Head
209 Size Primer
Smooth, Yellow Plastic Tube

Winchester's 3-inch 20 gauge hull is similar in design to the 12 gauge Double A type. For more information on this design, read Reference Notes # 5 on the 12 gauge version.

This 20 gauge hull will be found in Super-X and Super Double-X loadings.

Remington S.P. Plastic Shell *(With Fiber Basewad)*

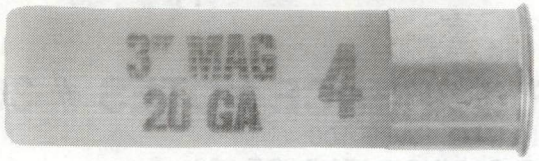
REFERENCE NOTES # 34

HULL I.D. PAGE 107
RELOADING DATA PAGE 207
20 GAUGE 3 INCH
Remington S.P. Plastic Shell
Reifenhauser Process Hull Construction
Molded Composition Fiber Basewad
8-Point Folded Crimp
High Brass-Plated Steel Head
Rem. 57* Size Primer
Ribbed, Yellow Plastic Tube

Remington's 20 gauge 3-inch S.P. (steel-plastic) with a composition fiber basewad is similar in design to the 12 gauge S.P. hull. Before reloading this hull, read Reference Notes # 9 for "Special Information" regarding this hull design.

CAUTION: REMINGTON HAS PRODUCED SOME 3-INCH 20 GAUGE HULLS THAT HAVE AN INJECTION MOLDED PLASTIC BASE-WAD. RELOADING DATA FOR THESE HULLS ARE NOT THE SAME. THEY ARE DIFFERENT HULLS AND RELOADING DATA ARE NOT INTERCHANGEABLE.

Remington S.P. Plastic Shell *(With Plastic Basewad)*



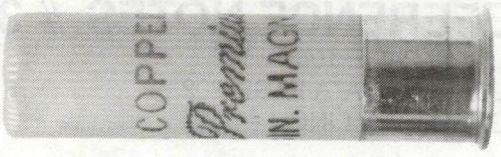
REFERENCE NOTES # 35

HULL I.D. PAGE 107
RELOADING DATA PAGE 207
20 GAUGE 3 INCH
Remington S.P. Plastic Shell
Reifenhauser Process Hull Construction
Injection Molded Plastic Basewad
8-Point Folded Crimp
High Brass-Plated Steel Head
209 Size Primer
Ribbed, Yellow Plastic Tube

Remington is now producing 3-inch 20 gauge shells with a plastic basewad instead of the fiber one. This is a different hull design and reloading data are not interchangeable with the fiber basewad hulls. This hull is yellow and has an injection molded plastic basewad and a brass-plated steel head. Plastic basewads may be found in black, yellow and green colors.

This hull has a tendency to crush and form a bulge just above the metal head when crimped. If this happens, read the "Crimp" section of Chapter 6 -Components on how to adjust the cam-operated crimp die on MEC reloaders. If another brand of reloader is used, check with the manufacturer on how to eliminate this problem.

Federal Hi-Power Plastic Shell



REFERENCE NOTES # 36

HULL I.D. PAGE 108
RELOADING DATA PAGE 208
20 GAUGE 3 INCH
Federal Hi-Power Plastic Shell
Reifenhauser Process Hull Construction
Rolled Paper Basewad
6-Point Folded Crimp
High Brass-Plated Steel Head
209 Size Primer
Ribbed, Yellow Plastic Tube

Federal's 3-inch 20 gauge hull is similar in design to the 12 gauge. For more information on this design, read Reference Notes # 13 on the 12 gauge version.

Winchester-Western Compression-Formed Plastic Shell

REFERENCE NOTES # 37

HULL I.D. PAGE 108
RELOADING DATA PAGE 209
28 GAUGE 2-3/4 INCH
Winchester-Western Compression-Formed Plastic Shell
Compression-Formed Plastic Hull Construction
Integral Plastic Basewad
6-Point Crimp
High Brass Head
209 Size Primer
Smooth, Red Plastic Tube

Winchester's 28 gauge hull is similar in design to the 12 gauge. For more information on this design, read Reference Notes # 5 on the 12 gauge version.

Factory loads in this hull can be found in Double A and Super-X Brands. This hull is about 3/32-inch shorter than the Federal and Remington 28 gauge hulls. SPECIAL NOTE: Handloaders who have MEC reloaders with chrome-plated steel crimping dies may have to make a modification to their reloader in order to get a good final crimp on this hull. Write directly to MEC for instructions on this modification. The new MEC reloading presses have ZYTEL Crimp dies, and if the cam is moved to the full "down" position, the final crimp on the hull should be acceptable. Read the "Crimp" section in Chapter 6—Components for instructions on how to adjust the cam-operated crimp die on MEC reloaders. If another brand of reloader is used, check with the manufacturer on how to correct this problem.

Remington S.P. Plastic Shell *(With Plastic Basewad)*

REFERENCE NOTES # 38

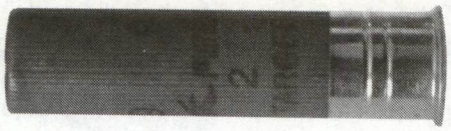
HULL I.D. PAGE 108
RELOADING DATA PAGE 211
28 GAUGE 2-3/4 INCH
Remington S.P. Plastic Shell
Reifenhauser Process Hull Construction
Injection Molded Plastic Basewad
6-Point Folded Crimp
High Brass Or Brass-Plated Steel Head
209 Size Primer
Ribbed, Green Plastic Tube

Remington's 28 gauge shell consists of three parts: a green plastic tube, an injection molded plastic basewad and a brass or brass-plated steel head. The basewad may be found in black, green or yellow colors.

This hull has a tendency to crush and form a bulge just above the metal head when crimped. If this happens, read the "Crimp" section of Chapter 6—Components on how to set the cam-operated crimp die on MEC reloaders. If another brand is used, check with the manufacturer for instructions to eliminate this problem.

Several years ago Remington made a 28 gauge hull in S.P. construction with a molded composition fiber basewad. Most of these hulls are probably out of circulation, but, as with any hull, the handloader should make positive identification before reloading.

Federal Hi-Power Plastic Shell



REFERENCE NOTES # 39

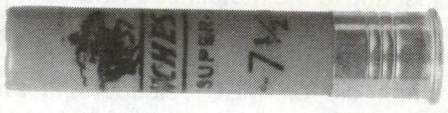
HULL I.D. PAGE 108
RELOADING DATA PAGE 213
28 GAUGE 2-3/4 INCH
Federal Hi-Power Plastic Shell
Reifenhauser Process Hull Construction
Rlled Paper Basewad
6-Point Folded Crimp
High Brass Or Brass-Plated Steel Head
209 Size Primer
Ribbed, Burgundy Plastic Tube

Federal's 28 gauge hull is similar in design to the 12 gauge Hi-Power. For more information on this design, read Reference Notes # 13 on the 12 gauge version.

This hull has a lot of internal capacity when compared to other 28 gauge hulls and is easy to reload with heavier amounts of shot.

This hull has a tendency to crush and form a bulge just above the metal head when crimped. If this happens, read the "Crimp" section of Chapter 6—Components on how to adjust the cam-operated crimp die on MEC reloaders. If another brand is used, check with the manufacturer for instructions to eliminate this problem.

Winchester-Western Compression-Formed Plastic Shell



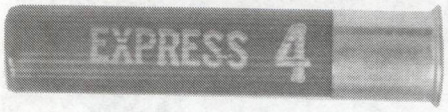
REFERENCE NOTES # 40

HULL I.D. PAGE 109
RELOADING DATA PAGE 215
410 BORE 2-1/2 INCH
Winchester-Western Compression-Formed Plastic Shell
Compression-Formed Process Hull Construction
Integral Plastic Basewad
6-Point Folded Crimp
High Brass Head
209 Size Primer
Smooth, Red Plastic Tube

The .410 bore Winchester factory shell is of the basic compression-formed plastic design consisting of a red, one-piece plastic tube with a crimped-on brass head. They are loaded by Winchester in the Double A skeet and Super-X Brands but the hull is the same.

SPECIAL NOTE: New MEC reloaders with ZYTEL crimp dies are shipped with two final crimp dies. The one with the roller in the top position is for the 2½-inch hull and the die with the roller in the bottom position is for the 3-inch hull.

Remington S.P. Plastic Shell *(With Plastic Basewad)*



REFERENCE NOTES # 41

HULL I.D. PAGE 109
RELOADING DATA PAGE 216
410 BORE 2-1/2 INCH
Remington S.P. Plastic Shell
Reifenhauser Process Hull Construction
Injection Molded Plastic Basewad
6-Point Folded Crimp
High Brass Or Brass-Plated Steel Head
209 Size Primer
Ribbed, Green And Blue Plastic Tube

The Remington .410 Bore hull is of typical S.P. design and construction. It is manufactured in three parts: a green (Remington) and blue (Peters) plastic tube, an injection molded plastic basewad and a brass or brass-plated steel head. The basewad may be found in black, yellow or green colors.

This hull has a tendency to crush and form a bulge just above the metal head when crimped. If this happens read the "Crimp" section of Chapter 6—Components on how to set the cam-operated crimp die on MEC reloaders. If another brand is used, contact the manufacturer for instructions to eliminate this problem.

Federal Plastic Shell

REFERENCE NOTES # 42

HULL I.D. PAGE 109
RELOADING DATA PAGE 217
410 BORE 2-1/2 INCH
Federal Plastic Shell
Reifenhauser Process Hull Construction
Rolled Paper Basewad
6-Point Folded Crimp
High Brass Or Brass-Plated Steel Head
209 Size Primer
Ribbed, Burgundy Plastic Tube

Federal's .410 bore hull is of typical construction with a burgundy plastic tube, a rolled paper basewad and a crimped-on metal head. More information on this hull design can be found in Reference Notes # 13 on the 12 gauge version.

This hull has a tendency to crush and form a bulge just above the metal head when crimped. If this happens, read the "Crimp" section of Chapter 6 —Components on how to adjust the cam-operated crimp die on MEC reloaders. If another brand is used, contact the manufacturer for instructions on how to eliminate this problem.

Winchester-Western Compression-Formed Plastic Shell

REFERENCE NOTES # 43

HULL I.D. PAGE 109
RELOADING DATA PAGE 218
410 BORE 3 INCH
Winchester-Western Compression-Formed Plastic Shell
Compression-Formed Process Hull Construction
Integral Plastic Basewad
6-Point Folded Crimp
High Brass Or Brass-Plated Steel Head
209 Size Primer
Smooth, Red Plastic Tube

The .410 bore Winchester-Western factory shell is the basic compression-formed design consisting of a red, one-piece plastic tube with a crimped-on metal head. This hull is factory loaded in the Super-X brand.

SPECIAL NOTE: New MEC reloaders with ZYTEL dies are shipped with two final crimp dies. The one with the roller in the top position is for the 2-1/2-inch hull and the die with the roller in the bottom position is for the 3-inch hull.

Remington S.P. Plastic Shell
(With Plastic Basewad)

REFERENCE NOTES # 44

HULL I.D. PAGE 110
RELOADING DATA PAGE 219
410 BORE 3 INCH
Remington S.P. Plastic Shell
Reifenhauser Process Hull Construction
Injection Molded Plastic Basewad
6-Point Folded Crimp
High Brass Or Brass-Plated Steel Head
209 Size Primer
Ribbed, Green Or Blue Plastic Tube

Remington's 3-inch .410 bore hull is of typical S.P. design and construction. It is manufactured in three parts: a green (Remington) and blue (Peters) plastic tube, an injection molded plastic basewad and a brass or brass-plated steel head. The basewad may be found in black, yellow or green colors.

This hull has a tendency to crush and form a bulge just above the metal head when crimped. If this happens, read the "Crimp" section of Chapter 6—Components on how to set the cam-operated crimp die on MEC reloaders. If another brand is used, contact the manufacturer for instructions to eliminate this problem.

Federal Plastic Shell

REFERENCE NOTES # 45

HULL I.D. PAGE 110
RELOADING DATA PAGE 220
410 BORE 3 INCH
Federal Plastic Shell
Reifenhauser Process Hull Construction
Rolled Paper Basewad
6-Point Folded Crimp
High Brass Or Brass-Plated Steel Head
209 Size Primer
Ribbed, Burgundy Plastic Tube

Federal's 3-inch .410 bore hull is of typical construction with a burgundy plastic tube, a rolled paper basewad and a crimped-on metal head. More information of this design can be found in Reference Notes # 13 on the 12 gauge version.

This hull has a tendency to crush and form a bulge just above the metal head when crimped. If this happens, read the "Crimp" section of Chapter 6—Components on how to adjust the cam-operated crimp die on MEC reloaders. If another brand is used, contact the manufacturer for instructions on how to eliminate this problem.

Section 3 - Reloading Data

Reloading Data (Recipes)—Choose the recipe best suited for your requirements. The actual procedure of choosing a load is explained in Chapter 7. Always refer to the DOUBLE CHECK LIST at the end of Chapter 7 before actual reloading.

Hull #1
10 Gauge 2-7/8″
Hull I.D. Page 97
Reference Notes Page 113

Remington S.P. Plastic Shell
(With Fiber Basewad)

10
10 Gauge 2-7/8″

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅜ oz.	CCI 157	22.5 gr "Hi-Skor" 700X	Rem. SP10	1190 fps	9700 lup
1⅜ oz.	CCI 157	30.0 gr PB	Rem. SP10	1310 fps	10000 lup
1⅜ oz.	CCI 157	31.0 gr PB	Pacific Versalite 10	1310 fps	9600 lup
1½ oz.	CCI 157	27.0 gr SR7625	Rem. SP10	1120 fps	7200 lup
1½ oz.	CCI 157	31.0 gr SR7625	Pacific Versalite 10	1260 fps	10000 lup
1⅝ oz.	CCI 157	27.0 gr SR7625	Pacific Versalite 10	1110 fps	8300 lup

Hull #2
10 Gauge 3½″
Hull I.D. Page 97
Reference Notes Page 113

Winchester-Western Polyformed Plastic Shell
(With Paper Basewad)

10
10 Gauge 3½″

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
2 oz.	Win. 209	41.0 gr SR7625	Rem. SP10	1230 fps	10000 lup
2 oz.	Win. 209	48.5 gr SR4756	Rem. SP10	1305 fps	9900 lup
2⅛ oz.	Win. 209	38.5 gr SR7625	Rem. SP10	1155 fps	9900 lup
2⅛ oz.	Win. 209	45.0 gr SR4756	Rem. SP10	1240 fps	9800 lup
2⅛ oz.	Win. 209	43.0 gr Blue Dot	Rem. SP10	1180 fps	10000 psi
2¼ oz.	CCI 109	46.0 gr HS6	Rem. SP10	1281 fps	10300 lup
2¼ oz.	CCI 209	46.0 gr HS6	Rem. SP10	1281 fps	10300 lup
2¼ oz.	Win. 209	46.0 gr HS6	Rem. SP10	1281 fps	10300 lup
2¼ oz.	Win. 209	42.5 gr SR4756	Rem. SP10	1175 fps	10000 lup
2¼ oz.	Win. 209	47.0 gr 571	Rem. SP10	1210 fps	9900 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

10
10 Gauge 3½"

Remington S.P. Plastic Shell
(With Fiber Basewad)

Hull #3
10 Gauge 3½"
Hull I.D. Page 97
Reference Notes Page 114

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
2 oz.	CCI 157	41.5 gr SR7625	Rem. SP10	1235 fps	9600 lup
2 oz.	CCI 157	43.0 gr SR7625	Pacific Versalite 10	1250 fps	10000 lup
2⅛ oz.	Rem. 57*	42.0 gr Blue Dot	Rem. SP10	1180 fps	10200 psi
2¼ oz.	CCI 157	46.0 gr HS6	Rem. SP10	1281 fps	10300 lup

10
10 Gauge 3½"

Federal Plastic Shell

Hull #4
10 Gauge 3½"
Hull I.D. Page 98
Reference Notes Page 114

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
2 oz.	Fed. 209	46.5 gr SR4756	Rem. SP10	1300 fps	9800 lup
2⅛ oz.	Fed. 209	44.0 gr SR4756	Rem. SP10	1230 fps	10000 lup

12
12 Gauge 2¾"

Winchester-Western Compression-Formed Plastic Shell

Hull #5
12 Gauge 2¾"
Hull I.D. Page 98
Reference Notes Page 114

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	CCI 109	18.5 gr Red Dot	Win. WAA12F1	1200 fps	8000 psi
1 oz.	CCI 209	18.5 gr Red Dot	Win. WAA12F1	1200 fps	8000 psi
1 oz.	CCI 209M	17.5 gr Red Dot	Win. WAA12(white)	1200 fps	9900 psi
1 oz.	Win. 209	18.0 gr Red Dot	Win. WAA12F1	1200 fps	9000 psi
1 oz.	Win. 209	20.0 gr Red Dot	Rem. RXP12	1290 fps	10100 psi
1 oz.	Win. 209	19.0 gr Red Dot	Win. WAA12(white)	1290 fps	10500 psi
1 oz.	CCI 209M	18.5 gr Red Dot	Win. WAA12(white)	1290 fps	10400 psi
1 oz.	Win. 209	20.0 gr Green Dot	Win. WAA12(white)	1290 fps	8700 psi
1 oz.	CCI 209M	21.5 gr Green Dot	Win. WAA12(white)	1290 fps	9900 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #5
12 Gauge 2¾"
Hull I.D. Page 98
Reference Notes Page 114

Winchester-Western Compression-Formed Plastic Shell
(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	Win. 209	21.0 gr Green Dot	Rem. RXP12	1290 fps	8800 psi
1 oz.	Win. 209	19.5 gr Green Dot	Fed. 12S0	1200 fps	8400 psi
1 oz.	Win. 209	20.0 gr Green Dot	Win.WAA12F1	1200 fps	7600 psi
1 oz.	Win. 209	18.0 gr Bullseye	Fed. 12S0	1200 fps	9600 psi
1 oz.	Win. 209	17.5 gr Bullseye	Rem. RXP12	1200 fps	8800 psi
1 oz.	Win. 209	17.5 gr Bullseye	Win. WAA12(white)	1200 fps	9900 psi
1 oz.	CCI 109	23.0 gr Trap 100	Win. WAA12(white)	1315 fps	9600 lup
1 oz.	CCI 209	23.0 gr Trap 100	Win. WAA12(white)	1315 fps	9600 lup
1 oz.	Win. 209	23.0 gr Trap 100	Win. WAA12(white)	1315 fps	9600 lup
1 oz.	Win. 209	17.5 gr "Hi-Skor" 700X	Win.WAA12F1	1200 fps	8500 lup
1 oz.	Win. 209	17.0 gr "Hi-Skor" 700X	Fed. 12S0	1190 fps	9700 lup
1 oz.	Fed. 209	17.0 gr "Hi-Skor" 700X	Win.WAA12F1	1210 fps	9000 lup
1 oz.	Fed. 209	22.0 gr PB	Win. WAA12(white)	1210 fps	6700 lup
1 oz.	Fed. 209	23.0 gr SR7625	Win. WAA12(white)	1205 fps	7000 lup
1 oz.	CCI 109	21.5 gr 452AA	Win. WAA12(white)	1290 fps	9900 lup
1 oz.	CCI 209	21.5 gr 452AA	Win. WAA12(white)	1290 fps	9900 lup
1 oz.	Fed. 209	22.0 gr 452AA	Win. WAA12(white)	1290 fps	10100 lup
1 oz.	CCI 209	20.0 gr 452AA	Win.WAA12F1	1180 fps	6800 lup
1 oz.	CCI 209	21.5 gr 452AA	Win.WAA12F1	1235 fps	7800 lup
1 oz.	CCI 209	23.0 gr 452AA	Win.WAA12F1	1290 fps	8500 lup
1 oz.	Win. 209	20.0 gr 452AA	Win.WAA12F1	1180 fps	7300 lup
1 oz.	Win. 209	21.5 gr 452AA	Win.WAA12F1	1235 fps	7900 lup
1 oz.	Win. 209	23.0 gr 452AA	Win.WAA12F1	1290 fps	8900 lup
1⅛ oz.	CCI 109	19.0 gr Trap 100	Win. WAA12(white)	1172 fps	9700 lup
1⅛ oz.	CCI 209	19.0 gr Trap 100	Win. WAA12(white)	1172 fps	9700 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

Winchester-Western Compression-Formed Plastic Shell
(Continued)

Hull #5
12 Gauge 2¾"
Hull I.D. Page 98
Reference Notes Page 114

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	CCI 109	19.0 gr Trap 100	Rem. RXP12	1159 fps	9500 lup
1⅛ oz.	CCI 209	19.0 gr Trap 100	Rem. RXP12	1159 fps	9500 lup
1⅛ oz.	Win. 209	19.0 gr Trap 100	Win. WAA12(white)	1159 fps	9700 lup
1⅛ oz.	Win. 209	19.0 gr Trap 100	Rem. RXP12	1159 fps	9500 lup
1⅛ oz.	CCI 109	20.0 gr Trap 100	Win. WAA12(white)	1220 fps	10400 lup
1⅛ oz.	CCI 209	20.0 gr Trap 100	Win. WAA12(white)	1220 fps	10400 lup
1⅛ oz.	CCI 109	20.0 gr Trap 100	Rem. RXP12	1194 fps	10100 lup
1⅛ oz.	CCI 209	20.0 gr Trap 100	Rem. RXP12	1194 fps	10100 lup
1⅛ oz.	Win. 209	20.0 gr Trap 100	Win. WAA12(white)	1220 fps	10400 lup
1⅛ oz.	Win. 209	20.0 gr Trap 100	Rem. RXP12	1194 fps	10100 lup
1⅛ oz.	Win. 209	19.5 gr 452AA	Win. WAA12(white)	1145 fps	9400 lup
1⅛ oz.	Win. 209	20.5 gr 452AA	Win. WAA12(white)	1200 fps	10100 lup
1⅛ oz.	Win. 209	19.5 gr 452AA	Rem. RXP12	1145 fps	9300 lup
1⅛ oz.	Win. 209	21.0 gr 452AA	Rem. RXP12	1200 fps	9900 lup
1⅛ oz.	Win. 209	19.5 gr 452AA	Fed. 12C1	1145 fps	9000 lup
1⅛ oz.	Win. 209	21.0 gr 452AA	Fed. 12C1	1200 fps	10000 lup
1⅛ oz.	CCI 109	19.0 gr 452AA	Win. WAA12(white)	1145 fps	9600 lup
1⅛ oz.	CCI 109	20.5 gr 452AA	Win. WAA12(white)	1200 fps	10500 lup
1⅛ oz.	CCI 109	19.0 gr 452AA	Rem. RXP12	1145 fps	9600 lup
1⅛ oz.	CCI 109	20.5 gr 452AA	Rem. RXP12	1200 fps	10400 lup
1⅛ oz.	CCI 109	20.5 gr 452AA	Fed. 12C1	1200 fps	10400 lup
1⅛ oz.	Fed. 209	20.5 gr 452AA	Win. WAA12(white)	1200 fps	10000 lup
1⅛ oz.	Fed. 209	21.0 gr 452AA	Fed. 12C1	1200 fps	9900 lup
1⅛ oz.	Win. 209	23.5 gr 473AA	Win. WAA12(white)	1200 fps	8500 lup
1⅛ oz.	Win. 209	25.0 gr 473AA	Win. WAA12(white)	1255 fps	9500 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #5
12 Gauge 2¾"
Hull I.D. Page 98
Reference Notes Page 114

Winchester-Western Compression-Formed Plastic Shell
(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	Win. 209	27.0 gr 473AA	Win. WAA12(white)	1300 fps	9800 lup
1⅛ oz.	Win. 209	28.0 gr 473AA	Win. WAA12(white)	1330 fps	10100 lup
1⅛ oz.	Win. 209	24.0 gr 473AA	Rem. RXP12	1200 fps	8200 lup
1⅛ oz.	Win. 209	25.0 gr 473AA	Rem. RXP12	1255 fps	8500 lup
1⅛ oz.	Win. 209	28.0 gr 473AA	Rem. RXP12	1330 fps	10100 lup
1⅛ oz.	Win. 209	24.0 gr 473AA	Fed. 12C1	1200 fps	8300 lup
1⅛ oz.	CCI 109	23.5 gr 473AA	Win. WAA12(white)	1200 fps	8900 lup
1⅛ oz.	CCI 109	24.5 gr 473AA	Win. WAA12(white)	1255 fps	9400 lup
1⅛ oz.	CCI 109	27.0 gr 473AA	Win. WAA12(white)	1330 fps	10400 lup
1⅛ oz.	CCI 109	23.5 gr 473AA	Rem. RXP12	1200 fps	8400 lup
1⅛ oz.	CCI 109	25.0 gr 473AA	Rem. RXP12	1255 fps	9400 lup
1⅛ oz.	CCI 109	27.0 gr 473AA	Rem. RXP12	1330 fps	10100 lup
1⅛ oz.	CCI 109	24.0 gr 473AA	Fed. 12C1	1200 fps	8500 lup
1⅛ oz.	Fed. 209	23.5 gr 473AA	Win. WAA12(white)	1200 fps	9200 lup
1⅛ oz.	Fed. 209	24.5 gr 473AA	Win. WAA12(white)	1255 fps	9900 lup
1⅛ oz.	Fed. 209	23.5 gr 473AA	Rem. RXP12	1200 fps	8500 lup
1⅛ oz.	Fed. 209	25.0 gr 473AA	Rem. RXP12	1255 fps	9300 lup
1⅛ oz.	Fed. 209	23.5 gr 473AA	Fed. 12C1	1200 fps	8700 lup
1⅛ oz.	Win. 209	32.5 gr 540	Win. WAA12(white)	1300 fps	9200 lup
1⅛ oz.	Win. 209	35.0 gr 540	Win. WAA12(white)	1400 fps	10000 lup
1⅛ oz.	Win. 209	17.0 gr Red Dot	Win. WAA12(white)	1145 fps	10000 psi
1⅛ oz.	Win. 209	18.0 gr Red Dot	Win. WAA12(white)	1200 fps	10400 psi
1⅛ oz.	Win. 209	17.0 gr Red Dot	Rem. RXP12	1145 fps	8400 psi
1⅛ oz.	Win. 209	18.5 gr Red Dot	Rem. RXP12	1200 fps	9800 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

Winchester-Western Compression-Formed Plastic Shell
(Continued)

Hull #5
12 Gauge 2¾"
Hull I.D. Page 98
Reference Notes Page 114

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	CCI 109	17.0 gr Red Dot	Win. WAA12(white)	1145 fps	9200 psi
1⅛ oz.	CCI 209	17.0 gr Red Dot	Win. WAA12(white)	1145 fps	9200 psi
1⅛ oz.	CCI 209M	17.5 gr Red Dot	Win. WAA12(white)	1145 fps	10400 psi
1⅛ oz.	CCI 109	18.0 gr Red Dot	Win. WAA12(white)	1200 fps	10400 psi
1⅛ oz.	CCI 209	18.0 gr Red Dot	Win. WAA12(white)	1200 fps	10400 psi
1⅛ oz.	CCI 209M	18.5 gr Red Dot	Win. WAA12(white)	1200 fps	10500 psi
1⅛ oz.	CCI 109	18.5 gr Red Dot	Rem. RXP12	1200 fps	9500 psi
1⅛ oz.	CCI 209	18.5 gr Red Dot	Rem. RXP12	1200 fps	9500 psi
1⅛ oz.	Win. 209	18.0 gr Red Dot	Pacific Versalite	1145 fps	9500 psi
1⅛ oz.	Win. 209	18.5 gr Red Dot	Fed. 12C1	1200 fps	9700 psi
1⅛ oz.	CCI 109	18.5 gr Red Dot	Fed. 12C1	1200 fps	10100 psi
1⅛ oz.	CCI 209	18.5 gr Red Dot	Fed. 12C1	1200 fps	10100 psi
1⅛ oz.	CCI 209	19.5 gr Red Dot	Pattern Control Red	1200 fps	9600 psi
1⅛ oz.	Win. 209	19.0 gr Red Dot	Lage Uniwad	1200 fps	9000 psi
1⅛ oz.	Fed. 209	17.5 gr Red Dot	Win. WAA12(white)	1200 fps	10600 psi
1⅛ oz.	Win. 209	18.0 gr Green Dot	Win. WAA12(white)	1145 fps	8200 psi
1⅛ oz.	Win. 209	19.5 gr Green Dot	Win. WAA12(white)	1200 fps	9300 psi
1⅛ oz.	Win. 209	21.5 gr Green Dot	Win. WAA12(white)	1255 fps	10500 psi
1⅛ oz.	CCI 109	18.0 gr Green Dot	Win. WAA12(white)	1145 fps	8200 psi
1⅛ oz.	CCI 209	18.0 gr Green Dot	Win. WAA12(white)	1145 fps	8200 psi
1⅛ oz.	CCI 109	19.0 gr Green Dot	Win. WAA12(white)	1200 fps	9300 psi
1⅛ oz.	CCI 209	19.0 gr Green Dot	Win. WAA12(white)	1200 fps	9300 psi
1⅛ oz.	CCI 209M	18.5 gr Green Dot	Win. WAA12(white)	1145 fps	10100 psi
1⅛ oz.	CCI 209M	20.0 gr Green Dot	Win. WAA12(white)	1200 fps	10400 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #5
12 Gauge 2¾″
Hull I.D. Page 98
Reference Notes Page 114

Winchester-Western Compression-Formed Plastic Shell
(Continued)

12
12 Gauge 2¾″

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	Win. 209	18.0 gr Green Dot	Rem. RXP12	1145 fps	8100 psi
1⅛ oz.	Win. 209	19.5 gr Green Dot	Rem. RXP12	1200 fps	8900 psi
1⅛ oz.	Win. 209	21.0 gr Green Dot	Rem. RXP12	1255 fps	9500 psi
1⅛ oz.	CCI 109	19.5 gr Green Dot	Rem. RXP12	1200 fps	8600 psi
1⅛ oz.	CCI 209	19.5 gr Green Dot	Rem. RXP12	1200 fps	8600 psi
1⅛ oz.	Rem. 97*	20.0 gr Green Dot	Win. WAA12(white)	1200 fps	9400 psi
1⅛ oz.	Rem. 97*	21.0 gr Green Dot	Win. WAA12(white)	1255 fps	10400 psi
1⅛ oz.	Fed. 209	19.5 gr Green Dot	Win. WAA12(white)	1200 fps	9400 psi
1⅛ oz.	Win. 209	20.5 gr Green Dot	Pattern Control Red	1200 fps	9800 psi
1⅛ oz.	CCI 109	21.0 gr Green Dot	Pattern Control Red	1200 fps	8500 psi
1⅛ oz.	CCI 209	21.0 gr Green Dot	Pattern Control Red	1200 fps	8500 psi
1⅛ oz.	Win. 209	19.5 gr Green Dot	Fed. 12C1	1200 fps	8700 psi
1⅛ oz.	CCI 109	20.0 gr Green Dot	Fed. 12C1	1200 fps	8800 psi
1⅛ oz.	CCI 209	20.0 gr Green Dot	Fed. 12C1	1200 fps	8800 psi
1⅛ oz.	Win. 209	21.0 gr Green Dot	Pacific Versalite	1200 fps	9000 psi
1⅛ oz.	CCI 209	21.0 gr Green Dot	Pacific Versalite	1200 fps	8300 psi
1⅛ oz.	CCI 209	20.0 gr Green Dot	Lage Uniwad	1200 fps	9300 psi
1⅛ oz.	Win. 209	21.0 gr Green Dot	Windjammer	1200 fps	9000 psi
1⅛ oz.	Win. 209	21.0 gr Unique	Win. WAA12(white)	1200 fps	9100 psi
1⅛ oz.	Win. 209	23.5 gr Unique	Win. WAA12(white)	1255 fps	9100 psi
1⅛ oz.	Win. 209	25.5 gr Unique	Win. WAA12(white)	1310 fps	10000 psi
1⅛ oz.	CCI 209M	21.5 gr Unique	Win. WAA12(white)	1200 fps	10300 psi
1⅛ oz.	CCI 209M	25.5 gr Unique	Win. WAA12(white)	1310 fps	9700 psi
1⅛ oz.	Fed. 209	21.5 gr Unique	Win. WAA12(white)	1200 fps	8200 psi
1⅛ oz.	Fed. 209	24.5 gr Unique	Win. WAA12(white)	1310 fps	10600 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

Winchester-Western Compression-Formed Plastic Shell
(Continued)

Hull #5
12 Gauge 2¾"
Hull I.D. Page 98
Reference Notes Page 114

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	Rem. 97*	25.5 gr Unique	Win. WAA12(white)	1310 fps	10100 psi
1⅛ oz.	Win. 209	22.0 gr Unique	Rem. RXP12	1200 fps	8700 psi
1⅛ oz.	Win. 209	24.0 gr Unique	Rem. RXP12	1310 fps	9800 psi
1⅛ oz.	CCI 109	22.5 gr Unique	Rem. RXP12	1200 fps	8100 psi
1⅛ oz.	CCI 209	22.5 gr Unique	Rem. RXP12	1200 fps	8100 psi
1⅛ oz.	Win. 209	22.0 gr Unique	Fed. 12C1	1200 fps	8900 psi
1⅛ oz.	Win. 209	23.5 gr "Hi-Skor" 800X	Win. WAA12(white)	1205 fps	7300 lup
1⅛ oz.	Win. 209	25.5 gr "HI-Skor" 800X	Rem. RXP12	1270 fps	7600 lup
1⅛ oz.	Win. 209	22.0 gr PB	Win. WAA12(white)	1145 fps	6600 lup
1⅛ oz.	Win. 209	23.5 gr PB	Win. WAA12(white)	1215 fps	7300 lup
1⅛ oz.	CCI 109	23.0 gr PB	Win. WAA12(white)	1210 fps	7500 lup
1⅛ oz.	CCI 209	23.0 gr PB	Win. WAA12(white)	1210 fps	7500 lup
1⅛ oz.	Fed. 209	22.0 gr PB	Win. WAA12(white)	1205 fps	8400 lup
1⅛ oz.	Win. 209	23.0 gr PB	Rem. RXP12	1195 fps	7500 lup
1⅛ oz.	Win. 209	24.5 gr PB	Rem. RXP12	1245 fps	8300 lup
1⅛ oz.	CCI 209	22.5 gr PB	Rem. RXP12	1195 fps	7400 lup
1⅛ oz.	Fed. 209	22.0 gr PB	Rem. RXP12	1205 fps	8500 lup
1⅛ oz.	Win. 209	23.5 gr PB	Pacific Versalite	1210 fps	7600 lup
1⅛ oz.	CCI 209	23.5 gr PB	Pacific Versalite	1210 fps	7200 lup
1 ⅛ oz.	Win. 209	17.5 gr "Hi-Skor" 700X	Win. WAA12(white)	1135 fps	7900 lup
1⅛ oz.	Win. 209	19.0 gr "Hi-Skor" 700X	Win. WAA12(white)	1200 fps	9200 lup
1⅛ oz.	Win. 209	20.0 gr "Hi-Skor" 700X	Win. WAA12(white)	1245 fps	10500 lup
1⅛ oz.	CCI 109	17.5 gr "Hi-Skor" 700X	Win. WAA12(white)	1145 fps	8300 lup
1⅛ oz.	CCI 209	17.5 gr "Hi-Skor" 700X	Win. WAA12(white)	1145 fps	8300 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #5
12 Gauge 2¾"
Hull I.D. Page 98
Reference Notes Page 114

Winchester-Western Compression-Formed Plastic Shell
(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	CCI 109	19.0 gr "Hi-Skor" 700X	Win. WAA12(white)	1215 fps	10200 lup
1⅛ oz.	CCI 209	19.0 gr "Hi-Skor" 700X	Win. WAA12(white)	1215 fps	10200 lup
1⅛ oz.	Fed. 209	19.0 gr "Hi-Skor" 700X	Win. WAA12(white)	1200 fps	10100 lup
1⅛ oz.	Fed. 209	20.0 gr "Hi-Skor" 700X	Win. WAA12(white)	1240 fps	10600 lup
1⅛ oz.	Rem 97*	19.0 gr "Hi-Skor" 700X	Win. WAA12(white)	1195 fps	9200 lup
1⅛ oz.	Win. 209	18.0 gr "Hi-Skor" 700X	Rem. RXP12	1155 fps	8400 lup
1⅛ oz.	Win. 209	19.0 gr "Hi-Skor" 700X	Rem. RXP12	1190 fps	8900 lup
1⅛ oz.	Win. 209	20.5 gr "HI-Skor" 700X	Rem. RXP12	1245 fps	10100 lup
1⅛ oz.	CCI 109	17.5 gr "Hi-Skor" 700X	Rem. RXP12	1150 fps	8300 lup
1⅛ oz.	CCI 209	17.5 gr "Hi-Skor" 700X	Rem. RXP12	1150 fps	8300 lup
1⅛ oz.	CCI 109	19.0 gr "Hi-Skor" 700X	Rem. RXP12	1195 fps	9000 lup
1⅛ oz.	CCI 209	19.0 gr "Hi-Skor" 700X	Rem. RXP12	1195 fps	9000 lup
1⅛ oz.	Rem 97*	19.5 gr "Hi-Skor" 700X	Rem. RXP12	1215 fps	9000 lup
1⅛ oz.	Fed. 209	19.0 gr "Hi-Skor" 700X	Rem. RXP12	1190 fps	9300 lup
1⅛ oz.	CCI 209	19.5 gr "Hi-Skor" 700X	Lage Uniwad	1190 fps	9200 lup
1⅛ oz.	CCI 209	19.5 gr "Hi-Skor" 700X	Pacific Versalite	1205 fps	9100 lup
1⅛ oz.	Win. 209	24.0 gr SR7625	Win. WAA12(white)	1135 fps	5800 lup
1⅛ oz.	Win. 209	25.5 gr SR7625	Win. WAA12(white)	1200 fps	6600 lup
1⅛ oz.	CCI 109	23.0 gr SR7625	Win. WAA12(white)	1145 fps	6500 lup
1⅛ oz.	CCI 209	23.0 gr SR7625	Win. WAA12(white)	1145 fps	6500 lup
1⅛ oz.	CCI 109	24.5 gr SR7625	Win. WAA12(white)	1190 fps	6900 lup
1⅛ oz.	CCI 209	24.5 gr SR7625	Win. WAA12(white)	1190 fps	6900 lup
1⅛ oz.	Fed. 209	23.0 gr SR7625	Win. WAA12(white)	1195 fps	8200 lup
1⅛ oz.	Win. 209	24.0 gr SR7625	Rem. RXP12	1155 fps	6000 lup
1⅛ oz.	Win. 209	25.0 gr SR7625	Rem. RXP12	1195 fps	6500 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

Winchester-Western Compression-Formed Plastic Shell
(Continued)

Hull #5
12 Gauge 2¾"
Hull I.D. Page 98
Reference Notes Page 114

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	Win. 209	27.0 gr SR7625	Rem. R12H	1260 fps	7500 lup
1⅛ oz.	Fed. 209	23.5 gr SR7625	Rem. RXP12	1195 fps	7300 lup
1⅛ oz.	CCI 109	24.5 gr SR7625	Rem. RXP12	1210 fps	6900 lup
1⅛ oz.	CCI 209	24.5 gr SR7625	Rem. RXP12	1210 fps	6900 lup
1⅛ oz.	Win. 209	24.5 gr SR7625	Pacific Versalite	1155 fps	6400 lup
1⅛ oz.	CCI 209	26.0 gr SR7625	Pacific Versalite	1205 fps	6600 lup
1⅛ oz.	Fed. 209	25.5 gr SR7625	Fed 12S4	1255 fps	8400 lup
1¼ oz.	CCI 109	31.0 gr HS6	Win. WAA12F114	1250 fps	9200 lup
1¼ oz.	CCI 209	31.0 gr HS6	Win. WAA12F114	1250 fps	9200 lup
1¼ oz.	CCI 109	33.0 gr HS6	Win. WAA12F114	1324 fps	10500 lup
1¼ oz.	CCI 209	33.0 gr HS6	Win. WAA12F114	1324 fps	10500 lup
1¼ oz.	Win. 209	31.0 gr HS6	Win. WAA12F114	1250 fps	9200 lup
1¼ oz.	Win. 209	33.0 gr HS6	Win. WAA12F114	1324 fps	10500 lup
1¼ oz.	CCI 109	31.0 gr HS6	Rem. R12H	1246 fps	9000 lup
1¼ oz.	CCI 209	31.0 gr HS6	Rem. R12H	1246 fps	9000 lup
1¼ oz.	CCI 109	34.0 gr HS6	Rem. R12H	1320 fps	10300 lup
1¼ oz.	CCI 209	34.0 gr HS6	Rem. R12H	1320 fps	10300 lup
1¼ oz.	Win. 209	34.0 gr HS6	Rem. R12H	1320 fps	10300 lup
1¼ oz.	Win. 209	23.5 gr Unique	Win. WAA12F114	1220 fps	9900 psi
1¼ oz.	CCI 209M	23.5 gr Unique	Win. WAA12F114	1220 fps	9900 psi
1¼ oz.	Fed. 209	23.0 gr Unique	Win. WAA12F114	1220 fps	10000 psi
1¼ oz.	Rem. 97*	23.5 gr Unique	Win. WAA12F114	1220 fps	10000 psi
1¼ oz.	Win. 209	23.5 gr Unique	Fed 12S4	1220 fps	10400 psi
1¼ oz.	Win. 209	22.5 gr Unique	Rem. RP12	1220 fps	9500 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #5
12 Gauge 2¾"
Hull I.D. Page 98
Reference Notes Page 114

Winchester-Western Compression-Formed Plastic Shell
(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1¼ oz.	Win. 209	25.0 gr Herco	Win. WAA12F114	1220 fps	8400 psi
1¼ oz.	Win. 209	26.5 gr Herco	Win. WAA12F114	1275 fps	10700 psi
1¼ oz.	CCI 209M	24.0 gr Herco	Win. WAA12F114	1220 fps	9100 psi
1¼ oz.	CCI 209M	27.0 gr Herco	Win. WAA12F114	1275 fps	10700 psi
1¼ oz.	Fed. 209	24.0 gr Herco	Win. WAA12F114	1220 fps	10100 psi
1¼ oz.	Fed. 209	26.0 gr Herco	Win. WAA12F114	1275 fps	10700 psi
1¼ oz.	Win. 209	34.5 gr Blue Dot	Win. WAA12F114	1275 fps	9900 psi
1¼ oz.	Win. 209	37.0 gr Blue Dot	Win. WAA12F114	1330 fps	10600 psi
1¼ oz.	CCI 209M	35.0 gr Blue Dot	Win. WAA12F114	1275 fps	8600 psi
1¼ oz.	CCI 209M	36.5 gr Blue Dot	Win. WAA12F114	1330 fps	9500 psi
1¼ oz.	Fed. 209	33.5 gr Blue Dot	Win. WAA12F114	1330 fps	10500 psi
1¼ oz.	Win. 209	35.0 gr Blue Dot	Rem. SP12	1275 fps	8200 psi
1¼ oz.	Win. 209	37.0 gr Blue Dot	Rem. SP12	1330 fps	10300 psi
1¼ oz.	Win. 209	38.0 gr Blue Dot	Rem. RP12	1330 fps	10200 psi
1¼ oz.	Win. 209	27.0 gr SR7625	Win. WAA12R(red)	1215 fps	7800 lup
1¼ oz.	Win. 209	30.0 gr SR7625	Win. WAA12R(red)	1335 fps	10200 lup
1¼ oz.	Win. 209	26.5 gr SR7625	Rem. SP12	1215 fps	8200 lup
1¼ oz.	Win. 209	29.0 gr SR7625	Rem. RP12	1330 fps	10700 lup
1¼ oz.	Fed. 209	26.5 gr SR7625	Win. WAA12R(red)	1225 fps	8500 lup
1¼ oz.	Fed. 209	29.5 gr SR7625	Win. WAA12R(red)	1330 fps	10300 lup
1¼ oz.	Win. 209	31.0 gr SR4756	Win. WAA12R(red)	1210 fps	7700 lup
1¼ oz.	Win. 209	34.0 gr SR4756	Win. WAA12R(red)	1330 fps	9200 lup
1¼ oz.	Win. 209	30.5 gr SR4756	Rem. RP12	1215 fps	8100 lup
1¼ oz.	Win. 209	33.5 gr SR4756	Rem. RP12	1335 fps	9900 lup
1¼ oz.	Fed. 209	33.5 gr SR4756	Win. WAA12R(red)	1320 fps	9300 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

Winchester-Western Compression-Formed Plastic Shell
(Continued)

Hull #5
12 Gauge 2¾"
Hull I.D. Page 98
Reference Notes Page 114

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1¼ oz.	Fed. 209	30.0 gr SR4756	Rem. RP12	1220 fps	8400 lup
1¼ oz.	Fed. 209	33.0 gr SR4756	Rem. RP12	1330 fps	10000 lup
1¼ oz.	Win. 209	25.0 gr "Hi-Skor" 800X	Win. WAA12F114	1225 fps	8500 lup
1¼ oz.	Win. 209	27.5 gr "Hi-Skor" 800X	Win. WAA12F114	1320 fps	10300 lup
1¼ oz.	Win. 209	25.0 gr "Hi-Skor" 800X	Rem. SP12	1230 fps	8400 lup
1¼ oz.	Win. 209	28.0 gr "Hi-Skor" 800X	Rem. SP12	1330 fps	10200 lup
1¼ oz.	Fed. 209	24.5 gr "Hi-Skor" 800X	Win. WAA12F114	1220 fps	8900 lup
1¼ oz.	Fed. 209	27.5 gr "Hi-Skor" 800X	Win. WAA12F114	1330 fps	10900 lup
1¼ oz.	CCI 109	24.5 gr 473AA	Win. WAA12(white)	1220 fps	9800 lup
1¼ oz.	Win. 209	23.5 gr 473AA	Win. WAA12F114	1150 fps	9500 lup
1¼ oz.	Win. 209	25.0 gr 473AA	Win. WAA12F114	1220 fps	10100 lup
1¼ oz.	Win. 209	30.0 gr 540	Win. WAA12F114	1220 fps	8500 lup
1¼ oz.	Win. 209	31.0 gr 540	Win. WAA12F114	1255 fps	9100 lup
1¼ oz.	Win. 209	33.0 gr 540	Win. WAA12F114	1330 fps	10400 lup
1¼ oz.	Win. 209	31.5 gr 540	Rem. R12H	1220 fps	8900 lup
1¼ oz.	Win. 209	33.0 gr 540	Rem. R12H	1255 fps	9000 lup
1¼ oz.	CCI 109	34.5 gr 540	Win. WAA12(white)	1330 fps	10500 lup
1⅜ oz.	Win. 209	34.0 gr Blue Dot	Win. WAA12F114	1240 fps	10500 psi
1⅜ oz.	CCI 209M	33.5 gr Blue Dot	Win. WAA12F114	1240 fps	8300 psi
1⅜ oz.	Win. 209	33.0 gr Blue Dot	Rem. SP12	1240 fps	10600 psi
1⅜ oz.	Win. 209	32.0 gr SR4756	Rem. RP12	1260 fps	10300 lup
1⅜ oz.	Fed. 209	32.0 gr SR4756	Rem. RP12	1270 fps	10700 lup
1⅜ oz.	Win. 209	32.5 gr SR4756	Win. WAA12R(red)	1265 fps	10000 lup
1⅜ oz.	Win. 209	26.0 gr "Hi-Skor" 800X	Rem. SP12	1235 fps	10300 lup
1⅜ oz.	Win. 209	26.0 gr "Hi-Skor" 800X	Win. WAA12R(red)	1250 fps	10500 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #5
12 Gauge 2¾"
Hull I.D. Page 98
Reference Notes Page 114

Winchester-Western Compression-Formed Plastic Shell

(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅜ oz.	Fed. 209	25.5 gr "Hi-Skor" 800X	Win. WAA12R(red)	1225 fps	10300 lup
1⅜ oz.	CCI 109	34.0 gr HS6	Win. WAA12R(red)	1289 fps	10700 lup
1⅜ oz.	CCI 209	34.0 gr HS6	Win. WAA12R(red)	1289 fps	10700 lup
1⅜ oz.	Win. 209	34.0 gr HS6	Win. WAA12R(red)	1289 fps	10700 lup
1⅜ oz.	Win. 209	32.0 gr 540	Win. WAA12F114	1275 fps	10300 lup
1⅜ oz.	Win. 209	36.0 gr 571	Win. WAA12F114	1285 fps	10300 lup
1⅜ oz.	Fed. 209	35.5 gr 571	Win. WAA12R(red)	1285 fps	10500 lup
1⅜ oz.	Fed. 209	35.5 gr 571	Rem. RP12	1285 fps	10100 lup
1⅜ oz.	Win. 209	39.5 gr 571	Win. WAA12R(red)	1330 fps	9800 lup
1⅜ oz.	Win. 209	39.5 gr 571	Rem. RP12	1330 fps	9900 lup
1½ oz.	CCI 109	31.0 gr HS6	Win. WAA12R(red)	1253 fps	10500 lup
1½ oz.	CCI 209	31.0 gr HS6	Win. WAA12R(red)	1253 fps	10500 lup
1½ oz.	CCI 109	31.0 gr HS6	Rem. RP12	1260 fps	10600 lup
1½ oz.	CCI 209	31.0 gr HS6	Rem. RP12	1260 fps	10600 lup
1½ oz.	Win. 209	31.0 gr HS6	Win. WAA12R(red)	1253 fps	10500 lup
1½ oz.	CCI 109	37.0 gr HS7	Win. WAA12R(red)	1306 fps	10800 lup
1½ oz.	CCI 209	37.0 gr HS7	Win. WAA12R(red)	1306 fps	10800 lup
1½ oz.	CCI 109	37.0 gr HS7	Rem. RP12	1296 fps	10600 lup
1½ oz.	CCI 209	37.0 gr HS7	Rem. RP12	1296 fps	10600 lup
1½ oz.	Win. 209	37.0 gr HS7	Win. WAA12R(red)	1306 fps	10800 lup
1½ oz.	Win. 209	37.0 gr HS7	Rem. RP12	1296 fps	10600 lup
1½ oz.	Win. 209	44.5 gr Hercules 2400	Rem. RP12	1260 fps	10400 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

Winchester-Western Compression-Formed Plastic Shell
(Continued)

Hull #5
12 Gauge 2¾"
Hull I.D. Page 98
Reference Notes Page 114

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1½ oz.	CCI 109	35.5 gr 571	Win. WAA12R(red)	1260 fps	10500 lup
1½ oz.	Win. 209	36.5 gr 571	Win. WAA12R(red)	1260 fps	10300 lup
1½ oz.	Win. 209	36.5 gr 571	Rem. RP12	1260 fps	9800 lup

12
12 Gauge 2¾"

Winchester-Western Polyformed Plastic Shell *(With Plastic Basewad)*

Hull #6
12 Gauge 2¾"
Hull I.D. Page 99
Reference Notes Page 115

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	Win. 209	23.0 gr 452AA	Fed. 12S3	1290 fps	8400 lup
1 oz.	Win. 209	23.0 gr Trap 100	Fed. 12S3	1280 fps	8500 lup
1 oz.	CCI 109	23.0 gr Trap 100	Fed. 12S3	1280 fps	8500 lup
1 oz.	CCI 209	23.0 gr Trap 100	Fed. 12S3	1280 fps	8500 lup
1⅛ oz.	CCI 109	21.0 gr Trap 100	Fed. 12S3	1155 fps	8100 lup
1⅛ oz.	CCI 209	21.0 gr Trap 100	Fed. 12S3	1155 fps	8100 lup
1⅛ oz.	Win. 209	21.0 gr Trap 100	Fed. 12S3	1155 fps	8100 lup
1⅛ oz.	CCI 109	21.0 gr Trap 100	Win. WAA12(white)	1200 fps	9300 lup
1⅛ oz.	CCI 209	21.0 gr Trap 100	Win. WAA12(white)	1200 fps	9300 lup
1⅛ oz.	Win. 209	21.0 gr Trap 100	Win. WAA12(white)	1200 fps	9300 lup
1⅛ oz.	CCI 109	22.0 gr Trap 100	Fed. 12S3	1209 fps	9400 lup
1⅛ oz.	CCI 209	22.0 gr Trap 100	Fed. 12S3	1209 fps	9400 lup
1⅛ oz.	Win. 209	22.0 gr Trap 100	Fed. 12S3	1209 fps	9400 lup
1⅛ oz.	Win. 209	20.5 gr 452AA	Fed. 12S3	1145 fps	7500 lup
1⅛ oz.	Win. 209	22.0 gr 452AA	Fed. 12S3	1200 fps	8500 lup
1¼ oz.	CCI 109	33.0 gr HS 6	Rem. R12H	1288 fps	9800 lup
1¼ oz.	CCI 209	33.0 gr HS 6	Rem. R12H	1288 fps	9800 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #6
12 Gauge 2¾"
Hull I.D. Page 99
Reference Notes Page 115

Winchester-Western Polyformed Plastic Shell *(With Plastic Basewad)*

(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1¼ oz.	Win. 209	33.0 gr HS 6	Rem. R12H	1288 fps	9800 lup
1¼ oz.	Win. 209	35.0 gr 540	Rem. R12H	1330 fps	8400 lup
1½ oz.	CCI 109	37.0 gr HS 7	Win. WAA12R(red)	1309 fps	10400 lup
1½ oz.	CCI 209	37.0 gr HS 7	Win. WAA12R(red)	1309 fps	10400 lup
1½ oz.	Win. 209	37.0 gr HS 7	Win. WAA12R(red)	1309 fps	10400 lup
1½ oz.	Win. 209	33.5 gr 540	Win. WAA12R(red)	1260 fps	8900 lup

Hull #7
12 Gauge 2¾"
Hull I.D. Page 99
Reference Notes Page 116

Peters Plastic Target Shell ("Blue Magic")

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	Rem. 97*	18.0 gr Red Dot	Rem. RXP12	1200 fps	8400 psi
1 oz.	CCI 109	18.5 gr Red Dot	Rem. RXP12	1200 fps	8000 psi
1 oz.	CCI 209	18.5 gr Red Dot	Rem. RXP12	1200 fps	8000 psi
1 oz.	Rem. 97*	18.0 gr Red Dot	Win. WAA12F1	1200 fps	8500 psi
1 oz.	CCI 109	18.5 gr Red Dot	Win. WAA12F1	1200 fps	7600 psi
1 oz.	CCI 209	18.5 gr Red Dot	Win. WAA12F1	1200 fps	7600 psi
1 oz.	Rem. 97*	19.5 gr Red Dot	Rem. R12L	1290 fps	9400 psi
1 oz.	Fed. 209	19.5 gr Red Dot	Rem. R12L	1290 fps	10500 psi
1 oz.	Win. 209	19.5 gr Red Dot	Rem. R12L	1290 fps	10400 psi
1 oz.	CCI 209M	20.5 gr Red Dot	Rem. R12L	1290 fps	9800 psi
1 oz.	Rem. 97*	20.5 gr Red Dot	Rem. RXP12	1290 fps	9700 psi
1 oz.	Rem. 97*	20.0 gr Green Dot	Rem. RXP12	1200 fps	7500 psi
1 oz.	CCI 109	20.0 gr Green Dot	Rem. RXP12	1200 fps	7000 psi
1 oz.	CCI 209	20.0 gr Green Dot	Rem. RXP12	1200 fps	7000 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

Peters Plastic Target Shell ("Blue Magic")

(Continued)

Hull #7
12 Gauge 2¾"
Hull I.D. Page 99
Reference Notes Page 116

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	CCI 109	21.5 gr Green Dot	Win. WAA12F1	1200 fps	6500 psi
1 oz.	CCI 209	21.5 gr Green Dot	Win. WAA12F1	1200 fps	6500 psi
1 oz.	Rem. 97*	21.5 gr Green Dot	Rem. R12L	1290 fps	8400 psi
1 oz.	CCI 209M	22.0 gr Green Dot	Rem. R12L	1290 fps	9100 psi
1 oz.	Rem. 97*	21.5 gr Green Dot	Rem. RXP12	1290 fps	8600 psi
1 oz.	Rem. 97*	18.0 gr Bullseye	Win. WAA12F1	1200 fps	8700 psi
1 oz.	CCI 109	18.5 gr Bullseye	Win. WAA12F1	1200 fps	8300 psi
1 oz.	CCI 209	18.5 gr Bullseye	Win. WAA12F1	1200 fps	8300 psi
1 oz.	CCI 209M	17.5 gr Bullseye	Rem. R12L	1200 fps	9000 psi
1 oz.	Fed. 209	16.5 gr "Hi-Skor" 700X	Rem. RXP12	1145 fps	7500 lup
1 oz.	Fed. 209	17.0 gr "Hi-Skor" 700X	Win. WAA12F1	1195 fps	8500 lup
1 oz.	Rem. 97*	18.0 gr "Hi-Skor" 700X	Rem. RXP12	1195 fps	7600 lup
1 oz.	Rem. 97*	19.5 gr "Hi-Skor" 700X	Win. WAA12(white)	1280 fps	9300 lup
1 oz.	CCI 109	20.0 gr PB	Rem. RXP12	1155 fps	6200 lup
1 oz.	CCI 209	20.0 gr PB	Rem. RXP12	1155 fps	6200 lup
1 oz.	CCI 109	21.0 gr PB	Rem. RXP12	1200 fps	6800 lup
1 oz.	CCI 209	21.0 gr PB	Rem. RXP12	1200 fps	6800 lup
1 oz.	Fed. 209	21.0 gr PB	Rem. RXP12	1205 fps	7200 lup
1 oz.	CCI 109	22.5 gr SR7625	Rem. RXP12	1135 fps	5400 lup
1 oz.	CCI 209	22.5 gr SR7625	Rem. RXP12	1135 fps	5400 lup
1 oz.	CCI 109	24.0 gr SR7625	Rem. RXP12	1210 fps	6100 lup
1 oz.	CCI 209	24.0 gr SR7625	Rem. RXP12	1210 fps	6100 lup
1 oz.	CCI 109	23.5 gr SR7625	Win. WAA12(white)	1190 fps	6200 lup
1 oz.	CCI 209	23.5 gr SR7625	Win. WAA12(white)	1190 fps	6200 lup
1 oz.	Fed. 209	23.0 gr SR7625	Win. WAA12(white)	1200 fps	6700 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #7
12 Gauge 2¾"
Hull I.D. Page 99
Reference Notes Page 116

Peters Plastic Target Shell ("Blue Magic")

(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	CCI 109	22.5 gr SR7625	Fed. 12S3	1190 fps	6100 lup
1 oz.	CCI 209	22.5 gr SR7625	Fed. 12S3	1190 fps	6100 lup
1 oz.	Win. 209	20.5 gr 452AA	Win. WAA12F1	1180 fps	6600 lup
1 oz.	Win. 209	21.5 gr 452AA	Win. WAA12F1	1235 fps	7500 lup
1 oz.	Win. 209	23.0 gr 452AA	Win. WAA12F1	1290 fps	8400 lup
1 oz.	Fed. 209	23.0 gr 452AA	Win. WAA12F1	1290 fps	8100 lup
1⅛ oz.	CCI 109	19.0 gr Trap 100	Win. WAA12(white)	1152 fps	9800 lup
1⅛ oz.	CCI 209	19.0 gr Trap 100	Win. WAA12(white)	1152 fps	9800 lup
1⅛ oz.	CCI 109	20.0 gr Trap 100	Win. WAA12(white)	1206 fps	10400 lup
1⅛ oz.	CCI 209	20.0 gr Trap 100	Win. WAA12(white)	1206 fps	10400 lup
1⅛ oz.	CCI 109	19.0 gr Trap 100	Rem. RXP12	1140 fps	9200 lup
1⅛ oz.	CCI 209	19.0 gr Trap 100	Rem. RXP12	1140 fps	9200 lup
1⅛ oz.	CCI 109	20.0 gr Trap 100	Rem. RXP12	1190 fps	10100 lup
1⅛ oz.	CCI 209	20.0 gr Trap 100	Rem. RXP12	1190 fps	10100 lup
1⅛ oz.	Win. 209	19.0 gr Trap 100	Win. WAA12(white)	1152 fps	9800 lup
1⅛ oz.	Win. 209	20.0 gr Trap 100	Win. WAA12(white)	1206 fps	10400 lup
1⅛ oz.	Win. 209	19.0 gr Trap 100	Rem. RXP12	1140 fps	9200 lup
1⅛ oz.	Win. 209	20.0 gr Trap 100	Rem. RXP12	1190 fps	10100 lup
1⅛ oz.	CCI 109	17.5 gr Red Dot	Rem. RXP12	1145 fps	8200 psi
1⅛ oz.	CCI 209	17.5 gr Red Dot	Rem. RXP12	1145 fps	8200 psi
1⅛ oz.	CCI 109	19.0 gr Red Dot	Rem. RXP12	1200 fps	9500 psi
1⅛ oz.	CCI 209	19.0 gr Red Dot	Rem. RXP12	1200 fps	9500 psi
1⅛ oz.	CCI 209M	17.5 gr Red Dot	Rem. RXP12	1145 fps	9600 psi
1⅛ oz.	CCI 209M	18.5 gr Red Dot	Rem. RXP12	1200 fps	10300 psi
1⅛ oz.	Win. 209	17.5 gr Red Dot	Rem. RXP12	1145 fps	9900 psi
1⅛ oz.	Win. 209	18.5 gr Red Dot	Rem. RXP12	1200 fps	10700 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12

12 Gauge 2¾″

Peters Plastic Target Shell ("Blue Magic")

(Continued)

Hull #7
12 Gauge 2¾″
Hull I.D. Page 99
Reference Notes Page 116

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	Rem. 97*	17.5 gr Red Dot	Rem. RXP12	1145 fps	9300 psi
1⅛ oz.	Rem. 97*	18.5 gr Red Dot	Rem. RXP12	1200 fps	10100 psi
1⅛ oz.	Fed. 209	18.0 gr Red Dot	Rem. RXP12	1200 fps	10700 psi
1⅛ oz.	Rem. 97*	17.0 gr Red Dot	Win. WAA12(white)	1145 fps	9100 psi
1⅛ oz.	Rem. 97*	18.5 gr Red Dot	Win. WAA12(white)	1200 fps	10000 psi
1⅛ oz.	CCI 109	17.5 gr Red Dot	Win. WAA12(white)	1145 fps	9100 psi
1⅛ oz.	CCI 209	17.5 gr Red Dot	Win. WAA12(white)	1145 fps	9100 psi
1⅛ oz.	CCI 109	18.5 gr Red Dot	Win. WAA12(white)	1200 fps	9900 psi
1⅛ oz.	CCI 209	18.5 gr Red Dot	Win. WAA12(white)	1200 fps	9900 psi
1⅛ oz.	CCI 109	18.5 gr Red Dot	Pacific Versalite	1200 fps	9600 psi
1⅛ oz.	CCI 209	18.5 gr Red Dot	Pacific Versalite	1200 fps	9600 psi
1⅛ oz.	CCI 209	19.0 gr Red Dot	Lage Uniwad	1200 fps	9700 psi
1⅛ oz.	Rem. 97*	18.5 gr Red Dot	Fed 12C1	1200 fps	10500 psi
1⅛ oz.	Rem. 97*	18.0 gr Red Dot	Pacific Versalite	1200 fps	9200 psi
1⅛ oz.	CCI 209M	19.0 gr Green Dot	Rem. RXP12	1145 fps	9000 psi
1⅛ oz.	CCI 209M	20.0 gr Green Dot	Rem. RXP12	1200 fps	9600 psi
1⅛ oz.	Rem. 97*	18.5 gr Green Dot	Rem. RXP12	1145 fps	8300 psi
1⅛ oz.	Rem. 97*	20.0 gr Green Dot	Rem. RXP12	1200 fps	8400 psi
1⅛ oz.	Rem. 97*	22.0 gr Green Dot	Rem. RXP12	1255 fps	9800 psi
1⅛ oz.	CCI 109	20.5 gr Green Dot	Rem. RXP12	1200 fps	8200 psi
1⅛ oz.	CCI 209	20.5 gr Green Dot	Rem. RXP12	1200 fps	8200 psi
1⅛ oz.	Win. 209	20.0 gr Green Dot	Rem. RXP12	1200 fps	9400 psi
1⅛ oz.	Win. 209	21.5 gr Green Dot	Rem. RXP12	1255 fps	10700 psi
1⅛ oz.	Fed. 209	20.5 gr Green Dot	Rem. RXP12	1200 fps	9200 psi
1⅛ oz.	CCI 109	19.0 gr Green Dot	Win. WAA12(white)	1145 fps	7600 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #7
12 Gauge 2¾″
Hull I.D. Page 99
Reference Notes Page 116

Peters Plastic Target Shell ("Blue Magic")

(Continued)

12
12 Gauge 2¾″

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	CCI 209	19.0 gr Green Dot	Win. WAA12(white)	1145 fps	7600 psi
1⅛ oz.	CCI 109	20.0 gr Green Dot	Win. WAA12(white)	1200 fps	9400 psi
1⅛ oz.	CCI 209	20.0 gr Green Dot	Win. WAA12(white)	1200 fps	9400 psi
1⅛ oz.	CCI 109	22.5 gr Unique	Rem. RXP12	1200 fps	8400 psi
1⅛ oz.	CCI 209	22.5 gr Unique	Rem. RXP12	1200 fps	8400 psi
1⅛ oz.	Rem. 97*	22.0 gr Unique	Rem. RXP12	1200 fps	8000 psi
1⅛ oz.	Rem. 97*	23.0 gr Unique	Rem. RXP12	1255 fps	8900 psi
1⅛ oz.	CCI 209M	23.5 gr Unique	Rem. RXP12	1255 fps	9800 psi
1⅛ oz.	Win. 209	24.0 gr Unique	Rem. RXP12	1255 fps	10200 psi
1⅛ oz.	Rem. 97*	23.0 gr Unique	Win. WAA12(white)	1255 fps	9200 psi
1⅛ oz.	Rem. 97*	26.5 gr Unique	Win. WAA12(white)	1310 fps	10500 psi
1⅛ oz.	Rem. 97*	24.0 gr Unique	Pattern Control Red	1255 fps	9500 psi
1⅛ oz.	CCI 209M	25.0 gr Unique	Rem. RXP12	1310 fps	10600 psi
1⅛ oz.	Rem. 97*	17.5 gr "Hi-Skor" 700X	Rem. RXP12	1135 fps	8400 lup
1⅛ oz.	Rem. 97*	18.5 gr "Hi-Skor" 700X	Rem. RXP12	1195 fps	9000 lup
1⅛ oz.	Rem. 97*	20.0 gr "Hi-Skor" 700X	Rem. RXP12	1245 fps	10600 lup
1⅛ oz.	Fed. 209	17.0 gr "Hi-Skor" 700X	Win. WAA12(white)	1150 fps	9600 lup
1⅛ oz.	Rem. 97*	19.0 gr "Hi-Skor" 700X	Win. WAA12(white)	1205 fps	9300 lup
1⅛ oz.	Win. 209	17.0 gr "Hi-Skor" 700X	Win. WAA12(white)	1140 fps	9100 lup
1⅛ oz.	Win. 209	18.5 gr "Hi-Skor" 700X	Win. WAA12(white)	1205 fps	10200 lup
1⅛ oz.	Win. 209	19.5 gr "Hi-Skor" 700X	Win. WAA12(white)	1240 fps	10900 lup
1⅛ oz.	CCI 109	18.5 gr "Hi-Skor" 700X	Win. WAA12(white)	1200 fps	10100 lup
1⅛ oz.	CCI 209	18.5 gr "Hi-Skor" 700X	Win. WAA12(white)	1200 fps	10100 lup
1⅛ oz.	CCI 109	18.5 gr "Hi-Skor" 700X	Rem. RXP12	1195 fps	9700 lup
1⅛ oz.	CCI 209	18.5 gr "Hi-Skor" 700X	Rem. RXP12	1195 fps	9700 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

Peters Plastic Target Shell ("Blue Magic")

(Continued)

Hull #7
12 Gauge 2¾"
Hull I.D. Page 99
Reference Notes Page 116

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	Fed. 209	18.5 gr "Hi-Skor" 700X	Rem. RXP12	1200 fps	10500 lup
1⅛ oz.	Rem. 97*	18.5 gr "Hi-Skor" 700X	Pacific Versalite	1200 fps	9200 lup
1⅛ oz.	CCI 109	18.5 gr "Hi-Skor" 700X	Pacific Versalite	1205 fps	9700 lup
1⅛ oz.	CCI 209	18.5 gr "Hi-Skor" 700X	Pacific Versalite	1205 fps	9700 lup
1⅛ oz.	CCI 109	20.0 gr PB	Win. WAA12(white)	1140 fps	7800 lup
1⅛ oz.	CCI 209	20.0 gr PB	Win. WAA12(white)	1140 fps	7800 lup
1⅛ oz.	CCI 109	21.5 gr PB	Win. WAA12(white)	1195 fps	8200 lup
1⅛ oz.	CCI 209	21.5 gr PB	Win. WAA12(white)	1195 fps	8200 lup
1⅛ oz.	Win. 209	20.0 gr PB	Win. WAA12(white)	1140 fps	7500 lup
1⅛ oz.	Win. 209	21.5 gr PB	Win. WAA12(white)	1195 fps	8100 lup
1⅛ oz.	Fed. 209	21.5 gr PB	Win. WAA12(white)	1200 fps	8900 lup
1⅛ oz.	Win. 209	23.0 gr PB	Win. WAA12(white)	1250 fps	9400 lup
1⅛ oz.	CCI 109	22.0 gr PB	Rem. R12H	1195 fps	7700 lup
1⅛ oz.	CCI 209	22.0 gr PB	Rem. R12H	1195 fps	7700 lup
1⅛ oz.	CCI 209	22.0 gr PB	Pacific Versalite	1200 fps	7300 lup
1⅛ oz.	Fed. 209	23.0 gr PB	Rem. R12H	1250 fps	9300 lup
1⅛ oz.	Rem. 97*	23.0 gr "Hi-Skor" 800X	Rem. RXP12	1205 fps	7600 lup
1⅛ oz.	Rem. 97*	24.0 gr "Hi-Skor" 800X	Rem. RXP12	1260 fps	8000 lup
1⅛ oz.	Rem. 97*	23.0 gr "Hi-Skor" 800X	Win. WAA12(white)	1200 fps	7400 lup
1⅛ oz.	Rem. 97*	24.0 gr "Hi-Skor" 800X	Win. WAA12(white)	1255 fps	7700 lup
1⅛ oz.	Rem. 97*	23.0 gr "Hi-Skor" 800X	Pacific Versalite	1205 fps	7200 lup
1⅛ oz.	CCI 109	23.5 gr SR7625	Rem. RXP12	1210 fps	7800 lup
1⅛ oz.	CCI 209	23.5 gr SR7625	Rem. RXP12	1210 fps	7800 lup
1⅛ oz.	Win. 209	24.0 gr SR7625	Rem. RXP12	1205 fps	7400 lup
1⅛ oz.	CCI 209	22.5 gr SR7625	Win. WAA12(white)	1150 fps	6700 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #7
12 Gauge 2¾"
Hull I.D. Page 99
Reference Notes Page 116

Peters Plastic Target Shell ("Blue Magic")

(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	CCI 209	24.0 gr SR7625	Win. WAA12(white)	1205 fps	7400 lup
1⅛ oz.	CCI 109	24.0 gr SR7625	Win. WAA12(white)	1205 fps	7400 lup
1⅛ oz.	Win. 209	23.0 gr SR7625	Win. WAA12(white)	1145 fps	6500 lup
1⅛ oz.	Win. 209	24.0 gr SR7625	Win. WAA12(white)	1200 fps	7700 lup
1⅛ oz.	Win. 209	25.0 gr SR7625	Win. WAA12(white)	1255 fps	8100 lup
1⅛ oz.	Fed. 209	23.5 gr SR7625	Win. WAA12(white)	1205 fps	8000 lup
1⅛ oz.	CCI 209	23.5 gr SR7625	Pacific Versalite	1215 fps	7400 lup
1⅛ oz.	Fed. 209	24.0 gr SR7625	Fed. 12S4	1260 fps	9800 lup
1⅛ oz.	Win. 209	19.5 gr 452AA	Win. WAA12(white)	1145 fps	10100 lup
1⅛ oz.	Win. 209	20.0 gr 452AA	Rem. RXP12	1145 fps	9200 lup
1⅛ oz.	Win. 209	21.5 gr 452AA	Rem. RXP12	1200 fps	10400 lup
1⅛ oz.	CCI 209	18.5 gr 452AA	Win. WAA12(white)	1145 fps	9500 lup
1⅛ oz.	CCI 209	19.5 gr 452AA	Rem. RXP12	1145 fps	8700 lup
1⅛ oz.	CCI 209	20.0 gr 452AA	Win. WAA12(white)	1200 fps	10400 lup
1⅛ oz.	CCI 209	20.5 gr 452AA	Rem. RXP12	1200 fps	9800 lup
1⅛ oz.	Win. 209	24.0 gr 473AA	Win. WAA12(white)	1200 fps	8500 lup
1⅛ oz.	Win. 209	24.0 gr 473AA	Rem. RXP12	1200 fps	7800 lup
1⅛ oz.	Win. 209	25.0 gr 473AA	Win. WAA12(white)	1255 fps	9400 lup
1⅛ oz.	Win. 209	25.5 gr 473AA	Rem. RXP12	1255 fps	9100 lup
1⅛ oz.	Win. 209	26.5 gr 473AA	Rem. RXP12	1290 fps	9500 lup
1¼ oz.	Rem. 97*	23.0 gr Unique	Rem. SP12	1220 fps	9800 psi
1¼ oz.	Rem. 97*	23.0 gr Unique	Win. WAA12F114	1220 fps	10700 psi
1¼ oz.	Rem. 97*	24.0 gr Herco	Rem. SP12	1220 fps	9700 psi
1¼ oz.	Rem. 97*	25.0 gr Herco	Win. WAA12F114	1220 fps	10200 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12

12 Gauge 2¾"

Peters Plastic Target Shell ("Blue Magic")

(Continued)

Hull #7
12 Gauge 2¾"
Hull I.D. Page 99
Reference Notes Page 116

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1¼ oz.	CCI 209M	24.5 gr Herco	Rem. SP12	1220 fps	10300 psi
1¼ oz.	Win. 209	24.5 gr Herco	Rem. SP12	1220 fps	10300 psi
1¼ oz.	Rem. 97*	27.0 gr Herco	Win. WAA12F114	1275 fps	10100 psi
1¼ oz.	Rem. 97*	26.0 gr Herco	Rem. SP12	1275 fps	9700 psi
1¼ oz.	Rem. 97*	35.0 gr Blue Dot	Rem. SP12	1275 fps	8900 psi
1¼ oz.	Rem. 97*	36.5 gr Blue Dot	Rem. SP12	1330 fps	10000 psi
1¼ oz.	CCI 209M	34.5 gr Blue Dot	Rem. SP12	1275 fps	9800 psi
1¼ oz.	CCI 209M	35.5 gr Blue Dot	Rem. SP12	1330 fps	10500 psi
1¼ oz.	Win. 209	35.0 gr Blue Dot	Rem. SP12	1275 fps	10200 psi
1¼ oz.	Win. 209	36.5 gr Blue Dot	Rem. SP12	1330 fps	10500 psi
1¼ oz.	Fed. 209	35.5 gr Blue Dot	Rem. SP12	1330 fps	10700 psi
1¼ oz.	Win. 209	23.5 gr PB	Rem. SP12	1215 fps	10100 lup
1¼ oz.	Fed. 209	24.5 gr SR7625	Win. WAA12F114	1225 fps	10600 lup
1¼ oz.	Win. 209	28.5 gr SR7625	Win. WAA12R(red)	1325 fps	10800 lup
1¼ oz.	Rem. 97*	24.5 gr "Hi-Skor" 800X	Rem. SP12	1225 fps	9100 lup
1¼ oz.	CCI 209M	24.0 gr "Hi-Skor" 800X	Rem. SP12	1225 fps	9600 lup
1¼ oz.	Rem. 97*	24.0 gr "Hi-Skor" 800X	Win. WAA12F114	1225 fps	9300 lup
1¼ oz.	CCI 209M	24.0 gr "Hi-Skor" 800X	Win. WAA12F114	1235 fps	9700 lup
1¼ oz.	CCI 209M	24.0 gr "Hi-Skor" 800X	Fed. 12S4	1235 fps	10500 lup
1¼ oz.	Rem. 97*	27.0 gr "Hi-Skor" 800X	Rem. SP12	1335 fps	10700 lup
1¼ oz.	Rem. 97*	27.0 gr "Hi-Skor" 800X	Win. WAA12F114	1325 fps	10800 lup
1¼ oz.	Win. 209	25.5 gr 473AA	Win. WAA12(white)	1220 fps	10500 lup
1¼ oz.	Win. 209	26.0 gr 473AA	Rem. RXP12	1220 fps	10300 lup
1¼ oz.	Fed. 209	27.5 gr SR4756	Rem. RP12	1220 fps	9800 lup
1¼ oz.	Win. 209	31.5 gr SR4756	Rem. RP12	1325 fps	10100 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #7
12 Gauge 2¾"
Hull I.D. Page 99
Reference Notes Page 116

Peters Plastic Target Shell ("Blue Magic")

(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1¼ oz.	CCI 109	31.5 gr SR4756	Rem. RP12	1320 fps	10200 lup
1¼ oz.	CCI 209	31.5 gr SR4756	Rem. RP12	1320 fps	10200 lup
1¼ oz.	Win. 209	32.0 gr SR4756	Win. WAA12R(red)	1330 fps	10100 lup
1¼ oz.	CCI 109	31.5 gr SR4756	Win. WAA12R(red)	1325 fps	10600 lup
1¼ oz.	CCI 209	31.5 gr SR4756	Win. WAA12R(red)	1325 fps	10600 lup
1¼ oz.	Win. 209	35.5 gr 540	Win. WAA12F114	1330 fps	10500 lup
1¼ oz.	CCI 109	32.0 gr HS6	Win. WAA12F114	1254 fps	9200 lup
1¼ oz.	CCI 209	32.0 gr HS6	Win. WAA12F114	1254 fps	9200 lup
1¼ oz.	CCI 109	34.0 gr HS6	Win. WAA12F114	1339 fps	10400 lup
1¼ oz.	CCI 209	34.0 gr HS6	Win. WAA12F114	1339 fps	10400 lup
1¼ oz.	Win. 209	32.0 gr HS6	Win. WAA12F114	1254 fps	9200 lup
1¼ oz.	Win. 209	34.0 gr HS6	Win. WAA12F114	1339 fps	10400 lup
1⅜ oz.	Rem. 97*	35.5 gr Blue Dot	Rem. RP12	1295 fps	10200 psi
1⅜ oz.	Rem. 97*	35.5 gr Blue Dot	Rem. SP12	1295 fps	10000 psi
1⅜ oz.	Rem. 97*	25.0 gr "Hi-Skor" 800X	Rem. SP12	1240 fps	10900 lup
1⅜ oz.	CCI 109	24.5 gr "Hi-Skor" 800X	Rem. SP12	1220 fps	10600 lup
1⅜ oz.	CCI 209	24.5 gr "Hi-Skor" 800X	Rem. SP12	1220 fps	10600 lup
1⅜ oz.	CCI 109	24.5 gr "Hi-Skor" 800X	Win. WAA12R(red)	1220 fps	10300 lup
1⅜ oz.	CCI 209	24.5 gr "Hi-Skor" 800X	Win. WAA12R(red)	1220 fps	10300 lup
1⅜ oz.	Win. 209	38.5 gr 571	Win. WAA12R(red)	1330 fps	10000 lup
1⅜ oz.	Win. 209	38.0 gr 571	Rem. SP12	1330 fps	10400 lup
1½ oz.	CCI 109	31.0 gr HS6	Win. WAA12R(red)	1210 fps	10500 lup
1½ oz.	CCI 209	31.0 gr HS6	Win. WAA12R(red)	1210 fps	10500 lup
1½ oz.	CCI 109	31.0 gr HS6	Rem. RP12	1219 fps	10600 lup
1½ oz.	CCI 209	31.0 gr HS6	Rem. RP12	1219 fps	10600 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

Peters Plastic Target Shell ("Blue Magic")

(Continued)

Hull #7
12 Gauge 2¾"
Hull I.D. Page 99
Reference Notes Page 116

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1½ oz.	CCI 109	37.0 gr HS7	Win. WAA12R(red)	1290 fps	10700 lup
1½ oz.	CCI 209	37.0 gr HS7	Win. WAA12R(red)	1290 fps	10700 lup
1½ oz.	Win 209	37.0 gr HS7	Win. WAA12R(red)	1290 fps	10700 lup
1½ oz.	CCI 109	37.0 gr HS7	Rem. RP12	1274 fps	10600 lup
1½ oz.	CCI 209	37.0 gr HS7	Rem. RP12	1274 fps	10600 lup
1½ oz.	Win 209	37.0 gr HS7	Rem. RP12	1274 fps	10600 lup
1½ oz.	Rem. 97*	42.0 gr 2400	Rem. RP12	1260 fps	10700 psi
1½ oz.	Win. 209	35.5 gr 571	Win. WAA12R(red)	1230 fps	10400 lup
1½ oz.	Win. 209	36.0 gr 571	Rem. RP12	1230 fps	10400 lup

12
12 Gauge 2¾"

Remington Unibody Plastic Shell *(With Integral Basewad)*

Hull #8
12 Gauge 2¾"
Hull I.D. Page 99
Reference Notes Page 117

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	Rem. 97*	17.5 gr Bullseye	Rem. R12L	1200 fps	9300 psi
1 oz.	Rem. 97*	17.0 gr Bullseye	Fed. 12S3	1200 fps	9500 psi
1 oz.	Rem. 97*	18.5 gr Red Dot	Rem. R12L	1200 fps	9000 psi
1 oz.	Rem. 97*	17.5 gr Red Dot	Fed. 12S3	1200 fps	8600 psi
1 oz.	Rem. 97*	20.0 gr "Hi-Skor" 700X	Rem. RXP12	1285 fps	9400 lup
1 oz.	Rem. 97*	19.5 gr "Hi-Skor" 700x	Win. WAA12(white)	1285 fps	10000 lup
1 oz.	CCI 109	24.0 gr PB	Rem. RXP12	1285 fps	7300 lup
1 oz.	CCI 209	24.0 gr PB	Rem. RXP12	1285 fps	7300 lup
1 oz.	CCI 109	24.0 gr PB	Win. WAA12(white)	1290 fps	7400 lup
1 oz.	CCI 209	24.0 gr PB	Win. WAA12(white)	1290 fps	7400 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #8
12 Gauge 2¾"
Hull I.D. Page 99
Reference Notes Page 117

Remington Unibody Plastic Shell
(With Integral Basewad)
(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	Rem. 97*	18.0 gr Red Dot	Rem. RXP12	1145 fps	9300 psi
1⅛ oz.	Rem. 97*	18.5 gr Red Dot	Rem. RXP12	1200 fps	10100 psi
1⅛ oz.	Rem. 97*	19.0 gr Green Dot	Rem. RXP12	1145 fps	9000 psi
1⅛ oz.	Rem. 97*	21.0 gr Green Dot	Rem. RXP12	1200 fps	9800 psi
1⅛ oz.	Rem. 97*	23.0 gr Unique	Rem. RXP12	1200 fps	9500 psi
1⅛ oz.	Rem. 97*	24.0 gr Unique	Rem. RXP12	1255 fps	9700 psi
1⅛ oz.	Rem. 97*	17.5 gr "Hi-Skor" 700X	Rem. RXP12	1140 fps	8700 lup
1⅛ oz.	Rem. 97*	20.0 gr "Hi-Skor" 700X	Rem. RXP12	1250 fps	10500 lup
1⅛ oz.	CCI 109	21.0 gr PB	Rem. RXP12	1145 fps	7100 lup
1⅛ oz.	CCI 209	21.0 gr PB	Rem. RXP12	1145 fps	7100 lup
1⅛ oz.	CCI 109	22.5 gr PB	Rem. RXP12	1195 fps	7500 lup
1⅛ oz.	CCI 209	22.5 gr PB	Rem. RXP12	1195 fps	7500 lup
1⅛ oz.	Fed. 209	23.5 gr SR7625	Win. WAA12(white)	1205 fps	8000 lup
1⅛ oz.	Rem. 97*	23.0 gr "Hi-Skor" 800X	Rem. RXP12	1200 fps	7900 lup
1⅛ oz.	Rem. 97*	28.0 gr "Hi-Skor" 800X	Rem. RXP12	1400 fps	10500 lup
1⅛ oz.	CCI 209M	24.0 gr "Hi-Skor" 800X	Lage Uniwad	1250 fps	8200 lup
1⅛ oz.	CCI 209M	28.5 gr "Hi-Skor" 800X	Lage Uniwad	1405 fps	10400 lup
1¼ oz.	Rem. 97*	23.5 gr Unique	Rem. SP12	1220 fps	10500 psi
1¼ oz.	Rem. 97*	25.5 gr Herco	Rem. SP12	1220 fps	10500 psi
1¼ oz.	CCI 209M	25.0 gr Herco	Rem. SP12	1220 fps	10400 psi
1¼ oz.	CCI 109	24.0 gr PB	Rem. RP12	1220 fps	9900 lup
1¼ oz.	CCI 209	24.0 gr PB	Rem. RP12	1220 fps	9900 lup
1¼ oz.	Fed. 209	23.0 gr PB	Rem. RP12	1210 fps	10800 lup
1¼ oz.	CCI 109	26.0 gr SR7625	Rem. RP12	1220 fps	8200 lup
1¼ oz.	CCI 209	26.0 gr SR7625	Rem. RP12	1220 fps	8200 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

Remington Unibody Plastic Shell
(With Integral Basewad)
(Continued)

Hull #8
12 Gauge 2¾"
Hull I.D. Page 99
Reference Notes Page 117

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1¼ oz.	Fed. 209	25.0 gr SR7625	Rem. RP12	1215 fps	8900 lup
1¼ oz.	CCI 109	28.0 gr SR7625	Rem. RP12	1315 fps	10500 lup
1¼ oz.	CCI 209	28.0 gr SR7625	Rem. RP12	1315 fps	10500 lup
1¼ oz.	CCI 109	29.5 gr SR7625	Win. WAA12R(red)	1345 fps	10600 lup
1¼ oz.	CCI 209	29.5 gr SR7625	Win. WAA12R(red)	1345 fps	10600 lup
1¼ oz.	Win. 209	29.5 gr SR4756	Rem. RP12	1215 fps	8700 lup
1¼ oz.	Win. 209	33.0 gr SR4756	Rem. RP12	1340 fps	10300 lup
1¼ oz.	Win. 209	33.5 gr SR4756	Win. WAA12R(red)	1325 fps	9800 lup
1¼ oz.	Fed. 209	32.0 gr SR4756	Win. WAA12R(red)	1325 fps	10500 lup
1¼ oz.	Rem. 97*	23.5 gr "Hi-Skor" 800X	Rem. SP12	1225 fps	9200 lup
1¼ oz.	CCI 209M	24.0 gr "Hi-Skor" 800X	Lage Uniwad	1225 fps	9300 lup
1¼ oz.	CCI 209M	27.0 gr "Hi-Skor" 800X	Rem. SP12	1325 fps	10600 lup
1¼ oz.	Rem. 97*	35.5 gr Blue Dot	Rem. RP12	1330 fps	10700 psi
1¼ oz.	Rem. 97*	36.0 gr Blue Dot	Win. WAA12F114	1330 fps	10100 psi
1¼ oz.	CCI 209M	34.5 gr Blue Dot	Rem. SP12	1330 fps	10100 psi
1⅜ oz.	Rem. 97*	33.5 gr Blue Dot	Rem. RP12	1240 fps	10200 psi
1⅜ oz.	Rem. 97*	33.5 gr Blue Dot	Win. WAA12F114	1240 fps	9600 psi
1⅜ oz.	Rem. 97*	24.0 gr "Hi-Skor" 800X	Rem. RP12	1210 fps	10300 lup
1⅜ oz.	Rem. 97*	24.0 gr "Hi-Skor" 800X	Win. WAA12R(red)	1215 fps	10100 lup
1½ oz.	CCI 209M	22.0 gr "Hi-Skor" 800X	Win. WAA12R(red)	1130 fps	10800 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #9
12 Gauge 2¾"
Hull I.D. Page 100
Reference Notes Page 118

Remington S.P. Plastic Shell
(With Fiber Basewad)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	CCI 157	23.5 gr 452AA	Win. WAA12(white)	1290 fps	9800 lup
1 oz.	CCI 157	23.5 gr 452AA	Rem. R12L	1290 fps	9700 lup
1 oz.	CCI 157	22.0 gr Trap 100	Rem. R12H	1170 fps	9500 lup
1 oz.	CCI 157	23.0 gr Trap 100	Rem. R12H	1217 fps	10400 lup
1⅛ oz.	CCI 157	19.5 gr 452AA	Win. WAA12(white)	1145 fps	9200 lup
1⅛ oz.	CCI 157	19.5 gr 452AA	Rem. R12H	1145 fps	9100 lup
1⅛ oz.	CCI 157	21.5 gr 452AA	Win. WAA12(white)	1200 fps	10200 lup
1⅛ oz.	CCI 157	21.5 gr 452AA	Rem. R12H	1200 fps	10300 lup
1⅛ oz.	CCI 157	24.5 gr 473AA	Rem. R12H	1200 fps	7700 lup
1⅛ oz.	CCI 157	26.0 gr 473AA	Rem. R12H	1255 fps	8800 lup
1⅛ oz.	CCI 157	28.5 gr 473AA	Rem. R12H	1330 fps	9400 lup
1⅛ oz.	Rem. 57*	21.0 gr Green Dot	Rem. RPA12	1255 fps	9600 psi
1⅛ oz.	Rem. 57*	21.0 gr Green Dot	Win. WAA12(white)	1255 fps	9900 psi
1¼ oz.	CCI 157	34.0 gr HS6	Win. WAA12R(red)	1341 fps	10400 lup
1¼ oz.	Rem. 57*	29.0 gr Herco	Rem. SP12	1330 fps	8700 psi
1¼ oz.	Rem. 57*	30.0 gr Herco	Win. WAA12R(red)	1330 fps	10100 psi
1¼ oz.	Rem. 57*	28.5 gr Herco	Win. WAA12F114	1330 fps	10400 psi
1¼ oz.	CCI 157	32.0 gr 540	Rem R12H	1220 fps	7800 lup
1¼ oz.	CCI 157	33.0 gr 540	Rem R12H	1255 fps	8100 lup
1¼ oz.	CCI 157	36.0 gr 540	Pacific Blue Verelite	1330 fps	9200 lup
1⅜ oz.	CCI 157	35.0 gr HS6	Win. WAA12R(red)	1294 fps	10300 lup
1⅜ oz.	CCI 157	35.5 gr 540	Rem. RP12	1295 fps	9300 lup
1½ oz.	CCI 157	35.0 gr 540	Win. WAA12R(red)	1260 fps	10300 lup
1½ oz.	CCI 157	35.0 gr 540	Rem. RP12	1260 fps	10100 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

Remington RXP Plastic Target Shell

Hull #10
12 Gauge 2¾"
Hull I.D. Page 100
Reference Notes Page 118

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	CCI 209	23.0 gr Trap 100	Win. WAA12(white)	1315 fps	9600 lup
1 oz.	CCI 109	23.0 gr Trap 100	Win. WAA12(white)	1315 fps	9600 lup
1 oz.	Win. 209	23.0 gr Trap 100	Win. WAA12(white)	1315 fps	9600 lup
1 oz.	CCI 209	17.5 gr Red Dot	Win. WAA12(white)	1200 fps	9000 psi
1 oz.	CCI 109	17.5 gr Red Dot	Win. WAA12(white)	1200 fps	9000 psi
1 oz.	Rem. 97*	17.0 gr Red Dot	Win. WAA12(white)	1200 fps	9300 psi
1 oz.	Rem. 97*	19.5 gr Red Dot	Rem. RXP12	1290 fps	9500 psi
1 oz.	Rem. 97*	19.5 gr Red Dot	Rem. R12L	1290 fps	9500 psi
1 oz.	CCI 209	20.0 gr Green Dot	Win. WAA12(white)	1200 fps	7100 psi
1 oz.	CCI 109	20.0 gr Green Dot	Win. WAA12(white)	1200 fps	7100 psi
1 oz.	Rem. 97*	19.0 gr Green Dot	Win. WAA12(white)	1200 fps	8400 psi
1 oz.	Rem. 97*	22.0 gr Green Dot	Rem. RXP12	1290 fps	8600 psi
1 oz.	Win. 209	22.5 gr 452AA	Win. WAA12(white)	1290 fps	10300 lup
1 oz.	Win. 209	22.5 gr 452AA	Rem. R12L	1290 fps	10100 lup
1⅛ oz.	CCI 109	19.0 gr Trap 100	Win. WAA12(white)	1149 fps	9400 lup
1⅛ oz.	CCI 209	19.0 gr Trap 100	Win. WAA12(white)	1149 fps	9400 lup
1⅛ oz.	CCI 109	19.0 gr Trap 100	Rem. RXP12	1141 fps	9300 lup
1⅛ oz.	CCI 209	19.0 gr Trap 100	Rem. RXP12	1141 fps	9300 lup
1⅛ oz.	CCI 109	20.0 gr Trap 100	Win. WAA12(white)	1196 fps	10100 lup
1⅛ oz.	CCI 209	20.0 gr Trap 100	Win. WAA12(white)	1196 fps	10100 lup
1⅛ oz.	CCI 109	20.0 gr Trap 100	Rem. RXP12	1193 fps	10200 lup
1⅛ oz.	CCI 209	20.0 gr Trap 100	Rem. RXP12	1193 fps	10200 lup
1⅛ oz.	Win. 209	20.0 gr Trap 100	Win. WAA12(white)	1196 fps	10100 lup
1⅛ oz.	CCI 209	17.0 gr Red Dot	Win. WAA12(white)	1145 fps	9200 psi
1⅛ oz.	CCI 209	17.0 gr Red Dot	Rem. RXP12	1145 fps	7900 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #10
12 Gauge 2¾"
Hull I.D. Page 100
Reference Notes Page 118

Remington RXP Plastic Target Shell

(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	CCI 209	18.0 gr Red Dot	Pacific Versalite	1145 fps	9200 psi
1⅛ oz.	Rem. 97*	17.0 gr Red Dot	Win. WAA12(white)	1145 fps	9300 psi
1⅛ oz.	Rem. 97*	17.0 gr Red Dot	Rem. RXP12	1145 fps	8700 psi
1⅛ oz.	CCI 109	18.0 gr Red Dot	Win. WAA12(white)	1200 fps	9500 psi
1⅛ oz.	CCI 209	18.0 gr Red Dot	Win. WAA12(white)	1200 fps	9500 psi
1⅛ oz.	CCI 109	18.0 gr Red Dot	Rem. RXP12	1200 fps	8900 psi
1⅛ oz.	CCI 209	18.0 gr Red Dot	Rem. RXP12	1200 fps	8900 psi
1⅛ oz.	CCI 109	18.5 gr Red Dot	Pacific Versalite	1200 fps	10000 psi
1⅛ oz.	CCI 209	18.5 gr Red Dot	Pacific Versalite	1200 fps	10000 psi
1⅛ oz.	Rem. 97*	18.0 gr Red Dot	Win. WAA12(white)	1200 fps	10100 psi
1⅛ oz.	Rem. 97*	18.0 gr Red Dot	Rem. RXP12	1200 fps	9400 psi
1⅛ oz.	CCI 109	18.0 gr Green Dot	Win. WAA12(white)	1145 fps	8500 psi
1⅛ oz.	CCI 209	18.0 gr Green Dot	Win. WAA12(white)	1145 fps	8500 psi
1⅛ oz.	CCI 109	18.0 gr Green Dot	Rem. RXP12	1145 fps	7700 psi
1⅛ oz.	CCI 209	18.0 gr Green Dot	Rem. RXP12	1145 fps	7700 psi
1⅛ oz.	Rem. 97*	18.0 gr Green Dot	Win. WAA12(white)	1145 fps	8100 psi
1⅛ oz.	Rem. 97*	18.0 gr Green Dot	Rem. RXP12	1145 fps	7800 psi
1⅛ oz.	CCI 109	19.0 gr Green Dot	Win. WAA12(white)	1200 fps	8700 psi
1⅛ oz.	CCI 209	19.0 gr Green Dot	Win. WAA12(white)	1200 fps	8700 psi
1⅛ oz.	CCI 109	19.0 gr Green Dot	Rem. RXP12	1200 fps	7900 psi
1⅛ oz.	CCI 209	19.0 gr Green Dot	Rem. RXP12	1200 fps	7900 psi
1⅛ oz.	Rem. 97*	19.0 gr Green Dot	Win. WAA12(white)	1200 fps	9200 psi
1⅛ oz.	Rem. 97*	19.0 gr Green Dot	Rem. RXP12	1200 fps	8600 psi
1⅛ oz.	Rem. 97*	21.0 gr Green Dot	Rem. RXP12	1255 fps	10300 psi
1⅛ oz.	CCI 109	21.0 gr Unique	Win. WAA12(white)	1200 fps	8500 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12

12 Gauge 2¾"

Remington RXP Plastic Target Shell

(Continued)

Hull #10
12 Gauge 2¾"
Hull I.D. Page 100
Reference Notes Page 118

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	CCI 209	21.0 gr Unique	Win. WAA12(white)	1200 fps	8500 psi
1⅛ oz.	CCI 109	21.0 gr Unique	Rem. RXP12	1200 fps	8000 psi
1⅛ oz.	CCI 209	21.0 gr Unique	Rem. RXP12	1200 fps	8000 psi
1⅛ oz.	Rem. 97*	21.0 gr Unique	Win. WAA12(white)	1200 fps	8800 psi
1⅛ oz.	Rem. 97*	23.0 gr Unique	Win. WAA12(white)	1255 fps	9300 psi
1⅛ oz.	Rem. 97*	21.0 gr Unique	Rem. RXP12	1200 fps	8400 psi
1⅛ oz.	Rem. 97*	23.0 gr Unique	Rem. RXP12	1255 fps	8800 psi
1⅛ oz.	Win. 209	19.5 gr 452AA	Win. WAA12(white)	1145 fps	9700 lup
1⅛ oz.	Win. 209	21.0 gr 452AA	Win. WAA12(white)	1200 fps	10500 lup
1⅛ oz.	Win. 209	19.5 gr 452AA	Rem. RXP12	1145 fps	9600 lup
1⅛ oz.	Win. 209	21.0 gr 452AA	Rem. RXP12	1200 fps	10400 lup
1⅛ oz.	Win. 209	23.5 gr 473AA	Win. WAA12(white)	1200 fps	8600 lup
1⅛ oz.	Win. 209	24.0 gr 473AA	Rem. RXP12	1200 fps	8400 lup
1⅛ oz.	CCI 109	23.0 gr 473AA	Win. WAA12(white)	1200 fps	9000 lup
1⅛ oz.	CCI 109	23.5 gr 473AA	Rem. RXP12	1200 fps	8300 lup
1⅛ oz.	Win. 209	25.0 gr 473AA	Win. WAA12(white)	1255 fps	9600 lup
1⅛ oz.	Win. 209	27.5 gr 473AA	Win. WAA12(white)	1330 fps	9900 lup
1⅛ oz.	Win. 209	25.5 gr 473AA	Rem. RXP12	1255 fps	9700 lup
1⅛ oz.	Win. 209	27.5 gr 473AA	Rem. RXP12	1330 fps	10500 lup
1¼ oz.	CCI 109	30.0 gr HS6	Win. WAA12F114	1250 fps	9500 lup
1¼ oz.	CCI 209	30.0 gr HS6	Win. WAA12F114	1250 fps	9500 lup
1¼ oz.	CCI 109	31.0 gr HS6	Win. WAA12F114	1296 fps	10400 lup
1¼ oz.	CCI 209	31.0 gr HS6	Win. WAA12F114	1296 fps	10400 lup
1¼ oz.	CCI 109	31.0 gr HS6	Rem. SP12	1242 fps	9000 lup
1¼ oz.	CCI 209	31.0 gr HS6	Rem. SP12	1242 fps	9000 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #10
12 Gauge 2¾"
Hull I.D. Page 100
Reference Notes Page 118

Remington RXP Plastic Target Shell

(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1¼ oz.	CCI 109	32.0 gr HS6	Rem. SP12	1290 fps	9900 lup
1¼ oz.	CCI 209	32.0 gr HS6	Rem. SP12	1290 fps	9900 lup
1¼ oz.	Win. 209	30.0 gr HS6	Win. WAA12F114	1250 fps	9500 lup
1¼ oz.	Rem. 97*	22.5 gr Unique	Rem. SP12	1220 fps	9700 psi
1¼ oz.	Rem. 97*	23.0 gr Unique	Win. WAA12F114	1220 fps	9800 psi
1¼ oz.	Rem. 97*	24.5 gr Herco	Win. WAA12F114	1220 fps	10100 psi
1¼ oz.	Rem. 97*	27.0 gr Herco	Rem. SP12	1330 fps	10200 psi
1¼ oz.	Rem. 97*	25.0 gr Herco	Rem. SP12	1220 fps	10000 psi
1¼ oz.	Rem. 97*	27.0 gr Herco	Rem. SP12	1330 fps	10200 psi
1¼ oz.	Rem. 97*	27.0 gr Herco	Win. WAA12R(red)	1330 fps	9800 psi
1¼ oz.	Win. 209	29.0 gr 540	Win. WAA12F114	1220 fps	8900 lup
1¼ oz.	Win. 209	30.0 gr 540	Win. WAA12F114	1255 fps	9600 lup
1¼ oz.	Win. 209	31.0 gr 540	Win. WAA12F114	1305 fps	10300 lup
1⅜ oz.	CCI 109	34.0 gr HS6	Win. WAA12R(red)	1289 fps	10700 lup
1⅜ oz.	CCI 209	34.0 gr HS6	Win. WAA12R(red)	1289 fps	10700 lup
1⅜ oz.	Win. 209	34.0 gr HS6	Win. WAA12R(red)	1289 fps	10700 lup
1⅜ oz.	Rem. 97*	35.0 gr Blue Dot	Rem. RP12	1295 fps	9700 psi
1⅜ oz.	Rem. 97*	35.0 gr Blue Dot	Rem. SP12	1295 fps	9300 psi
1⅜ oz.	Rem. 97*	35.0 gr Blue Dot	Win. WAA12R(red)	1295 fps	9200 psi
1⅜ oz.	Win. 209	33.0 gr 540	Win. WAA12R(red)	1275 fps	10200 lup
1⅜ oz.	Win. 209	32.5 gr 540	Rem. RP12	1275 fps	10500 lup
1⅜ oz.	Win. 209	37.5 gr 571	Win. WAA12R(red)	1295 fps	10100 lup
1⅜ oz.	Win. 209	37.5 gr 571	Rem. RP12	1295 fps	10000 lup
1½ oz.	CCI 109	31.0 gr HS6	Rem. RP12	1253 fps	10500 lup
1½ oz.	CCI 209	31.0 gr HS6	Rem. RP12	1253 fps	10500 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

Remington RXP Plastic Target Shell

(Continued)

Hull #10
12 Gauge 2¾"
Hull I.D. Page 100
Reference Notes Page 118

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1½ oz.	Win. 209	31.0 gr HS6	Rem. RP12	1253 fps	10500 lup
1½ oz.	Win. 209	36.5 gr 571	Rem. RP12	1240 fps	10400 lup
1½ oz.	CCI 109	37.0 gr HS7	Rem. RP12	1320 fps	10700 lup
1½ oz.	CCI 209	37.0 gr HS7	Rem. RP12	1320 fps	10700 lup

12
12 Gauge 2¾"

Federal Gold Medal Plastic Target Shell

Hull #11
12 Gauge 2¾"
Hull I.D. Page 100
Reference Notes Page 119

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	Fed. 209	18.0 gr Bullseye	Fed. 12S0	1200 fps	7600 psi
1 oz.	CCI 109	19.0 gr Bullseye	Fed. 12S0	1200 fps	8400 psi
1 oz.	CCI 209	19.0 gr Bullseye	Fed. 12S0	1200 fps	8400 psi
1 oz.	Fed. 209	18.0 gr Red Dot	Fed. 12S0	1200 fps	7900 psi
1 oz.	Fed. 209	18.0 gr "HI-Skor" 700X	Fed. 12S0	1185 fps	7800 lup
1 oz.	Win. 209	18.0 gr "HI-Skor" 700X	Fed. 12S0	1185 fps	7700 lup
1 oz.	Win. 209	18.5 gr "Hi-Skor" 700X	Win. WAA12F1	1200 fps	6900 lup
1 oz.	Fed. 209	22.5 gr PB	Fed. 12S3	1210 fps	6000 lup
1 oz.	Win. 209	22.5 gr PB	Fed. 12S3	1190 fps	5600 lup
1 oz.	Fed. 209	24.5 gr SR7625	Fed. 12S3	1140 fps	5100 lup
1 oz.	CCI 209M	24.5 gr SR7625	Fed. 12S3	1145 fps	5000 lup
1 oz.	CCI 209M	26.0 gr SR7625	Fed. 12S3	1210 fps	5400 lup
1 oz.	CCI 209M	27.0 gr SR7625	Rem R12L	1210 fps	5000 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #11
12 Gauge 2¾"
Hull I.D. Page 100
Reference Notes Page 119

Federal Gold Medal Plastic Target Shell

(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	CCI 109	19.0 gr Trap 100	Win. WAA12(white)	1144 fps	9100 lup
1⅛ oz.	CCI 209	19.0 gr Trap 100	Win. WAA12(white)	1144 fps	9100 lup
1⅛ oz.	CCI 109	20.0 gr Trap 100	Win. WAA12(white)	1204 fps	10400 lup
1⅛ oz.	CCI 209	20.0 gr Trap 100	Win. WAA12(white)	1204 fps	10400 lup
1⅛ oz.	CCI 109	20.0 gr Trap 100	Rem. RXP12	1189 fps	9900 lup
1⅛ oz.	CCI 209	20.0 gr Trap 100	Rem. RXP12	1189 fps	9900 lup
1⅛ oz.	Fed. 209	17.5 gr Red Dot	Fed. 12S3	1145 fps	9000 psi
1⅛ oz.	Fed. 209	18.5 gr Red Dot	Fed. 12S3	1200 fps	10000 psi
1⅛ oz.	Fed. 209	19.0 gr Red Dot	Rem. RXP12	1200 fps	10400 psi
1⅛ oz.	Fed. 209	21.0 gr Red Dot	Rem. RXP12	1255 fps	10700 psi
1⅛ oz.	Fed. 209	17.5 gr Red Dot	Win. WAA12(white)	1145 fps	8900 psi
1⅛ oz.	Fed. 209	19.0 gr Red Dot	Win. WAA12(white)	1200 fps	10100 psi
1⅛ oz.	CCI 109	18.5 gr Red Dot	Rem. RXP12	1145 fps	7800 psi
1⅛ oz.	CCI 209	18.5 gr Red Dot	Rem. RXP12	1145 fps	7800 psi
1⅛ oz.	CCI 109	20.0 gr Red Dot	Rem. RXP12	1200 fps	8400 psi
1⅛ oz.	CCI 209	20.0 gr Red Dot	Rem. RXP12	1200 fps	8400 psi
1⅛ oz.	Win. 209	19.0 gr Red Dot	Fed. 12S3	1200 fps	10500 psi
1⅛ oz.	CCI 109	19.5 gr Red Dot	Win. WAA12(white)	1200 fps	9500 psi
1⅛ oz.	CCI 209	19.5 gr Red Dot	Win. WAA12(white)	1200 fps	9500 psi
1⅛ oz.	Fed. 209	20.5 gr Red Dot	Pacific Versalite	1255 fps	10700 psi
1⅛ oz.	Fed. 209	19.5 gr Green Dot	Fed. 12S3	1145 fps	7800 psi
1⅛ oz.	Fed. 209	22.5 gr Green Dot	Fed. 12S3	1255 fps	9800 psi
1⅛ oz.	Fed. 209	21.5 gr Green Dot	Rem. RXP12	1200 fps	9100 psi
1⅛ oz.	Fed. 209	19.5 gr Green Dot	Win. WAA12(white)	1145 fps	8000 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

Federal Gold Medal Plastic Target Shell

(Continued)

Hull #11
12 Gauge 2¾"
Hull I.D. Page 100
Reference Notes Page 119

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	Fed. 209	21.0 gr Green Dot	Win. WAA12(white)	1200 fps	9000 psi
1⅛ oz.	Fed. 209	22.5 gr Green Dot	Win. WAA12(white)	1255 fps	10200 psi
1⅛ oz.	CCI 109	20.5 gr Green Dot	Win. WAA12(white)	1145 fps	7000 psi
1⅛ oz.	CCI 209	20.5 gr Green Dot	Win. WAA12(white)	1145 fps	7000 psi
1⅛ oz.	CCI 109	22.0 gr Green Dot	Win. WAA12(white)	1200 fps	7900 psi
1⅛ oz.	CCI 209	22.0 gr Green Dot	Win. WAA12(white)	1200 fps	7900 psi
1⅛ oz.	CCI 109	22.0 gr Green Dot	Rem. RXP12	1200 fps	8300 psi
1⅛ oz.	CCI 209	22.0 gr Green Dot	Rem. RXP12	1200 fps	8300 psi
1⅛ oz.	CCI 209M	22.5 gr Green Dot	Fed. 12S3	1255 fps	9800 psi
1⅛ oz.	Rem. 97*	22.5 gr Green Dot	Fed. 12S3	1255 fps	9800 psi
1⅛ oz.	Win. 209	20.5 gr Green Dot	Fed. 12S3	1200 fps	9000 psi
1⅛ oz.	Fed. 209	23.0 gr Unique	Win. WAA12(white)	1200 fps	8600 psi
1⅛ oz.	Fed. 209	24.0 gr Unique	Win. WAA12(white)	1255 fps	9300 psi
1⅛ oz.	Win. 209	23.0 gr Unique	Fed. 12S3	1200 fps	8600 psi
1⅛ oz.	CCI 209M	23.5 gr Unique	Fed. 12S3	1200 fps	8000 psi
1⅛ oz.	Fed. 209	24.0 gr Unique	Fed. 12S3	1255 fps	10500 psi
1⅛ oz.	Rem. 97*	24.5 gr Unique	Fed. 12S3	1255 fps	9000 psi
1⅛ oz.	CCI 109	23.5 gr Unique	Rem. RXP12	1200 fps	8800 psi
1⅛ oz.	CCI 209	23.5 gr Unique	Rem. RXP12	1200 fps	8800 psi
1⅛ oz.	CCI 109	24.5 gr Unique	Win. WAA12(white)	1200 fps	7500 psi
1⅛ oz.	CCI 209	24.5 gr Unique	Win. WAA12(white)	1200 fps	7500 psi
1⅛ oz.	Fed. 209	18.0 gr "Hi-Skor" 700X	Fed. 12S3	1145 fps	7500 lup
1⅛ oz.	Fed. 209	21.0 gr "Hi-Skor" 700X	Fed. 12S3	1265 fps	9700 lup
1⅛ oz.	Fed. 209	19.5 gr "Hi-Skor" 700X	Rem. R12L	1195 fps	8500 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #11
12 Gauge 2¾"
Hull I.D. Page 100
Reference Notes Page 119

Federal Gold Medal Plastic Target Shell

(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	Win. 209	18.0 gr "Hi-Skor" 700X	Rem. R12L	1135 fps	7400 lup
1⅛ oz.	Win. 209	21.0 gr "Hi-Skor" 700X	Rem. R12L	1265 fps	9700 lup
1⅛ oz.	CCI 109	20.0 gr "Hi-Skor" 700X	Rem. R12L	1205 fps	8000 lup
1⅛ oz.	CCI 209	20.0 gr "Hi-Skor" 700X	Rem. R12L	1205 fps	8000 lup
1⅛ oz.	Rem. 97*	19.5 gr "Hi-Skor" 700X	Fed. 12S3	1195 fps	7700 lup
1⅛ oz.	Fed. 209	21.5 gr PB	Fed. 12S4	1150 fps	6600 lup
1⅛ oz.	Fed. 209	24.5 gr PB	Fed. 12S4	1250 fps	7700 lup
1⅛ oz.	CCI 109	24.5 gr PB	Rem. R12L	1205 fps	6000 lup
1⅛ oz.	CCI 209	24.5 gr PB	Rem. R12L	1205 fps	6000 lup
1⅛ oz.	Win. 209	24.0 gr PB	Rem. R12L	1190 fps	6100 lup
1⅛ oz.	CCI 209M	26.5 gr SR7625	Rem. R12H	1200 fps	6000 lup
1⅛ oz.	CCI 209M	28.0 gr SR7625	Rem. R12H	1255 fps	6200 lup
1⅛ oz.	Fed. 209	27.0 gr SR7625	Rem. R12H	1195 fps	5700 lup
1⅛ oz.	Fed. 209	28.0 gr SR7625	Rem. R12H	1240 fps	6000 lup
1⅛ oz.	Fed. 209	27.5 gr SR7625	Fed. 12S4	1260 fps	7200 lup
1⅛ oz.	Win. 209	27.5 gr SR7625	Rem. R12H	1200 fps	5500 lup
1⅛ oz.	Win. 209	24.0 gr "Hi-Skor" 800X	Fed. 12S3	1205 fps	6500 lup
1⅛ oz.	Win. 209	24.0 gr "Hi-Skor" 800X	Win. WAA12(white)	1205 fps	6200 lup
1⅛ oz.	Win. 209	25.5 gr "Hi-Skor" 800 X	Win. WAA12(white)	1265 fps	6600 lup
1¼ oz.	Fed. 209	24.0 gr Unique	Fed. 12S4	1220 fps	10500 psi
1¼ oz.	Fed. 209	24.0 gr Unique	Rem. SP12	1220 fps	10400 psi
1¼ oz.	Fed. 209	24.0 gr Unique	Win. WAA12F114	1220 fps	10600 psi
1¼ oz.	CCI 209M	24.5 gr Unique	Fed. 12S4	1220 fps	9500 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

Federal Gold Medal Plastic Target Shell

(Continued)

Hull #11
12 Gauge 2¾"
Hull I.D. Page 100
Reference Notes Page 119

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1¼ oz.	Fed. 209	25.0 gr Herco	Fed. 12S4	1220 fps	10200 psi
1¼ oz.	Fed. 209	26.0 gr Herco	Rem. SP12	1220 fps	9700 psi
1¼ oz.	Fed. 209	25.0 gr Herco	Win. WAA12F114	1220 fps	10100 psi
1¼ oz.	CCI 209M	25.5 gr Herco	Fed. 12S4	1220 fps	8700 psi
1¼ oz.	Win. 209	25.5 gr Herco	Fed. 12S4	1220 fps	9400 psi
1¼ oz.	Rem. 97*	25.5 gr Herco	Fed. 12S4	1220 fps	8800 psi
1¼ oz.	Win. 209	26.0 gr PB	Rem. SP12	1235 fps	7600 lup
1¼ oz.	Win. 209	29.0 gr PB	Rem. SP12	1345 fps	10400 lup
1¼ oz.	Fed. 209	29.0 gr PB	Rem. SP12	1335 fps	10200 lup
1¼ oz.	CCI 209M	28.0 gr SR7625	Rem. SP12	1225 fps	6400 lup
1¼ oz.	CCI 209M	30.5 gr SR7625	Rem. SP12	1320 fps	7600 lup
1¼ oz.	Fed. 209	28.5 gr SR7625	Rem. SP12	1230 fps	6400 lup
1¼ oz.	Fed. 209	31.0 gr SR7625	Rem. SP12	1325 fps	7700 lup
1¼ oz.	CCI 209M	31.0 gr SR4756	Rem. SP12	1215 fps	6300 lup
1¼ oz.	Fed. 209	34.0 gr SR4756	Rem. RP12	1325 fps	7500 lup
1¼ oz.	Fed. 209	34.5 gr SR4756	Win. WAA12R(red)	1325 fps	7300 lup
1¼ oz.	Fed. 209	25.0 gr "Hi-Skor" 800X	Win. WAA12F114	1225 fps	7400 lup
1¼ oz.	Fed. 209	28.0 gr "Hi-Skor" 800X	Win. WAA12F114	1330 fps	8900 lup
1¼ oz.	Fed. 209	27.5 gr "Hi-Skor" 800X	Fed. 12S4	1325 fps	9700 lup
1¼ oz.	Fed. 209	35.0 gr Blue Dot	Rem. SP12	1330 fps	10500 psi
1¼ oz.	Rem. 97*	38.0 gr Blue Dot	Rem. SP12	1330 fps	9100 psi
1¼ oz.	Win. 209	37.0 gr Blue Dot	Rem. SP12	1330 fps	9000 psi
1¼ oz.	CCI 209M	37.5 gr Blue Dot	Rem. SP12	1330 fps	8300 psi
1⅜ oz.	Fed. 209	31.5 gr SR7625	Rem. RP12	1325 fps	9800 lup
1⅜ oz.	Fed. 209	31.5 gr SR7625	Win. WAA12R(red)	1305 fps	9300 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #11
12 Gauge 2¾"
Hull I.D. Page 100
Reference Notes Page 119

Federal Gold Medal Plastic Target Shell

(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅜ oz.	Fed. 209	34.0 gr SR4756	Rem. RP12	1340 fps	9900 lup
1⅜ oz.	Fed. 209	34.0 gr SR4756	Win. WAA12R(red)	1315 fps	8600 lup
1⅜ oz.	Fed. 209	28.0 gr "Hi-Skor" 800X	Rem. SP12	1310 fps	10300 lup
1⅜ oz.	CCI 209M	28.0 gr "Hi-Skor" 800X	Rem. SP12	1305 fps	10000 lup
1⅜ oz.	Fed. 209	27.5 gr "Hi-Skor" 800X	Win. WAA12F114	1310 fps	10300 lup
1⅜ oz.	CCI 209M	27.5 gr "Hi-Skor" 800X	Win. WAA12F114	1310 fps	10200 lup
1⅜ oz.	Fed. 209	35.5 gr Blue Dot	Rem. RP12	1295 fps	10700 psi
1⅜ oz.	Rem. 97*	37.0 gr Blue Dot	Rem. RP12	1295 fps	9300 psi
1⅜ oz.	Win. 209	36.0 gr Blue Dot	Rem. RP12	1295 fps	9200 psi
1⅜ oz.	CCI 209M	36.5 gr Blue Dot	Rem. RP12	1295 fps	9000 psi
1½ oz.	Fed. 209	27.5 gr "Hi-Skor" 800X	Rem. RP12	1255 fps	10900 lup
1½ oz.	CCI 209M	27.5 gr "Hi-Skor" 800X	Rem. RP12	1245 fps	10800 lup
1½ oz.	Fed. 209	27.0 gr "Hi-Skor" 800X	Win. WAA12R(red)	1270 fps	10800 lup
1½ oz.	CCI 209M	27.0 gr "Hi-Skor" 800X	Win. WAA12R(red)	1265 fps	10600 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12

12 Gauge 2¾"

Federal Paper Target Shell

Hull #12
12 Gauge 2¾"
Hull I.D. Page 101
Reference Notes Page 120

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	Fed. 209	19.0 gr Red Dot	Rem. RXP12	1200 fps	7200 psi
1 oz.	Fed. 209	20.0 gr Red Dot	Rem. R12L	1290 fps	9300 psi
1 oz.	CCI 109	20.0 gr Red Dot	Win. WAA12F1	1200 fps	7000 psi
1 oz.	CCI 209	20.0 gr Red Dot	Win. WAA12F1	1200 fps	7000 psi
1 oz.	CCI 209M	21.0 gr Red Dot	Fed. 12S3	1290 fps	8700 psi
1 oz.	Fed. 209	21.5 gr Green Dot	Rem. R12L	1290 fps	8800 psi
1 oz.	Fed. 209	23.5 gr Green Dot	Fed. 12S3	1290 fps	9400 psi
1 oz.	CCI 209M	23.0 gr Green Dot	Fed. 12S3	1290 fps	7800 psi
1 oz.	Fed. 209	22.5 gr Green Dot	Fed. 12S0	1290 fps	9200 psi
1 oz.	CCI 109	19.5 gr Bullseye	Win. WAA12F1	1200 fps	6800 psi
1 oz.	CCI 209	19.5 gr Bullseye	Win. WAA12F1	1200 fps	6800 psi
1 oz.	Fed. 209	18.5 gr "Hi-Skor" 700X	Fed. 12S0	1200 fps	8500 lup
1 oz.	Fed. 209	18.0 gr "Hi-Skor" 700X	Win. WAA12F1	1190 fps	7400 lup
1 oz.	Rem. 97*	18.5 gr "Hi-Skor" 700X	Win. WAA12F1	1205 fps	7500 lup
1 oz.	Win. 209	23.5 gr PB	Fed. 12S3	1205 fps	5500 lup
1⅛ oz.	CCI 109	22.0 gr Trap 100	Win. WAA12(white)	1163 fps	9600 lup
1⅛ oz.	CCI 209	22.0 gr Trap 100	Win. WAA12(white)	1163 fps	9600 lup
1⅛ oz.	Win. 209	22.0 gr Trap 100	Win. WAA12(white)	1163 fps	9600 lup
1⅛ oz.	CCI 109	23.0 gr Trap 100	Win. WAA12(white)	1219 fps	10500 lup
1⅛ oz.	CCI 209	23.0 gr Trap 100	Win. WAA12(white)	1219 fps	10500 lup
1⅛ oz.	Win. 209	23.0 gr Trap 100	Win. WAA12(white)	1219 fps	10500 lup
1⅛ oz.	CCI 209M	18.5 gr Red Dot	Fed. 12C1	1145 fps	7900 psi
1⅛ oz.	CCI 209M	20.0 gr Red Dot	Fed. 12C1	1200 fps	8700 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #12
12 Gauge 2¾"
Hull I.D. Page 101
Reference Notes Page 120

Federal Paper Target Shell

(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	CCI 109	19.0 gr Red Dot	Rem. RXP12	1200 fps	9600 psi
1⅛ oz.	CCI 209	19.0 gr Red Dot	Rem. RXP12	1200 fps	9600 psi
1⅛ oz.	CCI 209	18.0 gr Red Dot	Win. WAA12(white)	1145 fps	9000 psi
1⅛ oz.	CCI 109	19.0 gr Red Dot	Win. WAA12(white)	1200 fps	9600 psi
1⅛ oz.	CCI 209	19.0 gr Red Dot	Win. WAA12(white)	1200 fps	9600 psi
1⅛ oz.	Fed. 209	19.0 gr Red Dot	Win. WAA12(white)	1200 fps	10500 psi
1⅛ oz.	CCI 209	19.0 gr Red Dot	Fed. 12C1	1200 fps	9200 psi
1⅛ oz.	Win. 209	19.5 gr Red Dot	Fed. 12C1	1200 fps	9800 psi
1⅛ oz.	Fed. 209	19.0 gr Red Dot	Fed. 12C1	1200 fps	9300 psi
1⅛ oz.	Fed. 209	19.0 gr Red Dot	Rem. RXP12	1200 fps	9900 psi
1⅛ oz.	CCI 209M	20.0 gr Green Dot	Fed. 12C1	1145 fps	7400 psi
1⅛ oz.	CCI 209M	21.5 gr Green Dot	Fed. 12C1	1200 fps	7700 psi
1⅛ oz.	CCI 209M	22.5 gr Green Dot	Fed. 12C1	1255 fps	8500 psi
1⅛ oz.	CCI 109	20.0 gr Green Dot	Win. WAA12(white)	1200 fps	8500 psi
1⅛ oz.	CCI 209	20.0 gr Green Dot	Win. WAA12(white)	1200 fps	8500 psi
1⅛ oz.	CCI 109	20.0 gr Green Dot	Rem. RXP12	1200 fps	8000 psi
1⅛ oz.	CCI 209	20.0 gr Green Dot	Rem. RXP12	1200 fps	8000 psi
1⅛ oz.	Win. 209	21.0 gr Green Dot	Fed. 12C1	1200 fps	8100 psi
1⅛ oz.	Win. 209	22.5 gr Green Dot	Fed. 12C1	1255 fps	9000 psi
1⅛ oz.	Fed. 209	19.5 gr Green Dot	Win. WAA12(white)	1200 fps	9000 psi
1⅛ oz.	Fed. 209	20.0 gr Green Dot	Rem. RXP12	1200 fps	8600 psi
1⅛ oz.	Fed. 209	21.5 gr Green Dot	Rem. RXP12	1255 fps	9300 psi
1⅛ oz.	Rem. 97*	21.0 gr Green Dot	Fed. 12C1	1200 fps	8400 psi
1⅛ oz.	CCI 209M	24.5 gr Unique	Fed. 12C1	1255 fps	8400 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12

12 Gauge 2¾"

Federal Paper Target Shell

(Continued)

Hull #12
12 Gauge 2¾"
Hull I.D. Page 101
Reference Notes Page 120

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	CCI 109	22.0 gr Unique	Rem. RXP12	1200 fps	7300 psi
1⅛ oz.	CCI 209	22.0 gr Unique	Rem. RXP12	1200 fps	7300 psi
1⅛ oz.	CCI 109	22.0 gr Unique	Win. WAA12(white)	1200 fps	7900 psi
1⅛ oz.	CCI 209	22.0 gr Unique	Win. WAA12(white)	1200 fps	7900 psi
1⅛ oz.	Fed. 209	22.5 gr Unique	Fed. 12C1	1255 fps	8900 psi
1⅛ oz.	Win. 209	24.5 gr Unique	Fed. 12C1	1255 fps	8300 psi
1⅛ oz.	Fed. 209	19.5 gr "Hi-Skor" 700X	Fed. 12C1	1200 fps	9100 lup
1⅛ oz.	Fed. 209	18.0 gr "Hi-Skor" 700X	Win. WAA12(white)	1155 fps	8400 lup
1⅛ oz.	Fed. 209	19.0 gr "Hi-Skor" 700X	Win. WAA12(white)	1200 fps	9200 lup
1⅛ oz.	CCI 209	18.0 gr "Hi-Skor" 700X	Win. WAA12(white)	1145 fps	7500 lup
1⅛ oz.	CCI 109	19.5 gr "Hi-Skor" 700X	Win. WAA12(white)	1200 fps	8500 lup
1⅛ oz.	CCI 209	19.5 gr "Hi-Skor" 700X	Win. WAA12(white)	1200 fps	8500 lup
1⅛ oz.	CCI 109	21.0 gr "Hi-Skor" 700X	Win. WAA12(white)	1270 fps	10000 lup
1⅛ oz.	CCI 209	21.0 gr "Hi-Skor" 700X	Win. WAA12(white)	1270 fps	10000 lup
1⅛ oz.	Win. 209	21.0 gr "Hi-Skor" 700X	Win. WAA12(white)	1250 fps	9300 lup
1⅛ oz.	Fed. 209	23.5 gr PB	Fed. 12C1	1190 fps	6800 lup
1⅛ oz.	Fed. 209	25.0 gr PB	Fed. 12C1	1240 fps	7400 lup
1⅛ oz.	CCI 109	24.0 gr PB	Win. WAA12(white)	1195 fps	6300 lup
1⅛ oz.	CCI 209	24.0 gr PB	Win. WAA12(white)	1195 fps	6300 lup
1⅛ oz.	CCI 109	26.0 gr PB	Win. WAA12(white)	1255 fps	7000 lup
1⅛ oz.	CCI 209	26.0 gr PB	Win. WAA12(white)	1255 fps	7000 lup
1⅛ oz.	Win. 209	25.0 gr PB	Win. WAA12(white)	1195 fps	5900 lup
1⅛ oz.	Fed. 209	26.5 gr SR7625	Win. WAA12(white)	1205 fps	6000 lup
1⅛ oz.	Fed. 209	28.0 gr SR7625	Win. WAA12(white)	1265 fps	6500 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #12
12 Gauge 2¾"
Hull I.D. Page 101
Reference Notes Page 120

Federal Paper Target Shell

(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	CCI 109	26.5 gr SR7625	Win. WAA12(white)	1200 fps	6100 lup
1⅛ oz.	CCI 209	26.5 gr SR7625	Win. WAA12(white)	1200 fps	6100 lup
1⅛ oz.	Win. 209	27.5 gr SR7625	Win. WAA12(white)	1220 fps	5700 lup
1⅛ oz.	Win. 209	28.5 gr SR7625	Fed. 12C1	1260 fps	6300 lup
1⅛ oz.	Win. 209	24.5 gr "Hi-Skor" 800X	Win. WAA12(white)	1210 fps	6600 lup
1⅛ oz.	Win. 209	25.5 gr "Hi-Skor" 800X	Win. WAA12(white)	1250 fps	7100 lup
1¼ oz.	CCI 209M	23.0 gr Green Dot	Fed. 12S4	1220 fps	10500 psi
1¼ oz.	Fed. 209	23.0 gr Green Dot	Fed. 12S4	1220 fps	10500 psi
1¼ oz.	Fed. 209	21.0 gr Green Dot	Rem. SP12	1220 fps	9600 psi
1¼ oz.	Fed. 209	23.0 gr Green Dot	Win. WAA12F114	1220 fps	9900 psi
1¼ oz.	Fed. 209	24.0 gr Unique	Fed. 12S4	1220 fps	9800 psi
1¼ oz.	Fed. 209	22.0 gr Unique	Rem. SP12	1220 fps	9600 psi
1¼ oz.	Fed. 209	23.5 gr Unique	Win. WAA12F114	1220 fps	9500 psi
1¼ oz.	Rem. 97*	24.0 gr Unique	Fed. 12S4	1220 fps	10400 psi
1¼ oz.	Win. 209	24.5 gr Unique	Fed. 12S4	1220 fps	10600 psi
1¼ oz.	CCI 209M	25.5 gr Unique	Fed. 12S4	1220 fps	9700 psi
1¼ oz.	Fed. 209	25.5 gr PB	Rem. RP12	1220 fps	8200 lup
1¼ oz.	Win. 209	25.5 gr PB	Rem. RP12	1215 fps	7900 lup
1¼ oz.	Win. 209	28.0 gr SR7625	Win. WAA12F114	1225 fps	7300 lup
1¼ oz.	Win. 209	31.0 gr SR7625	Rem. RP12	1335 fps	9000 lup
1¼ oz.	Fed. 209	30.5 gr SR4756	Rem. RP12	1215 fps	7200 lup
1¼ oz.	Win. 209	34.5 gr SR4756	Rem. RP12	1325 fps	8000 lup
1¼ oz.	Fed. 209	25.0 gr "Hi-Skor" 800X	Fed. 12S4	1235 fps	8700 lup
1¼ oz.	Fed. 209	28.5 gr "Hi-Skor" 800X	Win. WAA12F114	1320 fps	9700 lup
1¼ oz.	Fed. 209	29.0 gr "Hi-Skor" 800X	Rem. SP12	1325 fps	9300 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12

12 Gauge 2¾"

Federal Hi-Power Plastic Shell

Hull #13
12 Gauge 2¾"
Hull I.D. Page 101
Reference Notes Page 120

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	CCI 109	22.0 gr Trap 100	Win. WAA12(white)	1163 fps	9600 lup
1⅛ oz.	CCI 209	22.0 gr Trap 100	Win. WAA12(white)	1163 fps	9600 lup
1⅛ oz.	Win. 209	22.0 gr Trap 100	Win. WAA12(white)	1163 fps	9600 lup
1⅛ oz.	CCI 109	23.0 gr Trap 100	Win. WAA12(white)	1219 fps	10500 lup
1⅛ oz.	CCI 209	23.0 gr Trap 100	Win. WAA12(white)	1219 fps	10500 lup
1⅛ oz.	Win.209	23.0 gr Trap 100	Win. WAA12(white)	1219 fps	10500 lup
1⅛ oz.	Fed. 209	19.5 gr "Hi-Skor" 700X	Fed. 12S3	1200 fps	8800 lup
1⅛ oz.	Fed. 209	21.0 gr "Hi-Skor" 700X	Fed. 12S4	1255 fps	10300 lup
1⅛ oz.	Fed. 209	23.0 gr PB	Fed. 12S4	1195 fps	7300 lup
1⅛ oz.	Fed. 209	24.5 gr PB	Fed. 12S4	1250 fps	8000 lup
1⅛ oz.	Fed. 209	27.0 gr SR7625	Fed. 12S4	1260 fps	7100 lup
1⅛ oz.	CCI 209M	20.0 gr Red Dot	Fed. 12S3	1200 fps	9300 psi
1⅛ oz.	CCI 209M	21.5 gr Red Dot	Fed. 12S3	1255 fps	10100 psi
1⅛ oz.	Fed. 209	19.0 gr Red Dot	Fed. 12S3	1200 fps	9300 psi
1⅛ oz.	Fed. 209	21.5 gr Red Dot	Fed. 12S3	1255 fps	10100 psi
1⅛ oz.	Win. 209	19.5 gr Red Dot	Fed. 12S3	1200 fps	9500 psi
1⅛ oz.	Win. 209	21.5 gr Red Dot	Fed. 12S3	1255 fps	10700 psi
1⅛ oz.	Fed. 209	18.5 gr Red Dot	Win. WAA12(white)	1145 fps	9600 psi
1⅛ oz.	Fed. 209	19.0 gr Red Dot	Win. WAA12(white)	1200 fps	9800 psi
1⅛ oz.	Fed. 209	19.5 gr Red Dot	Rem. RXP12	1200 fps	9300 psi
1⅛ oz.	Fed. 209	21.0 gr Red Dot	Rem. RXP12	1255 fps	9800 psi
1⅛ oz.	Fed. 209	21.0 gr Green Dot	Fed. 12S3	1200 fps	8000 psi
1⅛ oz.	Fed. 209	22.0 gr Green Dot	Fed. 12S3	1255 fps	9000 psi
1⅛ oz.	Fed. 209	22.0 gr Green Dot	Fed. 12C1	1255 fps	10100 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #13
12 Gauge 2¾"
Hull I.D. Page 101
Reference Notes Page 120

Federal Hi-Power Plastic Shell

(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	CCI 209M	21.5 gr Green Dot	Fed. 12S3	1200 fps	8600 psi
1⅛ oz.	CCI 209M	22.0 gr Green Dot	Fed. 12S3	1255 fps	9600 psi
1⅛ oz.	Fed. 209	20.0 gr Green Dot	Win. WAA12(white)	1200 fps	9300 psi
1⅛ oz.	Fed. 209	22.0 gr Green Dot	Win. WAA12(white)	1255 fps	10300 psi
1⅛ oz.	Fed. 209	20.5 gr Green Dot	Rem. RXP12	1200 fps	9100 psi
1⅛ oz.	Win. 209	23.0 gr Green Dot	Fed. 12S3	1255 fps	9400 psi
1⅛ oz.	CCI 209M	25.5 gr Unique	Fed. 12S3	1255 fps	8400 psi
1⅛ oz.	Win. 209	25.0 gr Unique	Fed. 12S3	1255 fps	9100 psi
1⅛ oz.	Fed. 209	24.0 gr Unique	Fed. 12S3	1255 fps	8100 psi
1⅛ oz.	Fed. 209	23.0 gr Unique	Win. WAA12(white)	1255 fps	8600 psi
1⅛ oz.	Fed. 209	23.0 gr Unique	Rem. RXP12	1255 fps	8100 psi
1¼ oz.	CCI 109	32.0 gr HS6	Win. WAA12F114	1260 fps	9100 lup
1¼ oz.	CCI 209	32.0 gr HS6	Win. WAA12F114	1260 fps	9100 lup
1¼ oz.	CCI 109	34.0 gr HS6	Win. WAA12F114	1339 fps	10400 lup
1¼ oz.	CCI 209	34.0 gr HS6	Win. WAA12F114	1339 fps	10400 lup
1¼ oz.	Win. 209	34.0 gr HS6	Win. WAA12F114	1339 fps	10400 lup
1¼ oz.	CCI 209	35.0 gr. HS6	Rem. R12H	1337 fps	10300 lup
1¼ oz.	CCI 109	35.0 gr. HS6	Rem. R12H	1337 fps	10300 lup
1¼ oz.	Fed. 209	23.0 gr Green Dot	Win. WAA12F114	1220 fps	9900 psi
1¼ oz.	Fed. 209	23.0 gr Unique	Win. WAA12F114	1220 fps	9400 psi
1¼ oz.	Fed. 209	23.0 gr Unique	Fed. 12S4	1220 fps	9800 psi
1¼ oz.	CCI 209M	25.0 gr Unique	Fed. 12S4	1220 fps	10000 psi
1¼ oz.	Win. 209	25.0 gr Unique	Fed. 12S4	1220 fps	9500 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

Federal Hi-Power Plastic Shell

(Continued)

Hull #13
12 Gauge 2¾"
Hull I.D. Page 101
Reference Notes Page 120

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1¼ oz.	Fed. 209	29.0 gr Herco	Fed. 12S4	1330 fps	10200 psi
1¼ oz.	Fed. 209	28.5 gr Herco	Rem. SP12	1330 fps	9900 psi
1¼ oz.	Fed. 209	29.5 gr Herco	Win. WAA12F114	1330 fps	9400 psi
1¼ oz.	CCI 209M	30.0 gr Herco	Fed. 12S4	1330 fps	9500 psi
1¼ oz.	Win. 209	30.0 gr Herco	Fed. 12S4	1330 fps	10200 psi
1¼ oz.	Rem. 97*	30.0 gr Herco	Fed. 12S4	1330 fps	10000 psi
1¼ oz.	Rem. 97*	39.0 gr Blue Dot	Fed. 12S4	1330 fps	8100 psi
1¼ oz.	Win. 209	38.0 gr Blue Dot	Fed. 12S4	1330 fps	8600 psi
1¼ oz.	CCI 209M	38.0 gr Blue Dot	Fed. 12S4	1330 fps	9800 psi
1¼ oz.	Fed. 209	27.5 gr SR7625	Rem. SP12	1225 fps	7500 lup
1¼ oz.	Fed. 209	30.0 gr SR7625	Rem. RP12	1320 fps	9200 lup
1¼ oz.	Fed. 209	32.5 gr SR4756	Rem. SP12	1225 fps	7000 lup
1¼ oz.	Fed. 209	36.0 gr SR4756	Rem. RP12	1330 fps	8200 lup
1¼ oz.	Win. 209	30.0 gr 540	Win. WAA12F114	1255 fps	9700 lup
1¼ oz.	Win. 209	36.5 gr 540	Rem. R12H	1330 fps	8100 lup
1⅜ oz.	CCI 109	34.0 gr HS6	Win. WAA12R(red)	1282 fps	10200 lup
1⅜ oz.	CCI 209	34.0 gr HS6	Win. WAA12R(red)	1282 fps	10200 lup
1⅜ oz.	Win. 209	34.0 gr HS6	Win. WAA12R(red)	1282 fps	10200 lup
1⅜ oz.	CCI 209M	39.5 gr Blue Dot	Rem. RP12	1350 fps	9600 psi
1⅜ oz.	Win 209	40.0 gr Blue Dot	Rem. RP12	1350 fps	9600 psi
1⅜ oz.	Rem. 97*	40.5 gr Blue Dot	Rem. RP12	1350 fps	9500 psi
1⅜ oz.	Fed. 209	38.5 gr Blue Dot	Rem. RP12	1295 fps	8600 psi
1⅜ oz.	Fed. 209	39.5 gr Blue Dot	Rem. RP12	1350 fps	9700 psi
1⅜ oz.	Fed. 209	37.5 gr Blue Dot	Win. WAA12R(red)	1295 fps	8500 psi
1⅜ oz.	Fed. 209	32.0 gr SR7625	Win. WAA12R(red)	1340 fps	10900 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #13
12 Gauge 2¾"
Hull I.D. Page 101
Reference Notes Page 120

Federal Hi-Power Plastic Shell

(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅜ oz.	Fed. 209	34.0 gr SR4756	Win. WAA12R(red)	1285 fps	8600 lup
1½ oz	CCI 109	31.0 gr HS6	Win. WAA12R(red)	1225 fps	10200 lup
1½ oz	CCI 209	31.0 gr HS6	Win. WAA12R(red)	1225 fps	10200 lup
1½ oz	Win. 209	31.0 gr HS6	Win. WAA12R(red)	1225 fps	10200 lup
1½ oz	CCI 109	41.0 gr HS7	Win. WAA12R(red)	1314 fps	10300 lup
1½ oz	CCI 209	41.0 gr HS7	Win. WAA12R(red)	1314 fps	10300 lup
1½ oz	Win. 209	41.0 gr HS7	Win. WAA12R(red)	1314 fps	10300 lup
1½ oz	Fed. 209	36.0 gr Blue Dot	Rem. RP12	1275 fps	9500 psi
1½ oz	Rem. 97*	36.5 gr Blue Dot	Rem. RP12	1275 fps	9300 psi
1½ oz	Win. 209	37.0 gr Blue Dot	Rem. RP12	1275 fps	9900 psi
1½ oz	CCI 209M	37.0 gr Blue Dot	Rem. RP12	1275 fps	9500 psi
1½ oz	Fed. 209	30.0 gr SR4756	Win. WAA12R(red)	1160 fps	8500 lup
1½ oz	Win. 209	34.5 gr 540	Win. WAA12R(red)	1260 fps	10400 lup
1½ oz	Win. 209	34.5 gr 540	Rem. RP12	1260 fps	10300 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

Federal Champion II Plastic Target Shell

Hull #14
12 Gauge 2¾"
Hull I.D. Page 101
Reference Notes Page 121

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	CCI 109	23.0 gr Trap 100	Win. WAA12(white)	1313 fps	9900 lup
1 oz.	CCI 209	23.0 gr Trap 100	Win. WAA12(white)	1313 fps	9900 lup
1 oz.	Win. 209	23.0 gr Trap 100	Win. WAA12(white)	1313 fps	9900 lup
1 oz.	Win. 209	23.5 gr 452AA	Win. WAA12(white)	1290 fps	9300 lup
1⅛ oz.	CCI 109	20.0 gr Trap 100	Win. WAA12(white)	1161 fps	10200 lup
1⅛ oz.	CCI 209	20.0 gr Trap 100	Win. WAA12(white)	1161 fps	10200 lup
1⅛ oz.	CCI 109	21.0 gr Trap 100	Win. WAA12(white)	1190 fps	10800 lup
1⅛ oz.	CCI 209	21.0 gr Trap 100	Win. WAA12(white)	1190 fps	10800 lup
1⅛ oz.	Win. 209	21.0 gr Trap 100	Win. WAA12(white)	1190 fps	10800 lup
1⅛ oz.	CCI 109	21.0 gr Trap 100	Rem. R12H	1188 fps	10600 lup
1⅛ oz.	CCI 209	21.0 gr Trap 100	Rem. R12H	1188 fps	10600 lup
1⅛ oz.	Win. 209	23.5 gr 473AA	Win. WAA12(white)	1200 fps	9400 lup
1¼ oz.	CCI 109	31.0 gr HS6	Win. WAA12F114	1304 fps	10500 lup
1¼ oz.	CCI 209	31.0 gr HS6	Win. WAA12F114	1304 fps	10500 lup
1¼ oz.	Win. 209	31.0 gr HS6	Win. WAA12F114	1304 fps	10500 lup
1¼ oz.	Win. 209	29.0 gr 540	Win. WAA12F114	1220 fps	9100 lup

12
12 Gauge 2¾"

ACTIV Plastic Hull

Hull #15
12 Gauge 2¾"
Hull I.D. Page 102
Reference Notes Page 121

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	CCI 209M	17.5 gr Red Dot	Activ L-29	1180 fps	7000 psi
1 oz.	CCI 209M	20.0 gr Red Dot	Activ L-29	1290 fps	8500 psi
1 oz.	Win. 209	18.5 gr Red Dot	Activ L-29	1180 fps	6700 psi
1 oz.	Win. 209	20.5 gr Red Dot	Activ L-29	1290 fps	8500 psi
1 oz.	CCI 209M	18.0 gr Red Dot	Activ T-28	1212 fps	7000 psi
1 oz.	Fed. 209	18.0 gr Red Dot	Activ T-28	1184 fps	6500 psi
1 oz.	CCI 209M	16.5 gr "Hi-Skor" 700X	Activ L-29	1180 fps	6500 psi
1 oz.	CCI 209M	19.0 gr "Hi-Skor" 700X	Activ L-29	1290 fps	8000 psi
1 oz.	CCI 209M	18.75 gr "Hi-Skor" 700X	Activ T-28	1212 fps	6800 psi
1 oz.	CCI 209M	21.0 gr "Hi-Skor" 700X	Activ T-28	1315 fps	7800 psi
1 oz.	Win. 209	17.0 gr "Hi-Skor" 700X	Activ L-29	1180 fps	6000 psi
1 oz.	Win. 209	19.7 gr "Hi-Skor" 700X	Activ L-29	1290 fps	8000 psi
1 oz.	CCI 209M	21.5 gr Red Dot	Activ T-28	1315 fps	8500 psi
1 oz.	Fed. 209	21.5 gr Red Dot	Activ T-28	1310 fps	8100 psi
1⅛ oz.	CCI 209M	19.5 gr Trap 100	Activ L-33	1145 fps	7100 psi
1⅛ oz.	CCI 209M	21.5 gr Trap 100	Activ L-33	1200 fps	7400 psi
1⅛ oz.	Win. 209	20.1 gr Trap 100	Activ L-33	1145 fps	6000 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #15
12 Gauge 2¾"

Hull I.D. Page 102
Reference Notes Page 121

ACTIV Plastic Hull

(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	Win. 209	21.5 gr Trap 100	Activ L-33	1200 fps	7000 psi
1⅛ oz.	Win. 209	22.7 gr Trap 100	Activ L-33	1255 fps	8100 psi
1⅛ oz.	CCI 209M	17.5 gr "Hi-Skor" 700X	Activ L-33	1145 fps	7800 psi
1⅛ oz.	CCI 209M	18.0 gr "Hi-Skor" 700X	Activ L-33	1200 fps	8100 psi
1⅛ oz.	CCI 209M	19.0 gr "Hi-Skor" 700X	Activ L-33	1255 fps	9100 psi
1⅛ oz.	Win. 209	17.2 gr "Hi-Skor" 700X	Activ L-33	1145 fps	7000 psi
1⅛ oz.	Win. 209	18.6 gr "Hi-Skor" 700X	Activ L-33	1200 fps	7800 psi
1⅛ oz.	Win. 209	20.0 gr "Hi-Skor" 700X	Activ L-33	1255 fps	8600 psi
1⅛ oz.	Win. 209	18.0 gr Red Dot	Activ L-33	1145 fps	7500 psi
1⅛ oz.	Win. 209	19.5 gr Red Dot	Activ L-33	1200 fps	9000 psi
1⅛ oz.	Win. 209	21.0 gr Red Dot	Activ L-33	1255 fps	9500 psi
1⅛ oz.	CCI 209M	18.75 gr "Hi-Skor" 700X	Activ T-28	1175 fps	7000 psi
1⅛ oz.	CCI 209M	22.00 gr "Hi-Skor" 700X	Activ T-28	1365 fps	10600 psi
1⅛ oz.	Win. 209	22.30 gr "Hi-Skor" 700X	Activ T-28	1365 fps	10500 psi
1⅛ oz.	CCI 209M	18.0 gr Red Dot	Activ T-28	1175 fps	8000 psi
1⅛ oz.	Fed. 209	18.0 gr Red Dot	Activ T-28	1157 fps	7300 psi
1⅛ oz.	CCI 209M	19.0 gr Red Dot	Activ T-28	1210 fps	8000 psi
1⅛ oz.	Fed. 209	19.0 gr Red Dot	Activ T-28	1183 fps	7800 psi
1⅛ oz.	CCI 209M	17.5 gr Red Dot	Activ L-33	1145 fps	7800 psi
1⅛ oz.	CCI 209M	19.5 gr Red Dot	Activ L-33	1200 fps	8700 psi
1⅛ oz.	CCI 209M	20.5 gr Red Dot	Activ L-33	1255 fps	9800 psi
1⅛ oz.	CCI 209M	23.5 gr Green Dot	Activ T-32	1285 fps	9000 psi
1⅛ oz.	Fed. 209	23.5 gr Green Dot	Activ T-32	1286 fps	9200 psi
1⅛ oz.	Win. 209	25.0 gr Green Dot	Activ L-33	1365 fps	10500 psi
1⅛ oz.	CCI 209M	19.5 gr "Hi-Skor" 700X	Activ T-28	1210 fps	7600 psi
1⅛ oz.	CCI 209M	21.25 gr "Hi-Skor" 700X	Activ T-28	1285 fps	9000 psi
1⅛ oz.	CCI 209M	22.0 gr "Hi-Skor" 700X	Activ T-28	1315 fps	9300 psi
1⅛ oz.	CCI 209M	25.0 gr Green Dot	Activ T-32	1315 fps	9500 psi
1⅛ oz.	Fed. 209	25.0 gr Green Dot	Activ T-32	1327 fps	9500 psi
1⅛ oz.	CCI 209M	20.5 gr 452AA	Activ L-33	1145 fps	6954 psi
1⅛ oz.	CCI 209M	21.5 gr 452AA	Activ L-33	1200 fps	8190 psi
1⅛ oz.	CCI 209M	22.5 gr 452AA	Activ L-33	1255 fps	8850 psi
1⅛ oz.†	CCI 209	19.0 gr Red Dot	Activ L-29	1145 fps	6600 psi
1⅛ oz.†	CCI 209	18.5 gr Red Dot	Fed. 12 S0	1145 fps	7800 psi
1⅛ oz.†	CCI 209M	18.0 gr Red Dot	Activ L-29	1145 fps	8100 psi
1⅛ oz.†	CCI 209M	17.5 gr Red Dot	Fed. 12 S0	1145 fps	8100 psi
1⅛ oz.†	Fed. 209	18.0 gr Red Dot	Activ L-29	1145 fps	8000 psi
1⅛ oz.†	Fed. 209	18.0 gr Red Dot	Fed. 12 S0	1145 fps	8700 psi
1⅛ oz.†	Win. 209	18.0 gr Red Dot	Activ L-29	1145 fps	7200 psi
1⅛ oz.†	Win. 209	18.5 gr Red Dot	Fed. 12 S0	1145 fps	9000 psi
1⅛ oz.†	Win. 209	18.0 gr Red Dot	Fed. 12 S3	1145 fps	8500 psi
1⅛ oz.†	Win. 209	17.5 gr Red Dot	Rem. PT12	1145 fps	8300 psi
1⅛ oz.†	Win. 209	18.5 gr Red Dot	Win. WAA12F1	1145 fps	7700 psi
1⅛ oz.†	CCI 209	20.5 gr Red Dot	Activ L-29	1200 fps	8100 psi
1⅛ oz.†	CCI 209	20.0 gr Red Dot	Fed. 12 S0	1200 fps	8200 psi
1⅛ oz.†	CCI 209M	19.5 gr Red Dot	Activ L-29	1200 fps	9800 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

ACTIV Plastic Hull

(Continued)

Hull #15
12 Gauge 2¾"
Hull I.D. Page 102
Reference Notes Page 121

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.†	CCI 209M	19.5 gr Red Dot	Fed. 12 S0	1200 fps	10000 psi
1⅛ oz.†	Fed. 209	19.5 gr Red Dot	Activ L-29	1200 fps	9500 psi
1⅛ oz.†	Fed. 209	19.5 gr Red Dot	Fed. 12 S0	1200 fps	9600 psi
1⅛ oz.†	Win. 209	20.0 gr Red Dot	Activ L-29	1200 fps	9500 psi
1⅛ oz.†	Win. 209	19.5 gr Red Dot	Fed. 12 S0	1200 fps	9800 psi
1⅛ oz.†	Win. 209	19.5 gr Red Dot	Fed. 12 S3	1200 fps	10300 psi
1⅛ oz.†	Win. 209	19.5 gr Red Dot	Rem. PT12	1200 fps	9400 psi
1⅛ oz.†	Win. 209	19.5 gr Red Dot	Win. WAA12F1	1200 fps	8700 psi
1⅛ oz.†	Win. 209	20.5 gr Red Dot	Activ L-29	1255 fps	10200 psi
1⅛ oz.†	CCI 209M	21.0 gr Green Dot	Activ L-29	1200 fps	7000 psi
1⅛ oz.†	CCI 209M	21.5 gr Green Dot	Fed. 12 S0	1200 fps	8700 psi
1⅛ oz.†	Fed. 209	21.5 gr Green Dot	Fed. 12 S0	1200 fps	7500 psi
1⅛ oz.†	Win. 209	21.5 gr Green Dot	Activ L-29	1200 fps	7100 psi
1⅛ oz.†	Win 209	21.0 gr Green Dot	Fed. 12 S0	1200 fps	7700 psi
1⅛ oz.†	Win. 209	21.5 gr Green Dot	Fed. 12 S3	1200 fps	7400 psi
1⅛ oz.†	Win. 209	22.0 gr Green Dot	Rem PT12	1200 fps	8000 psi
1⅛ oz.†	Win. 209	22.5 gr Green Dot	Win. WAA12F1	1200 fps	6500 psi
1⅛ oz.†	CCI 209M	23.0 gr Green Dot	Activ L-29	1255 fps	8400 psi
1⅛ oz.†	CCI 209M	22.0 gr Green Dot	Fed. 12 S3	1255 fps	9400 psi
1⅛ oz.†	CCI 209M	23.0 gr Green Dot	Win. WAA12(white)	1255 fps	8800 psi
1⅛ oz.†	Win. 209	23.5 gr Green Dot	Activ L-29	1255 fps	8300 psi
1¼ oz.	CCI 209M	22.0 gr Green Dot	Activ T-32	1220 fps	10300 psi
1¼ oz.	CCI 209M	23.0 gr Green Dot	Activ T-35	1250 fps	9500 psi
1¼ oz.	Fed. 209	23.0 gr Green Dot	Activ T-35	1248 fps	9100 psi
1¼ oz.	Win. 209	22.5 gr Green Dot	Activ T-32	1220 fps	10100 psi
1¼ oz.	Win. 209	22.5 gr Trap 100	Activ T-32	1220 fps	10222 psi
1¼ oz.	CCI 209M	19.50 gr "Hi-Skor" 700X	Activ T-32	1220 fps	10300 psi
1¼ oz.	CCI 209M	21.25 gr "Hi-Skor" 700X	Activ T-32	1250 fps	10200 psi
1¼ oz.	Win. 209	20.0 gr "Hi-Skor" 700X	Activ T-32	1220 fps	10000 psi
1¼ oz.	CCI 209M	26.5 gr Unique	Activ T-32	1330 fps	10600 psi
1¼ oz.	CCI 209M	27.8 gr Unique	Activ T-35	1331 fps	10100 psi
1¼ oz.	Fed. 209	27.8 gr Unique	Activ T-35	1332 fps	10500 psi
1¼ oz.	Win. 209	26.2 gr PB	Activ T-32	1330 fps	10400 psi
1¼ oz.	CCI 209M	25.5 gr PB	Activ T-32	1330 fps	10500 psi
1¼ oz.	CCI 209M	27.75 gr PB	Activ T-35	1331 fps	9000 psi
1¼ oz.★	CCI 209M	27.8 gr Unique	Activ T-35	1331 fps	10500 psi
1¼ oz.★	Fed. 209	27.8 gr Unique	Activ T-35	1314 fps	10100 psi
1¼ oz.	Win. 209	27.5 gr Unique	Activ T-32	1330 fps	10600 psi
1¼ oz.	Win. 209	37.2 gr HS-6	Activ T-32	1330 fps	7000 psi
1¼ oz.†	CCI 209	23.0 gr Green Dot	Activ T-32	1220 fps	9300 psi
1¼ oz.†	CCI 209	23.5 gr Green Dot	Win. WAA12(white)	1220 fps	9000 psi
1¼ oz.†	CCI 209M	22.0 gr Green Dot	Activ T-32	1220 fps	9600 psi
1¼ oz.†	CCI 209M	22.5 gr Green Dot	Win. WAA12(white)	1220 fps	10000 psi
1¼ oz.†	Fed. 209	22.5 gr Green Dot	Activ T-32	1220 fps	10000 psi
1¼ oz.†	Fed. 209	22.5 gr Green Dot	Win. WAA12(white)	1220 fps	9800 psi
1¼ oz.†	Win. 209	23.0 gr Green Dot	Activ T-32	1220 fps	9700 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #15
12 Gauge 2¾"

Hull I.D. Page 102
Reference Notes Page 121

ACTIV Plastic Hull

(Continued)

12
12 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1¼ oz.†	Win. 209	22.0 gr Green Dot	Rem RXP 12	1220 fps	9900 psi
1¼ oz.†	Win. 209	22.0 gr Green Dot	Win. WAA12(white)	1220 fps	10200 psi
1¼ oz.†	CCI 209	25.5 gr Unique	Activ T-32	1220 fps	8100 psi
1¼ oz.†	CCI 209	25.5 gr Unique	Win. WAA12(white)	1220 fps	8400 psi
1¼ oz.†	CCI 209M	24.5 gr Unique	Activ T-32	1220 fps	9000 psi
1¼ oz.†	CCI 209M	24.5 gr Unique	Win. WAA12(white)	1220 fps	9000 psi
1¼ oz.†	Fed. 209	24.5 gr Unique	Activ T-32	1220 fps	9200 psi
1¼ oz.†	Fed. 209	24.5 gr Unique	Win. WAA12(white)	1220 fps	9500 psi
1¼ oz.†	Win. 209	24.5 gr Unique	Activ T-32	1220 fps	9000 psi
1¼ oz.†	Win. 209	24.5 gr Unique	Fed 12C1	1220 fps	8900 psi
1¼ oz.†	Win. 209	24.5 gr Unique	Rem. RXP12	1220 fps	9200 psi
1¼ oz.†	Win. 209	24.0 gr Unique	Win. WAA12(white)	1220 fps	9200 psi
1¼ oz.†	Fed. 209	27.5 gr Unique	Activ T-32	1330 fps	10500 psi
1¼ oz.†	Win. 209	27.5 gr Unique	Activ T-32	1330 fps	10200 psi
1¼ oz.†	CCI 209	30.5 gr Herco	Fed. 12 S4	1330 fps	9800 psi
1¼ oz.†	CCI 209M	29.0 gr Herco	Activ T-32	1330 fps	10200 psi
1¼ oz.†	Fed. 209	29.5 gr Herco	Activ T-32	1330 fps	10300 psi
1¼ oz.†	Win. 209	29.0 gr Herco	Activ T-32	1330 fps	9700 psi
1¼ oz.†	Win. 209	28.5 gr Herco	Rem. SP12	1330 fps	9800 psi
1¼ oz.†	Win. 209	28.5 gr Herco	Win. WAA12F114	1330 fps	10300 psi
1¼ oz.†	CCI 209	39.5 gr Blue Dot	Fed. 12 S4	1330 fps	9300 psi
1¼ oz.†	Fed. 209	37.0 gr Blue Dot	Fed. 12 S4	1330 fps	10100 psi
1¼ oz.†	Win. 209	39.5 gr Blue Dot	Fed. 12 S4	1330 fps	9000 psi
1¼ oz.†	Win. 209	39.0 gr Blue Dot	Rem. SP12	1330 fps	8700 psi
1¼ oz.†	Win. 209	40.0 gr Blue Dot	Win. WAA12F114	1330 fps	8800 psi
1⅜ oz.	CCI 209M	38.5 gr Blue Dot	Activ T-35	1350 fps	9500 psi
1⅜ oz.	CCI 209M	32.0 gr SR4756	Activ T-35	1350 fps	9900 psi
1⅜ oz.	Win. 209	39.0 gr Blue Dot	Activ T-35	1350 fps	9200 psi
1⅜ oz.	Win. 209	32.0 gr SR4756	Activ T-35	1350 fps	10000 psi
1⅜ oz.	Win. 209	36.9 gr HS-6	Activ T-35	1350 fps	8400 psi
1⅜ oz.†	CCI 209	30.5 gr Herco	Activ T-35	1295 fps	10300 psi
1⅜ oz.†	CCI 209M	29.5 gr Herco	Activ T-35	1295 fps	10500 psi
1⅜ oz.†	CCI 209	40.0 gr Blue Dot	Rem. RP12	1295 fps	8500 psi
1⅜ oz.†	CCI 209M	38.5 gr Blue Dot	Activ T-35	1295 fps	8700 psi
1⅜ oz.†	CCI 209M	38.0 gr Blue Dot	Rem. RP12	1295 fps	9400 psi
1⅜ oz.†	Fed. 209	38.0 gr Blue Dot	Activ T-35	1295 fps	9700 psi
1⅜ oz.†	Fed. 209	37.0 gr Blue Dot	Rem. RP12	1295 fps	10200 psi
1⅜ oz.†	Win. 209	39.0 gr Blue Dot	Activ T-35	1295 fps	9100 psi
1⅜ oz.†	Win. 209	38.0 gr Blue Dot	Rem. RP12	1295 fps	9500 psi
1⅜ oz.†	Fed. 209	40.0 gr Blue Dot	Activ T-35	1350 fps	10100 psi
1⅜ oz.†	Win. 209	39.5 gr Blue Dot	Activ T-35	1350 fps	10100 psi
1½ oz.	CCI 209M	35.0 gr Blue Dot	Activ T-42	1315 fps	10900 psi
1½ oz.	Fed. 209	38.0 gr Blue Dot	Activ T-42	1316 fps	10300 psi
1½ oz.	Win. 209	35.5 gr Blue Dot	Activ T-42	1315 fps	10900 psi
1½ oz.	CCI 209M	33.95 gr SR4756	Activ T-42	1321 fps	10600 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 2¾"

ACTIV Plastic Hull

Hull #15
12 Gauge 2¾"
Hull I.D. Page 102
Reference Notes Page 121

(Continued)

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1½ oz.	Win. 209	39.0 gr HS-7	Activ T-35	1315 fps	10700 psi
1½ oz.★	CCI 209M	36.0 gr Blue Dot	Activ T-42	1312 fps	10800 psi
1½ oz.★	Fed. 209	37.0 gr Blue Dot	Activ T-42	1314 fps	10800 psi
1½ oz.†	CCI 209	38.5 gr Blue Dot	Activ T-42	1260 fps	9600 psi
1½ oz.†	CCI 209M	36.5 gr Blue Dot	Activ T-42	1260 fps	10200 psi
1½ oz.†	CCI 209M	35.5 gr Blue Dot	Rem. RP12	1260 fps	10000 psi
1½ oz.†	Win. 209	36.0 gr Blue Dot	Activ T-42	1260 fps	10400 psi
1½ oz.†	Win. 209	35.5 gr Blue Dot	Rem. RP12	1260 fps	9900 psi
1⅝ oz.	CCI 209M	37.0 gr Blue Dot	Activ T-42	1286 fps	10700 psi
1⅝ oz.	Fed. 209	37.0 gr Blue Dot	Activ T-42	1261 fps	10000 psi
1⅝ oz.★	CCI 209M	35.0 gr Blue Dot	Activ T-42	1286 fps	11400 psi
1⅝ oz.★	Fed. 209	35.0 gr Blue Dot	Activ T-42	1254 fps	11200 psi

★ BUFFERED LOADS
† LOADS FROM HERCULES 200-277E 4-85.

★ Maximum precautions should be taken with "buffered" loads. The pressure values may vary widely, depending on the type and amount of buffer material used, and the dispersion of the buffer among the pellets.

SKR Industries, Inc. recommends the use of fine ground polyethylene as distributed by Ballistic Products, Inc. of Long Lake, Minnesota.

Ballistic Products, Inc. recommendations: "The amount of buffer used will depend upon the space for the material. In loads calling for small pellets, less buffer will be used as the space between pellets will be less. Too much buffer material will raise the shot level in the cup, causing bad crimping and bulged cases".

For more information on buffer material and other reloading products and components contact:

Ballistic Products, Inc.
P.O. Box 488
Long Lake, Minnesota 55356
(612) 473-1550

CAUTION: The ballistic data shown above was obtained under strictly controlled conditions in ACTIV INDUSTRIES, INC'S., laboratory. This data may vary considerably depending on the components used and the reloading techniques of the individual.

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DO NOT LOAD STEEL SHOT

DO NOT SUBSTITUTE COMPONENTS

Hull #16
12 Gauge 3″
Hull I.D. Page 102
Reference Notes Page 122

Winchester-Western Compression-Formed Plastic Shell

12
12 Gauge 3″

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1½ oz.	Win. 209	38.5 gr Blue Dot	Rem. SP12	1315 fps	10300 psi
1½ oz.	Win. 209	29.0 gr SR7625	Win. WAA12F114	1205 fps	10200 lup
1½ oz.	Fed. 209	34.0 gr SR4756	Rem. SP12	1290 fps	10900 lup
1⅝ oz.	CCI 109	31.0 gr HS6	Rem. R12L	1185 fps	10500 lup
1⅝ oz.	CCI 209	31.0 gr HS6	Rem. R12L	1185 fps	10500 lup
1⅝ oz.	CCI 109	36.0 gr HS7	Rem. R12H	1238 fps	10500 lup
1⅝ oz.	CCI 209	36.0 gr HS7	Rem. R12H	1238 fps	10500 lup
1⅝ oz.	Win. 209	36.0 gr HS7	Rem. R12H	1238 fps	10500 lup
1⅝ oz.	Win. 209	50.0 gr Hercules 2400	Rem. RP12	1335 fps	10000 psi
1⅝ oz.	Win. 209	32.0 gr SR4756	Rem. RP12	1200 fps	10300 lup
1⅝ oz.	Win. 209	36.0 gr 571	Win. WAA12(white)	1205 fps	10500 lup
1⅝ oz.	Win. 209	36.0 gr 571	Rem. R12H	1205 fps	10100 lup
1¾ oz.	Win. 209	45.0 gr 2400	Rem. RP12	1245 fps	9900 psi
1¾ oz.	CCI 109	31.0 gr SR4756	Win. WAA12R(red)	1140 fps	10300 lup
1¾ oz.	CCI 209	31.0 gr SR4756	Win. WAA12R(red)	1140 fps	10300 lup
1¾ oz.	CCI 109	31.0 gr SR4756	Rem. RP12	1135 fps	10000 lup
1¾ oz.	CCI 209	31.0 gr SR4756	Rem. RP12	1135 fps	10000 lup
1⅞ oz.	Win. 209	33.0 gr 571	Win. WAA12R(red)	1100 fps	10500 lup
1⅞ oz.	Win. 209	34.0 gr 571	Rem. RP12	1100 fps	10100 lup
1⅞ oz.	CCI 109	33.0 gr HS7	Win. WAA12R(red)	1174 fps	10500 lup
1⅞ oz.	CCI 209	33.0 gr HS7	Win. WAA12R(red)	1174 fps	10500 lup
1⅞ oz.	Win. 209	33.0 gr HS7	Win. WAA12R(red)	1174 fps	10500 lup
1⅞ oz.	CCI 109	33.0 gr HS7	Rem. RP12	1149 fps	10100 lup
1⅞ oz.	CCI 209	33.0 gr HS7	Rem. RP12	1149 fps	10100 lup
1⅞ oz.	Win. 209	33.0 gr HS7	Rem. RP12	1149 fps	10100 lup

Hull I.D. #18
12 Gauge 3″
Reloading Data Page 103
Reference Notes Page 123

Remington S.P. Plastic Shell *(With Fiber Basewad)*

12
12 Gauge 3″

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅝ oz.	Rem. 57*	41.0 gr Blue Dot	Rem. SP12	1300 fps	9100 psi
1⅝ oz.	Rem. 57*	39.0 gr Blue Dot	Win. WAA12F114	1300 fps	10900 psi
1⅝ oz.	CCI 157	35.5 gr SR4756	Win. WAA12R(red)	1255 fps	10500 lup
1⅝ oz.	CCI 157	34.0 gr SR4756	Rem. RP12	1235 fps	10400 lup
1⅝ oz.	CCI 157	34.0 gr HS6	Rem. R12L	1214 fps	10400 lup
1⅝ oz.	CCI 157	40.0 gr HS7	Rem. RPA12	1281 fps	10300 lup
1⅞ oz.	Rem. 57*	38.5 gr Blue Dot	Rem. RP12	1250 fps	9400 psi
1⅞ oz.	CCI 157	36.0 gr 571	Win. WAA12R(red)	1140 fps	10500 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12
12 Gauge 3″

Remington S.P. Plastic Shell
(With Fiber Basewad)

(Continued)

Hull #18
12 Gauge 3″
Hull I.D. Page 103
Reference Notes Page 123

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅞ oz.	CCI 157	36.0 gr 571	Rem. RP12	1140 fps	10500 lup
1⅞ oz.	CCI 157	29.0 gr HS6	Win. WAA12R(red)	1151 fps	10500 lup
1⅞ oz.	CCI 157	37.0 gr HS7	Win. WAA12R(red)	1198 fps	10500 lup

12
12 Gauge 3″

Federal Hi-Power Plastic Shell

Hull #19
12 Gauge 3″
Hull I.D. Page 103
Reference Notes Page 123

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅜ oz.	CCI 109	37.0 gr HS6	Win. WAA12(white)	1328 fps	10100 lup
1⅜ oz.	CCI 209	37.0 gr HS6	Win. WAA12(white)	1328 fps	10100 lup
1⅜ oz.	Win. 209	37.0 gr HS6	Win. WAA12(white)	1328 fps	10100 lup
1⅜ oz.	CCI 109	43.0 gr HS7	Win. WAA12(white)	1395 fps	10100 lup
1⅜ oz.	CCI 209	43.0 gr HS7	Win. WAA12(white)	1395 fps	10100 lup
1⅜ oz.	Win. 209	43.0 gr HS7	Win. WAA12(white)	1395 fps	10100 lup
1⅜ oz.	Fed. 209	30.5 gr Herco	Fed. 12S3	1295 fps	10000 psi
1⅜ oz.	Fed. 209	30.5 gr Herco	Rem. RXP12	1295 fps	9300 psi
1⅜ oz.	Fed. 209	30.5 gr Herco	Win. WAA12(white)	1295 fps	9700 psi
1⅜ oz.	Fed. 209	40.0 gr Blue Dot	Fed. 12S4	1350 fps	9400 psi
1⅜ oz.	Fed. 209	40.0 gr Blue Dot	Rem. SP12	1350 fps	8900 psi
1⅜ oz.	Fed. 209	40.0 or Blue Dot	Win. WAA12F114	1350 fps	9800 psi
1⅜ oz.	Fed. 209	35.0 gr SR7625	Fed. 12S4	1375 fps	10600 lup
1⅜ oz.	Fed. 209	35.0 gr SR7625	Rem. R12H	1370 fps	10000 lup
1⅜ oz.	Fed. 209	42.0 gr SR4756	Rem. SP12	1460 fps	10400 lup
1⅜ oz.	Fed. 209	32.0 gr "Hi-Skor" 800X	Fed. 12S3	1355 fps	10000 lup
1⅝ oz.	CCI 109	34.0 gr HS6	Rem. R12L	1214 fps	10400 lup
1⅝ oz.	CCI 209	34.0 gr HS6	Rem. R12L	1214 fps	10400 lup
1⅝ oz.	CCI 109	40.0 gr HS7	Rem. RPA12	1281 fps	10300 lup
1⅝ oz.	CCI 209	40.0 gr HS7	Rem. RPA12	1281 fps	10300 lup
1⅝ oz.	Win. 209	40.0 gr HS7	Rem. RPA12	1281 fps	10300 lup
1⅝ oz.	Fed. 209	39.0 gr Blue Dot	Rem. SP12	1280 fps	10400 psi
1⅝ oz.	Fed. 209	56.0 gr 2400	Rem. RP12	1335 fps	8000 psi
1⅝ oz.	Fed. 209	32.0 gr SR7625	Rem. RP12	1215 fps	10500 lup
1⅝ oz.	Win. 209	32.0 gr SR7625	Win. WAA12R(red)	1220 fps	10500 lup
1⅝ oz.	Fed. 209	36.0 gr SR4756	Rem. RP12	1280 fps	10900 lup
1⅝ oz.	Fed. 209	36.0 gr SR4756	Win. WAA12R(red)	1275 fps	10400 lup
1⅝ oz.	Fed. 209	28.0 gr "Hi-Skor" 800X	Fed. 12S4	1200 fps	10700 lup
1⅞ oz.	CCI 109	37.0 gr HS7	Win. WAA12R(red)	1198 fps	10500 lup
1⅞ oz.	CCI 209	37.0 gr HS7	Win. WAA12R(red)	1198 fps	10500 lup
1⅞ oz.	Win. 209	37.0 gr HS7	Win. WAA12R(red)	1198 fps	10500 lup
1⅞ oz.	Fed. 209	31.0 gr SR4756	Win. WAA12R(red)	1110 fps	10900 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #19
12 Gauge 3″
Hull I.D. Page 103
Reference Notes Page 123

Federal Hi-Power Plastic Shell

(Continued)

12
12 Gauge 3″

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅞ oz.	CCI 109	33.0 gr SR4756	Win. WAA12R(red)	1140 fps	10600 lup
1⅞ oz.	CCI 209	33.0 gr SR4756	Win. WAA12R(red)	1140 fps	10600 lup

Hull #20
16 Gauge 2¾″
Hull I.D. Page 103
Reference Notes Page 123

Winchester-Western Compression-Formed Shell

16
16 Gauge 2¾″

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	CCI 109	16.0 gr Trap 100	Rem. R16	1149 fps	10400 lup
1 oz.	CCI 209	16.0 gr Trap 100	Rem. R16	1149 fps	10400 lup
1 oz.	Win. 209	16.0 gr Trap 100	Rem. R16	1149 fps	10400 lup
1 oz.	Win. 209	15.0 gr Red Dot	Rem. R16	1165 fps	10400 psi
1 oz.	Win. 209	16.5 gr Green Dot	Rem. R16	1165 fps	9700 psi
1 oz.	Win. 209	17.0 gr Green Dot	Rem. R16	1220 fps	10300 psi
1 oz.	Win. 209	18.0 gr Unique	Rem. R16	1165 fps	9100 psi
1 oz.	Win. 209	18.5 gr Unique	Rem. R16	1220 fps	9600 psi
1 oz.	Win. 209	20.0 gr Herco	Rem. R16	1220 fps	9000 psi
1 oz.	Win. 209	15.5 gr "Hi-Skor" 700X	Rem. R16	1175 fps	10000 lup
1 oz.	Rem. 97*	15.5 gr "Hi-Skor" 700X	Rem. R16	1170 fps	9300 lup
1 oz.	Win. 209	18.5 gr PB	Rem. R16	1175 fps	8000 lup
1 oz.	Win. 209	20.0 gr SR7625	Rem. R16	1155 fps	7000 lup
1 oz.	Fed. 209	19.5 gr SR7625	Rem. R16	1165 fps	7400 lup
1 oz.	Fed. 209	22.5 gr SR4756	Rem. R16	1170 fps	7400 lup
1 oz.	Win. 209	19.0 gr "Hi-Skor" 800X	Rem. R16	1155 fps	7100 lup
1 oz.	Win. 209	20.5 gr "Hi-Skor" 800X	Rem. R16	1215 fps	7900 lup
1 oz.	Fed. 209	20.0 gr "Hi-Skor" 800X	Rem. R16	1215 fps	8000 lup
1 oz.	Win. 209	17.5 gr 452AA	Rem. R16	1165 fps	10300 lup
1 oz.	CCI 109	17.5 gr 452AA	Rem. R16	1165 fps	10500 lup
1 oz.	Win. 209	21.5 gr 473AA	Rem. R16	1220 fps	8800 lup
1 oz.	CCI 109	21.0 gr 473AA	Rem. R16	1220 fps	9000 lup
1⅛ oz.	CCI 109	26.0 gr HS6	Rem. R16	1234 fps	10300 lup
1⅛ oz.	CCI 209	26.0 gr HS6	Rem. R16	1234 fps	10300 lup
1⅛ oz.	Win. 209	26.0 gr HS6	Rem. R16	1234 fps	10300 lup
1⅛ oz.	Win. 209	21.5 gr Herco	Rem. SP16	1240 fps	10900 psi
1⅛ oz.	Win. 209	28.0 gr Blue Dot	Rem. SP16	1260 fps	9600 psi
1⅛ oz.	CCI 109	19.0 gr PB	Rem. SP16	1165 fps	10000 lup
1⅛ oz.	CCI 209	19.0 gr PB	Rem. SP16	1165 fps	10000 lup
1⅛ oz.	Win. 209	21.0 gr SR7625	Rem. SP16	1200 fps	9800 lup
1⅛ oz.	Win. 209	24.0 gr SR4756	Rem. SP16	1190 fps	9000 lup
1⅛ oz.	Fed. 209	23.0 gr SR4756	Rem. SP16	1185 fps	9400 lup
1⅛ oz.	Win. 209	21.5 gr "Hi-Skor" 800X	Rem. SP16	1235 fps	9800 lup
1⅛ oz.	CCI 209M	21.5 gr "Hi-Skor" 800X	Rem. SP16	1240 fps	9600 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

16
16 Gauge 2¾″

Winchester-Western Compression-Formed Shell

(Continued)

Hull #20
16 Gauge 2¾″
Hull I.D. Page 103
Reference Notes Page 123

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	Win. 209	27.5 gr 540	Rem. R16	1240 fps	9400 lup
1⅛ oz.	Win. 209	28.5 gr 540	Rem. R16	1290 fps	10300 lup
1⅛ oz.	CCI 109	27.5 gr 540	Rem. R16	1240 fps	9200 lup
1⅛ oz.	CCI 109	28.5 gr 540	Rem. R16	1290 fps	9600 lup
1¼ oz.	CCI 109	23.0 gr HS6	Rem. SP16	1127 fps	10600 lup
1¼ oz.	CCI 209	23.0 gr HS6	Rem. SP16	1127 fps	10600 lup
1¼ oz.	Win. 209	23.0 gr HS6	Rem. SP16	1127 fps	10600 lup
1¼ oz.	CCI 109	30.0 gr HS7	Rem. SP16	1253 fps	10500 lup
1¼ oz.	CCI 209	30.0 gr HS7	Rem. SP16	1253 fps	10500 lup
1¼ oz.	Win. 209	30.0 gr HS7	Rem. SP16	1253 fps	10500 lup
1¼ oz.	Win. 209	30.5 gr 571	Rem. SP16	1230 fps	10500 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #21
16 Gauge 2¾"
Hull I.D. Page 103
Reference Notes Page 123

Remington S.P. Plastic Shell—Express
(With Fiber Basewad)

16
16 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	Rem. 57*	15.5 gr Red Dot	Rem. R16	1165 fps	10000 psi
1 oz.	Rem. 57*	17.0 gr Green Dot	Rem. R16	1165 fps	8900 psi
1 oz.	Rem. 57*	17.5 gr Green Dot	Rem. R16	1220 fps	9300 psi
1 oz.	Rem. 57*	19.0 gr Unique	Rem. R16	1165 fps	8600 psi
1 oz.	Rem. 57*	19.5 gr Unique	Rem. R16	1220 fps	8700 psi
1 oz.	Rem. 57*	20.0 gr Herco	Rem. R16	1220 fps	7500 psi
1 oz.	Rem. 57*	20.0 gr Herco	Rem. SP16	1220 fps	7600 psi
1⅛ oz.	Rem. 57*	19.0 gr Unique	Rem. SP16	1240 fps	10100 psi
1⅛ oz.	Rem. 57*	21.5 gr Herco	Rem. SP16	1240 fps	9500 psi
1⅛ oz.	Rem. 57*	22.5 gr Herco	Rem. SP16	1260 fps	9900 psi
1⅛ oz.	Rem. 57*	28.0 gr Blue Dot	Rem. SP16	1260 fps	9700 psi
1⅛ oz.	CCI 157	26.0 gr HS6	Rem. SP16	1267 fps	10400 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

16
16 Gauge 2¾"

Remington S.P. Plastic Shell—Shurshot-Victor *(With Fiber Basewad)*

Hull #22
16 Gauge 2¾"
Hull I.D. Page 104
Reference Notes Page 124

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	Rem. 57*	15.5 gr Red Dot	Rem. R16	1165 fps	10200 psi
1 oz.	Rem. 57*	16.0 gr Green Dot	Rem. R16	1165 fps	9000 psi
1 oz.	Rem. 57*	17.0 gr Green Dot	Rem. R16	1220 fps	9700 psi
1 oz.	Rem. 57*	18.5 gr Unique	Rem. R16	1220 fps	8700 psi
1 oz.	Rem. 57*	20.0 gr Herco	Rem. R16	1220 fps	7300 psi
1 oz.	Rem. 57*	20.0 gr Herco	Rem. SP16	1220 fps	7300 psi
1 oz.	CCI 157	15.5 gr "HI-Skor" 700X	Rem. R16	1165 fps	10100 lup
1 oz.	CCI 157	18.5 gr PB	Rem. R16	1175 fps	8400 lup
1 oz.	CCI 157	20.0 gr SR7625	Rem. R16	1160 fps	7400 lup
1 oz.	CCI 157	23.5 gr SR4756	Rem. SP16	1165 fps	6800 lup
1 oz.	Rem. 57*	18.0 gr "Hi-Skor" 800X	Rem. R16	1165 fps	8300 lup
1 oz.	Rem. 57*	19.5 gr "Hi-Skor" 800X	Rem. R16	1220 fps	8800 lup
1⅛ oz.	Rem. 57*	17.5 gr Green Dot	Rem. SP16	1185 fps	10400 psi
1⅛ oz.	Rem. 57*	18.0 gr Unique	Rem. SP16	1185 fps	9400 psi
1⅛ oz.	Rem. 57*	19.0 gr Unique	Rem. SP16	1240 fps	9800 psi
1⅛ oz.	Rem. 57*	21.0 gr Herco	Rem. SP16	1185 fps	8200 psi
1⅛ oz.	Rem. 57*	22.5 gr Herco	Rem. SP16	1240 fps	10700 psi
1⅛ oz.	CCI 157	21.0 gr SR7625	Rem. SP16	1175 fps	8800 lup
1⅛ oz.	Rem. 57*	19.5 gr "Hi-Skor" 800X	Rem. SP16	1190 fps	10300 lup
1⅛ oz.	CCI 157	26.0 gr HS6	Rem. SP16	1267 fps	10400 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #24
16 Gauge 2¾"
Hull I.D. Page 104
Reference Notes Page 124

Federal Hi-Power Plastic Shell

16
16 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	Fed. 209	16.0 gr Red Dot	Rem. R16	1165 fps	9700 psi
1 oz.	Fed. 209	17.5 gr Green Dot	Rem. R16	1165 fps	9100 psi
1 oz.	Fed. 209	18.5 gr Green Dot	Rem. R16	1220 fps	9700 psi
1 oz.	Fed. 209	18.5 gr Unique	Rem. R16	1165 fps	8100 psi
1 oz.	Fed. 209	19.5 gr Unique	Rem. R16	1220 fps	9000 psi
1 oz.	Fed. 209	15.5 gr "Hi-Skor" 700X	Rem. R16	1175 fps	9700 lup
1 oz.	Win. 209	15.5 gr "Hi-Skor" 700X	Rem. R16	1160 fps	9200 lup
1 oz.	Win. 209	18.5 gr PB	Rem. R16	1180 fps	7600 lup
1 oz.	Fed. 209	20.0 gr SR7625	Rem. R16	1160 fps	6700 lup
1 oz.	Win. 209	20.5 gr SR7625	Rem. R16	1170 fps	6700 lup
1 oz.	Win. 209	23.5 gr SR4756	Rem. R16	1180 fps	6800 lup
1 oz.	CCI 209M	19.0 gr "Hi-Skor" 800X	Rem. R16	1165 fps	6700 lup
1 oz.	CCI 209M	20.5 gr 'Hi-Skor" 800X	Rem. R16	1230 fps	7500 lup
1 oz.	Fed. 209	19.0 gr "Hi-Skor" 800X	Rem. R16	1170 fps	7100 lup
1 oz.	Fed. 209	20.0 gr "Hi-Skor" 800X	Rem. R16	1215 fps	7500 lup
1⅛ oz.	CCI 109	27.0 gr HS6	Rem. R16	1259 fps	10100 lup
1⅛ oz.	CCI 209	27.0 gr HS6	Rem. R16	1259 fps	10100 lup
1⅛ oz.	Win. 209	27.0 gr HS6	Rem. R16	1259 fps	10100 lup
1⅛ oz.	Fed. 209	19.5 gr Unique	Rem. R16	1240 fps	10800 psi
1⅛ oz.	Fed. 209	22.0 gr Herco	Rem. SP16	1240 fps	9300 psi
1⅛ oz.	Fed. 209	23.0 gr Herco	Rem. SP16	1260 fps	9900 psi
1⅛ oz.	Fed. 209	28.5 gr Blue Dot	Rem. SP16	1260 fps	9400 psi
1⅛ oz.	Win. 209	19.5 gr PB	Rem. SP16	1180 fps	10100 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

16
16 Gauge 2¾"

Federal Hi-Power Plastic Shell

(Continued)

Hull #24
16 Gauge 2¾"
Hull I.D. Page 104
Reference Notes Page 124

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	Win. 209	21.5 gr SR7625	Rem. SP16	1185 fps	8100 lup
1⅛ oz.	CCI 109	24.5 gr SR7625	Rem. SP16	1295 fps	9900 lup
1⅛ oz.	CCI 209	24.5 gr SR7625	Rem. SP16	1295 fps	9900 lup
1⅛ oz.	Fed. 209	23.5 gr SR4756	Rem. SP16	1190 fps	8300 lup
1⅛ oz.	Win. 209	24.5 gr SR4756	Rem. SP16	1190 fps	7800 lup
1⅛ oz.	CCI 209M	20.5 gr "HI-Skor" 800X	Rem. SP16	1190 fps	8100 lup
1⅛ oz.	CCI 209M	22.0 gr "Hi-Skor" 800X	Rem. SP16	1245 fps	8800 lup
1⅛ oz.	Fed. 209	21.5 gr "HI-Skor" 800X	Rem. SP16	1230 fps	9500 lup
1⅛ oz.	Win. 209	23.5 gr "Hi-Skor" 800X	Rem. SP16	1305 fps	10100 lup
1¼ oz.	Fed. 209	30.0 gr Blue Dot	Rem. SP16	1265 fps	10600 psi
1¼ oz.	CCI 109	32.0 gr HS7	Rem. SP16	1269 fps	10400 lup
1¼ oz.	CCI 209	32.0 gr HS7	Rem. SP16	1269 fps	10400 lup
1¼ oz.	Win. 209	32.0 gr HS7	Rem. SP16	1269 fps	10400 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #25
20 Gauge 2¾"
Hull I.D. Page 105
Reference Notes Page 125

Winchester-Western Compression-Formed Plastic Shell

20
20 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
⅞ oz.	CCI 109	13.5 gr Trap 100	Win. WAA20	1104 fps	10500 lup
⅞ oz.	CCI 209	13.5 gr Trap 100	Win. WAA20	1104 fps	10500 lup
⅞ oz.	Win. 209	13.5 gr Trap 100	Win. WAA20	1104 fps	10500 lup
⅞ oz.	CCI 109	23.0 gr HS6	Win. WAA20	1345 fps	10500 lup
⅞ oz.	CCI 209	23.0 gr HS6	Win. WAA20	1345 fps	10500 lup
⅞ oz.	Win. 209	23.0 gr HS6	Win. WAA20	1345 fps	10500 lup
⅞ oz.	Win. 209	18.0 gr 473AA	Win. WAA20	1200 fps	10900 lup
⅞ oz.	CCI 109	17.5 gr 473AA	Win. WAA20	1200 fps	10900 lup
⅞ oz.	Win. 209	14.5 gr Green Dot	Rem. RXP20	1155 fps	9900 psi
⅞ oz.	CCI 109	14.5 gr Green Dot	Rem. RXP20	1155 fps	9300 psi
⅞ oz.	CCI 209	14.5 gr Green Dot	Rem. RXP20	1155 fps	9300 psi
⅞ oz.	Win. 209	14.0 gr Green Dot	Win. WAA20	1155 fps	10300 psi
⅞ oz.	CCI 109	14.0 gr Green Dot	Win. WAA20	1155 fps	10000 psi
⅞ oz.	CCI 209	14.0 gr Green Dot	Win. WAA20	1155 fps	10000 psi
⅞ oz.	Win. 209	15.0 gr Green Dot	Rem. RXP20	1200 fps	10000 psi
⅞ oz.	CCI 109	15.0 gr Green Dot	Rem. RXP20	1200 fps	10000 psi
⅞ oz.	CCI 209	15.0 gr Green Dot	Rem. RXP20	1200 fps	10000 psi
⅞ oz.	Win. 209	14.5 gr Green Dot	Win. WAA20	1200 fps	10600 psi
⅞ oz.	CCI 109	14.5 gr Green Dot	Win. WAA20	1200 fps	10300 psi
⅞ oz.	CCI 209	14.5 gr Green Dot	Win. WAA20	1200 fps	10300 psi
⅞ oz.	CCI 209M	15.0 gr Unique	Win. WAA20	1155 fps	10200 psi
⅞ oz.	Win. 209	15.5 gr Unique	Fed. 20S1	1200 fps	10400 psi
⅞ oz.	Win. 209	16.0 gr Unique	Rem. RXP20	1200 fps	9000 psi
⅞ oz.	CCI 109	16.0 gr Unique	Rem. RXP20	1200 fps	9900 psi
⅞ oz.	CCI 209	16.0 gr Unique	Rem. RXP20	1200 fps	9900 psi
⅞ oz.	Win. 209	16.0 gr Unique	Win. WAA20	1200 fps	10500 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

20
20 Gauge 2¾"

Winchester-Western Compression-Formed Plastic Shell
(Continued)

Hull #25
20 Gauge 2¾"
Hull I.D. Page 105
Reference Notes Page 125

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
⅞ oz.	CCI 109	16.0 gr Unique	Win. WAA20	1200 fps	10700 psi
⅞ oz.	CCI 209	16.0 gr Unique	Win. WAA20	1200 fps	10700 psi
⅞ oz.	CCI 109	16.5 gr Unique	Lage Uniwad	1200 fps	10800 psi
⅞ oz.	CCI 209	16.5 gr Unique	Lage Uniwad	1200 fps	10800 psi
⅞ oz.	Win. 209	16.5 gr Herco	Rem. RXP20	1200 fps	9000 psi
⅞ oz.	CCI 109	16.5 gr Herco	Rem. RXP20	1200 fps	8800 psi
⅞ oz.	CCI 209	16.5 gr Herco	Rem. RXP20	1200 fps	8800 psi
⅞ oz.	Win. 209	16.5 gr Herco	Win. WAA20	1200 fps	9600 psi
⅞ oz.	CCI 109	16.5 gr Herco	Win. WAA20	1200 fps	10200 psi
⅞ oz.	CCI 209	16.5 gr Herco	Win. WAA20	1200 fps	10200 psi
⅞ oz.	CCI 209M	17.5 gr Herco	Win. WAA20	1200 fps	10000 psi
⅞ oz.	Win. 209	16.0 gr PB	Win. WAA20	1180 fps	10200 lup
⅞ oz.	CCI 109	16.0 gr PB	Win. WAA20	1185 fps	10600 lup
⅞ oz.	CCI 209	16.0 gr PB	Win. WAA20	1185 fps	10600 lup
⅞ oz.	Win. 209	17.5 gr SR7625	Win. WAA20	1205 fps	9300 lup
⅞ oz.	Fed. 209	19.5 gr SR4756	Win. WAA20F1	1210 fps	10100 lup
⅞ oz.	Fed. 209	19.5 gr SR4756	Rem. SP20	1215 fps	9500 lup
⅞ oz.	Win. 209	17.0 gr "Hi-Skor" 800X	Win. WAA20	1210 fps	9800 lup
⅞ oz.	Fed. 209	16.5 gr "Hi-Skor" 800X	Win. WAA20	1200 fps	9900 lup
⅞ oz.	Win. 209	17.0 gr "Hi-Skor" 800X	Rem. RXP20	1200 fps	9500 lup
⅞ oz.	Fed. 209	16.5 gr "Hi-Skor" 800X	Fed. 20S1	1200 fps	10800 lup
1 oz.	CCI 109	20.0 gr HS6	Rem. SP20	1195 fps	10300 lup
1 oz.	CCI 209	20.0 gr HS6	Rem. SP20	1195 fps	10300 lup
1 oz.	Win. 209	20.0 gr HS6	Rem. SP20	1195 fps	10300 lup
1 oz.	CCI 109	19.0 gr HS6	Win. WAA20F1	1194 fps	10600 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #25
20 Gauge 2¾"
Hull I.D. Page 105
Reference Notes Page 125

Winchester-Western Compression-Formed Plastic Shell

(Continued)

20
20 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	CCI 209	19.0 gr HS6	Win. WAA20F1	1194 fps	10600 lup
1 oz.	Win. 209	19.0 gr HS6	Win. WAA20F1	1194 fps	10600 lup
1 oz.	CCI 109	24.5 gr HS7	Rem. SP20	1274 fps	10600 lup
1 oz.	CCI 209	24.5 gr HS7	Rem. SP20	1274 fps	10600 lup
1 oz.	Win. 209	24.5 gr HS7	Rem. SP20	1274 fps	10600 lup
1 oz.	CCI 109	22.5 gr HS7	Win. WAA20F1	1280 fps	10500 lup
1 oz.	CCI 209	22.5 gr HS7	Win. WAA20F1	1280 fps	10500 lup
1 oz.	Win. 209	22.5 gr HS7	Win. WAA20F1	1280 fps	10500 lup
1 oz.	Win. 209	21.5 gr 540	Win. WAA20F1	1165 fps	9900 lup
1 oz.	Win. 209	22.5 gr 540	Win. WAA20F1	1220 fps	10900 lup
1 oz.	Win. 209	23.0 gr 540	Rem. SP20	1165 fps	10000 lup
1 oz.	Win. 209	24.0 gr 540	Rem. SP20	1220 fps	10700 lup
1 oz.	Win. 209	23.5 gr 571	Win. WAA20F1	1165 fps	9300 lup
1 oz.	Win. 209	25.5 gr 571	Win. WAA20F1	1250 fps	10800 lup
1 oz.	Win. 209	23.5 gr 571	Rem. SP20	1165 fps	9800 lup
1 oz.	Win. 209	24.5 gr 571	Rem. SP20	1220 fps	10300 lup
1 oz.	Win. 209	16.5 gr Herco	Rem. RXP20	1165 fps	9600 psi
1 oz.	Win. 209	16.5 gr Herco	Rem. SP20	1165 fps	10000 psi
1 oz.	Win. 209	16.5 gr Herco	Win. WAA20	1165 fps	10400 psi
1 oz.	Win. 209	23.0 gr Blue Dot	Rem. RXP20	1220 fps	11300 psi
1 oz.	Win. 209	23.5 gr Blue Dot	Rem. SP20	1220 fps	11400 psi
1 oz.	Win. 209	23.0 gr Blue Dot	Win. WAA20F1	1220 fps	11500 psi
1 oz.	Win. 209	20.5 gr SR4756	Rem. RP20	1165 fps	9400 lup
1 oz.	Win. 209	21.5 gr SR4756	Rem. RP20	1215 fps	10300 lup
1 oz.	CCI 109	22.0 gr SR4756	Rem. RP20	1220 fps	10300 lup
1 oz.	CCI 209	22.0 gr SR4756	Rem. RP20	1220 fps	10300 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

20
20 Gauge 2¾"

Winchester-Western Compression-Formed Plastic Shell
(Continued)

Hull #25
20 Gauge 2¾"
Hull I.D. Page 105
Reference Notes Page 125

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	Win. 209	17.5 gr "Hi-Skor" 800X	Win. WAA20F1	1205 fps	10700 lup
1 oz.	Win. 209	17.0 gr "Hi-Skor" 800X	Rem. RXP20	1165 fps	10300 lup
1 oz.	CCI 209M	18.0 gr "Hi-Skor" 800X	Win. WAA20F1	1215 fps	10900 lup
1⅛ oz.	CCI 109	24.0 gr HS7	Rem. RP20	1202 fps	10600 lup
1⅛ oz.	CCI 209	24.0 gr HS7	Rem. RP20	1202 fps	10600 lup
1⅛ oz.	Win. 209	24.0 gr HS7	Rem. RP20	1202 fps	10600 lup
1⅛ oz.	CCI 109	24.5 gr 571	Rem. RP20	1175 fps	10500 lup
1⅛ oz.	Win. 209	24.5 gr 571	Rem. RP20	1175 fps	10200 lup

20
20 Gauge 2¾"

Remington RXP Plastic Target Shell

Hull #26
20 Gauge 2¾"
Hull I.D. Page 105
Reference Notes Page 125

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
⅞ oz.	CCI 109	13.5 gr Trap 100	Win.WAA20	1104 fps	10500 lup
⅞ oz.	CCI 209	13.5 gr Trap 100	Win.WAA20	1104 fps	10500 lup
⅞ oz.	Win. 209	13.5 gr Trap 100	Win.WAA20	1104 fps	10500 lup
⅞ oz.	CCI 109	23.0 gr HS6	Win.WAA20	1345 fps	10500 lup
⅞ oz.	CCI 209	23.0 gr HS6	Win.WAA20	1345 fps	10500 lup
⅞ oz.	Win. 209	23.0 gr HS6	Win.WAA20	1345 fps	10500 lup
⅞ oz.	Win. 209	17.5 gr 473AA	Rem. RXP20	1200 fps	10800 lup
⅞ oz.	Win. 209	20.5 gr 540	Win.WAA20	1200 fps	9700 lup
⅞ oz.	Rem. 97*	14.0 gr Green Dot	Rem. RXP20	1155 fps	11300 psi
⅞ oz.	CCI 109	14.5 gr Green Dot	Rem. RXP20	1200 fps	10900 psi
⅞ oz.	CCI 209	14.5 gr Green Dot	Rem. RXP20	1200 fps	10900 psi
⅞ oz.	Rem. 97*	13.5 gr Green Dot	Win.WAA20	1155 fps	11400 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #26
20 Gauge 2¾"
Hull I.D. Page 105
Reference Notes Page 125

Remington RXP Plastic Target Shell

(Continued)

20
20 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
⅞ oz.	CCI 209	14.0 gr Green Dot	Win.WAA20	1155 fps	10700 psi
⅞ oz.	Rem. 97*	16.0 gr Unique	Rem. RXP20	1200 fps	9700 psi
⅞ oz.	Rem. 97*	16.0 gr Unique	Win.WAA20	1200 fps	10700 psi
⅞ oz.	CCI 109	16.0 gr Unique	Win.WAA20	1200 fps	10800 psi
⅞ oz.	CCI 209	16.0 gr Unique	Win.WAA20	1200 fps	10800 psi
⅞ oz.	Rem. 97*	17.0 gr Herco	Rem. RXP20	1200 fps	10600 psi
⅞ oz.	CCI 109	17.0 gr Herco	Rem. RXP20	1200 fps	9900 psi
⅞ oz.	CCI 209	17.0 gr Herco	Rem. RXP20	1200 fps	9900 psi
⅞ oz.	CCI 109	17.0 gr Herco	Fed. 20S1	1200 fps	11300 psi
⅞ oz.	CCI 209	17.0 gr Herco	Fed. 20S1	1200 fps	11300 psi
⅞ oz.	Rem. 97*	17.0 gr Herco	Win.WAA20	1200 fps	10600 psi
⅞ oz.	CCI 109	16.5 gr Herco	Win.WAA20	1200 fps	10400 psi
⅞ oz.	CCI 209	16.5 gr Herco	Win.WAA20	1200 fps	10400 psi
⅞ oz.	CCI 209M	16.5 gr Herco	Rem. RXP20	1200 fps	10700 psi
⅞ oz.	CCI 109	16.0 gr PB	Rem. RXP20	1200 fps	10500 lup
⅞ oz.	CCI 209	16.0 gr PB	Rem. RXP20	1200 fps	10500 lup
⅞ oz.	CCI 109	16.0 gr PB	Win.WAA20	1200 fps	10800 lup
⅞ oz.	CCI 209	16.0 gr PB	Win.WAA20	1200 fps	10800 lup
⅞ oz.	Win. 209	17.0 gr SR7625	Rem. RXP20	1205 fps	9600 lup
⅞ oz.	CCI 109	16.5 gr SR7625	Fed. 20S1	1210 fps	10900 lup
⅞ oz.	CCI 209	16.5 gr SR7625	Fed. 20S1	1210 fps	10900 lup
⅞ oz.	Fed. 209	16.0 gr SR7625	Win.WAA20	1200 fps	10500 lup
⅞ oz.	Win. 209	20.0 gr SR4756	Rem. RXP20	1200 fps	8600 lup
⅞ oz.	Fed. 209	19.0 gr SR4756	Win.WAA20	1215 fps	10000 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

20
20 Gauge 2¾"

Remington RXP Plastic Target Shell

(Continued)

Hull #26
20 Gauge 2¾"
Hull I.D. Page 105
Reference Notes Page 125

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
⅞ oz.	Rem. 97*	17.0 gr "Hi-Skor" 800X	Rem. RXP20	1205 fps	9200 lup
⅞ oz.	CCI 209M	17.0 gr "Hi-Skor" 800X	Rem. RXP20	1205 fps	9100 lup
⅞ oz.	Rem. 97*	17.0 gr "Hi-Skor" 800X	Win.WAA20	1210 fps	9900 lup
⅞ oz.	CCI 209M	16.5 gr "Hi-Skor" 800X	Win.WAA20	1195 fps	9500 lup
⅞ oz.	CCI 209M	16.5 gr "Hi-Skor" 800X	Fed. 20S1	1195 fps	10400 lup
1 oz.	CCI 109	20.0 gr HS6	Rem. SP20	1195 fps	10300 lup
1 oz.	CCI 209	20.0 gr HS6	Rem. SP20	1195 fps	10300 lup
1 oz.	Win. 209	20.0 gr HS6	Rem. SP20	1195 fps	10300 lup
1 oz.	CCI 109	19.0 gr HS6	Win. WAA20F1	1194 fps	10600 lup
1 oz.	CCI 209	19.0 gr HS6	Win. WAA20F1	1194 fps	10600 lup
1 oz.	Win. 209	19.0 gr HS6	Win. WAA20F1	1194 fps	10600 lup
1 oz.	CCI 109	24.5 gr HS7	Rem. SP20	1274 fps	10600 lup
1 oz.	CCI 209	24.5 gr HS7	Rem. SP20	1274 fps	10600 lup
1 oz.	Win. 209	24.5 gr HS7	Rem. SP20	1274 fps	10600 lup
1 oz.	CCI 109	22.5 gr HS7	Win. WAA20F1	1280 fps	10500 lup
1 oz.	CCI 209	22.5 gr HS7	Win. WAA20F1	1280 fps	10500 lup
1 oz.	Win. 209	22.5 gr HS7	Win. WAA20F1	1280 fps	10500 lup
1 oz.	Rem. 97*	15.5 gr Unique	Win. WAA20	1165 fps	11200 psi
1 oz.	Rem. 97*	16.0 gr Unique	Rem. RXP20	1165 fps	10600 psi
1 oz.	Rem. 97*	18.0 gr Herco	Rem. RXP20	1220 fps	11000 psi
1 oz.	CCI 109	20.5 gr SR4756	Rem. RP20	1165 fps	9800 lup
1 oz.	CCI 209	20.5 gr SR4756	Rem. RP20	1165 fps	9800 lup
1 oz.	Win. 209	20.0 gr SR4756	Rem. RP20	1165 fps	10500 lup
1 oz.	CCI 109	21.5 gr SR4756	Rem. RP20	1205 fps	10300 lup
1 oz.	CCI 209	21.5 gr SR4756	Rem. RP20	1205 fps	10300 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #26
20 Gauge 2¾"
Hull I.D. Page 105
Reference Notes Page 125

Remington RXP Plastic Target Shell

(Continued)

20
20 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	Rem. 97*	16.5 gr "HI-Skor" 800X	Rem. RXP20	1160 fps	10900 lup
1 oz.	Win. 209	22.0 gr 540	Win. WAA20F1	1220 fps	10700 lup
1 oz.	Win. 209	25.0 gr 571	Win. WAA20F1	1240 fps	10900 lup

Hull #27
20 Gauge 2¾"
Hull I.D. Page 105
Reference Notes Page 126

Remington S.P. Plastic Shell—Express
(With Plastic Basewad)

20
20 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
⅞ oz.	CCI 109	16.0 gr PB	Win. WAA20F1	1190 fps	10700 lup
⅞ oz.	CCI 209	16.0 gr PB	Win. WAA20F1	1190 fps	10700 lup
⅞ oz.	Fed. 209	17.0 gr SR7625	Rem. SP20	1215 fps	10900 lup
⅞ oz.	Fed. 209	16.5 gr SR7625	Win. WAA20F1	1195 fps	10700 lup
⅞ oz.	Fed. 209	18.0 gr SR4756	Rem. SP20	1210 fps	10200 lup
⅞ oz.	Win. 209	18.5 gr SR4756	Fed. 20S1	1200 fps	10900 lup
⅞ oz.	Rem. 97*	17.0 gr "Hi-Skor" 800X	Rem. RXP20	1205 fps	8800 lup
⅞ oz.	CCI 209M	17.0 gr "Hi-Skor" 800X	Win. WAA20	1205 fps	9000 lup
1 oz.	CCI 109	19.5 gr SR4756	Rem. RP20	1175 fps	9900 lup
1 oz.	CCI 209	19.5 gr SR4756	Rem. RP20	1175 fps	9900 lup
1 oz.	Rem. 97*	18.0 gr "Hi-Skor" 800X	Rem. RP20	1220 fps	10400 lup
1 oz.	CCI 209M	18.0 gr "Hi-Skor" 800X	Lage Uniwad 20	1210 fps	10700 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

20
20 Gauge 2¾"

Remington S.P. Plastic Shell—Shurshot-Victor *(With Fiber Basewad)*

Hull #28
20 Gauge 2¾"
Hull I.D. Page 106
Reference Notes Page 126

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
⅞ oz.	CCI 157	14.0 gr Trap 100	Rem. RXP20	1110 fps	10400 lup
⅞ oz.	Rem. 57*	15.0 gr Green Dot	Fed. 20S1	1200 fps	10600 psi
⅞ oz.	Rem. 57*	15.0 gr Green Dot	Rem. RXP20	1200 fps	9700 psi
⅞ oz.	Rem. 57*	15.0 gr Green Dot	Win. WAA20	1200 fps	9900 psi
⅞ oz.	Rem. 57*	15.5 gr Unique	Rem. RXP20	1200 fps	8400 psi
⅞ oz.	Rem. 57*	15.0 gr Unique	Win. WAA20	1200 fps	8900 psi
⅞ oz.	Rem. 57*	17.0 gr Herco	Rem. RXP20	1200 fps	8300 psi
⅞ oz.	Rem. 57*	17.0 gr Herco	Win. WAA20	1200 fps	9000 psi
⅞ oz.	CCI 157	18.5 gr SR7625	Rem. RXP20	1210 fps	8700 lup
1 oz.	Rem. 57*	17.0 gr Unique	Rem. RP20	1220 fps	10600 psi
1 oz.	Rem. 57*	17.0 gr Unique	Rem. SP20	1220 fps	10400 psi
1 oz.	Rem. 57*	19.0 gr Herco	Rem. RP20	1220 fps	10800 psi
1 oz.	Rem. 57*	19.0 gr Herco	Rem. SP20	1220 fps	11400 psi
1 oz.	CCI 157	26.0 gr HS7	Rem. SP20	1266 fps	10100 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull I.D. #29
20 Gauge 2¾"
Reloading Data Page 106
Reference Notes Page 126

Remington S.P. Plastic Shell—Express
(With Fiber Basewad)

20
20 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	CCI 157	26.0 gr HS7	Rem. SP20	1266 fps	10100 lup
1 oz.	Rem. 57*	16.0 gr Unique	Rem. RP20	1165 fps	9300 psi
1 oz.	Rem. 57*	16.0 gr Unique	Rem. SP20	1165 fps	10100 psi
1 oz.	Rem. 57*	17.0 gr Unique	Rem. RP20	1220 fps	10100 psi
1 oz.	Rem. 57*	17.0 gr Unique	Rem. SP20	1220 fps	10900 psi
1 oz.	Rem. 57*	18.5 gr Herco	Rem. RP20	1220 fps	10100 psi
1 oz.	Rem. 57*	18.5 gr Herco	Rem. SP20	1220 fps	10400 psi
1 oz.	CCI 157	18.5 gr SR7625	Rem. RP20	1165 fps	9700 lup
1 oz.	CCI 157	21.0 gr SR4756	Rem. RP20	1155 fps	8400 lup
1 oz.	CCI 157	23.5 gr 540	Rem. SP20	1220 fps	9700 lup
1 oz.	CCI 157	23.5 gr 540	Win. WAA20F1	1250 fps	9700 lup
1 oz.	CCI 157	26.0 gr 571	Win. WAA20F1	1250 fps	9700 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

20

20 Gauge 2¾"

Federal Paper Target Shell

Hull #30
20 Gauge 2¾"
Hull I.D. Page 106
Reference Notes Page 127

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
⅞ oz.	CCI 109	15.0 gr Trap 100	Win. WAA20	1131 fps	10600 lup
⅞ oz.	CCI 209	15.0 gr Trap 100	Win. WAA20	1131 fps	10600 lup
⅞ oz.	Win. 209	15.0 gr Trap 100	Win. WAA20	1131 fps	10600 lup
⅞ oz.	Fed. 209	15.0 gr Green Dot	Fed. 20S1	1155 fps	9900 psi
⅞ oz.	CCI 109	14.5 gr Green Dot	Fed. 20S1	1155 fps	8900 psi
⅞ oz.	CCI 209	14.5 gr Green Dot	Fed. 20S1	1155 fps	8900 psi
⅞ oz.	CCI 209M	14.5 gr Green Dot	Fed. 20S1	1155 fps	9800 psi
⅞ oz.	CCI 109	15.0 gr Green Dot	Fed. 20S1	1200 fps	9000 psi
⅞ oz.	CCI 209	15.0 gr Green Dot	Fed. 20S1	1200 fps	9000 psi
⅞ oz.	CCI 209M	15.0 gr Green Dot	Fed. 20S1	1200 fps	10500 psi
⅞ oz.	Fed. 209	14.5 gr Green Dot	Rem. RXP20	1155 fps	10100 psi
⅞ oz.	CCI 109	15.0 gr Green Dot	Rem. RXP20	1155 fps	8700 psi
⅞ oz.	CCI 209	15.0 gr Green Dot	Rem. RXP20	1155 fps	8700 psi
⅞ oz.	Fed. 209	14.5 gr Green Dot	Win. WAA20	1155 fps	9500 psi
⅞ oz.	CCI 109	15.5 gr Green Dot	Win. WAA20	1200 fps	8800 psi
⅞ oz.	CCI 209	15.5 gr Green Dot	Win. WAA20	1200 fps	8800 psi
⅞ oz.	Fed. 209	15.5 gr Unique	Fed. 20S1	1155 fps	9000 psi
⅞ oz.	CCI 109	17.0 gr Unique	Fed. 20S1	1200 fps	8400 psi
⅞ oz.	CCI 209	17.0 gr Unique	Fed. 20S1	1200 fps	8400 psi
⅞ oz.	CCI 209M	17.0 gr Unique	Fed. 20S1	1200 fps	9900 psi
⅞ oz.	Fed. 209	16.0 gr Unique	Win. WAA20	1200 fps	9200 psi
⅞ oz.	CCI 109	17.0 gr Unique	Win. WAA20	1200 fps	8500 psi
⅞ oz.	CCI 209	17.0 gr Unique	Win. WAA20	1200 fps	8500 psi
⅞ oz.	CCI 109	17.0 gr Unique	Rem. RXP20	1200 fps	8500 psi
⅞ oz.	CCI 209	17.0 gr Unique	Rem. RXP20	1200 fps	8500 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #30
20 Gauge 2¾"
Hull I.D. Page 106
Reference Notes Page 127

Federal Paper Target Shell

(Continued)

20
20 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
⅞ oz.	Fed. 209	14.5 gr "Hi-Skor" 700X	Fed. 20S1	1190 fps	10900 lup
⅞ oz.	Win. 209	15.0 gr "Hi-Skor" 700X	Win. WAA20	1210 fps	10500 lup
⅞ oz.	Fed. 209	17.5 gr PB	Win. WAA20	1205 fps	9000 lup
⅞ oz.	Fed. 209	18.5 gr SR7625	Fed. 20S1	1210 fps	8700 lup
⅞ oz.	Fed. 209	18.5 gr SR7625	Rem. RXP20	1220 fps	8500 lup
⅞ oz.	Fed. 209	21.0 gr SR4756	Win. WAA20	1215 fps	8600 lup
⅞ oz.	Fed. 209	17.0 gr "Hi-Skor" 800X	Fed. 20S1	1195 fps	9300 lup
⅞ oz.	Fed. 209	17.5 gr "Hi-Skor" 800X	Win. WAA20	1210 fps	8600 lup
⅞ oz.	CCI 209M	17.5 gr "Hi-Skor" 800X	Win. WAA20	1210 fps	8500 lup
⅞ oz.	CCI 209M	17.5 gr "Hi-Skor" 800X	Rem. RXP20	1200 fps	7900 lup
1 oz.	CCI 109	22.0 gr HS6	Win. WAA20F1	1205 fps	10400 lup
1 oz.	CCI 209	22.0 gr HS6	Win. WAA20F1	1205 fps	10400 lup
1 oz.	Win. 209	22.0 gr HS6	Win. WAA20F1	1205 fps	10400 lup
1 oz.	CCI 109	25.0 gr HS7	Win. WAA20F1	1256 fps	10100 lup
1 oz.	CCI 209	25.0 gr HS7	Win. WAA20F1	1256 fps	10100 lup
1 oz.	Win. 209	25.0 gr HS7	Win. WAA20F1	1256 fps	10100 lup
1 oz.	Fed. 209	17.0 gr Herco	Rem. RP20	1165 fps	11400 psi
1 oz.	Fed. 209	16.5 gr Herco	Rem. SP20	1165 fps	11500 psi
1 oz.	Fed. 209	16.5 gr Herco	Win. WAA20F1	1165 fps	11300 psi
1 oz.	Fed. 209	17.5 gr SR7625	Rem. SP20	1155 fps	10000 lup
1 oz.	CCI 209	19.5 gr SR7625	Win. WAA20F1	1210 fps	10700 lup
1 oz.	Fed. 209	21.5 gr SR4756	Rem. SP20	1215 fps	10500 lup
1 oz.	Win. 209	22.5 gr SR4756	Win. WAA20F1	1225 fps	10000 lup
1 oz.	Fed. 209	17.5 gr "Hi-Skor" 800X	Fed. 20S1	1175 fps	10200 lup
1 oz.	Fed. 209	17.0 gr "Hi-Skor" 800X	Rem. SP20	1160 fps	9500 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

20 Gauge 2¾"

Federal Paper Target Shell

Hull #30
20 Gauge 2¾"
Hull I.D. Page 106
Reference Notes Page 127

(Continued)

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	CCI 209M	17.0 gr "Hi-Skor" 800X	Rem. SP20	1160 fps	9300 lup
1 oz.	Fed. 209	17.0 gr "Hi-Skor" 800X	Win. WAA20F1	1160 fps	9300 lup
1 oz.	CCI 209M	17.5 gr "Hi-Skor" 800X	Win. WAA20F1	1170 fps	9300 lup
1 oz.	Fed. 209	18.5 gr "Hi-Skor" 800X	Win. WAA20F1	1215 fps	10800 lup

20 Gauge 2¾"

Federal Plastic Target Shell

Hull #31
20 Gauge 2¾"
Hull I.D. Page 106
Reference Notes Page 127

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
⅞ oz.	CCI 109	15.0 gr Trap 100	Win. WAA20	1131 fps	10600 lup
⅞ oz.	CCI 209	15.0 gr Trap 100	Win. WAA20	1131 fps	10600 lup
⅞ oz.	Win. 209	15.0 gr Trap 100	Win. WAA20	1131 fps	10600 lup
⅞ oz.	Fed. 209	14.5 gr Green Dot	Fed. 20S1	1155 fps	9800 psi
⅞ oz.	Fed. 209	15.5 gr Green Dot	Fed. 20S1	1200 fps	10400 psi
⅞ oz.	CCI 209M	14.5 gr Green Dot	Fed. 20S1	1155 fps	9100 psi
⅞ oz.	CCI 209M	16.5 gr Green Dot	Fed. 20S1	1200 fps	9300 psi
⅞ oz.	CCI 109	15.5 gr Green Dot	Fed. 20S1	1200 fps	9400 psi
⅞ oz.	CCI 209	15.5 gr Green Dot	Fed. 20S1	1200 fps	9400 psi
⅞ oz.	Fed. 209	15.0 gr Green Dot	Rem. RXP20	1155 fps	9700 psi
⅞ oz.	CCI 109	16.0 gr Green Dot	Rem. RXP20	1200 fps	9600 psi
⅞ oz.	CCI 209	16.0 gr Green Dot	Rem. RXP20	1200 fps	9600 psi
⅞ oz.	CCI 109	14.5 gr Green Dot	Win. WAA20	1155 fps	8000 psi
⅞ oz.	CCI 209	14.5 gr Green Dot	Win. WAA20	1155 fps	8000 psi
⅞ oz.	CCI 109	15.5 gr Green Dot	Win. WAA20	1200 fps	9100 psi
⅞ oz.	CCI 209	15.5 gr Green Dot	Win. WAA20	1200 fps	9100 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #31
20 Gauge 2¾"
Hull I.D. Page 106
Reference Notes Page 127

Federal Plastic Target Shell

(Continued)

20
20 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
⅞ oz.	Fed. 209	15.5 gr Green Dot	Win. WAA20	1200 fps	10500 psi
⅞ oz.	Fed. 209	16.0 gr Unique	Fed. 20S1	1200 fps	10200 psi
⅞ oz.	CCI 109	17.0 gr Unique	Rem. RXP20	1200 fps	9200 psi
⅞ oz.	CCI 209	17.0 gr Unique	Rem. RXP20	1200 fps	9200 psi
⅞ oz.	CCI 109	17.0 gr Unique	Win. WAA20	1200 fps	8500 psi
⅞ oz.	CCI 209	17.0 gr Unique	Win. WAA20	1200 fps	8500 psi
⅞ oz.	Fed. 209	16.0 gr Unique	Win. WAA20	1200 fps	9800 psi
⅞ oz.	Fed. 209	17.0 gr PB	Rem. RXP20	1205 fps	9800 lup
⅞ oz.	Fed. 209	17.5 gr SR7625	Rem. RXP20	1195 fps	8400 lup
⅞ oz.	Fed. 209	18.0 gr "Hi-Skor" 800X	Fed. 20S1	1210 fps	8600 lup
⅞ oz.	Fed. 209	18.0 gr "Hi-Skor" 800X	Rem. RXP20	1205 fps	8000 lup
⅞ oz.	CCI 209M	18.5 gr "Hi-Skor" 800X	Rem. RXP20	1210 fps	7700 lup
⅞ oz.	CCI 209M	18.5 gr "Hi-Skor" 800X	Win. WAA20	1210 fps	8200 lup
1 oz.	CCI 109	22.0 gr HS6	Win.WAA20F1	1205 fps	10400 lup
1 oz.	CCI 209	22.0 gr HS6	Win.WAA20F1	1205 fps	10400 lup
1 oz.	Win. 209	22.0 gr HS6	Win.WAA20F1	1205 fps	10400 lup
1 oz.	CCI 109	25.0 gr HS7	Win.WAA20F1	1256 fps	10100 lup
1 oz.	CCI 209	25.0 gr HS7	Win.WAA20F1	1256 fps	10100 lup
1 oz.	Win. 209	25.0 gr HS7	Win.WAA20F1	1256 fps	10100 lup
1 oz.	CCI 209M	18.5 gr Herco	Fed. 20S1	1220 fps	9800 psi
1 oz.	Fed. 209	22.0 gr Blue Dot	Rem. SP20	1220 fps	11000 psi
1 oz.	Fed. 209	23.0 gr Blue Dot	Win.WAA20F1	1220 fps	10900 psi
1 oz.	Win. 209	18.0 gr SR7625	Rem. SP20	1160 fps	10200 lup
1 oz.	CCI 209	19.5 gr SR7625	Rem. SP20	1205 fps	10000 lup
1 oz.	CCI 109	19.5 gr SR7625	Rem. SP20	1205 fps	10000 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

20 Gauge 2¾"

Federal Plastic Target Shell

(Continued)

Hull #31
20 Gauge 2¾"
Hull I.D. Page 106
Reference Notes Page 127

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 oz.	Fed. 209	20.5 gr SR4756	Rem. SP20	1180 fps	10100 lup
1 oz.	Fed. 209	21.5 gr SR4756	Rem. RP20	1210 fps	9900 lup
1 oz.	CCI 209M	18.0 gr "Hi-Skor" 800X	Rem. SP20	1165 fps	8600 lup
1 oz.	Fed. 209	19.0 gr "Hi-Skor" 800X	Rem. SP20	1220 fps	9600 lup
1 oz.	Fed. 209	18.5 gr "Hi-Skor" 800X	Fed. 20S1	1215 fps	10500 lup
1 oz.	CCI 209M	18.0 gr "Hi-Skor" 800X	Win.WAA20F1	1175 fps	8600 lup
1 oz.	Fed. 209	19.0 gr "Hi-Skor" 800X	Win.WAA20F1	1230 fps	10000 lup

20 Gauge 2¾"

Federal Hi-Power Plastic Shell

Hull #32
20 Gauge 2¾"
Hull I.D. Page 107
Reference Notes Page 127

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
⅞ oz.	CCI 109	15.0 gr Trap 100	Win. WAA20	1131 fps	10600 lup
⅞ oz.	CCI 209	15.0 gr Trap 100	Win. WAA20	1131 fps	10600 lup
⅞ oz.	Win. 209	15.0 gr Trap 100	Win. WAA20	1131 fps	10600 lup
⅞ oz.	Fed. 209	15.5 gr Green Dot	Rem. RXP20	1200 fps	11000 psi
⅞ oz.	Fed. 209	15.5 gr Green Dot	Win. WAA20	1200 fps	11500 psi
⅞ oz.	Fed. 209	16.0 gr Unique	Fed. 20S1	1200 fps	10600 psi
⅞ oz.	Fed. 209	16.0 gr Unique	Rem. RXP20	1200 fps	10100 psi
⅞ oz.	Fed. 209	16.0 gr Unique	Win. WAA20	1200 fps	10400 psi
⅞ oz.	Fed. 209	17.0 gr Herco	Fed. 20S1	1200 fps	8900 psi
⅞ oz.	Fed. 209	18.5 gr Herco	Rem. RXP20	1200 fps	8900 psi
⅞ oz.	Fed. 209	17.0 gr Herco	Win. WAA20	1200 fps	9000 psi
⅞ oz.	Fed. 209	18.0 gr PB	Rem. RXP20	1220 fps	9000 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #32
20 Gauge 2¾"
Hull I.D. Page 107
Reference Notes Page 127

Federal Hi-Power Plastic Shell

(Continued)

20
20 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
⅞ oz.	Fed. 209	19.0 gr SR7625	Rem. RXP20	1220 fps	7900 lup
⅞ oz.	Fed. 209	20.5 gr SR4756	Rem. RXP20	1190 fps	8100 lup
⅞ oz.	Win. 209	19.0 gr 473AA	Win. WAA20	1200 fps	9100 lup
⅞ oz.	Fed. 209	19.0 gr 473AA	Win. WAA20	1200 fps	9300 lup
⅞ oz.	Win. 209	19.0 gr 473AA	Fed. 20S1	1200 fps	9600 lup
⅞ oz.	Fed. 209	19.0 gr 473AA	Fed. 20S1	1200 fps	9900 lup
1 oz.	CCI 109	22.0 gr HS6	Win. WAA20F1	1205 fps	10400 lup
1 oz.	CCI 209	22.0 gr HS6	Win. WAA20F1	1205 fps	10400 lup
1 oz.	Win. 209	22.0 gr HS6	Win. WAA20F1	1205 fps	10400 lup
1 oz.	CCI 109	25.0 gr HS7	Win. WAA20F1	1256 fps	10100 lup
1 oz.	CCI 209	25.0 gr HS7	Win. WAA20F1	1256 fps	10100 lup
1 oz.	Win. 209	25.0 gr HS7	Win. WAA20F1	1256 fps	10100 lup
1 oz.	Fed. 209	17.5 gr Unique	Fed.20S1	1220 fps	10600 psi
1 oz.	Fed. 209	18.0 gr Herco	Fed.20S1	1220 fps	10600 psi
1 oz.	Fed. 209	18.0 gr Herco	Win. WAA20	1220 fps	10900 psi
1 oz.	Fed. 209	22.5 gr Blue Dot	Win. WAA20F1	1220 fps	10000 psi
1 oz.	Fed. 209	17.5 gr SR7625	Rem. SP20	1160 fps	10000 lup
1 oz.	Win. 209	19.0 gr SR7625	Rem. SP20	1205 fps	10500 lup
1 oz.	Fed. 209	21.5 gr SR4756	Rem. SP20	1220 fps	10600 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

20
20 Gauge 3″

Winchester-Western Compression-Formed Plastic Shell

Hull #33
20 Gauge 3″
Hull I.D. Page 107
Reference Notes Page 128

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	Win. 209	25.5 gr Blue Dot	Win. WAA20F1	1230 fps	11100 psi
1⅛ oz.	Win. 209	25.5 gr Blue Dot	Rem. SP20	1230 fps	11000 psi
1⅛ oz.	Win. 209	23.5 gr SR4756	Win. WAA20F1	1185 fps	10900 lup
1⅛ oz.	Win. 209	23.5 gr SR4756	Rem. SP20	1200 fps	10900 lup
1⅛ oz.	Fed. 209	25.0 gr SR4756	Rem. SP20	1215 fps	10900 lup
1⅛ oz.	Win. 209	27.0 gr 571	Win. WAA20	1220 fps	11000 lup
1⅛ oz.	CCI 109	27.0 gr 571	Win. WAA20	1220 fps	11100 lup
1⅛ oz.	CCI 109	27.0 gr HS7	Rem. RXP20	1239 fps	10400 lup
1⅛ oz.	CCI 209	27.0 gr HS7	Rem. RXP20	1239 fps	10400 lup
1⅛ oz.	Win. 209	27.0 gr HS7	Rem. RXP20	1239 fps	10400 lup
1¼ oz.	Win. 209	25.0 gr Blue Dot	Rem. SP20	1190 fps	11500 psi
1¼ oz.	Win. 209	34.5 gr 2400	Rem. RP20	1240 fps	9600 psi
1¼ oz.	Win. 209	39.0 gr IMR4227	Rem. RP20	1135 fps	9600 lup
1¼ oz.	Fed. 209	39.0 gr IMR4227	Rem. RP20	1185 fps	10900 lup
1¼ oz.	Win. 209	24.0 gr 571	Win. WAA20	1135 fps	10800 lup
1¼ oz.	CCI 109	24.0 gr 571	Win. WAA20	1135 fps	11000 lup
1¼ oz.	CCI 109	24.0 gr HS7	Win. WAA20	1166 fps	10600 lup
1¼ oz.	CCI 209	24.0 gr HS7	Win. WAA20	1166 fps	10600 lup
1¼ oz.	Win. 209	24.0 gr HS7	Win. WAA20	1166 fps	10600 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #34
20 Gauge 3″
Hull I.D. Page 107
Reference Notes Page 128

Remington S.P. Plastic Shell
(With Fiber Basewad)

20
20 Gauge 3″

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	Rem. 57*	26.0 gr Blue Dot	Rem. SP20	1230 fps	10000 psi
1⅛ oz.	Rem. 57*	27.5 gr Blue Dot	Rem. SP20	1285 fps	10500 psi
1⅛ oz.	Rem. 57*	25.5 gr Blue Dot	Win. WAA20F1	1230 fps	9700 psi
1⅛ oz.	Rem. 57*	28.0 gr Blue Dot	Win. WAA20F1	1285 fps	10700 psi
1⅛ oz.	CCI 157	24.5 gr SR4756	Rem. RP20	1205 fps	10000 lup
1⅛ oz.	CCI 157	26.0 gr HS7	Rem. SP20	1245 fps	10300 lup
1¼ oz.	Rem. 57*	25.5 gr Blue Dot	Rem. SP20	1190 fps	10800 psi
1¼ oz.	CCI 157	28.5 gr 571	Rem. SP20	1220 fps	10000 lup
1¼ oz.	CCI 157	25.0 gr HS7	Rem. SP20	1153 fps	10200 lup

Hull #35
20 Gauge 3″
Hull I.D. Page 107
Reference Notes Page 128

Remington S.P. Plastic Shell
(With Plastic Basewad)

20
20 Gauge 3″

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
⅞ oz.	Rem. 97*	20.0 gr "Hi-Skor" 800X	Lage Uniwad	1320 fps	9800 lup
1 oz.	Rem. 97*	18.5 gr "Hi-Skor" 800X	Rem. RXP20	1205 fps	10000 lup
1 oz.	CCI 209M	18.5 gr "Hi-Skor" 800X	Win. WAA20	1205 fps	10700 lup
1⅛ oz.	Rem. 97*	17.5 gr "Hi-Skor" 800X	Rem. RXP20	1120 fps	10800 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

20
20 Gauge 3″

Federal Hi-Power Plastic Shell

Hull #36
20 Gauge 3″
Hull I.D. Page 108
Reference Notes Page 129

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1⅛ oz.	Fed. 209	27.0 gr Blue Dot	Rem. RXP20	1285 fps	11200 psi
1⅛ oz.	Fed. 209	36.0 gr 2400	Rem. SP20	1285 fps	8600 psi
1⅛ oz.	Fed. 209	24.0 gr SR4756	Rem. SP20	1215 fps	10900 lup
1⅛ oz.	Win. 209	26.0 gr SR4756	Rem. SP20	1270 fps	10600 lup
1⅛ oz.	Win. 209	26.0 gr SR4756	Win. WAA20F1	1265 fps	10600 lup
1⅛ oz.	Fed. 209	20.5 gr "Hi-Skor" 800X	Fed. 20S1	1205 fps	10400 lup
1⅛ oz.	Fed. 209	21.0 gr "Hi-Skor" 800X	Rem RXP20	1215 fps	10700 lup
1¼ oz.	CCI 109	26.0 gr HS7	Rem RXP20	1196 fps	10500 lup
1¼ oz.	CCI 209	26.0 gr HS7	Rem RXP20	1196 fps	10500 lup
1¼ oz.	Win. 209	26.0 gr HS7	Rem RXP20	1196 fps	10500 lup
1¼ oz.	CCI 109	26.0 gr HS7	Win. WAA20	1196 fps	10500 lup
1¼ oz.	CCI 209	26.0 gr HS7	Win. WAA20	1196 fps	10500 lup
1¼ oz.	Win. 209	26.0 gr HS7	Win. WAA20	1196 fps	10500 lup
1¼ oz.	Fed. 209	25.0 gr Blue Dot	Rem RXP20	1190 fps	11000 psi
1¼ oz.	Win. 209	24.0 gr SR4756	Rem.RP20	1155 fps	10400 lup
1¼ oz.	Fed. 209	40.0 gr IMR4227	Rem.RP20	1175 fps	8700 lup
1¼ oz.	Win. 209	40.0 gr IMR4227	Rem.RP20	1150 fps	7800 lup
1¼ oz.	Fed. 209	19.5 gr "Hi-Skor" 800X	Rem RXP20	1120 fps	10400 lup
1¼ oz.	CCI 109	45.0 gr H4227	Rem.RP20	1300 fps	8400 lup
1¼ oz.	CCI 209	45.0 gr H4227	Rem.RP20	1300 fps	8400 lup
1¼ oz.	Win. 209	45.0 gr H4227	Rem.RP20	1300 fps	8400 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #37
28 Gauge 2¾"
Hull I.D. Page 108
Reference Notes Page 129

Winchester-Western Compression-Formed Plastic Shell

28
28 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
1 1/16 oz.	CCI 109	10.8 gr "Hi-Skor" 700X	Win. WAA28	1170 fps	11400 lup
1 1/16 oz.	CCI 209	10.8 gr "Hi-Skor" 700X	Win. WAA28	1170 fps	11400 lup
1 1/16 oz.	Rem. 97-4	11.6 gr "Hi-Skor" 700X	Win. WAA28	1195 fps	11200 lup
1 1/16 oz.	Win. 209	12.6 gr PB	Win. WAA28	1190 fps	11200 lup
1 1/16 oz.	CCI 109	12.3 gr PB	Fed. 28S1	1165 fps	11200 lup
1 1/16 oz.	CCI 209	12.3 gr PB	Fed. 28S1	1165 fps	11200 lup
1 1/16 oz.	Win. 209	14.0 gr SR7625	Win. WAA28	1225 fps	10300 lup
1 1/16 oz.	CCI 109	13.7 gr SR7625	Fed. 28S1	1210 fps	11300 lup
1 1/16 oz.	CCI 209	13.7 gr SR7625	Fed. 28S1	1210 fps	11300 lup
1 1/16 oz.	Win. 209	15.0 gr SR4756	Win. WAA28	1175 fps	9000 lup
1 1/16 oz.	Fed. 209	15.0 gr SR4756	Win. WAA28	1215 fps	10600 lup
1 1/16 oz.	Win. 209	15.6 gr SR4756	Fed. 28S1	1225 fps	11200 lup
1 1/16 oz.	CCI 109	16.5 gr SR4756	Fed. 28S1	1265 fps	11400 lup
1 1/16 oz.	CCI 209	16.5 gr SR4756	Fed. 28S1	1265 fps	11400 lup
¾ oz.	CCI 109	17.0 gr HS6	Win. WAA28	1196 fps	9400 lup
¾ oz.	CCI 209	17.0 gr HS6	Win. WAA28	1196 fps	9400 lup
¾ oz.	Win. 209	17.0 gr HS6	Win. WAA28	1196 fps	9400 lup
¾ oz.	CCI 109	17.0 gr HS6	Rem. SP28	1196 fps	9400 lup
¾ oz.	CCI 209	17.0 gr HS6	Rem. SP28	1196 fps	9400 lup
¾ oz.	Win. 209	17.0 gr HS6	Rem. SP28	1196 fps	9400 lup
¾ oz.	CCI 109	20.5 gr HS7	Win. WAA28	1313 fps	10300 lup
¾ oz.	CCI 209	20.5 gr HS7	Win. WAA28	1313 fps	10300 lup
¾ oz.	Win. 209	20.5 gr HS7	Win. WAA28	1313 fps	10300 lup
¾ oz.	CCI 109	20.5 gr HS7	Rem. SP28	1313 fps	10300 lup
¾ oz.	CCI 209	20.5 gr HS7	Rem. SP28	1313 fps	10300 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

28
28 Gauge 2¾"

Winchester-Western Compression-Formed Plastic Shell
(Continued)

Hull #37
28 Gauge 2¾"
Hull I.D. Page 108
Reference Notes Page 129

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
¾ oz.	Win. 209	20.5 gr HS7	Rem. SP28	1313 fps	10300 lup
¾ oz.	Win. 209	12.5 gr Green Dot	Win. WAA28	1200 fps	11900 psi
¾ oz.	CCI 109	13.0 gr Unique	Win. WAA28	1200 fps	8400 psi
¾ oz.	CCI 209	13.0 gr Unique	Win. WAA28	1200 fps	8400 psi
¾ oz.	Win. 209	13.0 gr Unique	Win. WAA28	1200 fps	9400 psi
¾ oz.	CCI 109	14.0 gr Herco	Win. WAA28	1200 fps	7900 psi
¾ oz.	CCI 209	14.0 gr Herco	Win. WAA28	1200 fps	7900 psi
¾ oz.	Win. 209	14.0 gr Herco	Win. WAA28	1200 fps	8400 psi
¾ oz.	CCI 209M	14.0 gr "Hi-Skor" 800X	Win. WAA28	1210 fps	10500 lup
¾ oz.	Win. 209	14.0 gr "Hi-Skor" 800X	Win. WAA28	1210 fps	10800 lup
¾ oz.	Rem. 97-4	14.0 gr "Hi-Skor" 800X	Fed. 28S1	1195 fps	11000 lup
¾ oz.	CCI 109	17.5 gr 540	Win. WAA28	1200 fps	10200 lup
¾ oz.	Win. 209	17.5 gr 540	Win. WAA28	1200 fps	9900 lup
¾ oz.	CCI 109	19.0 gr 571	Win. WAA28	1200 fps	10300 lup
¾ oz.	Win. 209	19.0 gr 571	Win. WAA28	1200 fps	10200 lup
¾ oz.	CCI 109	20.5 gr 571	Win. WAA28	1260 fps	11100 lup
¾ oz.	Win. 209	20.5 gr 571	Win. WAA28	1260 fps	11000 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #38
28 Gauge 2¾"
Hull I.D. Page 108
Reference Notes Page 129

Remington S.P. Plastic Shell
(With Plastic Basewad)

28
28 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
¾ oz.	CCI 109	21.0 gr HS7	Rem. SP28	1294 fps	10000 lup
¾ oz.	CCI 209	21.0 gr HS7	Rem. SP28	1294 fps	10000 lup
¾ oz.	Win. 209	21.0 gr HS7	Rem. SP28	1294 fps	10000 lup
¾ oz.	CCI 109	21.0 gr HS7	WIN. WAA28	1294 fps	10000 lup
¾ oz.	CCI 209	21.0 gr HS7	WIN. WAA28	1294 fps	10000 lup
¾ oz.	Win. 209	21.0 gr HS7	WIN. WAA28	1294 fps	10000 lup
¾ oz.	Rem. 97*	12.0 gr Green Dot	Rem. SP28	1200 fps	10500 psi
¾ oz.	CCI 209	12.0 gr Green Dot	Rem. SP28	1200 fps	10200 psi
¾ oz.	CCI 109	12.0 gr Green Dot	Rem. SP28	1200 fps	10200 psi
¾ oz.	Rem. 97*	12.0 gr Green Dot	WIN. WAA28	1200 fps	10300 psi
¾ oz.	CCI 209	12.0 gr Green Dot	WIN. WAA28	1200 fps	10400 psi
¾ oz.	CCI 109	12.0 gr Green Dot	WIN. WAA28	1200 fps	10400 psi
¾ oz.	Rem. 97*	13.5 gr Unique	Fed. 28S1	1200 fps	11300 psi
¾ oz.	Rem. 97*	15.0 gr Unique	Fed. 28S1	1295 fps	10600 psi
¾ oz.	CCI 209	14.0 gr Unique	Fed. 28S1	1200 fps	10900 psi
¾ oz.	CCI 109	14.0 gr Unique	Fed. 28S1	1200 fps	10900 psi
¾ oz.	Rem. 97*	13.0 gr Unique	Rem. SP28	1200 fps	9100 psi
¾ oz.	CCI 209	13.0 gr Unique	Rem. SP28	1200 fps	9100 psi
¾ oz.	CCI 109	13.0 gr Unique	Rem. SP28	1200 fps	9100 psi
¾ oz.	Rem. 97*	13.0 gr Unique	WIN. WAA28	1200 fps	8900 psi
¾ oz.	CCI 209	13.0 gr Unique	WIN. WAA28	1200 fps	9100 psi
¾ oz.	CCI 109	13.0 gr Unique	WIN. WAA28	1200 fps	9100 psi
¾ oz.	Rem. 97*	14.0 gr Herco	Rem. SP28	1200 fps	8700 psi
¾ oz.	CCI 209	14.0 gr Herco	Rem. SP28	1200 fps	8900 psi
¾ oz.	CCI 109	14.0 gr Herco	Rem. SP28	1200 fps	8900 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

28

28 Gauge 2¾"

Remington S.P. Plastic Shell
(With Plastic Basewad)

(Continued)

Hull #38
28 Gauge 2¾"
Hull I.D. Page 108
Reference Notes Page 129

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
¾ oz.	Rem. 97*	14.0 gr Herco	WIN. WAA28	1200 fps	8800 psi
¾ oz.	CCI 209	14.0 gr Herco	WIN. WAA28	1200 fps	8300 psi
¾ oz.	CCI 109	14.0 gr Herco	WIN. WAA28	1200 fps	8300 psi
¾ oz.	Rem. 97*	18.0 gr Blue Dot	Rem. SP28	1200 fps	7600 psi
¾ oz.	CCI 209	18.0 gr Blue Dot	Rem. SP28	1200 fps	7500 psi
¾ oz.	CCI 109	18.0 gr Blue Dot	Rem. SP28	1200 fps	7500 psi
¾ oz.	Rem. 97*	21.0 gr Blue Dot	Rem. SP28	1295 fps	9700 psi
¾ oz.	Rem. 97*	18.0 gr Blue Dot	WIN. WAA28	1200 fps	7700 psi
¾ oz.	CCI 209	18.0 gr Blue Dot	WIN. WAA28	1200 fps	7300 psi
¾ oz.	CCI 109	18.0 gr Blue Dot	WIN. WAA28	1200 fps	7300 psi
¾ oz.	Win. 209	14.0 gr PB	Rem. SP28	1185 fps	11100 lup
¾ oz.	Win. 209	15.0 gr SR7625	Rem. SP28	1200 fps	9100 lup
¾ oz.	CCI 209	17.0 gr SR4756	Rem. SP28	1210 fps	8700 lup
¾ oz.	CCI 109	17.0 gr SR4756	Rem. SP28	1210 fps	8700 lup
¾ oz.	Win. 209	17.0 gr SR4756	Rem. SP28	1205 fps	8400 lup
¾ oz.	Rem. 97*	14.0 gr "Hi-Skor" 800X	Rem. SP28	1210 fps	9600 lup
¾ oz.	CCI 209M	14.0 gr "Hi-Skor" 800X	Rem. SP28	1215 fps	9400 lup
¾ oz.	Rem. 97*	14.5 gr "Hi-Skor" 800X	WIN. WAA28	1215 fps	9300 lup
¾ oz.	CCI 209M	14.5 gr "Hi-Skor" 800X	WIN. WAA28	1220 fps	9400 lup
¾ oz.	Rem. 97*	16.0 gr "Hi-Skor" 800X	Rem. SP28	1300 fps	10800 lup
¾ oz.	CCI 209M	16.0 gr "Hi-Skor" 800X	Rem. SP28	1300 fps	10800 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #39
28 Gauge 2¾"
Hull I.D. Page 108
Reference Notes Page 130

Federal Hi-Power Plastic Shell

28
28 Gauge 2¾"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
¾ oz.	CCI 109	23.5 gr HS7	Win. WAA28	1327 fps	10200 lup
¾ oz.	CCI 209	23.5 gr HS7	Win. WAA28	1327 fps	10200 lup
¾ oz.	Win. 209	23.5 gr HS7	Win. WAA28	1327 fps	10200 lup
¾ oz.	CCI 109	23.5 gr HS7	Rem. SP28	1327 fps	10200 lup
¾ oz.	CCI 209	23.5 gr HS7	Rem. SP28	1327 fps	10200 lup
¾ oz.	Win. 209	23.5 gr HS7	Rem. SP28	1327 fps	10200 lup
¾ oz.	Fed. 209	12.5 gr Green Dot	Rem. SP28	1200 fps	11800 psi
¾ oz.	CCI 109	13.0 gr Green Dot	Rem. SP28	1200 fps	10000 psi
¾ oz.	CCI 209	13.0 gr Green Dot	Rem. SP28	1200 fps	10000 psi
¾ oz.	Fed. 209	13.5 gr Unique	Fed. 28S1	1200 fps	11600 psi
¾ oz.	Fed. 209	13.0 gr Unique	Rem. SP28	1200 fps	11200 psi
¾ oz.	CCI 109	13.5 gr Unique	Rem. SP28	1200 fps	9400 psi
¾ oz.	CCI 209	13.5 gr Unique	Rem. SP28	1200 fps	9400 psi
¾ oz.	Fed. 209	13.5 gr Unique	Win. WAA28	1200 fps	10500 psi
¾ oz.	CCI 109	14.0 gr Unique	Win. WAA28	1200 fps	10400 psi
¾ oz.	CCI 209	14.0 gr Unique	Win. WAA28	1200 fps	10400 psi
¾ oz.	Fed. 209	14.0 gr Herco	Fed. 28S1	1200 fps	11700 psi
¾ oz.	Fed. 209	13.0 gr Herco	Rem. SP28	1200 fps	10100 psi
¾ oz.	CCI 109	14.5 gr Herco	Rem. SP28	1200 fps	10000 psi
¾ oz.	CCI 209	14.5 gr Herco	Rem. SP28	1200 fps	10000 psi
¾ oz.	Fed. 209	14.0 gr Herco	Win. WAA28	1200 fps	10900 psi
¾ oz.	CCI 109	15.0 gr Herco	Win. WAA28	1200 fps	10500 psi
¾ oz.	CCI 209	15.0 gr Herco	Win. WAA28	1200 fps	10500 psi
¾ oz.	Fed. 209	18.0 gr Blue Dot	Rem. SP28	1200 fps	9900 psi
¾ oz.	Fed. 209	20.0 gr Blue Dot	Rem. SP28	1295 fps	10900 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

28

28 Gauge 2¾"

Federal Hi-Power Plastic Shell

(Continued)

Hull #39
28 Gauge 2¾"
Hull I.D. Page 108
Reference Notes Page 130

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
¾ oz.	CCI 109	18.5 gr Blue Dot	Rem. SP28	1200 fps	9800 psi
¾ oz.	CCI 209	18.5 gr Blue Dot	Rem. SP28	1200 fps	9800 psi
¾ oz.	CCI 109	14.0 gr PB	Rem. SP28	1200 fps	10100 lup
¾ oz.	CCI 209	14.0 gr PB	Rem. SP28	1200 fps	10100 lup
¾ oz.	Fed. 209	14.5 gr SR7625	Rem. SP28	1205 fps	10400 lup
¾ oz.	Win. 209	15.0 gr SR7625	Rem. SP28	1195 fps	9200 lup
¾ oz.	CCI 109	17.0 gr SR4756	Fed. 28S1	1200 fps	8700 lup
¾ oz.	CCI 209	17.0 gr SR4756	Fed. 28S1	1200 fps	8700 lup
¾ oz.	Win. 209	17.5 gr SR4756	Rem. SP28	1200 fps	8200 lup
¾ oz.	Fed. 209	14.5 gr "Hi-Skor" 800X	Fed. 28S1	1215 fps	10300 lup
¾ oz.	CCI 209M	14.5 gr "Hi-Skor" 800X	Win. WAA28	1205 fps	8800 lup
¾ oz.	CCI 209M	16.0 gr "Hi-Skor" 800X	Win. WAA28	1290 fps	10200 lup
¾ oz.	CCI 209M	14.5 gr "Hi-Skor" 800X	Rem. SP28	1210 fps	8900 lup
⅞ oz.	CCI 109	18.0 gr HS6	Win. WAA28	1178 fps	10500 lup
⅞ oz.	CCI 209	18.0 gr HS6	Win. WAA28	1178 fps	10500 lup
⅞ oz.	Win. 209	18.0 gr HS6	Win. WAA28	1178 fps	10500 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #40
.410 Bore 2½"
Hull I.D. Page 109
Reference Notes Page 130

Winchester-Western Compression-Formed Plastic Shell

.410
.410 Bore 2½"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
½ oz.	CCI 109	15.0 gr H110	Win. WAA41	1200 fps	10800 lup
½ oz.	CCI 209	15.0 gr H110	Win. WAA41	1200 fps	10800 lup
½ oz.	Win. 209	15.0 gr H110	Win. WAA41	1200 fps	10800 lup
½ oz.	Win. 209	13.0 gr 2400	Rem. SP410	1200 fps	12000 psi
½ oz.	Win. 209	13.0 gr 2400	Win. WAA41	1200 fps	12000 psi
½ oz.	Win. 209	13.5 gr 296	Win. WAA41	1150 fps	9100 lup
½ oz.	Win. 209	14.0 gr 296	Win. WAA41	1200 fps	9800 lup
½ oz.	Win. 209	14.0 gr 296	Fed. 410SC	1200 fps	10300 lup
½ oz.	Fed. 209	14.5 gr 296	Fed. 410SC	1200 fps	10200 lup
½ oz.	CCI 109	14.0 gr 296	Win. WAA41	1200 fps	9100 lup
½ oz.	CCI 109	14.0 gr 296	Fed. 410SC	1200 fps	9900 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

.410

.410 Bore 2½"

Remington S.P. Plastic Shell
(With Plastic Basewad)

Hull #41
.410 Bore 2½"
Hull I.D. Page 109
Reference Notes Page 130

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
½ oz.	CCI 109	15.0 gr H110	Rem. SP410	1200 fps	10600 lup
½ oz.	CCI 209	15.0 gr H110	Rem. SP410	1200 fps	10600 lup
½ oz.	Win. 209	15.0 gr H110	Rem. SP410	1200 fps	10600 lup
½ oz.	Win. 209	15.0 gr 296	Rem. SP410	1200 fps	9500 lup
½ oz.	Fed. 209	15.5 gr IMR4227	Rem. SP410	1105 fps	10300 lup
½ oz.	Rem. 97*	13.5 gr 2400	Fed. 410SC	1200 fps	11700 psi
½ oz.	Rem. 97*	14.0 gr 2400	Rem. SP410	1200 fps	11500 psi
½ oz.	CCI 109	14.5 gr 2400	Rem. SP410	1200 fps	11600 psi
½ oz.	CCI 209	14.5 gr 2400	Rem. SP410	1200 fps	11600 psi
½ oz.	CCI 209M	13.0 gr 2400	Rem. SP410	1200 fps	11800 psi
½ oz.	Rem. 97*	14.0 gr 2400	Win. WAA41	1200 fps	11900 psi
½ oz.	CCI 109	14.5 gr 2400	Win. WAA41	1200 fps	12000 psi
½ oz.	CCI 209	14.5 gr 2400	Win. WAA41	1200 fps	12000 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #42
.410 Bore 2½"
Hull I.D. Page 109
Reference Notes Page 131

Federal Plastic Shell

.410
.410 Bore 2½"

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
½ oz.	CCI 109	15.0 gr H110	Rem. SP410	1200 fps	10600 lup
½ oz.	CCI 209	15.0 gr H110	Rem. SP410	1200 fps	10600 lup
½ oz.	Win. 209	15.0 gr H110	Rem. SP410	1200 fps	10600 lup
½ oz.	Fed. 209	15.5 gr IMR4227	FED. 410SC	1115 fps	11200 lup
½ oz.	Fed. 209	15.5 gr IMR4227	Rem. SP410	1115 fps	11100 lup
½ oz.	CCI 109	13.5 gr 2400	FED. 410SC	1200 fps	11100 psi
½ oz.	CCI 209	13.5 gr 2400	FED. 410SC	1200 fps	11100 psi
½ oz.	CCI 209M	13.5 gr 2400	FED. 410SC	1200 fps	11900 psi
½ oz.	Fed. 209	13.0 gr 2400	FED. 410SC	1200 fps	11800 psi
½ oz.	CCI 109	14.5 gr 2400	Rem. SP410	1200 fps	11500 psi
½ oz.	CCI 209	14.5 gr 2400	Rem. SP410	1200 fps	11500 psi
½ oz.	Fed. 209	13.5 gr 2400	Rem. SP410	1200 fps	11400 psi
½ oz.	CCI 109	14.0 gr 2400	Win. WAA41	1200 fps	11200 psi
½ oz.	CCI 209	14.0 gr 2400	Win. WAA41	1200 fps	11200 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

.410

.410 Bore 3″

Winchester-Western Compression-Formed Plastic Shell

Hull #43
.410 Bore 3″
Hull I.D. Page 109
Reference Notes Page 131

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
5/8 oz.	Win. 209	17.5 gr IMR4227	Fed. 410SC	1160 fps	12400 lup
5/8 oz.	Win. 209	17.4 gr IMR4227	Rem. SP410	1160 fps	12400 lup
5/8 oz.	Rem. 97*	17.5 gr IMR4227	Rem. SP410	1160 fps	12000 lup
11/16 oz.	CCI 109	14.5 gr H110	Win. WAA41	1058 fps	11800 lup
11/16 oz.	CCI 209	14.5 gr H110	Win. WAA41	1058 fps	11800 lup
11/16 oz.	Win. 209	14.5 gr H110	Win. WAA41	1058 fps	11800 lup
11/16 oz.	Win. 209	12.5 gr 2400	Fed. 410SC	1135 fps	12900 psi
11/16 oz.	Win. 209	13.5 gr 2400	Rem. SP410	1135 fps	12400 psi
11/16 oz.	Win. 209	13.0 gr 2400	Rem. SP4103	1135 fps	12400 psi
11/16 oz.	Win. 209	13.0 gr 2400	Win. WAA41	1135 fps	12900 psi
11/16 oz.	Win. 209	13.5 gr 296	Win. WAA41	1135 fps	10800 lup
11/16 oz.	Win. 209	13.5 gr 296	Fed. 410SC	1135 fps	10800 lup
11/16 oz.	Fed. 410	14.0 gr 296	Fed. 410SC	1135 fps	10600 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #44
.410 Bore 3″
Hull I.D. Page 110
Reference Notes Page 132

Remington S.P. Plastic Shell
(With Plastic Basewad)

.410
.410 Bore 3″

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
11/16 oz.	CCI 109	14.5 gr H110	Rem. SP4103	1051 fps	11200 lup
11/16 oz.	CCI 209	14.5 gr H110	Rem. SP4103	1051 fps	11200 lup
11/16 oz.	Win. 209	14.5 gr H110	Rem. SP4103	1051 fps	11200 lup
11/16 oz.	CCI 109	16.0 gr H4227	Rem. SP4103	1069 fps	10000 lup
11/16 oz.	CCI 209	16.0 gr H4227	Rem. SP4103	1069 fps	10000 lup
11/16 oz.	Win. 209	16.0 gr H4227	Rem. SP4103	1069 fps	10000 lup
11/16 oz.	Rem. 97*	13.5 gr 2400	Fed. 410SC	1135 fps	11400 psi
11/16 oz.	Rem. 97*	15.0 gr 2400	Rem. SP410	1135 fps	12400 psi
11/16 oz.	CCI 209M	14.5 gr 2400	Rem. SP410	1135 fps	12200 psi
11/16 oz.	Rem. 97*	14.0 gr 2400	Rem. SP4103	1135 fps	12500 psi
11/16 oz.	Rem. 97*	14.0 gr 2400	Win. WAA41	1135 fps	12500 psi

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

.410

.410 Bore 3″

Federal Plastic Shell

Hull #45
.410 Bore 3″
Hull I.D. Page 110
Reference Notes Page 132

Shot Wgt.	Primer	Powder	Wad Column	Velocity	Pressure
11/16 oz.	CCI 109	14.5 gr H110	Rem. SP4103	1051 fps	11200 lup
11/16 oz.	CCI 209	14.5 gr H110	Rem. SP4103	1051 fps	11200 lup
11/16 oz.	Win. 209	14.5 gr H110	Rem. SP4103	1051 fps	11200 lup
11/16 oz.	CCI 109	16.0 gr H4227	Rem. SP4103	1069 fps	10000 lup
11/16 oz.	CCI 209	16.0 gr H4227	Rem. SP4103	1069 fps	10000 lup
11/16 oz.	Win. 209	16.0 gr H4227	Rem. SP4103	1069 fps	10000 lup
11/16 oz.	Fed. 209	13.0 gr 2400	Fed. 410SC	1135 fps	12300 psi
11/16 oz.	Fed. 209	13.5 gr 2400	Rem. SP4103	1135 fps	12500 psi
11/16 oz.	Fed. 209	13.0 gr 2400	Win. WAA41	1135 fps	11100 psi
11/16 oz.	Win. 209	17.5 gr IMR4227	Fed. 410SC	1140 fps	12400 lup
11/16 oz.	Rem. 97*	17.5 gr IMR4227	Rem. SP410	1140 fps	12200 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #5
12 Gauge 2¾"
Hull I.D. Page 98
Reference Notes Page 114

Buckshot Loads

Winchester-Western Compression-Formed Plastic Shell

12
12 Gauge 2¾"

Primer	Powder	Wad Column	Buckshot Size	Buckshot No. Pellets	Velocity	Pressure
CCI 109	34.0 gr HS 6	Win. WAA12(white) (with petals cut off)	4	27	1311 fps	10200 lup
CCI 209	34.0 gr HS 6	Win. WAA12(white) (with petals cut off)	4	27	1311 fps	10200 lup
Win. 209	34.0 gr HS 6	Win. WAA12(white) (with petals cut off)	4	27	1311 fps	10200 lup
CCI 109	35.0 gr HS 6	Win. WAA12(white) (with petals cut off)	OO	9	1349 fps	9500 lup
CCI 209	35.0 gr HS 6	Win. WAA12(white) (with petals cut off)	OO	9	1349 fps	9500 lup
Win. 209	35.0 gr HS 6	Win. WAA12(white) (with petals cut off)	OO	9	1349 fps	9500 lup

Hull #7
12 Gauge 2¾"
Hull I.D. Page 99
Reference Notes Page 116

Buckshot Loads

Peters Plastic Target Shell ("Blue Magic")

12
12 Gauge 2¾"

Primer	Powder	Wad Column	Buckshot Size	Buckshot No. Pellets	Velocity	Pressure
Fed. 209	19.0 gr "Hi-Skor" 700X	Rem. SP12	4	25	1200 fps	10600 lup
Fed. 209	19.0 gr "Hi-Skor" 700X	Win. WAA12R(red)	3	23	1220 fps	10500 lup
Fed. 209	20.0 gr "Hi-Skor" 700X	Win. WAA12F114	1	12	1325 fps	10600 lup
Fed. 209	19.0 gr "Hi-Skor" 700X	Rem. RP12	O	10	1235 fps	10500 lup
Fed. 209	21.0 gr "Hi-Skor" 700X	Rem. SP12	OO	8	1330 fps	10700 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

12

12 Gauge 2¾"

Buckshot Loads

Remington Unibody Plastic Shell

(With Integral Basewad)

Hull #8
12 Gauge 2¾"
Hull I.D. Page 99
Reference Notes Page 117

Primer	Powder	Wad Column	Buckshot Size	Buckshot No. Pellets	Velocity	Pressure
CCI 109	34.0 gr HS 6	Win. WAA12(white) (with petals cut off)	4	27	1329 fps	10100 lup
CCI 209	34.0 gr HS 6	Win. WAA12(white) (with petals cut off)	4	27	1329 fps	10100 lup
Win. 209	34.0 gr HS 6	Win. WAA12(white) (with petals cut off)	4	27	1329 fps	10100 lup
CCI 109	35.0 gr HS 6	Win. WAA12(white) (with petals cut off)	OO	9	1396 fps	9400 lup
CCI 209	35.0 gr HS 6	Win. WAA12(white) (with petals cut off)	OO	9	1396 fps	9400 lup
Win. 209	35.0 gr HS 6	Win. WAA12(white) (with petals cut off)	OO	9	1396 fps	9400 lup

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Hull #10
12 Gauge 2¾"
Hull I.D. Page 100
Reference Notes Page 118

Buckshot Loads

Remington RXP Plastic Target Shell

12
12 Gauge 2¾"

Primer	Powder	Wad Column	Buckshot Size	Buckshot No. Pellets	Velocity	Pressure
CCI 109	34.0 gr HS 6	Win. WAA12(white) (with petals cut off)	4	27	1329 fps	10100 lup
CCI 209	34.0 gr HS 6	Win. WAA12(white) (with petals cut off)	4	27	1329 fps	10100 lup
Win. 209	34.0 gr HS 6	Win. WAA12(white) (with petals cut off)	4	27	1329 fps	10100 lup
CCI 109	35.0 gr HS 6	Win. WAA12(white) (with petals cut off)	OO	9	1396 fps	9400 lup
CCI 209	35.0 gr HS 6	Win. WAA12(white) (with petals cut off)	OO	9	1396 fps	9400 lup
Win. 209	35.0 gr HS 6	Win. WAA12(white) (with petals cut off)	OO	9	1396 fps	9400 lup

Hull #13
12 Gauge 2¾"
Hull I.D. Page 101
Reference Notes Page 120

Buckshot Loads

Federal Hi-Power Plastic Shell

12
12 Gauge 2¾"

Primer	Powder	Wad Column	Buckshot Size	Buckshot No. Pellets	Velocity	Pressure	
Fed. 209	20.5 gr "Hi-Skor" 700X	Rem. SP12	4	24	1225 fps	10800 lup	*
Fed. 209	20.5 gr "Hi-Skor" 700X	Rem. SP12	3	22	1235 fps	10700 lup	*
Fed. 209	21.0 gr "Hi-Skor" 700X	Fed. 12S4	1	12	1300 fps	10900 lup	*
Fed. 209	20.5 gr "Hi-Skor" 700X	Rem. SP12	O	10	1230 fps	10600 lup	*
Fed. 209	20.5 gr "Hi-Skor" 700X	Fed. 12S4	OO	8	1285 fps	10700 lup	*

* Note: All of the above loads have 20.0 gr of Ballistic Products Shot Buffer added to the buckshot pellets

DO NOT LOAD STEEL SHOT **DO NOT SUBSTITUTE COMPONENTS**

Chapter 10

CARE, CLEANING AND FUN WITH YOUR SHOTGUN

When all sporting arms fired black powder the residue from the propellant attracted moisture and a rusting action commenced at once. The primer salts in those days were an even worse offender and they quickly generated a rusting action. Modern shells are no longer loaded with black powder and primers are now made with a non-corrosive firing mixture. This has greatly reduced the hazards of corrosion.

Why Clean?

Almost all guns are built to last a lifetime. . .and beyond. With simple, basic care they can and do. But primer-powder residue, plastic fouling from the wad, fluctuating temperature and humidity, exposure to the elements which often occurs during the game season and sweaty hands all contribute to a gun's deterioration if not cleaned properly. A gun damaged by neglect may not function properly and create a safety hazard—but a well cared for firearm shoots better and easily increases in value.

The New Gun

The new shotgun as it comes over the counter will have the exterior surfaces lightly oiled and the bore will be coated with a grease preservative. Generally, the interior and chamber of the barrel must be cleaned, removing all grease and other possible obstructions.

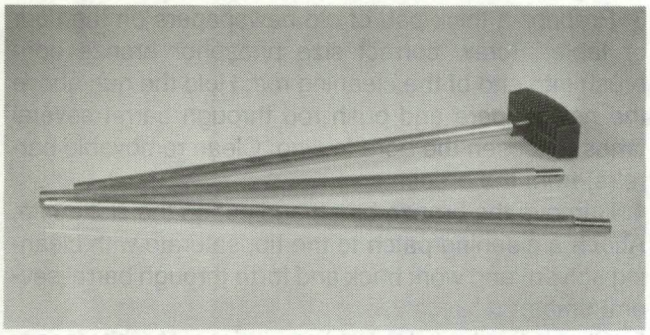
To insure maximum performance and continue satisfaction with any firearm periodic cleaning and lubrication with high quality cleaning accessories is essential. Always follow the firearm manufacturers instructions' for assembly and disassembly prior to cleaning and lubricating.

Gun Cleaning Kits And Accessories

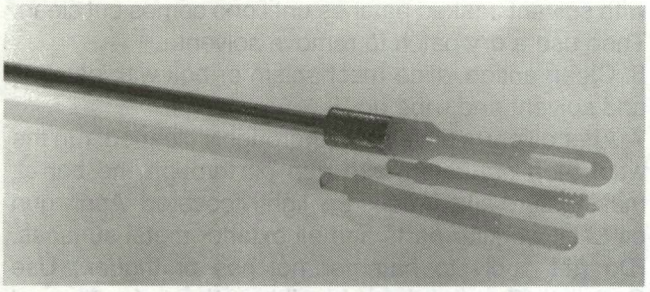
Outers Laboratories Division of OMARK INDUSTRIES offers the most complete line of products for the shooter who takes pride in his equipment. Outers Gun Cleaning Kits contain only the finest gun care prod-

ucts—the standard of the industry. By assembling all the essential cleaning materials in the kit box the sportsman, when going into the field, needs only to pack the kit with his shooting gear to be sure he can care for his gun while away from home. Outers Kits are available in Standard, Deluxe, and Field variations and contain many of the following products:

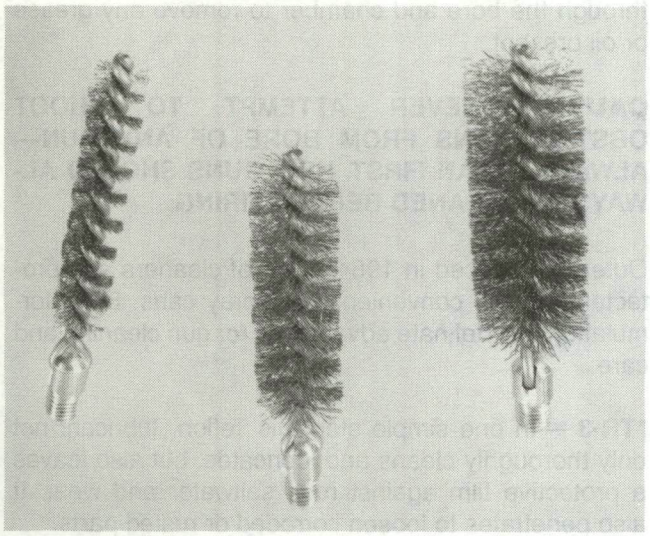
Cleaning Rod—High Strength aluminum alloy with extra long sleeve-type joints for maximum strength.



Cleaning Tip—Slotted nylon tip attaches to end of rod and holds the cleaning patches.

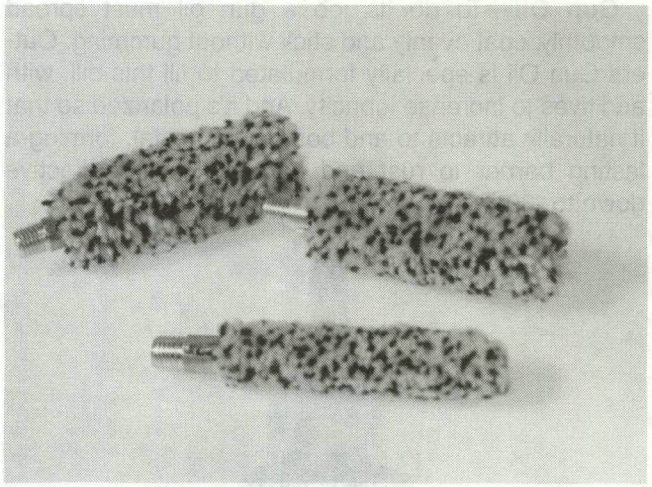


Phosphor Bronze Bore Brush—Bronze brushes are the best to use for removing primer, powder, plastic and lead fouling—they won't damage the bore. Stainless steel bore brushes are available for cleaning the most stubborn fouling.



Cleaning Patches—Cut to correct size—absorbs deposits dissolved by solvent and have excellent "tooth" for cleaning action.

Wool Mops—Handy swabs attach to the cleaning rod. Soak with gun oil for final protective lubrication, wrap in plastic and re-use over and over again.



Gunslick Gun Lubricant—The ideal lubricant for movable parts. Creates hand-honed triggers and actions.

Cleaning Solvent—Outers Solvent is formulated to penetrate completely and thoroughly remove all traces of leading, powder residue and fouling. Lab tests have repeatedly shown it performs with remarkable efficiency. Yet it contains no acid, so it's safe to use on the finest steels. Frequent use keeps firearms operating at maximum efficiency and helps prevent rust and pitting.

Gun Oil—To do its job a gun oil must spread smoothly, coat evenly and stick without gumming. Outers Gun Oil is specially formulated to fill this bill, with additives to increase lubricity. And it's polarized so that it naturally attracts to and bonds with metal, forming a lasting barrier to rust and corrosion that's effective down to -30 F.

Gun Cleaning Procedure

SAFETY FIRST—ALWAYS MAKE SURE YOUR FIREARM IS UNLOADED

1. Follow the firearm manufacturers' instructions for disassembly.
2. All guns should be cleaned as soon as possible after firing. Remember that moisture, temperature, humidity extremes and fingerprints all begin reacting immediately to a firearm.
3. Prepare a thick pad of old newspapers on the floor or table. Screw correct size phosphor bronze bore brush into end of the cleaning rod. Hold the gun above the newspapers and push rod through barrel several times to loosen the bore fouling. Clean removable barrel(s) from the breech end.
4. Remove the bronze brush and put on the slotted tip. Attach a cleaning patch to the tip, saturate with cleaning solvent and work back and forth through barrel several times.
5. Check the bore by holding a piece of white paper one inch from the breech to reflect light or look through barrel that has been removed from the action. If traces of fouling are visible, repeat steps 3 and 4. Continue with solvent soaked patches until one comes out clean. Then use a dry patch to remove solvent.
6. Clean action, slide mechanism or bolt with patches and solvent and wipe dry.
7. After all parts have been thoroughly cleaned, run the wool mop saturated with gun oil through the barrel, making sure all surfaces are lightly covered. Apply gun oil to all working parts and all exterior metal surfaces. (Do not apply to hammer notches or trigger.) Use Gunslick Gun Lubricant for slide actions of pump and autoloading shotguns by briskly rubbing into metal and wiping off all surplus. Gunslick may also be used for internal mechanisms of all guns.
8. After gun is put away, it is a good idea to check it periodically and clean and lubricate it if needed. Before firing your gun after cleaning, run enough patches through the bore and chamber to remove any grease or oil present.

CAUTION—NEVER ATTEMPT TO SHOOT OBSTRUCTIONS FROM BORE OF ANY GUN—ALWAYS CLEAN FIRST. NEW GUNS SHOULD ALWAYS BE CLEANED BEFORE FIRING.

Outers introduced in 1984 a line of cleaners and protectants in the convenience of spray cans. Each formulation has definate advantages for gun cleaning and care:

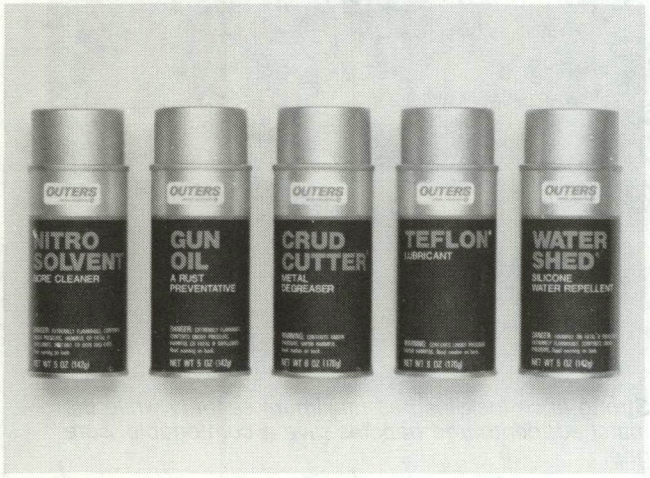
***TR-3** —In one simple step this Teflon lubricant not only thoroughly cleans and lubricates, but also leaves a protective film against rust, saltwater and wear. It also penetrates to loosen corroded or rusted parts.

***Crud Cutter** —Crud Cutter is a potent cleaner that dissolves gummy build-ups of grease and oil, softens powder residue and washes out caked dirt. It improves movement of working parts and solves most gun failures caused by faulty operation of mechanisms like triggers, ejectors, extractors, etc. A handy extention tube allows access to hard-to-reach spots.

***Nitro Solvent**—Specifically designed for firearms bore and mechanism cleaning this strong solvent cuts through lead deposits, nitro powder residue and metal fouling.

***Water Shed**—This spray-on water and stain repellent chemically unites with almost any fabric or leather to provide durable protection against moisture, water and stains. It does not eliminate breathability of the material and works on canvas, nylon, cotton and leathers.

***Gun Oil**—This is the same excellent light oil lubricant Outers has become so popular for in the standard bottle. It maintains peak efficiency in a full range of temperatures, forms a light film to reduce friction and eliminate squeaks, yet will not gum up. A handy extention tube allows access to hard-to-reach spots.



Outers Aerosols

Things To Remember:

Outers Gun Oil and Cleaning Solvent are made expressly for firearms. Never use ordinary household or motor oils.

Do not over oil. Too much oil can attract dirt and unburned powder or powder residue, making it gummy.

Clean as soon as possible after firing your gun.

Fingerprints can cause rapid rusting since there is acid content in perspiration. Whenever anyone handles your gun, a quick go-over with an oiled cloth will forestall any problems.

Make sure your gun is unloaded before cleaning.

All cleaning equipment must fit the gauge of your firearm.

Check your gun periodically during storage.

Follow the Ten Commandments of Gun Safety:

A good shooter is a safe shooter. He knows there is no place for horseplay in shooting or hunting. He learns and obeys the commandments of firearms safety and insists that his companions know and follow them, too.

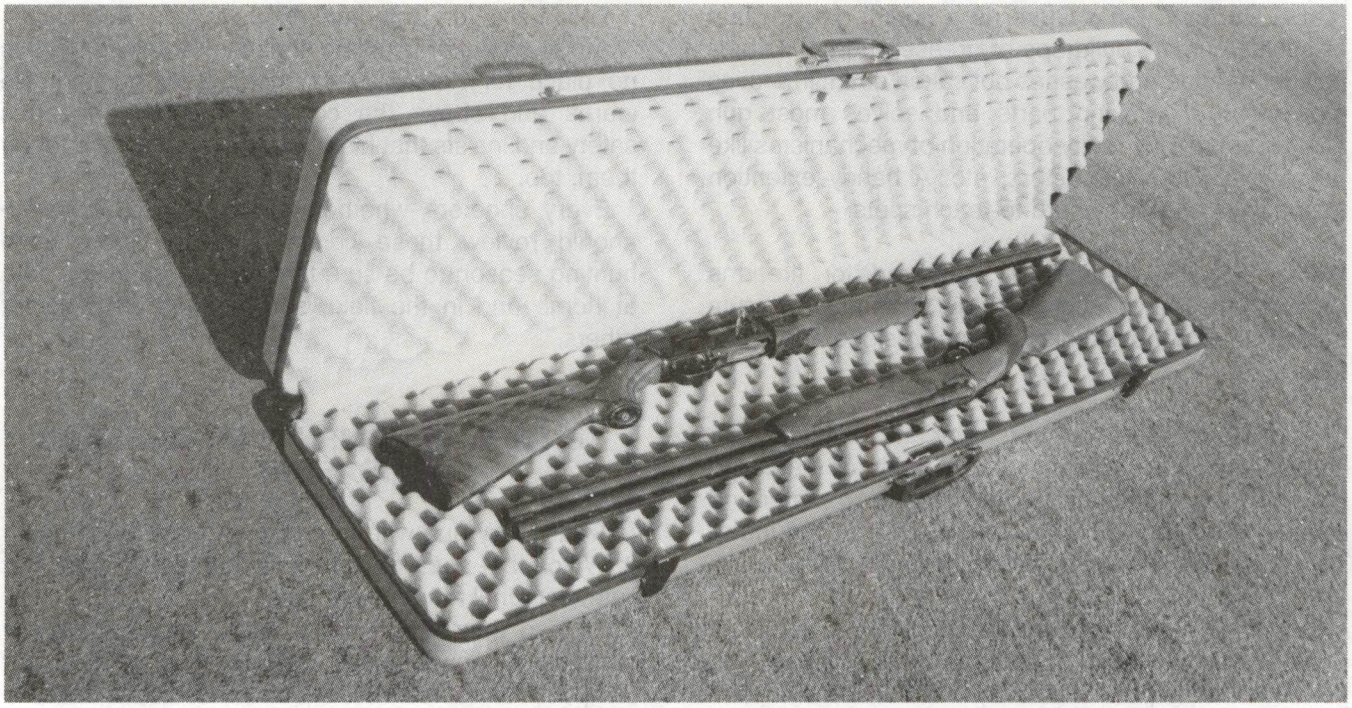
Every shooter—whether novice or experienced—should review these commandments before each hunting season to be sure that his gun handling, both at home and in the field, sets a good example for others.

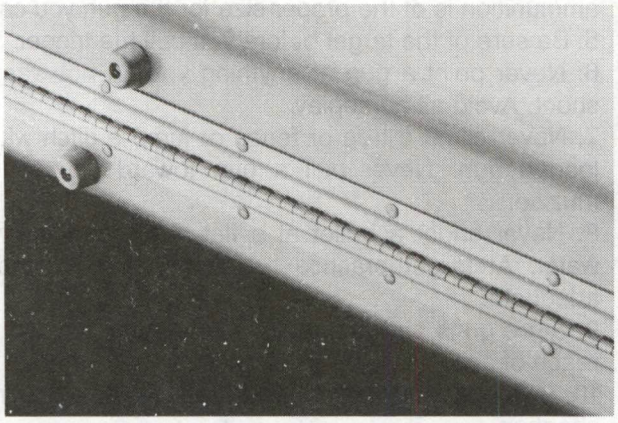
TEN COMMANDMENTS OF FIREARMS SAFETY

1. Treat every gun with the respect due a loaded gun.
2. Watch that muzzle! Carry your gun safely; keep the safety on until ready to shoot.
3. Unload guns when not in use. Carry only empty guns, taken down or with the action open, into your camp, car or home. Guns should be carried in cases to and from the shooting area.
4. Be sure barrel is clear of obstructions, and that your ammunition is of the proper size for the gun you carry.
5. Be sure of the target before you pull the trigger.
6. Never point a gun at anything you do not want to shoot. Avoid all horseplay.
7. Never climb a tree or fence or jump a ditch with a loaded gun. Never pull a gun toward you by the muzzle.
8. Never shoot a bullet at a flat hard surface, or at water. At target practice be sure your backstop is adequate.
9. Store guns and ammunition separately beyond the reach of children.
10. Avoid all alcoholic beverages before or during shooting.

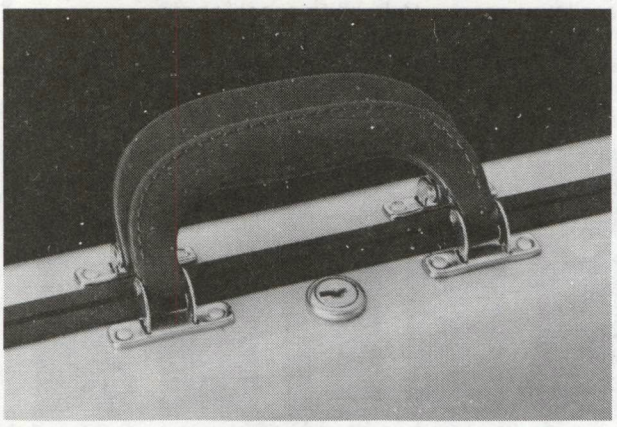
Gun Care In The Field (And To And From)

Any fine firearm is a considerable investment and deserves maximum protection. From home to the field and back a protective gun case is an asset. One of the finest is the new Silverline Gun Case made by Outers. This satin finish aluminum case is extra thick for added protection, and gracefully contoured for added good looks. A full length piano hinge assures permanent alignment, while a strong, tumbler-like lock ensures security. This rugged, precision-built case is designed for a lifetime of convenience and protection; yet it retails at 25% to 50% less than comparable cases. A silicone-treated gun sleeve of Canton flannel, large enough to fit over any rifle or shotgun and provide an extra measure of protection against scratches and corrosion is included inside the case. The Silverline Case and its' features are shown on the next page.

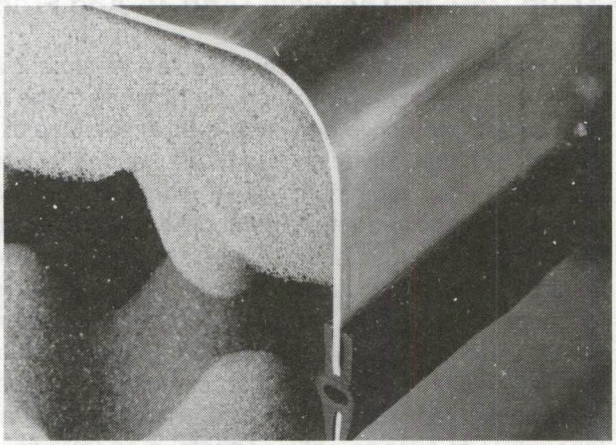




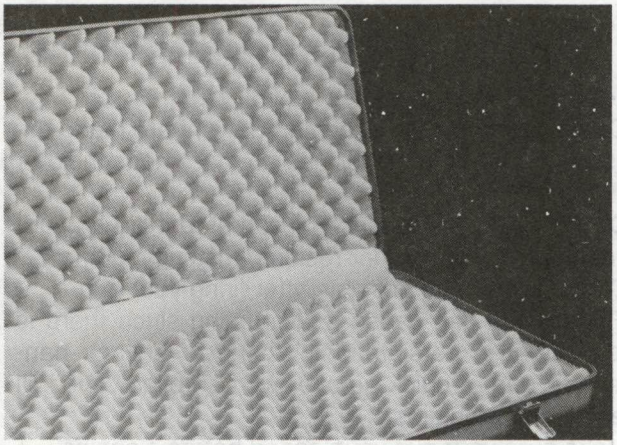
Piano hinge runs the full length of the case and bumper feet provide shock protection.



Strong latch lock insures maximum security while the matched, contoured handles give a comfortable, sure grip.



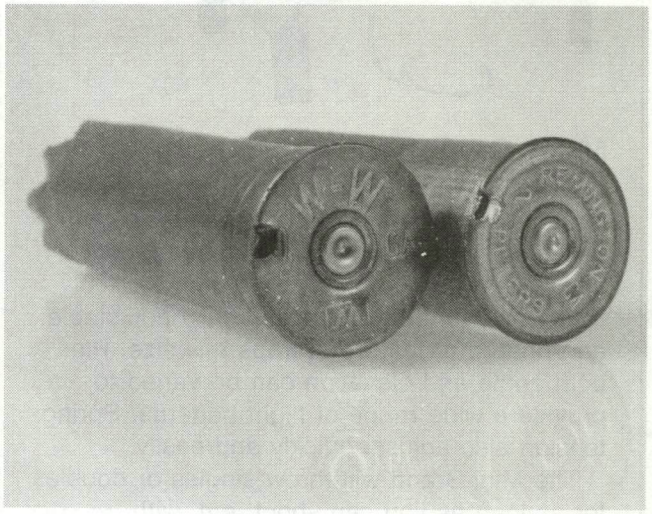
The specially designed rubber valance gives the Silverline a dust and moisture proof seal.



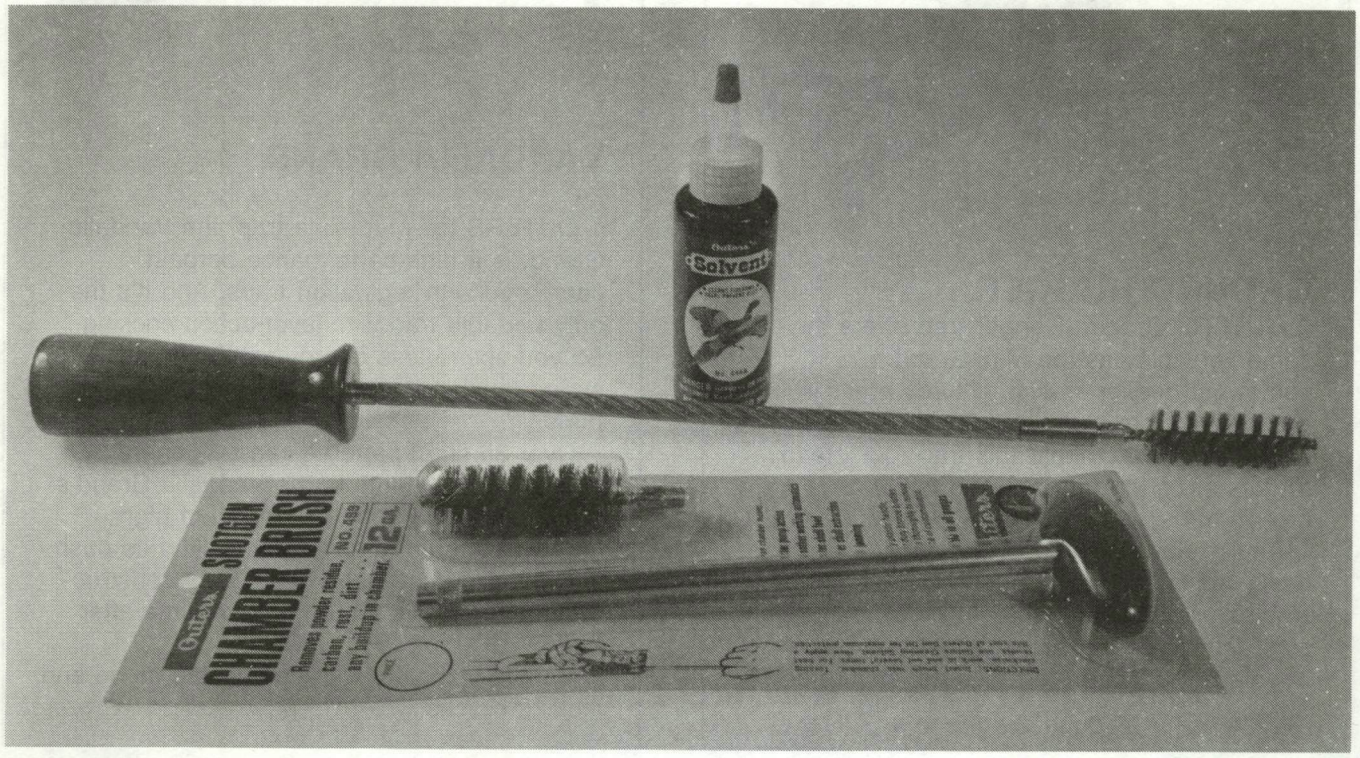
Foam hinge cover and extra thick convoluted foam provide valuable firearms that extra measure of protection.

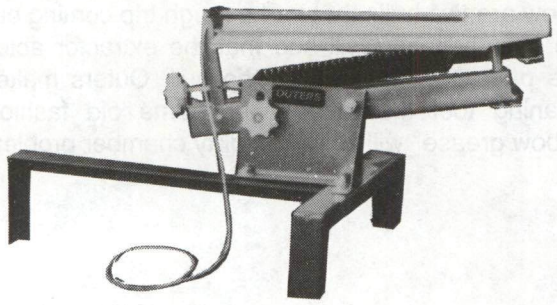
While at the shooting range or in the field many knowledgeable shooters carry a silicone gun cloth. A few quick wipes removes fingerprints and helps protect the gun from rust and corrosion. The Outers Silicone Gun Cloth is packed in a handy ziplock pouch.

Any shooter that has spent a hot, humid day in the field, at a trap or skeet range has had, or seen, jamming, misfires or ejection hangup problems. Plastic hulls, a hot, humid day and a lot of shooting make for chamber fouling problems. The plastic seems to react with the heat and moisture along with powder residue etc., to form a gummy build up in the barrel chamber and forcing cone. Unless cleaned out periodically the problems mentioned above are inevitable. Pictured below are two hulls that had a rough trip coming out of the chamber. You will see that the extractor actually tore past the metal rim of the hull. Outers makes a cleaning tool that along with some old fashioned "elbow grease" will solve the dirty chamber problem.



Shown below are two chamber rods and brushes. The solid rod and brush is fine for break-open type shotguns like single and double barrels. The long rod and oversize brush provide maximum control and leverage for removing stubborn deposits. The new Outers Imperial Flexible Shotgun Chamber Cleaning Rod and Brush permits chamber cleaning in an autoloader or pump shotgun without removing the barrel.





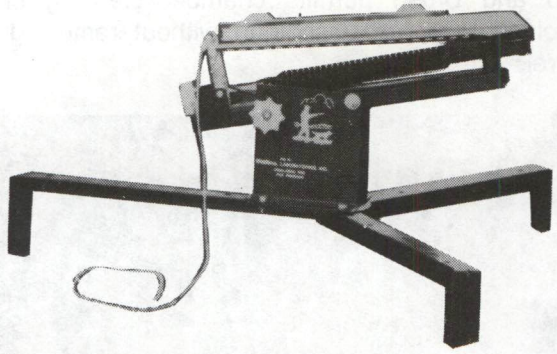
MINI-GRAND

OUTERS Mini-Grand packs a whole lot of features into an absolute minimum size. And delivers 'em at a downright minimum price too.

Its powerful throwing arm is fully adjustable; an unheard of feature in traps this size. Plus both angle and elevation can be varied to provide a wide range of flight patterns. Spring tension also adjusts quickly and easily.

The Mini-Grand will throw singles or doubles for as long as you can shoot 'em, with remarkable uniformity, thanks to its heavy-duty construction and press-in ground grippers. No extra anchors or attachments are needed.

A lanyard pull makes for simple solo operation.



GROUND HUGGER

OUTERS Ground Hugger trap offers the same versatility as the Mini-Grand in a somewhat beefier version. Sturdy press-in ground grippers plus a full 70 square inches of support surface hold this trap rock steady for lots of uniform throws and few if any broken birds.

Angle, elevation and spring tension are all easily adjusted. The Ground Hugger will throw singles or doubles and is set up for simple solo use with a lanyard pull that can be handled or attached to a shooter's wrist or belt.

Not every shooter shoots trap and skeet competitively. There are thousands of shooters that shoot clay birds for fun. They practice on these clay pigeons to warm up their wingshooting skills prior to hunting season.

Nowhere in the regulations does it say you have to have an expensive regulation trap to get in loads of fun and skill-improving practice. Outers manufacturers three inexpensive portable traps that will help any shooter "fine-tune" his trigger finger. Shown below are the traps and their features.

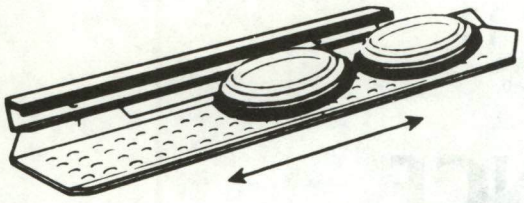
VANDALIA GRAND

OUTERS top-of-the-line trap, the Vandalia Grand, is a high-performance bargain compared with regulation traps. And it's the only portable trap with lever-action cocking. So you spend less energy setting its powerful spring tension and more shootin' the birds it hurls.

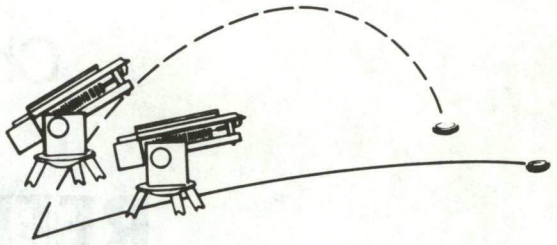
Over 35 flight patterns can be generated through adjustments to the Vandalia Grand's angle, elevation and tension. From high looping patterns to bullet paths. And its push-in ground grippers and heavy-duty construction mean throws will be uniform time after time.

Comes complete with detachable tripod and locking braces.

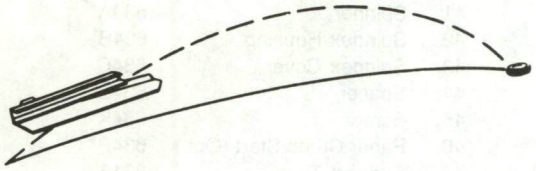
FLIGHT CONTROL



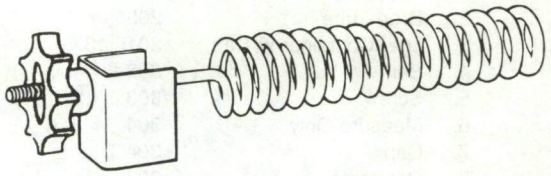
Control direction of flight by placing target at different positions on the arm. (Center target for forward flight, front position for right, rear for left.) All OUTERS traps throw excellent singles and doubles.



The entire trap mechanism of the Mini-Grand, Ground Hugger and Vandalia Grand can be raised or lowered. Flight angle can be varied from a high looping throw to a flat, bullet-like throw.



By changing the angle and elevation of the arm, the height of the target at its midpoint in flight can be varied as much as 10 to 15 feet. (The larger traps provide the greatest degree of variation.)



Spring tension can be adjusted to suit individual preference. These powerful springs will throw the target as far as many expensive regulation traps. Sometimes even farther.

Chapter 11

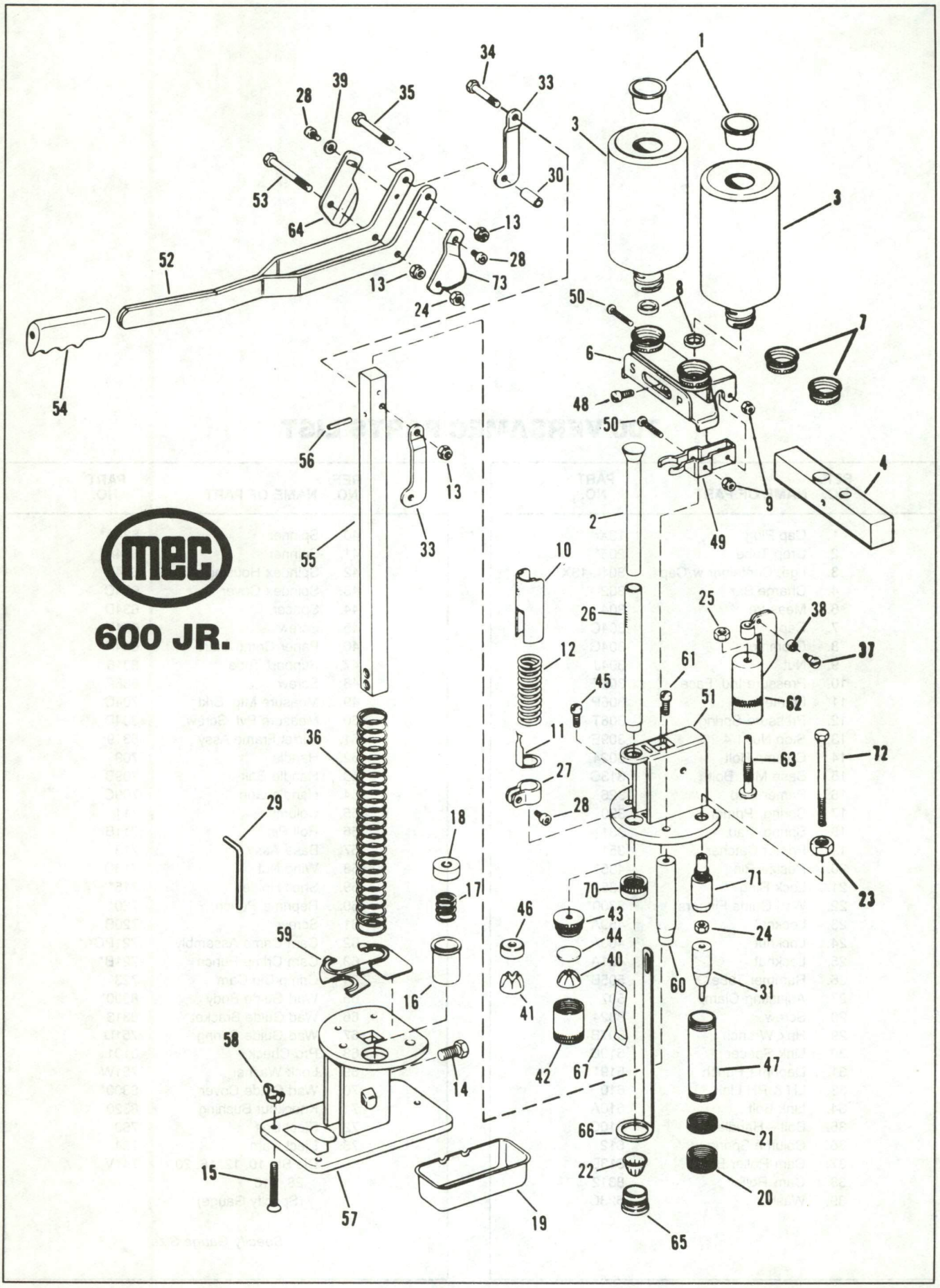
REFERENCE

600 JR. PARTS LIST

REF. NO.	NAME OF PART	PART NO.
1.	Cap Plug	13X
2.	Drop Tube	205*
3.	Lge. Container w/Cap	301L-13X
4.	Bar	302
5.	Screw	303
6.	Measure Only	304
7.	Cap	304C
8.	Grommet	304G
9.	Nut	304J
10.	Pressure Ind. Face	306F
11.	Pointer	306P
12.	Pressure Spring	306T
13.	Stop Nut 1 4 20	309E
14.	Column Bolt	8024
15.	Base Mtg. Bolt	313C
16.	Primer Cup	326
17.	Spring, Primer	330
18.	Spring, Pad	331
19.	Primer Catcher	351
20.	Resize Ring	435*
21.	Lock Ring	435A
22.	Wad Guide Fingers	8300*
23.	Locknut	459A
24.	Locknut	460A
25.	Locknut	461A
26.	Rammer Tube	505B*
27.	Adjusting Clamp	507
28.	Screw	8324
29.	Hex Wrench	507B
30.	Link Spacer	510B
31.	Deprime Punch	519*
33.	LH & RH Link	610
34.	Link Bolt	610A
35.	Bolt—Handle	610C
36.	Column Spring	612
37.	Cam Roller Bolt	613D
38.	Cam Roller	8312
39.	Washer	623C

REF. NO.	NAME OF PART	PART NO.
40.	Spinner	634A*
41.	Spinner	634A*
42.	Spindex Housing	634B
43.	Spindex Cover	634C
44.	Spacer	634D
45.	Screw	634K
46.	Paper Crimp Start (Opt.)	634P*
47.	Support Tube	8316
48.	Bar Stop Screw	303
49.	Measure MTG Brkt.	704C
50.	Measure Pvt. Screw	304D
51.	Turret Frame Assy.	8319
52.	Handle	709
53.	Handle Bolt	709B
54.	Handle Grip	709C
55.	Column	711
56.	Roll Pin	8096
57.	Base Assy.	713
58.	Wing Nut	713D
59.	Shell Holder	715*
60.	Reprime Punch	720*
61.	Screw	303
62.	Cam Crimp Assembly	721PCA*
63.	Cam Crimp Punch	721B*
64.	Crimp Die Cam	723
65.	Wad Guide Body	8300*
66.	Wad Guide Bracket	8313
67.	Wad Guide Spring	751D
70.	Wad Guide Cover	8300*
71.	Knockout Bushing	8321*
72.	Eject Bolts	460-10
73.	Eject Cam	724
74.	Eject Bolt	460-3
	Die Set 12, 16, 20, 28, 410 (Specify Gauge)	741P
	Die Set—10 Ga.	741P-10

**Specify Gauge Size*

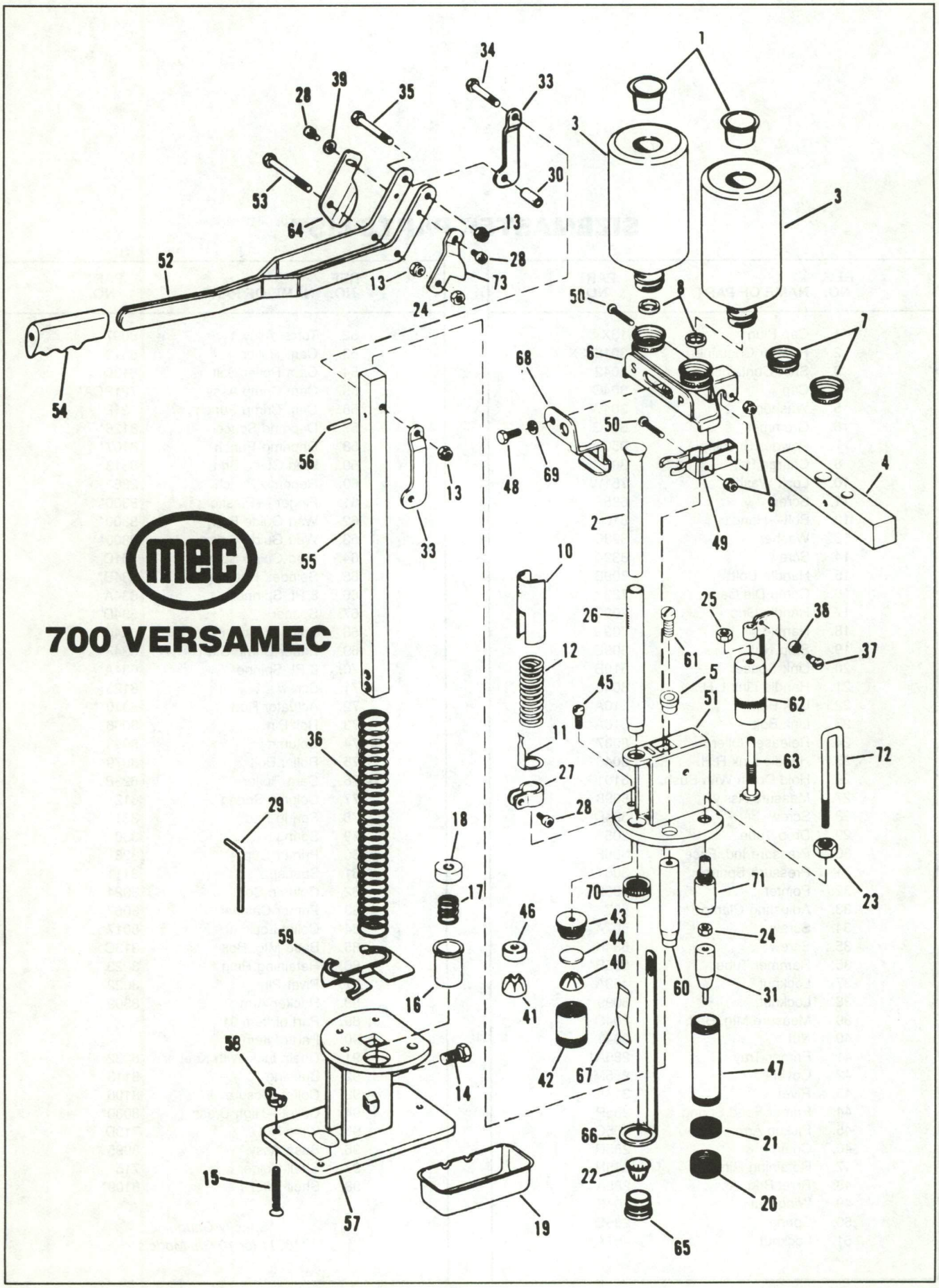

mec
600 JR.

700 VERSAMEC PARTS LIST

REF. NO.	NAME OF PART	PART NO.
1.	Cap Plug	13X
2.	Drop Tube	205*
3.	Lge. Container w/Cap	301L-13X
4.	Charge Bar	302
6.	Measure	304
7.	Cap	304C
8.	Grommet	304G
9.	Nut	304J
10.	Pressure Ind. Face	306F
11.	Pointer	306P
12.	Pressure Spring	306T
13.	Stop Nut 1 4 20	309E
14.	Column Bolt	8024
15.	Base Mtg. Bolt	313C
16.	Primer Cup	326
17.	Spring, Primer	330
18.	Spring, Pad	331
19.	Primer Catcher	351
20.	Resize Ring	435*
21.	Lock Ring	435A
22.	Wad Guide Fingers	8300*
23.	Locknut	459A
24.	Locknut	460A
25.	Locknut	461A
26.	Rammer Tube	505B*
27.	Adjusting Clamp	507
28.	Screw	8324
29.	Hex Wrench	507B
30.	Link Spacer	510B
31.	Deprime Punch	519*
33.	LH & RH Link	610
34.	Link Bolt	610A
35.	Bolt—Handle	610C
36.	Column Spring	612
37.	Cam Roller Bolt	613D
38.	Cam Roller	8312
39.	Washer	623C

REF. NO.	NAME OF PART	PART NO.
40.	Spinner	634A*
41.	Spinner	634A*
42.	Spindex Housing	634B
43.	Spindex Cover	634C
44.	Spacer	634D
45.	Screw	634K
46.	Paper Crimp Start	634P*
47.	Support Tube	8316
48.	Screw	685F
49.	Measure Mtg. Brkt.	704C
50.	Measure Pvt. Screw	304D
51.	Turret Frame Assy.	8319
52.	Handle	709
53.	Handle Bolt	709B
54.	Handle Grip	709C
55.	Column	711
56.	Roll Pin	711B
57.	Base Assy.	713
58.	Wing Nut	713D
59.	Shell Holder	715*
60.	Reprime Punch	720*
61.	Screw	720B
62.	Cam Crimp Assembly	721PCA*
63.	Cam Crimp Punch	721B*
64.	Crimp Die Cam	723
65.	Wad Guide Body	8300*
66.	Wad Guide Bracket	8313
67.	Wad Guide Spring	751D
68.	Pro Check	8101
69.	Lock Washer	751W
70.	Wad Guide Cover	8300*
71.	Knockout Bushing	8320*
72.	Eject Bolt	760
73.	Eject Cam	764
	Die Set 10, 12, 16, 20, 28, 410 (Specify Gauge)	741V

*Specify Gauge Size

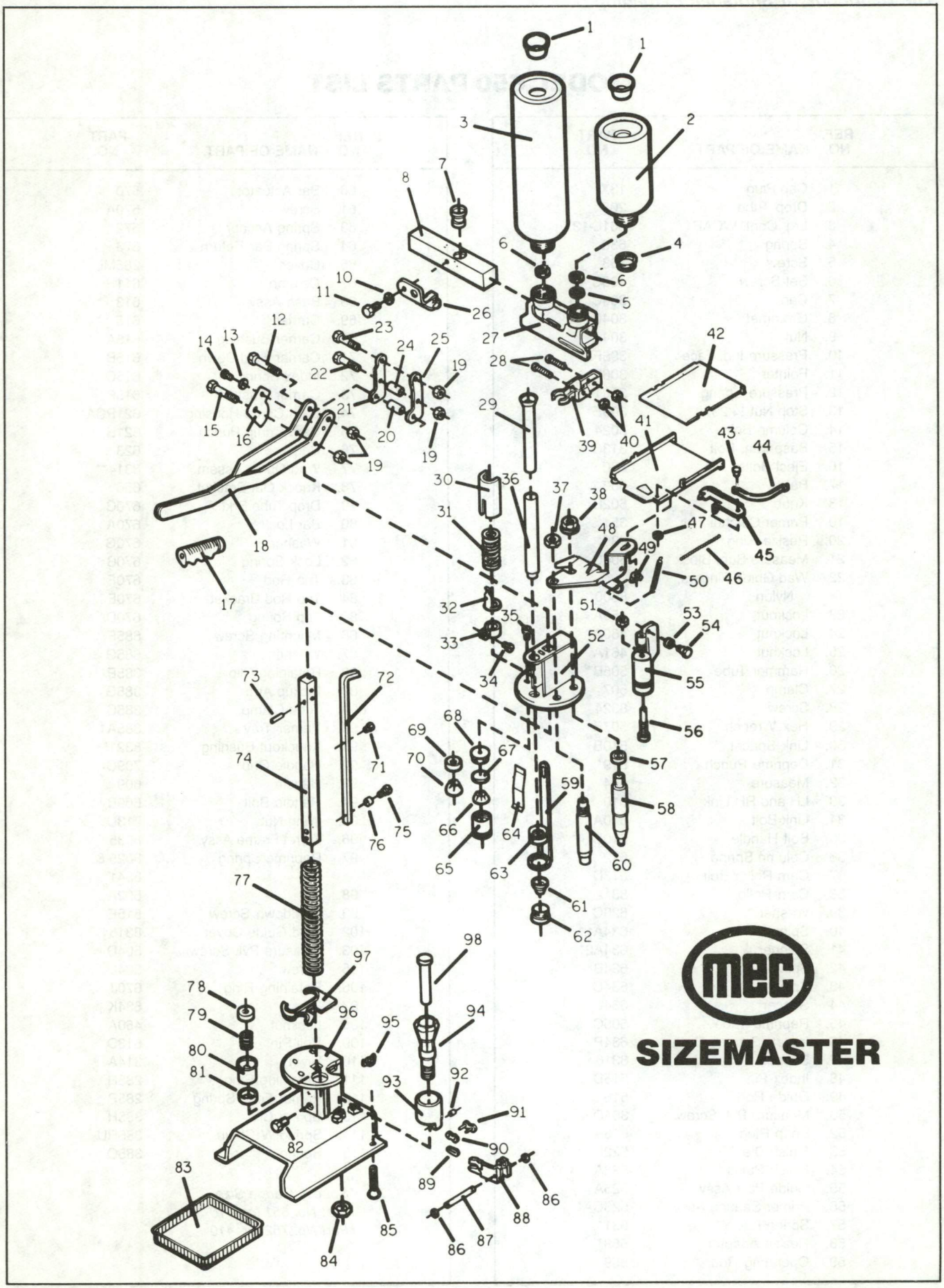

mec
700 VERSAMEC

SIZEMASTER PARTS LIST

REF. NO.	NAME OF PART	PART NO.
1.	Cap Plug	13X
2.	Powder Container	301L13X
3.	Shot Container	8042
4.	Cap	304C
5.	Washer	304W
6.	Grommet	304G
7.	Powder Bushing	050
8.	Charge Bar	302
10.	Lock Washer	751W
11.	Screw	685F
12.	Bolt—Handle	610C
13.	Washer	623C
14.	Screw	8324
15.	Handle Bolt	709B
16.	Crimp Die Cam	723
17.	Handle Grip	709C
18.	Handle	709
19.	Stop Nut	309E
20.	Link Spacer	510B
21.	Handle Link L.H.	8046
22.	Link Bolt	110A
23.	Link Bolt	610A
24.	Release Roller	8037
25.	Handle Link R.H.	8046
26.	Hold Down With Bush.	8101
27.	Measure Ass'y.	8098
28.	Screw	304D
29.	Drop Tube	205*
30.	Pressure Ind. Face	306F
31.	Pressure Spring	306T
32.	Pointer	306P
33.	Adjusting Clamp	507
34.	Screw	507A
35.	Screw	634K
36.	Rammer Tube	505B*
37.	Locknut	459A
38.	Locknut	8099
39.	Measure Mtg. Brkt.	704C
40.	Nut	304J
41.	Primer Tray	285A1
42.	Cover	285ML
43.	Rivet	314A
44.	Primer Feed Spring	285P
45.	Pickup Arm	285G
46.	Chain	285R
47.	Retaining Ring	285H
48.	Rivet Brkt. Assy.	285A4
49.	Wing Nut	304F
50.	Spring	285Q
51.	Locknut	461A

REF. NO.	NAME OF PART	PART NO.
52.	Turret Assy.	8097
53.	Cam Roller	8312
54.	Cam Roller Bolt	613D
55.	Cam Crimp Assy.	721PCA*
56.	Cam Crimp Punch	721B*
57.	Deprime Spacer—3"	8126*
58.	Deprime Punch	8107*
59.	Wad Guide Brkt.	8313
60.	Reprime Punch	286*
61.	Finger —Plastic	8300*
62.	Wad Guide Body	8300*
63.	Wad Guide Cover	8300*
64.	Wad Guide Spring	751D
65.	Spindex Housing	634B*
66.	8 Pt. Spinner	634A
67.	Spacer	634D
68.	Spindex Cover	634C*
69.	Paper Crimp Start	634P*
70.	6 Pt. Spinner	634A
71.	Screw	8125
72.	Actuator Rod	8310**
73.	Roll Pin	8096
74.	Column	8093
75.	Roller Bolt	8079
76.	Cam Roller	623B
77.	Column Spring	612
78.	Spring Pad	331
79.	Spring	330
80.	Primer Cup	326
81.	Spacer 3"	8111
82.	Column Bolt	8024
83.	Primer Catcher	8067
84.	Collet Locknut	8017
85.	Base Mtg. Bolt	313C
86.	Retaining Ring	8023
87.	Pivot Pin	8022
88.	Rocker Arm	8309
89.	Part of Item 91	
90.	Part of Item 91	
91.	Chain Link With Keeper	8032
92.	Bushing	8113
93.	Collet Closure	8106
94.	Collet—High Brass	8080*
95.	Wing Nut	713D
96.	Base Assy.	8095
97.	Shell Holder	715*
98.	Shell Lifter	8109*

**Specify Gauge*
***8311 for 10 Ga. Models*

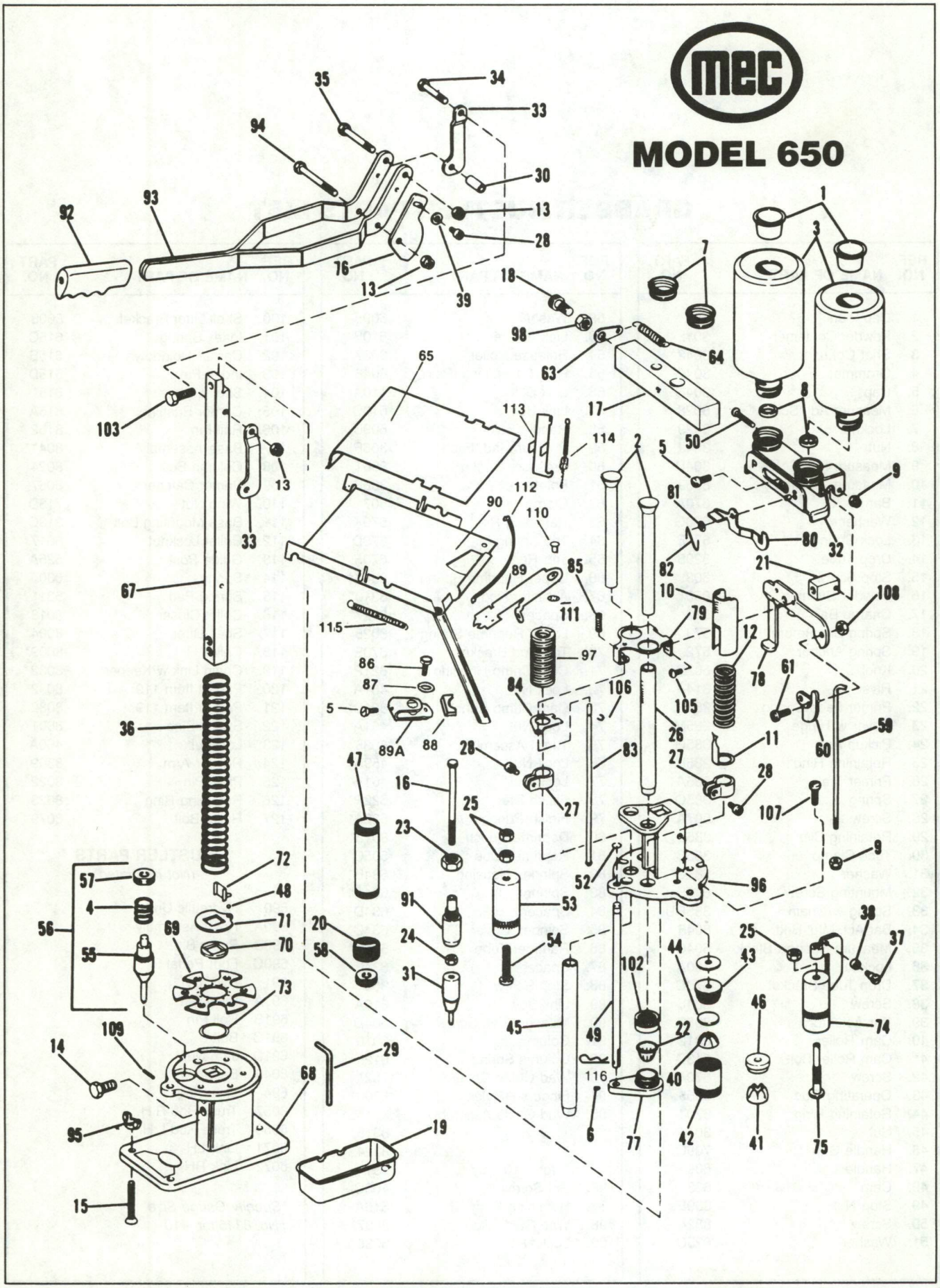

mec
SIZEMASTER

MODEL 650 PARTS LIST

REF. NO.	NAME OF PART	PART NO.
1.	Cap Plug	13X
2.	Drop Tube	205*
3.	Lrg. Cont. WCAP	301L-13X
4.	Spring	630
5.	Screw	303
6.	Set Screw	408C
7.	Cap	304C
8.	Grommet	304G
9.	Nut	304J
10.	Pressure Ind. Face	306F
11.	Pointer	306P
12.	Pressure Spring	306T
13.	Stop Nut ¼ 20	309E
14.	Column Bolt	8024
15.	Base Mtg. Bolt	313C
16.	Eject Bolts	660
17.	Bar	502
18.	Knob	502B
19.	Primer Catcher	351
20.	Resize Ring	435*
21.	Measure Sup. Block	504C
22.	Wad Guide Fingers, Nylon	8300*
23.	Locknut	459A
24.	Locknut	460A
25.	Locknut	461A
26.	Rammer Tube	505B*
27.	Clamp	507
28.	Screw	8324
29.	Hex Wrench	507B
30.	Link Spacer	510B
31.	Deprime Punch	519*
32.	Measure	604
33.	LH and RH Link	610
34.	Link Bolt	610A
35.	Bolt Handle	610C
36.	Column Spring	612
37.	Cam Roller Bolt	613D
38.	Cam Roller	8312
39.	Washer	623C
40.	Spinner	634A1*
41.	Spinner	634A2*
42.	Spindex HSG.	634B
43.	Spindex Cover	634C
44.	Spacer	634D
45.	Reprime Tube	505C
46.	Insert (Paper—Opt.)	634P
47.	Support Tube	8316
48.	Index Pin	515D
49.	Guide Rod	516
50.	Measure Pvt. Screw	304D
52.	Snap Ring	616A
53.	Finish Die	522P*
54.	Finish Punch	522A*
55.	Guide Post Assy.	525A
56.	Primer Seating Assy.	525CA*
57.	Spring Pad	531*
58.	Resize Adaptor	568*
59.	Operating Rod	569

REF. NO.	NAME OF PART	PART NO.
60.	Bar Actuator	570
61.	Screw	570A
63.	Spring Anchor	572
64.	Spring Bar Return	573
65.	Cover	285ML
67.	Column	611
68.	Base Assy.	613
69.	Carrier	615
70.	Carrier Bushing	615A
71.	Carrier Hold Down	615B
72.	Index Spring	615C
73.	Carrier Washer	615F
74.	Cam Crimp Housing	621PCA*
75.	Cam Crimp Punch	621B
76.	Cam	623
77.	Wad Guide Assem.	8314**
78.	Knock Out Bracket	656
79.	Drop Tube Brkt.	670C
80.	Bar Lock	670A
81.	Washer	670G
82.	Lock Spring	670B
83.	Trip Rod	670F
84.	Trip Rod Bracket	670E
85.	Trip Spring	670D
86.	Mounting Screw	685F
87.	Washer	685G
88.	Retaining Clip	385E
89.	Pickup Arm	385G
89A.	Tube Clamp	385C
90.	Primer Tray	385A1
91.	Knockout Bushing	8321*
92.	Handle Grip	709C
93.	Handle	609
94.	Handle Bolt	609B
95.	Wing Nut	713D
96.	Turret Frame Assy.	8035
97.	Reprime Spring	8025 & 8341
98.	Nut	502A
99.	Holddown Screw	515E
102.	Wad Guide Cover	8315†
103.	Measure Pvt. Screw	504D
105.	Screw	304L
106.	Retaining Ring	670J
107.	Screw	634K
108.	Locknut	460A
109.	Roll Pin	613D
110.	Rivet	314A
111.	Retaining Ring	285H
112.	Primer Feed Spring	285P
113.	Spring Clip	385H
114.	Spring W/Chain	385RU
115.	Spring	385Q

**Specify Gauge Size*
***Part No. 651 for .410*
†Part No. 752 for .410


MODEL 650

GRABBER HUSTLER PARTS LIST

REF. NO.	NAME OF PART	PART NO.
1.	Cap Plug	13X
2.	Powder Container	301L-13X
3.	Shot Container	8042
4.	Grommet	304G
5.	Cap	304C
6.	Measure Adj. Screw	8028
7.	Locknut	8029
8.	Nut	304J
9.	Measure Pvt. Screw	304D
10.	Measure Assembly	8059
11.	Bar Lock	670A
12.	Washer	670G
13.	Lock Spring	670B
14.	Drop Tube	8205
15.	Stop Screw	303
16.	Powder Bushing	050
17.	Charge Bar	502
18.	Spring Bar Return	573
19.	Spring Anchor	572
20.	Knob	502B
21.	Rivet	314A
22.	Primer Feed Spring	285P
23.	Cover w/Hinge	285ML
24.	Pickup Arm	385G
25.	Retaining Ring	285H
26.	Primer Tray	385A1
27.	Spring	385Q
28.	Screw	507A
29.	Retaining Clip	385E
30.	Tube Clamp	385C
31.	Washer	685G
32.	Mounting Screw	685F
33.	Spring w/Chain	385RU
34.	Bar Act. Mtg. Brkt.	8045
35.	Measure Support Block	504C
36.	Locknut	460A
37.	Drop Tube Bracket	670C
38.	Screw	304L
39.	Bar Actuator	8053
40.	Cam Roller	8312
41.	Cam Roller Bolt	613D
42.	Screw	570A
43.	Operating Rod	8055
44.	Retaining Ring	670J
45.	Nut	304J
46.	Handle Grip	709C
47.	Handle	609
48.	Cam	623
49.	Stop Nut	309E
50.	Screw	8324
51.	Washer	623C

REF. NO.	NAME OR PART	PART NO.
52.	Washer	609F
53.	Link Spacer	510B
54.	Release Roller	8037
55.	R.H. & L.H. Link (Pair)	8046
56.	Link Bolt	110A
57.	Link Bolt	610C
58.	Handle Bolt	609B
59.	Pressure Ind. Face	306F
60.	Pressure Spring	306T
61.	Pointer	306P
62.	Clamp	507
63.	Retaining Ring	670K
64.	Trip Spring	670D
65.	Trip Rod	670F
66.	Upper Reprime Spring	8343†
67.	Actuator Rod	8310*
68.	Spacer	8027
69.	Lower Reprime Spring	8025
70.	Trip Rod Bracket	670E
71.	Cam Crimp Housing	621P*
72.	Lock Nut	461A
73.	Cam Crimp Punch	621B*
74.	Lock Nut	461A
75.	Turret Assembly	8035
76.	Lock Nut	459A
77.	Lock Nut	461A
78.	Finish Die	522P*
79.	Finish Punch	522A*
80.	Deprime Punch	8013*
81.	Reprime Tube	505C*
82.	Spindex Housing	634B*
83.	Spinner	634A1*
84.	Spacer	634D
85.	Spindex Cover	634C*
86.	Rammer Tube	505B*
87.	Spacer	634L
88.	Stop Screw	303
89.	Link Bolt	610A
90.	Measure Pvt. Screw	504D
91.	Column	8010
92.	Column Spring	612
93.	Wad Guide Cover	752*
94.	Fingers—Nylon	8300*
95.	Wad Guide Assembly	8314, 8315, 8324
	for .410 only	651
96.	Set Screw	408C
97.	Retaining Ring	616A
98.	Wad Guide Rod*	8007
99.	Lock Nut	8036

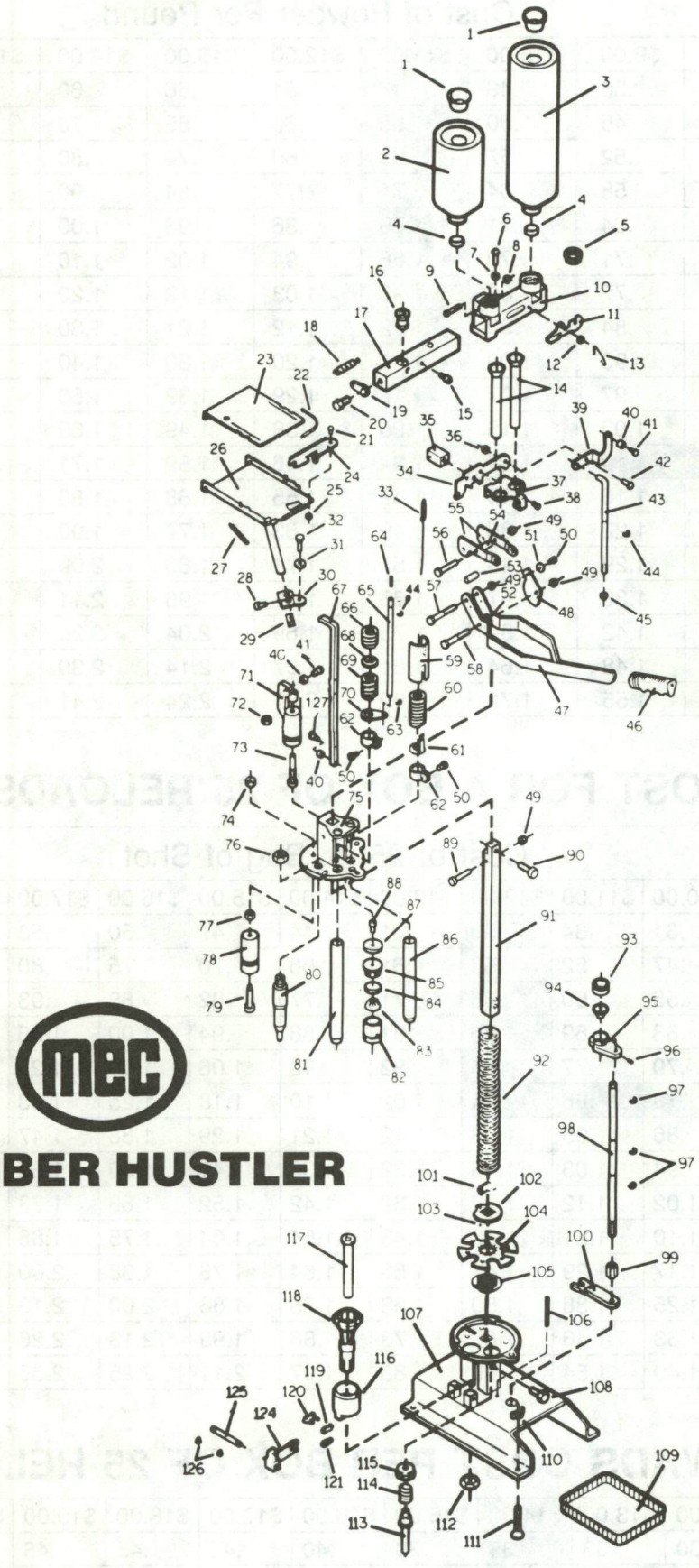
REF. NO.	NAME OF PART	PART NO.
100.	Shell Lifter Bracket	8008
101.	Index Spring	615C
102.	Carrier Holddown	615B
103.	Index Pin	515D
104.	Shell Carrier	615*
105.	Carrier Bushing	615A
106.	Roll Pin	8162
107.	Base Assembly	8041*
108.	Column Bolt	8024
109.	Primer Catcher	8067
110.	Wing Nut	713D
111.	Base Mounting Bolt	313C
112.	Collet Locknut	8017
113.	Guide Post	525A
114.	Spring	630
115.	Spring Pad	531*
116.	Collet Closer	8018
117.	Shell Lifter	8004*
118.	Collet	8009*
119.	Chain Link w/Keeper	8032
120.	Part of Item 119	8032
121.	Part of Item 119	8032
122.	Swivel Block	8001
123.	Locknut	460A
124.	Rocker Arm	8309
125.	Pivot Pin	8022
126.	Retaining Ring	8023
127.	Roller Bolt	8079

HUSTLER PARTS

(Not Illustrated)

690	Hydraulic Unit
690A	Hose Assembly
690B	Pump Bkt.
690C	Foot Pedal
691	Hyd. Cyl.
691A	Pivot Bkt.
691B	Roll Pin
691C	Bolt
691D	Jam Nut
8040	Base
694	Link Strap
8057	Truss Rod R.H.
8058	Truss Rod L.H.
8071	Link LH
8072	Link RH

**Specify Gauge Size*
†No. 8345 for .410


mec
GRABBER HUSTLER

POWDER COST FOR A BOX OF 25 RELOADS

Loads Per Pound	Grains Per Load	Cost of Powder Per Pound								
		$8.00	$9.00	$10.00	$11.00	$12.00	$13.00	$14.00	$15.00	$16.00
583	12	.34	.38	.43	.47	.51	.56	.60	.64	.69
500	14	.40	.45	.50	.55	.60	.65	.70	.75	.80
437	16	.46	.52	.57	.63	.69	.74	.80	.86	.92
388	18	.52	.58	.64	.71	.77	.84	.90	.97	1.03
350	20	.57	.64	.71	.79	.86	.93	1.00	1.07	1.14
318	22	.63	.71	.79	.86	.94	1.02	1.10	1.18	1.26
291	24	.69	.77	.86	.95	1.03	1.12	1.20	1.29	1.37
269	26	.74	.84	.93	1.02	1.12	1.21	1.30	1.39	1.49
250	28	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60
233	30	.86	.97	1.07	1.18	1.29	1.39	1.50	1.61	1.72
218	32	.92	1.03	1.15	1.26	1.38	1.49	1.60	1.72	1.83
205	34	.98	1.10	1.22	**1.34**	1.46	1.59	1.71	1.83	1.95
194	36	1.03	1.16	1.29	1.42	1.55	1.68	1.80	1.93	2.06
184	38	1.09	1.22	1.36	1.49	1.63	1.77	1.90	2.04	2.17
175	40	1.14	1.29	1.43	1.57	1.71	1.86	2.00	2.14	2.29
166	42	1.20	1.36	1.51	1.66	1.81	1.96	2.11	2.26	2.41
159	44	1.26	1.42	1.57	1.73	1.89	2.04	2.20	2.36	2.52
152	46	1.32	1.48	1.64	1.81	1.97	2.14	2.30	2.47	2.63
145	48	1.38	1.55	1.72	1.90	2.07	2.24	2.41	2.59	2.76

SHOT COST FOR A BOX OF 25 RELOADS

Loads Per 25 Lb. Bag	Oz. Per Load	Cost of 25 lb. Bag of Shot										
		$9.00	$10.00	$11.00	$12.00	$13.00	$14.00	$15.00	$16.00	$17.00	$18.00	$19.00
800	1/2	.28	.31	.34	.38	.41	.44	.47	.50	.53	.56	.59
533	3/4	.42	.47	.52	.56	.61	.66	.70	.75	.80	.84	.89
457	7/8	.49	.55	.60	.66	.71	.77	.82	.88	.93	.98	1.04
400	1	.56	.63	.69	.75	.81	.88	.94	1.00	1.06	1.13	1.19
355	1-1/8	.63	.70	.77	.85	.92	.99	1.06	1.13	1.20	1.27	1.34
319	1-1/4	.71	.78	.86	**.94**	1.02	1.10	1.18	1.25	1.33	1.41	1.49
290	1-3/8	.78	.86	.95	1.03	1.12	1.21	1.29	1.38	1.47	1.55	1.63
266	1-1/2	.85	.94	1.03	1.13	1.22	1.32	1.41	1.50	1.60	1.69	1.79
246	1-5/8	.91	1.02	1.12	1.22	1.32	1.42	1.52	1.63	1.73	1.83	1.93
228	1-3/4	.99	1.10	1.21	1.32	1.43	1.54	1.64	1.75	1.86	1.97	2.08
213	1-7/8	1.06	1.17	1.29	1.41	1.53	1.64	1.76	1.88	2.00	2.11	2.23
200	2	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	2.13	2.25	2.38
188	2-1/8	1.20	1.33	1.46	1.60	1.73	1.86	1.99	2.13	2.26	2.39	2.53
178	2-1/4	1.26	1.40	1.54	1.69	1.83	1.97	2.11	2.25	2.39	2.53	2.67

PRIMERS & WADS COST PER BOX OF 25 RELOADS

Cost Per 1000	$12.00	$13.00	$14.00	$15.00	$16.00	$17.00	$18.00	$19.00	$20.00	$21.00
Primers	.30	.33	.35	.38	.40	.43	.45	.48	.50	.53
Wads	.30	.33	**.35**	.38	.40	.43	.45	.48	.50	.53

GUIDE TO SHOTSHELL RELOADING COSTS

This guide is designed to enable the handloader to figure the actual costs of reloading a box of 25 shotshells. In order to do this the following information is needed:

Cost of powder per pound.

Weight of powder (in grains) specified by the recipe.

Cost of shot per 25-pound bag.

Weight of shot (in ounces) specified by the recipe.

Cost of primers and wads per thousand.

This information is cross-referenced in the following charts; costs can be added in the spaces provided following the charts. The charts also show the number of reloaded shells that a pound of powder and a 25-pound bag of shot will give. This information is handy when buying components.

EXAMPLE: Based on the following component costs and using a recipe that calls for 34 grains of powder and 1-1/4 ounces of shot, you can figure the cost per box of 25 shells. This is a popular duplication of a 3-3/4 dram equivalent load that fires 1-1/4 ounces of shot at 1330 fps.

Powder $11.00 per pound

Shot 12.00 per 25-pound bag

Wads 3.50 per bag of 250 X 4 = $14.00 per thousand wads

Primers 1.48 per box of 100 X 10 = $14.80 per thousand primers

Our sample recipe calls for 34 grains of powder. Using the Powder Cost Chart, we find where the $11.00 column intersects the 34 grain line to see that the cost per box of 25 is $1.34.

The amount of shot in our example recipe is 1-1/4 ounces per load. Using the Shot Cost Chart, we locate where the $12.00 column intersects the 1-1/4 ounce line to learn that the cost per box of 25 is 94 cents.

Primers are sold in boxes of 100 or cartons of 1,000. The primer cost in our example is $1.48 per box of 100. The cost per thousand, therefore, is $14.80. We do not locate a column for $14.80 using the primers & Wads Chart, but by interpolating, the cost of primers per box of 25 reloads is determined to be 37 cents.

Wads are sold in bags of 250. To figure the cost of wads per box of 25 we first must determine the cost of 1,000 wads. Multiply the cost per bag of 250 X 4 to arrive at the cost per 1,000. At $3.50 per bag of 250, 1,000 wads will cost $14.00. Using the Primers & Wads Chart, we determine our wads' cost per box of 25 reloads to be 35 cents.

The individual costs are added below.

$1.34 Powder cost
0.94 Shot cost
0.37 Primers cost
0.35 Wads cost

$3.00 / box of 25 reloaded shells

Economy of reloading shotshells is just one reason to discover reloading. Today's plastic hull is the most expensive part of the shell and, as such, is largely responsible for the high cost of factory-loaded ammunition. A fellow cannot afford to do too much shooting when he pays $8.75 for a box of 25 factory-loaded 3-3/4 dram equivalent, 1-1/4 ounce 12 gauge shells. Every time the trigger is pulled it costs the shooter 35 cents and this takes the pleasure out of shooting. In effect, the non-reloader scraps the most expensive part of the shell—the hull. The reloader can take those 25 fired hulls and reload them for about $3.00, or 12 cents each, and reload the hulls several times before they are worn out. No wonder the handloader says, "SAVE YOUR HULLS!" Each hull is worth 23 cents to him. (All costs are based on average 1984 discount store prices.)

In the following spaces a handloader can keep a listing of personal reloading data and figure the cost of reloading for each box of 25 shells.

TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS

\# _____

_____ Hulls★
_____ Primers
_____ Powder
_____ Wads
_____ Shot
$ _____ /Box of 25

TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS

_____

_____ Hulls★
_____ Primers
_____ Powder
_____ Wads
_____ Shot
$ _____ /Box of 25

TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS

_____

_____ Hulls★
_____ Primers
_____ Powder
_____ Wads
_____ Shot
$ _____ /Box of 25

TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS

_____

_____ Hulls★
_____ Primers
_____ Powder
_____ Wads
_____ Shot
$ _____ /Box of 25

TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS

_____

_____ Hulls★
_____ Primers
_____ Powder
_____ Wads
_____ Shot
$ _____ /Box of 25

TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS

_____

_____ Hulls★
_____ Primers
_____ Powder
_____ Wads
_____ Shot
$ _____ /Box of 25

TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS

_____

_____ Hulls★
_____ Primers
_____ Powder
_____ Wads
_____ Shot
$ _____ /Box of 25

TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS

_____

_____ Hulls★
_____ Primers
_____ Powder
_____ Wads
_____ Shot
$ _____ /Box of 25

TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS

_____

_____ Hulls★
_____ Primers
_____ Powder
_____ Wads
_____ Shot
$ _____ /Box of 25

★ *There may or may not be a cost for the hulls. Many handloaders pick up once-fired hulls in the field, making their hull cost the original shooter's expense. Many of the better quality hulls can be purchased from dealers or trap and skeet ranges, etc. Some of these hulls can be reloaded 10 times (some less, some more, depending on quality) so figure the cost per box to be approximately one-tenth the original purchase price.*

PERSONAL RELOADING DATA RECIPES

#	HULL	PRIMER	POWDER –GRAINS	PLASTIC WAD	OUNCES OF SHOT	PRESSURE	VELOCITY	COST PER BOX	REMARKS

# _____ TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS	# _____ TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS
_____ Hulls★ _____ Primers _____ Powder _____ Wads _____ Shot $ _____ /Box of 25	_____ Hulls★ _____ Primers _____ Powder _____ Wads _____ Shot $ _____ /Box of 25
# _____ TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS	**# _____ TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS**
_____ Hulls★ _____ Primers _____ Powder _____ Wads _____ Shot $ _____ /Box of 25	_____ Hulls★ _____ Primers _____ Powder _____ Wads _____ Shot $ _____ /Box of 25
# _____ TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS	**# _____ TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS**
_____ Hulls★ _____ Primers _____ Powder _____ Wads _____ Shot $ _____ /Box of 25	_____ Hulls★ _____ Primers _____ Powder _____ Wads _____ Shot $ _____ /Box of 25
# _____ TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS	**# _____ TOTAL RELOADING COSTS FOR A BOX OF 25 SHOTSHELLS**
_____ Hulls★ _____ Primers _____ Powder _____ Wads _____ Shot $ _____ /Box of 25	_____ Hulls★ _____ Primers _____ Powder _____ Wads _____ Shot $ _____ /Box of 25

★ *There may or may not be a cost for the hulls. Many handloaders pick up once-fired hulls in the field, making their hull cost the original shooter's expense. Many of the better quality hulls can be purchased from dealers or trap and skeet ranges, etc. Some of these hulls can be reloaded 10 times (some less, some more, depending on quality) so figure the cost per box to be approximately one-tenth the original purchase price.*

PERSONAL RELOADING DATA RECIPES

#	HULL	PRIMER	POWDER –GRAINS	PLASTIC WAD	OUNCES OF SHOT	PRESSURE	VELOCITY	COST PER BOX	REMARKS

mec POWDER BUSHING CHART

Per Information Available November 3, 1982

The bushing chart does not represent recommended weights of charge. It is intended as a guide only to show the relationship of the volumetric capacity to the various bushings.

BUSH NO.	X58 RED DOT	GREEN DOT	UNIQUE	HERCO	2400	BLUE DOT	800X	700X	PB	7625	4756	4227	TRAP 100	H110	296	HS7 571	452	473	540 HS6
10	6.1	6.3	8.6	7.9	12.4	10.6	8.8	7.1	7.2	8.2	8.3	11.8	8.0	13.0	13.7	13.4	7.5	9.1	13.0
11	6.5	6.7	9.1	8.3	13.1	11.2	9.3	7.5	7.6	8.7	8.8	12.5	8.5	13.8	14.6	14.2	7.9	9.7	13.8
12	6.8	7.1	9.6	8.8	13.9	11.9	9.8	7.9	8.1	9.2	9.3	13.3	9.0	14.6	15.4	15.0	8.4	10.2	14.6
12A	7.2	7.5	10.2	9.3	14.6	12.5	10.4	8.4	8.5	9.7	9.8	14.0	9.5	15.4	16.3	15.8	8.9	10.8	15.4
13	7.6	7.9	10.7	9.8	15.4	13.2	10.9	8.8	9.0	10.2	10.3	14.8	10.0	16.3	17.2	16.7	9.4	11.4	16.3
13A	8.0	8.3	11.3	10.4	16.3	13.9	11.5	9.3	9.5	10.8	10.9	15.6	10.6	17.1	18.1	17.6	9.9	12.0	17.1
14	8.4	8.7	11.9	10.9	17.1	14.6	12.1	9.8	10.0	11.3	11.4	16.4	11.1	18.0	19.0	18.5	10.4	12.6	18.0
15	8.9	9.2	12.5	11.4	18.0	15.4	12.7	10.3	10.5	11.9	12.0	17.2	11.7	18.9	20.0	19.5	10.9	13.2	19.0
16	9.3	9.6	13.1	12.0	18.9	16.2	13.4	10.8	11.0	12.5	12.6	18.1	12.3	19.9	21.0	20.4	11.4	13.9	19.9
17	9.7	10.1	13.7	12.6	19.8	16.9	14.0	11.3	11.5	13.1	13.2	18.9	12.9	20.8	22.0	21.4	12.0	14.6	20.8
18	10.2	10.6	14.4	13.2	20.7	17.7	14.7	11.9	12.1	13.7	13.8	19.8	13.5	21.8	23.0	22.4	12.6	15.3	21.8
19	10.7	11.1	15.0	13.8	21.6	18.5	15.3	12.4	12.6	14.4	14.5	20.7	14.1	22.8	24.1	23.4	13.1	16.0	22.8
20	11.2	11.6	15.7	14.4	22.6	19.4	16.0	13.0	13.2	15.0	15.1	21.7	14.7	23.8	25.1	24.5	13.7	16.7	23.9
21	11.6	12.1	16.4	15.0	23.6	20.2	16.7	13.5	13.8	15.7	15.8	22.6	15.4	24.9	26.2	25.6	14.3	17.4	24.9
22	12.1	12.6	17.1	15.7	24.6	21.1	17.5	14.1	14.4	16.3	16.5	23.6	16.0	26.0	27.4	26.7	14.9	18.2	26.0
23	12.7	13.1	17.8	16.3	25.7	22.0	18.2	14.7	15.0	17.0	17.2	24.6	16.7	27.0	28.5	27.8	15.6	18.9	27.1
24	13.2	13.7	18.6	17.0	26.7	22.9	18.9	15.3	15.6	17.7	17.9	25.6	17.4	28.2	29.7	28.9	16.2	19.7	28.2
25	13.7	14.2	19.3	17.7	27.8	23.8	19.7	15.9	16.2	18.4	18.6	26.6	18.1	29.3	30.9	30.1	16.9	20.5	29.3
26	14.3	14.8	20.1	18.4	28.9	24.8	20.5	16.6	16.9	19.2	19.3	27.7	18.8	30.5	32.1	31.3	17.5	21.3	30.5
27	14.8	15.4	20.9	19.1	30.0	25.7	21.3	17.2	17.5	19.9	20.1	28.8	19.5	31.6	33.4	32.5	18.2	22.1	31.7
28	15.4	15.9	21.7	19.8	31.2	26.7	22.1	17.9	18.2	20.7	20.9	29.9	20.3	32.8	34.6	33.8	18.9	23.0	32.9
29	16.0	16.5	22.5	20.6	32.3	27.7	22.9	18.5	18.9	21.4	21.6	31.0	21.0	34.1	35.9	35.0	19.6	23.8	34.1
30	16.5	17.1	23.3	21.3	33.5	28.7	23.8	19.2	19.6	22.2	22.4	32.1	21.8	35.3	37.3	36.3	20.3	24.7	35.4
31	17.1	17.8	24.1	22.1	34.7	29.7	24.6	19.9	20.3	23.0	23.2	33.3	22.6	36.6	38.6	37.6	21.1	25.6	36.6
32	17.7	18.4	25.0	22.9	36.0	30.8	25.5	20.6	21.0	23.9	24.1	34.5	23.4	37.9	40.0	38.9	21.8	26.5	37.9
33	18.4	19.0	25.9	23.7	37.2	31.9	26.4	21.3	21.7	24.7	24.9	35.7	24.2	39.2	41.4	40.3	22.6	27.4	39.2
34	19.0	19.7	26.7	24.5	38.5	33.0	27.3	22.0	22.5	25.5	25.7	36.9	25.0	40.6	42.8	41.7	23.3	28.4	40.6
35	19.6	20.3	27.6	25.3	39.8	34.1	28.2	22.8	23.2	26.4	26.6	38.1	25.9	41.9	44.2	43.1	24.1	29.3	42.0
36	20.3	21.0	28.6	26.2	41.1	35.2	29.1	23.5	24.0	27.3	27.5	39.4	26.7	43.3	45.7	44.5	24.9	30.3	43.3
37	20.9	21.7	29.5	27.0	42.4	36.3	30.1	24.3	24.8	28.1	28.4	40.7	27.6	44.7	47.1	45.9	25.7	31.3	44.7
38	21.6	22.4	30.4	27.9	43.8	37.5	31.0	25.1	25.6	29.0	29.3	42.0	28.5	46.1	48.7	47.4	26.6	32.3	46.2
38A	22.3	23.1	31.4	28.8	45.2	38.7	32.0	25.9	26.4	30.0	30.2	43.3	29.4	47.6	50.2	48.9	27.4	33.3	47.6
39	23.0	23.8	32.4	29.7	46.6	39.9	33.0	26.7	27.2	30.9	31.2	44.6	30.3	49.1	51.7	50.4	28.3	34.3	49.1
39A	23.7	24.5	33.4	30.6	48.0	41.1	34.0	27.5	28.0	31.8	32.1	46.0	31.2	50.6	53.3	52.0	29.1	35.4	50.6
40	24.4	25.3	34.4	31.5	49.4	42.3	35.0	28.3	28.9	32.8	33.1	47.4	32.1	52.1	54.9	53.5	30.0	36.4	52.1
40A	25.1	26.0	35.4	32.4	50.9	43.6	36.1	29.1	29.7	33.8	34.1	48.8	33.1	53.6	56.6	55.1	30.9	37.5	53.7
41	25.8	26.8	36.4	33.4	52.4	44.9	37.1	30.0	30.6	34.7	35.0	50.2	34.1	55.2	58.2	56.7	31.8	38.6	55.2
41A	26.6	27.5	37.5	34.3	53.9	46.2	38.2	30.9	31.5	35.7	36.1	51.6	35.0	56.8	59.9	58.4	32.7	39.7	56.8
42	27.3	28.3	38.5	35.3	55.4	47.5	39.3	31.7	32.4	36.8	37.1	53.1	36.0	58.4	61.6	60.0	33.6	40.9	58.4
42A	28.1	29.1	39.6	36.3	57.0	48.8	40.4	32.6	33.3	37.8	38.1	54.6	37.0	60.0	63.3	61.7	34.6	42.0	60.1
43	28.9	29.9	40.7	37.3	58.5	50.1	41.5	33.5	34.2	38.8	39.2	56.1	38.1	61.7	65.0	63.4	35.5	43.2	61.7
43A	29.7	30.7	41.8	38.3	60.1	51.5	42.6	34.4	35.1	39.9	40.2	57.6	39.1	63.4	66.8	65.1	36.5	44.3	63.4
44	30.5	31.6	42.9	39.3	61.7	52.9	43.7	35.4	36.1	41.0	41.3	59.2	40.1	65.1	68.6	66.9	37.5	45.5	65.1
44A	31.3	32.4	44.1	40.4	63.4	54.3	44.9	36.3	37.0	42.0	42.4	60.7	41.2	66.8	70.4	68.6	38.5	46.7	66.8
45	32.1	33.2	45.2	41.4	65.0	55.7	46.1	37.2	38.0	43.1	43.5	62.3	42.3	68.5	72.3	70.4	39.5	47.9	68.6
45A	32.9	34.1	46.4	42.5	66.7	57.1	47.3	38.2	39.0	44.2	44.6	63.9	43.4	70.3	74.1	72.3	40.5	49.2	70.4
46	33.7	35.0	47.6	43.6	68.4	58.6	48.5	39.2	39.9	45.4	45.8	65.6	44.5	72.1	76.0	74.1	41.5	50.4	72.2

THE TEN COMMANDMENTS OF SHOTSHELL RELOADING

1. Exercise care and common sense at all times and always wear eye protection. It is an unnecessary risk to reload without safety glasses.

2. Do not reload without an instruction manual for the machine you are using whether it be a MEC or any other brand. (In almost all cases these instruction manuals are free.) Do not take shortcuts. Use your reloader according to its instruction manual.

3. Reload only when you can give it your undivided attention. Develop a reloading routine to avoid mistakes. Don't become distracted, avoid haste and reload at a leisurely pace.

4. Carefully examine each empty shotshell hull. Do not reload hulls that are defective or excessively worn.

5. Observe "good housekeeping" in your reloading area. Keep your equipment and components neat, clean and orderly.

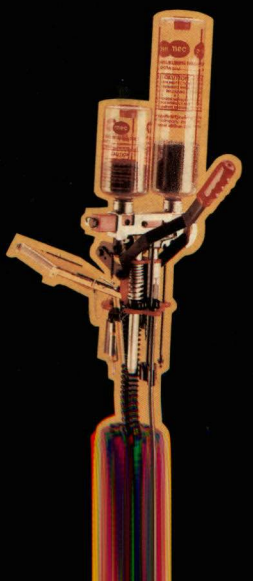
6. Observe and heed all warnings in the "Introduction" section to the reloading data.

7. Double check. Take a second look at the recipe in the "Data Section" and be sure you are using the proper components in the proper amount. Do not substitute components and never exceed recommended loads. Check the "dropped" powder charge with a powder scale to be sure it conforms to the recipe and "check-weigh" dropped charges frequently.

8. Keep only the powder and primers you are using handy. Keep no more than needed in an open container. When not actually using powder or primers, store them out of the way in their original factory containers. Do not repackage powder or primers. This will preserve identity and shelf life. Only use powder and primers of a known identity. Scrap those of uncertain or unknown identity.

9. Store powder and primers beyond the reach of children and away from heat and open flames in accordance with SAAMI recommendations. Do not store primers in bulk! Do not force primers! Take care in filling automatic primer feeds. Do not smoke when reloading. Keep a fire extinguisher within reach of your reloading bench.

10. Keep complete records of your reloads. Apply a descriptive label to each box of shells. Then, when you find a reload that performs well, you'll have the recipe at hand.



SKR Industries, Inc.

P.O. Box 1382 • San Angelo, Texas 76902