



# ARP

automotive *Racing* products®

2009 CATALOG

**The World Leader In Fastener Technology**



# HI-PERFORMANCE FOR COMPETITION

Stock Replacement  
Rod Bolts  
pages 29-33

Aftermarket Replacement  
Rod Bolts- page 34-35

Distributor Hold-Down  
Studs - pages 55, 58

Harmonic Balancer  
Bolts - page 56

Intake Manifold  
Bolts - pages 53, 60, 68

Camshaft Bolts  
page 57

Thermostat  
Housing Bolts  
pages 54, 59

Valve Cover Bolts  
& Studs - pages 48, 60

Rocker Arm  
Adjusters - page 47  
Rocker Arm Studs - page 46

**ASSEMBLE YOUR ENGINE  
THE RIGHT WAY WITH  
ARP FASTENERS!**

Front Cover  
Studs - page 51

Header Studs  
& Bolts - page 49

Flywheel/Flexplate  
Bolts - page 62

Water Pump  
Bolts - page 51

Drive Plate  
Bolts - page 66

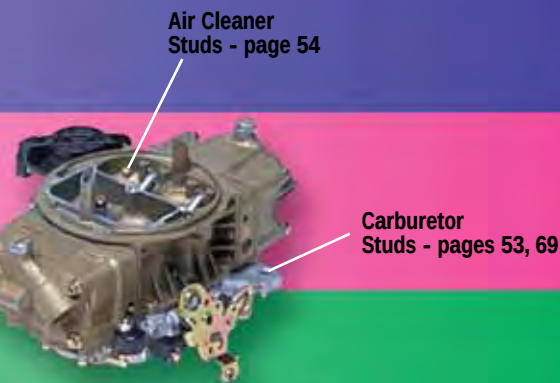
Wheel Studs  
pages 66, 67

Torque Converter  
Bolts - page 63





# FASTENERS AND STREET



Main Studs & Bolts - pages 43-45, 74

**ARP**  
automotive *Racing* products

1863 Eastman Avenue  
Ventura, CA 93003

e-mail: [info@arpfasteners.com](mailto:info@arpfasteners.com)  
web: [www.arp-bolts.com](http://www.arp-bolts.com)  
phone: 805-339-2200  
fax: 805-650-0742

**800-826-3045**



## INDEX

|                                     |              |
|-------------------------------------|--------------|
| Accessory rear cam drive.....       | 52           |
| Air cleaner studs.....              | 54           |
| Alternator bolts.....               | 59           |
| Alternator studs.....               | 58, 69       |
| Apparel.....                        | 91           |
| Assembly lube.....                  | 86           |
| Bellhousing stud kits.....          | 52, 64       |
| Blower studs.....                   | 55           |
| Brake hat bolts.....                | 65, 68       |
| Camshaft bolts.....                 | 57           |
| Carburetor float bowl bolts.....    | 55           |
| Carburetor studs.....               | 53, 69       |
| Carrier fasteners.....              | 65           |
| Chrome moly bolt 5-packs.....       | 77-81        |
| Clutch cover bolt kits.....         | 63           |
| Coil bracket bolts.....             | 54, 58       |
| Cylinder head bolts.....            | 41-42        |
| Distributor studs.....              | 55, 58       |
| Drive pins.....                     | 66           |
| Drive plate bolts.....              | 66           |
| Engine accessory kits.....          | 61           |
| Flexplate bolts.....                | 63           |
| Flywheel bolts.....                 | 62           |
| Front cover bolts and studs.....    | 51           |
| Front mandrel bolts.....            | 69           |
| Fuel pump bolts.....                | 51, 59       |
| Fuel pump pushrods.....             | 56           |
| General purpose nuts.....           | 82           |
| General purpose washers.....        | 84           |
| Harmonic balancer bolts.....        | 56           |
| Head bolts.....                     | 41           |
| Head studs.....                     | 36-42, 72-73 |
| Header bolts & studs.....           | 49           |
| Hex nuts.....                       | 82           |
| Insert washers.....                 | 85           |
| Intake manifold bolts.....          | 53, 60, 68   |
| Main studs & bolts.....             | 43-45, 74    |
| Metric exhaust/accessory studs..... | 75           |
| Motor mount bolts.....              | 51, 64       |
| Nyloc nut 5-packs.....              | 82           |
| Oil pan bolts & studs.....          | 50, 60       |
| Oil pump drives.....                | 57           |
| Perma-Loc adjusters.....            | 47           |
| Plate nuts.....                     | 83           |
| Porsche specialty fasteners.....    | 75           |
| Pressure plate bolts.....           | 63           |
| Rear end cover bolts.....           | 64           |
| Ring compressors.....               | 88           |
| Ring gear bolts.....                | 65           |
| Rocker arm studs.....               | 46           |
| Rod bolt extensions.....            | 87           |
| Rod bolt stretch gauge.....         | 88           |
| Rod bolts.....                      | 29-35, 70-71 |
| Spark plug indexer.....             | 87           |
| Special purpose washers.....        | 84           |
| Stainless steel bolt 5-packs.....   | 81           |
| Stand-off brackets.....             | 85           |
| Starter bolts.....                  | 52           |
| Thermostat housing bolts.....       | 54, 59       |
| Thread chasers.....                 | 87           |
| Thread sealer.....                  | 86           |
| Torque converter bolts.....         | 63           |
| Torque specs.....                   | 24-26        |
| Transmission pan bolts.....         | 63           |
| Valve cover bolts & studs.....      | 48, 60       |
| Water pump bolts.....               | 59           |
| Weld bungs.....                     | 85           |
| Wheel studs.....                    | 66-67        |

## ROD BOLTS

pages 29-35

replacement and aftermarket

## CYLINDER HEAD

pages 36-42, 46-49, 72-73

Head studs & bolts, rocker arm adjusters & valve cover

## ENGINE BLOCK

pages 43-45, 50-52

Main studs & bolts, oil pan & pump, front cover, water pump

## INTAKE SYSTEM

pages 53-55

Manifold bolts, carb, air cleaner & blower studs, coil, distributor

## ENGINE COMPONENTS

pages 56-57

Cam, harmonic damper bolts, fuel pump pushrod, oil pump

## ACCESSORIES

pages 58-61

Complete bolt kits, individual bolts from intake to oil pan

## DRIVELINE

pages 62-66

Flywheel, flex & pressure plate, converter, rear end, wheel studs

## NASCAR SPECIALTIES

pages 67-69

Special fasteners for NASCAR competition

## SPORT COMPACT

pages 70-75

Rod bolts, head bolts & studs, main bolts & studs, driveline

## BULK FASTENERS

pages 76-85

Bolt 5-packs, washers, nuts, weld bungs, stand-off brackets

## TOOLS

pages 86-89

Rod bolt extenders, stretch gauge, ring compressors, thread chasers

## APPAREL

pages 91

## A Brief History

They say that to be successful you must identify a need and satisfy it. Back in 1968 racing enthusiast Gary Holzapfel saw that many of his friends' broken engines were caused by fastener failure. At the time, there were no commercially available studs and bolts up to the challenge. So Holzapfel



*Gary Holzapfel  
Founder and CEO*

called upon his many years of fastener making experience for a leading aerospace subcontractor and founded ARP® (Automotive Racing Products). In the ensuing years, the firm has grown from what was literally a backyard garage workshop into a highly diversified manufacturer with four operational entities in Southern California with a combined area in excess of 115,000 square feet. These include forging, machining, finishing and packaging/warehousing facilities in Santa Paula and Ventura, California. There is even a unique racing-themed restaurant at the main Santa Paula facility (called "Hozy's Grill" - which is open to the public).



*ARP's state-of-the-art manufacturing facility in Santa Paula, California.*



*Packaging, warehousing and sales operations are handled out of Ventura, California.*



*All metal finishing operations are done in this Santa Paula plant.*



*On hand at the Grand Opening of ARP's new manufacturing facility in Santa Paula, CA were (l to r) 12-time NHRA World Champ John Force, ARP's VP Sales & Marketing Bob Florine, Founder and CEO Gary Holzapfel, Assistant Sales Manager Chris Raschke and ARP President Mike Holzapfel.*

Today, ARP's product line contains thousands of part numbers, and has expanded to include virtually every fastener found in an engine and driveline. These range from quality high performance OEM replacement parts to exotic specialty hardware for Formula 1, IndyCar, NASCAR and NHRA drag racing and marine applications.

As a matter of fact, ARP's customer list reads like a "who's who" of motorsports around the world. In the past several years, virtually every major championship on the planet has been won with engines prepared by ARP customers.

These include NASCAR Sprint Cup, CART, Formula 1, NHRA Top Fuel, Funny Car, & Pro Stock, NASCAR Nationwide Series and Camping World Truck Series. And so it goes. ARP works closely with many, many teams as a supplier of engine and driveline fasteners, and has clearly become recognized as "the" preeminent source for serious racers.

In addition to its core automotive business, ARP has an Aerospace Division, and is one of the very few companies in the world fully licensed by the United States Government to manufacture MS-21250 fatigue rated fasteners.

ARP also manufactures a variety of industrial fasteners on a contract basis, and is known for its ability to promptly provide efficient solutions to problems at hand.



*This facility is home to ARP's forging and heat-treating operations.*



## The Manufacturing Process...

In order to ensure optimum quality control, ARP has grown to be exceptionally self-reliant and now controls all aspects of the manufacturing process. All operations are performed in-house and closely monitored. This is how ARP has been able to establish a reputation for "zero defects" quality throughout the industry.

The process begins right at the mill, where ARP orders only premium grade materials including several proprietary alloys. The ever-popular 8740 chrome moly steel, for example, comes from the mill in four distinct grades. The lowest is "commercial," which is followed by "aircraft quality." ARP uses only the top two grades (SDF and CHQ), which cost twice as much, but provide the foundation for defect-free fasteners. These materials come in bar stock (for studs) and huge coils (for bolts).

Transforming raw material into a fastener begins with "hot" and "cold" heading processes. Material is fed into powerful devices and cold forged, or induction-heated and formed under tons of pressure.



*Material comes from the mill in large coils...which subsequently will be fed into cold-headers and formed into bolts.*



*Some bolts begin as induction-heated lengths of bar stock that are forged on huge presses with the desired head shape.*



*ARP's bank of cold-headers can handle material up to 5/8" diameter and form bolts in a multi-phase operation.*



*An overview of part of ARP's expansive machining operations. The shop is laid out for optimum efficiency.*



*Lengths of bar stock are automatically fed into special machines and cut to the appropriate length.*



Following the basic shaping, material is heat-treated to desired levels. This crucial process is done entirely in-house to assure total quality control. ARP uses special vertical racks to hold each piece individually and assure complete 360° penetration. This is far superior to commonly-used methods of dumping items into a large bin and batch-treating.

Studs are centerless ground to guarantee concentricity. The thread rolling operation (to MIL-S-8879A specs) is done after heat-treat, which accounts for a fatigue strength up to *ten times higher* than fasteners which are threaded prior to heat-treat.

ARP manufactures nuts in a multi-step process that begins with raw material being fed into a giant forming device that “blanks” the hex and 12-point nuts and continues with highly sophisticated automated threading equipment tapping each nut with an accuracy of .001” (which is five times higher than the aerospace standard). This ensures an exceptionally close-tolerance fit between the bolt/stud and nut.

Metal finishing is also performed in-house at ARP. Operations include black oxide coating of chrome moly or polishing stainless steel to a brilliant luster.



*The Grinding Department is where all studs are centerless ground to ensure that they are perfectly concentric. As many as ten machining steps are required to achieve this level of accuracy.*



*Powerful cold-forging equipment is used to make ARP's hex and 12-point nuts. Multi-stage dies are employed to precision-form the finished “blanks.”*



*A series of CNC-threading machines are employed by ARP to accurately tap the threads in nuts. Tolerances held are 5 times better than aerospace standards.*



*ARP performs the thread rolling operation after heat-treating, which results in a fatigue strength up to 10-times higher than fasteners with threads rolled prior to elevating the material's tensile strength.*



*Heat-treating is critically important in obtaining the correct tensile strength. Fasteners are placed in special vertical racks to ensure complete 360° penetration.*







*A bank of CNC machining centers are employed at ARP to perform specialty operations.*



*Contemporary EDM technology is used to perform special operations, such as hex-broaching the nose of a unique short-run fastener*

Also on the premises is a fully-equipped lab for R&D and quality control. It has everything required to ensure that ARP products measure up to the company's ultra high standards. Some of the tests that ARP personnel perform on an ongoing basis include proof loading (using a 120,000 lb. capability tensile machine), fatigue cycle (Amsler) and hardness (Rockwell). Visual inspections include use of an Optical Comparator (to check thread root contour, etc.), fixtured micrometers and microscopic grain flow analysis. The computer-controlled fatigue cycle testers allow ARP to take fasteners to a failure point in millions of cycles – as opposed to the aerospace norm of 65,000 average to 130,000 cycles maximum. This allows ARP engineers to verify the design specifications of each fastener, and prove its ability to provide superior long-term service.

Finished products are packaged and warehoused in ARP's Ventura facility, which is also home to the firm's customer service, technical and sales office.



*ARP's popular stainless steel engine & accessory fasteners are polished to a brilliant luster using this specialized equipment.*



*Fasteners are shot-peened after heat-treatment to remove any surface irregularities and improve overall external integrity.*



*The finishing touch for most chrome moly fasteners is the black oxidizing operation. Fasteners go through a series of "baths."*

## Behind The Scenes

There are a number of important elements in the production of specialty fasteners, not the least of which are materials, design and manufacturing. As you read further into this catalog, you will get a better idea of the extraordinary steps taken by ARP to produce the very finest products of their kind on the market today. The key to success in all areas is personnel. And here's where ARP's cadre of highly qualified and dedicated specialists shines brightly.

Two valuable resources in the design of ARP products are Dr. Kenneth Foster and Russell Sherman, P.E. Both men have extensive backgrounds in mechanical engineering, metallurgy and stress analysis. Their academic credentials are substantial, and real world experience equally impressive. Dr. Foster has a Ph.D. in Engineering Mechanics from Cornell University and has taught at several colleges. He was formerly the head of Stress & Dynamics at Hughes Aircraft, Space Systems division. Mr. Sherman has been awarded a fellowship from A.S.M. International, a technical achievement award from Fastener Technology International, and holds a number of fastener patents.

Some of the most valuable work done by Foster and Sherman



*Kenneth Foster, PhD  
Consulting Engineer*



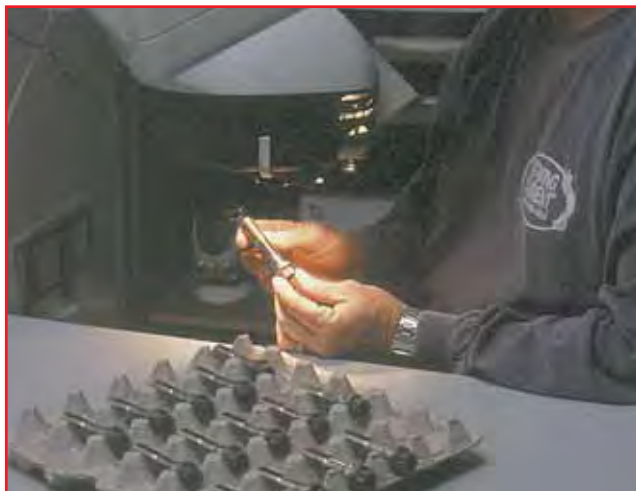
*Russell Sherman, P.E.  
Consulting Engineer*



*Robert Logsdon  
Quality Control Mgr.*

includes analyzing various aspects of engine, chassis and driveline structural loads, and coming up with solutions to the problems at hand. In this manner, the ARP Research Team is able to continually expand the company's product line.

ARP has added Robert Logsdon to its cadre of consultants. He comes to ARP with vast experience in the area of Metrology, Quality Control, Manufacturing, Acquisition and Configuration Management. Logsdon is a graduate of the U.S. Naval Academy of Metrology Engineering, the Defense Management College and U.S. Air Force Institute of



*High powered electronic microscopes are used to carefully inspect critical components. ARP's quality control team is relentless!*



*A series of special checking devices are employed to monitor the quality of threads. For every thread size, there is a checking device.*



*A computer-controlled Instron tensile machine is used to determine the ultimate tensile strength of studs and bolts.*



*ARP has two of these highly sophisticated Amsler fatigue machines, which check fasteners through millions of cycles.*



Technology. Additionally, ARP has one of the industry's most complete in-house R&D/QC facilities and a wide variety of testing equipment. Through the combined efforts of Logsdon and ARP's management team, the ISO 9001 Level 1 (Quality Manual), Level 2 (Quality System Procedures) and Level 3 (Work Instructions) documentation has been finalized and is being implemented. ARP is now ISO 9001 compliant.

ARP also enjoys a solid working relationship with many of the most respected professional engine builders and race teams from the world over – including those involved in Formula 1, NASCAR Winston Cup and Busch Series, NHRA, IHRA, World of Outlaws and a host of others. Constant interaction with these racing experts to provide fasteners for a wide variety of competition applications enables ARP to stay on the cutting edge of fastener technology development.

You will find ARP fasteners sold by leading performance retailers and professional engine builders from coast to coast. These firms know that ARP fasteners are the standard of the industry, and smart consumers will accept no substitutions. As you can see, all ARP fasteners are proudly made in the USA to the industry's highest standards. ARP also supports racers

through generous contingency awards programs with many racing programs. ARP is a long-time NHRA Major Sponsor.

### *What ARP Can Do For You*

In addition to manufacturing a comprehensive array of cataloged fasteners for automotive and aerospace applications, ARP thrives on the challenges of developing fasteners to solve unique problems. Racers, Pro Street enthusiasts and street rodders have, over the years, approached ARP about manufacturing special fasteners for unique applications, and the company has responded with innovative solutions.

ARP can provide complete R&D services, including metallurgical research, product design, prototype machining and extensive laboratory testing. Moreover, ARP has experience manufacturing fasteners from a wide variety of materials. All work can be performed under the strictest confidence. ARP is well versed in facilitating proprietary research and custom manufacturing for corporations the world over.

It is for good reason that ARP is recognized as "The World Leader In Fastener Technology!"



*The finished goods are given a protective coating and stored in sealed containers, awaiting packaging. Millions are in stock!*



*ARP fasteners are prominently featured at leading performance retailers.*



*After final packaging the kits are placed in storage racks and are ready for order fulfillment. Thousands of SKU's are warehoused.*



*Components for each kit are placed on the appropriate display cards, sealed and labeled. Through-put has been significantly increased.*



## JOHN CARROLL SMITH: A TRIBUTE

There are many of us who can say we knew John Carroll Smith in life.

Carroll Smith was known around the engineering shops as a design and development engineer. He was known on race circuits as a team manager, driver coach and racing guru. And before that, he was known for his 30+ years of racing experience, driving in SCCA events, as well as on circuits in Europe including the Targa Florio and Le Mans.

Even more of us know Carroll Smith through his books. His "To Win" series of books brought technical acclaim as they became staples for amateur and professional racers, while his "Engineer in Your Pocket" are today highly regarded as engineering handbooks. We're never surprised to find his name on or featured in – books on race car design, preparation, engineering and tuning.

Among his peers at the Society of Automotive Engineers, he served as a judge for the Formula SAE competition. One of his proudest honors was the Society's Excellence in Engineering Education award.

Carroll Smith was a race engineer and special motorsports consultant with Automotive Racing Products for more than decade. The pages of our catalog alone bear the mark of his enormous contributions to our efforts.

Here at ARP, as elsewhere, Carroll Smith's mission was

simple. He was determined to impart the encyclopedic knowledge of racing and the machinery of racing that he learned during those decades on the world's racetracks, around those shops and among his engineering peers.

He left us at ARP with a significant engineering inheritance. Much of what we now know from Carroll will ensure we remain the world leader in the field of racing fasteners. It is our way of reciprocating for what he gave us that we impart his expertise and experience in the form we know best, superior engineered products.

As an engineer, Carroll Smith had successes in Formula 5000, numerous GT and sports car races, and with the Ferrari Formula 1 team. He is best known, however, for his work with Carroll Shelby and the Ford GT40 program which he helped develop into a winner at Le Mans.

Ford has recently announced it is bringing back the GT40, its signature race car and a vehicle which, even forty years later, bears Carroll's fingerprints. To those of us who knew him in person and through his work, the return of the GT40 is just another indicator of the enormous contribution to race engineering that John Carroll Smith continues to make, even after his passing.

Carroll Smith passed away at his California home on May 16, 2003, from pancreatic cancer.

### THE "AEROSPACE QUALITY" MYTH

In areas from hose ends to engine fasteners the terms "Aerospace material and Aerospace Quality" have become buzz words implying the very best in design, materials and quality control.

"It isn't necessarily so", says Gary Holzapfel, founder and CEO of Santa Paula, California based ARP, Inc. ARP (Automotive Racing Products) supplies extremely high strength and fatigue resistant threaded engine fasteners to NASCAR, CART, IRL, NHRA and Formula One engine builders and manufacturers. Holzapfel explained his reasons in an interview with Carroll Smith.

**Smith: "Gary, do you believe that the term "aerospace quality" is over rated in the specialty fastener industry?"**

"Yes I do. First of all, the term is meaningless. Any AMS (Aerospace Material Specification) material must be matched to the specific application. As an example, some airframe bolts (AN3-20) are legitimate "aerospace parts" and are very well suited for the low stress applications for which they were designed. But with a minimum ultimate tensile strength of 125,000 psi, and a relatively low temperature limit, they would be completely unsuitable for use in a racing engine.

We started out in the aerospace fastener business and we understand it. That's why we're not in it any longer. What is not generally understood about aerospace fasteners is that the fastener manufacturers do not design the product. The nuts, bolts and studs are spec'd by the airframe or engine designers and put out for bid. As long as the supplier certifies that the product meets the minimum requirement of the specification and it passes the customer's inspection procedures, low bid wins."

**Smith: "Are you implying that the aerospace fastener manufacturers cut corners in order to win contracts?"**

"No, it's a matter of manufacturing goals and simple economics. The aerospace market is price dominated. In order to get the contract, the fastener manufacturer's goal is to meet the specification at the least cost, not to produce the best possible part.

This means that they are going to use the least expensive steel and manufacturing processes that will meet the specification. There is nothing wrong with this approach.

It certainly does not mean that certified aerospace fasteners are unsafe in any aspect. They will do the job for which they were designed.

There is another factor. Airframe and aircraft engine manufacturers design their components to a very high margin of safety. Further, aerospace structures are designed to be "fail safe." There is a back up or second line of defense for virtually every structural component so that an isolated failure will not lead to disaster. They are also subjected to frequent and rigorous inspections."

**Smith: "What's different about motor racing?"**

"Quite a lot, really. While the demands for strength, fatigue resistance and quality control can be similar, and the assembly and inspection procedures in racing can







ARP's Mike Holzapfel and Russ Sherman discuss a fastener's alloy.

be as rigorous as aerospace, in professional racing very few parts are over designed and there are no fail safe features.

There are no back up provisions for component failure. A failed (or even loosened) nut or bolt in a racing engine means disaster - instant catastrophic failure. An expensive engine is destroyed and a race is lost.

That is why random failures are unacceptable in motor racing, and why aerospace standards should be only a starting point. This means that a specialist in the production of high performance engine fasteners must design and manufacture the very best fasteners that can be produced."

#### Smith: "So where does the production for a new racing fastener begin?"

"The design process begins with the customer's requirements the operating conditions and loads to be expected, the packaging constraints and the weight and cost targets. This allows us to select the optimum material for the part, and to do the initial mechanical design.

There is more to material selection than simply choosing the best alloy. It means using only the cleanest and purest steel available, which, in turn, means researching to identify the best and most modern steel mills. It means working closely with the mills both to insure consistent quality and to develop new and better alloys.



There are not only a myriad of alloys to choose from; but for each alloy there are several grades of "aircraft specification" steel wire from which fasteners can be made. We believe that only the top (and most expensive) grade - shaved-seamless, guaranteed defect-free - is suitable for racing engine applications.

We also believe that samples from each batch should be subjected to complete metallurgical inspection."

#### Smith: "How many alloys do you work with?"

"We are currently produc-

ing fasteners from at least 6 different steel alloys from 8740 chrome moly to the very high strength chromium-cobalt-nickel alloys such as Custom Age 625+. We also use stainless steel and titanium. With UTSs (Ultimate Tensile Strength) from 180,000 to 270,000 psi, we can suit the material to the job and the customer's cost restraints. We are continually researching and experimenting with new alloys and manufacturing processes - some with all around better strength and fatigue properties."

#### Smith: "Once the design work is done and material has been selected, what's next?"

"Next comes the actual process of manufacturing. It goes without saying that all high strength bolts must have rolled rather than cut threads, and that the threads must be rolled after heat-treatment.

But there is more to it. The old saying to the effect of, "If you are doing something in a particular way because that's the way it has always been done, the chances are that you are doing it wrong," holds true in fastener technology.

Technology advances, and we have to advance with it. All of the manufacturing processes should be subject to continuous experimentation and development. As an example, with some alloys, cold heading produces a better product than hot heading, and vice versa. The number and force of the blows of the cold heading machine can make a significant difference in the quality of the end product. Excessive numbers of blows can lead to voids in the bolt head. ARP, in fact, holds significant patents on cold heading procedures for the higher nickel and cobalt based alloys. In a typical aerospace manufacturing process, these alloys are hot headed from bars, reduced in diameter from 48 to 50% by cold drawing, resulting in a hardness of about Rockwell C46 which is too hard for cold heading. So, the blanks are locally induction heated in a very narrow temperature envelope and hot headed.

If care is not taken the process can reduce the hardness of the bolt head and the area immediately under it as much as 3 to 5 points on the Rockwell C scale. Subsequent heat-treatment does not restore this partially annealed area to full hardness and strength. Therefore, the final result can be a relatively soft headed bolt. **This process is not preferred by ARP.**

Our patented process begins with a softer wire that can be cold forged. The process work hardens the head and the under head area to the desired hardness. We then power extrude the front end to achieve the reduction and hardness in the shank resulting in a bolt with even strength and hardness from end to end.

The same is true of thread rolling. Temperature and die speed must be controlled and changed for different alloys. Many bolt manufacturers who meet the Aerospace Specifications don't come close to meeting our standards. **We consistently go beyond standard aerospace specs.**

Our concern with the manufacturing processes extends to the details of heat-treating, shot-peening, fillet rolling and grinding - down to the frequency of dressing the grinding wheels. In the arena where aerospace standards are a starting point and random failures are unacceptable, I feel ARP stands alone as a primary







engineering and manufacturing source for specialty and custom fasteners for use in motorsports.

It is important to realize that simply quoting an AMS (Aerospace Material Specification) number without strength and percentage of elongation numbers is meaningless. Statements that the use of a particular material will, in itself, result in extreme strength and resistance to fatigue can be misleading. In the world of high strength alloys, whether they are used for bolts or for landing gears, the manufacturing processes are at least as important as the material specification.

Some in our industry claim to inspect materials at the “molecular” level. In metallurgical terms, molecules are not necessarily part of the vocabulary. Our engineers tell us that talking about molecules is misleading. When reference is made to metal, it is typically in terms of atom structures. We routinely check metallurgical features microscopically. By the way, the same is true for claims of manufacturing to “zero tolerance.”

*“Our engineers tell us that this is technically unrealistic.”*

**Smith: “How does the actual process work at ARP?”**

“For each new design, we produce a number of prototype parts using different design aspects and sometimes different methods.

We inspect and test after each process, choose the best design and method of manufacture, and then freeze the design and write the manufacturing specification.”

**Smith: “You have mentioned the importance of fatigue resistance. Is there a difference in the procedures for strength and fatigue testing between aerospace and the specialty racing industry?”**

“Yes. While the ultimate tensile strength testing is the same, fatigue testing is different. Aerospace fasteners are fatigue tested to the relevant specification of fluctuating tension load and

number of cycles typically 130,000 cycles with the high tension load at 50% of the UTS and the low load at 10% of the high load. If all of the test samples last 85,000 cycles (per AMS 5842-D), the lot is accepted.

Even though racing fasteners are not continuously subjected to their maximum design load, at 18,000 rpm, 100,000 cycles takes just 5 minutes, thirty-four seconds. Except for drag racing, measured in seconds, no race lasts just 5 minutes. Therefore we consider this Aerospace Standard to be inadequate. At ARP, we fatigue test to elevated loads (10% above aerospace requirements) and to a minimum cycle life that exceeds 350,000 cycles. The majority of samples are routinely tested to one million cycles. During material development...and in the case of extremely critical new designs, we test to destruction.

Thread rolling is the last mechanical operation in our manufacturing process. For each production run the thread rolling machine is shut down after a few parts. These parts are inspected for dimensional accuracy and thread quality, and are physically tested for both strength and fatigue before the run is continued. Random samples are inspected and tested throughout the run. Extremely critical components are individually inspected for dimensional integrity.”

**Smith: “What about out sourcing?”**

“Economics often dictate that many processes in the manufacture of aerospace fasteners are out sourced or farmed out. In fact, 30 plus years ago, ARP began as an out source thread rolling shop.

Over the years, however, we have found, through experience, that the only way to maintain the quality we require is to keep everything in-house. From heading through machining, grinding, heat-treat, thread rolling, and shot-peening to black oxide treatment we perform every operation in house on our own equipment with our own employees.”

**Smith: “Gary, One of the things that I am hearing is that every aspect of the manufacture of racing engine fasteners is more expensive than that of similar aerospace items.”**

“True, but the bottom line is that we have to look at the cost aspect of the very best fastener versus the cost aspect of a blown engine and a lost race. In the end, the manufacturing of fasteners for racing comes down to a matter of attitude; a refusal to accept published standards and procedures as the best that can be done and most of all a determination to learn and to make still better products.”





There are literally hundreds of standards and specifications. For all types of applications, from bridges to spaceships. None are, however, as critical as those required for real-world motorsports applications. In an environment where lighter is faster there is clearly no room for redundancy systems, like those found in military and aerospace applications. The mere nature of Motorsports requires designers to produce fasteners that are light; yet produce toughness, fatigue and reliability factors that extend far beyond other acknowledged application standards. The design and production of fasteners, exclusively for racing, clearly involves many complex factors. Some so special no standards or design criteria exist; and so everyone at ARP is totally dedicated to the development and analysis of appropriate bolt designs exclusively for special applications. Designs that take into account the special loads and endurance that must be carried, the material selection, processing, and the methods of installation that will continue to deliver ARP quality and reliability.

The focus of the following material, prepared by the ARP engineering staff, could be called:

## **“MOTORSPORTS FASTENER ENGINEERING for the NON-ENGINEER”**

It is hoped that by providing an overview of the engineering, design and production forces ARP applies daily, you – as the end user – will be better equipped to evaluate your initial fastener requirements, effectiveness and performance.

### **DESIGN PROCEDURES for AUTOMOTIVE BOLTS**

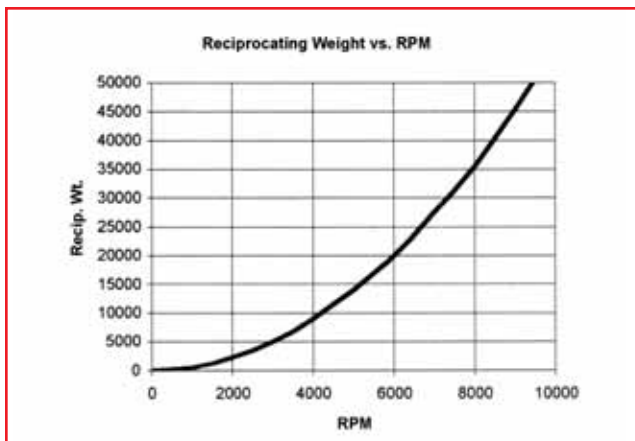
Presented by Dr. Kenneth Foster, PhD

The design of automotive bolts is a complex process, involving a multitude of factors. These include the determination of operating loads and the establishment of geometric configuration. The process for connecting rod bolts is described in the following paragraphs as an example.

The first step in the process of designing a connecting rod bolt is to determine the load that it must carry. This is accomplished by calculating the dynamic force caused by the oscillating piston and connecting rod. This force is determined from the classical concept that force equals mass times acceleration. The mass includes the mass of the piston plus a portion of the mass of the rod. This mass undergoes oscillating motion as the crankshaft rotates. The resulting acceleration, which is at its maximum value when the piston is at top dead center and bottom dead center, is proportional to the stroke and the square of the engine speed. The oscillating force is sometimes called the reciprocating weight. Its numerical value is proportional to:

$$\left( \text{Piston Weight} + \frac{\text{Rod Weight}}{3} \right) \times \text{Stroke} \times (\text{RPM})^2$$

It is seen that the design load, the reciprocating weight, depends on the square of the RPM speed. This means that if the speed is doubled, for example, the design load is increased by a factor of 4. This relationship is shown graphically below for one particular rod and piston.



A typical value for this reciprocating weight is in the vicinity of 20,000 lbs. For purposes of bolt design, a “rule of thumb” is to size the bolts and select the material for this application such that each of the 2 rod bolts has a strength of approximately 20,000 lbs. (corresponding to the total reciprocating weight). This essentially builds in a nominal safety factor of 2. The stress is calculated according to the following formula:

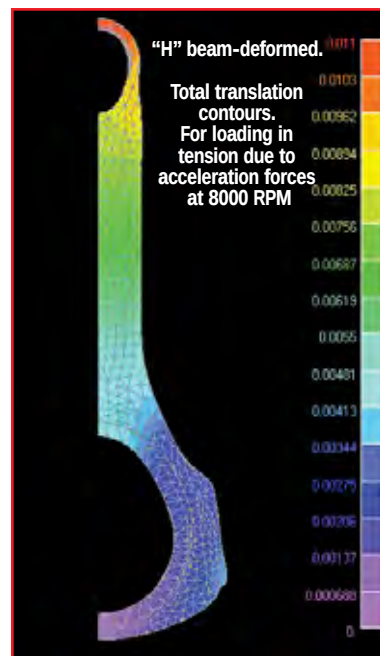
$$\text{Stress} = \frac{\text{Force}}{\text{Area}} = \frac{\text{Recip. Wt.}}{\frac{\pi D^2}{4}}$$

so that the root diameter of the thread can be calculated from the formula:

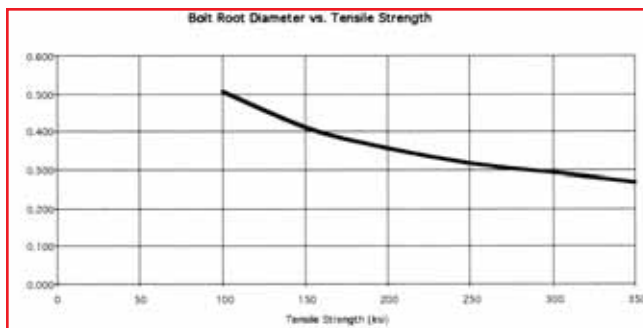
$$D = \sqrt{\frac{4 \times \text{Recip. Wt.}}{\pi \times \text{Allowable Stress}}}$$

This formula shows that the thread size can be smaller if a stronger material is used. Or, for a given thread size, a stronger material will permit a greater reciprocating weight. The graph (see page 14) shows the relationship between thread size and material strength.

It must be realized that the direct reciprocating load is not the only source of stresses in bolts. A secondary effect arises because of the flexibility of the journal end of the connecting rod. The reciprocating load causes bending deformation of the bolted joint (yes, even steel deforms under load). This deformation causes bending stresses in the bolt as well as in the rod itself. These bending stresses fluctuate







from zero to their maximum level during each revolution of the crankshaft.

The next step is to establish the details of the geometric configuration. Here the major consideration is fatigue, the fracture that could occur due to frequent repetition of high stresses, such as the bending stresses described above. Several factors must be considered in preventing fatigue; attention to design details is essential.

Fatigue failure is frequently caused by localized stress risers, such as sharp corners. In bolts, this would correspond to the notch effect associated with the thread form. It is well known that the maximum stress in an engaged bolt occurs in the last engaged thread. By removing the remaining, non-engaged threads, the local notch effect can be reduced. This leads to the standard configuration used in most ARP rod bolts: a reduced diameter shank and full engagement for the remaining threads. Providing a local fillet radius at the location of the maximum stress further reduces the local notch effect. Thus this configuration represents the optimum with respect to fatigue strength.

The reduced diameter shank is helpful in another sense. It reduces the bending stiffness of the bolt. Therefore, when the bolt bends due to deformation of the connecting rod, the bending stresses are reduced below what they would otherwise be. This further increases the fatigue resistance of the bolt. A typical bolt configuration is shown below.



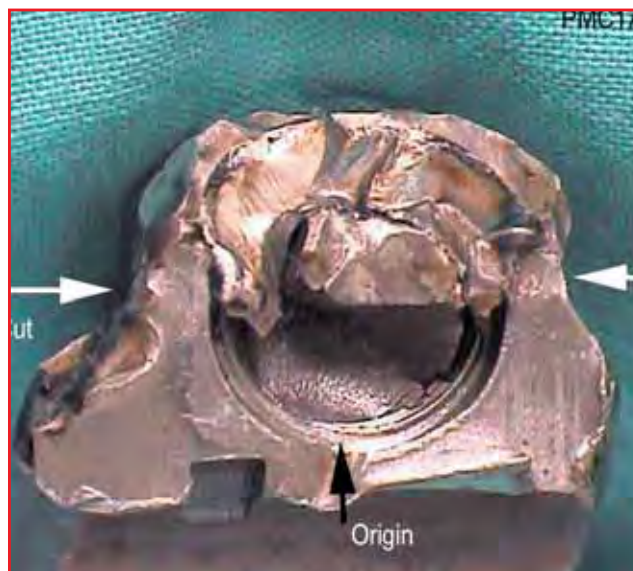
Once the bolt configuration has been established, the manufacturing process comes into play. This involves many facets, which are discussed in detail elsewhere. Here, however, one process is of primary interest. With respect to bolt fatigue strength, thread rolling is a major consideration. Threads are rolled after heat treating. This process, which deforms the metal, produces a beneficial compressive stress in the root of the thread. It is beneficial because it counteracts the fluctuating tensile stresses that can cause fatigue cracking. If heat-treatment were to occur after rolling, the compressive stresses would be eliminated. This would therefore reduce the fatigue resistance of the bolt.

An additional factor must be taken into account in defining the bolt configuration: the length of engaged thread. If too few threads are engaged, the threads will shear at loads that are lower than the strength of the bolt. As a practical matter, the thread length is always selected so that the thread shear strength is

significantly greater than the bolt tension strength.

This problem is especially important in bolts used in aluminum rods because of the fact that the shear strength of aluminum is much lower than the shear strength of steel.

Finally, although not a design parameter, the subject of bolt installation preload must be addressed. It is a fundamental engineering concept that the force in a bolt in an ideal preloaded joint will remain equal to the preload until the externally applied force exceeds the preload. Then the force in the bolt will be equal to the external force. This means that fluctuating external forces will not cause fluctuating forces in a preloaded bolt as long as the preload exceeds the external force. The result is that fatigue failure will not occur. In a non-ideal joint, such as in a connecting rod, the bolt will feel fluctuating stresses due to fluctuating rod distortions. These are additive to the preload, so that fatigue could result. In connecting rods, precise preloads are required because if they are too low, the external forces (the reciprocating weights) will exceed the preloads, thus causing fatigue. If they are too high,



they provide a high mean stress that combines with the fluctuating stresses due to rod distortion. Again, fatigue is promoted. The objective, then, is to preload a bolt so that it just exceeds the external load, and no higher. To sum up: both insufficient preloads and excessive preloads can lead to fatigue failures.

Appropriate preloads are specified for each ARP bolt. These preloads can be attained in a connecting rod by applying proper torque using a torque wrench or by measuring the amount of stretch in the bolt using a stretch gauge (it is known that a bolt stretches in proportion to the tension in it). The torque method is sometimes inaccurate because of the uncertainty in the coefficient of friction at the interface between the bolt and the rod. This inaccuracy can be minimized by using the lubricant supplied by ARP.

Other factors, equally as important as design, include material selection, verification testing, processing, and quality control. These aspects of bolt manufacturing are discussed elsewhere in this document.

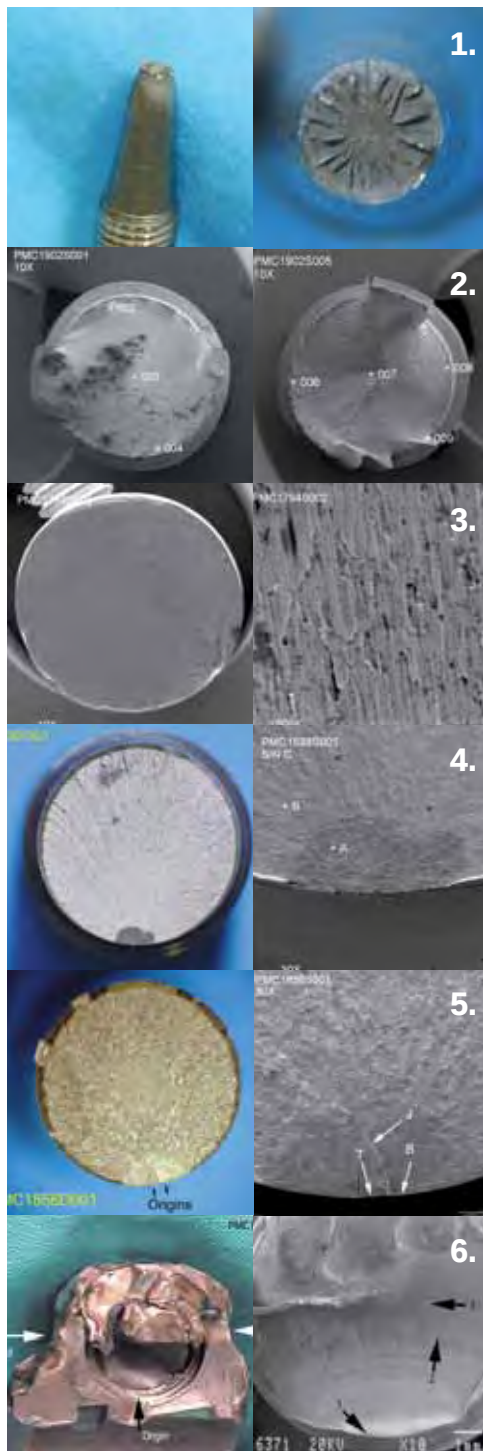
The foregoing discussion concentrated on the design of bolts. The same considerations apply in the design of studs.

# Recognizing Common Failures

There are six types of metallurgical failures that affect fasteners. Each type has unique identifying physical characteristics. The following chart is designed to be used like a spark plug reading chart to help analyze fastener failures. While few of us have access to sophisticated analysis equipment, a standard Bausch and Lomb three lens magnifying glass will generally show 98% of what we want to see. Several of the photos below have been taken utilizing a Scanning Electron Microscope (SEM) and are presented to simply illustrate typical grain configurations after failure.

## 1. Typical Tensile Overload

In a tensile overload failure the bolt will stretch and “neck down” prior to rupture. One of the fracture faces will form a cup and the other a cone. This type of failure indicates that either the bolt was inadequate for the installation or it was preloaded beyond the material's yield point.



## 2. Torsional Shear (twisting)

Fasteners are not normally subjected to torsional stress. This sort of failure is usually seen in drive shafts, input shafts and output shafts. However we have seen torsional shear failure when galling takes place between the male and female threads (always due to using the wrong lubricant or no lubricant) or when the male fastener is misaligned with the female thread. The direction of failure is obvious and, in most cases, failure occurs on disassembly.

## 3. Impact Shear

Fracture from impact shear is similar in appearance to torsional shear failure with flat failure faces and obvious directional traces. Failures due to impact shear occur in bolts loaded in single shear, like flywheel and ring gear bolts. Usually the failed bolts were called upon to locate the device as well as to clamp it and, almost always, the bolts were insufficiently preloaded on installation. Fasteners are designed to clamp parts together, not to locate them. Location is the function of dowels. Another area where impact failures are common is in connecting rod bolts, when a catastrophic failure, elsewhere in the engine (debris from failing camshaft or crankshaft) impacts the connecting rod.

## 4. Cyclic fatigue failure originated by hydrogen embrittlement.

Some of the high strength “quench and temper” steel alloys used in fastener manufacture are subject to “hydrogen embrittlement.” L-19, H-11, 300M, Aeromet 100 and other similar alloys popular in drag racing, are particularly susceptible and extreme care must be exercised in manufacture. The spot on the first photo is typical of the origin of this type of failure. The second is a SEM photo at 30X magnification.

## 5. Cyclic fatigue cracks propagated from a rust pit (stress corrosion)

Again, many of the high strength steel alloys are susceptible to stress corrosion. The photos illustrate such a failure. The first picture is a digital photo with an arrow pointing to the double origin of the fatigue cracks. The second photograph at 30X magnification shows a third arrow pointing to the juncture of the cracks propagating from the rust pits. L-19, H-11, 300M and Aeromet 100, are particularly susceptible to stress corrosion and must be kept well oiled and never exposed to moisture including sweat. Inconel 718, ARP 3.5 and Custom age 625+ are immune to both hydrogen embrittlement and stress corrosion.

## 6. Cyclic fatigue cracks initiated by improper installation preload

Many connecting rod bolt failures are caused by insufficient preload. When a fastener is insufficiently preloaded during installation the dynamic load may exceed the clamping load resulting in cyclic tensile stress and eventual failure. The first picture is a digital photo of such a failure with the bolt still in the rod. The arrows indicate the location of a cut made to free the bolt. The third arrow shows the origin of the fatigue crack in the second picture – an SEM photo at 30X magnification that clearly shows the origin of the failure (1), and the telltale “thumbprint” or “beach mark” (2). Finally (3) tracks of the outwardly propagating fatigue cracks, and the point where the bolt (unable to carry any further load) breaks-away.



*The following material is intended to provide a brief overview of the metallurgical considerations that, daily, influence the design and production of the most reliable fasteners in motorsports. It is hoped that a simple understanding of the knowledge and commitment required to produce this reliability will make your future fastener decisions much, much easier.*

## Metallurgy for the Non-Engineer

By Russell Sherman, PE

### 1. What is grain size and how important is it?

Metals freeze from the liquid state during melting from many origins and each one of these origins grows until it bumps into another during freezing. Each of these is a grain and in castings, they are fairly large. Grains can be refined (made smaller); by first cold working and then by recrystallizing at high temperature. Alloy steels, like chrome moly, do not need any cold work; to do this – reheat treatment will refine the grain size. But austenitic steels and aluminum require cold work first. Grain size is very important for mechanical properties. High temperature creep properties are enhanced by large grains but good toughness and fatigue require fine grain size – the finer the better. All ARP bolts and studs are fine grain – usually ASTM 8 or finer. With 10 being the finest.

### 2. How do you get toughness vs. brittleness?

With steels, as the strength goes up, the toughness decreases. At too high a strength, the metal tends to be brittle. And threads accentuate the brittleness. A tool steel which can be



*ARP engineers use "Scanning Electron Microscopic" inspection capable of detecting all elements in the periodic table with atomic numbers greater than 5 – permitting the acquisition of high resolution imaging.*

heat-treated to 350,000 psi, would be a disaster as a bolt because of the threads.

### 3. Define Rockwell as we use it. Why do we use the C scale?

A man named Rockwell developed a means of measuring hardness of metals which was superior to other methods. A Rockwell hardness tester measures the depth of penetration into the metal when a load is applied. For hard materials, a diamond penetrator is used. For soft material, small balls are used – 1/16" or 1/8" diameter – and the machine measures the depth. We use the C scale for the 120,000 psi strength level



*Metallurgist, Russell Sherman, PE, and stress/dynamics engineer Dr. Kenneth Foster, PhD, are the heart of ARP's technical power team.*

and above. The C scale uses the greatest load – 150 Kg. The A scale uses only a 60 Kg. load but can be correlated with C. It is necessary to use the A scale for thin sheets because using the 150 Kg load would cause the diamond to penetrate almost all the way through.

### 4. What is "micro hardness?"

Some parts are too small to be Rockwell hardness tested. They are placed in hard plastic and a microscope is used to place a small indenter into the metal. Using the microscope the length of the impression is measured.

### 5. How does modulus of elasticity refer to our products?

The modulus of elasticity of all alloy steels is exactly the same – 30,000,000 psi. This is true whether it is heat-treated or not – whether it is 100,000 psi strength level or 300,000 psi. Metals are like a spring – put a load on them and they will stretch – double the load and they will stretch double. This is important in connecting rod bolts because by measuring the stretch we really are measuring the load. Load is what is important and measuring stretch of a given size and configuration bolt will indicate how much load is stretching the bolt.

### 6. What are metal carbides and what is their significance?

The strength of all alloy and carbon steels is derived from the metal carbides formed during heat treat. The carbon in steels combines with iron, vanadium and with chromium, as well as many other metal alloy additions to form compounds, which are a very hard phase within the iron matrix. Tool steels generally have high carbon content (above .8%) and can be made very hard – but brittle.



## 7. What exactly is chrome?

Chrome is the metal chromium and is typically used for plating because it is shiny. It is also used as an alloy addition to iron to form a stainless steel. A stainless steel must contain at least 12% chromium, but these lean chromium steels can still show some rust on the surface. Using 18% chromium will make a more rust resisting stainless. Exposing any stainless to oxygen at temperatures above 1200°F will cause the chromium to join the oxygen and therefore leave the surface depleted in chromium. If it falls below 12% the surface will show rust.

## 8. What does it mean when a broken part looks crystallized?

When the fracture face has a rocky appearance it is because the material had a very large grain structure. Basically the grain grew during manufacturing due to poor technique and handling. A properly processed part will have a silky smooth appearance which is an indication of fine grain size. So crystallization does not occur as a result of load or fatigue – it was present in the material at the time of manufacture.

## 9. Define “precipitation hardening” and “phase change.”

The precipitation hardening comes from microscopic precipitation of hard phases which serve to keep rows of atoms from moving under stress. Some metals undergo a change in atomic structure at high temperature. Alloy steels, which are bcc at room temperature, become fcc at temperatures above 1400°F. This switch over is called a phase change. When cooled down they revert back to the bcc structure. Management of this phase is extremely critical and ARP maintains a complete in-house heat-treatment facility. It's the only way we can assure material integrity.

## 10. What does a “face centered cubic” (fcc) atom arrangement look like? How many atoms?

A face centered cubic arrangement of atoms (austenitic) looks like a Las Vegas die with a five showing on all six faces. This can't be seen visually by any type of microscope.

The number of atoms in any one cubic cell would be 14 – these do not stand alone but are attached to other cells which share some of the atoms.

## 11. How does a “body center cubic” (bcc) atom look? How many atoms?

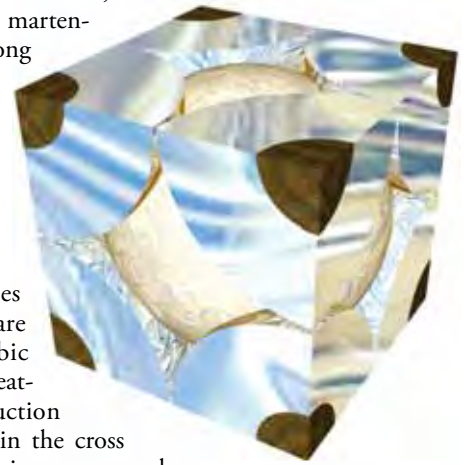
The body center cubic structure would look like a die with a four on

all faces and one atom in the center of the cube. The atomic arrangement of pure iron is bcc at room temperature and does not change until the temperature reaches 1674°F. At this temperature it changes to austenite which is face center cubic (fcc). The addition of carbon to the iron lowers this transition temperature. This is the basis for heat treat-

ment of steel. If the iron carbon alloy (steel) is quenched from the fcc field, the structure becomes martensite, a very hard strong condition.

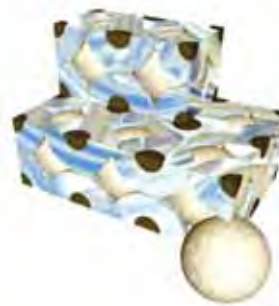
## 12. What does a “stainless steel” atom arrangement look like?

The 300 Series stainless steels are face-centered cubic and are not heat-treatable. Heavy reduction (power dumping), in the cross section, during forging causes a dramatic increase in strength. This is the process ARP uses to make 304 Stainless Steel reach 170,000 psi UTS.

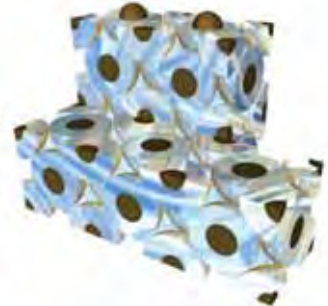


## 13. How do the space lattice or crystal structures appear?

### Body-Centered Cubic



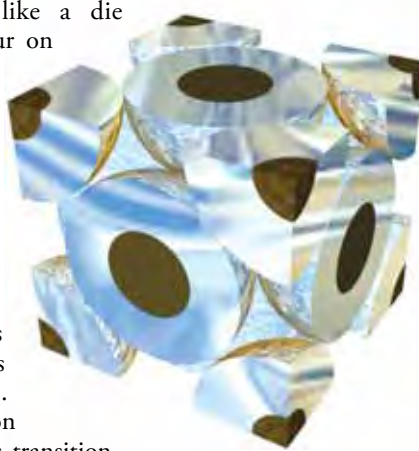
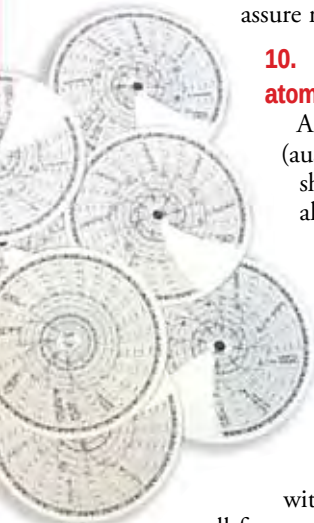
### Face-Centered Cubic



All grains or crystals are composed of atoms bound together in a definite pattern. These structures are called space lattice or crystal structures. At a fixed temperature, the atoms in an array are spaced a definite distance from one another, although they vibrate about their mean position. Even though atoms are actually not held together in this manner, it is helpful to picture the crystals as a 3-dimensional latticework connected by imaginary lines. Metallurgists who primarily study ferrous metal are interested in only two basic crystal structures: bcc (body-centered cubic) and fcc (face-centered cubic).

## 14. What are the metallurgical ramifications of “cold heading” vs. “hot heading?”

Cold heading is a more efficient process and allows the part to be cold worked. The temperatures used for hot forging will reduce the effect of work hardening. This is important for metals which derive much of their strength from the cold work. Cold heading produces a better product than hot heading. The number and force of the blows of the cold heading machine can make a significant difference in the quality of the

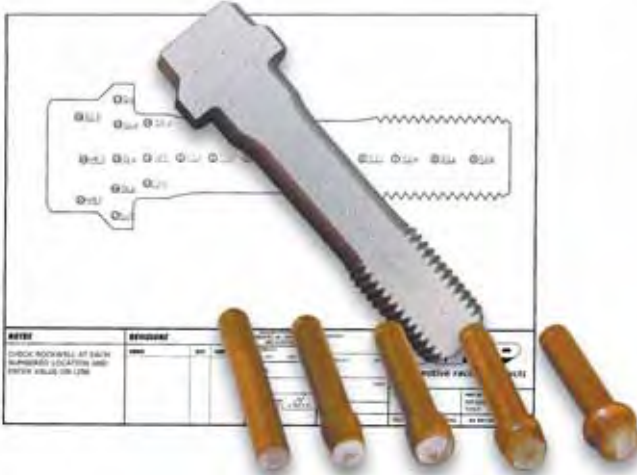




end product. Excessive numbers of blows can lead to voids in the bolt head. ARP, in fact, holds significant patents on cold heading procedures for the higher nickel and cobalt based alloys.

Our patented process begins with a cold drawn wire that can be cold forged. The process work hardens the head and the under head area to the desired hardness. We then power extrude the front end to achieve the reduction and hardness in the shank resulting in a bolt with even strength and hardness from end to end.

In a typical aerospace manufacturing process, these alloys are hot headed from bars, reduced in diameter from 48 to 50% by cold drawing, resulting in a hardness of about



Rockwell C46 which is too hard for cold heading. So, the blanks are locally induction heated in a very narrow temperature envelope and hot headed. The process reduces the hardness immediately in the area under the head approximately 3 to 5 points on the Rockwell C scale. Subsequent heat treatment does not restore this partially annealed area to full hardness and strength. The final result is a relatively soft-headed bolt. Therefore, this process is not used by ARP.

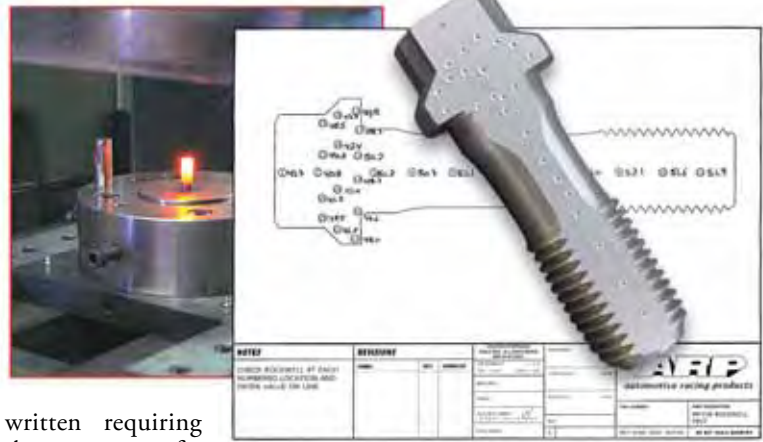
#### 15. What is the difference between the usage of "bar" material vs. "wire"?

Bars produced by the mill in straight sections are normally shipped in 12 foot lengths. Wire is supplied in continuous coil form and is hundreds of feet in length. Bars are cut to length and the bolts are hot forged from these lengths. Wire on the other hand is fed into a cold header in a continuous manner.

#### 16. What exactly is A286? And to what is it compared?

A286 is a 25% nickel and 18% chromium alloy with smaller amounts of titanium and aluminum, which precipitate during aging – after solution treatment. It is a true stainless steel due to the high chromium and it is austenitic due to the high nickel. A286 was developed as a high temperature alloy for use in pre-jet aircraft engines. The strength level was only 140,000 psi, but it had good high temperature strength and exceptional toughness, making it an excellent fastener alloy.

Rocketdyne became interested in it for rocket engines being developed in the early 60's. But they required higher strength. We were part of the team that developed a thermo-mechanical method to produce a strength level of 200,000 psi. This involved severe cold reduction after solution treatment and before aging. An aerospace material spec (AMS) was then



written requiring this treatment for

200,000 psi strength level. There is no other steel alloy, at this level, which can match A286 for corrosion resistance, toughness or bolt fatigue strength.

#### 17. Define "Power Dump."

This is a term used to define the heavy extrusion of the fastener body during forging. The part is forced into a die much smaller than the blank thereby causing a severe reduction in cross section area. This reduction of the cross sectional area is



5-stage "Cold Header" used by ARP

accompanied by an increase in length because metals can't be compressed. However, power dumping or reduction, delivers a significant increase in strength properties and is part of the patented process we use to produce fasteners from 304 stainless steel with 170,000 psi UTS and AMS 5844 (ARP 3.5) with ultimate tensile strengths in the 270,000 psi UTS range with outstanding fatigue.

#### 18. What is the difference between 4130 and 8740 chrome moly?

Both are alloy steels with similar chemistry. The 4130 has only .3% carbon and can't be hardened as high as 8740, which has .4% carbon. Also, 8740 has about .45% nickel and 4130 has none. Both have moly (most alloy steels have moly). The chromium content of 4130 is slightly higher, .95% instead of .55%. However, 8740 is generally considered to have slightly better toughness due to the nickel.

### 19. What exactly is ARP2000 and how does it compare to 8740 and 4340?

ARP2000 is a heavily alloyed martensitic quench and temper steel, initially developed for use in steam power plants. As such it has excellent stability at high temperatures. But most important, ARP research discovered that in addition to temperature stability it has excellent notch toughness in the higher strength ranges and is alloyed to be tempered to Rockwell C44/47. 8740 and 4340 can be tempered to the same hardness. But, the tempering temperature would yield material in the “temper brittle zone” (between 500° and 700°F), producing significant notch sensitivity. ARP2000 is tempered above that temperature range and has a strength between 200,000 and 220,000 psi.

### 20. How does L19 compare to ARP2000?

L19 differs from ARP2000 in that it is a vacuum melted alloyed steel with sufficient chromium and carbon to achieve high hardness (but below the level of a stainless steel). L19 is air-cooled from the hardening temperature in a way that does not require an oil quench to achieve full hardness and is tempered to assure full conversion to martensite between 1025°F and 1075°F. L19 is a proprietary material capable of achieving strengths of 220,000/230,000 or 260,000/270,000 psi as may be required. Both L19 and ARP2000 steels are modified bcc (martensite) at room temperature. L19 has the same advantage as ARP2000 in that a high strength is obtained at a high tempering temperature. This alloy is easily contaminated and requires special handling.

### 21. What is AMS5844? And how does it compare to AMS5842E?

Both of these alloys are considered multiphase, non-steel, austenitic materials. Both derive their strength (260,000 psi) from severe cold work (48/50%) which raises the hardness from Rockwell C 46 up to 49/50. The AMS5842 (for MP159) was developed much later than AMS5844 (for MP35) in order to increase the usable service temperature by about 100° so it could be used in hotter sections of jet engines.

### 22. Provide a brief overview of the metallurgy required to produce AN, AMS & other Aerospace type fasteners.

All alloy steel fasteners are essentially manufactured by the same process. Incoming steel from the mill is forged to specification, then heat treated and thread rolled. Regular AN bolts are forged to size and are normally not precision ground. They may even have threads on them when heat treated.

Expensive aerospace fasteners are more likely suited for some motorsport applications. These fasteners require precision forging, careful heat treatment and then precision grinding, fillet rolling under the head and a great deal of skill in thread rolling.

### 23. What is moisture tolerance and how or where is it important?

Non-stainless steels have low moisture tolerances because the water attacks the steel by forming iron oxide (rust). Therefore none of these have a high tolerance for moisture and the surface must be protected by oil or plating. ARP maintains an in-house plating facility to assure all non-stainless product is delivered 100% corrosion free.

### 24. How do the various standards compare to each other with regard to fasteners? Where are the standards?

A standard fastener is one that can be referenced from a nationally or internationally recognized standards document and may be produced by any interested manufacturer.

In all fastener categories the custodian of each group (MS-AN-NAS) have tried to standardize the processing of specifications such as AS (American Standard) heat-treating, MIL-H-6875 cadmium plating, AMS QQ-P-416 passivation and AMS QQ-P-35 testing, MIL-Std 1312 and NDT in aerospace applications are generally by sample.

**ASTM** stands for the American Society for Testing Materials, a large industry funded group used to write standards for many materials and testing procedures. It compares directly to **AMS (Aerospace Material Standard)**.

In the case of ARP, 100% raw material is purchased to AMS specification – with the exception of special alloys used in proprietary products. All materials are carefully examined for proper chemistry – and finally, periodic examination by an independent laboratory. ARP consistently strives to exceed industry specifications for quality and product management.

**MS (Military Standards):** MS bolt specifications cover a wide range of fastener hardware, high strength bolts, nuts and washers with spec's for materials and processing. MS fasteners have various tensile strengths.

**AN (Army-Navy) Specifications:** Generally lower strength bolts and studs primarily in the 125,000 psi UTS range. AN also covers a wide range of nuts, washers and other hardware.

**NAS (National Aerospace Standard):** These specifications cover fasteners in the strength ranges 160,000/180,000/200,000 psi UTS.

**ISO (International Standards Organization):**

**ISO 9001-94:** is a quality control system designed for manufacturers with design control.

**ISO 9002-94:** is a quality control system designed for manufacturers who build parts to customer specifications, and do not have design control.

**ISO 9001-2000:** is current ISO system well suited for manufacturers with engineering design functions, drawing control and statistical techniques to achieve demanding quality requirements.

**This system is the main focus of ARP's World Quality Concept.**

### 25. What metallurgical issues cause common failures?

The most common cause of failure of connecting rod bolts (and wheel bolts) is too little induced load (stretch) during installation. This allows the alternating load to impose cyclic loading on the bolt. Over tightening is also another cause, because the induced stress is too close to the yield point.



## MATERIAL SPECIFICATIONS

ARP manufactures fasteners from a wide assortment of materials ranging from popular stainless steel and 8740 chrome moly to exotic alloys that have been developed to handle space travel. You should also know that there are grades within specific alloys. For example, 8740 is available in four grades: 1. SDF (guaranteed seamless and defect free). 2. CHQ (cold head quality). 3. Aircraft. 4. Commercial. ARP uses only the first two (SDF and CHQ), even though they cost more than double "Aircraft" quality.

**STAINLESS STEEL:** Ideally suited for many automotive and marine applications because stainless is tolerant of heat and virtually impervious to rust and corrosion. ARP "Stainless 300" is specially alloyed for extra durability. It's polished using a proprietary process to produce a beautiful finish. Tensile strength is typically rated at 170,000 psi.

**8740 CHROME MOLY:** Until the development of today's modern alloys, chrome moly was popularly considered a high strength material. Now viewed as only moderate strength, 8740 chrome moly is seen as a good tough steel, with adequate fatigue properties for most racing applications, but only if the threads are rolled after heat-treatment, as is the standard ARP production practice. Typically, chrome moly is classified as a quench and temper steel, that can be heat-treated to deliver tensile strengths between 180,000 and 210,000 psi.

**ARP2000®:** An exclusive, hybrid-alloy developed to deliver superior strength and better fatigue properties. While 8740 and ARP2000 share similar characteristics – ARP2000 is capable of achieving a clamp load at 220,000 psi. ARP2000 is used widely in short track and drag racing as an up-grade from 8740 chrome moly in both steel and aluminum rods. Stress corrosion and hydrogen embrittlement are typically not a problem, providing care is taken during installation.

**L19:** This is a premium steel that is processed to deliver superior strength and fatigue properties. L19 is a very high strength material compared to 8740 and ARP2000 and is capable of delivering a clamp load at 260,000 psi. It is primarily used in short track and drag racing applications where inertia loads exceed the clamping capability of ARP2000. Like most high strength, quench and temper steels – L19 requires special care during manufacturing to avoid hydrogen embrittlement. This material is easily contaminated and subject to stress corrosion. It must be kept well-oiled and not exposed to moisture.

**AERMET® 100:** With a typical tensile strength of 280,000 psi, Aermet 100 is a new martensitic super-alloy that is stronger and less expensive than the super-alloy austenitic materials that follow. Because it is capable of achieving incredibly high clamping loads, it is ideal for short but extreme environments like top fuel, funny car and some short track

applications. Although Aermet 100 is a maraging steel that is far superior to other high strength steels in its resistance to stress corrosion, it must be kept well-oiled and not exposed to moisture.

**INCONEL 718:** A nickel based material that is in the high temperature, super-alloy class, it is found to be equally suitable in lower temperature applications. This material delivers tensile strengths into the 220,000 psi range and exhibits improved fatigue properties. Best of all, Inconel 718 is completely immune to hydrogen embrittlement and corrosion.

**ARP3.5® (AMS5844):** While similar to Inconel 718, these super-alloys are found in many jet engine and aerospace applications where heat and stress attack the life of critical components. The high cobalt content of this alloy, while expensive, delivers a material with superior fatigue characteristics and typically tensile strength in the 260,000 psi range. The immunity to hydrogen embrittlement and corrosion of these materials is a significant design consideration. These materials are primarily used in connecting rods where extremely high loads, high RPM and endurance are important factors – Formula 1, NASCAR and CART applications.

**CUSTOM AGE 625 PLUS®:** This newly formulated super-alloy demonstrates superior fatigue cycle life, tensile strength and toughness – with complete resistance to atmospheric corrosion and oxidation. ARP is the first to develop manufacturing and testing processes for fasteners with Custom Age 625+. Best of all it is less expensive and expected to soon replace MP-35 as the material of choice in the high strength, super-alloy field. Typical tensile strength is 260,000 psi.

**TITANIUM:** ARP now offers special order fasteners made of an alloy (Ti6Al-4V) that is specially heat-treated (a process developed by ARP's own Russ Sherman) and provides superior strength to other titanium alloys employed in racing and aerospace. The material has a nominal tensile strength of 180,000 psi, and is very corrosion resistant. The main advantage of titanium, of course, is its weight – which is about 40% lighter than a comparable fastener made of steel. Head studs and accessory bolts are ideal applications for this lightweight material.

AerMet® 100, Custom 450® and Custom Age 625 PLUS® are all registered trademarks of CRS Holdings Inc., a subsidiary of Carpenter Technology Corporation.

### QUICK REFERENCE GUIDE TO MATERIALS USED IN FASTENERS

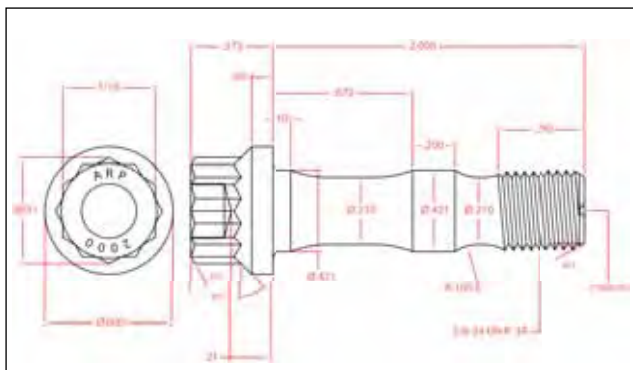
| MATERIAL         | USE? | YIELD STRENGTH  | TENSILE STRENGTH | USED FOR                             |
|------------------|------|-----------------|------------------|--------------------------------------|
| Grade 5          | No   | 90,000 psi      | 120,000 psi      | Accessory bolts and studs            |
| Grade 8          | No   | 120,000 psi     | 150,000 psi      | Accessory bolts and studs            |
| "Stainless 300"  | Yes  | 140,000 psi     | 170,000 psi      | Accessory bolts & studs, head studs  |
| Custom 450®      | Yes  | 150,000 psi     | 180,000 psi      | Head bolts, accessory bolts          |
| 8740 chrome moly | Yes  | 180,000 psi     | 200,000 psi      | Rod bolts, head & main studs & bolts |
| A286             | Yes  | 170,000 psi     | 200,000 psi      | Head bolts, accessory bolts          |
| ARP2000          | Yes  | 180,000 psi     | 220,000 psi      | Rod bolts, head & main studs         |
| L19              | Yes  | 200-230,000 psi | 260,000 psi      | Connecting rod bolts                 |
| Inconel 718      | Yes  | 190-210,000 psi | 220,000 psi      | Connecting rod bolts                 |
| Custom Age 625+® | Yes  | 235-255,000 psi | 260,000 psi      | Head studs, connecting rod bolts     |
| ARP 3.5          | Yes  | 220-250,000 psi | 260,000 psi      | Connecting rod bolts                 |
| AerMet® 100      | Yes  | 260,000 psi     | 280,000 psi      | Connecting rod bolts                 |
| Titanium         | Yes  | 160,000 psi     | 180,000 psi      | Head studs, accessory bolts          |

The following pages in this catalog detail the vast number of “off the shelf” fasteners available from ARP. However, it’s important for you to know that a significant amount of ARP’s business comes from the development and manufacture of custom fasteners. For example, many top Formula 1, CART and IRL race teams and constructors have come to rely on ARP for a myriad of special purpose fasteners. Many of these have been developed on a proprietary basis, and we cannot go into details about “what” is being manufactured for “whom” by ARP. But suf-



L19

fice to say that that ARP has established a reputation within the racing industry for doing cutting edge R&D and following it up with fasteners made to the most stringent quality control standards on the planet. ARP also "private labels" a number of special fasteners for various manufacturers in the performance industry.



The bottom line is that because of ARP's extensive in-house R&D and manufacturing capabilities, the firm is in a position to design and build fasteners on a custom basis. Serious inquiries from members of the high performance industry are always welcome. Look to ARP to provide effective solutions to all your fastener needs!

One of ARP's best-kept "secrets" is the company's deep involvement in the manufacture of titanium fasteners. As a matter of fact, ARP's resident metallurgist, Russ Sherman, literally "wrote the book" when he developed the original procedures for the heat treatment of the most popular titanium alloy in use today (Ti6Al-4V), and presented the research data to the American Society for Metals. Sherman's procedure of solution-treating, warm processing and aging brings the titanium to strength levels never before achieved, and has also been instrumental in setting new standards for the aerospace industry.

This particular titanium alloy and process lends itself well to a number of racing applications, including head studs and accessory fasteners. Of course, the primary advantage of using titanium instead of steel is weight; titanium is about 40% lighter. The material ARP uses has a tensile strength of 180,000 psi, comparable to heat-treated chrome moly – but about half the weight.

ARP stands ready to manufacture Ti6Al-4V titanium fasteners custom-made to your specifications. Contact our Special Projects Dept. at **805-525-1497**.



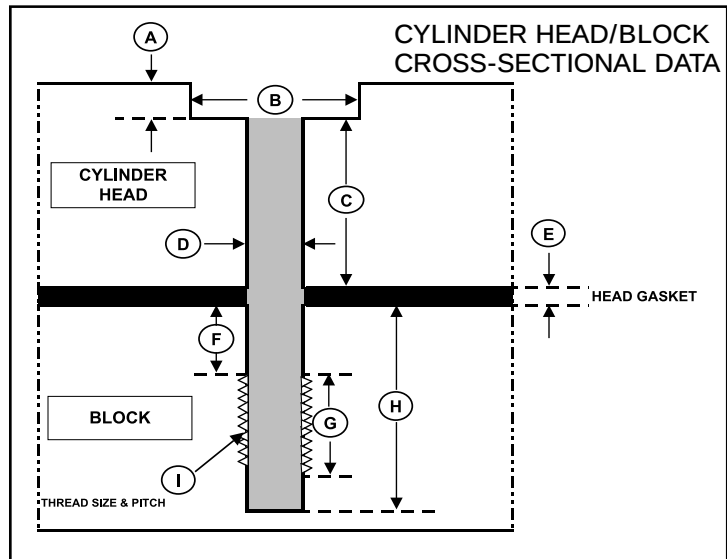
# GETTING THE CORRECT ARP HEAD STUD/BOLT FOR THE APPLICATION

Today, there are literally dozens of different cylinder head and engine block combinations for the more popular applications, and new offerings coming out all the time. It is virtually impossible for ARP's engineering staff to obtain detailed information from all of these various sources, so it may be necessary for customers to calculate exactly what they have so the correct cylinder head studs or bolts are used. Whether it's a small block Chevy engine or a Honda VTEC, the procedure remains the same.

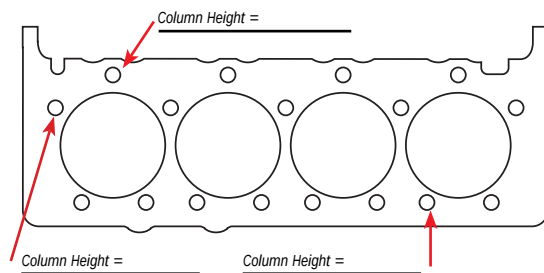
The illustration on the right shows the nine different variables that come into play when determining the proper fastener for a particular position. Many cylinder heads have different column heights, etc. at various positions, and additional variables come into play when using aftermarket engine blocks (some of which have "blind" tapped holes for attaching the heads that are shallower than OEM). It is therefore critically important that you determine exactly how many different bolt/hole combinations exist for the cylinder head installation.

You must have the following data:

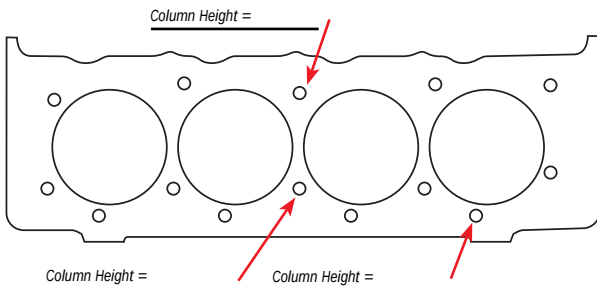
- A. Depth of cylinder head counter bore \_\_\_\_\_
- B. Diameter (o.d.) of head counter bore \_\_\_\_\_
- C. Column height (net thickness of head) \_\_\_\_\_
- D. Diameter (o.d.) of bolt hole in head \_\_\_\_\_
- E. Head gasket thickness (uncompressed) \_\_\_\_\_
- F. Depth of counter bore in block \_\_\_\_\_
- G. Length of thread in block \_\_\_\_\_
- H. Depth of hole from surface to bottom \_\_\_\_\_
- I. Thread size and pitch \_\_\_\_\_



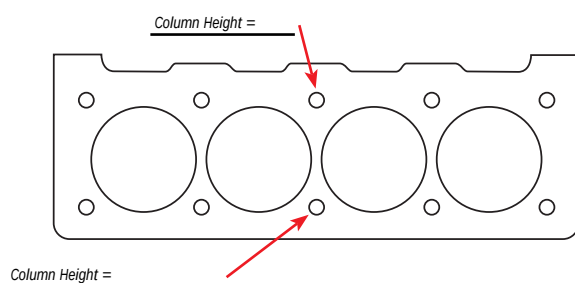
## STANDARD SMALL BLOCK CHEVROLET



## STANDARD BIG BLOCK CHEVROLET



## CHRYSLER, FORD & MOST 4-CYLINDER



ICY/Phoenix Racing - Subaru Factory Team



Bryan Fuller uses ARP hardware on all his custom rides

# GLOSSARY OF TECH TERMS

**Austenitic:** Refers to the atomic arrangement of some metals, such as nickel based alloys, and some steels with about 18% chromium. This atomic arrangement is called “face centered cubic.” Austenitic steels can not be heat treated, but can be strengthened by cold working.

**CHQ:** A term used to grade heading wire and stands for “cold heading quality.” This grade is superior to both Commercial and Aircraft quality.

**Clamp Load:** This is the force exerted by a tightened bolt and is the same as preload.

**Fatigue:** The process by which failure is caused after many repetitions of loads smaller than the ultimate strength of the material.

**Ferritic:** Refers to steels with an atomic arrangement different from austenite and martensite. These steels are not strong and the widest use is in steam power plants and accessory fasteners made by some companies, because they are able to withstand wet environments. Newer steels such as ARP300 and A286 are far superior.

**Hydrogen Embrittlement:** This condition results from the accumulation of hydrogen gas in the atomic structure of the metal. This gas flows to the point of high stress (stress risers) and causes microscopic cracks. The hydrogen then flows to the “new” crack tip and causes it to crack further. In this way the crack moves across the part, because the crack-tip IS the stress riser. Finally the crack gets so large that the section is not large enough to support the load. No hydrogen embrittlement can take place without tensile stress. ARP employs a baking process that purges hydrogen gas from the steel.

**Knurling:** A process of creating serrations in a part by rolling a die, under pressure, against the part. Normally these serrations are very sharp and can create cracks and ARE stress risers. The process is used on knobs so the user can get a firm grip. But in the case of fasteners, the body can be knurled so the part can be forced into and retained in an irregular hole – stress risers and all.

**Maraging:** Refers to steels that are a low carbon version of martensitic steels, specially alloyed so that the martensite is not hard. These steels can be worked in the quenched condition and then be hardened by low temperature aging. The strength comes from the formation of complex metal carbides.

**Martensitic:** Refers to atomic arrangement and in the case of steels, is a modified body centered cubic structure. These steels can be heat-treated because martensite is iron carbide, which is very hard. However, these steels can be hydrogen embrittled and will rust. Generally, martensite normally refers to metal structures which are formed by quenching from high temperature.

**MS21250:** A military specification for a 12-point, 180,000 psi bolt which specifies the fatigue load required for testing every size.

**Notch Sensitivity:** Refers to the ability of a metal to withstand the increased stress at a notch. Some materials, such as glass, crack very easily if notched. While others, such as soft gold or tin stretch out under stress – even with a notch. Normally, the stronger the steel, the more likely it is to break quickly at the notch. “Toughness” is wanted because this is associated with opposite of notch sensitivity. Austenitic metals are usually less notch sensitive than martensitic steels of the same strength levels.

**OAL:** Means “Over All Length.”

**Preload:** The force IN a bolt when it is installed with a torque greater than simply hand tight. Preload can be established by measuring torque or bolt stretch or by the less than accurate “turn-of-the-nut” method.

**Qualified Products List:** A government requirement that simply mandates that bolts be manufactured only by companies which have qualified by making bolts that have been submitted for testing and approval to a government agency. ARP has qualified for this list.

**Quench & Temper:** A method of heat-treating martensitic steels. The parts are heated into the austenitic range (usually above 1450°F) then quenched into water or oil. This leaves the part in a very hard martensitic condition which then must be tempered by heating at lower temperatures (between 350°F and 1200°F), depending upon the steel and strength desired.

**Reciprocating Load:** The acceleration force exerted on a connecting rod due to the up and down motion of the piston and its associated mass ie; wrist pin, rings, small end of the rod.

**Stretch:** The increase in length of a bolt when installed with a preload.

**Stress:** The load applied to a part divided by the cross-sectional area of the part, usually expressed in pounds per square inch (psi).

**Stress Corrosion:** This is a special form of hydrogen embrittlement in which the metal is attacked while under stress. Without the stress the crack will not move. But under stress the crack moves and corrosion takes place at the freshly opened crack face.

**Stress Ratio:** The ratio of the minimum stress to the maximum stress in a structure which is subject to fluctuating loads.

**Stress Riser:** You have a notch, ding or some change in section size, so now the stress at these points is increased above nominal stress. Compare this kind of stress to the flow of water in a river. When the river hits a narrow point it flows faster. Perhaps there is a rock in the middle – the river flows faster around the rock. The stress at these points can be so high that the part will fail – even though the average stress on the part never exceeded the tensile strength of the part.

**S.D.F.:** Seam and defect free. A designation for premium steel. This is typically the highest grade available, and is the only steel used by ARP.

**Thread Engagement:** This refers to the number of threads engaged in a nut or threaded hole. Full engagement, meaning all the female threads are engaged, is a desirable configuration to maximize fatigue strength.

**Ultimate Tensile Strength:** The maximum stress that a particular material can support without breaking. It is expressed in terms of lbs. per square inch, and is measured by means of a tensile test. The maximum force (lbs.) that a test specimen can support is divided by the cross-sectional area (square inches) of the specimen, the result is ultimate tensile strength in psi.

**Torque Angle:** A method of tightening a fastener relative to the amount of degrees turned once the underside of the bolt head or nut face contacts the work surface. This procedure is suitable for engine assembly only when the installation has been calibrated in terms of bolt stretch relative to the exact application (the amount of compression of the clamped components is critical).

**UHL:** Means “Under Head Length.” The distance as measured from tip of the fastener to a place directly at the base of the head.

**Yield Strength:** The stress at which a given material or component exhibits a permanent deformation (i.e. “takes a set”). When the load that caused the stress is removed, the part will not return to its original dimensions. If you exceed the yield strength of a fastener (tighten it until it feels funny and then back it off a bit) the fastener is ruined and must be replaced.



# GENERAL TORQUE RECOMMENDATIONS

Listed here are the general torque recommendations for most ARP fasteners. Recommended torque is equal 75% of the fastener's yield strength. Simply read down to the correct fastener size, then across to find the torque value for your application. ALWAYS LUBRICATE THE FASTENERS PRIOR TO APPLYING TORQUE TO ENSURE ACCURATE READINGS.

**NOTE: THE TORQUE VALUES REPRESENTED HERE ARE INTENDED TO BE FOR GENERAL INFORMATION ONLY, NOT FOR SPECIFIC INSTALLATIONS. ON SPECIFIC INSTALLATIONS, WHERE SUPPLIED INSTRUCTIONS DEVIATE FROM THE TORQUE VALUES LISTED HERE, ALWAYS FOLLOW THE SPECIFIC INSTRUCTIONS PACKAGED WITH EACH KIT.**

## Recommended Torque to Achieve Optimum Preload (Clamping Force) Using ARP Lubricants - Torque (ft./lbs.) - Preload (lbs.)

*Note: For those using Newton/meters as a torquing reference, you must multiply the appropriate ft./lbs. factor by 1.356.*

| Fastener Diameter | Fastener Tensile Strength (PSI)           |         |                                           |         |                                    |         |
|-------------------|-------------------------------------------|---------|-------------------------------------------|---------|------------------------------------|---------|
|                   | 170,000/180,000 (1,171 Nmm <sup>2</sup> ) |         | 190,000/200,000 (1,309 Nmm <sup>2</sup> ) |         | 220,000 (1,515 N/mm <sup>2</sup> ) |         |
|                   | Torque w/ARP lube                         | Preload | Torque w/ARP lube                         | Preload | Torque w/ARP lube                  | Preload |
| 1/4"              | 12                                        | 3,492   | 14                                        | 3,967   | 16                                 | 4,442   |
| 5/16"             | 24                                        | 5,805   | 28                                        | 6,588   | 32                                 | 7,371   |
| 3/8"              | 45                                        | 8,622   | 50                                        | 9,782   | 55                                 | 10,942  |
| 7/16"             | 70                                        | 11,880  | 80                                        | 13,470  | 90                                 | 15,060  |
| 1/2"              | 110                                       | 16,391  | 125                                       | 18,515  | 140                                | 20,639  |
| 9/16"             | 160                                       | 21,220  | 180                                       | 23,944  | 200                                | 26,668  |
| 5/8"              | 210                                       | 26,372  | 240                                       | 29,756  | 270                                | 33,140  |
| 6mm               | 11                                        | 3,359   | 13                                        | 3,814   | 15                                 | 4,269   |
| 8mm               | 24                                        | 5,801   | 28                                        | 6,581   | 32                                 | 7,361   |
| 10mm              | 54                                        | 9,970   | 62                                        | 11,305  | 70                                 | 12,640  |
| 11mm              | 72                                        | 12,184  | 82                                        | 13,961  | 92                                 | 15,738  |
| 12mm              | 98                                        | 14,472  | 112                                       | 16,949  | 125                                | 19,425  |
| 14mm              | —                                         | —       | 184                                       | 22,771  | 205                                | 25,730  |
| 16mm              | —                                         | —       | 244                                       | 29,664  | 272                                | 33,519  |

# ROD BOLT STRETCH & TORQUE SPECS

| Make        | Rod Bolt Part No. | Stretch (inches) | ARP Lube (ft./lbs.) |
|-------------|-------------------|------------------|---------------------|
| ALFA ROMEO  | 126-6101          | .0075 - .0080    | 45                  |
| AMC         | 112-6001          | .0060 - .0065    | 40                  |
|             | 114-6001          | .0060 - .0065    | 40                  |
|             | 114-6002          | .0070 - .0075    | 50                  |
|             | 114-6004          | .0060 - .0065    | 50                  |
| BMC/TRIUMPH | 206-6001          | .0065 - .0070    | 55                  |
|             | 206-6002          | .0065 - .0070    | 35                  |
|             | 206-6003          | .0065 - .0070    | 45                  |
|             | 206-6004          | .0065 - .0070    | 45                  |
|             | 206-6005          | .0065 - .0070    | 45                  |
|             | 206-6006          | .0065 - .0070    | 55                  |
|             | 206-6007          | .0045 - .0050    | 30                  |
|             | 206-6009          | .0065 - .0070    | 32                  |
| BMW         | 201-6102          | .0065 - .0070    | 50                  |
|             | 201-6103          | .0075 - .0080    | 70                  |
|             | 201-6104          | .0065 - .0070    | 70                  |
|             | 201-6201          | .0070 - .0075    | 40                  |
|             | 201-6301          | .0080 - .0085    | 36                  |
|             | 201-6302          | .0080 - .0085    | 36                  |
|             | 206-6008          | .0055 - .0060    | 25                  |
| BUICK       | 123-6001          | .0060 - .0065    | 55                  |
|             | 123-6002          | .0065 - .0070    | 55                  |
|             | 124-6001          | .0050 - .0055    | 45                  |
|             | 124-6002          | .0040 - .0045    | 45                  |
|             | 124-6003          | .0040 - .0045    | 45                  |
|             | 125-6001          | .0055 - .0060    | 50                  |
| CADILLAC    | 135-6003          | .0060 - .0065    | 50                  |
| CHEVY       | 131-6001          | .0055 - .0060    | 45                  |
|             | 132-6001          | .0055 - .0060    | 45                  |
|             | 132-6002          | .0050 - .0055    | 30                  |
|             | 133-6001          | .0060 - .0065    | 55                  |
|             | 133-6002          | .0060 - .0065    | 45                  |
|             | 134-6001          | .0055 - .0060    | 45                  |
|             | 134-6002          | .0050 - .0055    | 55                  |
|             | 134-6003          | .0055 - .0060    | 55                  |
|             | 134-6004          | .0075 - .0080    | 75                  |
|             | 134-6005          | .0060 - .0065    | 55                  |
|             | 134-6006          | .0055 - .0060    | 40                  |
|             | 134-6027          | .0060 - .0065    | 55                  |
|             | 134-6401          | .0055 - .0060    | 45                  |
|             | 134-6402          | .0050 - .0055    | 55                  |
|             | 134-6403          | .0055 - .0060    | 55                  |
|             | 135-6001          | .0060 - .0065    | 80                  |
|             | 135-6002          | .0055 - .0060    | 55                  |
|             | 135-6401          | .0060 - .0065    | 80                  |
|             | 135-6402          | .0055 - .0060    | 55                  |
|             | 234-6301          | .0065 - .0070    | 45                  |
|             | 234-6302          | .0060 - .0065    | 45                  |
|             | 234-6401          | .0065 - .0070    | 45                  |
|             | 234-6402          | .0055 - .0060    | 55                  |
|             | 234-6403          | .0065 - .0070    | 55                  |
|             | 235-6401          | .0070 - .0075    | 85                  |
|             | 235-6402          | .0065 - .0070    | 55                  |
|             | 235-6403          | .0070 - .0075    | 85                  |

| Make        | Rod Bolt Part No. | Stretch (inches) | ARP Lube (ft./lbs.) |
|-------------|-------------------|------------------|---------------------|
| CHRYSLER    | 141-6001          | .0060 - .0065    | 50                  |
|             | 141-6401          | .0060 - .0065    | 50                  |
|             | 142-6001          | .0055 - .0060    | 50                  |
|             | 142-6002          | .0060 - .0065    | 50                  |
|             | 144-6001          | .0060 - .0065    | 50                  |
|             | 144-6401          | .0060 - .0065    | 50                  |
|             | 145-6001          | .0070 - .0075    | 75                  |
|             | 145-6002          | .0060 - .0065    | 50                  |
|             | 145-6402          | .0060 - .0065    | 50                  |
|             | 244-6401          | .0070 - .0075    | 55                  |
|             | 245-6402          | .0070 - .0075    | 55                  |
| FORD        | 150-6004          | .0060 - .0065    | 50                  |
|             | 150-6005          | .0060 - .0065    | 50                  |
|             | 150-6404          | .0060 - .0065    | 50                  |
|             | 151-6001          | .0060 - .0065    | 40                  |
|             | 151-6002          | .0060 - .0065    | 40                  |
|             | 151-6003          | .0050 - .0055    | 25                  |
|             | 151-6004          | .0055 - .0060    | 25                  |
|             | 151-6005          | .0045 - .0050    | 36                  |
|             | 152-6001          | .0060 - .0065    | 50                  |
|             | 152-6002          | .0060 - .0065    | 50                  |
|             | 153-6001          | .0060 - .0065    | 35                  |
|             | 153-6002          | .0060 - .0065    | 40                  |
|             | 154-6001          | .0060 - .0065    | 50                  |
|             | 154-6002          | .0060 - .0065    | 35                  |
|             | 154-6003          | .0060 - .0065    | 50                  |
|             | 154-6004          | .0050 - .0055    | 50                  |
|             | 154-6005          | .0060 - .0065    | 50                  |
|             | 154-6006          | .0060 - .0065    | 50                  |
|             | 154-6401          | .0060 - .0065    | 50                  |
|             | 154-6402          | .0060 - .0065    | 35                  |
|             | 154-6403          | .0060 - .0065    | 50                  |
|             | 155-6001          | .0060 - .0065    | 50                  |
|             | 155-6002          | .0060 - .0065    | 50                  |
|             | 155-6003          | .0060 - .0065    | 50                  |
|             | 200-6001          | .0045 - .0050    | 60                  |
|             | 250-6404          | .0070 - .0075    | 55                  |
|             | 251-6201          | .0050 - .0055    | 25                  |
|             | 251-6202          | .0060 - .0065    | 40                  |
|             | 251-6301          | .0065 - .0070    | 45                  |
|             | 251-6402          | .0065 - .0070    | 45                  |
|             | 254-6402          | .0070 - .0075    | 30                  |
|             | 254-6403          | .0070 - .0075    | 55                  |
|             | 255-6402          | .0070 - .0075    | 55                  |
|             | 256-6301          | .0065 - .0070    | 42                  |
| HOLDEN      | 205-6001          | .0055 - .0060    | 55                  |
|             | 205-6002          | .0055 - .0060    | 45                  |
| HONDA/ACURA | 208-6001          | .0050 - .0055    | 26                  |
|             | 208-6002          | .0055 - .0060    | 45                  |
|             | 208-6003          | .0080 - .0085    | 50                  |
|             | 208-6004          | .0080 - .0085    | 37                  |
|             | 208-6005          | .0080 - .0085    | 26                  |
|             | 208-6401          | .0070 - .0075    | 50                  |
| LANCIA      | 275-6001          | .0075 - .0080    | 70                  |



# ROD BOLT STRETCH & TORQUE SPECS

| Make          | Rod Bolt Part No. | Stretch (inches) | ARP Lube (ft./lbs.) |
|---------------|-------------------|------------------|---------------------|
| MAZDA         | 118-6401          | .0060 - .0065    | 38                  |
| MITSUBISHI    | 107-6001          | .0055 - .0060    | 40                  |
|               | 107-6002          | .0060 - .0065    | 26                  |
|               | 107-6003          | .0065 - .0070    | 40                  |
|               | 107-6004          | .0065 - .0070    | 40                  |
|               | 207-6002          | .0065 - .0070    | 30                  |
| NISSAN/DATSUN | 102-6001          | .0060 - .0065    | 26                  |
|               | 102-6002          | .0050 - .0055    | 26                  |
|               | 202-6001          | .0060 - .0065    | 45                  |
|               | 202-6002          | .0060 - .0065    | 26                  |
|               | 202-6003          | .0060 - .0065    | 45                  |
|               | 202-6004          | .0070 - .0075    | 45                  |
|               | 202-6005          | .0065 - .0070    | 45                  |
|               | 202-6006          | .0065 - .0070    | 30                  |
| OLDSMOBILE    | 181-6001          | .0055 - .0060    | 40                  |
|               | 184-6001          | .0060 - .0065    | 50                  |
|               | 185-6001          | .0055 - .0060    | 50                  |
| OPEL/VAUXHALL | 109-6001          | .0055 - .0060    | 32                  |
|               | 109-6002          | .0050 - .0055    | 24                  |
|               | 109-6003          | .0050 - .0055    | 32                  |
|               | 209-6003          | .0065 - .0070    | 38                  |
| PEUGEOT       | 117-6101          | .0070 - .0075    | 45                  |
| PONTIAC       | 190-6001          | .0060 - .0065    | 50                  |
|               | 190-6002          | .0060 - .0065    | 50                  |
|               | 190-6003          | .0075 - .0080    | 75                  |
|               | 190-6004          | .0055 - .0060    | 75                  |
|               | 191-6001          | .0055 - .0060    | 45                  |
|               | 194-6001          | .0055 - .0060    | 45                  |
| PORSCHE       | 104-6006          | .0055 - .0060    | 40                  |
|               | 204-6001          | .0095 - .0100    | 50                  |
|               | 204-6002          | .0105 - .0110    | 55                  |
|               | 204-6003          | .0090 - .0095    | 50                  |
|               | 204-6004          | .0095 - .0100    | 50                  |
|               | 204-6005          | .0100 - .0105    | 40                  |
| RENAULT       | 116-6001          | .0045 - .0050    | 36                  |
|               | 216-6301          | .0065 - .0070    | 42                  |
|               | 216-6302          | .0065 - .0070    | 42                  |
| SUBARU        | 260-6301          | .0070 - .0075    | 42                  |
|               | 260-6302          | .0070 - .0075    | 42                  |

| Make            | Rod Bolt Part No. | Stretch (inches) | ARP Lube (ft./lbs.) |
|-----------------|-------------------|------------------|---------------------|
| TOYOTA          | 203-6001          | .0050 - .0055    | 40                  |
|                 | 203-6002          | .0060 - .0065    | 50                  |
|                 | 203-6003          | .0050 - .0055    | 40                  |
|                 | 203-6004          | .0060 - .0065    | 50                  |
|                 | 203-6005          | .0075 - .0080    | 65                  |
|                 | 203-6301          | .0075 - .0080    | 65                  |
| VOLKSWAGEN/AUDI | 104-6001          | .0055 - .0060    | 40                  |
|                 | 104-6002          | .0065 - .0070    | 40                  |
|                 | 104-6003          | .0075 - .0080    | 40                  |
|                 | 104-6004          | .0085 - .0090    | 35                  |
|                 | 104-6005          | .0050 - .0055    | 40                  |
|                 | 104-6007          | .0085 - .0090    | 35                  |
|                 | 204-6006          | .0075 - .0080    | 40                  |
|                 | 204-6201          | .0075 - .0080    | 30                  |
| GENERAL REPL.   | 200-6002          | .0055 - .0060    | 75                  |
|                 | 200-6003          | .0055 - .0060    | 75                  |
|                 | 200-6004          | .0045 - .0050    | 75                  |
|                 | 200-6006          | .0050 - .0055    | 75                  |
|                 | 200-6201          | .0065 - .0070    | 80                  |
|                 | 200-6202          | .0065 - .0070    | 80                  |
|                 | 200-6203          | .0065 - .0070    | 80                  |
|                 | 200-6204          | .0065 - .0070    | 80                  |
|                 | 200-6205          | .0065 - .0070    | 80                  |
|                 | 200-6206          | .0065 - .0070    | 75                  |
|                 | 200-6207          | .0055 - .0060    | 55                  |
|                 | 200-6208          | .0065 - .0070    | 55                  |
|                 | 200-6209          | .0055 - .0060    | 55                  |
|                 | 200-6210          | .0050 - .0055    | 30                  |
|                 | 200-6506          | .0065 - .0070    | 70                  |
|                 | 300-6601          | .0065 - .0070    | 85                  |
|                 | 300-6602          | .0055 - .0060    | 55                  |
|                 | 300-6603          | .0055 - .0060    | 55                  |
|                 | 300-6608          | .0055 - .0060    | 32                  |
|                 | 300-6701          | .0065 - .0070    | 85                  |
|                 | 300-6702          | .0065 - .0070    | 60                  |
|                 | 300-6703          | .0065 - .0070    | 60                  |
|                 | 300-6704          | .0060 - .0065    | 60                  |
|                 | 300-6706          | .0060 - .0065    | 75                  |
|                 | 300-6708          | .0055 - .0060    | 32                  |



Drag racing's winningest driver, John Force, relies on ARP.

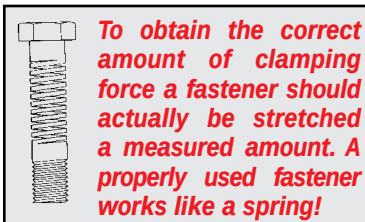


Tony Schumacher - 2008 NHRA Top Fuel Champion

# PROPER FASTENER RETENTION

There are three methods that can be employed to determine how much tension is exerted on a fastener; using a torque wrench, measuring the amount of stretch, and turning the fastener a pre-determined amount (torque angle). Of these methods, use of a stretch gauge is the most accurate.

It is important to note that in order for a fastener to function properly it must be "stretched" a specific amount. The material's ability to "rebound" like a spring is what provides the clamping force. You should know that different materials react differently to these conditions, and ARP engineers have designed each fastener to operate within specific ranges.



On the other hand, if a fastener is over torqued and becomes stretched too much – you have exceeded the yield strength and it's ruined. If the fastener is longer than manufactured – even if it is only .001", it is in a partially failed condition. Therefore, ARP has engineered its fasteners with the ductility to stretch a given amount and rebound for proper clamping.

Heat, primarily in aluminum, is another problem area. Because the thermal expansion rate of aluminum is far greater than that of steel it is possible to stretch a fastener beyond yield as the aluminum expands under heat. An effective way of counteracting material expansion is through producing a more flexible bolt.

## The Torque Angle Method

Since the amount that a bolt or nut advances per degree of rotation is determined by the thread pitch, it would appear that the amount of stretch in a given bolt or stud can be accurately predicted by measuring the degrees of turn from the point where the underside of the bolt head or nut face contacts the work surface. Termed the "torque angle" method, this procedure has long been the standard of civil engineering. It has been suggested that torque angle is a relatively simple and valid procedure to use in our "blind" installations – where it is not possible to physically measure the actual bolt stretch.

ARP has conducted extensive evaluations of the torque angle method. We have concluded that, for our purposes, it is suitable only when individually calibrated for each installation.

Simple calculation of bolt stretch based on thread pitch is not accurate. No material is incompressible. When a bolt or a stud is preloaded or stretched, the components being clamped compress to some small extent. When we are looking for bolt stretch of only a few thousandths of an inch, the amount of clamped material compression becomes a very real factor. Our investigation has proven that installed stretch is dependent, not only on the pitch of the thread and the degree of rotation, but also on the amount of compression of the clamped components, the length of the male fastener, the amount of engaged thread, the type of lubrication and the number of times that the fastener has been cycled. For example, for the same degree of rotation, the actual amount of bolt stretch will be critically different between an aluminum cylinder head and a cast iron cylinder head – or a steel main cap on an aluminum block and a steel main cap on a cast iron block. Further, there is a significant difference between the long and short cylinder head bolts or studs on the same head. The torque angle method can be accurate – but only if each individual installation has been previously calibrated by direct measurement of bolt stretch. When using the torque angle method, it is best to begin rotation from some small measured torque – no more than ten lb./ft. – rather than the first point of contact with the work face. To achieve accuracy it is also best to cycle the fasteners five times before either calibrating or installing.



## Using A Torque Wrench

If the stretch method cannot be used in a particular installation, and the fasteners must be installed by torque alone, there are certain factors that should be taken into account. ARP research has verified the following "rules" pertaining to use of a torque wrench:

1. The friction factor changes from one application to the next. That is, the friction is at its highest value when the fastener is first tightened. Each additional time the fastener is torqued and loosened, this value gets smaller. Eventually the friction levels out and becomes constant for all following repetitions. Therefore, new fasteners should be tightened and loosened through several cycles before applying final torque. The number of times depends on the lubricant. For all situations where ARP lubricants are used, five cycles are required before final torquing.

2. The lubricant used is the main factor in determining friction, and therefore, the torque for a particular installation. Motor oil is a commonly used lubricant because of its ready availability. If less friction is desired in order to install the fasteners with less torque, special low friction lubricants are available. With special lubes, the required torque can be reduced as much as 20 to 30 percent. It is important to keep in mind that the reverse is also true. If the torque value has been specified for a particular fastener on the basis of low friction lube, installing the fastener with motor oil will result in insufficient preload; the torque has to be increased to compensate for the extra friction caused by the motor oil.

3. Surface finish is also important. For example, black oxide behaves differently than a polished fastener. It is therefore important to observe the torque recommendations supplied with each fastener.

NOTE: It is possible for even the most expensive of torque wrenches to lose accuracy. We have seen fluctuations of as much as ten (10) foot pounds of torque from wrench to wrench. Please have your torque wrench checked periodically for accuracy.

## The Stretch Gauge

We highly recommend using a stretch gauge when installing rod bolts and other fasteners where it is possible to measure the length of the fastener. It is the most accurate way to determine the correct pre-load in the rod bolt. Simply follow manufacturer's instructions, or use the *chart on page 25 of this catalog* for ARP fasteners. Measure the fastener prior to starting, and monitor overall length during installation. When the bolt has stretched the specified amount, the correct preload, or clamping load, has been applied. We recommend you maintain a chart of all rod bolts, and copy down the length of the fastener prior to and after installation. If there is a permanent increase of .001" in length, or if there is deformation, the bolt should be replaced. *A sample stretch monitoring chart is on page 28.*





## THE IMPORTANCE OF PROPER ROD BOLT STRETCH/TORQUE...

Whether measured by stretch or by torque, properly preloading a rod bolt is essential for trouble-free performance. If a bolt is installed without sufficient preload (or pre-stretch), every revolution of the crankshaft will cause a separation between the connecting rod and rod cap. This imposes additional stretch in the bolt. The stretch disappears when the load is removed on each revolution, or cycle. Over time, this cycle stretching and relaxing can cause the bolt to fail due to fatigue, just like a paper clip that is bent back and forth by hand. To prevent this condition, the bolt's pre-load must be greater than the load caused by engine operation.

A properly installed bolt remains stretched by its preload and isn't exercised by the cyclic loads imposed on the connecting rod. A quality bolt will stay stretched this way for years without failing. The important thing is to prevent the bolt from failing due to fatigue by tightening it to a load greater than the demand of the engine. Protect your bolts – tighten them as recommended.

You can easily monitor the condition of the rod bolts through use of a stretch gauge, or a micrometer for that matter. Prior to installing the rod, measure the length of the bolt in a "relaxed" (untorqued) state. Write this down. You can make up a chart similar to the one shown on this page to properly keep track of the data. When you tear the engine down for maintenance, again measure the length of each rod bolt – being careful to keep everything in the proper order. If any of the rod bolts have taken a permanent set and have stretched by .001" or longer you should replace the fastener **IMMEDIATELY!** The stretching is a sure indicator that the bolt has been compromised and taken past its yield point.

In other types of bolted joints, this careful attention to tightening is not as important. For example, flywheel bolts need only be tightened enough to prevent them from working loose. Flywheel loads are carried either by shear pins or by side loads in the bolts; they don't cause cyclic tension loads in the bolts. Connecting rod bolts, on the other hand, support the primary tension loads caused by engine operation and must be protected from cyclic stretching. That's why proper tightening of connect-

ing rod bolts is so important. See page 25 for recommended stretch and torque.

Friction is an extremely challenging problem because it is so variable and difficult to control. The best way to avoid the pitfalls of friction is by using the stretch method. This way preload is controlled and independent of friction. Each time the bolt is torqued and loosened, the friction factor gets smaller. Eventually the friction levels out and becomes constant for all following repetitions. Therefore, when installing a new bolt where the stretch method can not be used, the bolt should be tightened and loosened several times before final torque. The number of cycles depends on the lubricant. For ARP recommended lubes, five loosening and tightening cycles is sufficient.

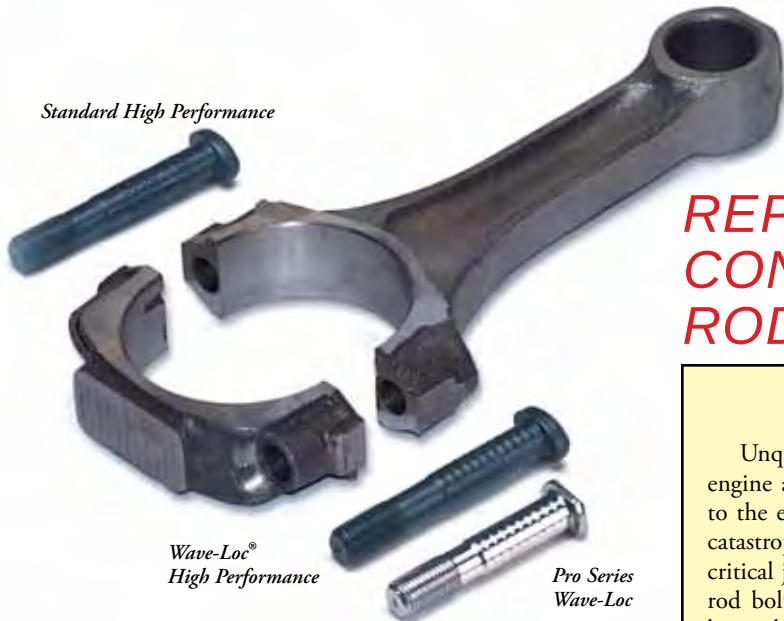


*A rod bolt stretch gauge is one of the most important tools a serious engine builder can own. It's valuable in properly setting up a rod for resizing, obtaining the proper torque load when installed in the engine, and monitoring the condition of the bolt while in use.*

### ROD BOLT STRETCH MONITORING CHART

|                                                                                          |                                                                                          |                                                                                          |                                                                                          |
|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| <b>ROD #1</b><br>INSIDE BOLT<br>IN _____ OUT _____<br>OUTSIDE BOLT<br>IN _____ OUT _____ | <b>ROD #2</b><br>INSIDE BOLT<br>IN _____ OUT _____<br>OUTSIDE BOLT<br>IN _____ OUT _____ | <b>ROD #3</b><br>INSIDE BOLT<br>IN _____ OUT _____<br>OUTSIDE BOLT<br>IN _____ OUT _____ | <b>ROD #4</b><br>INSIDE BOLT<br>IN _____ OUT _____<br>OUTSIDE BOLT<br>IN _____ OUT _____ |
| <b>ROD #5</b><br>INSIDE BOLT<br>IN _____ OUT _____<br>OUTSIDE BOLT<br>IN _____ OUT _____ | <b>ROD #6</b><br>INSIDE BOLT<br>IN _____ OUT _____<br>OUTSIDE BOLT<br>IN _____ OUT _____ | <b>ROD #7</b><br>INSIDE BOLT<br>IN _____ OUT _____<br>OUTSIDE BOLT<br>IN _____ OUT _____ | <b>ROD #8</b><br>INSIDE BOLT<br>IN _____ OUT _____<br>OUTSIDE BOLT<br>IN _____ OUT _____ |

Standard High Performance

Wave-Loc®  
High PerformancePro Series  
Wave-Loc

## Choose From **Three** ARP Replacement Rod Bolts:

Because factory connecting rods (or aftermarket versions of OEM rods) are used in a variety of applications from rebuilt stock motors to modified powerplants used in circle track, marine and drag racing engines – including those with superchargers and/or nitrous oxide injection systems – ARP offers replacement rod bolts in three different models. All of them are substantially better than the stock OEM and most aftermarket bolts.



### **GOOD: STANDARD HIGH PERFORMANCE BOLTS**

A premium grade 8740 alloy chrome moly steel is used to manufacture ARP High Performance connecting rod bolts. This material is heat-treated to provide a tensile strength in the 200,000 psi range, which is substantially stronger than the OEM bolts. Cycle testing shows ARP High Performance rod bolts to be nearly five times more reliable than stock bolts.



### **BETTER: WAVE-LOC® HIGH PERFORMANCE BOLTS**

The same heat-treated 8740 chrome moly steel is used to make these rod bolts as ARP's standard High Performance rod bolts. The big difference is in the shank design, with ARP's exclusive (and patented) Wave-Loc technology providing substantial benefits. Because there are fairly wide tolerances in factory bolt holes, the bolt must be able to fit snugly and a knurl is applied. Unfortunately, these knurls cut deep into the bolt material, leaving sharp edges and enormous "stress risers" that promote failure. That's why ARP developed the Wave-Loc design that features symmetrical waves and provides an effective interference fit without creating stress risers in the bolt or the rod.



### **BEST: "PRO" SERIES WAVE-LOC BOLTS**

For the most severe applications, in conjunction with aftermarket I-beam rods, ARP has developed the "Pro" Series Wave-Loc bolts. These ultra heavy-duty rod bolts are made from a special material designated ARP2000. It has approximately 200% the fatigue life of 8740 chrome moly steel and has a tensile strength of about 220,000 psi, and is capable of more than 12,000 lbs. clamping force.

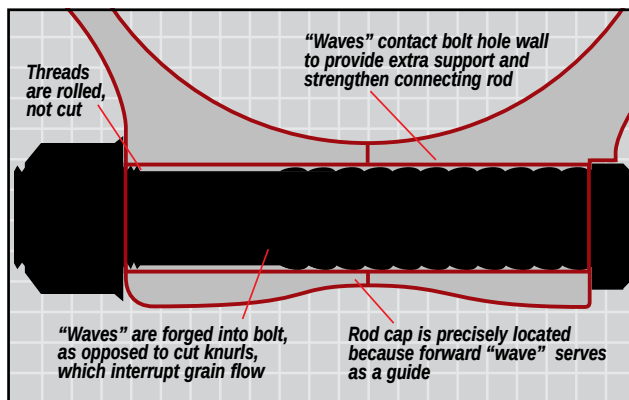
## REPLACEMENT CONNECTING ROD BOLTS

### TECH NOTE: ROD BOLTS

Unquestionably the most important fasteners in any engine are the connecting rod bolts, as they hold the key to the entire rotating assembly. A broken bolt will lead to catastrophic engine failure. As you can imagine, the most critical joint is where the connecting rod halves mate. The rod bolts must support the primary tension loads caused by each rotation (or cycle) of the crankshaft. When the crank rotates, the big end of the connecting rod essentially becomes oval-shaped and the rod bolts bend. As the crankshaft continues to rotate, the rod becomes round again. With alternating tension loads and cyclic bending of the bolts, it is very important to install fasteners that are able to exert a clamping force greater than the load imposed upon the joint (tension).

In addition to utilizing a rod bolt with sufficient strength to withstand the tremendous cyclical strains placed upon it, it is absolutely imperative that the bolts be properly tightened. The preferred method of monitoring the correct amount of tension is through use of a stretch gauge. This is far more accurate than using a torque wrench. Moreover, through subsequently checking the rod bolts length at tear-downs, it is possible to determine if it has been stressed beyond safe limits and must be replaced.

### ADVANTAGES OF WAVE-LOC ROD BOLTS:



- Wave-Loc surface contacts the rod and cap for optimum alignment and reduction of fluctuating stress – which strengthens the rod itself!
- Provides snug fit for all OEM connecting rods despite wide range of factory rod bolt hole tolerances.
- Available for most applications.
- Superior material grain flow because of patented Wave-Loc surface design as compared to knurled bolts that have sharp edges and "built-in" stress risers.
- Galling and scoring of the rod is virtually eliminated because there is only smooth contact and absolutely no "digging."

800-826-3045

**ARP**  
 automotive Racing products





| Application                                                                                     | Head Style | Hi-Perf 8740 (complete) | Hi-Perf 8740 (2-PC) | HP Wave 8740 (complete) | HP Wave 8740 (2-PC) | Pro Wave ARP2000 (complete) | Pro Wave ARP2000 (2-PC) | Pro Series ARP2000 (complete) | Pro Series ARP2000 (2-PC) |
|-------------------------------------------------------------------------------------------------|------------|-------------------------|---------------------|-------------------------|---------------------|-----------------------------|-------------------------|-------------------------------|---------------------------|
| Note: Please verify rod bolt head style against the photos labeled A-M when replacing rod bolts |            |                         |                     |                         |                     |                             |                         |                               |                           |
| <b>ALFA ROMEO</b>                                                                               |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 2.0L GTV                                                                                        | A          | 126-6101                |                     |                         |                     |                             |                         |                               |                           |
| <b>AMC</b>                                                                                      |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 258 cid inline 6                                                                                | D          | 112-6001                |                     |                         |                     |                             |                         |                               |                           |
| 290-304-343-360 cid 11/32"                                                                      | D          | 114-6001                |                     |                         |                     |                             |                         |                               |                           |
| 390 cid (1968-69)                                                                               | D          | 114-6004                |                     |                         |                     |                             |                         |                               |                           |
| 390-401 cid (1970 & later) 3/8"                                                                 | D          | 114-6002                |                     |                         |                     |                             |                         |                               |                           |
| <b>BMC/TRIUMPH/ROVER</b>                                                                        |            |                         |                     |                         |                     |                             |                         |                               |                           |
| A Series 3/8"                                                                                   | J          | 206-6001                | 206-6021            |                         |                     |                             |                         |                               |                           |
| A & B Series 11/32"                                                                             | C          | 206-6002                |                     |                         |                     |                             |                         |                               |                           |
| B Series (1964-68) 18GB & 18GF 3/8"                                                             | E          | 206-6003                |                     |                         |                     |                             |                         |                               |                           |
| Bonneville 650cc motorcycle (1956-72)                                                           |            | 206-6009                |                     |                         |                     |                             |                         |                               |                           |
| K Series                                                                                        | E          | 206-6007                |                     |                         |                     |                             |                         |                               |                           |
| 1.3L & 1.5L Spitfire                                                                            | E          |                         |                     |                         |                     |                             |                         | 206-6004                      |                           |
| 2.0L GT6 & 2.5L TR6                                                                             | E          |                         |                     |                         |                     |                             |                         | 206-6005                      |                           |
| 2.0L SOHC TR7                                                                                   | K          | 206-6006                |                     |                         |                     |                             |                         |                               |                           |
| <b>BMW</b>                                                                                      |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 1.6L Mini Cooper M8 x 43MM UHL                                                                  | E          | 206-6008                |                     |                         |                     |                             |                         |                               |                           |
| 2.3L (S14) M11 x 41MM UHL                                                                       | E          |                         |                     |                         |                     |                             |                         | 201-6104                      |                           |
| 2.5L (M50/M50TU) inline 6 M9 x 53MM UHL                                                         | E          |                         |                     |                         |                     |                             |                         | 201-6301                      |                           |
| 3.0L (S50 EURO) inline 6 M10 x 45MM UHL                                                         | E          |                         |                     |                         |                     |                             |                         | 201-6102                      |                           |
| 3.2L (S54) inline 6 M11 x 47MM UHL                                                              | E          |                         |                     |                         |                     |                             |                         | 201-6103                      |                           |
| 4.4L (M62/M62TU) V8 M9 x 53MM UHL                                                               | E          |                         |                     |                         |                     |                             |                         | 201-6302                      |                           |
| <b>BUICK</b>                                                                                    |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 90° V6 (cap screw type) 1.500" UHL                                                              | E          |                         |                     |                         |                     |                             |                         | 123-6001                      | 123-6021                  |
| 90° V6 (cap screw type) 1.700" UHL                                                              | E          |                         |                     |                         |                     |                             |                         | 123-6002                      | 123-6022                  |
| 215 cid aluminum V8                                                                             | D          | 124-6001                |                     |                         |                     |                             |                         |                               |                           |
| 350 cid (1968-73) standard 11/32"                                                               |            | 124-6002                |                     |                         |                     |                             |                         |                               |                           |
| 350 cid (1968-73) .015 in. oversize 11/32"                                                      |            | 124-6003                |                     |                         |                     |                             |                         |                               |                           |
| 400-401-425-430-455 cid                                                                         | B          | 125-6001                |                     |                         |                     |                             |                         |                               |                           |
| <b>CADILLAC</b>                                                                                 |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 472-500 cid with 12 pt nuts                                                                     | D          | 135-6003                |                     |                         |                     |                             |                         |                               |                           |
| <b>CHEVROLET, SMALL BLOCK</b>                                                                   |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 7/16" "K" rod with 12 pt nuts                                                                   | A          | 134-6004                |                     |                         |                     |                             |                         |                               |                           |
| 265-283-327 cid (small journal) 11/32"                                                          | D          | 134-6001                | 134-6021            | 134-6401                | 134-6411            | 234-6401                    | 234-6421                |                               |                           |
| 305-307-327-350 cid (large journal) 3/8"                                                        | B          | 134-6003                | 134-6023            | 134-6403                | 134-6423            | 234-6403                    | 234-6423                |                               |                           |
| 350 cid PM Rod (1992-97) LT1/LT4                                                                | B          | 134-6005                |                     |                         |                     |                             |                         |                               |                           |
| 383 Stroker w/ 350 rod (extra head clearance)                                                   | A          | 134-6027                |                     |                         |                     |                             |                         |                               |                           |
| 400 cid                                                                                         | A          | 134-6002                | 134-6022            | 134-6402                | 134-6422            | 234-6402                    | 234-6422                |                               |                           |
| Gen III/LS Series small block (except LS7) "Cracked Cap Design"                                 | E          | 134-6006                | 134-6026            |                         |                     |                             |                         | 234-6301                      | 234-6321                  |
| <b>CHEVROLET, BIG BLOCK</b>                                                                     |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 396-402-427-454 cid 3/8"                                                                        | A          | 135-6002                | 135-6022            | 135-6402                | 135-6422            | 235-6402                    | 235-6422                |                               |                           |
| 409 cid                                                                                         | B          | 134-6003                | 134-6023            | 134-6403                | 134-6423            | 234-6403                    | 234-6423                |                               |                           |
| 454-502 cid 7/16"                                                                               | A          | 135-6001                | 135-6021            | 135-6401                | 135-6421            | 235-6401                    | 235-6421                |                               |                           |
| 454-502 cid 7/16" with 12 pt nuts                                                               | A          |                         |                     |                         |                     | 235-6403                    | 235-6423                |                               |                           |
| <b>CHEVROLET, 4 AND 6-CYLINDER</b>                                                              |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 140-145-164 cid Corvair 5/16"                                                                   | D          |                         |                     | 132-6002                | 132-6022            |                             |                         |                               |                           |
| 194-230-250 cid inline 6                                                                        | D          | 132-6001                | 132-6021            |                         |                     |                             |                         |                               |                           |
| 120-140 cid 4-cylinder Vega                                                                     | D          | 131-6001                | 131-6021            |                         |                     |                             |                         |                               |                           |
| 2.8L 60° V6                                                                                     | D          | 133-6002                | 133-6022            |                         |                     |                             |                         |                               |                           |
| 4.3L 90° V6                                                                                     | A          | 133-6001                | 133-6021            |                         |                     |                             |                         |                               |                           |
| <b>CHRYSLER</b>                                                                                 |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 2.2L & 2.5L 4-cylinder                                                                          | D          | 141-6001                | 141-6021            | 141-6401                |                     |                             |                         |                               |                           |
| 170-225 cid Slant Six (1976 & earlier)                                                          | F          | 142-6001                |                     |                         |                     |                             |                         |                               |                           |
| 225 cid Slant Six (1977 & later)                                                                | D          | 142-6002                |                     |                         |                     |                             |                         |                               |                           |
| 318-340-360 Wedge & 318-360 Magnum                                                              | D          | 144-6001                | 144-6021            | 144-6401                | 144-6421            | 244-6401                    | 244-6421                |                               |                           |
| 383-400-413-440 Wedge & 354-392 Hemi                                                            | D          | 145-6002                | 145-6022            | 145-6402                |                     | 245-6402                    | 245-6422                |                               |                           |
| 426 factory Hemi 7/16"                                                                          | M          | 145-6001                | 145-6021            |                         |                     |                             |                         |                               |                           |
| <b>FORD, SMALL BLOCK</b>                                                                        |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 239-256-272-292 Y block (rod marked EBU)                                                        | M          | 154-6005                |                     |                         |                     |                             |                         |                               |                           |
| 239-256-272-292 Y block (rod marked ECZ)                                                        | F          | 154-6004                | 154-6024            |                         |                     |                             |                         |                               |                           |
| 289-302 cid standard 5/16"                                                                      | B          | 154-6002                | 154-6022            | 154-6402                | 154-6422            | 254-6402                    | 254-6422                |                               |                           |

Red part numbers indicate new items



| Application<br><small>Note: Please verify rod bolt head style against the photos labeled A-M when replacing rod bolts</small> | Head Style | Hi-Perf 8740 (complete) | Hi-Perf 8740 (2-PC) | HP Wave 8740 (complete) | HP Wave 8740 (2-PC) | Pro Wave ARP2000 (complete) | Pro Wave ARP2000 (2-PC) | Pro Series ARP2000 (complete) | Pro Series ARP2000 (2-PC) |
|-------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------|---------------------|-------------------------|---------------------|-----------------------------|-------------------------|-------------------------------|---------------------------|
| <b>FORD, SMALL BLOCK (CONTINUED)</b>                                                                                          |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 302 cid Sportsman SVO 3/8"                                                                                                    | M          | 150-6005                | 150-6025            |                         |                     |                             |                         |                               |                           |
| 312 cid                                                                                                                       | F          | 154-6004                | 154-6024            |                         |                     |                             |                         |                               |                           |
| 351 Cleveland                                                                                                                 | C          | 154-6003                | 154-6023            | 154-6403                | 154-6423            | 254-6403                    | 254-6423                |                               |                           |
| 351-400M                                                                                                                      | C          | 154-6001                | 154-6021            | 154-6401                | 154-6421            |                             |                         |                               |                           |
| Boss 302 & 351W                                                                                                               | C          | 150-6004                | 150-6024            | 150-6404                | 150-6424            | 250-6404                    | 250-6424                |                               |                           |
| 351W with square head rod bolt                                                                                                | M          | 154-6006                |                     |                         |                     |                             |                         |                               |                           |
| <b>FORD, BIG BLOCK</b>                                                                                                        |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 390-406-410-427-428 cid FE Series                                                                                             | G          | 155-6002                | 155-6022            |                         |                     | 255-6402                    | 255-6422                |                               |                           |
| 427 LeMans                                                                                                                    | E          | 200-6001                | 200-6021            |                         |                     |                             |                         |                               |                           |
| 428 Cobra Jet (replacement for 13/32" bolt)                                                                                   | A          | 155-6001                | 155-6021            |                         |                     |                             |                         |                               |                           |
| 429-460 cid                                                                                                                   | M          | 155-6003                | 155-6023            |                         |                     |                             |                         |                               |                           |
| Boss 429-460                                                                                                                  | C          | 150-6004                | 150-6024            | 150-6404                | 150-6424            | 250-6404                    | 250-6424                |                               |                           |
| <b>FORD, 4 AND 6-CYLINDER</b>                                                                                                 |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 1.6L CVH M8                                                                                                                   | E          | 151-6004                |                     |                         |                     |                             |                         |                               |                           |
| 1.6L Zetec (E) M8                                                                                                             | E          | 151-6003                | 151-6023            |                         |                     |                             |                         |                               |                           |
| 1.8L Duratec                                                                                                                  | E          |                         |                     |                         |                     |                             |                         | 251-6202                      |                           |
| 2.0L DOHC Cosworth Sierra/Escort                                                                                              | E          |                         |                     |                         |                     |                             |                         | 251-6301                      |                           |
| 2.0L RS 2000 M8                                                                                                               | E          |                         |                     |                         |                     |                             |                         | 251-6201                      | 251-6222                  |
| 2.0L Zetec M9                                                                                                                 | E          | 151-6005                |                     |                         |                     |                             |                         |                               |                           |
| 2000cc Pinto                                                                                                                  | D          | 151-6001                | 151-6021            |                         |                     |                             |                         |                               |                           |
| 2300cc Pinto                                                                                                                  | F          | 151-6002                | 151-6022            |                         |                     | 251-6402                    | 251-6422                |                               |                           |
| 2.8L & 2.9L V6                                                                                                                | B          | 153-6001                |                     |                         |                     |                             |                         |                               |                           |
| 3.8L V6 Super Coupe T-bird                                                                                                    | C          | 153-6002                | 153-6022            |                         |                     |                             |                         |                               |                           |
| 240-300 cid inline 6                                                                                                          | G          | 152-6001                |                     |                         |                     |                             |                         |                               |                           |
| 4.9L inline 6                                                                                                                 | C          | 152-6002                |                     |                         |                     |                             |                         |                               |                           |
| <b>FORD, MODULAR</b>                                                                                                          |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 4.6L & 5.4L                                                                                                                   | E          |                         |                     |                         |                     |                             |                         | 256-6301                      |                           |
| <b>HOLDEN</b>                                                                                                                 |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 11/32"                                                                                                                        | B          | 205-6002                |                     |                         |                     |                             |                         |                               |                           |
| 3/8"                                                                                                                          | B          | 205-6001                |                     |                         |                     |                             |                         |                               |                           |
| <b>HONDA/ACURA</b>                                                                                                            |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 1.2L, 1.6L & 1.8L M8                                                                                                          | A          | 208-6001                |                     |                         |                     |                             |                         |                               |                           |
| 1.6L & 1.8L M9                                                                                                                | A          |                         |                     |                         |                     |                             |                         | 208-6401                      |                           |
| 2.0L (F20C) & 2.2L (F22C) S2000                                                                                               | E          |                         |                     |                         |                     |                             |                         | 208-6002                      |                           |
| 2.0L (K20A)                                                                                                                   | E          |                         |                     |                         |                     |                             |                         | 208-6003                      |                           |
| 3.0L (C30A) V6 Acura NSX M9                                                                                                   |            |                         |                     |                         |                     |                             |                         | 208-6004                      |                           |
| 3.2L (C32B) V6 Acura NSX M8                                                                                                   |            |                         |                     |                         |                     |                             |                         | 208-6005                      |                           |
| <b>LANCIA</b>                                                                                                                 |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 2.0L SOHC 8V & DOHC 16V Turbo                                                                                                 | E          |                         |                     |                         |                     |                             |                         | 275-6001                      |                           |
| <b>MAZDA</b>                                                                                                                  |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 1.6L (B6) & 1.8L (BP) DOHC Miata M9                                                                                           | K          | 118-6401                |                     |                         |                     |                             |                         |                               |                           |
| <b>MITSUBISHI</b>                                                                                                             |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 2.0L (4B11) (2008 & later)                                                                                                    | E          |                         |                     |                         |                     |                             |                         | 207-6002                      |                           |
| 2.0L (4G63) (1993 & earlier) M9                                                                                               | C          | 107-6001                | 107-6021            |                         |                     |                             |                         |                               |                           |
| 2.0L (4G63) (1994-07) M8                                                                                                      | A          | 107-6002                | 107-6022            |                         |                     |                             |                         |                               |                           |
| 2.6L (G54B)                                                                                                                   | C          | 107-6003                | 107-6023            |                         |                     |                             |                         |                               |                           |
| 3.0L (6G72) & 3.5L (6G74) V6                                                                                                  | C          | 107-6004                | 107-6024            |                         |                     |                             |                         |                               |                           |
| <b>NISSAN/DATSUN</b>                                                                                                          |            |                         |                     |                         |                     |                             |                         |                               |                           |
| A Series (A12-A12A-A13-A14-A15)                                                                                               | A          | 102-6002                |                     |                         |                     |                             |                         |                               |                           |
| L16 Series M8                                                                                                                 | C          | 102-6001                |                     |                         |                     |                             |                         |                               |                           |
| L20 Series 4-cylinder & 2.2L (Z22) M9                                                                                         | C          | 202-6001                |                     |                         |                     |                             |                         |                               |                           |
| L24 Series (early) inline 6 M8                                                                                                | C          | 202-6002                |                     |                         |                     |                             |                         |                               |                           |
| L24 (late), L26 & L28 Series inline 6 M9                                                                                      | C          | 202-6003                |                     |                         |                     |                             |                         |                               |                           |
| 2.0L (SR20DE/DET) 11/32"                                                                                                      | C          | 202-6005                |                     |                         |                     |                             |                         |                               |                           |
| 3.0L (VG30E/ET) SOHC V6 M9                                                                                                    | C          | 202-6003                |                     |                         |                     |                             |                         |                               |                           |
| 3.0L (VG30D/DET/DETT) DOHC V6 11/32"                                                                                          | C          | 202-6004                |                     |                         |                     |                             |                         |                               |                           |
| 3.5L (VQ35) DOHC V6 M8                                                                                                        | E          |                         |                     |                         |                     |                             |                         | 202-6006                      |                           |
| <b>OLDSMOBILE</b>                                                                                                             |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 2.3L & 2.4L Quad 4                                                                                                            | I          | 181-6001                |                     |                         |                     |                             |                         |                               |                           |
| 307-350-403-425 cid                                                                                                           | A          | 184-6001                | 184-6021            |                         |                     |                             |                         |                               |                           |
| 455 cid                                                                                                                       | F          | 185-6001                | 185-6021            |                         |                     |                             |                         |                               |                           |

Red part numbers indicate new items

800-826-3045







| Application                                                                                            | Head Style | Hi-Perf 8740 (complete) | Hi-Perf 8740 (2-PC) | HP Wave 8740 (complete) | HP Wave 8740 (2-PC) | Pro Wave ARP2000 (complete) | Pro Wave ARP2000 (2-PC) | Pro Series ARP2000 (complete) | Pro Series ARP2000 (2-PC) |
|--------------------------------------------------------------------------------------------------------|------------|-------------------------|---------------------|-------------------------|---------------------|-----------------------------|-------------------------|-------------------------------|---------------------------|
| <b>NOTE: Please verify rod bolt head style against the photos labeled A-M when replacing rod bolts</b> |            |                         |                     |                         |                     |                             |                         |                               |                           |
| <b>OPEL/VAUXHALL</b>                                                                                   |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 1.4L & 1.6L 8V M8                                                                                      | E          | 109-6002                |                     |                         |                     |                             |                         |                               |                           |
| 1.4L 16V M9                                                                                            | E          | 109-6003                |                     |                         |                     |                             |                         |                               |                           |
| 2.0L 16V M9                                                                                            | E          | 109-6001                |                     |                         |                     |                             |                         | 209-6003                      |                           |
| <b>PEUGEOT</b>                                                                                         |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 205 & 306                                                                                              | M          | 117-6101                |                     |                         |                     |                             |                         |                               |                           |
| <b>PONTIAC</b>                                                                                         |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 151 cid (Iron Duke) 4-cylinder 11/32"                                                                  | D          | 191-6001                |                     |                         |                     |                             |                         |                               |                           |
| 3800 V6 (cap screw type) 1.700" UHL                                                                    | E          |                         |                     |                         |                     |                             |                         | 123-6002                      | 123-6022                  |
| 301 cid                                                                                                | D          | 194-6001                |                     |                         |                     |                             |                         |                               |                           |
| 287-317-347-370-389 cid (1955-62)                                                                      | D          | 190-6002                | 190-6022            |                         |                     |                             |                         |                               |                           |
| 326-389-400-455 cid (1963 & later) 3/8"                                                                | I          | 190-6001                | 190-6021            |                         |                     |                             |                         |                               |                           |
| 455 Super Duty 7/16"                                                                                   | M          | 190-6003                | 190-6023            |                         |                     |                             |                         |                               |                           |
| 455 Super Duty (cap screw type) 7/16-24                                                                | E          | 190-6004                |                     |                         |                     |                             |                         |                               |                           |
| <b>PORSCHE</b>                                                                                         |            |                         |                     |                         |                     |                             |                         |                               |                           |
| RSR Ti rod                                                                                             | H          |                         |                     |                         |                     | 204-6004                    |                         |                               |                           |
| 1.7L & 2.0L Type IV                                                                                    | K          | 104-6006                |                     |                         |                     |                             |                         |                               |                           |
| 2.0L 911S (1969)                                                                                       | H          |                         |                     |                         |                     | 204-6003                    |                         |                               |                           |
| 911, 930 Turbo & 933 M9                                                                                | H          |                         |                     |                         |                     | 204-6005                    |                         |                               |                           |
| 911 M10                                                                                                | H          |                         |                     |                         |                     | 204-6001                    |                         |                               |                           |
| 944                                                                                                    | K          |                         |                     |                         |                     | 204-6002                    |                         |                               |                           |
| <b>RENAULT</b>                                                                                         |            |                         |                     |                         |                     |                             |                         |                               |                           |
| Clio (F4R) 16V M9                                                                                      | E          |                         |                     |                         |                     |                             |                         | 216-6301                      |                           |
| R5 Turbo (Mid-Engine)                                                                                  | E          |                         |                     |                         |                     |                             |                         | 216-6302                      |                           |
| R12 Gordini/Alpine (807g)                                                                              | E          | 116-6001                |                     |                         |                     |                             |                         |                               |                           |
| <b>SUBARU</b>                                                                                          |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 1.8L (EJ18) & 2.2L (EJ22) SOHC, 2.5L (EJ25) SOHC/DOHC non turbo & 2.0L (EJ20) DOHC Turbo               | I          |                         |                     |                         |                     | 260-6301                    |                         |                               |                           |
| 2.5L (EJ25) DOHC Turbo                                                                                 | E          |                         |                     |                         |                     |                             |                         | 260-6302                      |                           |
| <b>TOYOTA</b>                                                                                          |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 1.6L (4AGE) DOHC & 1.6L (4ALC) SOHC M9                                                                 | A          | 203-6001                |                     |                         |                     |                             |                         |                               |                           |
| 1.6L (2TC/2TG) & 1.8L (3TC)                                                                            | A          | 203-6003                |                     |                         |                     |                             |                         |                               |                           |
| 2.0L (3SGTE) & 2.4L (22R)                                                                              | A          | 203-6002                |                     |                         |                     |                             |                         |                               |                           |
| 3.0L (7MGTE) inline 6 (1986-92) Supra                                                                  | A          | 203-6004                |                     |                         |                     |                             |                         |                               |                           |
| 3.0L (2JZGE/GTE) inline 6 (1993-98) Supra                                                              | E          |                         |                     |                         |                     |                             |                         | 203-6005                      |                           |
| <b>VOLKSWAGEN/AUDI</b>                                                                                 |            |                         |                     |                         |                     |                             |                         |                               |                           |
| Audi 5-cylinder                                                                                        | L          |                         |                     |                         |                     |                             |                         | 104-6007                      |                           |
| Formula Vee (cap screw type) M9                                                                        | E          | 104-6005                | 104-6025            |                         |                     |                             |                         |                               |                           |
| Super Vee (cap screw type) Audi-style rod                                                              | E          |                         |                     |                         |                     |                             |                         | 104-6003                      | 104-6023                  |
| 1600cc air cooled                                                                                      | K          | 104-6001                |                     |                         |                     |                             |                         |                               |                           |
| 1600cc water-cooled Rabbit & Corrado G60                                                               | K          | 104-6002                |                     |                         |                     |                             |                         |                               |                           |
| 1.8L & 2.0L water cooled                                                                               | L          |                         |                     | 104-6004                | 104-6024            |                             |                         |                               |                           |
| 2.7L (APB/BEL) Turbo & 2.8L (AFC/ACK/AHA/ATQ) Non Turbo V6                                             | E          |                         |                     |                         |                     |                             |                         | 204-6201                      |                           |
| 2.8L & 2.9L VR6                                                                                        | E          |                         |                     |                         |                     |                             |                         | 204-6006                      |                           |

Red part numbers indicate new items



2008 UIM P1 world champion



Corey Kruseman - Team owner and 2006 USAC Champion

## HOW TO: INSTALL CAP-STYLE ROD BOLTS

Replace your original connecting rod cap screws with these ARP products for enhanced durability and improved strength. Use whenever cap screw-style bolts are used for rod cap retention.

### TECH TIP

Be sure the torque spec used when re-sizing a rod **and** final engine assembly are the **same**. Communicate with your machinist! Use a stretch gauge for both functions, if possible.

**NOTE:** The only way to know if a bolt is ready to fail is if it has permanently yielded .001" or more. See page 27.



1. Clean and inspect all hardware for obvious damage. If necessary, chase or re-tap con rod threads to ensure proper thread engagement and accurate torque readings.

2. Position washer under bolt head to ensure it clears the under head radius. NOTE: Improper installation will cause premature bolt failure.



3. Assemble cap to rod, then lubricate with ARP Moly lube and install bolt & washer. Measure pre-torqued bolt length. You should keep a log of the original free standing length. A sample is on page 28.

4. Using a stretch gauge or micrometer to measure fastener stretch, torque rod bolt until recommended bolt stretch is achieved. A rod bolt stretch chart is on page 25.

5. Once properly preloaded, have the rods resized before assembling them to the pistons, then install in engine using the prescribed bolt-stretch method.

## HOW TO: INSTALL OEM-STYLE ROD BOLTS

Improved reliability and optimum strength are the main attributes of ARP's replacement rod bolts. These are the finest fasteners available today, and are recommended for all high performance applications.

### TECH TIP

Be sure the torque spec used when re-sizing a rod **and** final engine assembly are the **same**. Communicate with your machinist! Use a stretch gauge for both functions, if possible.



1. Inspect rods to ensure there is adequate chamfer to clear radius under heads, then install bolts after inspecting for damaged hardware.

2. Reinstall the rod cap, then measure bolt length using a micrometer (free standing length).



3. Lubricate rod nuts with ARP Moly lube, torque nuts to achieve recommended bolt stretch. A rod bolt stretch chart is located on page 25.

4. With proper preload applied, have rods resized. This procedure is recommended any time rod bolts are replaced.

5. Install rod and piston assemblies in engine using the prescribed bolt stretch method or by following recommended torque values.

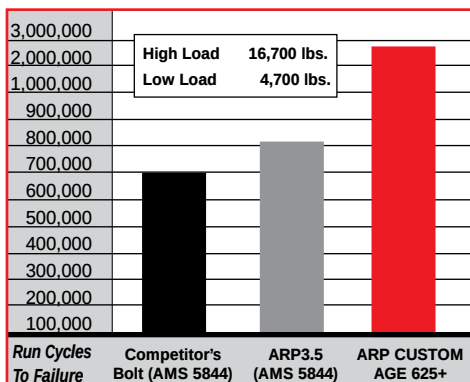


## PRO SERIES CONNECTING ROD BOLTS

A large number of connecting rod manufacturers have chosen ARP bolts as standard equipment. They're proud to advertise their products as being equipped with ARP rod bolts. And for good reason. The "weak link" in a connecting rod has always been the bolt, and racers know that nobody builds a better bolt than ARP. However, it is critically important to monitor the stretch of each bolt and replace it when it has permanently elongated by .001". Below you will find an extensive listing of aftermarket connecting rods and replacement bolt specifications.

In some instances, you may want to go to an ARP rod bolt made from a better grade of material. This will provide you with improved reliability. However, please understand that when you want bolts made from exotic, super high strength materials, the cost will increase significantly. If you're on a budget, it's best to go with the most cost-effective solution. This is typically defined by the loads that are carried by the bolts in terms of piston/rod weight and the rotational speed of the engine. The most cost effective design is the one in which the bolt strength is just great enough to handle its anticipated load – plus a safety margin for the occasional overloads. Using a material which has far more strength than required is not as cost effective – but will definitely give you an extra margin of safety and longer service life.

You should also know that ARP rod bolts are superior to those from other manufacturers. Especially in the area of fatigue strength. Testing has shown ARP rod bolts to have ten times the fatigue strength of other bolts. In the chart below, you'll find a bar chart that graphically shows the difference between ARP Pro Series rod bolts and the fastener made by a leading competitor. It's easy to see why ARP bolts are superior. As such, it makes good sense to rely on ARP for optimum connecting rod service and reliability. Make the most of your racing budget and rely on ARP rod bolts. You'll find the ARP name proudly stamped on each bolt as your assurance of quality.



- Forged in-house at ARP using only the finest quality materials
- Heat-treated using special vertical racks to assure complete 360° penetration
- Threads rolled after heat-treat to provide up to 10-times longer fatigue strength
- Precision CNC-machined to exacting specifications
- Specially designed for optimum reliability in each application



ARP connecting rod bolts are used in everything from exotic 18,000 rpm Formula 1 engines to 6,000 horsepower nitro-burning Top Fuel motors

*It's important to note that a number of premium quality connecting rods come from their respective manufacturers with ARP rod bolts as standard equipment. We are pleased to consider these key firms our "Performance Partners" and embarked upon a program to recognize this alliance. ARP also manufactures replacement connecting rod bolts for products from other firms. We feel that our fasteners are substantially better than those OEM offerings, and they will serve to increase the durability and service life of these rods. For information pertaining to obtaining replacement bolts for these rods, contact our tech department.*



**ARP**  
automotive *Racing* products

800-826-3045

| Application                                                            | Material        | UHL<br>(in.) | Thread<br>Dia. (in.) | Wrench<br>Dia. (in.) | Set<br>Qty | Complete<br>Set | 2-Piece<br>Pack |
|------------------------------------------------------------------------|-----------------|--------------|----------------------|----------------------|------------|-----------------|-----------------|
| Ford 427 (LeMans) and general replacement for aluminum rods, w/ washer | 8740            | 1.800        | 7/16                 | 7/16                 | 16         | 200-6001        | 200-6021        |
| Venolia, BRC, aluminum rod replacement, with washer                    | 8740            | 1.800        | 7/16                 | 7/16                 | 16         | 200-6002        | 200-6022        |
| Manley Elgin replacement                                               | 8740            | 1.800        | 7/16                 | 7/16                 | 16         | 200-6003        | 200-6023        |
| General replacement, aluminum rods, with washers, under cut            | 8740            | 2.000        | 7/16                 | 7/16                 | 16         | 200-6004        | 200-6024        |
| Manley replacement                                                     | 8740            | 1.600        | 7/16                 | 7/16                 | 16         | 200-6006        | 200-6026        |
| Manley replacement, rod part number 14051 and 14055                    | ARP2000         | 1.850        | 7/16                 | 7/16                 | 16         | 200-6201        | 200-6221        |
| Carrillo replacement for CARR bolt, with washers                       | ARP2000         | 1.800        | 7/16                 | 1/2                  | 16         | 200-6202        | 200-6222        |
| Carrillo replacement for H-bolt, without washers                       | L19             | 1.725        | 7/16                 | 1/2                  | 16         | 200-6203        | 200-6223        |
| Lentz replacement with washers                                         | ARP2000         | 1.800        | 7/16                 | 1/2                  | 16         | 200-6204        | 200-6224        |
| Lentz replacement without washers                                      | ARP2000         | 1.725        | 7/16                 | 1/2                  | 16         | 200-6205        | 200-6225        |
| Venolia, Brooks, KB, Aluminum rod replacement with washer              | ARP2000         | 2.000        | 7/16                 | 1/2                  | 16         | 200-6206        | 200-6226        |
| General replacement, steel rods                                        | ARP2000         | 1.600        | 3/8                  | 7/16                 | 8          | 200-6209        | 200-6219        |
| General replacement, steel rods                                        | ARP2000         | 1.500        | 5/16                 | 3/8                  | 8          | 200-6210        | 200-6220        |
| Venolia, Brooks, KB, BRC, Aluminum rod replacement with washer         | L19             | 2.000        | 7/16                 | 1/2                  | 16         | 200-6506        | 200-6526        |
| Venolia, Brooks, KB, Aluminum rod replacement with washer              | Custom Age 625+ | 2.000        | 7/16                 | 1/2                  | 16         | 300-6706        | 300-6726        |
| Carrillo, Lentz, Ferrea replacement without washer                     | ARP3.5          | 1.750        | 7/16                 | 1/2                  | 16         | 300-6601        | 300-6621        |
| Carrillo, Lentz, Ferrea replacement without washer                     | Custom Age 625+ | 1.750        | 7/16                 | 1/2                  | 16         | 300-6701        | 300-6721        |
| Carrillo replacement                                                   | ARP3.5          | 1.600        | 3/8                  | 7/16                 | 16         | 300-6602        | 300-6622        |
| Carrillo replacement                                                   | Custom Age 625+ | 1.600        | 3/8                  | 7/16                 | 16         | 300-6702        | 300-6722        |
| Carrillo replacement                                                   | ARP3.5          | 1.600        | 3/8                  | 7/16                 | 8          | 300-6603        | 300-6623        |
| Carrillo replacement                                                   | Custom Age 625+ | 1.600        | 3/8                  | 7/16                 | 8          | 300-6703        | 300-6723        |
| Carrillo replacement                                                   | ARP3.5          | 1.500        | 5/16                 | 3/8                  | 8          | 300-6608        | 300-6628        |
| Carrillo replacement                                                   | Custom Age 625+ | 1.500        | 5/16                 | 3/8                  | 8          | 300-6708        | 300-6728        |
| General replacement, steel rods                                        | ARP2000         | 1.500        | 3/8                  | 7/16                 | 8          | 200-6207        | 200-6227        |
| General replacement, steel rods                                        | ARP2000         | 1.750        | 3/8                  | 7/16                 | 8          | 200-6208        | 200-6228        |
| General replacement                                                    | Custom Age 625+ | 1.500        | 3/8                  | 7/16                 | 8          | 300-6704        | 300-6724        |

## MATERIALS USED IN THE MANUFACTURE OF CAP SCREW TYPE CONNECTING ROD BOLTS

**8740 CHROME MOLY:** Until the development of today's modern alloys, chrome moly was popularly considered a high strength material. Now viewed as only moderate strength, 8740 chrome moly is seen as a good tough steel, with adequate fatigue properties for most racing applications, but only if the threads are rolled after heat-treatment, as is the standard ARP production practice. Typically, chrome moly is classified as a quench and temper steel, that can be heat-treated to deliver tensile strengths between 180,000 and 210,000 psi.

**AERMET 100:** With a typical tensile strength of 280,000 psi, Aermet 100 is a new martensitic super-alloy that is stronger and less expensive than the super-alloy austenitic materials that follow. Because it is capable of achieving incredibly high clamping loads, it is ideal for short but extreme environments like top fuel, funny car and some short track applications. Although Aermet 100 is a maraging steel that is far superior to other high strength steels in its resistance to stress corrosion, it must be kept well-oiled and not exposed to moisture.

**ARP2000:** An exclusive, hybrid-alloy developed to deliver superior strength and better fatigue properties. While 8740 and ARP2000 share similar characteristics – ARP2000 is capable of achieving a clamp load at 220,000 psi. ARP2000 is used widely in short track and drag racing as an up-grade from 8740 chrome moly in both steel and aluminum rods. Stress corrosion and hydrogen embrittlement are typically not a problem, providing care is taken during installation.

**L19:** This is a premium steel that is processed to deliver superior strength and fatigue properties. L19 is a very high strength material compared to 8740 and ARP2000 and is capable of delivering a clamp load at 260,000 psi. It is primarily used in short track and drag racing applications where inertia loads exceed the clamping capability of ARP2000. Like most high strength, quench and temper steels – L19 requires special care during manufacturing to avoid hydrogen embrittlement. This material is easily contaminated and subject to stress corrosion. It must be kept well-oiled and not exposed to moisture.

**INCONEL 718:** A nickel based material that is in the high temperature, super-alloy class, it is found to be equally suitable in lower temperature applications. This material delivers tensile strengths into the 220,000 psi range and exhibits improved fatigue properties. Best of all, Inconel 718 is completely immune to hydrogen embrittlement and corrosion.

**ARP3.5 (AMS5844):** While similar to Inconel 718, these super-alloys are found in many jet engine and aerospace applications where heat and stress attack the life of critical components. The high cobalt content of this alloy, while expensive, delivers a material with superior fatigue characteristics and typically tensile strength in the 260,000 psi range. The immunity to hydrogen embrittlement and corrosion of these materials is a significant design consideration. These materials are primarily used in connecting rods where extremely high loads, high RPM and endurance are important factors – Formula 1, Winston Cup and CART applications.

**CUSTOM AGE 625 PLUS:** This newly formulated super-alloy demonstrates superior fatigue cycle life, tensile strength and toughness – with complete resistance to atmospheric corrosion and oxidation. ARP is the first to develop manufacturing and testing processes for fasteners with Custom Age 625+. Best of all it is less expensive and expected to soon replace MP-35 as the material of choice in the high strength, super-alloy field. Typical tensile strength is 260,000 psi.





## CYLINDER HEAD STUDS

It is for good reason that virtually every top professional engine builder relies on ARP Pro Series head studs for their all-out competition powerplants. Simply stated, there's not a better stud setup on the market today.

For openers, ARP uses a premium grade 8740 alloy that is rated far superior to "aircraft" quality. Then, each stud is placed vertically in special racks and precisely heat-treated to 200,000 psi. This procedure ensures complete heat penetration and the results are far superior to those lesser quality studs from other manufacturers who just dump pieces in a basket and hope for the best.

Following heat-treat, each stud is centerless ground to make it as close to perfectly concentric as possible. This procedure involves about ten very slight cuts and results in an exceptionally straight part. It's important to note that lesser quality studs are not even centerless ground – the material is thread rolled in bar stock form (mostly before heat-treat, when the material is easier to machine). Because ARP studs are manufactured to such exacting tolerances, you will note that gaskets and cylinder heads literally glide into position and are perfectly aligned – something that won't happen with inferior quality head studs.

ARP studs are thread rolled after heat-treat, which gives them about 1000% (that's ten times) better fatigue strength than those studs that are threaded prior to heat-treat (a very common industry practice). It costs a lot more to do it this way, because it's tough on tooling, but the results are well worth the extra effort.

You will also note that ARP offers specially undercut studs for several engines. This procedure (done only to the shorter studs) more equalizes the "stretch" of both studs, which makes for a more consistent clamping force – and one that compensates for head gasket compression when the cylinder heads are installed. This helps prevent blown head gaskets, and assures optimum engine sealing!

Premium quality heat-treated 8740 chrome moly steel head stud kits are available for most every domestic and import applications. You won't find a better quality stud on the market from any other source. Look for ARP stamped on each stud as your assurance of quality.

Clearly, they are the best on the market today, and the favorite of leading professional engine builders in all forms of racing.

### HEAD STUDS vs. BOLTS... A TECHNICAL DISCUSSION

ARP's factory Tech Representatives are often asked which is better, cylinder head studs or bolts. The answer, invariably, depends on the installation. On many street-driven vehicles, where master cylinders and other items protrude into the engine compartment, it's probably necessary to use head bolts so that the cylinder heads can be removed with the engine in the car.

For most applications, however, studs are recommended. And for good reason. Using studs will make it much easier to assemble an engine (especially a racing powerplant which must be serviced frequently and quickly!) with the cylinder head and gasket assured of proper alignment.

Studs also provide more accurate and consistent torque loading. Here's why. When you use bolts to secure the head, the fastener is actually being "twisted" while it's being torqued to the proper reading. Accordingly, the bolt is reacting to two different forces simultaneously. A stud should be installed in a "relaxed" mode – never crank it in tightly using a jammed nut.

If everything is right, the stud should be installed finger tight. Then, when applying torque to the nut, the stud will stretch only on the vertical axis. Remember, an undercut shorter stud will have a rate similar to a longer, standard shank stud. This provides a more even clamping force on the head. Because the head gasket will compress upon initial torquing, make sure studs and bolts are re-torqued after the engine has been run.

| Application                                              | Hex Nuts | Hex Nuts<br>U/C Studs | 12-Point Nuts | 12-Point Nuts<br>U/C Studs |
|----------------------------------------------------------|----------|-----------------------|---------------|----------------------------|
| <b>AMC</b>                                               |          |                       |               |                            |
| 258 cid inline 6                                         | 112-4001 |                       |               |                            |
| 290-343-390 cid (1969 & earlier) 7/16"                   | 114-4001 |                       | 114-4201      |                            |
| 304-360-390-401 cid (1970 & later) 1/2"                  | 114-4002 |                       | 114-4202      |                            |
| 401 cid with Indy heads                                  |          |                       | 114-4203      |                            |
| <b>BMC/TRIUMPH</b>                                       |          |                       |               |                            |
| A Series, 9 studs                                        |          |                       | 206-4201      |                            |
| A Series, 11 studs                                       |          |                       | 206-4204      |                            |
| A Series, 11 studs, shaved head                          |          |                       | 206-4206      |                            |
| B Series                                                 |          |                       | 206-4202      |                            |
| 1.3L & 1.5L Spitfire                                     |          |                       | 206-4203      |                            |
| 2.0L GT6 & 2.5L TR6                                      |          |                       | 206-4205      |                            |
| 2.0L SOHC TR7                                            |          |                       |               | 206-4208                   |
| 2.1L TR4                                                 |          |                       | 206-4207      |                            |
| <b>BMW</b>                                               |          |                       |               |                            |
| 2002 Coupe, 318i, 320i 4-cylinder                        |          |                       |               | 201-4601                   |
| 530, 535, 635, 735                                       |          |                       |               | 201-4602                   |
| 2.5L (M50), 3.0L (S50US) & 3.2L (S52US) inline 6 ARP2000 |          |                       | 201-4302      |                            |
| E46 M3/S54 inline 6 ARP2000                              |          |                       | 201-4303      |                            |
| Mini Cooper                                              |          |                       | 201-4301      |                            |
| <b>BUICK</b>                                             |          |                       |               |                            |
| V6 Stage I (1977-85)                                     | 123-4001 |                       | 123-4201      |                            |
| V6 Grand National and T-Type (1986-87)                   | 123-4003 |                       | 123-4203      |                            |

Red part numbers indicate new items

| Application                                                                                                                                                                              | Hex Nuts | Hex Nuts<br>U/C Studs | 12-Point Nuts | 12-Point Nuts<br>U/C Studs |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------|---------------|----------------------------|
| <b>BUICK (CONTINUED)</b>                                                                                                                                                                 |          |                       |               |                            |
| V6 with 1986-87" block and GN1 Champion heads                                                                                                                                            |          |                       | 223-4204      |                            |
| V6 Stage II                                                                                                                                                                              | 223-4002 |                       | 223-4202      |                            |
| V6 Stage II with Champion heads                                                                                                                                                          |          |                       | 223-4203      |                            |
| 215 cid                                                                                                                                                                                  | 124-4002 |                       | 124-4202      |                            |
| 215 cid, Rover V8                                                                                                                                                                        | 124-4003 |                       |               |                            |
| 350 cid                                                                                                                                                                                  | 124-4001 |                       | 124-4201      |                            |
| 401-425 cid, nail head                                                                                                                                                                   | 124-4004 |                       | 124-4204      |                            |
| 455 cid                                                                                                                                                                                  | 125-4001 |                       | 125-4201      |                            |
| <b>CADILLAC</b>                                                                                                                                                                          |          |                       |               |                            |
| 472-500 cid with 6 & 12 pt nuts for clearance                                                                                                                                            | 135-4007 |                       |               |                            |
| <b>CHEVROLET, SMALL BLOCK</b>                                                                                                                                                            |          |                       |               |                            |
| 23° OEM cast iron and aluminum Chevrolet, Gen III Vortec/Truck; LT1 Airflow Research, Brownfield;<br>Brodix -8,-10,-11, Track I, Dart Sportsman and Dart II & most Edelbrock, Trick Flow | 134-4001 | 234-4401              | 234-4301      | 234-4601                   |
| 18° standard port                                                                                                                                                                        | 234-4107 | 234-4507              | 234-4307      | 234-4707                   |
| 18° raised port                                                                                                                                                                          | 234-4108 | 234-4508              | 234-4308      | 234-4708                   |
| 18° with raised intake 3/8" #10134363 and 64                                                                                                                                             |          |                       | 234-4321      | 234-4721                   |
| with Bowtie aluminum and cast block, .950, coarse thread                                                                                                                                 |          |                       | 234-4320      | 234-4720                   |
| 18° with 3/8" holes                                                                                                                                                                      |          |                       | 234-4322      |                            |
| 18° Chevy heads, w/ Brodix, Rodeck aluminum block                                                                                                                                        |          |                       | 234-4710      |                            |
| 7/16"-3/8" stepped                                                                                                                                                                       | 234-4015 |                       | 234-4315      |                            |
| Aluminum Block with Brodix -12 & 12x heads                                                                                                                                               | 234-4123 |                       |               |                            |
| Aluminum Bowtie splayed bolt head                                                                                                                                                        |          |                       | 234-4213      |                            |
| Brodix, -12, and Brodix 18°                                                                                                                                                              | 234-4103 | 234-4503              | 234-4303      | 234-4703                   |
| Brodix, -12 rollover (angle mill)                                                                                                                                                        |          |                       | 234-4311      |                            |
| Brodix, 18° rollover                                                                                                                                                                     |          |                       | 234-4310      |                            |
| Brodix, -18c,-18x with 3/8" step stud                                                                                                                                                    |          |                       | 234-4727      |                            |
| Brodix, canted valve                                                                                                                                                                     |          |                       | 234-4312      |                            |
| Brodix-Pontiac raised port                                                                                                                                                               | 234-4106 | 234-4506              | 234-4306      | 234-4706                   |
| Brodix-Pontiac standard port                                                                                                                                                             | 234-4105 | 234-4505              | 234-4305      | 234-4705                   |
| Brodix, w/ -8, 10, 11, 11x, Track 1 heads, w/ Brodix, Rodeck aluminum block                                                                                                              |          |                       | 134-4301      |                            |
| Brodix, w/ 12x, 12RP/GB2000 heads, w/ Brodix, Rodeck aluminum block                                                                                                                      |          |                       | 134-4302      |                            |
| Brodix, w/ 23° production style heads, w/ Brodix, Rodeck aluminum block                                                                                                                  |          |                       | 134-4303      |                            |
| Brodix, w/ Brodix Weld-Tech Jones GB2200 heads, w/ Brodix, Rodeck aluminum block                                                                                                         |          |                       | 134-4304      |                            |
| Brodix, w/ BD1010 & BD2000 heads, w/ Brodix, Rodeck aluminum block                                                                                                                       |          |                       | 134-4305      |                            |
| Brodix, All Pro heads, w/ Brodix, Rodeck aluminum block                                                                                                                                  |          |                       | 134-4306      |                            |
| Brodix, w/ 12/18° WT/Clone Brodix head 3/8" ctr bolt holes, w/ Brodix, Rodeck aluminum block                                                                                             |          |                       | 134-4307      |                            |
| Brodix, w/ 12/18° Brodix head, 7/16" studs, w/ Brodix, Rodeck aluminum block                                                                                                             |          |                       | 134-4308      |                            |
| Brodix, w/ Weld-Tech Jones GB2300 heads, w/ Brodix, Rodeck aluminum block                                                                                                                |          |                       | 134-4309      |                            |
| Brodix, w/ 16° Brodix head, w/ Brodix, Rodeck aluminum block                                                                                                                             |          |                       |               | 234-4726                   |
| Brodix canted valve head, w/ Brodix, Rodeck aluminum block                                                                                                                               |          |                       | 234-4711      |                            |
| Bowtie Block with 14° Pro Action head                                                                                                                                                    |          |                       | 234-4725      |                            |
| Bowtie cast iron and aluminum block with Brodix 12 Weld-Tech                                                                                                                             |          |                       |               | 234-4723                   |
| Dart II, Brodix Track I, 23° Pro Action, Iron Eagle II, iron block                                                                                                                       | 234-4109 | 234-4509              | 234-4309      | 234-4709                   |
| Dart, 18°                                                                                                                                                                                |          |                       | 234-4323      |                            |
| Dart, 18° II Generation steel block                                                                                                                                                      | 234-4036 |                       | 234-4336      |                            |
| Dart, Buick                                                                                                                                                                              | 234-4102 | 234-4502              | 234-4302      | 234-4702                   |
| Dart, Oldsmobile 14°                                                                                                                                                                     | 234-4104 | 234-4504              | 234-4304      | 234-4704                   |
| Dart Sportsman, .950, coarse thread                                                                                                                                                      | 134-4002 | 234-4402              | 234-4332      | 234-4602                   |
| Pro Action 14°                                                                                                                                                                           |          |                       | 234-4334      |                            |
| Pro Action 14° Tall Deck                                                                                                                                                                 |          |                       | 234-4335      |                            |
| Pro Action head                                                                                                                                                                          |          |                       | 234-4333      | 234-4433                   |
| SBC w/ -12 aluminum block                                                                                                                                                                |          |                       | 234-4324      |                            |
| SB2                                                                                                                                                                                      |          |                       |               | 234-4722                   |
| SB2, Brodix, Rodeck aluminum block                                                                                                                                                       |          |                       | 134-4310      |                            |
| SB2-2 7/16" block w/ 220 ksi                                                                                                                                                             |          |                       | 234-4724      |                            |
| SB2-2 3/8" block w/ 220 ksi                                                                                                                                                              |          |                       | 300-4202      |                            |
| SB2-2 3/8" block w/ 260 ksi                                                                                                                                                              |          |                       | 300-4201      |                            |
| Gen III/LS Series small block (2003 & earlier)                                                                                                                                           | 234-4110 |                       | 234-4316      |                            |
| Gen III/LS Series small block (2004 & later) w/ all same length studs                                                                                                                    |          |                       | 234-4317      |                            |
| Gen III/LSX small block ARP 2000                                                                                                                                                         |          |                       | 234-4319      |                            |
| <b>CHEVROLET, BIG BLOCK</b>                                                                                                                                                              |          |                       |               |                            |
| 348-409 cid                                                                                                                                                                              | 135-4002 |                       | 235-4202      |                            |
| 396-402-427-454 Cast iron OEM, Mark IV, aluminum factory heads, also early Bowtie                                                                                                        | 135-4001 | 235-4401              | 235-4201      | 235-4601                   |
| Bowtie                                                                                                                                                                                   | 235-4110 |                       | 235-4310      |                            |
| Late Bowtie, Dart Merlin, iron and aluminum Dart 360, Edelbrock, Dart Pro 1, AFR, Profiler 24°                                                                                           | 235-4103 | 235-4503              | 235-4303      | 235-4703                   |
| long exhaust studs, <b>ONLY 8 PIECES</b> (with nuts and washers)                                                                                                                         | 235-4106 |                       | 235-4306      |                            |
| Brodix, -2, -4, 2x, 3x, Canfield, Holley, Big Duke                                                                                                                                       | 235-4102 | 235-4502              | 235-4302      | 235-4702                   |
| With Edelbrock Performer RPM heads, Pro Top Line                                                                                                                                         | 235-4018 | 235-4518              | 235-4318      | 235-4718                   |
| With Edelbrock Victor heads                                                                                                                                                              | 235-4019 | 235-4519              | 235-4319      | 235-4719                   |
| Brodix, Pontiac Pro Stock                                                                                                                                                                | 235-4107 | 235-4507              | 235-4307      | 235-4707                   |
| Symmetrical-spread port Chevy                                                                                                                                                            | 235-4104 | 235-4504              | 235-4304      | 235-4704                   |
| With GM aluminum block, 7/16" diameter                                                                                                                                                   | 135-4005 | 235-4505              | 135-4205      | 235-4705                   |
| With GM aluminum block, 1/2" diameter                                                                                                                                                    | 135-4006 | 235-4506              | 135-4206      | 235-4706                   |
| Dart Big Chief                                                                                                                                                                           | 235-4112 | 235-4512              | 235-4312      | 235-4712                   |
| Oldsmobile DRCE                                                                                                                                                                          | 235-4109 | 235-4509              | 235-4309      | 235-4709                   |

Red part numbers indicate new items



| Application                                                                                                                                                                                        | Hex Nuts | Hex Nuts<br>U/C Studs | 12-Point Nuts | 12-Point Nuts<br>U/C Studs |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------|---------------|----------------------------|
| <b>CHEVROLET, BIG BLOCK (CONTINUED)</b>                                                                                                                                                            |          |                       |               |                            |
| Mark V, Mark VI with Brodix/Canfield heads                                                                                                                                                         | 235-4114 | 235-4514              | 235-4314      | 235-4714                   |
| Mark V, Mark VI crate with Dart or AFR heads                                                                                                                                                       | 235-4113 | 235-4513              | 235-4313      | 235-4713                   |
| Mark V, with Mark V heads or Edelbrock heads                                                                                                                                                       | 235-4108 | 235-4508              | 235-4308      | 235-4708                   |
| Merlin - World                                                                                                                                                                                     | 235-4016 |                       | 235-4316      | 235-4716                   |
| Brodix, 14.5°                                                                                                                                                                                      |          |                       | 235-4320      |                            |
| Brodix, Sonny Lenard 14.5° Pro Stock head & PS head, w/ Brodix aluminum block                                                                                                                      |          |                       | 135-4301      |                            |
| Brodix, fits BB1 OEFI, 2, 2t, 2x, 2extra, 3, 4, 4extra, 5 heads, w/ Brodix aluminum block                                                                                                          |          |                       | 135-4302      |                            |
| Brodix, w/ Dart Pro 1 or 360 heads, Pro Top Line, w/ Brodix aluminum block                                                                                                                         |          |                       | 135-4303      |                            |
| Brodix, w/ Big Duke/Big Chief heads, w/ Brodix aluminum block                                                                                                                                      |          |                       | 135-4304      |                            |
| ZL1 Limited Edition, block #12370850, head #12363390/392/399                                                                                                                                       |          |                       | 235-4321      |                            |
| <b>CHEVROLET, 4 AND 6-CYLINDER</b>                                                                                                                                                                 |          |                       |               |                            |
| GM 2.2L Ecotec                                                                                                                                                                                     |          |                       |               | 231-4701                   |
| GMC Vega 140                                                                                                                                                                                       | 131-4002 |                       |               |                            |
| Inline 4-cylinder (1962 & later)                                                                                                                                                                   | 131-4001 |                       | 131-4201      |                            |
| Inline 6-cylinder (1962 & later)                                                                                                                                                                   | 132-4001 |                       | 132-4201      |                            |
| 2.8L 60° V6 M11                                                                                                                                                                                    | 233-4003 |                       | 233-4303      |                            |
| 4.3L 90° V6                                                                                                                                                                                        | 233-4001 | 233-4401              | 233-4301      | 233-4601                   |
| 4.3L 90° V6 with 18° raised port                                                                                                                                                                   | 233-4108 | 233-4508              | 233-4308      | 233-4708                   |
| 4.3L 90° V6 with 18° standard port                                                                                                                                                                 | 233-4107 | 233-4507              | 233-4307      | 233-4707                   |
| 4.3L 90° V6 with Oldsmobile 14° heads                                                                                                                                                              | 233-4104 | 233-4504              | 233-4304      | 233-4704                   |
| 4.3L 90° V6 with Pontiac raised runner                                                                                                                                                             | 233-4102 | 233-4502              | 233-4302      | 233-4702                   |
| <b>CHRYSLER, SMALL BLOCK</b>                                                                                                                                                                       |          |                       |               |                            |
| 273-318-340-360 Wedge                                                                                                                                                                              | 144-4001 |                       | 144-4201      |                            |
| 318-340-360 Wedge with W2 or W-2 Econo heads                                                                                                                                                       | 144-4002 |                       | 144-4202      |                            |
| 318-340-360 Wedge with W-5 or W-7 heads & 318-360 Magnum with factory or Edelbrock Magnum heads                                                                                                    | 144-4003 |                       | 144-4203      |                            |
| 318-340-360 Wedge with Edelbrock RPM heads                                                                                                                                                         | 144-4005 |                       |               |                            |
| 318-340-360 Wedge with B1-BS heads                                                                                                                                                                 | 144-4004 |                       | 144-4204      |                            |
| 5.7L & 6.1L Hemi                                                                                                                                                                                   |          |                       | 244-4300      |                            |
| <b>CHRYSLER, BIG BLOCK</b>                                                                                                                                                                         |          |                       |               |                            |
| 383-400-413-426-440 Wedge with factory heads or Edelbrock RPM heads                                                                                                                                | 145-4006 |                       | 145-4206      |                            |
| 383-400-413-426-440 Wedge with B-1 heads                                                                                                                                                           | 145-4007 |                       | 245-4307      |                            |
| 383-400-413-426-440 Wedge with Koffel BTS full                                                                                                                                                     | 145-4012 |                       |               |                            |
| 383-400-413-426-440 Wedge with Indy 440 heads                                                                                                                                                      | 145-4011 |                       | 245-4311      |                            |
| 331-354-392 factory Hemi & Edelbrock RPM heads                                                                                                                                                     | 145-4001 |                       | 145-4201      |                            |
| 426 factory Hemi & 426-472-528 Hemi Crate Motor 7/16"                                                                                                                                              | 145-4003 |                       | 245-4203      |                            |
| 426 factory Hemi (modified for 1/2")                                                                                                                                                               | 145-4002 |                       | 245-4202      |                            |
| KB Hemi, inner                                                                                                                                                                                     |          |                       | 245-4306      |                            |
| KB Hemi, short deck, 1/2"                                                                                                                                                                          |          |                       | 245-4308      |                            |
| KB Hemi, standard deck, 1/2"                                                                                                                                                                       | 245-4005 |                       | 245-4305      |                            |
| KB Hemi, long deck, 1/2"                                                                                                                                                                           |          |                       | 245-4309      |                            |
| KB Hemi, standard deck, 9/16"                                                                                                                                                                      |          |                       | 245-4310      | 245-4710                   |
| <b>CHRYSLER, 4 AND 6-CYLINDER</b>                                                                                                                                                                  |          |                       |               |                            |
| 2.2L 4 cylinder (non-turbo only) M11                                                                                                                                                               |          | 241-4501              |               | 241-4701                   |
| 170-225 cid Slant Six                                                                                                                                                                              | 142-4001 |                       |               |                            |
| <b>DIESEL</b>                                                                                                                                                                                      |          |                       |               |                            |
| Chevy GMC 6.2L M12                                                                                                                                                                                 | 130-4062 |                       |               |                            |
| Chevy Duramax 6.6L (2001& later) (LB7/LLY/LBZ/LMN) ARP2000                                                                                                                                         |          |                       | 230-4201      |                            |
| Chevy Duramax 6.6L (2001& later) (LB7/LLY/LBZ/LMN) Custom Age                                                                                                                                      |          |                       | 230-4202      |                            |
| Dodge Cummins 5.9L 12V (1989-98) ARP2000                                                                                                                                                           |          |                       | 247-4203      |                            |
| Dodge Cummins 5.9L 12V (1989-98) Custom Age                                                                                                                                                        |          |                       | 247-4205      |                            |
| Dodge Cummins 5.9L 24V (1998 & later) ARP2000                                                                                                                                                      |          |                       | 247-4202      |                            |
| Dodge Cummins 5.9L 24V (1998 & later) Custom Age                                                                                                                                                   |          |                       | 247-4204      |                            |
| Ford 6.9L International                                                                                                                                                                            | 150-4069 |                       |               |                            |
| Ford 6.0L Powerstroke ARP2000                                                                                                                                                                      |          |                       | 250-4202      |                            |
| Ford 7.3L Powerstroke (1993-03) ARP2000                                                                                                                                                            |          |                       | 250-4201      |                            |
| Oldsmobile 5.7L, 350 cid                                                                                                                                                                           | 184-4003 |                       |               |                            |
| <b>DODGE</b>                                                                                                                                                                                       |          |                       |               |                            |
| 2.0L SOHC Neon, block #4667642, head #4556737                                                                                                                                                      |          |                       | 141-4203      |                            |
| 2.0L DOHC Neon, block #4667642, head #4667086                                                                                                                                                      |          |                       | 141-4202      |                            |
| 2.4L DOHC, block #4621443/445, head #4667086                                                                                                                                                       |          |                       | 141-4204      |                            |
| 3.0L (6G72) DOHC ARP2000                                                                                                                                                                           |          |                       |               | 207-4205                   |
| Viper Gen II (1996-03) ARP2000                                                                                                                                                                     |          |                       | 247-4201      |                            |
| <b>FORD, SMALL BLOCK</b>                                                                                                                                                                           |          |                       |               |                            |
| 289-302, 5.0L with factory heads or AFR 185 with 7/16" holes                                                                                                                                       | 154-4001 | 254-4401              | 154-4201      | 254-4701                   |
| 289-302, 5.0L with 351 Windsor head, 7/16"-14 cylinder block thread<br>M-6049-J302, SVO high port & M-6049-L302, AFR 185 with 1/2" holes<br>Edelbrock aluminum, GT-40 style with insert "T" washer | 154-4005 | 254-4405              | 154-4205      | 254-4705                   |
| Boss 302                                                                                                                                                                                           | 154-4002 |                       | 154-4202      |                            |
| 351 Windsor with factory heads, M-6049-J302, SVO high port and M-6049-L302 GT-40 style,<br>Edelbrock aluminum and Iron Dart with 1/2-13 cylinder block threads                                     | 154-4003 | 254-4503              | 154-4203      | 254-4703                   |
| 351 Cleveland, 351-400M                                                                                                                                                                            | 154-4004 |                       | 154-4204      |                            |
| 351 SVO and Fontana aluminum blocks w/94 or later Yates heads                                                                                                                                      | 254-4102 | 254-4101              | 254-4302      | 254-4301                   |
| 351 SVO high port and improved SVO high port, M-6049-C302, M-6049-C320B                                                                                                                            | 254-4107 |                       | 254-4307      |                            |
| 351 SVO Yates design                                                                                                                                                                               | 254-4109 |                       | 254-4309      |                            |

Red part numbers indicate new items

| Application                                                                         | Hex Nuts | Hex Nuts<br>U/C Studs | 12-Point Nuts | 12-Point Nuts<br>U/C Studs |
|-------------------------------------------------------------------------------------|----------|-----------------------|---------------|----------------------------|
| <b>FORD, SMALL BLOCK (CONTINUED)</b>                                                |          |                       |               |                            |
| 351 SVO Yates 1994 design                                                           | 254-4110 |                       | 254-4310      |                            |
| 351 "R" block with C3 heads                                                         | 254-4111 | 254-4501              | 254-4311      | 254-4601                   |
| 351 "R" block w/6049-N351 heads                                                     | 254-4112 |                       | 254-4314      |                            |
| Std. 351 Block w/6049-N351 heads                                                    | 254-4113 |                       | 254-4315      |                            |
| 351 "R" block with Brodix/Neal heads or Blue Thunder heads                          |          |                       | 254-4312      |                            |
| <b>FORD, BIG BLOCK</b>                                                              |          |                       |               |                            |
| 390-428 FE series with factory heads or Edelbrock heads                             | 155-4001 |                       | 155-4201      |                            |
| 390-428 FE series with Blue Thunder heads                                           |          |                       | 155-4204      |                            |
| 427 SOHC                                                                            | 155-4002 |                       | 155-4202      |                            |
| 429-460 cid with factory heads & 429CJ SVO alum #M-6049-A429, also Edelbrock, KAASE | 155-4003 |                       | 155-4203      |                            |
| 460 SVO aluminum, M-6049-A460 & M-6049-B460, C460 (must use 12pt. nuts)             |          |                       | 255-4304      |                            |
| 460 cid with Blue Thunder heads                                                     | 255-4101 |                       | 255-4301      |                            |
| 460 cid with Trick Flow "Pro Stock" heads                                           |          |                       | 255-4305      |                            |
| <b>FORD, 4 AND 6-CYLINDER</b>                                                       |          |                       |               |                            |
| 1600cc, Escort M10                                                                  |          |                       | 151-4203      |                            |
| 2.0L DOHC Cosworth Sierra/Escort M12                                                |          |                       |               | 251-4701                   |
| 2.0L Zetec                                                                          |          |                       |               | 251-4702                   |
| 2000cc Pinto                                                                        |          |                       | 151-4201      |                            |
| 2300cc Pinto                                                                        |          |                       | 151-4202      | 151-4702                   |
| 2.3L Duratec (2003 & later)                                                         |          |                       | 151-4204      |                            |
| 2.5L Duratec V6                                                                     |          |                       | 253-4701      |                            |
| 3.8L V6 Super Coupe T-bird                                                          | 153-4001 |                       | 153-4203      |                            |
| 4.5L SVO inline valve V6, head #M6049-H380                                          | 253-4102 |                       | 253-4302      |                            |
| 240-300 cid inline 6                                                                | 152-4001 |                       | 152-4201      |                            |
| <b>FORD, MODULAR</b>                                                                |          |                       |               |                            |
| 4.6L & 5.4L 2V/4V                                                                   | 156-4101 |                       | 156-4301      |                            |
| 4.6L & 5.4L 2V/4V ARP2000                                                           | 256-4001 |                       | 256-4201      |                            |
| 4.6L & 5.4L 3V ARP2000                                                              | 256-4002 |                       | 256-4202      |                            |
| <b>GENERAL MOTORS</b>                                                               |          |                       |               |                            |
| 2.2L Ecotec                                                                         |          |                       |               | 231-4701                   |
| <b>HOLDEN</b>                                                                       |          |                       |               |                            |
| Commodore V6 7/16"                                                                  | 205-4002 |                       |               |                            |
| 308 cid                                                                             | 205-4001 |                       |               | 205-4601                   |
| 308 cid 7/16"                                                                       |          |                       |               | 205-4602                   |
| 308 cid 1/2"                                                                        |          |                       | 234-4201      |                            |
| <b>HONDA/ACURA</b>                                                                  |          |                       |               |                            |
| Acura B18A1, M11                                                                    |          |                       |               | 208-4302                   |
| Acura VTEC B18C1, M11, GSR                                                          |          |                       |               | 208-4303                   |
| B16A                                                                                |          |                       |               | 208-4601                   |
| B20B, w/B16A head                                                                   |          |                       |               | 208-4306                   |
| Civic D16Y                                                                          |          |                       | 208-4305      |                            |
| F20 S2000                                                                           |          |                       |               | 208-4702                   |
| Honda D16Z - Only, M10                                                              |          |                       | 208-4301      |                            |
| Honda H22A4, VTEC                                                                   |          |                       |               | 208-4304                   |
| H23A                                                                                |          |                       |               | 208-4307                   |
| K20A (A2 & A3)                                                                      |          |                       |               | 208-4701                   |
| <b>MAZDA</b>                                                                        |          |                       |               |                            |
| 1.6L (B6) & 1.8L (BP) DOHC Miata                                                    |          |                       | 218-4701      |                            |
| 2.0L FS-DE (1998-02)                                                                |          |                       | 218-4703      |                            |
| 2.3L DOHC 16V (2003 & later)                                                        |          |                       | 218-4702      |                            |
| <b>MITSUBISHI</b>                                                                   |          |                       |               |                            |
| 2.0L (4B11) DOHC Turbo ARP2000 (without installation tool)                          |          |                       | 207-4207      |                            |
| 2.0L (4B11) DOHC Turbo ARP2000 (with installation tool)                             |          |                       | 207-4206      |                            |
| 2.0L (4G63) DOHC (1993 & earlier) M12                                               |          |                       | 207-4201      | 207-4701                   |
| 2.0L (4G63) DOHC (1994 & later) M11                                                 |          |                       | 207-4203      | 207-4702                   |
| 2.6L (G54B)                                                                         |          |                       | 207-4202      |                            |
| 3.0L (6G72) DOHC V6 ARP2000                                                         |          |                       |               | 207-4205                   |
| <b>NISSAN/DATSUN</b>                                                                |          |                       |               |                            |
| A-12 engines                                                                        |          |                       | 202-4202      |                            |
| A-14 engines                                                                        |          |                       | 202-4203      |                            |
| L20 series, 4-cylinder                                                              |          |                       | 202-4201      |                            |
| L24, L26, L28 series, 6-cylinder                                                    |          |                       | 202-4206      |                            |
| 1.6L (CA16DE/DET) & 1.8L (CA18DE/DET)                                               |          |                       |               | 202-4702                   |
| RB20, RB20DET, RB25, RB25DET                                                        |          |                       | 202-4301      |                            |
| RB26DETT, GTR ARP2000                                                               |          |                       | 202-4207      |                            |
| 2.0L (SR20DE) DOHC (1991-01) M11                                                    |          |                       |               | 102-4701                   |
| 2.0L (SR20DET/RN14) DOHC Turbo (1991-94) M12                                        |          |                       | 202-4303      |                            |
| VQ30, VQ35                                                                          |          |                       |               | 202-4701                   |
| <b>OLDSMOBILE</b>                                                                   |          |                       |               |                            |
| 2.3L Quad 4                                                                         |          |                       | 281-4301      |                            |
| 215 cid, aluminum heads                                                             | 184-4002 |                       | 184-4202      |                            |
| 403 cid                                                                             | 184-4004 |                       | 184-4204      |                            |
| Batton                                                                              | 184-4005 |                       | 184-4205      |                            |
| 455 cid with factory heads or Edelbrock heads 7/16"                                 | 185-4001 |                       | 185-4201      |                            |

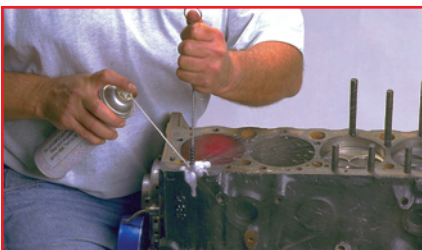
Red part numbers indicate new items



| Application                                                                    | Hex Nuts | Hex Nuts<br>U/C Studs | 12-Point Nuts | 12-Point Nuts<br>U/C Studs |
|--------------------------------------------------------------------------------|----------|-----------------------|---------------|----------------------------|
| <b>PONTIAC</b>                                                                 |          |                       |               |                            |
| Iron Duke 4 cylinder 1/2"                                                      | 191-4001 |                       | 191-4201      |                            |
| Super Duty 4 cylinder with "Iron Duke" head                                    | 290-4101 |                       | 290-4301      |                            |
| 3800 supercharged V6 (L67 Regal, SC Monte Carlo, Impala) (1999 & later)        | 193-4001 |                       | 193-4002      |                            |
| Ram Air 2 & 455                                                                |          |                       | 190-4201      |                            |
| Ram Air 5                                                                      | 190-4005 |                       | 190-4205      |                            |
| 350-400-428-455 cid with D port heads (1967 & later)                           | 190-4002 |                       | 190-4202      |                            |
| 400 Ram Air 2 and 4, 455 HO and 455 Super Duty with Round port heads (1968-74) | 190-4003 |                       | 190-4203      |                            |
| 400-455 cid with Edelbrock heads (mfg. before 3/15/02)                         |          |                       | 190-4304      |                            |
| 400-455 cid with Edelbrock heads (mfg. after 3/15/02)                          |          |                       | 190-4305      |                            |
| <b>PORSCHE</b>                                                                 |          |                       |               |                            |
| 911 & 930 Turbo, premium austenitic studs - Dilivar replacement                |          |                       |               | 204-4206                   |
| 996                                                                            |          |                       |               | 204-4210                   |
| <b>ROVER</b>                                                                   |          |                       |               |                            |
| K Series                                                                       |          |                       |               | 206-4209                   |
| <b>SATURN</b>                                                                  |          |                       |               |                            |
| 1.9L DOHC (1991-99)                                                            |          |                       | 165-4202      |                            |
| 1.9L SOHC (1999-02)                                                            |          |                       | 165-4201      |                            |
| <b>SUBARU</b>                                                                  |          |                       |               |                            |
| EJ Series 2.0L, 2.2L, 2.5L, DOHC                                               |          |                       |               | 260-4701                   |
| EJ Series Phase 2 (1999 & later) SOHC                                          |          |                       |               | 260-4702                   |
| <b>SUZUKI</b>                                                                  |          |                       |               |                            |
| GSX 1300R Hayabusa with cylinder spacer (1999-05)                              |          |                       |               | 271-4701                   |
| <b>TOYOTA</b>                                                                  |          |                       |               |                            |
| 1.6L (4AGE) DOHC                                                               |          |                       | 203-4203      |                            |
| 1.6L (2TC) & 1.8L (3TC)                                                        |          |                       | 203-4206      |                            |
| 1.8L (1ZZFE) DOHC ARP2000                                                      |          |                       |               | 203-4703                   |
| 2.0L (3SGTE) DOHC                                                              |          |                       | 203-4204      |                            |
| 2.4L (22R)                                                                     |          |                       | 203-4201      |                            |
| 2.8L (5MGE) & 3.0L (7MGE/GTE) inline 6 (1981-92) Supra                         |          |                       | 203-4202      | 203-4701                   |
| 3.0L (2JZGE/GTE) inline 6 (1993-98) Supra                                      |          |                       | 203-4205      | 203-4702                   |
| <b>VAUXHALL/OPEL</b>                                                           |          |                       |               |                            |
| 2.0L 16V                                                                       |          |                       | 209-4301      | 209-4701                   |
| 2.5L V6 Opel                                                                   |          |                       | 209-4302      | 209-4702                   |
| <b>VOLKSWAGEN/AUDI</b>                                                         |          |                       |               |                            |
| Audi 5 cylinder, 10 valve                                                      |          |                       | 204-4205      | 204-4703                   |
| Audi 5 cylinder, 20 valve                                                      |          |                       | 204-4207      | 204-4704                   |
| 1.8L & 2.0L 8V Golf/Jetta & 1.6L Super Vee                                     |          |                       | 204-4203      | 204-4701                   |
| 1.8L & 2.0L 16V Golf/Jetta                                                     |          |                       | 204-4204      | 204-4702                   |
| 1.8L DOHC 20V Turbo M10/ARP2000 (without installation tool)                    |          |                       | 204-4103      |                            |
| 1.8L DOHC 20V Turbo M10/ARP2000 (with installation tool)                       |          |                       | 204-4104      |                            |
| 1.8L DOHC 20V Turbo M11/ARP2000 (without installation tool) (early AEB)        |          |                       | 204-4101      |                            |
| 1.8L DOHC 20V Turbo M11/ARP2000 (with installation tool) (early AEB)           |          |                       | 204-4102      |                            |
| 2.8L & 2.9L VR6                                                                |          |                       |               | 204-4705                   |

Red part numbers indicate new items

## TECH TIPS: HEAD STUD INSTALLATIONS



1. Clean and chase all bolt threads in block to ensure proper thread engagement and accurate torque readings.



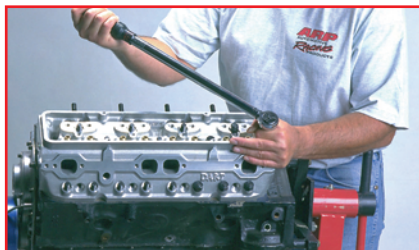
2. All hardware should be cleaned and inspected for possible shipping damage prior to installation.



3. Since most studs extend into the water jacket, coat threads with ARP thread sealer and screw in hand tight ONLY.



4. Install gasket and head, then lubricate washers and nuts with oil or ARP moly assembly lubricant prior to their installation.



5. Following the engine manufacturer's torque sequence, tighten the nuts three times to the recommended torque value found on the instructions provided with each kit.

**NOTE:** To ensure positive sealing of "wet" head studs, a hardening or semi-hardening sealant, such as Loc-Tite or Permatex, etc. should be used. Some engine builders employ a sealer in the coolant, such as Aluma-Seal, Silver Seal or K&W sealer, etc. You may also use high temperature RTV silicone. Whatever product is used, it is imperative that the cylinder head is installed and torqued to proper levels **BEFORE THE SEALANT HAS CURED!**

# CYLINDER HEAD BOLTS

## HIGH PERFORMANCE SERIES

High Performance head bolts are available with a reduced wrenching hex or 12-point and wide area flanged head that eliminates the need for valve train removal to facilitate cylinder head retorquing. All High Performance Series bolts are 180,000 psi (which is 15% stronger than Grade 8) and kits come complete with hardened parallel-ground washers.

## PROFESSIONAL SERIES

All Pro Series bolts are cold-forged to ensure molecular integrity, heat-treated prior to thread rolling and machining, and are rated nominally at 200,000 psi. ARP Pro Series head bolt kits are application specific – designed for use with typically competition only components. These fasteners deliver superior strength and meet the ARP “ZERO defect – ZERO failure” quality standard. Hardened and parallel-ground washers are included with each kit to ensure even load distribution and accurate torque readings. All Pro Series head bolts have a reduced wrenching hex or 12-point head and wide area flange to eliminate the need for valve train removal for cylinder head retorquing and permits the use of larger diameter valve springs. Most applications have undercut short bolts that can help eliminate head gasket failures through providing more “stretch” to compensate for the additional compression of gaskets.

Refer to Main & Head Bolt Instructions on page 45.

All kits come complete with hardened parallel-ground washers.

| Application                                                                                                                                                                      | High Performance |          | Pro Series |            | Stainless |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------|------------|------------|-----------|----------|
|                                                                                                                                                                                  | Hex              | 12-Point | 12-Point   | 12-Pt. U/C | Hex       | 12-Point |
| <b>AMC</b>                                                                                                                                                                       |                  |          |            |            |           |          |
| 258 cid inline 6 with 1/2" bolts                                                                                                                                                 | 112-3601         |          |            |            |           |          |
| 290-343-390 cid (1969 and earlier) 7/16"                                                                                                                                         | 114-3601         |          |            |            |           |          |
| 290-343-390 cid (1969 and earlier) with Edelbrock heads 7/16"                                                                                                                    | 114-3605         |          |            |            |           |          |
| 304-360-390-401 cid (1970 & later) 1/2"                                                                                                                                          | 114-3602         |          |            |            |           |          |
| 304-360-390-401 cid (1970 & later) with Edelbrock heads 1/2"                                                                                                                     | 114-3604         |          |            |            |           |          |
| 401 cid with Indy heads                                                                                                                                                          | 114-3603         |          |            |            |           |          |
| <b>BMW</b>                                                                                                                                                                       |                  |          |            |            |           |          |
| Mini Cooper                                                                                                                                                                      |                  |          | 206-3601   |            |           |          |
| <b>BUICK</b>                                                                                                                                                                     |                  |          |            |            |           |          |
| V6 Stage I (1977-85)                                                                                                                                                             | 123-3601         | 123-3701 | 223-3701   |            | 423-3601  | 423-3701 |
| V6 Grand National and T-Type (1986-87)                                                                                                                                           | 123-3603         | 123-3703 | 223-3703   |            |           |          |
| V6 with 1986-87 block and GN1 Champion heads                                                                                                                                     |                  |          | 223-3705   |            |           |          |
| V6 Stage II                                                                                                                                                                      |                  |          | 223-3700   |            |           |          |
| V6 Stage II with Champion heads                                                                                                                                                  |                  |          | 223-3704   |            |           |          |
| V6 with Duttweiler and M&A aluminum heads                                                                                                                                        | 123-3602         |          |            |            |           |          |
| 455 cid                                                                                                                                                                          | 125-3601         |          |            |            |           |          |
| <b>CHEVROLET, SMALL BLOCK</b>                                                                                                                                                    |                  |          |            |            |           |          |
| 23° Cast iron OEM, Gen III Vortec/Truck, most Edelbrock, LT-AFR, Brodix-8,-10,-11,-11xb, LT-1, Dart Pro-1 & Trick Flow heads                                                     | 134-3601         | 134-3701 | 234-3701   |            | 434-3601  | 434-3701 |
| 23° Cast iron OEM, Gen III Vortec/Truck, most Edelbrock, LT-AFR, Brodix-8,-10,-11,-11xb, LT-1, Dart Pro-1 & Trick Flow heads (black oxide inner rows, stainless steel outer row) | 134-3603         | 134-3703 |            |            |           |          |
| 23° Pro Action head                                                                                                                                                              |                  | 134-3604 |            |            |           |          |
| 12-Rollover Brodix, 18° Brodix                                                                                                                                                   | 134-3602         | 134-3702 | 234-3702   |            |           |          |
| 18° standard port                                                                                                                                                                | 134-3607         |          | 234-3707   | 234-3723   |           |          |
| 18° hi-port                                                                                                                                                                      | 134-3608         |          | 234-3708   | 234-3720   |           |          |
| 18° hi-port with 3/8" holes, casting #10134363 and 64                                                                                                                            |                  |          | 234-3721   | 234-3722   |           |          |
| Bowtie with Brodix 12 - Weld-Tech, Dart II, WP Sportsman II, Brodix Track I                                                                                                      |                  |          | 234-3703   |            |           |          |
| Dart-Buick                                                                                                                                                                       |                  |          | 234-3709   |            |           |          |
| Oldsmobile 14°                                                                                                                                                                   |                  |          | 234-3705   |            |           |          |
| Pontiac Brodix aluminum heads, raised intake, -10x2 RI                                                                                                                           |                  |          | 234-3704   |            |           |          |
| Gen III/LS Series small block (2003 & earlier) hex                                                                                                                               |                  |          | 134-3609   |            |           |          |
| Gen III/LS Series small block (2004 & later) w/ all same length hex bolts                                                                                                        |                  |          | 134-3610   |            |           |          |
| <b>CHEVROLET, BIG BLOCK</b>                                                                                                                                                      |                  |          |            |            |           |          |
| 348, 409, Cast iron OEM                                                                                                                                                          | 135-3602         |          |            |            |           |          |
| 396-402-427-454 Cast iron OEM                                                                                                                                                    | 135-3601         | 135-3701 | 235-3701   |            | 435-3601  | 435-3701 |
| 396-402-427-454 Cast iron OEM (black oxide inner rows, stainless steel outer rows)                                                                                               | 135-3604         | 135-3704 |            |            |           |          |
| Mark IV or Mark V block with Brodix aluminum heads                                                                                                                               | 135-3609         | 135-3709 | 235-3709   |            |           |          |
| Mark IV or Mark V block with Brodix-2, -4 and Canfield aluminum heads                                                                                                            | 135-3606         | 135-3702 | 235-3702   |            |           |          |
| Mark IV block with Edelbrock heads 60409, 60429, 60459, 60479, 60499, 60559                                                                                                      | 135-3610         | 135-3710 |            |            |           |          |
| Mark IV or Mark V block with Edelbrock heads 77609, 77659, 7760, 7765                                                                                                            | 135-3611         | 135-3711 |            | 235-3711   |           |          |



| Application                                                                           | High Performance |          | Pro Series |            | Stainless |          |
|---------------------------------------------------------------------------------------|------------------|----------|------------|------------|-----------|----------|
|                                                                                       | Hex              | 12-Point | 12-Point   | 12-Pt. U/C | Hex       | 12-Point |
| <b>CHEVROLET, BIG BLOCK (CONTINUED)</b>                                               |                  |          |            |            |           |          |
| Mark IV or Mark V block with AFR Casting #315/335/357                                 |                  | 135-3712 |            |            |           |          |
| Mark V with 502 heads                                                                 |                  | 135-3706 | 235-3706   |            |           |          |
| Mark V block with World Merlin, late Bowtie and Dart aluminum, AFR                    | 135-3607         | 135-3707 | 235-3707   |            |           |          |
| Dart aluminum head exhaust bolts only, (8 pieces)                                     | 135-3605         | 135-3705 | 235-3708   |            |           |          |
| Late Bowtie aluminum, World Prod. Merlin, Iron Dart, Pro-1, Pro Top Line              | 135-3603         | 135-3703 | 235-3703   |            |           |          |
| Pontiac Pro Stock aluminum head, Brodix                                               |                  |          | 235-3704   |            |           |          |
| Pontiac Pro Stock aluminum head, Dart Big Chief                                       |                  |          | 235-3705   |            |           |          |
| <b>CHEVROLET, 6-CYLINDER</b>                                                          |                  |          |            |            |           |          |
| 90° V6                                                                                |                  |          | 233-3701   |            |           |          |
| 90° V6 with 18° standard port                                                         | 133-3607         |          | 233-3707   |            |           |          |
| 90° V6 with 18° hi-port                                                               |                  |          | 233-3708   |            |           |          |
| 90° V6 hi-port 3/8" holes                                                             |                  |          | 233-3721   |            |           |          |
| <b>CHRYSLER, SMALL BLOCK</b>                                                          |                  |          |            |            |           |          |
| 273-318-340-360 Wedge                                                                 | 144-3602         |          |            |            |           |          |
| 318-340-360 Wedge with W-2, W-2 Econo heads or Edelbrock RPM heads                    | 144-3601         |          |            |            |           |          |
| 318-340-360 Wedge with W-5, W-7 cylinder heads                                        | 144-3604         |          |            |            |           |          |
| 318-360 Magnum with factory heads or Edelbrock Magnum heads                           | 144-3605         |          |            |            |           |          |
| <b>CHRYSLER, BIG BLOCK</b>                                                            |                  |          |            |            |           |          |
| 383-400-413-426-440 Wedge with factory heads or Edelbrock RPM heads 60919/929/149/189 | 145-3606         | 145-3706 |            | 245-3706   | 445-3606  | 445-3706 |
| 383-400-413-426-440 Wedge with Edelbrock Victor heads 77919, 77929                    | 145-3609         |          |            |            |           |          |
| 383-400-413-426-440 Wedge with Indy 440 heads                                         | 145-3607         |          |            |            |           |          |
| 426 factory Hemi & Mopar 426-472-528 Hemi Crate Motor 7/16"                           | 145-3901         |          |            |            |           |          |
| <b>CHRYSLER, 4-CYLINDER</b>                                                           |                  |          |            |            |           |          |
| 2.2L & 2.5L M11                                                                       |                  |          | 241-3701   |            |           |          |
| <b>FORD, SMALL BLOCK</b>                                                              |                  |          |            |            |           |          |
| 289-302 with factory heads or Edelbrock heads 60259, 60379                            | 154-3601         | 154-3701 |            |            | 454-3601  | 454-3701 |
| 302 Boss                                                                              | 154-3602         | 154-3702 | 254-3702   |            | 454-3602  | 454-3702 |
| 302 with 351 Windsor heads 1/2"-7/16" insert washer with 7/16" bolts                  | 154-3605         | 154-3705 |            |            | 454-3605  | 454-3705 |
| 302 with 351 Windsor heads 1/2"-7/16" stepped bolt                                    |                  |          | 254-3708   |            |           |          |
| 351 Cleveland & 351-400M                                                              | 154-3604         |          | 254-3704   |            |           |          |
| 351 Cleveland SVO, iron block                                                         |                  |          | 254-3701   |            |           |          |
| 351 Windsor with factory heads or Edelbrock heads 60259, 60379                        | 154-3603         |          |            |            |           |          |
| 351 SVO, Yates design                                                                 |                  |          | 254-3709   |            |           |          |
| 351 SVO, Yates 1994 design                                                            |                  |          | 254-3710   |            |           |          |
| 351R block with C3/C3L heads                                                          |                  |          | 254-3711   |            |           |          |
| <b>FORD, BIG BLOCK</b>                                                                |                  |          |            |            |           |          |
| 390-428 FE series with factory heads or Edelbrock heads 60069, 60079                  | 155-3601         |          |            |            |           |          |
| 390-428 FE series with Blue Thunder heads                                             | 155-3604         |          |            |            |           |          |
| 427 SOHC                                                                              | 155-3602         |          |            |            |           |          |
| 429-460 cid                                                                           |                  |          | 255-3701   |            |           |          |
| 429-460 cid with Edelbrock heads 60669, 60079, 61669, 61649                           | 155-3603         |          |            |            |           |          |
| <b>FORD, 6-CYLINDER</b>                                                               |                  |          |            |            |           |          |
| 4.5L SVO inline valve V6                                                              |                  |          | 253-3702   |            |           |          |
| <b>HARLEY DAVIDSON MOTORCYCLE</b>                                                     |                  |          |            |            |           |          |
| '48-'84 All pan heads & shovel heads                                                  |                  |          |            |            | 460-3601  |          |
| '57-early '73 XL's                                                                    |                  |          |            |            | 460-3602  |          |
| <b>HOLDEN</b>                                                                         |                  |          |            |            |           |          |
| 308 cid                                                                               | 205-3601         |          |            | 205-3701   |           |          |
| <b>MITSUBISHI</b>                                                                     |                  |          |            |            |           |          |
| 2.0L (4G63) DOHC (1994 & later) M11                                                   |                  |          |            | 207-3900   |           |          |
| <b>OLDSMOBILE</b>                                                                     |                  |          |            |            |           |          |
| 350-455 cid with factory heads or Edelbrock heads 60519, 60529 (1976 & earlier) 7/16" | 180-3600         | 180-3700 | 280-3700   |            | 480-3600  | 480-3700 |
| 307-350-403-455 cid (1977 & later) 1/2"                                               | 180-3601         |          |            |            |           |          |
| <b>PONTIAC</b>                                                                        |                  |          |            |            |           |          |
| 326-347-370-389-421 cid with D port heads (1964 and earlier)                          | 190-3608         |          |            |            |           |          |
| 326-389-421 cid with D port heads (1965-66 only)                                      | 190-3602         |          |            |            |           |          |
| 350-400-428-455 cid with D port heads (1967 & later)                                  | 190-3607         |          |            |            |           |          |
| 400 Ram Air II/IV & 455 HO, Ram Air II, Super Duty with Round port heads (1968-74)    | 190-3601         |          |            |            |           |          |
| 400-455 cid with Edelbrock heads 60579, 60599 (mfg. before 3/15/02)                   | 190-3604         |          |            |            |           |          |
| 400-455 cid with Edelbrock heads 60579, 60599 (mfg. after 3/15/02)                    | 190-3605         |          |            |            |           |          |
| <b>TOYOTA</b>                                                                         |                  |          |            |            |           |          |
| 2.8L (5MGE) & 3.0L (7MGE/GTE) inline 6 (1981-92) Supra                                |                  |          | 203-3902   |            |           |          |
| <b>VOLKSWAGEN/AUDI</b>                                                                |                  |          |            |            |           |          |
| 1.8L DOHC 20V Turbo M10/ARP2000 (without installation tool)                           |                  |          | 204-3901   |            |           |          |
| 1.8L DOHC 20V Turbo M10/ARP2000 (with installation tool)                              |                  |          | 204-3902   |            |           |          |

Red part numbers indicate new items

# MAIN STUD KITS

## STUDS vs. BOLTS

ARP recommends the use of main studs over bolts whenever possible for several key reasons. First is the ability to obtain more accurate torque readings because studs don't "twist" into the block. All clamping forces are on one axis. By the same token, there is less force exerted on the block threads, which contributes to improved block life (very critical on aluminum blocks). Finally, there are factors of easier engine assembly and proper alignment of caps every time.



There are many important reasons to use ARP main stud kits, including the elimination of main cap walk and fretting, as well as protecting the threads in your engine block. All kits come complete with hardened parallel-ground washers and high quality nuts. Some applications have provisions for mounting windage trays and have specially designed standoff studs with serrated lock nuts to position the windage tray and lock it securely in place. The studs are manufactured from 8740 chrome moly steel, heat-treated in-house to 200,000 psi tensile strength, and precision J-form threads rolled after heat-treat to create a fastener that has threads 1000% stronger than others.

## TECH TIPS: MAIN STUD INSTALLATION

There are a number of important considerations when installing ARP main studs. First and foremost is making sure the block and studs are as clean as possible. Foreign matter and debris can easily affect the quality of thread engagement and cause erroneous torque readings. Do not re-cut threads in the block – use the special "chaser" taps as listed on page 87 of this catalog. This will preserve the integrity of the threads and provide better engagement. Calibrate your torque wrench – even new wrenches have been known to be off by as much as 10 foot pounds! Use consistent tightening techniques.



1. Clean and chase appropriate threads in block to ensure proper thread engagement and accurate torque readings.



2. All hardware (and caps) should be cleaned and inspected prior to installation, looking for any shipping damage or defects.



3. Screw studs into block, finger tight ONLY. For permanent installation, apply Loc-tite (or similar adhesive) sparingly to threads. Be sure and install the caps promptly before the cement sets to prevent misalignment of studs in block.



4. Install main caps, checking for binding and misalignment. Lubricate threads, nuts and washers with oil or ARP moly assembly lubricant before installation. Note that torque specs will vary by lubricant. Moly lube is most consistent. Have block align honed.



5. Following the engine manufacturer's torque sequence, tighten the nuts three times to the recommended torque value found on the instructions provided with each kit. NOTE: If using Loc-Tite or similar cement, proper pre-load must be achieved prior to it setting up.

| Application              | 2-Bolt Main | 4-Bolt Main |
|--------------------------|-------------|-------------|
| <b>AUDI</b>              |             |             |
| 5-cylinder               | 204-5404    |             |
| <b>BMC/TRIUMPH</b>       |             |             |
| A Series                 | 206-5401    |             |
| B Series (3 cap main)    | 206-5402    |             |
| B Series (5 cap main)    | 206-5403    |             |
| 2.0L SOHC TR7            | 206-5404    |             |
| Austin Healey 6-cylinder | 206-5405    |             |
| <b>BMW</b>               |             |             |
| M10 & S14 4-cylinder     | 201-5001    |             |

| Application                        | 2-Bolt Main | 4-Bolt Main |
|------------------------------------|-------------|-------------|
| <b>BMW (CONTINUED)</b>             |             |             |
| M50, M52, S50US & S52US inline 6   | 201-5000    |             |
| S54 inline 6                       | 201-5002    |             |
| <b>BUICK</b>                       |             |             |
| V6 Stage I & II                    | 123-5401    |             |
| V6 Stage II without windage tray   |             | 222-5602    |
| V6 Stage II with splayed cap bolts |             | 322-5802    |
| 215 cid aluminum V8                | 124-5401    |             |
| 350 cid                            | 124-5402    |             |
| 401 cid (nail head)                | 124-5404    |             |



| Application                                          | 2-Bolt Main | 4-Bolt Main |
|------------------------------------------------------|-------------|-------------|
| <b>BUICK (CONTINUED)</b>                             |             |             |
| 400-430-455 cid (hex)                                | 125-5401    |             |
| 400-430-455 cid (12 pt nuts)                         | 125-5402    |             |
| <b>CADILLAC</b>                                      |             |             |
| 472-500 cid                                          | 135-5507    |             |
| <b>CHEVY, SMALL BLOCK</b>                            |             |             |
| 400 cid with windage tray                            |             | 234-5606    |
| 400 cid with windage tray & 3.0" outer studs         |             | 234-5607    |
| 400 cid with splayed cap bolts & windage tray        |             | 234-5605    |
| Large journal (hex)                                  | 134-5401    | 134-5601    |
| Large journal (12 pt nuts)                           | 134-5403    |             |
| Large journal with windage tray (except LT-1 & LT-4) | 234-5501    | 234-5601    |
| Large journal with straps (F & R caps)               | 234-5503    | 234-5603    |
| Large journal with splayed cap bolts                 |             | 234-5602    |
| Large journal with straps & splayed cap bolts        |             | 234-5604    |
| LT-1 with factory windage tray (1992-97)             | 134-5502    |             |
| Small journal                                        | 134-5402    |             |
| Small journal with windage tray                      | 134-5501    |             |
| SB2 (including 4-bolt F & R caps) w/o windage tray   |             | 134-5602    |
| SBC Rocket block                                     |             | 184-5403    |
| Dart Little M with splayed cap bolts                 |             | 234-5801    |
| Dart Little M with splayed cap outer studs           |             | 134-5801    |
| Dart Little M w/ iron main caps & splayed cap bolts  |             | 234-5609    |
| Gen III/LS Series small block & GMPP LSX block       |             | 234-5608    |
| <b>CHEVY, BIG BLOCK</b>                              |             |             |
| 396-402-427-454 cid                                  | 135-5402    | 135-5601    |
| 396-402-427-454 cid with windage tray                | 235-5502    | 235-5701    |
| Mark IV Aluminum block                               |             | 135-5603    |
| Mark IV Bowtie with windage tray                     |             | 235-5702    |
| Mark V 502                                           |             | 135-5606    |
| Mark V 502 with windage tray                         |             | 235-5606    |
| Dart Big M with splayed cap bolts                    |             | 235-5601    |
| Dart Big M with splayed cap outer studs              |             | 235-5603    |
| <b>CHEVY, 6-CYLINDER</b>                             |             |             |
| 235-261 cid inline 6 (1954-62)                       | 132-5402    |             |
| 194-230-250-292 cid inline 6 (1963 & later)          | 132-5401    |             |
| 90° V6                                               |             | 233-5602    |
| 90° V6 with windage tray                             |             | 233-5702    |
| 90° V6 with splayed cap bolts                        |             | 233-5601    |
| <b>CHRYSLER</b>                                      |             |             |
| 2.0L SOHC/DOHC 4-cyl Neon (block # 4667642)          | 141-5801    |             |
| 2.2L & 2.5L 4-cylinder M11                           | 141-5401    |             |
| 170-198-225 cid Slant Six                            | 142-5401    |             |
| 318-440 Wedge (hex)                                  | 140-5401    |             |
| 318-440 Wedge (12 pt nuts)                           | 140-5402    |             |
| 318-340-360 Wedge with windage tray                  | 240-5501    |             |
| 5.7L & 6.1L Hemi with cross bolts                    | 244-5400    |             |
| 354-392 Hemi                                         | 145-5404    |             |
| 426 factory Hemi                                     | 145-5601    | 145-5602    |
| KB 426 Hemi                                          | 245-5602    |             |
| <b>DIESEL</b>                                        |             |             |
| Chevy Duramax 6.6L (LB7/LLY) (2005 & earlier)        | 230-5401    |             |
| Chevy Duramax 6.6L (LBZ/LMM) (2006 & later)          | 230-5402    |             |
| Dodge/Cummins 5.9L 12V (1997 & earlier)              | 247-5402    |             |
| Dodge/Cummins 5.9L 12V & 24V (1998 & later)          | 247-5401    |             |
| Ford 7.3L Powerstroke (1993-03)                      |             | 250-5801    |
| Oldsmobile 5.7L, 350 cid                             | 184-5402    |             |
| <b>FORD, SMALL BLOCK</b>                             |             |             |
| 289-302 cid                                          | 154-5401    |             |
| 289-302 cid with windage tray                        | 254-5501    |             |
| 289-302 cid with girdle (10 studs 1/2" longer)       | 154-5408    |             |
| 289-302 cid with girdle (7 studs 1/2" longer)        | 154-5410    |             |
| 302 cid with dual or rear sump oil pan*              | 154-5407    |             |
| 302 SVO                                              |             | 154-5605    |
| 302 "R" block (1/2" dia. studs)                      |             | 254-5601    |
| 302 Iron Eagle                                       |             | 154-5608    |
| Boss 302 with windage tray                           |             | 154-5602    |
| 351 Cleveland                                        | 154-5404    | 154-5604    |
| 351 Windsor                                          | 154-5403    | 154-5606    |
| 351 Windsor with windage tray                        | 154-5503    |             |
| 351 Windsor with dual or rear sump oil pan*          | 154-5409    |             |

| Application                                        | 2-Bolt Main | 4-Bolt Main |
|----------------------------------------------------|-------------|-------------|
| <b>FORD, SMALL BLOCK (CONTINUED)</b>               |             |             |
| 351 SVO with outer studs (for mains No# 2,3,4)     |             | 154-5603    |
| 351 SVO with outer bolts (for mains No# 1,2,3,4,5) |             | 354-5604    |
| 351 "R" block                                      |             | 354-5605    |
| 351 Iron Eagle                                     |             | 154-5607    |
| Ford Australian 7/16"                              | 154-5405    |             |
| Ford Australian 1/2"                               | 154-5406    |             |
| <b>FORD, BIG BLOCK</b>                             |             |             |
| 390-428 cid FE series (hex)                        | 155-5401    |             |
| 390-428 cid FE series (12 pt nuts)                 | 155-5421    |             |
| 429-460 cid                                        | 155-5402    | 155-5501    |
| 429-460 cid with Ford Motorsports windage tray     | 255-5502    | 255-5702    |
| <b>FORD, MODULAR (side bolts not included)</b>     |             |             |
| 4.6L & 5.4L 2V/4V (without windage tray)           | 156-5401    | 156-5802    |
| 4.6L 4 valve with windage tray                     |             | 256-5701    |
| 4.6L supercharged Cobra w/ windage tray (2003-04)  | 156-5403    |             |
| <b>FORD, 4 AND 6-CYLINDER</b>                      |             |             |
| 1600cc Escort                                      | 151-5403    |             |
| 2.0L Zetec (1997 and earlier)                      | 151-5406    |             |
| 2.0L Zetec (1998 and later)                        | 151-5404    |             |
| 2.3L Duratec (2003 & later)                        | 151-5405    |             |
| 2000cc Pinto                                       | 151-5401    |             |
| 2300cc Pinto                                       | 151-5402    |             |
| 240-300 cid inline 6                               | 152-5401    |             |
| 4.5L SVO inline valve V6                           | 253-5401    |             |
| <b>HOLDEN</b>                                      |             |             |
| 308 cid                                            | 205-5401    | 205-5501    |
| <b>HONDA/ACURA</b>                                 |             |             |
| 1.6L (B16A)(12 pt nuts)                            | 208-5402    |             |
| 1.8L (B18C1) Acura                                 | 208-5403    |             |
| 1.8L (B18A1/B1) Acura                              | 208-5404    |             |
| 2.2L (H22A) & 2.3L (H23A) (12 pt nuts)             | 208-5401    |             |
| <b>MAZDA</b>                                       |             |             |
| 1.6L (B6) & 1.8L (BP) DOHC Miata (12 pt nuts)      | 218-5401    |             |
| 2.3L DOHC 16V (2003 & later)                       | 218-5402    |             |
| <b>MITSUBISHI</b>                                  |             |             |
| 2.0L (4G63) DOHC                                   | 207-5401    |             |
| 2.6L (G54B)                                        | 207-5402    |             |
| 3.0L (6G72) V6 (1993 & later)                      |             | 207-5801    |
| <b>NISSAN/DATSUN</b>                               |             |             |
| L20 Series 4-cylinder                              | 202-5401    |             |
| L24, L26 & L28 Series 6-cylinder                   | 202-5406    |             |
| 2.0L (SR20DE/DET)                                  | 202-5402    |             |
| 3.5L (VQ35) DOHC V6                                |             | 202-5801    |
| <b>OLDSMOBILE</b>                                  |             |             |
| 2.4L Quad 4                                        | 281-5401    |             |
| 350-403 cid                                        | 184-5401    |             |
| 455 cid                                            | 185-5401    |             |
| DRCE-iron block                                    | 285-5801    |             |
| <b>PONTIAC</b>                                     |             |             |
| Super Duty 4 cylinder - cast block                 | 291-5801    |             |
| Super Duty 4 cylinder - mag block                  | 291-5802    |             |
| 3800 V6 supercharged (1999 & later) (hex)          | 193-5401    |             |
| 3800 V6 supercharged (1999 & later) (12 pt nuts)   | 193-5402    |             |
| 400-455 cid                                        | 194-5401    | 194-5601    |
| <b>SATURN</b>                                      |             |             |
| 1.9L DOHC (1991-99)                                | 165-5402    |             |
| 1.9L SOHC (1999-02)                                | 165-5401    |             |
| <b>TOYOTA</b>                                      |             |             |
| 1.6L (4AGE) & 2.0L (3SFE) DOHC                     | 203-5403    |             |
| 2.0L (3SGTE) DOHC                                  | 203-5404    |             |
| 2.4L (22R)                                         | 203-5406    |             |
| 3.0L (7MGTE) Supra (1986-92) w/ bolts for #3 cap   | 203-5402    |             |
| 3.0L (2JZGE/GTE) Supra (1993-98)                   | 203-5405    |             |
| <b>VAUXHALL/OPEL</b>                               |             |             |
| 2.0L 16 valve                                      | 209-5401    |             |
| 2.5L V6                                            | 209-5402    |             |
| <b>VOLKSWAGEN</b>                                  |             |             |
| 1.6L & 2.0L Rabbit, Golf & Jetta                   | 204-5402    |             |
| 2.8L & 2.9L VR6                                    | 204-5403    |             |

Red part numbers indicate new items

# MAIN BOLTS

Far superior to any other main bolt kit offered for use in competition engines, ARP main bolts are designed to meet the exacting standards and demands of professional engine builders. Forged from 8740 chrome moly, all bolts feature generous under-head radius and rolled threads for the utmost reliability. The threads are rolled after heat-treating, which makes them about 1000% longer fatigue life than most main bolts, which are threaded prior to heat-treating. Available in the popular **High Performance Series**, which, at a nominal rating of 180,000 psi, is a premium replacement for OEM fasteners, or the 200,000 psi nominal rated **Pro Series**, application-specific main bolts with reduced wrenching head and are designed for use in competition applications. Parallel-ground, hardened washers are included with each kit.



| Application                                      | High Perf. Part No. | Pro Series Part No. |
|--------------------------------------------------|---------------------|---------------------|
| <b>BUICK</b>                                     |                     |                     |
| V6 Stage I, 4-bolt main                          | 123-5201            |                     |
| V6 Stage II                                      | 123-5202            |                     |
| 455 cid, 2-bolt main                             | 125-5201            |                     |
| <b>CHEVROLET, SMALL BLOCK</b>                    |                     |                     |
| Large journal, 2-bolt main                       | 134-5001            |                     |
| Large journal, 4-bolt main                       | 134-5202            |                     |
| Large journal, 4-bolt main (12 pt)               |                     | 234-5201            |
| Large journal, 4-bolt w/ 1/2" straps on F&R caps |                     | 234-5203            |
| Small journal, 2-bolt main                       | 134-5002            |                     |
| <b>CHEVROLET, BIG BLOCK</b>                      |                     |                     |
| 396-402-427-454 cid, 2-bolt main                 | 135-5002            |                     |
| 396-402-427-454-502 cid, 4-bolt main             | 135-5201            |                     |
| <b>CHEVROLET, 6-CYLINDER</b>                     |                     |                     |
| 90° V6, 4-bolt main                              |                     | 233-5201            |
| 90° V6, 4-bolt main with 1/2" straps on F&R caps |                     | 233-5203            |
| <b>CHRYSLER</b>                                  |                     |                     |
| 318-440 Wedge, 2-bolt main                       | 140-5001            |                     |
| 426 Hemi, 2-bolt main with cross bolts           | 145-5201            |                     |
| <b>FORD, SMALL BLOCK</b>                         |                     |                     |
| 289-302 cid, 2-bolt main                         | 154-5001            |                     |
| 289-302 cid, 4-bolt main                         | 154-5201            |                     |
| 351 Windsor, 2-bolt main                         | 154-5003            |                     |
| 351 Windsor, 4-bolt main                         | 154-5203            |                     |

| Application                                                   | High Perf. Part No. | Pro Series Part No. |
|---------------------------------------------------------------|---------------------|---------------------|
| <b>FORD, SMALL BLOCK (CONTINUED)</b>                          |                     |                     |
| 351 Cleveland, 351-400M, 2-bolt main                          | 154-5004            |                     |
| 351 Cleveland, 4-bolt main                                    | 154-5204            |                     |
| SVO 351 cid, 4-bolt main, 3/8" outer bolts                    |                     | 254-5202            |
| SVO 351 cid, 4-bolt main, 7/16" outer bolts                   |                     | 254-5203            |
| <b>FORD, BIG BLOCK</b>                                        |                     |                     |
| 390-428 cid FE Series                                         | 155-5201            |                     |
| 429-460 cid                                                   | 155-5202            |                     |
| <b>FORD, 6-CYLINDER</b>                                       |                     |                     |
| 4.5L SVO inline valve V6                                      |                     | 253-5201            |
| <b>HOLDEN</b>                                                 |                     |                     |
| 308 cid                                                       | 205-5001            |                     |
| <b>MGB</b>                                                    |                     |                     |
| 2 cap main                                                    |                     | 206-5001            |
| 5 cap main                                                    |                     | 206-5002            |
| <b>OLDSMOBILE</b>                                             |                     |                     |
| 350-403 cid, 2-bolt main                                      | 184-5001            |                     |
| 350 cid diesel, 2-bolt main                                   | 184-5002            |                     |
| 455 cid, 2-bolt main                                          | 185-5001            |                     |
| <b>SUBARU</b>                                                 |                     |                     |
| 2.0L, 2.2L & 2.5L SOHC/DOHC EJ Series Crankcase thru bolt kit |                     | 260-5401            |
| <b>TOYOTA</b>                                                 |                     |                     |
| 1.6L (4AGE) DOHC                                              |                     | 203-5001            |

## MAIN & HEAD BOLT INSTALLATION

Recommended for applications requiring the utmost in reliability and the convenience of bolts. ARP bolt kits yield optimum reliability.

**SPECIAL NOTE:** Where the stretch method cannot be used, the bolts must be installed by torque and several factors should be taken into account. *Please refer to the "Using a Torque Wrench" section on page 27.*



1. Clean and chase all block threads to ensure maximum thread engagement and accurate torque readings.



2. Inspect all hardware prior to installation, then clean and lubricate with ARP moly assembly lubricant.



3. Seal all threads extending into the water jacket with ARP thread sealer.

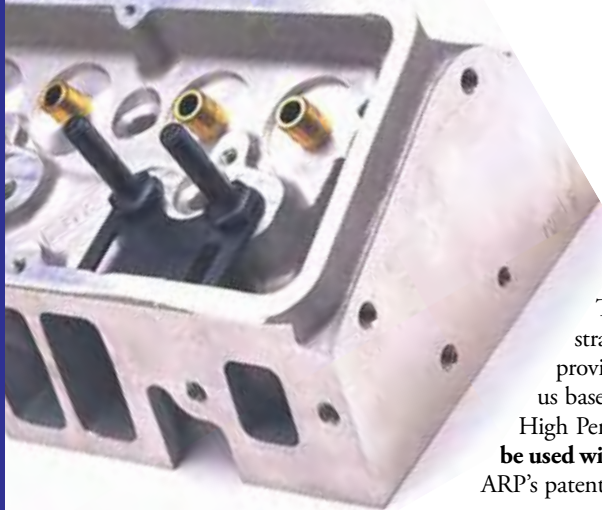


4. Install the main cap or head gasket and head, checking for improper fit or binding. Make sure all mating surfaces are fully seated. Install all bolts hand-tight.



5. Following the engine manufacturer's torque sequence, tighten the bolts three times to the recommended torque value found on the instructions provided with each kit.





## ROCKER ARM STUD KITS

If you have ever installed a rocker stud into a cylinder head and watched it wobble as it screwed in – you knew from the beginning that the rocker geometry was going to be inconsistent all over the place.

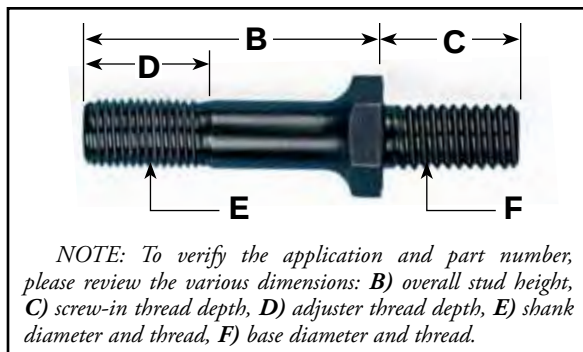
ARP rocker studs are concentric within .005 T.I.R. thread pitch to thread pitch. They run-in straight and true. Lengths are exact – designed to provide positive seating every time. An extra-large radius base offers greater resistance to flex. Available in both High Performance and Pro Series models. **NOTE: Not to be used with OEM-style, self-locking nuts.** To be used with ARP's patented Perma-Loc™ adjusters (see next page).

### HIGH PERFORMANCE SERIES

Made of 8740 chrome moly forgings and heat-treated to **180,000 psi**. Excellent for E.T. Bracket Racing, limited rule oval track competition and street use. Tip ground flush for optimum adjuster seating.

### PRO SERIES

Designed for competition applications, ARP's Pro Series rocker arm studs are made of premium grade 8740 chrome moly steel and heat-treated to a tensile strength of **200,000 psi**.



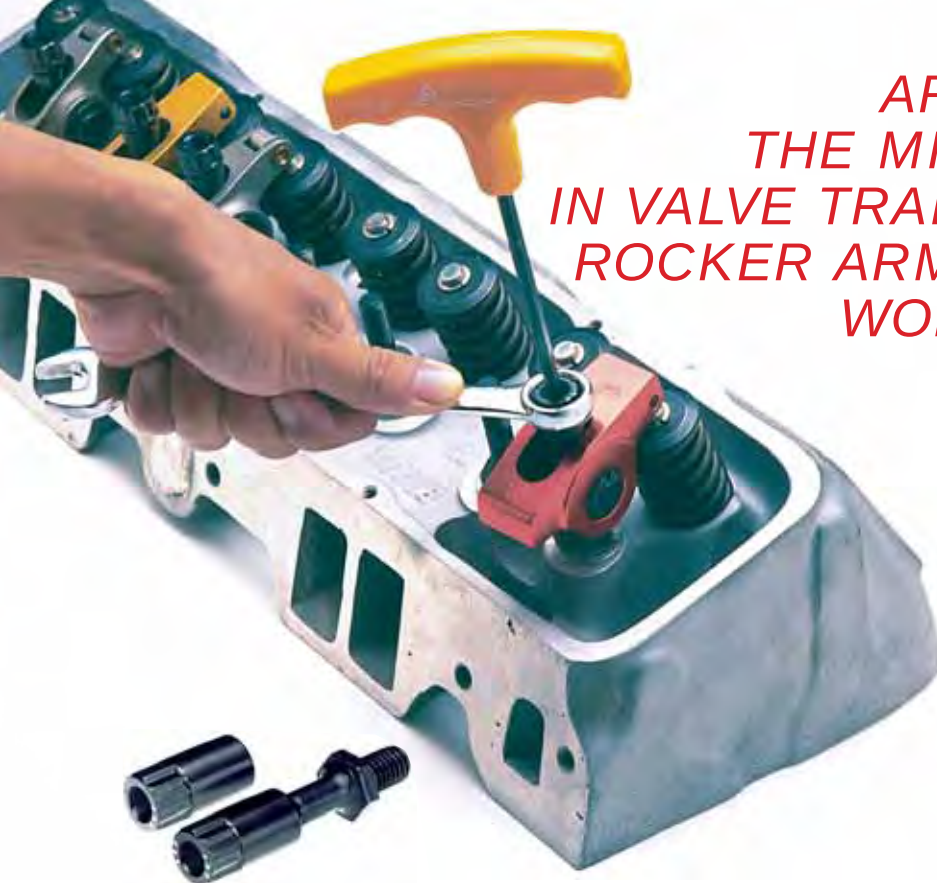
| Application                                    | B     | C         | D     | E       | F          | High Perf. | High Perf.<br>(2 PC-Pack) | Pro Series |
|------------------------------------------------|-------|-----------|-------|---------|------------|------------|---------------------------|------------|
| 3/8" typical small block application ❶         | 1.750 | .700      | .800  | 3/8-24  | 7/16-14    | 134-7101   | 134-7121                  | 234-7201   |
| 3/8" with roller rockers ❷                     | 1.895 | .710      | 1.000 | 3/8-24  | 7/16-14    | 134-7104   | 134-7124                  |            |
| 7/16" typical small block application          | 1.770 | .700      | .670  | 7/16-20 | 7/16-14    | 134-7103   | 134-7123                  | 234-7202   |
| Aluminum heads, intake studs only, 8 pieces ❸  | 2.000 | .820      | .700  | 7/16-20 | 7/16-14    |            |                           | 235-7204   |
| Dart aluminum, 16 pieces ❸                     | 2.000 | 1.3, .820 | .700  | 7/16-20 | 7/16-14    |            |                           | 235-7205   |
| Aluminum heads, exhaust studs only, 8 pcs. ❸   | 2.000 | 1.650     | .700  | 7/16-20 | 7/16-14    |            |                           | 235-7203   |
| Mark V                                         | 1.900 | .750      | .750  | 7/16-20 | 3/8-16     | 135-7102   | 135-7122                  |            |
| With roller rockers and stud girdle ❹          | 2.100 | .750      | .800  | 7/16-20 | 7/16-14    |            |                           | 334-7203   |
| With roller rockers and stud girdle ❹          | 2.000 | .750      | .800  | 7/16-20 | 7/16-14    |            |                           | 334-7204   |
| With roller rockers and stud girdle ❹          | 2.100 | .850      | .800  | 7/16-20 | 7/16-14    |            |                           | 334-7202   |
| With roller rockers and stud girdle            | 1.900 | .860      | .830  | 7/16-20 | 7/16-14    |            |                           | 234-7205   |
| With roller rockers and stud girdle ❺          | 1.900 | .660      | .830  | 7/16-20 | 7/16-14    |            |                           | 334-7201   |
| 7/16" typical small block application ❹        | 1.900 | .750      | .850  | 7/16-20 | 7/16-14    |            |                           | 200-7202   |
| 7/16" typical big block application ❶          | 1.750 | .800      | .850  | 7/16-20 | 7/16-14    | 135-7101   | 135-7121                  | 235-7201   |
| With roller rockers and stud girdle            | 1.900 | .850      | .850  | 7/16-20 | 7/16-14    |            |                           | 234-7206   |
| Chevrolet big block (aluminum heads)           | 2.350 | .850      | .850  | 7/16-20 | 7/16-14    | 135-7202   | 135-7222                  |            |
| With roller rockers and girdles                | 1.900 | .750      | 1.000 | 7/16-20 | 7/16-14    | 100-7101   | 100-7121                  | 200-7201   |
| Typical Ford small block ❷                     | 1.900 | .750      | 1.000 | 7/16-20 | 7/16-14    | 100-7101   | 100-7121                  | 200-7201   |
| Dart aluminum heads, 16 pieces                 | 2.000 | 1.3, .820 | 1.000 | 7/16-20 | 7/16-14    |            |                           | 235-7202   |
| Aluminum heads, exhaust studs only, 8 pieces   | 2.000 | 1.650     | 1.000 | 7/16-20 | 7/16-14    |            |                           | 235-7206   |
| Aluminum heads, intake, 8 pieces               | 2.000 | .820      | 1.000 | 7/16-20 | 7/16-14    |            |                           | 235-7207   |
| 7/16" with 1/2" coarse, Pontiac (1964 & later) | 2.000 | 1.025     | 1.050 | 7/16-20 | 1/2-13     |            |                           | 290-7201   |
| SVO 351 cid, with roller rockers and girdle    | 2.700 | .850      | 1.300 | 7/16-20 | 7/16-14    |            |                           | 354-7204   |
| SVO 351 cid, with roller rockers and girdle    | 2.800 | .800      | 1.500 | 7/16-20 | 7/16-14    |            |                           | 354-7203   |
| SVO 351 cid, with roller rockers and girdle    | 3.000 | .660      | 1.930 | 7/16-20 | 7/16-14    |            |                           | 354-7202   |
| SVO 351 cid, with roller rockers and girdle ❶  | 3.000 | .950      | 1.750 | 7/16-20 | 7/16-14    |            |                           | 254-7201   |
| Chevrolet late model Vortec                    | 1.750 | .600      | .850  | 3/8-24  | M8 x 1.25  | 134-7201   | 134-7221                  |            |
| GM 4.3L Vortec V6                              | 1.595 | .800      | .580  | 3/8-24  | M10 x 1.50 | 100-7201   | 100-7221                  |            |
| Chevrolet big block 496 cid (8100 series)      | 1.750 | .750      | .600  | 7/16-20 | M10 x 1.50 | 135-7201   | 135-7221                  |            |

- ❶ These parts have a shank portion under hex to locate guide plate.
- ❷ Fits most stock SB Chevy with 3/8 screw-in studs
- ❸ Fits most stock SB Chevy with 7/16 screw-in studs
- ❹ Fits most stock BB Chevy with 7/16 screw-in studs
- ❺ Fits most SB Ford with 7/16 screw-in studs
- ❻ Fits most SB Ford with 3/8 screw-in studs

### IMPORTANT TECH NOTE

It is highly advisable to determine what the optimum rocker arm stud length is for your particular application. This is especially true when "long" pushrods and valves are employed – you should raise the "installed height" of the rocker arm to compensate for the longer-than-stock components.

# ARP HAS THE MISSING LINK IN VALVE TRAIN RELIABILITY ...A ROCKER ARM ADJUSTER THAT WON'T LOOSEN!



- **Exclusive 12-point head**
- **Patented design**
- **Heat-treated premium grade A 8740 chrome moly steel**
- **190,000 psi tensile strength**
- **Precision machined threads**
- **Locking set screw ground flush with rocker arm stud**
- **Doesn't require special tools**

## PERMA-LOC™

### PERMA-LOC™ SPECIAL FEATURES:

12-point head with special shouldered "stop" to hold wrench. Eliminates need for special adjusting tools.

Forged in-house from 8740 alloy chrome moly steel and heat-treated throughout (not simply case hardened, as others are).

Bottom flush-ground perpendicular to threads.

CUT-AWAY VIEW



Patent #5,323,741

Threads are precision CNC-machined exactly perpendicular to the bottom of adjuster to ensure an optimum seat and even pressure.

Set screw has flush-machined tip for optimum contact and seating on stud.

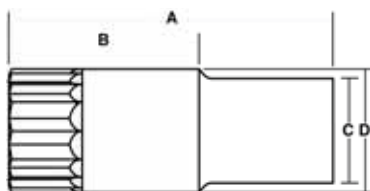
Threads machined for maximum engagement.

One of the more aggravating things found in many high performance engines is constantly having to re-adjust rocker arms. Until ARP introduced the patented Perma-Loc adjuster, there wasn't a "poly lock" on the market that you didn't have to continually tighten.

There are several important reasons why ARP's exclusive Perma-Loc rocker arm adjusters won't loosen like others. First, the adjuster body is heat-treated all the way through (not just case hardened). This eliminates the thread "movement" common to others. Secondly, the threads are machined exactly perpendicular to the bottom of the adjuster, so it seats evenly and applies pressure on a full 360° circle. Lastly, the set screw is machined flush on the bottom (not pointed) so it will have optimum contact on the rocker arm stud.

You'll find ARP Perma-Loc's easy to use, too. The compact 12-point head is designed to hold your wrench in position while you lock the set screw with an Allen wrench.

**All in all, they're the best you can buy!**



Because there are many different style rocker arms made by each manufacturer, we suggest that you verify the physical dimensions and thread requirements prior to ordering. If you have any questions, call ARP's tech staff toll-free for details.

| Application          | Length (A) | Thread Size | Body Dia (D) | 16pc-Pack |
|----------------------|------------|-------------|--------------|-----------|
| Stamped steel rocker | 1.200      | 3/8-24      | .620         | 300-8241  |
| Stamped steel rocker | 1.200      | 7/16-20     | .640         | 300-8242  |
| Aluminum rocker      | 1.200      | 3/8-24      | .550         | 300-8243  |
| Aluminum rocker      | 1.200      | 3/8-24      | .600         | 300-8244  |
| Aluminum rocker      | 1.200      | 7/16-20     | .550         | 300-8245  |
| Aluminum rocker      | 1.200      | 7/16-20     | .600         | 300-8246  |

| Application           | Length (A)  | Thread Size | Body Length (B) | Shank Size (C) | Body Dia (D) | 16pc Pack |
|-----------------------|-------------|-------------|-----------------|----------------|--------------|-----------|
| Stud girdle           | 2.050       | 7/16-20     | 1.200           | .600           | .750         | 300-8247  |
| Stud girdle           | 2.615       | 7/16-20     | 1.485           | .600           | .750         | 300-8248  |
| Big block with girdle | 2.050/2.615 | 7/16-20     | 1.200/1.485     | .600           | .750         | 300-8249  |

800-826-3045

**ARP**  
automotive Racing products





## VALVE COVER BOLTS & STUDS

To ensure proper sealing of valve covers, ARP manufactures a variety of special application-specific bolt and stud kits. Many professional engine builders prefer to use studs because of their ability to properly position the gasket and guide the cover into position. ARP offers studs and bolts in a choice of chrome moly steel with a black oxide finish or stainless steel. You have a choice between conventional hex head bolts and nuts or compact, easy access 12-point designs. The nuts feature a wide base for better load distribution and sealing, while the compact head is easily accessed. Stud kits come complete with nuts and washers, while bolt kits are shipped with the required flat washers.



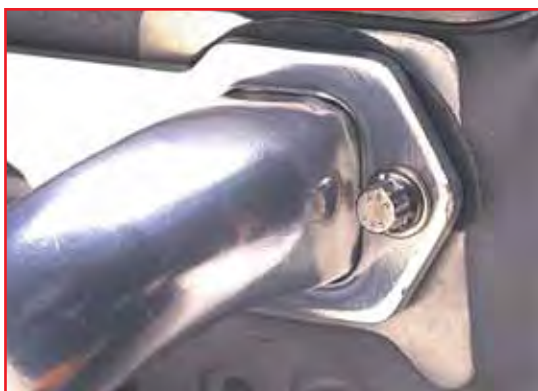
| Application                                              |      |        | STUD OAL        | STUD KITS   |          |               |          | BOLT KITS   |          |               |          |
|----------------------------------------------------------|------|--------|-----------------|-------------|----------|---------------|----------|-------------|----------|---------------|----------|
|                                                          |      |        |                 | Black Oxide |          | Stainless 300 |          | Black Oxide |          | Stainless 300 |          |
|                                                          | Qty. | Size   | BOLT UHL        | Hex         | 12-Point | Hex           | 12-Point | Hex         | 12-Point | Hex           | 12-Point |
| <b>CHRYSLER</b>                                          |      |        |                 |             |          |               |          |             |          |               |          |
| KB Hemi                                                  | 20   | 1/4-20 | 2.450           |             | 245-7601 |               |          |             |          |               |          |
| <b>CAST ALUMINUM COVERS</b>                              |      |        |                 |             |          |               |          |             |          |               |          |
| Bolt kit                                                 | 8    | 1/4-20 | .812            |             |          |               |          | 100-7507    | 100-7503 | 400-7507      | 400-7503 |
| Bolt kit                                                 | 14   | 1/4-20 | .812            |             |          |               |          | 100-7504    | 100-7508 | 400-7508      | 400-7504 |
| Chevy SB2 w/ nyloc nuts                                  | 16   | 1/4-20 | 1.800           |             |          | 434-7609      |          |             |          |               |          |
| Stud kit                                                 | 8    | 1/4-20 | 1.500           | 200-7603    | 200-7613 | 400-7603      | 400-7613 |             |          |               |          |
| Stud kit                                                 | 12   | 1/4-20 | 1.500           | 200-7610    | 200-7620 | 400-7606      | 400-7616 |             |          |               |          |
| Stud kit                                                 | 14   | 1/4-20 | 1.500           | 200-7604    | 200-7614 | 400-7604      | 400-7614 |             |          |               |          |
| Stud kit                                                 | 16   | 1/4-20 | 1.500           | 200-7605    | 200-7615 | 400-7605      | 400-7615 |             |          |               |          |
| Stud kit, Dart, Brodix, B&B                              | 8    | 1/4-20 | 3.500           | 200-7606    | 200-7616 |               |          |             |          |               |          |
| Stud kit, Dart, Brodix, B&B                              | 14   | 1/4-20 | 3.500           | 200-7607    | 200-7617 |               |          |             |          |               |          |
| Stud kit, Dart, Brodix, B&B                              | 16   | 1/4-20 | 3.500           | 200-7608    | 200-7618 |               |          |             |          |               |          |
| Stud kit, BB Chevy                                       | 14   | 1/4-20 | 1.500/<br>4.500 |             | 200-7619 |               |          |             |          |               |          |
| Bolt kit, Brodix hd., SB                                 | 4    | 1/4-20 | 4.000           |             |          |               |          | 100-7511    | 100-7514 | 400-7511      | 400-7514 |
| Bolt kit, Brodix hd., SB                                 | 4    | 1/4-20 | 4.250           |             |          |               |          | 100-7512    | 100-7515 | 400-7512      | 400-7515 |
| Bolt kit, Brodix hd., SB                                 | 4    | 1/4-20 | 4.500           |             |          |               |          | 100-7513    | 100-7516 | 400-7513      | 400-7516 |
| Bolt kit, Brodix hd., BB                                 | 7    | 1/4-20 | 4.000           |             |          |               |          | 100-7517    | 100-7520 | 400-7523      | 400-7526 |
| Bolt kit, Brodix hd., BB                                 | 7    | 1/4-20 | 4.250           |             |          |               |          | 100-7518    | 100-7521 | 400-7524      | 400-7527 |
| Bolt kit, Brodix hd., BB                                 | 7    | 1/4-20 | 4.500           |             |          |               |          | 100-7519    | 100-7522 | 400-7525      | 400-7528 |
| Chevy, Gen III/LS Series small block (.165 thick washer) | 8    | M6     | 2.755           |             |          |               |          | 100-7524    | 100-7523 | 400-7529      | 400-7530 |
| <b>STAMPED STEEL COVERS</b>                              |      |        |                 |             |          |               |          |             |          |               |          |
| 350 Chevy, cntr blt'd vlv cvr                            | 8    | 1/4-20 | 3.250           |             |          |               |          | 100-7509    | 100-7510 | 400-7509      | 400-7510 |
| Bolt kit                                                 | 8    | 1/4-20 | .515            |             |          |               |          | 100-7505    | 100-7501 | 400-7505      | 400-7501 |
| Bolt kit                                                 | 14   | 1/4-20 | .515            |             |          |               |          | 100-7506    | 100-7502 | 400-7506      | 400-7502 |
| Stud kit                                                 | 8    | 1/4-20 | 1.170           | 200-7601    | 200-7611 | 400-7601      | 400-7611 |             |          |               |          |
| Stud kit                                                 | 14   | 1/4-20 | 1.170           | 200-7602    | 200-7612 | 400-7602      | 400-7612 |             |          |               |          |



Main & Poteet's 4-cylinder record-setting Bonneville car



Johnson Hot Rods used ARP for their first foray onto the salt.



# HEADER BOLTS & STUDS

ARP manufactures a variety of premium grade bolt and stud kits to facilitate installation of exhaust headers including the popular stainless stud kit with 12-point nuts. The Stainless 300 material is not affected by corrosion or extreme heat, making it ideal for the application. What's more, the compact 12-point nut lets you easily slip a socket close to the pipe. Each ARP accessory stud or bolt kit includes the specific number of parts for your application, plus premium-quality washers and hex or 12-point nuts, as required. Studs are manufactured with a unique nut-starter nose that helps prevent cross-threading. Studs and bolts come either black oxide chrome moly or Stainless 300. Both are nominally rated at **170,000 psi** tensile strength; substantially stronger than Grade 8 hardware. Specially drilled "NASCAR" models are available for those who wish to safety wire their header bolts to prevent loosening.

Special "NASCAR" model header bolts are available that are drilled for use of safety wire. Perfect for any racer who desires the ultimate in security. Available for small block and big block Chevrolet engines, plus many "universal" applications.



**NOTE:**

8mm stainless studs listed on page 75.

| Application<br><br>NOTE:<br>Studs come with flanged lock nut.<br>Bolts come with washers. |      |          | STUD<br>OAL     | STUD KITS   |          |               |          | BOLT KITS   |          |               |          |
|-------------------------------------------------------------------------------------------|------|----------|-----------------|-------------|----------|---------------|----------|-------------|----------|---------------|----------|
|                                                                                           | Qty. | Size     |                 | Black Oxide |          | Stainless 300 |          | Black Oxide |          | Stainless 300 |          |
|                                                                                           |      |          | BOLT<br>UHL     | Hex         | 12-Point | Hex           | 12-Point | Hex         | 12-Point | Hex           | 12-Point |
| BUICK                                                                                     |      |          |                 |             |          |               |          |             |          |               |          |
| 3.8L V6                                                                                   | 12   | 3/8      | 1.670           | 120-1412    | 120-1402 | 420-1412      | 420-1402 |             |          |               |          |
| 350-455 cid                                                                               | 14   | 3/8      | 1.670           | 120-1411    | 120-1401 | 420-1411      | 420-1401 |             |          |               |          |
| 350-455 cid                                                                               | 14   | 3/8      | .750            |             |          |               |          | 120-1101    | 120-1201 | 420-1101      | 420-1201 |
| CHEVROLET, SMALL BLOCK                                                                    |      |          |                 |             |          |               |          |             |          |               |          |
| 3/8" dia. bolt, 3/8" wrench                                                               | 12   | 3/8      | .750            |             |          |               |          | 100-1101    | 100-1201 | 400-1101      | 400-1201 |
| 3/8" dia. bolt, drilled, 3/8" wrench                                                      | 12   | 3/8      | .750            |             |          |               |          | 100-1103    | 100-1203 | 400-1103      | 400-1203 |
| 3/8" dia. stud                                                                            | 14   | 3/8      | 1.670           |             |          |               | 400-1400 |             |          |               |          |
| 3/8" dia. stud                                                                            | 12   | 3/8      | 1.670           | 100-1412    | 100-1402 | 400-1412      | 400-1402 |             |          |               |          |
| Gen III/LS Series small block                                                             | 12   | M8       | 1.750           |             |          |               | 434-1301 |             |          |               |          |
| 3/8" dia. bolt, 3/8" wrench                                                               | 12   | 3/8      | 1.000           |             |          |               |          | 100-1111    | 100-1211 | 400-1111      | 400-1211 |
| CHEVROLET, BIG BLOCK                                                                      |      |          |                 |             |          |               |          |             |          |               |          |
| 3/8" dia. bolt, 3/8" wrench                                                               | 16   | 3/8      | .750            |             |          |               |          | 100-1102    | 100-1202 | 400-1102      | 400-1202 |
| 3/8" dia. bolt, drilled, 3/8" wrench                                                      | 16   | 3/8      | .875            |             |          |               |          |             |          | 400-1104      | 400-1204 |
| 3/8" dia. stud                                                                            | 16   | 3/8      | 1.670           | 100-1413    | 100-1403 | 400-1413      | 400-1403 |             |          |               |          |
| 3/8" dia. bolt, 3/8" wrench                                                               | 16   | 3/8      | 1.000           |             |          |               |          | 100-1112    | 100-1212 | 400-1112      | 400-1212 |
| CHRYSLER                                                                                  |      |          |                 |             |          |               |          |             |          |               |          |
| 5/16" dia. bolt                                                                           | 14   | 5/16     | .750            |             |          |               |          | 144-1102    | 144-1202 | 444-1102      | 444-1202 |
| KB Hemi, stud w/prov for blower<br>brackets, Mopar 340-360 cid                            | 16   | 3/8      | 1.670/<br>2.000 | 245-1311    | 245-1301 | 445-1311      | 445-1301 |             |          |               |          |
| Neon, Spt, PT Cruiser 2.4 turbo                                                           | 10   | M8       | 2.000           |             |          |               | 441-1302 |             |          |               |          |
| Neon, SOHC & DOHC                                                                         | 8    | M8       | 2.000           |             |          |               | 441-1301 |             |          |               |          |
| FORD                                                                                      |      |          |                 |             |          |               |          |             |          |               |          |
| 3/8" bolt                                                                                 | 16   | 3/8      | .750            |             |          |               |          | 100-1102    | 100-1202 | 400-1102      | 400-1202 |
| 3/8" stud                                                                                 | 16   | 3/8      | 1.670           | 100-1414    | 100-1404 | 400-1414      | 400-1404 |             |          |               |          |
| OLDSMOBILE                                                                                |      |          |                 |             |          |               |          |             |          |               |          |
| 330-455 cid                                                                               | 14   | 3/8      | .750            |             |          |               |          | 180-1101    | 180-1201 | 480-1101      | 480-1201 |
| 330-455 cid                                                                               | 14   | 3/8      | 1.670           | 180-1411    | 180-1401 | 480-1411      | 480-1401 |             |          |               |          |
| UNIVERSAL                                                                                 |      |          |                 |             |          |               |          |             |          |               |          |
| Bolt kit, 5/16" wrench                                                                    | 12   | 3/8      | .750            |             |          |               |          | 100-1107    | 100-1207 | 400-1107      | 400-1207 |
| Bolt kit, 5/16" wrench                                                                    | 16   | 3/8      | .750            |             |          |               |          | 100-1108    | 100-1208 | 400-1108      | 400-1208 |
| Bolt kit, 5/16" wrench                                                                    | 12   | 3/8      | 1.000           |             |          |               |          | 100-1109    | 100-1209 | 400-1109      | 400-1209 |
| Bolt kit, 5/16" wrench                                                                    | 16   | 3/8      | 1.000           |             |          |               |          | 100-1110    | 100-1210 | 400-1110      | 400-1210 |
| Bolt kit, drilled, uses 3/8" socket                                                       | 16   | 3/8      | .750            |             |          |               |          |             |          | 400-1105      | 400-1205 |
| Bolt kit, drilled, uses 3/8" socket                                                       | 12   | 3/8      | .875            |             |          |               |          |             |          | 400-1106      | 400-1206 |
| Stud kit                                                                                  | 16   | 3/8-5/16 | 1.500           | 100-1401    | 100-1411 |               |          |             |          |               |          |
| Stud kit, broached w/ 12-pt, locking<br>nut. 3/8"                                         | 14   | 3/8      | 1.125           | 100-1405    | 100-1415 |               |          |             |          |               |          |



## OIL PAN BOLT & STUD KITS

The engineers at ARP spent quite a bit of time developing these highly effective, unique oil pan studs. They're designed to make it as easy as possible to install a pan and seal it properly. You'll note that the studs have a radiused bullet nose that serves to locate the pan rails, then allow the nuts to be easily installed without the worry of cross-threading. For those who prefer bolts, ARP's got you covered, too. Both are available in black oxide finished chrome moly steel or rust-proof stainless steel. Also, you may choose between conventional hex style or the space-saving 12-point nuts. The stud kits come complete with a special locking flanged nut, while the bolt kits come with washers.

### TECH TIP

Always use some type of lubricant, such as ARP Moly Lube, when assembling fasteners. Assembling without lubricant can lead to galling or seizing, resulting in costly, time consuming repairs.



| Application<br><br>NOTE:<br>Studs come with flanged lock nut.<br>Bolts come with washers. | STUD KITS   |          |               |          | BOLT KITS   |          |               |          |
|-------------------------------------------------------------------------------------------|-------------|----------|---------------|----------|-------------|----------|---------------|----------|
|                                                                                           | Black Oxide |          | Stainless 300 |          | Black Oxide |          | Stainless 300 |          |
|                                                                                           | Hex         | 12-Point | Hex           | 12-Point | Hex         | 12-Point | Hex           | 12-Point |
| <b>CHEVROLET, SMALL BLOCK</b>                                                             |             |          |               |          |             |          |               |          |
| 265-400 cid                                                                               | 234-1901    | 234-1902 | 434-1901      |          | 234-1802    | 234-1801 | 434-1802      | 434-1801 |
| 350 cid with girdle, 5/16" diameter                                                       | 334-1902    |          |               |          |             |          |               |          |
| Gen III/LS Series small block                                                             |             |          |               |          | 134-6901    | 134-6902 | 434-6901      | 434-6902 |
| <b>CHEVROLET, BIG BLOCK</b>                                                               |             |          |               |          |             |          |               |          |
| 396-454 cid                                                                               | 235-1901    | 235-1902 | 435-1901      | 435-1902 | 235-1802    | 235-1801 | 435-1802      | 435-1801 |
| <b>CHEVROLET, 6-CYLINDER</b>                                                              |             |          |               |          |             |          |               |          |
| 90° V6                                                                                    | 333-1901    |          |               |          |             |          |               |          |
| <b>CHRYSLER, SMALL BLOCK</b>                                                              |             |          |               |          |             |          |               |          |
| 318-340-360 Wedge & 318-360 Magnum                                                        | 200-1901    | 200-1902 | 400-1901      | 400-1902 | 200-1802    | 200-1801 | 400-1802      | 400-1801 |
| <b>CHRYSLER, BIG BLOCK</b>                                                                |             |          |               |          |             |          |               |          |
| KB Hemi, 1.300" U.H.L.                                                                    | 245-1901    | 245-1903 |               |          |             |          |               |          |
| KB Hemi, 1.700" U.H.L.                                                                    | 245-1902    | 245-1904 | 445-1902      | 445-1904 |             |          |               |          |
| <b>FORD, SMALL BLOCK</b>                                                                  |             |          |               |          |             |          |               |          |
| 289-302-351C & 351W (early model)                                                         | 254-1901    | 254-1902 | 454-1901      | 454-1903 | 254-1802    | 254-1801 | 454-1802      | 454-1801 |
| 302-351W (late model with side rails)                                                     | 254-1903    | 254-1904 | 454-1902      | 454-1904 | 254-1804    | 254-1803 | 454-1804      | 454-1803 |
| <b>FORD, BIG BLOCK</b>                                                                    |             |          |               |          |             |          |               |          |
| 390-428 cid FE Series                                                                     |             |          |               |          | 255-1802    | 255-1801 | 455-1802      | 455-1801 |
| <b>PONTIAC</b>                                                                            |             |          |               |          |             |          |               |          |
| 350-455 cid                                                                               | 200-1901    | 200-1902 | 400-1901      | 400-1902 | 200-1802    | 200-1801 | 400-1802      | 400-1801 |

## OIL PUMP BOLTS & STUDS



You've probably heard many a horror story about someone losing an engine when the oil pump fell off into the pan because of a broken bolt. Well, you can put your mind at ease when using ARP's premium grade oil pump bolt and stud kits. You have a choice of black oxide finished 8740 chrome moly steel or low maintenance stainless steel. Both are nominally rated at **170,000 psi** tensile strength to provide you with plenty of clamping force. Moreover, take your pick between conventional hex style or 12-point designs. This is "insurance" that no conscientious engine builder should be without! The studs come with flat washers and nuts, while the Ford bolt kit has flat washers only. These inexpensive fasteners can literally save your engine.

| Application                                      | Black Oxide |          | Stainless 300 |          |
|--------------------------------------------------|-------------|----------|---------------|----------|
|                                                  | Hex         | 12-Point | Hex           | 12-Point |
| <b>CHEVROLET</b>                                 |             |          |               |          |
| Small block, stud kit                            | 230-7001    | 230-7002 |               |          |
| Small & big block, 3.125", high volume, stud kit | 230-7003    | 230-7004 |               |          |
| <b>FORD</b>                                      |             |          |               |          |
| 3/8" & 5/16" 4 piece bolt kit                    | 150-6902    | 150-6901 | 450-6902      | 450-6901 |
| Oil pump to pickup, stud kit                     | 154-7005    |          |               |          |

## FRONT COVER, WATER PUMP & ALTERNATOR KITS

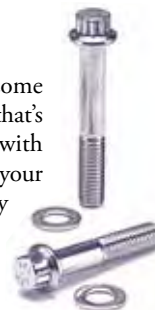
ARP's timing cover bolts are available in both polished stainless steel or black oxide finish chrome moly. You also can choose between standard hex head bolts or compact 12-point fasteners. Also available as part of ARP's complete Engine & Accessory kits. *Please go to page 61 for listings of available Engine & Accessory kits.*



Studs are preferred by many Pro engine builders because they eliminate the chance of pinching gaskets and contribute to easier engine assembly. You will note that ARP studs feature a special "bullet nose" to guide the nut accurately into place. Available in black oxide finish 8740 chrome moly or polished stainless steel with hex or 12-point nuts.



Alternators that come loose are a pain, so that's why ARP came up with these super tough bolts (your choice of chrome moly steel or polished stainless (ARP 300 - both rated **170,000 psi**). The stainless has the added advantage of being rust and corrosion resistant. It's the fastener of choice!



| Application                                                             | STUD KITS   |          |               |          | BOLT KITS   |          |               |          |
|-------------------------------------------------------------------------|-------------|----------|---------------|----------|-------------|----------|---------------|----------|
|                                                                         | Black Oxide |          | Stainless 300 |          | Black Oxide |          | Stainless 300 |          |
|                                                                         | Hex         | 12-Point | Hex           | 12-Point | Hex         | 12-Point | Hex           | 12-Point |
| <b>CHEVROLET</b>                                                        |             |          |               |          |             |          |               |          |
| 90° V6, timing cover                                                    | 333-1401    |          |               |          |             |          |               |          |
| 3/8" alternator pivot bolt                                              |             |          |               |          |             |          | 430-3303      | 430-3304 |
| All V8, alternator bracket bolts                                        |             |          |               |          | 130-3302    | 130-3301 | 430-3302      | 430-3301 |
| All V8, timing cover                                                    | 200-1401    | 200-1411 | 400-1401      |          | 200-1502    | 200-1501 | 400-1502      | 400-1501 |
| All V8 with Jesel belt drive or gear drive                              | 334-1401    |          |               |          |             |          |               |          |
| All V8, water pump long                                                 |             |          |               |          | 130-3202    | 130-3201 | 430-3202      | 430-3201 |
| Gen III/LS Series small block, timing cover                             |             |          |               |          | 134-1501    | 134-1502 | 434-1501      | 434-1502 |
| Gen III/LS Series small block, water pump with thermostat housing bolts |             |          |               |          | 134-3201    | 134-3202 | 434-3201      | 434-3202 |
| Gen III/LS Series small block, rear motor cover                         |             |          |               |          | 134-1503    | 134-1504 | 434-1503      | 434-1504 |
| <b>CHRYSLER</b>                                                         |             |          |               |          |             |          |               |          |
| KB Hemi, timing cover                                                   | 245-1511    | 245-1501 | 445-1511      | 445-1501 |             |          |               |          |
| <b>FORD</b>                                                             |             |          |               |          |             |          |               |          |
| 289-302, aluminum timing cover & water pump                             |             |          |               |          | 154-1504    | 154-1503 | 454-1504      | 454-1503 |
| 289-302, cast-iron timing cover & water pump                            |             |          |               |          | 154-1502    | 154-1501 | 454-1502      | 454-1501 |
| 351 SVO, timing cover                                                   | 354-1401    |          |               |          |             |          |               |          |
| 351W, alternator bracket bolts                                          |             |          |               |          | 150-3302    | 150-3301 | 450-3302      | 450-3301 |
| <b>PONTIAC</b>                                                          |             |          |               |          |             |          |               |          |
| All V8, alternator bracket bolts                                        |             |          |               |          | 190-3302    | 190-3301 | 490-3302      | 490-3301 |
| All V8, timing cover and water pump                                     |             |          |               |          | 190-1502    | 190-1501 | 490-1502      | 490-1501 |

## FUEL PUMP BOLT KITS

| Application | Black Oxide |          | Stainless 300 |          |
|-------------|-------------|----------|---------------|----------|
|             | Hex         | 12-Point | Hex           | 12-Point |
| CHEVROLET   | 130-1602    | 130-1601 | 430-1602      | 430-1601 |
| PONTIAC     | 190-1602    | 190-1601 | 490-1602      | 490-1601 |

Make sure that mechanical fuel pumps stay properly aligned by using ARP's durable black oxide finished chrome moly or rust-proof stainless bolts (both materials are rated at **170,000 psi** and considerably stronger than Grade 8 hardware). Your choice of either conventional hex heads or 12-point head. Washers are included.



## MOTOR MOUNT BOLT KITS

| Application                                         | Black Oxide |          | Stainless 300 |          |
|-----------------------------------------------------|-------------|----------|---------------|----------|
|                                                     | Hex         | 12-Point | Hex           | 12-Point |
| Chevy, V6 & V8 mount to block                       | 130-3102    | 130-3101 | 430-3102      | 430-3101 |
| Chevy, V6 & V8 mount to frame                       | 130-3105    |          | 430-3105      |          |
| Chevy, LS Series small block mount bracket to block | 134-3102    | 134-3101 | 434-3102      | 434-3101 |
| Ford, 289-302-351W                                  | 150-3102    | 150-3101 | 450-3102      | 450-3101 |
| Pontiac, All V8                                     | 190-3102    | 190-3101 | 490-3102      | 490-3101 |



Secure any engine with complete confidence with ARP's rugged motor mount bolts. You can choose between black oxide finished 8740 chrome moly or corrosion-resistant stainless steel; choice of hex or 12-bolt head. Kits come complete with flat washers.



## BELLHOUSING STUD KITS

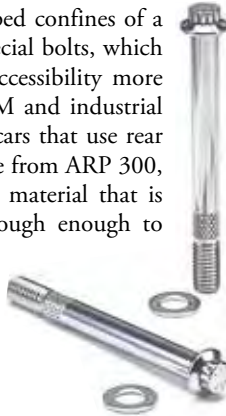
Here's just what you need to secure a bellhousing in place. The studs are designed with a bullet nose to guide the bellhousing into position and accept nuts without the fear of cross-threading. Choice of rugged 8740 heat-treated alloy or rust-proof stainless steel. Complete with nuts and flat washers.



| Application                          | Dia. | Length | Pro Series | Stainless |
|--------------------------------------|------|--------|------------|-----------|
| Chevy, Chrysler KB Hemi              | 3/8  | 2.000  | 245-0901   | 445-0901  |
| Top fuel motor plate, std.           | 7/16 | 2.140  | 245-0202   |           |
| Top fuel motor plate, w/ 1/4" spacer | 7/16 | 2.400  | 245-0201   |           |

## STARTER BOLT KITS

Installing starter motors in the cramped confines of a race car is simplified by use of ARP's special bolts, which feature small diameter heads to make accessibility more convenient. They are stronger than OEM and industrial grades, and especially suited for use on cars that use rear motor plates. These starter bolts are made from ARP 300, a 100% maintenance free stainless steel material that is stronger than Grade 8 hardware and tough enough to easily withstand the strain of a 10 to 15 pound starter cantilevered off the back of an engine. Bolts have standard shank knurling. Rated at **170,000 psi**. Includes washers, as required.



| Application                         | UHL           | Part No. |
|-------------------------------------|---------------|----------|
| <b>CHEVROLET</b>                    |               |          |
| All standard, 12 pt                 | 3.700         | 430-3501 |
| All standard, hex                   | 3.700         | 430-3502 |
| All with high torque starter, 12 pt | 3.700         | 430-3503 |
| All with high torque starter, hex   | 3.700         | 430-3504 |
| All with long and short, hex        | 1.880 & 4.450 | 430-3505 |
| All with long and short, 10mm, hex  | 1.775 & 4.470 | 430-3506 |
| All, 2 ea. long, 3/8" bolt, hex     | 4.450         | 430-3507 |
| <b>FORD</b>                         |               |          |
| 2-bolt, 12 pt                       | 1.500         | 450-3501 |
| 3-bolt, 12 pt                       | 1.500         | 450-3502 |

## SEAL PLATE & ACCESSORY CAM DRIVE

### SPECIFICATIONS

- Drive: forged ARP2000, 220,000 psi alloy chrome moly steel with corrosion-resistant oxide finish.
- Concentricity: .001 T.I.R., between shaft and hex, 1" and 1.5" length
- Threads: form rolled 9/16" x .625" on cam end, 3/8" hex on drive
- Seal Plate: CNC-machined 7075-T4 aluminum with Viton seal



If the survivability of your camshaft drive, through an entire race without stripping or breaking, has been a matter of concern – ARP's new cam drive should put your mind to rest. We built this setup to be "bulletproof." Totally reliable. A through-hardened, not just case hardened, chrome moly shaft, premium grade Viton seal, plus anodized aluminum plate are manufactured in-house to insure that every part is guaranteed ARP quality.

| Application        | 1.0"     | 1.5"     |
|--------------------|----------|----------|
| All 9/16-18 x .625 | 934-0005 | 934-0006 |

The perfect compliment to our "bulletproof" cam drives are these precision seal plates. They're made of CNC-machined 7075-T4 alloy aluminum and anodized to resist corrosion. Available in 2.100" and 2.380" diameters to fit most any OEM or aftermarket block.

| Application                      | Diameter | Part No. |
|----------------------------------|----------|----------|
| Small Block GM, 2.100 O.D. block | 2.100    | 934-0007 |
| Dart, aluminum block             | 2.380    | 934-0008 |



Walsh Off-Road Motorsports 1600 car



Dennis Anderson - "Grave Digger"



Special "NASCAR" model bolts have drilled heads (one per set) to facilitate tech official's sealing. These 12-point bolts have a generous flange head for superior load distribution.

## INTAKE MANIFOLD BOLT & STUD KITS

Prevent intake manifold leaks with ARP's quality fasteners. They're rated at **170,000 psi** and precision machined for optimum thread engagement. Wide underhead flange and companion washers provide even load distribution. Precision rolled threads prevent galling while promoting more consistent torque loading. Facilitates optimum sealing of gasket surfaces. Available in choice of black oxide finish chrome moly or corrosion resistant stainless steel, as well as hex or 12-point heads. Washers included.



| Application                                         | Black Oxide |          | Stud     | Stainless 300 |          |          |
|-----------------------------------------------------|-------------|----------|----------|---------------|----------|----------|
|                                                     | Hex         | 12-Point |          | Hex           | 12-Point | NASCAR   |
| <b>AMC</b>                                          |             |          |          |               |          |          |
| 290-343-390 cid, uses 3/8" socket                   | 114-2001    |          |          | 414-2001      | 414-2101 |          |
| <b>BUICK</b>                                        |             |          |          |               |          |          |
| 3.8L V6                                             | 123-2001    |          |          | 423-2001      |          |          |
| 215 cid, uses 3/8" socket                           | 124-2001    | 124-2101 |          | 424-2001      | 424-2101 |          |
| <b>CHEVROLET</b>                                    |             |          |          |               |          |          |
| 90° V6, 1.000" drilled                              |             |          |          |               |          | 333-2101 |
| SB 2, standard deck                                 |             |          |          |               | 334-2104 |          |
| SB 2, tall deck, drilled                            |             |          |          |               |          | 334-2105 |
| Small block, 1.000", drilled                        |             |          |          |               |          | 334-2102 |
| Small block, 1.250", drilled                        |             |          |          |               |          | 334-2103 |
| 265-400 cid, factory OEM                            | 134-2001    | 134-2101 |          | 434-2001      | 434-2101 |          |
| 305-350 Vortec, fits most aftermarket alum. intakes | 134-2002    | 134-2103 |          | 434-2002      | 434-2102 |          |
| 305-350 Tuned Port                                  | 134-2004    | 134-2104 |          | 434-2004      | 434-2104 |          |
| LS1, LS4, LS6, 4.8L-RL4, 5.3L-LM7, 6.0L-LQ4         | 130-2001    | 130-2101 |          | 430-2001      | 430-2101 |          |
| Gen III/LS Series small block, valley cover bolts   | 134-8001    | 134-8002 |          | 434-8001      | 434-8002 |          |
| 396-454 cid, 1.250" U.H.L.                          | 135-2001    | 135-2101 |          | 435-2001      | 435-2101 |          |
| 502 cid, 1.500" U.H.L.                              | 135-2002    |          |          | 435-2002      | 435-2102 |          |
| <b>CHRYSLER</b>                                     |             |          |          |               |          |          |
| 318-440 Wedge, uses 3/8" socket                     | 144-2001    | 144-2101 |          | 444-2001      | 444-2101 |          |
| <b>FORD</b>                                         |             |          |          |               |          |          |
| 260-289-302, 351W, uses 3/8" socket                 | 154-2001    | 154-2101 |          | 454-2001      | 454-2101 |          |
| 289-302, 351W intake stud kit                       |             |          | 354-2103 |               |          |          |
| 351C, 351-400M                                      | 154-2004    | 154-2104 |          | 454-2004      | 454-2104 |          |
| 351W, uses 3/8 wrenching                            | 154-2002    | 154-2102 |          | 454-2003      | 454-2103 |          |
| 351 SVO, Jack Roush design, drilled                 |             |          |          |               |          | 354-2102 |
| 390-428 cid FE Series                               | 155-2002    | 155-2102 |          | 455-2002      | 455-2102 |          |
| 429-460 cid                                         | 155-2005    | 155-2105 |          | 455-2001      | 455-2101 |          |
| <b>PONTIAC</b>                                      |             |          |          |               |          |          |
| 350-455 cid, uses 3/8" socket                       | 194-2001    | 194-2101 |          | 494-2001      | 494-2101 |          |

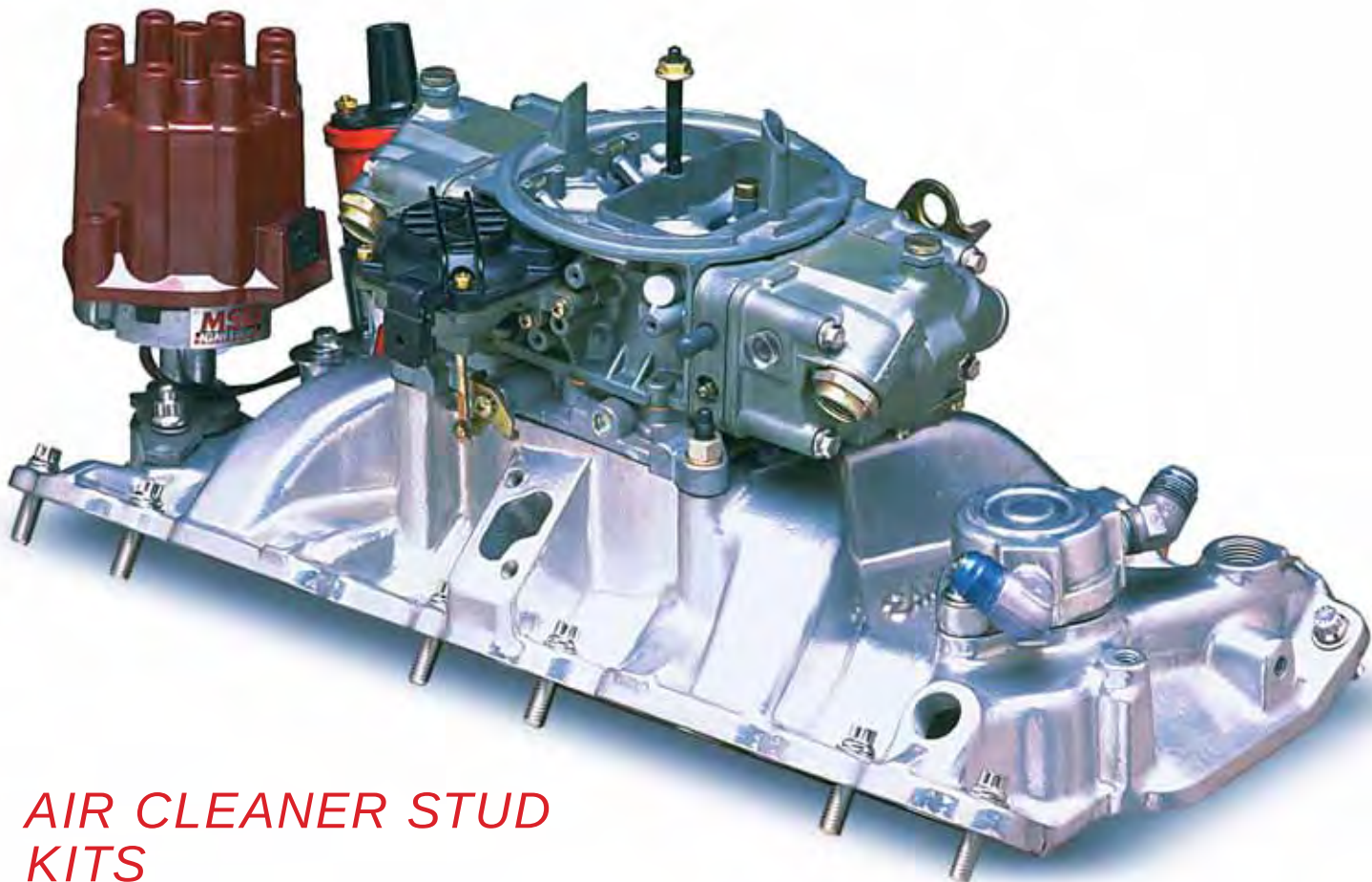
Red part numbers indicate new items

## CARB STUD KITS

The best way to make sure that carburetors stay perfectly sealed to the intake manifold is through the use of ARP's carb studs, which feature J-form threads to resist loosening from vibration. They're offered in a variety of heights to accommodate most any combination of carb and spacer, and are available in 8740 chrome moly with a black oxide finish or rust-proof stainless steel. Special ARP Pro Series NASCAR type stud **kits have one of the studs drilled** to facilitate sealing the carburetor in the engine by race officials. All carb stud kits come with hex nuts and washers.

| Application                                             | Qty. | Size | O.A.L.        | Black Oxide | Stainless 300 | Pro Series |
|---------------------------------------------------------|------|------|---------------|-------------|---------------|------------|
| Standard                                                | 4    | 5/16 | 1.700         | 200-2401    | 400-2401      |            |
| 1/2" spacer                                             | 4    | 5/16 | 2.225         | 200-2403    | 400-2403      |            |
| 1" spacer                                               | 4    | 5/16 | 2.700         | 200-2402    | 400-2402      |            |
| 2" spacer                                               | 4    | 5/16 | 3.700         | 200-2404    |               | 300-2404   |
| 3" spacer                                               | 4    | 5/16 | 4.700         | 200-2405    |               |            |
| 1-1/4" Moroso spacer                                    | 4    | 5/16 | 3.200         | 200-2408    | 400-2408      |            |
| 2" Moroso spacer                                        | 8    | 5/16 | 1.250 & 1.700 | 200-2409    |               |            |
| Dominator with 1/2" or 1" spacer                        | 4    | 5/16 | 3.200         | 200-2412    | 400-2412      |            |
| Dominator carb stud, no spacer                          | 4    | 5/16 | 2.225         | 200-2414    | 400-2414      |            |
| Dominator carb stud, with spacer                        | 4    | 5/16 | 4.400         | 200-2415    |               |            |
| HP Dominator carb stud, no spacer                       | 4    | 5/16 | 2.225         | 200-2416    |               |            |
| HP Dominator carb stud with 1/2" spacer                 | 4    | 5/16 | 2.700         | 200-2417    |               |            |
| HP Dominator carb stud with 1" spacer                   | 4    | 5/16 | 3.200         | 200-2418    |               |            |
| Standard (drilled for NASCAR wire seal)                 | 4    | 5/16 | 1.700         |             |               | 300-2401   |
| 2" spacer (drilled for NASCAR wire seal)                | 8    | 5/16 | 1.700 & 2.225 |             |               | 300-2406   |
| 1" spacer (drilled for NASCAR wire seal)                | 4    | 5/16 | 2.700         |             |               | 300-2403   |
| 1/2" spacer (drilled for NASCAR wire seal)              | 4    | 5/16 | 2.225         |             |               | 300-2402   |
| 1" Moroso spacer (drilled for NASCAR wire seal)         | 4    | 5/16 | 2.700         |             |               | 300-2407   |
| 1-1/4" Moroso spacer (drilled for NASCAR wire seal)     | 4    | 5/16 | 3.200         |             |               | 300-2408   |
| 2" Moroso spacer (drilled for NASCAR wire seal)         | 8    | 5/16 | 1.250 & 1.700 |             |               | 300-2409   |
| Quadrajet (all), with 1/4" base gasket (2 stud, 2 bolt) | 4    | 5/16 | 1.700 & 4.400 | 200-2413    | 400-2413      |            |





## AIR CLEANER STUD KITS

Keep your air cleaner firmly in position with an ARP stud kit. Includes your choice of a black oxide finished chrome moly or stainless steel stud with an appropriate nut. Vastly superior to the cheap fasteners that sometimes get used.

| Application       | Black Oxide | Stainless 300 |
|-------------------|-------------|---------------|
| 5/16 x 2.225" OAL | 200-0301    | 400-0301      |
| 5/16 x 2.700" OAL | 200-0302    | 400-0302      |
| 5/16 x 3.200" OAL | 200-0303    | 400-0303      |
| 1/4 x 2.225" OAL  | 200-0304    | 400-0304      |
| 1/4 x 2.443" OAL  | 200-0307    | 400-0307      |
| 1/4 x 2.700" OAL  | 200-0305    | 400-0305      |
| 1/4 x 3.200" OAL  | 200-0306    | 400-0306      |

## THERMOSTAT HOUSING BOLTS

Nobody likes water leaks. And here's ARP's contribution to the solution. These premium grade bolts are engineered to properly engage the manifold threads and resist loosening. They're application- specific, and come in your choice of black oxide finished chrome moly or rust-proof stainless steel, with handy 12-point or standard hex heads. Washers included.



| Application                 | UHL       | Black Oxide |          | Stainless 300 |          |
|-----------------------------|-----------|-------------|----------|---------------|----------|
|                             |           | Hex         | 12-Point | Hex           | 12-Point |
| CHEVY (3 PC)                | 1.00/2.00 | 130-7402    | 130-7401 | 430-7402      | 430-7401 |
| CHEVY LS SERIES SMALL BLOCK | 20mm      | 134-7402    | 134-7401 | 434-7402      | 434-7401 |
| FORD FE                     | 2.250     | 155-7402    | 155-7401 | 455-7402      | 455-7401 |
| FORD 351W                   | 0.875     | 150-7402    | 150-7401 | 450-7402      | 450-7401 |
| PONTIAC                     | 1.000     | 190-7402    | 190-7401 | 490-7402      | 490-7401 |

## COIL BRACKET BOLTS

Add a touch of class to your coil bracket installation with an ARP bolt kit. Available in black oxide finished chrome moly or rust-proof stainless steel, as well as with a conventional hex head or 12-point (great for tight, hard-to-reach coils). Washers included.



| Application                 | Black Oxide |          | Stainless 300 |          |
|-----------------------------|-------------|----------|---------------|----------|
|                             | Hex         | 12-Point | Hex           | 12-Point |
| CHEVY                       | 130-2302    | 130-2301 | 430-2302      | 430-2301 |
| CHEVY LS SERIES SMALL BLOCK | 134-2302    | 134-2301 | 434-2302      | 434-2301 |
| FORD WINDSOR                | 150-2302    | 150-2301 | 450-2302      | 450-2301 |



## CARBURETOR FLOAT BOWL KITS

The smart way to attach a Holley float bowl is with ARP's special new bolts. They're made from 304 stainless steel and are virtually impervious to corrosion. A polished finish makes them an enhancement to any carb. They are 5/16" wrenching and nominally rated at **170,000 psi**. Available for both single and dual metering block applications.

| Application                 | Pieces | Part No. |
|-----------------------------|--------|----------|
| 2-barrel, hex               | 4      | 400-0312 |
| Dual metering blocks, hex   | 8      | 400-0310 |
| Single metering blocks, hex | 8      | 400-0311 |



## BREAK-AWAY BLOWER STUDS

Engineered to minimize damage to either manifold or blower housing during unexpected blower explosions – these break-away blower studs are designed to allow separation of manifold and blower. Use of these special studs could save you thousands of dollars! Manufactured from premium-quality aluminum and heat-treated to provide the optimum balance between keeping the supercharger in place and breaking under a predetermined amount of force. Kit comes complete with anodized studs, 12-point, quality steel nuts and heavy-duty parallel-ground and hardened steel washers.

| Application               | Diameter | OAL   | Part No. |
|---------------------------|----------|-------|----------|
| Blower stud kit (blue)    | 7/16     | 2.880 | 100-0601 |
| SSI blower stud kit (red) | 7/16     | 2.500 | 100-0602 |



## DISTRIBUTOR STUD KITS

One of the most critical – yet often overlooked – fasteners used in any engine locks the timing in place. ARP offers these premium grade studs, which are equipped with vibration-resistant J-form threads, in black oxide finished chrome moly or rust-proof stainless steel. A special bullet nose helps guide nut into place without crossthreading. Choice of conventional hex or space-saving 12-point nuts. Washers included.



| Application | Black Oxide |          | Stainless 300 |          |
|-------------|-------------|----------|---------------|----------|
|             | Hex         | 12-Point | Hex           | 12-Point |
| CHEVY       | 130-1702    | 130-1701 | 430-1702      | 430-1701 |
| FORD        | 150-1702    | 150-1701 | 450-1702      | 450-1701 |
| PONTIAC     | 190-1702    | 190-1701 | 490-1702      | 490-1701 |



Steve Matusek of Aeromotive depends on ARP



Gregg Hopp, Unlimited lights hydro champion



## HARMONIC BALANCER BOLT KITS

| Application                                 | Socket Size | Diameter/<br>Thread Size | UHL   | Part No. |
|---------------------------------------------|-------------|--------------------------|-------|----------|
| <b>BUICK</b>                                |             |                          |       |          |
| All V6 & V8                                 | 13/16       | 3/4-16                   | 1.300 | 120-2501 |
| <b>CHEVROLET</b>                            |             |                          |       |          |
| Small block                                 | 5/8         | 7/16-20                  | 2.470 | 134-2501 |
| Small block                                 | 13/16       | 7/16-20                  | 2.470 | 234-2501 |
| Small block                                 | 1-1/16      | 7/16-20                  | 2.470 | 234-2502 |
| Gen III/LS Series small block (except LS7)  | 1-1/16      | M16 x 2.0                | 4.325 | 234-2503 |
| Gen III/LS7 small block                     | 1-1/16      | M16 x 2.0                | 5.225 | 234-2504 |
| <b>CHEVROLET</b>                            |             |                          |       |          |
| Big block                                   | 5/8         | 1/2-20                   | 1.550 | 135-2501 |
| Big block                                   | 13/16       | 1/2-20                   | 1.550 | 235-2501 |
| Big block                                   | 1-1/16      | 1/2-20                   | 1.550 | 235-2502 |
| <b>CHRYSLER</b>                             |             |                          |       |          |
| 318-440 Wedge & 426 Hemi with thin damper   | 1-1/16      | 3/4-16                   | 1.420 | 245-2501 |
| 318-440 Wedge with thick damper & Viper V10 | 1-1/16      | 3/4-16                   | 2.200 | 240-2501 |
| <b>FORD</b>                                 |             |                          |       |          |
| 1.8L & 2.0L Duratec                         | 19mm        | M14 x 1.50               | 1.735 | 251-2501 |
| 4.6L Modular V8                             | 18mm        | M12 x 1.50               | 1.800 | 156-2501 |
| 289-460 cid (except 351C)                   | 5/8         | 5/8-18                   | 2.050 | 150-2501 |
| 351C                                        | 5/8         | 5/8-18                   | 1.800 | 154-2501 |
| <b>HONDA</b>                                |             |                          |       |          |
| B Series (B16/18)                           | 19mm        | M14 x 1.25               | 1.350 | 208-2501 |
| <b>MITSUBISHI</b>                           |             |                          |       |          |
| 2.0L (4G63) DOHC                            | 19mm        | M14 x 1.50               | 1.525 | 207-2501 |
| <b>OLDSMOBILE</b>                           |             |                          |       |          |
| V8                                          | 13/16       | 3/4-16                   | 1.300 | 180-2501 |
| <b>PONTIAC</b>                              |             |                          |       |          |
| 350-455 cid                                 | 5/8         | 5/8-18                   | 1.580 | 190-2501 |

Red part numbers indicate new items



As the crankshaft flexes and twists, the balancer absorbs incredible amounts of kinetic energy. To ensure that the balancer is locked in position, ARP has developed these ultra strong **200,000 psi** bolts that let you exert maximum clamping force. Special features include 1/4" thick, wide area washer and an extra tall 12-point head that accepts a deep socket and eliminates the worry of stripping the head.

## SQUARE DRIVE BALANCER BOLTS

ARP offers a special version of its rugged **200,000 psi** rated balancer bolt that can accept a standard 1/2" drive ratchet or breaker bar to facilitate rotating the crank assembly.



- 1/2" square drive forged into bolt head, enabling the rotation of an engine with any 1/2" drive tool
- Made from heat-treated 8740 chrome moly steel with heavy-duty black oxide finish

| Application               | Part No. |
|---------------------------|----------|
| <b>BUICK</b>              | 120-2502 |
| <b>CHEVY</b>              |          |
| Small Block               | 134-2503 |
| Big Block                 | 135-2503 |
| <b>CHRYSLER</b>           | 145-2503 |
| <b>FORD</b>               |          |
| 289-460 cid (except 351C) | 150-2503 |
| 351C                      | 154-2502 |
| <b>OLDSMOBILE</b>         | 180-2502 |
| <b>PONTIAC</b>            | 190-2502 |

## FUEL PUMP PUSHROD KIT

Stock fuel pump pushrods leave a lot to be desired. In fact, they've been known to break at the most inopportune time. To provide you with required reliability and improved performance, ARP has developed these sophisticated and durable pushrods. They're made from premium grade aerospace chrome moly and centerless ground to precise diameter. A hollow core serves to reduce the reciprocating mass, which requires less energy to operate. The less drag on the motor, the more power available to you!



NOTE: Not for use on roller cams!

| Application       | Diameter | OAL    | Part No. |
|-------------------|----------|--------|----------|
| Chevy Small Block | 1/2      | 5.750" | 134-8701 |
| Chevy Big Block   | 1/2      | 5.750" | 135-8701 |

## CAM BOLT KITS



Install an ARP cam bolt kit and end your camshaft timing worries! ARP quality delivers increased pre-load clamping force and assures positive timing gear register. Includes appropriate fasteners for your application. Increased material strength overcomes valve train harmonics and stress. Added features include oversized bolt head flange for cam button retention and reduced socket head size to facilitate easy installation and removal. Available in both **High Performance** and **Pro Series** kits.



| Application                                                               | Socket Size | Diameter/<br>Thread Size | UHL            | High Perf.<br>180,000 psi | Pro Series<br>200,000 psi |
|---------------------------------------------------------------------------|-------------|--------------------------|----------------|---------------------------|---------------------------|
| <b>BMW</b>                                                                |             |                          |                |                           |                           |
| 1.6L Mini Cooper - cam sprocket bolt kit                                  | 19mm        | M12 x 1.5                | 2.085          |                           | 206-1001                  |
| <b>BUICK</b>                                                              |             |                          |                |                           |                           |
| All V6                                                                    | 3/8         | 5/16-18                  | .560           | 123-1001                  |                           |
| <b>CHEVROLET</b>                                                          |             |                          |                |                           |                           |
| 265-454 cid                                                               | 1/2         | 5/16-18                  | .750           | 134-1001                  | 234-1001                  |
| 265-454 cid - with oversize head for use with cam button                  | 7/16        | 5/16-18                  | .750           |                           | 300-1001                  |
| Gen III/LS Series small block - cam retainer plate bolt kit               | 10mm        | M8 x 1.25                | 20mm           | 134-1002                  |                           |
| Gen III/LS Series small block - cam sprocket bolt kit                     | 10mm        | M8 x 1.25                | 25mm           | 134-1003                  |                           |
| <b>CHRYSLER/DODGE</b>                                                     |             |                          |                |                           |                           |
| 2.0L DOHC & 2.4L DOHC - cam tower stud kit (head# 4667086)                | 8mm<br>10mm | M6 x 1.0<br>M8 x 1.0     | 1.825<br>2.115 | 141-1001                  |                           |
| 383-440 Wedge & 426 Hemi - 3 bolt pattern                                 | 5/8         | 3/8-16                   | .750           | 144-1001                  |                           |
| 383-440 Wedge & 426 Hemi - 3 bolt pattern (reduced head, extended length) | 3/8         | 3/8-16                   | .875           | 244-1001                  |                           |
| <b>FORD, SMALL BLOCK</b>                                                  |             |                          |                |                           |                           |
| 260-289-302 cid (1965-68)                                                 | 5/8         | 3/8-16                   | 1.460          | 154-1001                  | 254-1001                  |
| 302-351W cid (1969 & later)                                               | 5/8         | 3/8-16                   | 1.580          | 155-1001                  | 255-1001                  |
| 351C, 351-400M                                                            | 5/8         | 3/8-16                   | 1.970          | 154-1002                  | 254-1002                  |
| 351 SVO - cam retainer plate bolt kit                                     | 7/16        | 1/4-20                   | .750           |                           | 250-1001                  |
| 4.6L Modular V8 - cam sprocket bolt kit (1 per cam required)              | 18mm        | M12 x 1.5                | 1.800          |                           | 256-1001                  |
| <b>FORD, BIG BLOCK</b>                                                    |             |                          |                |                           |                           |
| 390-428 cid FE Series                                                     | 5/8         | 7/16-14                  | 1.750          | 155-1002                  | 255-1002                  |
| 429-460 cid                                                               | 5/8         | 3/8-16                   | 1.580          | 155-1001                  | 255-1001                  |
| <b>FORD, 4-CYLINDER</b>                                                   |             |                          |                |                           |                           |
| 2.0L Zetec                                                                | 18mm        | M10 x 1.5                | 1.600          |                           | 251-1002                  |
| <b>PONTIAC</b>                                                            |             |                          |                |                           |                           |
| 350-455 cid                                                               | 3/4         | 1/2-20                   | 1.000          | 190-1001                  |                           |

## OIL PUMP DRIVESHAFT KITS

Many an engine has been destroyed as a result of oil pump driveshaft failure. To cure this all-too-common problem, ARP has designed an extra heavy-duty shaft that will provide you with the necessary reliability. The shaft is made from heat-treated, premium grade aerospace chrome moly steel. Moreover, the shaft diameter is a larger diameter than the OEM unit. These features combine to enable ARP shafts to handle the added torque requirements of increased capacity oil pumps or heavy viscosity lubricants.

**CHEVY DRIVES:** Made from premium grade 8740 and heat-treated to **190,000 psi**, ARP uses a unique manufacturing process where the alignment sleeve is roll formed onto the shaft (not welded or pinned), enabling the sleeve to float, allowing for slight misalignment.



| Application                 | Part No. |
|-----------------------------|----------|
| <b>CHEVROLET</b>            |          |
| Small block (all)           | 134-7901 |
| Big block                   | 135-7901 |
| Big block (+.400 tall deck) | 135-7902 |

**IMPORTANT NOTE:** Make sure you **ALWAYS** check clearances: shaft to block and pump to distributor.

**FORD DRIVES:** Made from ARP2000 and heat-treated to **220,000 psi**. These pump drives feature a CNC milled (not broached) hex, and has the retaining washer installed.



| Application            | Part No. |
|------------------------|----------|
| <b>FORD</b>            |          |
| 239-312 Y block        | 154-7906 |
| 289-302 cid & Boss 302 | 154-7904 |
| 351W                   | 154-7901 |
| 351C, 351-400M         | 154-7905 |
| 390-428 cid FE Series  | 154-7902 |
| 429-460 cid            | 154-7903 |





## INDIVIDUAL ACCESSORY BOLT KITS

Just about any fastener type you can think of is available from ARP in convenient skin-packed cards by product group. Look for them at your favorite performance parts retailer. And note that all ARP fasteners are proudly manufactured in the U.S.A. in our own factory. It will pay you to invest in the best.

For your convenience, ARP has taken the most popular combinations and compiled complete Engine & Accessory Bolt Kits. *You'll find them all on page 61 of this catalog.* Each kit contains about a dozen different fastener groups. They're available for engines ranging from Briggs & Stratton to big block Chevy, Ford and Chrysler powerplants.

Also available, display skin-packed in groups of five are "bulk" fasteners that are offered in coarse, fine and metric threads. These 5-packs come in a wide array of lengths, ranging from about 1/2" to 5 inches. They are offered in polished stainless steel or in black oxide chrome moly. You can also get companion 5-packs of nuts and washers. *See the complete listing on page 82.*

## ALTERNATOR STUD KITS

Strange as it may seem, there have been many races lost in oval track, off-road and endurance competition due to the OEM alternator stud failing and the subsequent loss of electrical power. To prevent this from ever happening, conscientious engine builders rely on ARP's "bulletproof" alternator studs. They're made from a premium grade 8740 chrome moly steel alloy and heat-treated to a nominal **200,000 psi** tensile strength. They are very rigid and won't bend under the stress of competition, eliminating problems with alternator pulley alignment. Here's more reliable "insurance" from the innovators at ARP. Available in 5.000" and 5.250" lengths. Includes a 12-point nut and flat washer.



| Description | OAL   | Coarse Thread Length | Fine Thread Length | Part No. |
|-------------|-------|----------------------|--------------------|----------|
| 7/16 stud   | 5.000 | 1.000                | 1.000              | 300-0501 |
| 7/16 stud   | 5.250 | 1.000                | 1.000              | 300-0502 |

## COIL BRACKET BOLT KITS

Add a touch of class to your coil bracket installation with an ARP bolt kit. Available in black oxide finished chrome moly or rust-proof stainless steel, as well as with a conventional hex head or compact 12-point (great for use with those coils mounted in tight, hard-to-reach places). Washers included. Coil bracket bolts also included in ARP's popular Engine & Accessory kits.



| Application                 | Black Oxide |          | Stainless 300 |          |
|-----------------------------|-------------|----------|---------------|----------|
|                             | Hex         | 12-Point | Hex           | 12-Point |
| CHEVY                       | 130-2302    | 130-2301 | 430-2302      | 430-2301 |
| CHEVY LS SERIES SMALL BLOCK | 134-2302    | 134-2301 | 434-2302      | 434-2301 |
| FORD                        | 150-2302    | 150-2301 | 450-2302      | 450-2301 |

## DISTRIBUTOR STUD KITS

One of the most critical – yet often overlooked – fasteners used in any engine locks the timing in place. ARP offers these premium grade studs, which are equipped with vibration-resistant J-form threads, in your choice of black oxide finished chrome moly or rust-proof stainless steel. Select from conventional hex or space-saving 12-point nuts. Washers included.



| Application | Black Oxide |          | Stainless 300 |          |
|-------------|-------------|----------|---------------|----------|
|             | Hex         | 12-Point | Hex           | 12-Point |
| CHEVY       | 130-1702    | 130-1701 | 430-1702      | 430-1701 |
| FORD        | 150-1702    | 150-1701 | 450-1702      | 450-1701 |
| PONTIAC     | 190-1702    | 190-1701 | 490-1702      | 490-1701 |

| Application                                                             | Black Oxide |          | Stainless 300 |          |
|-------------------------------------------------------------------------|-------------|----------|---------------|----------|
|                                                                         | Hex         | 12-Point | Hex           | 12-Point |
| <b>CHEVROLET</b>                                                        |             |          |               |          |
| 3/8 alternator pivot bolt kit                                           |             |          | 430-3303      | 430-3304 |
| All V8, timing cover bolt kit                                           | 200-1502    | 200-1501 | 400-1502      | 400-1501 |
| All V8, water pump, long bolt kit                                       | 130-3202    | 130-3201 | 430-3202      | 430-3201 |
| All V8, alternator bracket bolt kit                                     | 130-3302    | 130-3301 | 430-3302      | 430-3301 |
| Gen III/LS Series small block, timing cover                             | 134-1501    | 134-1502 | 434-1501      | 434-1502 |
| Gen III/LS Series small block, water pump with thermostat housing bolts | 134-3201    | 134-3202 | 434-3201      | 434-3202 |
| Gen III/LS Series small block, rear motor cover                         | 134-1503    | 134-1504 | 434-1503      | 434-1504 |
| <b>CHRYSLER</b>                                                         |             |          |               |          |
| KB Hemi, timing cover stud kit                                          | 245-1511    | 245-1501 | 445-1511      | 445-1501 |
| <b>FORD</b>                                                             |             |          |               |          |
| 289-302, aluminum timing cover & water pump                             | 154-1504    | 154-1503 | 454-1504      | 454-1503 |
| 289-302, cast-iron timing cover & water pump                            | 154-1502    | 154-1501 | 454-1502      | 454-1501 |
| 351W, alternator bracket bolt kit                                       | 150-3302    | 150-3301 | 450-3302      | 450-3301 |
| <b>PONTIAC</b>                                                          |             |          |               |          |
| All V8, alternator bracket bolt kit                                     | 190-3302    | 190-3301 | 490-3302      | 490-3301 |
| All V8, timing cover and water pump                                     | 190-1502    | 190-1501 | 490-1502      | 490-1501 |

## FRONT COVER, WATER PUMP & ALTERNATOR

We have an assortment of premium quality stainless steel and black oxide finish 8740 chrome moly bolts for the most popular applications. Washers included. These bolts are also available as part of our complete Engine & Accessory Kit packages (see page 61 for details).



## FUEL PUMP BOLT KITS



Absolute security is yours with ARP's durable fuel pump bolts. Your choice of black oxide finished chrome moly steel or rust-proof stainless steel. Both are nominally rated at **170,000 psi** and considerably stronger than Grade 8 hardware. Hex or 12-point head. Washers included.

| Application      | Black Oxide |          | Stainless 300 |          |
|------------------|-------------|----------|---------------|----------|
|                  | Hex         | 12-Point | Hex           | 12-Point |
| <b>CHEVROLET</b> | 130-1602    | 130-1601 | 430-1602      | 430-1601 |
| <b>PONTIAC</b>   | 190-1602    | 190-1601 | 490-1602      | 490-1601 |

| Application                   | Dia. | UHL   | Black Oxide |          | Stainless 300 |          |
|-------------------------------|------|-------|-------------|----------|---------------|----------|
|                               |      |       | Hex         | 12-Point | Hex           | 12-Point |
| BUICK                         |      |       |             |          |               |          |
| 350-455 cid, 14 pcs.          | 3/8  | .750  | 120-1101    | 120-1201 | 420-1101      | 420-1201 |
| CHEVROLET, SMALL BLOCK        |      |       |             |          |               |          |
| 12 pieces                     | 3/8  | .750  | 100-1101    | 100-1201 | 400-1101      | 400-1201 |
| 12 pieces, drilled            | 3/8  | .750  | 100-1103    | 100-1203 | 400-1103      | 400-1203 |
| 12 pieces                     | 3/8  | 1.000 | 100-1111    | 100-1211 | 400-1111      | 400-1211 |
| CHEVROLET, BIG BLOCK          |      |       |             |          |               |          |
| 16 pieces                     | 3/8  | .750  | 100-1102    | 100-1202 | 400-1102      | 400-1202 |
| 16 pieces, drilled            | 3/8  | .875  |             |          | 400-1104      | 400-1204 |
| 16 pieces                     | 3/8  | 1.000 | 100-1112    | 100-1212 | 400-1112      | 400-1212 |
| CHRYSLER                      |      |       |             |          |               |          |
| 318-340-360 Wedge, 14 pcs.    | 5/16 | .750  | 144-1102    | 144-1202 | 444-1102      | 444-1202 |
| FORD                          |      |       |             |          |               |          |
| 16 pieces                     | 3/8  | .750  | 100-1102    | 100-1202 | 400-1102      | 400-1202 |
| OLDSMOBILE                    |      |       |             |          |               |          |
| 330-455 cid, 14 pcs.          | 3/8  | .750  | 180-1101    | 180-1201 | 480-1101      | 480-1201 |
| UNIVERSAL                     |      |       |             |          |               |          |
| 12 pcs., 5/16" wrenching      | 3/8  | .750  | 100-1107    | 100-1207 | 400-1107      | 400-1207 |
| 16 pcs., 5/16" wrenching      | 3/8  | .750  | 100-1108    | 100-1208 | 400-1108      | 400-1208 |
| 12 pcs., 5/16" wrenching      | 3/8  | 1.000 | 100-1109    | 100-1209 | 400-1109      | 400-1209 |
| 16 pcs., 5/16" wrenching      | 3/8  | 1.000 | 100-1110    | 100-1210 | 400-1110      | 400-1210 |
| 16 pcs., 3/8" socket, drilled | 3/8  | .750  |             |          | 400-1105      | 400-1205 |
| 12 pcs., 3/8" socket, drilled | 3/8  | .875  |             |          | 400-1106      | 400-1206 |

## HEADER BOLTS

ARP manufactures premium grade bolt kits to facilitate installation of exhaust headers in both stainless steel or 8740 chrome moly steel. The Stainless 300 material is not affected by corrosion or extreme heat, making it ideal for the application. What's more, the compact 12-point nut version lets you easily slip a socket close to the pipe. Each ARP bolt kit includes the specific number of parts for your application, plus premium-quality washers and hex or 12-point nuts, as required. The black oxide finished chrome moly bolts and stainless steel fasteners are nominally rated at **170,000 psi** tensile strength. Specially drilled "NASCAR" models available for those who wish to safety wire their header bolts to prevent loosening.



## THERMOSTAT HOUSING BOLTS

These premium grade bolts are engineered to properly engage the manifold threads and resist loosening. They're application-specific, and come in your choice of black oxide finished chrome moly or rust-proof stainless steel, with handy 12-point or standard hex heads. Washers included.



| Application                        | UHL       | Black Oxide |          | Stainless 300 |          |
|------------------------------------|-----------|-------------|----------|---------------|----------|
|                                    |           | Hex         | 12-Point | Hex           | 12-Point |
| <b>CHEVY (3 PC)</b>                | 1.00/2.00 | 130-7402    | 130-7401 | 430-7402      | 430-7401 |
| <b>CHEVY LS SERIES SMALL BLOCK</b> | 20mm      | 134-7402    | 134-7401 | 434-7402      | 434-7401 |
| <b>FORD FE</b>                     | 2.250     | 155-7402    | 155-7401 | 455-7402      | 455-7401 |
| <b>FORD 351W</b>                   | 0.875     | 150-7402    | 150-7401 | 450-7402      | 450-7401 |
| <b>PONTIAC</b>                     | 1.000     | 190-7402    | 190-7401 | 490-7402      | 490-7401 |



## INTAKE MANIFOLD BOLTS

| Application                                         | Black Oxide |          | Stainless 300 |          |
|-----------------------------------------------------|-------------|----------|---------------|----------|
|                                                     | Hex         | 12-Point | Hex           | 12-Point |
| <b>AMC</b>                                          |             |          |               |          |
| 290-343-390 cid, uses 3/8" socket                   | 114-2001    |          | 414-2001      | 414-2101 |
| <b>BUICK</b>                                        |             |          |               |          |
| 3.8L V6                                             | 123-2001    |          | 423-2001      |          |
| 215 cid, uses 3/8" socket                           | 124-2001    | 124-2101 | 424-2001      | 424-2101 |
| <b>CHEVROLET</b>                                    |             |          |               |          |
| 265-400 cid, factory OEM                            | 134-2001    | 134-2101 | 434-2001      | 434-2101 |
| 305-350 Vortec, fits most aftermarket alum. intakes | 134-2002    | 134-2103 | 434-2002      | 434-2102 |
| LS1, LS4, LS6, 4.8L-RL4, 5.3L-LM7, 6.0L-LQ4         | 130-2001    | 130-2101 | 430-2001      | 430-2101 |
| Gen III/LS Series small block, valley cover bolts   | 134-8001    | 134-8002 | 434-8001      | 434-8002 |
| 396-454 cid, 1.250" U.H.L.                          | 135-2001    | 135-2101 | 435-2001      | 435-2101 |
| 502 cid, 1.500" U.H.L.                              | 135-2002    |          | 435-2002      | 435-2102 |
| <b>CHRYSLER</b>                                     |             |          |               |          |
| 318-440 Wedge, uses 3/8" socket                     | 144-2001    | 144-2101 | 444-2001      | 444-2101 |
| <b>FORD</b>                                         |             |          |               |          |
| 260-289-302-351W, uses 3/8" socket                  | 154-2001    | 154-2101 | 454-2001      | 454-2101 |
| 351C, 351-400M                                      | 154-2004    | 154-2104 | 454-2004      | 454-2104 |
| 390-428 cid FE Series                               | 155-2002    | 155-2102 | 455-2002      | 455-2102 |
| 429-460 cid                                         | 155-2005    | 155-2105 | 455-2001      | 455-2101 |
| <b>PONTIAC</b>                                      |             |          |               |          |
| 350-455 cid, uses 3/8" socket                       | 194-2001    | 194-2101 | 494-2001      | 494-2101 |

Red part numbers indicate new items



Prevent intake manifold leaks with ARP's quality fasteners. They're super strong and precision machined for optimum thread engagement. Wide underhead flange and companion washers provide even load distribution. Precision rolled threads prevent galling while promoting more consistent torque loading. Also facilitates optimum sealing of gasket surfaces. Available in choice of black oxide finished chrome moly or corrosion resistant stainless steel, as well as hex or 12-point heads. Both materials are nominally rated at **170,000 psi**. Washers included.



## OIL PAN BOLTS



ARP's premium grade pan bolts combine sealing efficiency with good looks. They are available in black oxide finished chrome moly steel or rust-proof stainless steel. Also, take your pick from conventional hex bolt heads and a space-saving 12-point design. Includes washers. *For details on ARP oil pan stud kits refer to page 50 of this catalog.*

| Application                           | Black Oxide |          | Stainless 300 |          |
|---------------------------------------|-------------|----------|---------------|----------|
|                                       | Hex         | 12-Point | Hex           | 12-Point |
| <b>CHEVROLET</b>                      |             |          |               |          |
| 265-400 cid                           | 234-1802    | 234-1801 | 434-1802      | 434-1801 |
| Gen III/LS Series small block         | 134-6901    | 134-6902 | 434-6901      | 434-6902 |
| 396-454 cid                           | 235-1802    | 235-1801 | 435-1802      | 435-1801 |
| <b>CHRYSLER</b>                       |             |          |               |          |
| 318-340-360 Wedge & 318-360 Magnum    | 200-1802    | 200-1801 | 400-1802      | 400-1801 |
| <b>FORD</b>                           |             |          |               |          |
| 289-302-351C & 351W (early model)     | 254-1802    | 254-1801 | 454-1802      | 454-1801 |
| 302-351W (late model with side rails) | 254-1804    | 254-1803 | 454-1804      | 454-1803 |
| 390-428 cid FE Series                 | 255-1802    | 255-1801 | 455-1802      | 455-1801 |
| <b>PONTIAC</b>                        |             |          |               |          |
| 350-455 cid                           | 200-1802    | 200-1801 | 400-1802      | 400-1801 |

## VALVE COVER BOLT KITS

| Application                          | Black Oxide |          | Stainless 300 |          |
|--------------------------------------|-------------|----------|---------------|----------|
|                                      | Hex         | 12-Point | Hex           | 12-Point |
| <b>CAST ALUMINUM COVERS</b>          |             |          |               |          |
| Bolt kit, 1/4-20, 8 pieces           | 100-7507    | 100-7503 | 400-7507      | 400-7503 |
| Bolt kit, 1/4-20, 14 pieces          | 100-7504    | 100-7508 | 400-7508      | 400-7504 |
| Chevy, Gen III/LS Series small block | 100-7524    | 100-7523 | 400-7529      | 400-7530 |
| <b>STAMPED STEEL COVERS</b>          |             |          |               |          |
| 350 Chevy, center bolted valve cover | 100-7509    | 100-7510 | 400-7509      | 400-7510 |
| Bolt kit, 1/4-20, 8 pieces           | 100-7505    | 100-7501 | 400-7505      | 400-7501 |
| Bolt kit, 1/4-20, 14 pieces          | 100-7506    | 100-7502 | 400-7506      | 400-7502 |

ARP offers special valve cover bolts both as individual packages, or included in complete Engine & Accessory Kits (see page 61). The bolts are offered in a choice of chrome moly steel with a black oxide finish or corrosion-proof polished stainless steel (ARP Stainless 300 material). Additionally, you have a choice between conventional hex head bolts

and nuts or compact, easy access 12-point designs. The heads feature a wide base for better load distribution and sealing (helps prevent those pesky gasket leaks), while the compact head is easily accessed. Kits are shipped with the required flat washers. *ARP also manufactures valve cover stud kits, which are listed on page 48 of this catalog.*



## ENGINE & ACCESSORY FASTENER KITS

It's easy to assemble a show-quality engine when you use ARP's handy Engine & Accessory Fastener Kit. Virtually everything you need comes completely organized in one convenient package (no need to deal with twelve different part numbers)! More importantly, each and every fastener is superior in strength to the OEM bolts, and also significantly better than hardware grades (even Grade 8). You have a choice of two premium quality materials and finishes.

Traditionalists will appreciate the strength and functionality of ARP's heat-treated 8740 Chrome Moly steel alloy bolts, which feature a black oxide finish.

Those who desire a dazzling engine will no doubt prefer fasteners made of ARP's specially alloyed Stainless 300 material, which has the added benefit of being virtually impervious to rust and corrosion. The stainless steel is polished to achieve a brilliant luster, and provides a distinctive, maintenance-free environment. Each kit has a dozen different type fasteners, all neatly organized and labeled in protective vacuum-wrapped packages.

Both materials are nominally rated at **170,000 psi** tensile strength and come in both hex and 12-point heads.

Please note that these kits are designed for carbureted engines. Newer EFI applications may require the purchase of additional fasteners.

- **Each Kit Contains 12 Groups of Fasteners (except for Briggs & Stratton)**
- **Black Oxide Finish 8740 Chrome Moly Steel or Stainless Polished Steel**
- **Stronger Than Any Hardware Grades**
- **Choice Of Hex or 12-Point Heads**
- **Available For All Popular Engine Types**
- **100% Satisfaction Guaranteed.**
- **Save Time, Money and Hassles!**



**Everything you need to attach components and accessories from a long block on up is packaged in one economical, convenient kit!**

- |                             |                      |
|-----------------------------|----------------------|
| ■ Intake manifold bolts     | ■ Oil pan bolts      |
| ■ Valve cover bolts         | ■ Coil bracket bolts |
| ■ Thermostat housing bolts  | ■ Header bolts       |
| ■ Alternator bracket bolts  | ■ Front cover bolts  |
| ■ Distributor bracket bolts | ■ Water pump bolts   |
| ■ Motor mount bolts         | ■ Fuel pump bolts    |



| Application                                                   | Black Oxide |          | Stainless 300 |          |
|---------------------------------------------------------------|-------------|----------|---------------|----------|
|                                                               | Hex         | 12-Point | Hex           | 12-Point |
| <b>BRIGGS &amp; STRATTON</b>                                  |             |          |               |          |
| 4-cycle, 5 horsepower Jr. Dragster                            |             |          | 500-9601      | 500-9501 |
| <b>CHEVROLET</b>                                              |             |          |               |          |
| 350-400 cid with or without headers (1986 & earlier) ①        | 534-9801    | 534-9701 | 534-9601      | 534-9501 |
| 305-350 cid with headers (1987-95)                            | 534-9802    | 534-9702 | 534-9602      | 534-9502 |
| 350 LT1-LT4 with headers (1992-97)                            | 534-9803    | 534-9703 | 534-9603      | 534-9503 |
| 305-350 Vortec with headers (1996 & later) except LS1 and LS6 | 534-9804    | 534-9704 | 534-9604      | 534-9504 |
| Gen III/LS Series small block with or without headers         | 534-9805    | 534-9705 | 534-9605      | 534-9505 |
| 396-454 cid ①                                                 | 535-9801    | 535-9701 | 535-9601      | 535-9501 |
| <b>CHRYSLER</b>                                               |             |          |               |          |
| 318-340-360 Wedge ①                                           | 544-9801    | 544-9701 | 544-9601      | 544-9501 |
| 383-440 Wedge                                                 | 545-9801    | 545-9701 | 545-9601      | 545-9501 |
| <b>FORD</b>                                                   |             |          |               |          |
| 289-302 cid ①                                                 | 554-9801    | 554-9701 | 554-9601      | 554-9501 |
| Boss 302 ①                                                    | 554-9802    | 554-9702 | 554-9602      | 554-9502 |
| 351 Cleveland                                                 | 554-9804    | 554-9704 | 554-9604      | 554-9504 |
| 351 Windsor ①                                                 | 554-9803    | 554-9703 | 554-9603      | 554-9503 |
| 390-428 FE Series                                             | 555-9802    | 555-9702 | 555-9602      | 555-9502 |
| 429-460 cid ①                                                 | 555-9801    | 555-9701 | 555-9601      | 555-9501 |
| <b>PONTIAC</b>                                                |             |          |               |          |
| 350-455 cid ①                                                 | 594-9801    | 594-9701 | 594-9601      | 594-9501 |

① 1987 & newer EFI engines or those with aftermarket components may require additional fasteners be purchased

Red part numbers indicate new items





## FLYWHEEL BOLT KITS



Flywheel and Flexplate bolts play an important role in the performance and safety of race cars and street machines alike. That's why the fastener experts at ARP have developed special bolts that are far superior to OEM hardware. ARP offers two styles of Flywheel/Flexplate bolts: High Performance and Pro Series. They are both forged from aerospace alloy and heat-treated prior to thread rolling and machining. Both feature an exclusive, flat, 12-point head design and larger than stock shank diameter for increased strength and improved flywheel register. The popular High Performance series is rated at **180,000 psi**, and the premium grade Pro Series, originally developed for NASCAR Winston Cup competition, has a **200,000 psi** rating. Complete with washers and nuts where applicable.

NOTE: The thread size of metric fasteners is listed using international designations. For example, "M10" indicates a 10mm thread size.

| Application                                     | UHL   | Thread Size | High Perf. | Pro Series |
|-------------------------------------------------|-------|-------------|------------|------------|
| <b>BMC</b>                                      |       |             |            |            |
| 1600cc A Series                                 | .900  | 3/8-24      |            | 206-2802   |
| <b>CHEVROLET</b>                                |       |             |            |            |
| 90° V6 & 265-454 V8 with 2pc. rear seal         | 1.000 | 7/16-20     | 100-2801   | 200-2802   |
| 90° V6 & 305-502 V8 with 1pc. rear seal         | 1.000 | 7/16-20     |            | 200-2807   |
| Gen III/LS Series small block                   | .880  | M11 x 1.5   |            | 330-2802   |
| V8 with Tilton flywheel, uses 1/2" socket       | .875  | 7/16-20     |            | 330-2801   |
| <b>CHRYSLER</b>                                 |       |             |            |            |
| SL6, 3.9L V6 & 273-440 V8 w/ 6 bolt crank       | .875  | 7/16-20     |            | 240-2801   |
| Aftermarket 383-440 V8 & Hemi w/ 8 bolt crank   | .875  | 1/2-20      |            | 245-2801   |
| <b>FORD</b>                                     |       |             |            |            |
| 1.8L & 2.0L Duratec                             | .990  | M12 x 1.0   |            | 251-2802   |
| 2.0L Zetec                                      | .900  | M11 x 1.0   |            | 251-2801   |
| 2000cc Pinto                                    | 1.150 | M10 x 1.0   |            | 151-2801   |
| 4.6L & 5.4L Modular V8                          | 1.000 | M10 x 1.0   |            | 254-2801   |
| 289-460 V8                                      | 1.000 | 7/16-20     | 100-2801   | 200-2802   |
| 351 NASCAR V8, uses 3/4" socket                 | .925  | 7/16-20     |            | 350-2802   |
| V8 with Tilton flywheel, uses 1/2" socket       | .950  | 7/16-20     |            | 350-2801   |
| <b>HONDA</b>                                    |       |             |            |            |
| 1.5L & 1.6L SOHC, D Series (6 pcs.)             | .990  | M12 x 1.0   |            | 208-2801   |
| 1.6L, 1.7L, 1.8L & 2.0L DOHC, B Series (8 pcs.) | .990  | M12 x 1.0   |            | 208-2802   |
| <b>PONTIAC</b>                                  |       |             |            |            |
| Iron Duke 4 cylinder (12 pcs.)                  | .750  | 7/16-20     |            | 291-2801   |
| 350-455 V8 with washers (6 pcs.)                | 1.000 | 1/2-20      |            | 290-2802   |
| <b>ROVER</b>                                    |       |             |            |            |
| K Series (8 pcs.)                               | .826  | M10 x 1.0   |            | 206-2803   |
| <b>TOP FUEL</b>                                 |       |             |            |            |
| 8740 with washers (200,000 psi)                 | 1.000 | 1/2-20      |            | 200-2804   |
| L19 with washers (260,000 psi)                  | 1.000 | 1/2-20      |            | 200-2805   |
| <b>TOYOTA</b>                                   |       |             |            |            |
| 1.6L (4AGE) DOHC (8 pcs.)                       | 1.050 | M10 x 1.25  |            | 203-2802   |
| 2.0L (3SGTE) DOHC (8 pcs.)                      | 1.000 | M12 x 1.25  |            | 203-2801   |
| 2.2L (20R) & 2.4L (22R) (6 pcs.)                | 1.040 | M11 x 1.25  |            | 203-2803   |
| <b>VAUXHALL/OPEL</b>                            |       |             |            |            |
| 2.0L                                            | .985  | M10 x 1.25  |            | 209-2801   |

Red part numbers indicate new items

## FLEXPLATE BOLT KITS



| Application                                   | UHL  | Thread Size | High Perf. | Pro Series |
|-----------------------------------------------|------|-------------|------------|------------|
| <b>CHEVROLET</b>                              |      |             |            |            |
| 90° V6 & 265-454 V8 with 2pc. rear seal       | .680 | 7/16-20     | 100-2901   | 200-2902   |
| 90° V6 & 305-502 V8 with 1pc. rear seal       | .725 | 7/16-20     |            | 200-2906   |
| Gen III/LS Series small block                 | .880 | M11 x 1.5   |            | 244-2901   |
| <b>CHRYSLER</b>                               |      |             |            |            |
| SL6, 3.9L V6 & 273-440 V8 w/ 6 bolt crank     | .500 | 7/16-20     |            | 200-2903   |
| Aftermarket 383-440 V8 & Hemi w/ 8 bolt crank | .500 | 1/2-20      |            | 200-2905   |
| 5.9L 12V & 24V Dodge/Cummins diesel           | .700 | M12 x 1.25  |            | 147-2901   |
| <b>FORD</b>                                   |      |             |            |            |
| 2000cc & 2300cc Pinto                         | .800 | M10 x 1.0   |            | 251-2901   |
| 289-460 V8                                    | .680 | 7/16-20     | 100-2901   | 200-2902   |
| 4.6L & 5.4L Modular V8                        | .800 | M10 x 1.0   |            | 254-2901   |
| <b>PONTIAC</b>                                |      |             |            |            |
| 350-455 V8                                    | .675 | 1/2-20      |            | 200-2904   |

Red part numbers indicate new items

## TORQUE CONVERTER BOLTS

| Application                                                   | UHL   | Thread Size | Pro Series |
|---------------------------------------------------------------|-------|-------------|------------|
| <b>CHRYSLER</b>                                               |       |             |            |
| Torqueflite 727 & 904 w/ production converter                 | .450  | 5/16-24     | 240-7301   |
| Torqueflite 727 & 904 w/ aftermarket converter                | .500  | 7/16-20     | 240-7302   |
| <b>GENERAL MOTORS</b>                                         |       |             |            |
| Powerglide, TH350 & TH400 w/ production converter             | .750  | 3/8-24      | 230-7301   |
| Powerglide, TH350 & TH400 w/ most aftermarket converter       | .725  | 7/16-20     | 230-7302   |
| Powerglide, TH350 & TH400 w/ race converter - 1/2" thick tabs | 1.250 | 7/16-20     | 230-7303   |
| 200, 700, 4L60 & 4L80 (3pcs. car)                             | .590  | M10 x 1.5   | 230-7304   |
| 200, 700, 4L60 & 4L80 (6pcs. truck)                           | .590  | M10 x 1.5   | 230-7305   |
| Universal IMCA Brenn drive flange kit (6 bolts)               | 1.250 | 7/16-20     | 230-7306   |

Red part numbers indicate new items

You can forget about the problem of shearing a torque converter bolt after you install these super strong **200,000 psi** gems. They are designed for each specific application and provide the optimum grip. Kits come with hardened parallel-ground washers.



## AUTO TRANS PAN BOLT KITS

| Application           | 12-Point |
|-----------------------|----------|
| <b>GENERAL MOTORS</b> |          |
| Turbo 350-400         | 430-0401 |

Here's another area in which ARP provides a superior strength fastener that will provide better reliability than the OEM hardware. Made of rust-proof stainless steel, they're attractive, too. Includes washers.



## CLUTCH COVER/PRESSURE PLATE BOLT KITS

The importance of pressure plate bolts in a racing or hi-performance street application cannot be emphasized nearly enough. These fasteners play a key role in both the performance and safety of a vehicle. Because of this, ARP has developed special pressure plate bolts that are application specific to ensure the optimum grip length. ARP offers High Performance Series bolts that are made from a premium grade chrome moly and hardened to a nominal tensile strength of **180,000 psi**. The Pro Series bolts, originally developed for NASCAR Winston Cup competition, are stronger and rated at **200,000 psi**. Both models feature a large diameter, low-profile design. Complete with washers.



| Application                                       | Thread Size | High Perf. | Pro Series |
|---------------------------------------------------|-------------|------------|------------|
| <b>CHEVROLET</b>                                  |             |            |            |
| 265-502 V8                                        | 3/8-16      | 130-2201   | 230-2202   |
| V8 with Tilton flywheel and 3 disk AP clutch      | 5/16-24     |            | 330-2202   |
| V8 with Tilton flywheel (1.500 UHL bolts)         | 5/16-24     |            | 330-2203   |
| Gen III/LS Series small block                     | M10 x 1.50  | 134-2201   |            |
| <b>FORD</b>                                       |             |            |            |
| 289-460 V8 (1985 & earlier)                       | 5/16-18     | 150-2201   | 250-2201   |
| 302-351W V8 (1986-95)                             | M8 x 1.25   | 150-2202   |            |
| V8 w/ Tilton flywheel and 3 disk AP clutch (hex)  | 5/16-24     |            | 350-2202   |
| V8 w/ Tilton flywheel and 3 disk AP clutch (12pt) | 5/16-24     |            | 350-2203   |
| <b>HONDA</b>                                      |             |            |            |
| SOHC D Series (6 pcs.)                            | M8 x 1.25   | 108-2201   |            |
| DOHC B Series (9 pcs.)                            | M8 x 1.25   | 108-2202   |            |
| <b>PONTIAC</b>                                    |             |            |            |
| 350-455 V8                                        | 3/8-16      | 190-2201   | 290-2201   |

Red part numbers indicate new items



## BELLHOUSING STUD KITS

Here's just what you need to secure a bellhousing in place. The studs are designed with a radiused head to position the bellhousing and accept nuts without the fear of cross-threading. Choice of rugged 8740 heat-treated alloy or rust-proof stainless steel. Complete with nuts and flat washers.



| Application                          | Dia. | Length | Pro Series | Stainless |
|--------------------------------------|------|--------|------------|-----------|
| Chevy, Chrysler KB Hemi              | 3/8  | 2.000  | 245-0901   | 445-0901  |
| Top fuel motor plate, std.           | 7/16 | 2.400  | 245-0201   |           |
| Top fuel motor plate, w/ 1/4" spacer | 7/16 | 2.150  | 245-0202   |           |

## PUMP & LOWER PULLEY BOLTS

To provide the reliability required in racing and high performance street applications, ARP offers premium grade **170,000 psi** fasteners to securely attach the water pump and lower pulleys. You can count on them to perform. Washers included.



| Application                     | Thread  | UHL   | Socket Size | High Perf. | Stainless |
|---------------------------------|---------|-------|-------------|------------|-----------|
| <b>LOWER PULLEY</b>             |         |       |             |            |           |
| <b>CHEVROLET</b>                |         |       |             |            |           |
| SB & BB, 12 pt, 3-pc.           | 3/8-24  | .750  | 3/8         |            | 430-6801  |
| SB & BB, 12 pt, 3-pc.           | 3/8-24  | 2.125 | 1/2         | 334-6801   |           |
| <b>FORD</b>                     |         |       |             |            |           |
| 12 pt, 3-pc.                    | 3/8-16  | 1.000 | 3/8         | 350-6801   | 450-6803  |
| 12 pt, 4-pc.                    | 3/8-16  | 1.000 | 3/8         | 350-6802   | 450-6803  |
| <b>WATER PUMP PULLEY, 12 PT</b> |         |       |             |            |           |
| 12 pt, 4-pc.                    | 5/16-24 | .750  | 3/8         |            | 430-6802  |

## STAINLESS STEEL REAR END COVER

| Application | UHL  | Thread  | Part No. |
|-------------|------|---------|----------|
| <b>GM</b>   |      |         |          |
| 10-bolt     | .750 | 5/16-18 | 437-3001 |
| 12-bolt     | .750 | 5/16-18 | 437-3002 |

Here's an easy way to enhance the appearance of any GM 10 or 12-bolt rear end setup. ARP's stainless steel rear end cover bolts offer a lustrous contrast to a painted OEM cover or perfectly compliment a chrome plated aftermarket version. These sturdy **170,000 psi** bolts are much stronger than stock (or even Grade 8) hardware, have precision machined threads for secure engagement, and won't rust. The best! Washers included.



## MOTOR MOUNT BOLTS

Secure any engine with complete confidence with ARP's rugged motor mount bolts. You can choose between black oxide finished 8740 chrome moly or corrosion-resistant stainless steel; choice of hex or 12-point head. Kits come complete with flat washers.

| Application                                          | Black Oxide |          | Stainless 300 |          |
|------------------------------------------------------|-------------|----------|---------------|----------|
|                                                      | Hex         | 12-Point | Hex           | 12-Point |
| <b>CHEVROLET</b>                                     |             |          |               |          |
| V6 & V8 mount to block                               | 130-3102    | 130-3101 | 430-3102      | 430-3101 |
| V6 & V8 mount to frame                               | 130-3105    |          | 430-3105      |          |
| Gen III/LS Series small block mount bracket to block | 134-3102    | 134-3101 | 434-3102      | 434-3101 |
| <b>FORD</b>                                          |             |          |               |          |
| 289-302-351W                                         | 150-3102    | 150-3101 | 450-3102      | 450-3101 |
| <b>PONTIAC</b>                                       |             |          |               |          |
| All V8                                               | 190-3102    | 190-3101 | 490-3102      | 490-3101 |



## RING GEAR BOLT KITS

The tremendous shock loads generated at launch by most any drag racing vehicle equipped with today's sticky tire compounds or the acceleration and deceleration of oval track cars put considerable strain on the ring gear. For this reason, the fastener experts at ARP have developed the Pro Series ring gear bolts. They're forged from premium grade 8740 chrome moly steel and are heat-treated to a nominal rating of **200,000 psi** tensile strength. Specially hardened, precision-ground washers are included where required. Available to fit most any ring gear setup ranging from popular 9" Ford GM 10 & 12-bolt rear ends to the beefy Strange differentials found in Top Fuel and Funny Car applications.



### TECH NOTE

It is critically important to properly tighten ring gear bolts and make sure they don't loosen. This is especially important in drag cars with tire shake. It's also a good idea to check bolt tightness on a routine basis. If you use a locking compound (like Loc-Tite), it is best to install the ring gear first without any compound, then remove the bolts one at a time, reinstalling them with the compound. Be sure and torque each bolt before going on to the next one, because the Loc-Tite sets up fast. Install and torque the bolts in an alternating or crossing pattern to distribute the load evenly around the ring gear.

| Application                                   | UHL   | Thread     | Part No. |
|-----------------------------------------------|-------|------------|----------|
| <b>CHRYSLER</b>                               |       |            |          |
| 7 1/4" and 8 3/4" (1972 & earlier) .390 grip  | .835  | 3/8-24 LH  | 240-3001 |
| Clutch-type LSD- case half bolts with washers | 2.800 | 3/8-24 LH  | 250-3006 |
| <b>FORD</b>                                   |       |            |          |
| 8" ring gear bolt kit with washers            | .940  | 7/16-20    | 250-3009 |
| 9" uses 5/8" socket                           | .940  | 7/16-20    | 250-3002 |
| 8.8" and 9" uses 3/4" socket                  | .750  | 7/16-20    | 250-3003 |
| Ring gear bolt kit with washers, 1/2" shank   | 1.060 | 7/16-20    | 350-3004 |
| <b>GENERAL MOTORS</b>                         |       |            |          |
| 10 and 12-bolt                                | .800  | 3/8-24     | 230-3001 |
| Camaro/Pickup Truck                           | .850  | 7/16-20 LH | 230-3002 |
| <b>STRANGE</b>                                |       |            |          |
| Top Fuel differential with washers            | 1.200 | 7/16-20    | 250-3001 |
| <b>VOLKSWAGEN</b>                             |       |            |          |
| VW 020 ring gear bolt kit with 12pt nuts      | 1.200 | M9 x 1.00  | 204-3001 |
| VW 02A ring gear bolt kit with 12pt nuts      | 1.180 | M10 x 1.25 | 204-3002 |
| VW 02M ring gear bolt kit with 12pt nuts      | 1.100 | M9 x 1.00  | 204-3003 |

Red part numbers indicate new items

## CARRIER FASTENERS

When assembling a rear end, optimum reliability can be obtained by employing these rugged chrome moly bolts and studs.



| Application                                | UHL   | Thread           | Part No. |
|--------------------------------------------|-------|------------------|----------|
| <b>FORD</b>                                |       |                  |          |
| 8" carrier bearing stud kit                | 2.600 | 7/16-14, 7/16-20 | 250-3008 |
| 8" and 9" pinion support bolt kit          | 1.000 | 3/8-16           | 250-3007 |
| 9" carrier bearing stud kit                | 3.250 | 1/2-13, 1/2-20   | 250-3004 |
| 9" carrier bearing stud kit, H case (hex)  | 3.400 | 1/2-13, 1/2-20   | 250-3012 |
| 9" carrier bearing stud kit, H case (12pt) | 3.400 | 1/2-13, 1/2-20   | 250-3013 |
| 9" housing stud kit (10 pcs.)              | 1.645 | 3/8-24           | 250-3005 |
| 9" pinion support stud kit (12 pt, ss)     | 2.000 | 3/8-16, 3/8-24   | 250-3010 |
| 9" pinion support stud kit (hex, ss)       | 2.000 | 3/8-16, 3/8-24   | 250-3011 |
| 9" pinion support stud kit (12 pt, blk)    | 2.000 | 3/8-16, 3/8-24   | 250-3020 |
| 9" pinion support stud kit (hex, blk)      | 2.000 | 3/8-16, 3/8-24   | 250-3021 |

Red part numbers indicate new items

## BRAKE HAT BOLT KITS

The perfect upgrade for many original brake hat bolts, this ARP kit features bolts produced from only the finest quality 8740 chrome moly. Features an exclusive 12-point cap screw design and appropriate grip length per the application. All ARP brake hat bolts are drilled to permit safety wiring. Rated **200,000 psi** tensile strength.

| Application          | UHL  | Part No. |
|----------------------|------|----------|
| 5/16-24 with washers | .880 | 300-0801 |
| 5/16-18 with washers | .850 | 300-0802 |
| 1/4-28 (48 pcs.)     | .750 | 300-0803 |

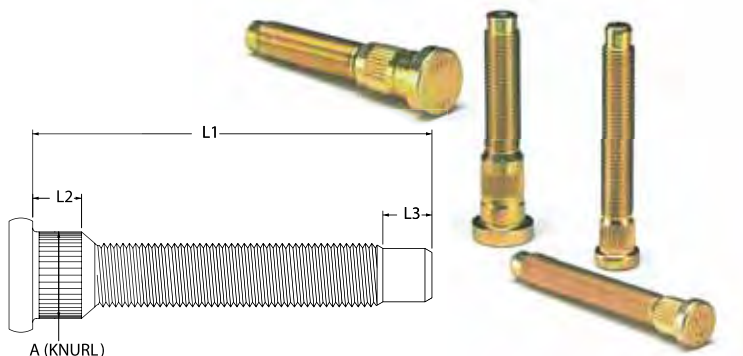


800-826-3045

**ARP**  
automotive Racing products

## WHEEL STUDS

ARP's heat-treated 8740 chrome moly wheel studs are a much-needed replacement for any car engaged in oval track or drag racing competition. They have a tensile strength of **200,000 psi** and are able to easily handle the tremendous acceleration shock loads (shear) and lateral forces (elongation) found in racing. The studs are sold in 4 or 5 packs and are cadmium plated for extra durability. Nuts not included. Now available for all popular applications, including General Motors, Ford, Honda and Chrysler replacements, as well as for oval track racing and aftermarket street and strip axes.



| Application                                              | A<br>Knurl Dia. | L1<br>UHL | L2<br>Knurl Length | L3<br>Nose Length | Thread<br>Size | Part No. |
|----------------------------------------------------------|-----------------|-----------|--------------------|-------------------|----------------|----------|
| <b>CHRYSLER</b>                                          |                 |           |                    |                   |                |          |
| Chrysler, rear                                           | .680            | 3.125     | .400               | .400              | 1/2-20         | 100-7705 |
| <b>DODGE</b>                                             |                 |           |                    |                   |                |          |
| Neon, front                                              | .585            | 2.450     | .256               | .360              | M12 x 1.5      | 100-7721 |
| <b>FORD</b>                                              |                 |           |                    |                   |                |          |
| Ford, rear disc brakes/Chrysler front                    | .625            | 3.500     | .400               | .437              | 1/2-20         | 100-7703 |
| Ford, front disc brakes, early                           | .618            | 3.050     | 1.000              | .250              | 1/2-20         | 100-7707 |
| Mustang II front                                         | .554            | 3.435     | .390               | .435              | 1/2-20         | 100-7714 |
| Mustang (2005 & later) front                             | .550            | 3.315     | .300               | .300              | 1/2-20         | 100-7722 |
| Mustang (2005 & later) rear                              | .615            | 3.115     | .300               | .300              | 1/2-20         | 100-7723 |
| <b>GM</b>                                                |                 |           |                    |                   |                |          |
| Late GM drum brake                                       | .486            | 3.165     | .420               | .308              | 7/16-20        | 100-7701 |
| Late GM disc brake and early drum brake                  | .580            | 3.200     | .300               | .305              | 7/16-20        | 100-7702 |
| Late GM Camaro, Firebird, Corvette                       | .509            | 2.500     | .315               | none              | M12 x 1.5      | 100-7708 |
| Late GM Camaro, Firebird, Corvette                       | .509            | 3.250     | .315               | none              | M12 x 1.5      | 100-7713 |
| <b>HONDA</b>                                             |                 |           |                    |                   |                |          |
| Stock replacement (1996 & earlier) 4 pack                | .485            | 1.850     | .275               | .350              | M12 x 1.5      | 100-7709 |
| Stock replacement (1997 & later) 5 pack                  | .485            | 1.850     | .275               | .350              | M12 x 1.5      | 100-7710 |
| Extended length (1996 & earlier) 4 pack                  | .485            | 2.850     | .275               | .350              | M12 x 1.5      | 100-7711 |
| Extended length (1997 & later) 5 pack                    | .485            | 2.850     | .275               | .350              | M12 x 1.5      | 100-7712 |
| <b>LEXUS</b>                                             |                 |           |                    |                   |                |          |
| IS 300                                                   | .558            | 2.600     | .230               | none              | M12 x 1.5      | 100-7715 |
| <b>MAZDA</b>                                             |                 |           |                    |                   |                |          |
| Miata, front and rear (1990-93) & front (1994-05) 4 pack | .507            | 2.750     | .335               | .350              | M12 x 1.5      | 100-7719 |
| Miata, rear (1994-05) 4 pack                             | .579            | 2.750     | .300               | .350              | M12 x 1.5      | 100-7720 |
| <b>MITSUBISHI</b>                                        |                 |           |                    |                   |                |          |
| Lancer EVO VIII                                          | .565            | 3.000     | .270               | .350              | M12 x 1.5      | 100-7717 |
| <b>SUBARU</b>                                            |                 |           |                    |                   |                |          |
| WRX                                                      | .565            | 3.000     | .270               | .350              | M12 x 1.25     | 100-7716 |
| <b>TOYOTA</b>                                            |                 |           |                    |                   |                |          |
| Celica GTS (1986-89) front                               | .565            | 2.340     | .325               | .363              | M12 x 1.5      | 100-7718 |
| <b>OTHERS</b>                                            |                 |           |                    |                   |                |          |
| Aftermarket axes, 12 pt style head                       | none            | 3.470     | none               | .500              | 1/2-20         | 100-7704 |
| Speedway Eng, Pro 4 disc                                 | .568            | 2.970     | .710               | .465              | 1/2-20         | 100-7706 |

Red part numbers indicate new items

## DRIVE PLATE BOLT KITS

Developed for racers who leave nothing to chance, ARP's special drive plate bolts have many important features, including use of a premium grade chrome moly alloy, heat-treating to **200,000 psi**, J-form thread rolling after heat-treat and a special profile. The bolts come with special precision-ground washers.



## SPRINT CAR DRIVE PINS

ARP sprint car drive pins feature a broached hex for ease of installation and proper pre-load while the rounded end facilitates quick, positive wheel location. All critical shear points feature a large radius for improved reliability and maximum load carrying capacity. Drive pins are rated **200,000 psi** tensile strength.



| Application                       | UHL   | Part No. |
|-----------------------------------|-------|----------|
| 7/16-14, 12 pt, drilled (8 pcs.)* | 1.500 | 200-3401 |
| 7/16-14, 12 pt, drilled (5 pcs.)* | 1.500 | 200-3402 |

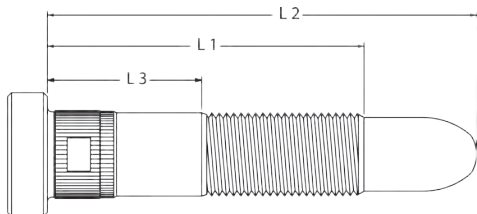
| Application       | UHL    | Part No. |
|-------------------|--------|----------|
| Front, 2.450" OAL | 1/2-20 | 200-2601 |
| Rear, 3.275" OAL  | 1/2-20 | 200-2602 |





NOTE: The products listed in this section have been designed to comply with NASCAR® rules. No specific endorsement by NASCAR® is implied.

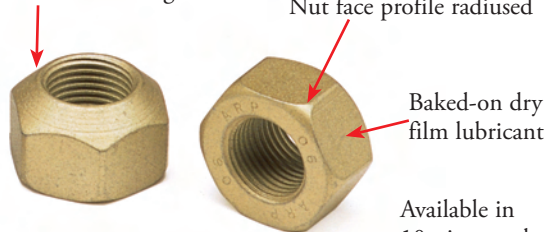
## SPEED STUDS™



Because races can be won or lost in the pits, the engineers at ARP set about to create the ultimate oval track competition wheel stud that facilitates accurate wheel positioning and quicker release/tightening of lug nuts. ARP's new "Speed Studs" (and companion "Speed Nuts") are so good that a large number of NASCAR teams in Sprint Cup, Nationwide and Camping World Truck series use them exclusively. They're made from heat-treated **190,000 psi** chrome moly steel and feature precision J-form threads (formed after heat-treat for improved fatigue strength), exclusive nut-starter and bullet shape radius that all but eliminates cross-threading, shot-peening, special baked-on dry film lubricant (reduces possibility of galling and assures consistent clamp loads), and double magnaflux inspection. A new head design is employed that fits the registers of all popular hubs without grinding, and studs are available in 27 underhead lengths to provide you with the optimum thread engagement for your particular setup. The finest studs available!

## SPEED NUTS™

190,000 PSI tensile strength



Available in 10-piece packs

Designed for professional racing environments where split-second improvements in pit stop times can make the winning difference, and "unbustable" reliability is an absolute must. ARP's Speed Nuts feature a profiled nut face for easy installation, quicker socket releases and resistance to jamming. They're made from premium heat-treated chrome moly that's nominally rated at **190,000 psi** tensile strength, shot-peened to remove stress risers and double magnafluxed after heat-treating and thread-forming to assure 100% metallurgical integrity. Coated with Alumotef III gold coating. Speed Nuts are ready for "instant" use (thread chasing not required).

| Application                   | UHL    | Part No. |
|-------------------------------|--------|----------|
| NASCAR, 10-piece, fine        | 5/8-18 | 300-7801 |
| IMCA Wide 5, 10-piece, coarse | 5/8-11 | 300-7802 |



| L1 - Thread Length                                                  | L2 - UHL | L3 - Knurl Length | Kit Number |
|---------------------------------------------------------------------|----------|-------------------|------------|
| <b>FINE THREAD (THREAD SPECS - 5/8-18, KNURL DIAMETER - .660)</b>   |          |                   |            |
| 1.600                                                               | 2.450    | .500              | 300-7710   |
| 1.700                                                               | 2.550    | .600              | 300-7711   |
| 1.750                                                               | 2.600    | .650              | 300-7725   |
| 1.800                                                               | 2.650    | .700              | 300-7712   |
| 1.850                                                               | 2.700    | .750              | 300-7726   |
| 1.900                                                               | 2.750    | .675              | 300-7705   |
| 1.950                                                               | 2.800    | .850              | 300-7727   |
| 2.000                                                               | 2.850    | .900              | 300-7713   |
| 2.050                                                               | 2.900    | .825              | 300-7706   |
| 2.100                                                               | 2.950    | 1.000             | 300-7714   |
| 2.150                                                               | 3.000    | 1.050             | 300-7728   |
| 2.200                                                               | 3.050    | 1.100             | 300-7715   |
| 2.250                                                               | 3.100    | 1.150             | 300-7734   |
| 2.300                                                               | 3.150    | 1.200             | 300-7716   |
| 2.350                                                               | 3.200    | 1.250             | 300-7729   |
| 2.400                                                               | 3.250    | 1.200             | 300-7707   |
| 2.450                                                               | 3.300    | 1.250             | 300-7730   |
| 2.500                                                               | 3.350    | 1.400             | 300-7717   |
| 2.550                                                               | 3.400    | 1.350             | 300-7708   |
| 2.600                                                               | 3.450    | 1.500             | 300-7718   |
| 2.650                                                               | 3.500    | 1.550             | 300-7731   |
| 2.700                                                               | 3.550    | 1.600             | 300-7719   |
| 2.750                                                               | 3.600    | 1.550             | 300-7709   |
| 2.800                                                               | 3.650    | 1.700             | 300-7720   |
| 2.850                                                               | 3.700    | 1.750             | 300-7732   |
| 2.900                                                               | 3.750    | 1.800             | 300-7721   |
| 2.950                                                               | 3.800    | 1.850             | 300-7733   |
| 3.000                                                               | 3.850    | 1.900             | 300-7722   |
| 3.100                                                               | 3.950    | 2.000             | 300-7723   |
| 3.200                                                               | 4.050    | 2.100             | 300-7724   |
| <b>COARSE THREAD (THREAD SPECS - 5/8-11, KNURL DIAMETER - .685)</b> |          |                   |            |
| 1.900                                                               | 2.650    | .500              | 300-7806*  |
| 1.850                                                               | 2.650    | .950              | 300-7803*  |
| 3.220                                                               | 4.031    | .750              | 300-7804*  |

\* These kits have black oxide finish.

Note: All Speed Stud applications fit Stock Car Products and Speedway Engineering Hubs without grinding or modifications.



No. 07 Jack Daniel's car, driven by Casey Mears



Jeff Burton drives the Caterpillar Chevy for Richard Childress Racing

## INTAKE MANIFOLD BOLT KITS



Not only will these premium quality ARP fasteners help prevent intake manifold leaks, but **one is drilled to allow for a safety wire**. What's more, they're rated at **170,000 psi** and feature precision rolled threads for optimum engagement, to prevent galling and promote more consistent torque loading. Wide under-head flange design and companion flat washers provide even load distribution and facilitates optimum sealing of gasket surfaces. Made of corrosion resistant stainless steel. Washers included and bolt drilled for NASCAR inspector's wire lock.

| Application                             | Part No. |
|-----------------------------------------|----------|
| <b>CHEVROLET</b>                        |          |
| SB 2, drilled                           | 334-2104 |
| SB 2, tall deck                         | 334-2105 |
| Small block, 1.000", drilled            | 334-2102 |
| Small block, 1.250", drilled            | 334-2103 |
| V6 Chevy 90°, 1.000", drilled           | 333-2101 |
| <b>FORD</b>                             |          |
| SVO 351 cid, Jack Roush design, drilled | 354-2102 |

## DRILLED HEADER BOLTS

ARP offers special NASCAR header bolts that have been drilled for use of safety wire. They are made from heat-treated 8740 chrome moly steel (with a black oxide finish - rated at **180,000 psi**) or Stainless 300 that is polished to a bright shine (nominally rated at **170,000 psi** tensile strength – considerably stronger than Grade 8 hardware), and engineered to provide complete reliability in the most severe racing environments. They are available in hex or 12-point heads. Through use of safety wire, exhaust headers will maintain original tightness and can't back off!



| Application                | Qty | Dia. | UHL  | Wrenching | Black Oxide |          | Stainless 300 |          |
|----------------------------|-----|------|------|-----------|-------------|----------|---------------|----------|
|                            |     |      |      |           | Hex         | 12-Point | Hex           | 12-Point |
| CHEVROLET                  |     |      |      |           |             |          |               |          |
| Chevy small block, drilled | 12  | 3/8  | .750 | 3/8       | 100-1103    | 100-1203 | 400-1103      | 400-1203 |
| Chevy big block, drilled   | 16  | 3/8  | .875 | 3/8       |             |          | 400-1104      | 400-1204 |
| UNIVERSAL                  |     |      |      |           |             |          |               |          |
| Universal, drilled         | 16  | 3/8  | .750 | 3/8       |             |          | 400-1105      | 400-1205 |
| Universal, drilled         | 12  | 3/8  | .875 | 3/8       |             |          | 400-1106      | 400-1206 |

## BRAKE HAT BOLT KITS



The perfect upgrade for many original brake hat bolts, this ARP kit features bolts produced from only the finest quality 8740 chrome moly. Features an exclusive 12-point cap screw design and appropriate grip length per the application. All brake hat bolts are drilled for safety wire lock. Rated **200,000 psi** tensile strength.

| Application        | UHL  | Part No. |
|--------------------|------|----------|
| 5/16-24, 32 pieces | .880 | 300-0801 |
| 5/16-18, 32 pieces | .850 | 300-0802 |
| 1/4-28, 48 pieces  | .750 | 300-0803 |

JACK DANIEL'S OLD NO. 7 BRAND, the stylized no. 07 and PACE YOURSELF, DRINK RESPONSIBLY are all trademarks of Jack Daniel's Properties, Inc. The RCR checkered flag logo is a registered trademark of RCR Enterprises, LLC. CLINT BOWYER and Clint Bowyer's autograph are trademarks of Clint Bowyer, Inc. All trademarks, personal likenesses and the likeness of the no. 07 race car are used under license from their owners. The stylized no. 31 and the RCR checkered flag logo are registered trademarks of RCR Enterprises, LLC. JEFF BURTON and Jeff Burton's autograph are trademarks of Jeff Burton Autosports, Inc. CAT, CATERPILLAR, CAT RACING, their respective logos, "Caterpillar Yellow," the POWER EDGE trade dress, other marks and corporate identity used herein are trademarks of Caterpillar and may not be used without permission. All trademarks, personal likenesses and the likeness of the no. 31 race car are used under license from their owners.

## DRILLED CARB STUDS



The best way to make sure that carburetors stay perfectly sealed to the intake manifold is through the use of ARP's carb studs, which feature J-form threads to resist loosening from vibration. They're offered in a variety of heights to accommodate most any combination of carb and spacer, and are available in 8740 chrome moly with a black oxide finish or rust-proof stainless steel. Special NASCAR type studs have **one of the studs drilled** to facilitate sealing the carb by race officials. All carb stud kits come with hex nuts and washers.



| Application                                        | OAL         | Pieces | Part No. |
|----------------------------------------------------|-------------|--------|----------|
| Standard, drilled for NASCAR wire seal             | 1.700       | 4      | 300-2401 |
| 1/2" spacer, drilled for NASCAR wire seal          | 2.225       | 4      | 300-2402 |
| 1" spacer, drilled for NASCAR wire seal            | 2.700       | 4      | 300-2403 |
| 2" spacer, drilled for NASCAR wire seal            | 3.700       | 4      | 300-2404 |
| 2" spacer, drilled for NASCAR wire seal            | 1.700/2.225 | 8      | 300-2406 |
| 1" Moroso spacer, drilled for NASCAR wire seal     | 2.700       | 4      | 300-2407 |
| 1-1/4" Moroso spacer, drilled for NASCAR wire seal | 3.200       | 4      | 300-2408 |
| 2" Moroso spacer, drilled for NASCAR wire seal     | 1.250/1.700 | 8      | 300-2409 |

## ALTERNATOR STUDS



Strange as it may seem, there have been many races lost in oval track, off-road and endurance competition due to the OEM alternator stud failing and the subsequent loss of electrical power. To prevent this from ever happening, conscientious engine builders rely on ARP's "bulletproof" alternator studs. They're made from a premium grade 8740 chrome moly steel alloy and heat treated to a nominal **200,000 psi** tensile strength. They are very rigid and won't bend under the stress of competition, eliminating problems with alternator pulley alignment. Here's more reliable "insurance" from the innovators at ARP. Available in 5.000" and 5.250" lengths. Includes a 12-point nut and flat washer.

| Description | OAL   | Coarse Thread Length | Fine Thread Length | Part No. |
|-------------|-------|----------------------|--------------------|----------|
| 7/16 stud   | 5.000 | 1.000                | 1.000              | 300-0501 |
| 7/16 stud   | 5.250 | 1.000                | 1.000              | 300-0502 |

## FRONT MANDREL BOLTS

Get maximum reliability through the use of ARP's rugged 8740 chrome moly steel front mandrel bolts. They're undercut to provide the required stretch, shot-peened for extra durability and designed for full thread engagement. Nominally rated at **200,000 psi** tensile strength for durability you can count on! Available for GM and Ford applications.



| Application    | Dia. | Length | Thread Length | Socket Size | Head Style | Part No. |
|----------------|------|--------|---------------|-------------|------------|----------|
| GENERAL MOTORS |      |        |               |             |            |          |
|                | 7/16 | 6.000  | 1.100         | 1/2         | 12-point   | 330-0701 |
|                | 1/2  | 6.000  | 1.100         | 9/16        | 12-point   | 330-0702 |
|                | 7/16 | 6.250  | 1.150         | 9/16        | 12-point   | 330-0703 |
|                | 1/2  | 4.000  | .750          | 15/16       | Hex        | 330-0704 |
|                | 1/2  | 4.000  | .625          | 15/16       | Hex        | 330-0705 |
|                | 1/2  | 3.750  | .625          | 15/16       | Hex        | 330-0706 |
|                | 1/2  | 3.250  | .750          | 15/16       | Hex        | 330-0707 |
|                | 7/16 | 5.000  | 1.000         | 1/2         | 12-point   | 330-0708 |
|                | 7/16 | 5.500  | 1.000         | 1/2         | 12-point   | 330-0709 |
| FORD           |      |        |               |             |            |          |
|                | 5/8  | 8.000  | 1.100         | 15/16       | Hex        | 350-0701 |
|                | 5/8  | 8.375  | 1.000         | 15/16       | Hex        | 350-0702 |
|                | 5/8  | 7.000  | 1.000         | 15/16       | Hex        | 350-0703 |

800-826-3045



# THE WORLD'S FASTEST SPORT COMPACT COMPETITORS RELY ON ARP FASTENERS!



Hubie Fuh's amazing Mini features ARP



Titan Motorsports Toyota on the starting line.

## CONNECTING ROD BOLTS

ARP manufactures replacement rod bolts for many popular import and domestic Sport Compact engines that are made of premium grade 8740 chrome moly steel and heat treated to a nominal tensile strength of **200,000 psi**. Threads are rolled after heat treat to ensure optimum fatigue strength. They are far superior to OEM fasteners in terms of durability and service life – fully capable of handling the extra stress of high combustion pressure engines. For extreme applications, rod bolts made of special ARP2000 material (rated at a **220,000 psi** nominal tensile strength) are available, including those with the patented Wave-Loc design. Special high strength bolts also available for aftermarket connecting rods. Call for details.

### TECH TIP: Measuring Rod Bolt Stretch

The most accurate method of obtaining the correct torque load on a connecting rod bolt is through measuring the amount of bolt stretch. This is preferred to using a torque wrench. *See chart on page 25* for the appropriate amount to stretch a rod bolt over its relaxed state. ARP's rod bolt stretch gauge (*see page 88*) can also be used to determine the condition of a rod bolt. If it has permanently stretched .001" or more, the bolt has been compromised beyond its yield. Replace it immediately! Use the rod bolt stretch chart *on page 28* (or a version thereof) to keep track of the bolt's length at installation and prior to removal.

| Application                             | Head Style | Hi-Perf 8740 (complete) | Hi-Perf 8740 (2-PC) | HP Wave 8740 (complete) | HP Wave 8740 (2-PC) | Pro Wave ARP2000 (complete) | Pro Wave ARP2000 (2-PC) | Pro Series ARP2000 (complete) | Pro Series ARP2000 (2-PC) |
|-----------------------------------------|------------|-------------------------|---------------------|-------------------------|---------------------|-----------------------------|-------------------------|-------------------------------|---------------------------|
| <b>ALFA ROMEO</b>                       |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 2.0L GTV                                | A          | 126-6101                |                     |                         |                     |                             |                         |                               |                           |
| <b>BMC/TRIUMPH/ROVER</b>                |            |                         |                     |                         |                     |                             |                         |                               |                           |
| A Series 3/8"                           | J          | 206-6001                | 206-6021            |                         |                     |                             |                         |                               |                           |
| A & B Series 11/32"                     | C          | 206-6002                |                     |                         |                     |                             |                         |                               |                           |
| B-Series (1964-68) 18GB & 18GF 3/8"     | E          | 206-6003                |                     |                         |                     |                             |                         |                               |                           |
| K-Series                                | E          | 206-6007                |                     |                         |                     |                             |                         |                               |                           |
| 1.3L & 1.5L Spitfire                    | E          |                         |                     |                         |                     |                             |                         | 206-6004                      |                           |
| 2.0L GT6 & 2.5L TR6                     | E          |                         |                     |                         |                     |                             |                         | 206-6005                      |                           |
| 2.0L SOHC TR7                           | K          | 206-6006                |                     |                         |                     |                             |                         |                               |                           |
| <b>BMW</b>                              |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 1.6L Mini Cooper M8 x 43MM UHL          | E          | 206-6008                |                     |                         |                     |                             |                         |                               |                           |
| 2.3L (S14) M11 x 41 MM UHL              | E          |                         |                     |                         |                     |                             |                         | 201-6104                      |                           |
| 2.5L (M50/M50TU) inline 6 M9 x 53MM UHL | E          |                         |                     |                         |                     |                             |                         | 201-6301                      |                           |
| 3.0L (S50 EURO) inline 6 M10 x 45MM UHL | E          |                         |                     |                         |                     |                             |                         | 201-6102                      |                           |
| 3.2L (S54) inline 6 M11 x 47MM UHL      | E          |                         |                     |                         |                     |                             |                         | 201-6103                      |                           |
| 4.4L (M62/M62TU) V8 M9 x 53MM UHL       | E          |                         |                     |                         |                     |                             |                         | 201-6302                      |                           |
| <b>FORD, 4 AND 6-CYLINDER</b>           |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 1.6L CVH M8                             | E          | 151-6004                |                     |                         |                     |                             |                         |                               |                           |
| 1.6L Zetec M8                           | E          | 151-6003                | 151-6023            |                         |                     |                             |                         |                               |                           |
| 1.8L Duratec                            | E          |                         |                     |                         |                     |                             |                         | 251-6202                      |                           |
| 2.0L DOHC Cosworth Sierra/Escort        | E          |                         |                     |                         |                     |                             |                         | 251-6301                      |                           |
| 2.0L RS 2000 M8                         | E          |                         |                     |                         |                     |                             |                         | 251-6201                      | 251-6222                  |
| 2.0L Zetec M9                           | E          | 151-6005                |                     |                         |                     |                             |                         |                               |                           |
| 2000cc Pinto                            | D          | 151-6001                | 151-6021            |                         |                     |                             |                         |                               |                           |
| 2300cc Pinto                            | F          | 151-6002                | 151-6022            |                         |                     | 251-6402                    | 251-6422                |                               |                           |
| 2.8L & 2.9L V6                          | B          | 153-6001                |                     |                         |                     |                             |                         |                               |                           |
| <b>HOLDEN</b>                           |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 11/32"                                  | B          | 205-6002                |                     |                         |                     |                             |                         |                               |                           |
| 3/8"                                    | B          | 205-6001                |                     |                         |                     |                             |                         |                               |                           |

Red part numbers indicate new items

| Application                                                                         | Head Style | Hi-Perf 8740 (complete) | Hi-Perf 8740 (2-PC) | HP Wave 8740 (complete) | HP Wave 8740 (2-PC) | Pro Wave ARP2000 (complete) | Pro Wave ARP2000 (2-PC) | Pro Series ARP2000 (complete) | Pro Series ARP2000 (2-PC) |
|-------------------------------------------------------------------------------------|------------|-------------------------|---------------------|-------------------------|---------------------|-----------------------------|-------------------------|-------------------------------|---------------------------|
| <b>HONDA/ACURA</b>                                                                  |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 1.2L, 1.6L & 1.8L M8                                                                | A          | 208-6001                |                     |                         |                     |                             |                         |                               |                           |
| 1.6L & 1.8L M9                                                                      | A          |                         |                     |                         |                     |                             |                         | 208-6401                      |                           |
| 2.0L (F20C) & 2.2L (F22C) S2000                                                     | E          |                         |                     |                         |                     |                             |                         | 208-6002                      |                           |
| 2.0L (K20A)                                                                         | E          |                         |                     |                         |                     |                             |                         | 208-6003                      |                           |
| 3.0L (C30A) V6 Acura NSX M9                                                         |            |                         |                     |                         |                     |                             |                         | 208-6004                      |                           |
| 3.2L (C32B) V6 Acura NSX M8                                                         |            |                         |                     |                         |                     |                             |                         | 208-6005                      |                           |
| <b>LANCIA</b>                                                                       |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 2.0L SOHC 8V & DOHC 16V Turbo                                                       | E          |                         |                     |                         |                     |                             |                         | 275-6001                      |                           |
| <b>MAZDA</b>                                                                        |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 1.6L (B6) & 1.8L (BP) DOHC Miata M9                                                 | K          | 118-6401                |                     |                         |                     |                             |                         |                               |                           |
| <b>MITSUBISHI</b>                                                                   |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 2.0L (4B11) (2008 & later)                                                          | E          |                         |                     |                         |                     |                             |                         | 207-6002                      |                           |
| 2.0L (4G63) (1993 & earlier) M9                                                     | C          | 107-6001                | 107-6021            |                         |                     |                             |                         |                               |                           |
| 2.0L (4G63) (1994-07) M8                                                            | A          | 107-6002                | 107-6022            |                         |                     |                             |                         |                               |                           |
| 2.6L (G54B)                                                                         | C          | 107-6003                | 107-6023            |                         |                     |                             |                         |                               |                           |
| 3.0L (6G72) & 3.5L (6G74) V6                                                        | C          | 107-6004                | 107-6024            |                         |                     |                             |                         |                               |                           |
| <b>NISSAN/DATSUN</b>                                                                |            |                         |                     |                         |                     |                             |                         |                               |                           |
| A Series (A12-A12A-A13-A14-A15)                                                     | A          | 102-6002                |                     |                         |                     |                             |                         |                               |                           |
| L16 Series M8                                                                       | C          | 102-6001                |                     |                         |                     |                             |                         |                               |                           |
| L20 Series 4-cylinder & 2.2L (Z22) M9                                               | C          | 202-6001                |                     |                         |                     |                             |                         |                               |                           |
| L24 Series (early) inline 6 M8                                                      | C          | 202-6002                |                     |                         |                     |                             |                         |                               |                           |
| L24 (late), L26 & L28 Series inline 6 M9                                            | C          | 202-6003                |                     |                         |                     |                             |                         |                               |                           |
| 2.0L (SR20DE/DET) 11/32"                                                            | C          | 202-6005                |                     |                         |                     |                             |                         |                               |                           |
| 3.0L (VG30E/ET) SOHC V6 M9                                                          | C          | 202-6003                |                     |                         |                     |                             |                         |                               |                           |
| 3.0L (VG30D/DET/DETT) DOHC V6 11/32"                                                | C          | 202-6004                |                     |                         |                     |                             |                         |                               |                           |
| 3.5L (VQ35) DOHC V6 M8                                                              | E          |                         |                     |                         |                     |                             |                         | 202-6006                      |                           |
| <b>OPEL/VAUXHALL</b>                                                                |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 1.4L & 1.6L 8V M8                                                                   | E          | 109-6002                |                     |                         |                     |                             |                         |                               |                           |
| 1.4L 16V M9                                                                         | E          | 109-6003                |                     |                         |                     |                             |                         |                               |                           |
| 2.0L 16V M9                                                                         | E          | 109-6001                |                     |                         |                     |                             |                         | 209-6003                      |                           |
| <b>PEUGEOT</b>                                                                      |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 205 & 306                                                                           | M          | 117-6101                |                     |                         |                     |                             |                         |                               |                           |
| <b>PORSCHE</b>                                                                      |            |                         |                     |                         |                     |                             |                         |                               |                           |
| RSR Ti rod                                                                          | H          |                         |                     |                         |                     | 204-6004                    |                         |                               |                           |
| 1.7L & 2.0L Type IV                                                                 | K          | 104-6006                |                     |                         |                     |                             |                         |                               |                           |
| 2.0L 911S (1969)                                                                    | H          |                         |                     |                         |                     | 204-6003                    |                         |                               |                           |
| 911, 930 Turbo & 993 M9                                                             | H          |                         |                     |                         |                     | 204-6005                    |                         |                               |                           |
| 911 M10                                                                             | H          |                         |                     |                         |                     | 204-6001                    |                         |                               |                           |
| 944                                                                                 | K          |                         |                     |                         |                     | 204-6002                    |                         |                               |                           |
| <b>RENAULT</b>                                                                      |            |                         |                     |                         |                     |                             |                         |                               |                           |
| Clio (F4R) 16V M9                                                                   | E          |                         |                     |                         |                     |                             |                         | 216-6301                      |                           |
| R5 Turbo (Mid-Engine)                                                               | E          |                         |                     |                         |                     |                             |                         | 216-6302                      |                           |
| R12 Gordini/Alpine (807g)                                                           | E          | 116-6001                |                     |                         |                     |                             |                         |                               |                           |
| <b>SUBARU</b>                                                                       |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 1.8L (EJ18) & 2.2L (EJ22) SOHC, 2.5L (EJ25) DOHC Non Turbo & 2.0L (EJ20) DOHC Turbo | I          |                         |                     |                         |                     | 260-6301                    |                         |                               |                           |
| 2.5L (EJ25) DOHC Turbo                                                              | E          |                         |                     |                         |                     |                             |                         | 260-6302                      |                           |
| <b>TOYOTA</b>                                                                       |            |                         |                     |                         |                     |                             |                         |                               |                           |
| 1.6L (4AGE) DOHC & 1.6L (4ALC) SOHC M9                                              | A          | 203-6001                |                     |                         |                     |                             |                         |                               |                           |
| 1.6L (2TC/2TG) & 1.8L (3TC)                                                         | A          | 203-6003                |                     |                         |                     |                             |                         |                               |                           |
| 2.0L (3SGTE) & 2.4L (22R)                                                           | A          | 203-6002                |                     |                         |                     |                             |                         |                               |                           |
| 3.0L (7MGTE) inline 6 (1986-92) Supra                                               | A          | 203-6004                |                     |                         |                     |                             |                         |                               |                           |
| 3.0L (2JZGE/GTE) inline 6 (1993-98) Supra                                           | E          |                         |                     |                         |                     |                             |                         | 203-6005                      |                           |
| <b>VOLKSWAGEN/AUDI</b>                                                              |            |                         |                     |                         |                     |                             |                         |                               |                           |
| Audi 5-cylinder                                                                     | L          |                         |                     |                         |                     |                             |                         | 104-6007                      |                           |
| Formula Vee (cap screw type) M9                                                     | E          | 104-6005                | 104-6025            |                         |                     |                             |                         |                               |                           |
| Super Vee (cap screw type) Audi style rod                                           | E          |                         |                     |                         |                     |                             |                         | 104-6003                      | 104-6023                  |
| 1600cc air cooled                                                                   | K          | 104-6001                |                     |                         |                     |                             |                         |                               |                           |
| 1600cc water cooled Rabbit & Corrado G60                                            | K          | 104-6002                |                     |                         |                     |                             |                         |                               |                           |
| 1.8L & 2.0L water cooled                                                            | L          |                         |                     | 104-6004                | 104-6024            |                             |                         |                               |                           |
| 2.7L (APB/BEL) Turbo & 2.8L (AFC/ACK/AHA/ATQ) Non Turbo V6                          | E          |                         |                     |                         |                     |                             |                         | 204-6201                      |                           |
| 2.8L & 2.9L VR6                                                                     | E          |                         |                     |                         |                     |                             |                         | 204-6006                      |                           |

Red part numbers indicate new items

800-826-3045





## HEAD STUDS

Obtaining the optimum cylinder head-to-block sealing is especially critical in small displacement engines employing high compression pistons or power adders like turbochargers, nitrous oxide and superchargers. That's why ARP head studs are popular among leading Sport Compact/Import racers.

You should know that ARP uses a premium grade 8740 alloy that is rated far superior to "aircraft" quality. Then, each stud is precisely heat-treated to **200,000 psi**. Following heat-treat, each stud is centerless ground to make it as close to perfectly concentric as possible. This procedure involves about ten very slight

cuts and results in an exceptionally straight part. It's important to note that lesser quality studs are not even centerless ground – the material is thread rolled in bar stock form (mostly before heat-treat, when the material is easier to machine). Because ARP studs are manufactured to such exacting tolerances, you will note that gaskets and cylinder heads literally glide into position and are perfectly aligned – something that won't happen with inferior quality head studs.

ARP studs are thread rolled *after* heat-treat, which gives them about 1000% (that's ten times) better fatigue strength than those studs that are threaded prior to heat-treat.

You will also note that ARP offers specially undercut studs for several engines. This procedure (done only to the shorter studs) more equalizes the "stretch" of both studs, which makes for a more consistent clamping force – one that compensates for head gasket compression when the head is installed. This helps prevent blown head gaskets, and assures optimum sealing!

Premium parallel ground washers are also included with each kit.

| Application                                             | Hex Nuts | 12-Point Nuts | 12-Point Nuts<br>U/C Studs |
|---------------------------------------------------------|----------|---------------|----------------------------|
| <b>BMC/TRIUMPH</b>                                      |          |               |                            |
| A Series, 9 studs                                       |          | 206-4201      |                            |
| A Series, 11 studs                                      |          | 206-4204      |                            |
| A Series, 11 studs, shaved head                         |          | 206-4206      |                            |
| B Series                                                |          | 206-4202      |                            |
| 1.3L & 1.5L Spitfire                                    |          | 206-4203      |                            |
| 2.0L GT6 & 2.5L TR6                                     |          | 206-4205      |                            |
| 2.0L SOHC TR7                                           |          |               | 206-4208                   |
| 2.1L TR4                                                |          | 206-4207      |                            |
| <b>BMW</b>                                              |          |               |                            |
| 2002 Coupe, 318i, 320i 4 cylinder                       |          |               | 201-4601                   |
| 530, 535, 635, 735                                      |          |               | 201-4602                   |
| 2.5L (M50), 3.0L (S50US), 3.2L (S52US) inline 6 ARP2000 |          | 201-4302      |                            |
| E46 M3/S54 inline 6 ARP2000                             |          | 201-4303      |                            |
| Mini Cooper                                             |          | 201-4301      |                            |
| <b>FORD, 4 AND 6-CYLINDER</b>                           |          |               |                            |
| 1600cc Escort M10                                       |          | 151-4203      |                            |
| 2.0L DOHC Cosworth Sierra/Escort M12                    |          |               | 251-4701                   |
| 2.0L Zetec                                              |          |               | 251-4702                   |
| 2000cc Pinto                                            |          | 151-4201      |                            |
| 2300cc Pinto                                            |          | 151-4202      | 151-4702                   |
| 2.3L Duratec (2003 & later)                             |          | 151-4204      |                            |
| 2.5L Duratec V6                                         |          | 253-4701      |                            |
| <b>GM</b>                                               |          |               |                            |
| 2.2L Ecotec                                             |          |               | 231-4701                   |
| <b>HOLDEN</b>                                           |          |               |                            |
| Commodore V6 7/16"                                      | 205-4002 |               |                            |
| 308 cid                                                 | 205-4001 |               | 205-4601                   |
| 308 cid 7/16"                                           | 254-4009 |               | 205-4602                   |
| 308 cid 1/2"                                            |          | 234-4201      |                            |
| <b>HONDA/ACURA</b>                                      |          |               |                            |
| Acura B18A1, M11                                        |          |               | 208-4302                   |
| Acura VTEC B18CI, M11, GSR                              |          |               | 208-4303                   |
| B16A                                                    |          |               | 208-4601                   |
| B20B, w/B16A head                                       |          |               | 208-4306                   |
| Civic D16Y                                              |          | 208-4305      |                            |
| F20 S2000                                               |          |               | 208-4702                   |
| Honda D16Z - Only, M10                                  |          | 208-4301      |                            |
| Honda H22A4, VTEC                                       |          |               | 208-4304                   |
| H23A                                                    |          |               | 208-4307                   |
| K20A (A2 & A3)                                          |          |               | 208-4701                   |

Red part numbers indicate new items



## HEAD STUDS (CONT.)

| Application                                         | Hex Nuts | 12-Point Nuts | 12-Point Nuts<br>U/C Studs |
|-----------------------------------------------------|----------|---------------|----------------------------|
| <b>MAZDA</b>                                        |          |               |                            |
| 1.6L (BP) & 1.8L (BP) DOHC Miata                    |          | 218-4701      |                            |
| 2.0L FS-DE (1998-02)                                |          | 218-4703      |                            |
| 2.3L DOHC (2003)                                    |          | 218-4702      |                            |
| <b>MITSUBISHI</b>                                   |          |               |                            |
| 2.0L (4G63) DOHC (1993 & earlier) M12               |          | 207-4201      | 207-4701                   |
| 2.0L (4G63) DOHC (1994 & later) M11                 |          | 207-4203      | 207-4702                   |
| 2.6L (G54B)                                         |          | 207-4202      |                            |
| 3.0L (6G72) DOHC V6 ARP 2000                        |          |               | 207-4205                   |
| <b>NISSAN/DATSUN</b>                                |          |               |                            |
| A-12 engines                                        |          | 202-4202      |                            |
| A-14 engines                                        |          | 202-4203      |                            |
| L20 series, 4-cylinder                              |          | 202-4201      |                            |
| L24, L26, L28 series, 6-cylinder                    |          | 202-4206      |                            |
| CA16DE, CA16DET, CA18DE, CA18DET                    |          |               | 202-4702                   |
| RB20, RB20DET, RB25, RB25DET                        |          | 202-4301      |                            |
| RB26DETT, GTR ARP2000                               |          | 202-4207      |                            |
| 2.0L (SR20DE) DOHC (1991-01) M11                    |          |               | 102-4701                   |
| 2.0L (SR20DET/RN14) DOHC Turbo (1991-94) M12        |          | 202-4303      |                            |
| VQ30, VQ35                                          |          |               | 202-4701                   |
| <b>SATURN</b>                                       |          |               |                            |
| 1.9L DOHC (1991-99)                                 |          | 165-4202      |                            |
| 1.9L SOHC (1999-02)                                 |          | 165-4201      |                            |
| <b>SUBARU</b>                                       |          |               |                            |
| EJ Series 2.0L, 2.2L, 2.5L DOHC                     |          | 260-4701      |                            |
| EJ Series Phase 2 (1999 & later) SOHC               |          |               | 260-4702                   |
| <b>TOYOTA</b>                                       |          |               |                            |
| 1.6L (4AGE) DOHC                                    |          | 203-4203      |                            |
| 1.6L (2TC) & 1.8L (3TC)                             |          | 203-4206      |                            |
| 1.8L (1ZZFE) DOHC ARP2000                           |          |               | 203-4703                   |
| 2.0L (3SGTE) DOHC                                   |          | 203-4204      |                            |
| 2.4L (22R)                                          |          | 203-4201      |                            |
| 2.8L (5MGE) & 3.0L (7MGTE) inline 6 (1981-92) Supra |          | 203-4202      | 203-4701                   |
| 3.0L (2JZGE/GTE) inline 6 (1993-98) Supra           |          | 203-4205      | 203-4702                   |
| <b>VAUXHALL/OPEL</b>                                |          |               |                            |
| 2.0L 16V                                            |          | 209-4301      | 209-4701                   |
| 2.5L V6 Opel                                        |          | 209-4302      | 209-4702                   |
| <b>VOLKSWAGEN/AUDI</b>                              |          |               |                            |
| Audi 5 cylinder, 10 valve                           |          | 204-4205      | 204-4703                   |
| Audi 5 cylinder, 20 valve                           |          | 204-4207      | 204-4704                   |
| Super Vee                                           |          | 204-4202      |                            |
| 1.8L & 2.0L, 8V Golf/Jetta                          |          | 204-4203      | 204-4701                   |
| 1.8L & 2.0L, 16V Golf/Jetta                         |          | 204-4204      | 204-4702                   |
| 2.8L & 2.9L VR6                                     |          |               | 204-4705                   |

Red part numbers indicate new items

## HEAD BOLTS

### HIGH PERFORMANCE SERIES

High Performance head bolts are made of 8740 chrome moly and available with a reduced wrenching hex or 12-point with a wide area flanged head. They are nominally rated at **180,000 psi** and kits come complete with hardened parallel-ground washers.

### PROFESSIONAL SERIES

All Pro Series bolts are designed for competition applications and are rated nominally at **200,000 psi**. Available with undercut short bolts that can help eliminate head gasket failures through providing more “stretch” to balance the longer bolts and compensate for the additional compression of gaskets.

Please Refer to Main &  
Head Bolt Instructions  
on page 45.



| Application                                             | High Performance |          | Pro Series |          |
|---------------------------------------------------------|------------------|----------|------------|----------|
|                                                         | Hex              | 12-Point | Hex        | 12-Point |
| <b>BMW</b>                                              |                  |          |            |          |
| Mini Cooper                                             |                  |          |            | 206-3601 |
| <b>HOLDEN</b>                                           |                  |          |            |          |
| 308 cid                                                 | 205-3601         | 205-3701 | 254-3703   |          |
| <b>TOYOTA</b>                                           |                  |          |            |          |
| 2.8L (5MGE) & 3.0L (7MGTE) inline 6 (1981-92) Supra     |                  |          |            | 203-3902 |
| <b>VOLKSWAGEN/AUDI</b>                                  |                  |          |            |          |
| 1.8L DOHC 20V Turbo M10/ARP2000 (w/o installation tool) |                  |          |            | 204-3901 |
| 1.8L DOHC 20V Turbo M10/ARP2000 (w/ installation tool)  |                  |          |            | 204-3902 |

Red part numbers indicate new items

800-826-3045



## MAIN STUDS

ARP main studs are manufactured from 8740 chrome moly steel, heat-treated in-house to **200,000 psi** tensile strength, and precision J-form threads rolled after heat-treat to create a fastener that has threads 1000% stronger than others. All kits come complete with hardened parallel-ground washers and aerospace quality nuts. Reduce crankshaft flex and main cap fretting with these premium quality main studs. Don't settle for anything less than the best!



| Application                                   | 2-Bolt Main | 4-Bolt Main |
|-----------------------------------------------|-------------|-------------|
| <b>BMC/TRIUMPH</b>                            |             |             |
| A Series                                      | 206-5401    |             |
| B Series (3 cap main)                         | 206-5402    |             |
| B Series (5 cap main)                         | 206-5403    |             |
| 2.0L SOHC TR7                                 | 206-5404    |             |
| Austin Healey 6 cylinder                      | 206-5405    |             |
| <b>DODGE</b>                                  |             |             |
| 2.0L SOHC/DOHC Neon w/ block #4667642         | 141-5801    |             |
| <b>FORD, 4-CYLINDER</b>                       |             |             |
| 1600cc Escort                                 | 151-5403    |             |
| 2.0L Zetec                                    | 151-5404    |             |
| 2000cc Pinto                                  | 151-5401    |             |
| 2300cc Pinto                                  | 151-5402    |             |
| <b>HONDA/ACURA</b>                            |             |             |
| 1.6L (B16A) (12 pt nuts)                      | 208-5402    |             |
| 1.8L (B18C1) Acura                            | 208-5403    |             |
| 1.8L (B18A1/B1) Acura                         | 208-5404    |             |
| 2.2L (H22A) & 2.3L (H23A) (12 pt nuts)        | 208-5401    |             |
| <b>MAZDA</b>                                  |             |             |
| 1.6L (B6) & 1.8L (BP) DOHC Miata (12 pt nuts) | 218-5401    |             |
| 2.3L DOHC 16V (2003 & later)                  | 218-5402    |             |
| <b>MITSUBISHI</b>                             |             |             |
| 2.0L (4G63) DOHC                              | 207-5401    |             |

| Application                                               | 2-Bolt Main | 4-Bolt Main |
|-----------------------------------------------------------|-------------|-------------|
| <b>MITSUBISHI (continued)</b>                             |             |             |
| 2.6L (G54B)                                               | 207-5402    |             |
| 3.0L (6G72) V6 (1993 & later)                             |             | 207-5801    |
| <b>NISSAN/DATSUN</b>                                      |             |             |
| L20 Series 4-cylinder                                     | 202-5401    |             |
| L24, L26 & L28 Series 6-cylinder                          | 202-5406    |             |
| 2.0L (SR20DE/DET)                                         | 202-5402    |             |
| 3.5L (VQ35) DOHC V6                                       |             | 202-5801    |
| <b>TOYOTA</b>                                             |             |             |
| 1.6L (4AGE) & 2.0L (3SFE) DOHC                            | 203-5403    |             |
| 2.0L (3SGTE) DOHC                                         | 203-5404    |             |
| 2.4L (22R)                                                | 203-5406    |             |
| 3.0L (7MGTE) inline 6 (1986-92) Supra w/ bolts for #3 cap | 203-5402    |             |
| 3.0L (2JZGE/GTE) inline 6 (1993-98) Supra                 | 203-5405    |             |
| <b>VAUXHALL/OPEL</b>                                      |             |             |
| 2.0L 16 valve                                             | 209-5401    |             |
| 2.5L V6                                                   | 209-5402    |             |
| <b>VOLKSWAGEN</b>                                         |             |             |
| 1.6L & 2.0L Rabbit, Golf and Jetta                        | 204-5402    |             |
| 2.8L & 2.9L VR6                                           | 204-5403    |             |

## MAIN BOLTS

Far superior to any other main bolt kit offered for use in competition engines. ARP main bolts are designed to meet the exacting standards and demands of professional engine builders. Forged from 8740 chrome moly, all bolts feature generous under-head radius and rolled threads for the utmost reliability. The threads are rolled after heat-treating, which gives them about 1000% longer fatigue life than most main bolts, which are threaded prior to heat-treating. Available in the popular High Performance Series, which, at a nominal rating of **180,000 psi**, is a premium replacement for OEM fasteners, or the **200,000 psi** nominal rated Pro Series, application-specific main bolts with reduced wrenching head and are designed for use in competition applications. Parallel-ground, hardened washers are included with each kit.

| Application                                                   | Pro Series |
|---------------------------------------------------------------|------------|
| <b>MGB</b>                                                    |            |
| 2 cap main                                                    | 206-5001   |
| 5 cap main                                                    | 206-5002   |
| <b>SUBARU</b>                                                 |            |
| 2.0L, 2.2L & 2.5L SOHC/DOHC EJ Series Crankcase thru bolt kit | 260-5401   |
| <b>TOYOTA</b>                                                 |            |
| 1.6L (4AGE) DOHC                                              | 203-5001   |



## PORSCHE SPECIALTY FASTENERS

ARP engineers have developed a number of special fasteners for Porsche 911 and 930 Turbo and Non Turbo applications that provide the reliability needed for serious competition. These fasteners are manufactured from high grade materials, and are superior to OEM Porsche bolts and studs. A number of special rod bolts are also available for Porsche engines. *They are listed on pages 32 and 71 of this catalog.*

| Application                                             | Part No. |
|---------------------------------------------------------|----------|
| Case halves stud kit- 911-930 Turbo                     | 504-9501 |
| Trans mount stud kit-911-930 Turbo                      | 504-9502 |
| Crankcase thru bolt kit- 2.0L-2.7L air cooled engines   | 204-5407 |
| Crankcase thru bolt kit- 3.0L-3.3L air cooled engines   | 204-5405 |
| Crankcase thru bolt kit- 3.6L & 3.8L air cooled engines | 204-5406 |
| Head stud kit- 3.6L Turbo water cooled engine           | 204-4210 |
| Head stud kit- 2.0L-3.8L air cooled engines             | 204-4206 |

Red part numbers indicate new items

## STAINLESS ACCESSORY STUDS

ARP has developed an innovative multi-purposes accessory stud that can be used for exhaust systems, intake manifold and a host of other uses. The studs are manufactured from a proprietary alloy developed by ARP (Stainless 300) and are impervious to the rust and corrosion that plagues ordinary fasteners. This stainless steel alloy is nominally rated at **170,000 psi** tensile strength, which is substantially stronger than Grade 8 hardware. Ideally suited for installing exhaust headers, the 8mm studs have a unique “nut starter” nose and a hex-broached tip – which allows the studs to easily be installed using an Allen wrench. The studs come with “easy wrenching” 12-point nuts, which work great in the tightest of quarters. Flat washers are also included. Offered in five different lengths, in quantities of 4, 8, 10 and 16-packs.

**Great for Intake  
& Exhaust  
Systems**



| Application               | 4-Pack   | 8-Pack   | 10-Pack  | 16-Pack  |
|---------------------------|----------|----------|----------|----------|
| M8 x 1.25 x 32mm (1.250") | 400-8001 | 400-8011 | 400-8021 | 400-8031 |
| M8 x 1.25 x 38mm (1.500") | 400-8002 | 400-8012 | 400-8022 | 400-8032 |
| M8 x 1.25 x 45mm (1.750") | 400-8003 | 400-8013 | 400-8023 | 400-8033 |
| M8 x 1.25 x 51mm (2.000") | 400-8004 | 400-8014 | 400-8024 | 400-8034 |
| M8 x 1.25 x 57mm (2.250") | 400-8005 | 400-8015 | 400-8025 | 400-8035 |

NOTE: #400-8014 fits SOHC & DOHC Neon (exhaust) and #400-8024 fits Neon & PT Cruiser (2.4L engine)

## CAM TOWER STUD KIT

Camshaft positioning is critical on overhead cam engines and ARP makes sure that the cam towers are properly secured through use of these durable studs. They're made from 8740 chrome moly steel, with threads rolled after heat treat to ensure the optimum fatigue strength. Far superior to OEM fasteners.

| Application                           | Part No. |
|---------------------------------------|----------|
| <b>CHRYSLER/DODGE</b>                 |          |
| 2.0L DOHC & 2.4L DOHC (head #4667086) | 141-1001 |



800-826-3045



## STAINLESS STEEL & CHROME MOLY 5-PACKS WITH WASHERS



**Stainless Steel & Chrome Moly Bolts**  
**Available In Sizes From 1/4" to 7/16"**  
**With Underhead Lengths Ranging**  
**From 1/2" to 5". Hex or 12-Pt. Heads.**  
**Packaged In Convenient 5-Pack Cards.**

**NOTE:**  
**Packed 5**  
**on a card**  
**with washers**



Now you can use premium quality ARP stainless steel or chrome moly fasteners to install most anything on a car, boat or trailer. The specially alloyed "ARP 300" stainless steel and heat-treated 8740 chrome moly bolts (black oxide finish) are nominally rated at **170,000 psi** tensile strength to provide a substantial extra margin of safety over Grade 8 hardware.

What's more, you can't beat the gorgeous looks of ARP's specially polished stainless steel fasteners, and their ability to resist rust. They're truly maintenance free!

You can get **5-packs** (washers included) of any size bolt from 1/4" to 7/16" in lengths ranging from 1/2" to 5", with a choice of hex or 12-point heads. Matching nuts are also available (see pages 82-83).



# STANDARD BOLT 5-PACKS

| Diameter - Pitch                             | UHL   | Wrenching | Black Oxide |          | Stainless |          |
|----------------------------------------------|-------|-----------|-------------|----------|-----------|----------|
|                                              |       |           | Hex         | 12 point | Hex       | 12 point |
| 1/4" BOLTS, 5/16" WRENCHING, STANDARD THREAD |       |           |             |          |           |          |
| 1/4-20                                       | 0.515 | 5/16      | 650-0515    | 640-0515 | 621-0515  | 611-0515 |
| 1/4-20                                       | 0.750 | 5/16      | 650-0750    | 640-0750 | 621-0750  | 611-0750 |
| 1/4-20                                       | 1.000 | 5/16      | 650-1000    | 640-1000 | 621-1000  | 611-1000 |
| 1/4-20                                       | 1.250 | 5/16      | 650-1250    | 640-1250 | 621-1250  | 611-1250 |
| 1/4-20                                       | 1.500 | 5/16      | 650-1500    | 640-1500 | 621-1500  | 611-1500 |
| 1/4-20                                       | 1.750 | 5/16      | 650-1750    | 640-1750 | 621-1750  | 611-1750 |
| 1/4-20                                       | 2.000 | 5/16      | 650-2000    | 640-2000 | 621-2000  | 611-2000 |
| 1/4-20                                       | 2.250 | 5/16      | 650-2250    | 640-2250 | 621-2250  | 611-2250 |
| 1/4-20                                       | 2.500 | 5/16      | 650-2500    | 640-2500 | 621-2500  | 611-2500 |
| 1/4-20                                       | 2.750 | 5/16      | 650-2750    | 640-2750 | 621-2750  | 611-2750 |
| 1/4-20                                       | 3.000 | 5/16      | 650-3000    | 640-3000 | 621-3000  | 611-3000 |
| 1/4-20                                       | 3.250 | 5/16      | 650-3250    | 640-3250 | 621-3250  | 611-3250 |
| 1/4-20                                       | 3.500 | 5/16      | 650-3500    | 640-3500 | 621-3500  | 611-3500 |
| 1/4-20                                       | 3.750 | 5/16      | 650-3750    | 640-3750 | 621-3750  | 611-3750 |
| 1/4-20                                       | 4.000 | 5/16      | 650-4000    | 640-4000 | 621-4000  | 611-4000 |
| 1/4-20                                       | 4.250 | 5/16      | 650-4250    | 640-4250 | 621-4250  | 611-4250 |
| 1/4-20                                       | 4.500 | 5/16      | 650-4500    | 640-4500 | 621-4500  | 611-4500 |
| 5/16" BOLTS, 3/8" WRENCHING, STANDARD THREAD |       |           |             |          |           |          |
| 5/16-18                                      | 0.560 | 3/8       | 651-0560    | 641-0560 | 622-0560  | 612-0560 |
| 5/16-18                                      | 0.750 | 3/8       | 651-0750    | 641-0750 | 622-0750  | 612-0750 |
| 5/16-18                                      | 1.000 | 3/8       | 651-1000    | 641-1000 | 622-1000  | 612-1000 |
| 5/16-18                                      | 1.250 | 3/8       | 651-1250    | 641-1250 | 622-1250  | 612-1250 |
| 5/16-18                                      | 1.500 | 3/8       | 651-1500    | 641-1500 | 622-1500  | 612-1500 |
| 5/16-18                                      | 1.750 | 3/8       | 651-1750    | 641-1750 | 622-1750  | 612-1750 |
| 5/16-18                                      | 2.000 | 3/8       | 651-2000    | 641-2000 | 622-2000  | 612-2000 |
| 5/16-18                                      | 2.250 | 3/8       | 651-2250    | 641-2250 | 622-2250  | 612-2250 |
| 5/16-18                                      | 2.500 | 3/8       | 651-2500    | 641-2500 | 622-2500  | 612-2500 |
| 5/16-18                                      | 2.750 | 3/8       | 651-2750    | 641-2750 | 622-2750  | 612-2750 |
| 5/16-18                                      | 3.000 | 3/8       | 651-3000    | 641-3000 | 622-3000  | 612-3000 |
| 5/16-18                                      | 3.250 | 3/8       | 651-3250    | 641-3250 | 622-3250  | 612-3250 |
| 5/16-18                                      | 3.500 | 3/8       | 651-3500    | 641-3500 | 622-3500  | 612-3500 |
| 5/16-18                                      | 3.750 | 3/8       | 651-3750    | 641-3750 | 622-3750  | 612-3750 |
| 5/16-18                                      | 4.000 | 3/8       | 651-4000    | 641-4000 | 622-4000  | 612-4000 |
| 5/16-18                                      | 4.250 | 3/8       | 651-4250    | 641-4250 | 622-4250  | 612-4250 |
| 5/16-18                                      | 4.500 | 3/8       | 651-4500    | 641-4500 | 622-4500  | 612-4500 |
| 5/16-18                                      | 4.750 | 3/8       | 651-4750    | 641-4750 | 622-4750  | 612-4750 |
| 5/16-18                                      | 5.000 | 3/8       | 651-5000    | 641-5000 | 622-5000  | 612-5000 |
| 3/8" BOLTS, 3/8" WRENCHING, STANDARD THREAD  |       |           |             |          |           |          |
| 3/8-16                                       | 0.500 | 3/8       | 652-0500    | 642-0500 | 623-0500  | 613-0500 |
| 3/8-16                                       | 0.750 | 3/8       | 652-0750    | 642-0750 | 623-0750  | 613-0750 |
| 3/8-16                                       | 1.000 | 3/8       | 652-1000    | 642-1000 | 623-1000  | 613-1000 |
| 3/8-16                                       | 1.250 | 3/8       | 652-1250    | 642-1250 | 623-1250  | 613-1250 |
| 3/8-16                                       | 1.500 | 3/8       | 652-1500    | 642-1500 | 623-1500  | 613-1500 |
| 3/8-16                                       | 1.750 | 3/8       | 652-1750    | 642-1750 | 623-1750  | 613-1750 |
| 3/8-16                                       | 2.000 | 3/8       | 652-2000    | 642-2000 | 623-2000  | 613-2000 |
| 3/8-16                                       | 2.250 | 3/8       | 652-2250    | 642-2250 | 623-2250  | 613-2250 |
| 3/8-16                                       | 2.500 | 3/8       | 652-2500    | 642-2500 | 623-2500  | 613-2500 |
| 3/8-16                                       | 2.750 | 3/8       | 652-2750    | 642-2750 | 623-2750  | 613-2750 |
| 3/8-16                                       | 3.000 | 3/8       | 652-3000    | 642-3000 | 623-3000  | 613-3000 |
| 3/8-16                                       | 3.250 | 3/8       | 652-3250    | 642-3250 | 623-3250  | 613-3250 |
| 3/8-16                                       | 3.500 | 3/8       | 652-3500    | 642-3500 | 623-3500  | 613-3500 |
| 3/8-16                                       | 3.750 | 3/8       | 652-3750    | 642-3750 | 623-3750  | 613-3750 |
| 3/8-16                                       | 4.000 | 3/8       | 652-4000    | 642-4000 | 623-4000  | 613-4000 |

## STANDARD BOLT 5-PACKS (CONT.)

| Diameter - Pitch                                        | UHL   | Wrenching | Black Oxide |          | Stainless |          |
|---------------------------------------------------------|-------|-----------|-------------|----------|-----------|----------|
|                                                         |       |           | Hex         | 12 point | Hex       | 12 point |
| 3/8" BOLTS, 3/8" WRENCHING, STANDARD THREAD (CONTINUED) |       |           |             |          |           |          |
| 3/8-16                                                  | 4.250 | 3/8       | 652-4250    | 642-4250 | 623-4250  | 613-4250 |
| 3/8-16                                                  | 4.500 | 3/8       | 652-4500    | 642-4500 | 623-4500  | 613-4500 |
| 3/8-16                                                  | 4.750 | 3/8       | 652-4750    | 642-4750 | 623-4750  | 613-4750 |
| 3/8-16                                                  | 5.000 | 3/8       | 652-5000    | 642-5000 | 623-5000  | 613-5000 |
| 3/8" BOLTS, 7/16" WRENCHING, STANDARD THREAD            |       |           |             |          |           |          |
| 3/8-16                                                  | 0.750 | 7/16      | 654-0750    | 644-0750 | 625-0750  | 615-0750 |
| 3/8-16                                                  | 1.000 | 7/16      | 654-1000    | 644-1000 | 625-1000  | 615-1000 |
| 3/8-16                                                  | 1.250 | 7/16      | 654-1250    | 644-1250 | 625-1250  | 615-1250 |
| 3/8-16                                                  | 1.500 | 7/16      | 654-1500    | 644-1500 | 625-1500  | 615-1500 |
| 3/8-16                                                  | 1.750 | 7/16      | 654-1750    | 644-1750 | 625-1750  | 615-1750 |
| 3/8-16                                                  | 2.000 | 7/16      | 654-2000    | 644-2000 | 625-2000  | 615-2000 |
| 3/8-16                                                  | 2.250 | 7/16      | 654-2250    | 644-2250 | 625-2250  | 615-2250 |
| 3/8-16                                                  | 2.500 | 7/16      | 654-2500    | 644-2500 | 625-2500  | 615-2500 |
| 3/8-16                                                  | 2.750 | 7/16      | 654-2750    | 644-2750 | 625-2750  | 615-2750 |
| 3/8-16                                                  | 3.000 | 7/16      | 654-3000    | 644-3000 | 625-3000  | 615-3000 |
| 3/8-16                                                  | 3.250 | 7/16      | 654-3250    | 644-3250 | 625-3250  | 615-3250 |
| 3/8-16                                                  | 3.500 | 7/16      | 654-3500    | 644-3500 | 625-3500  | 615-3500 |
| 3/8-16                                                  | 3.750 | 7/16      | 654-3750    | 644-3750 | 625-3750  | 615-3750 |
| 3/8-16                                                  | 4.000 | 7/16      | 654-4000    | 644-4000 | 625-4000  | 615-4000 |
| 7/16" BOLTS, STANDARD THREAD, 1/2" WRENCHING            |       |           |             |          |           |          |
| 7/16-14                                                 | 1.500 | 1/2       | 655-1500    | 645-1500 | 624-1500  | 614-1500 |
| 7/16-14                                                 | 1.750 | 1/2       | 655-1750    | 645-1750 | 624-1750  | 614-1750 |
| 7/16-14                                                 | 2.000 | 1/2       | 655-2000    | 645-2000 | 624-2000  | 614-2000 |
| 7/16-14                                                 | 2.250 | 1/2       | 655-2250    | 645-2250 | 624-2250  | 614-2250 |
| 7/16-14                                                 | 2.500 | 1/2       | 655-2500    | 645-2500 | 624-2500  | 614-2500 |
| 7/16-14                                                 | 2.750 | 1/2       | 655-2750    | 645-2750 | 624-2750  | 614-2750 |
| 7/16-14                                                 | 3.000 | 1/2       | 655-3000    | 645-3000 | 624-3000  | 614-3000 |
| 7/16-14                                                 | 3.250 | 1/2       | 655-3250    | 645-3250 | 624-3250  | 614-3250 |
| 7/16-14                                                 | 3.500 | 1/2       | 655-3500    | 645-3500 | 624-3500  | 614-3500 |
| 7/16-14                                                 | 3.750 | 1/2       | 655-3750    | 645-3750 | 624-3750  | 614-3750 |
| 7/16-14                                                 | 4.000 | 1/2       | 655-4000    | 645-4000 | 624-4000  | 614-4000 |
| 7/16-14                                                 | 4.250 | 1/2       | 655-4250    | 645-4250 | 624-4250  | 614-4250 |
| 7/16-14                                                 | 4.500 | 1/2       | 655-4500    | 645-4500 | 624-4500  | 614-4500 |
| 7/16-14                                                 | 4.750 | 1/2       | 655-4750    | 645-4750 | 624-4750  | 614-4750 |
| 7/16-14                                                 | 5.000 | 1/2       | 655-5000    | 645-5000 | 624-5000  | 614-5000 |
| 7/16" BOLTS, STANDARD THREAD, 7/16" WRENCHING           |       |           |             |          |           |          |
| 7/16-14                                                 | 1.500 | 7/16      | 653-1500    | 643-1500 | 626-1500  | 616-1500 |
| 7/16-14                                                 | 1.750 | 7/16      | 653-1750    | 643-1750 | 626-1750  | 616-1750 |
| 7/16-14                                                 | 2.000 | 7/16      | 653-2000    | 643-2000 | 626-2000  | 616-2000 |
| 7/16-14                                                 | 2.250 | 7/16      | 653-2250    | 643-2250 | 626-2250  | 616-2250 |
| 7/16-14                                                 | 2.500 | 7/16      | 653-2500    | 643-2500 | 626-2500  | 616-2500 |
| 7/16-14                                                 | 2.750 | 7/16      | 653-2750    | 643-2750 | 626-2750  | 616-2750 |
| 7/16-14                                                 | 3.000 | 7/16      | 653-3000    | 643-3000 | 626-3000  | 616-3000 |
| 7/16-14                                                 | 3.250 | 7/16      | 653-3250    | 643-3250 | 626-3250  | 616-3250 |
| 7/16-14                                                 | 3.500 | 7/16      | 653-3500    | 643-3500 | 626-3500  | 616-3500 |
| 7/16-14                                                 | 3.750 | 7/16      | 653-3750    | 643-3750 | 626-3750  | 616-3750 |
| 7/16-14                                                 | 4.000 | 7/16      | 653-4000    | 643-4000 | 626-4000  | 616-4000 |
| 7/16-14                                                 | 4.250 | 7/16      | 653-4250    | 643-4250 | 626-4250  | 616-4250 |
| 7/16-14                                                 | 4.500 | 7/16      | 653-4500    | 643-4500 | 626-4500  | 616-4500 |
| 7/16-14                                                 | 4.750 | 7/16      | 653-4750    | 643-4750 | 626-4750  | 616-4750 |
| 7/16-14                                                 | 5.000 | 7/16      | 653-5000    | 643-5000 | 626-5000  | 616-5000 |



# FINE THREAD BOLT 5-PACKS

| Diameter - Pitch                         | UHL   | Wrenching | Black Oxide |          | Stainless |          |
|------------------------------------------|-------|-----------|-------------|----------|-----------|----------|
|                                          |       |           | Hex         | 12 point | Hex       | 12 point |
| 1/4" BOLTS, 5/16" WRENCHING, FINE THREAD |       |           |             |          |           |          |
| 1/4-28                                   | .515  | 5/16      | 750-0515    | 740-0515 | 721-0515  | 711-0515 |
| 1/4-28                                   | .750  | 5/16      | 750-0750    | 740-0750 | 721-0750  | 711-0750 |
| 1/4-28                                   | 1.000 | 5/16      | 750-1000    | 740-1000 | 721-1000  | 711-1000 |
| 1/4-28                                   | 1.250 | 5/16      | 750-1250    | 740-1250 | 721-1250  | 711-1250 |
| 1/4-28                                   | 1.500 | 5/16      | 750-1500    | 740-1500 | 721-1500  | 711-1500 |
| 1/4-28                                   | 1.750 | 5/16      | 750-1750    | 740-1750 | 721-1750  | 711-1750 |
| 1/4-28                                   | 2.000 | 5/16      | 750-2000    | 740-2000 | 721-2000  | 711-2000 |
| 1/4-28                                   | 2.250 | 5/16      | 750-2250    | 740-2250 | 721-2250  | 711-2250 |
| 1/4-28                                   | 2.500 | 5/16      | 750-2500    | 740-2500 | 721-2500  | 711-2500 |
| 1/4-28                                   | 2.750 | 5/16      | 750-2750    | 740-2750 | 721-2750  | 711-2750 |
| 1/4-28                                   | 3.000 | 5/16      | 750-3000    | 740-3000 | 721-3000  | 711-3000 |
| 1/4-28                                   | 3.250 | 5/16      | 750-3250    | 740-3250 | 721-3250  | 711-3250 |
| 1/4-28                                   | 3.500 | 5/16      | 750-3500    | 740-3500 | 721-3500  | 711-3500 |
| 1/4-28                                   | 3.750 | 5/16      | 750-3750    | 740-3750 | 721-3750  | 711-3750 |
| 1/4-28                                   | 4.000 | 5/16      | 750-4000    | 740-4000 | 721-4000  | 711-4000 |
| 1/4-28                                   | 4.250 | 5/16      | 750-4250    | 740-4250 | 721-4250  | 711-4250 |
| 1/4-28                                   | 4.500 | 5/16      | 750-4500    | 740-4500 | 721-4500  | 711-4500 |
| 5/16" BOLTS, 3/8" WRENCHING, FINE THREAD |       |           |             |          |           |          |
| 5/16-24                                  | .560  | 3/8       | 751-0560    | 741-0560 | 722-0560  | 712-0560 |
| 5/16-24                                  | .750  | 3/8       | 751-0750    | 741-0750 | 722-0750  | 712-0750 |
| 5/16-24                                  | 1.000 | 3/8       | 751-1000    | 741-1000 | 722-1000  | 712-1000 |
| 5/16-24                                  | 1.250 | 3/8       | 751-1250    | 741-1250 | 722-1250  | 712-1250 |
| 5/16-24                                  | 1.500 | 3/8       | 751-1500    | 741-1500 | 722-1500  | 712-1500 |
| 5/16-24                                  | 1.750 | 3/8       | 751-1750    | 741-1750 | 722-1750  | 712-1750 |
| 5/16-24                                  | 2.000 | 3/8       | 751-2000    | 741-2000 | 722-2000  | 712-2000 |
| 5/16-24                                  | 2.250 | 3/8       | 751-2250    | 741-2250 | 722-2250  | 712-2250 |
| 5/16-24                                  | 2.500 | 3/8       | 751-2500    | 741-2500 | 722-2500  | 712-2500 |
| 5/16-24                                  | 2.750 | 3/8       | 751-2750    | 741-2750 | 722-2750  | 712-2750 |
| 5/16-24                                  | 3.000 | 3/8       | 751-3000    | 741-3000 | 722-3000  | 712-3000 |
| 5/16-24                                  | 3.250 | 3/8       | 751-3250    | 741-3250 | 722-3250  | 712-3250 |
| 5/16-24                                  | 3.500 | 3/8       | 751-3500    | 741-3500 | 722-3500  | 712-3500 |
| 5/16-24                                  | 3.750 | 3/8       | 751-3750    | 741-3750 | 722-3750  | 712-3750 |
| 5/16-24                                  | 4.000 | 3/8       | 751-4000    | 741-4000 | 722-4000  | 712-4000 |
| 5/16-24                                  | 4.250 | 3/8       | 751-4250    | 741-4250 | 722-4250  | 712-4250 |
| 5/16-24                                  | 4.500 | 3/8       | 751-4500    | 741-4500 | 722-4500  | 712-4500 |
| 5/16-24                                  | 4.750 | 3/8       | 751-4750    | 741-4750 | 722-4750  | 712-4750 |
| 5/16-24                                  | 5.000 | 3/8       | 751-5000    | 741-5000 | 722-5000  | 712-5000 |
| 3/8" BOLTS, 3/8" WRENCHING, FINE THREAD  |       |           |             |          |           |          |
| 3/8-24                                   | .500  | 3/8       | 752-0500    | 742-0500 | 723-0500  | 713-0500 |
| 3/8-24                                   | .750  | 3/8       | 752-0750    | 742-0750 | 723-0750  | 713-0750 |
| 3/8-24                                   | 1.000 | 3/8       | 752-1000    | 742-1000 | 723-1000  | 713-1000 |
| 3/8-24                                   | 1.250 | 3/8       | 752-1250    | 742-1250 | 723-1250  | 713-1250 |
| 3/8-24                                   | 1.500 | 3/8       | 752-1500    | 742-1500 | 723-1500  | 713-1500 |
| 3/8-24                                   | 1.750 | 3/8       | 752-1750    | 742-1750 | 723-1750  | 713-1750 |
| 3/8-24                                   | 2.000 | 3/8       | 752-2000    | 742-2000 | 723-2000  | 713-2000 |
| 3/8-24                                   | 2.250 | 3/8       | 752-2250    | 742-2250 | 723-2250  | 713-2250 |

# FINE THREAD BOLT 5-PACKS (CONT.)

| Diameter/Pitch                                      | UHL   | Wrenching | Black Oxide |          | Stainless |          |
|-----------------------------------------------------|-------|-----------|-------------|----------|-----------|----------|
|                                                     |       |           | Hex         | 12 point | Hex       | 12 point |
| 3/8" BOLTS, 3/8" WRENCHING, FINE THREAD (CONTINUED) |       |           |             |          |           |          |
| 3/8-24                                              | 2.500 | 3/8       | 752-2500    | 742-2500 | 723-2500  | 713-2500 |
| 3/8-24                                              | 2.750 | 3/8       | 752-2750    | 742-2750 | 723-2750  | 713-2750 |
| 3/8-24                                              | 3.000 | 3/8       | 752-3000    | 742-3000 | 723-3000  | 713-3000 |
| 3/8-24                                              | 3.250 | 3/8       | 752-3250    | 742-3250 | 723-3250  | 713-3250 |
| 3/8-24                                              | 3.500 | 3/8       | 752-3500    | 742-3500 | 723-3500  | 713-3500 |
| 3/8-24                                              | 3.750 | 3/8       | 752-3750    | 742-3750 | 723-3750  | 713-3750 |
| 3/8-24                                              | 4.000 | 3/8       | 752-4000    | 742-4000 | 723-4000  | 713-4000 |
| 3/8-24                                              | 4.250 | 3/8       | 752-4250    | 742-4250 | 723-4250  | 713-4250 |
| 3/8-24                                              | 4.500 | 3/8       | 752-4500    | 742-4500 | 723-4500  | 713-4500 |
| 3/8-24                                              | 4.750 | 3/8       | 752-4750    | 742-4750 | 723-4750  | 713-4750 |
| 3/8-24                                              | 5.000 | 3/8       | 752-5000    | 742-5000 | 723-5000  | 713-5000 |
| 3/8" BOLTS, 7/16" WRENCHING, FINE THREAD            |       |           |             |          |           |          |
| 3/8-24                                              | .750  | 7/16      | 754-0750    | 744-0750 | 725-0750  | 715-0750 |
| 3/8-24                                              | 1.000 | 7/16      | 754-1000    | 744-1000 | 725-1000  | 715-1000 |
| 3/8-24                                              | 1.250 | 7/16      | 754-1250    | 744-1250 | 725-1250  | 715-1250 |
| 3/8-24                                              | 1.500 | 7/16      | 754-1500    | 744-1500 | 725-1500  | 715-1500 |
| 3/8-24                                              | 1.750 | 7/16      | 754-1750    | 744-1750 | 725-1750  | 715-1750 |
| 3/8-24                                              | 2.000 | 7/16      | 754-2000    | 744-2000 | 725-2000  | 715-2000 |
| 3/8-24                                              | 2.250 | 7/16      | 754-2250    | 744-2250 | 725-2250  | 715-2250 |
| 3/8-24                                              | 2.500 | 7/16      | 754-2500    | 744-2500 | 725-2500  | 715-2500 |
| 3/8-24                                              | 2.750 | 7/16      | 754-2750    | 744-2750 | 725-2750  | 715-2750 |
| 3/8-24                                              | 3.000 | 7/16      | 754-3000    | 744-3000 | 725-3000  | 715-3000 |
| 3/8-24                                              | 3.250 | 7/16      | 754-3250    | 744-3250 | 725-3250  | 715-3250 |
| 3/8-24                                              | 3.500 | 7/16      | 754-3500    | 744-3500 | 725-3500  | 715-3500 |
| 3/8-24                                              | 3.750 | 7/16      | 754-3750    | 744-3750 | 725-3750  | 715-3750 |
| 3/8-24                                              | 4.000 | 7/16      | 754-4000    | 744-4000 | 725-4000  | 715-4000 |
| 7/16" BOLTS, 7/16" WRENCHING, FINE THREAD           |       |           |             |          |           |          |
| 7/16-20                                             | 1.000 | 7/16      | 753-1000    | 743-1000 | 724-1000  | 714-1000 |
| 7/16-20                                             | 1.250 | 7/16      | 753-1250    | 743-1250 | 724-1250  | 714-1250 |
| 7/16-20                                             | 1.500 | 7/16      | 753-1500    | 743-1500 | 724-1500  | 714-1500 |
| 7/16-20                                             | 1.750 | 7/16      | 753-1750    | 743-1750 | 724-1750  | 714-1750 |
| 7/16-20                                             | 2.000 | 7/16      | 753-2000    | 743-2000 | 724-2000  | 714-2000 |
| 7/16-20                                             | 2.250 | 7/16      | 753-2250    | 743-2250 | 724-2250  | 714-2250 |
| 7/16-20                                             | 2.500 | 7/16      | 753-2500    | 743-2500 | 724-2500  | 714-2500 |
| 7/16-20                                             | 2.750 | 7/16      | 753-2750    | 743-2750 | 724-2750  | 714-2750 |
| 7/16-20                                             | 3.000 | 7/16      | 753-3000    | 743-3000 | 724-3000  | 714-3000 |
| 7/16-20                                             | 3.250 | 7/16      | 753-3250    | 743-3250 | 724-3250  | 714-3250 |
| 7/16-20                                             | 3.500 | 7/16      | 753-3500    | 743-3500 | 724-3500  | 714-3500 |
| 7/16-20                                             | 3.750 | 7/16      | 753-3750    | 743-3750 | 724-3750  | 714-3750 |
| 7/16-20                                             | 4.000 | 7/16      | 753-4000    | 743-4000 | 724-4000  | 714-4000 |
| 7/16-20                                             | 4.250 | 7/16      | 753-4250    | 743-4250 | 724-4250  | 714-4250 |
| 7/16-20                                             | 4.500 | 7/16      | 753-4500    | 743-4500 | 724-4500  | 714-4500 |
| 7/16-20                                             | 4.750 | 7/16      | 753-4750    | 743-4750 | 724-4750  | 714-4750 |
| 7/16-20                                             | 5.000 | 7/16      | 753-5000    | 743-5000 | 724-5000  | 714-5000 |

# METRIC BOLT 5-PACKS

| Diameter x Pitch      | UHL | Wrenching | Black Oxide |          | Stainless |          |
|-----------------------|-----|-----------|-------------|----------|-----------|----------|
|                       |     |           | Hex         | 12 point | Hex       | 12 point |
| M6 BOLTS, 1.00 PITCH  |     |           |             |          |           |          |
| M6 x 1.00             | 12  | 8mm       | 660-1016    | 670-1016 | 760-1016  | 770-1016 |
| M6 x 1.00             | 16  | 8mm       | 660-1017    | 670-1017 | 760-1017  | 770-1017 |
| M6 x 1.00             | 20  | 8mm       | 660-1001    | 670-1001 | 760-1001  | 770-1001 |
| M6 x 1.00             | 25  | 8mm       | 660-1002    | 670-1002 | 760-1002  | 770-1002 |
| M6 x 1.00             | 30  | 8mm       | 660-1003    | 670-1003 | 760-1003  | 770-1003 |
| M6 x 1.00             | 35  | 8mm       | 660-1004    | 670-1004 | 760-1004  | 770-1004 |
| M6 x 1.00             | 40  | 8mm       | 660-1005    | 670-1005 | 760-1005  | 770-1005 |
| M6 x 1.00             | 45  | 8mm       | 660-1006    | 670-1006 | 760-1006  | 770-1006 |
| M6 x 1.00             | 50  | 8mm       | 660-1007    | 670-1007 | 760-1007  | 770-1007 |
| M6 x 1.00             | 55  | 8mm       | 660-1008    | 670-1008 | 760-1008  | 770-1008 |
| M6 x 1.00             | 60  | 8mm       | 660-1009    | 670-1009 | 760-1009  | 770-1009 |
| M6 x 1.00             | 65  | 8mm       | 660-1010    | 670-1010 | 760-1010  | 770-1010 |
| M6 x 1.00             | 70  | 8mm       | 660-1011    | 670-1011 | 760-1011  | 770-1011 |
| M6 x 1.00             | 75  | 8mm       | 660-1012    | 670-1012 | 760-1012  | 770-1012 |
| M6 x 1.00             | 80  | 8mm       | 660-1013    | 670-1013 | 760-1013  | 770-1013 |
| M6 x 1.00             | 90  | 8mm       | 660-1014    | 670-1014 | 760-1014  | 770-1014 |
| M6 x 1.00             | 100 | 8mm       | 660-1015    | 670-1015 | 760-1015  | 770-1015 |
| M6 x 1.00             | 135 | 8mm       | 660-1018    | 670-1018 | 760-1018  | 770-1018 |
| M8 BOLTS, 1.25 PITCH  |     |           |             |          |           |          |
| M8 x 1.25             | 12  | 10mm      | 661-1016    | 671-1016 | 761-1016  | 771-1016 |
| M8 x 1.25             | 16  | 10mm      | 661-1017    | 671-1017 | 761-1017  | 771-1017 |
| M8 x 1.25             | 20  | 10mm      | 661-1001    | 671-1001 | 761-1001  | 771-1001 |
| M8 x 1.25             | 25  | 10mm      | 661-1002    | 671-1002 | 761-1002  | 771-1002 |
| M8 x 1.25             | 30  | 10mm      | 661-1003    | 671-1003 | 761-1003  | 771-1003 |
| M8 x 1.25             | 35  | 10mm      | 661-1004    | 671-1004 | 761-1004  | 771-1004 |
| M8 x 1.25             | 40  | 10mm      | 661-1005    | 671-1005 | 761-1005  | 771-1005 |
| M8 x 1.25             | 45  | 10mm      | 661-1006    | 671-1006 | 761-1006  | 771-1006 |
| M8 x 1.25             | 50  | 10mm      | 661-1007    | 671-1007 | 761-1007  | 771-1007 |
| M8 x 1.25             | 55  | 10mm      | 661-1008    | 671-1008 | 761-1008  | 771-1008 |
| M8 x 1.25             | 60  | 10mm      | 661-1009    | 671-1009 | 761-1009  | 771-1009 |
| M8 x 1.25             | 65  | 10mm      | 661-1010    | 671-1010 | 761-1010  | 771-1010 |
| M8 x 1.25             | 70  | 10mm      | 661-1011    | 671-1011 | 761-1011  | 771-1011 |
| M8 x 1.25             | 75  | 10mm      | 661-1012    | 671-1012 | 761-1012  | 771-1012 |
| M8 x 1.25             | 80  | 10mm      | 661-1013    | 671-1013 | 761-1013  | 771-1013 |
| M8 x 1.25             | 85  | 10mm      |             |          |           | 771-1018 |
| M8 x 1.25             | 90  | 10mm      | 661-1014    | 671-1014 | 761-1014  | 771-1014 |
| M8 x 1.25             | 100 | 10mm      | 661-1015    | 671-1015 | 761-1015  | 771-1015 |
| M10 BOLTS, 1.25 PITCH |     |           |             |          |           |          |
| M10 x 1.25            | 20  | 12mm      | 663-1001    | 673-1001 | 763-1001  | 773-1001 |
| M10 x 1.25            | 25  | 12mm      | 663-1002    | 673-1002 | 763-1002  | 773-1002 |
| M10 x 1.25            | 30  | 12mm      | 663-1003    | 673-1003 | 763-1003  | 773-1003 |
| M10 x 1.25            | 35  | 12mm      | 663-1004    | 673-1004 | 763-1004  | 773-1004 |
| M10 x 1.25            | 40  | 12mm      | 663-1005    | 673-1005 | 763-1005  | 773-1005 |
| M10 x 1.25            | 45  | 12mm      | 663-1006    | 673-1006 | 763-1006  | 773-1006 |
| M10 x 1.25            | 50  | 12mm      | 663-1007    | 673-1007 | 763-1007  | 773-1007 |
| M10 x 1.25            | 60  | 12mm      | 663-1008    | 673-1008 | 763-1008  | 773-1008 |
| M10 x 1.25            | 70  | 12mm      | 663-1009    | 673-1009 | 763-1009  | 773-1009 |
| M10 x 1.25            | 80  | 12mm      | 663-1010    | 673-1010 | 763-1010  | 773-1010 |
| M10 x 1.25            | 90  | 12mm      | 663-1011    | 673-1011 | 763-1011  | 773-1011 |
| M10 x 1.25            | 100 | 12mm      | 663-1012    | 673-1012 | 763-1012  | 773-1012 |
| M10 BOLTS, 1.50 PITCH |     |           |             |          |           |          |
| M10 x 1.50            | 20  | 12mm      | 662-1001    | 672-1001 | 762-1001  | 772-1001 |
| M10 x 1.50            | 25  | 12mm      | 662-1002    | 672-1002 | 762-1002  | 772-1002 |
| M10 x 1.50            | 30  | 12mm      | 662-1003    | 672-1003 | 762-1003  | 772-1003 |
| M10 x 1.50            | 35  | 12mm      | 662-1004    | 672-1004 | 762-1004  | 772-1004 |
| M10 x 1.50            | 40  | 12mm      | 662-1005    | 672-1005 | 762-1005  | 772-1005 |
| M10 x 1.50            | 45  | 12mm      | 662-1006    | 672-1006 | 762-1006  | 772-1006 |
| M10 x 1.50            | 50  | 12mm      | 662-1007    | 672-1007 | 762-1007  | 772-1007 |
| M10 x 1.50            | 60  | 12mm      | 662-1008    | 672-1008 | 762-1008  | 772-1008 |
| M10 x 1.50            | 65  | 12mm      |             |          |           | 772-1013 |
| M10 x 1.50            | 70  | 12mm      | 662-1009    | 672-1009 | 762-1009  | 772-1009 |
| M10 x 1.50            | 80  | 12mm      | 662-1010    | 672-1010 | 762-1010  | 772-1010 |
| M10 x 1.50            | 90  | 12mm      | 662-1011    | 672-1011 | 762-1011  | 772-1011 |
| M10 x 1.50            | 100 | 12mm      | 662-1012    | 672-1012 | 762-1012  | 772-1012 |

Red part numbers indicate new items



## STANDARD & NYLOC 5-PACKS



To compliment ARP "bulk" 5-pack chrome moly and stainless steel fasteners we have assembled matching groups of nuts. They, too, come in convenient 5-pack skin cards. Take your pick from stainless steel and black oxide finished standard nuts and stainless steel Nyloc self-locking nuts.

## HEX NUTS



Constructed from the finest aerospace-quality materials, these hex nuts are available in most sizes to meet your needs. All hex nuts meet ARP's exacting quality control standards and are black oxidized. All hex nuts are rated **180,000 psi** tensile strength.

## 12-POINT NUTS



Available in a variety of sizes to suit your needs, all ARP 12-point nuts are constructed from aerospace-quality materials and meet their high standards of excellence. Rated **180,000 psi** tensile strength.

## STANDARD STAINLESS STEEL

| Thread Size | Socket Size | 12-Point (1 PC bulk) | 12-Point (2 PC-Pack) | 12-Point (10 PC-Pack) |
|-------------|-------------|----------------------|----------------------|-----------------------|
| 1/4-28      | 5/16        | 400-8300             | 400-8320             | 400-8330              |
| 3/8-24      | 7/16        | 400-8302             | 400-8322             | 400-8332              |
| 7/16-20     | 1/2         | 400-8303             | 400-8323             | 400-8333              |

|                        | Stainless Hex | Black Oxide Hex | Stainless Nyloc Hex | Cad Plated Nyloc Hex |
|------------------------|---------------|-----------------|---------------------|----------------------|
| <b>STANDARD THREAD</b> |               |                 |                     |                      |
| 1/4-20                 | 400-8651      | 200-8651        | 400-8661            | 200-8661             |
| 5/16-18                | 400-8652      | 200-8652        | 400-8662            | 200-8662             |
| 3/8-16                 | 400-8654      | 200-8654        | 400-8664            | 200-8664             |
| 7/16-14                | 400-8656      | 200-8656        | 400-8666            | 200-8666             |
| 1/2-13                 | 400-8657      | 200-8657        | 400-8667            | 200-8667             |
| <b>FINE THREAD</b>     |               |                 |                     |                      |
| 1/4-28                 | 400-8751      |                 | 400-8761            | 400-8771             |
| 5/16-24                | 400-8752      |                 | 400-8762            |                      |
| 3/8-24                 | 400-8754      |                 | 400-8764            |                      |
| 7/16-20                | 400-8756      |                 | 400-8766            |                      |
| 1/2-20                 | 400-8757      |                 | 400-8767            |                      |

| Thread Size | Socket Size | Hex (1 PC bulk) | Hex (2 PC-Pack) | Hex (10 PC-Pack) |
|-------------|-------------|-----------------|-----------------|------------------|
| 1/4-28 (1)  | 7/16        | 200-8601        | 200-8621        | 200-8631         |
| 5/16-18 (2) | 1/2         | 301-8304        | 301-8324        | 301-8344         |
| 5/16-24     | 1/2         | 200-8602        | 200-8622        | 200-8632         |
| 11/32-24    | 1/2         | 200-8603        | 200-8623        | 200-8633         |
| 3/8-16 (2)  | 9/16        | 200-8704        | 200-8724        | 200-8734         |
| 3/8-24      | 9/16        | 200-8604        | 200-8624        | 200-8634         |
| 7/16-14 (2) | 5/8         | 301-8305        | 301-8325        | 301-8345         |
| 7/16-20     | 5/8         | 200-8605        | 200-8625        | 200-8635         |
| 7/16-20     | 11/16       | 200-8606        | 200-8626        | 200-8636         |
| 1/2-20      | 3/4         | 200-8607        | 200-8627        | 200-8637         |
| 9/16-18     | 7/8         | 200-8608        | 200-8628        | 200-8638         |

(1) cad-plated (2) flanged hex nut

| Thread Size     | Socket Size | 12-Point (1 Pc Bulk) | 12-Point (2 Pc-Pack) | 12-Point (10 Pc-Pack) | 12-Point (SS per PC) |
|-----------------|-------------|----------------------|----------------------|-----------------------|----------------------|
| <b>STANDARD</b> |             |                      |                      |                       |                      |
| 1/4-20          | 5/16        | 301-8300             | 301-8320             | 301-8340              |                      |
| 1/4-28          | 5/16        | 300-8300             | 300-8320             | 300-8330              | 400-8300             |
| 5/16-18         | 3/8         | 301-8303             | 301-8323             | 301-8343              |                      |
| 5/16-24         | 3/8         | 300-8301             | 300-8321             | 300-8331              | 400-8301             |
| 11/32-24        | 7/16        | 300-8373             | 300-8383             | 300-8393              |                      |
| 3/8-16          | 7/16        | 301-8301             | 301-8321             | 301-8341              |                      |
| 3/8-24          | 7/16        | 300-8302             | 300-8322             | 300-8332              | 400-8302             |
| 3/8-24          | 1/2         | 300-8371             | 300-8381             | 300-8391              |                      |
| 3/8-24 (3)      | 1/2         | 300-8372             | 300-8382             | 300-8392              |                      |
| 7/16-14         | 1/2         | 301-8306             | 301-8326             | 301-8346              |                      |
| 7/16-20         | 1/2         | 300-8303             | 300-8323             | 300-8333              | 400-8303             |
| 7/16-20         | 9/16        | 300-8374             | 300-8384             | 300-8394              |                      |
| 7/16-20 (4)     | 1/2         | 300-8375             | 300-8385             | 300-8395              |                      |
| 1/2-13          | 9/16        | 301-8302             | 301-8322             | 301-8342              |                      |
| 1/2-20          | 9/16        | 300-8304             | 300-8324             | 300-8334              |                      |
| 1/2-20          | 5/8         | 300-8306             | 300-8326             | 300-8336              |                      |
| 9/16-12         | 11/16       | 301-8307             | 301-8327             | 301-8347              |                      |
| 9/16-18         | 11/16       | 300-8305             | 300-8325             | 300-8335              |                      |
| 5/8-18          | 13/16       | 300-8309             | 300-8329             | 300-8339              |                      |
| <b>METRIC</b>   |             |                      |                      |                       |                      |
| M6 x 1.00       | 8mm         | 300-8370             | 300-8380             | 300-8390              | 400-8370             |
| M7 x 1.00       | 9mm         | 300-8346             | 300-8356             | 300-8366              | 400-8346             |
| M8 x 1.00       | 10mm        | 300-8340             | 300-8350             | 300-8360              | 400-8340             |
| M8 x 1.25       | 10mm        | 300-8310             | 300-8311             | 300-8312              | 400-8310             |
| M9 x 1.00       | 11mm        | 300-8341             | 300-8351             | 300-8361              | 400-8341             |
| M9 x 1.25       | 12mm        | 300-8342             | 300-8352             | 300-8362              |                      |
| M10 x 1.25*     | 12mm        | 300-8343             | 300-8353             | 300-8363              |                      |
| M10 x 1.25      | 12mm        | 300-8344             | 300-8354             | 300-8364              | 400-8344             |
| M10 x 1.50      | 12mm        | 300-8345             | 300-8355             | 300-8365              | 400-8345             |
| M12 x 1.00      | 14mm        | 300-8347             | 300-8367             | 300-8387              | 400-8347             |
| M12 x 1.25      | 14mm        | 300-8307             | 300-8327             | 300-8337              | 400-8307             |
| M12 x 1.25*     | 14mm        | 300-8308             | 300-8328             | 300-8338              | 400-8308             |
| M12 x 1.75      | 14mm        | 300-8376             | 300-8386             | 300-8396              |                      |

\*small collar (3) .645 flange (4) .600 flange

## SERRATED FLANGE NUTS



These serrated hex nuts with flanged collars are available especially for carburetor, valve cover, front cover, oil pan studs and windage tray studs. Made from premium-quality material, they are cad-plated. All general purpose nuts are rated **150,000 psi** tensile strength.

**Note: Do not use on cylinder heads, mains, or rods!**

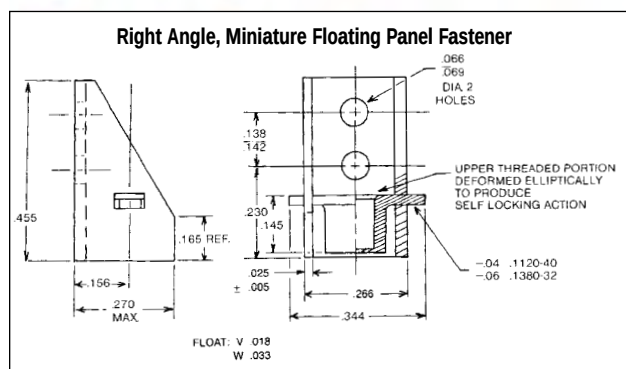
| Thread Size | Socket Size | Hex (1 PC bulk) | Hex (2 PC-Pack) | Hex (10 PC-Pack) | Hex SS (1 PC bulk) |
|-------------|-------------|-----------------|-----------------|------------------|--------------------|
| 1/4-28      | 7/16        | 200-8609        | 200-8629        | 200-8639         | 400-8609           |
| 5/16-24     | 1/2         | 200-8610        | 200-8620        | 200-8630         | 400-8610           |
| 5/16-24 (4) | 1/2         | 200-8645        | 200-8655        | 200-8665         |                    |
| 3/8-24      | 9/16        | 200-8600        | 200-8640        | 200-8650         |                    |
| M10 x 1.25  | 12mm        | 200-8663        | 200-8673        | 200-8683         |                    |

Red part numbers indicate new items

(4) non-serrated

## PLATE NUTS

Plate Nuts are a quick and efficient way to provide a captive self-locking nut wherever you might need one. Ideal for use in difficult to reach areas, particularly when in a hurry. Available in a wide variety, these represent a selection of popular applications. Can be riveted, screwed or welded in position. Made of carbon alloy steel. Finished in cadmium and chromate.



| Size                                                  | NAS | Part No. |
|-------------------------------------------------------|-----|----------|
| <b>FLOATING, WITH REPLACEABLE NUT</b>                 |     |          |
| 10-32                                                 | -3  | 200-9111 |
| 1/4-28                                                | -4  | 200-9112 |
| 5/16-24                                               | -5  | 200-9113 |
| <b>2-LUG, FIXED</b>                                   |     |          |
| 10-32                                                 | -3  | 200-9101 |
| 1/4-28                                                | -4  | 200-9102 |
| 5/16-24                                               | -5  | 200-9103 |
| 3/8-24                                                | -6  | 200-9104 |
| <b>2-LUG FIXED WITH COUNTER SUNK RIVET HOLES</b>      |     |          |
| 10-32                                                 | -3  | 200-9106 |
| 1/4-28                                                | -4  | 200-9107 |
| 5/16-24                                               | -5  | 200-9108 |
| <b>RIGHT ANGLE, MINIATURE FLOATING PANEL FASTENER</b> |     |          |
| 4-40                                                  |     | 200-9121 |

## SELF-LOCKING NUTS

For high stress, high temperature and severe vibration – all metal six point Jet-nuts and 12-point K-nuts are ideal for use practically everywhere. Features include elliptically offset, light weight, temperature resistant, positive locking and almost indefinitely reusable. The upper portion of the nut is distorted or offset elliptically. The elastic deformation creates a friction hold sufficient to lock the nut. Made of carbon-alloy steel, cadmium and chromate finish.



| Size                            | NAS | Part No. |
|---------------------------------|-----|----------|
| <b>HEX (JET NUT)</b>            |     |          |
| 10-32                           | -3  | 200-8101 |
| 1/4-28                          | -4  | 200-8102 |
| 5/16-24                         | -5  | 200-8103 |
| 3/8-24                          | -6  | 200-8104 |
| <b>HEX, 1/2 HEIGHT, DRILLED</b> |     |          |
| 1/4-28                          | -4  | 200-8113 |
| 5/16-24                         | -5  | 200-8114 |



| Size                              | NAS | Part No. |
|-----------------------------------|-----|----------|
| <b>12-POINT REDUCED WRENCHING</b> |     |          |
| 10-32                             | -3  | 200-8201 |
| 1/4-28                            | -4  | 200-8202 |
| 5/16-24                           | -5  | 200-8203 |
| 3/8-24                            | -6  | 200-8204 |
| <b>HEX, 1/2 HEIGHT</b>            |     |          |
| 10-32                             | -3  | 200-8107 |
| 1/4-28                            | -4  | 200-8108 |
| 5/16-24                           | -5  | 200-8109 |
| 3/8-24                            | -6  | 200-8110 |

## SPECIAL PURPOSE WASHERS

A true high performance washer from ARP, available in a variety of sizes and thickness, and with or without I.D. (inside diameter) chamfers. All are constructed from premium chrome moly and are parallel-ground, hardened, and finished in black oxide. Our 3/8" I.D. washers, for example, come in four different sizes (O.D.) and different thicknesses. Special connecting rod washers are available, as are some of the more popular metric sizes. All of the washers are available individually, with most of them also offered in handy 2-piece and 10-piece packages. Build up an inventory of these premium quality washers so you won't get caught short when the need arises.



| Application                             | Inside Dia. | Outside Dia. | Thickness | 1 PC. Bulk | 2 PC. Pack | 10 PC. Pack |
|-----------------------------------------|-------------|--------------|-----------|------------|------------|-------------|
| <b>PREMIUM CHROME MOLY, BLACK OXIDE</b> |             |              |           |            |            |             |
| Washer, no chamfer                      | 3/8         | 5/8          | .120"     | 200-8504   | 200-8544   | 200-8554    |
| Washer, with chamfer                    | 3/8         | 5/8          | .062"     | 200-8505   | 200-8675   | 200-8685    |
| Washer, no chamfer                      | 3/8         | .675         | .120"     | 200-8506   | 200-8546   | 200-8556    |
| Washer, no chamfer                      | 3/8         | 3/4          | .120"     | 200-8507   | 200-8677   | 200-8687    |
| Washer, with chamfer                    | 3/8         | 3/4          | .120"     | 200-8517   | 200-8547   | 200-8557    |
| Washer, no chamfer, radiused O.D.       | 3/8         | 7/8          | .150"     | 200-8508   | 200-8678   | 200-8688    |
| Washer, no chamfer                      | 5/16        | .550         | .120"     | 200-8593   | 200-8578   | 200-8584    |
| Washer, with chamfer                    | 5/16        | .550         | .120"     | 200-8594   | 200-8579   | 200-8585    |
| Washer, no chamfer                      | 5/16        | .675         | .120"     | 200-8595   | 200-8580   | 200-8586    |
| Washer, with chamfer                    | 5/16        | .675         | .120"     | 200-8575   | 200-8581   | 200-8587    |
| Washer, no chamfer                      | 5/16        | 13/16        | .120"     | 200-8576   | 200-8582   | 200-8588    |
| Washer, with chamfer                    | 5/16        | 13/16        | .120"     | 200-8577   | 200-8583   | 200-8589    |
| Washer, with chamfer                    | 7/16        | 13/16        | .120"     | 200-8509   | 200-8529   | 200-8539    |
| Washer, no chamfer                      | 7/16        | 13/16        | .120"     | 200-8510   | 200-8520   | 200-8530    |
| Connecting rod washer, with chamfer     | 7/16        | .675         | .062"     | 200-8501   | 200-8671   | 200-8681    |
| Connecting rod washer, with chamfer     | 7/16        | 3/4          | .073"     | 200-8502   | 200-8672   | 200-8682    |
| Washer, no chamfer                      | 7/16        | 3/4          | .120"     | 200-8511   | 200-8521   | 200-8531    |
| Washer, with chamfer                    | 7/16        | 3/4          | .120"     | 200-8518   | 200-8548   | 200-8558    |
| Washer, with chamfer                    | 7/16        | 7/8          | .120"     | 200-8512   | 200-8522   | 200-8532    |
| Washer, no chamfer                      | .471        | 1.300        | .120"     | 200-8429   | 200-8439   | 200-8449    |
| Washer, with chamfer                    | 1/2         | 7/8          | .120"     | 200-8513   | 200-8523   | 200-8533    |
| Washer, no chamfer                      | 1/2         | 7/8          | .120"     | 200-8514   | 200-8524   | 200-8534    |
| Washer, no chamfer                      | 9/16        | 1            | .120"     | 200-8515   | 200-8525   | 200-8535    |
| Washer, no chamfer                      | 6mm         | .990         | .065"     | 200-8676   | 200-8686   | 200-8696    |
| Washer, no chamfer                      | 8mm         | .575         | .062"     | 200-8641   | 200-8642   | 200-8643    |
| Washer, no chamfer                      | 10mm        | 3/4          | .120"     | 200-8519   | 200-8679   | 200-8689    |
| Washer, no chamfer                      | 10mm        | .850         | .120"     | 200-8590   | 200-8591   | 200-8592    |
| Washer, no chamfer                      | 12mm        | 3/4          | .120"     | 200-8516   | 200-8526   | 200-8536    |
| Washer, no chamfer                      | 12mm        | 7/8          | .120"     | 200-8500   | 200-8527   | 200-8537    |
| <b>STAINLESS STEEL</b>                  |             |              |           |            |            |             |
| Washer, with chamfer                    | 5/16        | .625         | .120"     | 400-8530   | 400-8540   | 400-8550    |
| Washer, no chamfer                      | 3/8         | .720         | .120"     | 400-8501   | 400-8504   | 400-8508    |
| Washer, with chamfer                    | 3/8         | .750         | .120"     | 400-8507   | 400-8527   | 400-8537    |
| Washer, with chamfer                    | 7/16        | 13/16        | .120"     | 400-8509   | 400-8529   | 400-8539    |
| Washer, with chamfer                    | 10mm        | .630         | .075"     | 400-8503   | 400-8523   | 400-8533    |
| Washer, with chamfer                    | 10mm        | .750         | .120"     | 400-8519   | 400-8520   | 400-8521    |
| Washer, no chamfer                      | 10mm        | .750         | .120"     | 400-8524   | 400-8534   | 400-8544    |
| Washer, with chamfer                    | 10mm        | .865         | .160"     | 400-8502   | 400-8522   | 400-8532    |

Red part numbers indicate new items

## GENERAL PURPOSE WASHERS

**Note: Do not use on cylinder heads, mains, or rods!**



Quality washer for many applications, such as attaching accessories, chassis components, etc. They are not of the hardness required for use on cylinder heads, mains and connecting rods. Available in black oxide and stainless steel. Stainless demonstrates excellent corrosion resistance. Washers have over-sized I.D. (inside diameter) to clear most under-bolt head radii. Available for 1/4, 5/16, 3/8, 7/16, 1/2" and 10mm shank bolts and studs.

| Inside Dia. | Outside Dia. | Thickness | Black Oxide | Stainless | Cad Plated |
|-------------|--------------|-----------|-------------|-----------|------------|
| 1/4         | 1/2          | .063"     | 200-8401    | 200-8414  | 200-8416   |
| 1/4         | 9/16         | .063"     | 200-8408    | 200-8409  |            |
| 5/16        | 9/16         | .063"     | 200-8402    | 200-8403  | 200-8417   |
| 5/16        | 5/8          | .063"     | 200-8410    | 200-8411  |            |
| 3/8         | 5/8          | .063"     | 200-8404    | 200-8405  | 200-8418   |
| 3/8         | 11/16        | .075"     | 200-8412    | 200-8413  |            |
| 7/16        | 3/4          | .063"     | 200-8406    | 200-8415  | 200-8419   |
| 1/2         | 7/8          | .063"     |             |           | 200-8407   |
| 10mm        | 3/4          | .072"     | 200-8421    | 200-8422  |            |

Red part numbers indicate new items



## INSERT WASHERS

These handy washers are made to protect the top of holes from galling or collapsing around studs or bolts. They're ideal for head bolt holes, mid-motor plates, or any other high-wear area that requires a washer. Easy to install by just oversizing hole and pressing in washer. ARP Insert Washers are fully CNC machined from premium thru-hardened 8740 stock.

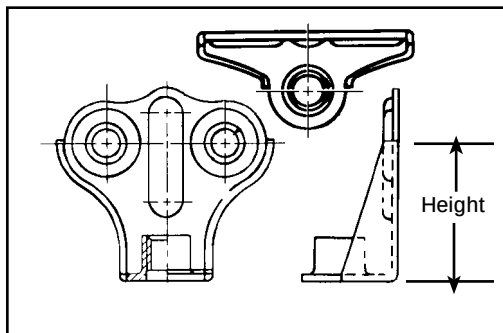
*Note: Step washers for Ford applications also listed on head bolt pages*



| Insert ID | Insert OD | OD Size | 1 PC-Bulk | 2 PC-Pack | 10 PC-Pack |
|-----------|-----------|---------|-----------|-----------|------------|
| 1/4       | .318      | .562    | 200-8560  | 200-8565  | 200-8570   |
| 5/16      | .380      | .625    | 200-8561  | 200-8566  | 200-8571   |
| 3/8       | .443      | .750    | 200-8562  | 200-8567  | 200-8572   |
| 7/16      | .571      | .812    | 200-8563  | 200-8568  | 200-8573   |
| 7/16      | .529      | .875    | 200-8596  | 200-8597  | 200-8598   |
| 1/2       | .567      | .875    | 200-8564  | 200-8569  | 200-8574   |

## STAND-OFF BRACKETS

These handy devices are excellent for attaching hydraulic lines, control cables or wire bundles to the chassis. They're stamped from **125,000 psi** steel, heat-treated, and cadmium plated for extra durability. They have a ribbed back for extra strength. Attach with 10/32 bolts. Available in three heights.



| Application                         | Part No. |
|-------------------------------------|----------|
| 10.32 x .465" Height                | 200-9301 |
| 10.32 x .465" Height, radiused back | 200-9305 |
| 10.32 x .665" Height                | 200-9302 |
| 10.32 x .865" Height                | 200-9303 |

## WELD BUNGS

ARP has introduced a line of premium quality weld-in bungs. The parts are CNC machined from solid aluminum billet (6061) or 1018 mild steel. Applications include, but are not limited to: oil or fuel tanks, radiators, valve covers, manifolds, and rear axle housings. Fittings are available with female pipe threads, male AN, and female O-ring types. The fittings come in sizes: 1/4, 3/8, 1/2, 3/4, and 1 inch sizes; NPT -6 thru -20 AN; and -6 thru -20 O-ring sizes.



### NPT

| Aluminum |          | Steel |          |
|----------|----------|-------|----------|
| Size     | Part No. | Size  | Part No. |
| 1/4      | 800-8101 | 1/4   | 800-8201 |
| 3/8      | 800-8102 | 3/8   | 800-8202 |
| 1/2      | 800-8103 | 1/2   | 800-8203 |
| 3/4      | 800-8104 | 3/4   | 800-8204 |
| 1        | 800-8105 | 1     | 800-8205 |

### AN Male

| Aluminum |          | Steel |          |
|----------|----------|-------|----------|
| Size     | Part No. | Size  | Part No. |
| AN6      | 800-8106 | AN6   | 800-8206 |
| AN8      | 800-8107 | AN8   | 800-8207 |
| AN10     | 800-8108 | AN10  | 800-8208 |
| AN12     | 800-8109 | AN12  | 800-8209 |
| AN16     | 800-8110 | AN16  | 800-8210 |
| AN20     | 800-8111 | AN20  | 800-8211 |

### AN O-Ring

| Aluminum |          | Steel |          |
|----------|----------|-------|----------|
| Size     | Part No. | Size  | Part No. |
| -6       | 800-8112 | -6    | 800-8212 |
| -8       | 800-8113 | -8    | 800-8213 |
| -10      | 800-8114 | -10   | 800-8214 |
| -12      | 800-8115 | -12   | 800-8215 |
| -16      | 800-8116 | -16   | 800-8216 |
| -20      | 800-8117 | -20   | 800-8217 |

800-826-3045

# ASSEMBLY LUBE & SEALER

It's difficult to determine the amount of torque required to provide the correct preload and clamp force of a given fastener. For example – when tightened, dry uncoated fasteners use up about 95% of the applied torque simply by overcoming the friction between the male and female threads. To ensure that all ARP fasteners provide the optimum level of service, the installed residual stress is calculated and verified experimentally using a superior quality lubricant. It is important to note that the friction coefficients of lubricants vary dramatically, making it difficult to consistently produce the exact amount of stress within the fastener to clamp the components together. That's why ARP developed an ultra-consistent lubricant and recommend the use of our premium grade **ASSEMBLY LUBRICANT** or **THREAD SEALER** in order to precisely duplicate the recommended tightening specifications provided with all ARP fasteners.

## Assembly Lubricant

- Premium grade Moly base with rust and corrosion inhibitors.
- Effective lubrication range: -30°F to 750°F.
- Load range: 500,000 psi.
- Designed for use with bolts

## Thread Sealer

- Teflon based w/rust & corrosion inhibitors.
- Effective range: -30° to 550°F.
- Sealant range: 10,000 psi (pressure).
- Application: delivers a flexible leak-proof seal in aluminum, steel, stainless steel and plastic against coolants, water, gasoline, natural gas and LPG.
- Designed for use with bolts



| Product                                          | Part #   |
|--------------------------------------------------|----------|
| Assembly Lubricant (0.5 fl. oz.)                 | 100-9902 |
| Assembly Lubricant (1.69 fl. oz.)                | 100-9903 |
| Assembly Lubricant (1 pt. brush top container)   | 100-9905 |
| Assembly Lubricant (1/2 pt. brush top container) | 100-9906 |
| Thread Sealer (1.69 fl. oz.)                     | 100-9904 |

**NOTE:** These products are formulated for use on fasteners. Not recommended for use on rotating components.

## TOP ENGINE BUILDERS AND MANUFACTURERS INSIST ON ARP!

Master engine builders in all forms of racing know that it takes ARP fasteners to win races and championships.

They know that ARP makes the best fasteners in the business. If you're not using ARP, then what are you waiting on?



Bill Mitchell  
Owner  
World Products



Austin Coil  
Crew Chief  
John Force Racing



Rick Mann  
Chief Engine Builder  
ECR Engines

# THREAD CLEANING CHASERS

ARP's handy thread cleaning chaser taps are designed with correct thread pitch and diameter to clean dirty blind or thru holes. Taps come in five USS sizes: 1/4", 5/16", 3/8", 7/16" and 1/2", as well as metric. They are sold individually or in sets. Please note that these are strictly *cleaning* taps and are not designed to cut thread. They are a handy addition to the tool box of any serious engine builder and an essential aid to preparing any block for final assembly. Don't take a chance on weakening block and cylinder head threads. Use these handy thread cleaning chasers whenever possible!



| Size    | Part No. |
|---------|----------|
| 1/4-20  | 911-0001 |
| 5/16-18 | 911-0002 |
| 3/8-16  | 911-0003 |
| 7/16-14 | 911-0004 |
| 1/2-13  | 911-0005 |

| Size       | Part No. |
|------------|----------|
| M8 x 1.25  | 912-0001 |
| M10 x 1.25 | 912-0002 |
| M10 x 1.50 | 912-0003 |
| M11 x 1.25 | 912-0004 |
| M11 x 1.50 | 912-0005 |
| M11 x 2.00 | 912-0011 |
| M12 x 1.25 | 912-0006 |
| M12 x 1.50 | 912-0007 |
| M12 x 1.75 | 912-0008 |

| Combination Sets        | Specs             | Part No. |
|-------------------------|-------------------|----------|
| USS Combo Pack, 5-pc    | 1/4 through 1/2   | 911-0006 |
| Metric Combo Pack, 4-pc | 1.25 Pitch        | 912-0009 |
| Metric Combo Pack, 4-pc | 1.50 & 1.75 Pitch | 912-0010 |

# SPARK PLUG INDEXER

By allowing you to consistently position spark plug ground electrodes out of harm's way, the ARP indexing tool takes the guess-work out of installing spark plugs where the combustion chamber and high dome piston clearances is critical. Designed to fit in the palm of your hand, this tool eliminates the need to perform cylinder head calibration. Best of all, the ARP indexer is made from aluminum alloy with precision machined threads that allows you to proof the quality of spark plug threads before installation in expensive cylinder heads. Anodized for protection and quick recognition. For use with tapered gasket 14mm plugs.



| Product            | Part #   |
|--------------------|----------|
| Spark Plug Indexer | 920-0001 |

# OIL PUMP PRIMER KITS

Those first moments an engine runs prior to building oil pressure are when damage can easily occur. ARP's Oil Pump Primer Kit lets you spin the oil pump with a drill motor and bring up the oil pressure prior to starting the engine. This prevents any unnecessary wear or damage to rotating, reciprocating and valve train components. ARP's rugged primer shafts are rated at **170,000 psi** to ensure extended service life of this valuable tool. They feature a special billet aluminum sleeve that accurately positions the shaft and keeps it from wobbling.



| Application                                     | Part No. |
|-------------------------------------------------|----------|
| <b>CHEVROLET</b>                                |          |
| SB & BB and 90° deluxe, 9.00" O.A.L.            | 130-8802 |
| <b>FORD</b>                                     |          |
| Small block, 1/4" hex drive                     | 150-8801 |
| 351C, 351W, 351M, 400, 429/460, 5/16" hex drive | 150-8802 |

# ROD BOLT EXTENSIONS

A long taper and full radius prevents nicking and scratching of crankshaft journals during connecting rod installation. ARP rod bolt extensions act as a guide during piston and rod installation – they will also hold the bearing shell in position in some applications. Available in 5/16", 3/8" and 7/16" extensions are packaged in pairs and are hard anodize color coded for ease of identification.

| Size     | Part No. |
|----------|----------|
| 5/16     | 910-0001 |
| 3/8      | 910-0003 |
| 7/16     | 910-0004 |
| Set of 3 | 910-0005 |





# TAPERED RING COMPRESSORS

ARP's new ring compressors are CNC machined from 6061-T6 billet tube material and feature a true radius for each different bore diameter. What's more, they are relieved for wire O-rings on bottom. Type 3 anodizing is used for long life, and the bore size is prominently engraved in 3/4" high numbers for easy identification. Standard stocking sizes from 3.552" to 4.750" (SAE) and 75mm to 95.5mm (metric). The true radius design is far superior to conventional "tapered" devices, and widely acclaimed by professional engine builders! This is truly the very best piston ring compressor on the market today.

Available in standard & metric



| Size  | Part No. |
|-------|----------|
| 3.552 | 899-5520 |
| 3.572 | 899-5720 |
| 3.800 | 899-8000 |
| 3.830 | 899-8300 |
| 3.900 | 899-9000 |
| 4.000 | 900-0000 |
| 4.005 | 900-0050 |
| 4.010 | 900-0100 |
| 4.020 | 900-0200 |
| 4.030 | 900-0300 |
| 4.040 | 900-0400 |
| 4.060 | 900-0600 |
| 4.070 | 900-0700 |
| 4.080 | 900-0800 |
| 4.090 | 900-0900 |
| 4.100 | 900-1000 |
| 4.105 | 900-1050 |
| 4.110 | 900-1100 |

| Size  | Part No. |
|-------|----------|
| 4.115 | 900-1150 |
| 4.125 | 900-1250 |
| 4.130 | 900-1300 |
| 4.135 | 900-1350 |
| 4.140 | 900-1400 |
| 4.145 | 900-1450 |
| 4.155 | 900-1550 |
| 4.165 | 900-1650 |
| 4.170 | 900-1700 |
| 4.175 | 900-1750 |
| 4.185 | 900-1850 |
| 4.187 | 900-1870 |
| 4.220 | 900-2200 |
| 4.235 | 900-2350 |
| 4.250 | 900-2500 |
| 4.255 | 900-2550 |
| 4.260 | 900-2600 |
| 4.270 | 900-2700 |

| Size  | Part No. |
|-------|----------|
| 4.280 | 900-2800 |
| 4.290 | 900-2900 |
| 4.310 | 900-3100 |
| 4.320 | 900-3200 |
| 4.330 | 900-3300 |
| 4.350 | 900-3500 |
| 4.360 | 900-3600 |
| 4.375 | 900-3750 |
| 4.390 | 900-3900 |
| 4.400 | 900-4000 |
| 4.440 | 900-4400 |
| 4.470 | 900-4700 |
| 4.500 | 900-5000 |
| 4.530 | 900-5300 |
| 4.560 | 900-5600 |
| 4.600 | 900-6000 |
| 4.625 | 900-6250 |
| 4.750 | 900-7500 |

| Size    | Part No. |
|---------|----------|
| 75.00mm | 901-7500 |
| 75.50mm | 901-7550 |
| 76.00mm | 901-7600 |
| 76.50mm | 901-7650 |
| 77.00mm | 901-7700 |
| 77.50mm | 901-7750 |
| 78.00mm | 901-7800 |
| 78.50mm | 901-7850 |
| 79.00mm | 901-7900 |
| 79.50mm | 901-7950 |
| 80.00mm | 901-8000 |
| 80.50mm | 901-8050 |
| 81.00mm | 901-8100 |
| 81.50mm | 901-8150 |

| Size    | Part No. |
|---------|----------|
| 82.00mm | 901-8200 |
| 82.50mm | 901-8250 |
| 83.00mm | 901-8300 |
| 83.50mm | 901-8350 |
| 84.00mm | 901-8400 |
| 84.50mm | 901-8450 |
| 85.00mm | 901-8500 |
| 85.50mm | 901-8550 |
| 86.00mm | 901-8600 |
| 86.50mm | 901-8650 |
| 87.00mm | 901-8700 |
| 87.50mm | 901-8750 |
| 88.00mm | 901-8800 |
| 88.50mm | 901-8850 |

| Size    | Part No. |
|---------|----------|
| 89.00mm | 901-8900 |
| 89.50mm | 901-8950 |
| 90.00mm | 901-9000 |
| 90.50mm | 901-9050 |
| 91.00mm | 901-9100 |
| 91.50mm | 901-9150 |
| 92.00mm | 901-9200 |
| 92.50mm | 901-9250 |
| 93.00mm | 901-9300 |
| 93.50mm | 901-9350 |
| 94.00mm | 901-9400 |
| 94.50mm | 901-9450 |
| 95.00mm | 901-9500 |
| 95.50mm | 901-9550 |

# ROD BOLT STRETCH GAUGE

We highly recommend using a stretch gauge when installing rod bolts and other fasteners where it is possible to measure the length of the bolt after tightening. It is the most accurate way to determine the correct pre-load in the rod bolt. Simply follow manufacturer's instructions, or *use the chart on page 25 of this catalog* for ARP fasteners. Measure the fastener prior to starting, and monitor overall length during installation. When the bolt has stretched the specified amount, the correct preload, or torque, has been applied. We recommend you maintain a chart of all rod bolts, and copy down the length of the fastener prior to and after installation. If there is a permanent increase of .001" in length or more, or if there is deformation, the bolt should be replaced immediately. Don't chance it! A sample chart is as follows:

ARP offers a highly accurate stretch gauge with a dial indicator that reads in increments of .0005". Features extra heavy springs for consistent repetition. Comes with a heavy-duty, insulated plastic carrying case for protection. A "must" for any serious engine builder.



| Product                     | Part #   |
|-----------------------------|----------|
| Stretch Gauge               | 100-9941 |
| Stretch Gauge, billet-style | 100-9942 |

# PROMOTIONAL MATERIALS



## P.O.P. POSTERS

There are four distinctive point-of-purchase posters available from ARP, each covering an important product group. They measure 24" by 12".

| Product                         | Part #   |
|---------------------------------|----------|
| Rod Bolts                       | 999-9901 |
| Cylinder Head & Main Studs      | 999-9902 |
| Valve Train Components          | 999-9903 |
| Stainless Steel Accessory Bolts | 999-9904 |

## BANNERS

You'll see these familiar banners at race tracks from coast to coast, and you can have one for your facility, too. They're screened on heavy-duty vinyl and have grommets on the corners. They measure 5 feet by 3 feet.

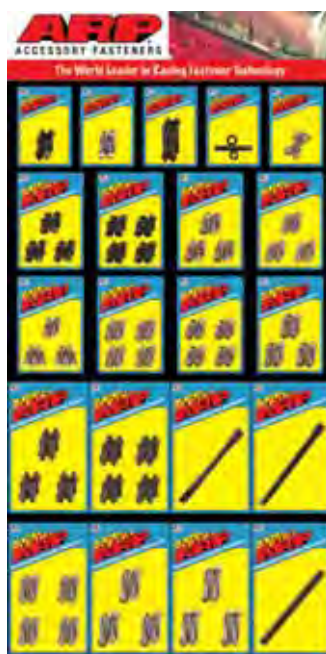
| Product | Part #   |
|---------|----------|
| Banner  | 999-9950 |



## PLAN-O-GRAMS

These product layouts will help you showcase popular items. They feature full color product photos, with provisions to display the product itself. The Plan-O-Gram is calculated on a 1" spaced grid pattern so it can be used on pegboard, gridwall, etc. The first offering measures approximately 2' wide by 4' tall, with a larger version under development at press time.

| Product                          | Part #   |
|----------------------------------|----------|
| Driveline Planogram - 24" x 48"  | 999-9975 |
| Accessory Planogram - 24" x 48"  | 999-9976 |
| Driveline Header Card - 24" x 5" | 999-9977 |
| Accessory Header Card - 24" x 5" | 999-9978 |
| General Header Card - 24" x 5"   | 999-9979 |



The World Leader in Racing Fastener Technology



The World Leader in Racing Fastener Technology



The World Leader in Racing Fastener Technology



# TRIBUTE TO SMOKEY YUNICK

For many years "Smokey" Yunick served as a valued tech consultant and spokesman for ARP. He was a popular host of our Tech Seminars at trade shows, and his knowledge of fasteners was truly astounding. Smokey passed away in 2001, but his wit and wisdom will live on. Here are a few of his observations and tech tips. R.I.P, Smokey!

Yesterday, fastener technology was pretty much "cut and try." Often times the thinking was, if it breaks go to one size bigger. The game of substituting aircraft fasteners didn't work either. Although the quality was there, aviation fasteners simply didn't exist for across-the-board substitution. They still don't.

In real life there was no bullet-proof manufacturer of fasteners specifically for race cars. There were attempts by various fastener manufacturers to claim expertise on a few special applications like rod bolts and wheel studs. But in reality, results were mixed, from good to terrible.



Hall of Fame Mechanic  
"Smokey" Yunick

It's this simple; properly designing racing fasteners requires the skills of metallurgists, stress analysts and engineers. And to make them requires special machinery and manufacturing techniques. It is also a fact that there is no way to do this cheaply, or in high volume production.

I was asked to be a spokesman for ARP. Because I had never done this before, I made it a point to visit the ARP manufacturing facilities to see if their products were good enough for me to endorse comfortably. The visit blew my mind. I've been around some nut and bolt joints before, but nothing I'd seen before could compare with the quality of inspection of the raw materials and their manufacturing process.

## Examining the "Over-Kill" fallacy

If there's one thing I've heard over and over from visitors to trade shows and races it's, *"Your fasteners are great. I'm not having any problems but I'm being told, by your competitors, that ARP is over-kill and therefore I'm wasting some money when I buy ARP pan bolts, manifold bolts or just about everything except for certain critical engine, drive train or suspension fasteners."* My first instinct is to say they are full of \_ \_ \_ \_.

But the subject is worth talking about. Cost is an important consideration when you choose a particular vendor's offering. Still, if you use lesser quality fasteners and they were not subject to many assembly and disassembly cycles, by people with varying skills from professional to rank amateur. Maybe, just maybe, you could make a case for minimum grade fasteners that are over designed, size-wise, to allow a reasonably safe application for conservative usage.

Now, let's get back in our world. The real world. We can expect the engines and vehicles to be leaned on, from a little to beyond any sensible extreme. We can expect 10 or more assembly/disassembly cycles. We can expect over-torquing, which will leave the fastener looking 100% but actually in a condition RED, semi-failed mode. We can expect some fasteners that are minimal in quality to end up in a critical, high-stress area. We can't expect everyone to be able to look at a fastener and determine its quality by looks, or even by markings. So we leave ourselves wide open for expensive and possibly dangerous results. For the amount of money saved by "type rating" every fastener's capability, and consideration of a long range view of the best mix of customers, I recommend all fasteners be of a quality that *does* exceed the minimum standards.

## "It's to your advantage to know fasteners."

To thoroughly understand it all would require at least 4 specific engineering degrees and 20 years of hands on experience in each. Nothing is forever, but take my word for it, ARP is the only game in town today. Just about every successful racer I know today uses their stuff 100%. You can help yourself in reference to material specs, thread lube and torque techniques, also in fastener maintenance and handling. If you do a good job here, you'll never lose position in a race from fastener failure.

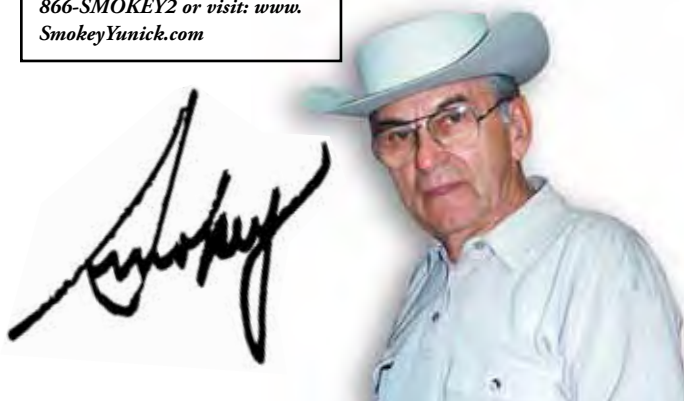
## There are many "little things" to consider

1. When you use a locking chemical for studs, bolts or even nuts, consider if you really need it.
2. If you are using a locking chemical, don't force nuts off or studs out without a proper first step, like heat or release chemical.
3. If you can't easily screw a nut and bolt together by hand they shouldn't be used.
4. Consider the importance in regard to how many exposed threads are left when fastener is set. Turns out this has a bearing on necessary torque and ultimate strength of the fastener.
5. Gradually try to understand and learn the difference in the various steels used in fasteners.
6. Turns out, the best way to consider a fastener as a spring of correct elasticity for that specific job. Yup, a fastener works best when stretched a specific amount.
7. You have got to start studying fasteners just like you do pistons, cranks, rods, etc. There's a lot to learn if you know what to look for.
8. The more you understand all the design limitations of fasteners, the better the engine durability will be.
9. If you can't stretch the bolt enough, it can still fatigue, lose torque or get loose.
10. Use a stretch gauge whenever possible. This is the only fool-proof method of getting the correct clamping force.
11. Get access to a master gauge to check your torque wrenches. You'd be surprised at how many torque wrenches read incorrect.
12. Don't forget that you'll get different torque readings when using different lubricants.
13. Use ARP's moly lube whenever possible.

## Get the "Inside Scoop" in Smokey's book...

In addition to being one of racing's most famous innovators and personalities, Smokey Yunick was known for being opinionated on many matters. He told it like it was, according to Smokey. Before his passing, Yunick spent considerable effort compiling anecdotes from his illustrious career. It's a "must have" book for anyone who is into auto racing. From Daytona Beach to Indy, Smokey lets it rip!

For details on purchasing  
Smokey's book or apparel call  
866-SMOKEY2 or visit: [www.SmokeyYunick.com](http://www.SmokeyYunick.com)





## RACING JACKETS

Take your pick from the traditional black suede-like material or new "checkered flag" motif. There's a full nylon lining with a handy zippered pocket. A heavy-duty metal zipper provides closure, while an elastic waistband and cuffs, plus generous side pockets, round out the technical features. Graphically, there's a large ARP logo embroidered on the back and a smaller version in front. The jackets are available in sizes M to XXXL.

## HATS



## RACING T-SHIRTS

Our T-shirts are heavy-duty 100% cotton and built to last! Adult sizes are available in three popular colors: white, sand and ash while childrens sizes are available in white, orange and ash. On the back is a large silk-screened full-color graphic with a "blueprint" theme and a small Automotive Racing Products logo is screened on the front. ARP T-shirts are available in sizes Small to XXXL for adults and Small (6-8), Medium (10-12) and Large (14-16) for children. Please state sizes when ordering.

## UNIFORM PATCHES

Add color to your jacket, crew uniform, driving suit or shop apron with these top quality embroidered emblems. They measure approximately 5" wide by 2" tall.



## HOODED SWEATSHIRT



## ORDERING PROCEDURES

All apparel must be ordered directly from ARP. Our dealers do not handle apparel. You may charge the order to your Visa or Master Card account. Please make sure you order the correct sizes, as we have a very strict return policy. Appropriate shipping charges will be added to each order; plus sales tax for California residents.

## APPAREL



BLACK RACING JACKET



CHECKERED FLAG JACKET



RACING T-SHIRTS



## SWEATSHIRT

back



All ARP apparel is sold on the basis of your being responsible for sizes. If there is a problem, you must return the garment to ARP within a week of receipt. Any garment that has been worn and soiled, dry cleaned or laundered, cannot be returned.



## **ARP® Quality Fasteners... The Reliable Way To Assemble An Engine!**

### **Sales Policy & General Information**

Hours of Operation: 7:30 AM to 4:30 PM Monday through Friday (Pacific Standard Time). Will Call Hours: 8:00 AM to 4:00 PM Monday through Friday at Ventura location only. For technical assistance, direct all written correspondence to the address below or E-mail us at: [info@arpfasteners.com](mailto:info@arpfasteners.com) or log onto our website at [arp-bolts.com](http://arp-bolts.com)

### **Orders**

Call 805-339-2200 and request the order desk.  
FAX orders should be sent to 805-650-0742.

### **Prices**

All prices are subject to change without notice. Warehouse, Distributor and Jobber price lists are available directly from ARP or local parts suppliers. ARP® encourages local retail sales. In the event there is no supplier or special assistance is required, you may contact ARP® directly at 805-339-2200.

A list of international ARP® parts suppliers is continually updated at [arp-bolts.com](http://arp-bolts.com).

### **Terms**

Orders may be paid for using VISA, MasterCard or American Express. All orders and open accounts are subject to credit approval by ARP®.

### **Shipping**

Normal shipping is United Parcel Service Ground. Next Day Air, 2nd Day Air, and 3-Day Select are also available. Orders must be processed by 12:00 noon (PST). All orders are shipped freight collect.

### **Merchandise Returns**

Contact a customer service representative if you are not completely satisfied with the performance of a product manufactured by ARP® to obtain an RMA. Always include a copy of the original invoice.

**All ARP® Fasteners Are Proudly Made In The U.S.A.**

**ARP**  
automotive *Racing* products  
[www.arp-bolts.com](http://www.arp-bolts.com) 800-828-3045

1863 Eastman Ave., Ventura, CA 93003, USA • Local: 805-339-2200 • Fax: 805-650-0742  
**ARP® Special Projects Department—Ask us what we can make for you!**