

MANUFACTURING

Manufacturing Capabilities



FDI is recognized for manufacturing the very finest quality aerospace bolts, screws and small machined components. Our state-of-the-art facilities produce some of the most complex parts found on the market today. We make standard and custom Mil-Spec fasteners that consist of but, are not limited to AN, AS, DIN, DS, MIL, MS, NA, NAS, NASM and much more.



Custom Manufacturing



FDI's expertise is the modification of Fasteners and Custom Bolts and Screws designed to fit your specific applications. We routinely manufacture these fasteners in any size, with any material, and have wire EDM services to make any head style, standard or custom. FDI specializes in altered item drawing parts and custom blue printed fasteners.



Blank Bolts Program



Our Blank Bolts Program is designed to improve delivery times while providing you with added savings. FDI premanufactures lots that can be tested, and certified to spec at any point of the manufacturing process. We'll hold the excess partially finished pieces at our location so that when it is time for your next order they will be finished to your spec, as needed, in smaller amounts.



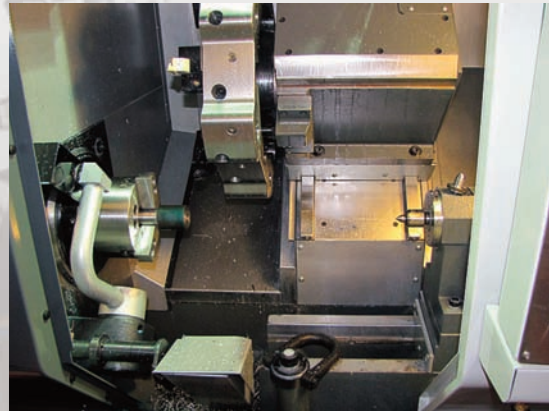
Standards Manufactured by Fastener Dimensions



Fastener Dimensions manufactures all of the Aerospace standard bolts and screws series plus ring-locked studs and insert and has the ability to expertly customize parts to your drawings.

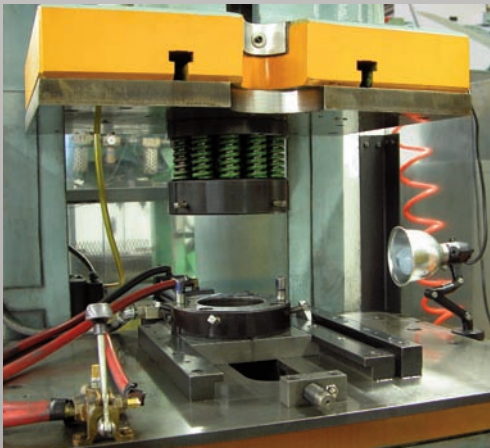
Manufacturing Equipment

Fastener Dimensions, Inc. manufactures the finest quality aerospace bolts, screws and small machined components. We have the technology and experience to meet and exceed the most challenging quality standards. With our new state-of-the-art facilities, we have produced some of the most complicated parts found on the market today. We manufacture standard and custom Mil-Spec fasteners on a daily basis. These parts also consist of but, are not limited to AN, AS, DIN, DS, MIL, MS, NA, NAS, NASM and much more. We specialize in A286, Waspaloy, Titanium and Inconel.



Hot Forging Department

- 1 – 60 Ton OBI Hot Forging Press
- 1 – 80 Ton OBI Hot Forging Presses
- 1 – 400 Ton AIDA Punch Press
*Equipped with Slide Table
Cap 30" long heading capacity*
- 1 – 110 Ton OBI Hot Forging Press
*Equipped with Slide Table
Cap 30" long heading capacity*
- 4 – 25KW Induction Heaters with Chillers
- 3 – Fully Automatic Bar Saws with Loaders



CNC Machine Department

- 3 – Haas SL10
- 1 – Haas SL20
- 2 – Haas ST15
- 1 – Haas ST25Y
- 2 - Super Mini-Mills with 4th Axis
- 1 – Haas TL-1 Tool Room Lathe
- 1 – 5 ft. x 10 ft. CNC Plasma Table

Thread Rolling Department

- 1 – Reed A22B
- 1 – Reed A22 HD
- 1 – Reed A22
with Single Cycle System
- 2 – Reed A22 STD
- 1 – Waterbury Farrel #10
- 1 – Waterbury Farrel #30
- 1 – Waterbury Farrel #50

Heat Treating Department

Currently an Outside Process

110 Ton OBI Hot Forging Press Equipped with Adjustable Slide Table and Custom Base Plate

Manufacturing Equipment

Our onsite facilities feature operations such as CNC Turning, CNC Milling, CNC Screw Machining, CNC Wire and Sinker EDM's, Centerless Grinding, Thread Rolling, Fillet Rolling, Tool Making, Tool Design, Fastener Drilling for safety wire, Hot Forging up to 1 1/2" diameter and over 30 inches in length under the head, among many other high-precision processes.



Centerless Grinding Department

- 5 – Cincinnati OM #2
- Grinding Tolerance +/- .00001
- In-feed and Thru-feed Tooling and Equipment

EDM Department

- Makino U3 Heat CNC Wire EDM
- Charmilles Sinker EDM

General Tool Support Equipment

- 2 – Bridgeport Milling Machines
- 1 – Hardinge DV59 Lathe
- 1 – Hardinge HLV Lathe
- 2 – Harig Surface Grinders
- 1 – Band Saw Vertical 20"
- 1 – Clausing 18" Gap Lathe
- Multiple pieces of Support Equipment and Secondary Machinery

Drilling Safety Wire Department

- 60 – Custom-built Automatic Drill Presses
- 150 – Custom Fastener Drilling Fixtures (for safety wire and cotter pin holes)
- 3 Corner, Flat-to-Flat 1, 2 and 3 holes thru, Shank Drilling, Index Drilling (for multiple holes thru)

Inspection Equipment

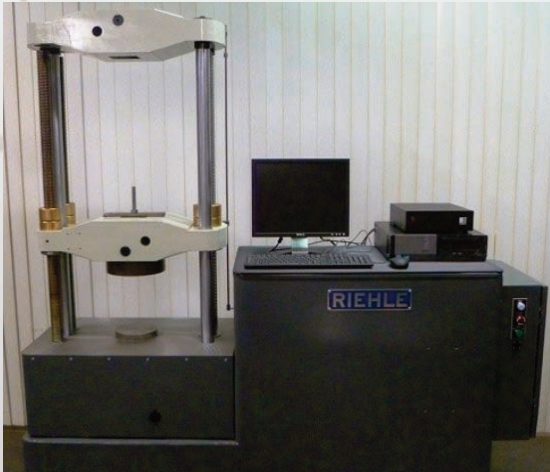
- Johnson segment and Tri-Roll gauges, UNF, UNC, UNEF, UNJF, UNR, UNRF, UNJC Segments. Internal and External segments are on site.
- Multiple Optical Comparators up to 30"
- Micrometers (all types)
- Knife Edge Veneers
- Surface Plates up to 48"
- Height Gauges to 30"
- Bore Gauges
- Thread Ring Gauges
- Plug Gauges
- Hex Gauges
- Keyence Inspection Machine



- Full Dimension Inspection
- Certified by the U.S. Government for System 21, 22 and 23
- FAI- 9102

Laboratory Testing and Evaluation

As a family owned company, Fastener Dimensions Inc. has always taken the quality of our products and services as a personal reflection of our standards. We carefully inspect each part that we make at every step of the manufacturing process and have procedures in place to ensure a level of excellence that meets even the most demanding requirements.



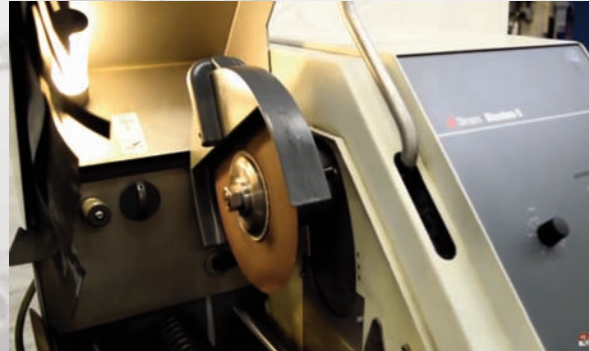
Laboratory Testing of Fasteners

Destructive Testing

- Ultimate Tensile, Axial Tensile, Wedge Tensile, Yield Tensile Strength test
- Riehle 60,000 LB.
- Riehle 300,000 LB.
- Clamp Furnace for elevated temp. testing
- Stress Rupture
- Creep Rupture
- Fatigue Testing
- Clamp Furnace to perform elevated temp. Fatigue test

Non-Destructive Testing (NDT)

- Florescent Penetrant Inspection
- Magnetic Partial Inspection



Metallurgical Examination Laboratory

Mounting

- Struers Cito-Press 5 – Mounting Press
 - Pace Tech TP-7001-Mounting Press
- Cutting Specimen Preparation

Cutting Specimen Preparation

- Struers Labotom 5 Metallurgical Specimen Saw
- Lecco 15"
- Lecco 8" Automatic

Polishing and Grinding

- 2 – Pace Nani 2000T with Automatic Heads

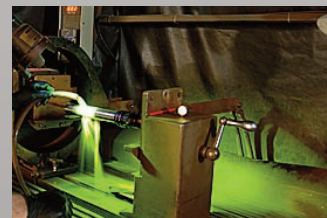
Specimen Evaluation and Inspection

- 5 Stereo Microscopes with Digital Camera
- Pace IM-5000 Metallurgical Microscope with Digital Camera

Hardness Testing

(Rockwell, Brinell, Knoop, Vickers)

- Wilson Rockwell Model: 4JR
- Lecco Model LM700AT With Digital Camera



***We can manufacture any bolt in any head configuration and any material.
AN, AS, MS, NAS, NASM fasteners – standard and custom***

Machining Options

- Hot Heading
- Cold Heading
- CNC Turning
- CNC Milling 4, 5 & 6 Axis Available
- CNC Screw Machines
- CNC Swiss Operations
- Conventional Screw Machines
(Brown & Sharp)

***FDI Specializes
in Custom Parts
to Blueprint.***

.....

*If you can't find
the parts you need
on our web site
we can manufacture
them on a short run
or outsource them
for you.*

.....

Onsite Secondary Operations

- Broaching
- Roll Forming
- Fillet Rolling
- Wire Bending
- Tool Making

Precision Hole Drilling & Tapping

- Gun Drilling
- Three Corner Head Drilling
- One Hole Thru Head
- Index Multi-Hole Drilling
- Shank Type Bleeder
Hole Drilling
- Thread Drilling for Cotter Pins
- Drilling Holes for Safety Wire

Part Marking

- Dot Peen / Vibro Engraving
- Electro Etch
- Impression Stamping
- Wire Tag Identification
- Ink Stamp
- Laser Engraving
- Custom Engraving All Types
- Knurling

- Stamping
- Polishing
- Tumbling
- Abrasive Blasting

Thread Forming

- Thread Cutting
- Thread Rolling
- Thread Grinding

Precision Grinding

- CNC Surface Grinding
- Centerless Grinding
.0001" Tolerance
- Profile Grinding
- Crush Grinding
- OD Grinding
- ID Grinding

EDM Services

- CNC Wire Cut EDM
- Sinker EDM
- EDM Precision
Hole Popping

Plating or Finish

Cadmium	Aluminum Coating	Anodize	Dry Lube
Silver	NAS4006	Alodine	Solid Film Lubes
Gold	Vacuum Cadmium	Electro-less Cadmium	Chem Film
Zinc	Diffused Nickel	Mechanical Cadmium	Teflon
Nickel	Olive Drab	Cadmium Fluoborate NAS672	Oil
Hard Chrome	Paint (all types)	Passivation	Grease
Hot-Dip Galvanize	Black Oxide	Phosphate	Cosmoline

We have the ability and technology to work with all of the high-strength aerospace alloys.

Fastener Dimensions has years of experience working with every standard material, as well as, with special alloys and exotic materials.

Standard & Exotic Materials

Alloy Steel and Tool Steel

- 1095, 135 MOD
- 17-22A
- 17-22A(S)
- 19-9DL
- 300M
- 4130
- 4140
- 4142 MOD
- 4320H
- 4330 MOD
- 4340
- 4620
- 52100
- 6130
- 6150
- 8620
- 8735
- 8740
- 9160
- 9310
- AERMET 100
- AF-1410
- ALLOY 53
- BG-42
- CBS 1000M
- CBS50NIL
- CBS 600
- CROMOLOY
- CRONIDUR 30
- CS5-42L
- CUSTOM 450 & 455
- D6
- D6AC
- FERRIUM C64
- GALL TOUGH
- H13
- H11
- HASTELOY S
- HP9-4-20, -25 & -30
- HY-180
- HY-TUF
- M50
- MAR300
- MARAGING
- MARAGING 250 & 300

Stainless Steel

- 13-8
- 15-5 PH
- 17-4
- 17-4 PH
- 301, 302, 303, 303SE, 303PH, 304, 304L, 305, 309S, 310, 310S, 316, 316L, 317L, 321, 330, 333, 347, 410, 420, 422, 430, 431, 440
- 17-7 PH
- 21-6-9
- A286
- AM350
- AM355
- CUSTOM 450, 455, 465
- DISCALOY
- GREEK ASCOLOY
- JETHETE M-152
- NITRONIC 50 & 60
- PH15-7 MO
- PYROWEAR 675

Titanium Alloy

- 3.0AL 2.5V
- 6-2-4-2 / 6AL 2SN 4ZR 2MO
- 6-2-4-6
- 6-4, 6AL-4V & 6AL-4V STA
- 6-6-2
- GRADE 5

Inconel

- Astrology M
- D-979
- FM62, 69, 92
- Hastelloy C, S, W, X
- Haynes 230, 230W
- Inconel 600, 601, 617, 625, 702, 718, 718SPF, 722, X750
- Incoloy 800, 801, 901, 909

Nickel Copper

- CU-NI
- Monel 400, 502, K500

Aluminum

- 1100
- 2011
- 2014
- 2017
- 2018
- 2024
- 2090
- 2124
- 2219
- 2424
- 2618
- 3003
- 4032
- 5020
- 5052
- 5083
- 5086
- 5454
- 5456
- 6061
- 6063
- 6066
- 6151
- 6162
- 623
- 6262
- 630
- 642
- 7049
- 7050
- 7075
- 7078
- 7149
- 7150
- 7175
- 7178
- 7249
- 7475

Cobalt

- Engiloy
- Haynes 188
- HS-556
- L-605
- MP159
- MP35n
- N-155
- Stellite 6B
- F-75
- TJA-1537
- Monel R405
- Nichrome V
- Nickel 201, 25
- Nimonic 263, 90
- Rene 41
- Waspaloy

Miscellaneous

- Beryllium Copper
- Brass 360
- Bronze ni-al-630
- Nylon
- Teflon®
- Fry alloy c276
- Fry Alloy X

And far too many more materials than there is room to list.

Custom Manufactured Fasteners and Components

PARTS SPECIALLY MADE TO ORDER BY FDI



Fastener Dimensions, Inc. specializes in the modification of fasteners and the design of Custom Bolts and Screws to fit your specific applications. We have the ability to manufacture these fasteners in any size and with any material. FDI has wire EDM services to make any head style, standard or custom. We are well known for our ability to custom modify AN, MS, NAS, NASM and AS fasteners to your blueprint and routinely make parts like this for Boeing, Sikorsky, ITT, PCX, and Magellan, to name a just few.

Custom bolts are available for manufacturer in any size, any material and any head style. We specialize in altered item drawing parts and custom blue printed fasteners.



If you can imagine it, we can make it for you.

FDI combines strong engineering capabilities with expert technical support to help OEMs develop new products and designs. Fastener Dimensions is at the forefront of current technology – our goal is to surpass customer expectations. Our engineers are on call and always ready to assist with your designs.

With our decades of knowledge and experience, combined with our full complement of onsite operations, FDI has produced some of the most intricate fasteners on the market. Call us or visit our web site to see how we can assist you with any of your applications.



Blank Bolts Program

BOLTS DELIVERED IN ONLY THE QUANTITIES THAT YOU NEED

What is a Blank?

A blank is an unfinished bolt, held in reserve, to be completed for future orders.

Fastener Dimensions maintains a supply of semi-finished bolts in inventory manufactured in standard diameters, head styles, lengths and materials. This is an investment that we make to give us the ability to get a head-start on your orders. This time-saving practice allows us to rapidly fulfill short runs and expedited orders with quicker turn-around times, smaller quantities, and minimal lead time requirements.

How the Process Works



Raw material is hand selected and procured.



Bars are cut to length on our fully-automated bar saw.



The trimmed slugs are induction heated.



Forging Bars into Headed Blanks



The red hot slug is brought to the press



slugs are hot forged



Headed blanks are heat-treated,



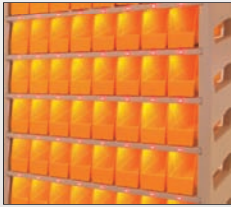
media blasted and descaled

Our Hot Forging Equipment with Adjustable Slide Tables and Custom Base Plates can produce bolts in any diameter from #8 to 2 inches and any length up to 30 inches under the head.

Headed blanks are set aside and stored in bins for future finishing. The stored blanks can be pulled for further refinements at any time to be completed.

Blank Bolts Program

BOLTS DELIVERED IN ONLY THE QUANTITIES THAT YOU NEED



blanks pulled from bin once order is received



then are sent to the grinding department,



CNC machined



ground pieces are then thread rolled



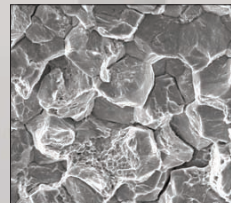
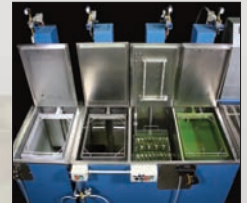
secondary operations performed if needed



electroplated, passivated or coated



parts undergo full dimensional inspection



Everyday advantages... How do our customers benefit?

- You do not need to have placed an order to benefit from our Blank Bolts program.
- Order only the quantities that you need.
- No need to store leftover inventory.
- You aren't required to place a minimum order that exceeds your immediate assembly needs.
- Reduce the need for rushed orders.
- Improve delivery times.
- Depending on the complexity, delivery can sometimes be as soon as in under two weeks time.

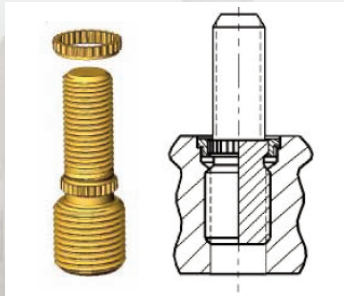
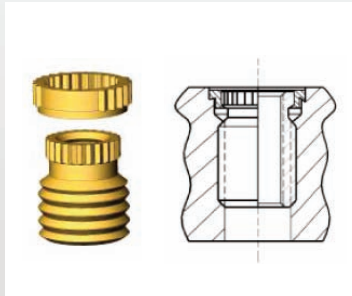
With a Long Term Agreement there's even greater ways that you benefit:

With a commitment for future orders of a specific part or parts, FDI will prepare lots that can be premanufactured, tested, and certified at any point of the process. When your shipment is needed, the semi-finished blanks are pulled from inventory to be completed.

- Customer owns inventory.
- Lock in prices and save with LTOs.
- FDI holds excess partially finished pieces at our location until you are ready to reorder.
- Efficiency improves fulfillment time.
- Tighter control of regulating the influx of new replenished inventory.

Manufacturer of Military Standard Ring-Locked Fasteners

Used in mated pairs, Ring-Locked Inserts and Studs are ideal for use in gear boxes, engines, pumps and vehicles in general. They provide excellent performance in high fatigue/high vibration applications. Their superior torsional resistance combined with a serrated Lock-Ring, prevent the stud from backing out, in either soft or hard parent materials. FDI manufactures and stocks many of the most popular series so that our customers can benefit from shorter lead times and expedited deliveries.



Ring-locked Inserts

AS51991/MS51991
AS51993/MS51993
MS51498

Ring-locked Studs

AS51989/MS51989
AS51992/MS51992
MS51497
MS51551



Ring-locked Inserts & Studs

- Standard and oversize styles available.
- Manufactured in both inch and metric threads.
- Solid configurations for plugs or special requirements.
- Hydraulic sealing configurations (low pressure)
- Produced in all common aerospace materials to MS, AN, NAS, SAE and other specifications.
- All styles available in standard configurations or with internal thread locking features.

Installation and Removal Tools

SPECIAL TOOLING REQUIRED



Fastener Dimensions stocks the entire line of special tools required for installation and removal of Inserts and Studs.

Fastener Dimensions specializes in the manufacture of made-to-print custom parts, as well as, standard MS parts.

MS51497

MILITARY PART NUMBER	MILITARY PART NUMBER	MILITARY PART NUMBER
MS51497D502-8	MS51497E642-8	MS51497E648-(19 thru 64)
MS51497D502-(9 thru 64)	MS51497E642-(9 thru 64)	MS51497A642-8
MS51497D503-9	MS51497E643-9	MS51497A642-(9 thru 64)
MS51497D503-10	MS51497E643-10	MS51497A643-9
MS51497D503-11	MS51497E643-11	MS51497A643-10
MS51497D503-(12 thru 64)	MS5149E7643-(12 thru 64)	MS51497A643-11
MS51497D504-11	MS51497E644-11	MS514976A43-(12 thru 64)
MS51497D504-12	MS5149E7644-12	MS51497A644-11
MS51497D504-(13 thru 64)	MS51497E644-(13 thru 64)	MS51497A644-12
MS51497D505-12	MS5149E7645-12	MS51497A644-(13 thru 64)
MS51497D505-13	MS51497E645-13	MS514976A45-12
MS51497D505-(14 thru 64)	MS514976E45-(14 thru 64)	MS51497A645-13
MS51497D506-15	MS5149E7646-15	MS514976A45-(14 thru 64)
MS51497D506-(16 thru 64)	MS51497E646-(16 thru 64)	MS51497A646-15
MS51497D507-16	MS5149E7647-16	MS51497A646-(16 thru 64)
MS514970507-(17 thru 64)	MS51497E647-(17 thru 64)	MS51497A647-16
MS51497D508-18	MS5149E7648-18	MS51497A647-(17 thru 64)
MSS14970508-(19 thru 64)	MS51497E648-(19 thru 64)	MS514976A48-18
MS51497E502-8	MS5149E7508-(19 thru 64)	MS51497A648-(19 thru 64)
MS51497E502-(9 thru 64)	MS51497E642-8	MS51497A802-8
MS51497E503-9	MS51497E642-(9 thru 64)	MS51497A802-(9 thru 64)
MS51497E503-10	MS51497E643-9	MS51497A803-9
MS51497E50113-11	MS51497E643-10	MS51497A803-10
MS5149E7503-(12 thru 64)	MS51497E643-11	
MS51497E504-11	MS5149E7643-(12 thru 64)	
MS51497E504-12	MS51497E644-11	
MS51497E504-(13 thru 64)	MS5149E7644-12	
MS51497E505-12	MS51497E464-(13 thru 64)	
MS51497E505-13	MS5149E7645-12	
MS51497E505-(14 thru 64)	MS51497E645-13	
MS51497E506-15	MS514976E45-(14 thru 64)	
MS51497E506-(16 thru 64)	MS5149E7646-15	
MS51497E507-16	MS5149E7646-16	
MS5149E7507-(17 thru 64)	MS5149E7647-16	
MS51497E508-18	MS51497E647-(17 thru 64)	
MS5149E7508-(19 thru 64)	MS5149E7648-18	

MS51551

MILITARY PART NUMBER

MS51551D103-(11 thru 24)

MS51551D103A-(11 thru 24)

MS51551D103B-(11 thru 24)

MS51551D104-(11 thru 54)

MS51551D104A-(11 thru 54)

MS51551D104B-(11 thru 54)

MS51551D105-(12 thru 64)

MILITARY PART NUMBER

MS51551D105A-(12 thru 64)

MS51551D105B-(12 thru 64)

MS51551D106-(13 thru 64)

MS51551D106A-(13 thru 64)

MS51551D106B-(13 thru 64)

MS51551D107-(14 thru 64)

MS51551D107A-(14 thru 64)

MILITARY PART NUMBER

MS51551D107B-(14 thru 64)

MS51551D108-(15 thru 54)

MS51551D108A-(15 thru 54)

MS51551D108B-(15 thru 54)

MS51551D109-(17 thru 54)

MS51551D109A-(17 thru 54)

MS51551D109B-(17 thru 54)

MS51989

MILITARY PART NUMBER

MS51989-102- (L)
MS51989-103- (L)
MS51989-104- (L)
MS51989-105- (L)
MS51989-106- (L)
MS51989-107- (L)
MS51989-108- (L)
MS51989-109- (L)
MS51989-110- (L)
MS51989-111- (L)
MS51989-112- (L)
MS51989-202- (L)
MS51989-203- (L)
MS51989-204- (L)
MS51989-205- (L)
MS51989-206- (L)
MS51989-207- (L)
MS51989-208- (L)
MS51989-209- (L)
MS51989-210- (L)
MS51989-211- (L)
MS51989-212- (L)
MS51989-302- (L)
MS51989-303- (L)
MS51989-304- (L)
MS51989-305- (L)

MILITARY PART NUMBER

MS51989-306- (L)
MS51989-307- (L)
MS51989-308- (L)
MS51989-309- (L)
MS51989-310- (L)
MS51989-311- (L)
MS51989-312- (L)
MS51989-402- (L)
MS51989-403- (L)
MS51989-404- (L)
MS51989-405- (L)
MS51989-406- (L)
MS51989-407- (L)
MS51989-408- (L)
MS51989-409- (L)
MS51989-410- (L)
MS51989-411- (L)
MS51989-412- (L)

LOCK RINGS

MILITARY PART NUMBER

MS51990-102P
MS51990-103P
MS51990-104P
MS51990-105P
MS51990-106P
MS51990-107P
MS51990-108P
MS51990-109P
MS51990-110P
MS51990-111P
MS51990-112P
MS51990-113P
MS51990-114P
MS51990E102P
MS51990E103P
MS51990E104P
MS51990E105P
MS51990E106P
MS51990E107P
MS51990E108P
MS51990E109P
MS51990E110P
MS51990E111P
MS51990E112P
MS51990E113P
MS51990E114P

MS51992

MILITARY PART NUMBER	MILITARY PART NUMBER	MILITARY PART NUMBER
MS51992C642- (9 thru 64)	MS51992C805- (12 thru 15)	MS51992E508-18
MS51992C643- (12 thru 64)	MS51992C806- (15 thru 18)	MS51992E508- (19 thru 64)
MS51992C644- (13 thru 64)	MS51992C807- (16 thru 17)	MS51992E642-8
MS51992C645- (14 thru 64)	MS51992C808- (18 thru 20)	MS51992E642- (9 thru 64)
MS51992C646- (17 thru 64)	MS51992D502-8	MS51992E643-9
MS51992C647- (18 thru 64)	MS51992D502- (9 thru 64)	MS51992E643-10
MS51992C648- (19 thru 64)	MS51992D503-9	MS51992E643-11
MS51992C802- (11 thru 64)	MS51992D503-10	MS51992E643- (12 thru 64)
MS51992C803- (13 thru 64)	MS51992D503-11	MS51992E644-11
MS51992C804- (15 thru 64)	MS51992D504- (12 thru 64)	MS51992E644-12
MS51992C805- (16 thru 64)	MS51992D504-11	MS51992E644- (13 thru 64)
MS51992C806- (17 thru 64)	MS51992D504-12	MS51992E645-12
MS51992C807- (18 thru 64)	MS51992D504- (13 thru 64)	MS51992E645-13
MS51992C808- (21 thru 64)	MS51992D505-12	MS51992E645- (14 thru 64)
MS51992C502- (11 thru 64)	MS51992D505-13	MS51992E646-15
MS51992C503- (13 thru 64)	MS51992D505- (14 thru 64)	MS51992E646- (16 thru 64)
MS51992C504- (15 thru 64)	MS51992D506-15	MS51992E647-16
MS51992C505- (16 thru 64)	MS51992D506- (16 thru 64)	MS51992E647- (17 thru 64)
MS51992C506- (17 thru 64)	MS51992D507-16	MS51992E648-18
MS51992C507- (18 thru 64)	MS51992D507- (17 thru 64)	MS51992E648- (19 thru 64)
MS51992C508- (21 thru 64)	MS51992D508-18	MS51992E802-8
MS51992C502- (8 thru 10)	MS51992D508- (19 thru 64)	MS51992E802- (9 thru 64)
MS51992C503- (9 thru 12)	MS51992E502-8	MS51992E803-9
MS51992C504- (11 thru 14)	MS51992E502- (9 thru 64)	MS51992E803-10
MS51992C505- (12 thru 15)	MS51992E503-9	MS51992E803-11
MS51992C506- (15 thru 18)	MS51992E503-10	MS51992E803- (12 thru 64)
MS51992C507- (16 thru 17)	MS51992E503-11	MS51992E804-11
MS51992C508- (18 thru 20)	MS51992E503- (12 thru 64)	MS5199204-12
MS51992C642- (8 thru 10)	MS51992E504-11	MS51992E804- (13 thru 64)
MS51992C643- (9 thru 12)	MS51992E504-12	MS51992E805-12
MS51992C644- (11 thru 14)	MS51992E504- (13 thru 64)	MS51992E805-13
MS51992C645- (12 thru 15)	MS51992E505-12	MS51992E805- (14 thru 64)
MS51992C646- (15 thru 18)	MS51992E505-13	MS51992E806-15
MS51992C647- (16 thru 17)	MS51992E505- (14 thru 64)	MS51992E806- (16 thru 64)
MS51992C648- (18 thru 20)	MS51992E506-15	MS51992E807-16
MS51992C802- (8 thru 10)	MS51992E506- (16 thru 64)	MS51992E80W- (17 thru 64)
MS51992C803- (9 thru 12)	MS51992E507-16	MS51992E808-18
MS51992C804- (11 thru 14)	MS51992E507- (17 thru 64)	MS51992E808- (19 thru 64)